

Implementation Plan
for
The National Strategy for the Arctic Region

January 2014

Implementation Overview

On May 10, 2013, the President issued the National Strategy for the Arctic Region (Strategy). The accompanying Implementation Plan¹ sets forth the methodology, process, and approach for executing the Strategy. This Implementation Plan complements and builds upon existing initiatives by Federal, State, local, and tribal authorities, the private sector, and international partners, and focuses efforts where opportunities exist and action is most needed. The Implementation Plan reflects the reality of a changing Arctic environment and upholds national interests in safety, security, and environmental protection, and works with international partners to pursue global objectives of addressing climatic changes.

This Implementation Plan follows the structure and objectives of the Strategy's three lines of effort and is consistent with the guiding principles. The lines of effort of the Strategy and the Implementation Plan are as follows:

- Advance United States Security Interests
- Pursue Responsible Arctic Region Stewardship
- Strengthen International Cooperation

These lines of effort and guiding principles are meant to be implemented as a coherent whole. The implementation of each line of effort is detailed in this plan through specific activities supported by programs overseen by Federal entities. Several areas of implementation support more than one line of effort and therefore are not repeated, but are considered as complementary activities.

¹ This Plan is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies or entities, its officers, employees, or agents, or any other person. Nothing in this plan shall be construed to impair or otherwise affect the functions of the Director of the Office of Management and Budget relating budgetary, administrative, regulatory, and legislative proposals.

Table of Contents

Implementation Overview	1
Guiding Principles	4
Advance United States Security Interests	5
Evolve Arctic Infrastructure and Strategic Capabilities	5
Prepare for Increased Activity in the Maritime Domain.....	5
Sustain and Support Evolving Aviation Requirements.....	6
Develop Communication Infrastructure in the Arctic.....	6
Enhance Arctic Domain Awareness	7
Preserve Arctic Region Freedom of the Seas	8
Sustain Federal Capability to Conduct Maritime Operations in Ice-impacted Waters.....	8
Promote International Law and Freedom of the Seas.....	9
Provide for Future United States Energy Security	10
Pursue the Development of Renewable Energy Resources.....	10
Ensure the Safe and Responsible Development of Non-Renewable Energy Resources.....	11
Pursue Responsible Arctic Region Stewardship	12
Protect the Arctic Environment and Conserve Arctic Natural Resources	12
Conserve Arctic Ecosystems.....	12
Improve Hazardous Material Spill Prevention, Containment, and Response.....	13
Use Integrated Arctic Management to Balance Economic Development, Environmental Protection, and Cultural Values	14
Increase Understanding of the Arctic through Scientific Research and Traditional Knowledge	15
Develop a Framework of Observations and Modeling to Support Forecasting and Prediction of Sea Ice.....	15
Implement the Pilot Distributed Biological Observatory in the Pacific Arctic.....	16
Develop Integrated Ecosystem Research in the Beaufort and Chukchi Seas.....	17
Improve Understanding of Glacial Dynamics.....	17
Understand Terrestrial Ecosystem Processes.....	18
Investigate Wildland Fires in the Arctic.....	19
Understand Atmospheric Processes to Improve Climate Predictions.....	19
Support a Circumpolar Arctic Observing System.....	20
Integrate Arctic Regional Models.....	21
Improve Arctic Community Sustainability, Well-being, and Cultural and Linguistic Heritage.....	22
Understand Human Health in the Arctic.....	22
Chart the Arctic Region	23
Strengthen International Cooperation	24
Pursue Arrangements that Promote Shared Arctic State Prosperity, Protect the Arctic Environment, and Enhance Security	24
Promote Arctic Oil Pollution Preparedness, Prevention, and Response Internationally.....	24
Enhance Arctic Search and Rescue.....	25
Prevent Unregulated Arctic High Seas Fisheries.....	25
Reduce Transport of Contaminants.....	26
Identify and Assess Invasive Species Risks and Impacts.....	26
Promote Scientific Research and Monitoring.....	27

Work through the Arctic Council to Advance U.S. Interests in the Arctic Region	28
Develop a Robust Agenda for the U.S. Chairmanship of the Arctic Council	28
Reduce Black Carbon in the Arctic	28
Accede to the Law of the Sea Convention and Related Affairs.....	29
Accede to the Law of the Sea Convention	29
Delineate the Outer Limit of the U.S. Extended Continental Shelf.....	29
Resolve Beaufort Sea Maritime Boundary.....	30
Cooperate with other Interested Parties	31
Expedite International Maritime Organization (IMO) Polar Code Development and Adoption	31
Promote Arctic Waterways Management	31
Continuous Assessment and Adaptation	32

Guiding Principles

The guiding principles outlined in the Strategy are reflected throughout this Implementation Plan. Departments and agencies of the Federal Government must continue to reflect the values of the United States throughout all implementation efforts. The guiding principles are:

- **Safeguard Peace and Stability**
- **Make Decisions Using the Best Available Information**
- **Pursue Innovative Arrangements**
- **Consult and Coordinate with Alaska Natives**

Climate change is already affecting the entire global population, and Alaska residents are experiencing the impacts in the Arctic. To ensure a cohesive Federal approach, implementation activities must be aligned with the Executive Order on Preparing the United States for the Impacts of Climate Change² while executing the Strategy. In addition to the guiding principles, the following approaches are important in implementing the activities across all of the lines of effort:

- **Foster Partnerships with Arctic Stakeholders.** As outlined in the Strategy, all lines of effort must involve Arctic partners, particularly the State of Alaska and Alaska Natives in the Arctic region. Federal agencies, the State of Alaska, tribal communities, local governments, and academia will work with other nations, industry stakeholders, non-governmental organizations, and research partners to address emerging challenges and opportunities in the Arctic environment. The Federal Government should strive to maintain the free flow of communication and cooperation with the State of Alaska to support national priorities.
- **Coordinate and Integrate Activities across the Federal Government.** Multiple Federal bodies currently have authority for Arctic policy (e.g., the National Ocean Council (NOC), Arctic Policy Group, and Interagency Arctic Research Policy Committee (IARPC)). The National Security Council Staff will develop an Executive Order through the interagency process to maximize efficiency, align interagency initiatives, and create unity of effort among all Federal entities conducting activities in the Arctic.

² Signed by the President on November 1, 2013.

Advance United States Security Interests

Our highest priority is to protect the American people, our sovereign territory and rights, and the natural resources and other interests of the United States. This line of effort focuses on the identification, development, and maintenance of capacity and capabilities necessary to promote safety, security, and stability in the region. In some cases, implementation will be achieved through multilateral cooperation. In other instances, national security interests will best be achieved through independent actions or bilateral initiatives.

Evolve Arctic Infrastructure and Strategic Capabilities

Prepare for Increased Activity in the Maritime Domain

Objective: Establish a framework to guide Federal activities related to the construction, maintenance, and improvement of ports and other infrastructure needed to preserve the mobility and safe navigation of United States military and civilian vessels throughout the Arctic region.

Next Steps: Create a coordinated approach toward improving and maintaining infrastructure in support of Federal maritime Arctic activities prioritized in consideration of national security, navigation safety, and stewardship of national resources. Encourage partners and stakeholders to invest in regional infrastructure that supports public safety (e.g., harbors of refuge and emergency response capabilities), economic security, and protection of maritime commerce as outlined in NSPD-66/HSPD-25³. This coordinated approach will include:

- Complete a 10-year projection of maritime activity in the Arctic region by the end of 2014.
- Deliver a 10-year prioritization framework to coordinate the phased development of Federal infrastructure identified through Department and Agency validated needs assessment by the end of 2015.
- Develop recommendations for pursuing Federal public-private partnerships in support of the needs assessment and identified prioritized activities by the end of 2015.

