# Implementing S.2355: The Climate Change Adaptation Act

Final Report for the MPA ESP Fall 2008 Workshop

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# Acronyms & Abbreviations

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|---|---|
| ACCT | Adaptation to Climate Change Taskforce |
| CIG | Climate Impacts Group |
| COAP | Coastal and Ocean Adaptation Program |
| CPO | Climate Program Office |
| EPA | Environmental Protection Agency |
| FEMA | Federal Emergency Management Agency |
| HR | Human Resources |
| HQ | Headquarters |
| ICC | International Chamber of Commerce |
| IPCC | Intergovernmental Panel on Climate Change |
| IT | Information Technology |
| NASA | National Aeronautics and Space Administration |
| NCS | National Climate Service |
| NGOs | Non-governmental organizations |
| NIDIS | National Integrated Drought Information System |
| NOAA | National Oceanic and Atmospheric Administration |
| NWS | National Weather Service |
| OAR | Oceanic and Atmospheric Research |
| OMB | Office of Management and Budget |
| PART | Program Assessment Rating Tool |
| PIM-SYSTEM | Performance and Innovation Management System |
| RCCs | Regional Climate Centers |
| RDS | Regional Decision Support |
| ReACCTs | Regional Adaptation to Climate Change Taskforces |
| RISA | Regional Integrated Sciences and Assessments |
| U.S. | United States |
| USGCRP | U. S. Global Change Research Program |

# Executive Summary

Global climate change has long been a focus of the scientific community, and it has recently begun to elicit significant political attention in the United States (U.S.). Changing weather patterns and sea level rise threaten human life, infrastructure, and ecosystems, particularly in the low-lying coastal areas where much of U.S. population is concentrated. Events like Hurricane Katrina have highlighted Americans' vulnerability to intensifying natural hazards, and leaders in the public, private, and non-profit sectors now recognize the need to adapt to observed and anticipated climatic changes.

The Climate Change Adaptation Act, a Senate bill introduced in 2007, proposed a formal federal government response to the adverse impacts of climate change. However, the bill did not address the causes of climate change or its potentially devastating consequences in the developing world, so environmental groups and others favoring a more comprehensive solution did not lend it the support its passage would have required. Still, the need for a national adaptation policy only grows more urgent, and the National Oceanic and Atmospheric Association (NOAA) must be prepared to implement such a policy once groundbreaking legislation is enacted. **This report is a summary of a two-semester long simulation, in which we were asked to assume that the Climate Change Adaptation Act had been signed into law and that NOAA asked our team to plan its implementation.**

The Climate Change Adaptation Act called for the federal government to develop general adaptation strategies and to fund and coordinate the implementation of specific solutions at the state and local levels. Yet in designing a federal program to enact this bill, we were left with many choices about how to fulfill its requirements. Climate change adaptation is a nascent field, so NOAA would need to first define "adaptation" and then begin to build the expertise that will be at the center of adaptation planning. We determined that this expertise is currently distributed throughout the U.S. government and economy, among many agencies and individuals currently involved in emergency management and adaptation planning, formally and informally.

Our program design therefore aims to centralize adaptation expertise within NOAA, through partnerships with the agencies, institutions, and businesses that have contributed to this field. In addition, we provide for the creation of regional task forces to coordinate implementation in diverse parts of the country, recognizing that central planning alone is inadequate for confronting the complexity of climate change. The result is a program with standardized procedures for assessing vulnerability and allocating adaptation resources, grounded in the most up-to-date climate science, yet also sensitive to local social, political and economic realities. If the program succeeds, then adaptation planning will become an integral part of the way business is done across the U.S.; and human, infrastructural, and ecological losses in highly vulnerable coastal areas will be minimized.

A well thought-out program design does not ensure that goals will be accomplished. For this reason, we developed an operational plan for the program's crucial first year. The first year is when offices will be established, staff hired, specific partnerships developed and funding allocated to contracts, grants, personnel and equipment. Our operational plan describes in detail how these and many other activities will be carried out, but is guided by considerations of the program's priorities and its long-term objectives. We therefore view the program design and operational plan together as the blueprint for achieving the desired outcomes of a national climate adaptation policy.

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# PART 1: The Coastal and Ocean Adaptation Program (COAP) Design

## 1. Introduction

### 1.1 The Environmental Problem: Climate Change Impacts

The phenomenon of global climate change has been a focus of the international scientific community for more than two decades. The Intergovernmental Panel on Climate Change (IPCC), a scientific body set up by the World Meteorological Organization and the United Nations Environment Programme, has been monitoring and reporting on this environmental problem since 1988 (IPCC, n.d.). Drawing on the work of more than 2,000 scientists from 154 countries (IPCCFacts.org, n.d.), the IPCC has presented policymakers with a growing list of climate change impacts expected this century. The IPCC Fourth Assessment Report (2007) warns of destructive impacts on environmental services, human health, agriculture, water resources, and infrastructure, due to warming, sea level rise, natural hazards, and ocean acidification.

The Climate Change Adaptation Act ("S.2355, Climate Change Adaptation Act ", 2007) (S.2355), a bill currently before the United States (U.S.) Senate, outlines the problems that U.S. coastal regions will face as a result. Increases in extreme weather events, in combination with sea level rise, may lead to more damaging storm surge, coastal erosion, and flooding. Changing climate patterns will leave some areas at risk of more severe droughts and wildfires. Median projected temperature increases will heighten extinction risk for 20 – 30% of currently assessed plant and animal species (IPCC, 2007) and stress ecosystems services such as water filtration and biomass production. More than half of the U.S. population lives within 50 miles of a coast (Gagnon-Lebrun & Agrawala, 2006), and 25% of the U.S. population lives less than 10 meters (m) above mean sea level (USGS, 2000). Threats to coastal economies, communities, and infrastructure therefore constitute a serious national security concern.

However, climate change only recently became a consensus-based political issue in the United States (U.S.). The IPCC's Fourth Assessment Report, coupled with Al Gore's documentary *An Inconvenient Truth,* finally brought extensive American media coverage and public attention to the issue. Climate change was frequently one of the top ten topics covered in TV and radio news in 2007, (The Project for Excellence in Journalism, 2008) and a bill to cap carbon emissions nationwide fell just short of passage in the U.S. Senate in 2008. Only a small fraction of news stories, however, discuss climate change *adaptation* (Boykoff & Roberts, 2007), defined by the IPCC as "initiatives and measures to reduce the vulnerability of natural and human systems against actual or expected climate change effects" (IPCC, 2007).

Still, climate change adaptation is finding its way into political discourse, as reflected by the introduction of S.2355 in November 2007. Adaptation retreated from the political agenda in the 1990's, when proponents of mitigation, (defined as policies that reduce atmospheric concentrations of greenhouse gases, (IPCC, 2007)), viewed it as a distraction. As Vice President, Gore called adaptation "laziness", and the Kyoto Protocol prioritized mitigation (Pielke, Prins, Rayner, & Sarewitz, 2007). Yet recent events have changed even Gore's mind ("Climate change and the poor: Adapt or die," September 11, 2008) and adaptation is back on the national agenda for several important reasons:

- The IPCC and the Pew Research Center report that climate change is happening more rapidly than models originally predicted and that mitigation cannot fully avert its impacts (Pew Center on Global Climate Change, 2008b).

- Disasters such as Hurricane Katrina have highlighted American vulnerability to climate, and shown that adaptation measures addressing this vulnerability are necessary even in the absence of climate change (Pielke et al., 2007).
- Reinsurance companies have attributed unprecedented losses dating back to the late 1980's to climate change and have long pressed for adaptation measures to be taken (Dlugolecki & Keykhah, 2002).
- Many state and local governments in the U.S. have begun to plan for climate impacts and would welcome federal guidance, coordination and funding in these efforts (Pew Center on Global Climate Change, 2008b).

## 1.2 Current Adaptation Environment

While adaptation is a fairly new issue, academic institutions, and various innovative public sector initiatives have laid much of the groundwork for a national adaptation policy. Adaptation to climate change is underway at all levels of government worldwide, and multiple U.S. federal agencies have supported region-specific climate impact modeling, which can provide a basis for adaptation planning domestically.

### The State of Adaptation Planning

Adaptation planning in many parts of the world has advanced further than in the U.S. The United Kingdom's Climate Impact Program supports climate change risk assessments and planning strategies nationwide (Pew Center on Global Climate Change, 2008b). New Zealand is systematically strengthening its infrastructure to withstand more intense natural hazards, and Denmark is working to reduce the impacts of more severe flooding (Daley, April 5, 2007). At the local level, Melbourne, Australia, through a contracted engineering consulting firm, developed a comprehensive adaptation strategy addressing drought, storms, heat waves, and sea level rise (Maunsell Sustralia Pty Ltd, 2008). Since the impacts of climate change are being felt globally, these efforts can serve as a model for the U.S.

Despite the absence of federal action on climate change, the U.S. would not be starting from scratch. The Pew Center on Global Climate Change (Pew Center on Global Climate Change, 2008a) surveyed adaptation planning in the U.S. and found a variety of approaches being taken at the state and local levels. These range from comprehensive adaptation commissions to individual policies addressing specific impacts. Pew recognizes Seattle, WA and New York, NY as current adaptation planning leaders in the U.S. Seattle is working to incorporate local climate modeling into planning and resource allocation decisions, and New York's PlaNYC 2030 emphasizes strategies to protect vulnerable infrastructure and public health. Eleven U.S. states have formally recognized the need for broad-scale adaptation planning and six have already begun the process. However, there is currently no formal process for sharing information across jurisdictions (Pew Center on Global Climate Change, 2008b).

### Climate Research in the U.S.

Since 1989, the U.S. has invested almost $20 billion in climate change research in order to establish a scientific basis for decision-making (US Climate Change Science Program, n.d.). This has been done primarily through the U.S. Global Change Research Program (USGCRP), which integrates research conducted by thirteen federal agencies. USGCRP produces an annual report on climate observations, climate modeling, and decision support tools, entitled *Our Changing Planet*. The National Oceanic and Atmospheric Administration's (NOAA's) Climate Program Office has overseen some of the work most applicable to adaptation planning. This includes a Regional Integrated Sciences and Assessments program that supports university teams studying climate impacts in each U.S. region through regional-scale modeling (NOAA, n.d.-a). NOAA has also designed Regional Climate Centers to house climatic data and provide climate services to stakeholders in all economic sectors and at all levels of government (NOAA, n.d.-b).

# 2. S2355: The Proposed Solution

## 2.1 S.2355's Objectives

On November 17, 2007, Senator Maria Cantwell (D-WA) introduced S.2355, the Climate Change Adaptation Act. As its justification, S.2355 cites the impacts anticipated by the IPCC Fourth Assessment Report and finds that U.S. decision-makers are not taking these impacts into account (on the basis of reports by the National Academy of Sciences and the Government Accountability Office). Its approach to this problem is for the federal government to conduct research, coordination, and general adaptation planning, leaving development and implementation of specific solutions to state and local governments. To this end, the bulk of the funding potentially available under the legislation is directed towards grants available for states' adaptation programs. Significantly, only coastal states are eligible for grants, even though the impacts of climate change will be felt inland as well.

To understand S.2355's objectives, it is important to consider what these specific solutions might be. Our survey of existing adaptation literature suggests that many managerial, scientific, and technological solutions are available. The IPCC finds that an effective early warning communication and response system is crucial to preventing loss of life and reducing economic impacts from natural hazards. Vulnerability assessments could be used to develop risk-based premiums for a national insurer of last resort that would cater to all Americans in case of natural disasters (Cohen, 2008, June 25). Proposals for infrastructure come in two forms: strengthening infrastructure to withstand climate change impacts or developing new infrastructure with higher adaptive capacity. This need not exclusively require manmade capital; using wetlands to buffer flooding impacts is considered more effective and economically viable than artificial technological solutions (Barbier, 2007; Hansen, Biringer, & Hoffman, 2003).

The choice of adaptation strategies has broad implications. Adaptation solutions can either complement or impede mitigation efforts. Some may strengthen ecosystem integrity while others merely exploit natural services. S.2355 seeks to address many types of vulnerability, but does not explain how competing objectives should be balanced.

## 2.2 Political Support and Opposition

S.2355 is controversial both because of the problem it addresses and because of its proposed solution. Those who accept that climate change is a problem may still object to this bill's approach. It is only possible to discuss the bill's *likely* supporters and opponents because so few have taken a position on record and because the bill in its present form was never brought to the Senate floor.

### Ideological Conflict

Environmental issues often pit environmental non-governmental organizations (NGOs) favoring government regulation against conservatives favoring limited government. On the issue of climate change adaptation, however, both groups are ambivalent and largely silent. Environmental NGOs remain focused overwhelmingly on mitigation. They accept the need for adaptation, but are far more concerned with vulnerable poor countries than with the U.S. The Sierra Club, for example, favors the auctioning of carbon permits to fund adaptation at home and abroad. The National Resources Defense Council concurs and stresses that adaptation alone is not sufficient.

Conservatives have long argued that climate change is not a problem at all, but they now stress that mitigation policies will do more harm than good (McRight & Dunlap, 2000, 2003). Adaptation could therefore appeal to them as a less costly alternative, but so far, conservative think tanks have not advocated for federal spending on such projects. Additionally, many Republicans still do not acknowledge that the science of climate change is sound. For example, outgoing Alaska Sen. Ted Stevens (R-AK) opposed this bill even though it would have provided his state with millions of dollars to cope with erosion and melting permafrost (Morello, 2007).

