

SCANNING THE HORIZON: COAST GUARD STRATEGY IN A HOT, FLAT, CROWDED WORLD

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USAWC STRATEGY RESEARCH PROJECT

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Current trends portend a future with significant new challenges and opportunities for the U.S. Coast Guard. This paper examines some of the likely global future trends, discusses their impacts on the maritime domain, and analyzes the Coast Guard's broad strategic plans to determine whether the service is ready for changes it may face. Global warming, global trade, population growth, and the continuing threat from terrorism will affect many mission areas. After reviewing the Coast Guard's traditional roles and missions, the paper discusses the maritime consequences from these trends including a warmer Arctic climate with reduced ice coverage, depleted fisheries, increases in the volume of maritime shipping, threats to maritime homeland security and additional offshore drilling for energy resources. The paper evaluates the Coast Guard's strategic guidance to determine whether it provides sound direction to prepare for changes in the operating environment. Finally, the paper provides a summary and recommendations to improve the Coast Guard's strategic posture.

SCANNING THE HORIZON: COAST GUARD STRATEGY IN A HOT, FLAT, CROWDED WORLD

As experienced mariners know, “forehandedness and prudence are essential qualities of good seamanship.”¹ A skilled sailor uses all means to anticipate risks and takes positive action in ample time in order to avoid hazards.² A vigilant ship’s watch must not only keep a sharp lookout while scanning the physical horizon but also must attempt to see into the future to predict changes in the weather, traffic density, conditions of visibility, navigational hazards, and the state of their own vessel and crew. When conditions are likely to change, the watch must alert the captain and lay out plans that prepare the ship to complete its voyage safely.

Thinking ahead, developing alternatives and implementing well-reasoned plans are characteristics common to not only bridge watches and shipboard captains, but to “captains” and senior leaders in other organizations as well. Effective strategic leaders must use analysis and imagination to anticipate future conditions. They must monitor the status of their organizations and environment while skillfully applying techniques such as futuring and environmental scanning to identify trends and scenarios that might influence their success.³ Once such trends are identified, leaders must decide upon strategies to prepare for upcoming opportunities and challenges.

The Coast Guard’s motto is *Semper Paratus*, “Always Ready.” In an effort to assist the service in charting a prudent strategic course for first half of the twenty-first century, this paper will look into the future to discern likely trends and evaluate strategic plans to determine whether the Coast Guard is ready for opportunities and challenges it may face. First, the paper will provide information on Coast Guard roles and missions

as a foundation for the discussion. Next, the paper will address dominant drivers that may influence the global environment in the near future. It will relate these trends to impacts on the maritime environment. It will also discuss the impacts in terms of Coast Guard missions and responsibilities, examining the service's strategies to discern how leadership plans to deal with these changes. Finally, it will recommend improvements to best position the service for the future.⁴

Coast Guard Missions

The Coast Guard is truly a multi-mission organization, carrying out a broad array of duties related to the maritime realm. The service came to its current structure through a uniting of maritime related federal organizations and functions including merger of the Revenue Cutter Service and the U.S. Lifesaving Service in 1915 creating the Coast Guard, integration of the Lighthouse Service in 1939, and incorporation of Steamboat Inspection Service in 1946. Following September 11, 2001, the service was transferred from the Department of Transportation to the newly created Department of Homeland Security and it developed a more robust approach for maritime homeland security. This amalgamation and evolution of duties has resulted in a flexible, adaptive and agile organization with a military, maritime and multi-mission character.⁵

The Homeland Security Act of 2002 grouped the myriad Coast Guard duties under eleven distinct missions.⁶ In *Coast Guard Publication 1*, the service further organizes these missions under three overarching roles.⁷ Under the category of maritime safety, the Coast Guard includes two of its most publicly recognized missions, search and rescue and marine safety. The Coast Guard is designated Search and Rescue Coordinator for U.S. maritime search and rescue regions.⁸ It directs organic units, vessels and aircraft and integrates efforts with other federal, state and local

responders to help mariners in distress. Additionally, it coordinates with the merchant fleet to affect rescues worldwide and works with numerous national and international organizations to ensure comprehensive search and rescue planning, preparedness and response.⁹ The Coast Guard's marine safety role includes efforts to keep boating and waterways safe. The Coast Guard develops standards and regulations, reviews and approves safety plans, completes inspections of facilities and vessels, and liaises with the International Maritime Organization. When a maritime accident occurs, the Coast Guard investigates to determine the causes and to ascertain if laws have been violated or regulations need to be changed, often working in conjunction with the National Transportation Safety Board and state maritime agencies.¹⁰

Under the role of maritime security, the Coast Guard performs missions of drug interdiction, migrant interdiction, defense readiness, and ports and waterways coastal security. The Coast Guard preserves the integrity of the U.S. maritime border, defending America from the pervasive inflow of illegal drugs and intercepting, ensuring the safety of, and properly processing those who try to reach this country illegally by crossing the water. Since its inception, the Coast Guard has played an important role in national defense, working closely with the Navy in times of armed conflict. The service has also always been assigned authorities and duties related to increasing the security of ports, waterways and the nation's coast. Following the attacks of September 11, 2001, these authorities were strengthened and the mission further emphasized.¹¹

Under the role of maritime stewardship, the Coast Guard performs missions of living marine resources, marine environmental protection, other law enforcement, aids to navigation and ice operations. Working closely with other federal and state agencies,

the Coast Guard “enforces marine resource management and protection” to provide for the viability of living marine resources.¹² The service protects the marine environment to preserve the larger marine ecosystem, enforces pollution and discharge laws, and spearheads preparation for and response to pollution incidents. The Coast Guard works to provide for safe and efficient vessel transits and ensures the accuracy and integrity of systems and markers that aid navigation. The Coast Guard also conducts icebreaking. On the Great Lakes and coastal waters, cutters keep ice-bound waterways open for vessel traffic during winter months. To further U.S. interests in the Arctic and Antarctic, the service operates the nation’s polar icebreakers.¹³

