# USDA Animal and Plant Health Inspection Service

Climate Change Adaptation Plan 2014

**Animal and Plant Health Inspection Service**
**Climate Adaptation Plan**
**January 28, 2014**

***APHIS Vision Statement***
Advance the well-being of U.S. consumers by ensuring the health and availability of affordable food products and protecting forests and private working lands against devastating pests and diseases so that U.S. farmers, ranchers, and other citizens of our rural communities thrive and prosper.

***APHIS Mission Statement***
Protect the health and value of U.S. agricultural, natural, and other resources.

***APHIS' Strategic Goals***
Goal 1: Support rural communities
- Objective 1.1 – Implement agricultural pest and disease management programs, including those affected in rural areas
- Objective 1.2 – Protect and promote animal welfare

Goal 2: Protect forests, rangelands, and private lands
- Objective 2.1 – Reduce threats to forests and private working lands

Goal 3: Expand opportunities to develop and trade safe agricultural products, including biotechnology-derived agricultural products
- Objective 3.1 – Enhance the regulatory framework that allows for the safe development of genetically engineered organisms
- Objective 3.2 – Facilitate safe agricultural trade through international standard setting and effective management of sanitary and phytosanitary (SPS) issues

Goal 4: Minimize and prevent damage to the U.S. food supply caused by plant and animal pests and diseases
- Objective 4.1 – Monitor the health status of U.S. agricultural resources
- Objective 4.2 – Develop and implement programs to address plant and animal pests and diseases of concern
- Objective 4.3 – Provide diagnostics and technical support to enhance pest and disease programs, including emergency response capabilities for these pests and diseases.

APHIS' strategic goals listed above, and APHIS' approaches to climate change, are identified in the APHIS Strategic Plan FY 2010-2015[1]. APHIS recognizes that climate change presents a threat to its ability to advance its strategic goals. The strategic plan describes activities that acknowledge climate change factors and incorporate response and adaptation strategies.

The APHIS Strategic Plan identifies climate change as a key external threat to its ability to meet its mission critical goals. Climate change will influence the level of risk to food security and human health associated with a suite of animal and plant diseases, invasive species, and agricultural pests. Changes in environmental conditions will increase the likelihood of shifts in the distribution and nature of current domestic diseases, invasive species, and agricultural pests. These changes will influence the dynamics of invasion and establishment of exotic diseases and agricultural pests. They will require that APHIS develop appropriate predictive risk and epidemiological models, domestic and offshore surveillance, and mitigation strategies to respond to changing climatic conditions that may affect disease and pest biology. Appropriate diagnostic tools and response strategies will afford APHIS' ability to maintain situational

[1] http://www.aphis.usda.gov/about_aphis/downloads/APHIS_Strategic_Plan_2015.pdf

awareness to support regulatory responses and sound decision-making. Tools that have been developed or are in consideration for development are described in more detail in Appendix A.

APHIS, in coordination with other federal agencies and cooperators, monitors weather, pest trends, and pest outbreaks worldwide to develop pest exclusion activities whenever needed to enhance protection at air, land, and sea ports of entry, and inland areas where trade and other pathways expose the environment and agriculture to foreign pests and diseases. Empirical evidence has demonstrated that short term climate disruptions (e.g. drought, heat, and hurricanes) can strongly influence pest and disease incursion. These disruptions sometimes exacerbate pest pressure; however, pest pressure also can be minimized. Climate change is already starting to influence invasion biology, pest/disease epidemiology, and ecosystem dynamics, which can influence not only the likelihood of arrival, but also the potential for establishment and spread. Therefore, APHIS is developing analytic systems and predictive models to protect agriculture, natural resources, commerce, and trade. More information about these tools is available in Appendix A.

APHIS does not anticipate that climate change will require a modification of its regulatory authority; however, climate change will likely require new regulations and policies as well as innovative, non-regulatory approaches to address new or shifting pest and disease scenarios.

***Planning for Climate Change Related Risk***

Section 5(a) of Executive Order 13653 (the "EO") states that "each agency shall develop or continue to develop, implement, and update comprehensive plans that integrate consideration of climate change into agency operations and overall mission objectives…" This plan is organized according to the structure of Section 5 of the EO. Information requested in other sections of the EO is also presented. Actions related to each of these sections are summarized in a series of tables in the Appendices.