### Economic Conflict

According to the International Chamber of Commerce (2007), business interests strongly favor government action on adaptation. Many firms are already working on adaptation independently and are looking to form partnerships with government for coordinated action. The insurance industry is especially supportive, as insurance executives view climate change as the biggest threat to their industry (Fialka, 2008).

Legislators from coastal states have an economic incentive to support legislation such as this, since they would be eligible for adaptation grants. This is especially true of the six states with adaptation plans in progress, who could receive funding for projects they are already undertaking. However, the bill's coastal focus could alienate legislators from interior states, including those ideologically predisposed to support it.

### Political Outcome

S.2355 was designed for the political environment in which it was introduced, but was not enacted in its current form. The 110th Congress, unable to agree on emissions reductions, might have embraced adaptation as a more expedient way to address a pressing issue otherwise ignored by the outgoing Republican administration. In fact, Canada recently approved a significant climate adaptation initiative, which its conservative government portrayed as response to citizens' urgent demands for action on climate change (Environment Canada, 2008). However, S.2355 never came before the Senate for a vote, probably with good reason. Without concessions to landlocked states and skeptical Republicans, there was no mathematical way this bill could have passed.

We will imagine, for purposes of this analysis, that the bill (hereafter "the Act") was signed into law and that it will be implemented in 2009. Although this did not occur, we are confident that similar legislation will indeed be passed by the next Congress, perhaps as part of a comprehensive climate change policy along the lines favored by environmental NGOs. It is therefore a valuable exercise to examine how a national climate change adaptation program could best be implemented.

## 2.3 Mandated and Discretionary Elements of the Act

The Act mandates several actions. It requires the President to develop a National Strategic Plan for Climate Change Adaptation and the Secretary of Commerce, acting through NOAA, to complete a series of activities related to the vulnerability of coastal and ocean areas to climate change. This report considers only the activities required of the Secretary of Commerce, which are the primary focus of the Act.

### Specific Requirements

The Act specifies required outputs, but offers only vague guidance on who should produce them, and virtually no guidance on how they should be shaped. Specifically, NOAA's major requirements are as follows:

- Regional assessments of coastal and ocean vulnerability must be completed within two years. Physical, biological, ecological, social, cultural, and economic impacts arising from various identified climatic changes must be considered. NOAA must consult with appropriate federal, state and local governmental entities and consider the findings of the USGCRP.
- A national coastal and ocean adaptation plan, composed of regional plans, must be submitted to Congress within three years. It must not duplicate existing hazard planning requirements and must recommend both short- and long-term strategies for addressing the vulnerabilities identified. All federal, state, and local governmental agencies critical to plan implementation must participate in plan development.
- Technical planning assistance must be provided on an ongoing basis to help coastal state and local governments develop adaptation plans. The assistance program must draw on the expertise developed in

NOAA's assessment and planning processes. Planning assistance must be coordinated with existing hazard mitigation authorities.

- Adaptation grants must be provided to eligible coastal states to help them develop and implement their adaptation plans. Funding will be allocated to states on an annual basis, in accordance with a formula developed under the Coastal Zone Management Act. NOAA must approve states' proposals prior to grant provision, and proposals must be consistent with the goals of the national coastal and ocean adaptation plan.

### Areas of Discretion

NOAA has a great deal of discretion in developing a program to fulfill these requirements. Any program design must answer several key questions:

- Who within NOAA or the other agencies described in the Act will complete the work required?
- Which government agencies meet the Act's descriptions, and how will NOAA coordinate with those agencies?
- To what extent should assessment and planning criteria be standardized across regions and states?
- How should assessed impacts be prioritized?
- How should adaptation grants be allocated? The Act authorizes NOAA to adjust calculated allocations for the benefit of "particularly vulnerable coastlines." This potentially allows for a great deal of discretion.

The central tension inherent in these questions is between using a centralized or a locally-driven adaptation process. Yet the most important question the program will answer is perhaps, "What is climate change adaptation?" The program design will go a long way in determining how the Act's litany of impacts and vulnerabilities will actually be addressed.

## 3. Program Design

Given the political context of the Act and the inherent uncertainties involved with climate change and adaptation, this section will begin by outlining key considerations that the optimal program design will need to address. We will then identify the planning parameters that will determine the strategic objective and desired outcomes of our program over the next three to five years. We will also define climate change adaptation in the context of the Act in order to develop the specific program elements.

## 3.1 Key Considerations

Because the Act is ultimately a legislative instrument, one of the challenges in defining the design of the implementation program is to adequately consider what is mandated in the Act, as well as what the Act leaves to the discretion of those who implement it. Additionally, the program design must also address the foreseeable controversies that may arise during implementation and that may pose a threat to effective implementation. In this context, the program design of the Act will account for the following considerations:

- **Adaptation design, planning and implementation require innovation:** In contrast with other policy areas where a high degree of expertise already exists among federal agencies, adapting to climate change is a relatively new management and implementation issue for federal, state and local authorities. In order to overcome this challenge, innovation, constant improvement, and feedback loops must be incorporated into the program design.

- **Adaptation is more than planning:** Though the Act mandates specific actions, products, and tools to induce effective adaptation planning, the overarching goal of adaptation should focus on the desired outcomes in the medium and long term for human populations, coastal regions, and the economy.
- **A participatory and consultative process between stakeholders is important:** Involving stakeholders from the initial steps of assessing risks and planning adaptation measures is important to ensure effective implementation in later stages. Private entities are key stakeholders in the process of developing and implementing adaptation strategies, in addition to public entities such as state and local governments, NOAA, and other federal agencies. A large base of stakeholder support will facilitate necessary policy changes as the science and understanding of adaptation evolve over time.
- **Social and political issues will be as important as technical and scientific ones:** Adaptation measures must be supported by the most advanced scientific, engineering, and technology research available. Yet sound science in and of itself will not be enough to ensure that proper and effective adaptation measures get planned and implemented. Social, political and institutional acceptance of adaptation will play a key role in determining the effectiveness of the program. As such, public involvement and educational campaigns will be important to the program's long-term success.
- **Accountability is a core issue of adaptation:** Human lives, property and ecosystems will *always* be at risk from natural hazards. Although adaptation is a systematic attempt to reduce risk, it cannot eliminate it. As such, in the aftermath of damages and losses caused by natural hazards, people will undoubtedly ask "Was enough done to prepare?" The federal government therefore must establish a shared accountability framework whereby adaptation is also seen as a responsibility of states, cities, and private entities.
- **Adaptation directly relates to emergency planning and response:** There is a high degree of overlap (institutional, jurisdictional and territorial) between adaptation and emergency preparedness and response. As such, the program design should ensure sufficient communication and coordination between government and state agencies.
- **Adaptation design, planning, and implementation require a different way of doing business:** Within the public and private sectors, decision makers and managers will face challenges when attempting to incorporate climate change adaptation into the organizational culture and strategic planning of organizations. Adapting to climate change requires a paradigm shift whereby it is regarded not as something "extra", but rather "business as usual" in the public and private sectors.
- **Vulnerability and adaptation need to be clearly defined so that they can be assessed, implemented, and measured:** As the preceding section describes, the Act is concerned with assessing *vulnerability* and then implementing *adaptation* programs. However, it does not explicitly define these two terms. A key challenge for the program design will be translating these concepts into measurable and communicable values.
- **The program design will ultimately need to consider a planning horizon of five to ten years with quick results starting from year one:** The optimal program design will address the need to implement, monitor and evaluate a multi-year process starting from year one. Although conducting regional assessments and funding state plans will be a multi-year process, the program should fund selected adaptation pilot projects in the first year. These pilot projects will benefit the implementation of the program by drawing public, media, and stakeholder attention to the issue of climate change adaptation. Additionally, testing different strategies in individual settings is a way to evaluate their effectiveness before committing to them on a larger scale (Cohen et al. 2008).
- **Public opinion and media relations will be important to minimizing jurisdictional and adaptation/mitigation conflicts.** The uncertain and evolving nature of climate change means that controversial issues may arise during program implementation, particularly with regard to the costs of adaptation measures and the potential jurisdictional conflicts between cities, counties, states, and the federal

government. Additionally, as adaptation and mitigation are two related but distinct facets of climate change policy, care will need to be given to ensure that the two are seen as complementary and not mutually exclusive or contradictory.

## 3.2 Planning Parameters

### Strategic Objective and Desired Outcomes

The overarching goal of the Act is for U.S. coastal states to adapt to and prepare for the impacts of climate change. Based on the mandated and discretionary elements of the Act, our program design will focus on what is required of the Secretary of Commerce, acting through NOAA. In this context, and to ensure that the mandated outputs are produced and core activities are conducted, we have designed the National Coastal and Ocean Adaptation Program (COAP).

The strategic objective of COAP is to reduce risks in coastal regions of the U.S. from climate change impacts on human populations, ecosystems, and the economy. In order to achieve its objective in a five-year planning horizon, COAP will need to accomplish the following expected outcomes.

- **Established adaptation expertise** (including design, planning, implementation, monitoring, and evaluation) within NOAA and among local states and cities in vulnerable regions.
- **Progressive procedures established for periodically assessing risks** to human life, private property, infrastructure, ecosystems, economic growth and commerce, at the regional, state and local levels.
- **Effective adaptation programs** to protect human life, property, infrastructure, and ecosystems designed, implemented and evaluated for all thirty coastal states and five territories of the U.S.
- **Climate change adaptation incorporated into the everyday business practices** of all economic sectors in vulnerable regions of the U.S. (including planning, management and organizational culture).

### Defining Adaptation: What is an acceptable level of risk?

Predicting climate change and its impacts is an exercise in assessing probability and vulnerability. Within the proposed program design, adaptation will refer to those actions taken to ensure that high-risk areas under maximum climate change scenarios for the year 2100 are "as safe" as they would be without factoring in climate change. It is important to note that determining exact risk will be an ongoing process that will become more refined over time.

## 3.3 Proposed Program Design

Based on a review of the existing institutional capacity that exists within NOAA and other federal agencies, the proposed design of COAP consists of four basic program elements. These program elements are designed to translate the strategic objective and intermediate outcomes of COAP into specific yearly operational results, at this point in the planning emphasizing those tasks that will have to be accomplished during the first year of the program's implementation. The following is a description of the four program elements with selected operational results:

### I. Establishing the Coastal and Ocean Adaptation Program (COAP) within NOAA

a) ***Offices and institutional framework:*** The National Climate Service (NCS), a body that will be created within NOAA as dictated by the Global Change Research Improvement Act,[1] will establish

1 The Global Change Research Improvement Act (S.2307) was a bill introduced in the 110th Congress. S.2355 amends statutory provisions that were to have been enacted under S.2307 ("S.2307, Global Change Research improvement

and oversee COAP. The proposed design of the NCS (NOAA, n.d.-b) dictates that two of its key functions will be to provide information to decision-makers in the public and private sectors regarding climate change and adaptation, and to assist planning and preparedness measures at the state and local levels against extreme weather events and hazards. However, until the NCS can be set up as an independent branch within NOAA, COAP will be housed in the existing Climate Program Office in NOAA's Oceanic and Atmospheric Research branch. This provisional "home" for COAP will allow it to take advantage of NOAA's existing services and organizational structure, while it develops institutional expertise in climate change adaptation. The headquarters (HQ) of COAP will be housed in Silver Spring, MD, where the Climate Program Office is located, with regional offices established strategically in the five coastal regions of the U.S.

b) ***Building full-operational-capacity***: In the first year of operation, a large portion of the personnel will come from NOAA and other federal agencies. As such, COAP HQ will not reach full operational capacity until the fourth quarter of the first year of implementation. The advantages of staffing in this manner are twofold: it facilitates coordination and communication between NOAA and COAP, and it enables COAP to begin its activities from day one.

c) ***Outside contracting of expertise***: COAP will invite outside contractors (including universities and research institutions) to provide educational, training and capacity-building services to COAP personnel from HQ and the regional offices, based on a competitive selection process.

## II. Assessing regional vulnerability

a) ***Interagency and interdisciplinary taskforces***: COAP will establish an Adaptation to Climate Change Taskforce (ACCT), based in HQ. During the first years of program implementation, the ACCT will be the lead body for establishing technical parameters for assessments, adaptation programs and grant guidelines. It will be comprised of COAP staff, contractors, and invited experts from within NOAA and other federal agencies. However, given the importance of stakeholder participation and general agreement among state and local actors, COAP will establish Regional Adaptation to Climate Change Taskforces (ReACCTs) in each of the five geographic regions considered by the program. The main role of the ReACCTs will be to coordinate local experts and contractors for the field work required for state assessments. The ReACCTs will also assist states in designing and developing effective adaptation programs. These taskforces will thus ensure effective communication between the federal, state, and local levels, as well as provide feedback to HQ and the ACCT from a regional, state, and local perspective. The ReACCTs will be comprised of experts and representatives from the regional and local offices of federal agencies (e.g. Federal Emergency Management Agency (FEMA), Regional Integrated Sciences and Assessments (RISA) teams and the National Integrated Drought Information System).

b) ***Prioritization of high-risk coastal areas***: In order to geographically identify the priority areas for adaptation measures, COAP will use existing modeling capacities inside and outside of NOAA. COAP will also record the intensity of the various expected climate change impacts at their greatest potential value for the year 2100, as calculated by the IPCC in 2007. This is similar to previous infrastructure planning parameters that considered 50-year or 100-year storms. The potential impacts considered will include all those that the IPCC defines as "Likely," with a 66% to 90% probability of occurrence, as well as all of those with a higher probability of occurrence.