Measuring Progress: Success of this objective will be measured by completion of the maritime trend analysis and an infrastructure prioritization framework that supports Federal responsibilities in response to anticipated increased activity. The Department of Transportation will lead bi-annual interagency meetings to assess progress, report on interagency activities, and update the framework.

Lead Agency: Department of Transportation

Supporting Agencies: Member Departments and Agencies of the Committee on the Marine Transportation System

³ National Security Presidential Directive-66/Homeland Security Presidential Directive-25, January 2009.

Sustain and Support Evolving Aviation Requirements

Objective: Preserve the current stability of the aviation environment, ensure Federal capability to manage security and safety challenges, and continue partnering with the State of Alaska to develop an integrated plan for the maintenance and improvement of aeronautical infrastructure that supports increased safety.

Next Steps: The Federal Aviation Administration (FAA) has primary oversight for all systems and equipment deployed across the National Airspace System, including those in the Alaska Arctic Region, while the State of Alaska has primary oversight for the majority of airports in the State. Next steps include continued coordination to maintain and upgrade appropriate physical infrastructure, improve navigation systems (such as the Automatic Dependent Surveillance-Broadcast (ADS-B) and Wide Area Augmentation System (WAAS)) and weather reporting to support air traffic control and aeronautical operations, and pursue collaborative initiatives for research and commercial purposes. The following deliverables will be pursued in support of the Strategy in accordance with the FAA's baseline schedules and capital investment plan:

- Complete ADS-B ground station deployments by the end of 2014.
- Continue conducting WAAS improvements, including scheduled geo-satellite updates.
- Continue to coordinate with the State of Alaska to assess existing infrastructure, maintenance requirements, and navigational systems, and to identify opportunities to enhance safety and security including in rural or remote areas by the end of 2015.

Measuring Progress: Working in close coordination with the State of Alaska, progress will be measured through existing FAA reporting processes that assess aviation safety in the Arctic region, completion of Federal capital improvement investment plans, and identification of areas of improvement to conduct Federal responsibilities.

Lead Agency: Department of Transportation (Federal Aviation Administration)

Supporting Agencies: Department of Defense, Department of Homeland Security, Department of the Interior

Develop Communication Infrastructure in the Arctic

Objective: Assess the telecommunication infrastructure in the Arctic and use new technology to support improved communications in the region, including in areas of sparse population to facilitate emergency response.

Next Steps: The next phase of this activity will include:

- Assess the current and potential availability of telecommunications services in the Arctic region, including local and long-distance terrestrial, commercial mobile cellular, public safety services, emergency services, navigational safety and satellite voice and broadband channel availability by the end of 2014.
- Develop a framework that lists and prioritizes opportunities for investments in telecommunications capacity and capability, with a strong emphasis on innovative technologies with Federal, State, and international public-private partnerships by the end of 2015.

- In collaboration with the Arctic Council, evaluate the feasibility of an Arctic-wide telecommunications network and radio frequency spectrum management with the goals of compatible interference-free operations and Arctic-wide communications by the end of the U.S. Chairmanship of the Arctic Council.

Measuring Progress: Success of this initiative will be the development of a framework, in coordination with Federal, State, local, tribal, native governments and the commercial enterprise, to prioritize investments in new facility and equipment installations such as high-powered high frequency radio stations, satellite ground stations, fixed microwave radio stations, public safety radio facilities, mobile cellular base stations, and fiber optic cable installations that enhance security and safety in the Arctic.

Lead Agency: Department of Commerce (National Telecommunications and Information Administration)

Supporting Agencies: Department of Defense, Department of Homeland Security (United States Coast Guard), Department of Transportation, Federal Communications Commission

Enhance Arctic Domain Awareness⁴

Objective: Increase maritime domain awareness⁵ in the Arctic region by improving appropriate capabilities to collect and exchange information by leveraging partnerships with all entities operating in the Arctic, including Federal, State, local, tribal, research, academia, industry, and international.

Next Steps: Enhance national capacity for knowledge management of the maritime domain in the Arctic by improving appropriate capabilities and leveraging partnerships with domestic and international partners as outlined in NSPD-66/HSPD-25. Specific activities include:

- Partner with academia and industry to evaluate the costs and benefits of Unmanned Aircraft Systems (UAS) in the Arctic to collect ship tracking, meteorological, oil spill, and hydrographic data.
- Evaluate the feasibility of using UAS to improve observational ability in the Arctic in coordination with FAA's ongoing efforts to safely integrate UAS into the national airspace system by the end of 2015 as defined in the UAS Comprehensive Plan.
- Continue to work with international partners toward enhancing Long Range Identification and Tracking (LRIT) system capability and investigating the feasibility of designating the Arctic as an LRIT area of interest. Publish a report by the end of 2015 which assesses progress on the use of LRIT to support increased awareness and navigational safety.

⁴ Arctic domain awareness is defined as the capacity to understand the Arctic domain, including factors and trends related to the Arctic's unique environment, cultures, resources, and commercial interests in order to promote safety, security, peace, stability, sustainable development, and environmental protection. Arctic Domain Awareness builds upon traditional knowledge; scientific research; maritime-related information sharing; and partnerships between Federal, state, local, tribal, and territorial authorities; and international cooperation.

⁵ Maritime Domain Awareness is the effective understanding of anything associated with the maritime domain that could impact the security, safety, economy, or environment of the United States. The Maritime Domain is all areas and things of, on, under, relating to, adjacent to, or bordering on a sea, ocean, or other navigable waterway, including all maritime-related activities, infrastructure, people, cargo, vessels, and other conveyances. National Maritime Domain Awareness Plan, 2013.

- Leverage relationships with international partners to improve national capacity to communicate and collect environmental data by satellite. Publish an assessment of current partnerships and capabilities with recommendations by the end of 2015.
- Leverage the Maritime Information Sharing Environment, developed as part of the National Maritime Domain Awareness Architecture to develop the capability to receive information from diverse sources, analyze the information, and disseminate information to stakeholders. Publish a plan to establish a mechanism for information sharing for the Arctic by the end of 2015.
- Develop a timeline to enhance shared situational awareness across Federal, State, local, tribal, industry, non-governmental organizations, and international partners through broadly accessible enterprise information services, standardized information formats, and common data standards by the end of 2016.
- Evaluate space-based observation capabilities through participation in scheduled and future pilot programs to evaluate the feasibility of using space-based data and publish results by the end of 2016.
- Enhance Automatic Identification System (AIS) capabilities, in alignment with current regulations, to facilitate identification and tracking of maritime assets across the Arctic region by the end of 2018.
- Participate in discussions focusing on information and data requirements through a variety of fora, including the navigation services community, to leverage multi-national and multi-agency capabilities.

Measuring Progress: Increased understanding of activity in the Arctic region will be measured through improved detection, identification, tracking, and dissemination of information and shared situational awareness through enhanced interagency and international cooperation. Progress in implementing this objective will be measured by completion of the described activities.

Lead Agency: Department of Homeland Security (United States Coast Guard)

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Defense, Department of Transportation (Federal Aviation Administration), National Aeronautics and Space Administration, National Maritime Intelligence-Integration Office

Preserve Arctic Region Freedom of the Seas

Sustain Federal Capability to Conduct Maritime Operations in Ice-impacted Waters

Objective: Ensure the United States maintains icebreaking and ice-strengthened ship capability with sufficient capacity to project a sovereign U.S. maritime presence, support U.S. interests in the Polar Regions and facilitate research that advances the fundamental understanding of the Arctic.

