A REPORT OF THE CSIS
EUROPE PROGRAM

The New Foreign Policy Frontier

U.S. INTERESTS AND ACTORS IN THE ARCTIC

March 2013

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50 YEARS | CHARTING OUR FUTURE

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Cover photos: A multi-year ice floe alongside the U.S. Coast Guard Cutter *Healy.* Source: Patrick Kelley, U.S. Coast Guard, Aug. 23, 2009; flickr user U.S. Geological Survey. Secretary Clinton and Norwegian Foreign Minister Store Participate in an Arctic Research Vessel Tour," June 2, 2012, [State Department photo/Public Domain]http://www.flickr.com/photos/statephotos/7337893250/in/photostream. The U.S. Coast Guard Cutter *Healy* breaks ice for the Russian tanker *Renda* to deliver 1.3 million gallons of petroleum products to the city of Nome, Alaska. Source: U.S. Coast Guard, Jan. 10, 2012.

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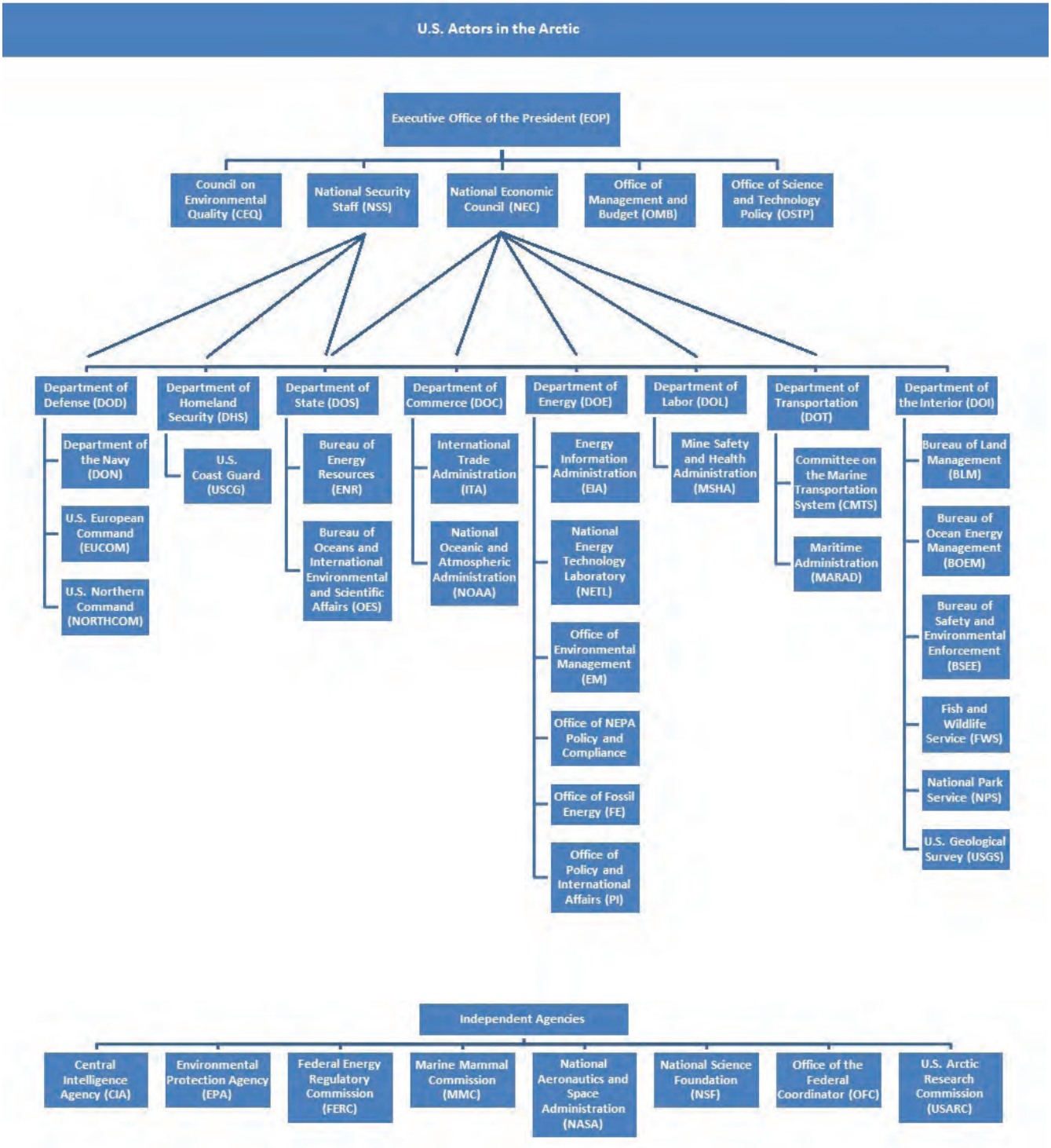
ORGANIZATION CHART



ACRONYMS AND ABBREVIATIONS

AK CSC	Alaska Climate Science Center
ANWR	Arctic National Wildlife Refuge
AON	Arctic Observing Network
APG	Arctic Policy Group
ARCUS	Arctic Research Consortium of the United States
ARPA	Arctic Research and Policy Act
BLM	Bureau of Land Management
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
BSSN	Bering Sea Sub-Network
CEQ	Council on Environmental Quality
CIA	Central Intelligence Agency
CMTS	Committee on the Marine Transportation System
D17	District 17 Unit
EEZ	Exclusive Economic Zone
EIA	Energy Information Administration
ENR	Bureau of Energy Resources
EPA	Environmental Protection Agency
ERMA	Environmental Response Management Application
EUCOM	United States European Command
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
FY 2013	Fiscal Year 2013
HSPD-25	Homeland Security Presidential Directive 25
IARPC	Interagency Arctic Research Policy Committee
ICCATF	Interagency Climate Change Adaptation Task Force
IMO	International Maritime Organization
IOPTF	Interagency Ocean Policy Task Force
IPY	International Polar Year
JTF-AK	Joint Task Force–Alaska
LNG	Liquefied Natural Gas
MARAD	U.S. Maritime Administration
MMC	Marine Mammal Commission
NASA	National Aeronautics and Space Administration

NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOC	National Ocean Council
NORAD	North American Aerospace Defense Command
NORTHCOM	United States Northern Command
NPFMC	North Pacific Fisheries Management Council
NPR-A	National Petroleum Reserve–Alaska
NPS	National Park Service
NSDD-90	National Security Decision Directive 90
NSDM-144	National Security Decision Memorandum 144
NSF	National Science Foundation
NSIDC	National Snow and Ice Data Center
NSMS	National Strategy for Maritime Security (ch 2)
NSPD-66	National Security Presidential Directive 66
NSS	National Security Staff
OCS	Outer Continental Shelf
OES	Bureau of Oceans and International Environmental and Scientific Affairs
OMB	Office of Management and Budget
OMC	Office of Marine Conservation
OPA	Office of Ocean and Polar Affairs
OPP	Office of Polar Programs
OSTP	Office of Science and Technology Policy
PACOM	United States Pacific Command
PDD/NSC-26	Presidential Decision Directive/National Security Council 26
R&D	Research and Development
SAO	Senior Arctic Official
SARSAT	Search and Rescue Satellite Aided Tracking
SCICEX	Science Ice Exercise
SEARCH	Study of Environmental Arctic Change
TFCC	Task Force Climate Change
UNCLOS	United Nations Convention on the Law of the Sea
USARC	United States Arctic Research Commission
USCG	United States Coast Guard
USCGC	United States Coast Guard Cutter
USEA	United States Energy Association
USGCRP	United States Global Change Research Program
USGS	United States Geological Survey
WEC	World Energy Council

EXECUTIVE SUMMARY

Since World War II, the Arctic has been a region of geostrategic importance to the United States. As unprecedented environmental transformation occurs in the Arctic, this region will increase in significance. When historians look back at this critical opportunity to develop U.S. Arctic policy, we do not want the question to be posed, "Who lost the Arctic?" but rather, "How did the United States win the Arctic?"

Crafting U.S. policy toward the Arctic, however, is a complex and challenging undertaking. Arctic policy must respond to the economic, environmental, security, and geopolitical concerns that confront the region. When the Barack Obama administration came into office in January 2009, it accepted and left unchanged the recently adopted Arctic strategy of the George W. Bush administration. In its second term, it is now time for the Obama administration to enhance U.S. Arctic policy by updating and prioritizing National Security Presidential Directive 66/Homeland Security Presidential Directive 25 (NSPD-66/HSPD-25), improving interagency cooperation, enhancing U.S. international and public diplomacy related to the Arctic, and increasing the focus of senior U.S. officials. These activities must begin now if the United States is to prepare for and fully maximize its chairmanship of the Arctic Council beginning in 2015.

This report proposes the following changes to U.S. Arctic policy and its organization:

- **Update and Prioritize NSPD-66/HSPD-25:** The United States must create a long-term economic strategy for the American Arctic that balances greater economic development and enhanced environmental sustainability and stewardship. Based on this vision, the United States must develop a detailed maritime transportation and infrastructure strategy that factors in public-private partnerships. The strategy must prioritize goals and objectives, include budget resources, and provide accountability for strategy implementation.
- **Reform White House Arctic Interagency Coordination:** Currently, six separate groups in the White House discuss Arctic issues; their activities should be centralized and streamlined into one interagency effort, with Arctic issues more fully addressed by the National Security Staff (NSS), the Council on Environmental Quality (CEQ), and the National Economic Council (NEC). The NSS, CEQ, and NEC should each hire an Arctic specialist who would report to their respective senior directors and to the deputy national security advisor for international economics.
- **Increase State Department Leadership in the Circumpolar Arctic:** The Bureau of European and Eurasian Affairs is responsible for bilateral and regional relations with six Arctic Council member states: Denmark, Finland, Iceland, Norway, Russia, and Sweden. The Obama administration should consider giving this bureau greater responsibility over all Arctic affairs by integrating officials engaged in Arctic work from the Bureau of Oceans and International Environmental and Scientific Affairs' Office of Ocean and Polar Affairs and by seconding officials

from the National Science Foundation and the Department of Interior to supplement expertise as needed. The responsible regional office within the European and Eurasian Bureau should in turn be renamed the Office of Nordic, Baltic, and Arctic Affairs, to give greater focus to the Arctic region.

- **Appoint a U.S. Arctic Envoy with Ambassadorial Rank:** With the exception of the United States, all Arctic nations' senior Arctic officials (SAOs) hold the rank of ambassador and have very senior positions. SAOs often serve as the central coordinators for their government's Arctic policy and report directly to their minister of foreign affairs. The United States is out of sync with its Arctic counterparts in its current diplomatic representation. The deputy assistant secretary in the Bureau of European and Eurasian Affairs that oversees the new Office of Nordic, Baltic, and Arctic Affairs could become the SAO and should receive an ambassadorial rank. Alternatively, a senior diplomat or deputy assistant secretary in the the Bureau of Oceans and International Environmental and Scientific Affairs will full-time responsibilities devoted to Arctic affairs could be named U.S. Arctic envoy with ambassadorial rank. The U.S. Arctic ambassador would coordinate policy with the seven U.S. embassies in Arctic Council member states and conduct outreach activities toward non-Arctic states and the private sector.
- **Develop a Robust Public Diplomacy Campaign:** Each U.S. embassy in an Arctic Council member capital should have a designated officer assigned to the Arctic portfolio. This is particularly important for the U.S. embassy in Moscow as well as for the consulates general in St. Petersburg and Vladivostok, as the United States seeks opportunities to engage Russia positively on Arctic development. One U.S. embassy, such as the U.S. embassy in Oslo, should be designated as the lead regional information and coordination hub for U.S. Arctic policy and would play a particularly active role during the American chairmanship of the Arctic Council in 2015–2017.

1 INTRODUCTION

The Arctic: A New Policy Frontier

In an August 2012 speech, U.S. deputy secretary of state Thomas R. Nides declared that, for the United States, the Arctic "is one of the last true frontiers in the United States. It is becoming a new frontier in our foreign policy."[1] The Arctic is a "new frontier" in the sense that the polar ice cap is melting so rapidly—confounding and deeply disturbing most climatologists and earth scientists—that once-frozen and nearly impenetrable borders in the High North are now being traversed with increased frequency. The Arctic also presents a "new" opportunity for U.S. policymakers to address the emerging political, diplomatic, economic, and security dynamics—bilateral, multilateral, regional, as well as international—caused by unprecedented climate change.

But the Arctic is anything but new to U.S. policy; it has been an important element of American foreign and security policy since World War II. Historically, U.S. Arctic policy has been supported by three main policy pillars: national security, development, and science. These priorities have been appropriately reflected in successive budgets of the Defense Department and the National Science Foundation for decades. Today, U.S. Arctic policy is increasingly shaped by economic factors, primarily concerning oil, gas, and mineral resource development. The importance of these factors is demonstrated by the fact that the most senior-level U.S. interagency policy group involved in the Arctic is the Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska. This group, established by a White House executive order in July 2011 and chaired by the deputy secretary of the Department of Interior, is dedicated to streamlining the drilling and licensing procedures of oil and gas companies seeking to explore off-shore Alaska. The enhanced role of the Department of the Interior in Arctic policy-making is an example of the increased importance of Arctic mineral resources as well as off-shore and on-shore natural resources. Therefore, it is the confluence of increasing U.S. economic, environmental, societal, and security interests, combined with the rapid physical transformation of the Arctic, that has created a new frontier and a new operating environment in which U.S. policymakers can develop Arctic policy.

Stretching the frontier analogy further, what exactly is America's future vision for the Arctic? Will the United States seek to explore, claim, and develop the Arctic akin to Theodore Roosevelt's vision in his 1889 book *The Winning of the West*,[2] which depicted the romanticism of America's pioneering spirit when confronting new frontiers? Or will Washington seek to protect and preserve the Arctic rather than develop it? What are U.S. policy objectives and priorities? What financial resources will be needed to implement these priorities? What are the right organizational and

1. Thomas R. Nides, "The Future of the Arctic" (remarks at the Arctic Imperative Summit, Alaska, August 26, 2012), http://www.state.gov/s/dmr/former/nides/remarks/2012/197643.htm.

2. American Writers, "Theodore Roosevelt: The Winning of the West," http://www.americanwriters.org/writers/roosevelt.asp.

A View from the Top: Image of the Arctic, Europe and Asia from NASA's Suomi NPP satellite.

Source: NASA/GSFC/Suomi NPP; Flickr user NASA Goddard Photo and Video; Jun 18, 2012, http://www.fotopedia.com/items/flickr-7394700302/slideshow>>

coordination structures to ensure that a comprehensive Arctic strategy is implemented and federal agencies are held accountable for this strategy?

It is time for the United States to think more broadly about "Winning the Arctic." There has been no updated Arctic policy statement since George W. Bush signed National Security Presidential Directive 66/Homeland Security Presidential Directive 25 (NSPD-66/HSPD-25) before leaving office in January 2009. Given the dramatic changes the Arctic region has experienced in the past four years, it is critical that this policy be sharpened and focused to reflect the shifting Arctic policy landscape. Unfortunately, several pieces are missing from the U.S. government's Arctic policies and statements—most notably, a prioritized and detailed strategy for the region and a dedicated and multi-year Arctic budget. Importantly, there is no single coordinating entity or federal department in charge of Arctic policy development and implementation. Similarly, no single body holds policymakers and policymaking bodies accountable for their decisions.

In a July 11, 2012, letter to President Obama, Senators Lisa Murkowski (R-Alaska) and Mark Begich (D-Alaska) sought answers to these questions, requested that President Obama develop ". . . a comprehensive national Arctic strategy," and lamented that the United States is "the only Arctic nation which lacks such a formal strategy which ties together all the individual agency policies and visions."[3] The senators also noted that, since the signing of the NSPD-66/HSPD-25, U.S. policy "has advanced in a less than organized fashion, with multiple federal agencies creating their own departmental policies, roadmaps, and vision and strategy statements to help guide future development. We think it is now time to take the next step in this policy development: creation of an overall national U.S. strategy for the Arctic."[4]

This paper offers some new thinking about the development of an American Arctic strategy and the organizational structures that would support such a strategy. The report provides an overview of the more than twenty federal agencies that implement one or more elements of U.S. Arctic policy, highlighting the most relevant agencies and their mandates. The report's lengthy annexes provide detailed information about all the agencies and their work in the Arctic. Our goal is to shed some light on how U.S. Arctic policy is made today and to highlight trends and issues that will shape and inform future U.S. policy. In light of significant U.S. interagency complexity related to the Arctic, the report concludes by recommending a new organizational approach for U.S. Arctic policy. This includes the need for a more senior-led and visible presence, in addition to a more streamlined internal, interagency process for Arctic policymaking within the U.S. government. This approach must be developed simultaneously with a more robust external, diplomatic, and international engagement strategy. Both elements are urgently required to support the future U.S. chairmanship of the Arctic Council, which begins in 2015.

3. Mark Begich and Lisa Murkowski, "Letter to the President," July 11, 2012, http://www.arctic.gov/downloads/Begich%20&%20Murkowski%20letter%20to%20POTUS%207_11_12.pdf. Emphasis added.

4. Ibid.

2 DECISIONS, DIRECTIVES, AND MEMORANDA THAT DEFINED EARLY U.S. ARCTIC POLICY

The U.S. government has articulated its fundamental interests in the Arctic for more than forty years. From Richard Nixon's 1971 National Security Decision Memorandum (NSDM-144), Ronald Reagan's 1983 National Security Decision Directive (NSDD-90),[1] and Bill Clinton's 1994 Presidential Decision Directive (PDD/NSC-26),[2] to the waning days of George W. Bush's administration when he signed NSPD-66/HSPD-25 in January 2009, the basic policy tenets of America's Arctic strategy have not changed significantly despite dramatic shifts both in the geopolitical landscape—that is, the end of the Cold War—and the physical one, with accelerated melting of the polar ice cap. Each policy statement, in its own unique wording, reaffirmed America's "essential *security* interests in the Arctic region," the need for "sound and rational *development* in the Arctic," the promotion of *scientific research,* and the advancement of "mutually beneficial international cooperation."[3]

Each policy statement since 1971 has been notable not only for its policy consistency, but also for its brevity. NSDM-144 was only two pages in length. President Nixon approved

> the sound and rational development of the Arctic, guided by the principle of minimizing any adverse effects to the environment; [promoting] mutually beneficial international cooperation in the Arctic; and at the same time [providing] for the protection of essential security interests in the Arctic, including preservation of the principles of freedom of the seas and superjacent airspace.[4]

Although a mere seven lines of text framed U.S. policy, the remainder of the then–secret classified memorandum was dedicated to the real challenges of U.S. Arctic policymaking: coordination and implementation.

The Nixon memorandum was distributed to seven federal agencies: the departments of State, Defense, Interior, Commerce, and Transportation, as well as the director of the National Science Foundation and the chairman of the Council on Environmental Quality. The coordination architecture consisted of the National Security Council directing an "Under Secretaries Committee" to review and forward action plans related to "increasing mutually beneficial international cooperation with Arctic and other countries" on a full range of issues from economic development to scientific research. This memorandum also created the Interagency Arctic Policy Group "responsible for overseeing the implementation of U.S. Arctic policy and reviewing and coordinating U.S.

1. National Security Decision Directive (NSDD-90), "United States Arctic Policy," April 14, 1983, http://www.fas.org/irp/offdocs/nsdd/nsdd-090.htm.
2. Presidential Decision Directive/National Security Council (PDD/NSC-26), "United States Policy on the Arctic and Antarctic Regions," June 9, 1994, http://www.fas.org/irp/offdocs/pdd/pdd-26.pdf.
3. NSDD-90, "United States Arctic Policy," emphasis added.
4. NSDM-144, "United States Arctic Policy and Arctic Policy Group," 1.

activities and programs" and reporting to the Under Secretaries Committee.[5] Forty years later, the legacy of the policy group exists in the form of the Interagency Policy Committee on the Arctic, an assistant secretary–level interagency group chaired by the National Security Staff to coordinate Arctic policy implementation within the executive branch.

More than a decade after the Nixon memorandum, NSDD-90 reaffirmed that the United States had "unique and critical interests in the Arctic region related directly to national defense, resource and energy development, scientific inquiry and environmental protection."[6] Once again, a two-page document highlighted the policy coordination role of the policy group. NSDD-90 also requested an examination of "relative priorities" over the next ten years and expressed a desire to enhance international coordination.[7] Another decade would pass before a new Presidential Decision Directive on Arctic and Antarctic regional policy would emerge in 1994.

That directive, PDD/NSC-26, was the first post–Cold War U.S. Arctic policy statement, noting, "The end of the Cold War . . . allows a significant shift of emphasis in U.S. Arctic policy. The new atmosphere of openness and cooperation with Russia has created unprecedented opportunities for collaboration among all eight Arctic nations. . ."[8] It further suggested that "[o]ur bilateral relations with Russia offer further opportunities to protect the Arctic environment."[9] However, this directive did not suggest a reduction in U.S. security readiness. It noted, "Although Cold War tensions have dramatically decreased, the United States continues to have basic national security and defense interests in the Arctic region . . . in maintaining peace and stability . . . we must maintain the ability to protect against attack across the Arctic, to move ships and aircraft freely. . ."[10] PDD/NSC-26 explicitly detailed policy coordination, requesting the Office of Science and Technology Policy (OSTP) and the Office of Management and Budget (OMB) to "work with relevant U.S. agencies through the Interagency Arctic Research Policy Committee (IARPC) to produce an integrated national program of research. . . ."[11] The document further requests that the Department of Interior, the Environmental Protection Agency (EPA), National Oceanic and Atmospheric Administration (NOAA) and the Coast Guard work to "protect the marine environment from oil pollution and other adverse effects."[12] Finally, it urges the departments of State and Interior to work with other Arctic countries to "conserve the region's rich and unique biological resources," going so far as to mention specifically the need to protect the "habitat of the Porcupine River caribou herd."[13]

The last paragraph of PDD/NSC-26, entitled "Coordination and Implementation," suggests a new configuration with "Arctic [and Antarctic] subgroups of the Interagency Working Group on Global Environmental Affairs, chaired by the Department of State and reporting to the National Security Council."[14] PDD/NSC-26 is silent on budgetary resources, but the document was distributed to 26 separate offices and agencies.

Fourteen years after PDD/NSC-26, the most recent American Arctic policy statement arrived in the last days of the George W. Bush administration in January 2009. In eight pages, the United

5. NSDM-144, "United States Arctic Policy and Arctic Policy Group," 2.
6. NSDD-90, "United States Arctic Policy," 1.
7. Ibid., 2.
8. PDD/NSC-26, 2.
9. Ibid., 4.
10. Ibid., 2.
11. Ibid., 2–3.
12. Ibid., 3.
13. Ibid.
14. Ibid., 5.

States reaffirmed that it is an Arctic nation and that its policy focus will be in seven areas, to be implemented through seven different coordination strategies by numerous federal agencies.

Focus Area	Responsible Federal Agencies
Meeting National and Homeland Security needs (e.g., freedom of navigation)	Departments of State, Defense, and Homeland Security
Strengthening International Governance (e.g., U.N. Convention on the Law of the Sea, Arctic Council)	Department of State
Resolving Outer Continental Shelf/Boundary Issues	Department of State
Promoting International Scientific Cooperation	Departments of State, Interior, and Commerce; National Science Foundation
Prioritizing Maritime Transportation	Departments of State, Defense, Transportation, Commerce, and Homeland Security
Promoting Economic and Energy Issues	Departments of State, Interior, Commerce, and Energy
Ensuring Environmental Protection, Conservation, and Stewardship	Departments of State, Interior, Commerce, and Homeland Security; Environmental Protection Agency

The final paragraph of NSPD-66/HSPD-25 is dedicated to the issue of budgetary resources and assets needed for policy implementation. Unfortunately, the document left the various heads of each appropriate federal agency to their own devices to identify funding to implement NSPD-66, noting that budgetary issues were "subject to the availability of appropriations."[15] Simply put, there would be no additional resources to implement NSPD-66/HSPD-25.

But unlike in 1971, when only seven agencies were tasked to engage in U.S. Arctic policy, the 2009 directive more than trebled the number: it tasks twenty-four separate departments, agencies, and offices with Arctic duties. U.S. Arctic policy is also addressed in other interagency strategies and venues, such as the National Oceans Policy under the auspices of the National Ocean Council, which is co-chaired by the OSTP and the Council on Environmental Quality (CEQ). The National Strategy for Maritime Security (NSMS), which the president's national security advisor for homeland security is responsible for implementing, provides another framework that impacts the Arctic.[16]

Policy coordination has been the Achilles' heel of U.S. Arctic policy. For example, one federal agency, the U.S. Arctic Research Commission, has been tapped to improve scientific research

15. National Security Presidential Directive and Homeland Security Presidential Directive (NSPD-66/HSPD-25), "Arctic Region Policy," January 9, 2009, http://www.fas.org/irp/offdocs/nspd/nspd-66.htm.

16. White House, "The National Strategy for Maritime Security," September 2005, http://georgewbush-whitehouse.archives.gov/homeland/maritime-security.html.

MS *Brilliance of the Seas* (Royal Caribbean International) cruises to the Norwegian Fjords and the Arctic Circle.

Source: Flickr user archer10 (Dennis); Feb 10, 2011, http://www.fotopedia.com/items/flickr-5241979027/slideshow.

coordination and is responsible for developing an integrated national Arctic research policy. This includes the task of promoting cooperation between different levels of government (federal, state and local), as well as reviewing and giving recommendations on various aspects of organizing domestic and international Arctic research. Yet a June 2011 publication by the U.S. Geological Survey reports that crucial aspects of U.S. coordination of Arctic science policy are missing. The report cites that, for example, there is no synthesis of multiple studies conducted to evaluate the cumulative impacts of offshore energy development on the Arctic ecosystem.[17] Clearly, it is absolutely vital to ensure that each U.S. policy actor can achieve its goals in an efficient manner.

In sum, while U.S. Arctic policy in 2009 was updated substantially and offered greater details than previous policies, the coordination mechanisms became more diffuse, cross-cutting, and unclear.

17. U.S. Geological Survey, "An Evaluation of the Science Needs to Inform Decisions on Outer Continental Shelf Energy Development in the Chukchi and Beaufort Seas, Alaska," June 2011, http://pubs.usgs.gov/circ/1370/.

3 U.S. ACTORS IN THE ARCTIC

In any policy area, those U.S. departments and agencies that have budgetary resources, decision-making authority, and policy oversight ultimately determine the coordination of policy. This chapter details the key U.S. institutional actors that have shaped and will continue to shape U.S. Arctic policy within the three prescribed pillars of security, development, and science.

Department of Defense

Security and international cooperation have always been a critical component of U.S. Arctic policy, and these elements are strongly emphasized in NSPD-66. Key tasks include ensuring freedom of navigation and overflight; preventing terrorist attacks; ensuring a maritime presence; and supporting U.S. missile defense and early warning systems. NSPD-66 also stresses the need for increased U.S. cooperation with other Arctic coastal states in such areas as search and rescue and disaster response.

Traditionally, the U.S. Department of Defense, and the U.S. Navy in particular, has played an important role in implementing Arctic policy. The Navy was the first department to develop a follow-on document to NSPD-66, known as the Navy's "Arctic Roadmap." Released in October 2009 and developed by the Navy's Task Force Climate Change, the roadmap underscores the need to develop strong cooperative partnerships with interagency and international Arctic stakeholders. It also calls for comprehensive assessments of the Navy fleet's readiness and mission requirements for the region, as well as advocacy for accession to the United Nations Convention on the Law of the Sea. Although its submarine fleet has decades of experience performing missions and exercises under the Arctic sea ice, the operational experience of the Navy's surface fleet in the region is far more limited. This is also the case with the Navy's air assets and with U.S. Marine Corps ground troops, which have limited training in extremely cold weather conditions. Increased situational awareness and preparedness for operations in this harsh region will be critical for the Navy moving forward. Human and commercial activity in the Arctic region will also increasingly demand policy attention from the U.S. Navy and the Department of Defense to fulfill their mission of ensuring freedom of navigation in the world's oceans and providing security and protection for the United States and its allies. Although the importance of the Navy is well known in such areas as the straits of Hormuz and Malacca, and the Suez and Panama canals, it is time to look north to the Bering Strait as a new area of naval policy focus and attention.

At the request of Congress,[1] in May 2011 the Department of Defense completed a comprehensive review of its role in the Arctic. Its "Report to Congress on Arctic Operations and the

1. House of Representatives Report 111-491 to accompany H.R. 5136, "National Defense Authorization Act for Fiscal Year 2011," 337, http://www.gpo.gov/fdsys/pkg/CRPT-111hrpt491/pdf/CRPT-111hrpt491.pdf.

Northwest Passage" examines existing U.S. capabilities and strategic interests in the Arctic, including detailed assessments of national security objectives and gaps in existing resources.[2] Specifically, the Department of Defense examined the need for a U.S. Arctic deep-water port and for icebreakers to support national security objectives in the region. The report concludes that the government must balance the risk of being "late to need" with the opportunity cost of making premature Arctic investments. Unfortunately, this report did not encompass the Department of Homeland Security and the U.S. Coast Guard, the agency that controls the U.S. icebreaker fleet and is in urgent need of funding to procure new ice-breaking vessels. The report concludes that additional evaluations of the future Arctic operating environment are needed before significant investments in infrastructure are made. Budgetary requirements for a significant U.S. investment in the Arctic are vast; it is estimated, for example, that one newly constructed icebreaker would cost $1 billion. As a result, in the present economically constrained environment, the military will almost certainly conduct numerous studies and assessments of Arctic needs rather than seek actual funding decisions.