Act ", 2007). We therefore assumed, for the purpose of this simulation, that S.2307 had been signed into law along with S.2355.

c) ***Regional and state vulnerability assessments***: COAP will develop standards for regional, state, and local risk assessments, in coordination with USGCRP, the National Academy of Science, the National Science Board, FEMA, and invited experts from state and city governments that are currently conducting or have conducted adaptation planning. COAP will then draft regional vulnerability assessments drawing on the findings of state assessments and regional climate models. These will provide the basis for adaptation strategies to be included in regional plans.

d) ***Anchoring adaptation policies in climate science:*** In light of the recent report from the USGCRP regarding the need for policy planners to use earth science information and decision-support tools to assess potential climate change impacts, COAP will establish an interagency cooperation agreement in order to develop technology tools and applications for regional assessments.

e) ***Stakeholder participation:*** In coordination with state and city governments and in consultation with representatives from the private sector (national and local), COAP will conduct a needs assessment to determine key areas for information, knowledge, skills and management tools regarding adaptation planning, design and implementation.

f) ***Capacity-building at the state and local levels***: The ReACCTs will lead regional capacity-building programs in coordination with state and local governments, in order to make full use of the expertise developed in the regional assessment process. When local capacity is insufficient, COAP or local authorities will invite outside contractors to provide additional support to public sector staff.

## III. Developing the National Coastal and Ocean Adaptation Plan

a) ***The blueprint for American coastal adaptation:*** The National Coastal and Ocean Adaptation Plan will be a foundational text in the field of climate change adaptation in the U.S. Drawing on all other program elements, it will outline measures for incorporating climate adaptation into all major federal programs related to coastal protection and risk management. It will also present region-specific strategies to guide all state and local adaptation planning, based on standardized principles developed in COAP's work throughout the country.

b) ***Best practices identified***: COAP will identify best practices in adaptation planning, design and implementation, in coordination with federal agencies, state and city governments, national and international experts. COAP will incorporate these best practices into the National Coastal and Ocean Adaptation Plan. COAP will draft this plan during its second year, as mandated by the Act, based on the results from regional assessments conducted in the first year, and on the pilot projects funded in each of the five regions.

c) ***National conference***: COAP will hold a national conference in the first year, in coordination with academic institutions, stakeholders, and implementing partners of COAP. In compliance with the Act's technical planning assistance requirement, this conference will launch COAP's initiative to incorporate adaptation into organizations' everyday business practices.

## IV. Implementing and monitoring state adaptation programs

a) ***State grants for adaptation programs:*** COAP will establish specific guidelines and procedures for the allocation of Coastal and Ocean Adaptation Grants, as mandated by the Act. For the first year of implementation, COAP HQ will develop and award interim grants in order to assist states in establishing their own institutional capacity and to support one "pilot" adaptation project in each of the five regions. For subsequent years, COAP will establish standardized guidelines for grants.

In order to define a state's vulnerability to climate change impacts and its corresponding eligibility for funding, six variables will be considered: the number of people living within these high-risk areas, the

current nominal market value of the private property holdings, the current costs of replacing infrastructure (water and sanitation, transportation and services), the approximate value of the environmental services provided by the ecosystems, the value of the economic activity and commerce occurring in these high-risk areas, and the value of strategic assets as determined in consultation with the corresponding federal agencies (Department of Homeland Security, Department of Defense and the Department of Energy). COAP will use the vulnerability calculated based on these variables to adjust the grant allocation formula provided in the bill.

b) ***National visibility of local responsibility:*** In coordination with the White House, FEMA and state authorities, COAP will present publicly a "Risk Preparedness Scorecard" for each participating state after the first year of program implementation. Each state will receive a "grade" in terms of emergency preparedness and adaptation implementation, ranging from "A" for those states that are in the process of implementing effective adaptation programs, to "F" for those states that do not participate in the assessment process. Grades in subsequent years will allow citizens to track their states' progress.

c) ***Monitoring for success***: COAP will establish a monitoring and evaluation mechanism, based on performance indicators, whereby states will be eligible for future grants contingent upon acceptable progress on prior grant activities. The oversight mechanism will consist of mandatory yearly progress reports from states, a field-visit from HQ and regional office staff , and an external evaluation every three years conducted by invited academic and research institutions. Additionally, COAP will build into its design a *Performance and Innovation Management System* from the beginning to ensure that continuous improvement is a measurable indicator of the program's successful implementation.

## 4. The Coastal and Ocean Adaptation Program (COAP) Design Conclusion

Adaptation to climate change is a recent policy priority in the U.S., so unforeseeable scientific, technical, institutional, financial, political, and social limitations will likely hinder implementation. The design of COAP addresses these issues by proposing a partnership-based strategy between federal agencies, state governments, academic and research institutions, and the private sector. The program calls on NOAA to establish a participatory and consultative process to ensure that the program is both national in scope and effective at the state and local levels.

NOAA will establish and locate COAP within its Climate Program Office. This will facilitate communication with climate change experts within NOAA, the USGCRP, the National Academy of Science, the National Science Board and other federal agencies. To effectively implement the partnership-based strategy, COAP will also establish taskforces that will consult with a wide-range of experts and consider the concerns and experiences of state and local actors.

Throughout this process, NOAA will maintain authority over five aspects of implementation. First, quality standards for the assessments and programs will be established at the central level. Second, NOAA will develop guidelines regarding the scope of the regional and state assessments. Third, NOAA will set the planning timelines for these assessments and for the state programs. Fourth, NOAA will review and evaluate best-practices and benchmarking activities. Finally, NOAA will award state adaptation program grants and conduct monitoring and compliance reviews. With this combination of a centralized approach to standards and partnerships with key stakeholders, the program design aims to transcend the central/local dichotomy often present in federally mandated programs.

# PART II: COAP Operational Plan

The overarching goal of the Act is to ensure that coastal states in the U.S. are prepared for the impacts of climate change. It proposes to accomplish this through the assessment of risks and the development and implementation of plans to address these challenges. The operational plan for COAP details the components necessary to achieve these goals. The organizational and staffing plan provides a detailed overview of who will be conducting the work at the national and regional level and how the offices will be structured. This information, in conjunction with the major events identified by the calendar, then drives the budgeting process. Lastly, the performance management system outlined in Section 3.3 ensures the policy and program directions of the Act are carried out. This plan details the program elements for the first year of COAP.

## 1. Operational Planning Principles

We have applied six "Planning Principles" in developing COAP's operational plan to ensure that operational results are clearly identified, and that activities are planned towards achieving them. These principles are:

1. ***Begin with the end-goal in mind***
   Plans must start with the operational results clearly defined, and deadlines for achieving those results placed on the planning calendar. Using backwards planning, the operational plan is developed by identifying all the steps that need to take place to make sure that each result can be achieved on time.
2. ***Plan at a high level, while envisioning the details***
   While the operational plan must be thorough, we cannot foresee every eventuality. It is important to set deadlines and identify key review dates, but detailed planning should be delegated to the appropriate senior staff.
3. ***Prioritize***
   COAP will begin with a small, flexible staff, which will be augmented by contracted support as necessary. This means that the initially small staff can be easily overwhelmed if given too much work. In developing the operational plan, we have therefore focused on COAP's priorities as identified in the program design.
4. ***Budget time to rewrite and revise***
   Major reports and presentations always require time for review and for revision from senior management. In large hierarchical organizations such as the federal government, each step of the review process can take weeks. Accordingly, we have budgeted significant time for reviewing and rewriting major program documents, such as grant criteria.
5. ***Walk the talk***
   Although COAP is not explicitly responsible for mitigation, it should reduce its carbon footprint to the extent possible. In developing the operational plan, we seek to minimize carbon emissions through maximal use of available technologies and public transportation.
6. ***Time is of the essence***
   COAP will not yet possess its full organizational capacity in its first year. Because outputs cannot wait for all staff to be hired or all offices established, actors other than those envisioned by the program design (such as consultants) will perform some critical tasks.

## 2. Program Operations by Quarter

The following sections present the major operational activities of COAP by quarter, beginning with set-up activities conducted prior to the first quarter of Year 1 (2009).

## 2.1 Pre-Quarter 1

Prior to Quarter 1, NOAA will focus on the development of the structural components and institutional frameworks necessary for COAP's operations. As outlined in the program design, COAP will be housed in the existing Climate Program Office (CPO) of NOAA's Oceanic and Atmospheric Research branch. During this period, the head of the CPO will approve any decisions involving budget, staffing, and organizational structure. Most pressingly, the CPO, in consultation with senior NOAA management, must hire the Executive Director of COAP, such that he/she can start work at the beginning of the first quarter. However, this is only one of the many activities COAP's parent agency must undertake in order to develop this intricate new program.

COAP integrates adaptation activities in five territories and 30 coastal states, including those on the coasts of the Great Lakes. The headquarters (HQ) of COAP will be in Silver Spring, MD, with regional offices established strategically in the five coastal regions of the U.S. Figure 1 identifies the states and territories that comprise each region, as well as the location of the regional offices and HQ. Prior to Year 1, NOAA must begin to establish COAP's HQ, its Information Pathways, and its Institutional Partnerships at the federal and regional levels. These activities are described in greater detail below.

### Establish Headquarters Office

HQ, based within the CPO, will be set up as a command and control structure for regional offices. Its primary responsibilities are:

- Coordinating with senior authorities at the CPO, NOAA, and Department of Commerce, as well as maintaining interagency partnerships.
- Housing COAP's functional expertise used to develop general adaptation strategies and standardized procedures.
- Providing support and coordination with the regional offices, regarding vulnerability assessments and adaptation grants.
- Exercising ultimate authority over grant allocation and submission of required outputs.

Using NOAA's existing capacity, work will be divided between the program department and the operational department that provides administrative support to the program department. Both will be managed by the Executive Director of COAP, who will report directly to the senior management of the CPO. The final decisions related to COAP will be made by the Executive Director, in consultation with the Adaptation to Climate Change Taskforce (ACCT), described in the program design.

### Establish COAP's Information Pathways

Locating COAP within NOAA will give COAP access to the NOAA experts who contributed to the most recent IPCC report. The tools and knowledge that are essential to the success of COAP will be provided in the Integrated Information System outlined below, along with a mechanism of institutional partnerships that will ensure that highly usable, actionable, issue-focused information is disseminated within COAP.

#### *COAP's Integrated Information System*

The CPO will integrate and cover three functional elements needed to provide the necessary information for COAP:

1. Integrated U.S. climate observation and monitoring capacity.

2. Climate analyses, research, and assessments to support regional modeling on a spatial scale.

3. Resource risk management focused on climate/resource system that will provide direct information to location-specific decisions.

The CPO will give COAP access to its tools and expertise such as observations and research, monitoring, and modeling that they currently administer. Further, the CPO has already established a Regional Decision Support (RDS) effort to accelerate the Program's interaction with users of climate information and forecasts (Climate Program Office, 2005).

## COAP's Institutional Partnerships

COAP's institutional partnerships will combine the research services of NOAA with related public and private enterprises, including universities, federal, state, and local science and management agencies, and non-governmental organizations. These institutional partnerships will work in tandem with the Integrated Information System described above. This will necessitate both federal and regional partnerships. Under the Act, the White House will be responsible for helping NOAA develop these interagency partnerships at the federal level.

### *Federal Level Partnerships*

COAP will have interagency partnerships across the 30 states and 5 territories covered by COAP. Recommended federal interagency partnerships include (Miles et al., 2006):

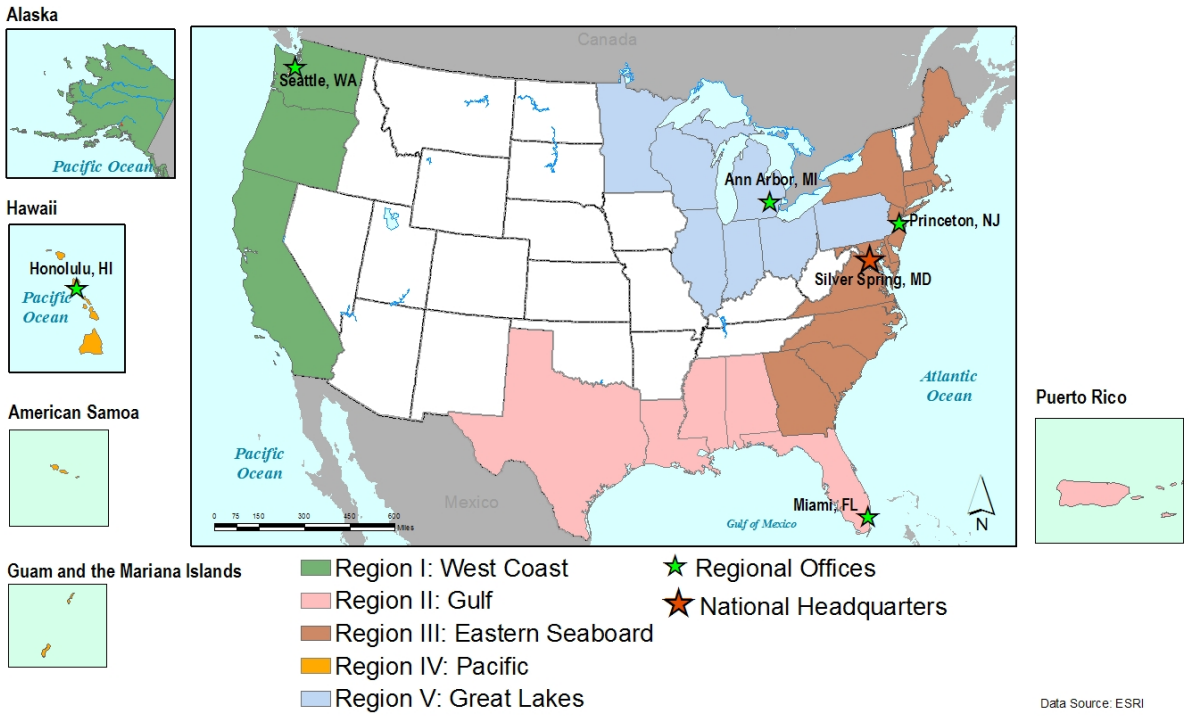
- Department of Agriculture – Natural Resources Conservation Service, U.S. Forest Service
- Department of Defense – Army Corps of Engineers
- Department of Homeland and Security – FEMA (as one of the priority partnerships)
- Department of Interior – Bureau of land Management, Bureau of Reclamation, U.S. Geological Survey
- Environmental Protection Agency (EPA)
- Department of Health and Human Services – Center for Disease Control
- Department of Housing and Urban Development
- US Climate Change Science Program Coordination Office