Dominant Global Trends

Population and Demographic Trends. In his book *Hot, Flat, and Crowded*, Thomas Friedman highlights the overwhelming impact that the world’s increasing human population and growing middle class are having on the earth’s resources. As the population multiplies overall, and more importantly, as a higher percentage of the world’s population increases its wealth and thus consumes more, the pressures on ecosystems are expanding dramatically.¹⁴ The United Nations projects the world population to increase from a current level of 6.8 billion people to between 8 and 10.5 billion people in the year 2050.¹⁵ Although these population increases are not nearly as dramatic as some previous predictions, and in fact, reflect a stabilization of the total world population by mid-century, the growth still represents an 18 to 54 percent increase on top of a population that is already straining natural resources. Much more critical and germane to the future is the socioeconomic dimension of a growing economic prosperity in very populous and previously rural countries. The middle class in less developed countries is the fastest growing segment of the world’s population. In

China, the middle class is expected to grow by 600 million people, twice the population of the United States. India is expected to multiply the number of middle class members by a factor of ten.¹⁶ In total, the middle class is expected to comprise 52 percent of the world's population by the year 2020 from approximately 30 percent currently.¹⁷ Of course, the rising wealth throughout the world can be considered a very positive development in terms of alleviating poverty, providing opportunity and improving quality of life for specific regions. However, as the population grows overall and as the portion of the population with increased income grows as well, pressures on resources including energy and food will continue to expand dramatically.¹⁸

Global Warming. According to the 2007 Intergovernmental Report on Climate Change, of the twelve years from 1995 to 2006, eleven were among the warmest since instrumental recording of global surface temperatures began in 1850. The linear trend of temperature increase over the last 50 years is between .10 and .16 degrees Celsius per year and is twice that of the preceding century.¹⁹ The report notes that average temperatures in the Northern Hemisphere during the second half of the twentieth century “were very likely higher than during any other 50 year period in the last 500 years and likely the highest in the past 1,300 years.”²⁰ It states that the concentrations of greenhouse gasses produced by human activity have increased significantly since 1750 and “far exceed pre-industrial levels”, and that, “most of the observed increase in the global average temperatures in the mid-twentieth century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations.”²¹ Regardless of discussion about the causal factors behind global warming trends, the increase in the earth's surface temperatures worldwide is projected to have far-reaching effects on all

aspects of the environment including the oceans. The Arctic region, as will be discussed in detail later in the paper, is undergoing dramatic change.

Global Trade. The increasing interconnectedness of business and trade is a significant trend of recent decades. Advantages gained from the abundance of natural resources in one country, lower cost production and manufacturing in others and consumer markets worldwide have driven increases in all types of transportation and shipment of raw materials, goods and services. From 2000 to 2008, world merchandise trade grew by an average of over 12 percent per year.²² However, the downturn in the worldwide economy at the end of 2008 caused global trade to contract and merchandise trade actually had negative growth rates in the last quarter of that year and the first quarter of 2009.²³ With the vast majority of global trade carried by sea, increases or decreases in economic activity have a significant impact on the Coast Guard's regulatory and security missions related to shipping.²⁴

Terrorism. The terrorist attacks of September 11, 2001, provided the realization that violent extremists opposed to the values of the United States are a significant threat to national security. As this act of terror decisively demonstrated, in the globalized, technologically infused and interconnected world of the 21st century, a relatively small, hostile group intent on doing harm can obtain the resources and coordinate a network to effectively attack a state from thousands of miles away. Without the right policies and a focused and intensive effort, our nation is vulnerable.

Terrorism has been used as a tactic throughout history. However, many theories about the current terrorist threat differentiate this movement from those that came previously and point to a wider and more prolonged conflict. The impacts of

globalization and the availability of technological advancements help radical extremists spread their message to a receptive audience. Technology also facilitates their ability to establish and manage a far-flung network of terrorist cells and provides them the capacity to carry out deadly attacks more effectively.

In *How Globalization Spurs Terrorism*, Fathali Moghaddam uses the term “fractured globalization” to discuss the strain that globalization is placing on social and moral dimensions of the Muslim world. He discusses the “enormous contradictions, inequalities, and conflicts” resulting from globalization and points out how these impacts are feeding Islamic fundamentalism and terrorism.²⁵ The 9/11 Commission Report notes that “because the Muslim world has fallen behind the West politically, economically, and militarily for the past three centuries,” the message of radical Islamic extremists is able to influence disaffected Muslims. The report also highlights the shift of terrorism from an international to a transnational threat and the significant impact that a geographically distant organization can achieve in the 21st century. It highlights that resolving the underlying drivers for the enmity of radicalized Muslims will take decades.²⁶ Kurt Campbell and Michele Flournoy also analyze the “changing face of terrorism.” They assert that modern terrorists are distinct from previous groups as evidenced by their goals, technology, public relations, financial methods, and “the combination of network structure and ideological cohesiveness.” They indicate that these factors point toward an intractable problem for 21st century democracies.²⁷ With expanding globalization, with technological capability becoming cheaper and more accessible, and with no immediate resolution readily apparent for conditions that underlie the terrorists’

frustration and anger, the threat from terrorism to the security of the United States will be a central concern for years to come.

Maritime Impacts

Growth and consumption trends of the world's population, warming of the earth's temperatures, reliance of the global economy on shipping, and terrorism will have significant impact on many aspects of the maritime domain.

Increased Maritime Activity in the Arctic. The Arctic region, specifically defined as the land and sea above the Arctic Circle at sixty-six degrees, thirty-three minutes, thirty-nine seconds north latitude, is composed of “a vast ocean surrounded by land, in contrast to the southern polar regions in which an ice-covered continent is surrounded by ocean.”²⁸ One of the Arctic's key features is the snow and ice that covers much of the sea and land surface.²⁹ Evidence indicates that the Arctic is particularly susceptible to climate change. In the last few decades, average temperatures in the Arctic have risen at almost twice as fast a rate as temperatures worldwide.³⁰ One explanation for the Arctic's susceptibility to climate change is, in a cyclical phenomenon, as ice coverage decreases, the sunlight reflective characteristics of the ice and snow changes to the dark and heat absorptive water surface. The shallower atmosphere toward the poles decreases the volume of air that must be warmed to cause the surface to begin warming. In addition, the heat absorbed by the ocean in the summer is more readily transferred to the atmosphere in the winter.³¹ As Figure 1 illustrates, analysis from the 1950's onward indicates that there is a significant decrease in the extent of Arctic ice coverage. Satellite data shows that since 1979, winter Arctic ice extent has decreased approximately 4.2 percent per decade. Similarly, average sea ice thickness and the amount and age of older multi-year sea ice have decreased dramatically as well.

