America's Coast Guard

Safeguarding U.S. Maritime Safety and Security in the 21st Century

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I. A New Perspective

The new century finds the United States Coast Guard at a critical crossroads. Every day, the men and women of the Coast Guard put their lives on the line to save others in danger at sea, enforce the nation's laws and treaties, protect the marine environment, ensure a safe and efficient marine transportation system, and support America's diplomatic and defense interests world wide. However, despite the American public's warm regard for its "Coasties," questions have been raised about the continued relevancy of the Coast Guard for these mission areas. Furthermore, for some there is great uncertainty whether it would be "good government" to make the significant investment in scarce public resources – even in an era of projected $1 trillion federal budget surpluses – for programs that would in effect recapitalize the Coast Guard for its third century of service to the United States, particularly in the contributions that the Service can make to the nation's maritime security.

"Indeed, these are perplexing times for the Coast Guard," James Kitfield noted in the October 1999 issue of *National Journal*. "In recent years,

> the Coast Guard has seen a dramatic increase in its role of interdicting drug traffickers, enforcing fisheries legislation, and controlling alien migration at sea. Overseas, its ships routinely operate alongside Navy vessels to enforce maritime embargoes. A heavy hurricane season has highlighted the mission with which most Americans identify the Coast Guard – saving lives at sea. Yet, because the Coast Guard resides in the Department of Transportation during peacetime, and because it remains an oft-neglected stepchild in terms of its significant law enforcement and national security roles, it finds itself under severe budget strain.[1]

In that regard, as the debates over the allocation of federal resources continue, it is important to keep in mind that the Coast Guard is a **military, multimission, maritime service** within the Department of Transportation and one of the nation's five Armed Services.[2] For more than two centuries, its core role has been to protect the public, the environment, and U.S. economic and security interests, in America's ports and inland waterways, along the nation's coasts, on international waters, or in any maritime region in which U.S. interests may be at risk. Since its founding as the Revenue Cutter Service in 1790, the Coast Guard has continued to provide unique services and benefits to America's maritime security because of its distinctive blend of humanitarian, law enforcement, diplomatic, and military capabilities, which undergird the Service's five maritime security roles:

- Maritime Safety
- Maritime Mobility
- Maritime Law Enforcement
- Marine Environmental Protection
- National Defense

"There is a growing awareness among Americans of the many ways the oceans influence our daily lives. Farmers in the nation's heartland depend upon weather systems driven by the interaction of the oceans and atmosphere to nourish their crops. Citizens who have never seen an ocean may benefit from energy and food from the waters off our coasts. Marine organisms provide the cure for many diseases and the promise of many more cures. Ocean-going vessels carry the bulk of our world trade, linking us to the global marketplace and keeping our economy strong. Our naval forces, which preserve the international freedoms of navigation so crucial to maritime commerce and global stability, use ocean data daily in their worldwide operations. A strong national security is essential to our nation's ocean policy."

The Honorable Richard Danzig
Secretary of the Navy
The Honorable William M. Daley
Secretary of Commerce
Turning to the Sea: America's Ocean Future
September 1999

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[1] James Kitfield, "The Stepchild Steps Out," *National Journal*, October 1999.

[2] *Coast Guard 2020: Ready Today...Preparing for Tomorrow* (Washington, D.C.: U.S. Coast Guard, 1998), pp. i, 1, 3. At his change of command ceremony in May 1998, Coast Guard Commandant Admiral James M. Loy stated that "Since 1790, we have been a military, multimissioned, maritime service. That simplicity offers great strength...Military...Multimissioned... Maritime.... They remain great imperatives for us, not because they're traditional, but because they give us the discipline, the adaptability, and the focus to accomplish the difficult tasks America demands of us." Appendix A provides a summary of legislative mandates for the Coast Guard's national maritime security roles, missions, and tasks. See also, "21st Century Hemispheric Maritime Security: A USCG Deepwater Vision" (Headquarters, U.S. Coast Guard G-OC, 30 October 1998), which served as the foundation for this report.

The objective of this report is to help the Coast Guard, the Departments of Transportation and Defense, other executive departments and agencies, the Congress, the Service's "partners" and "share-holders" – in state and local governments, U.S. and foreign industry, foreign governments, and private organizations in the United States and overseas – and the American public think broadly about future national security dynamics and trends. Important issues have been addressed – how these dynamics and trends will affect **America's maritime security** and hence the Coast Guard's current and future roles, missions, functions, and requirements. It discusses an expansive concept of U.S. maritime security interests, focusing on current and future threats to America's interests in its territorial seas and Exclusive Economic Zones (EEZs) as well as on the high seas. It provides an overview of the historical, strategic, policy, and operational contexts for the Coast Guard's maritime security roles, missions, functions, and tasks, and how the Service can most effectively and efficiently serve the United States in the 21st century. And it addresses the platforms and systems capabilities needed to satisfy current and future requirements.

U.S. Coast Guard Maritime Security Roles

- **Maritime Safety: Save lives and property at sea**
- **Marine Environmental Protection: Protect living and non-living marine resources**
- **Maritime Mobility: Provide a safe and efficient marine transportation system**
- **Maritime Law Enforcement: Uphold laws and treaties and defend maritime borders**
- **National Defense: Conduct military and defense operations**

A key focus of this report is on the Coast Guard's "Deepwater" operating environment and enduring as well as emerging needs in this region. The Deepwater operational area has been defined by the Service as operations conducted 50 miles or more to sea, although clearly Deepwater assets protect U.S. maritime security in regions much closer to the shore. Many of the Coast Guard's Deepwater capital assets are approaching or are at the ends of their service lives in block obsolescence. To deal with the need to modernize and replace these assets, the Coast Guard's **Integrated Deepwater Systems (IDS) Capabilities Replacement Project** has mapped out an innovative approach and program-plan to address all roles, missions, and functions and the subsystems, systems, and platforms needed to carry out the Service's multiple mandates.[3] Thus, another important objective of this paper is to inform U.S. and possible foreign industry partners about the full spectrum of Coast Guard Deepwater requirements, operations, and programs for the future.

U.S. Maritime Security Interests and Threats

America's maritime interests – its reliance upon the seas for food, commerce, and defense – have endured since colonial days. Today, on the cusp of a new millennium, the United States remains a major maritime nation, with a broad array of interests and concerns in the Arctic Ocean and Bering Sea, the Pacific Ocean, the Caribbean and Gulf of Mexico, and the Atlantic, which wash some 95,000 miles of coastline – in addition to many thousands of miles of river, lake, and navigable waterway shorelines throughout the United States. (Figure 1 illustrates the extent of U.S. territorial seas and exclusive economic zones.) America's future will remain tied inextricably to the seas. The seas link the nation with world commerce and trade, and allow us to project military power far from our shores to protect important U.S. interests and friends. But the seas also serve as highways for a bewildering variety of transnational threats and challenges that honor no national frontier.

[3] Specific system- and platform-level performance requirements for the Integrated Deepwater Systems elements has been provided by the Deepwater Project Office (G-ADW), "System Performance Specifications (SPS) for the Integrated Deepwater System," Attachment 0001/DTCG23-98-R-ADW0001, PRF-ADW-0001, 21 September 1998. Rather than replicate that information, this report addresses overarching strategic and operational concepts that the Operations Capability Directorate (G-OC), Headquarters, U.S. Coast Guard, believes are important. For additional public information, see the Deepwater Acquisition web page: www.uscg.mil/deepwater/.

Figure 1. U.S. Territorial Seas and Exclusive Economic Zones

As the Coast Guard looks to its third century of service, a complex mosaic of maritime users, interests, and transnational dangers – including pollution, illegal migration, drug-smuggling, international terrorism, and weapons proliferation, to name but a few – will challenge America as never before. To deal with these threats and challenges, the Service must continue to carry out several fundamental tasks that have been constant throughout the Coast Guard's history:

- **Provide credible presence** in and **conduct surveillance** of critical maritime regions
- **Detect, classify,** and **identify** targets of interest
- **Intercept** and **prosecute** those targets

At the dawn of the 21st century, the Coast Guard carries out its Deepwater tasks through routine patrols and focused, time-critical sorties conducted by high- and medium-endurance cutters, patrol boats and fixed- and rotary-wing aircraft. The success of these operations, in turn, depends upon Coast Guard, Joint-Service, and national-level command-and-control, communications, computers, intelligence, surveillance, and reconnaissance (C4ISR) systems. Much of what the Coast Guard does is aimed at deterring or preventing dangers and threats from materializing in the first place, and responding quickly and effectively to emergencies when deterrence and prevention are frustrated. These core tasks will be the basis for the Coast Guard's multifaceted contributions to the Nation's maritime security throughout the new century, whether the mission-objective is to rescue the distressed, to ensure safe maritime transport, to protect America's living marine resources and environment, to uphold the law on the sea, or to support U.S. diplomatic and military interests in far-flung regions of the world.

In essence, the Coast Guard will continue to provide maritime security that is a critical element in ensuring a healthy and clean marine environment, robust living and non-living marine resources, safe and efficient marine transportation and trade, homeland defense and maritime sovereignty – protecting U.S. citizens, interests, and friends at home and, increasingly, abroad. This is an expansive national security construct that reflects the realities of the next century. Indeed, no longer focused solely on military threats to the United States,

America's Maritime Security Interests

- **Living marine resources – protection of fisheries and other living marine resources**
- **Marine environment – protection of living marine resources' habitats, pollution prevention and control, response to and remediation of pollution incidents**
- **Marine transportation and trade – safe and efficient ports, harbors, and waterways; aids to navigation, domestic and international ice-breaking and patrol, safety of life at sea, search and rescue, response to maritime tragedies**
- **Maritime sovereignty and defense – protection of maritime borders, law enforcement, military and defense operations**

"national security" encompasses a rich tapestry of economic, social, environmental, political, diplomatic, cultural, *and* **military dimensions.** Indeed, a much more expansive construct has been articulated by the *President's National Security Strategy,* which recognizes that diverse and numerous threats – regional or state-centered threats, transnational threats, the spread of dangerous technologies, foreign intelligence collection, and failed states – must be countered through an integrated approach to defend the nation, shape the international environment, respond to crises, and prepare for an uncertain future.[4] Likewise, more than simply "guarding the coast," the Coast Guard has similarly broad responsibilities for safeguarding the global commons, and brings unique capabilities to the nation's full-spectrum, multi-agency response to America's maritime security needs.

"Most threats to U.S. interests were indigenous: voracious forces of societal change tearing at the fabric of developing societies; destabising overpopulation and overurbanization, coupled with underproductivity; new social, economic, and political ideas contesting with centuries-old rigidities; radical nationalism and militant sectarianism; clashes of ethnic and religions prejudices; and stress on educational systems wholly inadequate for dealing with the foregoing or with the onrush of new technologies compressing travel time and opening media vistas of distant lands of unimaginable wealth."

Discriminate Deterrence,
January 1988
Regional Conflict Working Group
Commission on Integrated Long-Term Strategy

America's need for maritime security does not limit Coast Guard operations to the waters off U.S. coasts and the "near-abroad" of the Western Hemisphere. Without doubt, many – if not most – critical Coast Guard roles, missions, functions, and operations will continue to be focused on safeguarding America's interests and needs in U.S. inland waters, territorial seas, and economic zones, as well as on the high seas areas of the regions close by U.S. sovereign territory. Still, waters and resources under U.S. jurisdiction total nearly 3.4 million square miles in area and encompass some of the most inhospitable marine environments in the world. (The eight U.S. central/western Pacific EEZs – surrounding the Hawaiian Islands and the Trust Territories of the Pacific – comprise more than 40 percent of the total U.S. EEZ area.) Even more importantly, the maritime security concept signifies that the Coast Guard must have the multimission capabilities to serve U.S. policies and support U.S. interests – alone or in concert with other U.S. agencies, allied and friendly forces, and in support of international organizations – in home waters or in any maritime area in which the President and U.S. regional Commanders-in-Chief (CinCs) determine the Coast Guard can provide important benefits to the nation. In what has been called a "pivotal states strategy," the Coast Guard must be seen as a key U.S. actor in American foreign policy aimed at a select group of countries – "pivotal states" – whose futures were poised at critical turning points, and whose fates would significantly affect regional, and even international, stability:

> The repercussions of rapid change in the developing world, including population growth, disruptive migration, and popular fundamentalist movements, are increasingly affecting industrialized countries, and even the United States can no longer isolate itself from them. Because it argues for both bilateral (and, in a complementary form, multilateral) cooperation to mitigate such pressures, a pivotal states strategy would encourage American policy makers to face these challenges before they directly threaten U.S. national security.[5]

General Charles E. Wilhelm, USMC, Commander-in-Chief, U.S. Southern Command, underscored this perception of the Coast Guard's roles in U.S. foreign policy in a 26 May 1999 letter to Mortimer L. Downey, Deputy Secretary of Transportation:

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[4] White House, *A National Security for a New Century* (Washington, D.C.: GPO, October 1998).

[5] Robert Chase, Emily Hill, and Paul Kennedy, eds., "Introduction" to *The Pivotal States: A New Framework for U.S. Policy in the Developing World* (New York: W.W. Norton & Company, 1999), p. 6.

The United States Coast Guard brings tremendous capabilities and contributions across a wide spectrum or regional engagement activities. Its role in the Southern Theater is a significant one, and will only grow as we continue to pursue a National Security Strategy that directs us to engage and shape an extremely diverse, dynamic, and expansive environment.[6]

However, compared to the threats confronting the Nation or to the technology available to the Service, the Coast Guard's ability to carry out its core tasks has declined, in some instances significantly. During the past half-century, the Service's missions have increased in number and complexity. As technology and the sophistication of the threats and challenges have increased, Coast Guard capabilities have remained constant, at best. Moreover, in some military/defense operations areas – littoral anti-submarine warfare or naval gunfire support, for example – there has been marked degradation, if not abandonment of capability. With this situation in mind, the Integrated Deepwater Systems Project is providing the opportunity to assess and prioritize all requirements so that the Coast Guard can respond with the right combination of capabilities in its shoreside command-and-control systems, cutters, and aircraft.

U.S. Coast Guard Deepwater Operations

- **Generally 50 nautical miles or more from U.S. shores**
- **Long transit distance to reach operating areas**
- **Extended on-scene presence independent of support**
- **Sustained operations in severe weather and high sea conditions**
- **Forward-deployed, often with other U.S., allied, and coalition naval, and maritime forces**

"Deepwater" Operational Environment

Unlike Coast Guard operations in coastal and inland waterways, Deepwater missions typically require a long-term, continuous presence away from home stations, sometimes for months on end, and the ability to operate independently in severe environments – from Arctic to tropical and equatorial climates – 24 hours a day, every day, wherever the demands of national maritime security require a Coast Guard humanitarian, law enforcement, or military presence. Certainly, other marine, coastal, and inland waterways are vital to the Nation, and these will grow in importance as burgeoning and many times competing demands are placed on these regions. And, the adaptable and multimission character of Deepwater cutter, aircraft, and command-and-control systems allows them to make significant contributions to the Service's missions and tasks in virtually all operating areas. However, the operational demands of the Service's Deepwater missions and tasks can be completely satisfied only with systems and platforms designed and engineered for this daunting environment.[7]

Nevertheless, the Coast Guard's existing systems and platforms capabilities to carry out all of the current and future roles, missions, and tasks in support of America's maritime security in the Deepwater operating environment are increasingly in doubt. The Deepwater demands are compelling, calling for a multi-dimensional capability to carry out numerous missions and tasks – above, on, and perhaps even below the surface of the sea – simultaneously (e.g., prosecuting a search and rescue case while at the same time engaged in counter-drug surveillance and fisheries enforcement) and often across vast areas of ocean space. Although there are likely to be significant changes during the next 40 years, in 1996 the then-nascent Deepwater Project identified 14 separate mission- and task-areas to "bound" the Deepwater requirements "problem":

- Search and rescue
- International Ice Patrol
- Humanitarian response to disasters
- General law enforcement

[6] General Wilhelm's letter to Deputy Secretary Downey is included in its entirety in the Appendix.

[7] For example, Deepwater cutters and command-control-and-communications (C3) systems played key roles in the nation's responses to the massive *Exxon Valdez* oil spill in Prince William Sound, Alaska, in 1989 and the *Argo Merchant* spill off Nantucket, Massachusetts in 1976, as well as the 1996 TWA Flight 800 tragedy.

- Protection of living marine resources
- Maritime pollution enforcement and response
- Foreign vessel inspection
- Lightering zone enforcement
- Alien migrant, drug, and maritime interdiction operations
- Forward-deployed support to regional military commanders-in-chief in peacetime engagement and crisis-response
- Military environmental response
- U.S. homeland defense
- Port security and force protection
- Joint/combined combat operations in smaller-scale contingencies and major theater war

Understanding the block obsolescence confronting much of the Coast Guard's Deepwater forces, and the growing inability to meet the Service's Deepwater requirements effectively and efficiently, the Deepwater Project continues to address the need to upgrade, modernize, and replace the Service's aging fleet of cutters and aircraft, as well as its command and control infrastructure, with an integrated system of shoreside, afloat, aviation, and information technology assets. The IDS Project is by far the largest acquisition project ever undertaken by the Coast Guard. And, it is the first time that a federal agency – other than the Department of Defense – has approached an acquisition program from an entire mission perspective. The Deepwater Project has set in place an integrated, "system-of-systems" approach that embraces today's and tomorrow's sensors, command-and-control systems, shoreside facilities, boats and cutters, aircraft, and people in an innovative "network-centric" concept of operations that encompasses all five core missions.

The Coast Guard's Deepwater acquisition program approach has been so innovative that in June 1999 it was designated a "Reinvention Laboratory" under the National Partnership for Reinventing Government. As such, it was empowered to test new ways of doing its job: "we've dramatically reformed the way we carry out the people's business," Rodney E. Slater, Secretary of Transportation, stated. "The Deepwater project will enhance America's national security by helping the Coast Guard perform its duties with maximum efficiency and savings to the taxpayer."[8]

Key to the Deepwater Project's philosophy is the need to leverage commercial and military technologies and innovation to develop a completely integrated, multimission, and highly flexible Deepwater operating system at the lowest possible total ownership cost – including research and development, design and engineering, acquisition, and life-cycle operations and support – to carry out the diverse and demanding roles, missions, and tasks that lie ahead.

An important development for the Coast Guard's Deepwater future was the approval of the Joint U.S. Navy-Coast Guard Policy Statement on the National Fleet.[9] Signed by the Chief of Naval Operations, Admiral Jay Johnson, and Coast Guard Commandant

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[8] "Coast Guard Deepwater Acquisition Project Designated as Government Reinvention Laboratory," Department of Transportation Press Release, CG 11-99, 24 June 1999.

[9] NATIONAL FLEET – A Joint Navy/Coast Guard Policy Statement, 21 September 1998. See Appendix C for the full text of the policy statement, and also Vice Admiral Thomas Fargo, USN, and Rear Admiral Ernest Riutta, USCG, "A 'National Fleet' for America," U.S. Naval Institute *Proceedings*, April 1999, pp. 48-51.

Admiral James Loy, the policy calls for both services to synchronize planning, procurement, training, and operations to provide the highest level of joint maritime capability for the nation's investment – a "shared purpose and common effort" focused on tailored operational integration of the Navy's and Coast Guard's multimission surface platforms. As Vice Admiral Thomas Fargo, then-Deputy Chief of Naval Operations for Plans, Policy, and Operations (N3/N5), and Rear Admiral Ray Riutta, Vice Commandant for Operations, noted in the April 1999 U.S. Naval Institute *Proceedings*:

> The Navy-Coast Guard collective task is to build fully interoperable, multimission, naval and maritime forces for tomorrow's challenges. To do that, the Navy and Coast Guard must work together even more closely if they are to continue to provide the best maritime capabilities in the world at the best price for the U.S. citizen.[10]

In this way, the Coast Guard will recapitalize for its future, to ensure and sustain its ability to meet the demands thrust upon it, especially in its Deepwater operating environment. The Service has put in place a comprehensive and objective program to assess requirements and acquire the assets to ensure that it can continue to meet the Nation's needs, and fulfill its calling as a unique instrument of U.S. national security – in inland waters, ports, and harbors; in America's territorial sea and Exclusive Economic Zone; and on the high seas.

A Unique Instrument of *Maritime* Security

Maritime security is the Coast Guard's unique contribution to U.S. national security in the nation's inland waterways, ports, and offshore maritime domains.[11] It embraces all elements of the cultural, social, environmental, economic, political, diplomatic, and military dimensions that today shape America's national security strategy, policies, and programs for economic prosperity and global engagement. The Coast Guard's unique status as a U.S. Armed Service with broad law enforcement authorities and responsibilities makes it an uncommon instrument of national security. The Coast Guard is not a navy, and strives to remain the world's best coastguard not the United States' second-best navy, a view underscored by Secretary of the Navy, Richard Danzig, in mid-October 1999:

> Clearly it is in the best interests of the Nation to promote the long and highly effective relationship between the Navy and the Coast Guard. Cutters have been always ready to work with the Navy and answer the Nation's call, in both peace and war. It is essential that the Coast Guard remain a military service, properly equipped with ships and aircraft that are interoperable with Navy ships and aircraft, and manned with crews both trained in naval procedures and experienced in operating with the Navy. By working together, each bringing our respective strengths and expertise to the support of the other, the Navy and Coast Guard can provide an increasing return for America's investment in response to growing demands of the upcoming century.[12]

The U.S. Coast Guard is a vital element in the nation's maritime security future. It has put in place a plan and program and is fostering wide-ranging collaboration among U.S. departments and agencies that together are the foundation and linchpin for the next century of Coast Guard service – *Semper Paratus* ... Always Ready – to America.

[10] Fargo and Riutta, *op.cit.*, p. 51.

[11] The Coast Guard's 1999 policy paper, "The United States Coast Guard: A Unique Instrument of National Security," is included in the Appendix.

[12] Statement of the Secretary of the Navy and the Chief of Naval Operations to the Interagency Task Force on the Roles and Missions of the U.S. Coast Guard, provided to the Deputy Secretary of Transportation, Mortimer L. Downey, 12 October 1999, p. 7.


U.S.
COAST
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II. America's Maritime Security Interests, Threats and Challenges

America's greatest liquid assets are the oceans on either side of the continent.[13] The "liquid assets" adjacent to the some 95,000 miles of U.S. coastlines are enormous, encompassing five maritime and ocean areas – the Arctic Ocean, Bering Sea, the Pacific Ocean, the Gulf of Mexico and the Caribbean, and the Atlantic Ocean – and ranging from Arctic to tropical and equatorial climates.[14] America's maritime borders encompass almost 3.4 million square miles of territorial seas and exclusive economic zones, the largest in the world. More than 95 percent of the nation's trade tonnage – excluding that transported over land bridges with Canada and Mexico – is carried by ship (less than three percent of which travels in U.S.-flag vessels), with important ports along Atlantic, Gulf, and Pacific coastlines serving as America's gateways to the world. One-quarter of all domestic goods is shipped by water, and half of all oil consumed in the United States arrives by sea. Fragile living resources, with some fisheries in crisis from overexploitation and pollution, support a $24 billion commercial industry and tens of thousands of jobs. Coastal tourism and marine recreation – which in 1997 generated $71 billion to state and local economies, 85 percent of all U.S. tourism-related revenues – are the fastest-growing sector of the U.S. service industry and demand clean shorelines and marine environments.[15]

Courtesy of Don Leavitt

"Yet many people still consider the oceans as not only inexhaustible, but immune to human interference," Anne Platt McGinn noted in the Worldwatch *State of the World*, 1999 assessment. "In part," she continued,

> the vast seascape is far removed from everyday life and therefore remains separate and disconnected from the more familiar landscape. Much of the ocean environment is relatively inaccessible to scientists, let alone the general public. Because scientists have only begun to piece together how ocean systems work, society has yet to appreciate – much less protect – the wealth of oceans in its entirety. Indeed, our current course of action is rapidly undermining this wealth. Overcoming ignorance and apathy is never

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[13] From *A Cartoon History of United States Foreign Policy, 1776-1976,* quoted in Gregory Hartmann and Scott C. Truver, *Weapons that Wait*, 2nd edition (Annapolis, MD: Naval Institute Press, 1991).

[14] The appendix provides basic data on maritime areas of interest to the Coast Guard, generally, and particularly the Deepwater Project. The Great Lakes and inland waterways are likewise important regions for Coast Guard operations, and Deepwater fixed-wing aircraft and helicopter assets provide essential services for search and rescue, environmental protection, ice imagery for icebreaking, and control of smuggling on the Great Lakes. However, the Coast Guard does not routinely operate Deepwater cutter assets in the Great Lakes and virtually never in inland waterways. That said, the command-control-and-communications infrastructure that supports Deepwater operations also supports operations in coastal, Great Lakes, and inland operating areas, and Deepwater aircraft – fixed-wing and helicopter – assets are employed to meet non-Deepwater needs.

[15] Richard Danzig and William M. Daley, *Turning to the Sea: America's Ocean Future* (Washington, DC: September 1999), p. 12.

easy, but educating people about our collective dependence on healthy oceans will help build support for marine conservation. And that is just what the oceans need."[16]

Courtesy of NOAA

At the dawn of the 21st century, the Coast Guard stands as the nation's sole military, multimission, maritime service that combines humanitarian, law enforcement, diplomatic, and military capabilities in a single organization focused on safeguarding and enhancing America's maritime safety and security. In all five core Coast Guard maritime security roles, the enduring tasks of providing a meaningful, credible presence; conducting surveillance; detecting, classifying, and identifying targets of interest; and intercepting and engaging those targets remain at the fulcrum of its operations to defend important U.S. maritime security interests:[17]

- **Maritime Safety:** Saving lives and property at risk on the seas – search and rescue, response to maritime tragedies, ensuring seaworthy vessels
- **Maritime Mobility**: Providing a safe and efficient marine transportation system – ports, harbors, waterways, aids to navigation, domestic and international ice-breaking and patrol
- **Maritime Law Enforcement:** Upholding laws and treaties and defending maritime borders and sovereignty
- **Marine Environmental Protection:** Protecting living and non-living marine resources – fisheries and endangered marine species, and offshore mineral resources – and the control, response, and remediation of pollution incidents
- **National Defense:** Conducting military and defense operations in peacetime, smaller-scale contingencies, and major theater war

Meanwhile, the nation's maritime borders are under increasing siege from a broad spectrum of threats and challenges, most of which have a pronounced law-enforcement component – illegal alien migration, for example – and then transition to a national security problem. Indeed, U.S. national security and maritime security can no longer be defined solely in terms of direct military threats to America and its allies. The United States can expect no "peer competitor" to emerge until 2015, if not beyond. In such a geopolitical environment in which no single power holds the United States at risk of imminent attack and destruction, "national security" has come to embrace broad economic, social, environmental, political, cultural, and military factors, trends, and dynamics that are not readily apparent or obvious as Americans go about their daily lives. Indeed, a much more expansive construct has been articulated by the President's *National Security*

"America is surrounded by one of the largest, richest, and most diverse marine territories of any nation. From the Arctic Ocean bordering Alaska to the Atlantic, Caribbean, and Pacific oceans framing the mainland, Americans enjoy and prosper from an abundance of marine resources and activities, including productive fisheries, global trade, coastal recreation, mineral and energy production, and diverse marine ecosystems."

***Our Ocean Future,* May 1998**

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[16] Anne Platt McGinn, "Charting a New Course for Oceans," *State of the World 1999: A Worldwatch Institute Report on Progress Toward a Sustainable Society* (New York: W.W. Norton & Company, 1999), p. 79.

[17] For discussions of Canadian maritime security concerns, see: Rear Admiral Fred Crickard (Ret.), "Canada's Ocean and Maritime Security," *Marine Policy*, Vol. 19, No. 4 (1995), pp. 335-342; Crickard and Peter T. Haydon, *Why Canada Needs Maritime Forces* (Ontario: Napier Publishing for The Naval Officers' Association of Canada, 1994); Crickard, *et alia*, ed. *Multinational Naval Cooperation and Foreign Policy into the 21st Century* (Aldershot, England: Ashgate Publishing, Ltd, 1998); Ann L. Griffiths and Peter T. Haydon, *Maritime Forces in Global Security: Comparative Views of Maritime Strategy as We Approach the 21st Century* (Halifax, Nova Scotia: Center for Foreign Policy Studies, Dalhousie University, 1995); and Colin S. Gray, *Canadians in a Dangerous World* (Toronto: The Atlantic Council of Canada, 1994).

Strategy, which recognizes that diverse and numerous threats – regional or state-centered threats, transnational threats, the spread of dangerous technologies, foreign intelligence collection, and failed states – must be countered through an integrated approach to defend the nation, shape the international environment, respond to crises, and prepare for an uncertain future:

> The goal of the national security strategy is to ensure the protection of our nation's fundamental and enduring needs: protect the lives and safety of Americans, maintain the sovereignty of the United States with its values, institutions and territory intact, and promote the prosperity and well-being of the nation and its people.... Our strategy is based on three national objectives: enhancing our security, bolstering our economic prosperity and promoting democracy abroad.[18]

Similarly, the Department of Transportation's *Strategic Plan* 1997-2002 recognizes that "we must be prepared to face global markets, environmental challenges, transnational security threats, and a communications and information revolution."[19] Secretary of Transportation Rodney E. Slater, warning of "terrorist threats, the increasing dependence on high-technology transportation systems and communications networks, and increasing illegal immigrant transportation and smuggling," clearly echoed the concerns of numerous observers who have called out for scrutiny of and the ability to counter a broad spectrum of threats to U.S. maritime security.[20] The specific national security "Outcome Goals" identified by Secretary Slater, which (especially Goals 4 and 5) will shape the operational needs for all Coast Guard assets, are as follows:

- **Goal 1.** Reduce the vulnerability and consequences of intentional harm to the transportation system and its users.
- **Goal 2.** Ensure readiness and capability of all modes of commercial transportation to meet national security needs.
- **Goal 3.** Ensure transportation physical and information infrastructure and technology are adequate to facilitate military logistics during mobility, training exercises, and mobilization.

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[18] *A National Security for a New Century , op.cit.,* p. 5. The May 1997 edition of the *National Security Strategy,* at p. 7, is much more expressive: "...the dangers we face are unprecedented in their complexity. Ethnic conflict and outlaw states threaten regional stability; terrorism, drugs, organized crime, and proliferation of weapons of mass destruction are global concerns that transcend national borders; and environmental damage and rapid population growth undermine economic prosperity and political stability in many countries."

[19] Rodney E. Slater, Secretary of Transportation, *U.S. Department of Transportation Strategic Plan 1997-2002* (Washington, D.C.: Department of Transportation, 30 September 1997), p. 1. See also pp. 33-35 for an expansion of DoT's national security strategic goal.

[20] See generally: *Coast Guard 2020, op.cit.,* pp. 4-5; Office of Naval Intelligence, *Worldwide Challenges 1997* (Washington, D.C.: Department of the Navy, March 1997); U.S.Navy Office of Naval Intelligence and U.S. Coast Guard Intelligence Coordination Center, *Threats and Challenges to Maritime Security 2020* (Washington, D.C.: U.S. Coast Guard, 1 March 1999); William S. Cohen, Secretary of Defense, 1998 *Annual Report to the President and the Congress* (Washington, D.C.: GPO, 1998), pp. 2, 24-26; Cohen, 1999 *Annual Report to the President and the Congress* (Washington, D.C.: GPO, 1999), pp. 1-3; *Critical Foundations: Protecting America's Infrastructures* (Washington, D.C.: GPO, October 1997), especially Chapter Three, "New Vulnerabilities, Shared Threats, Shared Responsibility," pp. 11-20; National Defense Panel, *Transforming Defense: National Security in the 21st Century* (Washington, D.C.: GPO, December 1997), pp. i-iii, 1-7, 11-22; Robert Mandel, *The Changing Face of National Security: A Conceptual Analysis* (Westport, CT: Greenwood Press, 1994); William J. Perry and Ashton B. Carter, "Preventative Defense," *Hoover Digest,* Number 4, 1999, pp. 84-92; and the annual Strategic Assessments prepared by the Institute for National Strategic Studies, National Defense University.

[21] 1999 *Annual Report to the President and the Congress, op.cit*., pp. 1-3.

- **Goal 4.** Maintain readiness of resources including operating forces and contingency resources owned, managed, or coordinated by DOT necessary to support the President's National Security Strategy and other security-related plans.
- **Goal 5.** Reduce flow of illegal drugs and of illegal aliens entering the United States.

Likewise, Secretary of Defense William S. Cohen explained in early 1999 that "the world remains a complex, dynamic, and dangerous place." While admitting that "there is great uncertainty about how the security environment will evolve," the Defense Secretary outlined six projected security challenges – large-scale, cross-border aggression; flow of potentially dangerous technologies; transnational dangers; threats to the U.S. homeland; failed states; and adversary use of asymmetric means – that will certainly affect the need for a full spectrum of maritime security and military capabilities, including the Coast Guard's contributions to protecting U.S. national security – not just military security – interests.[21]

Department of Transportation National Security Strategic Goal

Advance the Nation's vital security interests in support of national strategies such as the National Security Strategy and National Drug Control Strategy by ensuring that the transportation system is secure and available for defense mobility and that our borders are safe from illegal intrusion.

U.S. Department of Transportation *Strategic Plan* 1997-2002

Finally, the Phase I Report of the Hart-Rudman Commission, released in September 1999, outlined a future of crisis, terror, and conflict that will directly attack America in ways against which military superiority cannot entirely deter or protect.[22] The first of 14 prominent themes warned that "America will become increasingly vulnerable to hostile attack on our homeland, and our military superiority will not entirely protect us.

> The United States will be both absolutely and relatively stronger than any other state or combination of states. Although a global competitor to the United States is unlikely to arise over the next 25 years, emerging powers – either singly or in coalition – will increasingly constrain U.S. options regionally and limit its strategic influence. As a result, we will remain limited in our ability to impose our will, and we will be vulnerable to an increasing range of threats against American forces and citizens overseas as well as at home. American influence will increasingly be both embraced and resented abroad, as U.S. cultural, economic, and political power persists and perhaps spreads. States, terrorists, and other disaffected groups will acquire weapons of mass destruction and mass disruption, and some will use them. Americans will likely die on American soil, possibly in large numbers.[23]

Courtesy of Don Wilson/Port of Seattle

[22] *New World Coming: American Security in the 21st Century, Major Themes and Implications* (Washington, D.C.,The Commission, established by the Department of Defense as a result of congressional activism and language included in the Fiscal Year 1998 DoD Appropriations Act, was renamed The United States Commission on National Security/21st Century. See also, "Homeland Terrorism, More 'Kosovos' Ahead, Security Panel Warns," Inside the Navy, 9 August 1999, pp. 1, 12-13. The report is available at: http://www.nssg.gov/Reports/ New_World_Coming/new-world-coming.htm.

[23] *Ibid.*, p. 4.

Other key themes identified by the Hart-Rudman Commission were as follows:

- Rapid advances in information and biotechnologies will create new vulnerabilities for U.S. security.
- New technologies will divide the world as well as draw it together.
- The national security of all advanced states will be increasingly affected by the vulnerabilities of the evolving global economic infrastructure.
- Energy will continue to have major strategic significance.
- All borders will be more porous; some will bend and some will break.
- The sovereignty of states will come under pressure, but will endure.
- Fragmentation or failure of states will occur, with destabilizing effects on neighboring states.
- Foreign crises will be replete with atrocities and the deliberate terrorizing of civilian populations.
- Space will become a critical and competitive military environment.
- The essence of war will not change.
- U.S. intelligence will face more challenging adversaries, and even excellent intelligence will not prevent all surprises.
- The United States will be called upon frequently to intervene militarily in a time of uncertain alliances and with the prospect of fewer forward-deployed forces.
- The emerging security environment in the next quarter century will require different military and other national capabilities.

It must be admitted that a good deal of uncertainty is involved in predicting the world situation next year, much less 20 years into the future, and assessing the implications of that future for U.S. maritime security interests and the Coast Guard. In 1988 for example, few pundits and futurists had the foresight – or *chuztpah!* – to predict that by the end of 1989 the Berlin Wall would be torn down and the Soviet Union would be in disarray. Several issues or events may have a great effect on America's maritime security in 2020, but the specific occurrences and implications cannot be predicted with any degree of accuracy. Regional conflicts, natural disasters, asymmetric warfare carried out by hostile states or non-state actors, and technological surprises are all examples of "wild cards" that will affect maritime security in 2020. Even with these uncertainties, however, certain trends shaping America's maritime security interests can be illuminated. Indeed, if past is prologue, U.S. national and maritime security will increasingly be challenged in diverse and sometimes surprising ways. As Secretary Cohen warned in mid-1999:

> This is not hyperbole. It is reality. Indeed, past may be prologue. In 1995 the Japanese cult Aum Shinrikyo used Sarin gas in its attack on the Tokyo subway and also planned to unleash anthrax against U.S. forces in Japan. Those behind the 1993 World Trade Center bombing were also gathering the ingredients for a chemical weapon that could have killed thousands. In the past year, dozens of threats to use chemical or biological weapons in the United States have turned out to be hoaxes. Someday, one will be real.[24]

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[24] William S. Cohen, "Preparing for a Grave New World," *The Washington Post*, 26 July 1999, p. 19.

Marine Environment

America's marine waters and their ecosystems are vital to the health, well-being, and economy of the Nation. Along with increased use of the oceans for recreation, fishing, minerals development, and transportation, the potential is growing for greater stresses on the marine environment to pose grave risk to U.S. interests.

As discussed in the following section, the natural resources of the marine environment include biologically and economically important marine life, energy resources, and minerals. Presidential Decision Directive-36 outlines the national policy "for providing stewardship of the marine resources under U.S. jurisdiction and for U.S. leadership in promoting international cooperation to care for the high seas."[25] The marine ecological system itself is perhaps the most important "resource," having great aesthetic as well as economic value. The marine coastal environment, which for the United States can extend to the full expanse of the Nation's 200-nautical mile EEZ, is among the most valuable and productive natural resources on Earth.

It is also the most threatened by man's activities – on the land as well as above, on, and under the water. Harland Cleveland, former U.S. Assistant Secretary of State and ambassador to NATO, warned that the "poor and the rich, we are cooperating to destroy – in different but mutually reinforcing ways – the environment we share."[26] There is growing concern about the damage to coastal fishing stocks by both local and long-distance fishing fleets, as well as threats of pollution from ships carrying hazardous materials and from offshore energy exploration and development. Waste and pollution loads have increased, vital habitats have been degraded or destroyed, and water quality has decreased. Chemicals and debris from all sources are presenting severe problems – acute and chronic toxicity that threatens the food chain (including humans) through uptake, while marine debris often harms or kills marine organisms, damages fishing gear, and reduces the appeal of recreational beaches. Coastal pollution can have a significant effect on marine travel and tourism, and can pose severe risk of contamination to shellfish and other living marine resources. As oceanographer Scott W. Nixon explained, with "little cause for celebration" despite increased awareness and scientific research:

> Part of the problem will come directly as a result of population growth. With the occupancy of the planet expected to reach more than nine billion by 2050, there will be that many more mouths to feed, more fields to fertilize, more livestock to raise and more tons of waste to dispose of. Many experts predict that the release of

> **"The task of rescuing the seas is far from hopeless, given their amazing resilience. State and local efforts to restore the health of large estuaries like Long Island Sound and Chesapeake Bay are moving forward. Washington has begun to focus on the problem of agricultural runoff of poisonous wastes, and has embarked on an ambitious project to clean up the Mississippi River and help prevent the "dead zones" in the Gulf of Mexico. But none of these efforts confront the larger menace of overfishing. That is a global problem, on which Washington can and must take the lead."**
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> ***The Troubled Seas***
> ***New York Times***
> **13 September 1998**

[25] PDD-36, 15 April 1995. The five principal objectives are: Promoting Sustainable Fisheries; Promoting the Conservation of Whales and Other Protected Species; Becoming a Party to the Law of the Sea Convention; Supporting Integrated Coastal Resource Management and Reducing Marine Pollution, and Supporting Critical Scientific Research. It continues by listing the priorities in these efforts to include: vessel construction and safety standards; promoting navigational standards; curbing the spread of aquatic nuisance species through ballast water; raising maritime personnel training and certification standards; promoting insurance requirements; and reducing air pollution from ships – all important priorities on which the Coast Guard will continue to focus.

[26] Cleveland, "The Global Commons," *The Futurist,* May-June 1993, pp. 9-13, at p. 9. See also, Linda Starke, ed., *Vital Signs 1998: The Environmental Trends that are Shaping Our Future* (New York: W.W. Norton & Company, 1998, Worldwatch Institute), for several essays that outline the nation's environmental challenges.

[27] Scott W. Nixon, "Enriching the Sea to Death," *Scientific American Presents The Oceans*, Fall 1998, pp. 48-53 at p. 53. In his analysis of the effects of eutrophication on near-shore oceanic regions, Nixon noted that the developing countries of Western Europe and the United States produce 100 times

nutritive nitrogen from fertilizer and fossil-fuel combustion will double in the next 25 years, most of that increase occurring in the developing world...

With large stretches of the coastline exposed to unprecedented levels of nitrogen, it seems inevitable that ocean waters around the world will become greener, browner and redder and that there will be more frequent periods when the bottom of the sea in vulnerable locations becomes lifeless.[27]

Coastal population growth *will* play an important role in the health of the marine environment through 2020 and beyond. Human activity degrades the environment through non-point-source pollution – pollutants originating from non-distinct sources – and the physical alteration of habitats. Already, 66 percent of the world's people live within 60 miles of the ocean, and, because of migration from inland areas to the prosperous coasts, populations in coastal zones are increasing at a much faster rate than overall population. As much as 85 percent of the U.S. population lives near the coast, where population densities are five times the national average, and coastal populations are growing more rapidly than other populations: in the late 1990s, 17 of the 20 fastest growing states were located along the coast, and America's coastal population had been increasing by 3,600 people per day.[28] This continuous coastal growth poses a threat to the natural resources in the surrounding waters. While the United States is likely to expend the necessary resources to combat degradation of the marine environment resulting from coastal population growth, most developing countries will not have the means to do so.

Courtesy of Don Leavitt

> **"...man's fingerprint is found everywhere in the oceans. Chemical contamination and litter can be observed from the poles to the tropics and from beaches to abyssal depths.... But conditions in the marine environment vary widely. The open sea is relatively clean.... In contrast to the open ocean, the margins of the sea are affected by man almost everywhere, and encroachment on coastal areas continues worldwide.... If unchecked, this trend will lead to global deterioration in the quality and productivity of the marine environment."**
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> ***The State of the Marine Environment***
> **Group of Experts on the Scientific Aspects of Marine Pollution, 1990**

The degradation of the marine environment will remain a substantial concern. However, there will be a great disparity in the actual health of the seas from region to region around the world. Because of the high value that developed countries will place on preserving as pristine a marine environment as possible, they will continue the trend toward more regulation and stricter standards in shipping and environmental protection, and will devote the resources necessary to obtain their goal. The result will be healthier marine environments near most developed states by 2020. Conversely, the developing states will not have the means, even if they have the will, to enact effective measures to protect the seas adjacent to their countries. Waters abutting most developing states will, therefore, be more polluted in 2020 than today. Several factors will contribute in varying degrees to the degradation of the marine environment.

The monitoring of U.S. waters and high seas regions that are held in common with the world is necessary to ensure the well-being of their vast natural resources, and has implications for both conventional and customary international law.[29] Actions including the unauthorized or accidental discharge of oil and other petroleum products, hazardous

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the amount of nitrogen per square kilometer of land than much of Africa. In the fall 1999, the United Nations reported that the rate of population growth was slowing such that by 2050 world population will be approximately 8.9 billion. This is 500 million fewer people than the U.N. had predicted at the 1994 world population conference in Cairo. Still, the 20th century has experienced the fastest population growth in history, with the number of people quadrupling since 1900. "Population Growth Slows Worldwide, U.N. Report Says," *The Washington Post,* 23 September 1999, p. A22.

[28] *Our Ocean Future: Themes and Issues Concerning the Nation's Stake in the Oceans* (Washington, D.C.: The H. John Heinz II Center for Science, Economics and the Environment, May 1998), pp. 11-16; *Coast Guard 2020, op.cit.*, p. 13; Richard D. Kohout, *et alia, Looking Out to 2020: Trends Relevant to the Coast Guard* (Alexandria, VA: Center for Naval Analyses, CIM499/February 1997), pp. 123-154: and "Threats and Challenges, 2020," *op.cit.*, pp. III-43 - III-48.

[29] On the various law of the sea issues, particularly the exploitation of seabed resources, see National Intelligence Council, *Law of the Sea: End Game* (Washington, D.C.: National Technical Information Service, March 1996).

substances, or human waste can result in far-reaching effects to not only the local environment, but to the economic viability and personal health of maritime communities and regions. Likewise, the inadvertent introduction of alien marine species, transported in ships' ballast water, as well as other foreign species, already pose severe threats to local U.S. ecosystems. Every minute, 40,000 gallons of foreign ballast water that may contain exotic species and pathogens are pumped into U.S. harbors, threatening to displace or eliminate native species and damaging important fisheries. More than 240 non-indigenous species are now found in San Francisco Bay, for example, while foreign viruses reduced U.S. aquaculture shrimp production by half in 1996 and may cost the Great Lakes commercial and sport fisheries more than $500 million by the year 2005. Current estimates indicate that control measures alone can cost communities more than $6 billion each year to reduce problems caused by non-indigenous species.[30]

Maritime commercial activity will expand greatly during the next 20 years, resulting in larger amounts of petroleum and chemical products being transported by ship and produced in maritime regions. However, the adoption and enforcement of stricter safety standards will ensure that both the number of devastating incidents and the volume of contaminants spilled will decrease substantially. This trend is already evident in the United States, where the amount of oil and chemicals shipped through U.S. waters has steadily increased during the past 15 years, from 259.9 million gallons in 1982, to 307.8 million gallons in 1990, and to 333.1 million gallons in 1995. During same period, however, the amount of oil and chemicals spilled per million gallons shipped dropped dramatically, from 13.5 gallons to 5.96 gallons. Actions of developed states to effect a safer shipping industry will contribute to safer shipping in developing countries and therefore help reduce the threat of pollution from maritime accidents. Efforts such as the U.S. Port State Control program will grow, reducing if not eliminating loopholes exploited by shipping companies to save money through the use of flag states with lax shipping regulations and little ability to enforce the standards they do have. For these reasons, environmental damage caused by marine accidents should decrease worldwide over the next 20 years.

The number of significant spills from oil production and transportation in U.S. and nearby waters has been relatively low for some time.[31] But when a large-scale oil spill does occur, as in the 1989 *Exxon Valdez* accident in Alaska, the short-term effects can be devastating. In addition to the long-term destruction of habitat and local economies, the spill killed some 350,000 marine birds, 2,800 sea otters, 300 harbor seals, 250 bald eagles, and 22 killer whales. Ten years later, Exxon had spent $113 million in Cordova, alone, including $80 million for clean-up and $26 million compensating the town of 2,500 people for lost income; added to this was the $900 million settlement Exxon paid to the state and federal governments.[32] Another $5 billion in punitive damages ordered by a U.S. District Court have been appealed. (Figure 2 illustrates the immense expanse of the *Exxon Valdez* oil spill, transposed off the U.S. east coast.)

Both the number of incidents and volume of hazardous waste materials intentionally dumped into the marine environment will likely decline in the years ahead, a result of stricter regulation of the shipping industry. Whether vessels wish to transport toxins,

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[30] *Turning to the Sea: America's Ocean Future, op.cit.*, pp. 50-51.

[31] For example, on 28 June 1999, a tanker unloading oil at the Tosco refinery near Ferndale, Washington, north of Puget Sound, became untethered and spilled slightly more than 1,000 gallons of crude oil. The flow of oil was stopped immediately, but the spill touched land in two locations, posing a threat to wildlife.

[32] "Spill's Residue Still Sticks in Alaska's Craw," *The Washington Post*, 23 March 1999, pp. A3, A4.

dump nuclear or other industrial waste, or deballast tanks, doing so will remain explicitly prohibited without the possession of a permit. The likelihood of obtaining such permission, however, will decrease as restrictions tighten and are expanded to more types of chemicals and waste products. Consequently, the present declining trend in ocean dumping, in both volume and number of incidents, internationally and within waters under U.S. jurisdiction, is likely to continue. Detecting and apprehending ocean dumping violators will remain an enforcement challenge, however, as great incentive will exist to try to avoid legal but expensive disposal requirements.

Figure 2. Equivalent Area Covered by the EXXON VALDEZ Oil Spill

With maritime trade expected to as much as triple by 2020, the threat of invasive species entering the United States through seaborne trade will increase significantly. Invasive species are ones intentionally or unintentionally introduced into an area outside of their natural ranges. Invasive species affect marine, estuarine, freshwater, and terrestrial ecosystems throughout the world and have strong economic and environmental consequences. Nearly every part of the United States faces at least one highly damaging invasive species. For example, in June 1999 colonies of "killer bees" were found at the port of Jacksonville, Florida; officials were concerned that the Africanized honey bees had been brought in by ship and, if they spread, could threaten Florida's $20 million annual honey industry. Another example of the range and cost of damage from invasive species can be derived by examining the effects of the introduction of the zebra mussel into U.S. waters. These effects range from clogged municipal and industrial water intake pipes to the decline and perhaps extinction of native mussel populations. The minimum cost to industries and municipalities to repair zebra mussel damage from 1993 through 2003 is estimated to be more than $3 billion.

Thus, for waters under U.S. jurisdiction, the challenge will be to ensure the safety and seaworthiness of increasingly larger ships, many of which will not be able to berth at U.S. ports because of draft limitations. This will drive the need for farther-offshore lightering, vulnerable offshore facilities, and transshipment of hazardous materials through long and exposed pipelines, and, in the event of a large spill, enhanced Deepwater response and mediation capabilities.

"As we approach the new millennium, it is more evident than ever before that the oceans are a common asset of humanity as a whole. The oceans are a privileged space for the strengthening of relationships between states: relationships forged on a spirit of cooperation, understanding and solidarity. With an economic approach prevailing in these days of harsh competition, the important capital that are the oceans represent to humanity is often overlooked, particularly their non-material aspects. This capital has no price, no replacement and no exchange value. We must preserve it for the benefit of present and future generations."

Mario Soares
The Ocean Our Future
Independent World Commission on the Oceans, 1998

Marine Resources

The demand for food, minerals, and energy from the oceans will continue to increase, especially as world populations continue to grow. Globally, critical fish stocks are under great pressure as overfishing and habitat destruction continue. Meanwhile, new technologies are permitting more remote exploration and development of minerals and petroleum resources in ever-greater depths and farther out to sea.

Fisheries

In the mid-1990s the United States had an annual commercial fish catch of nearly five million metric tons, 90 percent of which was harvested within 200 nautical miles of the coast – an industry worth some $24 billion each year. The U.S. EEZ is estimated to hold some 20 percent of the world's fishery resources. About 110,000 commercial fishing vessels operate from U.S. ports; in addition, the fishing fleets of numerous countries ply the waters adjacent to – and sometimes venturing into – America's EEZ in search of protein. Moreover, saltwater sport fishing is popular in many states and contributes greatly to local economies. Nevertheless, these fishery resources, the ecosystems that support them, and the communities that depend on them are under increasing pressure from consumers who spend some $46 billion each year on fish products.[33]

Marine species dominate U.S. commercial landings, with freshwater fish representing only a small portion of the total catch. Shellfish account for only one-sixth of the weight of the total catch but nearly one-half of the value. Alaskan pollock makes up about one-third of all landings by weight but only one-tenth of the catch by value. Menhaden, a species used in the manufacture of oil and fertilizer, accounts for nearly one-fifth of the tonnage landed but only about three percent of the value. The most valuable species caught are crabs, salmon, and shrimp, each representing about one-sixth of the total value. Other important species include lobsters, clams, flounders, scallops, Pacific cod, and oysters.

Courtesy of Don Wilson/Port of Seattle

Alaska leads all states in both the volume and value of the catch; important species landed at Alaskan ports include salmon, king crab, halibut, and pollock. Other leading fishing states are Louisiana, Massachusetts, Texas, Maine, California, Florida, Hawaii, Washington, and Virginia. Measured by value of the catch in the mid-1990s, Dutch Harbor, Alaska, is the nation's leading fishing port, followed by New Bedford, Massachusetts. Other important U.S. fisheries include high-seas tuna landings in American Samoa and Guam.

The U.S. National Marine Fisheries Service (NMFS) has estimated that of the approximately 300 fish stocks that are economically valuable to the United States, 62 stocks in the U.S. EEZ are currently overfished or are at risk.[34] Another 28 highly migratory fish stocks with commercial value to the United States are also overfished. The overexploitation of these stocks represents hundreds of millions of dollars lost to the U.S. economy each year. For example, NMFS data provided to the President's Interagency Task

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[33] *Turning to the Sea: America's Ocean Future, op.cit.*, p. 16.

[34] Assistant Administrator for Fisheries, National Oceanographic and Atmospheric Administration, National Marine Fisheries Service, Briefing to the Interagency Task Force on the Roles and Missions of the Coast Guard, June 1999.

Force on the Roles and Missions of the Coast Guard in late spring 1999 indicated that if the New England groundfish fishery were operated at maximum economic yield (MEY), the industry would be worth more than $500 million annually, not the $50 million in 1998 resulting from severe overexploitation. Species such as the Gulf of Maine codfish are greatly overfished and would require draconian management efforts to avoid economic extinction and complete closure, as has been the fate of the Grand Banks cod stocks just to the northeast. The U.S. fishing fleet generally is overcapitalized; there are far too many boats trying to catch increasingly fewer fish. In addition to creating personal crises, financial hardships, and enforcement challenges, this situation has driven up demand for more imports of overseas-caught species.

