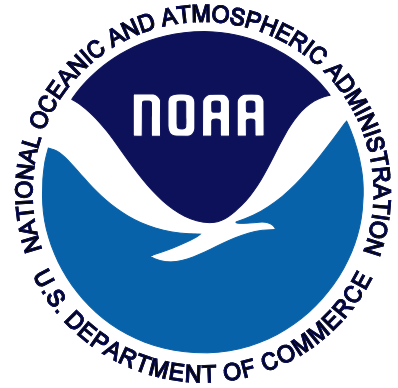




Dr. Jane Lubchenco
Under Secretary of Commerce for
Oceans and Atmosphere



IMPLEMENTING THE NOAA NEXT GENERATION STRATEGIC PLAN: ANNUAL GUIDANCE MEMORANDUM

DECEMBER 2010

NOAA's mission is central to many of today's greatest challenges. Climate change. Severe weather. Natural and human-induced disasters. Declining biodiversity. Ocean acidification. Threatened or degraded ocean and coastal resources. These challenges convey a common message: human health, prosperity, and well-being depend upon the health and resilience of coupled natural and social ecosystems. Managing this interdependence requires timely and usable information to make decisions and the science that underpins our knowledge of these systems. NOAA's mission of science, service, and stewardship is directed to a vision of the future where societies and their ecosystems are healthy and resilient in the face of sudden or prolonged change.

- NOAA's Next Generation Strategic Plan

This Annual Guidance Memorandum (AGM) represents the first formal step toward implementing NOAA's Next Generation Strategic Plan. NOAA's strategic goals and overarching vision of resilient economies, communities, and ecosystems cannot be achieved in a short amount of time, and NOAA cannot address every challenge and opportunity in equal measure and at the same time. In the context of NOAA's long-term strategy, this AGM establishes the programmatic priorities that will shape NOAA's execution focus in FY 2011, its preparations for FY 2012, and its plans for FY 2013-17.

Priorities for FY 11 – FY 17

Within the efforts of NOAA as a whole, this Annual Guidance Memorandum will ensure a sustained focus on priorities that have been underway for some time, such as climate services and eliminating overfishing, while shaping NOAA's approach to new and expanding opportunities in the coming years such as leveraging the many contributions to our domestic mission through international partnerships. These priorities are organized according to NOAA's Next Generation Strategic Plan goals and objectives, with additional cross-cutting, place-based priorities for the Gulf of Mexico and the Arctic.

IMPLEMENTING NOAA'S STRATEGIC GOALS

Advance Climate Services: The Climate Service will bring together longstanding NOAA core capabilities—world-class research, observations, data management, monitoring, state-of-the-art models, projections and predictions, assessments, education, and engagement—into a single, more coordinated and effective organization and will leverage existing on-the-ground service delivery mechanisms across the agency. NOAA must build on these existing capabilities and grow our scientific, technological, and organizational capacity to develop and deliver a new generation of climate science and services to our partners, our customers, the public, and ourselves. While working toward Congressional approval, NOAA will continue to focus on improving our service delivery abilities.

FY 11 execution focus:

- Gain approval for and implement a Climate Service organization within NOAA;
- Continue to expand and improve information pertinent to reports such as the State of the Climate Report, National Assessment, IPCC AR5, problem-focused assessments, and needs assessments in the societal challenge areas identified in the [Vision and Framework](#) document for the climate service;
- Sustain and build key NOAA observational assets and data archives critical to maintain the climate record;
- Advance climate modeling using NOAA's high performance computing abilities;
- Expand the Climate Portal through integration across NOAA and other agencies; and
- Implement regional climate services focused on user needs, such as advancing the regional drought early warning systems through NIDIS.

Define the future of NOAA's weather and water services: As science and technology evolve, we must develop a new vision of weather and water service delivery for the future and build the scientific, technological, and organizational capacity required to achieve that vision.

FY 11 execution focus:

- Continue development of the NextGen 4-D Weather Data Cube that will provide network-enabled access to the latest weather data;
- Initiate a National Academy of Sciences study on NWS modernization;
- Provide necessary upgrades for national critical IT certification and accreditation (C&A) mediation of space weather operations system;
- Socialize Integrated Water Resources Science and Services (IWRSS) throughout the Administration and coordinate involvement of additional agencies in the IWRSS Consortium; and

- Create a federal agency-wide plan to address identified gaps in research and observing systems and NWS products needed to provide more accurate and reliable information for industry to use in the expansion of renewable energy capacity.

Ensure sustainable seafood and jobs by eliminating overfishing, rebuilding fish stocks, conserving habitat and fostering sustainable aquaculture: Eliminating overfishing, rebuilding overfished stocks, and enabling ecologically sustainable marine aquaculture helps ensure the long-term sustainability of the U.S. commercial and recreational fishing industries, coastal tourism, and related businesses that support coastal communities. NOAA must continue to implement the innovative policies and collaborative management practices needed to achieve sustainable fisheries and safe seafood.

FY 11 execution focus:

- Document the stocks for which NOAA was successful in ending overfishing in 2010;
- Continue to improve (through the Stock Assessment Improvement Plan) the number and quality of stocks that are assessed on a regular basis;
- Consider new approaches for stock assessments and management decisions;
- Continue implementing annual catch limits and accountability measures and, where appropriate, support catch share programs;
- Implement the Recreational Fishing Action Agenda and the Marine Recreational Information Program;
- Execute an aquaculture policy that complements NOAA's vision of sustainable fisheries; and
- Work collaboratively through RFMOs, publish the final rule to identify and certify nations regarding illegal, unregulated, and unreported fishing, and bycatch of protected living marine resources.

Promote stewardship of oceans and coasts by implementing the National Ocean Policy (NOP): For the first time in our nation's history, the United States has a national policy that clearly states, "healthy oceans matter." Within the nine Priority Objectives identified in the National Ocean Policy, NOAA will focus on ecosystem-based management, coastal and marine spatial planning, resiliency and adaptation to climate change and ocean acidification, and observations, mapping, and infrastructure.