### *Regional Level Partnerships*

Although the regional offices will not be established until the second quarter, the CPO must immediately begin to prepare the institutional framework that will allow them to function. Regional offices will work collaboratively with regional level member agencies as well as with federal agencies on both national and regional scales (Miles et al., 2006), including but not limited to:

- NOAA's Regional Integrated Sciences and Assessments (RISA): RISA already supports research on the climate-sensitive sectors relevant to the concerns of the decision makers and policy planners at the state and city levels.
- National Environmental Satellite, Data and Information Service
- NWS Climate Prediction Center
- American Association of State Climatologists
- Climate Impacts Group (CIG) at the University of Washington
- The Earth Institute at Columbia University
- The Regional Climate Centers (RCCs): Existing connections of RCC to region-specific needs, in coordination with the CPO, should provide climate information to COAP.
- National Integrated Drought Information System (NIDIS)

*Figure 1. COAP Regions and Offices*




## 2.2 First Quarter Activities

The first quarter of 2009 marks the beginning of COAP's operations. Major milestones for this period include establishing and beginning to staff the departments and sub-departments within HQ. The following section presents a detailed description of COAP's Program Department at HQ.

### COAP's Program Department

The Program Department of HQ will have 25 staff members, and will be in charge of planning, implementation, realization and monitoring of COAP. Once established, this department will connect to NOAA's Operational department, which will provide administrative, IT and Human Resources support to COAP. The Director's office, which will oversee each sub-department, will have three staff members: the Director and his Assistant, and an Executive Officer who will oversee the ACCT. (As described in the Program Design, the ACCT will include each of the sub-department heads and borrowed or contracted experts from research institutions and universities).The Program Department will consist of the following sub-departments:

- ***Planning and Assessment***
  This sub-department will use information obtained through collaborative work with existing programs within NOAA to create tools for states and all climate change stakeholders. It will also be responsible for the completion of state and regional assessments. *Planning and Assessment* will be the largest of the sub-departments, with a total of 13 staff members, each specialized in sectors vulnerable to climate change impacts. It will initially be staffed with borrowed NOAA personnel, so that development of state vulnerability assessment procedures can begin right away.

- ***Modeling Applications***
  This sub-department will combine the observation, research, and modeling activities of multiple agencies into a coherent whole. It will identify available information about climate variations and trends, in order to predict expected impacts on the regional scale. *Modeling Applications* will have two staff members, an analyst and a data and modeling engineer.
- ***Communication and Media***
  Conducted through the Oceanic and Atmospheric Research's (OAR) Office of Communications, within NOAA, the primary purpose of this sub-department will be to raise public awareness about climate change adaptation. It will also advocate COAP goals and set up contracted education campaigns. *Communication and Media* will have two staff members, a Head of Communications and a Communication Officer.
- ***Grant Management***
  This sub-department will set and communicate guidelines for interim planning grants, receive and process grant applications, and provide monitoring and evaluation of each state assessment in addition to ensuring correct grant allocation. *Grant Management* will have two staff: a Head of Grants and an Assistant Grant Officer. In order to effectively distribute grants in the first year, a current NOAA grant officer will be assigned to this sub-department in January to begin drafting criteria.
- ***Policy and Program Analysis***
  In coordination with OAR's Office of Policy, Planning, and Evaluation, the *Policy and Program Analyses* sub-department will write the National Coastal and Ocean Adaptation Plan. Its purpose will be to analyze the context of the existing and proposed policies relevant to COAP, at both federal and state levels. This will include analysis of comparable adaptation policies implemented by other nations. *Policy and Program Analysis* will have two staff members, a Senior Policy Analyst and a Policy Analyst. This sub-department will ultimately be expanded in order to oversee the performance management system.
- ***Compliance and Jurisdictional Analysis***
  In cooperation with NOAA's office of Legislative Affairs, the *Compliance and Jurisdictional Analyses* sub-department will look at legislation of potential adaptation programs at the regional level and will identify possible contradictions with regional laws. *Compliance and Jurisdictional Analyses* will be run by a Senior Jurist.

Figure 2 illustrates this departmental organization and staffing distribution, as well as the regional organization to be developed in the second quarter.

## Major Activities and Milestones

The following presents a snapshot of COAP's major activities and milestones of the first quarter.

***Staffing***

- COAP Executive Director starts in temporary offices.
- "Borrowed" NOAA personnel start.
- Executive Director selects sub-department heads.
- CPO identifies long-term office space for COAP HQ office in Silver Spring, MD; HQ will move into long-term offices at the end of the first quarter.
- Identify regional office space at regional NOAA offices.

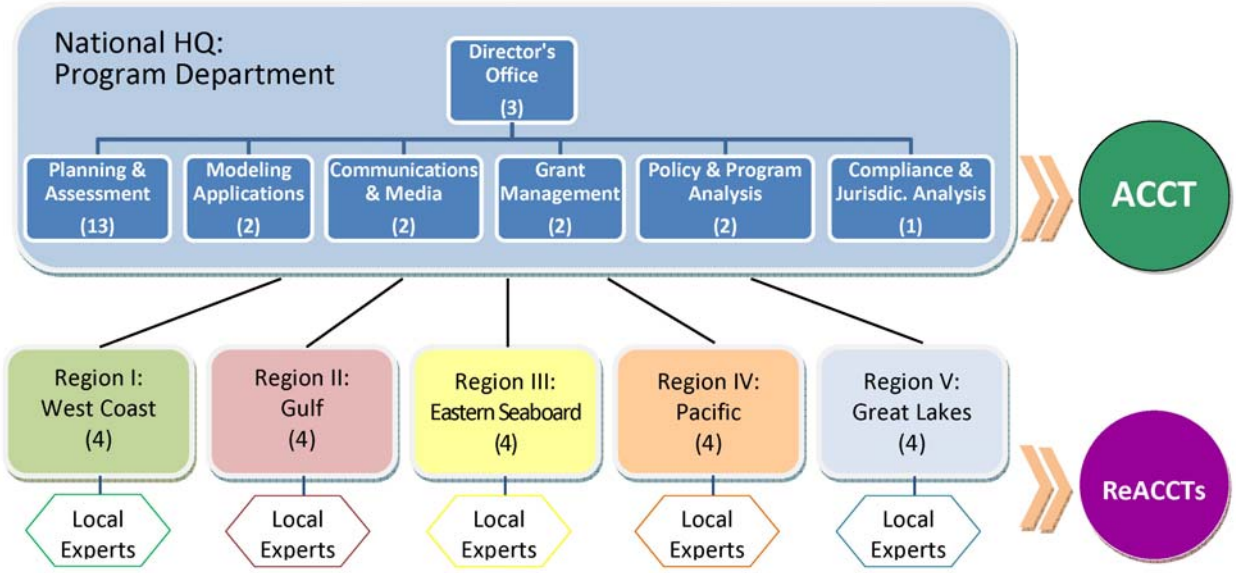
***State & Regional Assessments***

- *Planning and Assessments* begins design of assessments.

***State Grants***

- *Grant Management* drafts qualifying criteria and application format for states' Interim Grants.
- NOAA approves criteria and application format for Interim Grants.
- *Grant Management* forwards instructions, application format, and criteria for Interim Grants to states.

***Figure 2. COAP Organization - Federal and Regional Structure***




Note: (#) represents the number of employees belonging to that office.

## 2.3 Second Quarter Activities

The second quarter marks the establishment of the regional offices, described below. Their primary responsibility in the first months of operation will be to participate in the state and regional assessment process.

### Regional Offices

COAP will establish an office in each of the 5 coastal regions shown in Figure 1, whose primary responsibility in the first year will be bringing local expertise to bear on the assessment process directed by HQ. These regional offices will be co-located in existing NOAA offices to minimize cost and set up time. At the regional level, COAP will also establish and oversee the Regional Adaptation to Climate Change Taskforces (ReACCTs), comprised of contracted local experts (Figure 2). The ReACCTs will act as a client-oriented task-force focused primarily on facilitating the regional assessments and providing timely and effective assistance to state governments and local partners. Essentially, ReACCTs will provide local expertise to complement the centralized adaptation expertise at HQ. Additionally, in conjunction with the ACCT, these offices will conduct Regional Capacity Building Programs for state, city, and local actors.

### Major Activities and Milestones

The following presents a snapshot of COAP's major activities and milestones of the second quarter.

***Staffing***

- Regional offices are half-staffed during the second quarter.
- COAP is designated as having "Initial Operational Capability" (IOC), which means that COAP exists as a legal, operational, and funded program with a director empowered to make binding organizational decisions (U.S. Department of Defense, 2001 as amended through September 30, 2008).
- Program Heads, Executive officer of Task Force, Regional Heads, and Regional Assistants start.
- Regional Heads and assistants occupy and start setting up designated offices.
- Sub-department heads, Regional Heads, GS-10s and above go on a "Retreat". Goals of the retreat are to outline goals, theory, principles, brainstorm assessment process; review grant process for initial state grants, and present draft Budget.

***Budgeting***

- Executive Director submits 2010 Budget to Department of Commerce.

***State & Regional Assessments***

- *Planning and Assessments* begins search for contractors to conduct assessments.
- *Planning and Assessments* begins scheduling assessments with states.
- *Planning and Assessments* hire contractors to conduct the state assessments.

***State Grants***

- *Grant Management* drafts qualifying criteria and application format for Adaptation Grants.
- *Grant Management* reviews and approves state applications for Interim Grants, ongoing thereafter.

***National Coastal and Ocean Adaptation Plan (National Plan)***

- HQ begins to identify and outline requirements for National Plan.

## 2.4 Third Quarter Activities

The major milestone of the third quarter is COAP allocating interim grants to states. The third quarter is otherwise a transitional quarter, with contractors and HQ continuing to prepare the state assessments and the National Plan. The following presents a snapshot of all the major activities and milestones of the third quarter.

***Staffing***

- COAP HQ is three-quarters-staffed by the start of the 3rd quarter.
- Regional Offices are fully staffed by the beginning of the 3rd quarter.

***Budgeting***

- The 2009 Fiscal Year is closed-out and all 2009 funding is halted.

***State & Regional Assessments***

- *Planning and Assessments* begins first state assessment with contractor representatives.
- Contractors take lead in conducting subsequent assessments.

***State Grants***

- *Grant Management* allocates Interim Grants to states.
- *Grant Management* finalizes and forwards criteria and application format for Adaptation Grants to states.

***Other Milestones***

- Criteria and application format for Pilot Projects approved by NOAA.
- Instructions, criteria, and application format for Pilot Projects distributed to states.

## 2.5 Fourth Quarter Activities

The fourth quarter is marked by the initiation of Regional Assessments. In addition, the HQ office becomes fully operational and the preparation of both the state assessments and the National Plan continue. During this time, states complete applications for pilot project grants, which are allocated just before the end of the year. The following is a snapshot of the major activities and milestones of the fourth quarter.

***Staffing***

- HQ is fully staffed by the beginning of the 4th quarter.
- COAP achieves "Full Operational Capability" (FOC) as of October 1, 2009. This means that the organization will be fully staffed and equipped, and will assume responsibility for all programs for which it was created (U.S. Department of Defense, 2001 as amended through September 30, 2008).

***Budgeting***

- 2009 Fiscal Year Close-out; all expenses reviewed and reconciled; books closed.
- Executive Director begins development of 2011 Budget.

***State & Regional Assessments***

- Contractors complete 5 state assessment reports by November 2009.
- *Planning and Assessments* begins drafting Regional Assessments.

***National Coastal and Ocean Adaptation Plan***

- Executive Director completes and submits partial draft of the National Plan to NOAA and Department of Commerce for input. This draft includes federally policy recommendations, but excludes the region-specific strategies to be developed upon completion of Regional Assessments.