Ongoing analysis indicates a trend of increasing U.S. imports of fishery products, at increasingly high cost, as U.S. fisheries remain stagnant or decline. "This increasing dependence on imports can be explained," another assessment concluded,

> ...by greater demand in the United States for fish and non-edible fishery products, a declining domestic fishing industry that is unable to catch sufficiently greater amounts of fish, the decreasing availability of domestic fishery stocks, and the inability of inland fisheries or aquaculture to compensate for the difference between available supply and increasing domestic demand.[35]

Similar trends are expected worldwide, according to the United Nations Food and Agriculture Organization (FAO).[36] World commercial fish catch has more than quadrupled since 1950 and was 93 million tons in 1996, down from the peak level of more than 100 million tons in 1989. Between 1970 and 1990, the world's fishing fleet grew twice as fast as the rate of the global catch, doubling in total tonnage and number of vessels. Harvesting is so intense that in some fisheries as much as 90 percent of the stock is removed each year. The FAO estimates that 70 percent of the world's marine fish stocks are fully fished, overfished, depleted, or recovering, and by the turn of the century no additional increases will be possible. (Table 1 presents data on world fisheries depletion; Figure 3 shows the projected demand for fish for human consumption.)

Table 1.

Depletion of World Fisheries
(Harvests in Thousands of Metric Tons)

Fishing Area	Year Maximum Harvest Reached	Maximum Harvest	Most Recent Harvest*	Percent Change In Catch*
Atlantic, NW	1967	2,588	1,007	- 61%
Antarctic	1971	189	28	- 85%
Atlantic, SE	1972	962	312	- 68%
Atlantic, W/Central	1974	181	162	- 11%
Atlantic, E/Central	1974	481	320	- 33%
Atlantic, NE	1976	5,745	4,575	- 20%
Pacific, NW	1987	6,950	5,661	- 19%
Pacific, NE	1988	2,556	2,337	- 9%
Atlantic, SW	1989	1,000	967	- 3%
Pacific, SW	1990	498	498	–
Pacific, SE	1990	508	459	- 10%
Mediterranean	1991	284	284	–
Indian Ocean, W	1991	822	822	–
Indian Ocean, E	1991	379	379	–
Pacific, W/Central	1991	833	833	–

*Peak year to most recent harvest for which data are available, 1995-1997.

Sources: FAO Fisheries Department, The State of World Fisheries and Aquaculture (Rome: Food and Agriculture Organization, 1995), pp. 9-12; *Washington Post*, 25 July 1998, p. A17; and Carl Safina, "The World's Imperiled Fish," *Scientific American Presents The Oceans*, Fall 1998, p. 59.

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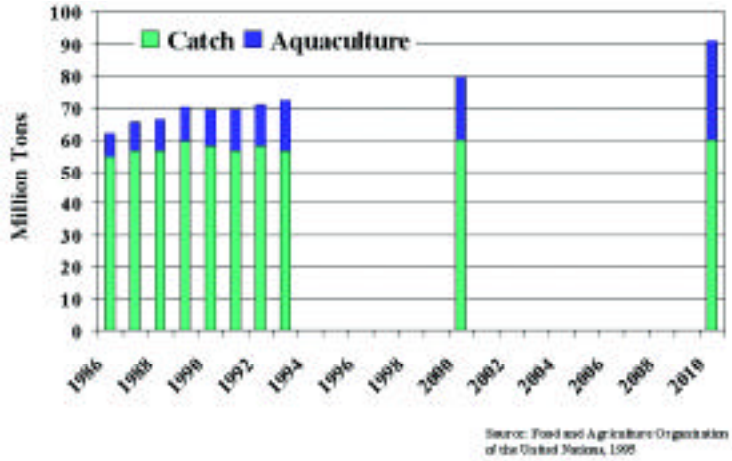
[35] *Looking Out to 2020: Trends Relevant to the Coast Guard*, *op.cit.*, p. 75.

[36] "The Catch of Fishing," *Washington Post*, 25 July 1997, p. A17. See also, FAO Fisheries Department, *The State of World Fisheries and Aquaculture* (Rome: Food and Agriculture Organization of the United Nations, 1995); Michael Parfit, "Diminishing Returns: Exploiting the Ocean's Bounty," *National Geographic*, November 1995, pp. 2-37; Carl Safina, "The World's Imperiled Fish," *Scientific American Presents The Oceans*, Fall 1998, pp. 58-63; "Threats and Challenges 2020," *op.cit.*, pp. III-1 - III-6, and *Turning to the Sea: America's Ocean Future* , *op.cit.*, pp. 18-21.

Figure 3. Projected Demand to the Year 2010 of Fish for Human Consumption



Source: Food and Agriculture Organization of the United Nations, 1999

Today, on the average, people receive about six percent of their total protein and 16 percent of their animal protein from fish. Nearly one billion people, primarily in Asia, relay on fish for at least 30 percent of their animal protein supply.[37] The FAO expects demand for edible fish products to increase from 80 million tons in 1998 to 91 million tons by 2010 (with 115 million tons anticipated in 2015) as world populations continue to increase, primarily in the developing countries, and commercial catches remain stable, at best, if not continue to decline. This demand can be satisfied only if aquaculture can be doubled from approximately 26 million tons in 1996 and overfishing is brought under control so that depleted stocks can recover. The FAO concludes that both are unlikely, and, if so, the result will be a further depletion of stocks, crisis, and even conflict among nations.

Indeed, "fish wars" over access to and protection of fisheries might ultimately engulf U.S. interests and demand a Coast Guard (if not a U.S. Navy) response, especially if world fishing fleets look to U.S.-managed fisheries as sources of protein and income. (See Figure 4, which shows areas of "prime conflict" over scarce fishery resources.) In the past four years, there were at least 13 incidents between fishing fleets and naval forces, at times with shots fired and people killed:[38]

- March 1995: Canadian coastguard forces chase down and seize a Spanish trawler poaching in Canada's Grand Banks fishery conservation/management zone
- November 1995: Malaysian naval vessel fires on a Thai trawler, killing the vessel's captain and his son
- December 1995: Australian forces seize eight Indonesian fishing boats near Ashmore Reef
- Summer 1996: In the northeast Atlantic, Iceland authorizes the use of force to exclude Danish trawlers from disputed waters
- August 1996: Ireland arrests a Japanese tuna-boat captain
- August 1996: The Philippine navy arrests 91 Chinese fishermen

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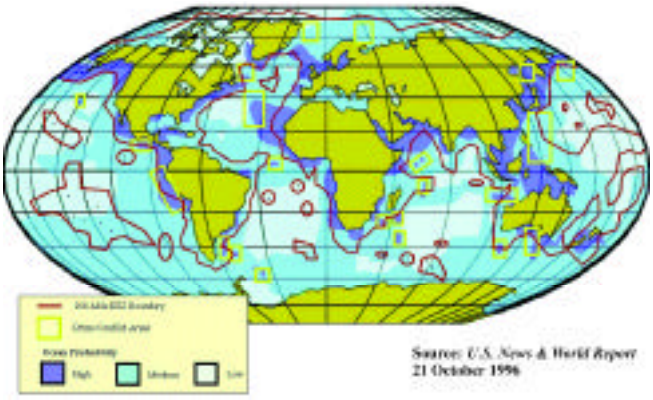
[37] Anne Platt McGinn, *op.cit.*, p. 80.

[38] Tim Zimmerman, "If World War III Comes, Blame Fish," *U.S. News & World Report*, 21 October 1996, pp. 59-60. Also, "South Korea Claims to Sink North Korean Boat in Disputed Waters," *The Washington Post*, 15 June 1999, pp. A21; and "U.S. Protests Seizure of Boat by Canada," *The Washington Post*, 3 July 1999, p. A7. Bronwen Maddox, in his 30 August 1994 *Financial Times* article, "Fleets Fight in Over-Fished Waters: Fishing Disputes Have Risen up the Diplomatic Agenda," catalogs 28 incidents of fishing disputes and clashes between August 1993 and August 1994.

- August 1996: Russian coastguard units fire on two small Japanese fishing craft near the disputed Kuril Island
- September 1996: Two Spanish fishermen are injured in Portuguese waters when a Portuguese naval patrol boat opens fire

Figure 4. Potential for "Fish Wars" Is Increasing



- October 1996: Vietnamese maritime authorities kill three Thai fisherman and detain two Thai trawlers accused of fishing in Vietnamese waters
- June 1998: Crew of a Russian border guard vessel kills two fishermen aboard Chinese high-seas driftnet vessel
- June 1999: South Korean naval vessels sink a North Korean torpedo boat and badly damage a second during a confrontation regarding jurisdiction over crab-rich waters of the Yellow Sea off the northwest coast of the Korean peninsula
- July 1999: Canadian coastguard forces seize an Alaska-based U.S. fishing boat for fishing in a disputed zone, prompting a State Department protest, demand for an explanation, and warning that "we plan to take appropriate action"
- August 1999: Russian factory trawler *Gissar* is discovered fishing within U.S. EEZ off Aleutian Islands in the Bering Sea, near the U.S.-Russian maritime boundary line, and a Coast Guard law-enforcement boarding team is put aboard[39]

If these incidents and controversies grow as expected, there will be an increasing demand for Coast Guard services to help protect U.S. – and perhaps even regional or world fisheries – in support of United Nations or international management programs through effective enforcement of fishery regimes.[40] This is, to be sure, not a new problem, as Thomas Jefferson observed in his Message to the First Congress on 2 February 1791: "The rapid view of the [cod] fishery enables us to discern under what policy it has flourished or declined in the hands of other nations, and to mark the fact, that it is too poor a business to be left to itself, even with the nation the most advantageously situated." With the U.S. cod fishery severely depressed in the late 1990s, and other stocks under great pressure as

[39] This incident followed a series of uncooperative actions by Russian fishing vessels along U.S.-Russian maritime boundary line during the summer. A large, 15-person boarding team from USCG *Hamilton* (WHEC-715) was put aboard *Gissar* because of intimidating actions from the Russian crew. Meanwhile, the Russian Federal Border Guard vessel *Antius* watched the incident from the Russian side of the maritime border, and its crew helped to translate *Hamilton*'s warnings and requests to the fishing vessels, but otherwise took no other action. After 18 other Russian fishing vessels surrounded *Hamilton* and threatened to "shoulder" – i.e., run into the cutter at a glancing angle – and impede the seizure, Coast Guard District 17 decided to allow the Russian border patrol vessel to escort *Gissar* to Russia. The Russians subsequently levied a fine on *Gissar* for fishing violations. Simultaneously, the State Department urged the Russian government to take action against the other Russian fishing vessels that

well, the Coast Guard's responsibilities in the at-sea enforcement of living marine resources laws and regulations will continue to be great. As Vaughn C. Anthony, a scientist formerly with the U.S. National Marine Fisheries Service, exclaimed: "Any dumb fool knows there's no fish around."[41]

Courtesy of MarAd

Non-Living Marine Resources

Exploitation of non-living marine resources likely will increase decades to come.[42] The world increasingly will probe and exploit the oceans for energy and minerals to fuel economic growth. Furthermore, exploration, drilling, and mining operations will move farther offshore as new technology advances the ability to operate in deeper waters. More facilities and operations in deeper waters will create more maritime safety and security challenges.

Oil and Natural Gas Exploitation. Offshore oil and gas exploitation currently accounts for about 20 percent of all domestically produced oil and more than a quarter of the nation's domestic production of natural gas. (In all, as much as one-third of the world's petroleum reserves lie offshore, and will be increasingly exploited in the years ahead as resources on land are depleted or become too costly to exploit.) This activity is an important source of federal revenues, generating more than $1.4 billion in bonuses, $68 million in rents, and $3.5 billion in royalties in 1997. It is an important employer, with some 38,000 workers offshore, and another 46,000 workers on-shore. Recent projections indicate that offshore production will increase as much as 100 percent in the Gulf of Mexico alone by the year 2010.[43] Still, about half of all petroleum consumed in the United States comes from overseas sources, a proportion that is likewise expected to increase in the decades ahead.

This increased offshore exploitation will be affected by two factors: continued government restriction and a push to deeper waters. A 1998 presidential directive under the Outer Continental Shelf Lands Act, which limits offshore oil and natural gas development to the Gulf Coast and parts of Alaska through 2012, will continue to stem industry growth in most of the U.S. EEZ. Oil and natural gas developments in water depths greater than 1,000 feet will become an increasingly important part of future production in the few areas where drilling is permitted. At the turn of the century, more than 4,000 platforms were operating in waters as deep as 3,900 feet, and some 30 drilling rigs were operating in waters more than 1,000 feet deep, one deeper than 7,700 feet.[44]

Thus no longer confined to near-shore areas, discoveries of oil and gas resources are increasingly far from shore, in waters as much as 10,000 feet deep, well beyond the U.S.

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had acted so recklessly. Ironically, as the *Hamilton-Gissar* drama was unfolding, the Coast Guard was requested to respond to a search and rescue case involving six Russian boaters whose craft had become separated from their companions, a total of 37 people in 14 skiffs, during a crossing of the 65-nautical mile Bering Strait from St. Lawrence Island. "Coast Guard, Freighter Save 6 Mission Russian Boaters," *The Washington Post*, 9 August 1999, p. A4.

[40] In the aftermath of the June 1999 Korean fisheries crisis, two U.S. Navy Aegis guided missile cruisers – the USS *Vincennes* (CG-49) and *Mobile Bay* (CG-53) – were ordered to the Yellow Sea to help stabilize the situation. See, "2 Koreas' Navy Vessels Circle Cautiously; U.S. Sends Ships," *The New York Times*, 18 June 1999, p. A1.

[41] Safina, "The World's Imperiled Fish," *op.cit.*, p. 60.

[42] "Threats & Challenges 2020," *op.cit.*, pp. III-7 - III-18.

EEZ. In 1997, for example, the Ram-Powell and Mensa projects in the Gulf of Mexico came on-line in water depths of 3,200 and 5,300 feet, respectively. The MARS project in the Gulf illustrates the potential scale of future activity. Located 130 miles offshore, MARS is projected to produce 100,000 barrels of oil and 100 million cubic feet of natural gas daily, which will be pumped to the shore or an offshore gathering platform through a pipeline. The vulnerability of this system to sabotage should not be discounted, nor the environmental damage that an attack or accident might cause.

U.S. Department of Energy forecasts indicate U.S. offshore oil production will increase through 2006 and then decline to current levels through 2020. The projected initial increase is a result of deepwater activities and technological advances. By 2020, offshore production will be characterized by wells located in deeper waters and, as it is today, will be focused in the Gulf of Mexico. Increased production in the Gulf, however, will be offset by reduced production in Alaska, which is expected to decline at an average annual rate of 4.3 percent through 2020. The decrease in Alaska's oil production will be driven by the continued decline in production from Prudhoe Bay, the largest producing field, which historically has produced over 60 percent of Alaskan oil. Overall U.S. oil production is projected to decline at an average annual rate of 1.1 percent through 2020, while the demand for petroleum products in the United States is expected to grow by an average annual rate of 1.2 percent. The resulting gap between rising demand and declining production will be satisfied with an increase in foreign imports.

Courtesy of MarAd

Thus, another environmental concern is oil transport and transfer operations. Fears of large oil spills along fragile coastal areas, combined with increased imports by large tankers may raise pressure to force oil transfer operations offshore. However, the high cost of offshore oil transfer facilities will limit future progress. Projects such as the Louisiana Offshore Oil Port (LOOP) have been only marginally successful from a fiscal perspective, despite the environmental benefits the LOOP offers by being so far from shore. The port of Corpus Christi, Texas, attempted a similar venture on a slightly smaller scale, but after analysis revealed it would take 20 to 25 years to break even, the project was halted. Future prospects for offshore port development are considered unlikely.

America's use of natural gas will increase significantly within the next 20 years in order to meet an increased demand for electricity and to offset an expected continued reliance on nuclear power. Projections for natural gas production through 2020 indicate an average annual growth rate of 1.5 percent. Natural gas consumption, however, is expected to

[43] *Our Ocean Future, op.cit.,* pp. 20-21.
[44] *Turning to the Sea: America's Ocean Future, op.cit.,* pp. 24-25.

increase at a slightly higher rate, 1.6 percent per year. Like the oil industry, the difference between domestic demand and supply will be met with increased foreign imports. Net natural gas imports are expected to grow from 12.4 percent of total gas consumption in 1996 to 15.2 percent in 2020. Most of the imports will come from expanded pipeline growth between the United States and Canada. While most of the imports will come across land, some offshore imports are expected from locations such as Sable Island, Nova Scotia. Liquified natural gas (LNG) will continue to be another source of energy, although less significant. Even so, LNG shipments will remain a maritime safety concern.

Ocean Minerals. The marine mineral industry will be substantially more robust in the next 20 years. Currently, the industry is active in exploration offshore, but production is limited to a few commodities such as sand and diamonds. In the short term, prohibitive costs and environmental concerns will hinder significant industry expansion beyond exploration. However, technological advances derived from deepwater oil exploration and production and, in some cases, increasing mineral prices may make marine mining ventures in several minerals profitable, including diamond mining – which in South Africa and Namibia has become more profitable than diamond mining on land. Technology developed in sophisticated marine diamond mining operations may be applied to mining for other minerals as well, decreasing development costs.

The most sought-after mineral commodities from the U.S. outer continental shelf during the next 20 years will continue to be sand and gravel, which are used primarily for beach restoration, coastal protection, and construction material. Through 2020, the demand for offshore sand and gravel likely will increase as land supplies begin to diminish and storms continue to erode beaches. Moreover, recovery operations will move farther offshore to avoid damaging coastal areas. There are immense sand and gravel reserves on the outer continental shelf, with estimates of more than one trillion cubic meters on the Atlantic shelf, alone. Already, six large sand-dredging projects are operating on the outer continental shelf along the Gulf and Atlantic coasts. In addition to sand and gravel, the oceans surrounding the United States contain a wide variety of mineral resources. These minerals are found on the continental shelf, in ocean basins, or dissolved in ocean waters. In the U.S. EEZ, potential mining prospects include:

- Phosphate beds from North Carolina to northern Florida
- Titanium-rich heavy mineral sands from New Jersey to Florida
- Gold-bearing sand and gravel deposits off the Alaskan shore
- Barite deposits off Southern California
- Manganese offshore along the Southern California and Georgia coasts
- Cobalt and platinum-rich seabeds in the Hawaiian EEZ

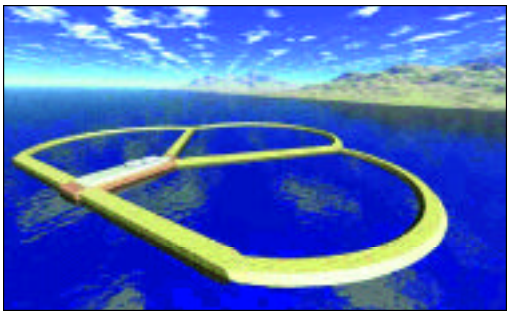
While mining of these marine minerals in U.S. waters is not currently active, they would almost certainly be exploited once price levels rise to the point where offshore operations become profitable.

Ocean Energy. Harnessing ocean energy for commercial applications in the next 20 years likely will remain economically unfeasible for large-scale operations, but the potential for small-scale development does exist. Ocean energy does offer a significant source of energy supply, but unless other, currently cheaper sources of energy rapidly diminish, there is little incentive for any significant growth in the industry. Ocean Thermal Energy

Conversion (OTEC) is one energy conversion process with several applications.[45] These include:

- Generating electricity
- Desalinating water
- Supporting deep-water mariculture
- Providing air-conditioning and refrigeration
- Assisting mineral extraction

The Department of Energy's National Renewable Energy Laboratory in Golden, Colorado, sees the OTEC potential as enormous. The Lab has concluded that, on an average day, 23 million square miles of tropical seas absorb an amount of solar radiation equal in heat content to about 250 billion barrels of oil. Assuming no more than one-tenth of one percent of this stored energy could be converted into electric power, it would still supply more than 20 times the total amount of electricity consumed in the United States each day.



Courtesy of Tidal Eectric, Inc.

Two other types of energy conversion, tidal and wave power, involve the mechanical motion of the ocean to generate electricity. Specially designed turbines mounted in dams or on moorings can capture the energy manifested in elevated sea levels, high tidal amplitudes, and strong currents.[46]

Marine Resource Concerns

The growth in marine natural resource exploitation, particularly in the far-offshore deep-water environment, will bring about new marine safety and security challenges in the years ahead. The year 2020 will likely see more oil and natural gas platforms in deeper waters, more pipelines offshore, increased ocean-based mining and dredging operations, and the possibility of ocean energy conversion facilities. Building, maintaining, and servicing these capital projects will greatly expand the amount of vessel traffic and human activity on the seas. While there will be strict regulation of these activities in U.S. waters, regulation alone will not guarantee the safety and security of life at sea nor the preservation of the environment. Substantial monitoring, enforcement, and response capabilities will be required.

There will be significant growth in U.S. offshore oil and natural gas platforms and pipelines. According to the U.S. Department of Energy, the number of oil and natural gas wells, both at sea and on land, is expected to increase by as much as 2.2 percent per year,

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[45] OTEC is the process of converting solar radiation to electric power using the ocean's natural thermal gradient to drive a power-producing cycle. Warm seawater from the ocean's surface and the cold deep water below are pumped through a surface and the cold deep water below is pumped through a heat exchanger that employs a working fluid, such as ammonia, propane, or freon, in a closed cycle. The warm water vaporizes the working fluid, which turns a turbine, thus producing energy. In order for OTEC plants to work efficiently, the warm surface temperature must differ by about 20 degrees Celsius from the cold deep water. OTEC facilities can be built on land, submerged on the continental shelf, or designed to float on the surface. Although some projections show that OTEC plants could be competitive during the next 5-10 years in three particular markets, OTEC competitiveness is highly dependent on other energy source prices.

[46] One such concept, offered by Tidal Electric of West Simsbury, Connecticut, envisions an impoundment structure comprising a two-directional dam and conventional dam techniques. Projects are being planned for the United States (Alaska), the United Kingdom (Cornwall and Wales), and Mexico, at 10 megawatt to 500 megawatt power-generation capacity. For more information see: http://tidalelectric.com.

depending on oil price levels. The greatest growth of offshore platforms will occur on the outer continental shelf of the Gulf of Mexico where the innovative use of cost-saving technology and expected continuation of recent huge finds have encouraged greater interest.

The growth in these oil and gas infrastructure and operations will have major implications for maritime safety and security. Wells will be significantly more remote, increasing emergency response time. The operations may be technically more sophisticated and produce at much higher rates, increasing the scope of potential marine accidents, such as spills. Specific pipeline concerns include greater environmental risks associated with longer pipelines, as well as more complex oil-spill contingency plans required for larger pipelines.

The concomitant increase in people working offshore, particularly in the commercial energy sector, is another safety concern that figures in Coast Guard planning. More accidents at sea could occur as larger crews begin operating farther from shorelines and Coast Guard facilities. Several projections indicate that development in the Gulf of Mexico alone could create as many as 100,000 new jobs, with up to 70 percent of these sustained beyond 25 years. The response time in the event of an accident will increase as support structures and vessels begin operating farther from shore. The Minerals Management Service estimates that many of the new facilities will be beyond a two-hour helicopter flight.

In general, the safety and security concerns brought on by offshore oil and gas exploitation can be applied to other marine industries as well. While the future for marine mineral mining and ocean energy conversion is less certain, operations in any of these fields pose their own risks to the marine environment and place more lives at risk on the seas. New technologies and larger, more complex facilities associated with far-offshore activities could also create conflict with interests ashore. Projected resource development will place increased demands on coastal ports and communities for support facilities and services. And, with an increasing number of actors seeking to exploit ocean resources, conflicts among users could arise. In the late 1990s, moreover, numerous communities are opposed to offshore development because of environmental and land-use concerns. Finally, such development will almost certainly be opposed by environmental activist groups, who may protest ashore or at sea.

Marine Transportation and Waterborne Trade

Waterborne trade remains the lifeblood of the American economy, whose arteries carry raw materials and finished goods to and from every corner of the world. In 1997, more than 95 percent of U.S. foreign trade by tonnage – 1.1 billion metric tons valued at nearly $626 billion – moved by ship, less than 3 percent of which was carried in vessels flying the American flag, a proportion expected to decline even as U.S. oceanborne trade increases in the years ahead.[47] U.S. oceanborne exports have increased 50 percent since 1990, a trend that is expected to continue into the next decade. Ironic for a country so tied to the sea and dependent upon sea power to protect national interests, the U.S. merchant marine is quite small, ranked only 15th in the world.

[47] *MARAD 98, 1998 Annual Report of the Maritime Administration* (Washington, D.C.: Department of Transportation, May 1999), pp. 44, 49.

Driven by global economic growth and flourishing international commerce, ocean-borne trade will at least double if not triple by 2020. Significant trade growth is expected between the United States and Asia during the next two decades. Nearly 75 percent of the world trade expansion during this period will come from emerging economies, especially those of the Pacific Rim and Asia. Several South American economies, particularly Brazil, and the Soviet successor states also will increase trade with the United States but not at the same level as Asia. Increased trade with these countries does not necessarily mean more ships, but rather larger ships carrying more cargo. Increased foreign trade also raises the potential for increases in smuggling of illegal goods hidden within legitimate cargo.

The most explosive growth will be in the container shipping industry, with the trend toward larger ships carrying more containers. The volume of cargo and size of ships will require U.S. ports to expand their infrastructure and deepen their channels to remain competitive. Smaller but faster container ships, travelling at speeds of up to 40 knots, will ply the coastal trade routes between U.S. ports. The movement of these relatively large vessels at such high speeds could create safety concerns in the coastal shipping lanes, particularly as recreational use will increase in addition to commercial traffic. Tanker traffic in U.S. waters will increase substantially by 2020 as U.S. oil imports rise. The increasing energy demand in the United States and decreasing domestic petroleum production will drive oil imports from half of U.S. domestic petroleum consumption in 1999 to some two-thirds in 2020. During this period, the number of cruise ships will likely double, and some of the newest cruise ships will be twice the size of cruise ships built in past few years. The Caribbean will remain the busiest region for these ships, but more routes to ever-remote areas such as Antarctica will open. High-speed ferries will be a burgeoning transportation business in 2020, with speeds expected to increase as ferry companies compete with other forms of transportation, such as commuter airlines. Ferry speeds may reach 80 or even 100 knots, posing significant safety challenges in busy coastal zones.

America's Marine Transportation System

Today, America's aging and fragmented marine transportation system (MTS) infrastructure is stressed and that stress continues to increase steadily, as Admiral James M. Loy, Coast Guard Commandant, and Clyde J. Hart, Jr., Administrator of the U.S. Maritime Administration (MarAd), outlined during a 13 May 1999 hearing on near- and far-term future MTS needs. In prepared testimony for the House Committee on Transportation and Infrastructure, Subcommittee on the Coast Guard and Maritime Transportation, Admiral Loy and Mr. Hart noted that "the challenge is clear.[48] Ports must be prepared to respond to the mounting pressures of growing trade, more noncommercial waterways users, the development of new means to harvest and preserve marine resources, and increasingly aggressive efforts by criminals and adversaries intent on doing societal harm. At the Federal level," Loy and Hart concluded, "we must include eliminating the gaps, overlaps, and stovepipes among government agencies. Government and the private sector must continue to work together if we want the very best MTS possible for the future."

The U.S. MTS is much more than the waterways and ports through which nearly all of America's foreign and one-quarter of its domestic trade moves every day. It is also the intermodal links to rail, truck, and pipeline services that support U.S. economic and military security. In particular, the marine infrastructure facilitates America's global outreach into overseas markets and the Nation's engagement in world affairs, including protection of

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[48] U.S. Department of Transportation, Statement of Admiral James M. Loy, Commandant, United States Coast Guard, and Clyde J. Hart, Jr., Maritime Administrator, on The Future Needs of the U.S. Marine Transportation System, before the Subcommittee on Coast Guard and Maritime Transportation, Committee on Transportation and Infrastructure, U.S. House of Representatives, 13 May 1999. See also the Department of Transportation report to Congress, *An Assessment of the U.S. Marine Transportation System* (Washington, D.C., September 1999). The September 1999 MTS Assessment was relied upon for much of the data presented in this section.

U.S. national security interests. The MTS includes, as well, the national and international regulatory framework that governs trade and commerce. In short, it is the intricate and in some instances delicate web of relationships and systems that link the farmer in Iowa to customers in Russia, China, and other U.S. trading partners throughout the world.

In the late 1990s, there were 336 seaports and 3,726 marine terminals in the United States, 150 of which handled about 95 percent of all marine cargo tonnage. Linked by some 25,000 miles of federally and privately maintained navigation channels, they serve thousands of miles of rail, highways, and pipelines that criss-cross the nation. More than 90 percent of the U.S. population is served by domestic shipping, which moves nearly one-quarter of the nation's freight (by ton-mile) for less than two percent of the total freight bill.

Courtesy of American Waterways Operators

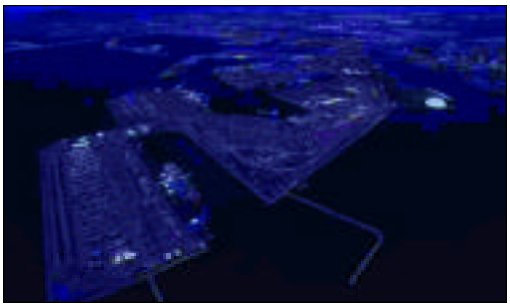
In peacetime, more than 95 percent of U.S. trade (measured by tonnage) is carried in ships, including the 3.3 billion barrels of oil that fuel the American economy – more than half of our annual consumption. And in war – as witnessed during the 1991-92 Persian Gulf war – some 95 percent of everything carried to and from conflict theaters will be moved by ships. At the height of the shipping movement in Operation Desert Shield, a "Steel Bridge" of ships linked U.S. ports with in-theater facilities in a continuous movement of "beans and bullets" needed to defeat Saddam Hussein's forces.

Overall, the national economic impact of the U.S. marine transportation system is enormous. According to the U.S. Maritime Administration, U.S. coastal and inland ports in 1996 generated 13.1 million jobs and personal income of $494.2 billion, resulted in sales of $1.5 trillion, contributed $742.9 billion to the nation's Gross Domestic Product (GDP), and generated nearly $200 billion in federal, state, and local taxes. Focusing just on the port industry, that sector of the U.S. economy was responsible for generating more than 1.4 million jobs and directly and indirectly responsible for some $53 billion in personal income and more than $140 billion in sales revenues each year during the late 1990s. More than $20 billion in federal, state, and local tax revenues were generated. In 1996, the public port industry's capital expenditures amounted to $1.3 billion, and generated some 45,600 jobs, $1.7 billion in personal income, and $3.9 billion in sales revenues. Looking at the users of America's ports, those business that make significant use of waterborne commerce and infrastructure for shipping or receiving goods, they accounted for 11.7 million jobs, $439.8 billion in personal income, and sales approaching $1.4 trillion.

U.S. waterborne trade in 1996 totalled 2,072 million metric tons (mmt), of which 998.5 mmt (48.2 percent) was in domestic commerce (Coastwise, 242.6 mmt; Lakewise, 104.2 mmt; Internal/Riverine, 564.3 mmt; Intraport, 80.7 mmt; and Intraterritorial, 6.7 mmt). U.S. oceanborne foreign trade comprised 1,073.5 mmt (51.8 percent), of which 664.6 mmt were imports and 408.9 mmt were exports. Compare that to 1960, in which total U.S. waterborne commerce was just 997.5 mmt, of which 30.8 percent comprised foreign trade and 69.2 percent U.S. domestic trade (226.5 mmt of which was on coastwise and river systems). In 1996, the Mississippi and Ohio rivers and the Gulf Intercoastal Waterway moved the bulk – nearly 611 mmt (76 percent) – of all inland and coastal waterway tonnage.[49]

The leading 50 U.S. coastal and inland ports handled 89.4 percent of the total waterborne trade in 1996. The top five – Port of South Louisiana (172.2 mmt), Houston (134.4 mmt), New York/New Jersey (119.4 mmt), New Orleans (76 mmt), and Baton Rouge (73.5 mmt) – accounted for about 28 percent. (Charleston, number 50, moved slightly more than 10 mmt that year.) Even with this high degree of concentration, there were 145 ports, or 40 percent of all U.S. ports handling waterborne commerce, that accounted for more than one million metric tons of cargo each in 1996.

In terms of movement of containerized cargoes, for 1996 the top 25 ports handled 98.3 percent of U.S. foreign container cargoes; the leading 10 ports accounted for about 80 percent, with the Los Angeles/Long Beach port complex accounting for nearly one-third of all containers. The top five container ports in 1997 were: Long Beach (2.7 million Twenty-foot Equivalent Units or TEUs), Los Angeles (2.1 million TEUs), New York/New Jersey (1.7 million TEUs), Charleston (955 thousand TEUs), and Seattle (843 thousand TEUs). Number 25 in 1997, Honolulu, accounted for about 37 thousand TEUs.



Courtesy of Port of Long Beach

Commercial vessels make approximately 70,000 port calls in the United States each year. At the same time, Americans operate about 20 million recreational craft. With both commercial and recreational traffic and competition for access to U.S. waterways expected to increase dramatically in the years ahead, the potential for disaster and increased demand on Coast Guard maritime safety and search and rescue capabilities, from inland waters to the high seas, will grow as well.

Estimates for 1999 indicate that as much as three billion metric tons of cargo valued at more than one trillion dollars would transit U.S. waters and arrive in/leave from U.S. ports. In addition, some 78 million recreational users, 140 million passengers, and 110 thousand fishing vessels would compete for access to a fixed area of water space. Looking out a quarter century, the Coast Guard's 1998 strategic vision publication, *Coast Guard 2020*, identified key challenges facing America's MTS. Specifically focusing on "economic globalization," *CG 2020* forecast:

> America will become more dependent upon international trade, the vast majority of which will be transported on the water. U.S. maritime trade will double, if not triple, by 2020. Trade with Asian-Pacific and Latin American countries will increase more than with other regions. Efficient maritime transportation will become more critical to America's economy and competitiveness. Global seaborne trade will bring larger numbers of ultra-large, deep-draft, and minimally crewed ships. America's inland and coastal commerce will experience increased barge and tow traffic. Higher volumes of oil, hazardous materials, and bulk commodities are likely. Just-in-time delivery of raw materials and finished goods will become the norm, magnifying the consequences of disruptions and emphasizing the importance of the marine transportation system's reliability. Furthermore, growing numbers of people will have the resources and leisure time to spend on cruises and recreational boating. Collectively, this congestion on America's waterways will create a greater need for a well-integrated intermodal transportation system with close links among the sea, land, and air components.

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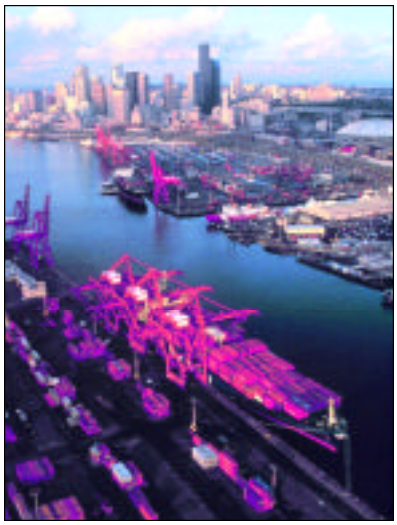
[49] Summary data for 1997 indicate that growth continues: U.S. waterborne foreign trade totalled 1.07 billion tons valued at $625.7 billion. *MARAD 98, op.cit.*, p. 49.

In the coming decades, the United States will become even more dependent upon international seaborne trade, as well as the domestic ocean, intercoastal, and inland waterways commerce, to ensure economic well-being. U.S. oceanborne trade is expected to at least double – some projections show a tripling of America's maritime commerce – by 2020. "Mega-ships" carrying 6,000-plus containers or more than 5,000 passengers and crew are already on computer "drawing boards," as are high-speed ferries capable of 80 knots, if not more. Inland waterways systems anticipate similar growth trends; forecasts for the Upper Mississippi barge traffic, for example, show a more than 60 percent increase during the next 50 years.[50] Inland and coastal commerce will need to accommodate increased traffic and demands on aging infrastructure; more than half of all the locks and dams on the inland waterways will be more than 50 years old by the turn of the century. Similarly, U.S. recreational boating activities will continue to increase, by perhaps as much as five percent per year through 2020. In short, America is at a critical juncture with respect to its MTS future. There will continue to be an increasing demand on our ports and waterways. Unfortunately, there is no coordinated public and private sector plan in place to address the challenge. Collectively, the increased likelihood of congestion on and competition for America's waterways will create growing demand for a well-integrated, intermodal transportation system with close links and cooperation among the sea, land, and air components. This is troubling, as the port infrastructure of the United States is being pushed to the limits of its capacity in the late 1990s, with major modernization decisions and investments looming on the horizon. National leadership is needed now to ensure our waterways keep pace with the shoreside infrastructure. In short, an efficient marine transportation system, linking ships, ports, transshipment points, and inland waterways will be crucial to the U.S. economy and international competitiveness in the decades to come.



Courtesy of MarAd

Container Shipping. The container shipping industry will undergo enormous growth through 2020, highlighted by larger ships carrying more cargo. Container ships are already growing in size, with the newest versions too large to enter most U.S. ports. These large container ships, sometimes referred to as "mega-ships," are increasingly capable of carrying 4,500 TEUs or more and require channel depths of nearly 50 feet. Industry experts believe about one-third of the world's container ship fleet will be 4,500 TEU capacity and larger within 15 years. The *Regina Maersk*, 1,043 feet long with a 6,000-TEU cargo capacity and 47.5-foot draft, is just one example of the mega-ships that will transit U.S. waters in the future. The push toward larger container ships is being driven by profit considerations; simply, more containers carried by a vessel decreases the cost per container. Mega-ships will primarily call at a few major load centers, which can handle the ship size and cargo volume. As a result, feeder ships transiting from the load centers to smaller ports will increase coastwise

[50] The total direct economic activity generated by the domestic trade is approximately $10 billion per year, of which some $4 billion results from wages paid to vessel crews and shoreside managers. The principal products moving in the domestic ocean trade are crude and refined petroleum, residual fuel, and coal, while containerized cargoes – including textiles, manufactured and household goods, and groceries move between the contiguous 48 states and Alaska, Hawaii, and Puerto Rico. In the inland waterways, the barge and towing industry is a vital element in America's intermodal transportation system that moves more than 600 million tons of cargoes annually.

movements, which could also produce a concomitant increase in the number of ships engaged in *cabotage*, or coastwise trade, reserved for U.S.-flag ships under the 1920 Jones Act.

With the move toward extremely large container ships calling on a few major load centers, another possible development in the container industry will be the "Fast Ship" working between the load centers and feeder ports. In the "Fast Ship" scenario, smaller, 1,200-TEU container ships traveling at speeds of up to 40 knots rapidly move containers to the feeder ports. The movement of these relatively large vessels at such high speeds could create safety concerns in coastal shipping lanes.

Bulk and Break-Bulk Shipping. While the growth in containerized cargo will have the greatest impact on future U.S. shipping trends, bulk and break-bulk cargo will remain extremely important through 2020. Bulk cargo vessels carry large quantities of cargo, such as grain or iron ore, in large, uncompartmented cargo holds. Break-bulk cargo vessels carry their shipments in barrels, bags, pallets, or other units. Bulk and break-bulk cargoes make up half of all cargo (by volume) entering or leaving the United States, and will continue to account for a large portion in 2020. The outlook for bulk and break-bulk cargo vessels should be stable for the foreseeable future, and these services will remain critically important in U.S. maritime trade. Thus, because no major changes in this field are expected, the demands on port infrastructure, vessel safety, and law enforcement efforts, from this sector of the market, will remain relatively stable.

Tankers. Tanker traffic in U.S. waters will increase substantially by 2020 as U.S. oil imports rise. Increasing energy demand in the United States and decreasing domestic petroleum production will drive oil imports from about half of U.S. petroleum consumption in 1996 to two-thirds in 2020. The demand for increased oil imports will be met with more transits rather than growth in tanker size. Domestically, Alaskan oil production will decrease, while oil drilling in the Gulf of Mexico will move farther offshore. These trends will bring accompanying changes in tanker movement patterns. By 2020, more foreign tankers will be entering U.S. waters, especially the Gulf of Mexico. The Gulf will be the area of primary activity for two reasons. First, most of the U.S. oil refining capacity is in or near Gulf ports. Second, increased deepwater oil production in the Gulf likely will require tankers as well as pipelines to move oil ashore. On the West Coast, fewer U.S. tankers will be transiting from Alaska to refineries in Southern California, because of the drop in Alaskan oil production.

Liquefied natural gas imports into the United States will continue to grow through 2020, but will represent only a small portion of U.S. energy imports. Still, the volatile characteristics associated with LNG will present a significant safety concern during vessel transits. Two U.S. ports (Everett, Massachusetts and Lake Charles, Louisiana) likely will continue to import LNG through 2020. LNG imports into Everett and Lake Charles are projected to increase nine-fold, reaching a level of 360 billion cubic feet in 2020, compared to just 40 billion cubic feet in 1996.

Cruise Ships and Ferries. Tremendous growth in the cruise line industry and the emergence of high-speed ferries will be the key developments in the maritime passenger transport business through 2020. Both developments will pose challenges to maritime transportation in the United States.

The cruise line industry will exhibit strong growth throughout the next two decades. Since 1980, the average annual growth of the industry has been almost eight percent, and with the world fleet of 230 cruise ships operating at 90 percent capacity,there are no signs of this growth slowing. North America is the largest market, and surveys indicate that nearly 60 percent of Americans want to take cruises, although only 11 percent have done so through 1998. The number of cruise line passengers worldwide is projected to triple to 15 million by 2020.

Courtesy of Victoria Clipper

The cruise line industry will respond to this increasing demand with new ships and new markets. The number of cruise ships will likely double before 2020, and the industry already is building or has plans to build 44 ships. Many of these new ships will be larger as well, with Leviathans such as the 142,000-ton *Voyager of the Seas* coming on line by 2001. Industry specialists indicate that the overriding trend in the worldwide cruise industry will be the significant increase in global capacity as older ships are retired from the North American arena.

New cruise markets will emerge as these older vessels reposition to other areas. The Caribbean will remain the top destination of cruise ships, with approximately 60 percent of such traffic (a 1992 study found that half a million cruise passengers would likely visit Cuba in the first two years after the lifting of the U.S. economic embargo, followed by 1.2 million in the subsequent few years), but more routes will open to remote areas such as South Pacific islands, the Amazon, and Antarctica. The Coast Guard has already had to respond to a virtual explosion of small cruise ships plying ever-remote areas of Alaska's Inside Passage, venturing where the larger ships cannot go. About 50 small (between 50 feet and 200 feet in length) vessels carried some 200,000 passengers in 1999, at times getting into so much trouble that Coast Guard assistance and that of other nearby vessels were needed.[51] Some of the areas have not been surveyed since 1890, prompting a close liaison among the Coast Guard, the National Oceanic and Atmospheric Administration, and the Alaska Small Vessel Task Force. This trend toward ever-more remote destinations has significant implications for Coast Guard search and rescue opera-

Courtesy of Royal Carribbean International

[51] During the 1999 cruise season, four vessels got into extremis and needed assistance. "Safer Ships Urged, Panel Targets Small Vessels," Associated Press/*Anchorage Daily News*, 28 August 1999.

tions, including the increasingly likely need for emergency medical evacuations of stricken passengers and crew members from cruise ships far offshore.[52]

Another maritime transportation industry expected to grow significantly by 2020 is the high-speed ferry business. In certain world markets, high-speed ferries are already competitive with other forms of transportation, particularly commuter airlines. High-speed passenger ferries already have begun to ply U.S. waters and will increase in number and speed during the next two decades. With speeds perhaps exceeding 80 knots, such ferries will pose significant safety challenges as they encounter other maritime traffic. The challenge will be to maintain adequate separation between these high-speed ferries and other vessels, thereby reducing the risk of human error.

Nuclear Waste. The need to move and secure shipments of spent nuclear fuel and waste from reprocessing will increase. This trade is now predominately between the Far East and reprocessing facilities in Europe. Concerns about an environmental catastrophe and security of the nuclear waste may lead to increased demands for storage in or transit through U.S. hands, particularly from the Russian Far East. At the same time, increased numbers of plants will generate a growing surplus of spent fuels to be transported. Because of some states' environmental concerns, moreover, shipments may also be detoured away from optimum shipping routes into more dangerous areas, thus increasing the risk to the vessel, its cargo, and the environment.

Port Infrastructure. U.S. ports will continue to face intensifying pressure to expand to meet the growing volume of shipping and to combat the threat of foreign competition. The container industry, in particular, because of the increasing volume of cargo and the growing size of the ships themselves, will divide ports into two categories: load centers with deep harbors and world-class inland intermodal infrastructure, and feeder ports that cannot accommodate the new generation of ultra-large vessels.

Courtesy of MarAd

The more numerous feeder ports still will play an important role in maritime trade, even though they will not handle volumes of cargo nearly as large as those moved through the load centers. Unlike the load centers, feeder ports will be less affected by global developments in the shipping industry. These ports will strive to diversify into the bulk and break-bulk trades to avoid dependence on the container industry. However, lower profit margins in bulk and break-bulk, and competition from other transportation modes (railroads, pipelines and canals/waterways), may prevent ship owners and operators from driving expensive capital development the way they can in the containerized sector.

While U.S. ports will compete among themselves for positions as load centers, their greatest competition may very well come from foreign ports. Vancouver and Halifax, Canada, and Freeport, Bahamas, already compete with American ports for U.S.-bound container cargo, and by 2020 Mexican ports could challenge as well, if planned improvements to the Mexican transportation infrastructure are completed. Halifax, where the main channel is 60 feet deep, has captured ten percent of New York's midwest-bound traffic

[52] See, for example, "Getting Sick on the High Seas: A Question of Accountability," *The New York Times*, 31 October 1999, pp. 1, 34-35. Although focused on legal issues of accountability for poor health care, the article underscores what might become a new element of USCG SAR requirements – emergency MedEvacs.

annually since 1994. The deep harbor and intermodal infrastructure in Halifax make the port a strong competitor for eastern U.S. ports. The North American Free Trade Agreement (NAFTA) further enhanced the competitiveness of Halifax and other non-U.S. North American ports, expanding their access to U.S. markets. While more than 95 percent by weight of all cargo leaving or entering the United States currently passes through U.S. ports, the challenge from foreign ports, particularly for containerized cargo, could reduce that figure.

Challenges and Developments

With global maritime trade perhaps tripling by 2020, larger numbers of ultra-large, deep-draft, and minimally crewed ships – many carrying hazardous cargoes – plying U.S. waters and economic zones, and cruise ships capable of carrying 5,000 or more people heading for ever-more remote areas, there will be a critical need for effective vessel identification and tracking in all weather conditions, throughout the year. The potential for disastrous environmental harm and loss of life from even a single incident will continue to grow. Likewise, the need will increase for more effective prevention of and rapid response to accidents, including those in the Deepwater environment, as increasing globalization and ever-larger vessels affect U.S. commercial, environmental, recreational, and security interests farther out to sea.

The future also has potentially grave implications for U.S. military readiness, in addition to global economic competitiveness, as current Defense Department and Navy projections show that almost all of the equipment, ordnance, and supplies needed to support any sizeable projection of military power must move by sea.[53] During the 1990-1991 Gulf War, nearly 95 percent of all material, supplies, and equipment sent to the combat theater – and returned to the United States once peace was restored – was carried on ships. Efficient ports are critically important for U.S. military combat operations, as well as to respond to regional crises and humanitarian needs, in America's strategy of engagement to enhance security, bolster economic prosperity, and promote democracy.

The vulnerability of the maritime transport system to interruption, whether from natural and man-made disasters or direct attack, must not be underestimated. In the wake of recent bombings within the United States, the susceptibility of ships and key infrastructure elements to terrorist attack is a problem that begs for a multifaceted solution, as identified by the President's Commission on Critical Infrastructure Protection.[54] "The physical distribution infrastructure is critical to the national security, economic well being, global competitiveness, and quality of life in the U.S.," the Commission noted in its October 1997 *Critical Foundations* report. "It includes 1,900 seaports and 1,700 inland river terminals on 11,000 miles of inland waterways carrying grain, chemicals, petroleum products, and import and export goods.... Tomorrow – perhaps next year, perhaps in ten years – critical transportation systems could be vulnerable to such attacks and crippled unless action is taken now." Likewise, piracy remains an international scourge that costs the world economy millions of dollars in losses each year; while pirates are absent from U.S. waters, the Coast Guard can play a strong leadership role in working with other

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[53] Admiral Jay Johnson, USN, Chief of Naval Operations, *Vision...Presence...Power: A Program Guide to the U.S. Navy* (Washington, D.C. Office of the Chief of Naval Operations, May 1998), p. 25, hereafter cited as VPP98; Secretary of Defense, *Report of the Quadrennial Defense Review* (Washington, D.C.: Department of Defense, May 1997), http://www.dtic.mil/ defenselink/pubs/ qdr/sect5.html, pp. 7-8, where the results of the 1995 Mobility Requirements Study Bottom-Up Review Update were confirmed. Also, an unpublished history of the Military Sealift Command's operations during the Gulf War, "Desert Sealift: The Military Sealift Command in Desert Shield, Desert Storm, and Desert Sortie" (prepared for the Commander, MSC, by Dr. Scott C. Truver and Norman Polmar, TECHMATICS, March 1993), described the sometimes severe challenges and difficulties of moving defense cargoes, particularly ordnance and ammunition, and especially through commercial ports. In Desert Shield Phase I, for example, only one layberth was available in Savannah, Georgia, for loadout of MSC's Fast Sealift Ships.

[54] *Critical Foundations: Protecting America's Infrastructures, op.cit.* The vulnerabilities of the

countries' naval and maritime defense forces to defeat *piracy jure gentium* – a crime against all nations. Thus, the security of the sources of supply and the maritime routes and gateways through which America's imports and exports must pass will continue to be a key U.S. maritime interest. Failure to plan now for these challenges will reduce U.S. competitiveness and increase risks to safety, security, and the marine environment, a perspective driven home by Admiral Loy and MarAd Administrator Hart. "These challenges will continue to require both public and private sector efforts," the nation's marine transportation leaders told the Congress in May 1999.[55]

"These challenges" are exacerbated by competing interests and demands, which often have pitted one element of the MTS against another, as well as the fragmented responsibility for management, oversight, and promotion of the overall system – if, indeed, "system" is not an oxymoron. More than 20 federal agencies have responsibilities for elements of the U.S. MTS. Varied jurisdictions, overlapping responsibilities, and a lack of overall leadership for the development of a national maritime transportation system vision, plan, or policy characterize the situation today. But there is hope, if a series of regional "listening sessions" that culminated in the fall 1998 National MTS Conference bear fruit. For the first time, every element of the MTS community was brought together, which allowed all participants to air concerns and identify possible solutions.

The seven "listening sessions' that MarAd and the Coast Guard conducted at coastal and inland ports during the spring and summer of 1998 resulted in several key issues and imperatives. These included: the need to develop consensus on a vision for the MTS of 2020; inter-agency coordination at the national, regional, and local levels; and recommendations to improve safety, security, global competitiveness, infrastructure, and environmental protection of the marine transportation system. These issues and imperatives were the focus of the National MTS Conference held from 17-19 November 1998, at which 144 representatives from all areas of the MTS community participated. "Two overriding concerns cited were time and again," Admiral Loy and Administrator Hart acknowledged during their 1999 testimony: "the lack of a shared national vision for the MTS and the lack of leadership and coordination among government agencies."

At the outset of the conference, Secretary of Transportation Rodney Slater put great emphasis on the need for A clear and focused statement, noting that it "will enable us to move forward to create a marine transportation system for the 21st century – one that continues to be safe, secure, and environmentally sound." In the end, a consensus was crafted that balanced virtually everyone's interests in a compelling vision of the future MTS:

> The U.S. Marine Transportation System will be the world's most technologically advanced, safe, secure, efficient, effective, accessible, globally competitive, dynamic, and environmentally responsible system for moving goods and people.

Operationalizing that goal has already begun, but will not be an easy proposition, as hundreds of millions of dollars, perhaps billions, will be needed to achieve a world-class MTS. Simply by raising the visibility of the MTS, especially in the Administration and the Congress, there is hope that this will encourage cooperation and sharing of information among all MTS players, and result in the needed resources to achieve the vision.

"Physical Distribution" network and the Coast Guard's role in transportation security are discussed at pp. A-11 – A-23. See also, *Turning to the Sea: America's Ocean Future*, *op.cit.*, pp. 32-33.

[55] Statement before the Subcommittee on Coast Guard and Maritime Transportation, *op.cit.*, 13 May 1999.

The Coast Guard and the Maritime Administration will remain key players in the current and future health of the U.S. MTS. They have bound together to help craft a vision for America's Marine Transportation System, much as President Eisenhower's vision of the 1950s' for an interstate highway system galvanized the nation into action. Working closely with all elements of America's MTS, the Coast Guard-MarAd team continues to seek a strategy, plan, and integrated programs that embrace the waterways, ports, and intermodal connections as a truly integrated, national system.

Maritime Sovereignty and Homeland Security

The basic requirement for the Coast Guard is to protect U.S.citizens and interests in inland waterways, territorial seas, and exclusive economic zones under U.S. jurisdiction, as well as to detect, deter, and defeat threats to U.S. sovereignty that might arise on the high seas. The marine areas under U.S. jurisdiction are enormous, covering 3.5 million square miles of ocean space. The spectrum of possible threats is likewise very broad, spanning economic, environmental, humanitarian, political, and military interests.