FY 11 execution focus:

- Implement the National Ocean Policy (NOP) through interagency engagement and leadership to develop the nine Priority Objective Strategic Action Plans;
- Lead the interagency efforts in four of the Priority Objectives: Coastal and Marine Spatial Planning (CMSP); Ecosystem Based Management (EBM); Resiliency and Adaptation to Climate Change and Ocean Acidification; Ocean, Coastal, and Great Lakes; and Observations, Mapping, and Infrastructure;
- Conduct national and regional workshops and outreach efforts with NOAA stakeholders across the country to promote understanding and implementation of the NOP;
- Develop and launch a CMSP data portal and National Information Management System with interagency partners;
- Engage with the regional ocean partnerships, state governments, international partners and tribes to strengthen regional approaches to ocean and coastal conservation, particularly in the Gulf of Mexico, in the Arctic, and in regions with active CMSP efforts underway;

- Identify opportunities for new interagency partnerships to leverage resources and address National Ocean Policy priority objectives; and
- Work to gain consensus on interagency integration and data standards.

IMPLEMENTING NOAA'S ENTERPRISE OBJECTIVES

Strengthen science: Strengthening NOAA's science means developing policies and practices that promote scientific and technological excellence and enabling scientists within NOAA to thrive and pursue the research necessary to inform our service and stewardship responsibilities. NOAA's long-term scientific and technical challenge is to develop and apply holistic, integrated Earth system approaches to understand how changes in the atmosphere, ocean, space, land surface, and cryosphere interact with ecosystems, organisms, and humans. Working with our partners in academia, the international community and elsewhere, we must embrace this challenge and focus on the integrated observations and data collection, model development, and physical and social science research needed to enhance understanding of Earth systems, their interactions, and the services they provide.

FY 11 execution focus:

- Plan and execute a NOAA science conference or series of workshops to build on Grand Challenges and strengthen ties with the external science community;
- Establish NOAA scientific integrity and conduct policies, support recruitment and retention of scientists through development of a more robust science career track;
- Work to diversify NOAA's scientific staff;
- Create a training module that promotes a scientific code-of-conduct and ethics for all NOAA staff;
- Develop a NOAA-wide ecosystem science plan that incorporates social and economic sciences in support of the National Ocean Policy and NOAA's strategic goals, including new approaches to tradeoff analyses; and
- Continue to play a leadership role in bilateral and multilateral fora to capitalize on expertise, technology, and capabilities not resident within NOAA.

Continuously improve internal business operations and services: NOAA will focus on continuously improving its organizational efficiency and effectiveness. Improved business operations will result in more effective services and enhanced partnerships and business relationships.

FY11 execution focus:

- Improve workforce development;
- Improve program and acquisition management;
- Improve performance management;
- Implement hiring reform; and
- Implement NOAALink for IT procurement.

PLACE-BASED PRIORITIES

Support recovery in the Gulf of Mexico: The Deepwater Horizon (DWH) oil spill has focused unprecedented attention on the Gulf of Mexico region. In collaboration with federal, state, and local partners, NOAA is committed to the long-term restoration of the Gulf of Mexico and to understanding lessons that can be applied in other regions for strengthening contingency response

and sustained recovery and restoration efforts necessary to realize our vision of healthy ecosystems, communities, and economies that are resilient in the face of change.

FY 11 execution focus:

- Continue assessment of loss of use of natural resources from the DWH oil spill through the Natural Resource Damage Assessment (NRDA) process;
- Engage the public by providing information about the NRDA process and soliciting comments and input on the NRDA restoration plan;
- Support Gulf Coast Ecosystem Restoration Task Force in developing the Gulf of Mexico Ecosystem Restoration Strategy;
- Champion scientific research and environmental monitoring and forecasting programs in the Gulf, including the development of a long-term science plan for the region;
- Work with other agencies and partners to increase understanding of and ways to mitigate or alleviate impacts of the DWH spill on human health and well being;
- Provide ongoing real-time and on-site marine wind, wave, and weather support to operations for recovery, restoration, and sustained commerce; and
- Promote coordination between the Gulf Coast Ecosystem Restoration Task Force and other entities, such as the National Ocean Council and the Gulf of Mexico Alliance, and more broadly with the other nations that share the Gulf.

Improve understanding, planning, and environmental protection in the Arctic: The Arctic contains diverse and unique ecosystems and abundant natural resources. The region is also significant because changes in its climate and ecosystems have global impacts. As the region opens up to new development and use, we are challenged to ensure we have the data and information necessary to make wise decisions that consider the complex interactions of the region's culture, economy, weather, and environment. A strategic approach that leverages NOAA's existing priorities and strengths, as well as those of our national and international partners, is needed. NOAA must engage its diverse and unique capabilities and associated data and information products to rapidly address the emerging environmental, social, economic, safety, and national security issues in the Arctic.

FY 11 execution focus:

- Sign an MOU with the Bureau of Ocean Energy, Management, Regulation, and Enforcement that allows NOAA to engage earlier in the Outer Continental Shelf development process and assist with environmental analyses and related assessments in their upcoming efforts;
- Ensure NOAA's active engagement in and support for Arctic science, observations and management through bilateral mechanisms and cooperation with Russia and Canada, including the use of Unmanned Aircraft Systems and the Russia Arctic research cruise;
- Implement recommendations of the 2009 Arctic Marine Shipping Assessment Report and prepare the Arctic Ocean Review governance report through lead role in the Arctic Council Working group on the Protection of the Arctic Marine Environment;
- Produce operational sea ice condition outlooks on a variety of timescales;
- Further develop and disseminate marine weather forecasts and warnings in U.S. Arctic waters;
- Promote use of integrated approaches to management and stewardship in the Arctic;
- Engage through the National Ocean Council and other interagency Arctic science and policy bodies (such as the Oceans and Arctic Interagency Policy Committees and the Committee on the Marine Transportation System) on Arctic issues and policy implementation; and

- Continue Arctic survey and mapping activities supporting Extended Continental Shelf delineation under the United Nations Convention on the Law of the Sea and through the International Hydrographic Organization (IHO) Regional Hydrographic Commission.