The Department of Defense is also involved in the environmental assessment of the Arctic, and it recognizes the importance of changing environmental conditions in the region. The Navy's Arctic roadmap highlights the role climate change plays in energy security, research and science, the economy, fisheries, tourism, the assertion of sovereignty, and other related issues. To be prepared to address the emerging challenges caused by the opening of the Arctic Ocean waters, the report recognizes that changes in the environment must be examined and taken into account when shaping any related policies. The Arctic roadmap calls for the Navy to continue science accommodation

Ministerial Meeting of the Arctic Council in Nuuk, Greenland. Secretary Clinton represented the United States among other participating foreign ministers from Canada, Denmark, Finland, Iceland, Norway, Russia and Sweden.

Source: U.S. State Department Image, May 12, 2011, http://www.state.gov/r/pa/ei/pix/2011/05/163291.htm.

2. Department of Defense, "Report to Congress on Arctic Operations and the Northwest Passage," May 2011, http://www.defense.gov/pubs/pdfs/Tab_A_Arctic_Report_Public.pdf.

missions as part of the Science Ice Exercise (SCICEX) program. Through SCICEX, the Navy allows civilian marine research scientists to use nuclear-powered submarines as data-collection platforms for scientific studies of the Arctic Ocean, including measurements of sea ice thickness, ocean hydrography, and bathymetry.[3]

The Obama administration recognized the importance of streamlining military organizational structures with Arctic responsibilities and took a meaningful step forward in 2011 with the Department of Defense's revised Unified Command Plan for the Arctic. Previously, the Arctic area of responsibility was divided equally among three combatant commands: European Command (EUCOM), Pacific Command (PACOM) and Northern Command (NORTHCOM). The 2011 Unified Command Plan shifted Arctic operations from this shared three-way command structure to a more focused two-way structure. Both NORTHCOM and EUCOM are now tasked with coordinating the response efforts of the Department of Defense, and for providing unity of command in the event of a security crisis. EUCOM's focus on the Russian Arctic and NORTHCOM's responsibility to advocate for Arctic capabilities within the Department of Defense are critical for the development of Arctic security strategy in the region.

Department of Homeland Security

The United States Coast Guard (USCG), under the auspices of the Department of Homeland Security, has the most expansive set of authorities for the Arctic Ocean of any U.S. government security actor. With service in the Arctic dating back to 1865 (the Coast Guard marching song begins, "From the Aztec shore to the Arctic zone. . ."), the USCG has an array of critical missions that include defense readiness, coastal security, security of ports and waterways, marine environmental protection, protection of living marine resources (including fisheries), ice operations, aids to navigation, marine safety, and law enforcement.

Most of the Coast Guard's permanent presence in Alaska matches the major population and economic concentrations in southern Alaska, with only temporary or occasional infrastructure in the north. Such operations include Arctic Domain Awareness patrols by various assets, including C-130 turboprop transport aircraft, as well as patrols of key ports, maritime security around Alaska, documentation of coastal erosion, ice observation, support of science missions, and training opportunities for pilots and crews in the harsh Arctic conditions.[4] The Coast Guard also conducts major cutter operations related to law enforcement and search and rescue, deploys icebreakers to clear navigational routes, maintains and replaces navigational buoys, and regulates maritime industry in the Arctic. Additionally, the Coast Guard engages in Arctic community outreach by providing water-safety training in schools; developing relationships with local indigenous populations; and providing medical, dental, optometry, and veterinary services.[5] This local engagement is particularly important to facilitate greater understanding and cooperation between regional populations and the Coast Guard.

Coast Guard responsibility for protecting the Alaskan maritime region operations falls to District 17, one of 17 regional Coast Guard commands. District 17 faces a number of challenges

3. SCICEX Science Advisory Committee, "SCICEX Phase II Science Plan: Technical Guidance for Planning Science Accommodation Missions," 2010, http://www.arctic.gov/publications/scicex_plan.pdf.

4. U.S. Coast Guard, "Missions: Arctic Domain Awareness," http://www.d17.uscgnews.com/clients/c780/261751.pdf.

5. U.S. Coast Guard, "USCG D17 Arctic Brief," January 27, 2011, http://www.uscg.mil/d17/Arctic%20Overview%20Feb2011.pdf.

conducting maritime operations in the Arctic, due not only to the harsh climate and communications difficulties, but also to the sheer geographic span that it is responsible for covering. The distance from Kodiak, the southernmost point in central Alaska, to Point Barrow, the northernmost point in central Alaska, is 940 miles—the same distance as from Los Angeles to Seattle.[6] District 17 is responsible for 33,000 miles of coastline, covering the entire state of Alaska and nearly four million square miles of water—more square miles than the continental United States.[7]

The Coast Guard faces a number of operation and budget challenges. In fiscal year (FY) 2011, its budget for Arctic operations, including the operational requirements for the Coast Guard Cutter (USCGC) *Healy*, the only medium polar icebreaker in the Coast Guard fleet until mid-2013, was $107 million.[8] Most recently, the FY 2013 budget request provided $8 million to begin the survey and design stage of the polar icebreaker procurement process. Perhaps not surprisingly, the Department of Homeland Security prioritizes, both from a personnel and budget resources standpoint, America's southern land and sea border as well as the fight against terrorism. This prioritization will always create tension between the growing operational demands of the Arctic and those of the Coast Guard's southern activities.

The U.S. Coast Guard and Russian Border Guard conduct a joint search and rescue exercise.

Source: U.S. Coast Guard; April 4, 2012, http://cgvi.uscg.mil/media/main.php?g2_itemId=1586544&g2_imageViewsIndex=1.

6. U.S. Coast Guard, "USCG D17 Arctic Brief," January 27, 2011, http://www.uscg.mil/d17/Arctic%20Overview%20Feb2011.pdf.

7. New admiral takes command of Coast Guard operations in Alaska," The Observer, September 6, 2009, http://www.observertoday.com/page/content.detail/id/528814/New-admiral-takes-command-of-Coast-Guard-operations-in-Alaska.html?nav=5060.

8. U.S. Coast Guard, "2012 Posture Statement," February 2012, 35, http://www.uscg.mil/posturestatement/docs/uscg_2012_posture_statement.pdf.

Department of State

As Arctic and non-Arctic actors seek economic advantage, unresolved border issues and potential scientific claims to extend the outer continental shelf in the Arctic will shape the future Arctic security environment. The established international legal framework and governance structure for the Arctic Ocean is the United Nations Convention on the Law of the Sea (UNCLOS). The United States currently has two Arctic border demarcation disputes in the Arctic: one with Canada in the Beaufort Sea, and a 1990 border agreement with Russia in the Bering Sea that has yet to be ratified by the Russian Duma. Under the provisions of UNCLOS, Arctic coastal states are submitting scientific claims to extend their outer continental shelves. Unfortunately, the United States is unable to do so as it currently remains outside of the treaty.

The State Department is charged with seeking Senate ratification of UNCLOS. Were it to ratify UNCLOS, the United States would benefit from "the firmest legal footing" in asserting an exclusive economic zone. Ratification is a strategic priority as it would also give the United States the right to impose environmental regulations on all foreign transit vessels passing through its territory, in addition to other benefits. The interagency U.S. Extended Continental Shelf Task Force has started preparing for possible ratification by working to determine the limits of the U.S. extended continental shelf, including in Alaska and the U.S. Arctic.

For the reasons above, the State Department plays a central role on all Arctic issues. The Office of Ocean and Polar Affairs within the Bureau of Ocean and International Environment and Scientific Affairs has principal responsibility for U.S. Arctic policy matters. State Department activities include fostering international and interdisciplinary scientific cooperation and participation in various multilateral platforms with a focus on polar regions.

The Department of State is also the leading U.S. government actor with regard to foreign policy and diplomacy issues related to Arctic energy and mineral resources. On issues related to oil and gas, the State Department seeks to balance U.S. policy between energy security, environmental sustainability, and economic prosperity. The department's Bureau of Energy Resources, established in 2011, is charged with U.S. energy diplomacy efforts and spearheads cooperation with industry, technology, and policy leaders to promote sustainable resource development domestically and internationally, including in the Arctic region.

The most important multilateral venue for Arctic policymaking is the Arctic Council. The individual who is the day-to-day U.S. interlocutor with the Arctic Council is the U.S. senior Arctic official (SAO). Each of the eight members of the Arctic Council has its own SAO. The U.S. SAO, an official in the Office of Ocean and Polar Affairs, is responsible for overseeing Arctic Council working groups and ad hoc task forces. Additionally, the SAO shapes the two-year action plan at the beginning of a chairmanship and the declaration for the ministerial meeting at its end. The domestic role of the SAO is to coordinate related U.S. activities on an international level through the work of the Arctic Policy Group (APG). A key achievement of the Arctic Council was the signing of the "Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic" in May 2011. This agreement was the first-ever binding treaty negotiated by the Arctic Council. Plans for a binding agreement on oil-spill response are underway and will be presented at the May 2013 Arctic Council Ministerial in Kiruna, Sweden.

The Office of Marine Conservation, part of the Bureau of Ocean and International Environment and Scientific Affairs, is tasked with maintaining a healthy and productive marine envi-

ronment and ecosystem, while also promoting economic benefits and food security through sustainable fisheries. The office recognizes that the region poses a variety of challenges for fisheries management. For example, in contrast to North Atlantic territories, which already have established commercial fisheries and mechanisms for international management, the North Pacific Ocean and Bering Sea remain largely undeveloped and without such mechanisms. To achieve its goals, the office participates in international fisheries conservation and management organizations. It represents U.S. interests internationally on topics involving conservation and management of living marine resources.

Kodiak Harbor, Alaska.

Source: Flickr user Dave 2x; Apr 20, 2012, http://images.cdn.fotopedia.com/flickr-3726875875-hd.jpg.

White House

Climate change and the development of a national energy strategy play critical roles in the U.S. government's future strategic planning for the Arctic region. Higher temperatures lead to the loss of sea ice cover in the Arctic, which has consequences for the Arctic ecosystem and the people who live there. The more Arctic waters open to increased maritime traffic, natural and mineral resource development, and tourism, the greater the risk of an environmental catastrophe taking place that would cause irreversible harm to fragile Arctic ecosystems. The U.S. government is working to better understand these fundamental changes and to better regulate its Arctic environment. As the White House is central to the development of national environmental and energy regulations, it will therefore shape all U.S. environmental and resource development policies in the Arctic. Additionally, it has the role of providing crisis management leadership in the event of a catastrophic event in the Arctic.

A key force behind the development and assessment of environmental regulations is the Council on Environmental Quality (CEQ) within the Executive Office of the President. The council has significant impact on shaping national and regional environmental and maritime policies; it

subsequently plays a key role in regulating the Arctic region. Since 2009 the council has co-chaired the Interagency Climate Change Adaptation Task Force together with the Office of Science and Technology Policy (OSTP) and the National Oceanic and Atmospheric Administration (NOAA). The task force seeks to determine areas where U.S. policies can be improved to help manage and respond to ongoing climate change. It also has published reports that specifically discuss the Arctic as a region with a fragile ecosystem that could easily be impacted by global warming.

In June 2009, President Obama brought together a group of senior government officials, the Interagency Ocean Policy Task Force, to shape a new comprehensive ocean policy. A year later the group presented its *Final Recommendations Report*. The recommendations became Executive Order 13547 and established the first U.S. national policy for bodies of water. They also led the administration to create the National Ocean Council (NOC), co-chaired by the CEQ and the OSTP. The main goal of the National Ocean Council is to ensure that the recommendations for ocean and coastal preservation and Great Lakes environmental health are incorporated into executive agencies' policies. The council also addresses climate change challenges and is responsible for implementing coastal and marine spatial planning. Both these tasks—climate change and coastal/marine spatial planning—are of great importance to the Arctic. In fact, understanding the "Changing Conditions in the Arctic" is listed as one of the nine national priority objectives in the task force's report.

Department of Commerce, NASA, and the National Science Foundation

Conducting environmental scientific research in the Arctic is another major aspect of U.S. government activity, and a number of governmental institutions and agencies are tasked with researching the unique Arctic environment. NOAA, which is part of the Department of Commerce, plays a leading role in this arena, focusing on the science behind environmental conditions, climate patterns, and the effects of climate change on existing ecosystems. NOAA seeks to "understand and predict changes in climate, weather, oceans, and coasts," which includes a focus on the Arctic. NOAA also works in close collaboration with the National Aeronautics and Space Administration (NASA) to manage and operate polar-orbiting and geostationary environmental satellite systems. Through these satellites, NASA provides the necessary technology to observe global climate change patterns and shifts in the extent of Arctic ice. In FY 2012, NOAA allocated $1.8 billion to the National Environmental Satellite, Data, and Information Service, including $181 million for operating its satellite programs and facilities and $1.69 billion for procurement, acquisition, and construction of new environmental monitoring satellite systems.[9] The budget request for FY 2013 was $2.04 billion: $191 million for operations and $1.85 billion for procurement.

The U.S. government is not the only interested consumer of NOAA climatic information. In August 2011, NOAA signed a unique collaborative agreement with three oil companies, Shell Exploration & Production, ConocoPhillips, and Statoil USA E&P Inc., to share ocean, coastal, and meteorological data, as well as sea ice and sea floor mapping studies.[10] This is an important example of the growing role and intersection of public and private sector interests in the Arctic.

9. National Oceanic and Atmospheric Administration, "FY 2013 Budget Summary," February 13, 2012, http://www.corporateservices.noaa.gov/nbo/fy13_bluebook/noaaBlueBook_2013_Web_Full.pdf.

10. National Oceanic and Atmospheric Administration, "NOAA and three global energy companies agree to share ocean, coastal and meteorological data for the Arctic," August 23, 2011, http://alaskafisheries.noaa.gov/newsreleases/2011/arcticmou082311.pdf.

Scientists from NOAA's Office of Coast Survey and the University of New Hampshire use echo sounding equipment to create a three-dimensional map of the sea floor north of Alaska in the Chukchi Cap.

Source: Flickr user NOAA's National Ocean Service; February 12, 2010, http://www.flickr.com/photos/usoceangov/4352249968/sizes/l/in/photostream/.

The National Science Foundation (NSF) is the lead agency in charge of implementing Arctic research policy. The Division of Arctic Sciences in NSF's Office of Polar Programs supports scientific research in areas of atmospheric, biological, physical, earth, ocean, and social sciences. The Arctic System Science Program conducts interdisciplinary investigations of the Arctic as a complex system in an attempt to predict how this system will evolve and how it will impact the world. The Arctic Observing Network uses a system of environmental monitoring capabilities to examine the changes that occur in the Arctic environment. The network collects atmospheric, terrestrial, maritime, and glacial data, which are used in the Study of Environmental Arctic Change (SEARCH) program. The NSF was a major contributor to and, in fact, the leading U.S. agency for the International Polar Year 2007–2008 project, funding 41 programs in 13 NSF organizations during FY 2006–2009 and spending an estimated $349 million on the awards.[11]

The director of the NSF chairs the Interagency Arctic Research Policy Committee, consisting of representatives from more than ten other agencies and departments. Its main objective is to assess existing Arctic research, find knowledge gaps, and formulate priorities for future projects. The committee assists the U.S. Arctic Research Commission in developing integrated national Arctic research policy and is responsible for creating a five year implementation plan, updated biennially, for that policy. The committee is also tasked with promoting international and interagency research cooperation in the Arctic.[12]

The National Snow and Ice Data Center is an information and referral center that plays an important role in monitoring the Arctic environmental landscape. The center supports research and analysis of the cryosphere by gathering, managing, and distributing scientific data regarding snow

11. National Science Foundation, "National Science Foundation International Polar Year Awards," http://www.nsf.gov/od/opp/ipy/awds_lists/2010_awds/ipy_awds_toc.jsp.

12. Interagency Arctic Research Policy Committee, "About the Interagency Arctic Research Policy Committee," http://www.nsf.gov/od/opp/arctic/iarpc/start.jsp

and ice cover and the Arctic climate. Center activities are supported through competitive grants and contracts from NASA, NSF, and NOAA.[13]

Sea otters in Katmai National Park and Preserve, Alaska.

Source: Flickr user patrickmoody, Jan 24, 2010, http://i.images.cdn.fotopedia.com/flickr-3907854179-original/US_National_Parks/Alaska/Katmai_National_Park_and_Preserve/Katmai_Alaska_3329.jpg.

Finally, the Arctic Ocean is home to large fish stocks and fish breeding areas. As temperatures rise, it is anticipated that Arctic fish stocks will move. While this will increase fishing opportunities, it could also result in disputes over quotas and fishing area boundaries. For the United States, these fisheries are both vast and valuable, consisting of nearly 1 million square miles of the Alaskan exclusive economic zone and currently valued at over $1 billion annually. Given the importance of these resources, the U.S. government has a strong interest in managing and regulating these valuable assets.

NOAA's National Marine Fisheries Service has key responsibilities for the management, conservation, and protection of the nation's living marine resources and their habitat within the U.S. exclusive economic zone.[14] The fisheries service predicts the status of fish stocks, ensures compliance with fisheries regulations, and works to reduce wasteful fishing practices. Its offices include the North Pacific Fisheries Management Council in Alaska, which works with local communities on fishery management issues and on promoting sustainable fisheries.[15] The Alaska Region of NOAA Fisheries oversees sustainable fisheries that produce about half of all fish caught in U.S. waters, covering 842,000 square nautical miles off the Alaskan coastline.[16]

13. National Snow and Ice Data Center, "Sponsors," http://nsidc.org/about/sponsors.html.
14. National Oceanic and Atmospheric Administration, "About National Marine Fisheries Service," http://www.nmfs.noaa.gov/aboutus/aboutus.html.
15. Ibid.
16. National Oceanic and Atmospheric Administration, "Alaska Regional Office," http://www.alaskafisheries.noaa.gov/.

Department of the Interior

As Arctic sea ice retreats, the oil and gas resources of Arctic Alaska are increasingly becoming available for extraction. Additionally, Arctic mineral resources such as zinc, lead, gold, and rare earth elements are growing more accessible as a result of technological advancements and improved infrastructure. A number of federal agencies are involved in different aspects of these developments. Issues such as permitting and the regulatory process for mining and oil and gas developments, conducting research on energy and mineral resources, and conducting international energy diplomacy are just a few of the tasks that government actors are responsible for in the Arctic.

The White House's Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska focuses on oil and gas issues in the Arctic and is led by the Department of the Interior. Established on July 12, 2011 by the presidential "Blueprint for a Secure Energy Future," the group is tasked with enhancing information sharing and coordination among government agencies over on- and offshore exploration of Alaska's oil and gas resources. The working group monitors the compliance of exploration processes with environmental regulations and safety standards. Additionally, it undertakes strategic planning in the areas of search and rescue, oil spill prevention, and Arctic infrastructure. The creation of this working group has led to the streamlining and efficiency of the drilling permitting process in the Arctic. This was best demonstrated by the government's approval of Shell's exploration plan in the Beaufort Sea in August 2011.

Within the Department of the Interior, the Bureau of Ocean Energy Management manages offshore leasing programs and conducts environmental assessments. The Office of Strategic Resources develops the five-year outer-continental-shelf oil-and-gas-leasing program and ensures responsible expansion of oil and gas exploration while protecting areas not suitable for drilling. In the Arctic Alaska region, the current lease program period runs from 2012 until 2017; the department has delayed the sale of oil leases in the Chukchi and Beaufort seas until 2015, to allot sufficient time to complete environmental assessments and evaluate subsistence needs and infrastructure capabilities.

The Bureau of Land Management manages onshore oil and gas development. The Oil and Gas Management Program within the bureau is in charge of land use planning, lease sales and permitting, and production and reclamation oversight. The bureau released the final activity plan and environmental impact statement for development of the National Petroleum Reserve–Alaska (NPR–A) in November 2012. In an effort to balance energy needs with wildlife protection and subsistence requirements of Alaska natives, the Department of the Interior has proposed expanding leasing for oil and gas development on more than half of the reserve's acreage, while restricting development in the remainder of the area to protect coastal habitats and calving and nesting areas for Arctic wildlife. Under the plan, a pipeline could still be built across the reserve to transport oil and gas from the Beaufort and Chukchi seas, albeit at a potentially higher cost.

The Alaskan natural gas pipeline proposal is a major project that seeks to transport natural gas from the Alaska North Slope natural gas reserves to the U.S. Midwest. Although the U.S. government has not yet approved this proposal, the project already includes roles for a wide array of U.S. agencies involved in the Arctic. The Federal Energy Regulatory Commission (FERC)—the lead agency that reviews applications for interstate natural gas pipelines—prepares environmental impact statements and submits semiannual reports to Congress regarding project development progress and fulfillment of regulatory filing requirements. The Office of Oil and Natural Gas

The Trans-Alaska pipeline.

Source: Flickr user jkbrooks85; Dec 22, 2009, http://fr.fotopedia.com/items/flickr-3120222550/slideshow.

within the Department of Energy supports policies for the development of the pipeline, and the State Department's Bureau of Energy Resources is consulted in the permitting process. The Office of the Federal Coordinator for Alaska Natural Gas Transportation Projects seeks to expedite federal permitting and construction of the Alaskan natural gas pipeline by coordinating the work of FERC, 25 other federal agencies, the state of Alaska, and the federal government in Canada.

The Energy and Resources Program within the United States Geological Survey (USGS)—also part of the Department of the Interior—conducts mineral and energy resource appraisals and assesses the impacts of resource extraction and use on the environment, economy, and human health. In 2008, the USGS published a resource appraisal of petroleum resources in the Arctic region, which is estimated to hold 13 percent of the world's undiscovered oil resources and 30 percent of the world's undiscovered gas resources, with 84 percent of these resources located in offshore areas.[17] The USGS also assessed potential oil and gas resources in the NPR–A and in Alaska's North Slope. The Alaskan Arctic is second only to Russia as the Arctic region with the most economic potential, holding an estimated 29.9 billion barrels of oil, 221 trillion cubic feet of natural gas, and 5.9 billion barrels of natural gas liquids. According to resource evaluations conducted by the Bureau of Ocean Energy Management, about 26 billion barrels of oil and 131 trillion cubic feet of gas resources are technically recoverable from undiscovered fields in Alaska's outer continental shelf.

In addition to these considerable oil and gas resources, the Arctic is home to large quantities of mineral resources, including strategically important rare earth elements. The USGS Mineral Resources Program conducts mineral resource assessments and research on the production, consumption, and environmental impact of mineral extraction in the United States. The USGS Alaska Science Center has assessed the mineral resource potential of the Arctic Alaska region, estimating that there are more than 50 million tons of zinc and lead deposits at the Red Dog mine, 3.2 trillion

17. U.S. Geological Survey, "Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle," 2008, 1, http://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf.

Offshore Oil Rig, Cook Inlet, Alaska.

Source: Flickr user jkbrooks85; April 5, 2012, http://www.flickr.com/photos/jkbrooks85/7453389126/.

tons of coal resources in the Nanushuk formation in the North Slope region, and 500,000 ounces of gold at the Rock Creek gold mine near Nome.[18]

Tasked with administering more than 237 million acres of federal mineral estates located in Alaska, the Bureau of Land Management's Alaska minerals program manages mining claims on federal lands, processes mineral lease applications and prospecting permits, and conducts mineral surveys and annual assessment of mining sites. The Office of Surface Mining Reclamation and Enforcement, part of the Department of the Interior, is responsible for coordinating land reclamation projects and preventing adverse social and environmental impacts of surface coal mining operations. In Alaska, the office oversees state implementation of surface coal mining regulation and reclamation programs.

Department of Energy

The Department of Energy is tasked with managing the transformation of the U.S. energy system, promoting energy technology innovation, developing science and technology solutions to energy and environmental challenges, enhancing nuclear security, and improving project management and regulatory supervision.[19] Several Department of Energy offices and agencies have responsibilities and authorities over oil and gas development in the Alaskan Arctic.

The Office of Policy and International Affairs, responsible for the department's international energy activities, also deals with policy regarding the use of rare earth elements, which are considered critical inputs in clean energy technologies.[20] In 2010, the department released its first "Critical Materials Strategy," which calls for the United States to seek to mitigate supply risks and decrease global demand for rare earth minerals by diversifying global supply chains, developing substitutes, and supporting recycling of these resources.[21] Large resources of rare earth elements have recently been discovered in the Arctic region, but remain unexplored to date. For example,

18. U.S. Geological Survey, "Alaska Resource Data File (ARDF)," http://mrdata.usgs.gov/ardf/.
19. U.S. Department of Energy, "Strategic Plan 2011," http://energy.gov/sites/prod/files/2011_DOE_Strategic_Plan_.pdf.
20. U.S. Department of Energy, "Office of Policy and International Affairs: About Us," http://energy.gov/node/1939/office-policy-and-international-affairs/about-us.
21. U.S. Department of Energy, "Critical Materials Strategy," 2010, http://energy.gov/sites/prod/files/edg/news/documents/criticalmaterialsstrategy.pdf.

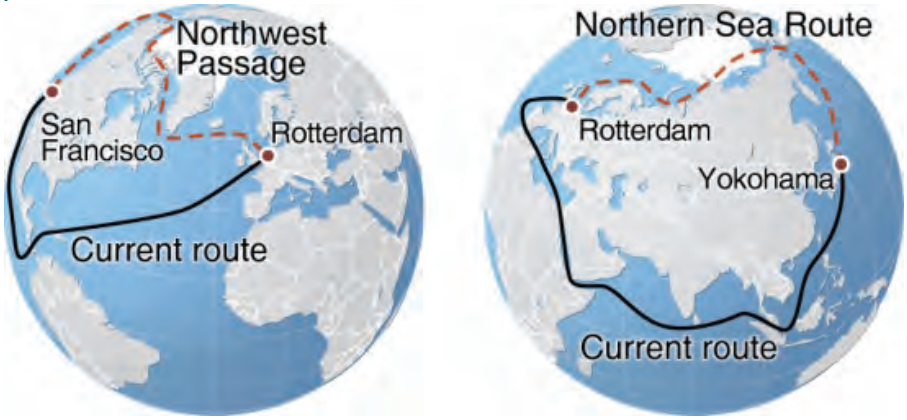
the southwest coast of Greenland holds 4.7 million tons of rare earth oxide, which could meet a quarter of the global demand for the next 50 years.[22]

Department of Transportation

The emergence of viable Arctic shipping lanes, such as the Northern Sea Route and the Northwest Passage, has the benefit of fueling economic growth but would also require enhanced regulation and standardization of shipping vessels and vast improvements in regional infrastructure. In 2010, four ships carrying 111,000 tons of cargo passed through the Northern Sea Route. This number increased to 34 ships carrying 820,000 tons of cargo in 2011[23] and to 46 vessels transporting over 1.26 million tons of cargo in 2012.[24] The United States employs a variety of actors to manage its key interests in the security, safety, and regulation of this ship traffic.

The U.S. Maritime Administration (MARAD), under the authority of the Department of Transportation, is responsible for the infrastructure, industry, and labor involved in all U.S. waterborne transportation systems. Since 2003, MARAD has worked to modernize the Port of Anchorage by providing federal oversight, assisting with federal and non-federal funding for the project, and streamlining the environmental review and permitting processes. Working in conjunction with the U.S. Coast Guard and ten other federal agencies, MARAD's Maritime Transportation System Initiative also seeks to improve the nation's waterways, ports, and intermodal landside connections, including those of the Alaskan Arctic.

Northern Sea Route and the Northwest Passage compared with currently used shipping routes.



Source: Hugo Ahlenius, UNEP/GRID-Arendal; 21 Feb 2012 b, http://www.grida.no/graphicslib/detail/northern-sea-route-and-the-northwest-passage-compared-with-currently-used-shipping-routes_1336#.

MARAD is also working with technical committees within both the International Maritime Organization and the International Organization for Standardization to develop a Polar Code that establishes mandatory safety standards for passenger ships and other vessels operating in ice-cov-

22. Greenland Minerals and Energy Ltd., "Fact Sheet," March 2011, http://www.ggg.gl/docs/Greenland_Minerals_and_Energy_Fact_Sheet-march2011.pdf; Leo Lewis, "Greenland challenge to Chinese over rare earth metals," *The Times*, October 5, 2009, http://www.thetimes.co.uk/tto/business/industries/naturalresources/article2183054.ece.

23. Trude Pettersen, "Rosatomflot Is ready for more cargo on Northern Sea Route," *Barents Observer,* December 14, 2011, http://barentsobserver.com/en/topics/rosatomflot-ready-more-cargo-northern-sea-route.

24. Trude, Pettersen, "46 vessels through Northern Sea Route," *Barents Observer*, November 23, 2012, http://barentsobserver.com/en/arctic/2012/11/46-vessels-through-northern-sea-route-23-11.

ered waters. Safety standards are a critical aspect of future Arctic activity with regard to shipping, fisheries, and the growing Arctic ecotourism industry. Maritime accidents involving shipping vessels in the difficult Arctic environment pose a challenge in terms of search-and-rescue operations and environmental damage response. Patrolling U.S. Arctic shipping routes and U.S. fisheries and conducting search-and-rescue operations are primarily the responsibility of the U.S. Coast Guard, but other actors are also involved.

4 CONCLUSIONS AND POLICY RECOMMENDATIONS

Time to Update NSPD-66/HSPD-25

NSPD-66/HSPD-25 contains a rigorous implementation schedule for the federal government. Yet, as this directive passes its fourth anniversary, many implementation strategies have not been put into effect. That said, several of the policy priorities and implementation strategies are redundant. For example, to meet U.S. security interests in the Arctic, an interagency group under the leadership of the departments of State, Defense, and Homeland Security is requested to "develop greater capabilities and capacity [. . .] to protect U.S. air, land and sea borders" and "increase Arctic maritime domain awareness."[1] Under maritime transportation, these same agencies, with the departments of Transportation and Commerce, are to "determine basing and logistics support requirements, including necessary airlift and icebreaking capabilities; and improve plans and cooperative agreements for search and rescue." These overlapping mandates raise the question whether this strategy is a security function, an act of commerce—or both—and who ultimately is accountable for implementing the strategy.