The salient factor in all of these, however, is that the Coast Guard – working with numerous local, regional, national and international agencies – must safeguard domestic security: Americans must feel secure within their own country. Indeed, as the National Defense Panel underscored in its 1997 report, "protecting the territory of the United States and its citizens from 'all enemies both foreign and domestic' is the principal task of government." More to the concern of the Coast Guard, the National Defense Panel concluded that "coastal and border defense of the homeland is a challenge that again deserves serious thought."[56]

An expansive concept of "homeland security" is now being explored and is directly related to the concept of maritime security. Former Under Secretary of Defense Fred C. Ikle warned that "Until recently, we have not greatly worried about direct attacks within the U.S. homeland – apart from the risk of nuclear war. The bombings of New York's World Trade Center and the Federal building in Oklahoma City in the United States to make evident that a few determined terrorists can cause enormous destruction almost anywhere in the United States."[57] The Sarin gas attack in the Tokyo subway and the bombings of the U.S. embassies in Africa underscored the vulnerability to terrorists.

Courtesy of FEMA

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[56] National Defense Panel, *Transforming Defense: National Security in the 21st Century, op.cit.*, pp. 25ff. More than advocating only "serious thought," the National Defense Panel, at pp. 26-27, stated that "The U.S. Coast Guard and the Department of Defense should work closely to ensure that new classes of cutters are outfitted with a combat systems suite that gives these ships a robust capability in support of homeland defense, including such missions as drug interdiction, immigration control, and anti-transnational crime operations."

[57] Fred C. Ikle, "An Argument for Homeland Defense," *The Washington Quarterly*, Spring 1998, p. 8.

[58] William Safire, "Team B vs. C.I.A.," *The New York Times*, 20 July 1998, p. 17.

[59] Falkenrath, "Confronting Nuclear, Biological and Chemical Terrorism," *Survival*, Autumn 1998, pp. 43-65, at p. 43. He concludes that intelligence is the first and most important line of defense and, at. p. 65, that the "best action policy-makers can take...is to focus on the threat before it reaches emergency proportions, and to begin implementing a balanced program of preventive and preparedness measures."

[60] Remarks of Deputy Secretary of Defense John J. Hamre, American Bar Association, National Security Panel Breakfast, 29 April 1999; http://www.defenselink.mil/speeches/1999/s19990429-depsecdef.html. More to the point of the Armed Services' roles in homeland defense, Hamre noted that

Moreover, the ease by which smugglers can clandestinely infiltrate U.S. maritime borders, bringing in drugs, illegal immigrants, and contraband goods, gives pause for grave concern. In some future crisis, or even in non-crisis situations when the United States would least expect it, terrorist cells could infiltrate America's ports and cities, armed with weapons of mass destruction – chemical, biological, or nuclear devices. Essayist William Safire posed a hypothetical problem for a future U.S. President in this way: "Saddam Hussein invades Saudi Arabia. You warn of Desert Storm II; he says he has a weapon of mass destruction on a ship near the U.S. and is ready to sacrifice Baghdad if you are ready to lose New York. Decide."[58] As Richard A. Falkenrath assessed the threat from nuclear, biological, and chemical terrorism:

> All modern societies, however, are vulnerable to massive loss of life from an attack involving a weapon of mass destruction (WMD) – nuclear, biological or chemical (NBC). This vulnerability has existed for many years: it is a function of accessible weapons, porous borders, free and open societies, and high population densities in cities. Yet while national-security leaders have generally recognized the military threat posed by NBC weapons, they have tended to downplay or disregard the possibility that these weapons might be used by a non-state or transnational actor in a campaign of mass-destruction terrorism....
>
> Something of a shift now appears under way, evident particularly in the United States since the early 1990s. Senior U.S. officials, congressional leaders and non-governmental experts now routinely call attention to the threat of WMD terrorism – particularly biological weapons – and rank it among the most serious challenges to U.S. security.[59]

That future may already be here. In late April 1999, then-Deputy Secretary of Defense John Hamre noted that

> ...during the last year, there have been over 100 alleged or implied terrorist incidents involving chemical or biological weapons in the United States. Most of them have been fraudulent.... I think they're happening virtually once a week now in California. It is a sad reality that we had the first threat of anthrax attack a year and a half ago and that we have had over 100 in the last 12 months. At some point, one of them will be real.[60]

But these concerns are not limited to terrorist threats, although the Coast Guard is likely to be a critical "first-responder" to an attack in a crowded roadstead or harbor, and Coast Guard men and women must be trained and equipped to handle such a crucial task.[61] Other important U.S. interests – a clean marine environment, healthy fish stocks, protected species, safe offshore production and lightering facilities, and secure maritime transport – are also "targets" needing protection. In short, America's maritime security and

"But the government's fear of bioterrorism isn't completely unfounded. Even if we don't know much about the terrorists, there is a large and authoritative body of knowledge about the use and effects of biological agents – and it is scary. This technical data, much of it obtained prior to the cancellation of the U.S. offensive biological program in 1969, demonstrates that it's possible to place large populations at risk by releasing appropriately prepared pathogens into the air. Even relatively small quantities of biological agents can have catastrophic results: a panel of World Health Organization experts calculated that 50 kilograms of anthrax released over a city of half a million people would kill 95,000 and incapacitate another 125,000. Some experts believe that, pound for pound, biological weapons are potentially more lethal than thermonuclear warheads."

W. Seth Carus
Assessing the Bioterrorism Threat
***New Republic,* August 1999**

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there was no desire to change *Posse Comitatus*, which he saw as "an enormously important protection for the Department of Defense as well as for Americans." In his July 1999 "Grave New World" commentary, Secretary of Defense Cohen likewise noted that "our military response efforts will be grounded primarily in the National Guard and Reserve. In contrast to their more familiar role of reinforcing active-duty forces overseas, our Guard and Reserve are the forward-deployed forces here at home. Special National Guard teams are being positioned around the nation to advise and assist communities upon request.... The Posse Comitatus Act and the Defense Department's implementing policies are clear – the military is not to conduct domestic law enforcement without explicit statutory authority, and we strongly believe no changes should be made to *Posse Comitatus*." Both Secretary Cohen and Deputy Secretary Hamre seemed to ignore the Coast Guard's role in homeland security. Unlike the other four Armed Services, the Coast Guard is not constrained by *Posse Comitatus* and has strong and comprehensive law-enforcement mandates, responsibilities, and capabilities.

[61] In addition to carrying out emergency response, containment, and remediation efforts, the Coast Guard will almost certainly be a critical command-and-control element, linking together local, regional, and national assets. See "Readying Emergency Teams for Terrorist Attacks," *The New York Times*, 3 July 1999, p. A9.

interests can be challenged in numerous ways, as Secretary of Defense Cohen summarized in his 1999 *Annual Report to the President and the Congress:*

> **Transnational Dangers.** The variety of actors that can affect U.S. security and the stability of the broader international community will continue to grow in number and capability. Increasingly capable and violent terrorists will continue to threaten the lives of American citizens and their institutions and will try to undermine U.S. policies and alliances. Over the next 15 years, terrorists will become even more sophisticated in their targeting, propaganda, and political action operations. State-sponsored terrorism will continue to provide support to a disparate mix of terrorist groups and movements. The illegal drug trade and international organized crime, including piracy and the illegal trade in weapons and strategic materials, will persist, undermining the legitimacy of friendly governments, disrupting key regions and sea lanes, and threatening the safety of U.S. citizens at home and abroad. Finally, environmental disasters, uncontrolled flows of migrants, and other human emergencies will sporadically destabilize regions of the world.
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> **Threats to U.S. Homeland.** The proliferation of advanced information and military technology increases the likelihood that a growing array of actors could attack the United States, using ballistic missiles, NBC weapons, or information warfare (which could include attacks on U.S. infrastructure through computer-based information networks). Together with the continued threat of illegal drugs, organized crime, and migrant flows, and the threat inherent in the remaining strategic nuclear arsenals of other countries, direct threats to the United States are significant, albeit dramatically smaller in scale than during the Cold War.[62]

It is, therefore, in America's strategic interest to engage these threats to the U.S. homeland as far away from the United States as possible. This has generated within the Coast Guard a novel strategic operational concept called simply "Pressing Out Our Borders." This envisages close planning liaison and operational teaming with the Navy, not unlike the "National Fleet" initiative championed by Admiral Johnson, the Chief of Naval Operations, and Admiral Loy, Coast Guard Commandant (see Appendix C and the "National Fleet" discussion in Chapter V). It calls for a "layered defense" comprising surveillance, detection, identification, sorting, and interception and engagement of threats in four areas of approach to the United States: overseas source departure zones, trans-oceanic route zones, U.S. coastal route zones, and U.S. port zones. In this way, threats that do materialize can be thwarted well before they can be in position to deliver an attack against America. As strategist Lawrence Freedman recognized,

> If a conflict is close to home, there is a risk that its effects will be felt within Western societies. There are good reason to be way of situations that allow gangsters and drug-traffickers to flourish, prompt extremist to export violence or encourage local bullies and predators. Substantial population movements, collapsing local currencies, disrupted markets and sources of important commodities such as oil can all have substantial knock-on effects. Images of human distress on a massive scale and violations

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[62] William S. Cohen, Secretary of Defense, *Annual Report to the President and the Congress,* 1999 (Washington, D.C.: Department of Defense, 1999), p. 2.

of human rights can prick Western consciences and discredit passivity. If non-military remedies such as diplomatic missions and economic sanctions are inadequate, the calculable losses of intervention can be outweighed by the less calculable damage resulting from non-intervention.[63]

Illegal Commerce

Just as the world's oceans are avenues for the nation's overseas commerce, they are also the highways for the import or export of illegal or untaxed commodities. Clearly, the smuggling of illegal drugs, aliens, the import of untaxed cargoes, and the export of unauthorized technologies will remain a major threat to the nation's security in the *next* 100 years of Coast Guard service, just as was the case during the first 200 years of its history. The permeability of international borders and the inability of governments to address effectively these transnational threats continue to lure both individuals and organizations looking for enormous profits. The sale of illicit drugs in the United States during 1993 alone was estimated at $49 billion, while the trafficking of illegal immigrants throughout the world is likewise a multibillion dollar enterprise.

With more than a quarter-million visits by commercial ships to U.S. ports, movement of more than four million maritime shipping containers, and six million sea passengers embarking and debarking annually, the complexity of ownership, registration, and operation of commercial merchant vessels provides a deep thicket from which those intent on breaking laws can operate. These complexities impede the ability to establish quickly who controls the movements of a vessel and its cargo. A ship's true owner may be camouflaged through multiple layers that involve multinational corporations. The ship itself will more than likely be registered under a "flag of convenience" that does not represent a ship's true nationality. The use of separate corporations for chartering ships, a separate vessel mortgagee, and multinational crews all provide opportunities for exploitation and "cover" for movement of contraband. Forward-operating Coast Guard forces executing interdiction operations must increasingly be supported by timely and focused intelligence, as well as effective command, control, and communications systems if they are to unravel successfully these complex relationships as a critical part of executing their missions.

Nowhere is this more true than with regard to the Nation's "war on drugs." Drug trafficking will continue to plague the United States through 2020, driven by Americans' demand for illicit drugs. Traffickers in the future will rely increasingly on commercial transportation systems to move their products. They also will use successful noncommercial means, remaining flexible in altering methods in response to law enforcement tactics. It is a "cat-and-mouse" game with lethal consequences.

Control of the processing and sale of illicit drugs worldwide is a continuous challenge that has no short-term solutions. The U.S. General Accounting Office has estimated that law enforcement, corrections, and public health costs of the illegal drug problem total $67 billion annually. Given that there will be a future illicit drug market, there also will be sources of supply and transportation methods to deliver drugs to market; the maritime trafficking of illegal drugs is expected to remain a global threat. While numerous studies

[63] Lawrence Freedman, *The Revolution in Strategic Affairs,* Adelphi Paper 318 (New York: Oxford University Press, 1998), p. 35.

have not attempted any specific conclusions concerning the scope of the U.S. drug market in 2020, they do suggest that:

- The number of chronic cocaine users will not significantly change. The number of chronic cocaine users has not significantly changed in seven years. Given that any program attempting to alter perceptions of drug use will require time to take effect, (reversing perceptions of tobacco use took 20 years, for example) the number of chronic users will not be significantly altered by 2020.
- Cocaine market demand will not significantly change. Given that chronic users account for three-quarters of the total cocaine market, the number of chronic users is unlikely to change significantly.
- The global use of illicit drugs may increase if social mores change significantly. Such changes could develop as a result of improved methods of drug ingestion, revived attempts to legalize controlled drugs, greater concern over personal freedoms, the lax enforcement of current drug laws, or a general global acceptance of drug abuse as an uncontrollable issue.

Courtesy of Corbb

Worldwide illegal drug production is expected to continue to expand well into 2020. Illegal drug producers will be increasingly flexible in circumventing international enforcement efforts. They will be able to weather law enforcement attacks on specific drug production nodes and survive. This flexibility will be largely due to an increased use of technology to support highly mobile operations and to improve both operational security and production methods. Organized crime syndicates will provide effective business planning and will make use of their significant financial power to corrupt the authorities in a growing number of countries. Moreover, links between drug traffickers and rebel groups within source countries can pose significant threats to regional stability and peace.[64]

During the past decade, illicit drug production has spread to places where law enforcement poses the least threat. That trend will continue. By 2020 major drug producing nations such as Afghanistan (heroin), Colombia (cocaine, heroin), and Mexico (marijuana, heroin, and synthetic drugs) will likely be competing with other countries to supply major U.S. and European markets. Countries most vulnerable to being overwhelmed by drug producers are those that have weak central governments, access to regional or global drug markets, and remote areas where illegal drugs can be cultivated without detection. These conditions exist in many Eurasian countries of the former Soviet bloc, as well as some developing African nations. With the drug trade's significant profit potential, several of these countries will likely fall into the ranks of those where drug production is already endemic.

Future producers will use technology at least as efficiently as today's narco-businessman. Tools such as portable computers, handheld satellite phones, and increasingly "miniaturized" equipment make highly mobile production facilities an easily attainable goal. Where mobility is not required, producers can use technology to reduce operating expenses. Large-scale *cannabis* growers use computer-controlled, warehouse-sized

[64] For example, the line between Colombia's thriving narcotics trade and the Marxist Revolutionary Armed Forces of Colombia (FARC), which earns tens of millions of dollars each year protecting illicit crops, has faded in recent years, prompting concerns about the stability of the Colombian government and sparking rumors about imminent U.S. military intervention. "Colombia Abuzz with Talk of Intervention," *The Washington Post*, 23 August 1999, p. 13.

hydroponics hot houses to grow thousands of plants in optimum growth conditions, decreasing labor costs and improving productivity and operational security. Other improvements in the technical process have increased plant yields in both coca leaves and marijuana. In Colombia, chemical process improvements have yielded higher purity heroin than that of rival producers in Mexico. In the future, technology may allow producers to increase plant yields, cheaply produce synthetic versions of organic drug components, or even mask indicators of drug use.

While technology may significantly improve raw production capabilities, organized crime will provide many producers the business acumen, political leverage, and funds with which to expand their enterprise effectively. High-profit potential will continue to attract crime syndicates to the drug production business in 2020. For producers, the diversification these partners bring could provide ready-made distribution networks, money laundering services, and even venture capital, which could be used to purchase and incorporate new technology. This union of complementary criminal enterprises inextricably links the drug trade to a host of other crimes such as smuggling (drugs, weapons, people) gambling, prostitution, and corruption.

Drug trafficking will continue to plague the global community well into the next century. Future traffickers will increasingly rely on commercial transportation systems to move their products. The relatively low cost of maritime bulk transshipment and good product security, as well as limited personal risk, will entice a number of future drug transporters away from traditional noncommercial maritime methods. Smugglers moving smaller loads by speedboat will have more capable platforms than vessels currently in use, and future amateur smugglers will be able to use traditional smuggling techniques with some degree of success. Speedboats or "go-fasts" will likely continue to improve beyond today's impressive standards – capabilities to carry a metric ton of drugs at speeds of 35 knots or more. Future boats may triple the speed and cargo capacity of current platforms, while virtually "disappearing" from surveillance and tracking sensors through the use of a variety of low-observable technologies. Innovations such as super efficient engines or jet drives may significantly increase their operating range, and new computers may allow for the remote operation of high-speed delivery vehicles from an airplane or remote site.

Population Growth and Illegal Migration

World population apparently reached 6 billion on or about 12 October 1999, is expected to reach 8.9 billion by 2050, and more than 10 billion sometime after 2100, according to United Nations projections.[65] Although such growth will continue to fuel naturally occurring migration, the occurrence of sudden, uncontrolled migrations will grow as large numbers of people are affected by ethnic and sectarian strife. In addition, population growth stresses already limited resources for water, energy, basic health care, and education in the emerging nations of the world and influences the basic desire to improve one's economic position. These levels of migration also place enormous economic and social burdens on targeted destination countries. Today, the speed and size of migrations have been directly impacted not only by improved means of transportation, but by the increased

[65] "6 Billion and Counting – but Slower," *The Washington Post*, 12 October 1999, pp, A1, A16.

level of information now available nearly worldwide as a result of the information revolution. People will continue to seek better lives for themselves and their families and given an external impetus will move rapidly, as the Worldwatch Institute recognized in 1995:

> A volatile cocktail of pressures has boiled over into wars, famine, and wrenching poverty to drive four million new refugees from their countries last year. These pressures also compel about `125 million people to live outside their countries of birth, and cause tens of millions to move from countryside to city inside their own countries every year – vast human migrations that have become a barometer of our changing, and sometimes declining, prospects for global security.[66]

Most – approaching 95 percent – of the world's population growth during the next 20 years will be in developing countries. The relationship between population growth and its potential to disrupt the international security environment, however, is not simply a function of population increases. Instead, population growth becomes a security concern when the effects of such growth clash with standing economic resources and political institutions. The huge population increases in many developing countries will overburden their labor markets, public systems, and social services, creating unrest and incentives for migration.[67]

Fueled by tremendous population increases in developing countries and uneven global economic growth, international migration will be one of the most important factors affecting maritime security through 2020. This is particularly true for the United States, long a preferred destination for migrants the world over. While it is impossible to predict how many people from individual countries will attempt to migrate to the United States in the 2000-2020 time frame, the migration issue will be of great concern to U.S. national security. Furthermore, illegal migration via maritime means will be the most visible and problematic, and may generate the highest political levels of attention.[68]

Of concern is the potential for recurrences of mass migrations by sea similar to those from impoverished Caribbean nations that were experienced in the mid-1990s. During seven months of 1994 alone, nearly 60,000 Haitian and Cuban immigrants were interdicted while attempting to make their way to the United States by sea in overcrowded and poorly outfitted vessels. Ernest Preeg has estimated that there were about one million people of Haitian origin in the United States in the mid-1990s, and "hundreds of thousands if not millions more would quickly migrate to the United States if U.S. immigration laws and the U.S. Coast Guard permitted it."[69] Only the dedicated efforts of Coast Guard

"Violence within states...could reach unprecedented levels. Generated by ethnic, tribal, and religious cleavages, and exacerbated by economic fragmentation and demographic shifts, such violence will form by far the most common type of conflict in the next century....

While such conflicts need not disrupt the core strategic interests of major powers, they will do so if they trigger larger interstate conflicts, grossly violate internationally accepted norms, or create massive flows of refugees, disease, and environmental degradation. The latter is particularly likely since such conflicts often generate humanitarian disasters that are hard to ignore in an age of mass communications. Yet major powers cannot intervene for humanitarian purposes without also intervening in the underlying politics that create such troubles in the first place. The Somalias, Bosnias, Rwandas, Kosovos, and Haitis of the world will not disappear, and neither will the dilemmas they pose."

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[66] Hal Kane, *The Hour of Departure: Forces that Create Refugees and Migrants,* Worldwatch Paper 125, Jane A. Peterson, ed. (Washington, D.C.: Worldwatch Institute June 1995), p. 1.

[67] For example, U.S. State Department officials in July 1999 worried that worsening economic conditions and political violence in Colombia would combine to create an immigration crisis and mass movements of people into the United States. In the first six months of the year, some 65,000 Colombians left the country, and officials projected that another 300,000 could leave in the next six months. But fewer than 15,000 Colombians each year are permitted to enter the United States as legal immigrants, according to the Immigration and Naturalization Service. "Colombians Fleeing Homeland: U.S. Officials Worry about Tide of Immigration Flowing North," *The Washington Post*, 28 July 1999, p. A14.

A looming illegal immigration threat is also felt by Canada, among others. In a one-month period in the summer 1999, more than 250 illegal immigrants from China's Fujian province landed on Canada's Pacific shores, having made the crossing in two filthy, unmarked vessels run by smugglers. At the end of August, the Canadian Coast Guard was put on alert after military aircraft detected a third ship believed to be carrying illegal Chinese migrants to Canada. "Third Mystery Ship Headed Toward Canada," United Press International, 30 August 1999.

[68] The unfortunate example of the "Miami Six" on 29 June 1999 illustrates the public-political potential of illegal migration incidents. It was, clearly, a situation that no one wanted – the drama of U.S. Coast Guard personnel using fire hoses (not "water cannons" as the media reported) and pepper spray to subdue six Cubans who were intent on making it to the United States and were intercepted just

men and women operating in the Caribbean approaches to the United States have prevented what could have been a loss of life on an unprecedented scale. Future Coast Guard forces, operating in the offshore approaches to our nation, must therefore be capable and suitably equipped to respond to this kind of transnational challenge.

The movement of people between countries is driven by the interaction of two forces: the negative reality of life at home (often because of political violence, social instability, economic problems, or a combination of these), and the perception that a better life exists elsewhere. International migration spurred by a decline of social welfare or internal political unrest has become more common over the past decades and will continue to drive the movement of many people. As a result, migration, the most natural economic response to population explosions and worsening living conditions in developing states, will remain a major challenge to global stability well into the 21st century.

The world of 2020 will see increasing disparities between the haves and the have-nots, not only between the rich and poor in a given country, but also between the developed and developing nations. Latin America, for example, has the highest income disparities in the world; in Brazil, the top fifth of the population has 32 times the income of the bottom fifth. This is only expected to worsen in the future. Income disparities between developed and developing nations are expected to widen as well. In 1995, the average annual income gap per person between developed and developing nations was approximately $18,000. By 2020, that difference will increase to about $30,000 (in 1995 dollars). These inequities in the global economy will be primary incentives for international migration toward developed nations such as the United States.

With emigration pressure from less developed countries expected to rise during the next 20 years, thousands of potential immigrants will be unable to gain legal admission to the United States because of quota-controls, travel costs, or other obstacles. For a variety of reasons, many of these migrants will attempt to enter the United States illegally, and, with more than 12,000 miles of continental U.S. maritime coastline, many of these attempts will be by maritime means. While some migrants will make these attempts on their own or en masse, others will receive assistance from family, friends, or paid smugglers to avoid detection and capture by border control forces.

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short of their goal. The six Cubans were clearly illegal immigrants attempting to circumvent the nation's immigration laws. They may, as well, have been pawns in an organized smuggling ring. Their physical and mental conditions showed that they could not have been in the water for the several days it would have taken to row a 15-foot rowboat the 90 miles between Cuba and Key West, much less all the way to Miami. Following an intensive investigation of the event, the Coast Guard determined that the use of pepper spray was authorized by existing policy guidance but that in retrospect its use against people in the water could have had the unintended consequence of disabling a person. Likewise, although permitted, the use of a fire hose to keep the migrants' boat away from the Coast Guard patrol boat and to keep the migrants' boat from making shore was assessed as ineffective and unnecessary. The Service announced a thorough review of use of force policy guidance and direction. "Miami Cubans Are Outraged At Treatment Of 6 Refugees," *New York Times*, 1 July 1999, p. A12; "Refugee Incident Spawns a Tempest," *Washington Post*, 3 July 1999, p. A3; and "Inquiry Clears Crew in Clash with Rafters," *Miami Herald*, 11 August 1999, pp. 1ff. See also "Release of Migrant Interdiction Incident of 29 June 1999 Investigation, Admiral Loy's Statement," U.S. Coast Guard Headquarters, 11 August 1999.

The incidence of violence has been increasing, as the situations in migrants' home countries becomes more desperate. In late September 1999, a group of Cuban migrants used machetes and knives to attack Coast Guard authorities who intercepted their boat off Key Largo, prompting a renewed interest in use-of-force doctrine and tactics.

[69] Ernest H. Preeg, *The Haitian Dilemma: A Case Study in Demographics, Development, and U.S. Foreign Policy* (Washington, D.C.: The Center for Strategic & International Studies, 1996), p. 1.

The United States has weathered five maritime mass migrations in the last two decades, all from Cuba and Haiti. In the Cuban "boatlifts," thousands of Cubans used any boat or raft they could obtain – even inflated inner tubes lashed together – to sail toward the United States. In the Haitian cases, thousands of people crowded onto dilapidated wooden sailboats to leave Haiti for the United States. The overwhelming demands of such large groups of people strained U.S. societal infrastructure and government resources so severely that the U.S. government now routinely monitors events that may spark other mass movements. The policies and actions of the United States, such as routine Coast Guard patrols north of Haiti and within the Mona Passage, direct repatriation of migrants, and the May 1995 Immigration Accords with Cuba have helped deter mass migrations. With these measures in place, the likelihood of future mass migrations has been reduced, though certainly not eliminated.

Interdicting illegal migrants at sea will continue to remain a serious challenge for the United States. From 1980 through 1998, about 290,000 illegal migrants were interdicted at sea, and with rapidly expanding regional populations in the developing world, this number is likely to increase. The high cost of interdicting migrants at sea and repatriating them will continue to challenge U.S. Coast Guard and Navy forces. While interdiction costs remain high, intercepting U.S.-bound illegal migrants before they reach the border saves the government significant sums. Because migrants interdicted at sea are afforded less legal recourse than those caught within the U.S. border, the government avoids the cost of providing basic human services and security as well as the expense of extended and costly appeals.

Increased populations and migration trends will also place greater pressure on the ability of the planet's inhabitants to feed themselves. Although the Malthusian principle – "The power of population is indefinitely greater than the power in the earth to produce subsistence for man" ("Essay on the Principle of Population," 1798) – has proven to be "very simple, attractive and arresting, and completely inconsistent with modern society and economics," according to Nicholas Eberstadt, a demographer at the American Enterprise Institute,[70] there is growing concern. The Worldwatch Institute, for example, points to "demographic fatigue" that has brought critical areas – water, food, fisheries, climate, cropland, forests, energy – to the brink of collapse.

Thus, the protection and conservation of the maritime food supply from illegal exploitation or contamination will play an even more critical role in the future. The

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[70] "Will the World Be Too Crowded to Manage?" *The Washington Times*, 7 February 1999, pp. A1, A7, at A7.

[71] The U.N. Law of the Sea Convention, 1982, defines "piracy" in article 101 as any of the following acts:

(a) any illegal acts of violence or detention, or any act of depredation, committed for private ends by the crew or passengers of a private ship or a private aircraft, and directed:

(i) on the high seas, against another ship or aircraft, or against persons or property on board such ship or aircraft;

(ii) against a ship, aircraft, persons or property in a place outside the jurisdiction of any state;

(b) any act of voluntary participation in the operations of a ship or of an aircraft with knowledge of facts making it a pirate ship or aircraft;

United States has also enacted laws that delineate responsibilities for monitoring fishing on the high seas. Enforcement of both U.S. EEZ and high seas fishery regimes requires the ability to monitor large ocean areas, to determine vessels engaged in prohibited fishing activities, and to intercept and engage those vessels.

Piracy and Organized Crime

Incidents of violent maritime crime – particularly piracy and maritime terrorism – may change in both nature and frequency as advanced technologies are used in attacks against ships and their cargoes. Consistent with contemporary experience, the vast majority of incidents will occur within port areas, at anchor or in coastal waters.

Piracy, in any of its many modern forms, along with terrorism and other types of maritime crimes, has flourished with the growth in global trade and exchange of commercial goods, financial instruments, and people. Today's pirate is a far cry from those of yesteryear, and most "piratical" acts are carried out within territorial seas, not high seas, which presents a problem of legal definition.[71] They are often well-equipped with heavy weapons, high-speed craft, and advanced communications. One pirate ship captured in Indonesian waters was outfitted with fraudulent immigration stamps, tools to forge ship documents, and sophisticated radar, communications, and satellite-tracking equipment. "We thought pirates belonged to history, but they are back and meaner than ever," remarked Yoshihiko Yamada, of the Nippon Foundation, a group that tracks piracy incidents.[72]

Courtesy of Worldwide Maritime Security Information

Not only have the numbers of these types of incidents increased worldwide – partly as a result of an improved worldwide reporting system – but they have become more lethal, with crews abandoned at sea in lifeboats or murdered outright. In March 1999, for example, the 5,600-ton freighter *Marine Master* was attacked off Thailand by 20 pirates in three fast boats. Shooting and wounding one crew member, the pirates set all 16 seaman adrift in small plastic life rafts; after six days drifting, they were rescued by fishermen. Pirates killed at least 67 seamen last year, all but one of them in Asia, and at least 40 are missing. Incidents of piracy tend to occur in four regional areas: Southeast Asia, Africa, South America, and Central America. Furthermore, most incidents of maritime crime occur in coastal waters, with nearly 80 percent of all reported "piracy" incidents occurring in territorial waters, and thus should more properly be called "sea robbery" rather than piracy *per se*. The majority of recent incidents have been focused primarily in Southeast Asia, astride major maritime chokepoints, where these sea-going criminals can easily observe potential prey. In 1998, one-third – 59 cases – of the 192 piracy incidents occurred in the Indonesian archipelago. But there have also been

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(c) any act of inciting or of intentionally facilitating [piratical acts].
Acts of piracy can also be committed by a warship, government ship or government aircraft whose crew has mutinied and taken control of the ship or aircraft.
This definition is somewhat narrow, as *de jure* piracy can occur only on the high seas, i.e., areas beyond a state's territorial sea, including Exclusive Economic Zones. As such, the suppression of piracy *de jure gentium* is a responsibility of all states. However, as most "piratical" acts take place within EEZs or territorial seas, some coastal states may be highly sensitive of foreign states' naval or coastguard forces pursuing pirates into their EEZs (legally permissible) or territorial seas (impermissible without the permission of the coastal state). See Richard Hill, "Piracy and Related Matters," in Stephen Jermy, John Lippiett, and Richard Hill, *Maritime Operations in Peace: Drug Interdiction, Disaster Relief, Suppression of Piracy*, International Studies Centre, University of Plymouth, Plymouth International Papers No. 10 (undated), pp. 33-37.

[72] "High-Tech Pirates Ravage Asian Seas," *The Washington Post*, 5 July 1999, p. A18.

increases in incidents along both coasts of Africa and the coast of Brazil. Estimates of the total financial losses due to piracy worldwide have reached $16 billion per year. The Nippon Foundation has estimated that pirates attack at least one ship every day and kill a seaman each week. Thus, the confidence that the high seas and important coastal trade routes are secure for commerce may increasingly be in doubt in this future, and should be a national security concern for the United States and its allies. The case of Japan is compelling. With nearly 100 percent of its domestic energy needs supplied by foreign oil, much of it transitting the Indonesian archipelago infested by pirates, its petroleum lifeline is at risk.

There is, moreover, a growing potential for catastrophic environmental disaster resulting from piratical depredation. The trend is for pirates to board ships while underway at slow speeds in constricted straits and waterways; to detain, set adrift, or murder the crews; and then leaving the ships underway with no one at the helm. The prospect of a fully laden crude oil tanker ramming other ships or running aground, with a significant discharge of its cargo, cannot be ignored.

Similarly, the potential for pirate groups to become politicized or hired out by politically motivated groups and engaging in terrorism must also be assessed. For example, in the Philippines, the Abu Sayaff Islamic terrorist group and the Moro National Liberation Front's "Lost Commandos" have engaged in maritime attacks to raise funds to carry out attacks against the government.

While the number of piracy incidents will most likely remain constant during the next 20 years, there will likely be an increase in incident reporting. It is widely accepted among the government and nongovernment organizations that track piracy worldwide – including the U.S. Office of Naval Intelligence (ONI), U.K. Defence Intelligence Service (DIS), Australian Defence Intelligence Organization (DIO) and the International Maritime Bureau (IMB) – that the annual number of piracy cases is seriously under-counted. DIS estimates the actual number of piracy cases could be 2,000 percent higher on an annual basis, while DIO assesses the under-reporting to be 20 to 70 percent. Since the establishment of the IMB's Regional Piracy Center in Malaysia in 1992 and its subsequent efforts to publicize the piracy problem, there has been increased reporting on major incidents, but incidents involving fishermen and recreational boaters are still heavily under-counted. Also, the average loss from a piracy incident does not cross the monetary threshold for insurance action, further contributing to under-reporting. Most incidents will continue to go unreported except in cases where there is serious loss of property and life or damage to a foreign interest. One reason for this is that a ship owner/operator stands to lose tens of thousands of dollars in revenue for each day that the vessel is idled for an investigation of a piracy case.

The concentration of piracy and "sea robbery" incidents will continue to be located in areas with little or no maritime law enforcement, political and economic instability, and a high volume of commercial activity. Of greater concern is the awareness that these incidents are now occurring within the once secure confines of harbors and anchorages. Crowded harbors and deeper-draft vessels now require ships to often anchor in areas distant from local marine security services. The criminal element is now exploiting various surveillance and enforcement weaknesses and conducting the maritime equivalent of the "smash and grab," striking and disappearing before security forces can respond.

Organized crime will increase in influence and scope during the next 20 years as organized criminal groups become increasingly entrenched in the international economy and as demand for and profits from the illicit transportation of people, drugs, and contraband multiply. If left unchecked, international criminal organizations will continue to expand their illegal activities in the 21st century. International criminal organizations will increase in number and influence as they become more adept at manipulating and chal-

"In the anti-piracy role, there is a need for some larger ships each with good endurance, sensors, communications and action information, having on board an elite corps ready to man at least two boarding boats, an armed helicopter and discriminating shipboard weapons; a larger number perhaps of smaller vessels with as many as possible of the above qualities but without, for example, a helicopter; fixed wing patrol aircraft with sufficient endurance, sensors and communications; and an operational command organisation with access to all available information and intelligence, the ability to talk to other government departments and access to allies if these are part of the particular anti-piracy scene."

Richard Hill
Piracy and Related Matters
Plymouth International Papers
Number 10
International Studies Centre
University of Plymouth, U.K., 1998

lenging local and national governments and international organizations and consolidating their power bases. The expected growth of transnational criminal organizations will be exacerbated by advances in communications and transportation technologies; a decrease in governmental controls over the international flow of goods, services, and money; the establishment of international affiliations among immigrant communities; and the projected rates of unemployment in developing countries and in the Soviet successor countries and Eastern Europe. Relying on a myriad of international connections to provide them with both human and financial resources, by 2020 transnational criminal syndicates will be as problematic for global security as organized insurgent groups and terrorists. The problem of organized crime will become more compelling as these groups and even "rogue governments," some running entire regions as virtual "medieval feudal fiefdoms," gain access to more sophisticated technologies. As Dr. Kimberley Thachuk, Visiting Fellow at the Institute for National Strategic Studies, warned the Transnational Issues Conference in mid-October 1998:

> ...it has been the explosion in new technology that has significantly abetted the growth and proliferation of international organized crime groups and their capabilities. With access to modern communications and weapons technologies, these enterprises now have considerable coercive political and economic leverage. The use of electronic transfers, unfettered internet access and high tech communications equipment has permitted international criminal organizations to increasingly commit faceless crimes that while they erode the state, are difficult to attribute to particular perpetrators. This enables organized crime groups to run massive transnational economic empires moving their operations between states fluidly with less state-imposed constraints than ever before. Some organizations, such as certain Russian or Colombian groups, now constitute a "state within a state" or are equivalent to some of the smaller states.[73]

Future terrorist organizations will continue to use attacks on maritime targets as a means of furthering their political goals. From the 1961 hijacking of the Portuguese flagged passenger vessel *Santa Maria* to the numerous maritime attacks of the Sri Lankan Tamil Sea Tigers during the 1990s, widely publicized incidents of terrorism in the maritime environment have drawn immediate concern and action. Trends seen in terrorism during the late 1980s and 1990s will likely continue in the future. The number of terrorist incidents worldwide has decreased while the number of casualties inflicted has risen. The typical terrorist tactic of holding hostages has declined, due in part to the growing sophistication of counter-terrorist forces worldwide. Also, the number of terrorist groups espousing a leftist ideology such as Marxism and Socialism has decreased, with a subsequent rise in the number of groups based on nationalism, ethnicity and religion.

While terrorists would prefer to attack a target that is immobile and easy to survey, there will continue to be a small number of attacks in the maritime environment. For example, several Middle Eastern terrorist groups maintain a maritime attack capability through diver and underwater warfare training provided by Iran and Libya. Other groups with a cultural maritime heritage find it easier to develop a competent maritime attack capability. The Sri Lankan Tamil Sea Tigers and the Filipino Abu Sayyang Group are

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[73] Dr. Kimberley Thachuk, "International Organized Crime and Drug Trafficking," paper presented at the Transnational Issues Conference, Institute for National Strategic Studies, National Defense University, Washington, D.C., 14-15 October 1998, p. 3.

examples of seafaring groups that have conducted multiple maritime terrorist attacks, as well as piracy acts for fundraising purposes. The concern for the future is that terrorists will shift emphasis and make the rapidly growing cruise line industry a new target of opportunity.

Similar actions, employed against U.S. defense sealift forces, introduce an asymmetric threat to America's security that could effectively neutralize the flow of troops and materials. The Nation must clearly address how it intends to protect not only this "steel bridge" during times of crisis, but also the routine protection of forward-deployed strategic assets such as the Maritime Prepositioning Ships (MPS) and Afloat Prepositioning Force (APF).

Asymmetric Threats

America's adversaries will be more likely to engage in asymmetric warfare such as terrorism, sabotage, information operations, and chemical or biological attacks – focused against weaknesses of strategy, doctrine, tactics, and technology – than direct military confrontation and attack. The proliferation of nuclear, chemical, and biological weapons will also remain a concern. Given that only a handful of countries will have the capability to project substantial naval power beyond their own geographic regions, and that the vast majority will remain unable to project power much beyond their own territorial waters, it is highly unlikely that any "peer" foreign naval power will emerge by 2020 that will be capable of challenging U.S. maritime superiority on a global basis. Rather, the vast majority of future maritime challenges will originate from individual states and stateless organizations. In order to defeat their adversaries, such countries and organizations will only be able to achieve success against modern Western maritime forces through the use of asymmetric warfare.

Asymmetric warfare concepts vary widely, and many types of warfare could be used asymmetrically. According to the National Defense University's Institute for National Strategic Studies, there are four broad asymmetric warfare options available to potential adversaries to combat foreseeable U.S. military superiority:[74]

- Acquiring weapons of mass destruction (WMD) and long-range ballistic or cruise missiles
- Acquiring high-technology sensors, communications, and weapon systems
- Exploiting cyberweapons to disrupt military logistics systems or the U.S. national strategic infrastructure
- Engaging the U.S. in environments that degrade U.S. ability to attack militarily significant targets. For example, choosing to fight in urban areas, or purposely blurring the distinctions between actions considered crimes and those viewed as warfare

In addition, small boat tactics, guerrilla warfare, terrorist activities, and the exploitation of media coverage of events are other possible asymmetric options. Regardless of the options employed, the asymmetric challenger, "unable or unwilling to confront U.S. military power directly, and in kind, will pursue asymmetrical advantages designed to negate the U.S. military's comparative advantages."[75] In this perspective, an adversary will subscribe to an overall strategy that links political and military objectives in a manner that thwarts any U.S. and allied hopes of a quick, "surgical" victory. He may even try to inflict a level of damage on U.S. forces and facilities that will weaken U.S. domestic

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[74] Hans A. Binnendijk and David C. Gompert, eds., *Strategic Assessment 1998: Engaging Power for Peace* (Washington, D.C.: National Defense University Press, 1998), pp. 170-171. See also Hans Binnendijk and Richard Kugler, eds., *Strategic Assessment 1999: Priorities for a Turbulent World* (Washington, D.C.: National Defense University Press, 1999), particularly Chapter One.

[75] William Rosenau, Kemper Gay, and David Mussington, "Transnational Threats and U.S. National Security," *Low Intensity Conflict and Law Enforcement*, Vol. 6, 1997, p. 152.

political resolve for a protracted war, avoiding a direct confrontation with superior U.S. military power and instead concentrating on inflicting unacceptably high levels of damage and casualties by exploiting U.S. vulnerabilities.

The world's littorals will continue to present the most challenging environment for operations by maritime forces. In coastal areas, both long- and short-range, land-based systems, as well as maritime forces, ranging from those tied closely to the shore to those with open-ocean capabilities, can be brought to bear against U.S. maritime forces. Moreover, with the continually increasing range and accuracy of standoff weapons, those few states with any capability to do so will seek to deny the United States the sea area necessary to conduct long-range strike operations, while the rest will seek at least to oppose those U.S. forces that must operate closer to shore.

Future conventional maritime weaponry that could present severe challenges in the littoral include naval mines, aircraft, antiship and land-attack cruise missiles, patrol combatants and larger naval surface combatants, advanced diesel/air-independent/nuclear submarines, special operations forces, small craft, coastal artillery, and ballistic missiles (including terminally guided weapons). Other nonconventional weapons, including biological and chemical weapons, could also be encountered. Many military operations in times of tension short of war – during sanctions enforcement, noncombatant evacuations or shipping escort operations, for example – could take place very near the bases and routine operating areas of potentially hostile foreign forces, allowing our adversaries to attack with little warning at a time and place of their choosing, and in waters well known to them.[76]

Control of the littoral battlespace of the future will be won by those forces that best combine surveillance, strike, and support capabilities. In many countries, improvement in littoral surveillance capabilities will be driven by a need to patrol exclusive economic zones and enforce sovereignty in them. In a few cases, an additional imperative will exist to monitor and target hostile forces approaching or operating within standoff weapon range of the country's coast. Surveillance and targeting technology is becoming more complex and capable, with space surveillance systems expected gradually to assume a more important role in reconnaissance and target cueing.

With the growing availability of vital information in electronic form, accessible through the Internet or private computer networks, the future security threat to information and technology infrastructures will increase dramatically. Despite efforts to construct "firewalls" and secure networks, critical military and economic data will be more vulnerable to attacks by individual "hackers" and organized, focused sabotage operations. Key functions of maritime operations, such as navigation, communications, and maritime surveillance, have always had a significant information component. The obvious dependence of maritime security and law enforcement on information makes the information itself a

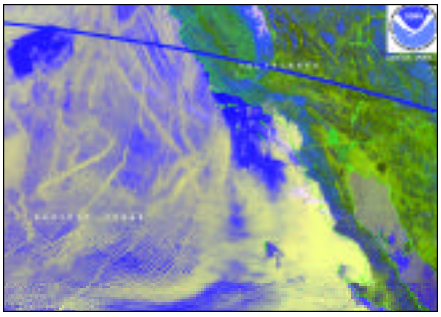
[76] One critically important area of the not-so-distant future that demands innovation, far-sightedness, investment, and the willingness to reject the overwhelming tendency toward "business as usual" is the need to counter the rapidly escalating threat of land-attack cruise missiles to U.S. forces overseas and to the U.S. homeland. Whether armed with conventional high-explosive warheads, special devices intended to defeat electrical/electronic grids, or Weapons of Mass Destruction (WMD – nuclear, biological, or chemical weapons), cruise missiles offer U.S. adversaries the ability to attack directly our will to fight, to employ imaginative tactics and techniques, to deny our power-projection forces access to forward operating areas, and to attack fixed installations and massed formations, including population centers in the U.S. homeland. In some future crisis or conflict, a containerized cruise missile armed with a "chem-bio" warhead could be launched against U.S. and allied forces ashore – not to mention against capitals and cities in America and overseas – from any one of hundreds of commercial containerships plying offshore shipping lanes, a "shell-game" with potentially disastrous consequences.

high-payoff target for adversaries, whether state-sponsored or not. Information warfare will increase by 2020; the dependence of the United States on information networks makes it especially vulnerable to information attack. Although the United States is strategically placed to benefit from, and perhaps even to continue to dominate, information technologies, America's ability to operate without fear of "cyber-attacks" against its information infrastructure will erode as other states choose information over industry as an instrument of national power.

Advanced Technologies

Technology development will be another overarching influence on the maritime environment during the next two decades. Advanced military and, increasingly important, commercial technologies will continue to spread worldwide, enabling state and non-state actors to acquire information, command-and-control, communications, sensors, and weapon systems that will decrease the United States' technological advantage. The assessment of the National Defense University is sobering: "From a national security perspective, the most salient trend in the new information environment is that the capabilities DoD spent billions to build in the 1980s are increasingly available for other nations to rent or buy at a fraction of that cost."[77] Therefore, while the United States will doubtlessly move forward with advancements in power sources, space systems, electronics and materials, the overall edge that it has enjoyed during much of the 20th century will begin to diminish.

Although America's technological advantage will decrease by 2020, the United States will remain one of the most technologically advanced states in both commercial/civilian and military spheres. The American application of existing technological innovations will continue to yield major advancements in defense systems and infrastructure, ensure American technological progress, and reduce the cost of high-end technological products. At the same time, these technological advancements will also produce benefits that can be shared by the civilian sectors, although the more compelling "technology flow" will be from the commercial/civilian sectors to the military. The trend evident in the late-1980s will continue: the most advanced militaries around the world increasingly will rely on commercially developed technologies for their highest-technology systems.



Courtesy of NOAA

For example, the capabilities of space-based ocean monitoring systems will greatly increase through 2020, and these will increasingly be available to anyone with the cash to rent them or buy their output – friend and foe, alike. The resolution and availability of imagery from commercial electro-optical and synthetic aperture radar satellites will improve dramatically. There will be numerous applications for this technology, such as navigation, surveillance, search and rescue, and monitoring of oil spills. Surveillance and targeting technology will become more complex and capable, with space surveillance systems expected to assume a more important role in reconnaissance and target cueing.

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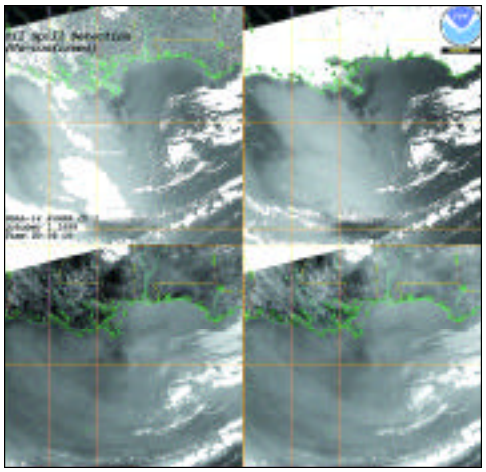
[77] *Strategic Assessment 1998*, *op.cit*., p. 151.

Although the United States will continue to be one of the biggest beneficiaries of future technological advancements and their subsequent applications in the maritime arena, other nations and non-state actors will be able to acquire the same or similar capabilities, and sometimes apply them in ways that will surprise America. Through 2020 and beyond, the operational capabilities of foreign naval and maritime forces will increase as more sophisticated weapons and maritime platforms enter service. Allies and adversaries will be able to acquire advanced systems through a variety of avenues, including indigenous and cooperative production, technology transfers, legal arms sales, illegal arms transfers, espionage, and the outright purchase and military application of "commercial off-the-shelf" – COTS – civilian technologies. The appearance of high-technology systems worldwide, as well as their application to a spectrum of contingencies and conflict – from conventional operations to asymmetric warfare – will ensure that the maritime environment continues to present a challenge to U.S. maritime forces, and particularly the Coast Guard in its maritime security roles.



Courtesy of NOAA

A Dangerous – If Uncertain – Future

Looking to this ambiguous yet potentially perilous future, the National Defense Panel explained in late 1997 that "The United States enters the new millennium facing challenges very different from those that shaped our national security policy during the almost 50 years of the Cold War."[78] Many of these are clearly "coastguard-type" challenges, and the United States, as well as our allies and friends, can benefit greatly from the Coast Guard's unique expertise in safeguarding maritime security. Although many of the missions, operations, and tasks necessary to defeat these challenges are clearly "non-traditional" missions for the Defense Department, they are long-standing *traditional* Coast Guard missions that are routinely carried out by the Coast Guard's men and women across the spectrum of operating areas – from America's ports and coastal waterways to Deepwater environments. In the future, there is likely to be a greater need for Coast Guard involvement in meeting these challenges. Indeed, as the Institute for National Strategic Studies recognized:

> Some threats of this kind seem to call for military forces to back up police forces that are outgunned and out-maneuvered by international crime syndicates. Quasi-police operations have been normal for armed forces in many nations and for U.S. armed forces in times past. They have not, however played a major role since World War II in the activities of most of the armed forces, other than the Coast Guard and National Guard. There may well be resistance within the military [other than in the Coast Guard and National Guard] to the use of increasingly scarce resources for quasi-police functions.[79]

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[78] *Transforming Defense: National Security in the 21st Century, op.cit.*, p. 5.

[79] Institute for National Strategic Studies, National Defense University, *Strategic Assessment 1995* (Washington, D.C.: GPO, 1995), p. 11. William Rosenau, Kemper Gay, and David Mussington conclude that "The post-World War II armed forces have long declared that 'fighting and winning the nation's wars' was their *raison d'etre*. Such a vision is likely to conflict with the requirements posed by transnational challenges. Developing human intelligence networks, enforcing embargoes and sanctions, securing borders and other essentially police-like activities will be important features of the military component of the U.S. response." "Transnational Threats and U.S. National Security," *op.cit.*, p. 158.

III. USCG Maritime Safety and Security Roles, Missions and Functions

Since the earliest days of the Republic, the Coast Guard's roles and missions have expanded so that they today touch upon virtually every facet of U.S. maritime life. The Congress in 1790 established the forerunner of today's Coast Guard, the Revenue Cutter Service, to protect America's interests in waters under national jurisdiction: "so many boats or cutters, not exceeding ten, as may be necessary to be employed for the protection of revenue," as the act read. Secretary of the Treasury Alexander Hamilton's vision was for "a few armed vessels, judiciously stationed at the entrances of our ports, might at a small expense be made useful sentinels of our laws."[80] Throughout the 19th century, a variety of federal organizations – Steamboat Inspection Service (1838), Federal Life-Saving Service (1848), Bureau of Navigation (1884) – were created to protect lives and property at sea and to regulate vessel safety. Most of these were single-function services, and only the Revenue Cutter Service was assigned additional roles, a result of the inherent flexibility of cutters and the fact that, along with the Navy, at the time it was the only federal service to operate on the high seas.

Cooperation, interaction, and cross-fertilization among these and other predecessor services finally culminated with the birth of the U.S. Coast Guard on 28 January 1915, which combined the Life-Saving Service with the Revenue Cutter Service. The new Coast Guard continued to have functions added to it in the years that followed. In 1939, the Lighthouse Service was consolidated under the Coast Guard, and in 1942 the Bureau of Marine Inspection and Navigation was temporarily (made permanent in 1946) added to the Service's portfolio. By 1967, which saw the Coast Guard moved into the newly created Department of Transportation, the Coast Guard had acquired numerous civilian law enforcement, maritime, and naval roles, missions, functions, and responsibilities. These have continued to expand, so that on the cusp of the 21st century America demands five maritime security roles of its "Guardians of the Sea":

- Maritime Safety
- Maritime Mobility
- Maritime Law Enforcement
- Marine Environmental Protection
- National Defense

Throughout this history, however, in peacetime, crisis, and war, the one constant has been the Coast Guard's essential mandate to protect and defend America's citizens, interests, and friends, in waters under national jurisdiction as well as in overseas areas of importance

Terms of Reference...

Role:
Broad, enduring purpose specified by Congress in law

Mission:
Task assigned by the President, Secretary, or Commandant to field commanders

Function:
Specific responsibility assigned by the Congress, President, or Secretary of Transportation to fulfill legally established roles

Capability:
Ability of a properly organized, trained, and equipped force to accomplish a particular mission or function

[80] The act authorizing the Revenue Cutter Service became law on 4 August 1790, less than a year after the establishment of the Treasury Department. Four general histories of the Coast Guard and its predecessors are very useful: Stephan H. Evans, Captain, USCG, *The United States Coast Guard, 1790-1915: A Definitive History* (Annapolis, MD: U.S. Naval Institute, 1949); Dennis L. Noble, *That Others Might Live: The U.S. Life-Saving Service, 1878-1915* (Annapolis, MD: Naval Institute Press, 1994); Irving H. King, *The Coast Guard Expands 1865-1915: New Roles, New Frontiers* (Annapolis, MD: Naval Institute Press, 1996); and Robert Erwin Johnson, *Guardians of the Sea: History of the United States Coast Guard, 1915-Present* (Annapolis, MD: 1987). Two other Naval Institute Press books by historian Irving H. King, *George Washington's Coast Guard* and *The Coast Guard under Sail*, are no longer in print but provide excellent insight into the foundation and early years of the Revenue Cutter Service. See also, Captain Patrick H. Roth, USN (Ret.), and Richard D. Kohout, *U.S. Coast Guard: Purpose, Characteristics, Contributions, and Value to the Nation* (Alexandria, VA: Center for Naval Analysis, CRM 97-17.09/February 1997). Hamilton's vision of a "few armed vessels" was articulated in Federalist Paper 12.

to American security interests. This core mandate, at its most fundamental level, has four elements:[81]

- a **humanitarian element** dedicated to the preservation of lives and property at risk on the seas
- a **policing element** focused on national sovereignty, resource management, safety, and the maintenance of law and order at sea
- a **diplomatic element** in which the Coast Guard's people and platforms become extensions of the United States in support of U.S. foreign policy
- a **military element** in which Coast Guard assets link with other U.S. Armed Forces, as well as foreign militaries, in direct support of military operations and homeland defense

Table 2. Geographic Reach of Coast Guard Roles and Missions

	U.S. Inland Waterways and Great Lakes	U.S. Coastal Waters	U.S. Territorial Sea and EEZ	High Seas	Global	International Interfaces and Staff Coordination
Maritime Safety & Mobility						
Aids to Navigation	■	■	■			
Search & Rescue	■	■	■	■	■	
International Ice Patrol		■		■		
Polar Ice Operations		■		■		
Domestic Ice Operations	■	■				
Waterways Management	■	■	■			
Commercial Vessel Safety	■	■	■			
Bridge Administration	■	■				
Recreational Boating Safety	■	■	■			
Port Safety & Security	■	■				
Maritime Law Enforcement						
Enforcement of Laws and Treaties	■	■	■	■		
Marine Environmental Protection						
Maritime Environmental Response	■	■	■			
National Defense						
General Defense Operations		■	■	■	■	
Port Operations Security & Defense	■	■			■	
Peacetime Military Engagement				■	■	
Maritime Intercept Operations				■	■	
Military Environmental Response				■	■	

Source: U.S. Coast Guard (G-OC), October 1999

[81] Ken Booth, *Navies and Foreign Policy* (London: Croom Helm, 1977), p. 16. Booth discusses the latter three elements, but clearly the Coast Guard's humanitarian service element – whether rescuing boaters or interdicting Cuban, Haitian, Chinese or other illegal immigrants at risk – is a fundamental element and core characteristic of the Service.