Alignment of AGM Priorities with NOAA’s Next Generation Strategic Plan

	NGSP Strategic Goals				NGSP Enterprise Objectives		
	Climate	Weather	Oceans	Coasts	S&T	Engage	Org/Ad
Implement a Climate Service	✓				✓	✓	✓
Define the future of NOAA’s weather and water services		✓			✓	✓	✓
Eliminate overfishing, rebuild fish stocks, conserve habitat and foster sustainable aquaculture			✓		✓	✓	✓
Implementing the National Ocean Policy (NOP)	✓		✓	✓	✓	✓	✓
Strengthen science	✓	✓	✓	✓	✓	✓	✓
Place-based focus: Gulf of Mexico			✓	✓	✓	✓	✓
Place-based focus: Arctic	✓	✓	✓	✓	✓	✓	✓

These priorities emerged from NOAA’s assessment of accomplishments and developments over the past year and the most urgent steps needed to begin implementing the Next Generation Strategic Plan. They reflect input from NOAA’s Line Offices, Staff Offices, and Regional Collaboration Teams, and were informed by deliberations during a leadership retreat in early October. The following section provides a brief overview of NOAA’s accomplishments in the context of last year’s priorities, followed by specific guidance for implementing NOAA’s strategic goals and objectives over the planning period.

Looking Back: FY 10 Accomplishments

With the support of Secretary Locke and the Department of Commerce, NOAA’s Line and Staff Offices pulled together to address the Administrator’s AGM priorities for FY 2010 and generated several significant accomplishments:

- **The Climate Service:** NOAA has advanced key service areas such as building out the Climate Portal, continuing our progress on drought services through NIDIS, and supporting assessments that help promote understanding and applications of climate science. As required by Congress, the National Academy of Public Administration (NAPA) completed a study that reinforced our proposed Climate Service line office approach, and concluded that a Climate Service in NOAA would be uniquely qualified as a lead federal agency for climate research and services. Using input from NAPA and various other internal and external stakeholders, NOAA developed a reorganization proposal supported by the Administration. The reorganization will help the agency fulfill society’s growing needs for climate information that helps individuals, businesses, and communities make informed decisions.
- **Coastal and marine spatial planning:** NOAA’s leadership in and commitment to sustainably managing our ocean, coastal, and Great Lakes resources can be clearly seen in the Final Recommendations of the President’s Interagency Ocean Policy Task Force, which were adopted by Executive Order 13547 in July 2010. Included in the Final Recommendations is a Framework for coastal and marine spatial planning (CMSP) that is aligned with NOAA’s strategic objectives

for CMSP. To further NOAA's leadership role in execution of the CMSP Framework, NOAA has established an agency-wide CMSP Program based in the National Ocean Service to coordinate our implementation of the Framework and to ensure that NOAA continues to be positioned to engage with our partners at the national and regional levels and to provide the tools and information needed for CMSP decision making.

- **Sustainable marine fisheries and aquaculture:** NOAA has remained committed to ensuring that fisheries management is ecosystem-based and driven by the best available science. Rebuilding stocks, ending overfishing, and enabling sustainable marine aquaculture ensures the long-term sustainability of our fisheries and our coastal communities. On December 10, 2009, NOAA released the draft catch share policy. The draft NOAA policy encouraged the voluntary use of well-designed catch share programs in appropriate fisheries to help rebuild and sustain fisheries and support fishermen, communities and vibrant working waterfronts. Since that time, NOAA staff have worked to finalize the policy, considering input from interested parties throughout the country. NOAA staff have also supported Regional Fishery Management Councils in the Northeast, Gulf of Mexico, and West Coast in developing catch share programs. NOAA's approach to implementing catch shares will continue to empower local fishermen to be part of the management and scientific assessment processes. Additionally, NOAA successfully engaged the recreational fishing community to consider shared goals in ecosystem management. The Recreational Saltwater Fishing Summit, in April 2010, brought together more than 100 recreational fishing interests from across the country to address a number of issues. From this conference, NOAA released an Action Agenda that will serve as a roadmap for furthering connections to the recreational community and appointed a Senior Recreational Fishing Advisor to oversee its implementation.
- **Arctic science and service:** Increasing air and ocean temperatures, thawing permafrost, loss of sea ice, and shifts in ecosystems are evidence of widespread and dramatic ongoing change in the Arctic. Given the environmental, economic, and national security issues associated with this region, NOAA developed an integrated strategy for action – in conjunction with the National Ocean Policy – for mobilizing its distinctive capabilities to forecast sea ice as well as routine and extreme weather-related events, strengthening our scientific understanding of regional climate and ecosystem dynamics, improving ocean and coastal resource management in the region, developing national and international partnerships to share data and information, and improving the resilience of Arctic communities and economies. NOAA's *Arctic Vision and Strategy* will guide agency actions and interagency and international engagement in the region for years to come.
- **Satellite-based earth observations:** Over the course of this year, NOAA thoroughly revised the management structure of the National Polar-orbiting Operational Environmental Satellite System (NPOESS) and navigated a complex transition to the Joint Polar Satellite System (JPSS). A new NOAA-NASA program management structure is now in place, and NOAA anticipates steady progress to plan in achieving its critical mission objectives with this observing system. NOAA also achieved significant milestones by concluding agreements to provide continuity of sea level rise data from the U.S.-European Jason-3 mission and for GPS radio occultation data from the U.S.-Taiwan COSMIC-2 mission.