Such policy overlap and redundancy accurately reflects U.S. Arctic policymaking today and unfortunately reflects poorly on the interagency process following the release of NSPD-66. A successful future policy demands a more streamlined and prioritized process.

It is time to update NSPD-66. Other Arctic coastal states emerged with Arctic policy statements around the same time as the United States did, in the 2007 to 2009 timeframe. Since issuing these statements, however, most other Arctic nations have updated and further refined their whole-of-government strategies. Unfortunately, the United States has failed to do so. Separate federal agencies and departments have developed, or will be developing, their own separate strategies based on NSPD-66, but this effort has been uneven at best. The Navy produced its "Arctic Roadmap" in October 2009 and its "Strategic Objectives for the U.S. Navy in the Arctic Region" in May 2010. The U.S. Coast Guard has begun to formulate its own implementation strategy but, other than issuing a joint white paper on Arctic capabilities between the departments of Homeland Security and Defense, the Coast Guard has yet to articulate its future plans. The Coast Guard Arctic strategy will be one important piece of the Department of Homeland Security's Arctic strategy that is currently under construction. The Department of Defense report on Arctic Operations and the Northwest Passage was congressionally mandated by the fiscal year 2011 National Defense Authorization Act. However, there is no such mandate for other U.S. government agencies and, consequently, most other agencies have yet to develop their own implementation strategy stemming from NSPD-66.

What would an updated U.S. Arctic strategy require? The seven policy areas identified in NSPD-66 remain relevant, but these areas must be defined more clearly.

1. Department of Defense, "Report to Congress on Arctic Operations and the Northwest Passage," May 2011, http://www.defense.gov/pubs/pdfs/Tab_A_Arctic_Report_Public.pdf.

First and foremost, the United States must create a long-term economic strategy for the American Arctic. The first component of an Arctic economic strategy must be an energy, mineral resource, and infrastructure strategy. NSPD-66 states that "Energy development in the Arctic region will play an important role in meeting growing global energy demand."[2] How large a role? At present, U.S. energy strategy consists of a five-year offshore licensing and permitting plan that ends in 2017. The government needs to define its long-term offshore and onshore energy strategy for Alaska, answering such questions as whether America's Arctic energy resources are intended to meet U.S. demand or to be exported to Asian markets. Other questions in need of answers include the status of port, pipeline, and liquid natural gas infrastructure; whether methane hydrates are viable; and whether energy development can be pursued in an environmentally sustainable way in such a fragile environment.

Based on the answers to these questions, America's Arctic economic strategy must also include a detailed maritime transportation and infrastructure strategy. This strategy would ideally be built around ecosystem-based management. It is clear that a future U.S. Arctic maritime or infrastructure strategy will likely be a public-private partnership, as the private sector will provide significantly more financial and physical resources than will the U.S. government. For example, during the summer of 2012, Shell Oil Company deployed 22 vessels (two drill ships and twenty support vessels) for its Chukchi and Beaufort Sea drilling operations.[3] The U.S. Coast Guard deployed one National Security Cutter to observe the drilling, and the United States has only one medium polar icebreaker available through mid-2013.

Coast Guard personnel aboard the Coast Guard Cutter Sycamore use a crane and handling lines to lower a DESMI "Polar Bear" skimmer into the Arctic Ocean during an oil recovery exercise near Barrow, Alaska.

Source: U.S. Coast Guard; Aug 2, 2012, http://cgvi.uscg.mil/media/main.php?g2_itemId=1714697&g2_imageViewsIndex=1

2. National Security Presidential Directive and Homeland Security Presidential Directive (NSPD-66/HSPD-25), "Arctic Region Policy," January 9, 2009, http://www.fas.org/irp/offdocs/nspd/nspd-66.htm.

3. Royal Dutch Shell, "Royal Dutch Shell Alaska drilling update," September 17, 2012, http://www.shell.com/home/content/media/news_and_media_releases/2012/alaska_drilling_update_17092012.html.

Time for a New Organizational Approach

The coordination of U.S. Arctic policy and the twenty-plus agencies involved in the process is, in many cases, a more difficult issue to analyze than U.S. policy itself—it is telling that a U.S. government Arctic policy organizational chart does not exist. Over the past decades numerous administrations have attempted to enhance Arctic policy coordination; this has resulted in more coordinating bodies and processes, but few tangible results.

Historically the White House has been the center of U.S. Arctic policy coordination as it plays its natural role of interagency coordinator. Currently, six interagency Arctic policymaking bodies exist:

- *Arctic Policy Group*. This is a working-level interagency group chaired by the State Department. All federal agencies that have institutional interests in the Arctic participate in monthly meetings.
- *Interagency Arctic Research Policy Committee*. This group is chaired by the National Science Foundation and was authorized by the 1994 Arctic Research Policy Act.
- *Interagency Policy Committee on the Arctic*. This is an assistant secretary–level interagency group chaired by the National Security Staff (NSS) to coordinate Arctic policy implementation within the executive branch.
- *Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska*. Created in July 2011 and chaired by the deputy secretary of the Department of the Interior, this group brings together the federal agencies and departments responsible for overseeing onshore and offshore drilling in Alaska.
- *Maritime Security Working Group*. This group is chaired by the assistant to the president for homeland security and, on occasion, focuses on the maritime security environment in the Arctic.
- *National Ocean Council*. Co-chaired by the Office of Science and Technology Policy and the Council on Environmental Quality, this interagency group, on occasion, discusses Arctic related issues.

The current method of interagency coordination is an appropriate reflection of the challenges of U.S. Arctic policymaking; it must combine policymaking at the local (tribal and indigenous communities), state, federal, and international levels. There is no single element of the federal government, other than the White House, that can bring the domestic and international policy streams together and make necessary budgetary decisions. Realistically, however, the Arctic simply cannot compete for the time and attention of senior White House officials who are seized daily with international and domestic crises. Therefore, while the National Security Staff will play a critical coordinating role related to the Arctic, it cannot be the institutional driver for long-term and innovative policy solutions. It is also important to highlight the inconsistency in levels of leadership and representation among the various interagency groups listed above. For example, as previously noted, the most senior level policy group for the Arctic is the coordinating group on Alaskan energy development, led by the deputy secretary of the Department of the Interior, while another group is co-led by the National Science Foundation. What all of these entities lack is both a holistic policy approach to the Arctic that brings together the security, economic, environmental, scientific, and international interests in the Arctic, as well as sustained and senior leadership to ensure the necessary strategic and budgetary attention required to achieve a forward-looking and balanced U.S. Arctic policy.

In the absence of an updated U.S. Arctic policy, NSPD-66 can form the basis of a new bureaucratic framework for future Arctic policy. Rather than six separate interagency groups in the White House to discuss the Arctic, there should be one centralized and streamlined interagency effort, with Arctic issues more fully addressed by the different sections within the White House: the National Security Staff, the Council on Environmental Quality, and the National Economic Council. Within the National Security Staff, there should be a director for circumpolar affairs (most likely housed within the European directorate, as six of the eight Arctic Council member states are European and Eurasian). This individual would have overall responsibility for coordinating Arctic issues, as well as issues related to the Arctic Council, bilateral, regional and global issues across the national security agencies. A senior official seconded from the U.S. Coast Guard should be assigned to work closely with the director for circumpolar affairs to address Arctic maritime security, safety, and stewardship issues.

At present, the only official working tangentially on Arctic issues is a Coast Guard official seconded to work on the National Security Staff on maritime transportation and transborder issues. Within the Council on Environmental Quality, an individual should be assigned to coordinate all environmental and scientific research issues related to the Arctic (this individual could have responsibilities for Antarctica as well). Currently, no one working within the council has responsibility for Arctic policy, although there is an official on the National Oceans Council that looks after Arctic issues. Within the National Economic Council, an individual should be responsible for economic and sustainable development in the Arctic. This individual would coordinate closely with those domestic agencies charged with Arctic economic issues—such as the departments of Interior, Transportation, Commerce, and Energy—but would closely coordinate with the Council on Environmental Quality on all environmental issues. These individuals would report, through their respective senior directors, to the deputy national security advisor for international economics, who would be responsible for implementation of the U.S. Arctic economic strategy.

It may seem unusual to recommend placing U.S. Arctic policy under the purview of the senior White House official charged with global economic issues, but the future of the Arctic is of geo-economic importance. As a region with strong potential to be a new source of natural and mineral resources and global shipping routes, geo-economics will ultimately shape future U.S. Arctic policy. As previous CSIS reports[4] have underscored, economic factors are currently transforming Canadian, Danish/Greenlandic, Norwegian, and Russian policies. It is appropriate to place senior White House coordination in the economic portfolio.

Although the White House has played and will continue to play a critical role in coordinating U.S. Arctic policy, there must be one institutional, day-to-day driver of Arctic policy vision and diplomatic initiatives. NSPD-66 speaks loudly on this subject; for each of the seven U.S. policy interests that it lists, only one U.S. department is named as an implementing agency for all arenas: the Department of State.

Furthermore, although the Department of State already performs a critical role in Arctic policy formulation, it must be reorganized to perform this task in a more effective and streamlined

4. Heather Conley, Terry Toland, and Jamie Kraut, *A New Security Architecture for the Arctic: An American Perspective* (Washington, DC: CSIS, January 2012), http://csis.org/files/publication/120117_Conley_ArcticSecurity_Web.pdf; Heather Conley and Jamie Kraut, *U.S. Strategic Interests in the Arctic: An Assessment of Current Challenges and New Opportunities for Cooperation* (Washington, DC: CSIS, April 2010),http://csis.org/files/publication/100426_Conley_USStrategicInterests_Web.pdf.

manner. At present, Arctic policy is formulated in the Office of Ocean and Polar Affairs (OPA) in the Bureau of Oceans and International Environmental and Scientific Affairs (OES). The U.S. senior Arctic official (SAO) works in the OPA and reports to the office's deputy director, who reports to the OPA office director. This official reports to the OES deputy assistant secretary, who reports to the OES assistant secretary of state. In turn, this official reports to the undersecretary of state for economic growth, energy, and the environment, who then reports to the secretary of state. This chain of command makes it difficult for the voice of the SAO to reach the secretary of state directly. It is also important to note that, until recently, the director of the Bureau of Oceans and International Environmental and Scientific Affairs reported to the undersecretary of state for global affairs. The change may be further recognition of the growing importance of economic diplomacy in the Arctic.

The governments of other Arctic coastal states, such as Canada, Denmark (via Greenland), and Norway, have embraced a very different model and level of coordination. These governments have established the Arctic or "High North" as one of their top foreign and national security priorities. They have placed very senior officials in charge of their Arctic policy, such as the Danish undersecretary for Arctic affairs. The Canadian health minister, who is also the minister in charge of northern economic development, has recently been named to lead Canada's upcoming Arctic Council chairmanship for 2013–2015. With the exception of the United States, all SAOs hold the rank of ambassador. Many serve as the central coordinator for their respective government's Arctic policy, report directly to their minister of foreign affairs, and travel frequently to Arctic Council capitals for consultation. Unfortunately, the State Department institutionally neither gives the Arctic significant diplomatic prioritization nor syncs its current diplomatic representation with its Arctic and non-Arctic counterparts. This is an untenable position, particularly in light of the upcoming American chairmanship of the Arctic Council in 2015.

Thinning Arctic Ice.

Source: Patrick Kelley, U.S. Coast Guard, Aug. 23, 2009; Flickr user U.S. Geological Survey, http://www.flickr.com/photos/usgeologicalsurvey/4371010590/in/set-72157623467470824.

The Bureau of Oceans and International Environmental and Scientific Affairs and the State Department's Policy Planning Staff have been the historic brain trust of U.S. oceans policy and international science policy. Long-standing and highly skilled civil servants in both offices serve as a human archive of U.S. Arctic positions and policy. They attend countless technical and policy meetings both within the U.S. government and with other Arctic and non-Arctic states. However, these officials are deeply buried under the bureaucratic weight of the State Department, and their work is often done in isolation from the work of the regional bureaus. As U.S. bilateral and multilateral relations with the Arctic coastal states, Arctic Council member states, and non-Arctic states increase in importance, steps must be taken to better integrate and elevate Arctic policy within the State Department.

The Obama administration was fortunate to have former Secretary of State Hillary Clinton and former Deputy Secretary of State James Steinberg as strong internal advocates for greater U.S. diplomatic activism in the Arctic. As the first secretary of state to attend an Arctic Council ministerial meeting—in Nuuk, Greenland in May 2011—and to discuss Arctic issues, following her visit to Northern Europe in the summer of 2012, Secretary Clinton personally elevated Arctic policy. There is great hope and expectation that Secretary of State John Kerry, who has focused on the global impact of climate change and strongly encouraged immediate Senate ratification of the UN Convention on the Law of the Sea, will build upon his predecessor's work and devote his energy and attention to Arctic issues writ large.

Therefore, it is the perfect time and opportunity for Secretary Kerry to upgrade U.S. diplomatic efforts in the Arctic both in Washington and at U.S. embassies in Arctic Council member capitals. This is an urgent task in light of the increasing importance of the Arctic in general, and particularly in preparation for the Arctic Council chairmanship.

One place to begin is State Department bureau realignment on Arctic policy. With six of the Arctic Council member states (Denmark, Finland, Iceland, Norway, Russia, and Sweden) in its regional portfolio, the Bureau of European and Eurasian Affairs must become more active in shaping Arctic policy. The bureau's current Office of Nordic and Baltic Affairs, charged with overseeing U.S. bilateral relations with the five Nordic members of the Arctic Council, could be renamed the Office of Nordic, Baltic, and Arctic Affairs. This new office would integrate those officials engaged in Arctic work from the Office of Polar Affairs and could second officials from the National Science Foundation and Department of the Interior to supplement expertise as needed.

The deputy assistant secretary that oversees the Nordic, Baltic, and Arctic office could become the senior Arctic official and should receive an ambassadorial rank, or a senior diplomat could be named as a U.S. Arctic envoy with ambassadorial rank. However, it is recommended that this individual be embedded within the Bureau of European, Eurasian, and Arctic Affairs but work closely with and coordinate all relevant policies with the Bureau of Oceans and International Environmental and Scientific Affairs. The U.S. Arctic ambassador would coordinate policy with the seven U.S. embassies in Arctic Council member states, as well as conduct outreach activities to non-Arctic states and the private sector. The SAO would report to the assistant secretaries of state of both bureaus. This official would also lead interagency policy coordination on Arctic policy with the National Economic Council, with senior representation from the departments of State, Defense, Interior, Commerce, Transportation, and Homeland Security; the National Science Foundation; and the Office of Management and Budget (OMB). When the need for a decision arises, this group should make recommendations to the Deputies Committee meeting, which is chaired by the deputy national security advisor.

Beyond Washington, a more active political, economic and public diplomacy strategy must be developed that fully utilizes U.S. embassy personnel based in Arctic Council member states. Each U.S. embassy in the region should have a designated officer assigned to the Arctic portfolio. This is particularly important for the U.S. embassy in Moscow and the consulates general in St. Petersburg and Vladivostok, as the United States seeks opportunities to engage Russia positively on Arctic development. Unfortunately, U.S. knowledge and understanding about developments surrounding the Russian Arctic are limited at best. Officers assigned to the U.S. embassy in Moscow should travel more frequently to Murmansk, Arkhangelsk, Yamal-Nenets, and other locations to engage with local and regional officials and the private sector. The State Department should develop a specific public diplomacy campaign in advance of the U.S. chairmanship of the Arctic Council and the twentieth anniversary of the Arctic Council. One U.S. embassy, such as the one in Oslo, should be designated as a regional information and coordination hub during the U.S. chairmanship of the Arctic Council from 2015 to 2017. Some initial, long-term planning by the State Department's Office of Polar Affairs has already been done in this area.

In addition to enhancing reporting of Arctic developments and engaging with key regional officials, the State Department should also develop, in cooperation with other departments and agencies, a public diplomacy campaign for the American audience, explaining overall U.S. activities in the Arctic. This campaign should mention environmental and scientific research activities, international cooperation, and civil society initiatives, as few of the U.S. government's positive and collaborative activities are well known beyond the state of Alaska.

The Arctic is a multidimensional region that involves both domestic and international policy. Arctic policy will continue to require the expertise of a range of U.S. government officials—a whole-of-government approach in the truest sense of the word. How the Obama administration chooses to prioritize objectives, budget resources accordingly, and organize itself internally and externally will determine future U.S. policy toward the Arctic. In full coordination and cooperation with other Arctic states, as well as non-Arctic actors and the private sector, and with a clear, forward-thinking national Arctic strategy, the United States has a great opportunity to be a leading Arctic nation in the twenty-first century and, by doing so, to "win the Arctic."

ANNEX A
KEY PLAYERS IN ARCTIC ENVIRONMENT AND CLIMATE CHANGE POLICY

Climate change will shape the strategic landscape for the United States in the Arctic. Increased loss of sea ice, increased release of greenhouse gases into the atmosphere, greater absorption of solar energy by the ocean, and rapid thawing of permafrost will drive dramatic environmental change. This will have a tremendous impact on the native flora and fauna within the Arctic Circle, as well as the indigenous populations that rely upon these resources for their existence. This fragile ecosystem is unique, and the impact of future human and commercial activity in the Arctic has been a driver for increased environmental consciousness and sustainable development over the last decade.

The Executive Branch: Executive Office of the President

The major force behind policy development and the assessment of environmental regulations is the Council on Environmental Quality (CEQ) within the Executive Office of the President. Formed in 1969 by the National Environmental Policy Act (NEPA),[1] the CEQ is entrusted with assessing, monitoring, and improving the nation's environmental conditions and related legislation. The CEQ is also charged with interagency coordination of environmental programs and oversight of federal agencies' compliance with NEPA. Federal agencies are required to implement environmental impact assessments of proposed actions or projects and to avoid or minimize associated environmental risks or damages. Among the CEQ initiatives are two interagency groups, the Interagency Climate Change Adaptation Task Force (ICCATF) and the National Ocean Council (NOC). Both groups have a significant impact on shaping national and regional environmental and maritime policies, and subsequently play an important role in policy and regulator development in the Arctic.

Since 2009 the CEQ has co-chaired the ICCATF together with the White House Office of Science and Technology Policy (OSTP) and the Commerce Department's National Oceanic and Atmospheric Administration (NOAA). The task force has the primary objective of evaluating and reporting on various existing U.S. federal policies and examining areas where these could be

1. NEPA was later amended by the Environmental Quality Improvement Act of 1970. The signing of NEPA into force by President Richard Nixon on January 1, 1970, gave rise to the so-called Environmental Decade, during which more than 10 acts pertaining to the field of environmental protection regulation emerged for the first time in the United States. Due to space constraints, the twentieth-century legislation will not be examined in this report. U.S. Senate Committee on Environment and Public Works, "National Environmental Policy Act of 1969 [As Amended Through Dec. 31, 2000]," December 31, 2000, http://epw.senate.gov/nepa69.pdf.

improved in light of ongoing climate change.[2] Thus far, the ICCATF has published three major documents: two progress reports—the 2010 "Recommended Actions in Support of a National Climate Change Adaptation Strategy"[3] and the 2011 "Federal Actions for a Climate Resilient Nation"[4]—as well as the "National Action Plan: Priorities for Managing Freshwater Resources in a Changing Climate,"[5] which was released in October 2011. These documents outline the main areas of the federal climate change adaptation process, an initiative aimed at addressing "effects of climate change that affect [f]ederal services, operations, programs, assets, and national security."[6] The initiative stresses the importance of acting both domestically and internationally to integrate environmental strategy and capacity while simultaneously improving efficiency and effectiveness on all administrative levels: local, regional, state, and national. The documents compiled by the task force discuss the state of Alaska, and subsequently the U.S. Arctic, as a region with a fragile ecosystem that could easily be influenced by climate change. They also provide guidelines as to how climate change adaptation efforts can be implemented, including having NOAA conduct an analysis of "climate change impacts in coastal habitat restoration, land acquisition, and facility development investments,"[7] and having the U.S. Navy conduct "joint and combined exercises in the Arctic," such as science accommodation missions.[8]

In June 2009, President Barack Obama called together a group of government officials, the Interagency Ocean Policy Task Force (IOPTF), to shape a new, comprehensive national ocean policy. A year later the group presented its final recommendations report, featuring recommendations for further action.[9] Executive Order 13547, "Stewardship of the Ocean, Coasts, and the Great Lakes," was enacted July 19, 2010, and implemented these recommendations by creating the first U.S. national policy for bodies of water and by establishing the National Ocean Council, co-chaired by the CEQ and the OSTP.[10] The main goal of the council is to ensure that recommendations for the preservation of ocean, coastal, and Great Lakes environmental health are incorporated into executive agencies' policies.[11] The council also addresses climate change challenges and is responsible for implementing coastal and marine spatial planning.

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2. White House Council on Environmental Quality, "Progress Report of the Interagency Climate Change Adaptation Task Force: Recommended Actions in Support of a National Climate Change Adaptation Strategy," October 5, 2010, 9, http://www.whitehouse.gov/sites/default/files/microsites/ceq/Interagency-Climate-Change-Adaptation-Progress-Report.pdf.

3. Ibid.

4. White House Council on Environmental Quality, "Progress Report of the Interagency Climate Change Adaptation Task Force: Federal Actions for a Climate Resilient Nation," October 28, 2011, http://www.whitehouse.gov/sites/default/files/microsites/ceq/2011_adaptation_progress_report.pdf.

5. Interagency Climate Change Adaptation Task Force, "National Action Plan: Priorities for Managing Freshwater Resources in a Changing Climate," October 2011, http://www.whitehouse.gov/sites/default/files/microsites/ceq/2011_national_action_plan.pdf.

6. White House Council on Environmental Quality, "Federal Agency Climate Change Adaptation Planning," March 4, 2011, 4, http://www.whitehouse.gov/sites/default/files/microsites/ceq/adaptation_support_document_3_3.pdf.

7. Ibid., 13.

8. Ibid., 13.

9. White House Council on Environmental Quality, "Final Recommendations of the Interagency Ocean Policy Task Force," July 19, 2010, http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf.

10. White House Office of the Press Secretary, "Executive Order 13547—Stewardship of the Ocean, Our Coasts, and the Great Lakes," July 19, 2010, http://www.whitehouse.gov/the-press-office/executive-order-stewardship-ocean-our-coasts-and-great-lakes.

11. National Ocean Council, "About the National Ocean Council," http://www.whitehouse.gov/administration/eop/oceans/about.

Both these tasks—climate change and coastal/marine spatial planning—are of key importance to the Arctic. The region exhibits visible signs of climate change as the extent of sea ice diminishes and human activity in the Arctic Ocean increases. Moreover, one of the nine national priority objectives in the IOPTF's final recommendations report is to monitor and respond to changing Arctic conditions,[12] specifically calling for the U.S. to "address environmental stewardship needs in the Arctic Ocean and adjacent coastal areas."[13] According to the document, the NOC is responsible for developing a comprehensive action plan to make sure these objectives are met. In March 2012 the NOC launched an online database[14] that consists of "biological, physical, oceanographic, habitat, and human use"[15] information and is of great value to both Arctic researchers as well as policymakers.

The Office of Science and Technology Policy (OSTP), established in 1976, ensures that presidential administrations and the executive branch stay well informed about scientific advances and shape future policies around these developments.[16] The office's responsibilities include promoting international scientific cooperation and engaging the private sector. To meet these objectives, OSTP assists in guiding the work of the ICCATF. The office has four divisions, one of which—the Division of Environment and Energy—concentrates on issues of climate change and environmental protection. This division specifically cites the ratification of the UN Convention on the Law of the Sea (UNCLOS) as one of its priorities, promotes collaboration with the UN Framework Convention on Climate Change, and supports improving the quality of U.S. water resources through reauthorization of respective legislative acts.[17]

OSTP, in partnership with the Office of Management and Budget (OMB), is entrusted with providing expertise on the goals and budget for the federal research and development (R&D) portfolio. This budget[18] outlines the funding for agencies like NOAA, the U.S. Geological Survey (USGS), the Environmental Protection Agency (EPA), and the U.S. Global Change Research Program (USGCRP), among many others. Each of these agencies has significant research programs in the Arctic. The fiscal year (FY) 2013 budget features a $2 billion increase for federal R&D compared to the 2012 levels.[19] This budget also allocates $2.6 billion in funding for the USGCRP, an umbrella initiative that dates back to 1990 and unites efforts by a number of federal agencies to examine and address the issue of global environmental change. The 2009 USGCRP publication

12. White House Council on Environmental Quality, "Final Recommendations of the Interagency Ocean Policy Task Force," 28.

13. Ibid., 39.

14. Data.gov, "Arctic Region Data," http://www.data.gov/communities/node/237/data_tools/arctic.

15. Deerin Babb-Brott, "Supporting science-based decision-making in the Arctic Region," National Ocean Council, March 23, 2012, http://www.whitehouse.gov/blog/2012/03/23/supporting-science-based-decision-making-arctic-region.

16. Office of Science and Technology Policy, "About OSTP," http://www.whitehouse.gov/administration/eop/ostp/about.

17. Office of Science and Technology Policy, "Environment & Energy," http://www.whitehouse.gov/administration/eop/ostp/divisions/energyenvironment.

18. Office of Science and Technology Policy, "Innovation, Education, and Infrastructure: Science, Technology, STEM Education, and 21st Century Infrastructure in the 2012 Budget," February 14, 2011, http://www.whitehouse.gov/sites/default/files/microsites/ostp/FY12-rd-fs.pdf.

19. Office of Science and Technology Policy, "Meeting the Challenges of Global Change: The U.S. Global Change Research Program in the 2013 Budget," February 13, 2012, http://www.whitehouse.gov/sites/default/files/microsites/ostp/fy2013rd_global_change.pdf.

"Global Climate Change Impacts in the United States" estimates that climate change effects will be most visible in the Arctic region.[20] The report also gives a comprehensive overview of current and future environmental shifts both on national and global levels.

Federal Executive Departments

Department of State

The Department of State holds the principal responsibility for U.S. Arctic policy matters. The highlights of the department's activities in this field include support for international and interdisciplinary scientific cooperation (including promoting the International Polar Year 2007–2008[21]), support toward ratification of UNCLOS, and participation in various multilateral platforms with a focus on polar regions. The department's FY 2013 budget includes funding for the Global Climate Change Initiative ($470 million) and $101 million for the Economic Support Fund's contribution to the Bureau of Oceans and International Environmental and Scientific Affairs (OES).[22] Funding is also allocated for the Bering Sea Sub-Network (BSSN), which brings together American and Russian coastal communities and monitors changes that occur in the Bering Sea marine environment.

A representative from OES heads the U.S. delegation to the Arctic Council. The bureau published seven fact sheets in support of UNCLOS in 2011 and 2012,[23] each stressing the importance of the treaty and the benefits that the United States would gain once it was ratified. In agreeing to the terms of UNCLOS, the United States would benefit from what the OES has called "the firmest legal footing"[24] in asserting an exclusive economic zone (EEZ) in the Arctic. Moreover, the ratification of the treaty would give the United States a right to regulate maritime traffic passing through its portion of the Bering Strait, and to impose environmental regulations on all foreign transit vessels.[25]

As part of the OES, the Office of Ocean and Polar Affairs (OPA) deals with the legislative and policy dimensions of maritime and polar issues. The range of issues OPA addresses includes,

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20. Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, eds., *Global Climate Change Impacts in the United States* (New York: Cambridge University Press, 2009), http://www.whitehouse.gov/sites/default/files/microsites/ostp/climate-impacts-report.pdf.

21. International Polar Year (IPY) 2007–2008 is a broad scientific program that encompasses multiple disciplines and numerous participant states. IPY addresses opportunities and challenges that are caused by environmental changes in the Polar Regions. The research themes for IPY 2007–2008 were: 1. Present environmental status of the Arctic and the Antarctic; 2. Past and present environmental and social change; 3. Global linkages between Polar Regions and the rest of the world; 4. New Science Frontiers; 5. Observatories from the interior of the Earth to the outer space; 6. Human dimension of circumpolar human societies. International Polar Year, "A Framework for the International Polar Year 2007–2008," November 2004, http://ipy.arcticportal.org/images/uploads/framework.pdf.

22. U.S. Department of State, "Executive Budget Summary Fiscal Year 2013: Function 150 & Other International Programs," February 13, 2012, http://www.state.gov/documents/organization/183755.pdf.

23. U.S. Department of State, "Fact Sheets," http://www.state.gov/e/oes/lawofthesea/factsheets/index.htm.

24. Bureau of Oceans and International Environmental and Scientific Affairs, "The Law of the Sea Convention Helps American Business," July 1, 2011, http://www.state.gov/e/oes/lawofthesea/factsheets/177206.htm.

25. United Nations, "United Nations Convention on the Law of the Sea: Agreement Relating to the Implementation of Part XI of the Convention," Article 42, http://www.un.org/Depts/los/convention_agreements/texts/unclos/closindx.htm.

among others, shaping U.S. policy to protect the environment and wildlife in the Arctic and participating in negotiations with other countries on ocean and polar agreements. OPA also works closely with the International Maritime Organization (IMO) in creating "a comprehensive regulatory framework for shipping."[26] In generating this framework, OPA considers environmental factors and shapes provisions of U.S. policy to take these into account. For instance, on the issue of maritime environment protection, OPA makes certain that policies meet international standards and follow UNCLOS guidelines.