***Other Milestones***

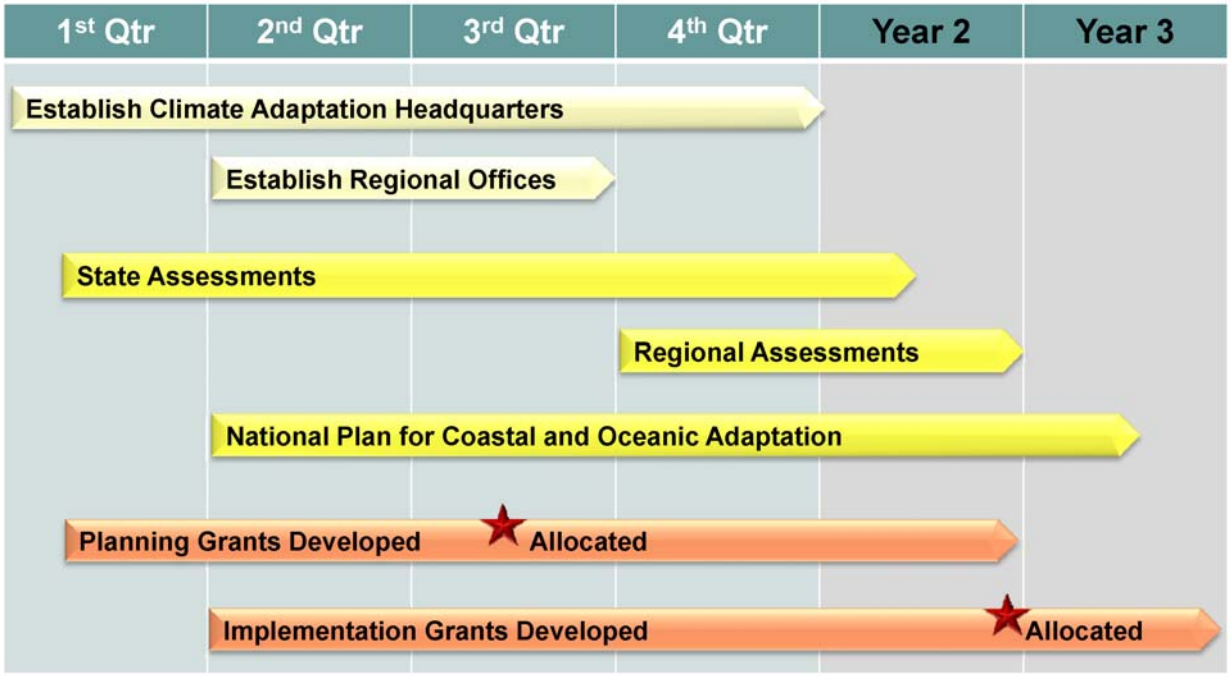
- COAP hosts the 1st Annual Coastal and Oceanic Adaptation Conference.
- Executive Director submits Annual Performance Management Report to NOAA's Office of Program Planning and Integration.
- Executive Director selects and initiates Pilot Projects.

## 2.6 Year 2 Activities

In applying the principle "begin with the end in mind", the major activities for the second year of COAP operations were planned to be the following (Figure 3):

- HQ continues to develop National Plan for Coastal and Ocean Adaptation, incorporating the Regional Assessments, once complete.
- *Planning and Assessments* complete Regional Assessments by October 2010.
- COAP HQ hosts the 2nd Annual Coastal and Oceanic Adaptation Conference.

***Figure 3. Major Program Elements Timeline[1]***




1 The detailed 2009 Calendar for COAP is available in the attached Appendix.

# 3. COAP Budget: Year 1

The program budget is based on the elements of COAP outlined in the Program Design, and accounts for the following fundamental activities required and implied by the Act:

### Mandated by the Act

- Establish COAP within the CPO in Silver Spring, MD
- Establish the regional offices
- Fund "planning grants" (Interim Grants) for states to develop their plans and adaptation measures
- Conduct regional assessments
- Begin development of the National Plan

### Implied Activities

- Build or occupy physical offices
- Acquire furniture, equipment, computers, telephones, and the IT structure
- Arrange service contracts. This includes for physical offices, such as cleaning and maintenance, as well as for IT systems, phone systems and cell phones
- Recruit and hire or contract personnel
- Train personnel. This training includes technical training for personnel on engineering adaptation measures, as well as routine annual training for all government employees, such as "equal opportunity in the workplace" seminars
- Begin operations. Implied in this step are additional expenses to prepare teams to conduct briefings and assessments

COAP's budget for year 1 (2009) is currently broken into 12 Program areas, with budgeted annual expenses, as detailed in Table 1.

***Table 1. The First Year (2009) Program Budget Breakdown in U.S. Dollars[1]***

| | |
|---|---|
| Director's Office | $332,593 |
| Planning and Assessments | $5,331,262 |
| Modeling and Applications | $295,515 |
| Communications and Media | $1,102,113 |
| Grants Management | $106,869 |
| Policy and Program Analysis | $159,918 |
| Compliance and Jurisdiction | $86,810 |
| Budget and Administration | $24,279 |
| Human Resources | $24,279 |
| Information Technology Systems | $180,954 |
| Five Regional Offices Total | $912,511 |
| State Grant Monies and Pilot Programs | $75,000,000 |
| **Overall Program Budget Total** | **$83,557,105** |

1 The full 2009 Budget is available in the attached Appendix.

## 3.1 Key Aspects of the Budget

The following sections provide information on key aspects of the budget.

### Grants to States

Grants to states in the first year will not exceed $75 million. Congress, in the legislation, stipulates that grant proposals for climate change adaptation purposes shall fund state adaptation plans which comply with the national plan. In the first year, these plans will need to be developed, and many states may lack the funds to conduct the necessary initial work. COAP will plan for a minimum state or territory grant of $200,000. This is an estimated

cost of the annual employment of 2 engineers, plus expenses, to develop an initial plan. Further, of the total sum, an amount of $5 million will be set aside as grants for pilot projects.

### NOAA Assistance

COAP plans to use existing NOAA capacity through the first three quarters of the calendar year by borrowing personnel and services. After the start of the next Fiscal Year, COAP will plan to fund (2) personnel each in the fields of Finance and Administration, IT Support, and Human Resources. COAP will then plan to fund the replacement of (11) personnel in its core program areas, who will be borrowed from NOAA for the first three quarters of the year. COAP intends to contract organizations to provide the following services to support the Planning and Assessment program: Training, Technical Support, Adaptation and Vulnerability Assessments, marketing and publishing to support the Communications and Media program, and experts to augment the Modeling and Applications program.

### Assessments

Each state assessment would be conducted by a 6-person team and assumes four trips to the assessment location, or one long extended trip. $10,000 is budgeted for the production of each assessment report. Based on these figures, each assessment, without personnel or office expenses, will cost $44,320, with a total for the thirty assessments of $1,329,600. Each team member is budgeted to receive the equivalent of a GS-13, Step 5 salary, with no fringe benefits. With five teams contracted, the overall staffing costs for each team are $466,662, and the total for all five teams is $2,333,310. Office expenses for five teams are estimated at $20,000 per team, resulting in a total of $100,000.

## 3.2 Budgetary Challenges

The challenges for which the budget accounted include:

- ***The geographic separation of offices***
  This was overcome by choosing to co-locate the offices within existing NOAA facilities, which significantly reduces the first year's overhead and start-up costs. Locations of the offices are included in Figure 1.
- ***Start-up costs***
  Start-up costs are unavoidable and primarily involve first-year purchases, such as office equipment and computers, and initial start-up fees for service contracts. Planning to borrow or use existing furniture, office space, and equipment keeps costs low and enables employees to start work as soon as they arrive.
- ***Sequencing costs with the gradual build-up of capacity***
  Expenditures in the first quarter are focused on establishing and furnishing fully-capable office spaces, whereas personnel are not hired until the second and third quarters to allow the management team and the borrowed personnel from NOAA to put the office together.
- ***Providing grant monies expeditiously***
  Since the vast majority of adaptation work will be done by the states, COAP must process and fund grants as quickly as possible. Therefore, under the operational plan, COAP establishes the grant-review team expediently and works to streamline the process for applying for and distributing "planning grants" for plan development.
- ***Conducting assessments***
  With office personnel flowing in over the course of the first year, it is difficult to conduct many of the state assessments that are a necessary precursor to the all-important regional assessments. This obstacle was overcome by choosing to rely primarily on contractors to conduct the first wave of assessments.

- ***Preparing the following year's budget on an abbreviated time-line***
  As COAP is starting its operations in January, it will have an abbreviated time-line to submit the following year's budget proposal to CPO. The budget therefore accounts for the need to hire or fund at least one budget analyst to manage the program's finances for the fourth quarter to augment the NOAA analysts.

# 4. Performance Management

Based on the Government Performance Results Act of 1993, performance evaluation mechanisms are now a common element in most organizational designs of federal agencies (Office of Management and Budget, 2008a). The Office of Management and Budget (OMB) of the White House has developed a program assessment rating tool (PART) to be used by all federal agencies in the monitoring and reporting of programs (NOAA, 2008; Office of Management and Budget, 2008). Implementing COAP, however, poses specific challenges given the very nature of climate change and how much we still need to learn regarding adaptation. In this context, performance and innovation will be particularly important for the success of COAP based on the following considerations:

- Climate Change Adaptation is a relatively new and evolving field, requiring COAP to identify the adaptation processes and experiences in the U.S. and abroad that can be used for benchmarking purposes.
- COAP is undertaking a multi-year implementation process that requires continuous monitoring and evaluation starting from year one.
- Operational results, outputs, and outcomes should be integrated and monitored in one performance evaluation system.
- Building institutional state-of-the-art expertise within NOAA requires performance measurement, continuous improvement and benchmarking.
- Developing COAP within the OAR branch of NOAA may pose a challenge when attempting to establish innovative procedures, processes and management, but with a properly designed and implemented Performance and Innovation Management System, NOAA's organizational culture and capacity can be engaged and harnessed.

## 4.1 Output and Outcome Indicators

The overarching goal of the Act is to ensure that coastal states are prepared for the expected impacts of climate change, through the assessment of risks and the development and implementation of plans to address these challenges. The following questions will need to be answered to properly measure the success of the Act in a planning horizon of five to ten years:

- ☑ Are people in coastal regions safer?
- ☑ Are contingency plans in place for emergency responses?
- ☑ Have monitoring systems been developed and implemented?
- ☑ Is infrastructure in high risk areas able to withstand extreme weather events?
- ☑ Are the impacts of climate change consistent with expectations and models?
- ☑ Has the funding for adaptation measures been well spent?
- ☑ Is the health of U.S. coastal ecosystems being maintained?

Within the framework identified by the Program Design (Section 3.3), the following are the key outcome indicators that will be measured beginning from the third year of program implementation:

*Table 2. Indicators of Key Program Outcomes*

| Populations | Infrastructure | Ecosystems |
|---|---|---|
| 15% fewer people living in vulnerable coastal areas<br>15% reduction in deaths from natural disasters | Revised regulatory requirements for public infrastructure<br>Optimal design lifetimes extended by 25% | 20% reduction in rate of coastal development in high risk areas<br>10% expansion of coastal acquisition and easement programs |
| Early warning systems, emergency preparedness and response systems in place<br>25% increase in voluntary evacuation programs | Real-time monitoring and threshold profiles for all "vulnerable" Interstate Highway bridges<br>Improved ability to withstand weather impacts | Ecosystem integrity and health improved by 20%<br>10% increase in land area of coastal ecosystems |
| Restructuring of National Flood Insurance Program and premium structures | 25% reduction in outages, downtime and economic loss due to coastal flooding and storms | Reduction in frequency and intensity of flooding events along coastal regions |

## 4.2 Measuring Success

Within the proposed organizational structure of COAP (Figure 2), the Policy and Program Analysis sub-department will have the primary responsibility of establishing and maintaining the Performance and Innovation Management System (PIM-SYSTEM).

The Policy and Program Analysis sub-department will report directly to the Office of the Executive Director, but will also liaise with NOAA's Office of Program Planning and Integration in order to ensure that methods, reporting and performance measurements are compatible with NOAA's current procedures.[2] In order to measure progress toward long-term outcomes that affect the lives and wellbeing of citizens, COAP will need to coordinate with its partner agencies and other stakeholders. As such, the PIM-System will focus on the following dimensions of the program's performance:

- Making progress toward the strategic outcomes (expected from the third year of program implementation);
- Producing expected outputs according to established timelines (quarterly and yearly reports, as well as the National Coastal and Ocean Adaptation Plan);
- Monitoring and evaluating yearly operational results (including first-year interim results when institutional capacity is being established);
- Management of staff, quality of contractors and quality of products and services delivered, and
- Budget allocation, efficiency and effectiveness, particularly with regards to shifts in budgeting allocation from the first year to subsequent years.

2 For a detailed description of the core capabilities and reference material of this office, see http://www.ppi.noaa.gov/PPI_Capabilities/performance_eval.html

In order to accomplish the performance measurement in all five program dimensions, the PIM-System will establish a three-level responsibility framework (NOAA, 2008b):

I. **First-Level:** Monthly, Quarterly and Annual Reporting to the Program Director of COAP conducted by the Policy and Program Analysis sub-department.

II. **Second-Level**: Quarterly Reporting to NOAA's *Office of Program Planning and Integration*, with an annual review board made up of top-level officials within NOAA*: Deputy Under-Secretary for Oceans and Atmosphere, Assistant Secretary of Commerce for Oceans and Atmosphere (also NOAA Deputy Administrator), Chief of Staff, and Under Secretary of Commerce for Oceans and Atmosphere (NOAA Administrator).* Mid-course adjustments affecting program design can be proposed by the Internal Review Board, accepted by the NOAA Administrator, with final approval from the Secretary of Commerce.

III. **Third-Level**: External Review Board (every two years) composed of key figures of the federal government, prominent scientists and officials (from NASA, USGCRP, and FEMA), public officials and leaders from the private, academic and non-profit sectors. Mid-course adjustments affecting program design can be proposed by the External Review Board, accepted by the NOAA Administrator, with final approval from the Secretary of Commerce.