In addition to progress made towards the priorities in last year's AGM, several other accomplishments from this year merit recognition:

- **Strengthen science:** Driven by the principles of scientific excellence and integrity, NOAA took a series of steps to strengthen science across NOAA in 2010. This included holding the first NOAA-wide workshop that convened practicing scientists and research managers to establish a long-term science vision for NOAA and identify the Grand Challenges we face across our mission areas. The NOAA Research Council also developed a new Administrative Order for NOAA outlining the requirements for enterprise monitoring and evaluation of Research and Development with the goal of optimizing the allocation of R&D resources and ensuring NOAA's research is of the highest quality and is meeting NOAA's mission requirements.
- **Deepwater Horizon oil spill:** It is especially noteworthy that our other accomplishments were achieved even as we mobilized to respond to the Deepwater Horizon oil spill. NOAA was on site from day one, providing oil spill trajectories, protecting seafood safety, providing continuous weather information, and conducting science and monitoring to better understand the challenges facing the region. NOAA personnel helped federal response coordinators more effectively deploy resources to minimize damage and protect highly sensitive ecosystems and wildlife habitats. The continuous release of oil for 87 days—5,000 feet deep in the Gulf of Mexico—challenged our response capabilities and technologies. But NOAA scientists and managers rose to the occasion and developed unique science-based solutions to solve the complex problems resulting from this unique incident. In addition, from the beginning NOAA has been involved as a Natural Resource Damage trustee for federal resources under the Oil Pollution Act to work with other federal and state trustees to develop approaches to assess the damage and begin the restoration process. The Gulf oil spill is the largest marine oil spill in U.S. history and will result in long-lasting impacts to the economy and the environment of the Gulf coast. Although the well is sealed, efforts to understand and mitigate the full consequences of the spill – on marine and coastal ecosystems, on wildlife and habitats, on seafood abundance and safety, and on the health and livelihoods of those who live along the Gulf Coast – will require a sustained and coordinated response by NOAA and diverse external partners.
- **The National Ocean Policy:** On July 19, 2010 the President signed Executive Order 13547, announcing the National Policy for Stewardship of the Ocean, Our Coasts, and the Great Lakes (National Ocean Policy) and establishing a National Ocean Council to improve national coordination and leadership. Based on the understanding that the nation's well-being depends upon healthy and resilient ocean, coastal, and Great Lakes ecosystems, the National Ocean Policy prioritizes nine key categories for action that seek to address the most pressing challenges facing the ocean, our coasts, and the Great Lakes. NOAA played a central role in developing the policy, including connecting with stakeholders through a series of regional meetings, and is committed to collaborating with our sister agencies and external partners to help implement the policy and underlying stewardship principles. The NOAA Ocean and Coastal Council has begun to coordinate activities related to the National Ocean Council, including establishing nine priority objective teams to help engage in and inform the interagency process. In addition, NOAA leadership has been traveling throughout the country talking to NOAA staff and partners about the goals of the National Ocean Policy and the importance of participating in this historic opportunity.

Guidance for NOAA's Strategic Goals and Enterprise Objectives

This section provides specific guidance for implementing NOAA's strategic goals and objectives over the planning period, FY 2011-17. To achieve these priorities NOAA must seek synergies across Line Offices and collaborate with other governmental partners, academia, the private sector, international and non-governmental organizations. During a time of fiscal constraints, NOAA's local, regional, national, and international partners can help leverage resources and provide innovative ideas in support of NOAA's mission. As the challenges NOAA must address become more complex, the agency also will need increasingly sophisticated scientific, technological, and organizational mechanisms for understanding user needs and engaging stakeholders and customers at local, regional, and international levels. Across all strategic goals and objectives, NOAA's success and benefits to society will depend upon our capacity to engage and collaborate with our partners, stakeholders, and the public.

CLIMATE ADAPTATION AND MITIGATION

AGM Focus: Advance Climate Services

Year after year the nation's demand for easily accessible, timely, and reliable scientific climate information escalates. To meet the growing demand, NOAA is fundamentally changing the way it delivers climate services to focus on connecting climate science to decision making. The proposed Climate Service will focus on building new connections between NOAA's historic strength in scientific understanding of climate, and the needs of resource management and commerce. NOAA will continue to actively work towards Congressional approval of our Climate Service proposal. This proposal will allow NOAA to establish a sound administrative foundation as the basis for maintaining a healthy interaction between the elements of climate science and service, and organize climate assets under a single line of accountability and management. However, NOAA must continue to enhance integration and coordination across line offices in order to advance strategic objectives. NOAA has already identified areas that require high levels of interdependencies across the agency, such as creating a seamless suite of weather to climate products, integrating regional climate services, and mainstreaming climate change science into coastal, water, and marine ecosystem resource management decisions. There are many more such examples, and NOAA employees must continue to reach across programs and lines, explicitly recognize our interdependencies, and use formal mechanisms such as service level agreements to advance our common objectives.

NOAA's long-term strategy for climate adaptation and mitigation is focused on objectives to ensure we can improve scientific understanding of the climate system, and then apply this knowledge using data, information, and products to support adaptation and mitigation choices. Recognizing that no single agency can meet the rising demands alone, NOAA is broadening and deepening its partnerships with the public, private, and nonprofit sectors to deliver climate services through a strengthened national climate service enterprise. Furthermore, NOAA recognizes that users want climate information on time and spatial scales relevant to the decisions they are trying to make. Leveraging NOAA's regional enterprise, as well as interagency assets and activities such as the National Assessment, will be key in ensuring user demands are understood and addressed.

Programmatically, NOAA must sustain its core climate capabilities of observations and monitoring, research and modeling, predictions and projections and the development of decision support and other climate services. NOAA will enhance climate services in four key areas: resilient coasts,

sustainable marine ecosystems, water resource management and changes in climate extremes. In order to do this NOAA must maintain the climate record through sustained observations and monitoring the changing state of global, national, and regional climate. NOAA must also continue to provide stewardship for the remotely sensed and in-situ data including the development of new climate data records. NOAA will build out the National U.S. Climate Reference Network, carbon observing network, a new Regional U.S. Climate Reference Network, and maintain its contribution to the Global Ocean Observing System. It will provide climate quality data stewardship for its satellite measurements. The State of the Climate Report will be expanded to include key socio-economic impacts. NOAA will support a variety of climate research, including: climate predictability, the role of the oceans in climate, regional scale climate processes and their impacts, understanding the impacts of greenhouse gases and aerosols, carbon biogeochemistry, sea-level change, as well as linkages to water cycle and air quality. NOAA will utilize its substantial new high-performance computing resources to strengthen climate modeling, especially at regional scales. It will implement regional drought early warning systems across the country. It will support the growth of the U.S. climate service provider community including the private sector, and coordinate the activities of the Regional Climate Services Directors and regional NOAA partners. NOAA plans to provide access to more data sources, audience focused communications and education resources via the Climate Portal, support national and international assessments, and provide attribution services to support assessments.