The Department of State leads another interagency body dealing directly with U.S. interests in the region, the Arctic Policy Group (APG). The work of the APG shapes U.S. policy positions at the Arctic Council. As a result, its work on environmental issues focuses on the Arctic Council's parameters of "monitoring, assessing, and preventing pollution in the Arctic; climate change; biodiversity conservation and sustainable use; emergency preparedness and prevention; and the living conditions of Arctic residents."[27] According to National Security Decision Memorandum 144 of 1971, the APG is entrusted with "the implementation of U.S. Arctic policy and reviewing and coordinating U.S. activities and programs in the Arctic, with the exception of purely domestic Arctic-related matters internal to Alaska."[28] The group meets on a monthly basis to discuss the aforementioned issues along with aspects of land and natural resources management and regional transportation issues.

Department of Defense

The Department of Defense also plays a critical role in the environmental assessment of the Arctic region, especially through the efforts of the U.S. Navy. In October 2009 the Navy's Task Force Climate Change (TFCC) released the "U.S. Navy Arctic Roadmap."[29] This document describes the Navy's strategy and objectives, along with a description of the steps necessary to reach these goals in FY 2010–2014. The paper recognizes the important role that changing environmental conditions in the Arctic play with respect to assertion of sovereignty, energy security, research and science, economy, fisheries, tourism, and other related issues. To be prepared to address the emerging challenges presented by the melting polar ice cap, the Navy recognizes that changes in the environment must be examined and taken into account when shaping future policies. The Arctic roadmap lists environmental assessment and prediction as one of its five objectives, and it proposes 11 actions that should lead to a better understanding of the changes, such as establishing a clear timeline of ice recession.

One outcome of the Arctic roadmap is the biennial production of an Arctic environmental assessment and outlook report that provides the latest information on conditions in the Arctic. This report includes updated forecasts regarding maritime accessibility based on the most recent scien-

26. Bureau of Oceans and International Environmental and Scientific Affairs, "Marine Environment," http://www.state.gov/e/oes/ocns/opa/marine/index.htm.

27. Kathryn Moran and John W. Farrell, "U.S. Arctic Research Policy," *Oceanography* 24, no. 3 (2011): 18–25, http://www.arctic.gov/publications/24-3_moran.pdf.

28. National Security Council, "National Security Decision Memorandum 144," December 22, 1971, http://www.fas.org/irp/offdocs/nsdm-nixon/nsdm-144.pdf.

29. U.S. Department of the Navy, "Navy Arctic Roadmap," November 10, 2009, http://www.navy.mil/navydata/documents/USN_artic_roadmap.pdf.

tific models. Thus far, only one report has been published, in August 2011.[30] It presents a detailed overview of Arctic environmental conditions, including oceanography, hydrography, meteorology, fisheries, ice-extent, and climatic trends, in accordance with the Arctic roadmap. The assessment is expected to become "instrumental in developing future strategic plans and investments in a region that is becoming increasingly accessible to exploration and commercial enterprise."[31] The roadmap calls for additional actions, including enhancing cooperation with domestic and foreign Arctic actors, utilizing unmanned technology for Arctic science projects, and developing Arctic environmental planning documentation.

Department of the Interior

Thirteen percent of the world's undiscovered oil resources and 30 percent of the world's undiscovered gas resources are located in the Arctic, with 84 percent of these resources believed to be located offshore.[32] Given these large quantities of resources, regulation of offshore resource development and related environmental requirements are two critical areas for U.S. Arctic governance. Responsibility for these tasks falls within two locations of the Department of the Interior: the Bureau of Ocean Energy Management (BOEM) and the Bureau of Safety and Environmental Enforcement (BSEE).[33] Both BOEM and BSEE have regional offices in Anchorage that oversee the Alaska outer continental shelf (OCS).

BOEM has three program offices that deal with the American Arctic: Environment, Leasing and Plans, and Resource Evaluation. The Alaska region's Environment Program Office addresses key issues such as scientific wildlife research, oceanography and meteorology, effects of oil spills, and overall anthropogenic influence on nature. BOEM also includes the Office of Environmental Programs, an entity that works on the same range of issues, but on a more strategic level. The office provides expertise on the environmental impact of energy and mineral extraction in the OCS areas[34] and also guides policy making on issues regarding NEPA and the OCS. Finally, BOEM's Environmental Assessment Branch participates in international (especially maritime cross-border) and interagency cooperation activities. The branch promotes the use of native peoples' knowledge in informing decision-making processes.

30. Office of the Oceanographer of the Navy, "Arctic Environmental Assessment and Outlook Report in support of the Navy Arctic Roadmap," August 2011, http://greenfleet.dodlive.mil/files/2011/08/U.S.-Navy-Arctic-Environmental-Assessment.pdf.

31. Office of the Oceanographer of the Navy, "Navy Completes Arctic Environmental Assessment," August 16, 2011, http://www.navy.mil/search/display.asp?story_id=62199.

32. U.S. Geological Survey, "90 Billion Barrels of Oil and 1,670 Trillion Cubic Feet of Natural Gas Assessed in the Arctic," July 23, 2008, http://www.usgs.gov/newsroom/article.asp?ID=1980&from=rss_home/#.UBLYR2O8gV4.

33. The two bureaus were separated following the reorganization of the Bureau of Ocean Energy Management, Regulation and Enforcement in January 2011 that, in turn, was previously a part of the Minerals Management Service together with the Office of Natural Resources Revenue. U.S. Department of the Interior, "Fact Sheet: The BSEE And BOEM Separation: An Independent Safety, Enforcement and Oversight Mission," January 19, 2011, http://www.doi.gov/news/pressreleases/upload/01-19-11_Fact-Sheet-BSEE-BOEM-separation-2.pdf.

34. Bureau of Ocean Energy Management, "About BOEM," http://www.boem.gov/About-BOEM/index.aspx.

BSEE, on the other hand, oversees offshore development efforts and ensures enforcement of safety and environmental regulations.[35] It consists of three main bodies. The Office of Offshore Regulatory Programs formulates the requirements for exploring the offshore energy resources. The Oil Spill Response Division defines the regulations for oil spill response plans and examines industries' compliance with them, collaborating with other agencies like the Coast Guard and the EPA. The Environmental Enforcement Division coordinates federal offshore energy regulations and guarantees that all exploratory activity is conducted in accordance with numerous environmental laws, while also meeting required lease and permit conditions. As exploratory drilling began offshore Alaska in the summer of 2012, BSEE worked together with NOAA to expand its interactive online mapping tool, the Environmental Response Management Application (ERMA), to the Arctic.[36] ERMA "provides a common operational picture to all individuals involved in an incident, improves communication and coordination among responders and stakeholders, and provides resource managers with the information necessary to make faster and better informed decisions."[37] Launched in August 2012, the Arctic ERMA was utilized by the Coast Guard, NOAA, and BSEE during a Chukchi Sea oil spill recovery equipment exercise.[38]

The department's scientific agency, the USGS, conducts research on a variety of environmental issues that fall under seven categories: Climate and Land Use Change, Core Science Systems, Ecosystems, Energy and Minerals, Environmental Health, Natural Hazards, and Water. The USGS compiles the scientific data into maps, images, data sets, and fact sheets.

The Climate and Land Use Change Research and Development Program leads a project on Arctic Paleoclimatology, which investigates the oceanographic and climatic history of the Arctic Ocean, including Arctic sea ice variability.[39] The Alaska Climate Science Center (AK CSC), a USGS regional center established in 2011 and hosted by the University of Alaska Fairbanks, provides climate change impact science and tools for adaptive management to ecosystem managers.[40]

The organization also publishes an extensive range of documents, many of which are important for assessing the nation's needs, developing sustainable ways to address them, and shaping policies to implement these measures. The most recent USGS publications on the Arctic include: "Arctic Sea Ice Decline: Projected Changes in Timing and Extent of Sea Ice in the Bering and

35. Bureau of Safety and Environmental Enforcement, "About BSEE," http://www.bsee.gov/About-BSEE/index.aspx.

36. National Oceanic and Atmospheric Administration, "NOAA Launches ERMA Mapping Tool for Responding to Arctic Oil Spills," July 31, 2012, http://response.restoration.noaa.gov/about/media/noaa-launches-erma-mapping-tool-responding-arctic-oil-spills.html.

37. Coastal Response Research Center, "Environmental Response Management Application," http://www.crrc.unh.edu/erma/.

38. Bureau of Safety and Environmental Enforcement, "Federal Mapping Tool That Aided First Responders in Gulf Spill Expanded to Arctic," July 31, 2012, http://www.bsee.gov/BSEE-Newsroom/Press-Releases/2012/press07312012.aspx.

39. U.S. Geological Survey, "Arctic Paleoclimatology," http://www.usgs.gov/climate_landuse/clu_rd/projects/artic_paleo.asp.

40. Department of the Interior, "About the Alaska CSC," http://www.doi.gov/csc/alaska/about.cfm. The Alaska Climate Science Center is one of eight regional centers within the National Climate Change and Wildlife Science Center. U.S. Geological Survey, "National Climate Change and Wildlife Science Center," https://nccwsc.usgs.gov/.

Chukchi Seas" from August 2010,[41] and "An Evaluation of the Science Needs to Inform Decisions on Outer Continental Shelf Energy Development in the Chukchi and Beaufort Seas, Alaska" from June 2011.[42]

A June 2011 USGC publication, "An Evaluation of the Science Needs to Inform Decisions on Outer Continental Shelf Energy Development in the Chukchi and Beaufort Seas, Alaska," holds particular importance regarding the current state of coordination among different agencies and organizations that handle Arctic marine research projects. The USGS spent roughly one year gathering necessary information about existing research activities that focus on the impact of energy development in Alaska. The report's findings show that the crucial aspect of coordination is missing, and there is no comprehensive overview of the situation in the Arctic. This is despite the fact that necessary research has been conducted and all the findings are available.[43] Under the framework of the International Polar Year (IPY) 2007-2008, the USGS has participated in many activities, including "satellite and ground-based monitoring of glaciers and ice caps, research on movements, distribution patterns and adaptation of polar wildlife, estimates of circum-Arctic energy resources, monitoring changes in permafrost temperatures, and the development of paleoclimate records from polar ice cores."[44] Given the size, scale, scope and importance of this research, it is essential to develop better coordination and closer cooperation among the relevant actors to create an integrated approach to science-based decision-making in matters pertaining to the Arctic region.

Department of Energy

The Office of Environmental Management within the Department of Energy is a body responsible for "dealing with the environmental legacy of the Cold War."[45] This office regulates and coordinates both nuclear and non-nuclear facilities' decontamination and clean-up processes. The office's activities include environmental restoration, waste management, technology development, and facility transition and management.[46] The office has remediated two Alaskan sites—Chariot and Amchitka—that were previously used for military purposes and were contaminated by nuclear tests conducted in the 1960s and 1970s. Remediation efforts were completed in 1997 and 2005, respectively.[47] Both sites are now monitored and maintained by the Office of Legacy Management.[48] Another Department of Energy

41. U.S. Geological Survey, "Arctic Sea Ice Decline: Projected Changes in Timing and Extent of Sea Ice in the Bering and Chukchi Seas," August 2010, http://pubs.usgs.gov/of/2010/1176/.

42. U.S. Geological Survey, "An Evaluation of the Science Needs to Inform Decisions on Outer Continental Shelf Energy Development in the Chukchi and Beaufort Seas, Alaska," June 2011, http://pubs.usgs.gov/circ/1370/.

43. Pew Environment Group, "Scientists Call on Obama Administration to Use Science as Guide for Arctic Drilling," January 29, 2012, http://www.pewenvironment.org/news-room/other-resources/scientists-call-on-obama-administration-to-use-science-as-guide-for-arctic-drilling-85899369512.

44. International Polar Year, "US Geological Survey participation in the International Polar Year," January 1, 2007, http://www.ipy.org/projects/item/417-us-geological-survey-participation-in-the-international-polar-year.

45. Office of Environmental Management, "History," http://www.em.doe.gov/Pages/History.aspx.

46. Ibid.

47. Office of Environmental Management, "Sites/Locations," http://www.em.doe.gov/Pages/siteslocations.aspx; Office of Legacy Management, "Chariot, Alaska, Site," http://www.lm.doe.gov/chariot/Sites.aspx.

48. The U.S. Navy was previously involved in a similar initiative—the Arctic Military Environmental Cooperation Program (AMEC). AMEC was setup in 1996, aimed at combining Norwegian, Russian and the U.S. efforts to help Russia address environmental challenges in the Arctic region, including decommissioning its nuclear submarines, cleaning up radioactive waste and implementing environmental safety measures. U.S. Department of Defense, "U.S., Norway, Russia to Meet on Arctic Environmental Cooperation," April 25, 2001, http://www.defense.gov/advisories/advisory.aspx?advisoryid=651.

office, the Office of NEPA Policy and Compliance, provides the necessary oversight to ensure that all of the department's projects and operations abide by the rules and regulations set by the National Environmental Policy Act and other environmental legal acts.[49]

Department of Commerce

A number of federal agencies focus on the science of environmental change. The leading agency in terms of maritime and atmospheric studies is NOAA, which is a part of the Department of Commerce. This agency focuses on the science behind environmental conditions, climate patterns, and the effects of climate change on existing ecosystems. It is one of NOAA's goals to be able to "understand and predict changes in climate, weather, oceans, and coasts."[50] The Arctic is considered a priority for any global climate change–related research. In response, NOAA established the Arctic Research Initiative in 1996 that received annual funding from Congress ranging from $1 million to $1.65 million until 2001.[51] In FY 2003, the Arctic Research Office initiated a new set of projects focused on the Study of Environmental Arctic Change (SEARCH), discussed below.

The Climate Program Office within NOAA's Office of Oceanic and Atmospheric Research oversees and manages NOAA's Arctic research activities. According to the "Arctic Research Program Report for FY 2010,"[52] the Arctic program's primary tasks include supporting Arctic climate observation networks monitoring the ocean, sea ice conditions, and the Arctic atmosphere; analyzing gathered and otherwise available climate data, including information obtained by unmanned aircraft systems; collaborating with domestic and foreign partners; and participating in public outreach activities. In NOAA's "Arctic Vision and Strategy," published in February 2011, these duties are further detailed, with an added focus on weather and maritime forecasts, management of Arctic resources, and support for Arctic coastal communities.[53] NOAA produces annual Arctic report cards and—in collaboration with the National Science Foundation (NSF) and the Arctic Research Consortium of the United States (ARCUS)—monthly sea ice outlooks. These reports provide information on both current and past climate indices and are available to partnering institutions as well as the general public.[54]

NOAA cooperates closely with several other international actors that work on Arctic issues, most notably the Arctic Council and the Russian Academy of Sciences (within the framework of the Russian–American Long-term Census of the Arctic). It also participates in a number of interagency and multilateral research groups—the SEARCH program, ARCUS, the Arctic Monitoring and Assessment Program, the Pacific Arctic Group, and many more.[55] NOAA's policy maintains

49. U.S. Department of Energy, "Office of NEPA Policy and Compliance: Mission," http://energy.gov/nepa/mission.

50. National Oceanic and Atmospheric Administration, "About NOAA," http://www.noaa.gov/about-noaa.html.

51. National Oceanic and Atmospheric Administration, "Programmatical Documents & Information," http://www.arctic.noaa.gov/arp/history.html.

52. National Oceanic and Atmospheric Administration, "Arctic Research Program Report for FY2010," http://www.arctic.noaa.gov/arp/docs/2010_Plans.pdf.

53. National Oceanic and Atmospheric Administration, "NOAA's Arctic Vision and Strategy," February 2011, ii, http://www.arctic.noaa.gov/docs/NOAAArctic_V_S_2011.pdf.

54. National Oceanic and Atmospheric Administration, "Realtime Data and Climate Indices," http://www.arctic.noaa.gov/data.html.

55. National Oceanic and Atmospheric Administration, "Arctic Research," http://www.research.noaa.gov/climate/t_arctic.html.

that, due to the common nature of emerging challenges, all involved parties should cooperate in the analysis of available information and come up with a unified policy to address climate change and its impacts on the Arctic.

Independent Agencies

National Aeronautics and Space Administration

One of the independent agencies working in close collaboration with NOAA is the National Aeronautics and Space Administration (NASA). NASA provides the necessary technology to observe global climate change patterns and shifts in ice extent, through the use of environmental satellites. For example, the Geostationary Operational Environmental Satellite/Polar Operational Environmental Satellite program is a joint endeavor of NASA and NOAA.[56] The project consists of two pairs of satellites that provide information for both short- and long-term weather forecasts as well as collect a wide range of data for the environmental and global change research.[57] The Joint Polar Satellite System, the next generation of polar-orbiting operational environmental satellite systems procured by NOAA from NASA, will replace the current polar satellite program within a decade.[58] These satellites play a crucial role in NOAA's Search and Rescue Satellite Aided Tracking (SARSAT) program that "manages, coordinates, and implements the United States activities in the international Cospas-Sarsat search and rescue program."[59] See Annex C for more information regarding SARSAT as it applies to Arctic security.

Environmental Protection Agency

The EPA is an independent U.S. environmental oversight institution and the leading body fighting air, water, and soil pollution; protecting nature; and promoting sustainable development in the United States. The EPA shapes environmental regulations; sets national standards in accordance with existing environmental legislation; conducts climate change research; and promotes information sharing and dissemination among experts, scientists, and the general population. In 2010 the EPA published "Climate Change Indicators in the United States,"[60] which outlined 24 indicators of climate change. These indicators generally fall under one of five groups: greenhouse gases, weather and climate, oceans, snow and ice, and society and ecosystems. Most of these indicators are present in the U.S. Arctic. The report specifically cites diminishing Arctic sea ice as a clear sign of climate change.

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56. The operational management of environmental satellites is conducted by the National Environmental Satellite, Data, and Information Service within NOAA and by NASA's Goddard Space Flight Center.

57. National Aeronautics and Space Administration, "The Geostationary Operational Environmental Satellite (GOES)/ Polar Operational Environmental Satellite (POES): Program Mission," http://science.nasa.gov/about-us/smd-programs/goes-poes/.

58. National Oceanic and Atmospheric Administration, "Joint Polar Satellite System," http://www.jpss.noaa.gov/.

59. National Oceanic and Atmospheric Administration, "SARSAT Mission Statement," http://www.sarsat.noaa.gov/mission.html; International Cospas-Sarsat Programme, "Cospas-Sarsat Participants," http://www.cospas-sarsat.org/en/about-cospas-sarsat/participating-countries-organisations. See Annex D for additional information regarding SARSAT.

60. Environmental Protection Agency, "Climate Change Indicators in the United States," 2010, http://epa.gov/climatechange/pdfs/climateindicators-full.pdf.

In addition to climate change, the EPA also works on land remediation projects. The Superfund program provides a framework for dealing with hazardous waste on abandoned industrial sites, several of which are located in Alaska. These include national priority list sites such as the Arctic Surplus, Salt Chuck Mine, and Adak Naval Air Station. In addition to this work, the EPA's International Program includes a number of Russia-U.S. joint initiatives, such as the U.S.-Russia Bilateral Presidential Commission Environmental Working Group, the Arctic Council's Arctic Contaminants Action Program,[61] and the National Plan of Action for the Protection of the Arctic Marine Environment project. Within the framework of the latter project, the EPA has worked with its Russian counterparts in cleaning up the hazardous waste remnants of the Cold War from Franz Josef Land in the Russian Arctic.

National Science Foundation

The NSF is "the lead agency responsible for implementing Arctic research policy" as defined by the Arctic Research and Policy Act of 1984, as amended.[62] Together with NOAA, the NSF is a member of the SEARCH program.[63] The Division of Arctic Sciences in NSF's Office of Polar Programs (OPP) addresses the Arctic both as an isolated region with unique characteristics and also as part of the larger global ecosystem.[64] The division conducts scientific research and provides operational support to other programs in areas including atmospheric, terrestrial, maritime, and glacial dimensions, with a focus on biology, ecology, physics, and the social sciences. The NSF Arctic System Science program examines the Arctic as a complex system comprising all these dimensions, in an attempt to predict how this system will evolve moving forward and how it will impact the world. Additionally, the NSF's Arctic Observing Network (AON) program is a long-term initiative aimed at examining the changes that occur in Arctic environmental and social systems. The AON collects data in five categories: atmosphere; ocean and sea ice; hydrology and the cryosphere; terrestrial ecosystems; and human dimensions, which are also used by SEARCH.[65]

The NSF's findings are publicly accessible on the foundation's website under the polar research section of its publications database.[66] The NSF also published the journal *Arctic Research of the United States* from 1987 through 2007 for the Interagency Arctic Research Policy Committee, discussed below. *Arctic Research* was "aimed at national and international audiences of government

61. One of the tasks includes regulating and reducing diesel-based black carbon emissions in the Arctic. Arctic Council, "Arctic Contaminants Action Program," http://www.arctic-council.org/index.php/en/acap.

62. National Science Foundation, "Arctic Research and Policy Act of 1984 (amended 1990)," http://www.nsf.gov/od/opp/arctic/iarpc/arc_res_pol_act.jsp.

63. The Study of Environmental Arctic Change (SEARCH) is an interagency cross-disciplinary research initiative that addresses and analyzes changes occurring in the Arctic environmental system. Currently there are circa 70 projects funded as part of the SEARCH program. Additionally, a number of projects are conducted in collaboration with international partner groups (e.g., the International Study of Arctic Change, and Developing Arctic Modeling and Observing Capabilities for Long-term Environmental Studies). Arctic Research Consortium of the United States, "Study of Environmental Arctic Change," http://www.arcus.org/search/index.php.

64. National Science Foundation, "About the Division of Arctic Sciences," http://www.nsf.gov/od/opp/arc/about.jsp.

65. National Science Foundation, "Fact Sheet: The Arctic Observing Network," http://www.nsf.gov/news/news_summ.jsp?cntn_id=109687.

66. National Science Foundation, "Publications: Polar Research (OPP)," http://www.nsf.gov/publications/index.jsp?org=NSF&archived=false&pub_type=&nsf_org=OPP&x=8&y=11.

officials, scientists, engineers, educators, private and public groups, and residents of the Arctic."[67] The journal gave a comprehensive overview of ongoing and future Arctic research projects. The foundation was a major contributor and, in fact, the leading U.S. agency for the International Polar Year 2007–2008 project, funding 41 programs in 13 NSF organizations during FY 2006–2009 and spending an estimated $349 million on the awards.[68]

U.S. Arctic Research Commission and the Interagency Arctic Research Policy Committee

The Arctic Research and Policy Act of 1984 (ARPA), as amended, constitutes the framework for all U.S. Arctic science activities. The act is formulated "to establish national policy, priorities, and goals and to provide a [f]ederal program plan for basic and applied scientific research with respect to the Arctic, including natural resources and materials, physical, biological and health sciences, and social and behavioral sciences."[69] ARPA created the U.S. Arctic Research Commission (USARC) and the Interagency Arctic Research Policy Committee (IARPC).[70]

USARC is responsible for developing an integrated national Arctic research policy. Its other tasks include promoting cooperation between different levels of government (federal, state, and local) as well as reviewing and giving recommendations on various aspects of organizing domestic and international Arctic research. The commission is funded through the NSF appropriations system, and its budget for FY 2012 was estimated at $1.45 million.[71] USARC will face a 4.1 percent decline in budget for FY 2013, having requested $1.39 million.[72] Currently USARC comprises four commissioners, appointed by the president, and a fifth ex-officio member, the director of the NSF.[73] The commission participates in the working process of a number of interagency and international committees. These include the Arctic Policy Group, the U.S. Extended Continental Shelf Task Force, the Alaska Ocean Observing System, the Consortium for Ocean Leadership, and the North Pacific Research Board.[74]

The IARPC is chaired by the director of the NSF and consists of representatives from more than ten agencies and departments.[75] Its main objective is to assess existing Arctic research, find knowl-

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67. National Science Foundation, "Arctic Research of the United States," http://www.nsf.gov/od/opp/arctic/arctrsch/start.jsp.

68. National Science Foundation, "National Science Foundation International Polar Year Awards," http://www.nsf.gov/od/opp/ipy/awds_lists/2010_awds/ipy_awds_toc.jsp.

69. National Science Foundation, "Arctic Research and Policy Act of 1984 (amended 1990)," http://www.nsf.gov/od/opp/arctic/iarpc/arc_res_pol_act.jsp.

70. By a presidential memorandum in 2010, IARPC became a subcommittee under the Committee on Environment and Natural Resource in the White House National Science and Technology Council, which was assigned the task of coordinating IARPC's activities. U.S. Arctic Research Commission, "Obama reassigns responsibilities for Arctic Research to a White House council," July 22, 2010, http://www.arctic.gov/news/07-23-2010.pdf; White House Office of the Press Secretary, "Presidential Memorandum—Arctic Research and Policy Act," July 22, 2010, http://www.whitehouse.gov/the-press-office/presidential-memorandum-arctic-research-and-policy-act-1984.

71. National Science Foundation, "FY 2013 Budget Request to Congress: United States Arctic Research Commission," February 13, 2012, http://www.nsf.gov/about/budget/fy2013/pdf/15-USARC_fy2013.pdf.

72. Ibid.

73. U.S. Arctic Research Commission, "Commissioners," http://www.arctic.gov/com_current.html.

74. Interagency Coordinating Committee on Oil Pollution Research, "US Arctic Research Commission," http://www.iccopr.uscg.gov/apex/f?p=118:361:5981592621229812.

75. The list of members permanently includes representatives from the NSF, the Department of Commerce, the Department of Defense, the Department of Energy, the Department of the Interior, the Depart-

edge gaps, and formulate priorities for future projects. The committee also assists USARC with developing a national research policy and a five-year plan for its implementation as well as promoting interagency and international research cooperation. The IARPC is the management agency responsible for drafting an integrated multiagency budget proposition, together with OMB and OSTP. Both the IARPC and the USARC are required to submit annual reports to Congress and biannual reports to the president regarding their activities and accomplishments. Similarly, both bodies are responsible for engaging the public in the Arctic research dialogue by conducting hearings and business meetings.[76]

The latest USARC "Report on the Goals and Objectives for Arctic Research 2011–2012"[77] lists five recommended research priorities for the Arctic region: (1) observe, understand, and respond to environmental change in the Arctic, Arctic Ocean, and Bering Sea; (2) improve Arctic human health; (3) assess natural resources; (4) advance civil infrastructure research; and (5) assess indigenous languages, identities, and cultural research needs.

The range of these priorities illustrates both the complexities of the Arctic and the diversity of the work done by Arctic researchers. One example is in the area of oil spill response. In 2010, USARC published a white paper recommending steps for expanded U.S. funding for Arctic and subArctic oil spill research, building on previous findings from its 2004 report, "Advancing Oil Spill Response in Ice-Covered Waters."[78] In November 2012, USARC released another white paper, "Oil Spills in Arctic Waters," an inventory of research conducted by governmental, nongovernmental, industrial, and private organizations.[79] USARC recommended that NOAA receive funding from the Oil Spill Liability Trust Fund[80] for oil spill R&D and that an Alaska-based Arctic subcommittee be created under the Interagency Coordinating Committee on Ocean Pollution Research[81] that would consolidate research on oil spill prevention, preparedness, and response in the Arctic.

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ment of State, the Department of Transportation, the Department of Health and Human Services, NASA, and the EPA, as is indicated by the Arctic Research and Policy Act (ARPA). In 2012 the additional principal members are from the Department of Homeland Security, the Department of Agriculture, Marine Mammal Commission (MMC), OMB, OSTP, Smithsonian Institution, and USARC. National Science Foundation, "Interagency Arctic Research Policy Committee Principals, 2012," http://www.nsf.gov/od/opp/arctic/iarpc/iarpc_principals2012.jsp.

76. See also U.S. Arctic Research Commission, "Publications: USARC Goals and Objectives Reports" http://www.arctic.gov/reports_goals.html; National Science Foundation, "Interagency Arctic Research Policy Committee Meetings," http://www.nsf.gov/od/opp/arctic/iarpc/iarpc_mtgs_public.jsp.

77. U.S. Arctic Research Commission, "Report on the Goals and Objectives for Arctic Research 2011–2012," April 2012, http://www.arctic.gov/publications/2011-12_usarc_goals.pdf.

78. U.S. Arctic Research Commission, "White Paper: U.S. Arctic Research Commission Recommends Steps to Expanded U.S. Funding for Arctic/Subarctic Oil Spill Research," 2010, http://www.arctic.gov/publications/oil_spill_wp.html; U.S. Arctic Research Commission, "Advancing Oil Spill Response in Ice-Covered Waters," 2004, http://www.arctic.gov/publications/oil_in_ice.html.

79. U.S. Arctic Research Commission, "Oil Spills in Arctic Waters: An Introduction and Inventory of Research Activities and USARC Recommendations," November 2012, http://www.arctic.gov/publications/oil_spills_2012.pdf.

80. The Oil Spill Liability Trust Fund is a billion-dollar fund managed by the U.S. Coast Guard's National Pollution Funds Center used as a funding source for removal costs and damages resulting from oil spills or for mitigating the threat of an oil spill. U.S. Coast Guard, "The Oil Spill Liability Trust Fund (OSLTF)," http://www.uscg.mil/npfc/About_NPFC/osltf.asp.