All Coast Guard roles, missions, and functions, especially in the Deepwater operating environment, have in common the tasks of providing credible presence in and conducting surveillance of critical maritime regions; detecting, sorting, and identifying targets of interest; and intercepting those targets – in short, exercising sea control over areas of importance to the United States. (Table 2 illustrates the geographic reach of Coast Guard national maritime security operations in the late 1990s.) The following discussions of the five core roles illustrate the breadth and depth of the Coast Guard's commitment of service to America, and underscore the compelling need for an effective, efficient, and adequate force structure comprising modern and highly capable systems and platforms and the highly skilled and motivated men and women who *are* the Coast Guard.

Maritime Safety

America's Lifesavers. The U.S. Coast Guard is renown worldwide for its search and rescue – "SAR" – heroism and ensuring the safety of life and property – whether near the shore or hundreds of miles at sea. Until 1832, the rendering of assistance to vessels in distress was not a specific duty of the revenue cutters, although cutter sailors would offer whatever aid they could. In that year, however, the Secretary of the Treasury directed several cutters to cruise during the winter months solely for this purpose and salvage duties. This had an immediate impact on the operations of the cutters. The vessels would now stay in commission year round rather than be laid up during the winter. Crew professionalism and training improved as a result. Moreover, the task of assisting vessels on the Great Lakes was specifically assigned to cutters in 1870, while those stationed on the Gulf and Pacific coasts assumed the roles as a matter of course. The connection between the cutters offshore and the Life-Saving Service became strong, a bond made complete with the advent of the Coast Guard in 1915.[82]

The Coast Guard's "Surfmen" conducted beach patrols, rigged shotlines in faking boxes, readied Lyle guns, deployed breeches buoys and lifecars, and muscled lifeboats through angry surf – always ready to go out when no others could . . . or would. On the threshold of the 21st century, with several revolutions in technology and systems – fixed-wing aircraft, helicopters, global navigation and communications systems, radar, homing devices – to aid them, America's Lifesavers still need the personal courage, dedication, and unique skills to protect lives and property at the mercy of angry seas. Some recent examples underscore the need for effective – and sometimes daring – Coast Guard SAR capabilities.

Shortly after midnight on 4 October 1980, radiomen at the Coast Guard stations in San Francisco, California, and Kodiak, Alaska, received a distress call from the cruise ship *Prinsendam*. The engine room was on fire and the ship was dead in the water

[82] Noble, *That Others Might Live, op.cit.*, generally. Also, John M. Waters, Jr., *Rescue at Sea,* 2nd ed. (Annapolis, MD: Naval Institute Press, 1989); and Johnson, *Guardians of the Sea, op.cit.*, pp. 4-9.

some 130 miles out in the Gulf of Alaska. At 5:12 AM, the captain gave the order to abandon the ship; 50 crew members were detailed to keep fighting the fire as the other 469 passengers and crew crowded into one motor launch, six lifeboats, and four life rafts.

The first rescuer on the scene was a Coast Guard HC-130 Hercules long-range aircraft out of Kodiak. Arriving at about 2:30 AM, the "Herc" stayed at the scene for another eight hours and served as the on-scene coordinator to direct air traffic and ship movements. The high-endurance cutter *Boutwell* (WHEC- 719) recalled its crew from liberty and immediately sailed from Juneau. The first ship to arrive was the supertanker *Williamsburg*, which began picking up survivors at first light. An hour later, Coast Guard HH-3F helicopters out of Sitka began rescuing passengers and crew by hovering some 30 feet above the water and plucking survivors up one at a time, and flying them to the nearby tanker. As the weather deteriorated and the fire could not be contained, the remaining 50 crew members abandoned the stricken vessel. *Boutwell* arrived soon thereafter and brought on board the remaining persons in lifeboats. A "joint" and "combined" force of Coast Guard helicopters and fixed-wing aircraft, *Boutwell*, and U.S. Air Force and Canadian aircraft combined to rescue every passenger and crew member without a single loss of life or serious injury – one of the most successful rescues in the Service's history.

"At 11:15 PM, October 29, a freighter off Long Island picks up a woman's terrified voice on the VHF: This is the Satori, the Satori, 39:49 north and 69:52 west, we are three people, this is a mayday. If anyone can hear us, please pass our position on to the Coast Guard. Repeat, this is a mayday..."

Sebastian Junger
***The Perfect Storm,* 1997**

In late October 1991, a massive storm struck without warning, generating waves more than 100 feet high, and swamping the *Andrea Gail*, a swordfishing boat out of Glouscester, Massachusetts.[83] All six on board were lost. By the time the storm spent its fury, another three ships and a National Guard helicopter had been stricken, putting in motion one of the largest and most intense Coast Guard search and rescue efforts in the history of the Coast Guard. The National Guard helicopter went down at 9:30 PM, and the cutter *Tamaroa* (WMEC-166), a 48-year old ex-Navy fleet tug had already been vectored to the area. Coast Guard Deepwater assets from Florida to Massachusetts were readied to give aid, as were Navy ships and aircraft. At 9:48, Air Station Cape Cod launched an HU-25 Falcon jet and an HH-3F Pelican SAR helicopter, while a Navy P-3B Orion Maritime Patrol Aircraft at New Brunswick, Maine, stood by, ready for takeoff. Half a dozen aircraft, two ships, and some 200 rescuers were focused on getting the four National Guard survivors to safety, and were ultimately successful in a dramatic test of human courage and determination.

In January 1995, the *S/V Mirage* reported taking on water some 200 nautical miles southeast of Wilmington, North Carolina. A Coast Guard HH-60 Jayhawk helicopter surged to the scene, rescuing four of the five people on board; the master elected to remain on board and safely navigated his ship to St. Thomas. During the operation, however, a hoist cable on the helicopter failed, which prevented the recovery of a Coast Guard rescue swimmer who had assisted getting the people off the ship. He stayed in a life raft deployed from the helicopter for about five hours in 40-knot winds and 20-foot seas. A second Jayhawk helo rescued the swimmer and transported him to the Navy Aegis guided missile cruiser USS *Ticonderoga* (CG-47) for medical attention.

Much closer to shore, the Coast Guard established the initial command, control, and communications capabilities for the multi-agency response to the TWA Flight 800 disaster

[83] Sebastian Junger, *The Perfect Storm* (New York: W.W. Norton & Company, Inc., 1997).

in July 1996, and continued to support the search and recovery efforts until the mission was called off.[84] The heart-rending task of recovering bodies and personal effects was carried off with dignity, but the danger from razor-sharp metal shards, literally miles of electrical and hydraulic cables, and sharks was always present. During the eight-months' search and recovery ordeal, the Coast Guard made its shore facilities available for use by the victims' families and other federal, state, and local organizations, and, as the investigation progressed, Deepwater cutters kept the search areas clear of vessels that were not part of the salvage and investigation efforts.

And the Coast Guard was called upon to coordinate the search and eventually recovery, not rescue, of the bodies of John F. Kennedy, Jr., his wife Carolyn Bessette Kennedy, and her sister, Lauren Bessette, following the crash of his aircraft in the waters off Martha's Vineyard in the late evening of 16 July 1999. At 2:15 AM the next morning, a Kennedy family friend made an urgent call to the Coast Guard, and the search got underway. Initially, there was hope that they would be found at another airport, having turned back as flying conditions worsened, or, later, to have survived a crash at sea. For five days, Air Force, Navy, National Oceanographic and Atmospheric Administration, Federal Aviation Administration, state and local governments, and private groups – all coordinated by the Coast Guard – scoured suspected areas of the Atlantic. The aircraft was found in 116 feet of water, and the bodies recovered by Navy divers, ultimately to be committed to the deep on 22 July.

The lives of the searchers were not at risk in the Kennedy case; however, very often rescuers put themselves in grave danger without knowing the identities of the people they are trying to save. In 1997, seven Coast Guardsmen were killed in two separate SAR cases involving private sailboats that had foundered in heavy weather. The federal government spends at least $370 million each year for search and rescue, most of it for Coast Guard operations, which handles close to 50,000 cases annually – some 400-500 of which are aircraft crashes. "There is a tremendous amount of energy for search and rescue because it is a human response," Chuck Mills, of the non-profit, educational National Association for Search and Rescue, noted. "It's not based on who you are."[85]

With maritime trade perhaps tripling by the year 2020, a virtual explosion in cruise ship demand (with some ships already carrying 6,000 or more passengers and crew), fishing vessels venturing farther offshore in search of productive fishing grounds, and a burgeoning of personal watercraft and boats, the job of ensuring maritime safety will become even more challenging. Prevention will be the watchword of the future, founded on risk assessments to reduce the probability of mishaps. Despite the nation's best efforts to prevent accidents, however, the sea is an unforgiving environment, and mariners – like the ill-fated crew of the *Andrea Gail* and the passengers on board the fire-struck MV *Ecstasy* off Miami in 1998 – will find themselves *in extremis*. Indeed, about 3,500 ships are involved annually in accidents, and human error is the cause of approximately 80 percent of those accidents.[86] Although advanced technologies will continue to be embraced, they will not eliminate the inherently dangerous – and intensely humanitarian – work of rescuing people and protecting property. The Coast Guard's Deepwater assets and capabilities will continue to be the foundation for success in this demanding mission area, which entails of cost of just 10

"...until just a couple of days ago, the recovery efforts, the rescue and recovery efforts that were undertaken, were consistent with what would have been done in any other case. Because the Coast Guard felt that they had the capacity to succeed in this, if they had a few more days, and because of the role of the Kennedy family in our national lives, and because of the enormous losses that they have sustained in our lifetimes, I thought it was appropriate to give them a few more days. And they – if anyone believes that was wrong, the Coast Guard is not at fault, I am. It was because I thought it was the right thing to do under the circumstances."

President William J. Clinton
News Conference, 21 July 1999

[84] U.S. *Navy Salvage Report*, TWA Flight 800 (Washington, D.C.: Commander, Naval Sea Systems Command, S0300-BZ-RPT-010/0910-LP-015-6130, May 1998), pp. 2-3.

[85] "Initial JFK Jr. Search Called Typical of Thousands," *Los Angeles Times*, 22 July 1999, A1.

[86] *Turning to the Sea: America's Ocean Future, op.cit.*, p. 10.

percent of the Service's annual budget. The question – "Who you 'gonna call?" – will continue to be answered: "The Coast Guard!" (Table 3 provides summary Coast Guard SAR data, which include all "lives saved," even those in connection with a law-enforcement activity.)

Table 3.
USCG Search & Rescue Activities
1992-1998

Fiscal Year	SAR Cases	Lives Saved	People Assisted	Property Loss Prevented*	USCG SAR Program Costs*
1992	52,645	5,547	131,537	$ 539	$417
1993	52,455	4,689	118,190	$ 909	$421
1994	53,266	7,889	115,622	$1,452	$423
1995	49,136	4,411	100,425	$2,449	$431
1996	42,956	4,992	84,284	$2,214	$416
1997	40,639	3,836	74,740	$ 878	$368
1998	37,215	3,192	66,141	$ 997	$385

*Millions of then-year dollars

Source: USCG (G-OPR), October 1999

Maritime Mobility

Prior to the creation of the Revenue Cutter Service in 1790, Secretary of the Treasury Alexander Hamilton sought ways to protect the vital cargos – and collect their associated taxes – of the American merchant marine, the foundation of the colonial economy. As a preventive measure, he proposed the creation of a federal Lighthouse Service to protect American shipping from the wide range of coastal hazards, including rocks and shoals. In 1789, President George Washington signed the ninth Act of Congress, the first to provide for any public work, making the federal government responsible for the establishment and maintenance of aids to navigation, including "...lighthouses, beacons, buoys, and public piers ... at the entrance of or within any bay, inlet, harbor, or port of the United States, for rendering the navigation thereof easy and safe."[87]

As U.S. seaborne commerce continued to flourish, the recognition of the need to enforce maritime safety and provide for aids to navigation became increasingly evident. For example, the harbor cutter *Manhattan* was directed to enforce anchorage regulations in New York harbor in 1888, a responsibility soon assigned to other ports and waterways. Safety of navigation soon included the responsibility to deal with derelicts that posed maritime hazards. So critical was the need, that Congress directed the Secretary of the Treasury to build a steam cutter specifically designed and outfitted "...for service at sea in bad weather, for the purpose of blowing up or otherwise destroying or towing into port wrecks, derelicts, and other floating hazards to navigation."[88]

Courtesy of Don Wilson/Port of Seattle

[87] Evans, *The United States Coast Guard 1790-1915, op.cit*., pp. 4-5.
[88] Johnson, *Guardians of the Sea, op.cit.,* p. 10

Regular Revenue Cutter Service cutter operations in the Arctic began in 1879, when the cutter *Corwin* was sent north to search for two whalers and the exploring cruiser *Jeannette*. Ultimately unsuccessful, as the three ships had already been lost, *Corwin*'s cruise nonetheless became an annual event. The Coast Guard soon built a reputation for giving aid to whaling crews whose vessels were trapped in the ice. The Service's domestic icebreaking responsibilities were subsequently codified by law in 1936, when President Franklin Roosevelt signed an executive order directing that the Service assist in keeping channels and harbors open to navigation.

The mission of safety at sea became internationally important with *Titanic*'s sinking in 1912. This tragic event saw the Service assume ice patrol duties the following year.[89] The assumption of this seemingly natural function reflected what the cutters had long been doing in the Bering Sea as an adjunct to their law enforcement, search and rescue, and presence missions. As a result of this mission, which was formally instituted in the wake of the *Titanic* tragedy, there have been no sinkings attributed to icebergs, and it remains an important Deepwater task.

Since 1917, when a merchant ship carrying ammunition exploded in port in Halifax, Nova Scotia, virtually leveling the city, the Coast Guard has regulated the handling, storage, and carriage of dangerous materials in the nation's ports. Coast Guard men and women inspect vessel and port facilities and operations involving hazardous cargoes to ensure their safe handling. The Service also regulates anchorages as well as deepwater ports, offshore terminals, and deep seabed mining and ocean thermal energy conversion projects. Moreover, to ensure compliance with domestic and international laws, the Coast Guard examines and certifies/licenses U.S. merchant mariners and inspects foreign vessels and their crews.

In 1939, as part of President Roosevelt's reorganization plans, the U.S. Lighthouse Service was placed under the Coast Guard, which gave the Coast Guard an all-encompassing role in the safety of the nation's waterways. This combination added nearly 50 percent more civilians to the Service and caused a district reorganization as well as provisions to bring many of the lighthouse personnel into the military organization. Additional responsibilities continued to accrue. In 1940, for example, the Coast Guard was tasked with weather patrol duties, a service it would perform for nearly 40 years until advanced satellite technology superseded cutters at sea.

Today, the Coast Guard is the lead agency for a variety port safety and security, waterways management, commerce and vessel safety inspection and certification missions and tasks, and weather observations, all conducted while simultaneously focusing on prevention and response measures to man-made and natural disasters. The Coast Guard is also responsible for providing a safe and efficient navigable waterways system to support domestic commerce, international trade, and the military sealift requirements for national defense – both at home and in overseas operating areas. In general, the mobility services provided by the Coast Guard and its partners include:

- Aids to navigation (ATON) – maintaining nearly 50,000 Federal navigation aids (lights, lighted/unlighted buoys, and daybeacons), seagoing/coastal/inland waters buoytenders, Aids to Navigation Teams (ANTs), and radio-navigation systems including Differential Global Positioning System (DGPS) and LORAN sites
- Charting, pilot/tide/current information

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[89] U.S. Coast Guard, *International Ice Patrol* (Washington, D.C.: U.S. Department of Transportation, July 1984). Except for the World War I/II years, the cutter patrols were conducted every ice season since 1913. The Service has not dedicated a cutter to the international ice patrol mission since *Evergreen* (WAGO-295) was decommissioned in 1990. The Coast Guard's International Ice Patrol duties in early 2000 are carried out by long-range HC-130 aircraft.

- Vessel traffic services, transportation system information, and management information systems – Vessel Traffic Information Systems (VTIS), Enhanced Automatic Identification Systems (EAIS), and the future Ports and Waterways Safety System (PAWSS) program
- Domestic and international ice operations – ice-breaking and patrol services
- Dredging and channel maintenance
- Technical assistance and advice
- Infrastructure development assistance
- Vessel safety standards and inspection
- Bridge administration, standards, and inspection – oversees the regulation and maintenance of some 18,000 bridges throughout the United States, which aims to maintain free access for navigation on navigable waters and a fair balance between the interests of water, road, and rail traffic
- Law enforcement and port safety/security and environmental protection

"A large number of aids to navigation buoys are being installed throughout the RVN [Republic of Vietnam] in conjunction with channel dredging and port improvement projects. Maintenance and servicing requirements for these aids to navigation are beyond the capability of the RVN Directorate of Navigation. The U.S. Coast Guard has performed these functions on a temporary basis since December 1966. Recommend the U.S. Coast Guard be tasked with the interim responsibility for installation, maintenance, and servicing of U.S.-sponsored aids to navigation in RVN until RVN Directorate of Navigation, with USAID [U.S. Agency for International Development] assistance, can assume responsibility."

Admiral Ulysses S. G. Sharp, USN
Commander-in-Chief
U.S. Pacific Command,
27 August 1967
As quoted in *The Coast Guard at War: Vietnam, 1965-1975*

One element of this MTS security role that touches on homeland defense and military operations is the Coast Guard's contribution to controlling access of certain vessels to all U.S. ports, territorial seas, and inland waters. On 5 April 1999, for example, as the conflict in Yugoslavia and NATO forces stepped-up Allied Force operations,the Assistant to the President for National Security Affairs declared that vessels flying the flag or under the effective control of the Federal Republic of Yugoslavia were to be denied access to the United States. This prohibition applied to commercial cargo, passenger, fisheries and fisheries support vessels, public vessels, and private yachts – not a new or an unusual mission for the Coast Guard. The Service has long had the authority and responsibility to track and control such "Special Interest Vessels" (SIVs) of certain flags, designs, and cargoes, and the SIV program has included operations aimed at Cuba, Iran, Iraq, Libya, North Korea, Sudan, and Syria. Activated in 1999 to prevent Yugoslav vessels the opportunity to attack U.S. security, the principal objective of this control remains the protection of U.S. vessels, ports, harbors, waterfront facilities, and people from sabotage or other unlawful activities, including intelligence-gathering from sensitive waterfront activities and defense operations.

In the international arena, the Coast Guard often serves as America's principal point of contact in a variety of organizations. The International Maritime Organization (IMO), for example, is a United Nations agency with 157 member states. The IMO's purpose is to improve the safety of international shipping and prevention of pollution from ships. The Department of State has delegated responsibility to the Coast Guard the lead agency for U.S. representation at the IMO. The Coast Guard leads the U.S. delegations to the Assembly, the Maritime Safety Committee, the Marine Environmental Protection Committee, the Legal Committee, the Facilitation Committee, and all technical committees. The Facilitation Committee especially affects mobility interests through its initiatives to improve port infrastructure worldwide to facilitate the rapid movement of cargoes.

Other international mobility duties include Coast Guard representation in the International Association of Lighthouse Authorities (IALA), the International Telecommunications Union (ITU), and the International Electro-Technical Commission (IEC), as well as conducting the International Ice Patrol since 1913, in the wake of the *Titanic*

tragedy. Under the 1972/1984 International Convention for the Safety of Life at Sea (SOLAS) convention, the United States is responsible for the international ice patrol in the North Atlantic and marginal seas, and is reimbursed for services by the 17 signatories using the service. The Coast Guard operates long-range HC-130H Hercules aircraft from Elizabeth City, North Carolina, deployed to Newfoundland on a rotational basis, usually from February through July of each year.[90] The Canadian government cooperates with the Coast Guard in this patrol, including the provision of services and equipment and reporting on ice conditions.

Maritime Law Enforcement

The Coast Guard traces its heritage to the compelling need to safeguard the Nation's revenue laws and to prevent smuggling in the first years of the fledgling Republic. But the need to defend America's maritime borders and its sovereignty from a variety of threats and to enforce laws and treaties has also been a constant since 1790.

In 1799, the fear of contagious diseases that might be transmitted in vessels led to the decision to direct the Revenue cutters to aid the enforcement of health and quarantine measures. This became a periodic concern, as in 1884-1885 when cutters imposed a virtual blockade of ship movements into the Delaware and Chesapeake Bays, as well as Gulf of Mexico ports, working with the Public Health and Marine-Hospital Service to prevent the spread of yellow fever and cholera. And in 1905, six cutters and seven chartered craft manned by Revenue Cutter Service personnel boarded some 1,500 vessels – and fumigated more than 250 – during a yellow fever epidemic in New Orleans.

International issues led to further additions to the Service's missions in its early years. The Revenue Service assumed duties in 1807 to detect and intercept ships engaged in the foreign slave trade. Also that year, President Thomas Jefferson turned to the Service to enforce the short-lived embargo that forbade American trade with foreign countries. During 1819-1820, moreover, several cutters were engaged in anti-piratical duties, with the cutters *Louisiana* and *Alabama* showing great zeal and enthusiasm for this duty against Gulf coast pirates.

Beginning in 1818, the Service enforced the nation's neutrality laws, and a 1833 mandate of Congress directed the Service to protect live-oak forests on public lands to safeguard the Nation's critical supplies of wood for vessels, extended to other trees later, against illegal logging. And from the mid-19th century on, the Service has been tasked with defending America's shores from illegal traffic in firearms and weapons, liquor, and other illegal substances and contraband. Following World War I, the Coast Guard faced a few lean years and then experienced its greatest peacetime growth. The catalyst was the 1920 Volstead or Prohibition Act that prohibited the manufacture, sale, and transportation of alcoholic beverages. With no other federal agency prepared to enforce the new law, much of the enforcement fell on the shoulders of the Coast Guard.

The Coast Guard began its enforcement efforts – along the east and west coasts, in the Gulf of Mexico, and in the Great Lakes – with approximately 100 vessels. By building special craft, and transfers of ships from the Navy, the Service peaked at some 330 vessels of 75 feet or longer. An average of no more than 200 vessels were at sea, guarding the coast at any time. In order to fill this deficiency, the Coast Guard combated smugglers by using aircraft to cover more territory and to report suspicious vessels – the genesis of Coast Guard aviation – and also the beginning of a dedicated Coast Guard intelligence service.

[90] The Coast Guard allocates about 400 aircraft resource hours per year to the International Ice Patrol. In 1994, the latest year for which comprehensive data are available, the cost of the International Ice Patrol to the United States was $646,821 and the estimated annual benefit to U.S. shipping was $3,552,600.

Illegal Drugs

Today the influx of illegal drugs is one of America's foremost national security problems. Testifying before the Senate Armed Services Committee's subcommittee on emerging threats and capabilities in April 1999, Barry R. McCaffrey, Director, Office of National Drug Control Policy, warned of the persistent flow of illegal drugs that kills 15,000 Americans and costs the public more than $110 billion each year. In addition to the social costs of drug use, McCaffrey stated that the $57 billion which Americans spend annually means that "in any given year drug use saps over $167 billion for our nation's economic strength."

The Coast Guard is the Nation's lead maritime agency in protecting America from the drug threat and, despite the vast complications in enforcement, this task is performed with little extra allocation.[91] But this involvement with the interdiction of drugs occupies and consumes a tremendous amount of assets. Drug interdiction remains difficult because it is tasked to multiple agencies, smugglers have a higher mobility, and there is a need of more vessels, aircraft, and personnel to patrol the vast coastlines of the United States and even greater expanse of the "transit zone." This six-million square-mile transit zone is roughly the size of the continental United States, and includes the Caribbean, Gulf of Mexico, and Eastern Pacific. (Figure 5 shows the major routes of the South American international drug trade into the United States.)

The Coast Guard has established Campaign Steel Web, a multi-year strategy, plan, and operations aimed at reducing the supply of drugs to the United States. In 1997, the

Figure 5. South America International Drug Routes

[91] Presidential Decision Directive 14, Western Hemisphere Counter-Drug Strategy, established the Coast Guard as the lead agency for maritime interdiction; the Coast Guard shares lead agency responsibilities for air interdiction with the U.S. Customs Service.

[92] Office of National Drug Control Policy, *The National Drug Control Strategy, 1998: A Ten-Year Plan* (Washington, D.C.: GPO, 1998), p. 42. The pressure on Puerto Rico, however, has resulted in drug traffickers returning to older routes between the Bahamas and Florida. In May 1998, for example, Federal official scored their greatest cocaine seizure from a pleasure boat – 4,000 pounds with a street

Coast Guard's cutters and aircraft forward-deployed off South America and in the Caribbean/eastern Pacific transit zone interdicted more than 103,600 pounds of cocaine, keeping nearly more than 500 million "hits" of cocaine – two months' consumption – off America's streets and out of its schools. The "street value" of the cocaine seized, estimated at $3.65 billion, exceeded the Coast Guard's entire operating budget of $3.15 billion in 1997. Marijuana seizures in 1997 were valued at an additional $324.8 million. But only 32 percent of estimated 430 metric tons of cocaine that entered the transit zone was actually seized, pointing to the critical need for more effective intelligence, surveillance, and interdiction assets. During 1997, Coast Guard-led interagency surge operations reduced the flow of cocaine to Puerto Rico – once a prime transshipment point – by 46 percent.[92] That success, however, led the drug-runners to seek other ways to ensure safe transit of their "commodities." For example, because of a weak police force and notoriously corrupt judiciary, Haiti has become one of the hemisphere's busiest conduits.[93] U.S. officials estimate that almost about 60 tons of cocaine – 20 percent of the total reaching the United States – passed through Haiti in 1998, an increase of more than nine tons from 1997. In the 12 months ending in September 1999, the Coast Guard seized a record 111,689 pounds of cocaine with a street value of $3.9 billion, an increase of 35 percent compared to the previous year. More than 67 percent of the cocaine seized in fiscal year 1999 was in the Miami-based Coast Guard Seventh District, which includes Florida, South Carolina, Georgia, Puerto Rico, the U.S. Virgin Islands, and much of the Caribbean. (Table 4 provides data on recent Coast Guard drug seizures.)

Table 4
USCG Drug Seizures, 1986-1999*
(Drug Seizures in Pounds)

Fiscal Year	Cases	Cocaine	Marijuana	Hashish/Oil	Heroin	Arrests	Vessels Seized
1986	307	8,499	2,074,282	2,135	0	721	165
1987	257	22,454	1,390,864	15	0	626	171
1988	276	38,955	755,352	86,052	0	528	216
1989	259	34,792	328,623	40,069	0	385	206
1990	207	78,731	57,078	12,700	0	321	134
1991	156	90,335	44,023	141,547	0	245	79
1992	133	48,951	116,849	0	0	218	52
1993	68	49,014	80,300	2	0	143	31
1994	67	47,333	33,895	0	0	73	28
1995	44	33,629	40,164	0	1,306	56	34
1996	35	28,585	31,000	0	6.5**	23	41
1997	122	103,617	102,538	50,587	343	233	64
1998	115	82,623	31,365	25	3**	297	75
1999	107	111,689	28,872	33,006	0	189	50

*Includes USCG assistance to other agencies; 1999 data are as of June 1999
**Gallons
Note: Each pound of cocaine results in approximately 4,500 "hits" or doses.
Source: U.S. Coast Guard (G-OPL), October 1999

value of $34 million found hidden throughout a 62-foot luxury yacht. Mireya Navarro, "Upgraded Drug Traffic Flourishes on Old Route," *The New York Times*, 31 May 1998, p. 12.

[93] "Flow of Colombian Cocaine Through Haiti Turns to Flood," *The Washington Post*, 4 May 1999, pp. A11, A20.

"The age of the Coast Guard's assets seriously undermines our nation's ability to stop the flow of drugs on the high seas and within our territorial waters. We are facing a DVD or CD-ROM threat with 8-track tape technology – graduates, ask your parents what an 8-track tape is."

General Barry R. McCaffrey, USA (Ret.)
Director, Office of National Drug Control Policy
USCG Academy Commencement Address
19 May 1999

The threat of illegal drugs to America will become more difficult to counter as advanced equipment and technology are increasingly employed by global and regional drug cartels. In response to the Coast Guard's efforts, smugglers have begun investing in high-speed (70-plus knot) craft and low-observable/radar-evading "stealth" vessels – even semi-submersibles – and aircraft in an attempt to evade detection at sea. According to General McCaffrey's April 1999 testimony, innovations have included the development of hard-to-detect "black cocaine" – mixing the drug with chemicals and fashioning it into bricks that look like metal moldings – and producing the altered drug in a range of other colors to throw off the whole inspection methodology.[94] Other capabilities include sophisticated counter-information technologies that will enable criminal organizations to challenge U.S. and world law enforcement organizations with greater boldness and daring.

There is little doubt, then, that the Coast Guard is a key element in the President's National Drug Control Strategy to detect, deter, control, and engage the drug trade. Indeed, in his foreword to *The National Drug Control Strategy, 1998*, McCaffrey implicitly acknowledged the importance of the Coast Guard's enforcement and international engagement activities in halting the flow of drugs into the United States:

> By closing the door on drugs at our borders, we increase the security of all Americans. The stream of commerce and culture across our borders represents tremendous opportunity for our great nation. Expanding the exchange of industry and ideas, while stemming the flow of illegal drugs, allows us to prosper. Similarly, reaching beyond our borders to foster multinational cooperation diminishes the drug threat America faces.[95]

But achieving success in these areas is not cheap. In 1998, for example, the Coast Guard expended more than 113,500 cutter hours in anti-drug operations, compared to about 96,700 hours in policing international and domestic fishing fleets and nearly 30,800 hours in alien migrant operations. This is a significant change from just 1994, when the Service expended about 39,800 cutter hours in counter-drug law enforcement and more than 90,300 hours in migrant efforts. Similarly, in 1995 the Coast Guard's almost 59,500 counter-drug cutter hours were dwarfed by the 110,700 hours devoted to fisheries law enforcement tasks. Little wonder that General McCaffery concluded that "Counter-drug efforts are now clearly the primary law enforcement role of the Coast Guard."[96]

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[94] "Cartels Shipping 'Black' Cocaine," *The Washington Post*, 28 April 1999, p. A2. See also, "Drug Cartels Hold Tech Advantage," *The Washington Post*, 15 November 1999, pp. A1, A18. Increasingly the cartels are using highly sophisticated encryption and communications technologies that are frustrating U.S. enforcement actions. In a recent case, it required some 24 hours to crack the code of a 30-second transmission by the traffickers, making the attempt pointless, according to a U.S. law-enforcement official.

[95] *The National Drug Control Strategy*, 1998, *op.cit.*, p.v. Goal 4 – "Shield America's air, land, and sea frontiers from the drug threat – calls for "flexible operations to detect, disrupt, deter, and seize illegal drugs in transit to the United States and at U.S. borders." Goal 5 – "Break foreign and domestic drug sources of supply" – calls for the disruption and dismantling of major international drug trafficking organizations and the arrest, prosecution, and incarceration of their leaders. In all, the strategy has set aggressive goals to reduce the supply of drugs in the United States 25 percent by 2002 and 50 percent by 2007. For an analysis of the strategic, operational, and tactical levels of counterdrug efforts, see William W. Mendel and Murl D. Munger, *Strategic Planning and the Drug Threat* (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, August 1997).

[96] General Barry R. McCaffrey, USA (ret.), Director, Office of National Drug Control Policy, "Semper Paratus – Readying Your Service and Yourself," Commencement Address, U.S. Coast Guard Academy, 19 May 1999.

In addition to at-sea interdiction operations, the *Drug Control Strategy* envisions much-improved bilateral and multilateral cooperations, especially with Mexico.[97] In this regard, the Coast Guard has already been working very closely with the Mexican navy, as well as the naval/coastguard forces of Panama, Jamaica, and Nicaragua, to keep up pressure against drug movements in the Caribbean and the eastern Pacific, and collaborating to interdict so-called "shark boats" or "go-fasts" – high-speed, low-profile boats that speed up the Gulf of Mexico and eastern Pacific and dump loads of marijuana for pickup and eventual distribution. The cooperation has extended to training in search and seizure techniques, and the establishment of a communication system with Mexico that allows the Coast Guard and Mexican navy to communicate at the tactical level – ship-to-ship and -aircraft – across the maritime and landward borders.[98]

Similarly, a growing cooperation between the Coast Guard and other nations' navies, coastguards, and drug-control authorities, including in-country training teams, has generated results. While U.S.-Cuban relations continue to be strained, and the countries have not had diplomatic ties since 1961, on occasion the practical need to stem the flow of drugs transcends politics and rhetoric.[99] Moreover, the United States, the United Kingdom, The Netherlands, and France routinely engage in counter-narcotics sweeps through the Caribbean. Working with the Royal Navy and Puerto Rico's Forces United for Rapid Action in May 1999, Coast Guard and other U.S. counterdrug agencies seized more than 11 tons of cocaine – some 103 million street-level doses – in six seizures. In the two largest incidents, the HMS *Marlborough*, carrying Coast Guard law enforcement detachments, intercepted and seized the *China Breeze* (of Panamanian registry, found to have 8,800 pounds of cocaine on board, the 11th largest single seizure on record) and the *Castor* (also under the Panamanian flag, with 5,687 pounds of cocaine, the 12th largest seizure).[100] British Defence Secretary George Robertson noted that "One drug bust of four tons of cocaine is good. Two in one week is even better. And we will not give up here."

Finally, but perhaps most importantly for future Deepwater systems, the Strategy calls for increased funding for the Coast Guard, to "...provide for capital improvements to enhance the Coast Guard's interdiction capabilities, particularly in the Caribbean." As Representative Wayne T. Gilchrest, Chairman, Subcommittee of Coast Guard and Maritime Transportation, remarked at a June 1998 hearing:

> Before 1992, our national drug control strategy was balanced between supply reduction and demand reduction. It worked – drug use in this country consistently

"Overseas law enforcement presence leverages resources and fosters the establishment of working relationships with foreign law enforcement agencies.... In addition, training foreign law enforcement officers is critical to combating international crime. Such training helps create professional law enforcement organizations and builds citizen confidence in law enforcement officers who operate under the rule of law."

***A National Security for a New Century,* October 1998**

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[97] *Ibid.*, pp. 42-44. See also, Office of National Drug Control Policy, *United States/Mexico Bi-National Drug Strategy* (Washington, D.C.: February 1998).

[98] Scott C. Truver, "The World is Our Coastline," U.S. Naval Institute *Proceedings*, June 1998, pp. 45-49, at p. 47.

[99] "Cuba Wages a Lonesome Drug War," *Washington Post*, 25 May 1999, pp. A1, A12; also, "In This Case, Cuba-U.S. Teamwork Netted Big Score," *idem.*, p. A12. See, also, "The Disputatious Diplomacy of Drugs," *The Economist*, 11 September 1999, pp. 37-38, where it was noted, "Despite their irreconcilable differences on almost everything else, fighting illegal drugs is one subject on which the governments of Cuba and the United States agree." That judgment has proven contentious, as Lincoln Dias Balart, a Cuban-American Republican congressman from Florida, has called Castro "one of the biggest drug traffickers in the world."

[100] "U.S. Partners Make Cocaine Seizure," Associated Press, 4 June 1999, 5:15 PM EST.

declined during the Reagan-Bush years. President Clinton changed our national strategy to emphasize demand reduction, especially drug treatment for hard-core addicts. I support effective drug treatment, but creating addicts while leaving our borders vulnerable is a reactionary strategy that will always leave us one step behind the drug cartels. By reducing the supply of drugs on our streets through effective interdiction, we can drive prices up, which deters our must vulnerable citizens, teenagers, from using drugs. If we can stop teenagers from starting a drug habit, we will win the War on Drugs in this country.

TV ads alone won't keep drugs off our streets and out of the hands of our children. Now is the time to renew our commitment to slashing drug availability and use. Now is not the time to slash the Coast Guard's drug interdiction budget. Our task is to find the money to get the job done.[101]

The Coast Guard, moreover, provides a level of "acceptable" presence that sometimes is not apparent when other national assets are involved in drug interdiction efforts. During 1990, the U.S. Navy suggested using the USS *John F. Kennedy* (CV-67) aircraft carrier battle group in a forward-presence/maritime interdiction/blockade role off Colombia. That proposal was rejected as a *politically unacceptable* level of military presence, and the uproar threatened all sea-based operations. Meanwhile, Coast Guard assets, strained as they might have been, stayed in place.

The Coast Guard has thus played a critical role on the front line of the nation's war on drugs. Cutters and aircraft have been the primary forces in the identification and interdiction of ships and aircraft used for smuggling illicit goods, and have worked in close cooperations with other U.S., regional, and international agencies. But, as Stephen Jermy concluded in an analysis of the Caribbean drug interdiction problem:

> It would be a mistake to measure the value of such deployments purely on their interdiction capability – regime development is the other implicit task. And one can argue that, in the longer view, this task is as important, and possibly more important, than the interdiction task. The ships are highly visible demonstrations of their countries' views on the drugs trade, and of their willingness to commit resources in its suppression. The vessels play a key role in the coalescing of norms and values within the regime. At the moment, this is achieved simply by their "being there," and being involved in the interdiction efforts. But with a slight change in focus and training, there is the capacity to do more.[102]

Living Marine Resources

Protection of the living marine resources also came early in the service's history, when protection of the Bering Sea fur seal and sea otter herds became a cutter responsibility. Later, protection of salmon and other fish and game species was added to the service's duties. The years following World War II saw and explosive expansion in both the size and efficiency of global fishing fleets. Distant-water fleets from several countries ventured to within sight of U.S. coastlines. Exploitation of living marine resources by these foreign fishermen was so great that, by the early 1970s, the United States had grave concerns about the health of its coastal ecosystems.

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[101] Statement of the Honorable Wayne T. Gilchrest, Chairman, Subcommittee on Coast Guard and Maritime Transportation, Hearing on Drug Interdiction and Other Matters Relating to the National Drug Control Policy, 19 June 1998, mimeo, p. l .

[102] Stephen Jermy, "Regional Prohibition Regimes: Drugs Trafficking in the Caribbean," *Maritime Operations in Peace, op.cit.*, p. 26.

As a result, Congress passed the Magnuson Fisheries Conservation and Management Act in 1976, a watershed event in the expansion of both Coast Guard responsibilities and areas in which the Coast Guard was directed to apply its scarce resources, which eventually all-but eliminated foreign fishing within 200 nautical miles of the coast. Unfortunately, the 1996 Magnuson Act encouraged the rapid growth of a domestic fleet to a size equal to, if not greater than, the foreign fleets it replaced, with an end result of continued fisheries depletion in many regions. Congress amended the Magnuson Act in 1996 in an attempt to reverse these trends, setting stringent guidelines for ending overfishing and rebuilding depleted stocks. Four key objectives are outlined:

- Rebuilding overfished stocks
- Reducing bycatch of overfished species
- Conserving fisheries habitats
- Safeguarding the economies of coastal communities

In all regions today, the Coast Guard faces daunting challenges of patrolling and protecting great expanses of ocean under the sovereign jurisdiction of the United States, as well as patrolling even greater high seas areas in support of an increasing number of international fishery regimes. In the northwest Atlantic, Coast Guard Deepwater fisheries enforcement patrols contribute greatly to the eventual renaissance of groundfish stocks, while sustained at-sea law enforcement presence in the Bering Sea has resulted in increased deterrence and apprehension of illegal foreign fishing in the nearly 3.4 million-square-mile U.S. EEZ that extends from some 95,000 miles of coastline – a vast area to patrol and control. And yet every day the Service is on duty in these Deepwater operating areas, which include some of the world's most valuable fisheries that support a more than $24 billion American commercial industry, as well as a recreational fishery estimated to be worth some $10 billion and growing.

In the Bering Sea, a region notorious for severe weather and sea conditions, a sustained, year-round Coast Guard presence with surface and long-range air assets provides long-endurance law enforcement presence to detect and deter illegal fishing activity. "It's not just an ocean – it's a battlefield" Coast Guard helicopter pilot Lieutenant Eric Vogelbacher remarked about patrolling the Russian-U.S. maritime line.[103] Additionally, these same assets simultaneously provide fishermen with a lifeline to safety and rescue.

These important fisheries and industry are at risk as a result of international exploitation and over-fishing by America's own fleets. The Coast Guard is the Nation's only on-scene enforcement resource to protect these distressed fisheries and to help rebuild stocks for the future. As Alaska Governor Tony Knowles wrote to Secretary of Transportation Rodney Slater in June 1998, pleading for assistance in enforcing the ban on the use of high seas drift nets – "curtains of death":

> I recently wrote Secretary of State Madeline Albright about the need for renewed efforts to pressure other nations to join in the Convention for the Conservation of

[103] Todd Lewan, "U.S. Fish Patrol Guards Perilous, Frigid Frontier," *Washington Post*, 1 June 1999, p. A13.

Anadromous Fish in the North Pacific. In addition to these diplomatic efforts, the State of Alaska supports continued financial support for the Coast Guard's monitoring and enforcement efforts. *The United States needs to maintain a fleet of ships and long-range aircraft to patrol the distant waters of our jurisdiction and beyond, where renegade fishing fleets that threaten our stocks operate. Maintaining the Coast Guard's deepwater patrol capability is important to the State of Alaska and our national interest.*[104]

Indeed, the enforcement requirements of several international treaties are principal drivers for a much-enhanced Deepwater capability, especially in the western Pacific. This must be done with ocean-capable vessels, able to take on the roughest seas in the world, and long-range aircraft able to cover vast distances to surveill critical boundaries and fishery areas. Under the aegis of a UN resolution and U.S. law, the High Seas Driftnet Fisheries Enforcement Act, the Coast Guard patrols and protects a great expanse of the Pacific Ocean, averaging approximately 75 days at sea and 250 flight hours per year focused on detecting, controlling, and engaging illegal driftnet fishing. Then, when violations are detected, Coast Guard cutters pursue the violators, sometimes for a week or more, before they are brought to justice, or escape.

In late June 1997, for example, a Coast Guard HC-130H Hercules search aircraft from Hawaii responded to a call to investigate a possible international driftnet fishing violation by a Chinese fishing vessel *Cao Yu 6025* and to monitor the vessel's movement. Because no high-endurance cutter was immediately available, a World War II-vintage buoy tender based in Guam, the Cutter *Basswood* (WLB-388), was ordered to take up the surveillance of the *Cao Yu*. Capable of making a top speed of only 12 knots, *Basswood* nonetheless kept up the vigil for some 1,500 miles until the Cutter Chase arrived on the scene to stop, board, search, and seize the *Cao Yu* and arrest its crew. *Basswood* then towed the vessel back to Guam, where the illegal catch was sold and the ship publicly auctioned.

As increasing stress is placed on U.S. waters and marine resources, the Coast Guard will aggressively work to preserve healthy stocks of fish and other living marine resources and to keep the waterways free of oil, chemicals, and other marine pollution, as well as invasive species. Shifts in offshore fishing trends, the enforcement of international agreements, and the increase in global trade will cause the Coast Guard to conduct its diverse environmental protection missions over greater distances than ever before, necessitating modern and interoperable Deepwater platforms and systems with long-range surveillance and intercept capabilities. Not only will the areas and distances to cover be greater, but, as recent trends indicate, the level of activity will increase, as well. The number of fisheries law enforcement boardings has increased, from 9,440 cases in fiscal year 1994 to 12,449 in fiscal year 1997.

Illegal Migrants

U.S. Coast Guard migrant interdiction operations are as much humanitarian efforts as they are law enforcement missions. Migrants typically take great risks and endure significant hardships in their attempts to flee their countries and enter the United States. In many case, migrant vessels interdicted at sea are overloaded and unseaworthy, lack basic safety equipment, and are operated by inexperienced mariners. The majority of alien migrant interdiction cases handled by the Coast Guard actually begin as search and rescue

[104] Letter from The Honorable Tony Knowles, Governor, State of Alaska, to The Honorable Rodney Slater, Secretary of Transportation, 12 June 1998. Emphasis added.

cases, most occurring in high seas, Deepwater areas of operations. Many of the migrants who have been rescued by the Service would most likely have perished at sea.

While the Coast Guard interdicted some 288,000 migrants from 43 countries between 1980 and 1998, the largest flows have been from Cuba, Dominican Republic, People's Republic of China (PRC), and Haiti. Maritime illegal migration and alien smuggling threaten the United States from all sides – along the entire east and west coasts, Hawaii, Guam, and Puerto Rico. Economics and quality of life continue to be the primary factors driving people to brave the seas in the hope of reaching America. The Coast Guard has seen a marked increase in organized alien smuggling ventures, especially from Cuba, Dominican Republic, and PRC.

In the late 1990s, China has become the single greatest source of human trafficking by sea, with intelligence sources estimating that as many as 20,000 illegal PRC immigrants reach the Western Hemisphere by sea each year, most ultimately destined for the United States. And, maritime immigrant smuggling is becoming economically more attractive. One large boatload of PRC aliens is worth some $6 million to the smugglers, with some PRC migrants paying $45,000 or more for the hazardous voyage, which might last as long as four months. In late August 1998, for example, the Coast Guard intercepted a converted Chinese fishing vessel literally crammed full of illegal migrants, many of whom were in very poor health and in desperate need of food and water.[105] Moreover, the U.S. territory of Guam has become a target of Chinese smugglers known as "snakeheads," who know that illegal migrants, once on shores considered to be American soil, are eligible to apply for political asylum.[106] "It really is an invasion," a U.S. immigration official noted.

To summarize the Coast Guard's major migrant interdiction accomplishments:

- In 1980, Coast Guard men and women stemmed a mass migration from Cuba, interdicting 125,000 illegal migrants who flooded toward south Florida; U.S. Navy surface forces played key roles in supporting Coast Guard afloat operations.
- In 1990-1991, Coast Guard Deepwater assets responded quickly and effectively to another mass migration, interdicting more than 37,600 Haitian migrants attempting to enter the United States illegally.
- In 1994, Coast Guard cutters and aircraft responded to two nearly simultaneous mass migrations from Cuba and Haiti, working closely with Navy and other Defense Department assets. An afloat Coast Guard task force commander directed operations for the largest fleet of cutters since World War II, interdicting more than 25,300 Haitian migrants in Operation Able Manner and nearly 38,600 Cuban migrants in Operation Able Vigil.

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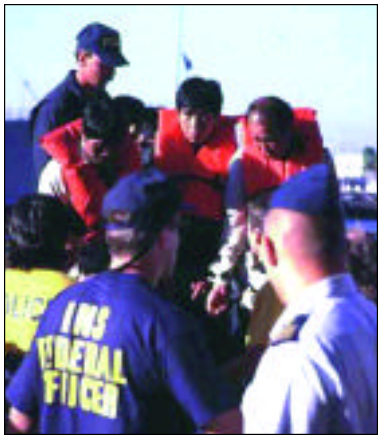
[105] William Branigin, "Coast Guard Discovers 150 Chinese Aboard Suspected Smuggler's Ship," *Washington Post*, 29 August 1998, p.A4. About three weeks later, the 185-foot *Chih Yung* fishing boat docked in San Diego, and a total of 174 (not 150) migrants were led off, most to be returned to China. The main compartment had filled with water, oil, and sewage, and all migrants, as well as the crew, were in great need of food and medical care. "Chinese Migrants Arrive in San Diego," *Washington Post*, 19 September 1998, p. A16. For a more comprehensive assessment of the Chinese "threat" to U.S. immigration policies, see Paul J. Smith, ed., *Human Smuggling: Chinese Merchant Trafficking and the Challenge to America's Immigration Tradition* (Washington, D.C.: Center for Strategic and International Studies, 1997).

[106] William Branigin, "Guam's Own 'China Beach'," *The Washington Post*, 6 May 1999, pp. A3, A4. See also, Craig S. Smith, "Wanna Leave China? Just Make It to Guam and the U.S. Beckons," *Wall Street Journal*, 4 August 1999, pp. A1, A6.

- Between June 1994 and September 1999, the Coast Guard interdicted 81,727 undocumented migrants from 26 countries attempting to enter the United States by sea. This included 12,454 migrants from the Dominican Republic and another 2,092 from the Peoples' Republic of China.

The expected increase in number of illegal migrants seeking entry into the United States by sea will create difficult social, economic, and political issues for the nation and generate demands for effective Coast Guard interdiction operations further out to sea, in waters under U.S. jurisdiction and beyond. Successful landings of illegal migrants in the United States create public discontent, further strain the healthcare and social-assistance systems of coastal states, and overwhelm limited detention facilities. The need is great, therefore, for a cost-effective capability to interdict, and through successful interdiction efforts, to enhance the deterrence of illegal migrant attempts, including smuggling. The nation can expect that in the future, as was the case in the 1980 Mariel crisis, foreign leaders might manipulate local crises and generate mass migrations.[107] The Coast Guard is the nation's first line of defense against illegal migration from the sea. Indeed, Presidential Decision Directive–9 states that the U.S. government will take the necessary measures to preempt, interdict, and deter alien smuggling, as well as to interdict and hold smuggled aliens as far as possible from the U.S. border and to repatriate them when appropriate.



Courtesy of Immigration and Naturalization Service

Partnering and Leadership

Interagency cooperation has been the key to the increasing U.S. effectiveness in maritime law enforcement and protection of America's maritime borders. These operations involve the Departments of State, Defense, Justice; the Coast Guard, Customs Service, Federal Bureau of Investigation, Drug Enforcement Agency, Environmental Protection Agency, National Marine Fisheries Service, and the Immigration and Naturalization Service, as well as numerous international, state, and local agencies. The Coast Guard is the only federal law enforcement agency with jurisdiction in both U.S. waters and on the high seas. In these arenas, the Coast Guard is the primary enforcer of U.S. laws and treaties that include customs and border control, protection of living marine resources, safeguarding the marine environment, fighting piracy, interdicting illegal immigrants and contraband, counter-drug operations, and helping to stem the proliferation of weapons of mass destruction.

Marine Environmental Protection

The Coast Guard's role in environmental protection dates back more than 175 years to the 1822 Timber Act that tasked the Revenue Cutter Service with protecting government timber from poachers. Most of the early statutory protection was in industries where profits were made from natural resources, such as fur bearing animals, whales, fish, and

[107] Mario Antonio Rivera argues that the Cuban boatlift of 1980 was a catastrophic event for the United States and that the Cuban government "manipulated the boatlift for its own purposes, not least in forcing onto the flotilla thousands of individuals considered undesirable by the regime, in the place of relatives Cuban-Americans had spent and risked much to retrieve." *Decision and Structure: U.S. Refugee Policy in the Mariel Crisis* (New York: University Press of America, 1991), at p. 1. Rivera concludes, at p. 2, that the Carter Administration's "...failed policy became all but inevitable once the Cuban government succeeded in challenging American sovereignty over its borders and controlling the exodus."

timber. However, the Oil Pollution Act of 1924, which forbade the discharge of oil into American coastal waters, set a new course for the Coast Guard. The legislation tasked the Service to monitor a single environmental issue, one that did not protect a specific resource but the environment as a whole. During the next 50 years, additional legislation further mandated the enforcement of laws to protect against harmful oil pollution, following large-scale oil spills from *Torrey Canyon* off the coast of England in 1967 and *Argo Merchant* off Nantucket, Massachusetts, in 1976. However, following the 1989 grounding of the *Exxon Valdez* , which spilled 10.1 million gallons of oil into Prince William Sound, Alaska, and caused more than $2 billion in economic damage, Congress passed the Oil Pollution Act of 1990 that gave the Coast Guard greater oversight powers, including increased response, inspection, and investigation responsibilities.

Courtesy of Eric Hill/Anchorage Daily News

Environmental protection thus has been and remains a constant concern for the Coast Guard. Service men and women are involved in all aspects of safeguarding the critical natural resources located in the U.S. 3.4 million square mile territorial sea and EEZ. This includes a wide range of prevention, protection, containment, and recovery activities and operations, all in support of the Coast Guard's three primary environmentally related mission areas: maritime pollution enforcement, lightering zone enforcement, and foreign vessel inspection.

Today, the Coast Guard's Deepwater assets also provide mission-critical command-and-control support and first responding forces to a wide range of environmental disasters and humanitarian tragedies. The Service was the first "on-scene" force in the response to the Exxon Valdez oil spill, and the Narragansett Bay/Point Judith, Rhode Island, oil spill in 1996, thereby facilitating timely response and recovery. Although these situations occurred within 50 miles of the shore, Coast Guard Deepwater assets provided critical support and capabilities to mediate the crises.