WEATHER-READY NATION

AGM focus: Define the future of NOAA's weather and water services

NOAA's weather and water products and services save lives, protect property, and promote economic well being. But sustaining our commitment to existing services, while continuing to improve our capacity to fulfill the nation's weather forecasting needs, requires targeted investments to shore up aging infrastructure, reduce risk, improve scientific understanding, and implement enhanced services. Today's services, and the societal benefits they provide, build upon decades of advancements by our skilled workforce and are realized from investments in innovative science and technology to enhance weather and water forecasts, including effective and collaborative transition efforts between research and operations. Public response to our warnings is ensured through education, outreach, and partnerships, but relies on robust observation, computation, data management, and telecommunication systems to reach individuals and communities in harm's way.

As a step towards defining future services, NOAA's National Weather Service will begin pilot projects in support of decision support activities and aligned with technology infusion plans. These projects will begin to identify the workforce skills needed in the future by, for instance, working with emergency managers to determine what information they need and how to present it in understandable formats that inform critical decisions.

Essential to meet the ever-increasing demand for comprehensive and integrated weather, water, and climate information is the four dimensional digital database of rapidly updated, high-resolution, probabilistic weather information consistent across space and time – the 4-D Weather Data Cube– along with essential tools needed to derive forecasts and warnings and guide decisions. This capability does not presently exist within the federal government; the Federal Aviation

Administration and others are relying on NOAA, as the federal expert in the provision of weather information, to develop and deliver it.

New sensing systems and data sets will come on line during FY 2012-2016. The amount of new observations, data assimilation, and computational model runs cannot be processed using current NWS IT infrastructure; networks must be upgraded to exploit these data. NWS needs to ensure the networking and computational infrastructure is in place to receive and use the observations coming online with new satellite systems and to provide adequate backup capabilities to eliminate operational risks for the NWS Telecommunications Operations Center.

Across all water management sectors, decision makers need a new generation of water information, forecasts, and decision support tools to effectively manage water resources and guide critical decisions involving lives and livelihoods. NOAA must implement Integrated Water Resources Science and Services (IWRSS) to integrate water information from multiple federal agencies, to increase the accuracy and timeliness of water information and associated uncertainties, and to deliver an accessible new suite of national, high-resolution water resources information and forecasts. In collaboration with federal partners, NOAA will begin implementing the technical, water science, and human dimensions of IWRSS.

HEALTHY OCEANS

AGM focus: Provide sustainable seafood and jobs by eliminating overfishing, rebuilding fish stocks, conserving habitat and fostering sustainable aquaculture

Overfishing degrades the ecological and economic sustainability of fisheries, negatively affecting fishing communities, the industry, recreational interests, and living marine resources. Eliminating overfishing, rebuilding overfished stocks, and enabling sustainable marine aquaculture are essential for achieving fish populations that can produce maximum sustainable yields, ensuring the long-term sustainability of commercial and recreational harvests, and maximizing the economic and social benefits of sustainable fisheries and safe seafood.

NOAA must continue its efforts to end overfishing by: implementing annual catch limits and accountability measures; promoting effective catch share programs; combating illegal, unregulated, and unreported fishing; improving enforcement outreach and compliance assistance; negotiating and enforcing sustainable management measures; continuing to strengthen partnerships with the Regional Fishery Management Councils and international fisheries management organizations; and supporting and revitalizing fishing communities. NOAA must also continue to improve its enforcement policies and procedures and establish more collaborative and effective working relationships with fishermen and to make strides in changing the composition of our workforce. Improving the scientific basis for management decision making includes strategic investments in assessments, technology, cooperative research and data management. To advance a more holistic approach to sustainable fisheries, NOAA must develop and implement a national aquaculture policy that complements healthy fisheries and creates vibrant fishing industries and employment opportunities in marine aquaculture.

While continuing to implement NOAA's strategy and policies for eliminating overfishing and increasing confidence in enforcement practices, NOAA also must envision the future of fisheries

management in light of changing long-term environmental conditions (such as those induced by climate change and ocean acidification), continued increases in demand for seafood, and the availability of new technologies for stock assessments and analyses of ecosystem interactions.

AGM focus: Promote ecosystem-based management by implementing the National Ocean Policy

Ecosystem-based management (EBM) is an approach to resource management that considers the entire ecosystem, including humans. The goal of EBM is to maintain an ecosystem in a healthy, productive, and resilient condition so that it can provide the services humans want and need, such as clean water, safe seafood, recreational opportunities, absorption of carbon dioxide, and flood protection. It requires managers to balance competing demands on ecosystems via improved understanding and predictions of ecosystem services, function, and resilience and of interactions and feedbacks between human and natural systems. NOAA will inform and support holistic EBM by building our capacity to understand and measure ecosystem services and the mechanisms that limit or reduce those services to society. In addition, NOAA will provide guidance to Fishery Management Councils on methods to implement ecosystem based fisheries management (EBFM) at the regional level.