81. The Interagency Coordinating Committee on Ocean Pollution Research, chaired by the U.S. Coast Guard, coordinates a comprehensive program of oil pollution research, technology development, and demonstration among federal agencies, industry, universities, research institutions, state governments, and other

Together with the White House National Ocean Council (NOC), USARC has supported the national ocean policy draft implementation plan requested by President Obama's 2010 Executive Order 13547, "Stewardship of the Ocean, Our Coasts, and the Great Lakes." As stated in the April 2012 testimony of USARC executive director John Farrell, the commission shaped the framework for the draft plan's objective on the "changing conditions in the Arctic."[82] USARC's proposals focused on five actions: (1) improving Arctic environmental response management, (2) observing and forecasting Arctic sea ice, (3) implementing a distributed biological observatory, (4) enhancing communication systems, and (5) advancing Arctic mapping and charting.[83]

The next IARPC five-year U.S. Arctic research program is expected to be published in 2013. The draft plan for FY 2013–2017[84] names seven priority areas for conducting interagency research in the Arctic: (1) sea ice and marine ecosystem studies; (2) terrestrial ecosystem studies; (3) atmospheric studies of surface heat, energy, and mass balances; (4) observing systems; (5) regional climate models; (6) adaptation tools for sustaining communities; and (7) human health studies. The draft also lists infrastructure requirements necessary to implement the plan, such as satellite systems, piloted and unmanned aircraft, icebreakers and ice-capable vessels, and field stations. Other IARPC publications include "Arctic Observing Network (AON): Toward a U.S. Contribution to Pan-Arctic Observing,"[85] compiled in collaboration with NSF in 2007. The report advocates for the creation of a single designated environmental monitoring system that could be applied by the U.S. government to produce a comprehensive picture of the change in Arctic environment.

Research Institutions

Nongovernmental organizations and private institutions also contribute to scientific research and understanding of the Arctic. These organizations influence U.S. decision-making on environmental issues and shape future Arctic policies through their advocacy and research. They dedicate their resources to developing and promoting a better understanding of the geological and climate processes that occur in the Arctic while also disseminating scientific data sets to facilitate better public awareness, coherent research, and safer exploitation of the region's waters and seabed. The National Snow and Ice Data Center, at the University of Colorado's Cooperative Institute for Research in Environmental Sciences[86] focuses on analyzing the cryosphere—"portions of the Earth

nations. U.S. Coast Guard, "Interagency Coordinating Committee on Oil Pollution Research (ICCOPR)," http://www.iccopr.uscg.gov/apex/f?p=118:20.

82. Natural Resources Committee, Subcommittee on Fisheries, Wildlife, Oceans and Insular Affairs Oversight Field Hearing on "Alaska's Sovereignty In Peril: The National Ocean Policy's Goal to Federalize Alaska," April 3, 2012, http://naturalresources.house.gov/Calendar/EventSingle.aspx?EventID=286902.

83. Natural Resources Committee, testimony by John Farrell, executive director of U.S. Arctic Research Commission, "Alaska's Sovereignty in Peril: The National Ocean Policy's Goal to Federalize Alaska," April 3, 2012, http://naturalresources.house.gov/UploadedFiles/FarrellTestimony04.03.12.pdf.

84. National Science Foundation, "Draft: Interagency Arctic Research Policy Committee Arctic Research Plan: FY 2013–2017," May 2012, http://www.nsf.gov/od/opp/arctic/iarpc/iarpc_5yr_plan/arc_res_5yr_plan_draft.pdf.

85. National Science Foundation, "Arctic Observing Network (AON): Toward a U.S. Contribution to Pan-Arctic Observing," 2007, http://www.nsf.gov/pubs/2008/nsf0842/nsf0842.pdf.

86. The National Snow and Ice Data Center (NSIDC), established by NOAA in 1982, is affiliated with NOAA's National Geophysical Data Center. National Snow and Ice Data Center, "NOAA at NSIDC," http://nsidc.org/noaa/. NSIDC activities are supported through competitive grants and contracts from NOAA, NASA, and the NSF. National Snow and Ice Data Center, "Sponsors," http://nsidc.org/about/sponsors.html.

where water is in solid form," including snow cover, all forms of ice, and frozen ground.[87] The center gathers scientific information by analyzing satellite images and conducting ground observations and then distributes it through a number of publications: daily images, a quarterly electronic newsletter, occasional journal entries, and special and annual reports. The center also provides a monthly scientific analysis of Arctic ice conditions and various data collections.[88] It tracks climate change, forecasts the rate of Arctic ice melt, and facilitates real-time and prospective maritime security.

ARCUS brings together a number of universities and scientific research organizations.[89] Established in 1988, the main goal of ARCUS is to coordinate Arctic research and organize gathered knowledge so that other bodies, including USARC, the IARPC, and the Polar Research Board, can use that knowledge. Members of the consortium gather annually for an Arctic Forum that brings scientists and political leaders together to provide networking opportunities for researchers, facilitate information exchange, and improve scientific project coordination. The 2012 Arctic Forum focused on the issues of governance and security, transportation and energy development, and the changing Arctic ecosystems.[90] The Consortium also hosts the project office for the interagency SEARCH program.[91]

87. National Snow and Ice Data Center, "Cryosphere," http://nsidc.org/cgi-bin/words/glossary.pl.

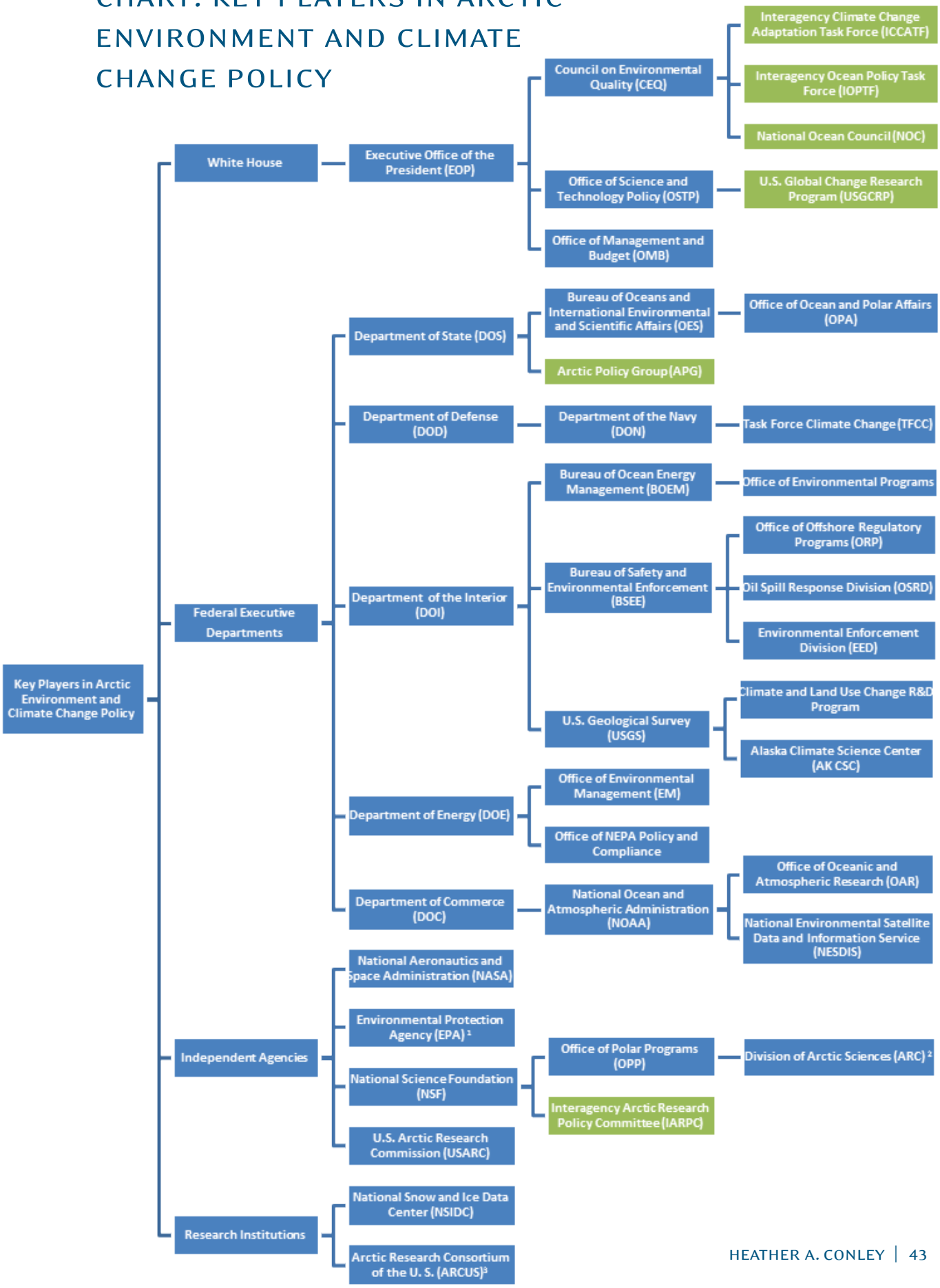
88. National Snow and Ice Data Center, "Arctic Sea Ice News & Analysis," http://nsidc.org/arcticseaicenews/.

89. Arctic Research Consortium of the United States, "2005 ARCUS Brochure," http://www.arcus.org/ARCUS/ARCUS_PDF/ARCUS_brochure.pdf.

90. Arctic Research Consortium of the United States, "Arctic Forum 2012," http://www.arcus.org/witness-the-arctic/2012/2/article/19176.

91. Arctic Research Consortium of the United States, "Study of Environmental Arctic Change," http://www.arcus.org/search/index.php.

CHART: KEY PLAYERS IN ARCTIC ENVIRONMENT AND CLIMATE CHANGE POLICY



Key:

1. EPA programs include the Superfund Program and the International Programs

2. The DAS runs the Arctic System Science (ARCSS) Program and the Arctic Observing Network (AON)

3. ARCUS hosts the project office for the Study of Environmental Arctic Change (SEARCH) program

The units highlighted in green represent interagency bodies. They are listed under the body's chair agency or main co-chair. See appendix for a complete membership list.

B ANNEX B
KEY PLAYERS IN ARCTIC ENERGY AND MINERAL RESOURCES POLICY

The Arctic is estimated to contain 13 percent of the world's undiscovered oil resources and 30 percent of its undiscovered gas resources.[1] As the sea ice retreats, these untapped natural resources are becoming increasingly attractive to multinational corporations eager to boost their reserves and take advantage of new commercial opportunities in the Arctic.

Additionally, the Arctic region of Alaska accounts for more than half of the state's mineral production value and holds rich deposits of zinc, lead, gold, and coal that have so far been underexplored. In 2010, exports of mineral resources from Alaska generated $1.3 billion and accounted for 36.8 percent of Alaska's foreign export earnings. Given technology advancements, increased access, and improved infrastructure, there is significant growth potential for mining operations in this remote region. In recent years, mining companies have staked numerous claims for prospecting mineral resources and developing extraction capabilities.

For the private sector to explore the natural resources of the American Arctic, a variety of federal agencies and bureaus must approve permitting and licensing of Arctic leases and mining operations as well as provide oversight of both onshore production and offshore drilling operations. These agencies are also tasked with providing reliable and unbiased statistics and research related to oil and gas development and mineral resource exploitation.

Federal Executive Departments

Department of the Interior

In 2011, President Barack Obama released his administration's "Blueprint for a Secure Energy Future,"[2] which established the U.S. strategy for achieving and maintaining energy security in both the short and long term, with specific goals to be accomplished by 2015, 2018, 2020, and 2035. The president's policy rests on three pillars: support for domestic resource development, promotion of innovation to cut costs and use energy more efficiently, and development of clean energy technology.[3] The document calls for a region-specific approach and briefly addresses the prospects and challenges of Alaskan on- and offshore exploration, calling this exploration a "frontier area" and emphasizing the need for greater coordination among government agencies.[4] The blueprint specifies that a necessary step to achieve these goals is the creation of a high-level interagency body that

1. U.S. Geological Survey, "Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle," 2008, 1, http://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf.
2. The White House, "Blueprint For A Secure Energy Future," March 30, 2011, http://www.whitehouse.gov/sites/default/files/blueprint_secure_energy_future.pdf.
3. Ibid., 4.
4. Ibid., 12–13.

would be responsible for consolidating all government efforts into a comprehensive framework for action. Presidential Executive Order 13580 established this body, the Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska, on July 12, 2011.[5]

The deputy secretary of the Department of the Interior leads the working group, whose members include designated deputy-level officials from eleven other federal agencies.[6] The working group's main task is to improve coordination of Alaskan oil and gas development. It has also been tasked with long-term planning for such issues as search-and-rescue capabilities, oil spill prevention mechanisms, and Arctic infrastructure development.[7] The group works closely with the White House Domestic Policy Council. Its objective is not only to encourage information sharing among various governmental, scientific, and regional actors, but also to ensure that all oil and gas exploration endeavors meet environmental and safety standards and regulations.

Multinational oil and gas companies had previously registered complaints regarding the lack of coordination among the different federal agencies in charge of the permitting process in Alaska, particularly development of their leases in the Chukchi and Beaufort seas.[8] This lack of coordination frequently led to significant delays for very short drilling seasons. On the other hand, environmental organizations have expressed concern that the establishment of this working group will hasten the process of approving drilling in the Arctic, which they do not support. The working group approved Shell Oil's drilling plans and procedures by August 2011, despite strong opposition from environmentalist groups.[9] Due to poor weather conditions and a lack of approval for its oil spill equipment, however, Shell was able to conduct only "top-hole" drilling of the ice, and only for a short window of time.[10]

The Department of the Interior is by far the most involved federal agency in shaping U.S. policy toward energy development in Alaska, as its main task is to manage U.S. domestic natural resources; it is also significantly involved in shaping U.S. mineral resources policy in the state. The department's area of responsibility extends to 214 million acres onshore and 485 million acres offshore on Alaska's outer continental shelf (OCS).[11]

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5. "Executive Order 13580—Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska," *Federal Register* 76, no. 136 (July 15, 2011), http://www.gpo.gov/fdsys/pkg/FR-2011-07-15/pdf/2011-18065.pdf.

6. The agencies-members of the Working Group include: the Department of Defense, the Department of Commerce, the Department of Agriculture, the Department of Energy, the Department of Homeland Security, the Environmental Protection Agency, the Office of the Federal Coordinator for Alaska Natural Gas Transportation Projects, the Council on Environmental Quality, the Office of Science and Technology Policy, the Office of Management and Budget, and the National Security Staff. U.S. Department of the Interior, "Members," http://www.doi.gov/alaskaenergy/members.cfm.

7. U.S. Department of the Interior, "Interagency Working Group on Alaska Energy," http://www.doi.gov/alaskaenergy/Interior.cfm.

8. Pete Slaiby, "Development and Infrastructure Options in Alaska's Arctic and Market Challenge" (presentation of CSIS Arctic Oil and Gas Conference, Washington, D.C., July 14, 2011), http://csis.org/event/arctic-oil-and-gas-development.

9. "U.S. agency approves Shell Arctic oil drilling plan," Reuters, August 4, 2011, http://www.reuters.com/article/2011/08/04/us-shell-arctic-plan-idUSTRE77368020110804.

10. Tim Bradner, "Shell completes top-hole work in short Arctic season," Alaska Journal of Commerce, November 9, 2012, http://www.alaskajournal.com/Alaska-Journal-of-Commerce/November-Issue-2-2012/Shell-completes-top-hole-work-in-short-Arctic-season/.

11. U.S. Department of the Interior, "Interagency Working Group on Alaska Energy," http://www.doi.gov/alaskaenergy/Interior.cfm.

A key bureau within the department is the Bureau of Ocean Energy Management (BOEM), tasked with overall development of the five-year OCS oil and gas leasing programs, managing offshore renewable-energy programs, and conducting resource evaluations and environmental impact assessments.[12] The key official responsible for the off-shore leasing program is the deputy secretary, who also serves as chair of the interagency working group mentioned above.

The Department of the Interior has sold leases for 43 million OCS acres, which account for 15 and 27 percent of domestic natural gas and oil production, respectively.[13] According to BOEM estimates, there are about 26 billion barrels of oil and 131 trillion cubic feet of gas resources in undiscovered fields in Alaska's OCS that are technically recoverable.[14]

BOEM's Office of Strategic Resources is in charge of the development of the five-year OCS oil and gas leasing program. The office works in accordance with the guidelines of the 2010 OCS oil and gas strategy to responsibly develop and expand exploration of oil and gas resources while protecting areas considered not suitable for drilling.[15] For the period 2012–2017, the Department of the Interior has proposed to extend leases for six offshore areas, two of which are located in the Alaskan Arctic region. The sales of oil leases in the Chukchi and Beaufort seas, however, have been delayed until the end of the lease program period (in 2016 and 2017, respectively) to allow for thorough environmental assessments and the evaluation of subsistence necessities and infrastructure capabilities.[16]

Production of an estimated 10 billion barrels of oil over the next 50 years would generate $96 billion in federal lease revenues (and an additional $97 billion in state and federal government tax revenue) and support an average of 54,700 nationwide jobs annually, so there is great interest and enthusiasm in developing these resources.[17] However, the department balances a wide range of scientific, environmental, safety, and social considerations when formulating its leasing programs. See Annex A for more information about the role of the department's Bureau of Safety and Environmental Enforcement (BSEE) in the development and enforcement of safety and environmental regulations for offshore development. The department relies on its key scientific agency, the U.S. Geological Survey (USGS), to collect and analyze biological, geographical, geological, and hydrological data and to provide reliable scientific information to federal departments with regulatory purview and the general public.[18]

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12. Bureau of Ocean Energy Management, "About BOEM," http://www.boem.gov/About-BOEM/index.aspx.
13. Bureau of Ocean Energy Management, "Offshore Energy and Minerals Management," http://www.boemre.gov/offshore/.
14. Bureau of Ocean Energy Management, "Assessment of Undiscovered Technically Recoverable Oil and Gas Resources of the Nation's Outer Continental Shelf, 2011," http://www.boem.gov/uploadedFiles/2011_National_Assessment_Factsheet.pdf.
15. U.S. Department of the Interior, "Outer Continental Shelf Oil and Gas Strategy," http://www.doi.gov/whatwedo/energy/ocs/index.cfm.
16. Bureau of Ocean Energy Management, "Proposed Outer Continental Shelf Oil & Gas Leasing Program 2012-2017," November 2011, http://www.boem.gov/uploadedFiles/Proposed_OCS_Oil_Gas_Lease_Program_2012-2017.pdf; "Oil Lease Sale In U.S. Beaufort Sea Delayed By Two Years To 2017," Bloomberg, June 26, 2012, http://www.bloomberg.com/news/2012-06-26/oil-lease-sale-in-u-s-beaufort-sea-delayed-by-two-years-to-2017.html.
17. "Economic Report Overview: Potential National-Level Benefits of Oil and Gas Development in the Beaufort Sea and Chukchi Sea," *Northern Economics*, February 2011, http://www.northerneconomics.com/pdfs/ShellOCS/National%20Effects%20Report%20FINAL.pdf.
18. U.S. Geological Survey, "About USGS," http://www.usgs.gov/aboutusgs/.

The USGS Energy Resources Program conducts mineral and energy resource appraisals and assessments of the impacts of resource extraction and use. It examines the impact of these activities on the environment, economy, and human health.[19] In 2004, the USGS undertook a multi-year research effort to provide the public a comprehensive and unbiased estimate of petroleum resources in the Arctic region. According to the "Circum-Arctic Resource Appraisal" released in 2008, the Arctic holds 13 percent of the world's undiscovered oil resources (90 billion barrels of oil) and 30 percent of the world's undiscovered gas resources (1,669 trillion cubic feet of natural gas and 44 billion barrels of natural gas liquids), with 84 percent of these resources located in offshore areas.[20] Five provinces hold more than 70 percent of the undiscovered oil resources: the Alaskan Arctic, Amerasia Basin, East Greenland Rift Basins, East Barents Basins, and West Greenland–East Canada. More than 70 percent of the undiscovered natural gas resources are located in three provinces: the West Siberian Basin, the East Barents Basins, and Arctic Alaska.

The USGS has also released several publications on energy resources in the Alaskan Arctic, including the 2008 "Assessment of Gas Hydrate Resources on the North Slope, Alaska," the 2010 "Updated Assessment of Undiscovered Oil and Gas resources of the National Petroleum Reserve in Alaska (NPR-A)," and the 2012 "Assessment of Potential Oil and Gas Resources in Source Rocks of the Alaska North Slope," among others.[21] With 17.6 percent of all undiscovered hydrocarbon resources (a total of 72.7 billion barrels of oil equivalent), the Alaskan Arctic is the second most prospective Arctic province, after the West Siberian Basin.[22] It estimated to have about 29.9 billion barrels of oil, more than 221 trillion cubic feet of natural gas, and 5.9 billion barrels of natural gas liquids.

Onshore oil and gas developments are managed by the Bureau of Land Management (BLM), which has more than 700 million subsurface acres in its administration.[23] According to bureau estimates, of the 279 million acres with oil and gas potential, more than 165 million are either closed to leasing or inaccessible.[24] The BLM's Oil and Gas Management Program is in charge of land use planning, lease sales, well permitting, production inspection, and reclamation oversight for potential development of areas identified as open for leasing. In fiscal year 2011, there were more than 49,000 active leases on 38 million acres of federal land, and the bureau had approved more than 4,000 new drilling permits.[25] In Alaska, there are currently 204 leases in effect, and more than 100 drilling permits have been issued since 2000.[26]

In August 2012, Interior Secretary Ken Salazar announced the department's proposed plan for management of the National Petroleum Reserve–Alaska (NPR-A). The final plan was released in

19. U.S. Geological Survey, "About the Energy Program," http://energy.usgs.gov/GeneralInfo/AbouttheEnergyProgram.aspx.

20. U.S. Geological Survey, "Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle," 2008, 1, http://pubs.usgs.gov/fs/2008/3049/fs2008-3049.pdf.

21. U.S. Geological Survey, "National Oil and Gas Assessment Publications," http://energy.usgs.gov/OilGas/AssessmentsData/NationalOilGasAssessment/Publications.aspx; U.S. Geological Survey, "Natural resources," http://www.usgs.gov/science/science.php?term=777.

22. U.S. Geological Survey, "Circum-Arctic Resource Appraisal," 4.

23. Bureau of Land Management, "Leasing of Onshore Federal Oil and Gas Resources," http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/leasing_of_onshore.html.

24. Ibid.

25. Bureau of Land Management, "Oil & Gas Statistics," http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/statistics.html.

26. Ibid.

December 2012[27] and envisions expanding the number of leases for oil and gas development on 11.8 million acres, which accounts for more than half of the NPR-A acreage, opening access to the majority of mineral resources that have either been discovered or are presumed to be economically recoverable (549 million barrels of oil and 8.7 trillion cubic feet of gas).[28] In an effort to balance energy needs with wildlife protection and subsistence requirements of the native population, however, the remainder of the NPR-A acreage would not be made available for development, with special protection granted to calving areas for caribou herds, nesting areas for migratory birds, and some coastal areas that serve as habitat for marine mammals.[29] While restrictive, the plan does not preclude the possibility of building a pipeline and other infrastructure across the NPR-A to transport potential oil and gas extracted from the Beaufort and Chukchi seas.[30]

As well as managing energy resources, the Department of the Interior has several bureaus, offices, and agencies responsible for managing the development of domestic mineral resources. The USGS Mineral Resources Program provides mineral resource assessments and research on the economic potential, production, consumption, and environmental impact of mineral extraction.[31] The USGS National Minerals Information Center collects, analyzes, and disseminates information about the "domestic and international supply of and demand for minerals and mineral materials essential to the U.S. economy and national security."[32] The center also releases aggregated statistics obtained from surveys filled by mining and mineral-processing companies.[33] Scientists at the USGS Alaska Science Center also investigate the mineral resource potential of public lands in Alaska.[34] According to USGS estimates for the Alaskan Arctic region, the Nanushuk formation in the North Slope region holds an estimated 3.2 trillion tons of coal resources; the Aqqaluk deposit at Red Dog mine has over 50 million tons of ore deposits containing zinc and lead; and the Rock Creek gold mine near Nome contains reserves of over 500,000 ounces of gold.[35]

BLM is tasked with administering more than 250 million acres of public lands and 700 million acres of subsurface minerals. Of these subsurface minerals, 237 million acres of the federal mineral estate are located in Alaska.[36] The BLM Alaska minerals program is responsible for mining claims on federal lands, processing mineral lease applications and prospecting permits, approving

27. Bureau of Land Management, "National Petroleum Reserve–Alaska Final Integrated Activity Plan/Environmental Impact Statement," Vol. 1, December 19, 2012, https://www.blm.gov/epl-front-office/projects/nepa/5251/41003/43153/Vol1_NPR-A_Final_IAP_FEIS.pdf.

28. U.S. Department of the Interior, "Secretary Salazar Announces Plan for Additional Development, Wildlife Protection in 23 Million Acre National Petroleum Reserve-Alaska," December 19, 2012, http://www.doi.gov/news/pressreleases/secretary-salazar-announces-plan-for-additional-development-wildlife-protection-in-23-million-acre-national-petroleum-reserve-alaska.cfm.

29. Ibid. See Annex A for more information about the Department of the Interior's role in environmental protection.

30. "A plan for the National Petroleum Reserve-Alaska," *Alaska Dispatch,* December 19, 2012, http://www.alaskadispatch.com/article/plan-national-petroleum-reserve-alaska.

31. U.S. Geological Survey, "Mineral Resources Program," http://minerals.usgs.gov/.

32. U.S. Geological Survey, "USGS National Minerals Information Center," http://minerals.usgs.gov/minerals/pubs/mit/nmic.pdf.

33. Ibid.

34. U.S. Geological Survey, "Geologic Science of Alaska," http://alaska.usgs.gov/science/geology/index.php.

35. U.S. Geological Survey, "Alaska Resource Data File (ARDF)," http://mrdata.usgs.gov/ardf/.

36. Bureau of Land Management, "Mineral and Surface Acreage Managed by the BLM," http://www.blm.gov/wo/st/en/info/About_BLM/subsurface.html.

mineral surveys and patents, conducting annual assessments and maintenance of mining sites, and surface management.[37] Because many mineral resources are located in national parks, preserves, monuments, or wildlife refuges, BLM does not allow mining on 75 percent of the federal land in Alaska.[38] The Bureau is also in charge of adjudicating more than 11,000 active mining claims for the remainder of available public lands.[39]

The Office of Surface Mining Reclamation and Enforcement is the bureau within the Department of the Interior that ensures environment and public protection from the adverse impact of surface coal mining operations. The office is also responsible for reclaiming and restoring lands and water degraded by mining operations.[40] It oversees state programs for mining regulations and land reclamation projects, and it coordinates with the coal industry, local communities, and other state and federal agencies to limit the adverse environmental and social impact of mineral resource exploitation.[41] In Alaska, surface coal mining regulation and reclamation programs are developed by the Division of Mining, Land, and Water within the Alaska Department of Natural Resources, but the Office of Surface Mining retains oversight role over its implementation.[42]

Department of Energy

Like the Department of the Interior, the Department of Energy is involved in both energy and mineral resource management policymaking. The department is tasked with promoting energy technology innovation, developing science and technology solutions to energy and environmental challenges, enhancing nuclear security, and improving project management and regulatory supervision.[43] Several offices and agencies have responsibilities and authorities over oil and gas development and mineral resource management in the Alaskan Arctic.

The Office of Fossil Energy works on projects to ensure the continued supply of clean and affordable energy from traditional fossil fuel resources. The Office of Oil and Natural Gas conducts research and formulates policy options "to ensure environmentally sustainable domestic and global supplies of oil and natural gas."[44] In the Alaskan Arctic region, the office supports energy infrastructure development, such as the construction of the Alaskan gas pipeline to deliver natural

37. Bureau of Land Management, "Mining Claims and Sites on Federal Lands," http://www.blm.gov/pgdata/etc/medialib/blm/wo/MINERALS__REALTY__AND_RESOURCE_PROTECTION_/energy.Par.28664.File.dat/MiningClaims.pdf; Bureau of Land Management, "BLM Alaska Minerals Program," http://www.blm.gov/ak/st/en/prog/minerals.html.

38. Bureau of Land Management, "Mining on Public Lands in Alaska," http://www.blm.gov/ak/st/en/prog/minerals/mining_on_public_lands.html.

39. Bureau of Land Management, "Claim Adjudication," http://www.blm.gov/ak/st/en/prog/minerals/claims.html.

40. Office of Surface Mining Reclamation and Enforcement, "About Us," http://www.osmre.gov/aboutus/Aboutus.shtm.

41. Ibid.

42. U.S. Department of the Interior, "Interagency Working Group on Alaska Energy," http://www.doi.gov/alaskaenergy/Interior.cfm.

43. U.S. Department of Energy, "Strategic Plan 2011," http://energy.gov/sites/prod/files/2011_DOE_Strategic_Plan_.pdf.

44. U.S. Department of Energy, "Office of Oil and Natural Gas," http://www.fossil.energy.gov/programs/oilgas/index.html.

gas to the continental United States,[45] and conducts research and development (R&D) projects such as methane hydrate field studies and production technologies tests in the North Slope to extract untapped natural gas resources under the Arctic permafrost.[46]

The Office of Policy and International Affairs is responsible for the department's international energy activities. This office acts as primary adviser to the secretary on domestic and international policy development and implementation; it represents the department in interagency committees or working groups and represents the U.S. government in bilateral and multilateral forums, such as the U.S.-Canada Clean Energy Dialogue and the Clean Energy Ministerial.[47] The office also formulates policy regarding the use of rare earth elements.[48] In 2010, the department released its first critical materials strategy, which calls for the United States to seek to mitigate supply risks and decrease global demand for rare earth minerals by diversifying global supply chains, developing substitutes, and supporting recycling of these resources.[49] Large resources of rare earth elements have recently been discovered in the Arctic region and remain unexplored to date. The southwest coast of Greenland holds 4.7 million tons of rare earth oxide, which could meet a quarter of the global demand for the next 50 years.[50]

The Office of Climate Change Policy and Technology is in charge of strategic planning for the U.S. Climate Change Technology Program, a multi-agency R&D program with a $5.2 billion annual investment portfolio for the development of climate change technology.[51]

The Department of Energy also operates a nationwide system of laboratories through its Office of Fossil Energy. The laboratory that engages on Arctic related issues is the National Energy Technology Laboratory (NETL). NETL implements a series of energy and environmental R&D programs,[52] such as on clean coal technologies, including carbon capture and storage initiatives, which could be used in new and existing coal plants in Alaska.[53] Similarly, the Arctic Energy Office within NETL's Strategic Center for Natural Gas and Oil was established in 2001 in partnership with the University of Alaska at Fairbanks to identify solutions to the technological, economic,

45. U.S. Department of Energy, "Alaska Natural Gas Pipeline," http://www.fossil.energy.gov/programs/oilgas/alaska/Alaska_Natural_Gas_Pipeline.html.