To this end, three well-trained and well-equipped Coast Guard National Strike Teams, located on the East, West, and Gulf coasts, are at the ready to respond to major oil or hazardous materials spills in the waterways and coastal regions of the United States. (These Strike Teams may also comprise the nation's maritime "first-responders" to a terrorist attack using chemical, biological, or nuclear weapons in a crowded port or roadstead.) In recent years, Coast Guard prevention efforts, namely through improved methods, education, and enforcement of penalties, have reduced steadily the number of large oil spills. In 1997, for the first time, there were no spills in the "major" category (more than 100,000 gallons) caused by maritime facilities, and the total amount spilled was less than one-third the average of the preceding four years. In total, however, more than 7,000 oil and hazardous substance spills occur in U.S. waters each year, totaling some 2.53 million gallons in the water and costing $48 million in clean-up operations.

Patrols by Coast Guard Deepwater surveillance aircraft of offshore lighterage areas have detected and deterred illegal dumping of waste oil, thereby greatly lessening the potential for environmental harm in sensitive marine areas. Such policing of offshore lighterage areas by Deepwater assets, which also includes the deployment of inspection teams, will increase in the years ahead, as international maritime commerce continues to grow and the requirement remains for single-hull tankers to operate either in deepwater ports or in designated lightering zones 60 nautical miles offshore.

Coast Guard regulations implementing the National Invasive Species Act of 1996 are in effect, and nearly all foreign vessels entering U.S. waters after voyages from foreign ports are subject to ballast sampling and reporting requirements.[108] Effective enforcement may also hinge upon Coast Guard Deepwater interceptions/inspections of target vessels before they enter U.S. ports.

As increasing stress is placed on U.S. waters, the Coast Guard will aggressively work to keep the waterways free of oil, chemicals, and other marine pollution, including alien species. Shifts in offshore activities, the enforcement of international agreements, and the increase in global trade will cause the Coast Guard to conduct its diverse environmental-protection missions over greater distances than ever before, necessitating modern and interoperable Deepwater platforms and systems with long-range surveillance and intercept capabilities.

The Coast Guard's prevention, enforcement, and response roles in marine environmental protection help to reduce the amount of pollution entering America's and the world's waterways. In response to marine environmental security challenges, and as a world leader in marine environmental protection, the Coast Guard shapes the safety and pollution-control standards for international and domestic maritime transportation through its policy-making and enforcement of laws and treaties, especially in the areas of lightering zone enforcement and Port State Control and inspection of U.S. and foreign commercial vessels. When prevention and enforcement fail, however, the Coast Guard maintains a rapid-response capability to contain and recover from pollution incidents in the inland waterways and coastal regions of the United States. And data collected by the Coast Guard are critical elements of successful litigation. In July 1999, Royal Caribbean Cruise Lines agreed to pay $18 million – a record fine – and to plead guilty to 21 felony counts from dumping oil and dangerous chemical and illegally storing hazardous waste in locations from Alaska to Florida.

"I would like to express my thanks to U.S. Coast Guard Commandant James M. Loy and the Coast Guard men and women who played an invaluable role in bringing about today's guilty plea of Royal Caribbean Cruise Lines (RCCL) for environmental crimes.

The Coast Guard's investigation, during which it observed RCCL's *Sovereign of the Seas* dumping oil off the coast of Puerto Rico in October 1994, led to the criminal prosecution resulting in today's record $18 million fine and the company's guilty plea to 21 counts for dumping waste oil and hazardous chemicals and lying to the Coast Guard.

Today's plea agreement sends the message that harming the environment does not pay, and that the Coast Guard stands, in the words of its motto, "Always Ready" to preserve the safety and environmental health of our waterways."

The Honorable Rodney E. Slater
Secretary of Transportation
July 1999

National Defense

For much of its history, the Coast Guard has served alongside the U.S. Navy. Indeed, the first "ancillary" duty thrust upon the Revenue Cutter Service came in 1797, when the impending Quasi-War with France caused the cutters to be assigned responsibility for coastal defense and protection of shipping and, the next year, to be placed at the disposal of the Secretary of the Navy.[109] There is a connection, for example, between the cutter *Vigilant* (WMEC-617) supporting the United Nations' embargo of Haiti in 1994 and the Revenue Cutter *Harriet Lane* off Charleston, South Carolina in 1861 – both cutters fired warning shots to force a ship to heave to. Likewise, there is a link between the actions of the Revenue Cutter *Hudson* in Santiago harbor during the Spanish-American War and the cutter *Ocracoke* (WPB-1307) off Cap Haitien in 1994 – both towed Navy ships out of harm's way.

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[108] This concern is not limited to ballast water-borne species, as other non-native species, especially insects, can be introduced to the United States by the vessels, themselves, as well as the cargoes they carry, potentially causing millions of dollars of damage to U.S. agriculture.

[109] Eight of the ten Revenue Cutter Service cutters served within the Navy during the Quasi-War, taking 15 armed French vessels, assisting in the capture of five others, and recovering at least ten American ships from French captors. Johnson, *Guardians of the Sea, op.cit.*, p. 2.

[110] Three Navy Department strategic-concept papers – *...From the Sea (1992), Forward...From the Sea* (1994), and *Operating Forward...From the Sea* (1997) – point to the dramatic shift of strategic and operational focus from open-ocean/blue-water operations to what is now called "littoral warfare," i.e., operations relatively close to an adversary's shoreline with the objective of directly contributing to "power-projection" operations ashore. All, moreover, envision the need for Joint operations with other elements of the U.S. military, including the Coast Guard, as well as Combined operations with allied and friendly navies and maritime defense forces.

Indeed, in every major conflict in which the United States has been engaged, the Coast Guard has served with the Navy and Marines. In early World War II, Coast Guard forces carried out critical convoy escort duties and were responsible for sinking several Nazi U-boats during the Battle of the Atlantic; in the Pacific Theater, they were important "force-multipliers" for pivotal amphibious operations that helped turn the tide of the conflict. During the Vietnam War, the Coast Guard honed military skills in operational environments that are particularly apropos for post-Cold War U.S. strategic concepts of littoral warfare.[110] Almost from the start of overt U.S. involvement in that conflict, the U.S. Navy studied the problem of assuring that a critical coastal interdiction mission could be carried out.[111] In early April 1965, then-Chief of Naval Operations Admiral David L. McDonald met with Admiral Edwin J. Roland, Coast Guard Commandant, to discuss the Coast Guard's possible contribution to coastal patrol. Acknowledging that the Navy had no suitable ships for the mission, McDonald asked in the Coast Guard had any "leftover" 83-foot patrol boats, which as a young officer McDonald had seen doing rescue work off Normandy beaches. Roland told the CNO that the 83-footers had been retired, but modern, steel-hulled 82- and 95-foot boats were available on short notice. Accordingly, on 16 April, Secretary of the Navy Paul H. Nitze formally asked Henry W. Fowler, the Secretary of Treasury, about the availability of Coast Guard cutters for Vietnam:

> At the present time, Seventh Fleet units are being employed to prevent sea infiltration into South Vietnam. However, we find such ships suffer major disadvantages in conducting patrols against shallow-draft junks. We are therefore attempting to locate a source of more suitable patrol craft. Such characteristics as high speed, shallow draft, sea-keeping ability, radar and communication equipment are important considerations.[112]

On 29 April 1965, President Lyndon Johnson committed the Coast Guard to service in Vietnam under the operational control of the U.S. Navy.

U.S. Coast Guard and the Nation's Defense

The U.S. Coast Guard's national security, military, and defense roles, missions, and functions are based in U.S. law:

- **The Coast Guard is "a military service and a branch of the Armed Forces of the United States at all times" (14 USC 1).**
- **The Coast Guard is required to "maintain a state of readiness to function as a specialized service in the Navy in time of war" (14 USC 2).**
- **The Coast Guard is authorized to assist the Department of Defense (as well as any federal, state, or local agency) in performing any activity for which the Coast Guard is especially qualified (14 USC 141).**

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[111] Alex Larzelere, *The Coast Guard at War: Vietnam, 1965-1975* (Annapolis, MD: Naval Institute Press, 1997), pp. 7-8.

[112] The joint Department of Defense–Department of the Treasury memorandum, prepared to support President Johnson's decision to commit the Coast Guard to wartime service in Vietnam, read, in part: "...the Coast Guard has operating forces which are well-suited to the mission.... They are equipped and trained to prevent sea infiltration.... In view of the counter-sea infiltration mission assigned the U.S. Navy and the availability of U.S. Coast Guard forces, it is requested that you approve the Treasury Department assignment of Coast Guard craft to assist the Department of the Navy." *Ibid*. Two years later, Navy Secretary Nitze requested the assignment of five Coast Guard high-endurance cutters (WHEC) to augment Operation Market Time forces, specifically to free up Navy destroyers more urgently needed for Naval Gun Fire Support (NGFS) tasks. The general inter-operability characteristics – high speed, sea-keeping, radar and communications – required in the mid-/late-1960s are even more critical for Coast Guard Deepwater forces operating alongside Navy and Marine Corps forces under the National Fleet concept articulated in the fall 1998.

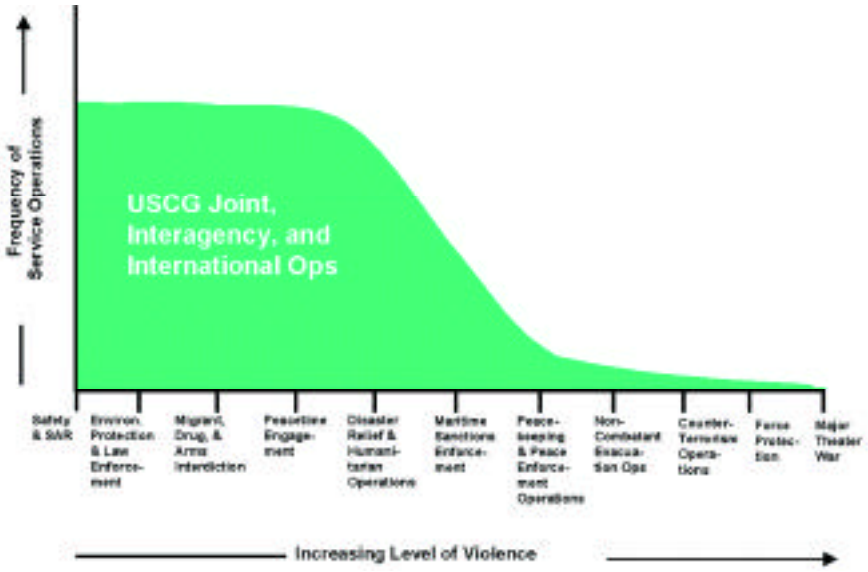
The success of maritime interdiction force operations was due in no small measure to the experience and training provided by the Coast Guard Law Enforcement Detachments... They were invaluable.

Vice Admiral Stanley R. Arthur, USN
Commander, U.S. Naval Forces
Central Command, March 1991

And so the close relationship between the Navy and Coast Guard has evolved, culminating in the landmark 1995 agreement between the Secretaries of Defense and Transportation, which assigned four major national defense missions to the Coast Guard in support of U.S. regional Commanders-in-Chief (CinCs). These missions – **Maritime Intercept Operations, Military Environmental Response Operations, Port Operations/Security and Defense** (POSD), and P**eacetime Engagement** – require Deepwater assets to execute essential military tasks in support of joint and combined forces in peacetime, crisis, and war.[113] (Figure 6 illustrates a notional spectrum of operational collaboration between the Coast Guard and Department of Defense assets at the dawn of the 21st century.)

In recent years, the U.S. CinCs have requested and been provided cutters to conduct Maritime Intercept Operations, Peacetime Engagement, and other supporting warfare tasks for all three forward-deployed Navy Fleets, cogent illustrations that "national maritime security" is not confined to nearby-U.S. waters: the Fifth Fleet in the Arabian Gulf/Middle East, the Sixth Fleet in the Mediterranean, and the Seventh Fleet in the

Figure 6. Spectrum of Coast Guard Defense Missions



[113] Memorandum of Agreement between the Department of Defense and the Department of Transportation on the Use of U.S. Coast Guard Capabilities and Resources in Support of the National Military Strategy, 3 October 1995.

Annex A defines **Maritime Interception Operations** as operations conducted to enforce the seaward portion of certain sanctions against another nation or group of nations. It may include stopping, boarding, searching, diverting, or redirecting vessel traffic.

Annex B defines **Military Environmental Response Operations** as those responding to incidents of marine pollution, such as the Iraqi-generated crude oil spill during Operation Desert Shield/Desert Storm, which have the potential to adversely affect U.S. and allied/coalition defense operations. Furthermore, responding to significant marine pollution incidents in the cessation of hostilities phase of a campaign is critical to successful war termination and the restoration of critical infrastructure. The Coast Guard is to participate in operational planning (including anticipation of environmental exploitation during hostilities and the development of related intelligence to facilitate response and minimize operational interference and environmental damage), training, and the deployment of Coast Guard assets in support of CinC environmental response needs.

Annex C defines **Port Operations, Security and Defense** as operations conducted to ensure port and harbor areas are maintained free of hostile threats, terrorist actions, and safety deficiencies which would be a threat to support and resupply operations. Pointedly, this function focuses on both Sea Ports

Western Pacific. Additionally, Coast Guard cutters have supported NATO operations in the Baltic Sea. For example, the USCG Cutter *Chase* (WHEC-718) in May 1998 completed a four-month deployment to the Arabian Gulf, and, among her tasks, seized four ships attempting to violate United Nations sanctions against Iraq.[114] *Chase's* and other cutters' deployments in recent years show that, just as it has for more than 200 years, the Coast Guard is an integral element of the Nation's Armed Forces.

During Operations Support Democracy (November 1993-August 1995) and Uphold Democracy (October 1994-March 1995), Coast Guard Deepwater assets as well as buoy tenders, patrol boats, and port security units supported United Nations-led operations to restore democratic institutions in Haiti. Two port security units, a harbor defense command unit, five law enforcement detachments, and 13 cutters carried out operations that included maritime surveillance and interdiction, search and rescue coverage for in-transit U.S. aircraft, and establishing and restoring aids to navigation.

Beyond U.S. coastal waters, the Coast Guard's role as an instrument of national policy and maritime security is becoming even more important. A central focus of U.S. national security strategy is to promote democracy abroad, to build trust and friendship among former adversaries, and to promote economic prosperity at home and overseas. The same transnational dangers that threaten U.S. interests at home will be felt by America's friends overseas. The Coast Guard's involvement in the elimination of regional security threats, the promotion of regional cooperation, and the protection of maritime interests are key elements in America's policy of global engagement and active and acceptable presence.[115] Working with interested countries, for example, the Coast Guard has drafted a *Model Maritime Service Code* to serve as a "template" for legislative frameworks to help the "maritime forces" of a foreign government to provide "enhanced security and safety, protect the mariner as well as the environment, and allow a maritime state to exercise the variety of maritime rights and obligations recognized under international law."[116] The Coast Guard's international role-model activities can be more direct, as Captain John E. Crowley recounted the summer-1997 deployment of the USCGC *Legare* (WMEC-912) to the U.S. European Command:

> ...*Legare* was a role model for developing countries' maritime services, but her crew also continued the U.S. sea service tradition of being role models as concerned citizens of a democratic nation.... Our peacetime engagement efforts resulted in meeting 400

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of Embarkation and Debarkation, in the United States and overseas. POSD also ensures the safe and efficient operations of all vessels and facilities within the port, harbor, and harbor approach environment. POSD are resource-intensive operations which require special training and a continued, sustained presence within the area of operations and include: port safety and security, marine environmental protection, waterways management, and search and rescue.

Annex D defines P**eacetime Military Engagement** as all military activities involving other nations intended to shape the security environment in peacetime, and which serve to: demonstrate U.S. political and military commitment; improve interoperability; reassure allies, friends, and coalition partners; promote transparency; convey democratic ideals; deter aggression; and help relieve sources of instability before they can become military crises. As a multimission law enforcement, humanitarian, and regulatory agency, as well as a military service, the Coast Guard is well-suited to perform maritime engagement roles. As a model maritime service, Coast Guard participation in CinC engagement strategies can improve mission effectiveness and efficiency through the employment of trained Coast Guard assets.

[114] David Rodney, "Coast Guard MIO in a High-Threat Environment," Center for Naval Analyses, CAB 98-56/June 1998.

[115] Vice Admiral James Loy and Captain Bruce Stubbs, U.S. Coast Guard, "Exporting Coast Guard Expertise," U.S. Naval Institute *Proceedings*, May 1997, pp. 55-57.

[116] *United States Coast Guard Model Maritime Service Code, 1995 Edition* (Washington, D.C.: Department of Transportation, U.S. Coast Guard, 1995), p. iii.

professionals in 56 sessions – held as round tables in the wardroom, personal defense exercises on the flight deck, herding oil in an aquarium, and hoisting rescue swimmers and combat divers. The chiefs' mess led the crew in experiences that directly reached another 208 people. In Kaliningrad, more than 5,000 visitors lined the pier to see the *Legare* and speak English to the crew; all in all, we introduced the U.S. Coast Guard to more than 26,000 people over the summer.[117]

Moreover, a forward-deployed posture of active and acceptable presence, which integrates Coast Guard forces more completely with Navy and Marine Corps forces, can generate enhanced effectiveness and greater efficiencies than one that focuses solely on increasingly hard-pressed Navy and Marine Corps elements. In some situations, Navy and Marine Corps forces may be barred from some future situation even as Coast Guard forces continue to be invited in – the hallmark of active and acceptable presence. During the Haitian political crisis of the early/mid-1990s, for example, a volatile crowd turned away a Navy amphibious ship from Port-au-Prince. Meanwhile, Coast Guard cutters continued to return illegal Haitian migrants rescued on the high seas, and at the same time kept intact an important communications channel to Haitian political and security officials.

Much more than a "force multiplier," then, the Coast Guard offers unique capabilities and performs a vital, complementary role that is increasingly relied upon by service chiefs and the CinCs. Coast Guard Deepwater assets are an important part of the CinCs' "tool kits" as they pursue their responsibilities in support of U.S. foreign policy objectives of engagement and enlargement. Beginning in 1995, the Coast Guard has deployed four cutters – USCGC *Dallas* (WHEC-716), *Gallatin* (WHEC-721), *Legare*, and *Tahoma* (WMEC-908) – to the Mediterranean, Black, and Baltic seas each year, again as a complement to the more routine forward-presence operations of Navy ships. In spring and summer 1999, the cutter *Bear* (WMEC-901) was deployed to the Mediterranean to support NATO Operation Allied Force, and in June the cutter *Dallas* departed its Charleston, S.C., home port for the Adriatic to help enforce the NATO-led peace efforts in Kosovo. *Dallas* was also scheduled to work with the navies and coastguard forces of Greece, Israel, Spain, and Turkey. Coast Guard Port Security Units and aviation squadrons have been sent to Turkey, the northern Red Sea, South Korea, and the Persian Gulf. Coast Guard assets have taken part in numerous exercises with other nation's maritime forces, and have made hundreds of port visits worldwide.

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[117] Captain John E. Crowley, Jr., USCG, "What is a Coast Guard Cutter Doing in Europe?" U.S. Naval Institute *Proceedings*, June 1998, pp. 48-49. Captain Crowley was *Legare's* commanding officer during the 1997 deployment.

[118] "Coast Guard, Navy Become Sea-Worthy Partners," *Navy Times*, 6 September 1999.

[119] Truver, "The World is Our Coastline," *op.cit.*, pp. 45-49. Rear Admiral Jay A. Campbell, USN, then-Director of Plans and Policy (J5), European Command, noted that "The Coast Guard is the right force to reach the majority of these navies, especially the Partnership for Peace navies. What these countries need and can afford is Coast Guard-type missions and associated force structures. The Coast Guard is an excellent example of how to merge together an agency with military and civilian duties." *Ibid.* at p. 46. Loy and Stubbs, *op.cit.*, p. 56.

[120] Jeremy Ginifer and Michael Pugh, in Michael Pugh, ed. *Maritime Security and Peacekeeping: A Framework for United Nations Operations* (Manchester and New York: Manchester University Press, 1994), at p. 237. See also, Harold J. Kearsley, *Maritime Power and the Twenty-first Century* (Aldershot, U.K: Dartmouth Publishing Company, 1992), who, at pp. 76-79, explains "maritime domain maintenance" as a peacetime activity focused on ensuring its maritime security is safeguarded. Others have expanded on the subject of UN missions and maritime agendas for peace, including Jeffrey I. Sands, "W(h)ither the Maritime Agenda for Peace?" in Ann L. Griffiths and Peter T. Haydon, *op.cit.*, pp. 39-56,

During the summer 1997 Foale Eagle exercise, for example, the USCGC *Hamilton* (WHEC-715) was an integral element of the USS *Independence* (CV-62) carrier battle group in western Pacific operating areas. And in the summer 1999, the cutter *Midgett* (WHEC-726) provided essential and unique capabilities during the WestPac deployment of the USS *Constellation* (CV-64) carrier battle group and the USS *Peleliu* (LHA-5) amphibious ready group.[118] Coast Guard liaison personnel on board *Peleliu* conducted training on visit, board, search and seizure (VBSS) tactics, techniques, and procedures for Sailors and Marines prior to the ARG's arrival in the Persian Gulf to enforce U.N. sanctions against Iraq.

The striking element in these and other linkages with many foreign navies and maritime forces is the similarity between the Coast Guard and the host-governments' forces, resulting in the recognition that the Coast Guard is the "right force" to reach the majority of these navies.[119] Inasmuch as some 70 percent of the world's navies are in fact coastguards in all but name, the continued and enhanced peacetime international engagement by the Coast Guard will continue to generate great benefits to the United States.

There is, moreover, the growing challenge of working with international organizations, the United Nations and its specialized agencies, in support of national principles in the use of ocean space, maritime security, and peacekeeping. The Coast Guard, for example, may be the ideal U.S. actor to provide naval/maritime defense assistance to international civilian authorities in drug interdiction, piracy suppression, disaster relief, and "maritime housekeeping."[120] Furthermore, the Coast Guard, because of its humanitarian and civilian law enforcement stature, and its culture of partnership with diverse agencies and organizations, may work more easily with Non-Governmental Organizations (NGOs), many of whom regard the military as out of touch with the values and members of the society they seek to protect.[121] On the other hand, the military can see the NGOs as undisciplined and an impediment to their work. The Coast Guard seems ideally situated to bridge this chasm between the NGOs and the military – another example of the Service's ability to provide *acceptable presence* overseas.

Looking ahead, the United States is facing far different threats than those experienced during the previous 45 years of Cold War. Not until sometime after 2015 is a "peer competitor" expected to emerge, although the U.S. Armed Forces in the meantime must still be able to meet the operational requirements of fighting and winning two nearly simultaneous

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who (at p. 41) identifies nine UN naval missions and supporting tasks: humanitarian assistance, maritime peacekeeping, maritime enforcement, humanitarian intervention, protect sea and air traffic, interdict sea and air traffic, make a show of force, control armaments/demilitarization, and respond to aggression. Others have been even more explicit, identifying the Coast Guard as having a "high degree of credibility" to support a new United Nations Maritime Agency; see Robert Stephens Staley, II, *The Wave of the Future: The United Nations and Naval Peacekeeping* (New York: Lynne Rienner Publishers, Inc., 1992). Strategist Geoffrey Till argued for "something of a rag-bag, but an increasingly important one" of international maritime assistance to maintain good order at sea; see "Maritime Strategy and the Twenty-First Century," in Till, ed. *Seapower: Theory and Practice* (Essex, UK: Frank Cass & Co. LTD, 1994), at pp. 193-194. Robert B. Oakley and Michael J. Dziedzic argue that national "constabulary forces" – such as the Coast Guard – would be "better suited for law enforcement functions" and for interaction with "CIVPOL" [a standby international force of Civilian Police] forces than regular military forces in supporting international peace operations. Oakely, ed. *Policing the New World Disorder: Peace Operations and Public Security* (Washington, D.C.: National Defense University Press, 1998), pp. 513-520.

[121] Michael C. Williams, *Civil-Military Relations and Peacekeeping* (Oxford, UK: Oxford University Press, International Institute for Strategic Studies, Adelphi Paper 321, August 1998), p. 38.

major theater wars. Also, small-scale contingencies of varying size and intensity – as well as noncombat Operations Other Than War (OOTW) – will demand effective and flexible U.S. forces that can be forward-deployed and tailored to support peacetime diplomacy and crisis-response operations in key world regions. Local and regional crises will continue to proliferate and become more dangerous as sophisticated weapons are increasingly available to nations and sub-national groups intent on challenging the United States and its allies and friends. As Don Daniel and Andrew Ross of the U.S. Naval War College explained:

> Although the U.S. military must be prepared to deter, fight, and win the nation's "real wars," that will not be its exclusive function. It must also be prepared, when possible, to prevent, manage, and resolve nontraditional conflicts. Ultimately, as former President Bush observed [in his 1991 *National Security Strategy of the United States*], "security is not indivisible. The safety, freedom, and well-being of one people cannot be separated form the safety, freedom, and *well-being* of all."[122]

"At sea, it is force, not reason, that confers sovereign rights."

Cardinal Richelieu
1626

The threat from domestic and international terrorism will continue to proliferate, placing premiums on the nation's ability to surveill, sort, identify, and intercept terrorists before they can act. A critical need will be to safeguard America's ports and waterways from attack and sabotage – in peacetime or in war – especially by groups employing chemical, biological, or even nuclear weapons of mass destruction. Likewise, in overseas crises and contingencies, a terrorist attack may focus on disrupting U.S. access to vital ports and waterways. In many such scenarios, the Coast Guard will be the Nation's "first-responder" to such threats.[123]

Most fundamentally, the President and the Unified Commanders-in-Chief require a full spectrum of naval capabilities to meet tomorrow's maritime challenges. And, the Coast Guard will have important Deepwater assets to help satisfy the CinCs' needs. But it will not be a "Small Navy." In this regard, the comments of Captain/Coast Guard Commandant Ellsworth P. Bertholf 80 years ago remain instructive, despite the recent blurring of peacetime-crisis-wartime roles and missions that show a greater commingling of Coast Guard-Navy responsibilities:

> ...the fundamental reasons for the two services are diametrically opposed. The Navy exists for the sole purpose of keeping itself prepared for...war. Its usefulness to the Government is therefore to a large degree potential. If it performs in peace time any useful function not ultimately connected with the preparation for war, that is a by-product. On the other hand, the Coast Guard does not exist solely for the purpose of preparing for war. If it did there would then be, of course, two navies – a large and a small one, and that condition...could not long exist. The Coast Guard exists for the particular and main purpose of performing duties which have no connection with a state of war, but which, on the contrary, are constantly necessary as peace functions. It is, of course, essentially an emergency service and it is organized along military

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[122] Donald C. F. Daniel and Andrew L. Ross, "U.S. Strategic Planning and the Pivotal States," in *The Pivotal States*, *op.cit*., p. 405, emphasis added by the authors. For a British perspective on the use of navies in non-war situations, see Eric Grove, "Navies Play Their Part in Peace Support Operations," *Jane's Navy International*, March 1999, pp. 26ff.

[123] In a paper presented at the October 1998 Transnational Issues Conference, W. Seth Carus warned of the threat from Nuclear-Biologic-Chemical weapons proliferation and called for a focused and coherent civilian-Defense Department capability to respond to and manage the consequences of such terrorist incidents. Clearly, the requirements for the Coast Guard's multidimensional capabilities must be addressed as a key element of ensuring the maritime dimension of U.S. security against these threats. Carus, "Transnational Threats and NBC Proliferation," *op.cit*., especially pp. 8-9.

lines because that sort of organization best enables the Coast Guard to keep prepared as an emergency service, and by organization along military lines it is invaluable in time of war as an adjunct and auxiliary to the Navy...while peace time usefulness is a by-product of the Navy, it is the war time usefulness that is a by-product of the Coast Guard.[124]

Unlike the other four Armed Services, warfare is not the Coast Guard's *raison d'etre*. However, because of the special multimission capabilities of Coast Guard cutters and their crews, Coast Guard units play critical roles in peacetime forward presence, humanitarian support, peacekeeping and peace-enforcement, crisis-response, and combat operations, across the spectrum of U.S. global engagement, including smaller-scale contingencies and major theater wars. The Coast Guard maintains a high state of readiness to function as a specialized service within the Navy – meaning the employment of Coast Guard resources and capabilities in a national emergency based on their peacetime applications – and has command responsibilities for the U.S. Maritime Defense Zones. The Coast Guard's involvement in routine peacetime engagement – a posture of active and acceptable presence – reaches out to all elements of other countries' maritime interests and agencies, and in some situations is much less threatening, and more politically acceptable, than a purely naval or military presence. The Coast Guard's extensive involvement in coastal and port maritime functions in peacetime provides capabilities to support peacetime international engagement and naval warfare operations in littoral regions, such as port security and safety, harbor defense, military environmental defense, maritime interception and coastal sea control, and force protection. Throughout its military and defense operations, the Coast Guard remains a full partner with the Navy and the other Armed Services in support of America's national security and military strategies.

All of these enduring attributes of the Coast Guard's direct support to U.S. national security strategy and policies were driven home in a 26 May 1999 letter from General Charles E. Wilhelm, USMC, Commander-in-Chief, U.S. Southern Command, to the Deputy Secretary of Transportation, Mortimer Downey. (See Appendix B.) Building upon a brief explanation of the trends and dynamics within the Southern Command Area of Responsibility (AOR), General Wilhelm cataloged the Coast Guard's many contributions to effective regional engagement:

- The Coast Guard has earned and enjoys an unprecedented level of trust and credibility with the countries and organizations within the AOR. USCG forces and missions closely match those of the region's navies, and through a multitude of engagement activities and initiatives the Coast Guard is the ideal mentor and role model.
- The Coast Guard's robust Resident and Mobile Training Teams continue to pay huge dividends in shaping our theater for the new century.
- The Caribbean Support Tender is a new initiative that clearly highlights the synergism of the SOUTHCOM-USCG partnership.
- The Coast Guard also participates heavily in the SOUTHCOM theater exercise program, adding an important dimension that Latin American navies appreciate and with which they can easily identify.

"The USCG is without a doubt my most valuable resource for maritime engagement in the Caribbean basin, making robust security assistance, military-to-military contact, and exercise contributions. They are the lead agency for maritime interdiction; however, increased Detection & Monitoring support is inefficient without critical linkages to USCG forces assigned for Intercept & Apprehension. Presently, the number of cutters available to support the counterdrug effort is significantly less than what we will need to achieve our operational counterdrug objectives. Migrant surges will also inevitably place a greater strain on the aging USCG fleet."

General Charles E. Wilhelm, USMC
Commander-in-Chief
U.S. Southern Command
May 1999

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[124] Private letter to Captain Robert O. Crisp, USCG, 18 April 1919. During this period immediately following World War I, sentiment ran strong for keeping the Coast Guard within the Department of the Navy, in a position analogous to that of the Marine Corps. Not all agreed, and about 25 officers, many on duty at Coast Guard headquarters, favored a return to the Treasury Department, Captain/Commandant Bertholf among them. Johnson, *Guardians of the Sea, op.cit.*, p. 59.

- The Coast Guard generally works with a broad cross-section of host government ministries, which in turn creates additional opportunities for further diplomatic and military contacts.
- Success of SOUTHCOM engagement strategies is also linked directly to our counterdrug mission. We cannot conduct an effective counterdrug campaign without Coast Guard support.

"The Coast Guard will play an increasingly important role in the future. The strategic value provided by the Coast Guard is reflected in the following:

- The Coast Guard is the only Federal law-enforcement agency with jurisdiction both inside U.S. territorial waters and on the open oceans.
- Possessing open-ocean, high-endurance cutters, the Coast Guard, with its uniquely trained crews, plays increasingly important roles in enforcing UN sanctions and international embargoes at sea. Operating alongside the Navy, the Coast Guard provides trained and experienced boarding teams.
- The Coast Guard, along with Navy assets, provides harbor defense and maritime traffic management for strategic ports. Both are vital services for power projection.
- In the important military-to-military contact program between U.S. and former Warsaw Pact navies, the Coast Guard often is more compatible with coastal navies than the Navy."

Strategic Assessment 1999: Priorities for a Turbulent World
Institute for Strategic Studies
National Defense University, 1999

A Unique Instrument of *Maritime* Security

At the dawn of a new century, the U.S. Coast Guard is an increasingly important element in America's multifaceted security strategies and responses to a complex array of threats and challenges at home and abroad. U.S. citizens and interests, and America's allies and friends throughout the world, are at increasing risk from extreme nationalism, terrorism, international organized crime, illegal alien migration, drug trafficking, weapons smuggling, proliferation of weapons of mass destruction, environmental damage, complex flows of trade and investment, and state aggression – transnational threats that honor no national frontier. As the President's October 1998 *National Security Strategy for a New Century* report makes clear, "to move against the threats of this new global era, we are pursuing a forward-looking national security strategy attuned to the realities of our new era.... Its three core objectives are:

- To enhance our security.
- To bolster America's economic prosperity.
- To promote democracy abroad."

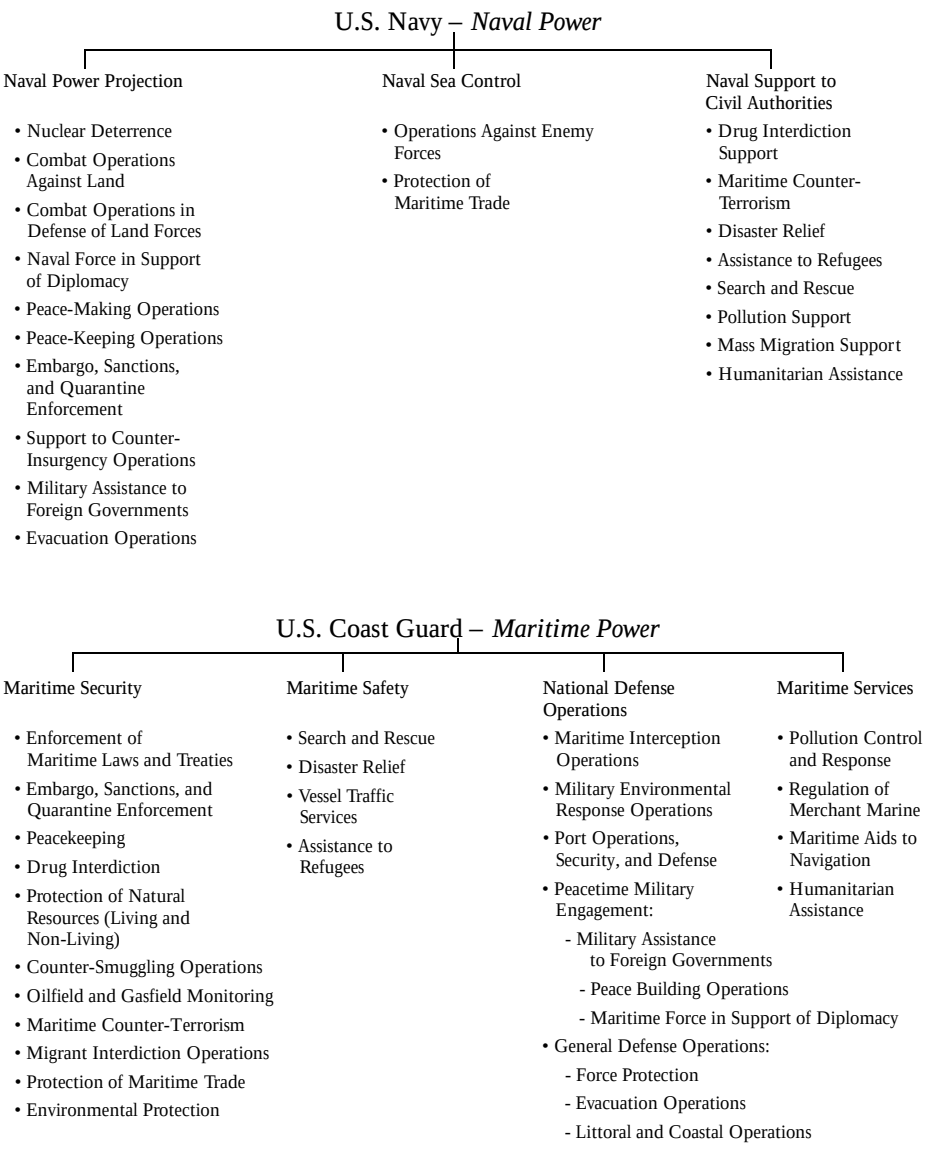
A critical need is for the "tools necessary to carry out this strategy" and "close coordination across all levels of government – federal, state and local – and across a wide range of agencies, including the Departments of Defense and State, the Intelligence Community, law enforcement, emergency services, medical care providers, and others," as the *National Security Strategy* makes clear. Since its founding as the Revenue Cutter Service in 1790, the Coast Guard has had increasingly expansive responsibilities for safeguarding national maritime security – the Coast Guard's unique contribution to America's national security – that is a crucial element in ensuring homeland defense and protecting critical infrastructures, safeguarding U.S. maritime sovereignty, and defending American citizens and interests worldwide. It embraces all elements of the cultural, social, environmental, economic, political, diplomatic, and military dimensions that today shape America's national security strategy, policies, and programs of global engagement. The Coast Guard's unique status as a U.S. Armed Force with law enforcement authorities and responsibilities makes it an uncommon instrument of national security. As a military, multimission, maritime service, the Coast Guard provides singular, non-redundant, complementary capabilities to safeguard U.S. security interests – today and in the 21st century.

One of the most basic operational requirements for the Coast Guard's roles, missions, and functions in the protection of U.S. maritime security is well-grounded, focused strategic, operational, and tactical intelligence linked to comprehensive surveillance and reconnaissance of critical marine areas. Coupled with practiced teamwork, coordination and integration of efforts by key federal, state, and local agencies, focused surveillance and reconnaissance linked to all-source intelligence will enable the Coast Guard to provide credible presence in and to conduct surveillance of critical maritime regions; to detect, identify, and sort targets of interest; and to intercept and engage those targets – the essence of maritime security.[125] In the most fundamental sense, the Coast Guard must be able to maintain a credible presence in key maritime regions, to deter potential threats to U.S. sovereignty, and to exercise sea control and projection of law enforcement and naval power

should deterrence fail. (Figure 7 provides comparison of Coast Guard and Navy missions.)

All that said, however, success in countering future threats and challenges to America's maritime security will depend upon increasingly obsolescent Coast Guard capabilities, especially in the Deepwater operating environment, which must be upgraded, modernized, or replaced beginning in the next few years. Unless the Coast Guard's Deepwater cutters, aircraft, and C4ISR systems are able to meet the challenges of the new century, the Coast Guard will be all but sidelined in some future crisis or conflict, "*Hardly Ready*" to make the valuable contributions that will be needed to protect U.S. interests.

Figure 7. Application of U.S. Maritime Power



[125] All forms of intelligence, at national and service-specific levels, serve to ensure that the Coast Guard can carry out critical missions: technical and encyclopedic, human (HUMINT), imagery (IMINT), signals (SIGINT), and electronic (ELINT) intelligence can provide the means for the intelligence preparation of the maritime security "battlespace" – whether the targets are illegal foreign fishing vessels operating within the U.S. EEZ, international criminal syndicates transporting illegal migrant, drug-runners, or foreign naval threats in time of war.


U S COAST GUARD
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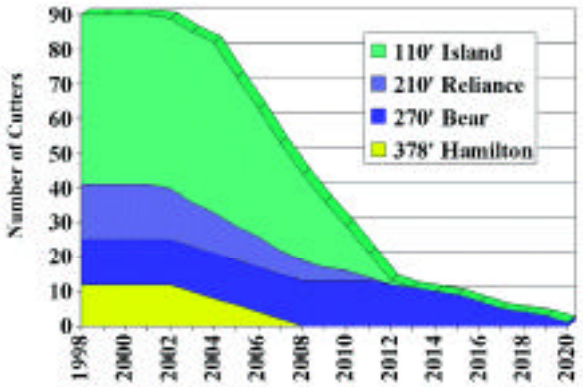
IV. USCG Maritime Security Operational Constraints

As the United States left the 20th century, the Coast Guard had modernized its patrol boats and near-shore assets. However, the Service in early 2000 is hamstrung by, first, obsolescent equipment and the fact that, among the world's 41 deepwater fleets, it is the 39th oldest and would, absent the Deepwater Project, soon be number 41; second, a younger and inexperienced workforce; and, finally, an unsustainable operational tempo exacerbated by budget constraints. Existing Deepwater assets are nearing the ends of their service lives. Performance is increasingly hampered and operational costs are increasing, even as the threats the Service must counter are becoming more sophisticated and capable and the implications of poor mission performance more dire to U.S. maritime security interests. (Appendix F provides data on in-service Coast Guard Deepwater cutters and aircraft. Figures 8 and 9 show cutter and aircraft projections.) There is a compelling need to modernize and enhance the Coast Guard's assets and capabilities to ensure that national maritime security requirements can be satisfied and that the Service's core mission areas can be supported. For example, the Coast Guard's internal Deepwater Mission Analysis Report concluded that

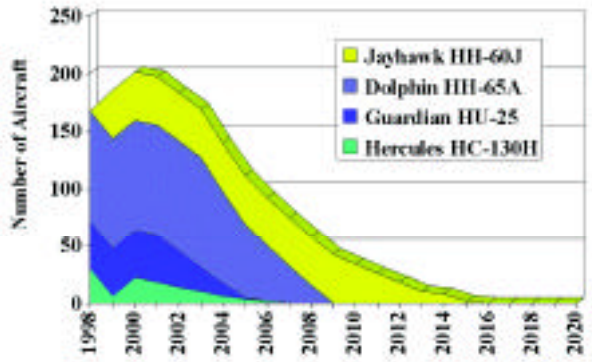
> ...capability improvements must be made, particularly as new mission requirements are added to our workload. Increases in our C4I [Command, Control, Communications, Computers, and Intelligence] capabilities, our ability to classify targets, our abilities to dispatch boarding parties more effectively, and the speed of our surface assets must be addressed.[126]

Figure 8. Projected Inventory USCG Legacy Cutters



[126] *Deepwater Mission Analysis Report,* U.S. Coast Guard Headquarters, 6 November 1995, p. ii. See also, *Deepwater Capabilities Project Mission Need Statement,* U.S. Coast Guard Headquarters, Office of Law Enforcement and Defense Operations (G-O), 3 May 1998, pp. 10-21. Two other functions have been added to the C4I arena: Surveillance (S) and Reconnaissance (R), making the "full-spectrum acronym" usually cited as C4ISR.

Figure 9. Projected Inventory of USCG Legacy Airfcraft



Recent cases illustrate the dilemma the Coast Guard faces every day. In December 1997, the cutter *Storis* (WMEC-38), built in 1942 and nearing 56 years of service, was on drug patrol off southern California. Lacking modern sensors and the ability to embark helicopters, and capable of maximum speed of 14 knots, the Storis was simply no match for the well-funded "high-tech" drug smugglers, armed with satellite telephones, precision navigation systems, and night-vision goggles, who literally could have run rings around the cutter. But *Storis* was all that was available at the time, and the cutter's crew did the best it could.[127] For that matter, the relatively "low-tech" stealthy boats that the Colombian cartels, especially, have used can easily frustrate interdiction efforts. These fiberglass vessels with World War II-type camouflage are virtually invisible to radar and the "Mark-One" eyeball – a cheap boat that defeats U.S. counter-drug operations.

In a late April 1999, a Navy surveillance aircraft detected an unmarked 120-foot trawler about 60 miles off Guam, but a Coast Guard cutter – one of only two assigned to Guam (a 55-year old buoy tender and a 110-foot patrol boat) – could not make the interception because of an engine fire.[128] As the trawler neared Guam and was headed toward a reef, a Coast Guard inflatable boat raced out to put a boarding party on the ship and steer it away from the danger at the last minute. A cutter later towed the trawler, with 120 Chinese migrants on board, to nearby Tinian, where they were held at an abandoned World War II air field. It was the third such interception in as many weeks; the first came on 17 April, when a cutter diverted a trawler carrying 147 Chinese to Tinian. With the Coast Guard fully engaged in that case, another smuggling ship with 105 Chinese on board sailed unchecked into Guam's Apra Harbor. "It sailed right into port," Ginger Cruz, a spokesperson for Governor Carl Gutierrez, said. "It was rather embarrassing."

Nor are such challenges experienced by the Coast Guard, alone; the Navy's support to America's war against the drug cartels can at times be stymied, as well.[129] On 4

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[127] *Storis* also figured in a September 1997 incident in which it had detected the Japanese fishing vessel *Yoshi Maru No. 38* illegally fishing within the U.S. EEZ in the Bering Sea. As Storis approached the vessel and ordered it to stop, the Japanese vessel fled, leaving the U.S. cutter in its wake. See also Navarro, "Upgraded Drug Traffic," *op.cit*., where the drug-runners' sophisticated technologies and operational concepts are reviewed.

[128] "Guam's Own 'China Beach'," *op.cit.*

[129] Molly Moore and John Ward Anderson, "Just What the Smugglers Ordered," *The Washington Post*, 2 August 1998, pp. A1, A38.

March 1998, for instance, a U.S. maritime patrol aircraft spotted a "go-fast" boat, loaded with what appeared to be cocaine, speeding northward near the Costa Rican-Nicaraguan border. The Navy's nuclear-powered, guided missile cruiser *California* (CGN-36) was dispatched to intercept the 40-foot craft, cleared to use "minimum force necessary, including warning shots and disabling fire" to force the boat to stop. But the "go-fast" refused, even after the U.S. warship fired 15 shots from its 5-inch guns. *California* was granted permission to pursue the "go-fast" into the Nicaraguan territorial sea, but played "cat-and-mouse" around Corn Island until the clearance expired at midnight, allowing the drug-runners to evade capture.

Deepwater Cutter Assessment

Although the Coast Guard's mainstay Deepwater Reliance (WMEC-615) 210-foot and *Hamilton* (WHEC-715) 378-foot cutter classes, built in the 1960s and early 1970s, have been modernized, they operate with relatively large and expensive crews, are becoming more difficult to maintain, do not incorporate modern technology, and are to be retired beginning in 2008.[130] One of the Coast Guard's premier Deepwater "over-achievers" in recent years, the high-endurance cutter Chase, shows the challenge of sustaining needed capabilities in this demanding mission area. Propelled by a combined diesel (cruise) or gas-turbine engine (sprint) plant, the cutter's performance is becoming more difficult to maintain. (Always innovative, perhaps, the Coast Guard was the first U.S. service to use gas turbines and controllable-pitch propellers in its ships and led in the post-World War II development of shipboard helicopter operations.) The cutter's turbines are converted Pratt & Whitney FT4A-6s originally used in the 1950s-era Boeing 707 airliner, and have been out of production for more than two decades. The Coast Guard, therefore, had to turn to the used-aircraft market for spares, a factor that continues to impact the class' operating and support costs.[131]

[130] When the *Hamilton* cutters received Fleet Rehabilitation and Modernization (FRAM) upgrades in the late 1980s and early 1990s, the notional manning standard was increased from 152 to 171 people. Naval analyst Norman Polmar stated that if these cutters "...are not replaced, the Coast Guard will in fact as well as name evolve into a coastal patrol force. Unfortunately," he continued, "the *Hamilton*-class modernization included the removal of the ships' 5-inch/38-cal DP [Dual Purpose] guns, which were very useful weapons." Although the 5-inch weapons were replaced by 76-mm Oto Melara, they are not the equivalent to the larger weapons in many naval tasks. A critical shortcoming is the lack of modern electronic countermeasures systems as well as advanced radars and communications capabilities. Polmar, *Ships and Aircraft of the U.S. Fleet*, 15th ed. (Annapolis, MD: Naval Institute Press, 1993), p. 551.

[131] James B. Thatch, "USCG's Urgent Need for Deepwater Replacements," *Sea Power*, April 1998, pp. 82-86, at p. 85. See also Norman Polmar, *Ships and Aircraft of the U.S. Fleet*, 16th ed. (Annapolis, MD: Naval Institute Press, 1997), pp. 503-505.

The Nichols Advanced Marine "Evaluation of the 378', 270' and 210' Class Cutters" report, dated 15 July 1999 and undertaken in support of the Deepwater Project, noted that the Coast Guard in mid-1999 maintained ten spare turbines acquired from Canada to support the *Hamilton* as and *Polar* class cutters. At the time of the evaluation, five of the ten turbines were awaiting overhaul and two were in the rework facility, leaving only three available for use. One important conclusion was that the difficult and labor-intensive nature of providing replacement and support for the Pratt & Whitney gas turbines were indicative of an obsolete system. The cost to replace each turbine and the level of support to operate and maintain the turbines were firm indicators of an increased level of risk to these cutters. Other increased maintenance costs derived from the fact that original supply sources in many instances no longer exist, and as a result available substitutes may match original equipment in function and performance but not in fit, requiring extensive engineering work-arounds and costly modification to existing plants.

Likewise, the engines on the Coast Guard's medium-range patrol aircraft in late 1999 were antiquated, unsupported, and failing at an alarming rate. As a result of such age-driven challenges, the overall logistics effort demands a significant amount of labor hours, leading to increased maintenance costs and

From an operational perspective, the 12 Hamilton and 16 Reliance cutters are labor-intensive, which drives up operating costs and places strains on the Service's personnel quality of life programs. As much as 70 percent of a cutter's life-cycle cost is attributed to its crew. Chase and the other Hamilton -class cutters normally operate with 19 officers and 152 enlisted personnel, two or three times as many as required in a modern, highly automated, and more capable cutter of similar size. These ships possess surface/air search radars and night vision equipment that aid in a variety of missions and tasks, but more modern and capable equipment is available (a critical need is for inverse synthetic aperture radars that would aid in detection, identification, and interception tasks).[132]

The 210s, moreover, show the signs of "mission creep" and advancing age. Designed in the early 1960s with a crew of only 60 and commissioned between 1963 and 1969 for SAR patrol and standby operations, they have assumed almost all Deepwater missions and crew size has grown to 77. Still, at that size the ship's combat information center is manned only by the bridge watchstanders. They have a relatively slow maximum speed of 18 knots, and their maximum range of 6,100 nautical miles at 13 knots is significantly less than the 378s or the 270s. The *Reliance* cutters are fitted with only a surface-search radar, and they have no electronic countermeasures or electronic support measures equipment installed. The 210s can land but not hangar helicopters.

Of more recent vintage are the 13 *Famous* or "Bear" (WMEC-901)-class cutters built between 1979 and 1990, but those ships, designed and engineered for a specific north Atlantic fisheries law enforcement mission, have demonstrated shortcomings in almost every other Deepwater mission and task. The class has only a nominal 14-day (maximum 21-day) endurance (food stores, fuel, garbage retention), slow maximum speed (20 knots), limited range (9,900 nautical miles at 12 knots; 3,850 nautical miles at top speed), and poor sea-keeping. Planned national defense features have been foregone, most notably in the anti-submarine warfare area. Key ASW systems were tested but never deployed, for example, because the class' self-generated noise is so great that the intended Tactical Towed Array Sonar System (TACTASS) would have been virtually worthless, especially in the "noisy" and cluttered littoral ASW environment.[133] Other operational shortcomings include:

- Limited berthing for additional personnel
- Poor boat launch/recovery system

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decreased cutter and aircraft operational availability.

[132] At 378 feet length overall, the *Hamilton*s displace 3,050 tons full load. Several NATO navies have corvette or frigate-sized surface ship programs, with missions that are similar to the Coast Guard's Deepwater mission set and operating profiles (albeit not equivalent to the U.S. Coast Guard's evolving international engagement/defense mission), but which have smaller crews. For example, the in-service Danish *Thetis* -class offshore patrol vessel (OPV) has a 369-foot length, displaces 3,500 tons, has a 90-day endurance, and operates with a crew of 60. The in-service Norwegian *Nordkapp* - class OPV has a 346-foot length, displaces 3,240 tons, has a 90-day endurance, and operates with a crew of 62. The Sea Wraith Stealth Corvette, under development by Vosper Thornycroft has a 377-foot length, displacement of 2,500 tons, and crew of 105. See, Surface Matrix Project Team, USCG Deepwater Capability

- Limited ability to maintain real-time video and data links between Coast Guard assets, and no Link-11/16 capability for tactical data links with other U.S.forces
- No close-in weapons system to defend against air threats (a severe constraint given the class' passive-only SLQ-32(V)1 electronic countermeasures system)
- Limited ability to deploy with HH-60 helicopter (only the short-range HH-65 or the out-of-service Navy SH-2F LAMPS can be accommodated in the "A" Class, although the "B" Class can deploy with the HH-60 and also land/refuel the Navy SH-60B LAMPS helicopter)
- No air-search radar for civilian law-enforcement and military tasks

The Deepwater Project's 1999 evaluation of the high- and medium-endurance cutter classes concluded that

> ...the Coast Guard historically keeps their cutters in service far longer than their Navy and foreign service counterparts. Our opinion is that this policy brings with it high life cycle costs for manning, maintenance and logistics. It also prohibits the Coast Guard from taking advantage of modern control, sensor and communication technology that would allow the cutters to not only reduce crewing levels significantly, perhaps by half, but also increase operating effectiveness.
>
> It is apparent...that the Coast Guard incurs a very real and significant opportunity cost by keeping cutters with inadequate and outdated mission equipment out on patrol, rather than replacing or significantly upgrading their capabilities. Given that most of the costs of cutter ownership are crew, fuel, and maintenance, these costs are essentially constant whether the cutter has a modern, up to date sensor and communications capability, or an inadequate one. Further, newer, less maintenance-intensive cutters would allow a greater number of days on patrol.[134]

In addition to the high- and medium-endurance cutters, the service's 49 Island-class (WPB-1301) 110-foot patrol boats, built between 1986 and 1990, have also been assigned Deepwater missions despite their constraints. These small cutters were designed primarily for near-shore/coastal drug interdiction, and cannot meet the full spectrum of Deepwater requirements. Range and endurance (Island A Class) are limited to 3,300 nautical miles at 13 knots and 900 nautical miles at 29.5 knots. The class cannot tow at low speeds because of poor seakeeping and handling, and the poor boat launch/recovery configuration prevents small boat operations in anything greater than sea state 4. Organic sensors and communications links (voice, video, data) are poor. There is very limited space for additional personnel, and they cannot accommodate 50-50 male/female crew mixes.