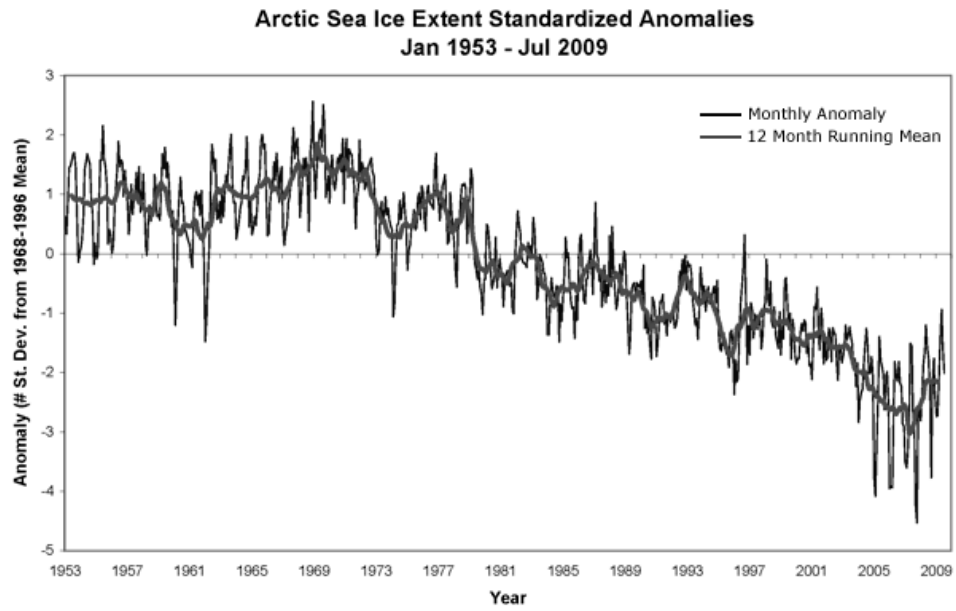


Figure 1: Annual Extent of Arctic Sea Ice³²

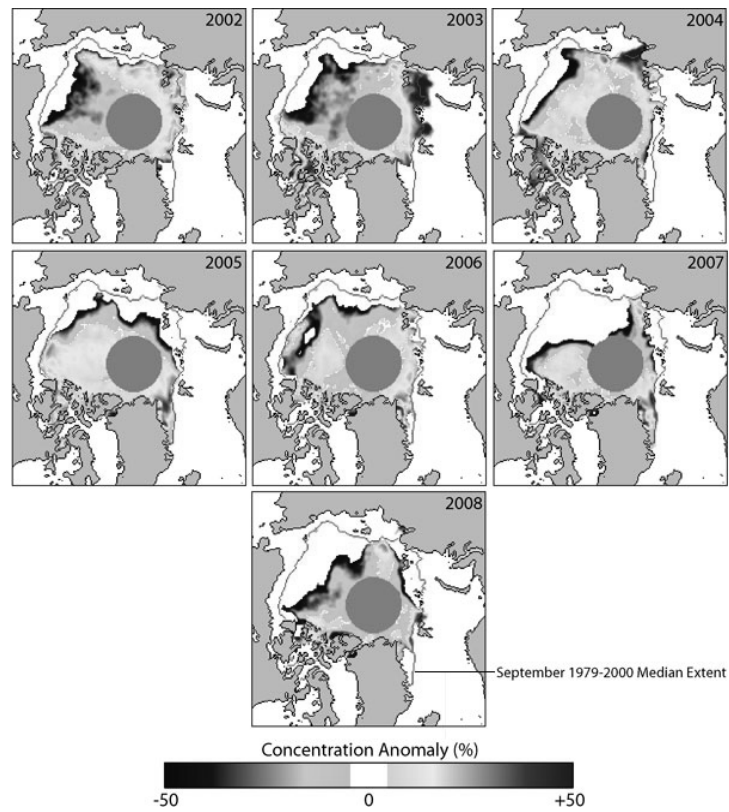


Figure 2: Annual Extent of Ice Coverage vs. Median from 1979-2000³³

Figure 2 displays yearly Arctic sea ice extent. The yearly comparison shows that for 2002 through 2008, the September ice extent never reached the mean for 1979 through 2000, and that the extent tended to decrease over time. August 2007 marked the record year for the least amount of sea ice extent recorded. Although the ice extent levels in 2008 and 2009 were above that of 2007, they were still well below the average for 1979 to 2000, and were the second and third lowest levels of ice extent on record.

As a substantially larger segment of the Arctic waters become free from ice, countries will gain access to additional natural resources. In accordance with the United Nations Convention on the Law of the Sea (UNCLOS), a coastal state can claim an exclusive economic zone extending up to 200 miles from its coastal “baseline”. The state has “sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the waters superjacent to the seabed and of the seabed and its subsoil.”³⁴ Further, if a country’s continental shelf extends under water greater than 200 miles offshore, the country can claim exclusive economic rights up to the extent of the shelf to a maximum of 350 miles offshore.³⁵

The U.S. Geological Survey estimates that there are 90 billion barrels of oil, 1,670 trillion cubic feet of natural gas and 44 billion barrels of recoverable natural gas liquids north of the Arctic Circle. These figures amount to approximately 22 percent of undiscovered, technically recoverable resources in the world.³⁶ If the long-term decrease in sea ice continues, more of these petroleum resources will be accessible through offshore drilling. The decrease in sea ice will also make maritime conveyance of recovered resources more feasible. Overland transport might be negatively affected,

as previously ice covered or frozen areas thaw, resulting in degraded roads and shore side transportation infrastructure.³⁷ An increase in offshore drilling and transport of petroleum products by sea would greatly impact the Coast Guard's maritime environmental protection in the region.

Access to living marine resources will also be increased. The Gulf of Alaska and the Bering Sea are the most productive U.S. fishing grounds. As of December 3, 2009, commercial fishing is prohibited in large portions of Arctic waters of the United States, but as other fisheries decline and as the ice further recedes in the summer, pressure to revise these regulations may increase.³⁸ Commercial fishing in the Arctic would have to be regulated and would result in an increase of mariners in distress, as fishing in general, and particularly in the northern climes, is one of the most dangerous jobs in the world.³⁹ Decreasing ice coverage will also impact many Arctic species including polar bears, seals, seabirds, and land animals that use ice for migration. If species became more vulnerable, the federal government will play a role in monitoring their well being and in trying to mitigate the damage. These developments will require the Coast Guard to provide more focused presence in the region to carry out missions of living marine resources, law enforcement related to fisheries, and search and rescue.