46. U.S. Department of Energy, "DOE's Methane Hydrate Field Studies," http://www.fossil.energy.gov/programs/oilgas/hydrates/fieldstudies.html#alaska; U.S. Department of Energy, "U.S. and Japan Complete Successful Field Trial of Methane Hydrate Production Technologies," May 2, 2012, http://www.fossil.energy.gov/news/techlines/2012/12016-US%2C_Japan_Gas_Hydrate_Field_Trial_.html.

47. U.S. Department of Energy, "Office of Policy and International Affairs: About Us," http://energy.gov/node/1939/office-policy-and-international-affairs/about-us.

48. Ibid.

49. U.S. Department of Energy, "Critical Materials Strategy," 2010, http://energy.gov/sites/prod/files/edg/news/documents/criticalmaterialsstrategy.pdf.

50. Greenland Minerals and Energy Ltd., "Fact Sheet," March 2011, http://www.ggg.gl/docs/Greenland_Minerals_and_Energy_Fact_Sheet-march2011.pdf; Leo Lewis, "Greenland challenge to Chinese over rare earth metals," *The Times*, October 5, 2009, http://www.thetimes.co.uk/tto/business/industries/naturalresources/article2183054.ece.

51. U.S. Department of Energy, "Climate Change," http://energy.gov/pi/office-policy-and-international-affairs/initiatives/climate-change.

52. National Energy Technology Laboratory, "About NETL," http://www.netl.doe.gov/about/index.html.

53. U.S. Department of Energy, "Clean Coal Technologies," http://www.fossil.energy.gov/programs/powersystems/index.html.

and environmental challenges for fossil energy production in Alaska.[54] The office has sponsored projects such as data collection services for Alaska North Slope oil and gas transportation networks, seismic monitoring of Alaska heavy oils, testing and evaluating the use of polymers to recover viscous oil resources in the North Slope, and testing production methods for light oil from frozen reservoirs such as the Umiat oil field.[55] It also conducts research on the development of Alaska's large coal resources, including the untapped coal deposits on the North Slope.[56]

The independent statistical and analytical agency within the Department of Energy, the U.S. Energy Information Administration (EIA), conducts comprehensive energy data collection and publishes informative analyses and short- and long-term forecasts of domestic and international energy market trends.[57] Relevant publications from EIA include "Arctic Oil and Natural Gas Potential," which discusses the economic, political, and environmental issues associated with development of fossil fuels in the Arctic region, and "Analysis of Crude Oil Production in the Arctic National Wildlife Refuge," which provides an assessment of the potential impact of federal oil and natural gas leasing in the area.[58] Another EIA analysis with an Arctic focus is the 2009 report "Bringing Alaska North Slope Natural Gas to Market," which concludes that the development of the Alaska natural gas pipeline is less financially risky than the alternative options of constructing a gas-to-liquids plant or a large liquefied natural gas (LNG) export facility.[59]

Department of State

The Department of State contributes to the formulation of U.S. international energy policy, works to enhance U.S. energy security and develop partnerships with potential resource suppliers, and it is also involved in mineral resources policy.

The key senior official responsible for energy within the Department of State is the under secretary for economic growth, energy, and the environment. Several bureaus reporting to the under secretary focus on efforts to promote energy security, environmental sustainability, and economic prosperity.

The department's Bureau of Energy Resources (ENR) was established in 2011 following a recommendation from the Quadrennial Diplomacy and Development Review. The bureau's mission is "to unite diplomatic and programmatic efforts on oil, natural gas, coal, electricity, renewable energy, energy governance, strategic resources, and energy poverty."60 The bureau will work

54. National Energy Technology Laboratory, "Arctic Energy Office," http://www.netl.doe.gov/technologies/oil-gas/AEO/main.html.

55. National Energy Technology Laboratory, "Arctic Energy Office Program Fact Sheet," http://www.netl.doe.gov/technologies/oil-gas/publications/AEO/AEOProgram102_8P.pdf.

56. National Energy Technology Laboratory, "The Arctic Energy Office: Fossil Energy—Alaska Coal," http://www.netl.doe.gov/technologies/oil-gas/AEO/FossilEnergy/AlaskaCoal.html.

57. U.S. Energy Information Administration, "About EIA," http://www.eia.gov/about/.

58. U.S. Energy Information Administration, "Arctic Oil and Natural Gas Potential," October 19, 2009, http://www.eia.gov/oiaf/analysispaper/arctic/index.html; U.S. Energy Information Administration, "Analysis of Crude Oil Production in the Arctic National Wildlife Refuge," May 2008, http://www.eia.gov/oiaf/servicerpt/anwr/index.html.

59. U.S. Energy Information Administration, "Bringing Alaska North Slope Natural Gas to Market," 2009, http://www.eia.gov/oiaf/aeo/otheranalysis/aeo_2009analysispapers/ansng.html.

60. U.S. Department of State, "Leading Through Civilian Power: The First Quadrennial Diplomacy and Development Review," 2010, 7, http://www.state.gov/documents/organization/153108.pdf.

through "inter-agency agreements"61 with other U.S. agencies to enhance cooperation with actors responsible for major energy supply and demand as well as promoting sustainable energy.62 The bureau is intended to play the role of a coordinator and convener of industry, technology, and policy leaders to ensure responsible and sustainable resource development both on the domestic and international level.63 Although the bureau has not been actively involved in Arctic energy issues, the special envoy and coordinator for international energy affairs, Ambassador Carlos Pascual, who currently leads the work of the bureau, has expressed interested in focusing on this region in the future.64 The bureau's Office of Energy Diplomacy is tasked with processing presidential permit applications for cross-border petroleum pipelines.65 In the Arctic, the work of the ENR holds special relevance as the State Department is consulted by the Federal Energy Regulatory Commission (FERC) when issuing cross-border natural gas pipeline permits such as those required for the Alaska pipeline project.

Department of Labor

Within the Department of Labor, the Mine Safety and Health Administration monitors and enforces compliance with safety and health standards set up under the Mine Act of 1977.[66] It conducts regular inspections of mining operations and facilities, issues citations for violations of standards, investigates mining accidents, and offers training and technical assistance to mine operations.[67] The administration actively monitors the safety of Alaskan mines, such as the Red Dog Mine, and regularly offers safety training courses for mining employees operating in permafrost conditions.[68]

Independent Agencies

Other relevant actors active in the area of Arctic oil and gas development are federal agencies with regulatory authority. The Federal Energy Regulatory Commission (FERC) is an independent agency that regulates the transmission of electricity, natural gas, and oil in interstate commerce

61. U.S. Department of State, "Leading Through Civilian Power: The First Quadrennial Diplomacy and Development Review," 2010, 40, http://www.state.gov/documents/organization/153108.pdf.

62. U.S. Department of State, "Bureau of Energy Resources," http://www.state.gov/e/enr/index.htm.

63. U.S. Department of State, "The State Department's New Bureau of Energy Resources: Shaping America's Global Energy Policy," November 16, 2011, http://www.state.gov/r/pa/pl/177233.htm.

64. Keynote address by Ambassador Carlos Pascual, special envoy and coordinator for international energy affairs, U.S. Department of State, on "The Challenges and Opportunities of Arctic Energy and Resources Development," at Brookings Institution, June 12, 2012, http://www.brookings.edu/~/media/events/2012/6/12%20arctic%20energy%20development/20120612%20arctic%20energy%20uncorrected%20transcript.pdf.

65. U.S. Department of State, "Applicants for Presidential Permit for Liquid Pipelines," http://www.state.gov/e/enr/applicant/index.htm.

66. Mine Safety and Health Administration, "MSHA's Statutory Functions," http://www.msha.gov/MSHAINFO/MSHAINF1.HTM.

67. Ibid.

68. Mine Safety and Health Administration, "State of Alaska Program Summary," http://www.msha.gov/TRAINING/STATES/AKSTATE.asp.

and reviews applications for interstate natural gas pipelines and LNG terminals.[69] FERC is led by five commissioners appointed by the president for five-year terms.[70]

FERC is the lead federal agency responsible for preparing the environmental impact statement for the Alaskan natural gas pipeline project and submitting semi-annual reports to Congress regarding progress in and impediments to licensing and constructing the pipeline. The project, first proposed by the TransCanada Alaska Company in 2009, consists of a gas treatment plant near Prudhoe Bay and more than 800 miles of pipeline from the Alaska North Slope to the Alaska-Yukon border.[71] The fourteenth report, issued in August 2012, outlined FERC activities to review the project, including public scoping meetings and formal intergovernmental consultation with native tribes in Alaska. The report also discussed TransCanada's project development progress, noting that the company had temporarily suspended plans to develop the North Slope-to-Alberta option and intended to file an application for an LNG export project in October 2014.[72]

To expedite federal permitting and construction of the Alaskan natural gas pipeline, Congress established in 2004 the Office of the Federal Coordinator for Alaska Natural Gas Transportation Projects, an independent federal agency tasked with coordinating the work of FERC, 25 other federal agencies, the state of Alaska, and the federal government in Canada.[73]

Industry Associations

The aforementioned federal agencies and departments also coordinate with several U.S. nongovernmental entities that are involved in domestic and international energy issues. The U.S. Energy Association (USEA) is an "association of public and private energy-related organizations, corporations, and government agencies" that represents the interests of the U.S. energy sector within the World Energy Council (WEC), the preeminent global forum promoting sustainable supply and use of energy.[74] As the U.S. member committee of the WEC, USEA's duties include organizing and coordinating the participation of the U.S. delegation in WEC proceedings and activities, as well as serving on WEC technical and study committees.[75] The USEA also organizes energy partnerships between domestic companies, organizations, and counterpart entities in developing countries, and sponsors conferences, workshops and informational briefings, training programs, trade exchange visits, and policy reports on global and domestic energy issues.[76]

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69. Federal Energy Regulatory Commission, "What FERC Does," http://www.ferc.gov/about/ferc-does.asp.

70. The current FERC commissioners are Jon Wellinghoff, Philip D. Moeller, John R. Norris, Cheryl A. LaFleur, and Tony Clark. Federal Energy Regulatory Commission, "Commission Members," http://www.ferc.gov/about/com-mem.asp.

71. Office of the Federal Coordinator for Alaska Natural Gas Transportation Projects, "Alaska Pipeline Project Resource Report No. 1 Preliminary Draft," http://www.arcticgas.gov/sites/default/files/documents/app-preliminary-draft-rr-01.pdf.

72. Federal Energy Regulatory Commission, "Fourteenth Report to Congress on Progress Made in Licensing and Constructing the Alaska Natural Gas Pipeline," August 2012, http://www.ferc.gov/legal/staff-reports/angta-fourteenth.pdf.

73. The Federal Coordinator position is currently held by Larry Persily, Alaska Natural Gas Transportation Projects, "Office of the Federal Coordinator for Alaska Natural Gas Transportation Projects," http://www.arcticgas.gov/ofc/about-us.

74. U.S. Energy Association, "About USEA," http://www.usea.org/about-usea.

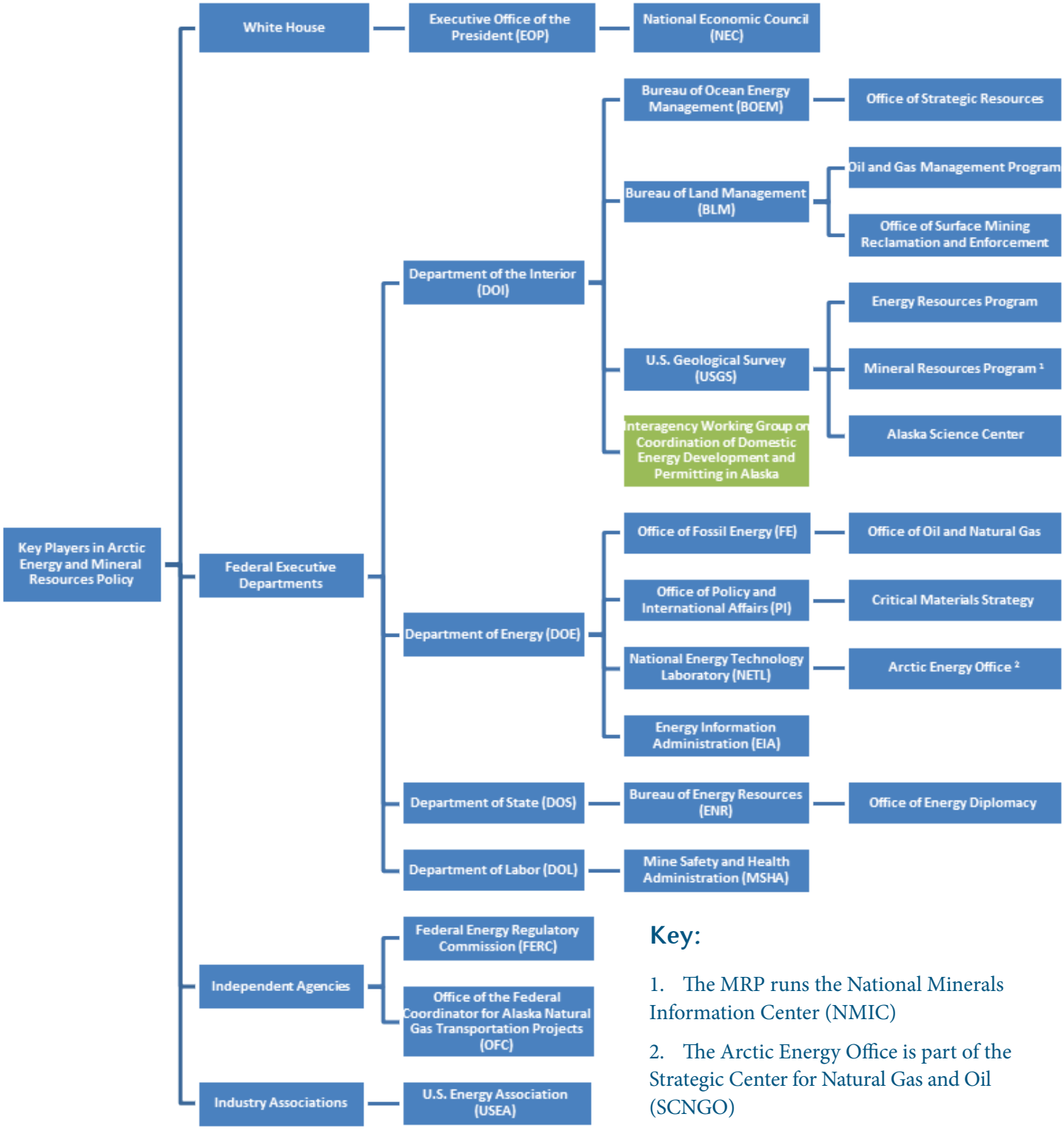
75. Ibid.

76. U.S. Energy Association, "Events," http://www.usea.in/events; U.S. Energy Association, "Programs," http://www.usea.in/programs; U.S. Energy Association, "Publications," http://www.usea.in/publications.

The USEA assists USAID and the Department of Energy in implementing the Russian-American Smart Grid Partnership Initiative, which aims to reduce greenhouse gas emissions through the introduction of energy efficiency and smart grid technologies and systems.[77] This enhanced collaboration with Russian federal energy agency counterparts and with Russian power generation and electricity transmission companies could have applications for greater U.S.-Russian cooperation on Arctic energy issues. As the Russian government no longer accepts U.S. foreign assistance, however, this option may no longer be available.

77. U.S. Energy Association, "Russian-American Smart Grid Partnership," http://usea.org/program/russian-american-smart-grid-partnership.

CHART: KEY PLAYERS IN ARCTIC ENERGY AND MINERAL RESOURCES POLICY



Key:

1. The MRP runs the National Minerals Information Center (NMIC)

2. The Arctic Energy Office is part of the Strategic Center for Natural Gas and Oil (SCNGO)

The units highlighted in green represent inter-agency bodies. They are listed under the body's chair agency or main co-chair. See appendix for a complete membership list.

C ANNEX C
KEY PLAYERS IN ARCTIC SHIPPING, TOURISM, AND FISHERIES

As Arctic sea ice dramatically recedes, the region's economic activity will dramatically increase. Ice-free shipping lanes will become more prevalent, and destination and trans-shipment to and through the Northern Sea Route and potentially the Northwest Passage will fuel Arctic economic growth, as will a steady growth in Arctic tourism. In addition to natural and mineral resources, the Arctic is also home to large fishing stocks. To address each of these rapidly evolving elements of an emerging Arctic economy, the United States employs a variety of different federal agencies to monitor and regulate commercial activity in the Arctic.

Shipping through the Arctic region may decrease transit times between Asia, Europe, and North America by up to 40 percent and reduce fossil fuel emissions released into the atmosphere. In the Northern Sea Route alone, the data tells a compelling story: in 2010, four ships carrying 111,000 tons of cargo passed through the Northern Sea Route; in 2011, 34 ships carried 820,000 tons of cargo;[1] and in 2012, 46 vessels transported over 1.26 million cargo tonnage.[2] For the Northwest Passage, 18 ships transited the passage in 2010 and 22 vessels did so in 2011.[3]

The United States has a key interest in the security, safety and regulation of this ship traffic. According to the 2009 White House Arctic Policy Directive NSPD-66/HSPD-25, the priorities for Arctic maritime transportation are "to facilitate safe, secure, and reliable navigation; to protect maritime commerce; and to protect the environment."[4] Several federal departments and agencies are charged with developing sufficient capabilities to address hazards from increased shipping in the Arctic, including airlift and icebreaking capabilities and search-and-rescue plans, as well as with developing management regimes for Arctic waterways, including monitoring of vessel traffic and standards for maritime safety.[5]

Arctic enthusiasm and ecotourism are also playing increasingly important roles in increasing commercial and human activity in the Arctic. In Alaska, tourism generates $2 billion annually in

1. Trude Pettersen, "Rosatomflot is ready for More Cargo on Northern Sea Route," *BarentsObserver*, December 14, 2011, http://www.barentsobserver.com/rosatomflot-is-ready-for-more-cargo-on-northern-sea-route.4998361-116320.html.

2. Trude Pettersen, "Record number of bulk carriers through Northern Sea Route," *BarentsObserver*, June 14, 2012, http://barentsobserver.com/en/business/record-number-bulk-carriers-through-northern-sea-route.

3. "Northwest Passage's risky tourism popularity," *MarketWatch*, August 28, 2012, http://articles.marketwatch.com/2012-08-28/commentary/33426866_1_arctic-tourism-northwest-passage-canadian-arctic.

4. White House Office of the Press Secretary, "National Security Presidential Directive/NSPD-66: Arctic Region Policy," January 9, 2009, 6, http://www.marad.dot.gov/documents/Arctic_Policy_White_House.pdf.

5. Ibid.

direct visitor spending and $3.4 billion when including labor income.[6] In recent years, the number of tourists traveling on large cruise ships in the Arctic has increased dramatically.[7] The U.S. Coast Guard reports that activity through the Bering Strait alone has increased from 245 ships in 2008 to 400 in 2011, and the increase is expected to continue.[8]

Finally, the Arctic Ocean is home to a number of important breeding areas of fish stocks. Although greater scientific data is needed in this arena, it is anticipated that these stocks will migrate north as water temperatures rise. As a result, lucrative Arctic fishing opportunities are likely to attract greater commercial interest. This will likely result in greater incidents at sea, national disputes over fishing quotas and fishing area boundaries, and the proliferation of illegal fishing. Ensuring maritime safety, stewardship, and adequate law enforcement presence is the primary responsibility of the U.S. Coast Guard, as noted above and also in annex D, but additional U.S. Arctic actors are also involved.

Federal Executive Departments

Department of Transportation

Within the Department of Transportation, the Maritime Administration (MARAD) is responsible for U.S. waterborne transportation systems, including infrastructure, industry and labor. MARAD works on issues including shipping, shipbuilding, port operations, vessel operations, national security, environment, and safety.[9] This work includes the Alaskan Arctic, most notably MARAD's partnership with the Municipality of Anchorage to modernize the Port of Anchorage. Since 2003, the Maritime Administration has provided federal oversight, assisted with federal and non-federal funding resources for this project, and streamlined the environmental review and permitting process.[10] The $700 million project to renovate the port by 2013 will improve the movement of goods and services throughout the state, including to and from its Arctic regions.[11]

MARAD, in conjunction with the U.S. Coast Guard and ten other federal agencies, has worked to improve the national marine transportation system through the Maritime Transportation System initiative,[12] which includes all the country's waterways, ports, and intermodal landside connections, including those located in the Alaskan Arctic. Marine freight shipping, commercial

6. Resource Development Council for Alaska, "Alaska's Tourism Industry," http://www.akrdc.org/issues/tourism/overview.html.

7. Statistisk Sentralbyrå, "Turisme—Stadig flere vil oppleve Arktis" [Tourism—More and more will experience the Arctic], October 2009, http://www.ssb.no/dette_er_svalbard/turisme.pdf.

8. U.S. Coast Guard, "USCG D17 Arctic Brief," January 27, 2011, http://www.uscg.mil/d17/Arctic%20Overview%20Feb2011.pdf; "Alaska sprints to build up Arctic infrastructure as development looms," *Alaska Dispatch*, August 27, 2012, http://www.alaskadispatch.com/article/alaska-sprints-build-arctic-infrastructure-development-looms.

9. U.S. Maritime Administration, "About Us," http://www.marad.dot.gov/about_us_landing_page/about_us_landing_page.htm.

10. U.S. Maritime Administration, "Port of Anchorage Intermodal Expansion Project," http://www.marad.dot.gov/ports_landing_page/infra_dev_congestion_mitigation/port_term_infra_dev/pt_infra_dev_anchorage/anchorage.htm.

11. Ibid.

12. U.S. Maritime Administration, "Marine Transportation System (MTS)," http://www.marad.dot.gov/ports_landing_page/marine_transportation_system/MTS.htm.

fishing, and ferry traffic are expected to continue to increase in the Arctic. As a result, MARAD and its offices, such as the Office of Security, are working to ensure efficiency and security for this critical transportation network, including data analysis to monitor and analyze transportation patterns; a maritime warning program for U.S. vessels; and maritime security training, exercises, and operations.[13]

The Committee on the Marine Transportation System (CMTS), chaired by the secretary of Transportation, is a federal cabinet-level, interdepartmental committee that coordinates the federal agencies and organizations involved in the Marine Transport System. One of the committee's integrated action teams, led by the Coast Guard, MARAD, and NOAA, focuses on Arctic marine transportation.[14] It is responsible for reporting to Congress on the implications of current and future increases in Arctic maritime traffic and to propose a national Arctic marine transportation system implementation plan that ensures "adequate maritime shipping safety, environmental protection and response, and national security capabilities in the U.S. Arctic."[15] The CMTS Arctic report is expected to be presented to Congress in 2013.

Several federal agencies are working to limit the risks of maritime accidents in the Arctic through regulation or enhanced capabilities. MARAD is working with technical committees within both the International Maritime Organization and the International Organization for Standardization to develop a polar code that mandates ship construction and safety standards for passenger ships and other vessels operating in ice-covered waters (the current polar code provides voluntary guidelines).[16] NOAA's Office of Coast Survey is conducting a hydrographic reconnaissance mission to update navigational charts along Alaska's 2,191-mile-long coastline, which is needed by the fishing, shipping, and passenger vessels using Arctic sea-lanes.[17]

Maritime accidents involving shipping vessels in the harsh Arctic environment pose a challenge in terms of search-and-rescue operations and environmental damage response. For more information on the U.S. Arctic actors involved in these arenas, please consult annexes A and D, respectively.

Department of Homeland Security

With an increasing number of vessels—including cruise ships—comes an increase in incidents at sea. For example, in August 2010, a cruise ship in Canadian Arctic waters struck an uncharted rock shelf and the 128 passengers and 69 crew members were stranded on the ship for two days,

13. U.S. Maritime Administration, "Office of Security," http://www.marad.dot.gov/ports_landing_page/port_cargo_security/port_cargo_security.htm.

14. The Arctic team consists of the following federal agencies and organizations: Bureau of Ocean Energy Management, Regulation, and Enforcement; National Oceanic and Atmospheric Administration; Oceanographer of the Navy; U.S. Army Corps of Engineers; U.S. Coast Guard; U.S. Department of State; U.S. Maritime Administration; and U.S. Transportation Command. Committee on the Marine Transportation System, "CMTS Action Teams," http://www.cmts.gov/Activities/ActionTeams.aspx.

15. Ibid.

16. U.S. Maritime Administration, "Maritime Administration Policy Paper: Shipbuilding and Repair," http://www.marad.dot.gov/documents/Shipbuilding.pdf.

17. National Oceanic and Atmospheric Administration, "NOAA Ship Fairweather conducting hydrographic reconnaissance in the Arctic," July 30, 2012, http://www.noaanews.noaa.gov/stories2012/20120730_fairweather.html.

until they were rescued by the Canadian Coast Guard.[18] Incidents such as this one serve as an important reminder of the lack of U.S. preparation to provide emergency response in a similar situation in the harsh Arctic environment.

Should an accident involving cruise vessels or ferries in U.S. Arctic waters take place, search and rescue operations would fall primarily under the responsibility of the Coast Guard (see Annex D). However, if a marine accident occurred in international waters or away from the Coast Guard's operational headquarters, a request for international assistance might be required. Acknowledging the need to facilitate international coordination on this issue, the U.S. and other Arctic states signed in May 2011 the "Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic," the first binding treaty negotiated under the auspices of the Arctic Council, to clearly define search and rescue areas of operation for each Arctic nation and to address such a scenario.[19]

Department of Commerce

The Department of Commerce is also greatly involved in Arctic economics, both for purposes of tourism and for the fisheries industry. The U.S. government is encouraging greater numbers of foreign tourists, particularly to federally managed tourist attractions such as national parks and wildlife preserves. An executive order established the Task Force on Travel and Competitiveness, co-chaired by the secretaries of Commerce and the Interior, in January 2012 to develop a national travel and tourism strategy. The strategy document, released in May 2012, outlines new administrative initiatives to promote popular tourist destinations.[20] The goal is to increase the number of annual international visitors from 62 million in 2011 to 100 million by the end of 2021.[21] Similarly, Congress established the Tourism Policy Council, led by the secretary of Commerce, to coordinate federal policies affecting tourism and international travel.[22] The Federal Interagency Council on Recreation, established in May 2011 under the America's Great Outdoors initiative, coordinates and streamlines the activities of federal, state, and tribal agencies to promote outdoor recreation on public lands.[23]

The Department of Commerce also houses the National Oceanic and Atmospheric Administration (NOAA). Within NOAA, the National Marine Fisheries Service (NMFS) is responsible for

18. "Stranded Arctic cruise passengers head home," August 30, 2010, CBC News, http://www.cbc.ca/news/canada/north/story/2010/08/30/arctic-ship-stranded-home.html.

19. U.S. Department of State, "Secretary Clinton Signs the Arctic Search and Rescue Agreement with Other Arctic Nations," May 12, 2011, http://www.state.gov/r/pa/prs/ps/2011/05/163285.htm.

20. White House Office of the Press Secretary, "Obama Administration Continues Efforts to Increase Travel and Tourism in the United States," May 10, 2012, http://www.whitehouse.gov/the-press-office/2012/05/10/obama-administration-continues-efforts-increase-travel-and-tourism-unite.

21. U.S. Department of the Interior, "National Travel & Tourism Strategy," May 2012, 3–4, http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&pageid=295021.

22. U.S. Department of Commerce, "Tourism Industries' Policy Coordination Program—Tourism Policy Council (TPC)," http://tinet.ita.doc.gov/policy/tpc.html.