Next Steps: The Federal Government requires the ability to conduct operations in ice-impacted waters in the Arctic. As maritime activity in the Arctic region increases, expanded access will be required. Next steps include:

- The lead and supporting Departments and Agencies will develop a document that lists the capabilities needed to operate in ice-impacted waters to support Federal activities in the Polar Regions and emergent sovereign responsibilities over the next ten to twenty years by the end of 2014.
- Develop long-term plans to sustain Federal capability to physically access the Arctic with sufficient capacity to support U.S. interests by the end of 2017.

Measuring Progress: Sustaining federal capability will be demonstrated through the Federal Government's ability to conduct operations in the Arctic to support statutory missions and sovereign responsibilities, and to advance interests in the region. Progress in implementing this objective will be measured by completion of the capabilities document, and long term sustainment plan.

Lead Agency: Department of Homeland Security

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Defense, Department of State, Department of Transportation, National Science Foundation

Promote International Law and Freedom of the Seas

Objective: The United States will continue to promote freedom of the seas and global mobility of maritime and aviation interests for all nations in accordance with international law. The United States will promote and conduct such activities in the Arctic region as appropriate.

Next Steps: The United States will exercise internationally recognized navigation and overflight rights, including transit passage through international straits, innocent passage through territorial seas, and the conduct of routine operations on, over, and under foreign exclusive economic zones, as reflected in the Law of the Sea Convention. Toward this end, the U.S. Government will, as appropriate:

- Conduct routine Arctic maritime exercises, operations, and transits consistent with international law.
- Inform the Arctic Council, International Maritime Organization, tribal organizations, and other interested governments of U.S. activities conducted.
- Engage the private commercial shipping and aviation sectors and involve stakeholders and experts in academia and non-governmental organizations to promote the rights and responsibilities of freedom of navigation and overflight in the Arctic region.
- Promote the global mobility of vessels and aircraft throughout the Arctic region by developing strong relationships and engaging in dialogue with international partners, especially Arctic states.
- Continue to document U.S. diplomatic communications in the *Digest of U.S. Practice in International Law* published by the Department of State.
- Continue to document the Department of Defense report on fiscal year freedom of navigation operations and other related activities conducted by U.S. Armed Forces

- Continue to deliver strategic communications at appropriate opportunities to reflect U.S. objections to unlawful restrictions in the Arctic on the rights, freedoms, and uses of the sea and airspace recognized under international law.
- Continue to encourage excessive maritime claims to be rescinded or otherwise reformed to comply with international law.

Measuring Progress: Progress will be measured through the continued preservation of the freedoms of navigation and overflight and other rights and uses of the seas consistent with customary international law as reflected in the Law of the Sea Convention throughout the Arctic region, including the Northwest Passage and Northern Sea Route.

Lead Agency: Department of State

Supporting Agencies: Department of Defense, Department of Homeland Security (United States Coast Guard)

Provide for Future United States Energy Security

Pursue the Development of Renewable Energy Resources

Objective: Promote development and deployment of available renewable energy resources in the U.S. Arctic to support local and regional energy security and reliability for remote Alaska communities and Federal facilities while reducing the environmental impacts of fossil fuel use.

Next Steps: Explore and develop strategies to employ renewable energy resources to support energy development, energy security, and affordable energy reliability requirements of Federal, State, and tribal entities through the following activities:

- Encourage development of highest probability of success renewable resources such as wind, wave, and solar energy (and others) through collaboration with local and regional stakeholders, leveraging private sector investments, and exploring potential public-private partnerships.
- Leverage current Federal and State of Alaska efforts to support renewable energy development in Alaska and convene key Federal stakeholders and the State of Alaska in 2014 for an inaugural meeting to develop a 10-year strategic plan.
- Conduct a regional planning exercise in 2014 and work in concert with state and regional plans to identify specific opportunities to accelerate deployment over the next 10 years.
- Identify partnerships to fund and promote science for renewable energy technology development by the end of 2014.
- Identify public-private partnership opportunities to explore renewable energy resources by the end of 2014.
- Develop an integration plan with the State of Alaska, local governments, tribal governments, Alaska Native Corporations, and key stakeholders by the end of 2014.

- Deploy small-scale clean energy systems in remote communities (e.g., the Department of Energy Alaska START program and the Department of the Interior Remote Community Renewable Energy partnership) by the end of 2014.
- Publish best practices in technology, deployment, operations and maintenance, in partnership with the Alaska Center for Energy and Power, through analysis of currently operating renewable energy projects, such as wind, solar, and biomass by the end of 2015.

Measuring Progress: The United States efforts to advance renewable energy will be measured through the development and execution of short and long-term plans, growth of renewable energy production infrastructure in the Arctic, and establishment of public-private partnerships that increase locally generated renewable energy.

Lead Agency: Department of Energy

Supporting Agencies: Department of Homeland Security, Department of the Interior, National Science Foundation

Ensure the Safe and Responsible Development of Non-Renewable Energy Resources

Objective: Ensure safe and responsible exploration and development of onshore and offshore Arctic non-renewable energy resources in an environmentally sound manner.

Next Steps: The development of all energy resources must be coupled with a coordinated responsible approach, domestically and internationally, which will be pursued through the following activities:

- Plan and conduct exploratory deep-water baseline benthic assessments.
- Evaluate the oil and gas potential, and obtain scientific and technical information needed to pursue a regionally tailored approach for potential future offshore leasing by the end of 2016.
- Assess the capacity and integrity of the Trans-Alaska Pipeline System to facilitate the flow of additional onshore and offshore oil resources by the end of 2016.
- Continue to encourage the development and improvement of technology to capture hydrocarbons in response to an oil spill including the loss of well control.
- Evaluate and promote spill prevention technology involved in the drilling process, wellbore integrity, production operations, and final well plugging and abandonment.

Measuring Progress: Safe and responsible exploration and development of non-renewable energy resources in the Arctic will be measured through Federal Government oversight, coordination, research and use of best available science and technology.

Lead Agency: Department of the Interior

Supporting Agencies: Department of Energy, Department of Commerce (National Oceanic and Atmospheric Administration)

Pursue Responsible Arctic Region Stewardship

People living in the Arctic depend on the unique environment for many important resources and cultural activities. Sustaining those activities depends on responsible stewardship through active conservation of resources, balanced management, and the application of scientific and traditional knowledge to physical and living environments. The implementation of responsible stewardship continues established initiatives in the National Ocean Policy, IARPC, and the Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska, as well as Integrated Ocean and Coastal Mapping efforts. Departments and agencies will continue to increase cooperation between all domestic and international partners to improve stewardship of the Arctic.

Protect the Arctic Environment and Conserve Arctic Natural Resources

Conserve Arctic Ecosystems

Objective: Catalogue baseline conditions, monitor changes in these conditions, and develop mechanisms for conserving Arctic ecosystems.

Next Steps: Conservation of Arctic ecosystems is a perpetual process which requires understanding how and why the system is changing and development of steps necessary to protect the environment. To meet this goal, the United States will:

- Create a coordinated approach to baseline exploration and monitoring to better understand changes in Arctic ecosystems by the end of 2014.
- Identify indicators of environmental change and environmentally sensitive areas, continue monitoring to document how the system and sensitive areas are being affected by environmental changes, and project risks to the system by the end of 2015.
- Develop and maintain an ongoing program to monitor ecosystem indicators, pollutants, and other data collected on key processes, species, habitats, and sensitive areas in Arctic Alaska in collaboration with the State of Alaska and neighboring countries by the end of 2015.
- Identify sensitive Arctic areas to inform the final Chukchi and Beaufort leasing plans, Bering Strait Port-Access Route Study, Aleutian Islands Risk Assessment, and the Alaska Federal and State Preparedness Plan for Response to Oil and Hazardous Substance Discharges and Releases by the end of 2016.
- Incorporate risk assessments into National Environmental Policy Act reviews to better balance competing interests and to account for rapid environmental change by the end of 2016.
- Conduct risk assessments of the impacts of climate warming, reduced permafrost, diminishing land/sea ice, and ocean acidification on Arctic Alaskan ecosystems by the end of 2016.
- Complete National Ocean Policy Implementation Plan milestones for the Arctic region.