If dramatic ice reductions continue, trans-Arctic shipping routes such as the Northwest Passage through the channels between northern Canadian islands and Greenland, and the Northern Sea Route above continental Russia, may become more viable for regular use by commercial traffic. Opening of these routes would decrease transit distances between some key ports by thousands of miles and result in significant savings in time and energy for shippers. For example, a ship sailing from New York to

Tokyo would save 2,600 miles using the Northwest Passage versus a route through the Panama Canal. Similarly, the shipping route from London to Tokyo is approximately 5,000 miles shorter using the Northern Sea Route than the Suez Canal.⁴⁰ Opening of Arctic routes might also allow for passage of supertankers and other ships with larger beams that cannot transit through the Panama Canal.⁴¹ Increased shipping would require greater regulatory activity and would increase the risk of maritime accidents and pollution in the area. If merchant vessels pushed the limits to maximize profitability, they could become beset early or late in the season or when operating too close to ice covered areas. Increased shipping in the Arctic would require increased regulation and monitoring by the Coast Guard, as well as increased icebreaking capability for the area.

The improved accessibility will also result in a more active military maritime presence as countries seek to project power to expand influence in the region. Historically, there has been debate among countries about how to apply maritime law and state sovereignty to Arctic waters. With the prospect of the region becoming more accessible for shipping and natural resource exploitation, discussions have become more vociferous.⁴² For example, Russia and Canada have both stated that the Lomonosov Ridge on the Arctic sea floor is an extension of their respective continental shelves, which would expand their territorial claim to resources.⁴³ A Russian submarine took the symbolic step of planting a flag on the ridge in 2007.⁴⁴ Canada claims the Northwest Passage as internal waters whereas the United States asserts it is an international strait.⁴⁵

Many countries including the United States, Russia and Canada have historically carried out military exercises in the region, and they will continue to do so as national

interests become increasingly apparent. Scandinavian countries have announced plans to establish their own military bloc. In 2008, the United States carried out a twelve-day military exercise called Northern Edge.⁴⁶ In 2009, the United States conducted Ice Exercise 2009, testing submarine operability and war-fighting capability in the Arctic.⁴⁷ To continue to support the U.S. military presence, vessels need to be designed to be able to safely transit through ice-choked waters. Some will need to be capable of ice breaking operations including conducting escorts for other, less capable vessels.

Depleted Fisheries. As the global population has increased, pressures on fisheries and other seafood stocks have multiplied, with dramatic consequences. The U.S. Commission on Open Ocean Policy states that an estimated one billion people “rely on fish as their primary source of animal protein.”⁴⁸ As of 2008, the National Marine Fisheries Service determined that 46 U.S. fish stocks were overfished.⁴⁹ In 2006, the Food and Agriculture Organization (FAO) of the United Nations reported, “of the nearly 600 species groups it monitors, 52 percent are fully exploited while 25 percent are overexploited, depleted or recovering from depletion.”⁵⁰ Other researchers concur, estimating that as of 2003, 24 percent of “the world’s fished biodiversity” was overexploited or depleted, and that this figure had increased dramatically from just 10 percent in 1974.⁵¹

The need for seafood to provide high quality protein to the world will drive several trends. First, with increasing economic gain to be realized, illegal fishing including overfishing, illegal exploitation of regulated species, and fishing in violation of treaties and recognized national limits will continue to occur. The FAO indicates, “illegal, unreported and unregulated fishing worldwide appears to be increasing as fishermen

seek to avoid stricter rules in many places in response to shrinking catches and declining fish stocks.”⁵² The United States will need to protect its valuable fishing resources through proactive management and maritime enforcement. Second, the enormous increase in aquaculture will continue. As the National Oceanographic and Atmospheric Administration reports, “aquaculture is the fastest growing form of food production in the world”.⁵³ Aquaculture currently provides nearly half of the world’s fish for consumption.⁵⁴ With the increase in farming of seafood, new and innovative methods including offshore fish farming will become more prevalent as demand drives their profitability. Increases in coastal and blue water fish farming will require more maritime regulation and law enforcement presence.

Increased Maritime Shipping. The International Maritime Organization estimates that more than 90 percent of the world’s global trade is carried by maritime shipping.⁵⁵ The Coast Guard’s regulatory and security oversight role is closely tied to the volume of shipping traffic. Recent expansions and contractions of the globalized economy have resulted in significant fluctuations in maritime shipping traffic. As globalization expanded and the world economy prospered from 2002 through 2008, maritime shipping grew steadily as well including a 4.8 percent increase in 2007 resulting in a record figure of over eight billion tons of goods loaded for shipment.⁵⁶ However, the contraction in the world economy at the end of 2008 slowed maritime shipping growth to 3.6 percent.⁵⁷ The United Nations Conference on Trade and Development projected an overall decrease for world seaborne trade in 2009 compared to 2008 and an estimated decrease in world exports of 10 percent.⁵⁸

The dynamics of global shipping are also driven by the cost advantage that can be gained from use of cheaper raw materials and labor as compared to the cost of transporting materials, goods and services around the world. In the booming economic expansion of the last decade, fuel prices rose from approximately \$30 a barrel in 2000 to over \$200 a barrel in 2008, and the cost of maritime shipping soared. The cost advantage gained by procuring materials from the lowest cost source (irrespective of the distance from manufacturing, or from placing manufacturing in the country with the lowest labor costs, or the location of the final market), began to be offset by shipping costs. High shipping costs began to cause a shift away from globalized trade and toward more regional trade, particularly for freight intensive goods.⁵⁹

Due to the complex relationship between increased economic globalization and the impact of fuel prices on shipping costs, the trend for global shipping in the future is not entirely clear. When economic growth resumes, the interdependency that has developed among natural resources, producers, manufacturers and worldwide markets will continue to drive increases in shipping trade in the short term. In the long term, it seems possible that pressure from fuel prices and a resulting shift away from globalization and toward regional trade might slow the growth of shipping somewhat. However, maritime shipping is an extremely fuel-efficient means of transportation, and thus, increases in fuel prices have less of an effect on maritime trade than on other means of transporting materials and goods. When the worldwide economy recovers, growth in maritime shipping will likely resume.⁶⁰