## 4.3 Continuous Improvement

As newer information and technology options become available, NCS and COAP personnel will need to incorporate these elements into the internal management processes, as well as into the services and assistance they provide to other agencies, state governments and local actors. Inter-agency coordination and communication is an important element of COAP. Given that many of the state and local actors involved in risk mitigation and emergency planning will also be involved in adaptation planning and implementation, the NCS and FEMA in particular should develop robust information and coordination channels from the very beginning of program implementation.

Finally, public awareness campaigns and advocacy programs should be a key component of later stages of program implementation. Because adaptation measures will affect all sectors of society, private sector organizations and environmental advocacy groups should be invited to participate as part of the external review board, in a specific and well-defined role.

# Conclusion

Global climate change is no longer just an environmental concern. In the 21st century, the impacts on human populations, ecosystems, commerce and economies, infrastructure and services will become increasingly prominent in international governance structures and domestic policies. Although research on climate change has been conducted in the U.S. since 1989, robust and effective mitigation policies at the national level have not kept up. Similarly, our current understanding of what the impacts from climate change will be at the local level, and how to best adapt to them, is still limited. In this context, the Climate Change Adaptation Act is an important but limited step in the right direction. The development of a detailed program for its implementation has been valuable as a policy-analysis exercise. Any policy instrument dealing with implementing adaptation programs in the U.S. will have to address the considerations, challenges, and controversies identified in this paper.

Those designing, planning, coordinating, and implementing adaptation programs in coastal regions of the U.S. will face several challenges. The very nature of climate change dictates that key policy and implementation decisions will have to be based on incomplete, probability-based information. As such, adaptation will be a continuous process of "learning by doing" at all levels of government and society. Furthermore, the costs associated with adaptation implementation will be a permanent point of contention. Effective partnerships among the public, private and non-profit sectors will play a key role in determining the success of adaptation policies and programs. Additionally, the legal framework in the U.S. will also have to address potential jurisdictional conflicts between citizens, cities, states and the federal government. The political and social implications of climate change adaptation will need to be carefully monitored to ensure that effective adaptation is not postponed or hampered by uninformed public or policy-makers. Finally, adaptation policy highlights the need to reassess and clearly define the role of the federal government in getting people out of harm's way and protecting national interests.

Although critics fear that a robust and effective adaptation policy in the U.S. may decrease the need for a similarly ambitious mitigation strategy, the changing political context in the U.S. with regards to climate change represents an opportunity for both mitigation and adaptation to become federal policy priorities. This would also be an opportunity for the U.S. to cooperate more actively on climate change adaptation with countries such as the U.K., New Zealand, Denmark and Australia, to ensure that the scientific, engineering, and technology options available to state and local actors in the U.S. are up-to-date. The U.S. has invested $20 billion in climate change research since 1989 (US Climate Change Science Program, n.d.); based on data provided by NOAA (2008), we estimated the adjusted losses due to weather-related disasters to be, on average, slightly more than $20 billion a year since 1980. In light of the severity of the current financial crisis, a more cost-effective approach to climate change adaptation, as proposed by the Act, is more important than ever.

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# APPENDIX

- COAP 2009 Program Budget

- Coastal and Ocean Adaptation Program Calendar
  - COAP 2009 Draft Master Calendar of Major Events
  - COAP 2009 Draft Detailed Workplan
  - COAP 2010 Draft Master Calendar

# COAP 2009 PROGRAM BUDGET

**Executive Director's Office**

| Personnel Services | | SES/GS Level | # of Quarters | Base Annual Salary | Quantity | Totals |
|---|---|---|---|---|---|---|
| HQ | Executive Director | SES V | 4 | $139,600.00 | 1 | $139,600.00 |
| | Executive Officer Task Force | GS-13 | 3 | $77,777.00 | 1 | $58,332.75 |
| | Executive Assistant | GS-8 | 4 | $40,834.00 | 1 | $40,834.00 |
| | | | | Base Salaries | | 238,767 |
| | | | | Fringe Benefits 25% | | 59,692 |
| | | | | Total Personnel Services | | 298,458 |
| Other Than Personnel Services | | | | | | |
| | Supplies | | 11 | $300.00 | | 825 |
| | Office Expenses | | 18 | $2,000 | | 9,000 |
| | Travel | | | $1,430.00 | 17 | 24,310 |
| | | | | Total OTPS | | 34,135 |
| | | | | Total Program Exec Group | | **$ 332,593** |

**Planning and Assessment Department**

| Personnel Services | | | | | | |
|---|---|---|---|---|---|---|
| | Head of Planning and Assesm | GS-12 | 3 | $65,405.00 | 1 | $49,053.75 |
| | Head of Adaptation | GS-11 | 3 | $54,568.00 | 1 | $40,926.00 |
| | Head of Support and Analysts | GS-10 | 3 | $49,668.00 | 1 | $37,251.00 |
| | Specialists | GS-9 | 2 | $45,103.00 | 9 | $202,963.50 |
| | Planning & Assement Assistan | GS-6 | 2 | $33,180.00 | 1 | $16,590.00 |
| From NOAA | Evaluation Manager | GS-10 | 1 | $49,668.00 | 1 | $12,417.00 |
| From NOAA | Economist | GS-10 | 1 | $49,668.00 | 1 | $12,417.00 |
| From NOAA | Infrastructure Specialist | GS-9 | 1 | $45,103.00 | 1 | $11,275.75 |
| From NOAA | Strategic Assets Specialist | GS-9 | 1 | $45,103.00 | 1 | $11,275.75 |
| From NOAA | Ecosystem Specialist | GS-8 | 1 | $40,834.00 | 1 | $10,208.50 |
| From NOAA | Human Welfare specialist | GS-8 | 1 | $40,834.00 | 1 | $10,208.50 |
| | | | | Base Salaries | | 414,587 |
| | | | | Fringe Benefits 25% | | 103,647 |
| | | | | Total Personnel Services | | 518,233 |
| Other Than Personnel Services | | | | | | |
| | Supplies | | 35 | $300.00 | | 2,625 |
| | Office Expenses | | 45 | $2,000 | | 22,500 |
| | Travel | | | $1,430.00 | 13 | 18,590 |
| | | | | Total OTPS | | 43,715 |
| Contracted Training | | | | | | 500,000 |
| Assessments | | | | | | |
| | Travel | | | $1,430.00 | 100 | 143,000 |
| | Report preparation and publication | | | $10,000.00 | 10 | 100,000 |
| | Contracted Assessments | | | $4,026,314.00 | | $4,026,314.00 |
| | | | | Total Assessments | | 4,269,314 |
| | | | | Total Planning And Assessments | | **$ 5,331,262** |

| **Modeling and Applications** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Personnel Services | | | SES/GS Level | # of Quarters | Base Annual Salary | Quantity | | Totals |
| | Analyst | | GS-10 | 3 | $49,668.00 | 1 | | $37,251.00 |
| | Data and Model Engineer | | GS-9 | 2 | $45,103.00 | 1 | | $22,551.50 |
| From NOAA | Data and Model Assistant | | GS-7 | 1 | $36,870.00 | 1 | | $9,217.50 |
| | | | | | Base Salaries | | | 69,020 |
| | | | | | Fringe Benefits 25% | | | 17,255 |
| | | | | | Total Personnel Services | | | 86,275 |
| | | | | | | | | |
| Other Than Personnel Services | | | | | | | | |
| | Supplies | | | 6 | $300.00 | | | 450 |
| | Office Expenses | | | 9 | $2,000 | | | 4,500 |
| | Travel | | | | $1,430.00 | 3 | | 4,290 |
| | Modeling Computers and Systems | | | | $200,000.00 | | | 200,000 |
| | | | | | Total OTPS | | | 209,240 |
| | | | | | Total Modeling and Applications | | | **$ 295,515** |
| | | | | | | | | |
| **Communications and Media** | | | | | | | | |
| Personnel Services | | | | | | | | |
| | Department Head | | GS-11 | 3 | $54,568.00 | 1 | | $40,926.00 |
| | Communication Officer | | GS-7 | 2 | $36,870.00 | 1 | | $18,435.00 |
| From NOAA | Communication Officer | | GS-7 | 1 | $36,870.00 | 1 | | $9,217.50 |
| | | | | | Base Salaries | | | 68,579 |
| | | | | | Fringe Benefits 25% | | | 17,145 |
| | | | | | Total Personnel Services | | | 85,723 |
| | | | | | | | | |
| Other Than Personnel Services | | | | | | | | |
| | Supplies | | | 6 | $300.00 | | | 450 |
| | Office Expenses | | | 9 | $2,000 | | | 4,500 |
| | Travel | | | | $1,430.00 | 8 | | 11,440 |
| | | | | | Total OTPS | | | 16,390 |
| Contracted Marketing and Education Services | | | | | | | | 1,000,000 |
| | | | | | Total Communications and Media | | | **$ 1,102,113** |
| | | | | | | | | |
| | | | | | | | | |
| **Grant Management** | | | | | | | | |
| Personnel Services | | | | | | | | |
| | Grant Management Director | | GS-11 | 3 | $54,568.00 | 1 | | $40,926.00 |
| | Grant Officer | | GS-7 | 3 | $36,870.00 | 1 | | $27,652.50 |
| From NOAA | Grant Officer | | GS-8 | 1 | $40,834.00 | 1 | | $10,208.50 |
| | | | | | Base Salaries | | | 78,787 |
| | | | | | Fringe Benefits 25% | | | 19,697 |
| | | | | | Total Personnel Services | | | 98,484 |
| | | | | | | | | |
| Other Than Personnel Services | | | | | | | | |
| | Supplies | | | 7 | $300.00 | | | 525 |
| | Office Expenses | | | 10 | $2,000 | | | 5,000 |
| | Travel | | | | $1,430.00 | 2 | | 2,860 |
| | | | | | Total OTPS | | | 8,385 |
| | | | | | Total Grants/Contracts Mgmt' | | | **$ 106,869** |
| | | | | | | | | |
| | | | | | | | | |

| **Policy and Program Analysis** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Personnel Services | | | SES/GS Level | # of Quarters | Base Annual Salary | Quantity | | Totals |
| | Senior Policy Analyst | | GS-11 | 3 | $54,568.00 | 1 | | $40,926.00 |
| | Head of Support and Analysts | | GS-10 | 2 | $49,668.00 | 2 | | $49,668.00 |
| From NOAA | Policy Analyst | | GS-7 | 1 | $36,870.00 | 3 | | $27,652.50 |
| | | | | | Base Salaries | | | 118,247 |
| | | | | | Fringe Benefits 25% | | | 29,562 |
| | | | | | Total Personnel Services | | | 147,808 |
| | | | | | | | | |
| Other Than Personnel Services | | | | | | | | |
| | Supplies | | | 10 | $300.00 | | | 750 |
| | Office Expenses | | | 17 | $2,000 | | | 8,500 |
| | Travel | | | | $1,430.00 | 2 | | 2,860 |
| | | | | | Total OTPS | | | 12,110 |
| | | | | | Total Policy and Program Analysis | | | **$ 159,918** |
| | | | | | | | | |
| **Compliance and Jurisdiction** | | | | | | | | |
| Personnel Services | | | | | | | | |
| | Head, Compliance and Juris | | GS-11 | 3 | $54,568.00 | 1 | | $40,926.00 |
| From NOAA | Lawyer | | GS-11 | 1 | $54,568.00 | 1 | | $13,642.00 |
| | | | | | Base Salaries | | | 54,568 |
| | | | | | Fringe Benefits 25% | | | 13,642 |
| | | | | | Total Personnel Services | | | 68,210 |
| | | | | | | | | |
| Other Than Personnel Services | | | | | | | | |
| | Supplies | | | 4 | $300.00 | | | 300 |
| | Office Expenses | | | 8 | $2,000 | | | 4,000 |
| | Travel | | | | $1,430.00 | 10 | | 14,300 |
| | | | | | Total OTPS | | | 18,600 |
| | | | | | Total Compliance and Jurisdiction | | | **$ 86,810** |
| | | | | | | | | |
| | | | | | | | | |
| **Budget and Administration** | | | | | | | | |
| Personnel Services | | | | | | | | |
| From NOAA | Budget Analyst | | GS-8 | 1 | $40,834.00 | 1 | | $10,208.50 |
| From NOAA | Budget Assistant | | GS-6 | 1 | $33,180.00 | 1 | | $8,295.00 |
| | | | | | Base Salaries | | | 18,504 |
| | | | | | Fringe Benefits 25% | | | 4,626 |
| | | | | | Total Personnel Services | | | 23,129 |
| | | | | | | | | |
| Other Than Personnel Services | | | | | | | | |
| | Supplies | | | 2 | $300.00 | | | 150 |
| | Office Expenses | | | 2 | $2,000 | | | 1,000 |
| | Travel | | | | $1,430.00 | 0 | | - |
| | | | | | Total OTPS | | | 1,150 |
| | | | | | Total Budget and Admin | | | **$ 24,279** |
| | | | | | | | | |
| | | | | | | | | |