5.a.i. Identification and assessment of climate change related impacts on and risks to the agency's ability to accomplish its missions, operations, and programs

Vulnerability Assessment

Risks associated with changing climate include:

*Food Distribution and Aid*

- APHIS regulations prohibit the importation of agricultural and food products that pose risk to plant, animal, and human health. Disaster relief (including food distribution) efforts associated with increased frequency of extreme weather events resulting from climate change will require enhanced coordination with other Federal, State, and local agencies to protect public and agricultural resources.
- Novel patterns in the distribution and movement of regulated agricultural products may create new or increased risk for introduction of pests and diseases. APHIS will work with Federal and State partners to enhance capacity to meet the challenges encountered with export and import requirements related to food distribution and aid.
- The storage, deployment, and forward-staging of food aid materials may be compromised as climate change and associated extreme weather events hamper the distribution of aid, impacting its local availability and potentially increasing the risks of stored product pests (e.g., khapra beetle).

*U.S. Agricultural Production and Trade*

- Climate change and associated shifts in disease and pest prevalence may overwhelm the current ability of off-shore programs to provide real-time information regarding pest and disease potential and may increase risk to U.S. agriculture.
- Existing surveillance and diagnostic networks for animal and plant health diseases (e.g., avian influenza, foot and mouth disease, citrus greening, Asian long-horned beetle, fruit flies, etc.) could be overwhelmed.
- Increased requirements for commodity and pathway risk analyses may overwhelm existing capacities.

*Emergency Response Systems*

- APHIS has established animal and plant health emergency frameworks to facilitate coordinated, timely responses to disease and pest emergencies. APHIS also has established frameworks to address all hazards (e.g., hurricanes, floods, wildfires) for impacts on plant and animal health and the needs of individuals with service animals and household pets, in addition to providing technical assistance for animal and agriculture emergency management. Climate change has the potential to overwhelm existing frameworks as a result of increases in extreme weather events, wildfires, and pest and disease outbreaks.
- In the event of wide-ranging climate disruption events, capacity could be overwhelmed and assistance from other USDA and Department of Homeland Security (DHS) emergency response resources would be required. State, local, Tribal, industry, and other stakeholders with key roles in threat mitigation also may be overwhelmed.
- Changes in pest and disease biology will require APHIS to ensure that its emergency response strategies (including new pest and disease response guidelines) and capabilities are updated and coordinated with the DHS National Response Framework.

*Shifts in Geographic Distribution of Wildlife, Weeds, Pests, and Diseases*

Climate change impacts on ecosystem and habitat characteristics will result in shifts of animal and pest populations into new or expanded habitats. This movement can result in increased spread of diseases (such as citrus greening) and other pests and increased encounters with wildlife in populated areas potentially increasing disease transmission among wildlife, livestock, and people. APHIS will direct and coordinate its surveillance, reporting, and mitigation initiatives with Federal, State, and Tribal stakeholders to maintain human, animal, and plant health. Partnering with others, such as the Department of Commerce's National Oceanic and Atmospheric Administration on the development of predictive models related to climate change would afford APHIS increased capacity to protect U.S. agriculture and natural resources while maintaining the flow of trade. Increased coordination and collaboration with international partners developing predictive models will enhance APHIS' ability to prepare for pest and disease incursions and other changes driven by climate change.

*Increase in Demand for Genetically Engineered (GE) Crops and Related APHIS Services*

APHIS expects an increase in the demand for GE crops that are modified to adapt to the effects of climate change and a commensurate increase in the numbers of permit and notification applications, risk assessments, field trials, inspections, compliance issues, and petitions for deregulation, thereby increasing demands on APHIS resources.

- Adapting to climate change will likely require innovations in agricultural technology,

including the introduction of novel traits. These innovations may create the need to revise and update protocols and approaches to risk assessments.

- Response to pest and disease outbreaks may require the increased use of treatment combinations and could therefore increase the complexity of environmental and risk analyses such as those required under the National Environmental Policy Act (NEPA).
- The increased desire for genetically engineered plants to resist pests or pests engineered to prevent the transmission of plant pathogens is expected to result in increased complexity of assessments.

The vulnerabilities listed above identify the climate change related impacts and associated risk that APHIS has determined may affect its ability to accomplish agency policies and programs and continue agency operations. To ensure that APHIS is best situated to handle these impacts and associated risks, APHIS is incorporating climate change modeling into risk assessments. To do so, pest and disease forecasting systems must be updated to shift from climatological-based forecasts (based on historical data) to systematically consider General Circulation Model outputs and Intergovernmental Panel on Climate Change scenarios. This shift requires development of enhanced capacity to establish links to these resources and maintain updated modeling approaches that best capture forecasts and associated uncertainty. In order to make these enhancements, as well as to achieve other climate-related objectives, APHIS is developing partnerships to leverage resources and minimize impacts of changing pest, disease, and vector distribution throughout the United States (see action items in Appendix A, Table 1).

In addition to understanding pest risks associated with climate change, APHIS also is working to understand climate-related environmental risks from and to its own actions to control pests, diseases, and vectors. An APHIS team comprised of multiple program areas developed a general draft APHIS-wide introductory NEPA climate change guidance document that lays the foundation for the various analytical approaches that programs may employ. These approaches, along with illustrative examples, will be provided in a supplemental document (Appendix A, Table 1).