Measuring Progress: The United States will measure progress in conserving ecosystems by assessing the degree to which they remain intact as compared to baseline conditions and the degree to which they contribute to the nutritional and cultural well-being of Alaskan Natives, biodiversity, and climate regulation.

Lead Agency: Department of Commerce (National Oceanic and Atmospheric Administration)

Supporting Agencies: Department of Defense, Department of Homeland Security (United States Coast Guard), Department of the Interior, Department of Transportation, Environmental Protection Agency

Improve Hazardous Material Spill Prevention, Containment, and Response

Objective: Improve oil and other hazardous material spill prevention, containment, and response infrastructure, technology, damage assessment, and restoration strategies to protect and conserve the Arctic environment from the potentially damaging effects of offshore or inland oil spills, hazardous material spills, drilling operations, and shipping.

Next Steps: Federal agencies, in coordination with the State of Alaska, Alaska Native organizations, industry, academia, environmental groups, and other partners, will continue working to protect Arctic communities and ecosystems from potential spills and other pollution events, including:

- Implement lessons learned from tabletop and full scale exercises including simulated oil spill demonstrations in the Arctic on an ongoing basis.
- Complete the Alaska Regional Response Team's Oil Dispersant Authorization Plan by the end of 2014.
- Complete the National Academy of Sciences' Arctic Spill Response Assessment by the end of 2014 and develop a plan for incorporation of recommendations within 90 days of completion of the assessment.
- Conduct a Worst Case Discharge deployment exercise to continue to enhance preparedness with partners and to identify logistical support needs by the end of 2016.
- Complete National Ocean Policy Implementation Plan annual milestones.

Measuring Progress: The United States will measure preparedness in protecting the environment through continued development, evaluation, and refinement of plans in collaboration with the Alaska Regional Response Team, National Response Team members, and international response partners. Progress will be measured by addressing gaps identified through training, exercises, drills and actual responses to hazardous materials and oil spills that may occur in the Arctic.

Lead Agency: Department of Homeland Security (United States Coast Guard) for open ocean and coastal spills; Environmental Protection Agency for inland spills.

Supporting Agencies: Member Departments and Agencies of the United States National Response Team

Use Integrated Arctic Management to Balance Economic Development, Environmental Protection, and Cultural Values

Integrated Arctic Management (IAM) is a science-based, whole-of-government approach for stewardship and planning in the U.S. Arctic that integrates and balances environmental, economic, and cultural needs and objectives. A key management tool of IAM is Ecosystem-Based Management (EBM), as defined in the National Ocean Policy. EBM incorporates better science and knowledge to support economic growth, efficient decision-making, and healthier and more resilient marine ecosystems that will strengthen jobs, local economies, and a skilled and diverse ocean workforce. A federal interagency team developed IAM by expanding upon the EBM concept to coordinate government decision-making across a number of social and economic sectors and to be inclusive of marine and terrestrial environments.

Objective: Implement IAM and employ management approaches, such as EBM, to enhance good governance to provide for sustainable economies in the region, ensure long-lasting benefits of balanced ecosystems, and preserve cultural activities of the people that depend on the Arctic environment.

Next Steps: As part of the National Strategy for the Arctic Region, the United States will implement the National Ocean Policy⁶ objectives relevant to the Arctic and complete recommendations outlined in the report *Managing for the Future in a Rapidly Changing Arctic*⁷ and:

- Continue to strengthen key partnerships with the State of Alaska, local governments, and Alaska Native organizations and develop an engagement plan to involve partners and stakeholders in IAM discussions and provide transparency of the process by the end of 2014.
- Conduct a review of interagency efforts related to natural resource management in the U.S. Arctic and clarify roles and responsibilities by the end of 2014.
- Coordinate among Federal agencies to integrate IAM and EBM, under existing regulatory and legislative authorities such as National Environmental Policy Act, the Endangered Species Act, and the Marine Mammal Protection Act into agency-specific programs and associated actions (e.g., risk analyses and permit reviews) by the end of 2014.
- Draft an interagency Memorandum of Understanding for the integration of IAM, in collaboration with the state of Alaska and Alaska Natives, by the end of 2014.

⁶ The National Ocean Policy Implementation Plan. National Ocean Council. 2013.

⁷ *Managing for the Future in a Rapidly Changing Arctic*. Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska. 2013.

- Document best practices for collaboration among experts, practitioners, and stakeholders to improve efficiency, consistency, and transparency of management efforts across agencies by the end of 2014.
- Develop ecosystem-based management principles, goals, and performance measures for the Arctic, produce a policy statement, and coordinate adoption by member agencies by the end of 2014.
- Address the recommendations outlined in *Managing for the Future in a Rapidly Changing Arctic* and implement IAM pilot projects by the end of 2016.
- Incorporate EBM policies into IAM, Federal agency environmental planning, and review processes using a phased approach by the end of 2016.

Measuring Progress: Success of this objective will be measured by the development and implementation of Federal decision-making processes and management approaches that provide for sustainable economies in the region, ensure long-lasting benefits of balanced ecosystems, and preserve cultural activities of the people that depend on the Arctic environment.

Lead Agencies: Department of the Interior and the Office of Science and Technology Policy
Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Defense, Department of Homeland Security (United States Coast Guard), Department of Interior, Department of Transportation (Maritime Administration), Environmental Protection Agency

Increase Understanding of the Arctic through Scientific Research and Traditional Knowledge

The IARPC, a subcommittee of the National Science and Technology Council, is responsible for coordinating research in the Arctic. In February 2013, IARPC released the *Arctic Research Plan: FY2013-2017* and is implementing that plan by way of interagency implementation teams. A summary of the activities of these interagency implementation teams that directly support this section of the National Strategy for the Arctic Region are included below. Refer to the Arctic Research plan for additional milestones and details.

Develop a Framework of Observations and Modeling to Support Forecasting and Prediction of Sea Ice

Objective: Improve sea ice forecasts and predictions at a variety of spatial and temporal scales.

Next Steps: An interagency expert group, convened by the IARPC⁸, on sea ice forecasting will conduct the following activities:

⁸ Arctic Research Policy Act of 1984; 15 U.S.C. / 4108.

- Develop a multi-year implementation plan to coordinate ongoing observations, process studies, and modeling, and to determine needed improvements to reduce uncertainty in forecasts by the end of 2014.
- Develop analytic methods (e.g., algorithms for the Advanced Microwave Scanning Radiometer 2) to better define the ice edge, ice concentration, and forecasting by the end of 2014.
- Launch the Ice, Cloud, and land Elevation Satellite 2 and the Gravity Recovery and Climate Experiment Follow-On to monitor changes in ice by the end of 2017.
- Conduct additional observation campaigns to provide data for model studies (e.g., NASA IceBridge acquisition of sea ice surface elevation) by the end of 2017.