| **Human Resources** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Personnel Services | | | SES/GS Level | # of Quarters | Base Annual Salary | Quantity | | Totals |
| From NOAA | HR Officer | | GS-8 | 1 | $40,834.00 | 1 | | $10,208.50 |
| From NOAA | HR Assistant | | GS-6 | 1 | $33,180.00 | 1 | | $8,295.00 |
| | | | | | Base Salaries | | | 18,504 |
| | | | | | Fringe Benefits 25% | | | 4,626 |
| | | | | | Total Personnel Services | | | 23,129 |
| | | | | | | | | |
| Other Than Personnel Services | | | | | | | | |
| | Supplies | | | 2 | $300.00 | | | 150 |
| | Office Expenses | | | 2 | $2,000 | | | 1,000 |
| | Travel | | | | $1,430.00 | 0 | | - |
| | | | | | Total OTPS | | | 1,150 |
| | | | | | Total Human Resource | | | **$ 24,279** |
| | | | | | | | | |
| **Information Technology** | | | | | | | | |
| Personnel Services | | | | | | | | |
| From NOAA | IT Specialist | | GS-8 | 1 | $40,834.00 | 1 | | $10,208.50 |
| From NOAA | HR Assistant | | GS-6 | 1 | $33,180.00 | 1 | | $8,295.00 |
| | | | | | Base Salaries | | | 18,504 |
| | | | | | Fringe Benefits 25% | | | 4,626 |
| | | | | | Total Personnel Services | | | 23,129 |
| | | | | | | | | |
| Other Than Personnel Services | | | | | | | | |
| | Supplies | | | 11 | $300.00 | | | 825 |
| | Office Expenses | | | 18 | $2,000 | | | 9,000 |
| | Travel | | | | $1,430.00 | 0 | | - |
| | | | | | Total OTPS | | | 9,825 |
| | | | | | | | | |
| | Computers | | | | 1200 | 65 | | 78,000 |
| | Computer Servers, Hardware, Software | | | | | | | 32,500 |
| | Phones | | | | 100 | 65 | | 6,500 |
| | Cell Phone (Blackberry) Contract | | | | 150 | 65 | | 9,750 |
| | Computer Service and Bandwith Contract | | | | | | | 21,250 |
| | | | | | Total Computers - Phones | | | 148,000 |
| | | | | | Total IT | | | **$ 180,954** |
| | | | | | | | | |
| | | | | | | | | |

| **Regional Offices** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Personnel Services | | | SES/GS Level | # of Quarters | Base Annual Salary | Quantity | | |
| Regions | Executive Officer | | GS-12 | 3 | $65,405.00 | 5 | | $245,268.75 |
| | Adaptation & Assesment Spec | | GS-9 | 2 | $45,103.00 | 10 | | $225,515.00 |
| | Assistant | | GS-6 | 3 | $33,180.00 | 5 | | $124,425.00 |
| | | | | | Base Salaries | | | 595,209 |
| | | | | | Fringe Benefits 25% | | | 148,802 |
| | | | | | Total Personnel Services | | | 744,011 |
| | | | | | | | | |
| Other Than Personnel Services | | | | | | | | |
| | Supplies | | | 50 | $300.00 | | | $3,750 |
| | Office Expenses | | | 65 | $2,000 | | | $32,500 |
| | Travel | | | | $1,430.00 | 75 | | $107,250 |
| | Office Equip and Maintenance Expenses | | | | $5,000.00 | 5 | | $25,000 |
| | | | | | Total OTPS | | | $168,500 |
| | | | | | Total 5 Regions | | | **$912,511** |
| | | | | | | | | |
| Grants | Grant monies for states | | | | | | | $70,000,000 |
| | Grant monies for Pilot Projects | | | | | | | $5,000,000 |
| | | | | | Total Grant Monies | | | $75,000,000 |
| Overall Program Breakdown of Totals: | | | | | | | | |
| | | | | | Program Exec Group | | | $332,593 |
| | | | | | Planning And Assessments | | | $5,331,262 |
| | | | | | Modeling and Applications | | | $295,515 |
| | | | | | Communications and Media | | | $1,102,113 |
| | | | | | Grants/Contracts Mgmt' | | | $106,869 |
| | | | | | Policy and Program Analysis | | | $159,918 |
| | | | | | Compliance and Jurisdiction | | | $86,810 |
| | | | | | Budget and Admin | | | $24,279 |
| | | | | | Human Resource | | | $24,279 |
| | | | | | IT | | | $180,954 |
| | | | | | 5 Regions | | | $912,511 |
| | | | | | Grant Monies | | | $75,000,000 |
| | | | | | | | | |
| **OVERALL PROGRAM BUDGET TOTAL** | | | | | | | | **$ 83,557,105** |

| **LINE ITEM BUDGET** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | Personnel Services | | | | | | | |
| | | Salary | | | | | | $1,693,272.75 |
| | | Fringe Benefits | | | | | | $423,318.19 |
| | | Total Personnel Services | | | | | | $2,116,590.94 |
| | Other than Personnel Services | | | | | | | |
| | | Travel | | | | | | $185,900.00 |
| | | Supplies | | | | | | $10,800.00 |
| | | Office Expenses | | | | | | $126,500.00 |
| | | Computers and Phone Equipment w/ Contracts | | | | | | $348,000.00 |
| | | Total OTPS | | | | | | $671,200.00 |
| | Markteing (Contracted) | | | | | | | $1,000,000.00 |
| | Training | (Contracted) | | | | | | $500,000.00 |
| | Assessments | | | | | | | |
| | | Contracted Assessments | | | | | | $4,026,314.00 |
| | | HQ Assessments | | | | | | $243,000.00 |
| | | Total Assessments | | | | | | $4,269,314.00 |
| | Subtotal | | | | | | | $8,557,104.94 |
| | | | | | | | | |
| | Grants | | | | | | | $75,000,000.00 |
| | | | | | | | | |
| | Total: | | | | | | | $83,557,104.94 |

# COAP 2009 DRAFT MASTER CALENDAR [Major Events]

| QTR | MONTH | DATE | ACTIVITY / OUTPUT | Office Responsible | Duration (weeks) |
|---|---|---|---|---|---|
| 1st QUARTER | JAN | 2 | COAP Executive Director Starts; Moves into temporary offices | PEG | |
| | | 5 | "Borrowed" NOAA Personnel Start | PEG | |
| | | 12 | Identify Long-term Office Space for COAP HQ office in Silver Spring, MD | PEG | 2 |
| | | 12 | Interim State Grants - Draft qualifying criteria for grants and grant application formats | GM | 4 |
| | | 16 | Approve staffing plan with Climate Program Office | PEG, HR | 1 |
| | | 20 | Assessment Design - Begin design of assessments | PAD | 12 |
| | | 26 | Purchase / Acquire Furniture, Carpet, Contract Painting for long-term office space | PEG, BAA | 3 |
| | FEB | 2 | Begin development of 2010 Budget; Executive Director provides budget guidance | BAA, PEG | 4 |
| | | 9 | Identify Regional Office space at the Regional OAR (Office of Oceanic and Atmospheric Research) labs; | PEG | 7 |
| | MAR | 23 | Interim State Grants - NOAA Approves criteria and application format | | |
| | | 24 | Interim State Grants - Instructions, application format, and criteria are forwarded to states | GM, PEG | |
| | | 27 | Move in to long-term offices | PEG | 1 |
| 2nd QUARTER | APR | 1 | COAP is designated as having "Initial Operational Capability" | PEG, NOAA | |
| | | 1 | Program Heads, Exective officer of Task Force, Regional Heads, Regional assistants start | PEG | Ongoing |
| | | 1 | Regional Heads and assistants occupy designated offices; start setting up offices | 5REG | 8 |
| | | 7 to 9 | "Retreat" in Maryland for Program Department Heads, Regional Heads, GS-10s and above; outline goals, theory, principles. Brainstorm assessment process; review grant process for initial state grants. Present draft Budget. | PEG | |
| | | 14 | Assessments - Begin search for contractors to conduct assessments | PAD | 4 |
| | | 14 | Adaptation Grants - Draft qualifying criteria for grants and grant application format | GM | 8 |
| | | 15 | Interim Grants - Review and Approve State applications | GM | Ongoing |
| | | 15 | National Plan - Start Identifying and Outlining Requirements | PPA, PAD, PEG, C&J | 8 |
| | | 20 | Initial Planning meeting for November COAP Conference | PEG, PAD | |
| | MAY | 7 | Assessments - PAD begins scheduling assessments with states | PAD | 12 |
| | JUNE | 7 | Assessments - Final selection and hiring of contractors | PAD | 1 |
| | | 15 | 2010 Budget - Final submitted to Department of Commerce | BAA | |
| | | 15 | Assessments - PAD and Contractors assemble assessment teams | PAD, CTR | 2 |
| 3rd QUARTER | JUL | 15 | Assessments - 1 year contract officially starts for contractors | CTR | 52 |
| | | 21 | Assessments - PAD starts first state assessment with contractors | PAD, CTR | 4 |
| | | 24 | Pilot Projects - criteria and application format approved by NOAA | GM | |
| | AUG | 3 | Pilot Projects - instructions, criteria, and application format forwarded to states & published | GM | |
| | | 11 | Adaptation Grants - GM Submits to NOAA / Department of Commerce for approval | GM | 2 |
| | | 15 | Assessments - Contractors conduct first assessments | CTR | 4 |
| | | 31 | Adaptation Grants - criteria and application format approved by NOAA / Department of Commerce | | |
| | SEP | 9 | Adaptation Grants - instructions, criteria and application format forwarded | GM | 2 |
| | | 29 | 2009 Fiscal Year Close-out; All 2009 funding halted | BAA | |

# COAP 2009 DRAFT MASTER CALENDAR [Major Events]

| QTR | MONTH | DATE | ACTIVITY / OUTPUT | Office Responsible | Duration (weeks) |
|---|---|---|---|---|---|
| 4th QUARTER | OCT | 1 | **2009 Fiscal Year Close-out; all expenses reviewed and reconciled; books closed** | BAA | 4 |
| | | 1 | **COAP is designated as having "Full Operational Capability" (FOC)** | PEG | |
| | NOV | 2 | **Assessments - PAD completes 5 state assessment reports** | PAD | 8 |
| | | 12 | **Begin development of 2011 Budget; Executive Director provides budget guidance** | BAA, PEG | 8 |
| | | 16 to 19 | **Coastal and Oceanic Adaptation Conference, hosted by COAP** | | 1 |
| | | 23 | **Assessments - Contractors submit update on 1st 3 months work + 5 state reports to PAD** | CTR, PAD | |
| | | 30 | **Assessments - PAD begins drafting regional assessments** | PAD | 30 |
| | DEC | 1 | **National Plan - PEG Submits Draft to NOAA and Commerce for Input** | PEG, NOAA | 8 |
| | | 4 | **Performance Management - Annual Report submitted to NOAA PPI** | PEG, PPA | |
| | | 11 | **Pilot Projects - Selection announced to Public by Executive Director** | PEG, CAM, GM | |

**Notes**

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PEG - Program Executive Group
PAD - Planning and Assessments Department
MAA - Modeling and Assessments
CAM - Communications and Media
GM - Grant Management
PPA - Policy and Program Analysis
C&J - Compliance and Jurisdiction
BAA - Budget and Administration
HR - Human Resources
IT - Information Technology
5REG - All Regional Offices
EREG - East Coast Region
WREG - West Coast Region
GREG - Gulf Coast Region
MWREG - Midwestern / Great Lakes Region
PREG - Pacific Region
CTR - Contractor

3 Days in "Red" are Mondays

4 Calendar was last updated on November 5, 2008

# COAP 2009 DRAFT DETAILED WORKPLAN

| QTR | MONTH | DATE | ACTIVITY / OUTPUT | Office Responsible | Duration (weeks) |
|---|---|---|---|---|---|
| 1st QUARTER | JANUARY | 1 | HOLIDAY - New Year's Day | | |
| | | 2 | **COAP Executive Director Starts; Moves into temporary offices** | PEG | |
| | | 5 | **"Borrowed" NOAA Personnel Start**; PAD Evaluation Manager (GS-10) assumes role as Interim Executive Officer of Task Force; includes (2) Budget, (2) HR, (2) IT | PEG | |
| | | 6 | Staffing Plan reviewed and Refined; Job descriptions written for Executive Officer of Task Force, Program Heads, Regional Executive Offcers and Regional Assistants | PEG, HR | 2 |
| | | 6 | Review initial operating expenses and budget | BAA | 2 |
| | | 6 | Interview and Hire PEG Executive Assistant | PEG, HR | 1 |
| | | 7 | Borrowed Computers (13) from NOAA set up in interim office space | IT | 1 |
| | | 12 | "Borrowed" NOAA Personnel Start: Additional (5) Personnel working in PAD | HR, PAD | |
| | | 12 | **Identify Long-term Office Space for COAP HQ office in Silver Spring, MD** | PEG | 2 |
| | | 12 | **Interim State Grants - Draft qualifying criteria for grants and grant application formats** | GM | 4 |
| | | 16 | **Approve staffing plan with Climate Program Office** | PEG, HR | 1 |
| | | 19 | HOLIDAY - Martin Luther King Jr Day | | |
| | | 20 | **Assessment Design - Begin design of assessments** | PAD | 12 |
| | | 26 | Job Descriptions posted for Program Heads to www.usajobs.gov | HR | |
| | | 26 | **Purchase / Acquire Furniture, Carpet, Contract Painting for long-term office** | PEG, BAA | 3 |
| | | 27 | Job Descriptions written for remaining positions in COAP and regional offices | HR | 4 |
| | FEBRUARY | 2 | **Begin development of 2010 Budget; Executive Director provides budget guidance** | BAA, PEG | 4 |
| | | 9 | **Identify Regional Office space at the Regional OAR (Office of Oceanic and Atmospheric Research) labs;** | PEG | 7 |
| | | 9 | Interim State Grants - PEG reviews criteria and application format | GM, PEG | 1 |
| | | 16 | HOLIDAY - President's Day | | |
| | | 17 | Install phone lines, cat-5 cable, routers, servers in long-term office space | IT | 3 |
| | | 17 | PEG Executive Assistant starts work | PEG, HR | |
| | | 17 | Interim State Grants - criteria and application format forwarded to NOAA Grant Office for review | GM | |
| | | 23 | Interviews held for Program Heads, Executive officer of Task Force, Regional Heads | PEG, HR | 8 |
| | | 24 | Interim State Grants - NOAA Grant Office returns for revision | GM | |
| | | 24 | Job Descriptions posted for remaining positions to www.usajobs.gov | HR | |
| | MARCH | 2 | Contract Cleaning Staff (Modify Existing Contract) | PEG, BAA | 2 |
| | | 2 | Presentation of draft budget to Executive Director; begin revisions | BAA, PEG | 4 |
| | | 2 | Interim State Grants - Revised criteria and application format is forwarded to CPO and NOAA for approval | GM | 3 |
| | | 9 | Install computers in long-term office space | IT | |
| | | 9 | Interim State Grants - write instructions for state offces to apply for grants | GM | 2 |
| | | 16 | Hire Program heads, executive officer of Task Force, Regional Heads | PEG, HR | 5 |
| | | 23 | Inspect all work in long-term office; accept work as complete | PEG | 1 |
| | | 23 | **Interim State Grants - NOAA Approves criteria and application format** | GM, NOAA | |
| | | 24 | **Interim State Grants - Instructions, application format, and criteria are forwarded to states** | GM, PEG | |
| | | 27 | **Move in to long-term offices** | PEG | 1 |
| | | 30 | Budget Review, 1st Quarter | BAA, PEG | |