To better understand risk and opportunities and thus be better able to plan for them, APHIS will:

- Adapt risk analysis models (both epidemiological and forecasting) to incorporate changes in the distribution of environmental and biological attributes predicted under different climate change scenarios. APHIS will use the output from these models to prioritize the likelihood and severity of threats and to focus subsequent activities on specific high-likelihood, high-impact diseases, agricultural pests or pest categories[2].
- Develop proposals in collaboration with other partners to adapt risk analysis models (both epidemiological and forecasting) to incorporate changes in the distribution of environmental and biological attributes predicted under different climate change scenarios[3].

[2] This corresponds to the second element in USDA's Climate Change Science Plan (http://www.usda.gov/oce/climate_change/science_plan2010/USDA_CCSPlan_112910.pdf): "to develop knowledge, institutional models, and tools to enable adaptation…"

[3] This corresponds to the second and third element in USDA's Climate Change Science Plan: "to develop knowledge and tools to …"

5.a.ii. Description of programs, policies, and plans the agency has already put in place, as well as additional actions the agency will take, to manage climate risks in the near term and build resilience in the short and long term.

Opportunities to minimize APHIS' vulnerability include:

*Predictive Modeling Important to Preparedness*

*Regulatory Strategies*

- Develop regulatory strategies that focus on risk pathways in lieu of specific pests.
- Ensure that climate change adaptation is incorporated into the APHIS decisionmaking framework.
- Ensure that regulatory considerations regarding adaptation approaches are consistent with the APHIS mission of safeguarding the health of plants, animals, and ecosystems and ensuring safe trade.

*Leverage Resources*

- APHIS will partner with Federal, State, local, and Tribal agencies, academic institutions, industries and other stakeholders to ensure a well-informed understanding and coordinated response to climate change.
- APHIS will leverage its research capabilities and program and response resources to enhance preparedness and the ability to mitigate and adapt to impacts related to climate change. The Agency will do so by adopting an infrastructure that enables rapid modification of policy and standard operating procedures.
- APHIS will seek to leverage trading partners to harmonize efforts and ensure that sanitary and phytosanitary measures are consistent with the goals of adaptation to climate change and the APHIS mission.

*Ensure Continuity of Operations*

- APHIS will maintain a workforce that is resilient to weather and other climate change-related disruptions so that the work of the Agency can continue as seamlessly as possible.
- APHIS will employ flexible management policies to assist employees impacted by disasters related to climate change (e.g., floods, hurricanes, wildfires) so that they may return to work as quickly as possible.

By using predictive modeling, assessing regulatory strategies, and leveraging resources, APHIS will mitigate the risks discovered during the vulnerability assessment. In addition, APHIS will examine its cooperative agreement process to ensure that it is responsive to increased demand to enter into agreements and partnerships associated with climate change.

Appendix A, Table 2 shows several of the programs, policies, and plans involving APHIS' management of climate risks in the near-term and anticipated actions in the short and long term.

 plant health emergency response systems.

*Emergency Response Systems*

- As stated in APHIS' 2012 Climate Change Adaptation Plan, the Agency has established animal and plant health emergency frameworks to facilitate coordinated timely responses to disease and pest emergencies.
    - In 2013, the Emergency Support Function #11 (ESF#11) Annex to the *National Response Framework* was revised and changed the scope of ESF#11 activities. Particularly, ESF#11 now includes technical assistance for animal and agricultural emergency management. As the delegated national coordinator for ESF#11, APHIS works with multiple Federal Departments and Agencies, and non-governmental organizations to coordinate Federal support for disasters exceeding the response capability and resources of the local, State, territorial, and Tribal governments.
    - APHIS works with the National and Regional Response Teams under the National Oil and Hazardous Substances Pollution Contingency Plan (NCP; 40 CFR 300) to support wildlife response for oil and hazardous substances releases.
    - In 2013, APHIS completed training eight Type 3 Incident Management Teams to respond to animal and plant health emergencies. These Incident Management Teams may be activated, if available, to support all-hazard emergencies, including those related to climate change.
    - APHIS has continuity plans to sustain Essential Functions in multiple geographic locations, during and after a catastrophic incident.
- As described in the section on vulnerabilities, wide-ranging climate disruption events could overwhelm capacity and assistance from other USDA and DHS emergency response resources would be required. State, local, Tribal, industry and other stakeholders with key roles in threat mitigation also may be overwhelmed. In response to this vulnerability, APHIS has several actions underway:
    - APHIS is working with USDA and DHS to develop procedures for requesting support and coordinating activities for large-scale responses.
    - As part of the development of incident-specific response annexes to the National Response Framework, APHIS is working with local, State, Tribal, and territorial governments, and non-governmental organizations to develop Food and Agriculture Incident specific annexes for each of the 10 Federal Emergency Management Agency Regions and at the national level.
    - APHIS maintains continuity plans to ensure that when disruptions occur, APHIS maintains redundancies to continue to perform its missions in other non-impacted operational locations. APHIS is expanding its Continuity of Operations plans to address business continuity and property protection issues.
    - APHIS has prepared for climate risks in the short and long term by implementing the USDA Telework Directive. Approximately 63 percent of APHIS employees have telework agreements in place, which allows for continuity in operations even during inclement weather such as a snowstorm.
    - For more severe weather outbreaks, such as Hurricane Sandy, APHIS developed a document outlining flexibilities available to employees that will allow them to maintain or return quickly to work productivity. During Hurricane Sandy, APHIS employed the use of the emergency leave transfer program. This program provided six employees with a total of 1,720 hours of donated leave to help them in the recovery process and maintain their expertise within the Agency.