To provide the scientific basis for EBM, NOAA must create a science framework that improves our understanding of ecosystems and of interactions between human and natural systems on a regional and international scale. One of several efforts underway is the development of regional Integrated Ecosystem Assessments (IEAs). An IEA is a comprehensive integration of diverse ecosystem data with economic and social science data, which is used to evaluate benefits and risks to social and ecological sectors posed by management actions and to continually evaluate performance. The Comparative Analysis of Marine Ecosystem Organization (CAMEO) Program is one example where NOAA, in partnership with the National Science Foundation (NSF), is focusing on how ecosystems respond to perturbations, the nature of those interactions, and the connections between and within ecosystems, with special emphasis on the pressures of climatic variability on ocean and coastal resources. Other important efforts underway by NOAA and in collaboration with national and international partners include work on the valuation of ecosystem services, the importance of biodiversity in sustaining ecosystem services, and ocean health threats and benefits. Developing the science associated with quantifying ecosystem services is essential to planning and management activities.

RESILIENT COASTAL COMMUNITIES AND ECONOMIES

AGM focus: Promote coastal and marine spatial planning by implementing the National Ocean Policy

Coastal and marine spatial planning (CMSP) is an integrated and proactive management approach to better determine how the ocean, coasts, and Great Lakes are sustainably used and protected. It moves us away from the current sector-by-sector, statute-by-statute approach toward a management system that can properly account for and predict cumulative impacts, sustain multiple ecosystem services, and explicitly evaluate the tradeoffs associated with proposed alternative use scenarios. CMSP builds upon and enhance Federal, State, tribal, local, regional, and transboundary decision-making and planning processes to ensure healthy and resilient oceans, coasts, and Great Lakes ecosystems. The intent is to design a more coherent, efficient, and transparent way to comprehensively manage multiple uses of the marine environment in a sustainable manner,

minimize conflicts among uses and with the environment, facilitate compatible uses, and provide more certainty for commercial and business interests. CMSP is intended to provide a better framework for application of existing laws and agency authorities, but is not intended to supersede them.

NOAA's commitment to CMSP will require the agency to effectively engage national, regional, and local partners in the coastal and marine spatial planning process, and with international partners, where appropriate. NOAA will also create and provide enhanced predictive and scenario models, observation data, decision tools and services, and best practices to inform spatial planning, management, and stewardship of resources and ecosystems. The role of NOAA's new CMSP Program is to support the Agency's engagement in the development and eventual execution of regional CMS plans. To this end, the program will focus on three core functions: 1) providing leadership and support for regional CMS planning and implementation; 2) strengthening CMSP science, data integration and technology capacity; and 3) enhancing and coordinating NOAA's internal CMSP efforts. These increased capacities will allow NOAA to engage with and support the regional, state, and local partners that choose to opt in to the planning process.

Advancing this priority requires NOAA to formalize the establishment of the NOAA CMSP Program, including the identification of regional leads and staff for engagement with the regional planning bodies, integrating regional data from a wide variety of sources, and beginning regional assessments where appropriate. NOAA will provide grants (pending appropriation) to support Regional Ocean Partnerships and other resources for tool development. The CMSP Program will coordinate planning across NOAA, and with federal and outside including international partners, to manage and integrate data into CMS planning, evaluation, and adaptive management. NOAA is committed to ensuring regional decision-making processes that are science-based and participatory, and in which important ocean and coastal areas can be identified and managed appropriately to ensure sustained viability and ecosystem services.

AGM Focus: Promote resiliency and adaptation to climate change and ocean acidification by implementing the National Ocean Policy

NOAA must provide the information services that communities, natural resource managers (e.g., fisheries management councils), industries, and others need to reduce the vulnerability to risks associated with changing climate conditions and ocean acidification. NOAA will make significant progress in providing products and services that allow states and local communities to assess and understand vulnerabilities to climate change, ocean acidification and coastal hazards; develop knowledge, skills, and capabilities to address and improve resilience of ocean and coastal resources and the communities that depend on them; develop, implement, and share effective adaptation strategies and policies; minimize environmental, social, and economic impacts from coastal and climate hazards; and adopt risk reduction measures.

To increase in the percentage of U.S. coastal states and territories demonstrating annual improvements in resilience to coastal and climate hazards, NOAA will conduct and evaluate adaptation demonstration projects in each Sea Grant state and improve the national geospatial framework through activities such as airborne gravity collection and expansion of national VDatum. To help coastal decision makers and community leaders make informed decisions, NOAA will develop improved monitoring and modeling and other products and tools for the management community to address, such issues as ocean acidification and coastal inundation, as well as to

upgrade coastal inundation tools and expand coverage to the Gulf of Mexico and West Coasts. For effective community plans and strategies, NOAA will develop and deliver training and technical assistance to communities that improve a community's readiness to cope with natural and human-induced coastal hazards and that build the capacity of local communities to characterize exposure to hazards and climate change.

SCIENCE AND TECHNOLOGY ENTERPRISE

AGM Focus: Strengthen Science

Strengthening science also involves redefining and strengthening the role of the Oceanic and Atmospheric Research (OAR) Line Office. OAR's evolving role is grounded in guiding and coordinating NOAA's long-term science agenda and fostering the foundational research for the next generation of services throughout NOAA's Line Offices. But NOAA also envisions that OAR will become the central organizing point for NOAA's larger scientific enterprise, fostering strategic engagement with our external research and service partners, domestic and international, and communicating our existing science in fresh and exciting ways to broader audiences.