Maritime Security: Throughout its history, the Coast Guard has had a focus on providing for the security of the nation, patrolling borders, interdicting drugs and illegal

migrants, overseeing maritime commerce, and assisting with national defense during wars. Following the terrorist attacks in 2001, the service's emphasis on maritime homeland security was greatly increased. With a newly realized threat to the continental United States from terrorist attacks, the Coast Guard enhanced its efforts to protect critical maritime and waterfront infrastructure that might be a prospective target. The Coast Guard stepped up programs to counter the risk that maritime shipping and transportation could be used to move terrorists or their weapons across borders. The service also began to work to counter the prospect that vessels large or small might themselves be turned into a means of attack.⁶¹

Increased Drilling for Oil Offshore. Reliance on fossil fuels as a primary energy resource will drive world trends for years to come. Currently, the world generates approximately 84 percent of its energy needs using fossil fuels. Because the share produced by fossil fuels is projected to decrease only slightly to 78 percent by 2035, the world will still depend on fossil fuels for the majority of its energy for decades.⁶² As Figure 3 illustrates, with a growing world population consuming more energy, demand is expected to increase to an extent that exceeds conservation and energy provided through renewable sources.

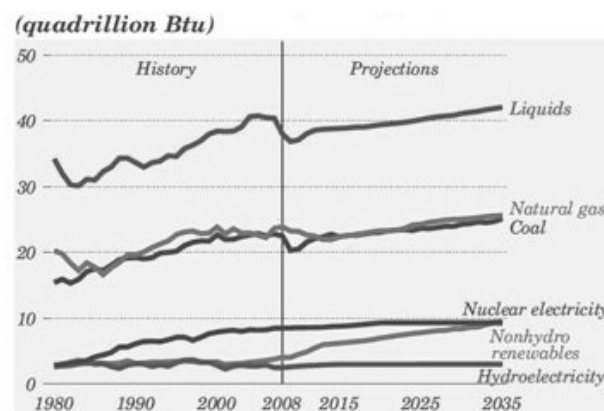


Figure 3: Energy Consumption by Fuel, 1980 - 2035⁶³

A U.S. Energy Information Administration analysis indicates that peak oil production will likely occur in the first half of the 21st century.⁶⁴ As the more easily accessed oil fields become less productive and as demand increases, prices will rise. Previously marginally profitable oil and gas reserves will become profitable for recovery, and new sources of oil will be exploited.⁶⁵ Some of the expansion in oil recovery will be provided by new technologies employed on shore, but much will be provided by accessing oil fields in deeper and deeper water through offshore drilling.⁶⁶

National policy regarding offshore drilling aside from the western Gulf of Mexico is in flux. In July 2008, President George W. Bush lifted a presidential moratorium on drilling for oil and natural gas on the Outer Continental Shelf.⁶⁷ In September 2008, Congress allowed a congressional moratorium to expire; however, in February of 2009, President Barack Obama's administration blocked offshore drilling plans and initiated a review of the offshore drilling policy.⁶⁸ Additional oil fields off both the east and west coasts may become economically viable for recovery as prices continue to rise. Currently, the U.S. Department of the Interior's Mineral Management Service website indicates that it has initiated the first step for a lease sale off the coast of Virginia.⁶⁹

Even if the moratorium is not lifted, improved technology, economic conditions, and the depleting production of near-shore wells have already driven a vast expansion of offshore drilling in waters over 1000 feet deep in the western Gulf of Mexico. From 1992 to 2007, deepwater offshore rigs drilling in deep water in the Gulf of Mexico increased from three to 30, and deepwater oil production rose approximately 820 percent.⁷⁰ During 2008, 108 new wells were spudded in deep water in the Gulf of Mexico, and by the end of the year, 57 percent of all leases were located in deep

water.⁷¹ Fifteen new mobile offshore drilling units were being built and contracted for use in Gulf of Mexico waters over 5000 feet deep and will be capable of operating in depths to 12,000 feet.⁷²

Coast Guard Strategic Guidance

The U.S. Coast Guard Strategy for Maritime Safety, Security, and Stewardship, promulgated in January 2007, and hereafter referred to as the *Coast Guard Strategy*, discusses many of the trends above.⁷³ Strategies can be analyzed in terms of ends or objectives, ways or methods, and means or resources required.⁷⁴ The *Coast Guard Strategy* highlights the use of maritime governance to tackle many future challenges. It addresses strategic ends in terms of Coast Guard roles of maritime safety, maritime security and maritime stewardship. The document cites six areas as strategic priorities, or ways, for the service to achieve these goals. They are: (1) strengthening regimes for the U.S. maritime domain, (2) achieving awareness in the maritime domain, (3) enhancing unity of effort in maritime planning and operations, (4) integrating Coast Guard capabilities for national defense, (5) developing a national capacity for marine transportation system recovery, and, (6) focusing international engagement on maritime governance. Progress on these overarching strategic priorities would contribute significantly to preparing for all of the trends mentioned in this paper.

The Coast Guard also has recently completed a strategic analysis and released a related report in August 2009 under Project Evergreen II, the latest evolution of the service's continuous process of strategy development and renewal.⁷⁵ Evergreen II used a scenario development process to anticipate future challenges and opportunities and then to develop strategies for a time horizon of twenty-five to thirty years into the future. These strategies help frame the future and feed the development of the broader Coast

Guard Strategy. The project report lists what it terms “emerging issues and forces for change” which consist of globalization, global terror, climate change, energy, U.S.–Canadian relations, and fish stocks, very similar to the dominant global trends outlined in this paper. It discusses five hypothetical planning scenarios, which describe different possible world environments in the year 2030. It then lays out 13 core action strategies to meet future challenges and opportunities. Although all of the core action strategies apply somewhat to the challenges outlined in this paper, the ones that are most relevant to the discussion are: 21st Century Partnerships, Advancing Global Maritime Governance, Maritime Policy Engagement, Polar Mission Capacity, and, Intelligent Technology Acquisition. In the discussion that follows, this paper will address specific elements of strategies outlined in the *Coast Guard Strategy* and in the *Evergreen II Project Report* that are applicable to each trend. It will also discuss the ends, ways and means that the Coast Guard needs to be successful in the future.

Strategies for the Warming Arctic

The *Coast Guard Strategy* notes the shrinking of the Arctic ice cap as a part of the increasing complexity of the country’s exclusive economic zone. It recognizes the challenges that will be posed by opening of new shipping routes and by the increased access to the energy resources offshore. Within the document, the Coast Guard lists a variety of ends that would apply to the changing Arctic environment including safe operations of transportation, protection of the maritime domain, upholding maritime sovereignty, safeguarding marine resources, and enforcing law, international conventions and treaties.