Natural disasters also present a risk to animals and their owners. In FY 13, APHIS published a final rule (now under review) requiring all dealers, exhibitors, intermediate handlers, carriers,

research facilities, and other entities regulated by APHIS under the Animal Welfare Act to develop contingency plans for responding to and recovering from emergencies most likely to impact their facility and animals. APHIS also has co-sponsored exercises and training in animal disaster response and has developed best practices for animal emergency planning and response.

In addition to preparing for the impacts of climate change, APHIS also is examining its own actions that may contribute to climate change. APHIS uses methyl bromide to control regulated plant pests; however, methyl bromide, an ozone-depleting substance, is also considered to be a greenhouse gas. Research is now underway to find suitable alternatives to methyl bromide (Appendix A, Table 2).

5.a.iii. A description of how any climate change related risk identified pursuant to paragraph (i) of this subsection that is deemed so significant that it impairs an agency's statutory mission or operation will be addressed, including through the agency's existing reporting requirements

APHIS has not identified any climate change risks that could potentially impair, obstruct, or prevent the success of agency mission activities, both in the near and long term.

5.a.iv. A description of how the agency will consider the need to improve climate adaptation and resilience, including the costs and benefits of such improvement, with respect to agency suppliers, supply chain, real property investments, and capital equipment purchases such as updating agency policies for leasing, building upgrades, relocation of existing facilities and equipment, and construction of new facilities

APHIS considered the need to improve climate change adaptation and resilience as it relates to procurement, acquisition, real property, and leasing decisions. During 2014, APHIS intends to achieve 85% compliance in the procurement of Energy Star qualified computers through USDA blanket purchase agreements. In addition, APHIS will continue its work with USDA's Office of the Chief Information Officer to consolidate data centers to ensure resource optimization. These actions will decrease the computing footprint and energy consumption. They will also improve resilience to increased power needs for heating and cooling in the face of climate change and reductions in power supply in the event of climate-related emergencies (Appendix A, Table 3).

5.a.v. A description of how the agency will contribute to coordinated interagency efforts to support climate preparedness and resilience at all levels of government, including collaborative work across agencies' regional offices and hubs, and through coordinated development of information, data, and tools, consistent with section 4 of this order.

A program that will enhance climate change resiliency involves eliminating nutria and their destructive impacts to the Delmarva Peninsula. Nutria is an invasive exotic rodent that severely damages wetlands by destroying native vegetation. In its undisturbed state, this vegetation provides not only essential natural habitat, but also serves as natural infrastructure to protect this coastal region from storms and floods. APHIS Wildlife Services participates in the Chesapeake Bay Nutria Eradication Project, a partnership between the Agency, U.S. Fish and Wildlife Service (USFWS), Maryland Department of Natural Resources, Virginia Department of Inland Fisheries

and Wildlife, and Delaware Fish and Wildlife. Funding and administrative control is provided by the USFWS, and APHIS is responsible for development and implementation of the program with mission critical support from relevant State agencies and the voluntary cooperation of hundreds of private landowners throughout the area of impact. The partnership as a whole is responsible for oversight (Appendix A, Table 4).

The goal of the project is to eliminate this invasive species to protect the remaining wetlands for the ecological and economic benefit of the human population and fish and wildlife resources. Nutria have impacted more than 250,000 acres and severely degraded the ecological value of tens of thousands of acres of emergent marsh. Coastal wetlands provide critical ecological functions that contribute to the region's resiliency to climate change, particularly sea level rise and increased frequency and severity of coastal storms. Coastal wetlands dampen the effects of storm surges, reducing the inland impacts of storm driven flooding. They also help protect upland habitats, including forest and agricultural resources from saltwater intrusion.