Measuring Progress: Progress will be measured by demonstrating increased certainty and accuracy of sea ice forecasts and predictions, and by showing improved understanding of feedback processes driving sea ice variability and the effects of that variability on marine and terrestrial ecosystems, Arctic and global weather, and climate.

Lead Agency: Department of Defense

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Energy, Department of Homeland Security (United States Coast Guard), Department of the Interior, National Aeronautics and Space Administration, National Science Foundation

Implement the Pilot Distributed Biological Observatory in the Pacific Arctic

Objective: Continue implementation of the pilot Distributed Biological Observatory (DBO) to inform understanding of the impacts of rapid physical changes in the Arctic on biological processes and provide climate-scale foundational information to support improved ecosystem-based management of the Arctic.

Next Steps: Specific actions include:

- Continue annual research cruises by pilot DBO partners.
- Create DBO-focused satellite sea ice, sea surface temperature, sea surface height, and ocean color products by the end of 2015.
- Publish an updated national/international DBO concept plan for decadal-scale implementation by the end of 2015.
- Execute decadal-scale plans and prepare periodic assessments on physical and ecological state of Pacific Arctic marine environment, integrating DBO data with data from collaborating agencies and other sources by the end of 2016.

Measuring Progress: Progress will be measured as an increased understanding of marine ecosystem responses to climate change in the Pacific Arctic from the northern Bering to the Beaufort Sea. Nationally, the results will be captured in progress reports to the IARPC Principals. Internationally, data will be accredited by the Pacific Arctic Group of the International Arctic Science Committee.

Lead Agency: National Oceanic and Atmospheric Administration

Supporting Agencies: Department of Defense, Department of Homeland Security (United States Coast Guard), Department of the Interior, National Aeronautics and Space Administration, National Science Foundation

Develop Integrated Ecosystem Research in the Beaufort and Chukchi Seas

Objective: Identify and understand processes that influence ecosystem structure and function, including sensitivities to changes in the physical and chemical environments, to support adaptation efforts and inform models that project the future ecosystem.

Next Steps: The IARPC Chukchi Beaufort Ecosystems Implementation Team will develop hypotheses about responses to long-term trends, build scenarios for future subsistence and commercial use of living marine resources, and undertake process studies to inform models to project future ecosystem status. This will be accomplished by the following steps:

- Conduct interagency and international workshops and consultations to identify high priority, scientific research objectives and coordinate funding and logistic plans by the end of 2014.
- Develop a foundation for new scientific research activities through syntheses and assessments of existing data and information by the end of 2014.
- Delineate and initiate 3 to 5 year research and exploration activities, including mechanisms to integrate interagency and international results by the end of 2014.
- Convene a science integration conference to demonstrate new and updated cyber-infrastructure tools to enhance data integration and application, and to identify opportunities for sharing of technology and tools among interagency partners by the end of 2016.

Measuring Progress: Progress will be measured by the inclusion of ecosystem modeling improvement strategies and trend analysis for the Chukchi and Beaufort Seas in annual IARPC progress reports.

Lead Agency: National Science Foundation

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of the Interior, National Aeronautics and Space Administration

Improve Understanding of Glacial Dynamics

Objective: Perform glacial-process studies targeting specific dynamic regimes and conduct long-term monitoring of key outlet glaciers and tidewater glaciers.

Next Steps: The IARPC Glaciers and Fjords Implementation Team will identify and improve understanding of basic processes controlling the interaction of land ice and oceans under a changing climate. To support these efforts, the team will:

- Define observational requirements for components (ocean/fjord/ice-ocean interface/glacier/atmosphere) of process studies and sustained monitoring by the end of 2014.

- Develop 3 to 5 year research initiatives, as appropriate, that integrate observations and process modeling to advance U.S. Earth system models by the end of 2015.
- Develop an interagency planning document for Arctic land ice monitoring with a focus on outlet and tidewater glaciers and their surroundings by the end of 2017.

Measuring Progress: Annual progress reports to the IARPC Principals will include new strategies to incorporate results of process studies into Earth system models and focus national and international research on ice/ocean interactions.

Lead Agency: National Science Foundation

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Defense, Department of Energy, Department of the Interior, National Aeronautics and Space Administration

Understand Terrestrial Ecosystem Processes

Objective: Coordinate and integrate terrestrial ecosystem research to increase the understanding of geophysical and ecosystem responses to a changing climate and to inform management decisions and subsistence uses.

Next Steps: Create interdisciplinary, multi-agency groups to identify gaps in terrestrial ecosystem processes, ecosystem services, and climate feedbacks, as well as to identify common metadata standards for sharing information results, which include:

- Summarize ongoing, cross-disciplinary Arctic studies, including information collected from local communities, and identify outstanding needs by the end of 2014.
- Synthesize local knowledge, GIS data, and integrated models to clearly show the relationship among climate, land use changes, ecosystem services, and village subsistence systems by the end of 2014.
- Complete an assessment of existing tools and methods for measuring and mapping the effects of cryosphere changes such as thawing permafrost on Arctic ecosystems and communities by the end of 2015.
- Complete a Pan-Arctic analysis to identify tundra and boreal regions that are most vulnerable to carbon loss with continued warming by the end of 2016.
- Initiate an integrated effort involving ground-, aircraft-, and space-based assets to study terrestrial ecosystems in Arctic by the end of 2016.
- Standardize project and data metadata currently maintained by collaborating agencies and non-governmental groups and make available on one website or via one-access-point web services that conform to the Alaska Data Integration working group (ADIwg) standards by the end of 2017.

Measuring Progress: Progress will be measured by a better understanding of the terrestrial ecosystem, supported by peer-reviewed research and reports that provide an integrated method to manage and influence decisions to counter the consequences of climate change.

Lead Agency: Department of the Interior

Supporting Agencies: National Science Foundation, National Aeronautics and Space Administration

Investigate Wildland Fires in the Arctic

Objective: Conduct studies of the impacts of wildland fires on vegetation, carbon, wildlife, air quality, permafrost degradation, and biogeochemical cycles to inform policy and land-management decisions.

Next Steps: The IARPC Wildfires Implementation Team will meet monthly to develop an integrated understanding of the trends and impacts of Arctic wildland fires to inform policy and land-management decisions, including:

- Produce an inventory of existing scientific research on Arctic wildfires and an assessment, based on consultation with local communities and indigenous groups, of the impacts of wildfires on cultural and subsistence resources by the end of 2014.
- Develop research projects to identify succession stages of tundra communities following a wildfire by the end of 2017.
- Develop a model of ecosystem effects of wildfire and a report detailing wildfire frequency, extent, and severity in the Arctic by the end of 2017.

Measuring Progress: Progress will be measured through annual reports to the IARPC Principals which demonstrate increased knowledge on the effects of wildfires, including recommendations to counter conditions and mitigate negative outcomes.

Lead Agency: Department of the Interior

Supporting Agencies: Department of Energy, National Science Foundation

Understand Atmospheric Processes to Improve Climate Predictions

Objective: Improve understanding of the complex interactions associated with atmospheric processes, reduce uncertainty in model outputs, and develop long-term observational data sets to better inform decisions in the areas of polar and extreme event prediction, shipping, human health, resource development, and commerce.

Next Steps: The IARPC Atmosphere Implementation Team focus areas will include:

- Identify and analyze the source regions, direct and indirect effects, and net impact of short-lived climate forcers on Arctic warming by the end of 2016.
- Improve understanding of processes that control the formation, longevity, and physical properties of Arctic clouds, including the effects of, and sensitivities to, aerosols by the end of 2016.
- Understand the atmosphere-to-surface heat, energy, and mass exchanges that ultimately control the evolving Arctic oceanic, terrestrial, and cryospheric systems by the end of 2017.