23. This council is composed of agency directors of the Bureau of Land Management, the National Park Service, the U.S. Fish and Wildlife Service, the Bureau of Reclamation, the U.S. Forest Service, the U.S. Army Corps of Engineers, and the National Oceanic and Atmospheric Administration. U.S. Department of the Interior, "Administration Announces Federal Council Dedicated to Promoting Outdoor Recreation," http://www.doi.gov/news/pressreleases/AMERICAS-GREAT-OUTDOORS-Administration-Announces-Federal-Council-Dedicated-to-Promoting-Outdoor-Recreation.cfm.

the management, conservation, and protection of the nation's living marine resources and their habitat within the U.S. exclusive economic zone (EEZ) in Alaska.[24] The NFMS predicts the status of fish stocks, ensures compliance with fisheries regulations, and works to reduce wasteful fishing practices. Through its six regional offices and eight councils, which include the North Pacific Fisheries Management Council (NPFMC) in Alaska, the NMFS works with local communities on fishery management issues and on promoting sustainable fisheries.[25] The Alaska region of NOAA Fisheries oversees sustainable fisheries that produce about half of all fish caught in U.S. waters, covering 842,000 square nautical miles off the coasts of Alaska.[26]

The Magnuson-Stevens Fishery Conservation and Management Act, designed to oversee management of U.S. fisheries, established the NPFMC.[27] The council has jurisdiction over Alaskan federal fisheries in the Gulf of Alaska, Bering Sea, and Aleutian Islands. These fisheries are currently valued at more than $1 billion annually.[28]

In August 2009, the NPFMC passed the "Fishery Management Plan for Fish Resources of the Arctic Management Area," a framework to manage Arctic marine resources sustainably.[29] This plan recognizes that shifting climatic conditions in the Arctic could lead to increased commercial fishery development in the U.S. Arctic EEZ and, if left unregulated or inadequately regulated, these developments could adversely impact the sensitive ecosystem and marine resources of the region.[30] Given the implications for both the region's population and the environment, the plan prohibits all commercial harvests of fish in the U.S. Arctic EEZ until sufficient information is available to support the sustainable management of a commercial fishery.[31] The plan does not regulate subsistence or recreational fishing or Arctic fisheries managed by the State of Alaska, but it does ban commercial fishing for any species of finfish, mollusks, crustaceans, and all other forms of marine animal and plant life.[32] Both the Coast Guard and NOAA's Office of Law Enforcement are responsible for enforcing the plan's regulations across the expansive Arctic Management Area, which covers 200,000 square miles from the Bering Strait to the disputed U.S.-Canadian maritime border.[33]

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24. National Oceanic and Atmospheric Administration, "About National Marine Fisheries Service," http://www.nmfs.noaa.gov/aboutus/aboutus.html.

25. Ibid.

26. National Oceanic and Atmospheric Administration, "Alaska Regional Office," http://www.alaskafisheries.noaa.gov/.

27. National Oceanic and Atmospheric Administration, "The North Pacific Fishery Management Council," http://www.fakr.noaa.gov/npfmc/.

28. Alaska State House of Representatives, "Sponsor Statement: House Concurrent Resolution 13: North Pacific Fishery Management Council," http://housemajority.org/spon.php?id=27hcr13.

29. National Oceanic and Atmospheric Administration, "Arctic Fisheries," https://alaskafisheries.noaa.gov/sustainablefisheries/arctic/.

30. National Oceanic and Atmospheric Administration, "Arctic Fishery Management," http://www.fakr.noaa.gov/npfmc/fishery-management-plans/arctic.html.

31. North Pacific Fishery Management Council, "Fishery Management Plan for Fish Resources of the Arctic Management Area," August 2009, ES-1, http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/Arctic/ArcticFMP.pdf.

32. Marine mammals and birds are not regulated by the Arctic FMP. National Oceanic and Atmospheric Administration, "Arctic Fishery Management," http://www.fakr.noaa.gov/npfmc/fishery-management-plans/arctic.html.

33. National Oceanic and Atmospheric Administration, "Arctic Fishery Management Plan," http://www.fakr.noaa.gov/npfmc/PDFdocuments/fmp/Arctic/ARCTICflier209.pdf; "U.S. Closes Arctic Wa-

Department of the Interior

Like the Department of Commerce, the Department of the Interior addresses issues related to U.S. Arctic fisheries and is also involved in the tourism industry.

The U.S. Fish and Wildlife Service (FWS) works to "conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people."[34] The FWS is responsible for managing the National Wildlife Refuge System, which includes 16 national wildlife reserves in Alaska,[35] and the Fisheries program, which includes six offices in Alaska.[36] The Arctic National Wildlife Refuge (ANWR) alone encompasses 19.2 million acres and is inhabited by 45 species of land and marine mammals and 180 species of birds.[37] With specific regard to fisheries, the Fisheries and Ecological Services division for the Alaska region works on issues such as fisheries management, endangered species, environmental contaminants, and habitat protection and restoration, as well as marine mammal conservation and recovery.[38] The FWS restores and maintains fish and aquatic resources at self-sustaining levels both to support the native Inuit populations and to maintain the output of Alaska's commercial fisheries, representing $5.8 billion in annual state revenues.[39] The Alaska Fisheries Program works closely with local, state, federal, and tribal partners to carry out these tasks.

The 2009–2013 strategic plan for the Alaska Region Fisheries Program, "Conserving America's Fisheries," stresses the importance of climate change in its future work, calling for strategies to better understand the physical changes across Alaskan landscapes and evaluate which species are most impacted by climate change. Referring to Alaska as "America's climate change ground zero,"[40] FWS maintains that it is only through better understanding of how change is occurring that the best policy course of action be determined to address it.

In terms of Arctic tourism, visitors to Alaska's far north can also engage in myriad nature-based, culture-based, and outdoor adventure activities in the North Slope (the Arctic coastal plain) and in the Brooks Range. The Alaskan Arctic is home to four wilderness parks expanding over 35 million acres federal land: ANWR, the Gates of the Arctic National Park and Preserve, the Noatak National Preserve, and the Kobuk Valley National Park.[41] As noted above, FWS manages ANWR, while the latter three are under the purview of the National Park Service (NPS); both are bureaus within the Department of the Interior. The number of visitors to the Noatak and Kobuk parks

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ters to Industrial Fishing," Oceana, November 3, 2009, http://oceana.org/en/news-media/press-center/press-releases/us-closes-arctic-waters-to-industrial-fishing.

34. U.S. Fish and Wildlife Service, "National Fish Hatchery System," http://www.fws.gov/fisheries/nfhs/.

35. U.S. Fish and Wildlife Service, "Refuge List by State: Alaska," http://www.fws.gov/refuges/profiles/ByState.cfm?state=AK.

36. U.S. Fish and Wildlife Service, "Fish and Wildlife Conservation Offices," http://www.fws.gov/fisheries/facilities/facilities_offices.html.

37. U.S. Fish and Wildlife Service, "Arctic National Wildlife Refuge," http://www.fws.gov/refuges/profiles/index.cfm?id=75600.

38. U.S. Fish and Wildlife Service, "Fisheries and Ecological Services," http://alaska.fws.gov/fisheries/index.htm.

39. Alaska Department of Fish and Game, "Commercial Fisheries," http://www.adfg.alaska.gov/index.cfm?adfg=fishingcommercial.main.

40. U.S. Fish and Wildlife Service, "Conserving America's Fisheries: Fisheries Program, Alaska Region Strategic Plan, 2009–2013," http://alaska.fws.gov/fisheries/fish/pdf/strategic_plan.pdf.

41. Alaska Wilderness Recreation & Tourism Association, "Northern Alaska," http://www.visitwildalaska.com/Northern_Alaska.

more than tripled from 2010 to 2011, matching the popularity of the Gates of the Arctic park at more than 11,000 visitors each.[42]

Department of State

The Department of State is primarily involved in Arctic economics in the form of fisheries, specifically through the Office of Marine Conservation (OMC), which is located within the Bureau of Oceans and International Environmental and Scientific Affairs. The OMC is tasked with formulating and implementing U.S. policy on issues concerning living marine resources, including the negotiation of bilateral and multilateral fisheries agreements.[43] The office also participates in international fisheries conservation and management organizations and represents U.S. interests internationally on topics involving conserving and managing living marine resources. The OMC works to ensure a healthy and productive marine environment and ecosystem, while also promoting economic benefits and food security through sustainable fisheries.[44]

The OMC recognizes that the region poses a variety of specific challenges for fisheries management. In contrast to the North Atlantic, which has established commercial fisheries and mechanisms for international management, the North Pacific Ocean and Bering Sea remain without such mechanisms.[45] To address this governance deficit, the office works closely with other U.S. agencies, such as the National Marine Fisheries Service and the Commerce Department's North Pacific Fisheries Management Council, to coordinate effective strategies to address these complex problems.[46]

Independent Agencies

The independent agency that provides oversight of federal regulations, policies, and programs for the protection and conservation of marine mammals is the Marine Mammal Commission (MMC), established by the Marine Mammal Protection Act of 1972.[47] In April 2012, the MMC recommended that the Interior Department's Bureau of Ocean Energy Management and its Bureau of Safety and Environmental Enforcement impose a quicker deadline for 2012 exploration operations in the Beaufort Sea in order to limit the possibility of oil spill response in icy conditions.[48] In June 2012, the MMC issued specific recommendations for the NMFS to follow for BP's seismic survey in the Beaufort Sea during the 2012 Arctic open-water season.[49] Finally, the MMC's research program awards grants for conservation studies, including recent projects on develop-

42. National Park Service, "National Park Service Statistics," http://www.nature.nps.gov/stats/state.cfm?st=ak.

43. U.S. Department of State, "Fisheries and Marine Conservation," http://www.state.gov/e/oes/ocns/fish/index.htm.

44. Ibid.

45. U.S. Department of State, "Arctic," http://www.state.gov/e/oes/ocns/opa/arc/index.htm.

46. U.S. Department of State, "Addressing Fisheries at the Global Level," http://www.state.gov/e/oes/ocns/fish/fisheries/index.htm.

47. Marine Mammal Commission, "About MMC" http://mmc.gov/about/welcome.shtml.

48. Marine Mammal Commission, "Status of exploration and drilling activities in the Arctic and actions that are being or will be taken to prevent, contain, and respond to an oil spill," April 2, 2012, http://mmc.gov/letters/pdf/2012/Beaufort_drills_040212.pdf.

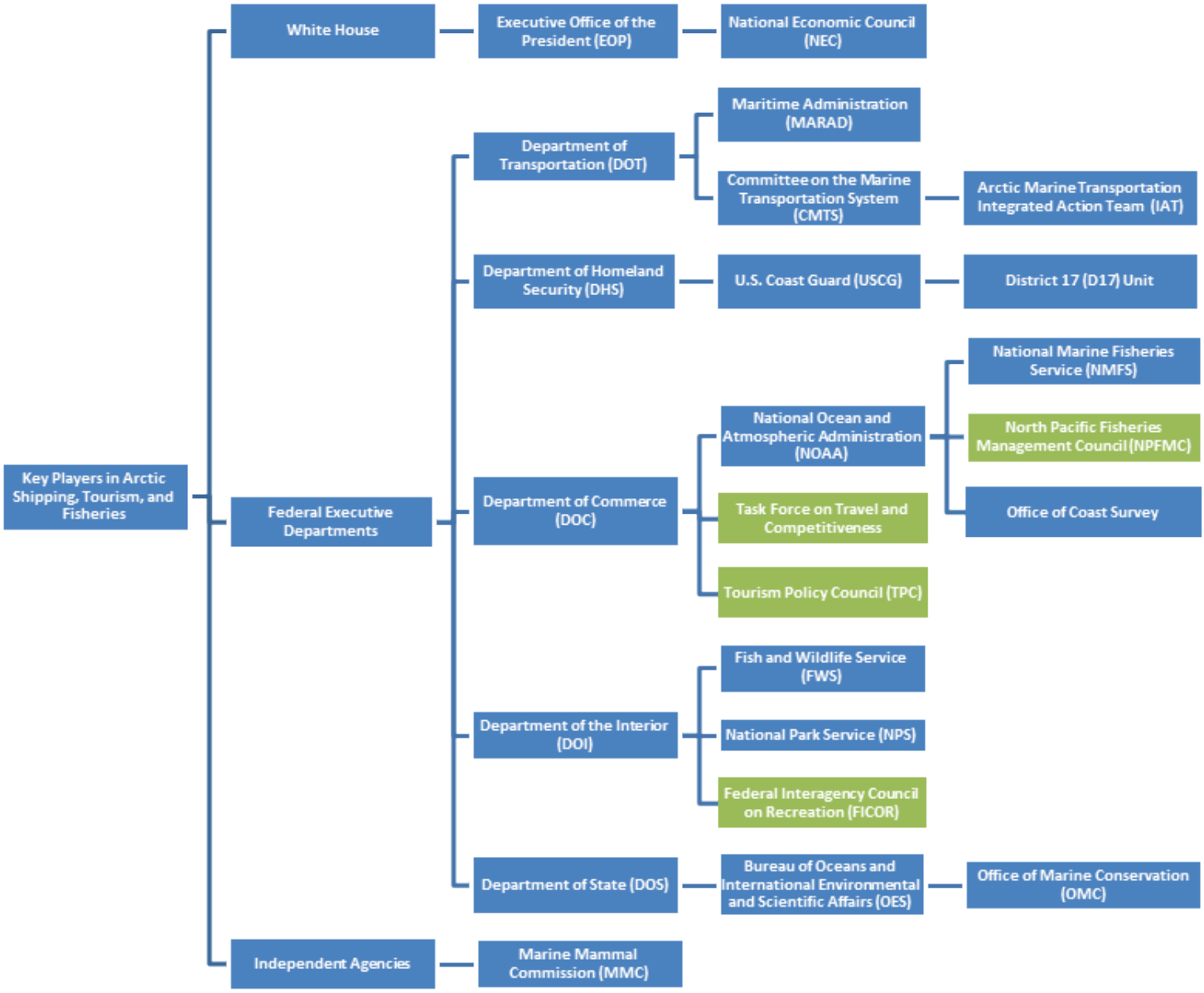
49. Marine Mammal Commission, "Application from BP Exploration (Alaska), Inc., for authorization to take marine mammals by harassment incidental to a seismic survey in the Alaskan Beaufort Sea during

ment of a pan-Arctic integrated polar bear research and monitoring plan, changing habitats of ice-dependent marine mammals in the area surrounding the Bering Strait, passive acoustic detection, and monitoring of endangered whales in the Arctic, among others.[50]

the 2012 Arctic open-water season," June 1, 2012, http://mmc.gov/letters/pdf/2012/BP12_seismic_survey_060112.pdf.

50. Marine Mammal Commission, "The Commission's Research Program," http://mmc.gov/research/welcome.shtml#funding.

CHART: KEY PLAYERS IN ARCTIC SHIPPING, TOURISM, AND FISHERIES



The units highlighted in green represent interagency bodies. They are listed under the body's chair agency or main co-chair. See appendix for a complete membership list.

ANNEX D
KEY PLAYERS IN ARCTIC SECURITY AND INTERNATIONAL COOPERATION

While the Arctic remains an area of low tension, the United States does have key security interests in the region. U.S. Arctic strategy, as embodied in National Security Presidential Directive 66/Homeland Security Presidential Directive 25 (NSPD-66/HSPD-25), lists as U.S. security priorities missile defense and early warning systems; freedom of navigation and overflight through the region; preventing terrorist attacks; and deployment of sea and air systems for strategic sealift, deterrence, maritime presence, and maritime security operations. At the same time, NSPD-66 also stresses the need for increased U.S. cooperation with other Arctic coastal states in such areas as search and rescue and disaster response. A number of federal agencies and departments are tasked with implementing elements of NSPD-66 in the fields of international security and cooperation.

Federal Executive Departments

Department of Defense

The U.S. Department of Defense is charged with the coordination and supervision of all agencies and functions of government related to national security and the U.S. armed forces, including security operations in the Arctic region. Based on the NSPD-66/HSPD-25 requirement to improve U.S. capabilities and strategic presence in the Arctic, the department completed a comprehensive review of its role in the region in May 2011 entitled "Report to Congress on Arctic Operations and the Northwest Passage." This document examined existing U.S. capabilities and strategic interests in the Arctic, including detailed assessments of national security objectives and gaps in existing resources. It also assessed the need for a U.S. deep-water port in the Arctic and for icebreakers to support national security objectives in the region. Thematically, the report stressed the importance of balancing the risk of being "late to need" with the opportunity cost of making premature Arctic investments.[1] It also addressed the need for future assessments of the Arctic operating environment before significant investments in infrastructure are made. Unfortunately, the report did not incorporate the Department of Homeland Security and the U.S. Coast Guard, the critical security actors in the American Arctic. Echoing these issues, the Government Accountability Office expressed concerns about the report, urging the Defense Department to develop a risk-based investment strategy and timeline for developing Arctic capabilities needed in the near-term. It also called for the establishment of a joint effort with the Coast Guard to identify collaborative Arctic capability investments over the long-term.[2]

1. U.S. Department of Defense, "Report to Congress on Arctic Operations and the Northwest Passage," May 2011, 3, http://www.defense.gov/pubs/pdfs/Tab_A_Arctic_Report_Public.pdf.
2. U.S. Government Accountability Office, "Report to Congressional Committees: Arctic Capabilities," January 2012, http://www.gao.gov/assets/590/587676.pdf.

As the Defense Department examines its strategic interests and capabilities in the Arctic, it has worked closely with the U.S. Navy, a thought leader among the armed services on the future of the Arctic. As the Navy's mission is to "maintain, train and equip combat-ready Naval forces capable of winning wars, deterring aggression and maintaining freedom of the seas,"[3] this naturally includes the Arctic Ocean, the strategic Bering Strait, and the North Atlantic. In May 2009, a mere five months following the release of NSPD-66, the Navy laid out its plan to guide policy, investment, and actions in the region through its "Arctic Roadmap."

The Navy's Task Force Climate Change (TFCC) was instrumental in developing the Arctic roadmap and providing a list of the Navy's action items, strategic objectives, and desired effects for the Arctic region in fiscal years 2010–2014. The report placed specific focus on the need to develop strong cooperative partnerships with interagency and international Arctic stakeholders.[4] It also advocated for accession to the UN Convention on the Law of the Sea (UNCLOS) and called for comprehensive assessments of the Navy fleet's readiness and mission requirements for the region. Action item 5.7 of the document called for the TFCC to produce an Arctic environmental assessment and outlook report, which the Navy released in August 2011. See Annex A for discussion of the report's environmental findings.

With regard to Arctic security, the most relevant findings of the "Arctic Environmental Assessment and Outlook" include analysis of the rapid decline in sea ice extent and thickness, a rise in Arctic atmospheric temperatures eight times the rate of the global average, the thawing of permafrost, and the shift of fish activity further north.[5] All of these findings will likely result in ever-growing human and commercial activity in the region, which has great implications for the Navy and its mission to provide security and protection for the United States and its allies. Although its submarine fleet has decades of experience performing missions and exercises under the sea ice, particularly during the Cold War, the operational experience of the Navy's surface fleet in the region is far more limited.[6] This is also the case with the Navy's air assets and its U.S. Marine Corps ground troops, which have limited experience in extremely cold climates. Increasing preparedness for operations and training exercises in harsh Arctic conditions will be vital for the U.S. armed forces. The report stressed the need for considering the Arctic in terms of "future policy, strategy force structure, and investment,"[7] although financial resource needs for these future investments were left unanswered.

The U.S. military combatant command, U.S. Northern Command (NORTHCOM), provides command and control of the Defense Department's homeland defense efforts and coordinates defense support of civil authorities.[8] NORTHCOM has key responsibilities for Arctic regional security that include air, land, and sea approaches to Alaska and the Arctic region. In 2011,

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3. U.S. Department of the Navy, "Mission of the Navy," http://www.navy.mil/navydata/organization/org-top.asp.

4. U.S. Department of the Navy, "Navy Arctic Roadmap," November 2009, http://www.navy.mil/navydata/documents/USN_artic_roadmap.pdf.

5. U.S. Department of the Navy, "Arctic Environmental Assessment and Outlook Report," August 2011, http://greenfleet.dodlive.mil/files/2011/08/U.S.-Navy-Arctic-Environmental-Assessment.pdf.

6. Ibid.

7. Ibid.

8. U.S. Department of Defense, "Statement by Peter Verga, Principal Deputy Assistant Secretary of Defense for Homeland Defense Before the National Commission on Terrorist Attacks Upon the United States," January 26, 2004, http://policy.defense.gov/portals/11/Documents/hdasa/PDASD_HD_Testimony_9-11%20Commission_012604.pdf.

President Barack Obama signed the 2011 Unified Command Plan, which realigned responsibility in the Arctic among U.S. geographic combatant commands and shifted Arctic operations from a shared three-way command structure that had previously included NORTHCOM, U.S. European Command (EUCOM), and U.S. Pacific Command (PACOM), to a more focused two-way command structure of EUCOM and NORTHCOM. The latter is now the lead advocate for Arctic issues and Arctic capabilities within the department, while EUCOM, which has responsibility for Europe, Israel, Russia, Iceland, and Greenland, is charged with managing military relationships with other Arctic nations in Europe.[9] The 2011 Unified Command Plan extended NORTHCOM's area of responsibility to include the North Pole and the Bering Strait, while EUCOM's area of responsibility has been extended to include the water space of the Laptev and Eastern Siberian Sea north of the Russian Federation.[10]

Joint Task Force–Alaska (JTF-AK) is a subordinate command of NORTHCOM that is responsible for planning and integrating the full spectrum of homeland defense efforts in the Alaska Joint Operations Area,[11] which covers Arctic territories. The task force's work includes crisis prevention and response, as well as consequence management. It also provides situational awareness for NORTHCOM and other state, federal, and local agencies by evaluating potential vulnerability of targets for aggression and terrorism in the state. The task force also supports domestic disaster relief operations in response to natural or man-made disasters.

The Elmendorf Air Force Base in Anchorage serves as headquarters for both JFT-AK and the Alaskan region of the North American Aerospace Defense Command (NORAD), a joint U.S.-Canadian organization that provides early warning and control over North American aerospace. In 2006, NORAD was given the additional responsibility of providing maritime warning and shared awareness of Canadian and U.S. maritime areas and waterways.[12] The commander of NORAD is concurrently commander of NORTHCOM, and the two commands share headquarters at Peterson Air Force Base, but neither command structure is subordinate to the other.

Joint Task Force–Alaska, NORTHCOM, and EUCOM play critical roles in strengthening Arctic security, as they are the organizations responsible for coordinating the Defense Department's response efforts and ensuring unity of command in the event of a security crisis. EUCOM's role in managing military relations with European regional allies, as well as its focus on the Russian Arctic,[13] is important for maintaining stability and military cooperation in the Arctic. However, NORTHCOM's role may be even more vital as it is charged with advocating for future Arctic capabilities within the Defense Department and thus ensuring a sufficient U.S. security presence in the region.

9. John Vandiver, "DOD's Strategy For Arctic Lacking, Agency Reports," *Stars and Stripes*, January 17, 2012, http://www.stripes.com/news/dod-s-strategy-for-arctic-lacking-agency-reports-1.166158.

10. Mia Bennett, "2011 Unified Command Plan streamlines U.S. military responsibilities in the Arctic," Foreign Policy Association, May 9, 2011, http://foreignpolicyblogs.com/2011/05/09/2011-unified-command-plan-streamlines-u-s-military-responsibilities-in-the-arctic/.

11. U.S. Northern Command, "About U.S. Northern Command," http://www.northcom.mil/About/index.html.

12. North American Aerospace Defense Command, "About NORAD,"http://www.norad.mil/about/index.html.

13. John Vandiver, "Arctic pact may herald cooperation in region," *Stars and Stripes*, May 13, 2011, http://www.stripes.com/news/arctic-pact-may-herald-cooperation-in-region-1.143488.

Department of Homeland Security

The U.S. Coast Guard (USCG) operates under the Department of Homeland Security and is responsible for maritime safety, security, and stewardship. Within these three main roles, the Coast Guard is responsible for eleven statutory missions, including defense readiness, coastal security, ports and waterways, marine environmental protection, living marine resources (including fisheries), ice operation, aids to navigation, marine safety, and law enforcement. Each of these missions is essential both to U.S. Arctic security and to strengthening Arctic governance. In January 2011 USCG Rear Admiral Christopher C. Colvin stated that "no other federal agency has a more expansive set of authorities in the Arctic Ocean than the United States Coast Guard."[14] The Coast Guard's mission and responsibilities in the Arctic Ocean are officially no different than its responsibilities in the Atlantic Ocean, Gulf of Mexico, or any other congressionally mandated Coast Guard jurisdiction, even though the Arctic presents unique challenges and resource requirements due to its harsh and rapidly evolving physical environment.

The Coast Guard has a long history of service in the Arctic: in 1865 the U.S. Lighthouse Service's tender Shubrick, operating with the U.S. Revenue Cutter Service, became the first U.S. government vessel to land on Russia's Alaskan coastline. Since the purchase of Alaska in 1867, the Coast Guard has been the dominant and most persistent federal presence in the U.S. Arctic.

The Coast Guard is involved in a wide range of operations with the USCG's District 17 (D17) unit as the leading presence in Alaska and the surrounding area. The Coast Guard's permanent presence in Alaska reflects the population and economic concentrations in southern Alaska, with only temporary or occasional infrastructure in the north, most of which are rusted remnants of President Dwight Eisenhower's Distant Early Warning line. However, USCG operations in the region include Arctic Domain Awareness, a set of missions that provides periodic surveillance and patrols of key ports, ensures maritime security around Alaska, documents coastal erosion, observes sea ice, supports science missions, and trains pilots and crews in harsh Arctic conditions.[15] The Coast Guard also conducts major security operations related to law enforcement and search and rescue, deploys icebreakers to clear navigational routes, maintains and replaces navigational buoys, and regulates the maritime industry in the Arctic. Additionally, the USCG engages in Arctic community outreach by providing water safety training in schools; developing relationships with local indigenous populations; and providing medical, dental, optometry and veterinary services.[16]

Conducting maritime operations in the Arctic poses an especially difficult challenge, due not only to the harsh climate and communications challenges, but also to the sheer geographic span that D17 is responsible for covering. The distance from Kodiak, the southernmost point in central Alaska, to Point Barrow, the northernmost point in central Alaska, is 940 miles—the same distance as from Los Angeles to Seattle.[17] D17 is responsible for 33,000 miles of coastline, covering

14. U.S. Coast Guard, "USCG D17 Arctic Brief," January 27, 2011, http://www.uscg.mil/d17/Arctic%20Overview%20Feb2011.pdf.

15. U.S. Coast Guard, "Missions: Arctic Domain Awareness," http://www.d17.uscgnews.com/clients/c780/261751.pdf.

16. U.S. Coast Guard, "USCG D17 Arctic Brief," January 27, 2011, http://www.uscg.mil/d17/Arctic%20Overview%20Feb2011.pdf.

17. Ibid.

the entire state of Alaska, and more than 3,852,500 square miles of water—more square miles than the continental United States.[18]

To conduct its mission, the Coast Guard collaborates with a network of federal, state, local, tribal, and territorial entities including the departments of Homeland Security and Defense, NOAA, NASA, the EPA, the NSF, and the Department of the Interior's Bureau of Safety and Environmental Enforcement. Both NOAA and NASA work on issues of climate change and ice extent through satellite surveillance and data collection, taking advantage of the Geostationary Operational Environmental Satellite and Polar Operational Environmental Satellite programs discussed in Annex A. In addition to being able to monitor the sea ice extent, these satellite networks are equipped with search-and-rescue transponders, allowing them to track ships navigating the Arctic.[19] NASA has also developed the NOAA-N, a polar-orbiting satellite developed for NOAA to collect information about the Earth's atmosphere and environment. Additionally, NOAA-N is capable of supporting the international search-and-rescue (SAR) program by using a satellite-aided tracking system that has been in use since 1982, transmitting the location of emergency beacons from ships, aircraft, and people in distress.[20] Both of these systems assist USCG search-and-rescue operations in Arctic waters.

While space technology can assist the Coast Guard in its Arctic mission, the challenges the service faces are exacerbated by a lack of capabilities, specifically the need for icebreakers and ice-hardened vessels. The Coast Guard has argued that it will be unable to carry out its duties as outlined in NSPD-66/HSPD-25 due to insufficient infrastructure and capabilities, particularly the need to develop greater capacity to protect the U.S. air, land, and sea borders in the Arctic region; to increase Arctic maritime domain awareness to protect maritime commerce, critical infrastructure, and key resources; to preserve the global mobility of U.S. military and civilian vessels and aircraft throughout the Arctic region; and to project a sovereign U.S. maritime presence in the Arctic in support of essential U.S. interests. According to USCG Rear Admiral Colvin, "[I]nfrastructure is insufficient, there is a lack of effective communication, [and] small boats and short range helicopters are ineffective"; to accomplish its objectives, the Coast Guard requires icebreakers or ice-hardened vessels with embarked helicopters.[21] Currently, however, the Coast Guard has only one fully operational medium polar icebreaker, the U.S. Coast Guard Cutter (USCGC) Healy. The Polar Star, the USCG's only heavy polar icebreaker, is expected to return to service in late 2013 following repairs.[22] In the president's fiscal year (FY) 2013 budget, the Coast Guard was given $8 million to initiate design activities for a new polar icebreaker; another $852 million are included in its five-year budget plan to incrementally fund its acquisition.[23] Other plans to modernize USCG

18. U.S. Coast Guard, "New admiral takes command of Coast Guard operations in Alaska," July 16, 2009, http://www.d17.uscgnews.com/go/doc/780/289889/New-admiral-takes-command-of-Coast-Guard-operations-in-Alaska.

19. National Oceanic and Atmospheric Administration, "NOAA's Geostationary and Polar-Orbiting Weather Satellites," http://noaasis.noaa.gov/NOAASIS/ml/genlsatl.html.

20. National Aeronautics and Space Administration, "Successful Launch of NOAA-N," http://www.nasa.gov/mission_pages/noaa-n/main/index.html.

21. U.S. Coast Guard, "USCG D17 Arctic Brief," January 27, 2011, http://www.uscg.mil/d17/Arctic%20Overview%20Feb2011.pdf.