Replacement Project, "Comparative Practices of European Frigates and Offshore Patrol Vessels," Naval Architecture Branch/USCG Engineering Logistics Center, September 1997.

[133] See, for example, Lieutenant Commander William L. Ross, USCG, "*Semper Paratus*? The Coast Guard is Not Equipped to Fight," *Naval War College Review*, Winter 1990, pp. 113-130; the Bear-class criticisms are discussed at pp. 120-122. Interviews with U.S. Coast Guard Headquarters staff cutter requirements officers confirmed that the shortcomings discussed in this 1990 article were still the norm at the close of 1999.

[134] Nichols Advanced Marine, *op.cit*., Executive Summary, p. 5.

Deepwater Aircraft Assessment

The Coast Guard's maritime, multimission, and military character will be its foundation for operations in the 21st century, and these same core values will continue to influence the employment strategy of all future Coast Guard aviation assets. Likewise, core aviation capabilities will continue to consist of surveillance and reconnaissance, search and rescue, logistics support, marine environmental response, and detection, classification, identification and interdiction in support of law enforcement and defense missions. In addition to several logistics support (C-20B, VC-4) and special mission (RU-38) aircraft, the current aviation asset mix consists of the following operational aircraft:

- 80 short-range rescue and recovery (SRR) HH-65A Dolphins, which are nearing the ends of their service lives
- 35 medium-range rescue and recovery (MRR) HH-60J Jayhawks, which are approaching the mid-point of their service lives
- 20 medium-range search (MRS) HU-25 Guardians, the first of which entered Coast Guard service in 1982
- 26 long-range search (LRS) HC-130 Hercules, some acquired as early as 1972

While the current SRR, MRR, MRS and LRS designations are derived from an attempt to match platform capabilities with mission requirements, limitations in current platform capabilities suboptimize multimission employment.[135] For example, while the HH-65A is compatible with all WHEC and WMEC flight decks, it is extremely weight critical, which limits its range, precludes its potential use-of-force and logistics-support applications, as well as its ability to carry a state-of-the-art radar and sensor package. On the other hand, while the HH-60J has Deepwater-capable range and endurance, it is compatible only with the 270-foot WMEC flight decks. Deployment capability is further impaired by limited shipboard maintenance and logistics support capability and restrictive pitch and roll limitations, especially at night. Additionally, sensors on the HH-60J consist of a weather radar and an antiquated, stand-alone forward-looking infrared (FLIR) sensor system. The fact that the FLIR, primarily an identification device, is not integrated with the radar, a detection and classification device, severely limits its utility.

USCG Fixed- & Rotary-Wing Aircraft Mission Classifications

Long-Range Search:
Multimission, radius of action greater than 750 nautical miles, total sortie time greater than four flight hours, significant cargo capacity

Medium-Range Search:
Multimission, radius of action of 750 nautical miles, total sortie time of four flight hours

Medium-Range Recovery:
Multimission, radius of action greater than 150 nautical miles, total sortie time greater than 3.5 flight hours, ability to recover four or more people from the water, cargo sling capacity greater than 2,000 pounds

Short-Range Recovery:
Multimission, radius of action of 150 nautical miles, total sortie time of 3.5 flight hours, ability to recover three people from the water, cargo sling capacity of 2,000 pounds

[135] The Coast Guard has identified an investment strategy and program that will help overcome some of the more critical operational capabilities in the existing aircraft platforms and systems and to ensure that a capabilities "gap" is avoided as the Service looks ahead to acquiring future Deepwater aviation platforms and systems. See LCDR Thomas Cullen, USCG, "Aviation Near-Term Support Strategy" Briefing, Office of Aeronautical Engineering, Headquarters, U.S. Coast Guard, 4 September 1998.

Eight other "special mission" classifications are: Long-Range Command and Control (LRCC), Long-Range Detection (LRD), Medium-Range Intercept (MRI), Medium-Range Apprehension (MRA),

With regard to fixed-wing capability, the dash speed of the Falcon, when combined with the APG-66 radar, makes it a suitable air intercept platform. This capability exists on only eight operational HU-25C aircraft, however. Moreover, use of this platform in search and rescue or maritime patrol applications is suboptimized due to the poor surface search capability of the APG-66 radar. Likewise, range and endurance (maximum range of 1,940 nautical miles at 250 knots), and especially sensor limitations on the HU-25A and the HU-25B models limit their effectiveness in these same mission areas. And, the 20 Falcon aircraft are all more than 14 years old and have major engine supportability problems. Seventeen other Falcons are in storage in early 2000 and would require significant funding to upgrade and return them to operational status.

The ongoing HC-130 sensor upgrade, consisting of an integrated, state-of-the-market FLIR/EO (electro-optical) device and a palletized, roll-on/roll-off advanced tactical workstation, will significantly enhance its multimission utility and provide near real-time data transmission capability.[136] This upgrade, in conjunction with Differential Global Positioning System (DGPS) navigation improvements on all platforms and night vision goggle implementation on helicopters, constitutes Coast Guard aviation's only significant capabilities advance in more than a decade. Thus, while each of these aircraft perform yeoman service across the full spectrum of Coast Guard missions, scrutiny of individual platform capabilities reveals an unintegrated system that falls well short of optimum tactical employment.

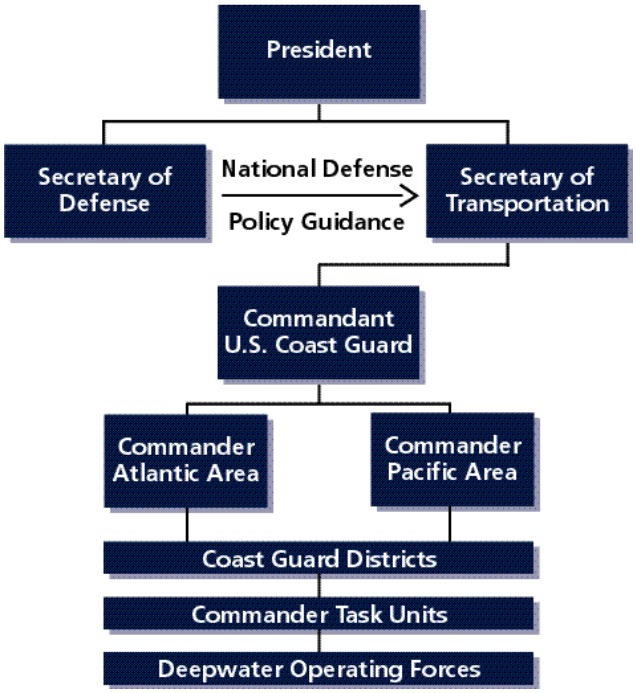
Deepwater C4ISR Assessment

The Coast Guard is unique among the U.S. Armed Forces in that the Commandant serves as both the Service Chief and the Service's senior Operational Commander. As such, the Coast Guard Commandant is responsible for providing trained, ready, and equipped forces for the Coast Guard Field Organization and exercises both Administrative Control and Operational Command of Coast Guard forces for the accomplishment of assigned missions. The Commandant receives national policy direction from the President, Secretary of Transportation, and Secretary of Defense. (See Figure 10.) The Commandant's principal operational commanders, the Commanders, Atlantic and Pacific Areas, also serve as the Commanders, Maritime Defense Zones, Atlantic and Pacific, respectively. Thus, in peacetime and war, the Commanders, Atlantic and Pacific Areas serve as the vital links between the Commandant and subordinate District Commanders and with the Unified Commanders in Chief. The Area Commanders exercise Administrative Control of all Coast Guard Deepwater surface assets; Operational Control of Deepwater cutter forces is exercised through the Coast Guard District Commanders. The District Commanders also exercise both Administrative and Operational Control of Deepwater aviation forces. When the President directs or upon declaration of war, the Coast Guard operates as a service within the Navy.

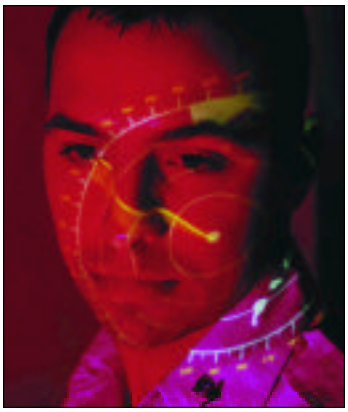
Medium-Range Detection (MRD), Medium-Range Logistics (MRL), Medium-Range Covert Surveillance (MRCS), and Short-Range Covert Surveillance (SRCS). The Coast Guard's lease of the Spanish CASA 212 in the early 1990s was targeted to meet the MRL mission demand.

[136] Since 1983 the Coast Guard has used the APS-135 Side-Looking Airborne Radar (SLAR) and the APS-137 Forward-Looking Airborne Radar (FLAR); the SLAR is particularly useful for iceberg detection. However, both systems are obsolescent, and the SLAR is no longer supportable.

Figure 10. U.S. Coast Guard Operational Command Structure



Until recently, the Coast Guard had not taken an organizational, cross-mission area, and inter-agency view regarding collecting, processing, and disseminating information needed to perform its missions. Nevertheless, the 1995 Deepwater Mission Analysis Report concluded that the "capabilities most in need of upgrading – areas where the biggest improvements in effectiveness could be achieved – are in target classification, boarding enhancements, and...C4I improvements."[137] Since then, numerous shortcomings have been identified for the Deepwater assets across all major mission areas that support national maritime security – the most significant, given the Coast Guard Commandant's dual administrative and operational command responsibilities, being the lack of an overarching and rigorous command and control architecture linking Headquarters with Area and District Commands and with individual units across mission areas.[138]



Sensor Shortfalls

The lack of effective radar and other all-weather/24-hour sensors for aircraft and cutters precludes these assets from covering larger areas with increased probabilities of detection and classification of targets of interest, particularly in high-threat/high-density areas, and at long/over-the-horizon

[137] *Deepwater Mission Analysis Report, op.cit.,* p. I-39.

[138] More detailed and system-specific information is available in the publications that were relied upon for this summary: Department of Transportation, United States Coast Guard, USCG C4I Baseline Architecture, Enclosure (1) to COMDTINST 3090.6. See also, "USCG C4I Objective Architecture and Transition Plan" (OATP), 24 November 1998.

ranges.[139] Likewise, there is a lack of effective capability to search for, detect, maintain track, and locate, especially passively and at night or in inclement weather. This ranges from large commercial vessels (in support of Port State Control program) to small targets-of-interest, such as small-profile vessels, rafts, or individuals in the water. A significant gap exists in the Coast Guard's sensor capabilities in polar regions related to finding thin ice areas. Moreover, there is a general lack of the capability to detect, assess, and monitor oil/hazardous materials spills in all weather conditions and at night. There is also a requirement for greater direct support from National Intelligence Community and other intelligence assets, especially in direct, real-time support of tactical operations (TENCAP – Tactical Exploitation of National Capabilities).

Command, Control and Communications Shortfalls

The lack of reliable connectivity among cutters, aircraft, boats, and operational shore facilities, especially at long/over-the-horizon ranges inhibits practically all operations, a situation that is exacerbated by the fact that communications suites and systems may vary by geographic or operating area. The Service has only limited communications capabilities to support multiple situations, crises, and operations simultaneously in all modes (voice, data, imagery), and there is a lack of ability to receive all distress calls in some portions of U.S. coastal areas where the majority of commercial or recreational traffic exists. Multi-agency operations are made more difficult by the limited capabilities available to Groups, Small Boat Stations, and other Coast Guard resources to interface effectively with the numerous federal, state, and local agencies, as well as international and private organizations, that are involved in various missions and tasks. There are, as well, only limited capabilities available to Groups, Small Boat Stations, cutters, aircraft, and other Coast Guard resources to interface effectively with Defense Department resources.

The Service is also challenged by limited and generally cumbersome interfaces for using Coast Guard command-and-control systems, and there is a lack of effective interface for exchanging information between mobile assets and shore facilities, especially high-speed and reliable communications. The Coast Guard's ability to protect sensitive/secure communications, particularly in coastal areas in which smaller Coast Guard resources/platforms are used, needs enhancement, and there is a lack of ability to exchange sensor, intelligence, and other tactical information among cutters, aircraft, and shore facilities. In addition to polar sensor shortcomings, the lack of an effective communications transport path to get ice surveillance information (satellite imagery or reconnaissance information from aircraft) to operational planners and cutters constrains the Service's international ice patrol operations.

Command and Decision Shortfalls

The lack of capability to maintain situational awareness and effective tactical display of an area of responsibility at the District or Group level, including status of reporting resources and monitoring of actions of Coast Guard resources has continued to create problems for effective force allocation. This, plus a general lack of interoperable decision support tools, effective situational risk assessment tools, and access to remote mission reporting information at Groups, has at times resulted in an inability to maintain situational awareness and effective tactical display by units involved in Joint-force operations. Similarly, there is a general inability to provide real-time tactical information and a situational picture on aircraft, small cutters and boats, and at Small Boat Stations. The

[139] In September 1999, the Coast Guard reported excellent results in the use of the S-band AN/SPS-73 surface-search radar in detection and monitoring of fisheries activities in Coast Guard District 1. Ranges out to nearly 49,000 yards were documented, performance that will enhance not only Coast Guard roles and missions but interoperability with Navy warships. CG Message R 280130Z SEP 99 SUI ASN-D00271000065

Coast Guard cannot easily share tactical information effectively on a real-time basis among disparate levels of Coast Guard resources and with other agencies and private organizations. Finally, the limited capability to collect data effectively and to evaluate the effectiveness of operations can either result in too many assets being allocated or too few, as well as decisions to call off operations prematurely.

Operational Constraints Summary

Thus, because of the impending block obsolescence of much of its Deepwater force structure, the Coast Guard's ability to continue to meet current, much less future, maritime security requirements is becoming increasingly problematic. For this reason, the Integrated Deepwater Systems Capability Replacement Project has assumed a central role in planning and programming for the Coast Guard of the 21st century. And, although experiments in 1999 that focused on armed helicopters and very high-speed Deployable Pursuit Boats link to motherships indicated much potential, particularly in drug interdiction operations, much more needs to be done to increase and enhance Coast Guard capabilities across all maritime safety and security missions.[140]

"...the USCG's ships and aircraft often can neither hear nor see the ships, boats and aircraft they are looking for – and even when they do succeed in establishing initial contact they have trouble communicating this important information to those who have a need to know. The cutters now in the Coast Guard inventory have no air-search radars, no modern synthetic-aperture radars, no sonar systems, no infrared sensors, and no night-vision equipment. They also lack the equipment needed to allow the analysis and sharing of tactical information between Coast Guard units. With the best equipment the Coast Guard now has, a cutter may be able to identify a 60-foot vessel at 2,000 yards – but that means that the 25-foot "cigarette boats" favored by drug runners have little to fear."

James B. Thatch
Sea Power, April 1998

[140] Commander Mike Emerson, "Coast Guard Helos: A Call to Arms," U.S. Naval Institute *Proceedings*, October 1999, pp. 30-33; Jack Dorsey, "New High-Powered Boats Help Coast Guard Level Playing Field," *The Virginia Pilot*, 10 November 1999.

V. Enduring and Emerging Factors Shaping USCG Maritime Security Systems

The Coast Guard's Integrated Deepwater System comprises the in-service/legacy and future/new-acquisition surface, air, shoreside infrastructure, and C4ISR assets and logistics support systems required to meet all current and future maritime security missions and tasks. The IDS assets must be able to support peacetime routine, civilian emergency, crisis-response, and wartime operations, in an affordable, efficient, and effective manner. In so doing, the Coast Guard will continue to provide the nation the inherent attributes of maritime power:[141]

- strategic and tactical mobility
- versatility and flexibility in response
- adaptability in roles, missions, and functions
- sustained reach and presence, and freedom of movement on the high seas

These Deepwater assets, moreover, must envision operations with a broad spectrum of "partners": U.S. civilian and military agencies and forces; Non-Governmental Organizations (NGO) and Private Volunteer Organizations (PVO), especially in humanitarian responses; other countries' civilian and military agencies; and international governmental organizations (e.g., United Nations and International Maritime Organization). At their most fundamental level, these humanitarian, civilian law enforcement, and defense missions and tasks require the capabilities to provide appropriate levels of presence and surveillance, and to detect, classify, identify, intercept, and engage targets of interest.[142]

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[141] These attributes are shared by all naval forces in varying degrees, and are the basis for both the U.S. Coast Guard's and Navy's strategic visions and operational concepts for the 21st century. For other views, see Directorate of Naval Staff Studies, *British Maritime Doctrine* (London: HMSO, BR1806, 1995), pp. 57-63; Geoffrey Till, *Modern Sea Power* (London: Brassey's Defence Publishers, 1987), pp. 169-171; C. E. Callwell and Colin S. Gray, *Military Operations and Maritime Preponderance: Their Relations and Interdependence* (Annapolis, Maryland: Naval Institute Press, 1996); and Andrew Droman, *et alia*, eds. *The Changing Face of Maritime Power* (New York: St. Martin's Press, 1999).

[142] Although specifically focused on anti-piracy requirements, the listing of operational requirements by Richard Hill, "Piracy and Related Matters," *op.cit.*, at pp. 39-40, is instructive for the Coast Guard's future maritime security systems, as any of the various challenges and threats confronting America in the next century – e.g., drug traffickers, weapons smugglers, terrorists – can be substituted for "pirate" in Hill's analysis:

"First, they need intelligence. This includes information as to pirates' bases; their craft – speed, profile, manoerverability, sensors; their manpower – numbers in crew, discipline, weapon proficiency; their weaponry – small arms or worse; their methods – day or night attacks, preliminary manoeuvres, ways of boarding, degree of brutality; and their objectives – just money, valuables, cargo or whole ship and cargo.

"Second, they need operational information. Their own sensors must be capable, tracking facilities must be adequate, the position of friendly forces known and maintained. Aircraft whether shore or ship based are likely to be essential to give broad cover.

"Third, they need communications. The ability to speak to one another, to detached craft, to co-operating aircraft and to shore headquarters, in real time, is essential.

"Fourth, they need organization. The co-ordination of anti-piracy operations is likely to be a matter for high command, able to speak to a variety of non-naval authorities, in a shore headquarters or, more rarely in distant waters, in a force flagship. Adequate, well-informed staff work is needed. This will include the production of clear directives to, and rules of engagement for, forces at sea and in the air.

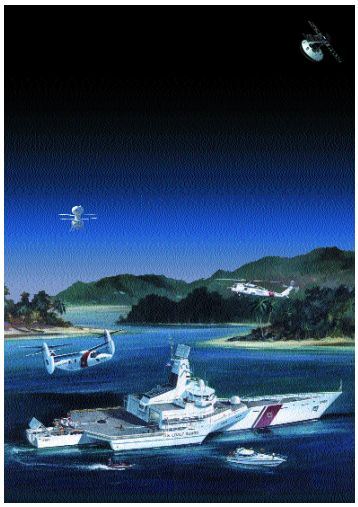
"Fifth, the need training. Small elite groups for anti-piracy initiatives at the 'sharp end' or in reaction to piratical attacks, need to be backed by well-trained operators in parent craft, particularly those manning sensors, combat centres, weapons and communications equipment.

"Sixth, they need endurance. Patient watching is likely to be a large part of anti-piracy work and it is no good having short-legged forces that must return to harbour just as things are hotting up.

Integrated Deepwater System Acquisition Program

Integrated Deepwater System Missions and Tasks

- Search and Rescue
- International Ice Patrol
- Humanitarian response
- General law enforcement
- Protection of living marine resources
- Maritime pollution enforcement and response
- Foreign vessel inspection
- Lightering zone enforcement
- Alien migrant, drug, and maritime interdiction operations
- Forward-deployed support to CinCs in peacetime engagement and crisis-response
- Environmental defense operations
- U.S. homeland security
- Port security and force protection
- Joint/combined combat operations in smaller-scale contingencies and major theater war



As the largest and most innovative acquisition effort ever undertaken by the Coast Guard, the Deepwater Project has been tasked with delivering the tools the men and women of the 21st-century Coast Guard need to stand an effective and efficient watch on the frontline of America's maritime safety and security.[143] With the Deepwater Project however, the Service has broken the traditional (non-DoD) federal acquisition paradigm and is implementing an innovative Mission-Based Performance Acquisition approach. Rather than focusing on specific hardware, e.g., a specific a class of cutter or aircraft, the Coast Guard has developed a performance specification that describes the fundamental capabilities the Service needs to perform all of its maritime security missions in the deepwater operational environment.

The overwhelming benefit of the Mission-Based Performance Acquisition approach is that industry is empowered with tremendous flexibility to leverage proven as well as leading-edge technologies and new processes to maximize the Coast Guard's deepwater operational effectiveness at the minimum total ownership cost. The Project's scope includes the entire range of Coast Guard deepwater assets – cutters, aircraft, sensors, communications, and logistics. The Coast Guard seeks to replace and or modernize these assets in order to gain the capabilities to effectively and efficiently perform its deepwater missions. The Project's encompassing scope affords industry vast trade-off spaces to develop the optimum type and mix of assets to comprise their proposed Integrated Deepwater System.

Deepwater Acquisition Strategy

The Deepwater acquisition strategy is patterned after the successful DoD model of contracting with competing industry teams for an eventual down-selection to a substantial contract award to a single team. The benefits of this approach include: industry is motivated to cost-share system development, competition encourages innovation and fair pricing, and collaborative teaming between government and industry reduces overall project risk. The end result is a contract award that ultimately yields the best value for the government.

As shown in Figure 11, throughout 1999 the Project was Phase 1 Conceptual Design, which began in August 1998 with the award of contracts to three industry teams each led by a single prime contractor. (Appendix G lists all Phase 1 industry team

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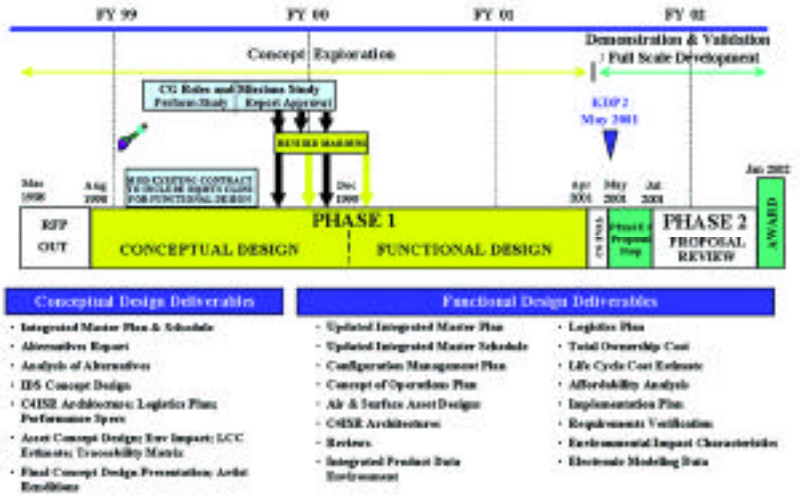
Operational replenishment is a capability that must be provided and practised.

"Finally, they need Rules of Engagement. These must be based on the two great principles governing all activities in the realm of self-defence (which after all, by extension to third parties, is the purpose of all anti-piracy operations). They are necessity and proportionality."

[143] This overview of the Deepwater Acquisition Program was derived from "The Deepwater Project – A Sea of Change for the U.S. Coast Guard," a paper prepared by LCDR Michael Anderson, Ms. Dianne Burton, LCDR Steve Palmquist, and LCDR Mike Watson, presented at the 1999 ASNE Day conference and published in the May 1999 issue of *Naval Engineers Journal* (pp. 125-131), as well as numerous internal USCG (G-OC and G-ADW) materials. For additional public information, see the Deepwater Acquisition Program's web page: www.uscg.mil/deepwater/. Another source for general IDS information is Ronald O'Rourke, "Coast Guard Integrated Deepwater System: Background and Issues for Congress," Congressional Research Service Report for Congress, 98-830F, 4 November 1998.

members.) During this phase of the project, participating industry teams were asked to conceive and engineer their proposed integrated Deepwater system concepts to approximately 50 percent design complete. After Conceptual Design, the Coast Guard can continue any or all of the participating teams into Functional Design. During Functional Design, the selected teams essentially continue to evolve and refine their Integrated Deepwater System concepts to approximately 80 percent design complete.

Figure 11. Deepwater Strategy and Plan



> "We need to make a long-term investment commitment to the deepwater needs of the Coast Guard. And, beyond the deepwater needs, we need to ensure that our people have the best equipment possible – from the latest computers to global-positioning technology. If we expect them to do the job with all they have to offer, then we have to make sure that we are doing all we can to ensure they the equipment then need to do the job."
>
> **The Honorable Rodney E. Slater**
> **Secretary of Transportation**
> *Sea Power,* **August 1999**

Also, in early 2000, the President's Interagency Task Force on the Roles and Missions of the Coast Guard was poised to report its findings. This group examined both current and possible future slates of overall Coast Guard mandates and responsibilities. The findings from this study will be incorporated into the Project as well as into industry's Integrated Deepwater System designs.

The commencement of Phase 2 marks another competitive decision point. The Coast Guard may continue up to three teams to develop their Phase 2 proposals for actual construction of their Integrated Deepwater System concept. The final award decision to one team for the construction and implementation of the Coast Guard's Integrated Deepwater System is scheduled for January 2002.

The Coast Guard is thus at a critical stage of the Deepwater Project in early 2000. The vast majority of the costs and capability of any proposed Integrated Deepwater System are locked-in during early Conceptual and Functional Design efforts. During this stage fundamental technical and cost risks are being identified and mitigated. Tradeoff studies are underway, and early operational assessments and technical demonstrations are being conducted to validate operational suitability and mitigate technical risk in system/subsystems. Bottoms-up cost estimates will be developed to support reliable acquisition and life cycle cost estimates. Essentially, the analysis and decisions made in Conceptual and Functional Design drive the fundamental cost and capabilities of the Integrated Deepwater System the Coast Guard will operate for the next 40 years, if not longer if past practice is any indication of future trends. It is critically important that a solid analytical foundation is in place to make the correct force structure, force elements, and force mix decisions, and that, to the maximum extent feasible, the Coast Guard take advantage of similar concept design and engineering studies in the U.S. Navy.

Deepwater Force Structure Analysis

Acquisition of cutters and aircraft typically takes a decade if not longer from the time the project is underway to the delivery of the first unit to the operating forces. Even with the full support of the Administration and Congress, for example, a new-design Deepwater cutter could not begin to be delivered until late in the first decade of the 21st century. Many of the Service's "legacy" cutters will be approaching if not exceeding 50 years of service by the time they can be replaced. Few of the world's navies or coastguards operate ships this old or technologically obsolete; in fact, at the end of 1999 the Coast Guard ranked 39th in age among 41 deepwater navies and coastguards. Yet, the American public will continue to place its trust in these increasingly problematic assets to go out when no one else can – or wants to – go.

A critical first step in this process therefore, is the determination of the optimum Deepwater force structure necessary to address the nation's maritime security roles, missions, and functions of today and the future that are to be satisfied by the Coast Guard's Deepwater forces. An effective force planning process must be based on a solid analytical framework of assumptions and variables in order to eliminate individual preferences for concepts or systems from impacting the analyses.[144] This analytical process must begin with the understanding of fundamental strategic, policy, and operational requirements placed on the expected force (which may include both legacy and new systems capabilities). As Chairman of the Joint Chiefs of Staff, General Henry H. Shelton, USA, wrote in the fall 1998 with regard to translating *Joint Vision 2020* concepts into capabilities, "Determining the warfighting capabilities that the joint force will need in the next century begins with defining the threats that our nation may face...."[145] These issues and other strategic- and operational-level topics were addressed by the Coast Guard and the President's Interagency Task Force on the Roles and Missions of the U.S. Coast Guard, and became the basis for additional studies and analyses.

As an integral element of the Deepwater Acquisition Project, the Coast Guard had already begun to investigate various future force structure mixes and alternatives and their effectiveness in meeting stated requirements. The use of scenarios and sensitivity assessments provided the basis for Deepwater trade-off studies and a comprehensive, objective evaluation of alternative systems, platforms, and force structure. These were, moreover, being structured at the operational level of analysis in which future systems, platforms, and integrated forces are arrayed against projected targets and threats; within operational situations in varying geographical, geophysical, and meteorological settings; and in response to multiple and simultaneous demands for services within entire areas of operations.

Coast Guard 2020 clearly acknowledges the challenges of the uncharted future. These challenges are significant variables in the force planning process that must be accommodated by force planners. One viewpoint suggests:

> In an uncertain and unpredictable world, as we have at the moment, prudence leans towards maintaining a force structure built with a maximum flexibility so that a wide range of tasks can be undertaken. Ideally, future force structures should be construct-

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[144] J. East, A. Fritz, M. Grund, "Suggested Coast Guard Force-Planning Framework," Center for Naval Analyses, CRM 99-75/September 1999, prepared for the Director, Operational Capabilities Directorate (G-OC).

[145] Henry H. Shelton, "Translating Concepts into Capabilities," U.S. Naval Institute *Proceedings*, September 1998, p. 29.

[146] Crickard, *op.cit.*

[147] See generally, John F. Troxell, *Force Planning in an Era of Uncertainty* (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 15 September 1997); Paul K. Davis, ed. *New Challenges for Defense Planning* (Santa Monica, CA: RAND, 1994); Paul K. Davis, David Gompert, and Richard Kugler, *Adaptiveness in National Defense: The Basis of a New Framework* (Santa Monica: RAND, 1996); Robert P. Haffa, Jr., "Planning U.S. Forces to Fight Two Wars: Right Number, Wrong Forces," *Strategic*

ed on the basis of a balanced mix of military capabilities that provides the necessary flexibility to undertake a wide range of national and international tasks.[146]

Two basic approaches and methodologies were available for the IDS planners and their industry teams.[147] The first is *threat-based analysis*, which is conceptually very strong when the threats to U.S. maritime security interests can be identified. The analytical task is to postulate reasonable scenarios, then determine the amount and mix of force to prevail. Both static and dynamic modeling can be employed to derive a quantifiable rationale for a specific policy/program alternative. The second basic methodology is *capabilities-based planning*, which is a valuable tool when threats to U.S. interests are somewhat vague or multifaceted and do not lend themselves to single-point scenario-based analysis. In this approach, the analyst would take advantage of professional judgment to determine the appropriate mix and level of Coast Guard Deepwater assets. It also focuses on end-state objectives rather than scenarios, and forces are sized/force mixed determined either by a resource constraint assumption (budget-limited) or by focusing on generic missions that are required to protect U.S. maritime security interests. Another alternative (see Figure 12) would be to combine both approaches, and to add performance plans and scenario alternatives, as well as deployment analyses, to help "bound" future challenges and to quantitatively rank potential force structures. "In fact," Dr. William Kaufmann of the Brookings Institution concluded in his study of conventional force planning,

> ...no one yet has devised a serious planning substitute for (a) the development and analysis of plausible but hypothetical campaigns in specific theaters, (b) the determination of the forces needed to bring about the desired military outcomes in those specific theaters, and (c) difficult judgments about the number of contingencies for which U.S. conventional forces should be prepared.[148]

Review, Winter 1999, pp. 15-22; and Richmond M. Lloyd, *et alia*, eds. *Fundamentals of Force Planning, Volume 1: Concepts* (Newport, R.I.: Naval War College Press, 1990), and *idem., Strategy and Force Planning* (Newport, R.I.: Naval War College Press, 1996). In the last, the article by Henry C. Bartlett and G. Paul Holman, Jr., "The Spectrum of Conflict: What Can It Do for Force Planners?", pp. 494-504, is particularly instructive for Coast Guard planners addressing current and future force structure demands.

[148] Kaufmann, *Planning Conventional Forces, 1950-1980* (Washington, D.C.: Brookings Institution, 1982), p. 24, quoted in Dr. Harland K. Ullman, *In Irons: U.S. Military Might in the New Century* (Washington, D.C.: National Defense University, 1995), at p. 111. Ullman continues by posing three sets of questions that are important for consideration as the IDS Project moves forward:

- What forces are needed strategically and operationally; how does that force structure incorporate the many independent and dependent variables of choice; and what are the assumptions and criteria underwriting each choice?
- What level of capability and what types of force structure are politically and economically sustainable and justifiable in this era of strategic uncertainty?
- How do we safely, sensibly, and affordably get from today's force structure and capability to that *[sic]* of tomorrow and properly balance the threat strategy, force structure, budget, and infrastructure relationships?

Figure 12. Notional Deepwater Force-Planning Process

Source: Adapted from John P. Troxell, *Force Planning in an Era of Uncertainty* (Carlisle, PA: Strategic Studies Institute, U.S. Army War College, 15 September 1997), p. 40.

"Reinvention Lab"

The Coast Guard's Deepwater Acquisition Project's program approach is so innovative that it has been designated a "Reinvention Laboratory" under the National Partnership for Reinventing Government.[149] As such, it is empowered to test new ways of doing the government's business, and to take the lessons-learned across government agencies. Deepwater was recognized for planning the entire Deepwater acquisition as a single coordinated system rather than a series of distinct procurements.

"[W]e've dramatically reformed the way we carry out the people's business," Rodney E. Slater, Secretary of Transportation, stated in an 8 June 1999 letter to Vice President Al Gore. "The Deepwater project will enhance America's national security by helping the Coast Guard perform its duties with maximum efficiency and savings to the taxpayer." It will do so by employing a unique procurement method in which competing teams design systems to meet a specified set of performance requirements. Instead of focusing on specific equipment, the Coast Guard has described the capabilities needed to perform its missions, thus permitting the three Deepwater contractor teams to determine which types, numbers, and mix of assets best meet these requirements.[150]

The Coast Guard's ability to remain *Semper Paratus* to carry out its daunting Deepwater missions and tasks at a cost that is affordable in today's and tomorrow's fiscal environment hangs in the balance. Without modernization or replacement of aging Deepwater capabilities, the Coast Guard will not be *"Always Ready"* to meet tomorrow's challenges to national maritime security. However, based upon a careful assessment of the

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[149] "Coast Guard Deepwater Acquisition Project Designated as Government Reinvention Laboratory," *op cit.*

[150] "System Performance Specifications (SPS) for the Integrated Deepwater System," *op.cit.*

requirements to carry out current Deepwater missions, and recognizing that there may well be other, yet-to-be-conceived mission sets that will be thrust upon the Coast Guard during the next half-century and more of Deepwater operations, there are several core and enduring – as well as emerging – factors that will help focus and shape the Coast Guard's Deepwater vision and programs.

A "National Fleet"

In his remarks at a November 1997 symposium, "The Role of Naval Forces in 21st Century Operations,"[151] then-Coast Guard Chief of Staff Vice Admiral James M. Loy called for a "national" response by the three Sea Services – the Coast Guard, the Navy, and the Marine Corps – to provide the full spectrum of naval and maritime capabilities needed to meet the challenges of the new millennium. "We need to think about coordinating and integrating our force planning activities," Admiral Loy remarked, "so that we can field non-redundant capabilities that are affordable, joint, interoperable, and multimission."

In early 2000, the Coast Guard and Navy are on the threshold of major recapitalizations of their forces to meet tomorrow's challenges. The Navy is committed to sustaining a near-term force structure of no fewer than 305 sophisticated, multimission warships – nuclear-powered aircraft carriers and submarines, guided missile cruisers and destroyers, and amphibious ships – that must be capable of fighting and winning in two nearly simultaneous Major Theater Wars, according to the direction of the 1997 Quadrennial Defense Review (QDR). Of these warships, by 2003 the Navy's surface force will comprise 116 multimission surface combatants (112 in the active forces and four Reserve Force warships).

This has proved to be insufficient, and today's Navy is increasingly under stress. As Admiral Johnson explained at the June 1999 Current Strategy Forum at the Naval War College, "Our forward-deployed carrier battle groups and amphibious ready groups are combat-ready and performing magnificently, as has been vividly demonstrated in recent events in the Balkans and the Arabian Gulf. But," he cautioned,

> ...today's force is a rotational force, and I continue to be deeply concerned about the readiness of units that are not forward deployed. To maintain the tip of the spear readiness, we are exacting a toll from our non-deployed ships and squadrons. Since the last Quadrennial Defense Review, I've said – and believed – that a force of 305 ships – fully manned, properly trained, and adequately resourced – would be sufficient for today's requirements within acceptable levels of risk. But...the mounting evidence leads me to believe that 305 ships is *[sic.]* not likely to be enough in the future.[152]

In addition to quantity, which has a quality of its own, among other multiwarfare needs, the Navy's surface combatants must be able to prevail in major theater war and must

"The shortfall in our surface capabilities to meet the challenges and threats that lie ahead demand a national response. The Navy-Coast Guard collective task is to prepare now the maritime forces for tomorrow's maritime challenges. To do that, we must, frankly, shed service parochialism and a "not-invented-here" philosophy. We must look forward, together, to providing the best maritime capabilities in the world, at a price Americans are willing to pay."

Vice Admiral James M. Loy, USCG Chief of Staff, November 1997

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[151] This symposium was jointly sponsored by the Fletcher School of Law and Diplomacy, the Institute for Foreign Policy Analysis, and the U.S. Navy and Marine Corps. Admiral Loy's presentation was later published as "Shaping America's Joint Forces: The Coast Guard in the 21st Century" in the Spring 1998 edition of *Joint Force Quarterly,* at pp. 9-16.

[152] Admiral Jay Johnson, "Shaping the Navy for a Changing World," keynote address at the Current Strategy Forum, U.S. Naval War College, 15 June 1999 (http://www.chinfo.navy.mil.). See also, Admiral Jay L. Johnson, U.S. Navy, "Numbers Do Matter," U.S. Naval Institute *Proceedings*, November 1999, p. 32.

be armed with theater ballistic missile defense and massed, precision land-attack weapons for direct support of land campaigns – capabilities that are clearly "high-end" and "high-tech." Additionally, these surface warships must have the capabilities to conduct the full array of responses required for smaller-scale contingency operations, as well as routine peacetime forward deployments, many of which will be conducted in concert with Coast Guard assets. The reality of the situation is apparent to naval and maritime strategist, Colin S. Gray, who recognized that

> In this decade the U.S. Navy will be reduced and reconfigured to be most effective in power projection against the shore, not for the conduct of blue-water campaigns to secure control of the oceans. The First Law of Prudence in Defense Planning, however, requires the making of provisions against the worst effects of unpleasant surprises. A U.S. Navy politically correct for the 1990s would be reshaped for modes regional conflicts and for constabulary duties in support of foreign policy. Unfortunately, such a navy would be both barely adequate to cope with strictly regional difficulties...and dramatically unfit to deliver the strategic effectiveness the United States would need in the case of a new balance-of-power struggle in Eurasia. It would be much better for the all but insular continental United States to have a navy somewhat overprepared for regional commitments, rather than critically underprepared for global scale of conflict.[153]

All current and future new-construction Navy surface warships – the *Arleigh Burke* (DDG-51) Aegis guided missile destroyers and the new-design DD-21 Land-Attack/ Maritime Dominance destroyers – are clearly "high-tech, high-end" surface warships that are not appropriate for the Coast Guard's Deepwater missions. But there are growing concerns that the relatively small numbers of ships that would at any time be available and ready to deploy would be insufficient to satisfy the Nation's commitments. In January 2000, the Coast Guard has 41 major cutters that safeguard America's maritime security and to support the requirements of the National Security and National Military strategies. With a Cold War 600-ship Navy comprising nearly 250 surface warships, 40 or so Coast Guard cutters were sometimes not given an appropriate consideration for their contributions to U.S. security needs. However, with the 305-ship Navy including only 116 surface combatants, and in a world plagued with regional instability, strife, and the reality of asymmetrical threats, the Coast Guard's major cutters along with several hundred coastal patrol boats take on new significance.

[153] Colin S. Gray, The Navy in the Post-Cold War World: The Uses and Value of Strategic Sea Power (University Park, PA: Pennsylvania State University Press, 1994), pp. 163-164.

Because of the growing sophistication of naval weapon systems and threats to maritime forces, the Coast Guard will not perform "high-end" warfighting missions. This does not mean the Coast Guard will not have a warfighting role, especially in Operations Other Than War (OOTW) – crisis-response, humanitarian operations, nation-building, peace-keeping and -enforcement, and counter-terrorism. In fact, the Chief of Naval Operations, in his 21 October 1997 letter to the Coast Guard Commandant, underscored that the Navy's "policy has been and will continue to be to ensure the Coast Guard is prepared to carry out assigned naval warfare tasks." Likewise, in his September 1999 report to the Interagency Task Force on the Roles and Missions of the Coast Guard, Secretary of the Navy Richard Danzig was emphatic on the Coast Guard's contribution to military operations and the need for Navy-Coast Guard interoperability:

> America's national security increasingly depends upon the successful completion of a wide variety of both maritime and naval missions. These range from the Coast Guard's maritime safety inspections and the protection of America's waterways to Navy's forward presence missions which help shape the security environment with a credible combat capability while being ready to respond to crises, from sanctions enforcement to war.
>
> The Coast Guard focuses on one end of the maritime spectrum, conducting operations that include law enforcement, search and rescue, environmental protection, and other peacetime missions. But it must maintain its readiness to operate with the Navy and fulfill the Service's responsibilities in our Nation's defense at the other end of the spectrum by helping to supplement the Navy wherever it can, including in a major war.

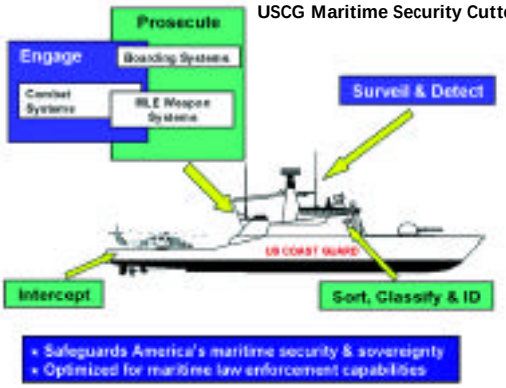
In this regard, Joint Coast Guard-Navy operations, perhaps under the nascent concept for a "National Fleet," are being taken into account by the Deepwater Program. This idea calls for the two services to address all possible operational requirements, from peacetime active and acceptable presence, to combat operations in major theater war. These operational needs will shape current and future designs and operational concepts for multimission surface warships and cutters that can mutually support the Nation's maritime and naval roles, missions, and functions that will be required of both the Coast Guard and the Navy. As Coast Guard Commandant Admiral Loy described in a 31 July 1998 letter to Chief of Naval Operations Admiral Johnson, "I envision a 'National Fleet' with the following attributes:

> First, it is a fleet of surface combatants and major cutters that would be affordable, interoperable, complementary, and balanced with minimum over-laps in their capabilities. Second, it would comprise capable multimission Navy surface combatants optimized for the full spectrum of naval operations, including Smaller Scale Contingencies (SSC) and Major Theater War (MTW). Third, the Coast Guard's "frigate-sized" maritime security cutter – which is one element of my ongoing Deepwater Project – would be optimized for peacetime and crisis-response Coast Guard missions. This cutter would also be able to work side-by-side with its Navy counterparts in many SSC and several MTW tasks, filling the requirement for a small, general-purpose, low cost, shallow-draft warship. Fourth, this cutter would become an attractive alternative for foreign military sales.

"The U.S. Navy forces in Vietnam have an urgent requirement for additional naval gunfire support. To provide such support it will be necessary to release U.S. Navy destroyers from other fleet missions. In order that the overall defense posture of the United States is not degraded, it is planned to assign destroyer escorts now on Market Time operations to replace these destroyers. Liaison between representatives of the U.S. Navy and U.S. Coast Guard has established that five high-endurance cutters can be made available to relieve the DERs [radar picket escorts]."

Paul H. Nitze, Secretary of the Navy
Memorandum to the Secretary of the Treasury
10 March 1967

The Joint Navy/Coast Guard Policy Statement on the National Fleet signed out by the Chief of Naval Operations and the Coast Guard Commandant on 21 September 1998 commits the Navy and Coast Guard "to shared purpose and common effort focused on tailored operational integration of our multimission platforms, meeting the entire spectrum of America's twenty-first century maritime needs."[154] This partnership calls for the Coast Guard and the Navy to



USCG Maritime Security Cutter

> ...work together to build a National Fleet of multimission surface combatants and cutters to maximize our effectiveness across all naval and maritime missions. The Navy and Coast Guard will coordinate surface ship planning, information systems integration, research and development, as well as expanding joint concepts of operations, logistics, training, exercises, and deployments. The Coast Guard and the Navy will work together to acquire and maintain future ships that mutually support and complement each service's roles and missions.

The likely benefits to such a coordinated and integrated approach are already apparent. They include meeting operational support and upgrade requirements more efficiently and economically; reduction of acquisition costs; standardized training and cross-training in service-specific operational specialties; improved operational planning, integrated doctrinal and tactical development; much-enhanced force and unit interoperability; and, where it makes sense to do so, commonality of technologies, systems, and platforms. "To ensure that we are prepared to meet the full range of America's maritime challenges," Secretary Danzig explained to the Interagency Task Force in September 1999, "we are building surface combatants and major cutters that are affordable, interoperable, and with complementary capabilities. These ships," Danzig continued, "will be designed around common naval equipment and systems where it is needed and makes sense." Such a joint-Service approach, moreover, could prove just as important for future Deepwater aviation elements as for the maritime security cutter.

A Common Aviation Vision

The Coast Guard is also addressing current and future fixed-wing and rotary-wing aviation requirements, again within the overall construct of the Service's roles, missions, functions, and task in support of America's maritime security. As has been proposed with regard to the Joint Navy/Coast Guard "National Fleet" initiative, the time is right to consider a Joint Navy/Coast Guard "Common Aviation Vision" that focuses on Coast

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[154] NATIONAL FLEET, *op.cit.* See Appendix C for the full text of the policy statement. See also "Coast Guard Eyes Large Part-Time Role in Forward Deployments," *Inside the Navy*, 29 November 1999, p. 2, where Admiral Loy noted that "Our intention is to create synergy among the Coast Guard and the Navy's multimission platforms, improving capability, interoperability, and affordability so that our nation is well-served acress the full breadth of this widened national security spectrum." During the summer and fall 1999, as this report was readied for publication, Coast Guard and Navy collaboration continued, including sharing of information regarding the so-called "Streetfighter" surface warship concept envisioned by Vice Admiral Arthur K. Cebrowski at the U.S. Naval War College and a "Littoral Warfare Craft" study sponsored by the Office of Naval Research. On Streetfighter and other "Navy-after-next" ship concepts, see Vice Admiral A. K. Cebrowski, U.S. Navy, and Captain Wayne P. Hughes, U.S. Navy (Retired), "Rebalancing the Fleet," U.S. Naval Institute *Proceedings*, November 1999, pp. 31-34; and Lieutenant Commander Dave Weeks, U.S. Naval Reserve, "A Combatant for the Littorals," *idem*., pp. 26-30.

Guard/Navy coordinated planning, research and development, acquisition, and life-cycle support – or, to paraphrase the "National Fleet" statement, the Sea Services should "work together to acquire and maintain future aircraft and aviation support systems that mutually support and complement each service's roles and missions."

Such an approach arguably would help ensure a force of aircraft and helicopters for naval/maritime operations that is designed specifically to work together. It is likely that this will also generate reductions in R&D and acquisition costs, as well as support costs through coordinated logistics, training, and operational planning. Perhaps the worst example of non-interoperability (not to mention non-commonality, which is different!) is the Coast Guard HH-65 helicopter with a French airframe and an American engine, a combination that makes it virtually insupportable anywhere in the world but a Coast Guard Air Station. That said, these aircraft continue to deploy to the Arabian Gulf on board cutters, and – until replaced – would deploy in significant numbers for crisis-response and wartime operations.

During the past three years, the Navy and Marine Corps aviation communities have undertaken a comprehensive assessment of current and future aviation requirements, and in 1997 produced a strategic vision and roadmap for R&D, new-aircraft acquisition, and modernization of existing land- and sea-based aviation assets[155] Specific Naval Aviation initiatives, which seem at first blush to have broad applicability to the Coast Guard's Deepwater aviation needs, include:

- Manned and unmanned tactical platforms and systems that support both operational- and tactical-level intelligence-gathering and real-time tactical reconnaissance needs[156]
- A Common Support Aircraft that looks to a common airframe (and mission-specific sensors and avionics) for a post-2010 initial operational capability
- The Helicopter Master Plan that addresses mission enhancements and modernization of the H-60 force, which could also support the future needs of the Coast Guard's HH-60J fleet, as well as the Marine Corp's MV-22 Osprey tilt-rotor aircraft that might be adapted for a variety of land- and high endurance cutter-based operations
- Long-range/endurance land-based patrol and multimission aircraft

Cooperation and coordination between the Coast Guard and Navy fixed- and rotary-wing aviation programs and operating forces could be extended to primary, advanced, and refresher training. Naval Aviation's strategic vision makes it abundantly clear that the Navy will pursue "integration of joint training where it makes sense."[157] Other possible areas include joint operational and depot-level maintenance. As the Coast Guard and the Navy are likely to work much more closely together in support of the Nation's maritime security,

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[155] Director, Air Warfare (N88), *Naval Aviation...Forward Air Power...From the Sea* (Washington, D.C.: Office of the Chief of Naval Operations, September 1997). Specific Naval Aviation program goals are outlined at pp. 16-21; aircraft and systems roadmaps and initiatives that have Coast Guard applicability are discussed at pp. 35, 40-42, 46-47, 48-51, and 54-58.

[156] See David Mulholland, "New Roles, Reliability Boost UAV Demand," *Defense News*, 14-20 September 1998, p. 12; Robert Holzer, "U.S. Navy Considers Vertical Takeoff UAVs," *ibid.*, p. 24; and Mulholland, "Global Hawk, DarkStar Offer Strategic Promise," *ibid.*, p. 16.

[157] *Naval Aviation Vision, op.cit.*, p. 67.

it makes good business and operational sense to explore all areas in which a common vision for land- and sea-based aviation can be fashioned.

Moreover, while the Service's multimission employment strategy requires current assets to serve, to at least some degree, in both coastal and deepwater environments, the separation between coastal and deepwater applications will become increasingly blurred with improvements in aircraft shipboard compatibility, DoT/DoD interoperability, standardization of cross-platform sensor capability and air-to-surface data link connectivity. In other words, whereas the Coast Guard now uses four core platforms to cover short-, medium-, and long-range mission requirements, it is both conceivable and economically desirable to imagine an integrated air and surface capabilities system which maximizes cross-platform, cross-deck, and cross-agency interoperability. This might ultimately permit a single aircraft platform routinely and seamlessly to cross short-range rescue and recovery (SRR), medium-range rescue and recovery/search (MRR/MRS) and even long-range search (LRS) boundaries. Possible attributes of such a system include the following:

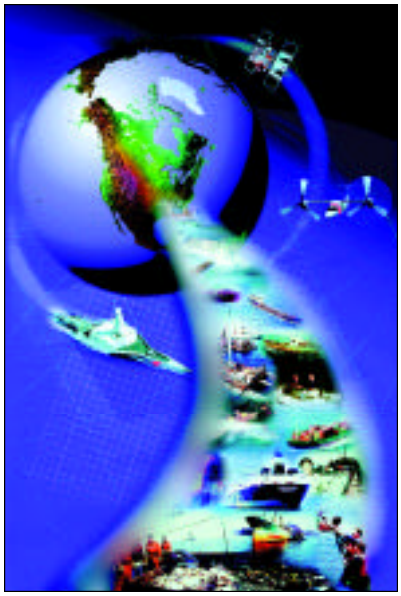
- **Integration of cutter and aviation capabilities.** All Coast Guard cutters must be capable of embarking and maintaining all vertical take-off and landing (VTOL)-capable aviation platforms, whether rotary wing, tilt-rotor, or unmanned aerial vehicles (UAVs). To optimize embarked aviation capability fully, detached aircrews and all deployable aviation platforms must be capable of remaining aboard ship for a minimum of two months without interruption. Because the vast majority of aviation maintenance infrastructure will remain ashore, sustenance of deployed aviation capability for prolonged periods will depend on: (1) improved individual aviation component reliability resulting in expansion of periodic maintenance intervals; (2) simplification of unit-level maintenance requirements; (3) maximum marinization of critical electronic components; (4) increased and improved shipboard aviation maintenance capability; and (5) flexible, reliable and economical logistics support and air delivery systems.
- **Standardization and integration of cross-platform sensor capability and air-to-surface information connectivity.** To the extent that sensor capability is standardized across all aviation and surface assets, acquisition, maintenance and training economies of scale will be realized while optimizing multimission utilization. Likewise, the real-time air-to-surface exchange of detection, classification and identification data will optimize tactical employment of both air and surface assets.
- **Interagency operability.** On an increasing basis, the Coast Guard interfaces with other agencies and DoD services. Whether as co-lead with Customs for air interdiction, as members of joint, interagency task forces, or in the Commandant's role as U. S. Interdiction Coordinator, the extent to which the Coast Guard can capitalize on a uniformed services acquisition strategy for aviation platforms and sensors will directly impact reductions in total ownership costs and markedly enhance the Coast Guard contribution to any interagency operation, to include national defense operations in time of war when, at the direction of the President, the Coast Guard functions as part of the Navy.
- **Satellite communications.** From short-notice requests for Statement of No Objection (SNO) authorization, to requests for aircraft parts, reliable and timely ship-to-shore and surface-to-air communications, both secure, non-secure, and DoD-compatible, are essential to development of any state-of-the-art operational capability.
- **Consolidation/collocation of air stations.** As advances in aviation technology increase performance parameters (speed, range, endurance), consolidation of air stations (or collocation with Navy/Marine Corps/DoD air stations) should be considered to reduce shore facility overhead costs and optimize logistics support

functions. While potentially a politically volatile issue, operational redundancy, particularly with respect to the Coast Guard's ability to meet its SAR program standard, must be eliminated.