Measuring Progress: Progress will be measured by the ability to better understand atmospheric processes and to better predict extreme events to protect people and property in the Arctic.

Lead Agency: Department of Energy

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Defense, National Aeronautics and Space Administration, National Science Foundation

Support a Circumpolar Arctic Observing System

Objective: Support the development of coordinated and integrated regional, national, and global observing systems to advance Arctic observing priorities.

Next Steps: The IARPC Arctic Observing System Implementation Team and the Arctic Data Implementation Team, by the end of 2015, will:

- Facilitate an observing-system design for the Arctic that includes in-situ and remotely sensed observations of sea ice as well as local community and traditional knowledge.
- Assess local resident priorities for addressing change and engage indigenous observers and communities in monitoring environmental variables.
- Monitor the biological and physical state of the Arctic marine environment, and where practical and feasible, assess concentrations of selected contaminants in the Arctic environment.
- Assess the effects of clouds and atmospheric constituents on surface radiation balance.
- Assess the impact of terrestrial warming and permafrost thawing on the carbon cycle.
- Undertake activities to improve discovery and access to Arctic data.
- Develop action plans to implement an integrated design, including connections with other national and international observing systems, sustain current and planned operations, and use system models to identify observing contributions and needs for forecasting and design.

Measuring Progress: Progress on the development of Arctic observing systems will be demonstrated through the continued identification of national Arctic observing priorities, recognition of knowledge gaps, and integration of international operations.

Lead Agency: National Science Foundation

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Defense, Department of Energy, Department of Homeland Security (United States Coast Guard), National Aeronautics and Space Administration

Integrate Arctic Regional Models

Objective: Coordinate an integrated and focused effort to improve Arctic modeling to benefit understanding of ongoing processes, better project future Arctic changes, and guide future process research and decisions.

Next Steps: The IARPC Modeling Team will:

- Disseminate a survey of Federal Arctic modeling efforts by the end of 2014.
- Complete a survey identifying opportunities for collaborative development and/ or joint campaigns by the end of 2014.
- Finish a review of the third session of the WMO Executive Council Panel of Experts on Polar Observations, Research, and Services on the development of the Global Integrated Polar Prediction System by the end of 2014.
- Complete an evaluation of stand-alone subsystem components of the Arctic system, incorporating mechanistic processes derived from experiments and/or observations by the end of 2014.
- Support surveys of existing modeling capabilities by participating agencies that tackle the ocean/land ice coupling problem, including parameterization and advancing grid mesh methodologies to accommodate fine scale dynamics by the end of 2014.
- Develop multi-disciplinary data testbeds and scenarios for both idealized and realistic model and multi-model projections, verification, validation, as well as foster exchange of codes, inputs, and experiences by the end of 2014.
- Complete observing-system studies using improved models to further inform observing system design by the end of 2014.
- Articulate critical Arctic processes for dedicated field and modeling campaigns across agencies by the end of 2015.
- Test improved parameterizations of Arctic physical processes and feedbacks by the end of 2015.
- Standardize model components, meta-data, and data products by the end of 2016.
- Couple and evaluate Arctic subsystem components within both Global Earth system and Arctic regional models by the end of 2017.
- Complete a new-generation of modeling approaches incorporating the coupled forward and inverse methodologies by the end of 2018.

Measuring Progress: The IARPC Modeling Implementation Team will provide annual reports to the IARPC Principals and will measure progress by improved modeling and Arctic forecasting at regional and global scales.

Lead Agency: Department of Energy

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Defense, Department of the Interior, National Aeronautics and Space Administration, National Science Foundation

Improve Arctic Community Sustainability, Well-being, and Cultural and Linguistic Heritage

Objective: Improve the ability for communities to adapt to new conditions created by environmental change and diverse socio-economic stressors.

Next Steps: The IARPC Arctic Communities Implementation Team will:

- Share basic scientific knowledge with Arctic residents and assist community leaders in developing sustainable pathways for successful adaptation by the end of 2014.
- Coordinate national efforts to identify local resident priorities and adaptation strategies by the end of 2014.
- Forecast climate scenarios and food security for Arctic residents and share best practices and findings from pilot projects by the end of 2015.
- Coordinate efforts to foster persistence of languages and cultural heritage by the end of 2016.

Measuring Progress: Progress will be measured in terms of the degree to which cultural vitality, human health, and overall well-being are preserved as documented through annual comparative reports.

Lead Agency: Smithsonian Institution

Supporting Agencies: Department of the Interior, National Science Foundation

Understand Human Health in the Arctic

Objective: Coordinate better comprehension of the health and survival rates of Arctic indigenous peoples to facilitate improvements in well-being.

Next Steps: The IARPC human health research activities planned for the next 5 years will focus on four activity areas:

- Expand circumpolar surveillance and research for infectious diseases, non-communicable diseases, trauma, injury, sanitation services, and indoor air quality to help prevent morbidity and mortality by the end of 2015.
- Continue interagency collaboration to monitor the impacts of climate change and environmental contaminants on human health and wildlife by the end of 2016.
- Support investigator-initiated research in major health priority areas such as mental health including substance abuse and suicide, obesity, diabetes, and cancer by the end of 2017.
- Continued engagement with indigenous communities and tribal groups in health related research activities and projects in the Arctic.

Measuring Progress: Progress will be measured through milestones detailed in the Arctic Research Plan and reductions in human and wildlife disease.

Lead Agency: Department of Health and Human Services

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), National Science Foundation, Smithsonian Institute

Chart the Arctic Region

The National Oceanic and Atmospheric Administration, the U.S. Coast Guard, the U.S. Navy, the U.S. Geological Survey, the U.S. Army Corps of Engineers, the State Department, and other Federal partners collaborate to improve marine charting in the Arctic (Integrated Ocean and Coastal Mapping) and topographic mapping (Alaska Mapping Executive Committee). The latter effort is in close collaboration with Alaska's Statewide Digital Mapping Initiative.

Objective: Coordinate the surveying, mapping, and charting of U.S. Arctic waters, hydrography, shorelines, and topography to efficiently create and update products to facilitate safe and environmentally sound marine transportation. Assess opportunities to improve product utility to the Arctic coastal community to address climate change adaptation strategies, storm surge readiness, energy development, emergency response, ecosystem science and stewardship, and extended continental shelf delineation.

Next Steps: To meet this objective, the Federal Government in the next 5 years will strive to:

- Complete acquisition of U.S. Arctic elevation data and geoid model development.
- Transition to Arctic water level gauge operations.
- Increase public access to existing Arctic mapping data sets.
- Increase the amount of hydrographic data acquired/linear nautical miles of shoreline mapped.
- Increase the percentage of the Bering Strait surveyed and charted for potential International Maritime Organization Routing Measures and Waterway Operating Rules.
- Increase the percentage of potential U.S. Arctic deep draft ports and harbors of refuge surveyed and charted.
- Increase the percentage of U.S. Arctic with comprehensive topographic mapping products.

Measuring Progress: Progress will be measured through the ability to update and access geospatial data and enhanced safe navigation and science.

Lead Agency: Department of Commerce (National Oceanic and Atmospheric Administration)

Supporting Agencies: Department of Defense, Department of Homeland Security (United States Coast Guard), Department of the Interior, Department of State, Department of Transportation

Strengthen International Cooperation

Implementation of all aspects of the Strategy recognizes that international engagement and cooperation is critical for success. This section is primarily focused on the efforts of international bodies, such as the Arctic Council and the International Maritime Organization. The United States will continue to use other multi-lateral venues, such as the Northern Chiefs of Defense forum and Arctic Security Forces Roundtable, and bilateral initiatives to strengthen cooperation in support of the Strategy. The Administration will continue to work within the Federal Government to influence domestic activities that have global impacts, including the United States becoming a party to the Convention on the Law of the Sea.