Additional actions that support climate change resiliency include the development of continuity of operations protocols (see Section 5.a.ii for more information) and information technology protocols. Development of information technology protocols permits the use of interagency tools and data. These protocols will support climate change simulation systems and database support. APHIS completed the transition in 2013 from a single pest forecasting provider to an interagency approach formalized through a multi-institution cooperative agreement in 2014 (Appendix A, Table 4).

***Modernizing Federal Programs and Policies to Support Climate Resilient Investment***
Section 2(a) of Executive Order 13653 states that Federal agencies shall address efforts to modernize federal programs and policies "(to) support the efforts of regions, States, local communities, and tribes,…consistent with their missions and in coordination with the Council on the Climate Preparedness and Resilience (Council) established in section 6 of this order…" that section also states that agencies shall "report on their progress in achieving the requirements identified above, including accomplished and planned milestones, in the Agency Adaptation Plans developed pursuant to section 5 of this order."

i. Identify and seek to remove or reform barriers that discourage investments or other actions to increase the Nation's resilience to climate change while ensuring continued protection of public health and the environment

APHIS has not identified any policies or programs that unintentionally discourage or disallow investments by external partners or grant recipients that would improve their preparedness for climate impacts.

ii. Reform policies and federal funding programs that may, perhaps unintentionally, increase the vulnerability of natural or built systems, economic sectors, natural resources, or communities to climate change related risks

During 2014, APHIS will examine its cooperative agreement process to ensure that it is responsive to increased demand for collaboration and partnership with others on climate change issues.

iii. Identify opportunities to support and encourage smarter, more climate-resilient investments by States, local communities, and tribes, including by providing incentives through agency guidance, grants, technical assistance, performance measures, safety considerations, and other programs.

APHIS has not pursued a process to identify opportunities that may support and encourage smarter, more climate-resilient investments by States, local communities, and Tribes. APHIS will, however, engage international, Federal, State, local, and Tribal partners as well as other stakeholders to gather relevant information to support decision-making and, where applicable and appropriate, to partner in program delivery. APHIS also will work with other State, Federal, and Tribal entities to ensure impacts associated with Agency actions in response to climate change provide for continued existence of other fish, wildlife, and plant communities consistent with the National Fish, Wildlife, and Plant Climate Adaptation Strategy (Appendix B, Table 1).

### *Sustained Adaptation Process*

*Priority Setting*

APHIS will define program elements that can be strongly influenced by climate change by establishing clear science- and programmatic-based criteria and evaluate the importance of the information using an analytical process to evaluate the relative importance of the potential impacts associated with climate change on APHIS' ability to meet its mission.

*Sources of Information*

APHIS will review and apply information from federal agencies, international initiatives and academic institutions with demonstrated expertise in climate change (predictive modeling, basic and applied research on pest/disease biology, ecology and environmental impacts) and integrate the relevant information into its Climate Adaptation Plan and program performance measures.

*Performance Metrics*

APHIS programs will identify performance metrics that demonstrate climate change adaptation is integrated into each program's policies, response plans, risk assessments, and environmental analyses.

*Methods APHIS will use to evaluate progress*

APHIS Leadership will review program operational plans and policies to ensure that adaptation to climate change is factored into our planning, implementation and evaluation of program performance.

# Appendix A. Section 5(a) Planning for Climate Change Related Risk

i. Identification and assessment of climate change related impacts on and risks to the agency's ability to accomplish its mission, operations and programs.

**Table 1. Identification and Assessment of Climate Change Related Impacts and Risks**

| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Incorporate climate change modeling into risk assessments | Develop process to determine when risk evaluation should incorporate effects due to climate change | VS Centers for Epidemiology and Animal Health | Risk reduction – assure that the possibility of new risks to imported animals/animal products as a result of climate change are evaluated timely | National and International | Ongoing | Research, collaboration with other agencies/ countries and development of methods | Projects completed as forecasted | | Need for funding anticipated | Availability of information | Initiated development of process to interact with select countries to determine if climate change is affecting risk of disease. |
| Identify specific pests, diseases, or vectors that are changing their distribution in the United States as a result of climate change | Develop partnerships to leverage resources and minimize impacts of changing pest, disease, and vector distribution on the health and value of U.S. agriculture, natural, and other resources | VS Centers for Epidemiology and Animal Health and WS National Wildlife Research Center | Risk mitigation – assure that shifts in disease and vector occurrence are known so appropriate mitigation methods can be established | National and International | Ongoing | Identify specific diseases and information needed to assess and potential partners for collaboration | Adaptation of climate models for forecasting vector distribution on a temporal, landscape, and local scale | As needed | Need for funding anticipated | Availability of information and resources to determine disease distribution | 1) Historical prevalence of Bluetongue and Epizootic Hemorrhagic Disease in United States examined.<br><br>2) Collaboration with National Center for Atmospheric Research and APHIS WS to develop National Science Foundation grant proposal to predict redistribution of orbiviruses. |