- **Reduction of in-aircraft training.** The current high percentages of programmed flight hours dedicated to operational training suboptimizes tactical asset utilization. Following the commercial industry model, the majority of training could be moved from the cockpit to state-of-the-art, full-motion simulators, thus returning increased aviation capability in the form of additional programmed flight hours to the operational commander.

Determination of the number and types of different aircraft required to realize this integrated systems approach to the enhancement of Coast Guard aviation capability will depend to a large extent on how many of the core attributes discussed above can be realized in the anticipated austere fiscal environment. The ultimate success of the system itself, however, hinges primarily on the extent to which air and surface assets, information systems, and support infrastructure are successfully integrated in the developmental stages of the Deepwater acquisition process.

"Net-Centric" Deepwater Operational Concept



One implicit objective of the Integrated Deepwater System Capabilities Replacement Project is to deploy an integrated "system-of-systems" of diverse surface, air, C4ISR, and shoreside infrastructure assets.[158] Another way to describe "system-of-systems" is by the phrase "network-centric" as opposed to "platform-centric" operations, in which the focus of operations is on linking diverse platforms together in a "network" of information. Clearly the Deepwater system "whole" is intended to provide much greater capability than the sum of its individual "parts." In order to ensure this, all Coast Guard shore station and cutter/aircraft platform capabilities will be linked together in a seamless "web" of strategic, operational, and tactical data that supports mission objectives. In its most succinct definition, network-centric operations are focused on the *massing of effects* rather than the *massing of platforms*.[159]

Total Maritime Awareness

The basic mandate for the Coast Guard in all its Deepwater mission areas and tasks is the ability to conduct surveillance of critical maritime regions; to detect, classify, and identify targets of interest; and to intercept and engage those targets, quickly and effectively. The Coast Guard will provide appropriate levels of credible, on-scene presence in critical maritime areas, gather and disseminate in real-time information about all targets, and exploit that information in the most effective and efficient manner possible. If it "moves" in Deepwater operating areas, the Coast Guard will know about it and be able to determine the appropriate course of action, applying the right mix of forces to achieve mission objectives – quickly, effectively, and safely.

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[158] See IDS "System Performance Specifications," *op.cit*. In his prepared statement before the House Subcommittee on Coast Guard and Maritime Transportation, 19 May 1998, then-Commandant Admiral Robert E. Kramek specifically used the "system-of-systems" concept to describe the IDS.

[159] This network-centric Deepwater concept will also be a key element in the Coast Guard's enhanced and expanded joint operations with the Navy, which itself has embraced the concept of Network-Centric Warfare. See, for example: Admiral Jay Johnson, USN, "Anytime, Anywhere: A Navy for the 21st Century," U.S. Naval Institute *Proceedings*, November 1997, pp. 48-50; Vice Admiral Arthur K. Cebrowski, USN, and John H. Garstka, "Network-Centric Warfare – Its Origins and Future," U.S. Naval Institute *Proceedings*, January 1998, pp. 28-35; Vice Admiral James R. Fitzgerald, USN (Ret.), Raymond J. Christian, and Robert C. Manke, "Network-Centric Antisubmarine Warfare," U.S. Naval Institute *Proceedings*, September 1998, pp. 92-95; *VPP98*, *op.cit*., pp. 21-23; *Vision...Presence...Power*, 1999 ed. (Washington, D.C.: Department of the Navy, March 1999), pp. 18-21; and "Interview with CincPACFLT, Admiral Archie Clemins," *UNDERSEA WARFARE Magazine*, Summer 1999, pp. 2-5. At the request of Vice Admiral Cebrowski, in 1999 the Navy Warfare Development Command crafted a concept paper, "Naval Operations in the Information Age: A Capstone Concept for Future Naval Operations." This outlined how U.S. naval forces will "influence events decisively in the 2015 time-

No matter how successful the Coast Guard might be in garnering the necessary resources for the IDS Project, it will be impossible to acquire sufficient surface and airborne platforms to have on-scene presence in all areas of interest, all the time. (This constraint is shared with the U.S. Navy, for example, which has seen its Cold War posture of maintaining 100 percent coverage by aircraft carrier battlegroups of *three* critical AORs in the Mediterranean, Western Pacific, and Southwest Asia cut back to 80 percent coverage in only *two* AORs.) The reality of current and likely future fiscal environments will not support such a robust operational posture. Still, surveillance of the United States' immense maritime zones, which will remain the prerequisite for national maritime security, will require a full spectrum of national, shared, and Coast-Guard-specific space-based, air, surface, undersea, and land-based sensors and platforms.

For the Coast Guard's IDS systems, the nascent network-centric operations will ultimately derive their power from a robust networking of well-informed but geographically dispersed forces and command-and-control nodes. The enabling elements are a highly webbed intelligence-surveillance-information service, demand-pull access to all appropriate information and intelligence sources, enhanced command-and-control processes, and integrated sensors – all linked to operating forces.[160] A Deepwater information "backplane" could be developed for the Coast Guard's network-centric integrated system, which will support the information flow among sensor, command-and-control elements, and operating forces' "grids" – no matter where the actual forces may be deployed. In this way, the Coast Guard will enjoy a degree of "total maritime awareness" heretofore impossible to achieve, but clearly a fundamental element of the novel "Pressing Out Our Borders" operational concept that undergirds the Coast Guard's contribution to homeland defense.[161] But, as Commander Darren Knight, of the Canadian Maritime Forces Command, warned in 1994, C4ISR

> ...is more than just technology: it is a concept, a shared mental image binding several interrelated components together. It is only through the understanding of the concept as a whole and its constituent components that [C4ISR] technology, and all

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frame" through the "use of information to monitor developments and forestall undesirable events...to focus decisive effects on enemy vulnerabilities," according to a late-1999 draft.

The "network-centric" concept is essentially identical for the Coast Guard and the Navy, and relates to a concept of operations in which the various ship, aircraft, and unmanned systems are linked within a "backplane" of information that can be accessed to support directly the specific operation, from unit/tactical levels through campaign levels of force employment – whether the objective is "ordnance on target" for the Navy (e.g., long-range Tomahawk Land-Attack Cruise Missile strikes against terrorist training facilities) or a "boarding party on target" for the Coast Guard (e.g., surveillance, detection, classification, interdiction, search, and seizure of a drug-runner's fast craft). Not all is rosy, however, as the Navy continued to experience some frustrations in implementing IT-21 in the Fleet, particularly in training and support. See Bob Brewin, "Navy faces IT Training, Support Woes," *Federal Computer Week*, 21 June 1999.

[160] The questions of "Plug-and-Play" linkage to, if not actual co-acquisition of, appropriate Defense Department and Navy C4ISR systems must be addressed. For example, the Navy's Global Command and Control System-Maritime (GCCS-M, formerly known as the Joint Maritime Command Information System, JMCIS) technologies, systems, and protocols will be important for Coast Guard-Navy interoperability. Likewise, compatibility with the DoD Joint Tactical Information Distribution System (JTIDS) must be ensured for future IDS assets. Moreover, as close integration with Navy/DoD logistics systems is being investigated for future Coast Guard procurements, generally, compatibility with the Naval Tactical Command Support System (NTCSS) should be addressed. NTCSS is an integral element of JMCIS/GCCS, with both afloat and ashore nodes, that provides the commander key maintenance, supply, medical, and administrative information through migrated subsystems of the Shipboard Non-tactical Automated Program (SNAP), the Naval Aviation Logistics Command Management Information System (NALCOMIS), and the Maintenance Resource Management System (MRMS). All rely extensively on commercial- and government-off-the-shelf (COTS/GOTS) technologies and systems.

[161] In this regard, a U.S. Army-led program for Joint Land-Attack Cruise Missile Defense Elevated Netted Sensor (JLENS) system could provide the needed surveillance coverage of critical U.S. maritime zones. JLENS exploits high-altitude (15,000 feet), tethered aerostats (on the size of Boeing 747s) or high towers atop coastal highlands – spaced along all coastlines and on critical inland borders – equipped with large-aperture, look-down search and control radars and communications systems. The JLENS aerostats are linked to mobile mooring systems and signal-processing stations, which then link to other command-and-control-and-engagement systems. In addition to providing a crisis/wartime barrier against cruise missile attacks, a Joint Army-Navy-Coast Guard JLENS system, linking to Coast Guard

other technology, can be made to work to its full theoretical potential. Navies of the world can be analyzed in terms of their ability to understand and implement a truly integrated [C4ISR] concept.[162]

The Coast Guard's leadership role in addressing current and emerging transnational maritime security threats will require seamless C4ISR connectivity with not only its own operating forces, but those of myriad governmental agencies and nations allied with the United States in confronting those threats.[163] Effective linking of limited C4ISR systems (necessary if stringent total cost of ownership goals are to be met) will be critical in ensuring that the capability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying an adversary's capability to do the same. This premise of information superiority is fundamental if America's military forces are to achieve new levels of effectiveness in joint operations.[164]

Future deepwater C4ISR architectures, systems, and transitional technologies should be adaptable across a wide range of surface and aviation platforms of varying sizes, and well as land-based sites. They should provide a degree of flexibility that will address changes in technologies or resources, as well as potential reconfiguration on-board operational platforms in response to changing missions and threats. In this regard, the Navy's Information Technology for the 21st Century – IT-21 – Program is focused on accelerating the Navy's capabilities to achieve information superiority. IT-21 is a Fleet-driven information technology strategy that provides Internet Protocol network connectivity for afloat, ashore, and mobile naval forces. IT-21 architecture leverages preexisting programs to provide global access to the Department of Defense's classified and unclassified Wide Area Networks.[165]

The resulting information superiority will fundamentally change the nature of Coast Guard operations, reduce work force requirements, and facilitate quality of life improvements for the Coast Guard's men and women. Indeed, former Commandant Admiral Robert E. Kramek described a future in which "we will work to take the 'search' out of 'search and rescue'." (To do so, however, will require a cooperative boating public to use available emergency-locator systems or to have advanced locating systems built into wireless

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and Maritime Defense Zone (MARDEZ) Atlantic and Pacific command centers, would be a key element in achieving the needed total maritime awareness to meet the nation's Deepwater needs. Early indications were that a JLENS system could provide redundant, 24-hour surveillance and engagement support at least out to 200 nautical miles from the coasts, capable of detecting and tracking very small surface craft. See Paul Kaminski and Scott Truver, "Cruise Missile Lessons," *Defense News*, 7 June 1999, p. 23.

For other perspectives on the need for total maritime awareness, see: Anders Lundqvist, "Civic Security – A Combined Technological, Institutional, and Cost Perspective," *EEZ Technology, op.cit.*, pp. 123-126; F.W. Crickard, G.J. Herbert, and B.A. Hobson, "Canada's Oceans Strategy: Surveillance and Enforcement," *idem*., pp. 153-158; and Orin E. Marvel, "C4ISR – The Big Picture," *idem*., pp. 159-162.

[162] Commander Darren Knight, Headquarters Maritime Forces Atlantic, "The Impact of Technology on Maritime Security: A User Perspective," in Griffiths and Haydon, Maritime Forces in Global Security, *op.cit*., p. 81. Commander Knight, writing before the widespread use of more expansive C4ISR term, specifically referred to "C3I" in his paper.

[163] For example, the Coast Guard is the lead counter-drug agency for maritime interdiction and co-lead agency (with the U.S. Customs Service) for air interdiction of illegal drugs. *Joint Pub 3-07.4, Joint Counterdrug Operations* (Washington, D.C.: Joint Chiefs of Staff, February 1998), p. III-23.

[164] *Concept for Future Joint Operations, Expanding Joint Vision 2010* (Washington, D.C.: Joint Chiefs of Staff, May 1997), p.i. See also, "Sea Power 2030: Operational Concept" Brief, *op.cit.*

[165] *VPP98*, *op.cit.*, pp. 21-22, and *VPP99*, *op.cit.*, pp. 18-21. See also, Captain Renny Ide, USN, OPNAV (N60B), "Information Technology for the 21st Century" Brief for the Director, Operations Capability Directorate (G-OC), Headquarters, U.S. Coast Guard, 5 August 1998.

[166] Lucent Technology's Bell Labs in June 1999 announced that it had developed a system that can very closely locate a wireless phone indoors or out. The technique uses the Global Positioning System (GPS) and "bare-bones" GPS technology in the wireless handset and linking to the existing GPS constellation. The impetus for this was the Federal Communications Commission requirement that a way be found by October 2001 to locate wireless phones placing calls to "911" emergency services. Lucent Technology's researchers have identified an additional feature that would make it possible to track the location of a wireless phone whether it is in use or not. Grant Buckler, *Newsbytes*, 30 June 1999, http://www.newsbytes.com.

phone and other communications systems.[166]) Effectiveness of command and response will be improved by transferring comprehensive operational, intelligence, and logistics information to the right place at the right time. The implementation cycles for commanders' directives will be accelerated, gaining operational initiative in virtually any situation, and increasing the probability of mission success.

Information superiority – much of it achieved through harnessing commercial technologies and systems – will result in the ability to share strategic, operational, and tactical pictures, and thereby ensure the ability of all Deepwater system elements to operate seamlessly together and to link with other civilian and Defense Department elements and commands – in short, to achieve and sustain total maritime awareness and security at the lowest total ownership costs. In short, a network-centric concept of operations will result in an integrated Coast Guard maritime security force, which will encompass national and Coast Guard-specific surveillance and reconnaissance assets, aircraft, cutters, commands, and shore support facilities linked together by the information network that focuses on the needs of the operators at sea.

Total Ownership Affordability

Affordability of Deepwater elements will be critical in delivering the required capabilities to tomorrow's Coast Guard at cost acceptable to the American taxpayer. A principal goal of IDS development is to minimize the total cost of ownership, those costs directly associated with research, development, procurement, operations, logistics support, and disposal – a "cradle-to-grave" approach. Total ownership costs also include indirect, but linked costs associated with the overall supporting infrastructure that plans, manages, and executes a system or program throughout its lifetime, as well as the costs associated with common items or systems necessary to the introduction of the system.

Application of a methodology that establishes realistic fiscal objectives while meeting operational requirements will allow routine components to work closely together as a team. Areas with the greatest potential to minimize the life-cycle costs of individual elements include reduced/optimal shipboard or aircraft manning levels, commonality of components across platforms and systems, and the use of a common, open systems architecture that will support insertion of future technologies. This will be particularly true with the harnessing of commercial information technologies and systems that will not only result in the ability to share common tactical pictures, but will enhance the synergy required to achieve operational effectiveness at the lowest total ownership cost.

Unquestionably, there is a need for manpower affordability in operations, both ashore and at sea, as personnel costs are the greatest contributors to total ownership costs. The reduction of personnel through innovative application of technology, similar to the approach being taken by the U.S. Navy as part of its "Smart Ship" program, combined with restructuring of traditional organizations, can ensure desired capabilities are sustained and even enhanced as the numbers or people afloat and ashore are reduced.[167]

In some regards, the future is already here for the Coast Guard. Its new *Juniper* (WLB-201)-class ocean-going buoy tenders, the lead unit of which was delivered in January 1996, have been described as being "wired for roughest seas" and the "cutter of the

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[167] Certainly, many of the personnel reductions achieved in the USS *Yorktown* (CG-48) as the Navy's "Smart Ship" laboratory have been the result of procedural changes, but the application of modern systems, especially automation, has also contributed to the success of the program so far, according to the Navy's Surface Warfare Directorate (N86). This perception has driven the demand for ever-greater technological infusion into future surface warships, with the "optimal manning" requirement for the DD-21 Land-Attack/Maritime Dominance destroyer set at 95 people. See, Scott C. Truver, "Surface Revolution: DD21 Redefines the Destroyer," *Jane's Navy International*, August 1998, pp. 12-18. Both the Navy and the Coast Guard, moreover, are learning that in many instances the infusion of leading-edge technologies throughout the ship, much originating in the commercial world, carry hidden maintenance and upgrade costs not apparent at the outset.

[168] Matthew L. Wald, "Fast Ship Steered with a Joy Stick," *The New York Times*, 2 February

future."[168] They are minimally manned vessels – no more than 40 crew members compared to about 55 on the older ocean-going tenders that are being phased out – that rely heavily on automation and technology to reduce crew workloads. A single watchstander carries out all propulsion evolutions, helping to reduce the number of people needed on the bridge. The *Juniper* class has some 4,000 sensors throughout each ship, which continuously monitor the operation of all principal equipment and spaces, and alert watchstanders if anything is amiss. The new tenders also serve other Coast Guard missions – icebreaking, pollution response, fisheries enforcement, and *Juniper's* computerized navigation system helped to direct some of the search efforts after the crash of TWA Flight 800. These and future cutters will go far in achieving Secretary of the Transportation Rodney Slater's vision that the Coast Guard was "using technology to work smarter." That said, the need for sufficient numbers of skilled people in critical personnel-intensive tasks – boarding teams, boat crews, oil-spill response teams – will not diminish in the decades ahead.

Although manning reductions will be critical to successful development of the IDS, the Coast Guard will continue to place the recruitment of the highest quality individuals as its foremost requirement. Clearly, the need for people with the philosophy, skills, and dedication needed for Coast Guard service will be as important, if not more so, in 2020 and beyond as was the case at the turn of the century.

Multimission and Operational Flexibility

Operational and mission flexibility, task agility, adaptability, and room for growth must be designed and built into every Deepwater system element. Building to narrow design characteristics – whether a future cutter or aircraft or information-processing/distribution system – to save dollars in the near term will only increase the risk of early obsolescence as threats, roles, missions, and functions change. This would be a false and dangerous economy from which there might be little opportunity for affordable change later on. If the past is indeed prologue, the Coast Guard's Deepwater systems – indeed, all future Coast Guard systems and platforms – will almost certainly be asked to assume potentially vastly different missions and tasks than what is in the Service's portfolio in 2000.

1997, METRO Section p. 34; and Adam Katz-Stone, "Farewell to Old Coast Guard, Hello New Cutter," *Navy Times*, 20 July 1998, p. 22. For a comprehensive engineering discussion, see Bernard F. Bentgen and Frank McGrath, "WLB and WLM: The Next Generation of United States Buoy Tenders," *Marine Technology*, April 1996, pp. 141-163. The "jury" was still out in mid-1999, however, regarding whether the Coast Guard has undercrewed and undersupported these new vessels.

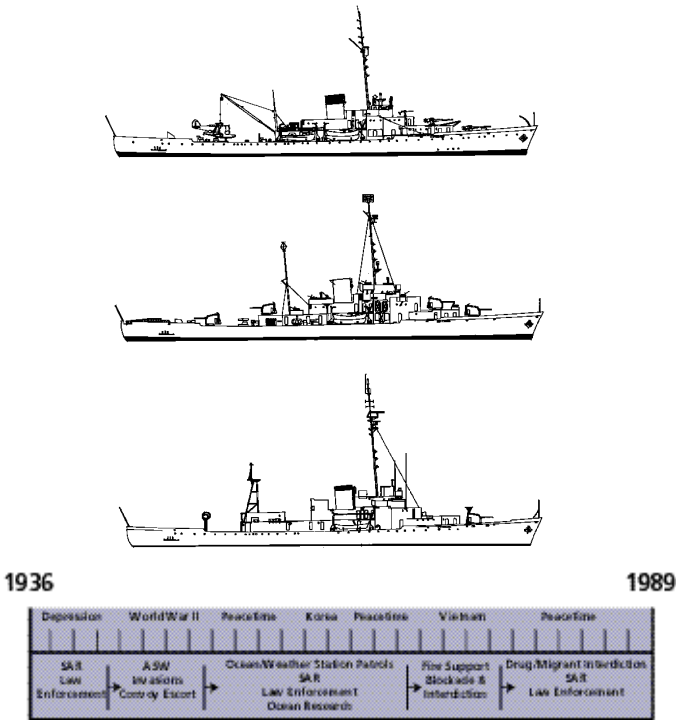
[169] Polmar, *Ships and Aircraft*, 16th ed., *op.cit.*, p. 505; Robert L. Scheina, *U.S. Coast Guard Cutters and Craft*, 1946-1990 (Annapolis, MD: Naval Institute Press, 1990), pp. 28-29; see also, Johnson, *Guardians of the Sea*, *op.cit*., pp. 154-155, 230-239.

The Coast Guard's experience with the Secretary-class 327-foot cutter provides an excellent illustration of the value of flexibility and versatility to carry out missions and tasks not originally anticipated when the cutters were acquired.[169] Built to a modified U.S. Navy *Erie*-class gunboat design, seven 327s were completed in 1936-37, with a design requirement to carry floatplanes and missions that included hydrographic research, general law enforcement, and search and rescue. An early example of Navy-Coast Guard standardization to save costs, the machinery plant and hull below the waterline were identical in the Secretary and *Erie* classes.

During World War II, they served as ocean escorts (WPG), protecting Allied convoys from German U-boats, and also served as amphibious command ships (WAGC).[170] One of the Secretary-class cutters, *Alexander Hamilton* (WPG-34), was sunk by the U-132 on 30 January 1942. By mid-1943 and the height of the Battle of the Atlantic, U.S. warships had sunk only 11 U-boats, six of which were destroyed by Coast Guard cutters, including three Secretary-class WPGs, *Spencer*, *Ingham*, and *Campbell*. When the Coast Guard returned to Treasury control at the end of the war, Secretary of the Navy James Forrestal stated, "During the arduous war years, the Coast Guard has earned the highest respect and deepest appreciation of the Navy and Marine Corps. Its performance of duty has been without exception in keeping with the highest traditions of the naval service."

In the immediate post-WW II period, the six survivors returned to peacetime missions, expanded to include ocean station patrols for weather and SAR standby. As the U.S. involvement in the Vietnam War grew, they conducted Naval Gun Fire Support tasks in support of forces ashore and maritime interdiction operations aimed at stopping Vietcong clandestine coastal movements. With the end of the war in 1975 and until the decommissioning of the last member of the class, the USCGC *Ingham* (WHEC/WPG-33) on 27 May 1988, they served in law enforcement, alien migrant and illegal drug interdiction,

Figure 13. The "Enduring Cutter" 327 - Foot *Secretary* Class 1936 to 1989



[170] *Guardians of the Sea*, *op.cit*., pp. 230-255.

and protecting living marine resources. For more than 50 years, these highly versatile and flexible cutters supported a broad spectrum of missions and tasks in both peace and war. (Figure 13 illustrates the multimission flexibility of the Secretary-class WPGs, enduring characteristics that must be embraced by the Deepwater project.)

Moreover, the Coast Guard usually conducts numerous distinct missions simultaneously, the heart of mission agility. A cutter on a fisheries patrol is prepared to divert to a search and rescue operation, to respond to a pollution incident, or to interdict a suspected drug smuggler – in many cases across thousands of nautical miles. A single cutter or aircraft thus can expect to enforce U.S. sovereignty and safeguard national maritime security in many ways through its active presence on the seas.

Operational flexibility, agility, adaptability, and the ability to carry out numerous missions simultaneously are enduring characteristics and will be important considerations for the future Coast Guard. The ability to adapt quickly, easily, effectively, and affordably to meet emergent requirements seems to invoke a design, systems engineering, and life-cycle support philosophy. This philosophy, furthermore, looks to embrace modularity and open-architecture systems designs that facilitate "plug-out/plug-in" of electronics, software, doctrine, sensors, and weapons for future IDS hardware, firmware, and software. It will, moreover, ensure that future Coast Guard Deepwater systems and platforms can be "tailored" for specific operations ensuring mission success.

Although he wrote about navies, James Cable's comments about an emerging "principle" seems to offer great irony for the Coast Guard:

> If anything approaching a principle emerges from the record of the past it may be that the natural political environment for navies, their raison d'etre, is the unforeseen. A navy exists and chance or an imaginative leader finds an unexpected use for it. This is at once the boon and the bane of naval force. In an appropriate emergency a navy is uniquely mobile and adaptable to political improvisation. But nobody devotes scarce resources to building a navy just because one day it might come in handy.[171]

In light of the Coast Guard's history of always coming in "handy" for a wide variety of tasks, it is remarkable how great the challenges have been to ensuring adequate resources for all its mandates.

"Tailored" for Multi-Agency Operations

The Coast Guard has a history of anticipating and responding to America's evolving needs. From its very beginning, the Coast Guard has absorbed new responsibilities – Revenue Cutter Service . . . Lighthouse Service . . . Lifesaving Service . . . Steamboat Inspection Service . . . Bureau of Navigation. The ability to adapt to new and sometimes daunting demands – such as far-offshore fishery enforcement (the Magnuson Act of 1976) and much-expanded vessel safety inspection and regulation (the Oil Pollution Act of 1990) – has been the hallmark of the Coast Guard. Perhaps more than any other federal agency, the Coast Guard has a history of effectively and efficiently consolidating diverse missions and additional responsibilities.

In most cases, the Coast Guard works with a wide range of organizations to accomplish its responsibilities. When other organizations have the resources and competencies, the Coast Guard does not take action except to ensure that the missions are accomplished effectively. More typically, the Coast Guard has primary responsibility for accomplishment of responsibilities and must cooperate and/or coordinate with numerous agencies. Thus, in all of its operations, the Coast Guard emphasizes cooperation and coordination with other

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[171] James Cable, *The Political Influence of Naval Force in History* (New York, New York.: St. Martin's Press, 1998), p. 172.

agencies and services. The Coast Guard stresses practical, local arrangements to get the job done. In many mission areas, such as search and rescue and waterways management, the Coast Guard leads the federal effort and coordinates operations of other federal, state, and local governments as well as private groups and international organizations.

The Coast Guard as supporting partner, shares responsibility with, and provides oversight to other agencies in many diverse areas. For example, the National Marine Fisheries Service regulates fisheries and living marine resources within the exclusive economic zone. The Coast Guard enforces these regulations at sea in cooperation with the National Marine Fisheries Service. The Office of Hazardous Material Safety is the lead agency for establishing regulations concerning transportation of dangerous cargoes. The Coast Guard enforces these regulations in the area of containerized or packaged cargoes in the marine mode. It works with other agencies in areas where they have responsibilities for hazardous material transportation. Its people enforce immigration law, but they act as maritime enforcement agents only. The Service can carry Immigration and Naturalization Service agents on its cutters, but it has no authority to initiate or process requests for asylum, or to make determinations whether migrants have a credible fear of returning to their homelands.

A recent analysis of the Coast Guard's enduring characteristics and its value to the nation concluded that a key aspect is its role as a coordinator and provider of maritime services.[172] It provides essential services, where and when required, and it bonds, focuses, and coordinates disparate actors, ensuring that the job gets done. No other agency has the breadth of responsibility in the maritime arena; existing authority; varied skill sets; international and domestic web of contacts, partnerships, and working relationships; predilection for cooperation and coordination; or is as "results-oriented" on a day-to-day basis.

Although most of the Coast Guard's responsibilities are domestically focused, it must operate and cooperate with international organizations and foreign agencies to perform its duties. To serve America's worldwide interests and provide U.S. leadership, the Coast Guard is active in international maritime affairs, providing important links, for example, to the International Maritime Organization (IMO), INTERTANKO, the North Atlantic Fisheries Organization, United Nations regional Action Plans, conferences, and in delicate multi- and bilateral negotiations.

The Coast Guard's IDS operational concepts, platforms, and systems must, therefore, anticipate the reality of planning and operations in close coordination with a variety of local, regional, national, and international partners. For example, in the command-and-control arena, alone, the Coast Guard will almost certainly have to link with local police and rescue squads (domestically as in the TWA Flight 800 and internationally as in the 1998 Swissair Flight 111 tragedies); regional and national emergency response agencies; state and federal law enforcement agencies, Department of Defense command elements and forces, and foreign coastguards and naval forces. Likewise, in drug interdiction operations, the Service works hand-in-glove with the U.S. Customs Service, Drug Enforcement Agency, Federal Bureau of Investigation, the Navy, and state and local law-enforcement agencies. Interoperability and compatibility, and the ability to "tailor" Coast Guard assets for the tasks at hand, will be important factors to consider as the Deepwater Program proceeds.

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[172] Roth and Kohout, *op.cit.*, pp. 37-44. In their study of Coast Guard identity and enduring characteristics, they relied upon the pioneering work of Carl Builder, who in his RAND study, *The Masks of War* (Baltimore, MD: Johns Hopkins University Press, 1989), focused on frameworks of Armed Service institutional personalities and identities as means to understand Service approaches to analysis, strategy, and planning. In this way, the CNA analysts noted (at page 42) "...how different the Coast Guard is from the other armed services. It is not a 'small navy.' The Coast Guard's 'altar' – what the service cherishes as the ideal – is its humanitarianism and multi-mission capabilities. This is very different from the 'tradition' of the Navy and its concept of independent command at sea. The Coast Guard is not preoccupied with 'toys' [i.e., platforms, systems, force structure] but rather passionately attached to skills.... We observed that, unlike any other service, the Coast Guard measured its institutional health by the accomplishment of its mission."

Expeditionary Mind-Set

If *Semper Paratus* means anything today and in the next century, it is that the Coast Guard will be ready and swift to respond to emergencies and crises in waters under U.S. jurisdiction, on the high seas, and in distant regions of critical importance to the United States. Deepwater assets will continue to deploy in both routine and emergency scenarios to overseas areas, alone or in the company of other U.S. Armed Services and the maritime and military forces of our allies and friends, to meet national and international needs.

This traditional expeditionary role of America's sea services – included the Coast Guard's military/defense operations – is as old as the Nation itself. It has demanded the perfection of unique operational skills and material requirements required of forces that respond on short notice and initiate operations along the shores of the worlds oceans. The challenges to expeditionary forces are at once environmental, technological, and human.[173]

They must, therefore, be structured, trained, supplied, and maintained to enable them to deploy with sufficient organic support to meet mission objectives – in Bering Sea SAR, western Pacific fisheries law enforcement, Caribbean drug interdiction, or Arabian Gulf sanction-enforcement operations. As with all naval and maritime forces, the Coast Guard's Deepwater surface cutters can remain on station for extended periods of time, and will be capable of being integrated into the Navy's at-sea underway replenishment system. Likewise, unrestricted by the need for transit or overflight approval from foreign governments, they can provide important levels of active, acceptable forward presence to deter threats from materializing in the first place. However, if deterrence is not successful, the Coast Guard's Deepwater forces must be able to identify and target threats as appropriate, in civilian, law enforcement, maritime, and national security/defense missions and tasks.

Readiness and sustainment – training, maintenance, spares, ordnance, equipment, safety, survivability – must therefore be "designed and built-in" from the outset of planning for future Deepwater assets, perhaps with the explicit objective of close working relationships with the logistics, support, and training infrastructure of the Navy to support Joint operations.

Shaped for Joint and Combined Military Operations

Because the Coast Guard's core maritime security role, missions, and tasks clearly include military/defense operations, the IDS will embrace the common direction for all U.S. Armed Services outlined by *Joint Vision 2010* to meet the challenging and uncertain future.[174] New and emerging technologies will be merged with innovative operational concepts that will greatly improve the Coast Guard's ability to conduct "joint" and "com-

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[173] *Challenges to Naval Expeditionary Warfare 1997* (Washington, D.C.: Office of Naval Intelligence, March 1997), pp. 1, 5.

[174] General John M. Shalikashvili, USA, Chairman, Joint Chiefs of Staff, *Joint Vision 2010* (Washington, D.C.: Department of Defense, July 1996). See also *Concept for Future Joint Operations: Expanding Joint Vision 2010*, *op.cit*.; and Strategic Studies Group, U.S. Naval War College, "Sea Power: 2030 Operational Concept," briefing dated 23 July 1998.

bined"– multi-U.S. service, multinational, and coalition – operations across the full range of peacetime, crisis, and wartime missions. Key to this future is information superiority. This, along with operational and technological innovation and a critical eye on total ownership costs, will ensure that the four new operational concepts, which are to serve as "templates" for future forces, including the Coast Guard, will satisfy future requirements in the most cost-effective manner possible:

- **Dominant Maneuver** is the multidimensional application of information, engagement, and mobility capabilities to position and employ widely dispersed air, sea, land, and space assets to accomplish operational tasks – whether civilian search and rescue in peacetime or Joint combat operations in major theater war.
- **Precision Engagement** is a "system of systems" that enables Coast Guard and other maritime assets to locate the objective, provide responsive command and control, generate the desired engagement, assess the level of success, and retain the flexibility to reengage the objective when required.
- **Full-Dimensional Protection** is the multilayered capability to protect U.S. and coalition forces at all levels while maintaining freedom of action.
- **Focused Logistics** is the fusion of information, logistics, and transportation technologies to provide rapid crisis response and to deliver tailored logistics packages and sustainment

It is important to note that the *Joint Vision 2010* "template" and novel operational concepts are equally important for the peacetime humanitarian, civilian, and law-enforcement tasks conducted by Coast Guard Deepwater forces as for their crisis-response and wartime/defense missions. The ability to respond quickly and effectively to an alien migrant interdiction task or a search-and-rescue mission – "precision engagement" – will rely upon similar technologies, systems, and operational concepts as the Coast Guard's support to enforcing UN sanctions or providing harbor/coastal defense against special forces attack in some future conflict. Likewise, "full-dimensional protection" might mean the ability to defend individual Coast Guard units, Joint or coalition forces, or U.S. ports and coastal cities against special operations forces, as well as to respond effectively against a terrorist group armed with chemical, biological, or nuclear weapons and intent on shutting down a critical U.S. port when it is least expected.

In addition to these key attributes that should be embraced by the Coast Guard's Deepwater Project to meet humanitarian, civilian law enforcement, and defense requirements noted above, there are several other important considerations that must be taken into account. Three are addressed here: Coast Guard-Navy discussions aimed at articulating the requirements for a "National Fleet"; possible linkages with the Navy's Naval Aviation programs to achieve a common maritime/naval aviation vision; and the potential attractiveness of the Deepwater Project for international participation and subsequent foreign sales.

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[175] Two reports are important in this regard: Richard D. Kahout and Captain Patrick H. Roth, USCG (Ret.), *Future Coast Guard Cutter Study: The National Defense Requirement* (Alexandria, VA: Center for Naval Analyses, CRM96-90, November 1996); and O. Kim Malmin, Commander Jeffery K. Karonis, USCG, and Douglas A. Adams, *Future Coast Guard Cutter Study: Candidate Cutters and their Costs* (Alexandria, VA: Center for Naval Analyses, CRM96-91, November 1996). Five alternative cutter variants were analyzed, from very low-end/limited-defense missions cutters to multimission cutters capable of medium-threat operations: Deployable, Survivable, Sea Control, Littoral Warfare, and Expeditionary cutters. The only current U.S. Navy surface warship programs are the *Arleigh Burke* (DDG-51) Aegis guided missile destroyers (57 acquired between 1983 and 2003) and the new-design DD-21. To date, only the U.S. Navy and the Japanese Maritime Self Defense Force have acquired the 9,000-ton DDG-51s, although several other navies have either acquired (Spain) or are contemplating acquiring (Australia, Norway, Germany, and Italy, among others) the Aegis SPY-1 multi-function radar and weapon system. These highly capable and sophisticated multimission Navy surface warships, however, are not what most foreign navies or coastguards require or can afford.

A *World* "System-of-Systems"

As a model maritime agency that interacts with foreign navies, coastguards, and maritime agencies in ways unique to a U.S. military service, the Coast Guard supports U.S. national security and foreign policies in similarly unique ways. The Coast Guard's Deepwater Project, coupled with the Service's evolving international engagement activities, provides an innovative opportunity for forging closer relationships with foreign navies and maritime forces, especially in support of U.S. international programs, cooperative development, and foreign sales initiatives. Because the Coast Guard already works closely with the Department of the Navy International Programs Office (Navy IPO) in a variety of excess defense articles transfers and international training programs, this relationship could be expanded to the potential benefit of U.S. foreign and security policy and strategy, naval/maritime interoperability, and U.S. defense industries. Indeed, a focused U.S. Deepwater Systems International Program could address allied and friendly navies' and coastguards' needs for a similar "system-of-systems" approach to solving their own maritime security needs.

Certainly, a sustained Deepwater cutter program will be of great benefit to U.S. shipyards, which are currently experiencing a significant down-turn in orders for both new-construction and repair of Navy ships. But the Deepwater cutter – or *cutters* if a "family" of Deepwater surface platform designs is pursued – will be a different breed of ship than the U.S. Navy wants.[175] Although the prospective Deepwater cutter program in the near term can help to bridge the gap in Navy warship construction, and help keep U.S. shipyards afloat, a critical element of the Nation's national security industrial base, there are international implications for the Deepwater project. For example, a future cutter could be what some analysts are calling the "World Ship," a design that more appropriately fills the needs without bankrupting the budgets of other navies and coastguards.[176] A "frigate-sized" cutter with modular features and open-architecture systems is seen by some observers as an attractive design for many world naval forces.[177] Thus, possible foreign military sales or cooperative development considerations for the future Deepwater system should be pursued vigilantly.[178]

Coast Guard-Navy Deepwater International Collaboration

- **A joint Coast Guard-Navy international Deepwater initiative is one element in a multifaceted effort to meet the core objectives of the nation's international and security assistance programs, which are to:**
- **Support U.S. National Security Strategy, National Military Strategy, and the Unified Commanders-in-Chief's regional strategies and engagement plans**
- **Enhance interoperability and cooperation with allies and partners**
- **Promote cost-effective modernization of U.S. and friendly forces to increase coalition military power**
- **Ensure the viability and effectiveness of the U.S. and allied industrial bases to support shared political, economic, technological, and security objectives**

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[176] Dr. Robbin Laird, Stephen Keller, and Steven Walsh, "The U.S. Shipbuilding Industry and the coming 'Global' Warship," CSSO Critical Issues Paper (TECHMATICS, Center for Security Strategies and Operations, March 1998), prepared for Rear Admiral Robert Sutton, then-Director, Navy International Programs Office. See also the Coast Guard's internal European naval shipbuilding market survey "Comparative Practices of European Frigates and Offshore Patrol Vessels," *op.cit.*

[177] Comments of Rear Admiral Robert Sutton, USN, then-Director, Navy International Programs Office, 19 August 1998. Admiral Sutton also noted that U.S. and foreign industry that may participate in the IDS program can readily identify the features and characteristics of ship, aircraft, and C4ISR systems and platforms that make best operational sense for allied and friendly naval and coastguard forces.

[178] For example, the 18 August 1998 draft of the National Fleet Joint Navy/Coast Guard Policy Statement highlighted the foreign military sales (FMS) potential of the Deepwater cutter, which, "...if acquired by allied and friendly navies and coastguards, could contribute greatly to meeting the Navy's international Program Office objectives of generating enhanced interoperability and cooperation with allies and partners." During subsequent development of the final statement, this explicit reference to FMS was dropped, although U.S. shipyard and other naval/maritime defense industries see the future maritime cutter as America's "best bet" for overseas sales of advanced naval surface platforms.

Common needs can be illuminated by looking at other countries' approaches to their "deepwater" challenges. As Rear Admiral Ray Riutta, USCG, Assistant Commandant for Operations, noted at the October 1998 Euronaval Conference, "It will come to no one's surprise that the four principal challenges that we in the United States face – large-scale, cross-border aggression; failed states; transnational dangers; and the flow of potentially dangerous technologies – are in many respects identical to those confronting Western Europe today and into the future."[179]

This perspective was echoed by two European ship designers. "The protection of their rights on the Exclusive Economic Zone has recently assumed a very high priority in the policy of most countries," V. Farinetti and E. Bonnetti, of Ficantieri, Genoa, Italy, have explained.[180] Addressing the design requirements for three notional cutter/offshore patrol vessel (OPV) types – patrol vessels for sheltered waters, OPVs of mixed naval/commercial design, and naval standard OPVs – they catalog numerous notional missions that are nearly identical to the Coast Guard's Deepwater needs: interdiction of smugglers and aliens, fisheries and offshore oilfield protection, SAR, environmental protection, and general law enforcement. "However the more potentially simultaneous tasks that the vessel is supposed to perform," they stated, "the bigger should be the dimensions of the ship in order to avoid, or at least minimize interference or conflict of priorities, thus enhancing the level of functionality and efficiency.... EEZ protection requires vessels having real multipurpose capability and offering high levels of habitability for the crew who are intended to perform long missions at sea," Farinetti and Bonetti concluded. "The ships should also present high reliability, maintainability, and a low through-life cost."

"The interdependency of nations is already enormous; what is still lacking is global interoperability, firstly of concepts (what do we want the global society to look like), of fair distribution of scarce resources, of fighting common threats (pollution, natural catastrophes, crime, non-state actors, the occasional autocrat who defies the world community), and secondly, rather as a consequence, interoperability at the "nuts and bolts" level of systems, from tire-nipples to computers.... Nations ought to be interoperable in that sense, fighting these risks together, together seeking a better and comprehensive use of the common mass of water that gives the planet Gaia her prosperity."

Vice Admiral W.J.E. van Rijn,
Royal Netherlands Navy
***Naval Forces,* Volume 20**
Number 4, 1999

[179] Rear Admiral Ray Riutta, USCG, Assistant Commandant for Operations, "Hemispheric Maritime Security: The U.S. Coast Guard Vision," Euronaval Conference, 18 October 1998; see also Scott C. Truver, "Strategic Imperatives for NATO's Navies: The Next 50 Years of Alliance Security," *NATO 50th Anniversary, 1949-1999* (Essex, United Kingdom: The Winchester Group, 1999) pp. 359-265, at p. 361.

For an example of another NATO state's concerns, see "The State's Action at Sea: French National Maritime Responsibilities and Tasks," published by the *Premier Ministre Secretariat General de la Mer,* which enumerates the following roles and missions: Safety of People, Safety of Navigation, Information of Seafarers, Maritime Leisure and Sporting Activities, Fight against Illegal Traffickings, Fishing Support and Surveillance, and Keeping Public Order at Sea. Likewise, the Italian Navy was increasingly being tasked to intercept and rescue people fleeing the misery of the Balkans. In July 1999, Italian authorities rescued 60 Gypsy migrants from Serbia, 39 of them children, after smugglers dumped them into the sea as their ship, which had sailed form the Albanian port of Vlore, neared Italy's southern coast. "The ship couldn't get close enough to dock because of cliffs," Gianluca Greco, chief of border police in Oranto, noted, "so the smugglers threw the people out." "Italians Rescue Serbian Gypsies from Sea," *Washington Post*, 28 July 1999, p. A18. See also, "Europe's Borders: A Single Market in Crime," *The Economist*, 16 October 1999, pp. 23-24, 28, in which the Italian navy's challenges of interdicting smugglers of alien migrants were further described: "Back in Otranto, the coastguards know they face a near-impossible task. The Italian government has reinforced the numbers of boats on patrol, and sent more policemen to the area. But, no sooner have they caught one lot of illegals and put them on the boat back to Albania than another boat with its pitiful human cargo hidden perilously inside will be on its way towards the coast again."

[180] V. Farinetti and E. Bonetti, "Vessel Design Considerations," *EEZ Technology,* Edition 4/Winter 1999, pp. 117-120.

Such considerations should also extend to other Deepwater system elements, including prospective manned fixed-wing aircraft and helicopters, as well as a variety of unmanned aerial, surface, and underwater vehicles that might be envisioned. Likewise, the Deepwater C4ISR system can benefit from the broadest possible U.S. and overseas participation, both to ensure that the resulting system has the best capabilities world – not solely U.S. – industries have to offer and to brighten the prospects for overseas sales.[181]

Looking to America's allied and friendly countries' requirements to upgrade their naval and maritime forces during the next 25 years, the prospect for an international elements in the Deepwater Project could be a vital factor in enhancing the U.S. security assistance "two-way street" philosophy. Perhaps most importantly, it could go far in enhancing U.S.-allied interoperability, especially in the maritime domain, which would overcome some of the negative "lessons" of the spring 1999 NATO Operation Allied Force air campaign against Yugoslavia. NATO political and military authorities noted that the lopsided division of labor between the United States and Europe. With the United States so far ahead in the use of precision-guided weapons, satellite reconnaissance, and other leading-edge technologies, NATO leaders admitted that Allied Force demonstrated that the alliance is in danger of becoming a "two-tier organization."[182] If not resolved, this could distort NATO's ability to respond to future crises and conflicts, and could even lead to serious friction regarding how to share defense burdens. Deepwater involvement by foreign, particularly NATO, navies, coastguards, and industries seems to offer solutions to both allied maritime interoperability and burden-sharing.

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[181] Vice Admiral Arthur K. Cebrowski, USN, then-Director, Space Information Warfare, Command and Control (N6), in 1997 envisioned a "Maritime Partners" initiative, which would help ensure that the naval and maritime-defense forces of U.S. allies and future coalition partners would have the most appropriate C4ISR interoperability with U.S. naval forces. See Scott C. Truver, "Harnessing the C4ISR Revolution," *Jane's Navy International*, October 1997, pp. 29-37, where the challenges for enhanced allied C4ISR interoperability are discussed.

[182] "War Showed U.S.-Allied Inequality," *The Washington Post*, 28 June 1999, pp. A1, A14.


U.S.

VI. Looking Ahead

The spirit and discipline of a military service, combined with flexibility, readiness, and a commitment to law enforcement, humanitarian service, and safety, have been the powerful blend that contributed to the Coast Guard's success during its first two centuries of service to America. It is this tradition that will enable the Service to meet the demands of the next century: far-offshore drug interdiction and law enforcement, long-distance search and rescue, combatting terrorism and defending the homeland, protecting the environment and the living resources of the seas, and supporting foreign policy goals and defense operations worldwide. As a military, multimission, maritime service, the Coast Guard provides singular, non-redundant, complementary capabilities to safeguard U.S. national security interests – today and in the 21st century.

The Coast Guard has rarely – if ever – had to seek roles, missions, functions, and tasks, especially in its Deepwater operating area. Throughout its 210-year history, new mandates have been routinely added to the Service's portfolio, usually in response to some specific national policy need and usually without additional resources being allocated for their accomplishment. The Service has received its numerous additional jobs because they either "fit" better under the Coast Guard or were more expensive to administer independently.

Indeed, in the late-1990s, this trend has continued, but has been exacerbated by ruthless streamlining to increase Service "efficiencies." The Coast Guard was directed to cut some 4,000 people from its 1994 roster by the end of 1998 (a more-than ten percent reduction) to save $400 million in operating costs, despite the increasing demands for all of its services, particularly the need to ensure maritime security in both nearby and overseas maritime regions. This created severe challenges for the Coast Guard, as Admiral Loy outlined in his 1999 "State of the Coast Guard" remarks:[183]

> ...streamlining should not be a continuous activity. The logical extension of doing more with less is doing everything with nothing. And because we know we can't take that final step, by logical necessity we also know there is some point beyond which further attempts to create additional savings are counterproductive. The goal of streamlining should not be minimal staffing; it should be *optimal* staffing, and optimal staffing is possible only with proper equipment and training. Streamline too much, and the Coast Guard begins to consume itself, degrade its readiness, and endanger both its *own people* and the *American people* who depend on our being Always Ready.
>
> How do we know when we've reached the limit of streamlining?
>
> I would offer that you're *beyond* the limit when 81 percent of small boat stations are standing 24 hour duty days for three days straight. You're *beyond* the limit when only 70 percent of VTS [Vessel Traffic System] Radarman billets are filled. You're *beyond* the limit when HU-25C [Falcon aircraft] not-mission-capable hours are on pace to double their rate from 1997. You're beyond the limit when the availability rate for 41-footers [patrol boats] drops 20 percent in four years and the availability rate for 44-footers drops 35 percent over the same period. You're *beyond* the limit when hull, machinery, and electronics casualties on cutters increase by almost 50 percent in a decade. Dull knives have to work harder to cut, and they don't produce clean slices.

"The U.S. Coast Guard has a complex range of missions and duties. The service is military and civilian, humanitarian and warrior, policeman and war fighter. All too often, these dualisms hinder public appreciation of the Coast Guard viewed as a whole. Whenever the Coast Guard comes to widespread public notice – which is often – the circumstances are very specific. The Coast Guard is seen rescuing mariners in distress, arresting drug smugglers, or combatting pollution....

The Coast Guard functions as an integral part of a national fleet as guardian of maritime security on behalf of national security. The case for modernization and replacement of the deepwater fleet with a character of force structure that emphasizes utility for national defense is compelling indeed."

Dr. Colin S. Gray
***A Coast Guard for the Future: America's Maritime Guardian Comparative Strategy,* Vol. 18, No. 2, 1999**

[183] Admiral James M. Loy, Commandant, U.S. Coast Guard, "State of the Coast Guard Address," 4 May 1999.

> More important. A dull knife is a dangerous tool.... [L]ess than half of our surfmen billets are filled by certified surfmen, and the average boat crew experience throughout the Coast Guard has dropped to less than one year. Lost workdays from shore injuries are up 29 percent. Mishap rates for forty-one footers and RHIs [Rigid-Hull Inflatable boats] have risen. Our aircraft ground mishap rates are up almost 50 percent from previous years.... A dull knife is dangerous both to Coast Guard people and to the American people who depend on us.

Streamlining not withstanding, there are going to be more missions in the next 20 to 25 years that are non-traditional missions for the other four Armed Services, but are traditional missions for and will be best addressed by the Coast Guard – assuming it can be honed to razor-sharp readiness. Moreover, there are certain to be variations and mutations of the Coast Guard's traditional mission set that demand new capabilities. Finally, new missions and tasks, only dimly perceived in early 2000, will certainly be thrust upon all of the Nation's military services in the next century.

This is especially true for the protection of **America's maritime safety and security – a focused vision for the U.S. Coast Guard of the 21st century.** Tomorrow's Coast Guard must have the technologies, systems, platforms, and trained and highly motivated people to meet the threats and challenges to U.S. maritime security interests at home and abroad. For America's "Guardian of the Seas," this means that the nation's Deepwater forces must be sufficient in number, effective, affordable, multimission, flexible, tailored for multi-agency operations, expeditionary, and shaped for Joint and multi-national operations within the Service's five core maritime security roles:

- Maritime Safety
- Maritime Mobility
- Maritime Law Enforcement
- Marine Environmental Protection
- National Defense

Toward the end of 1999 there was some uncertainty about the prospects for success in meeting these needs and carrying out these roles, unless the Administration and the Congress came to recognize the full "value-added" that the Coast Guard brings to America's maritime safety and security. The report of the Interagency Task Force on the Roles and Missions of the Coast Guard, signed out in late December, underscored the compelling national needs for a robust Coast Guard for the 21st century.[184] But there were concerns that this report would in fact do no more than "kick the can down the road," leaving the next Administration and Congress after the fall 2000 election to deal with the inevitable, bottom-line implication of the Task Force's recommendations – the need for sufficient funding for America's Guardian of the Seas. Without adequate resources, and most importantly the dedicated and skilled men and women who *are* the Coast Guard, the danger is great that critical capabilities will go wanting and missions unfulfilled, making a parody of the Coast Guard's *Semper Paratus* creed.

[184] The report, "A Coast Guard for the 21st Century," was called for in Presidential Executive Order 13115.

APPENDICES

A. Legislative Mandates for U.S. Coast Guard Roles, Missions, and Functions[185]

The following authorities mandate the Coast Guard to conduct operations within its five principal roles and supporting mission areas. There are a significant number of other statutory authorities that, although not written in mandatory terms, nevertheless assign responsibilities to the Coast Guard.

Alien Migrant Interdiction Operations

14 U.S.C.§ 2 - requires Coast Guard to, among other things, enforce or assist in the enforcement of all applicable Federal laws on, under, and over the high seas and waters subject to the jurisdiction of the United States, and to "engage in maritime air surveillance or interdiction to enforce or assist in the enforcement of the laws of the United States."

E.O. 12807 - directed the Secretary of Transportation to issue instructions to the Coast Guard to enforce the suspension and entry of undocumented aliens into the United States by sea and to interdict defined vessels.

Presidential Decision Directive 9 (PDD-9) - addresses the need to combat the problem of criminal alien smuggling, and provides guidance on the Coast Guard's role on combating alien smuggling as well as the roles of the other U.S. government agencies. It specifically tasks the Coast Guard with the interdiction of smuggling vessels and with transporting the migrants to the flag state of the vessel or to another non-U.S. country.

46 U.S.C. § 2304 - outlines that it is a violation of both U.S. Law and of a recognized duty under international law not to aid mariners in need assistance at sea.

Drug Interdiction

14 U.S.C. § 2 - requires the Coast Guard to, among other things, enforce or assist in the enforcement of all applicable Federal laws on, under, and over the high seas and waters subject to the jurisdiction of the United States, and to "engage in maritime air surveillance or interdiction to enforce or assist in the enforcement of the laws of the United States."

United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988 - Article 17 requires all States party to cooperate to the fullest extent possible to suppress illicit traffic by sea, in conformity with the international law of the sea. The United States has entered into numerous bilateral agreements to implement this binding international legal obligation. Many of these agreements expressly identify the U.S. Coast Guard as the relevant U.S. law enforcement agency under the agreement.

National Drug Control Strategy - The classified annex to the National Drug Control Strategy assigns specific missions to the USCG to secure the attainment of Goal 4 (Shield America's Air, Land, and Sea Frontiers from the Drug Threat) and 5 (Break Foreign and Domestic Drug Sources of Supply) of the Strategy.