22. Vigor Industrial, "Vigor Shipyards: Projects," http://vigorindustrial.com/vigor-shipyards/projects.

23. Ronald O'Rourke, "Coast Guard Polar Icebreaker Modernization: Background and Issues for Congress," Congressional Research Service, June 14, 2012, 19, http://www.fas.org/sgp/crs/weapons/RL34391.pdf.

infrastructure in Alaska include $6.1 million in FY 2013 to recapitalize and/or expand helicopter hangars and aviation refueling facilities.[24]

The Coast Guard has been actively involved in conducting exercises related to oil spill response in the Arctic region. From July 31 through August 2, 2012, the Coast Guard coordinated with the Department of Defense on Arctic Shield 2012, an exercise that involved the deployment of various spilled oil recovering systems off the coast of Barrow. Lieutenant Commander Michael Sarnowski called the exercise "an outstanding opportunity to evaluate our capabilities and see how critical our coordination with federal, state, local and tribal partners is for success in the event of an actual incident."[25]

The USCG is also involved in international cooperative missions in the Arctic region, including developing ties with its counterparts in Russia and China. With its Canadian partners, the USCG conducts joint surveys of the Arctic Ocean. For example, the USCGC Healy breaks ice and leads the way for the Canadian Coast Guard Cutter Louis S. St. Laurent, which follows behind and uses its scientific equipment to chart the seascape and conduct experiments. When operational, the USCGC Polar Sea has been used primarily for scientific missions for the National Science Foundation, but it has also performed U.S. sovereignty patrols under D17 tactical control.[26] While joint efforts with Arctic allies have been successful, the Coast Guard has advocated for U.S. scientists to be on U.S. ships operating in the U.S. Arctic to maintain persistent U.S. presence and U.S. sovereignty in the region.[27] Asserting U.S. sovereignty and maintaining a strategic and persistent presence in the Arctic is another reason used to advocate for additional U.S. icebreakers and ice-reinforced vessels; Senate ratification of the UN Convention on the Law of the Sea, which the departments of State, Defense, and Homeland Security fully support, would also require increased Coast Guard presence in the Arctic. In April 2012 Robert Papp, the commandant of the U.S. Coast Guard, remarked that by not ratifying UNCLOS, "it sets us [the U.S.] back" when trying influence issues such as global access to maritime routes.[28]

Department of Transportation

Within the Department of Transportation, the Maritime Administration (MARAD) is responsible for dealing with maritime transportation, including work on shipping, shipbuilding, port operations, vessel operations, national security, environment, and safety.[29] The agency's mission is to improve and strengthen the U.S. Marine Transportation System to meet the economic, environmental, and security needs of the nation through collaborative efforts with both public and

24. U.S. Department of Homeland Security, "Written testimony of U.S. Coast Guard Commandant Admiral Robert Papp Jr. for a House Committee on Appropriations, Subcommittee on Homeland Security hearing addressing The President's Fiscal Year 2013 budget request for the U.S. Coast Guard," March 7, 2012, http://www.dhs.gov/news/2012/03/07/written-testimony-us-coast-guard-commandant-papp-house-appropriations-subcommittee.

25. Caitlin Goettler, "Coast Guard, partners deploy spilled oil response systems in Arctic," Coast Guard Alaska, August 10, 2012, http://alaska.coastguard.dodlive.mil/2012/08/coast-guard-partners-deploy-spilled-oil-response-systems-in-arctic/.

26. U.S. Coast Guard, "USCG D17 Arctic Brief," January 27, 2011, http://www.uscg.mil/d17/Arctic%20Overview%20Feb2011.pdf.

27. Ibid.

28. Ibid.

29. U.S. Maritime Administration, "About Us," http://www.marad.dot.gov/about_us_landing_page/about_us_landing_page.htm.

private stakeholders—that is, commercial mariners—as well as all transportation sectors. Finally, MARAD maintains a fleet of cargo ships in reserve to provide surge sealift during war and national emergencies.[30] MARAD's work in the Arctic is outlined in NSPD-66, Section III, Part 5, "Maritime Transportation in the Arctic Region," which states that U.S. priorities in the region include the facilitation of safe, secure, and reliable navigation in the Arctic region; the protection of maritime commerce; and the protection of the environment.[31] Ship traffic through the Bering Strait nearly doubled from 2009 to 2010; with this increase likely to continue as a result of offshore oil drilling,[32] MARAD is currently examining the impacts of this spike in Arctic transportation on the U.S. transportation system and looking for ways to improve intermodal freight velocity and passenger movement in the region.[33]

Department of State

International diplomacy and governance will have a more profound impact on shaping the geostrategic landscape in the Arctic than will traditional military and security tools.

Unresolved maritime borders present one area of potential conflict in the Arctic. The United States has two unresolved border agreements in the region: the 1990 U.S.-Russian Border Agreement regarding the Bering Sea, which has yet to be ratified by Russia's parliament,[34] and the contested border agreements between the United States and Canada in the Beaufort Sea. Another emerging area of controversy is the effort by coastal states to extend their outer continental shelves under Article 76 of UNCLOS. Because the United States has not ratified UNCLOS, it is not permitted to submit scientific data to support its extended continental shelf claims. In contrast, the other four coastal states have already submitted or are in the process of submitting claims; Russia submitted its first claim in 2001. Despite this, the United States has continued to collect scientific data, in cooperation with Canada,[35] to be ready to submit its claims should the U.S. Senate ratify UNCLOS in the future.

The U.S. Extended Continental Shelf Task Force, an interagency body created in 2007[36] to establish the limits of the U.S. extended continental shelf, including Alaska and the U.S. Arctic, is spearheading the effort to document the U.S. claim. The work of the task force allows the U.S. to delineate sovereignty in its Arctic territories and declare these boundaries and rights to other nations. The task force coordinates these efforts and analyzes collected information to determine the extent of U.S. sovereign rights in the Arctic region. By pursuing the expansion of the U.S. outer

30. U.S. Maritime Administration, "About Us," http://www.marad.dot.gov/about_us_landing_page/about_us_landing_page.htm.

31. U.S. Maritime Administration, "Arctic Transportation," http://www.marad.dot.gov/environment_safety_landing_page/arctic_transportation/Arctic_Transportation.htm.

32. U.S. Maritime Administration, "About Us," http://www.marad.dot.gov/about_us_landing_page/about_us_landing_page.htm.

33. U.S. Maritime Administration, "Leading the Future: 2008–2013 Strategic Plan," http://www.marad.dot.gov/documents/Strategic_Plan_Text_Cover-R2_SP.pdf.

34. Vlad Kaczynski, "US-Russian Bering Sea Marine Border Dispute: Conflict over Strategic Assets, Fisheries and Energy Resources," *Russian Analytics Digest* 20, no. 7 (May 2007), http://www.css.ethz.ch/publications/pdfs/RAD-20-2-5.pdf.

35. Four of the 12 research and mapping expeditions conducted in the Arctic Ocean since 2003 have been joint ventures with Canada.

36. U.S. Department of State, "Extended Continental Shelf," March 9, 2009, http://www.state.gov/e/oes/rls/fs/2009/120185.htm.

continental shelf, the United States will gain rights over valuable sea bed and natural resources in the area, such as oil, gas, and gas hydrates, as well as mineral resources and "sedentary" seabed creatures such as clams, crabs, and corals.[37]

The Office of Ocean and Polar Affairs (OPA) within the department's Bureau of Oceans and International Environmental and Scientific Affairs (OES) chairs this task force alongside two co-vice chairs from NOAA and the USGS. In addition to these members, ten additional agencies[38] participate in and contribute to the work done by the task force. In FY 2009, $4.7 million was invested specifically in data collection in the Arctic and Gulf of Alaska.[39] This funding was reduced to $2 million in the 2012 USGS budget justification, although the document acknowledges that this might prevent the United States from meeting the timelines for submission of ECS claims should the United States ultimately accede to UNCLOS.[40]

The Office of Ocean and Polar Affairs also formulates and implements U.S. policy on international issues concerning oceans, the Arctic, and Antarctica. The office lists accession to and implementation of UNCLOS as one of its overarching goals. Additionally, the office is tasked with ensuring safe navigation in U.S. waters and defining the limits of the ECS in conjunction with the Extended Continental Shelf Task Force. Of key importance to maritime security and cooperation is the office's role in coordinating interagency search-and-rescue initiatives in the Arctic in conjunction with the U.S. Coast Guard. The office also hosts meetings of the multi-agency Arctic Policy Group, which includes 15 government organizations and several sub-agencies (see Annex E for its complete membership list). The group provides a venue through which a diverse group of actors, including research, industry, environmental, and indigenous people's organizations, can discuss Arctic developments.

The U.S. senior Arctic official (SAO) is Washington's representative to the Arctic Council, the premier international forum for discussing Arctic issues. The U.S. SAO is currently a State Department official from the Office of Ocean and Polar Affairs.[41] The SAO's tasks include overseeing Arctic Council working groups and ad hoc task forces. Additionally, the SAO shapes the two-year action plan at the beginning of a chairmanship (the next U.S. chairmanship of the Arctic Council will begin in 2015) and the declaration for the ministerial meeting at its end. The domestic role of the SAO is to coordinate internationally related U.S. Arctic activities through the work of the Arctic Policy Group.

37. Extended Continental Shelf Project, "About the Extended Continental Shelf Project," http://continentalshelf.gov/about.html.

38. The U.S. Geological Survey, the Executive Office of the President, the Joint Chiefs of Staff, the U.S. Navy, the U.S. Coast Guard, the Department of Energy, the National Science Foundation, the Environmental Protection Agency, BOEM and the Arctic Research Commission. National Oceanic and Atmospheric Administration, "ECS Data Management," http://www.ngdc.noaa.gov/mgg/ecs/ecs.html.

39. Margaret F. Hayes, "The U.S. Extended Continental Shelf," Environmental Law Institute, April 20, 2009, http://www.eli.org/pdf/seminars/04.20.09dc/Hayes4.20.pdf.

40. Actors have ten years to submit claims from the time of accession to the treaty. U.S. Geological Survey, "Budget Justifications and Performance Information FY 2012," http://www.usgs.gov/budget/2012/greenbook/greenbook_2012.pdf.

41. Arctic Council. "United States of America," http://www.arctic-council.org/index.php/en/united-states-of-america.

Independent Agencies

The Central Intelligence Agency (CIA) opened a Center on Climate Change and National Security in September 2009, but the center was reportedly closed in November 2012.[42] Although few details were publicly available regarding specific projects the center conducted, the press release announcing its creation cited that the center would focus on "the national security impact of phenomenon such as . . . rising sea levels, population shifts, and heightened competition for natural resources."[43] In a March 2012 speech at the University of Louisville, Secretary of Defense Leon Panetta discussed the CIA's work on climate change in broad terms, specifically stating: "[W]e do look at the polar ice cap and are able through imagery to determine what's happening with the polar ice cap . . . how quickly it is melting and what that impact will be . . . [T]he national security implications are that countries like Russia and others are going to be looking . . . to go after the resources in the Arctic."[44] He went on to say that the melting of the ice will lead to increased opportunities and that "countries are going to assert themselves to gain access to the resources that are there . . . [and] that also constitutes an issue that relates to national security."[45] Some media reports suggest that the work of the center has been moved to a new office devoted to economic and energy matters affecting national security.[46]

42. John M. Broder, "C.I.A. Closes Its Climate Change Office," *New York Times* Green Blog, November 20, 2012, http://green.blogs.nytimes.com/2012/11/20/c-i-a-closes-its-climate-change-office/.

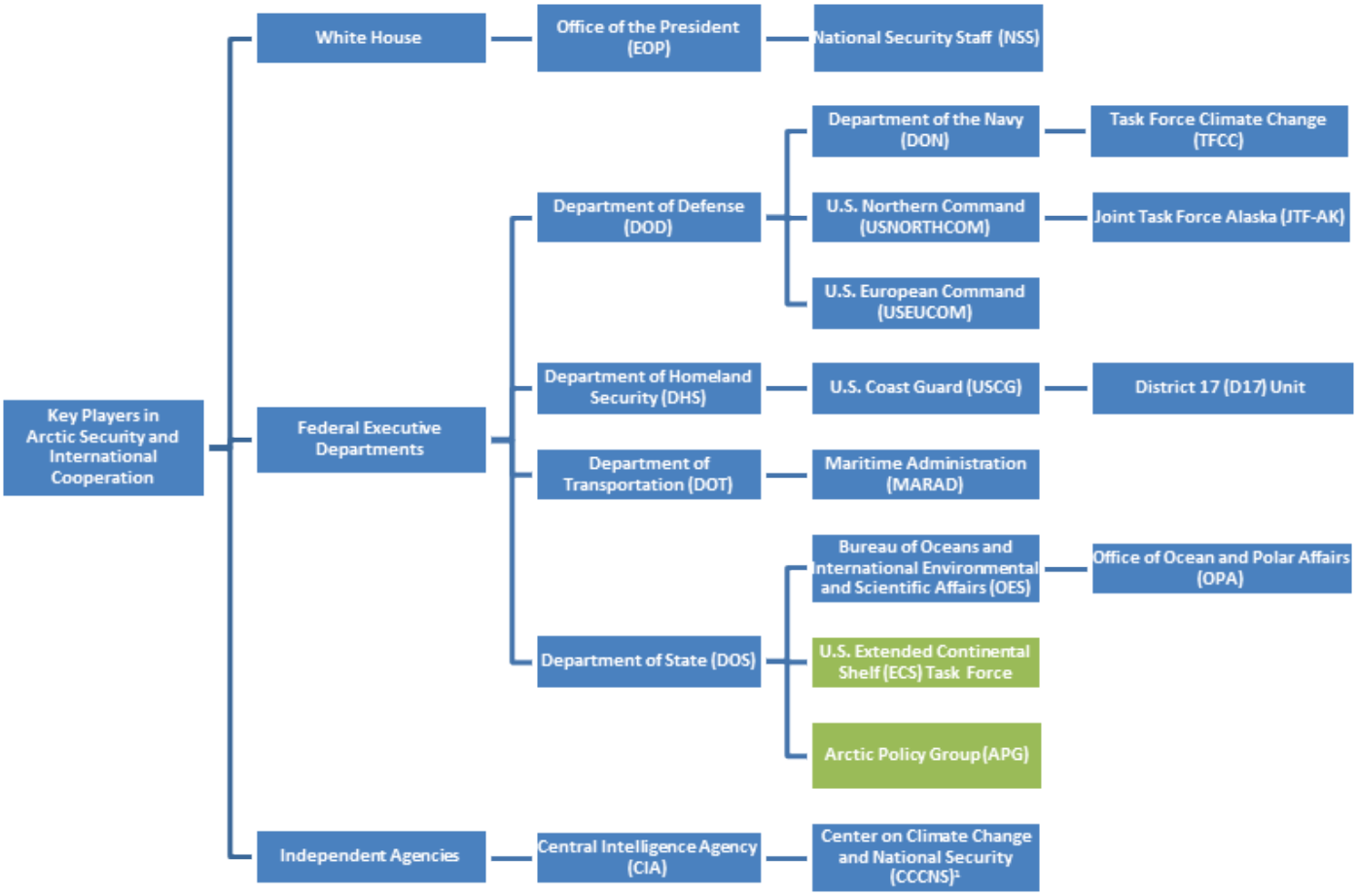
43. Central Intelligence Agency, "CIA Opens Center on Climate Change and National Security," September 25, 2009, https://www.cia.gov/news-information/press-releases-statements/center-on-climate-change-and-national-security.html.

44. Will Rogers, "Notable Mentions: Secretary Panetta on Climate Change and National Security," Center for a New American Security, March 7, 2012, http://www.cnas.org/blogs/naturalsecurity/2012/03/notable-mentions-secretary-panetta-climate-change-and-national-securit.

45. Ibid.

46. Broder, "C.I.A. Closes Its Climate Change Office."

CHART: KEY PLAYERS IN ARCTIC SECURITY AND INTERNATIONAL COOPERATION



Key:

1. The CCCNS was reportedly closed in November 2012.

The units highlighted in green represent interagency bodies. They are listed under the body's chair agency or main co-chair. See appendix for a complete membership list.

E ANNEX E
INTERAGENCY MEMBERSHIP LISTS

Arctic Policy Group (APG)[1]

Chair Agency

Department of State (DOS)
- Bureau of Oceans and International Environmental and Scientific Affairs (OES)
- Office of Ocean and Polar Affairs (OPA)

Member Departments and Agencies

Department of Commerce (DOC)
- National Oceanic and Atmospheric Administration (NOAA)

Department of Defense (DOD)
- Department of the Navy (DON)
- Joint Base Elmendorf-Richardson (JBER)
- Office of the Joint Chiefs of Staff (JCS)
- Office of the Secretary of Defense (OSD)
- U.S. European Command (USEUCOM)
- U.S. Northern Command (USNORTHCOM)

Department of Energy (DOE)

Department of Health and Human Services (DHHS)
- Centers for Disease Control and Prevention (CDC)
- National Institutes of Health (NIH)

Department of Justice (DOJ)

Department of Homeland Security (DHS)
- U.S. Coast Guard (USCG)

Department of the Interior (DOI)
- Bureau of Indian Affairs (BIA)
- Bureau of Land Management (BLM)
- Bureau of Ocean Energy Management (BOEM)
- Bureau of Safety and Environmental Enforcement (BSEE)
- Fish and Wildlife Service (FWS)
- National Parks Service (NPS)

1. "Arctic Policy Group: Participating Federal Agencies."

U.S. Geological Survey (USGS)
Department of State (DOS)
Department of Transportation (DOT)
Federal Aviation Administration (FAA)
Maritime Administration (MARAD)
Environmental Protection Agency (EPA)
Marine Mammal Commission (MMC)
National Aeronautics and Space Administration (NASA)
National Science Foundation (NSF)
U.S. Arctic Research Commission (USARC)

Committee on the Marine Transportation System (CMTS)[2]

Chair Agency

Department of Transportation (DOT)

Member Departments and Agencies

Department of Agriculture (USDA)
Department of Commerce (DOC)
Department of Defense (DOD)
Office of the Joint Chiefs of Staff (JCS)
Department of Energy (DOE)
Department of Homeland Security (DHS)
Department of the Interior (DOI)
Department of Justice (DOJ)
Department of Labor (DOL)
Department of State (DOS)
Department of the Treasury (USTREAS)
Environmental Protection Agency (EPA)
Executive Office of the President (EOP)
Council on Environmental Quality (CEQ)
Domestic Policy Council (DPC)
Homeland Security Council (HSC)
National Economic Council (NEC)
Federal Maritime Commission (FMC)

2. Committee on the Marine Transportation System, "CMTS Organization," http://www.cmts.gov/About/Organization.aspx.

Federal Interagency Council on Recreation (FICOR)[3]

Chair Agency

Rotating on an annual basis

Member Departments and Agencies

Department of Agriculture (USDA)
- Forest Service (FS)

Department of Commerce (DOC)
- National Oceanic and Atmospheric Administration (NOAA)
  - National Ocean Service (NOS)

Department of Defense (DOD)
- U.S. Army Corps of Engineers (USACE)

Department of the Interior (DOI)
- Bureau of Land Management (BLM)
- Bureau of Reclamation (USBR)
- Fish and Wildlife Service (FWS)
- National Park Service (NPS)

Interagency Arctic Research Policy Committee (IARPC)[4]

Chair Agency

National Science Foundation (NSF)

Member Departments and Agencies

Department of Agriculture (USDA)

Department of Commerce (DOC)
- National Oceanic and Atmospheric Administration (NOAA)

Department of Defense (DOD)
- Defense Research and Engineering (DR&E)

Department of Energy (DOE)

Department of Health and Human Services (DHHS)

Department of Homeland Security (DHS)

Department of the Interior (DOI)
- Bureau of Ocean Energy Management (BOEM)

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3. America's Great Outdoors, "Federal Interagency Council on Recreation Charter," http://americasgreatoutdoors.gov/files/2011/10/FICOR-Charter.pdf.

4. National Science Foundation, "Interagency Arctic Research Policy Committee Principals, 2012," http://www.nsf.gov/od/opp/arctic/iarpc/iarpc_principals2012.jsp.

Department of State (DOS)
    Bureau of Oceans and International Environmental and Scientific Affairs (OES)
Department of Transportation (DOT)
Environmental Protection Agency (EPA)
Executive Office of the President (EOP)
    Office of Management and Budget (OMB)
    Office of Science and Technology Policy (OSTP)
Marine Mammal Commission (MMC)
National Aeronautics and Space Administration (NASA)
Smithsonian Institution (SI)
U.S. Arctic Research Commission (USARC)

Interagency Climate Change Adaptation Task Force (ICCATF)[5]

Cochair Agencies

Council on Environmental Quality (CEQ)
National Oceanic and Atmospheric Administration (NOAA)
Office of Science and Technology Policy (OSTP)

Member Departments and Agencies

Department of Agriculture (USDA)
Department of Commerce (DOC)
Department of Defense (DOD)
    U.S. Army Corps of Engineers (USACE)
Department of Education (ED)
Department of Energy (DOE)
Department of Health and Human Services (DHHS)
Department of Homeland Security (DHS)
Department of Housing and Urban Development (HUD)
Department of the Interior (DOI)
Department of State (DOS)
Department of Transportation (DOT)
Department of the Treasury (USTREAS)
Environmental Protection Agency (EPA)
Executive Office of the President (EOP)
    Council of Economic Advisors (CEA)

5. Council on Environmental Quality, "Progress Report of the Interagency Climate Change Adaptation Task Force," October 28, 2011, Appendix A, http://www.whitehouse.gov/sites/default/files/microsites/ceq/2011_adaptation_progress_report.pdf.

National Economic Council (NEC)
National Security Staff (NSS)
Office of Management and Budget (OMB)
Millennium Challenge Corporation (MCC)
National Aeronautics and Space Administration (NASA)
Office of the Director of National Intelligence (ODNI)
National Intelligence Council (NIC)
U.S. Agency for International Development (USAID)

Interagency Ocean Policy Task Force (IOPTF)[6]

Chair Agency

Council on Environmental Quality (CEQ)

Member Departments and Agencies (incl. bureaus and offices)

Department of Agriculture (USDA)
Department of Commerce (DOC)
National Oceanic and Atmospheric Administration (NOAA)
Department of Defense (DOD)
Department of the Navy (DON)
Office of the Joint Chiefs of Staff (JCS)
Department of Energy (DOE)
Office of Policy and International Affairs (PI)
Department of Health and Human Services (DHHS)
Department of Homeland Security (DHS)
U.S. Coast Guard (USCG)
Department of the Interior (DOI)
Department of Justice (DOJ)
Department of Labor (DOL)
Department of State (DOS)
Bureau of Oceans and International Environmental and Scientific Affairs (OES)
Department of Transportation (DOT)
Environmental Protection Agency (EPA)
Executive Office of the President (EOP)
National Security Council (NSC)
Office of Energy and Climate Change (OECC)
Office of Management and Budget (OMB)
Office of Information and Regulatory Affairs (OIRA)

6. Council on Environmental Quality, "Final Recommendations Of The Interagency Ocean Policy Task Force," July 19, 2010, Appendix B, http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf.

Office of Science and Technology Policy (OSTP)
Office of the Vice President (OVP)
Federal Energy Regulatory Commission (FERC)
National Aeronautics and Space Administration (NASA)
National Science Foundation (NSF)

Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska[7]

Chair Agency

Department of the Interior (DOI)
Deputy Secretary of the Interior

Member Departments and Agencies

Department of Agriculture (USDA)
Department of Commerce (DOC)
National Oceanic and Atmospheric Administration (NOAA)
Department of Defense (DOD)
U.S. Army Corps of Engineers (USACE)
Department of Energy (DOE)
Department of Homeland Security (DHS)
U.S. Coast Guard (USCG)
Department of Transportation (DOT)
Environmental Protection Agency (EPA)
Executive Office of the President (EOP)
Council on Environmental Quality (CEQ)
National Security Staff (NSS)
Office of Management and Budget (OMB)
Office of Science and Technology Policy (OSTP)
Office of the Federal Coordinator for Alaska Natural Gas Transportation Projects (OFC)

7. Department of the Interior, "Interagency Working Group on Alaska Energy: Members," http://www.doi.gov/alaskaenergy/members.cfm.

National Ocean Council (NOC)[8]

Cochair Agencies

Council on Environmental Quality (CEQ)
Office of Science and Technology Policy (OSTP)

Member Departments and Agencies

Department of Agriculture (USDA)
Department of Commerce (DOC)
    National Oceanic and Atmospheric Administration (NOAA)
Department of Defense (DOD)
    Department of the Navy (DON)
    Office of the Joint Chiefs of Staff (JCS)
Department of Energy (DOE)
Department of Health and Human Services (DHHS)
Department of Homeland Security (DHS)
Department of the Interior (DOI)
Department of Justice (DOJ)
Department of Labor (DOL)
Department of State (DOS)
Department of Transportation (DOT)
Environmental Protection Agency (EPA)
Executive Office of the President (EOP)
    National Security Council (NSC)
    Office of the Director of National Intelligence (ODNI)
    Office of Management and Budget (OMB)
    Office of the Vice President (OVP)
National Aeronautics and Space Administration (NASA)
National Science Foundation (NSF)

Participating Agencies

Federal Energy Regulatory Commission (FERC)

8. White House, "Executive Order: Stewardship Of The Ocean, Our Coasts, And The Great Lakes," July 19, 2010, 3–4, http://www.whitehouse.gov/files/documents/2010stewardship-eo.pdf.

North Pacific Fisheries Management Council (NPFMC)[9]

Voting Member Departments and Agencies

Department of Commerce (DOC)
- National Oceanic and Atmospheric Administration (NOAA)
  - National Marine Fisheries Service (NMFS)

Alaska Department of Fish and Game (ADFG)

Oregon Department of Fish and Wildlife (ODFW)

Washington Department of Fish and Wildlife (WDFW)

Non-voting Member Departments and Agencies

Pacific States Marine Fisheries Commission (PSMFC)

Department of the Interior (DOI)
- Fish and Wildlife Service (FWS)

Department of Homeland Security (DHS)
- U.S. Coast Guard (USCG)
  - District 17 (D17)

Department of State (DOS)
- Bureau of Oceans and International Environmental and Scientific Affairs (OES)
  - Office of Marine Conservation (OMC)

Appointing Agencies:

Department of Commerce (DOC)
- Office of the Secretary

Nominating Agencies:

Office of the Governor of Alaska

Office of the Governor of Washington

Task Force on Travel and Competitiveness[10]

Cochair Agencies

Department of Commerce (DOC)

Department of the Interior (DOI)

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9. North Pacific Fisheries Management Council, "Membership: Council Members," http://www.fakr.noaa.gov/npfmc/membership/council-members.html.

10. White House, "Executive Order—Establishing Visa and Foreign Visitor Processing Goals and the Task Force on Travel and Competitiveness," http://www.whitehouse.gov/the-press-office/2012/01/19/executive-order-establishing-visa-and-foreign-visitor-processing-goals-a.

Member Departments and Agencies

Department of Agriculture (USDA)
Department of Defense (DOD)
    U.S. Army Corps of Engineers (USACE)
Department of Homeland Security (DHS)
Department of Labor (DOL)
Department of State (DOS)
Department of Transportation (DOT)
Department of the Treasury (USTREAS)
Executive Office of the President (EOP)
    Office of the United States Trade Representative (USTR)
Export-Import Bank (EXIM)

Coordinating Departments and Agencies

Executive Office of the President (EOP)
    Domestic Policy Council (DPC)
    Homeland Security Council (HSC)
    National Economic Council (NEC)
    Office of Management and Budget (OMB)

Tourism Policy Council (TPC)[11]

Chair Agency

Department of Commerce (DOC)
    Office of the Secretary

Member Departments and Agencies

Department of Commerce (DOC)
    International Trade Administration (ITA)
Department of Homeland Security (DHS)
    Bureau of Customs and Border Protection (CBP)
    U.S. Citizenship and Immigration Services (USCIS)
Department of the Interior (DOI)
Department of Labor (DOL)
Department of State (DOS)
Department of Transportation (DOT)
Executive Office of the President (EOP)
    Office of Management and Budget (OMB)
U.S. National Tourism Organization (USNTO)

11. Cornell University Law School, "USC § 2124—Tourism Policy Council," http://www.law.cornell.edu/uscode/text/22/2124.

U.S. Extended Continental Shelf (ECS) Task Force[12]

Chair Agency

Department of State (DOS)

Vice-Chair Agencies

Department of Commerce (DOC)

- National Oceanic and Atmospheric Administration (NOAA)

Department of the Interior (DOI)

Member Departments and Agencies

Department of Defense (DOD)

- Department of the Navy (DON)
- Office of the Joint Chiefs of Staff (JCS)

Department of Homeland Security

- U.S. Coast Guard (USCG)

Department of the Interior (DOI)

- Bureau of Ocean Energy Management (BOEM)
- Bureau of Safety and Environmental Enforcement (BSEE)
- U.S. Geological Survey (USGS)

Department of Energy (DOE)

Environmental Protection Agency (EPA)

Executive Office of the President (EOP)

National Science Foundation (NSF)

U.S. Arctic Research Commission (USARC)

U.S. Global Change Research Program (USGCRP)[13]

Cochair Agencies

Office of Science and Technology Policy (OSTP)

Council on Environmental Quality (CEQ)

Office of Management and Budget (OMB)

Member Departments and Agencies

Department of Agriculture (USDA)

Department of Commerce (DOC)

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12. Extended Continental Shelf Project, "About the Extended Continental Shelf Project," http://continentalshelf.gov/about.html.

13. U.S. Global Change Research Program, "Participating Departments and Agencies," http://www.globalchange.gov/about/program-structure/agencies.

National Oceanic and Atmospheric Administration (NOAA)
Department of Defense (DOD)
Department of Energy (DOE)
Department of Health and Human Services (DHHS)
Department of the Interior (DOI)
Department of State (DOS)
Department of Transportation (DOT)
Environmental Protection Agency (EPA)
National Aeronautics and Space Administration (NASA)
National Science Foundation (NSF)
Smithsonian Institution (SI)
U.S. Agency for International Development (USAID)

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