Pursue Arrangements that Promote Shared Arctic State Prosperity, Protect the Arctic Environment, and Enhance Security

Promote Arctic Oil Pollution Preparedness, Prevention, and Response Internationally

Objective: Implement international agreements consistent with domestic activities to reduce the risk of marine oil pollution while increasing global capabilities for preparedness and response to oil pollution incidents in the Arctic.

Next Steps: Next steps in this process include:

- Continue to coordinate with Russia, under the Russia-US Joint Contingency Plan, to enhance oil pollution preparedness and response in light of increasing vessel traffic and resource extraction, including conducting either a joint response seminar or exercise by the end of 2015.
- Participate in joint international training and related exercises pursuant to the *Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic* during the Canadian chairmanship of the Arctic Council.
- Continue to strengthen cooperation with Canada to implement Canada-U.S. Joint Contingency Plan for oil spills in the Beaufort Sea, including joint exercises by the end of 2015.
- Participate on the Arctic Council Task Force on Oil Pollution Prevention to reduce risks of incidents.

Measuring Progress: Oil pollution preparedness metrics are challenging to measure and readiness is best demonstrated through a response to an actual incident. However, progress can be gauged during joint international exercises that test the effectiveness in notification, response times and mobilization of resources to support trans-boundary pollution incidents.

Lead Agency: Department of Homeland Security (United States Coast Guard)

Supporting Agencies: Member Departments and Agencies of the United States National Response Team

Enhance Arctic Search and Rescue

Objective: Implement the *Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic*⁹, mitigate vulnerabilities, and maximize international cooperation with respect to Arctic search and rescue.

Next Steps: Implement the 2011 Arctic Search and Rescue Agreement and other international search and rescue (SAR) agreements relevant to the Arctic region through SAR information exchange, training, exercise participation, capacity building and the provision of mutual assistance as necessary. Next steps to strengthen search and rescue capabilities in the Arctic will include:

- Institutionalize international Arctic SAR exercises sponsored by the rotating chair of the Arctic Council by the end of 2015.
- Develop comprehensive understanding of national, state, regional, and, through Arctic Council coordination, international SAR resources potentially available in the region by the end of 2017.

Measuring Progress: SAR metrics are challenging to measure, but readiness may be gauged through comprehensive training, exercises, and drills designed to rigorously test and continually improve notification and response times. Progress may be measured by identification and application of lessons learned to future exercises, national SAR plans, policies and procedures.

Lead Agency: Department of Homeland Security (United States Coast Guard)

Supporting Agencies: Department of Defense, Department of State, Department of Transportation

Prevent Unregulated Arctic High Seas Fisheries

Objective: Negotiate an international agreement to ensure that appropriate fisheries management measures are in place before commercial fishing commences in the high seas area of the central Arctic Ocean and to promote cooperative scientific research relevant to future fisheries.

Next Steps: Continue negotiating among international partners to build upon a series of Arctic fisheries science and policy meetings that have taken place over the past several years to:

- Establish baseline conditions and define information needs for monitoring changes that might influence patterns of distribution and abundance of fish in the Arctic Ocean by the end of 2016.
- Continue work toward an international agreement that commits all parties to restrict their vessels from conducting commercial fishing in the high seas area until both adequate scientific information on which to manage such fishing and an international mechanism for fisheries management are available.

⁹ Signed by Secretary of State Hillary Rodham Clinton, May 12, 2011.

Measuring Progress: Progress will be measured by the development of an international agreement, supported by key nations, which prevent unregulated commercial fisheries in the high seas portion of the central Arctic Ocean before the establishment of appropriate fisheries management measures.

Lead Agency: Department of State

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Homeland Security (United States Coast Guard)

Reduce Transport of Contaminants

Objective: Reduce the emission and transport of hazardous and persistent contaminants both within and from outside the Arctic region, including persistent organic pollutants and mercury.

Next Steps: Multilateral initiatives anticipated to occur between 2014 and 2018 include:

- Pursue becoming a party to the *Stockholm Convention on Persistent Organic Pollutants*¹⁰.
- Support the Arctic Council's Arctic Contaminants Action Program efforts to implement a project to reduce mercury emissions from non-ferrous metals smelting impacting the Russian Arctic and an emissions control technology workshop to assist Russia in preparing to implement *The Minamata Convention on Mercury*.
- Support other activities in the Arctic to address emissions and transport of contaminants.

Measuring Progress: Progress will be primarily measured by reductions in the emissions and release of contaminants in the Arctic as demonstrated by data from relevant, available monitoring programs. In addition, information may be taken from available reports on the health and ecological impacts of contaminants in the Arctic, recognizing that many such changes require long timeframes before environmental reductions can be measured.

Lead Agency: Environmental Protection Agency

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Homeland Security (United States Coast Guard), Department of the Interior, Department of State, National Science Foundation

Identify and Assess Invasive Species Risks and Impacts

Objective: Develop, implement, and maintain an international invasive species prevention and management plan.

Next Steps: Next steps in this process include:

- Identify and assess invasive species pathways, risks, and ecosystem and economic impacts to the Arctic region by the end of 2015.

¹⁰ 2256 UNTS 119; 40 ILM 532 (2001).

- Establish baseline conditions, prepare an early detection and rapid response plan to reduce the threat of invasive species, and gather information regarding effective management options by the end of 2015.
- Develop a comprehensive invasive species prevention, control, and management plan in accordance with existing requirements by the end of 2017.
- Initiate implementation of invasive species prevention and management plans through extensive consultation with stakeholders by the end of 2019.
- Explore becoming party to the *International Convention for the Control and Management of Ships' Ballast Water and Sediments* (2004) in consideration of existing domestic regulations and standards by the end of 2014.

Measuring Progress: Progress will be measured by the extent to which impacts of invasive species are monitored across time and the integration of invasive species prevention and management plans into routine activities.

Lead Agency: Department of the Interior

Supporting Agencies: Member Departments and Agencies of the Aquatic Nuisance Species Task Force and the National Invasive Species Council

Promote Scientific Research and Monitoring

Objective: Promote scientific research and monitoring with international partners by facilitating cooperative scientific efforts and access to Arctic regions and by strengthening the means for sharing timely, accurate, and interoperable data.

Next Steps: Over the next 5 years, the United States will pursue bilateral and multilateral arrangements that:

- Promote international cooperation among scientists working in the Arctic, including through Arctic Council Task Forces, the International Arctic Science Committee, the Pacific Arctic Group and other emerging bilateral opportunities.
- Identify and support activities to fill spatial or topical gaps in existing science observing networks and in priority research foci.
- Leverage existing platforms as well as data and sample acquisition, storage, processing, and delivery systems that promote the progress of science.
- Foster exchanges of personnel, equipment, samples and data to achieve these aims.
- Ensure full and appropriate access by scientists to Arctic research sites.

Measuring Progress: Key measures for success include international cooperation for the identification and support of activities that progress science and increase free and open access to international research.

Lead Agency: National Science Foundation

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Energy, Department of Homeland Security (United States Coast Guard), Department of the Interior, Department of State, Environmental Protection Agency, National Aeronautical and Space Administration, U.S. Arctic Research Commission

Work through the Arctic Council to Advance U.S. Interests in the Arctic Region

Develop a Robust Agenda for the U.S. Chairmanship of the Arctic Council

Objective: Seize the opportunity of the U.S. Chairmanship of the Arctic Council (2015-2017) to advance Arctic priorities and to strengthen the Council as a consensus building forum.