The primary strategic way for the Arctic that is outlined in the *Coast Guard Strategy* is to apply the maritime governance approach and to develop international

regimes specific to the region. These regimes will include requirements for safe and reliable navigation throughout the region, multinational cooperation on vessel traffic routing, and comprehensive environmental protection and safety standards that base prevention measures on an in-depth risk assessment. While the *Coast Guard Strategy* does contain a section on operational capabilities and generally discusses the recapitalization of the Coast Guard's deep-water aircraft and vessels, it does not address specific organic operational capability required to meet upcoming change in the Arctic.

The *Evergreen II Project Report* also specifies partnerships, global maritime governance, and maritime policy engagement as crucial strategic ways for success. In addition, the report cites "polar mission capacity" as a specific core requirement. The report notes the increases in maritime activity, particularly related to energy, and highlights the risks of maritime accidents, increased pollution and jurisdictional disputes. It states that expansion of polar capability, including construction of two additional polar icebreakers as recommended by a 2006 National Academy of Science's assessment, as well as aircraft and shore facilities, is required to project "maritime presence and protect and advance U.S. interest in the Polar Regions."⁷⁶ The Coast Guard is also working to develop planning at the operational level and determine resources needed to support this planning through a High Latitude Mission Analysis Project. The resource requirements generated through this analysis will determine the means for mission requirements in the Arctic. The study is scheduled to be completed by the summer of 2010.⁷⁷

The Coast Guard currently has three polar capable icebreakers. Of these, one is a relatively new ship that is projected to be in service through approximately 2030, one is an older ship that has completed a service life extension to enable it to serve through approximately 2014, and one is an older ship that is currently in non-operational status and at the end of its service life.⁷⁸ In order to maintain capability to complete missions in the Arctic including supporting national security, regulatory, law enforcement, military, and scientific requirements, the nation needs to begin construction of additional icebreakers or refurbish its older icebreakers.

The Coast Guard's 17th District oversees execution of mission in the Alaskan area of responsibility. It has two sectors that direct operations, two air stations, twelve cutters, three small boat stations, a Marine Safety Unit, a Marine Safety Detachment and six long range aids to navigation stations. Additionally, medium and high endurance cutters operate out of or deploy to Alaskan waters to support District operations.⁷⁹ None of these units is located above the Arctic Circle, as the vast majority of activity in the 17th District's area of responsibility currently occurs in the waters of the Gulf of Alaska and in the Bering Sea. As activity increases in the Arctic, the Coast Guard must expand its physical presence and capability northward. In addition to revitalizing the icebreaker fleet, expanding Coast Guard presence would entail additional ice capable boats and aircraft, and more shore-side infrastructure to support seasonal deployment to northern Alaska. Liaison with and support from native populations and private sector organizations located in the Arctic region are essential to future mission success. Recognizing this requirement, the 17th District has carried out new summertime initiatives to improve its knowledge of northern Alaska operations and

to develop new operational protocols. In 2008, the District deployed C-130 airplanes and operational teams to northern communities.⁸⁰ In 2009, the Coast Guard participated in a multi-agency, 20-day assistance and operations initiative in Barrow and Nome, Alaska, called Arctic Crossroads.⁸¹

One method used to evaluate the soundness of strategies is to apply the standards of suitability, acceptability and feasibility. Suitability is a “test” of the ends of the strategy, that is, will the strategy achieve the goals? Acceptability is a test of the ways, that is, are the methods used to achieve the ends appropriate? Feasibility is a test of the means, that is, are resources available or can they be obtained within a realistic time frame in order to execute the ways to achieve the ends?⁸²

In the face of emerging challenges and opportunities in the Arctic, the Coast Guard appears to be positioning itself well in terms of forming a suitable, acceptable and feasible strategy. The *Coast Guard Strategy* and the *Evergreen II Project Report* demonstrate broad awareness of and strategic preparation for predictions of expanded maritime activity as ice coverage decreases. They contain a comprehensive list of suitable ends and a number of appropriate ways. The one area that raises significant questions is the resources or means. As mentioned previously, the service is conducting the High Latitude Mission Analysis to determine specific resource requirements. The Coast Guard has also provided information to answer questions from Congress regarding capability, both in the *Report to Congress: U.S. Coast Guard Polar Operations* and in testimony.⁸³ However, additional resource requests for assets to build Arctic capability will compete with other needs within the Coast Guard and throughout government, and it is not possible to predict with certainty whether or not

they will receive funding. It is at least apparent that the Coast Guard is taking timely and effective action to flesh out the ends and ways, and to conduct analysis to determine the means in order to support requests for new capability.

Strategies for Global Shipping and Maritime Homeland Security

The *Coast Guard Strategy* clearly details the expected continuing increase in global maritime shipping, the vital role it plays in an economically interdependent and interconnected world, and challenges due to its vulnerability. The *Strategy* points out the risk from closure of a port due to incidents such as labor strikes or from a more sinister possibility such as a terrorist attack. It also focuses on concerns that the growing size and capacity of cargo, tank and passenger vessels present for search and rescue and pollution response missions. Similarly, the *Strategy* underscores the risk of terrorist attacks including the use of vessels to transport weapons of mass destruction, the use of vessels as weapons in and of themselves, the permeability of maritime borders and the limited governance of the maritime domain.

The *Strategy* proposes ends under the service's Maritime Security and Maritime Stewardship roles. It cites relevant goals such as: "Protect the U.S. maritime domain and the Marine Transportation System, and deny their use and exploitation by terrorists as a means for attack...", "Defend U.S. national interests in the maritime domain against hostile acts through military action...", "Facilitate the economical movement of goods and people through the MTS...", and, "Conduct maritime recovery operations in the aftermath of incidents of national significance, including transportation security incidents."⁸⁴ All of the six strategic priorities proposed by the *Strategy* as previously listed are relevant to success. The strategic guidance in the *Evergreen II Project Report* also addresses both the impact on maritime shipping from globalization and the

challenges presented by continuing global terrorism. Partnerships, maritime governance and policy engagement, maritime domain awareness, underwater mission development and technology acquisitions all would assist in both regulating increased shipping activity and dealing with threats from terrorist networks.