# COAP 2009 DRAFT DETAILED WORKPLAN

| QTR | MONTH | DATE | ACTIVITY / OUTPUT | Office Responsible | Duration (weeks) |
|---|---|---|---|---|---|
| 2nd QUARTER | APRIL | 1 | **COAP is designated as having "Initial Operational Capability" (IOC)** | PEG, NOAA | |
| | | 1 | **Program Heads, Exective officer of Task Force, Regional Heads, Regional** | PEG | Ongoing |
| | | 1 | **Regional Heads and assistants occupy designated offices; start setting up offices** | 5REG | 8 |
| | | 7 to 9 | **"Retreat" in Maryland for Program Department Heads, Regional Heads, GS-10s and above; outline goals, theory, principles. Brainstorm assessment process; review grant process for initial state grants. Present draft Budget.** | PEG | |
| | | 12 | Religious Holiday - Easter | | |
| | | 14 | Program Heads interview personnel for all remaining positions | PEG, HR | 8 |
| | | 14 | **Assessments - Begin search for contractors to conduct assessments** | PAD | 4 |
| | | 14 | Final revisions to 2010 budget | BAA | |
| | | 14 | **Adaptation Grants - Draft qualifying criteria for grants and grant application** | GM | 8 |
| | | 15 | Income Tax Filing Deadline | | |
| | | 15 | **Interim Grants - Review and Approve State applications** | GM | Ongoing |
| | | 15 | **National Plan - Start Identifying and Outlining Requirements** | PPA, PAD, PEG, C&J | 14 |
| | | 20 | **Initial Planning meeting for November COAP Conference** | PEG, PAD | |
| | MAY | 4 | Interview Regional Adaptation and assessment personnel | 5REG, HR | 4 |
| | | 4 | 2010 Budget submitted to NOAA for review | BAA | 3 |
| | | 7 | **Assessments - PAD begins scheduling assessments with states** | PAD | 12 |
| | | 15 | Assessments - Interview contractors to conduct assessments | PAD | 3 |
| | | 25 | HOLIDAY - Memorial Day | | |
| | | 26 | 2010 Budget returned for revision | BAA | 3 |
| | JUNE | 1 | Hire Regional adaptation and assessment personnel | 5REG, HR | 4 |
| | | 1 | Hire remaining personnel | PEG, HR | 8 |
| | | 7 | **Assessments - Final selection and hiring of contractors** | PAD | 1 |
| | | 15 | Adaptation Grants - PEG reviews criteria and application format | GM, PEG | 2 |
| | | 15 | **2010 Budget - Final submitted to Department of Commerce** | BAA | |
| | | 15 | **Assessments - PAD and Contractors assemble assessment teams** | PAD, CTR | 2 |
| | | 22 | Mid-term planning meeting for Novermber COAP Conference | PEG, PAD | |
| | | 29 | Adaptation Grants - criteria and application format forwarded to NOAA Grant Office for 2nd Quarter Budget Review | GM<br>BAA, PEG | 3 |
| 3rd QUARTER | JULY | 1 | Regional adaptation and assessment personnel start work | 5REG | |
| | | 1 | Personnel identified to start work 3d quarter start | PEG, HR | |
| | | 3 | HOLIDAY - Independence Day | | |
| | | 15 | **Assessments - 1 year contract officially starts for contractors** | CTR | 52 |
| | | 20 | Adaptation Grants - NOAA Grant Office returns for revision | GM | 3 |
| | | 21 | **Assessments - PAD starts first state assessment with contractor reps** | PAD, CTR | 4 |
| | AUGUST | 1 | National Plan - PAD and C&J Provide Input and Review | PPA, PAD, C&J | 8 |
| | | 11 | **Adaptation Grants - GM Submits to NOAA / Department of Commerce for** | GM | 2 |
| | | 15 | **Assessments - Contractors conduct first assessments** | CTR | 4 |
| | | 21 | Assessments - PAD starts next two state assessments | PAD | 4 |
| | | 22 | Religious Holiday - Ramadan Starts | | |
| | | 24 | 2nd Mid-term planning meeting for November COAP Conference | PEG, PAD | |
| | | 31 | **Adaptation Grants - criteria and application format approved by NOAA / Department of Commerce** | GM | |
| | | 31 | 2009 Fiscal Year wrap-up starts; remaining program funds are pooled and reallocated | BAA, PEG | 2 |
| | | 31 | 3rd Quarter Budget Review | BAA, PEG | |
| | SEPTEMBER | 7 | HOLIDAY - Labor Day | | |
| | | 9 | **Adaptation Grants - instructions, criteria and application format forwarded to** | GM | 2 |
| | | 15 | Performance Management - Monthly report to Executive Director | PPA, PEG | |
| | | 15 | Performance Management - Quarterly Report submitted to Executive Director for review | PPA, PEG | 2 |
| | | 18 | Turnover responsibilities between NOAA/CPO and COAP - Final Meeting | PEG, NOAA | |
| | | 19-20 | Religious Holiday - Rosh Hashanah | | |
| | | 20 | Religious Holiday - Ramadan Ends | | |
| | | 28 | Religious Holiday - Yom Kippur | | |
| | | 29 | Assessments - PAD starts state assessments 4 and 5 | PAD | 4 |
| | | 29 | Performance Management - Quarterly Report submitted to NOAA's Office of Program | PEG, PPA | |
| | | 29 | **2009 Fiscal Year Close-out; All 2009 funding halted** | BAA | |

# COAP 2009 DRAFT DETAILED WORKPLAN

| QTR | MONTH | DATE | ACTIVITY / OUTPUT | Office Responsible | Duration (weeks) |
|---|---|---|---|---|---|
| 4th QUARTER | OCTOBER | 1 | National Plan - PPA Submits to PEG for Review | PPA, PEG | 4 |
| | | 1 | Personnel identified to start work 4th quarter start | PEG, HR | |
| | | 1 | 2010 Fiscal Year Funding (Interim?) Made available | BAA | |
| | | 1 | **2009 Fiscal Year Close-out; all expenses reviewed and reconciled; books closed** | BAA | 4 |
| | | 1 | **COAP is designated as having "Full Operational Capability" (FOC)** | PEG | |
| | | 12 | HOLIDAY - Columbus Day | | |
| | | 15 | Performance Management - Monthly report to Executive Director | PPA, PEG | |
| | | 19 | Final Planning meeting for November COAP Conference | PEG, PAD | |
| | | 26 | Pilot Projects - GM accepts final submissions | GM | |
| | NOVEMBER | 2 | National Plan - PEG returns to PPA for rewrite | PPA, PEG | 4 |
| | | 2 | **Assessments - PAD completes 5 state assessment reports** | PAD | 8 |
| | | 2 | Annual Performance Reviews of Staff and Contractors | PEG, ALL | 5 |
| | | 6 | Performance Management - Annual Report submitted to Executive Director for review | PPA, PEG | 4 |
| | | 10 | Pilot Projects - Recommendations submitted to Executive Director for review/selection | GM, PEG | 4 |
| | | 11 | HOLIDAY - Veterans' Day | | |
| | | 12 | **Begin development of 2011 Budget; Executive Director provides budget guidance** | BAA, PEG | 8 |
| | | 13 | Performance Management - Monthly report to Executive Director | PPA, PEG | |
| | | 16 to 19 | **Coastal and Oceanic Adaptation Conference, hosted by COAP** | PEG, PAD | 1 |
| | | 23 | **Assessments - Contractors submit update on 1st 3 months work + 5 state reports to PAD** | CTR, PAD | |
| | | 26 | HOLIDAY - Thanksgiving Day | | |
| | | 30 | **Assessments - PAD begins drafting regional assessments** | PAD | 30 |
| | DECEMBER | 1 | **National Plan - PEG submits to NOAA and Dept of Commerce for Input** | PEG, NOAA | 8 |
| | | 4 | **Performance Management - Annual Report submitted to NOAA PPI** | PEG, PPA | |
| | | 7 | Annual Performance Reviews of personnel complete | PEG | |
| | | 11 | **Pilot Projects - Selection announced to Public by Executive Director** | PEG, CAM, GM | |
| | | 15 | Performance Management - Monthly report to Executive Director | PPA, PEG | |
| | | 15 | Performance Management - Quarterly Report submitted to Executive Director for review | PPA, PEG | 2 |
| | | 16 | 4th Quarter Budget Review | BAA, PEG | |
| | | 25 | HOLIDAY - Christmas Day | | |
| | | 30 | Performance Management - Quarterly Report submitted to NOAA PPI | PEG, PPA | |
| | | 31 | HOLIDAY - Half Day | | |

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HR - Human Resources
IT - Information Technology
5REG - All Regional Offices
EREG - East Coast Region
WREG - West Coast Region
GREG - Gulf Coast Region
MWREG - Midwestern / Great Lakes Region
PREG - Pacific Region
CTR - Contractor

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4 Calendar was last updated on November 5, 2008

# COAP 2010 DRAFT MASTER CALENDAR

| QTR | MONTH | DATE | ACTIVITY / OUTPUT | Office Responsible | Duration (weeks) |
|---|---|---|---|---|---|
| 1st QUARTER | JAN | 1 | HOLIDAY - New Year's Day | | |
| | | 18 | HOLIDAY - Martin Luther King Jr Day | | |
| | FEB | 15 | HOLIDAY - President's Day | | |
| | | 22 | National Plan - Dept of Commerce returns with Comments | | |
| | MARCH | 5 | National Plan - Returned to White House for Approval/Publication | | |
| | | 20 | **Draft National Plan Published in-house, without annexes** | | |
| 2nd QUARTER | APRIL | 4 | Religious Holiday - Easter | | |
| | | 15 | | | 8 |
| | MAY | 31 | HOLIDAY - Memorial Day | | |
| | JUNE | 14 | Assessments - Contractors submit final state assessment reports | CTR, PAD | |
| | | 15 | Assessments - PAD reviews, revises contractors' final state assessment reports with CTRs | PAD | 3 |
| 3rd QUARTER | JULY | 5 | HOLIDAY - Independence Day | | |
| | | 9 to 10 | **Assessments - Contractors present final state reports to COAP** | CTR, PEG, PAD | |
| | | 13 | Assessments - PAD begins final work on regional assessments | PAD | 10 |
| | | 13 | National Plan - PPA begins incorporating State assessments into National Plan / Annexes | PPA | 8 |
| | AUG | 11 | Religious Holiday - Ramadan Starts | | |
| | SEPTEMBER | 6 | HOLIDAY - Labor Day | | |
| | | 9 to 10 | Religious Holiday - Rosh Hashanah | | |
| | | 10 | Religious Holiday - Ramadan Ends (Eid) | | |
| | | 15 | National Plan - PPA begins incorporating Regional assessments into National Plan / Annexes | PPA | 4 |
| | | 17 | Religious Holiday - Yom Kippur | | |
| | | 30 | **Assessments - Final Regional Assessments Complete** | PAD, PEG | |
| 4th QUARTER | OCTOBER | 11 | HOLIDAY - Columbus Day | | |
| | | 12 | National Plan - Submitted to PEG for Approval and forward | PPA, PEG | 2 |
| | | 26 | National Plan - Submitted to NOAA for Approval and forward | PPA, PEG | 4 |
| | NOV | 11 | HOLIDAY - Veterans' Day | | |
| | | 15 | COAP Headquarters office will host conference | | |
| | | 25 | HOLIDAY - Thanksgiving Day | | |
| | DEC | 1 | National Plan - PPA Submits to Dept of Commerce for Review | PPA, PEG | 4 |
| | | 24 | HOLIDAY - Christmas | | |
| | | 30 | National Plan - Dept of Commerce Returns to PPA for Review | PPA, PEG | 4 |

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GREG - Gulf Coast Region
PREG - Pacific Region

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