More broadly, NOAA has developed a compelling, long-term scientific and technical challenge: to develop and apply holistic, integrated Earth system approaches to understand, model, and predict the processes and interactions that connect changes in the atmosphere, ocean, water, space, land surface, and cryosphere with ecosystems, organisms, and humans over different scales. This vision touches every aspect of NOAA's mission and reflects the diverse views and insights of the NOAA-wide team that created it during a science workshop held in April 2010. To tackle this challenge, NOAA must redefine how science is generated, used, and communicated across the agency. Significant issues for NOAA to address during this planning period include:

- **Develop and implement a NOAA-wide ecosystem research agenda:** A NOAA-wide ecosystem research agenda would leverage the combined competencies of NOAA's Line Offices to build a new capacity to understand and model ecosystem dynamics and services at multiple scales. Specifically NOAA should: 1) develop a long-term adaptive ecosystem research and monitoring plan focusing on physical, biogeochemical, ecological, and socio-economic trends in time and space; 2) expand NOAA's ecosystem assessment, service, and coupled modeling capabilities to enable us to forecast critical ecosystem functions and services; 3) examine how human communities are affected by and respond to both acute (e.g., oil spills, harmful algal blooms, extreme weather, hypoxia, pathogens, chemical contaminants) and incremental events and changes (e.g., climate change, ocean acidification); 4) investigate and assess unexplored and ecologically, economically, and culturally important coastal and oceanic regions; and 5) expand sampling and testing techniques to ensure safe seafood.
- **Advance the scientific understanding of ocean acidification and its impacts:** Given the potential scale and scope of impacts on NOAA's trust resources and resource management responsibilities, NOAA must develop monitoring, modeling, and scientific assessment capabilities related to ocean acidification. On the basis of this research effort, NOAA must develop the understanding and information needed to inform resource management approaches and strategies to improve coastal community resilience. In particular, NOAA must focus on assessing impacts from ocean acidification on natural resources (such as fisheries) and

ecosystem functioning.

- **Design and transition future forecast systems:** Innovative advancements in earth system modeling, observations, tools, and service delivery mechanisms are required to provide NOAA with the environmental forecast systems of the future. In particular, NOAA should pursue new and enhanced capabilities to forecast high-impact events such as tornados, hurricanes, floods, air quality, winter storms, tsunamis, and ocean health-related threats from harmful algal blooms, chemical contaminants, and pathogens. These high impact events may become more variable in their occurrence and intensity, which will require improved predictions based on robust intra-seasonal to inter-annual forecasts and regional-scale modeling. High performance computing infrastructure for both development and operations is an essential enabler for advancement in this area. NOAA should improve coordination with national and international partners engaged in issuing decisions for public safety that may evolve with enhanced forecasts.
- **Ecosystems and Oil Spill Impacts:** The Deepwater Horizon oil spill highlighted critical gaps in our understanding of ocean and coastal ecosystems and hence our ability to define the full range of possible impacts during environmental disasters as the disaster is happening. This event also exposed the need to examine the Gulf of Mexico ecosystem from a holistic perspective. Specific elements would include championing research and monitoring programs in the Gulf, and improving current understanding to help prepare for future events, including research on 4-dimensional modeling, the environmental impacts of oil and dispersants; nearshore berm and barrier construction; short- and long-term seafood safety concerns; impacts to protected species migratory behavior, foraging and reproduction; the fate and transport of oil at deep depths; and the long-term impacts of oil on shorelines. Addressing these gaps as they related to the Gulf ecosystem will provide a new NOAA standard to expand into other regions and ecosystems – which is particularly essential in the Arctic – and represents an important component of a NOAA-wide ecosystem research agenda.
- **Develop a NOAA-Wide Environmental Modeling Enterprise:** Developing, operating, and advancing environmental models are critical to all of NOAA’s mission functions and to achieving NOAA’s strategic objective of a holistic understanding of the Earth system. To improve its modeling capabilities, NOAA needs an integrated Environmental Modeling Enterprise that brings together its diverse modeling activities through a NOAA-wide collaborative governance process. Selected, ongoing efforts will focus on model integration, delivering research, observational analyses, monitoring, operational predictions, and decision support services.

AGM focus: Promote improvement in observations, mapping, and infrastructure by implementing the National Ocean Policy

NOAA’s observing systems should provide a broad portfolio of environmental and physical data that informs the agency’s diverse array of mission requirements. However, significant technical advances are needed to collect – in real time – the biological data needed to understand changing systems. Improved and integrated observations can provide a better understanding of greenhouse gas concentrations, ocean acidification, sea level rise, and regional-scale climate impacts, but these systems must also maintain continuity in core observations for weather and water prediction, navigation, and fisheries management. NOAA must have a two-fold approach for improving observations: (1) transition mature observing technology research to operational systems; and (2) develop and share expertise, instrumentation, data, data processing, and related costs through

national and international partnerships to build the next generation of observing systems, in furtherance of the new U.S. National Space Policy.

The continuity of NOAA's core environmental remote observations is based on the successful transition to the JPSS Program, continued acquisition and development of climate sensors, and planning for continuity of ocean color and space weather observations. NOAA must improve capabilities to monitor greenhouse gas concentrations (by modernizing the carbon tracking network), ocean acidification (by testing and evaluating acidification sensors, buoys, and platforms), and sea level rise (through remote sensing and *in situ* measurements of sea surface height). NOAA must monitor regional climate change signals through installation and upgrades to National and Regional Climate Reference Networks and Regional Coastal Ocean Observing Systems and improve Arctic monitoring and the Arctic Observing Network. It must strengthen and integrate NOAA's upper air observing capability through analysis of atmospheric profiles of air temperature, water vapor, and wind vectors. NOAA must also continue to use and enhance national and international ocean observing frameworks including the Integrated Ocean Observing System, the Global Ocean Observing System, and Integrated Ocean and Coastal Mapping. NOAA must enhance these interagency programs to construct a "network of networks" that leverages sub-surface, surface, and upper air measurements from across the National Weather Enterprise (e.g., private sector, academia, and other government agencies). NOAA must ensure that its buoys, ships and aircraft that support many of these observing requirements operate efficiently and at optimal capacity. Finally, NOAA must also take into consideration use of new platforms, such as unmanned aircraft systems and autonomous underwater vehicles, and hosted payloads on commercial satellites.

ORGANIZATION AND ADMINISTRATION ENTERPRISE

AGM Focus: Continuously improve internal business operations and services

Innovation, collaboration, dedication, and inspiration are fostered within NOAA by effective management, maintenance of proper infrastructure, and proper use of financial resources. In concert with broader Departmental efforts, NOAA will focus on continuously improving its organizational efficiency and effectiveness. Improved business operations will result in more effective services. This year, the agency's priorities include improvements to workforce development, hiring reform, program and acquisition management, NOAALink for IT procurement, and performance management.