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| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 3) Initiated collaboration with University of Calgary and University of Prince Edward Island on climate change related projects |
| Develop guidance on how to address impacts associated with climate change, including those on low income, minority and Tribal communities, in environmental compliance documents | Develop an analytical framework to assess impacts associated with climate change for Agency actions subject to the National Environmental Policy Act, consistent with draft CEQ guidance. | PPD Environmental and Risk Analysis Services | Climate change is expected to impact the systems that APHIS regulates (e.g., plant and animal pests and diseases), which in turn can impact the need and type of actions necessary. Because some pests (e.g., forest insects) can increase net carbon release, long term impacts of agency actions may result in a net decrease in carbon release, whereas actions to fight the pest (e.g., tree removal) may result in temporary and local increases in carbon release. | APHIS | Ongoing | | Percentage/ number of Agency environmental compliance documents that address impacts of climate change | N/A | Time and resource constraints | Developing a unified approach to climate change in environmental compliance documents despite diversity in nature of agency programs and corresponding actions. | Internal draft near completion |

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ii. Description of programs, policies and plans that the agency has put in place and additional actions that the agency will take to manage climate risks in the near-term and build resilience in the short and long term:

**Table 2. Actions Taken to Manage Climate Risks in the Short Term and Build Resilience in the Long Term**

| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *Revision of the Emergency Support Function (ESF) #11 Annex to the* National Response Framework | To ensure that ESF#11 activities include technical assistance for animal and agricultural emergency management that may be necessary following increased frequency or intensity of extreme weather and weather-related events (e.g., floods, hurricanes, fires). | MRPBS Emergency Management Safety and Security Division | | National--multiple Federal Departments and Agencies, local, State, Tribal and territorial governments and NGOs | Ongoing | | Revision to emergency response plans, and CONOPs (Concept of Operations) | | | | ESF#11 Annex revised in May 2013: Revised the Emergency Support Function #11 (ESF#11) Annex to the National Response Framework and changed the scope of ESF#11 activities such that ESF#11 now includes technical assistance for animal and agricultural emergency management. Implementation is ongoing. |
| Developing Food and Agriculture Incident Annexes for each of the FEMA Regions and at the national | Develop Food and Agriculture Incident specific annexes to the National Response Framework | MRPBS Emergency Management Safety and Security Division | | APHIS, USDA, HHS, multiple Federal Departments and Agencies, local, | Ongoing | | Completed Food and Agriculture Incident Annexes | | | | Beginning template with FEMA Region VII. |

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| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| level | | | | State, Tribal, territorial governments, and NGOs | | | | | | | |
| Train Type3 Incident Management Teams to respond to animal and plant health emergencies. These Incident Management Teams may be activated, if available, to support all-hazard emergencies | *Provide trained Type 3 Incident Management Teams to respond to all-hazard emergencies, some of which will be associated with climate-related extreme-weather events.* | MRPBS Emergency Management Safety and Security Division Emergency Preparedness Branch | | APHIS | Ongoing | | Completed training consistent with National Incident Management System requirements | | | | As of August 2013, provided complete training for 8 Type 3 Incident Management Teams to respond to animal and plant health emergencies. On-going training is planned for team member replacement and refresher. |
| Develop, maintain and update continuity plans to include business continuity and property protection | Ongoing Development of Continuity plans to sustain Mission Essential Functions in multiple geographic locations, during, and after a catastrophic incident | MRPBS Emergency Management Safety and Security Division Emergency Preparedness Branch | | APHIS | Ongoing | | Complete and signed plans; training, tests, and exercises for continuity personnel | | | | Agency-level plan revised in 2013. HQ (NCR) Annex in preparation. |