National Interdiction Control Plan, 9 October 1997 - assigns to the Coast Guard responsibility for intercepting/apprehending maritime targets of interest detected in international waters and airspace.

Defense/Military Operations

10 U.S.C. § 101 - defines "armed forces" to include the Coast Guard, with the Army, Navy, Air Force, and Marine Corps.

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[185] This summary is based upon an internal Coast Guard memorandum, Robert S. Horowitz, Deputy Chief Counsel, "Mandatory Authorities for Mission Areas," Headquarters, U.S. Coast Guard, 17 February 1998, and additional input from Headquarters legal staff.

14 U.S.C. § 1 - establishes the Coast Guard as a military service and a branch of the armed forces of the United States "at all times."

14 U.S.C. § 2 - requires the Coast Guard to maintain a state of readiness to function as a specialized service in the Navy in time of war, including the fulfillment of Maritime Defense Zone responsibilities.

14 U.S.C. § 3 - requires the Coast Guard to operate as a service in the Navy upon declaration of war or when the President directs.

Memorandum of Agreement between the Department of Defense and the Department of Transportation on the Use of U.S. Coast Guard Capabilities and Resources in Support of the National Military Strategy, 3 October 1995 - identifies the following activities:Annex A defines Maritime Interception Operations as operations conducted to enforce the seaward portion of certain sanctions against another nation or group of nations. It may include stopping, boarding, searching, diverting, or redirecting vessel traffic.

Annex B defines military Environmental Response Operations as those responding to incidents of marine pollution that have the potential to adversely affect U.S. and allied/coalition defense operations.

Annex C defines Port Operations, Security and Defense as operations conducted to ensure port and harbor areas are maintained free of hostile threats, terrorist actions, and safety deficiencies that would be a threat to support and resupply operations. DPOSD also ensures the safe and efficient operations of all vessels and facilities within the port, harbor, and harbor approach environment.

Annex D defines Peacetime Military Engagement as all military activities involving other nations intended to shape the security environment in peacetime, and which serve to: demonstrate U.S. political and military commitment; improve interoperability; reassure allies, friends, and coalition partners; promote transparency; convey democratic ideals; deter aggression; and help relieve sources of instability before they can become military crises.

Foreign Vessel Inspection

14 U.S.C. § 2 - requires the Coast Guard to administer laws and promulgate and enforce regulations for the promotion of safety of life and property on and under the high seas and waters subject to the jurisdiction of the United States.

33 U.S.C. § 1223 - provides the Coast Guard the authority to direct the movement of any vessel on U.S. waters that the Coast Guard has reasonable cause to believe does not comply with any applicable law or treaty.

33 U.S.C. § 1228 - requires the Coast Guard to deny entry into the U.S. territorial sea to tanker vessels that are in violation of any U.S. treaty, law, or regulation, or that meet other criteria as posing a threat to port safety or the marine environment.

46 U.S.C. § 601 and 6301 - requires the Coast Guard to investigate marine casualties to tank vessels in the EEZ resulting in significant environmental harm or material damage affecting the seaworthiness or efficiency of the vessel. Also requires investigation of marine casualties to certain foreign passenger vessels operating out of the U.S. ports or carrying U.S. passengers if the casualty occurs on the high seas south of 75N, south of 60S, west of 35W, and east of the International Date Line.

46 CFR 4.01 - requires the Coast Guard to investigate all reportable marine casualties.

General Law Enforcement

14 U.S.C. § 2 - requires the Coast Guard to, among other things, enforce or assist in the enforcement of all applicable Federal laws on, under, and over the high seas and waters subject to the jurisdiction of the United States, and to "engage in maritime air surveillance or interdiction to enforce or assist in the enforcement of the laws of the United States."

Presidential Protection Assistance Act of 1976, P.L. 91-651, 84 Stat. 1941 - requires the Coast Guard to assist the Secret Service by providing service, equipment, and facilities, when requested, to assist the Secret Service in discharging its duties.

42 U.S.C. § 268 - requires the Coast Guard to enforce quarantine rules and regulations.

43 U.S.C. § 1333 - requires the Coast Guard to enforce all matters related to safety of life and property on artificial islands, installations and other devices on the Outer Continental Shelf.

43 U.S.C. § 1348 - requires the Coast Guard to enforce safety and environmental regulations promulgated under the Outer Continental Shelf Lands Act, 43 U.S.C. §§ 1331-1356.

46 U.S.C. Apps. § 87 - requires the Coast Guard, when requested by the Federal Maritime Commission, to assist the Commission in the enforcement of sanctions which the Commission is empowered to impose, including, when requested, denying entry to the United States to vessels flagged in States subject to such sanctions.

46 U.S.C. Apps. § 1710a - requires the Coast Guard, when requested by the Federal Maritime Commission, to assist the Commission in the enforcement of sanctions which the Commission is empowered to impose, including, when requested, denying entry to the United States to vessels flagged in States subject to such sanctions.

48 U.S.C. § 1494b - requires the Coast Guard to station a patrol vessel in St. Croix, U.S. Virgin Islands.

International Ice Patrol

14 U.S.C § 2 - requires the Coast Guard to engage in oceanographic research on the high seas and in water subject to the jurisdiction of the United States.

46 US.C. Apps. § 738a - requires the Coast Guard to maintain an ice patrol during the ice season in the North Atlantic Ocean in the vicinity of the Grand Banks of Newfoundland and to provide enumerated services to mariners including issuing radio warnings to vessels transitting the area informing them of ice conditions; assisting vessels and crews requiring aid; studying ice and current conditions in the region; and removing and destroying derelicts.

Convention on the Safety of Life at Sea (SOLAS), Chapter V, Regulation 5 - requires contracting governments to continue the international ice patrol. Pursuant to U.S. law, the Coast Guard is the only agency authorized to accomplish this international obligation.

Lightering Zone Enforcement

14 U.S.C. § 2 - requires the Coast Guard to, among other things, enforce or assist in the enforcement of all applicable Federal laws, on, under, and over the high seas and waters subject to the jurisdiction of the United States, and to "engage in maritime air surveillance or interdiction to enforce or assist in the enforcement of the laws of the United States."

33 U.S.C. 1221 - the Port and Waterways Safety Act provides the basis for our port state actions, and general management of ports and waterways to minimize deaths, injuries, property damage, and environmental damage. It authorizes the establishment of safety zones, Captain of the Port Orders, issuance of permits, and additional subpoena authority for investigations.

Living Marine Resources Enforcement

14 U.S.C. § 2 - requires the Coast Guard to, among other things, enforce or assist in the enforcement of all applicable Federal laws on, under, and over the high seas and waters subject to the jurisdiction of the United States, and to "engage in maritime air surveillance or interdiction to enforce or assist in the enforcement of the laws of the United States."

16 U.S.C. § 1861 - requires the Coast Guard to enforce the provisions of the National Fishery Management Program – The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) – "to prevent overfishing, to rebuild overfished stocks, to insure conservation, to facilitate long-term protection of essential fish habitats, and to realize the full potential of the Nation's fishery resources." The Act tasks the "Secretary of the department in which the Coast Guard is operating" with enforcement "of the provisions of this Act."

16 U.S.C. § 1540 - The Endangered Species Act - is written to protect America's endangered species. It charges the Secretaries of Commerce and Interior, and the Coast Guard, with enforcing its provisions.

16 U.S.C. § 3375 - The Lacey Act - prohibits the possession of and commerce in illegally taken fish, wildlife, and plants. It charges the Secretary of Transportation with enforcement of the Act's provisions.

16 U.S.C. § 1156 - requires the Coast Guard, when requested by the Secretary of State, to deliver to the cognizant State Party those persons and vessels seized for violating the provisions of Article III of the Interim Convention on the Conservation of North Pacific Fur Seals.

16 U.S.C. § 1826 - declares it to be the policy of Congress that the United States should secure a permanent ban to destructive high seas fisheries practices, in particular, the use of large-scale driftnets and requires the Coast Guard to cooperate with the Departments of State and Commerce in securing international agreements which would implement this policy. It also tasks the Coast Guard, among others, to work with international organizations, such as the North Pacific Anadromous Fish Commission, to implement and enforce the UN High Seas Driftnet Moratorium. The statue would, by implication, effectively require Coast Guard enforcement of such agreements, as it mandates that such agreements include provisions which would permit officials of the United States to board and inspect vessels of States-Party while such vessel is operating beyond the exclusive economic zone of any nation.

16 U.S.C. § 3607 - requires the Coast Guard to enforce the provisions of the North Atlantic Salmon Fishing program.

16 U.S.C. § 3637 - requires the Coast Guard to enforce provisions of the Pacific Salmon Fishing program.

16 U.S.C. § 5504 - requires the Coast Guard to cooperate with the Commerce Department in developing a report providing information regarding any activities of high seas fishing vessels that undermine the effectiveness of international conservation and management measures. The Coast Guard is, by implication, required to assemble such information in order to effectively discharge its duty to cooperate.

16 U.S.C. § 5606 - requires the Coast Guard to enforce provisions of the Northwest Atlantic Fisheries Convention, which regulates fishing outside any country's EEZ in the Northwest Atlantic, particularly on the Grand Banks and Flemish Cape off the coast of Newfoundland. Marine Mammal Protection Act - While it does not specifically task the Coast Guard, prohibits the taking or possession of marine mammals in the U.S. territorial sea and EEZ. Because of the area defined, this is a Coast Guard enforcement responsibility under 14 U.S.C. 2.

Maritime Pollution (MARPOL) Enforcement

14 U.S.C. § 2 - requires the Coast Guard to, among other things, enforce or assist in the enforcement of all applicable Federal laws on, under, and over the high seas and waters subject to the jurisdiction of the United States, and to "engage in maritime air surveillance or interdiction to enforce or assist in the enforcement of the laws of the United States."

33 U.S.C. § 1254 - requires the Coast Guard, in cooperation with Environmental Protection Agency, to conduct surveillance to monitor the water quality of the contiguous zone and the oceans.

33 U.S.C. § 1321 (c)(1) - as amended by the Oil Pollution Act of 1990, requires the President to ensure effective and immediate removal of a discharge of oil or hazardous substance in the exclusive economic zone and for natural resources under the exclusive management authority of the United States. Pursuant to E.O. 12777, Coast Guard is delegated responsibility for removal of a discharge, or mitigation or substantial threat of a discharge, of oil or hazardous substances in the coastal zone.

33 U.S.C. § 1417 - requires the Coast Guard to conduct surveillance and appropriate enforcement activity to prevent the unlawful transportation of material for dumping, or unlawful ocean dumping.

33 U.S.C. § 1901-12 - Act to Prevent Pollution from Ships implements the MARPOL Convention in U.S. Law and authorizes the development of implementing regulations. Annexes cover the discharge of oil and noxious liquid substances, and prohibits of the dumping of plastic trash anywhere in the ocean or the navigable waters of the United States. Additional prohibitions are directed against dumping of other types of garbage in water subject to U.S. Jurisdiction; regulations also cover the discharge of sewage.

33 U.S.C. § 1903 - requires the Coast Guard to enforce the provisions of the MARPOL Convention and the Act to Prevent Pollution from Ships.

42 U.S.C. § 9118 - requires the Coast Guard to enforce procedures with respect to any ocean thermal energy conversion facility in order to (1) promote the safety of life at sea; (2) prevent pollution of the marine environment; (3) clean up any pollutants which may be discharged; and (4) otherwise prevent or migrate any adverse impact from the construction and operation of such ocean thermal energy conversion facility or plantship.

42 U.S.C. § 9119 - requires the Coast Guard to promulgate and enforce regulations governing the movement and navigation of ocean thermal energy conversion plantships so as to prevent interference with other uses of the high seas.

42 U.S.C. § 9153 - with respect to ocean thermal energy conversion enforcement, gives the Coast Guard exclusive responsibility for enforcement measures which affect the safety of life and property at sea.

Search and Rescue

14 U.S.C. § 2 - requires the Coast Guard to develop, establish, maintain and operate rescue facilities for the promotion of safety on, under, and over the high seas and waters subject to the jurisdiction of the United States.

46 U.S.C. Apps. § 738a - requires the Coast Guard to render assistance to persons and property in distress in the vicinity of the Grand Banks of Newfoundland during ice season and as long as may be advisable throughout the remainder of the year.

Convention on the Safety of Life at Sea (SOLAS), Chapter V, Regulation 15 - mandates that contracting governments make necessary arrangements to rescue persons in distress at sea for waters off of their coast. Pursuant to U.S. law, the Coast Guard is the only agency authorized to accomplish this international obligation.

B. Commander-in-Chief, U.S. Southern Command Letter to Deputy Secretary of Transportation, 26 May 1999

DEPARTMENT OF DEFENSE
UNITED STATES SOUTHERN COMMAND
OFFICE OF THE COMMANDER IN CHIEF
3511 NW 91ST AVENUE
MIAMI, FL 33172-1217

May 26, 1999

Mr. Mortimer L. Downey
U.S. Deputy Secretary of Transportation
U.S. Department of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20590

Dear Secretary Downey,

I appreciate this opportunity to comment on the many vital contributions of the United States Coast Guard in Southern Command's Area of Responsibility (AOR). I also look forward to meeting with you and the other distinguished members of the Interagency Task Force on the Roles and Missions of the U.S. Coast Guard on 28 May 1999 in Washington D.C. Before I address the Coast Guard in specifics terms, let me set the stage by providing some background on the Southern Command Theater and underscoring some fundamental facts that will frame the Coast Guard's role in this region in a practical context.

The reality that events in the Southern Theater are vital to U.S. strategic interests is becoming increasingly apparent. U.S. economic prosperity is increasingly linked to the economic prosperity of the Latin American and Caribbean regions. The level of trade with these regions will, within a year, exceed the level of trade with all of Europe, and in the next 10 years, with Europe and Japan combined. Four countries in the region together have sufficient oil resources to be competitive with the countries of the Middle East. Venezuela alone can produce as much oil as can all the Persian Gulf states combined. Colombia recently discovered major oil reserves, while both Trinidad-Tobago and Ecuador are already significant oil suppliers.

Our cultural ties to the region are growing exponentially. By the year 2010 Hispanics will comprise the largest minority in our country and by mid-century may account for as much as a third of the population. We also have burgeoning populations of English and Creole-speaking Caribbean people. As these new Americans grow in number, as well as political and economic strength, they will demand that our leaders pay increased attention to our affairs and interests in this hemisphere.

Measured against the goals of our National Security Strategy, the Southern Command AOR is a "good news story." Over the past two decades the theater has changed from one dominated by military dictatorships and communist regimes to one in which democracies are the norm. For the first time in history, virtually every nation in the theater is a democracy of 32 nations, only intransigent Cuba remains outside the embrace of democratic rule and the prosperity possible only through a free market economy.

The picture is not all rose-colored, however. Many of these democracies are fragile and susceptible to transnational threats which have emerged as the greatest hazards to regional stability and democratic and economic development. Throughout the region the corrupting influences of narcotics trafficking, domestic and international terrorism, illegal migration, illicit arms sales, money laundering, and organized crime are threatening the foundations of democracy and impeding economic development.

It is against these transnational threats that we have framed our regional engagement strategy, a strategy that embodies the basic concepts of U.S. national strategy: shape the environment, respond to crises, and prepare for an uncertain future. Our regional engagement strategy stresses the first concept. If we skillfully shape the hemispheric security environment, we will not have to respond to crises, and the future will be far less uncertain.

We strive to shape the environment in a variety of ways. We take advantage of exercises and confront operational threats such as drug trafficking and crises like natural disasters. We proactively support military-to-military contacts and disaster relief and foster multilateral security cooperation among security forces in the region. We assist the countries of the region in building military forces appropriate to the current geopolitical environment, to help develop mutual confidence in their ability to work together for the common good and to resolve disagreements peacefully. Our efforts help to create opportunities for enhancing military acceptance of the professional concepts of military subordination to civilian leadership, respect for human rights, and support for democratic institutions.

With the understanding that regional engagement and counterdrug operations are our primary missions, let me lend form and substance to these concepts by citing some examples of specific Coast Guard activities and contributions that are vital to the pursuit and achievement of our strategic aims.

From the start line to the finish line the Coast Guard is an active partner essential to effective regional engagement. They are integral to our Theater Engagement planning process, providing unique perspectives and invaluable expertise. First and foremost, however, I must convey a key observation(our United States Coast Guard has earned and enjoys an unprecedented level of trust and credibility with the countries and organizations within the Southern Command AOR. Coast Guard forces and missions closely match those of the region's navies, particularly in the Caribbean basin, and through a multitude of engagement activities and initiatives, the Coast Guard has fully emerged as the ideal mentor and role model for many of the regional maritime services. Their prominent role in the development of the Haitian Coast Guard with a full time, multi-year presence of two to four trainers working closely with Canadian counterparts, is the most significant engagement success story in a country bedeviled with endemic political, social and economic crises. Similar training initiative successes are evident in Panama (development of their maritime capabilities), Antigua (RSS Training Center), Bolivia and Peru (riverine training).

The Coast Guard's robust Resident and Mobile Training Teams continue to pay huge dividends in shaping our theater for the new century. This past year the International Military Education and Training (IMET) program included 111 students from 22 countries. The Coast Guard also completed 62 Mobile Training Team (MTT) missions for 299 weeks of training and enrolled eight cadets at the U.S. Coast Guard Academy. As a side note, the Commander of the Barbados Coast Guard is an Academy graduate from the Class of 1984. The engagement value of these activities are immeasurable and can be linked directly to strengthened regional trust, cooperation, and stability.

The Caribbean Support Tender (CST) is a new initiative that clearly highlights the synergism of the SOUTHCOM - USCG partnership. This program will utilize an 180 foot, 1000 ton tender to provide practical "hands on" training and technical assistance for the regional maritime services of the Caribbean. Its multinational complement of officers and crew will foster teamwork and encourage information exchange to help improve their operational readiness and capabilities, and achieve our strategic aim of greater regional cooperation and confidence.

The Coast Guard also participates heavily in the SOUTHCOM theater exercise program. As my Executive Agent for the maritime phase of the annual Caribbean exercise *Tradewinds*, they have performed superbly in bringing together a majority of the region's maritime services in an operational environment that is both challenging and extremely productive. They are also regular participants in the annual *UNITAS* exercise which provides cooperative operational training opportunities with the navies of South America. Their participation always adds an important dimension which Latin American navies appreciate and identify with, and generally crosses multiple ministries of host governments, which in turn creates additional opportunities for further diplomatic and military contacts.

The success of these engagement activities is also linked directly to our counterdrug mission, as the relationships, trust, cooperation, and improved operational capabilities they build are key to the multinational effort required to effectively conduct counterdrug operations in this region. Direct Coast Guard support to include cutters (deep-water assets), aircraft and law enforcement detachments are imperative to our counterdrug effort. We cannot conduct an effective counterdrug campaign without Coast Guard support; they are infused in every counterdrug operation conducted in the Caribbean and are intimately involved in the strategy formulation process.

I can personally attest to the difference in "value added" that the Coast Guard makes each and every day in this theater. I observe them first hand in key staff billets right here in my headquarters and in key operational billets throughout the AOR as Chiefs of our Military Liaison Offices (MLO's). Our primary counterdrug organization, Joint Interagency Task Force – East, is superbly commanded by a Coast Guard Flag Officer, Rear Admiral Ed Barrett. From the most junior to the most senior, these professional Coast Guardsmen are extremely effective in their highly visible and critical roles, and their substantial contributions to regional engagement and our counterdrug mission make the difference.

In closing, let me offer these final observations. The USCG is without a doubt my most valuable resource for maritime engagement in the Caribbean basin, making robust security assistance, military-to-military contact, and exercise contributions. They are the lead agency for maritime interdiction; however, increased *Detection & Monitoring* support is inefficient without critical linkages to USCG forces assigned for *Intercept & Apprehension*. Presently, the number of cutters available to support the counterdrug effort is significantly less than what we will need to achieve our operational counterdrug objectives. Migrant surges will also inevitably place a greater strain on the aging USCG fleet. The USCG is the right fit for managing many of my downrange efforts, as evidenced by the outstanding results produced by my three Coast Guard Security Assistance Office (SAO) Chiefs. My staff is exploring options for additional USCG manpower to support other regional SAO positions.

In summary, my message is a simple one. The United States Coast Guard brings tremendous capabilities and contributions across a wide spectrum of regional engagement activities. Its role in the Southern Theater is a significant one, and will only grow as we continue to pursue a National Security Strategy that directs us to engage and shape an extremely diverse, dynamic and expansive environment.

Secretary Downey, thank you again for this opportunity to provide my perspective regarding the Coast Guard and its importance to Southern Command. I look forward to discussing in greater detail some of the points I have raised in this letter with you and the task force members during our session on Friday.

Sincerely,

// signed //

Charles E. Wilhelm
General, United States Marine Corps
Commander in Chief, U.S. Southern Command

C. NATIONAL FLEET
A Joint Navy/Coast Guard Policy Statement, 21 September 1998

Concept

The Navy and Coast Guard commit to shared purpose and common effort focused on tailored operational integration of our multi-mission platforms, meeting the entire spectrum of America's twenty-first century maritime needs. While we will remain separate services, each with a proud heritage, we recognize the need to work more effectively together. We describe the process for closer cooperation as the "National Fleet," a concept that synchronizes planning, training and procurement to provide the highest level of maritime capabilities for the nation's investment.

Background

Challenges to our maritime security mandated the formation of our respective services in the early years after the founding of the republic; the challenges grow more diverse and complex each year. Regional conflict, crisis response, sanctions enforcement, arms trafficking, illegal mass migration, smuggling, over-fishing, and terrorism are just a few of the growing problems we face in maritime security. As we enter the next millennium, described in Joint Vision 2010 as "more unpredictable and less stable," the Navy and Coast Guard, together, must deploy forces with greater flexibility, adaptability and affordability. Especially at the low end of the spectrum of conflict where we expect to find the bulk of our security activities, a combined and interoperable force will be needed to establish the numerical sufficiency required for effective global operations.

Our heritage of successful cooperation at sea establishes a clear point of departure as we project a new course for the future. Recent examples include response to the Haiti-Cuba mass migrations in 1993-94, support of the TWA Flight 800 salvage operations, clean-up of the Exxon Valdez spill, Arabian Gulf UN embargo operations, and ongoing Peacetime Engagement and Counter-Narcotics operations. In support of the Coast Guard's Counter-Narcotics mission, the Navy brings essential communications, intelligence, surveillance and detection capabilities. In the Navy's Peacetime Engagement mission, the Coast Guard provides expertise and proficiency in maritime law enforcement, fisheries protection, waterways management and environmental protection. In humanitarian support operations, the services support each other with a common dedication and overlapping skill sets that are force multipliers for the nation. Our joint operational experience suggests efficiencies to be gained, but also offers insights into aspects of our cooperation hindered by an unfocused approach. Because of incompatible equipment, mutual logistics support has proven difficult, as has the ability to exchange near real-time intelligence and information. As partners in maritime security, our approach should stress commonality wherever appropriate, from shipboard propulsion systems to aircraft components to training standards.

Attributes

The National Fleet has two main attributes. First, the fleet is comprised of surface combatants and major cutters that are affordable, adaptable, interoperable, and with complementary capabilities. Second, whenever appropriate, the fleet is designed around common equipment and systems, and includes coordinated operational planning, training and logistics. The Navy's contribution will be highly capable multi-mission Navy surface combatants designed for the full spectrum of naval operations, from Peacetime Engagement through Major Theater War (MTW). The Coast Guard's contribution will be maritime security cutters, designed for peacetime and crisis-response Coast Guard missions, and filling the requirement for relatively small, general-purpose, shallow draft warships. All ships and aircraft of the National Fleet will be interoperable to provide force depth for peacetime missions, crisis response, and MTW tasks.

Policy

The Navy and Coast Guard will work together to build a National Fleet of multi-mission surface combatants and cutters to maximize our effectiveness across all naval and maritime missions. The Navy and Coast Guard will coordinate surface ship planning, information systems integration, and research and development, as well as expand joint concepts of operations, logistics, training, exercises and deployments. The Coast Guard and Navy will work together to acquire and maintain future ships that mutually support and complement each service's roles and missions.

Chief of Naval Operations

Commandant of the Coast Guard

Dated: 21 September 1998

D. The United States Coast Guard: A Unique Instrument of U.S. National Security, October 1999

At the dawn of the 21st century, America's citizens and interests and its allies and friends throughout the world are at increasing risk from a variety of transnational threats that honor no frontier: extreme nationalism, terrorism, international organized crime, illegal alien migration, drug trafficking, conventional weapons smuggling, proliferation of weapons of mass destruction, environmental damage, complex flows of trade, and state aggression. "To move against the threats of this new global era," the President's October 1998 *National Security Strategy for a New Century* explains, "we are pursuing a forward-looking national security strategy attuned to the realities of our new era.... Its three core objectives are:

- To enhance our security.
- To bolster America's economic prosperity.
- To promote democracy abroad."

America's national security is thus no longer focused solely on military threats to the nation. Indeed, the dividing line between domestic and foreign policy is increasingly blurred by globalization – the process of accelerating economic, technological, cultural, and political integration. "More and more we as a nation are affected by events beyond our borders," the *National Security Strategy* recognizes. As U.S. national security interests embrace a rich tapestry of cultural, social, environmental, economic, political, diplomatic, and military dimensions, we must examine critically the tools necessary to carry out this strategy effectively. Further, the *National Security Strategy* makes clear that a "close coordination across all levels of government – federal, state and local" will be fundamental to success.

In this regard, the Coast Guard is an increasingly important and, indeed, a unique asset in America's multifaceted security strategies at home and abroad. The Coast Guard is a **military, multimission, maritime service** within the Department of Transportation and one of the five U.S. Armed Services. Its fundamental roles are to protect the public, the environment, and U.S. economic and security interests in America's inland waterways, ports and harbors; along some 47,000 miles of U.S. coastlines; in the U.S. territorial seas and our nearly 3.4 million square miles of exclusive economic zones; on international waters and in other maritime regions of importance to the United States. Interagency cooperation has been crucial in meeting the nation's needs in these critical regions, with the Coast Guard in many instances a lead coordinator of activities involving the Departments of State, Defense, Justice, and Transportation; the Customs Service, Federal Bureau of Investigation, Drug Enforcement Agency, Environmental Protection Agency, National Marine Fisheries Service, the Immigration and Naturalization Service; and numerous local, state, and international agencies and nongovernmental organizations.

Since its founding as the Revenue Cutter Service in 1790, the Coast Guard has unfailingly provided **services and benefits to America's security because of its distinctive blend of humanitarian, law enforcement, diplomatic, and military capabilities.** The Coast Guard has broad responsibilities for safeguarding **maritime security** – the Coast Guard's unique contribution to America's national security. Today these capabilities ensure homeland defense, protect critical infrastructures, safeguard U.S. maritime sovereignty, and defend American citizens and interests worldwide. The Coast Guard's five maritime security roles and their importance to America, today and in the future, are as follows.

National Defense. Notions of homeland defense and maritime sovereignty shape the Coast Guard's law enforcement roles, missions, and tasks to defend U.S. maritime borders and offshore zones as well as participating in global military and defense operations. Coast Guard units play critical roles in peacetime forward presence, humanitarian support,

peacekeeping and enforcement, crisis-response, and combat operations, across the spectrum of U.S. global engagement in support of the National Military Strategy's concepts of **Shape, Respond, and Prepare.** The Coast Guard's involvement in **shaping the international environment** is important and growing. Coast Guard peacetime engagement in a posture of active and acceptable presence reaches out to all elements of other countries' maritime interests and agencies, and in some situations is much less threatening and more politically acceptable than a purely naval or military presence. The Coast Guard's people and assets support in-country mobile training teams and international training at Coast Guard facilities in the United States, and have helped to establish maritime codes of law in several countries emerging from authoritarian rule. Coast Guard support to international initiatives, including bi- and multilateral search-and-rescue and environmental exercises, helps to underscore America's commitments to regional stability and peace.

The Coast Guard's extensive peacetime responsibilities in coastal and port maritime functions and a variety of country-to-country operations provides broad-spectrum capabilities to **respond to threats and crises.** In defending against transnational threats, the Coast Guard provides the maritime element in homeland defense against drugs, other contraband, illegal migrants, and weapons proliferation. A robust command and control network rings the nation to direct responses across the mission spectrum. Coast Guard operational capabilities for these needs figure importantly in smaller-scale contingencies, providing humanitarian assistance in natural disasters, boarding teams for maritime interdiction operations in support of United Nations sanctions, and port security in overseas theaters. Finally, Coast Guard tasks in Maritime Theater Warfare are embracing more facets of naval warfare operations in littoral regions, including port security and safety, harbor and environmental defense, maritime interception and coastal sea control, and force protection.

The United States clearly confronts a dilemma as to what form its naval and maritime forces should take in the future to deal with a variety of challenges: U.S. support to U.N.-sponsored global security operations; the security and defense implications of the U.N. Convention on the Law of the Sea; the need for naval arms control, disarmament, and confidence-building regimes; the proliferation of naval forces and weapons, particularly weapons of mass destruction; and the increasing significance of nonmilitary threats to U.S. maritime security. Thus, to **prepare now for an uncertain future,** the Coast Guard maintains a high state of readiness to function as a specialized service within the Navy and has command responsibilities for the U.S. Maritime Defense Zones. Its strategic vision document, Coast Guard 2020, underscores the need to embrace both the Revolutions in Military Affairs and Business Affairs to support robust investment in modernization and to transform Coast Guard strategy, doctrine, and organizations to meet the daunting challenges of the 21st century. In this regard, the National Fleet Policy Statement, signed in September 1998 by the Chief of Naval Operations and the Commandant of the Coast Guard, signaled a new era of close collaboration in planning, acquisition, training, and operations.

Maritime Law Enforcement. The Coast Guard is the only federal law enforcement agency with jurisdiction in both U.S. waters and on the high seas, and is the only U.S. Armed Service not constrained by the Posse Comitatus Act. In these arenas, the Coast Guard is the primary enforcer of U.S. laws and treaties that include customs and border control, protection of living marine resources, safeguarding the marine environment, fighting piracy, interdicting illegal immigrants and contraband, counter-drug operations, and helping to stem weapons proliferation. Its counter-drug operations are critical to achieving the goals of the National Drug Control Strategy, which calls for "flexible operations to detect, disrupt, deter, and seize illegal drugs in transit to the United States." General Barry R. McCaffrey, Director, Office of National Drug Control Policy, has warned of the persistent flow of illegal drugs that kills 15,000 Americans and costs the public more than $110 billion each year. From 1992 through 1998, for example, Coast Guard law-enforcement

teams conducted 597 drug-interdiction cases, seizing more than 393,000 pounds of cocaine and nearly 436,000 pounds of marijuana, and arresting 1,043 narco-traffickers. In 1999 alone, the Coast Guard interdicted more than 106,000 pounds of cocaine, keeping some 481 million "hits" with a value of $3.7 billion off America's streets and out of its schools.

Similarly, fisheries enforcement boardings have increased from 9,440 in 1994 to 14,173 in 1998, a critically important factor in helping to rebuild and maintain fish stocks threatened by overfishing. The economic value of these fisheries to America is approximately $24 billion, annually, and the U.S. economic zone holds some 20 percent of the world's commercial fishery resources. And the Coast Guard interdicted nearly 290,000 illegal immigrants from 43 countries between 1980 and 1998. Although illegal migration from Haiti, Cuba, the Dominican Republic, and other Central American countries continues to pose the greatest demand for Coast Guard interdiction assets, in 1998 China became the single greatest source of human trafficking by sea. Intelligence agencies estimated that as many as 20,000 illegal Chinese immigrants attempted to reach America by sea. The Coast Guard's at-sea interdiction operations save more than $15 million each year – the estimated cost of Immigration and Naturalization Service agents apprehending illegal migrants once ashore; the costs-avoided from the interdiction of Haitian refugees alone from 1990 through 1998 have been estimated at nearly $140 million.

Maritime Safety. The Coast Guard is renown worldwide as "America's Guardian of the Seas" – a reputation for personal courage and selflessness that goes back to the earliest days of the Revenue Cutter Service. The National Security Strategy has this role in mind when it states that "the safety of our citizens" is a vital national interest. From 1992 through 1997, Coast Guard search and rescue (SAR) assets conducted 291,094 SAR operations, saving 31,364 people from injury or death, assisting another 624,762 people in non-life-threatening situations, and preventing some $16.8 billion in property losses. With more than 85 percent of U.S. population living near the coasts, oceanborne trade perhaps tripling during the next two decades, a virtual explosion in cruise ship demand, fishing vessels and offshore platforms venturing farther offshore, and a dramatic increase in personal watercraft and recreational boats, the job of ensuring maritime safety and security will become even more challenging. Prevention, founded on expert risk assessments to reduce the probability of mishaps, will be the watchword of the future and advanced technologies will continue to be embraced to increase the probability of success. When lives and property are in jeopardy on the sea, in coastal areas, and in inland waters, the Coast Guard will be "Always There…Always Ready."

Marine Environmental Protection. The Coast Guard's **prevention, enforcement, and response functions** in marine environmental protection help to reduce the amount of pollution entering America's and the world's waterways. Coastal tourism and marine recreation – which in 1997 generated $71 billion to state and local economies, 85 percent of all U.S. tourism-related revenues – demand clean shorelines and marine environments. In response to marine environmental security challenges, and as a world leader in marine environmental protection, the Coast Guard shapes the safety and pollution-control standards for international and domestic maritime transportation. This is especially evident in the areas of Port State Control and the inspection of U.S. and foreign commercial vessels. The Coast Guard's polar ice-breaking fleet supports scientific and environmental investigations in both Arctic and Antarctic regions. The Service's ice-breaking efforts facilitate navigation and prevent flood damage, at a economic value of more than $93 million.

World and coastal shipping will continue to grow, while offshore exploitation of oil and gas resources will continue to expand at ever greater distances from shore and in deeper waters – both trends increasing the need for effective enforcement of laws and regulations. The Coast Guard's prevention of oil spills from all potential sources and activities saves as much as $5.8 billion each year in oil losses, cleanup costs, and environmental damage. When prevention and enforcement fail, however, the Coast Guard maintains a rapid-response capability to contain and recover from pollution incidents such as the massive 1989 Exxon Valdez spill in Prince William Sound, Alaska. Three well-trained and

well-equipped Coast Guard National Strike Teams, located on the East, Gulf, and West Coasts, are at the ready to respond to major oil or other hazardous materials spills in the inland waterways and coastal regions of the United States. In some future crisis, moreover, these Strike Teams may be the nation's "first-responders" to a terrorist attack using chemical, biological, or nuclear weapons in a crowded port or roadstead.

Maritime Mobility. Mindful of its mandate to ensure a safe, efficient, and effective marine transportation system, the Coast Guard is charged with regulating and inspecting commercial and private vessels, licensing merchant mariners, managing waterways, and protecting the security of America's ports. The U.S. marine transportation system encompasses some 13 million Americans employed in domestic shipping-related activities, which includes seafaring and non-seafaring positions related to coastwise and inland waterways operations. It also supports a chain of economic activities that contributes more than $742 billion to America's economy.

The Service's Aids to Navigation Program and Vessel Traffic Services, moreover, help to ensure safe vessel movements, a critical need as global maritime trade is expected to a triple by 2020 and larger numbers of ultra-large, deep-draft, and minimally crewed ships, many carrying hazardous cargoes, will ply U.S. waters and exclusive economic zones. Today, 95 percent of all U.S. overseas trade – in 1998 more than 8,000 foreign-flag vessels called at U.S. ports – and 25 percent of U.S. domestic/intercity trade moves by water. Furthermore, 134 million passengers transit U.S. waters each year in ferries, cruise/tour ships, and gaming vessels; 110,000 commercial fishing vessels harvest waters under U.S. jurisdiction; and millions of Americans and foreign tourists use 16 million recreational craft and frequent thousands of miles of U.S. beaches. In the not-too-distant future, cruise ships carrying 6,000 or more people will head for evermore remote areas. Fewer "mega-ports" along U.S. coasts will serve greater numbers of ships, while smaller "feeder ports" will contribute to burgeoning vessel densities in offshore areas – all of which will increase the requirement for effective vessel identification and tracking. Additionally, U.S. military strategy and operations will depend upon efficient inland waterways and multimodal transport nodes, safe ports, and secure sealift for some 95 percent of material sent to overseas conflicts.

Thus, **maritime security is the Coast Guard's unique contribution to U.S. national security** in the inland waterways and maritime domains. It embraces all elements of the cultural, social, environmental, economic, political, diplomatic, and military dimensions that today shape America's national security strategy, policies, and programs of global engagement. Indeed, maritime security begins at America's inland waterways and river transport systems that channel commerce to and from the rest of the world. And it encompasses roles, missions, and tasks that seek to safeguard U.S. citizens, interests, and friends increasingly at risk from a broad spectrum of threats and challenges.

A military, multimission, maritime service, the Coast Guard provides singular, non-redundant, and complementary capabilities to protect America's maritime security interests. As America's Guardian of the Seas and the only U.S. Armed Service with broad law enforcement authority, the **Coast Guard truly is a unique instrument of U.S. national security.**

E. Maritime Areas of Concern to the Deepwater Project

The **Arctic Ocean** is by far the smallest of the Earth's oceans; the deepest sounding obtained in Arctic waters is 18,050 feet, but the average depth is only 3,240 feet. All Arctic waters are cold. The Arctic water from the surface to a depth of 650 feet is the most variable because of the continual freezing and thawing cycle and because of additions of fresh water from rivers and from precipitation. Warmer Atlantic water underlies this layer to a depth of about 3,000 feet. Bottom water extends to the ocean floor; it is somewhat colder but similar in salinity. An inflow of Pacific water of warmer temperature and greater salinity may be observed in the Chukchi Sea, flowing as a wedge between the Arctic and Atlantic waters. Between about 60 N and 75 N the occurrence of sea ice is seasonal; above 75 N it is relatively permanent.

The **Bering Sea** may be divided into two nearly equal parts: a relatively shallow area along the continental and insular shelves in the north and east and a much deeper area in the southwest. In the shelf area, which is an enormous underwater plain, the depths are, in most cases, less than 500 feet. The deep part in the southwestern portion of the sea is also a plain, lying at depths of 12,000 to 13,000 feet and divided by separate ridges into three basins: the larger Aleutian Basin to the north and east, the Bowers Basin to the south, and the Komandor Basin to the west. The sea's deepest point, 13,442 feet, is in the Bowers Basin. Although the Bering Sea is situated in the same latitude as Great Britain, its climate is much more severe. The southern and western parts are characterized by cool, rainy summers with frequent fogs and comparatively warm, snowy winters. Winters are extreme in the northern and eastern portions, with temperatures of -31 to -49 F and high winds. The summers in the north and east are cool, with comparatively low precipitation.

The **Pacific Ocean** extends the length of the Americas' western coast, the narrow Bering Strait separates it from Russia and Asia to the northwest, the Arctic Ocean and several of the continent's major islands lie to the north. The Pacific occupies about one-third of the surface of the Earth and is by far the largest of the world's oceans. Its area, excluding adjacent seas, encompasses approximately 63.8 million square miles. It has twice the area and more than twice the water volume of the Atlantic – the next-largest ocean. Its area exceeds that of the whole land surface of the globe, Antarctica included. The mean depth of the Pacific (excluding adjacent seas) is 14,040 feet. The Pacific and Arctic systems mingle their waters in the Northern Hemisphere at the shallow Bering Strait. Except for its extreme northern and southern sections, which are characterized by fjords and numerous off-lying islands, and except for the deeply indented Gulf of California, the coastal boundary is relatively regular and the continental shelf narrow.

The **Atlantic Ocean** and its marginal seas constitute the world's second largest ocean after the Pacific and have an area of 41.1 million square miles; the Atlantic proper has an area of 31,830,000 square miles. The average depth (with marginal seas) of 10,925 feet is somewhat less than that of the Pacific and Indian Oceans because of extensive continental shelves in the north and the shallowness of the marginal seas. These seas include the Baltic, North, Black, and Mediterranean seas to the east and Baffin Bay, Hudson Bay, the Gulf of St. Lawrence, the Gulf of Mexico, and the Caribbean Sea to the west.

The **Gulf of Mexico** is a partially landlocked body of water on the southeastern periphery of the North American continent. To the northwest, north, and northeast it is bounded by the southern coast of the United States, while to the west, south, and southeast it is bounded by the east coast of Mexico. It is connected to the Atlantic Ocean by the Florida Strait, running between the peninsula of Florida and the island of Cuba, and to the Caribbean Sea by the Yucatán Channel, which runs between the Yucatán Peninsula and Cuba. Both these channels are about 100 miles wide. The Gulf's greatest east-west and north-south extent are approximately 1,100 and 800 miles, respectively, and it covers an area of some 600,000 square miles.

The **Caribbean Sea** is a partially landblocked body of water, roughly situated between 10 degrees North/64 degrees West and 23 degrees North/85 degrees West. It is bounded by the east coasts of Mexico (Yucatán Peninsula), Belize, Guatemala, Honduras, Nicaragua, and Costa Rica; the northern coastlines of Panama, Colombia, Venezuela, and Trinidad and Tobago; and is ringed to the north and east by Cuba, Haiti and the Dominican Republic, Puerto Rico, the U.S. and British Virgin Islands, and the Leeward and Windward Islands chains. It is approximately 1.063 million square miles in area, and the maximum depth is 25,200 feet.

F. Design and Operational Characteristics of Coast Guard Deepwater Cutters and Aircraft

F-1. Cutter Operating Characteristics

CLASS	Secretary	Famous	Reliance	Mature (230)	Mature (213)	Mature (282)	Island (A &B)	Island (C)
Class Type	WHEC	WMEC	WMEC	WMEC	WMEC	WMEC	WPB	WPB
LOA (ft.)	378' 4.5"	270	210	230	213	282	110	110
Beam (ft.)	42	38	34	43	41	50	21' 1"	21' 1"
Draft (ft.)	18' 9.25"	14	10.5	15	15	15	7' 3" (A) 7' 1" (B)	7' 3"
Masthead Height (ft.)	113	91	72.4	90	90	104	43	43
Displacement 3,340 **(tons)**	1,820	1,020	1,920	1,750	2,929	162 (A)	154 (B)	152
Propellers	2	2	2	1	2	2	2	2
Propulsion Type	CODOG	Diesel	Diesel	Diesel/ Electric	Diesel/ Electric	Diesel	Diesel	Diesel
Engines	2 Fairbanks-Morse 38TD8 1/8 diesels, 2 Pratt & Whitney FT4 gas turbines	2 Alco 18V-251E diesels	2 Alco 16V -251B diesels Electric Drive	3 Fairbanks-Morse 38D diesels, GSB-8 Electric Drive	4 Cooper-Bessemer diesels,	4 Caterpillar 3516 diesels RP200-1	2 Alco-Paxman Valenta 16 CM diesels	2 Caterpillar 3516 diesels
Horsepower	7,254/36,000	7,290	5,000	UA	UA	UA	5,760	5,460
Officers	19	14	12	10	9	7	2	2
Enlisted	147	86	65	68	66	92	14	14
Flight Deck Capability	HH-65/HH-60	HH-65 HH-60 (B only)	HH-65	None	None	HH-65	None	None
Fuel Capacity (gallons)	212,665	79,875	48,645	82,500	75,000	210,300	9,306 (A) 10,382 (B)	10,382
Maximum Range	14,000 nm @ 11 kts	9,900 nm @ 12 kts	6,100 nm @ 13 kts	UA	UA	UA	3,300 nm @ 13 kts (A) 2,960 nm @ 13 kts	3,500 nm @ 10 kts
Stores Endurance (days)	45	21	21	21	21	25	5	5
Maximum Speed (knots)	29	19.5	18	14	15	18	29.5	26
Cruising Speed (knots)	19	15	14	UA	UA	UA	UA	UA
Maximum Continuous Speed (knots)	24	19	17	10	14	16	26	26
Economic Speed (knots)	**11**	12	13	8	10	13	13	10
RHIB	1	1	1	1	1	2	1	1
MSB	1	1	1	1	1	0	0	0
Personnel Evacuees	500	450	325	UA	UA	UA	150	150
Additional Personnel Support	25	9	9	UA	UA	UA	2	2

UA – Unavailable
Source: U.S. Coast Guard (G-ADW), September 1999.

F-2. Aircraft Operating Characteristics

Class Name	HC-130	HU-25 (A)	HU-25 (B)	HU-25 (C)	C-20B	HH-60J	HH-65A
Manufacturer	Lockheed	Falcon Jet	Falcon Jet	Falcon Jet	Gulfstream	Sikorsky	Aerospatiale
Wing Span/Rotor Diameter	132' 7"	54'	54'	54'	77' 10"	54'	39' 2"
Height	38' 3"	18'	18'	18'	24' 6"	17'	13'
Length	97' 9"	56'	56'	56'	83'	65'	44' 5"
Wing Area (sq ft)	1,734	450	450	450	UA		
Max GrossWeight (lbs)	175,000	32,000	32,000	33,510	70,200	21,884	9,200
Empty Weight (lbs)	76,780	25,500	25,500	19,000	40,400	14,500	6,092
Number Engines	4	2	2	2	2	2	2
Propulsion Type	Allison T56-A15 Turboprop	Garrett ATF3-6-2C Turbofan	Garrett ATF3-6-2C Turbofan	Garrett ATF3-6-2C Turbofan	Rolls Royce Spey 511-8 Turbofan	General Electric T700-401C Gas Turbines	Lycoming LTS-101-750B-2 Gas Turbines
Fuel Capacity (lbs)	62,900	10,431	10,431	10,431	28,300	6,460	1,900
Max Endurance (hrs)	14	5.45	5.45	5.45	8	7	3.5
Max Speed (kts)	330	450	450	450	501	180	165
Cruising Speed (kts)	290	410	410	410	459	140	120
Economical Speed (kts)	248	250	250	250	442	127	120
Max Range (nm)	4,500	1,940	1,940	1,940	3,691	700	300
Radius of Action (nm)	1,600	800	800	800	3,000	300	150
Service Ceiling (ft) (hover)	33,000	41,000 +	41,000 +	41,000 +	45,000	5,000 (hover)	7,510
Take-Off Power (hp)	4 x 4,508 shp	2 x 5,440 lbs thrust	2 x 5,440 lbs thrust	2 x 5,440 lbs thrust	2 x 11,400 lbs thrust	2 x 1,662 shp	2 x 680 shp
Sea Level Climb (fpm)	2,570	UA	UA	UA	3,000	576	UA
Number Officers	2	2	2	2	2	2	2
Number Enlisted	5	3	3	3 or 5	2	2	3
Number Operational	26	9	3	8	1	35	80
Storage or Support	4	16	4	1	0	7	14
Total Airframes	30	25	7	9	1	42	94
Programmed Flight(hrs)	22,400	7,200	2,400	6,400	500	24,920	48,000
Cargo Sling Capacity						6,000 lbs	2,000 lbs
Rescue Hoist Capacity	UA	600 lbs					

UA – Unavailable
Source: U.S. Coast Guard (G-ADW), September 1999.

G. Integrated Deepwater System Project Industry Teams, Phase 1

Avondale Industries, Inc.

Newport News Shipbuilding

Boeing-McDonnell Douglas Corporation

John J. McMullen & Associates, Inc.

DAI, Inc.

Raytheon Systems Company

Science Applications International Corporation

Marinette Marine Corporation

Sikorsky Aircraft Corporation

Soza & Company, Ltd.

Bath Iron Works

CTM Automated Systems

AMSEC

Fuentez Systems Concepts, Inc.

Gibbs & Cox, Inc.

Interactive Television Corporation

Clark Atlanta University

Lockheed Martin Government Electronic Systems

Ingalls Shipbuilding, Litton PRC, M. Rosenblatt & Son, Sperry Marine, Inc., Litton Data Systems,University of New Orleans

Halter Marine

Bollinger Shipyards Inc.

Bell Helicopter Textron

Lockheed Martin Information Systems

Lockheed Martin Radar & Surveillance Systems

Lockheed Martin Sanders

Lockheed Martin Aeronautical Systems

Lockheed Martin Federal Systems

Lockheed Martin Management and Data Systems

LOGICON Syscon

L-3 Communications, Inc.

PROSOFT

H. Glossary

ADW.....USCG Deepwater Acquisition Project Office
AMIO.....Alien Migrant Interception Operation
AOR.....Area of Responsibility
APF.....Afloat Prepositioning Force
ASCM .....Anti-Ship Cruise Missile
ASW.....Anti-Submarine Warfare
ATON.....Aids to Navigation
C3.....Command, Control, and Communications
C4ISR.....Command, Control, Communications, Computers, IntelligenceSurveillance, and Reconnaissance
CG/CGN.....guided missile cruiser/nuclear-powered guided missile cruiser
CinC.....Commander-in-Chief
CNO.....Chief of Naval Operations (U.S. Navy)
COTS.....Commercial Off-The-Shelf
CV/CVN.....aircraft carrier/nuclear-powered aircraft carrier
DEA .....Drug Enforcement Agency
DER.....radar picket destroyer escort
DGPS.....Differential Global Positioning System
DoD.....Department of Defense
DoT.....Department of Transportation
DD-21.....Land-Attack Destroyer for the 21st Century (U.S. Navy program)
DDG.....guided missile destroyer
DIO.....Defence Intelligence Organization (Australia)
DIS.....Defence Intelligence Service (United Kingdom)
DP.....dual-purpose
EEZ.....Exclusive Economic Zone
ELT.....Enforcement Laws and Treaties
EO.....electro-optical
FAO.....Food and Agriculture Organization (United Nations)
FBI.....Federal Bureau of Investigation
FEMA.....Federal Emergency Management Agency
FF.....frigate
FFG.....guided missile frigate
FLAR.....Forward-Looking Airborne Radar
FLIR.....Forward-Looking Infrared sensor
FMS.....Foreign Military Sales
FRAM .....Fleet Rehabilitation and Modernization
GCCS.....Global Command and Control System
GDP.....Gross Domestic Product
GOTS.....Government Off-The-Shelf
GPS.....Global Positioning System
IALA.....International Association of Lighthouse Authorities
ICC.....Intelligence Coordination Center (U.S. Coast Guard)
IEC.....International Electro-Technical Commission
IDS.....Integrated Deepwater Systems
IMB.....International Maritime Bureau
IMO.....International Maritime Organization (United Nations)
IPO.....International Programs Office (Department of the Navy)
IR.....InfraRed

ITU .....International Telecommunications Union
J5.....Director of Plans and Policies, Joint Staff
JLENS.....Joint Land-attack cruise missile defense Elevated Netted Sensor
JTIDS.....Joint Tactical Information Distribution System
JV2010.....*Joint Vision 2010* publication
LAMPS.....Light Airborne Multi-Purpose System (helicopter)
LHD.....Landing Helicopter Dock (amphibious assault ship)
LNG.....Liquified Natural Gas
LORAN.....Long-Range Navigation system
LRR.....Long-Range Rescue and Recovery
LRS.....Long-Range Search
MarAD.....Maritime Administration
MDZ.....Maritime Defense Zone
MEY .....Maximum Economic Yield
MIO.....Maritime Intercept Operations
MPS.....Maritime Prepositioning Ships
MRR.....Medium-Range Rescue and Recovery
MRS.....Medium-Range Search
MSY .....Maximum Sustainable Yield
MLE.....Maritime Law Enforcement
mmt.....millions of metric tons
MTS .....Marine Transportation System
MTW .....Major Theater War
MV.....Motor Vessel
N6.....Director, Space Information Warfare, Command and Control (U.S. Navy)
NAFTO.....North Atlantic Free Trade Organization
NATO .....North Atlantic Treaty Organization
NBC.....Nuclear, Biological, Chemical weapons
NGFS.....Naval Gun Fire Support
NGO.....Non-Governmental Organization
nm.....nautical mile
NMFS.....National Marine Fisheries Service
OC .....USCG Operational Capabilities Directorate
OPL.....USCG Office of Law Enforcement
ONDCP.....Office of National Drug Control Policy
ONI.....Office of Naval Intelligence (U.S. Navy)
OOTW .....Operations Other than War
OPA.....Oil Pollution Act
OPV.....offshore patrol vessel
OTEC .....Ocean Thermal Energy Conversion
PAWSS .....Ports and Waterways Safety Program
PME.....Peacetime Military Engagement
POSD.....Port Operations/Security and Defense
PRC .....People's Republic of China
PVO .....Private Volunteer Organization
QDR .....Quadrennial Defense Review
R&D.....Research and Development
RVN.....Republic of Vietnam
SAR .....Search and Rescue, also Synthetic Aperture Radar
Semper Paratus.....Always Prepared (U.S. Coast Guard motto)
SLAR.....Side-Looking Airborne Radar

SNO.....Statement of No Objection
SOLAS .....Safety of Life at Sea convention
SOUTHCOM.....U.S. Southern Command
SPS.....Systems Performance Specifications
SRR.....Short-Range Rescue and Recovery
SSC.....Smaller-Scale Contingencies
TACTASS.....Tactical Towed-Array Sonar System
TEU .....Twenty-foot Equivalent Units
UN.....United Nations
USAID.....U.S. Agency for International Development
USC.....U.S. Code
USCG.....U.S. Coast Guard
USCGC.....U.S. Coast Guard Cutter
USMC.....U.S. Marine Corps
USN.....U.S. Navy
VTIS.....Vessel Traffic Information System
VTOL.....Vertical Take-Off or Landing (aircraft)
WAGB.....USCG icebreaker
WAGC.....USCG amphibious command ship
WMD.....Weapons of Mass Destruction (nuclear, chemical, biological)
WPG.....USCG patrol boat
WHEC.....USCG high-endurance cutter
WHO.....World Health Organization
WLB.....USCG buoy tender
WMEC.....USCG medium-endurance cutter