In the area of terrorism, the Coast Guard is also governed by national and service strategies including the *National Strategy for Maritime Security* (NSMS) of 2005, and *A Cooperative Strategy for 21st Century Seapower* (2007), the document signed by Navy, Marine Corps and Coast Guard leaders. The NSMS lays out specific strategic objectives as ends including the broad categories of: Prevent Terrorist Attacks and Criminal or Hostile Acts; Protect Maritime-Related Population Centers and Critical Infrastructure; Minimize Damage and Expedite Recovery, and, Safeguard the Ocean and its Resources. It also lists strategic actions or ways, and supporting implementing plans as means.⁸⁵ The *Cooperative Strategy* addresses Homeland Defense and the combined efforts of the Navy, Coast Guard and Marine Corps to provide for the nation's security.⁸⁶

At the operational level, the Coast Guard has developed extensive ways and means guidance for shipping safety and regulation and for maritime homeland security. In addition to their roles as Captains of the Port and Officers in Charge of Marine Inspections, Coast Guard Sector Commanders serve as Federal Maritime Security Coordinators. In these roles, Sector Commanders lead planning committees for maritime homeland security, maintain and exercise Area Maritime Security Plans, and coordinate safety and security inspections of facilities and vessels within their area. The Coast Guard also employs a Maritime Risk Analysis Model to help determine how to

apply available resources to deter and detect threats in the maritime environment effectively.

The *Coast Guard Strategy* and the *Evergreen II Project Report* clearly state objectives or ends for the service to achieve. The difficulty with the ends, as with many safety and security goals, is that perfection is required in order to achieve them. For example, if there is one terrorist attack, then it is difficult to say that the end of protecting the U.S. maritime domain and the marine transportation system has been achieved. Furthermore, incremental progress or achievements are difficult to measure against the goal because the lack of an event is the ultimate measure of success. However, the lack of an incident on any given day does not mean that an attack is not being planned or imminent. In spite of these issues, the nation would not want goals or ends which were more nuanced but which lessened the spirit of resolve toward preventing accidents and attacks. Ultimately, the ends are appropriate and the measure of suitability is met.

The ways of governance and cooperative efforts are most vital to success in these mission areas, and their emphasis is well founded. The discussion of ways could be strengthened with more information about Coast Guard specific mission execution. Because much of the detail regarding ways for Coast Guard units is well developed at the operational level, the lack of detail in the high-level strategic guidance is not as necessary as for a new area such as expanding missions in the Arctic. However, by not including a more specific discussion of ways, the critical element of feasibility of the means is not addressed. The Coast Guard is currently stretched to capacity with the current workload. If requirements expand in both of these mission areas, it is hard to

see how the service can successfully execute the strategies without additional resources, especially in terms of more personnel. Even in terms of governance and partnerships, additional means in terms of skilled, educated Coast Guard personnel are needed to engage partners and negotiate rules and regulations.

Strategies for Living Marine Resources

The depletion of living marine resources is recognized as a threat to the maritime domain by the *Coast Guard Strategy*. The *Strategy* notes that, “Fisheries protection requires oversight and presence throughout and beyond the U.S. Exclusive Economic Zone,” and that, “Fishery conservation efforts depend upon monitoring schemes that rely on the cooperation of fishermen.”⁸⁷ The *Evergreen II Project Report* also notes that fish stocks are critically at risk and increased aquaculture might result in additional responsibility for the Coast Guard.⁸⁸ While these documents do not provide specific ends, ways and means for addressing the continued stress that will be placed on fish and sea life in the future, the general options they outline, if effectively implemented, will contribute significantly to success in this mission area.

As the Coast Guard works collaboratively with the National Marine Fisheries Service and other federal, state and international organizations to assist in developing and enforcing fishing regulations, the strategic ways of strengthening maritime regimes, improving maritime domain awareness, and enhancing maritime planning and operations will be critical to success. Clear laws, broadly understood and communicated both nationally and internationally, must be agreed upon and enforced by all parties in order to reverse the trend of declining stocks. Technological improvements in marine domain awareness will continue to aid the service in monitoring fishing vessel activity and ensuring compliance with regulations. Advances in

command, control and communication as part of maritime planning and operations improvements are also vital to successful fisheries enforcement.

In terms of addressing strategic means, the *Coast Guard Strategy* includes a section on operational capability. Under this topic, the document discusses the Coast Guard's Integrated Deepwater System program, which includes recapitalization of its deep-water vessels and aircraft.⁸⁹ This program will result in greatly improved platforms with improved technology. These aircraft and vessels, multi-mission in nature as are virtually all Coast Guard platforms, will greatly enhance the service's ability to sustain a presence in the exclusive economic zone to stop illegal fishing activity and to enforce fisheries regulations. If blue-water aquaculture industry grows and regulations are passed that fall under the Coast Guard's authorities, these assets will serve that evolving mission as well.

At the operational planning level, Coast Guard strategies for fishing and other living marine resources are well founded. The service has a Fisheries Enforcement Strategic Plan called *Ocean Guardian*, which was approved in 2004. The plan provides a ten-year strategic vision and a framework, which emphasizes sound regulations, effective presence and productive partnerships along with application of technology for successful fisheries management.⁹⁰ The plan recognizes the trend of declining fisheries and the fact that urgent action is needed to counter that trend. It also provides specific ends, acceptable ways and feasible means to achieve success on both the national strategic level and the operational level for the service. The plan identifies challenges to mission success, and specifies performance initiatives to address these areas.

Strategies for Increased Offshore Drilling

The *Coast Guard Strategy* recognizes the “increasing complexity and use of the U.S. Exclusive Economic Zone” as one of the threats to the maritime domain. The *Strategy* notes that discoveries of oil in the Gulf of Mexico outer continental shelf and complexities with associate workforce, ownership and increased vessel traffic are not fully addressed by current regimes for governance. It recommends that growth in these areas need “to be matched by the development of comprehensive, integrated, and non-conflicting rules necessary to address the safety, security, and stewardship concerns of the nation.”⁹¹ The *Evergreen II Project Report* also highlights that energy issues will have a significant impact. It notes that future challenges may be associated with maritime activity that is farther offshore into the exclusive economic zone. However, it addresses this concern in its section on strategy for underwater mission development and does not provide guidance specific to deep water drilling concerns.⁹²

At the lower strategic and operational level, the Coast Guard has recognized the need to develop new plans and capabilities for this mission area. The service has designated Marine Safety Unit Morgan City, Louisiana, as a center of excellence for missions related to offshore continental shelf expansion. With this designation, the unit has received additional personnel and is preparing to provide training and develop expertise within the Coast Guard for areas such as facility and vessel inspection and pollution response associated with deep water and ultra deep water drilling.