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| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | (including climate-related events) | | | | | | | | | | |
| Work with USDA and DHS to develop procedures for requesting support and coordinating activities for large-scale emergency responses. | *Develop process to request support from USDA and/or the Federal community for large-scale responses* | MRPBS Emergency Management Safety and Security Division | | APHIS, USDA, DHS | Ongoing | | Written process for requesting assistance | | | | Initial meeting held with USDA-OGC and with DHS-OCC. |
| Continue to implement and follow the USDA Telework Directive | | MRPBS Human Resources Division | Widespread use of telework will allow the Agency to continue the work of the Government despite workplace interruptions resulting from climate change | | Ongoing | | Telework implementation is widespread; work continues with little disruption in inclement weather situations | | Cost of agency-provided equipment/capabilities | | More than 63 percent of APHIS employees have telework agreements in place, which cover Ad Hoc telework used in emergency situations. |
| Deploy established flexibilities to support employees affected by designated | To ensure that agency employees are able to receive administrative leave and | MRPBS Human Resources Division and Financial Management Division | Supervisors may grant 40 hours of administrative leave to employees affected by a designated disaster. Affected employees | APHIS | As needed | | Continued productively in spite of emergency situations faced by individual | | Temporary drop in productivity; increased workload on payroll, financial and HR personnel | | In an effort to provide assistance to Agency employees affected by Hurricane Sandy, APHIS created an |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| disasters; granting of administrative leave; up to 30 days advanced pay using flexible payment options; emer gency leave transfer program to receive donated annual leave from other Federal employees; subsistence payments for relocation following disaster-related evacuation | pay when affected by natural disasters – will improve employee retention and continuity of operations to ensure achievement of agency mission. | | whose particular situation requires more recovery time may request an additional 40 hours of administrative leave, for a total of up to 80 hours. | | | | employees | | | | emergency response document that outlines the various flexibilities available to its employees in an emergency that will help them maintain or return quickly to productivity. During Sandy, APHIS employed use of the Emergency Leave Transfer Program and provided employees with donated leave to help them with the recovery process. |
| Joint development efforts with USGS' FORT labs to integrate state of the art epidemiologica l models into APHIS operations | Coordinate the development of epidemiologi cal forecasting tools for plant pests and diseases | PPQ Center for Plant Health Science and Technology | | APHIS-USGS | | | Adaptation of VIS-TRAILS and Software for Assisted Habitat Modeling (SAHM) simulation environments | | | | The VIS-TRAILS and SAHM suite of simulation environments was identified as a partial alternative to current efforts. A new, integrated framework has been developed and data sharing needs identified |
| Conduct | | PPQ Science | Increasing | APHIS | | | | | | | Research is |

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| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| research to develop and introduce alternatives to methyl bromide as a treatment against various regulated plant pests. | | and Technology | regulatory pressure from Montreal protocol, EPA, and USDA to further reduce use of QPS methyl bromide (an ozone-depleting substance considered to be a greenhouse gas). | | | | | | | | funded in PPQ-Science and Technology to develop alternatives to methyl bromide |
| Provision of regulatory and non-regulatory support for emergency preparation to improve animal welfare. Specifically, publication of regulation to require entities regulated by APHIS under the Animal Welfare Act to prepare contingency plans for the care of their animals in the event of an emergency. Also, development | To better prepare businesses (where animals are integral to that business) and pet owners to respond to disaster in order to reduce the burden on local, State, and Federal response personnel; to protect public health by safely evacuating or sheltering dangerous animals; and to support | Animal Care | Natural disasters present a risk to animals and their owners | National – Emergency response is led by FEMA but involving other Federal, State and local agencies and non-governmental organizations and businesses | Ongoing | | | Federal level horizontal coordination among USDA, HHS, FEMA, DHA, and other Agencies responsible for animal issues during disaster. Vertical coordination is needed to integrate the efforts of Federal, State, and local government with the efforts of NGOs, businesses, and pet owners. Presidential Policy Directive #8 calls for this | Appropriated funds for disaster planning and response are directed to FEMA. | | 1)In FY13, APHIS Animal Care published a final rule requiring all dealers, exhibitors, intermediate handlers, carriers, research facilities and other entities regulated by the agency under the Animal Welfare Act to develop contingency plans for responding to and recovering from emergencies most likely to impact their facility and animals, as well as train their employees on those plans. This |

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| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| of best practices for animal emergency planning and response and provision of training exercises in animal disaster response. | business continuity by helping owners and managers to be prepared. | | | | | | | level of integration. The FEMA National Response Plan, Emergency Support Function #11 provides the framework for this integration. | | | regulation is currently under review.<br><br>2) APHIS coordinated the development of best practice documents for animal emergency planning and response and co-sponsored exercises in animal disaster response. |

iv. Description of how the agency will consider the need to improve climate change adaptation and resilience, including costs and benefits, regarding suppliers, supply chains, real property and capital equipment

**Table 3. Actions Taken to Improve Climate Change Adaptation and Resilience as it relates to Procurement and Acquisition**

| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
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| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ensure acquisition of Electronic Product Environmental Assessment Tool (EPEAT) registered and 100% Energy Star qualified Federal Energy Management Program designated electronic products | APHIS will purchase Energy Star computers thru USDA blanket purchase agreements. The same blanket purchase agreements have EPEAT-only imaging equipment | APHIS MRPBS Information Technology Division and Administrative Services Division | | Interagency | CY 2014 | | Achieve 85% compliance in the procurement of these technologies | | | | |
| Consolidation of APHIS data centers | Ensure APHIS-wide resource optimization, including data and systems. Decrease computing footprint and energy | APHIS MRPBS Information Technology Division | | APHIS/USDA | CY 2014 | | Consolidate 100% APHIS data centers at the NITC and the 100 % of update backup and disaster recovery activities | | | | |