Next Steps: Next steps in this process include:

- Conduct Arctic Policy Group preparations for U.S. Chairmanship through spring 2014.
- Hold listening sessions with targeted audiences, including partners such as the State of Alaska and Alaska natives.
- Develop an overarching theme for the U.S. Chairmanship.
- Develop high-quality project proposals with useful, concrete deliverables.
- Determine U.S. Chairmanship priorities within the Arctic Council by the end of 2014.
- Present U.S. priorities to other Arctic Council members and Permanent Participants and develop Arctic Council 2015 Ministerial Declaration by spring of 2015.
- Assume Arctic Council Chairmanship in June 2015.
- Undertake projects and initiatives through Arctic Council working groups, expert groups, task forces and other means between June 2015 and spring of 2017.
- Hold Arctic Council Deputy Ministers meeting in spring of 2016.
- Consider Presidential Arctic Summit in connection with the 20th anniversary of the Arctic Council in spring of 2016.
- Convene Arctic Council Ministerial meeting in May 2017.

Measuring Progress: Progress will be measured by the extent to which the United States oversees the completion of initiatives aligned with the National Strategy for the Arctic Region and strengthens the Arctic Council as a key forum for addressing Arctic issues.

Lead Agency: Department of State

Supporting Agencies: Department of Commerce, Department of Energy, Department of Homeland Security (United States Coast Guard), Department of the Interior, Environmental Protection Agency, National Science Foundation, U.S. Arctic Research Commission

Reduce Black Carbon in the Arctic

Objective: Strengthen assessments of black carbon emissions that affect the Arctic and implement efforts to reduce harmful emissions.

Next Steps: Take action to improve the knowledge base and develop policy. Specific steps include:

- Negotiate an Arctic Council arrangement and framework of activities on black carbon emissions reductions by the end of 2015.
- Complete a successful demonstration project with Arctic Council partners using cost-effective technologies to reduce black carbon emissions by the end of 2015.

- Develop an updated national black carbon emission inventory by the end of 2016.
- Submit recommendations to the International Maritime Organization to reduce harmful black carbon emissions by the end of 2016.
- Submit black carbon inventories to the *Convention on Long Range Transboundary Air Pollution*¹¹ by the conclusion of the U.S. Chairmanship in 2017.

Measuring Progress: Progress will be measured through international participation in the reduction of black carbon emissions affecting the Arctic supported by peer-reviewed reports.

Lead Agency: Environmental Protection Agency

Supporting Agencies: Department of Agriculture, Department of Commerce (National Oceanic and Atmospheric Administration), Department of Energy, Department of Homeland Security (United States Coast Guard), Department of Health and Human Services, Department of the Interior, Department of State, Department of Transportation, (Maritime Administration), National Science Foundation, U.S. Arctic Research Commission

Accede to the Law of the Sea Convention and Related Affairs

Accede to the Law of the Sea Convention

Objective: Continue to seek the Senate’s advice and consent to accede to the Law of the Sea Convention.

Next Steps: The Administration is committed, like the last three Administrations, to pursuing accession to the Convention on the Law of the Sea and will continue to place a priority on attaining Senate advice and consent to accession.

Measuring Progress: Progress will be measured by gaining Senate approval for the Law of the Sea Convention.

Lead Agency: Department of State

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Defense, Department of Homeland Security, Department of the Interior, Department of Transportation

Delineate the Outer Limit of the U.S. Extended Continental Shelf

Objective: Develop the U.S. submission in support of delineating the outer limit of the U.S. Extended Continental Shelf in the Arctic.

Next Steps: Continue to conduct activities in support of the United States’ Extended Continental Shelf (ECS) in the Arctic, including:

¹¹ TIAS 10541; 1302 UNTS 217; 18 ILM 1442 (1979).

- Process and interpret the seismic data, refine the base of slope, and develop a geologic framework for the U.S. ECS in the Arctic Ocean and Bering Sea through 2015.
- Complete the analyses and documentation necessary to delineate the outer limits of the U.S. ECS in the Arctic Ocean and Bering Sea through 2016.

Measuring Progress: Progress toward delineation of the outer limit of the U.S. continental shelf in the Arctic will be measured by the completion of the U.S. Extended Continental Shelf Task Force analysis, preparation of the necessary documentation, and submission of a well-supported delineation of the U.S. Extended Continental Shelf in the Arctic and elsewhere in accordance with the Convention on the Law of the Sea.

Lead Agency: Department of State

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Defense, Department of Homeland Security, Department of the Interior (United States Geological Survey)

Resolve Beaufort Sea Maritime Boundary

Objective: Work toward a maritime boundary in the Beaufort Sea that is agreed between the United States and Canada.

Next Steps: Assuming a willingness of the Canadian Government to pursue maritime boundary negotiations, next steps in this process include:

- Undertake careful legal and technical review of issues relating to a potential boundary agreement (on-going).
- Consult with State of Alaska and full range of other partners and stakeholders.
- Complete bilateral technical work with Canada that would underpin a potential boundary agreement.
- Embark on actual negotiations with Canada on a potential boundary agreement.

Measuring Progress: Progress will be measured by the success in reaching an agreement with Canada that is based on careful preparation and full consultation with U.S. interests.

Lead Agency: Department of State

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of the Interior (United States Geological Survey)

Cooperate with other Interested Parties

Expedite International Maritime Organization (IMO) Polar Code Development and Adoption

Objective: Develop and implement a mandatory international code for ships operating in polar waters (Polar Code), which includes the full range of design, construction, equipment, operational, search and rescue and environmental protection matters relevant to ships operating in the remote and inhospitable waters surrounding the two poles.

Next Steps: The United States continues to serve as a leader on the development of the IMO Polar Code and anticipates completion in 2014. The United States will continue to work diligently to expedite the entry of the Code into force as soon as legally possible.

Measuring Progress: Progress will be measured by the timely entry into force of the elements of the Code and the degree to which the Code results in improved safety and environmental standards for ships operating in the Arctic.

Lead Agency: Department of Homeland Security (United States Coast Guard)

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Defense, Department of State, Department of Transportation (Maritime Administration), Environmental Protection Agency, National Science Foundation

Promote Arctic Waterways Management

Objective: Develop Arctic waterways management regimes including traffic separation schemes, vessel tracking, and ship routing in cooperation with international partners to promote safe maritime transportation in the Arctic region.

Next Steps: The Federal Government will promote the safe, secure, efficient and free flow of maritime traffic through waterways management by:

- Complete a Waterways Analysis and Management System assessment to support decisions on the management of maritime traffic and other navigational priorities by the end of 2014.
- Complete the Bering Strait Port Access Route Study by the end of 2016.
- Develop appropriate regulations and proposals for submission to the IMO.

Measuring Progress: Progress will be measured by the establishment of a reliable and safe waterways management system in the U.S. Arctic that is supported by casualty metrics and has international recognition through the IMO.

Lead Agency: Department of Homeland Security (United States Coast Guard)

Supporting Agencies: Department of Commerce (National Oceanic and Atmospheric Administration), Department of Defense, Department of Transportation

Continuous Assessment and Adaptation

The Implementation Plan will be reviewed on an annual basis to ensure that progress continues to be made in positioning the United States to best prepare and respond to changes, challenges, and opportunities in the Arctic region. Federal departments and agencies will report on progress made against these implementation actions through an annual report to the President. The Implementation Plan of the Strategy will be revisited after 5 years to ensure that it still meets the intent and priorities of the Nation.