Developing Future Talent: At the heart of NOAA's operations is the creative work of scientists, engineers, technicians, managers, NOAA Corps Officers, and administrative staff. It is only by building this diverse stock of capabilities that NOAA can achieve its strategic goals. NOAA must recruit and maintain world-class professionals with multidisciplinary scientific, managerial, and administrative expertise and must increase its efforts to recruit underrepresented groups into the NOAA workforce. To these ends, the NOAA Science Workshop recommended development of a specific science career track and the refocusing of agency service providers (e.g., in human resources, grants and acquisitions, development of Memoranda of Understanding and Interagency Agreements, etc.), to ensure that their primary focus is on facilitating the ability of scientists to do science.

Reduce Hiring Cycle Time: The Presidential Memorandum on Improving the Federal Recruitment and Hiring Process directs agencies to overhaul recruitment processes for the civilian workforce with the goals of selecting high-quality candidates more quickly and efficiently. Additionally, the memorandum requires agency managers and supervisors to take a leadership role in recruiting and selecting employees from all segments of our society, including underrepresented groups.

Increase Program and Acquisition Management Certification: NOAA manages a wide variety of programs and projects involving major capital investments and expenditures, many of which require project managers with formal certifications in that discipline. However, the number of certified project and program managers in NOAA's workforce is significantly less than the number of programs slated for regular audit by the Department's Chief Financial Officer. NOAA faces an urgent need to substantially expand its cadre of certified project managers and assign them to appropriate programs.

Implement NOAALink: NOAA must improve how IT products and services are acquired, as well as the quality of those products and services, while reducing the associated costs. NOAALink is a procurement vehicle that could leverage IT investments in shared capabilities, thus minimizing overlap and duplication of effort and providing a quicker path to better enterprise-wide services. When implemented, NOAALink will span fifteen service areas within NOAA, including end-user services, data centers, application development, disaster recovery, and security.

Performance Management and Acquisition Review: NOAA's Line and Staff Offices must align their Annual Operating Plans (AOP) with the Department of Commerce Balanced Scorecard (BSC) and corresponding NOAA Scorecard. Metrics should be routinely reviewed to ensure progress toward the appropriate targets and priority outcomes. Program performance should be reviewed at the LO- and NOAA-level, based upon both the BSC and AOP commitments, as well as selected program execution reviews in the Program Management Council (PMC), the ARRA Oversight and Accountability Board, and other committees of the Chief Information Officer and Chief Financial Officer Councils. Formal acquisition and grants management review processes must be established, along with a new program management oversight process, modeled on the PMC and ARRA Board to improve program management at NOAA.

PLACE-BASED FOCUS

Capabilities from across NOAA's goals and objectives are required to address urgent place-based needs in the Gulf of Mexico and the Arctic.

AGM focus: Support recovery in the Gulf of Mexico

The Gulf of Mexico region provides nearly one third of the seafood harvested in the continental United States, as well as 30 percent of oil production and 13 percent of our natural gas production. The Gulf is also a critical maritime commerce hub for imports and exports. The high loss rate of coastal wetlands and barrier islands, which serve as critical storm protection for the Gulf Coast, increases the region's vulnerability to coastal storms and impacts of climate change, and now the recent oil spill further threatens population centers and valuable commercial and environmental resources.

In advancing this priority, NOAA must continue to lead the Deepwater Horizon Natural Resource Damage Assessment (NRDA) to ensure that the public is fully compensated for injuries to natural resources and ecosystem services and to determine the type and amount of restoration needed as a result of the spill. There is also a need to increase seafood surveillance and monitoring in the Gulf region, to ensure a safe, sustainable supply of seafood from this economically significant region. NOAA should also work with the Gulf Coast Ecosystem Restoration Task Force to begin to address historical degradation of the Gulf region's critical ecosystems, unrelated to the impacts of the oil spill, through restoration and protection and to provide the long term science planning and monitoring needed to inform restoration and management decisions throughout the region. NOAA will also work with the larger scientific community and state and regional partners to champion scientific research and monitoring programs in the Gulf.

AGM focus: Improve understanding, planning, and environmental protection in the Arctic

There is widespread evidence of changing ecosystem in the Arctic, and these changes have local to global implications. Additionally the region is particularly important for global political relationships and national security issues. As sea ice melts, economic opportunities grow related to oil and gas, mineral mining, maritime transportation, fishing, and other industries. These uses in turn have impacts to the natural system that is already taxed by the changing climate. Strong science is critical to effective decision-making to minimize the economic impacts and mitigate the effects of development on coastal and marine resources and associated communities. Improved scientific knowledge is critical to understanding this fragile environment, where our normal understanding of ecosystem function or standard approaches to restoration may not apply in the cold Arctic waters.

NOAA will build on the capabilities noted in its other strategic objectives such as climate, weather, and increased observing capacity to support Arctic coastal communities and safe navigation to and through the Arctic. It will require an integrated approach from across NOAA and the Administration to adequately address our goals for the region. Modernizing the Arctic geospatial framework will provide the foundation for many of NOAA's activities in the region, including effective climate adaptation, community resilience, and coastal resource and marine spatial planning strategies. NOAA will support the Arctic region with accurate land and tidal elevations to monitor sea level and ice conditions, build flood protections, make infrastructure more resilient, ensure safe and efficient marine transportation, model storm surge, and support habitat restoration. NOAA will improve sea ice models and forecasts and foundational ecosystem science. Improved marine weather, sea ice, and storm surge forecast services will ensure the safety, efficiency, and security of marine, aviation, and surface transportation, mineral exploration, and tourism activities, while protecting indigenous communities. NOAA will also increase our knowledge about the behavior of oil in ice and conduct other environmental assessments to prepare for oil spills in the Arctic. Throughout this effort, NOAA will engage domestic and international partners to promote cooperation to include the sharing of data, increase deployment and maintenance of observational platforms, and the sharing of intellectual resources.