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| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | consumption. | | | | | | | | | | |

v. Description of how the agency will contribute to interagency efforts, including regional offices/hubs and coordinated development of information, data and tools:

**Table 4. Climate Preparedness Interagency Efforts**

| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Work towards APHIS IT protocols that permit the use of interagency tools and data | Coordinate with APHIS IT to establish a "development space" to test and integrate state of the art simulation systems | MRPBS Information Technology Division and PPQ Center for Plant Health Science and Technology | | APHIS | Review the strategy white paper planned in CY 2012. Verify agency progress in the plan. | | Protocols for IT interagency communications to support climate change simulation systems and database support | | | | Completed transition in 2013 from a single pest forecasting provider to an interagency approach formalized through a multi-institution cooperative agreement in 2014. IT protocols necessitate the development of a 'scientific computing environment' due to regulatory security requirements. Strategy for this environment is expected in 2014. |
| The Chesapeake Bay Nutria Eradication Project (CBNEP) aims to | To eliminate this damaging invasive species in order to | APHIS WS Nutria Program | Coastal wetlands provide critical ecological functions that contribute to the region's resiliency to climate change, particularly sea level | Regional at Federal and State levels. | Ongoing – estimated completion 2017 | The CBNEP's eradication strategy has 5 phases: 1)Delimiting – defining the geographic | Phases 4 and 5 of the eradication campaign involve extensive population | CBNEP is a partnership between APHIS WS, USFWS, Maryland Department of Natural | To date project funding has been provided entirely through the USFWS Partners for Fish and | Verifying eradication is the most challenging phase of eradication campaigns | The eradication team discovered established nutria populations in 9 major watersheds on the Delmarva Peninsula. As of |

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| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| eradicate the invasive nutria from the Delmarva Peninsula, thereby preventing further erosion of coastal wetlands. | protect and preserve the remaining wetlands for the ecological and economic benefit of the Chesapeake Bay Region. | | rise and increased frequency and severity of coastal storms. Coastal wetlands dampen the effects of storm surges, reducing the inland impacts of storm driven flooding. They also help protect upland habitats, including forest and agricultural resources from saltwater intrusion. | | | extent of nutria; 2)Knock-down - rapid reduction of established populations to near-zero densities; 3)Mop-up – rapid removal of colonizing nutria that either escaped knock-down or immigrated; 4)Verification.- confirming eradication has been achieved and that colonizing nutria are quickly detected; 5) Surveillance- ensuring that nutria-free areas are maintained. | monitoring using observer based surveys, device based detection strategies, and detection dog surveys to determine presence/absence of nutria. | Resources, Virginia Department of Inland Fisheries and Wildlife, and Delaware Fish and Wildlife. Funding and administrative control is provided by the USFWS and APHIS WS is responsible for development and implementation of the program with mission critical support from relevant state agencies and the voluntary cooperation of hundreds of private landowners throughout the area of impact. | Wildlife Program and National Wildlife Refuge System. Budget cuts resulting from the sequester have reduced the funding available to transfer to WS in 2013 and additional cuts, up to $150,000 are possible in FY 2014. Maintaining the current WS work force and operational costs will require an infusion of funds from alternate sources to compensate for any cuts to the USFWS budget. | because of: 1. withdrawal of institutional and financial support as the problem is no longer so apparent; 2. The increased effort required to detect the rare survivors of knockdown; 3. Maintaining a skilled work force as the project nears completion | January 2014, 8 of the nine have been depopulated and the ninth is scheduled for depopulation in 2014. Recovery of damaged marsh has been documented by research partners with the U.S. Geological Survey. |

# Appendix B. Section 2(a) Modernizing Federal Programs and Policies to Support Climate Resilient Investment

iii. Identify opportunities to support and encourage (via funding programs, guidance, etc.) more climate-resilient investments by States, local communities, and Tribes.

**Table 1. Opportunities to Support and Encourage Climate-Resilient Investments by States, Tribes, and local communities.**

| Action Description | Action Goal | Agency Lead | Risk/Opportunity Description | Scale | Timeframe | Implementation Methods | Performance Metrics | Inter-Governmental Coordination | Resource Implications | Challenges/ Further Implications | Accomplishment Highlights to Date |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Examine the cooperative agreement process to ensure that APHIS is responsive to increased demand for collaboration and partnerships with others on climate change issues. | | MRPBS Financial Management Division | | APHIS | CY2014 | | Agency cooperative agreements documentation addresses climate change | | | | |