Discussion of increased outer continental shelf activity in higher level strategic planning indicates that the service is aware of the trend for offshore drilling in deeper water. The actions to address this trend are to use maritime governance and a designated center of excellence to increase mission capability. However, in terms of

ends, ways and means to meet the challenges presented by increased offshore drilling, the Coast Guard's strategic guidance is less robust than that provided for other future developments. Expanded offshore drilling in deeper water will present a number of new challenges that can only be met with a vigorous strategy. The ability to access oil at increasing water depths is achieved using new technology and equipment including mobile offshore drilling units (MODUs) and floating production storage offloading facilities (FPSO).

The Minerals Management Service has approved the use of FPSO in the Gulf of Mexico, the first of which is scheduled to be brought into the Gulf in 2010.⁹³ These larger and more complex platforms bring with them increasingly complex inspection and oversight responsibilities for the Coast Guard. Inspectors have responsibility for oversight of many aspects of these vessels including structural integrity, stability, lifesaving and firefighting systems and procedures, and response plans for spills as required under Title 46 of the Code of Federal Regulations and agreements with the Minerals Management Service.⁹⁴ In addition, although the private sector has primary responsibility for providing for the safety of their personnel when accidents occur, the Coast Guard needs to be ready to assist. The increasing distances from shore of the drilling activities stretch the fuel limits of some aircraft and would result in a more delayed response from Coast Guard cutters. While the Coast Guard is aware of these issues, the *Coast Guard Strategy* and the *Evergreen II Project Report* are not entirely clear on the desired ends for Coast Guard readiness or on the ways and means that the service will achieve this readiness.

At the operational level, each Sector Commander makes extensive plans to carry out vessel and facility inspection requirements. Under Title 40 Code of Federal Regulations, Section 30, they are responsible for coordinating for and planning to respond to spills in their area, including preparation of an Area Contingency Plan and chairmanship of an Area Committee which includes representatives from federal, state, local, private sector and volunteer partners and organizations. The plans address issues specific to each sector's geographic area. In spite of the operational readiness of specific units to handle the existing workload, the future portends challenges beyond any one sector's geographic area of responsibility. The service-wide strategies need to account for the dramatic increases in ever deeper drilling in the western Gulf of Mexico and for the likelihood that drilling will expand throughout the Gulf of Mexico and along the east and west coasts of the United States.

Conclusions and Recommendations

The analogy of scanning the horizon presented at the outset of this paper leads to two nautical questions that are helpful to analyze the strategies herein. Do the national strategies indicate that the service is keeping a good watch scanning the future horizon and spotting important trends? Will the existing strategic guidance keep the service on a good course to deal with the opportunities and challenges presented by the trends? In other words, does the service recognize future challenges and threats and is it providing adequate guidance to prepare?

In the case of the warming Arctic, the answer is yes. The trends in the Arctic are specified in the Coast Guard's service-wide strategies, and the ends, ways and means are addressed. For the areas of maritime shipping, maritime homeland security and fisheries depletion, the answer is also affirmative. In these areas, the *Coast Guard*

Strategy and the *Evergreen II Project Report* are very relevant in providing the ways to improve performance. While the high-level strategies could be more explicit in discussing definitive ends, guidance at the intersection of the strategic and operational level and within other national policies exists. The high-level strategies call out the concerns in each area and provide overarching methods or ways, and the operational strategies provide additional discussion on the ends and means. The difference between the specificity in the *Coast Guard Strategy* with respect to the Arctic presumably results because Arctic developments are more revolutionary and will open a new geographic area for operations, whereas the other areas present evolutionary growth. The challenges for global shipping, maritime homeland security and living marine resource have been recognized for a longer period, and Coast Guard actions will be an intensification of effort, not an entirely new mode of operations.

For the trend of increasing offshore oil exploration, the service-wide strategies need to be strengthened. While both the *Coast Guard Strategy* and the *Evergreen II Project Report* address this area, and while the Coast Guard has taken action to improve operational readiness, these strategies do not sufficiently account for the significant increase in the complexity of the equipment being employed. They also do not address the impact on the service that will result if drilling expands to the eastern Gulf of Mexico or along the east and west coasts.

One common theme from all of these trends is that the Coast Guard needs to grow in capability and in staffing over the coming years. All of these trends will necessitate significant increases in Coast Guard mission activity. Following the terrorist attacks of September 11, 2001, the Coast Guard took on a dramatically increased

emphasis on Maritime Homeland Security. While the service's budget increased significantly, almost doubling from about \$5 billion in 2001 to about \$9.7 billion in 2009, the service's active duty billets grew by only about 20 percent in the same period to approximately 42,000 personnel.⁹⁵ The Coast Guard is thinly staffed to perform all of its current missions. It is difficult to see how the Coast Guard can successfully carry out the ways outlined in these strategies to achieve the desired ends without a significant increase in staffing and capability over the coming years. Through the service's forward looking *Coast Guard Strategy*, with initiatives such as Evergreen II to refocus its lookout on the future horizon, and with operational plans actively being developed by Coast Guard leaders, the service is doing an impressive job looking into the future and laying out the ends and ways to set a sound course for the future. In order to stay on a safe course, the Coast Guard needs to communicate the challenges and opportunities presented in the maritime environment by a hot, flat, crowded world, and thus, increase its means in order to continue to succeed in all its varied and increasingly challenging missions.

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focus on Coast Guard strategies to deal with likely developments versus events that will occur with certainty, inclusion of several global trends substantially supported by the scientific community (but not universally agreed upon) seems an appropriate approach through which to shape the analysis and discussion.

This paper also cannot deal with all trends impacting Coast Guard missions in a hot, flat, crowded world. The trends chosen for discussion are those that most clearly impact areas of Coast Guard responsibility. Other trends that might have been discussed include increasing maritime pollution and decreasing pressure on clean fresh water supplies. However, agencies other than the Coast Guard have primary responsibility and can have a more significant impact on the outcomes for these trends. The increasing portion of the nation's population that lives along the coast, and the possibility of increases in hurricanes and other natural disasters upon these populations could also have been included. However, this trend occurs in the Coast Guard's core mission area of Search and Rescue response and the strategy to deal with it seems to be primarily an expansion and refinement of existing capability and thus was not included for further discussion.

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