



Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE



Climate Change Adaptation Plan

May 2022 to October 2025



Thunderstorm near Cuero, TX on June 3, 2021. USDA Photo by Lance Cheung.

Introduction

The US Department of Agriculture’s (USDA) Animal and Plant Health Inspection Service (APHIS) protects the health of the United States (US) agriculture and natural resources against invasive pests and diseases, regulates genetically engineered crops, administers the Animal Welfare Act, and helps people and wildlife coexist. APHIS also certifies the health of US agricultural exports and resolves phytosanitary and sanitary issues to open, expand, and maintain markets for US plant and animal products.

APHIS recognizes that climate change presents a threat to its ability to fully achieve its mission and advance its strategic goals. 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 scenarios.

The USDA Action Plan for Climate Adaption and Resilience, published October 2021, provides the framework for the APHIS Climate Change Adaptation Plan, which is a living document that will be regularly updated. The APHIS Climate Change Adaptation Plan describes the Agency’s mission and goals, identifies how climate change may impact those goals, and outlines adaptation and mitigation actions to address these potential effects.

Mission

To safeguard the health, welfare, and value of American agriculture and natural resources.

Driving Forces

Agriculture and the global marketplace continue to evolve, and APHIS must progress and change to keep pace. The driving forces below require that we take a critical look at how we strategically conduct our activities to best meet our mission. While some of these driving forces are predictable and have become established over time, other forces—such as the changing pest and disease landscape—are less predictable and present more uncertainties.

- Delivering Services with a Customer Focus
- Global Demand for US Agricultural Products
- Ensuring Protection is at a Reasonable Cost
- Rapid Advances in Science and Technology
- Changing Pest and Disease Landscape

Strategic Goals and Objectives (FY 2019-23)

To respond to these driving forces, APHIS must be fast and agile to meet the needs of our partners, stakeholders, and customers. APHIS will constantly strive to improve and deliver our services in a way that is less costly, faster, and more effective for American agriculture, farmers and ranchers, and the public. To accomplish the APHIS mission, our goals and objectives are as follows:

Goal 1. Deliver efficient, effective, and responsive programs

Objective 1.1: Improve the customer experience by modernizing information technology infrastructure, facilities, and streamlining the delivery of our services.

Objective 1.2: Maintain a high performing workforce through employee engagement and empowerment and provide a safe workplace.

Objective 1.3: Remove obstacles in APHIS programs by reducing regulatory burden and streamlining processes.

Objective 1.4: Maximize the return on taxpayer investment through stewardship of resources and focused program evaluations.

Objective 1.5: Leverage workforce differences to better serve the Agency's customers.

Goal 2. Safeguard American agriculture

Objective 2.1: Prevent damaging plant and animal pests and diseases from entering and spreading in the United States to promote plant and animal health.

Objective 2.2: Manage plant and animal pests and diseases once established in the United States to promote plant and animal health.

Objective 2.3: Ensure effective emergency preparedness and response systems.

Objective 2.4: Manage conflicts caused by wildlife, detect and control wildlife diseases, and protect agricultural and natural resources.

Objective 2.5: Ensure the safety, purity, and effectiveness of veterinary biologics and protect plant health by optimizing our oversight of genetically engineered organisms.

Objective 2.6: Provide and coordinate timely diagnostic laboratory support and services.

Objective 2.7: Ensure the humane treatment of vulnerable covered animals.

Goal 3. Facilitate safe U.S. agricultural export

Objective 3.1: Create export opportunities for American producers.

Objective 3.2: Ensure resolution of sanitary and phytosanitary issues and trade barriers.

Climate Change Effects and Vulnerabilities

In assessing the impacts of climate change, APHIS found that climate change could pose challenges to two of the Agency's Strategic Goals:

- Goal 2, Safeguard American agriculture
- Goal 3, Facilitate safe US agricultural export

Additionally, APHIS determined that potential effects to the Agency primarily corresponded with two of the five vulnerabilities identified in the USDA Adaptation Plan:

- Decreased Agricultural Productivity
- Shocks Due to Extreme Climate Events



Derecho damage to crops in Story, Marshall and Tama Counties in Iowa, September 2020. USDA photo by Jeremy Davis.



Aerial panorama of rain water that was added to cotton fields already saturated with days of heavy rain, during the past week in Bloomington, TX on June 3, 2021. Some of the plants have turned from a healthy green to stressed red color after prolonged suffocation/drowning under water. USDA Photo by Lance Cheung.

In this section, we review these two vulnerabilities to describe the greatest risks or potential impacts of climate change that may impact APHIS' mission, programs, operations, and stakeholders.

Decreased agricultural productivity

The 2021 USDA Climate Change Adaptation and Resiliency Plan recognizes that climate change threatens growth in agricultural productivity through direct effects such as changes in temperature and precipitation patterns and secondary effects such as increased plant pests and disease pressures, decline in pollinator health, reduced crop and forage quantity and quality, and infrastructure damage. Additional threats include impacts to water supply and increased frequency and intensity of extreme weather events. Climate change will expand or shift the range of a pest, pathogen, or vector organism, increasing its ability to establish in areas not previously considered at risk, elevating the risks to agriculture and forestry. Climate change is projected to impact crop production by reducing quantity and quality of yields, altering optimal growing periods, and increasing the likelihood of crop failure and damage. Livestock production will likely be impacted due to a reduction in the quantity and quality of pasture and forage and a lowered yield of feed grain which will affect livestock health and foster the

spread and resilience of pathogens and parasites that affect livestock development. Beneficial insects and microorganisms are also directly affected by climate change. Climate change will also likely cause changes in wildlife migratory patterns, diseases, and predator-livestock interactions.

These increased pressures may impact how APHIS meets its mission requirements which are protecting the health of US agriculture and natural resources against invasive pests and diseases, regulating genetically engineered crops, administering the Animal Welfare Act, helping people and wildlife coexist, certifying the health of US agricultural exports, and resolving phytosanitary and sanitary issues to open, expand, and maintain markets for US plant and animal products¹. Some of the potential impacts from these climate change pressures and the resulting decrease in agricultural productivity on APHIS mission areas are discussed below.

Shifts in Geographic Distribution of Wildlife, Weeds, Pests, and Diseases. Climate change's impact on ecosystem and habitat characteristics will cause animal and pest populations to shift into new or expanded habitats. This movement can result in increased spread of diseases (such as citrus greening) and other pests, as well as increased encounters with wildlife in populated areas potentially increasing

¹ Source: USDA APHIS | Mission



Feral swine rip and root their way across America in search of food impacting ranchers, farmers, land managers, conservationists, and suburbanites. Photo provide by NASA.

disease transmission among wildlife, livestock, and people (such as African swine fever, COVID19 and avian influenza). We expect increasing pandemics in the future when species expand and change their geographic locations and humans are available to host species that cause zoonotic diseases.

U.S. Agricultural Production and Trade.

Climate change and associated shifts in disease and pest prevalence may increase requirements for commodity and pathway risk analyses and could overwhelm the ability of offshore programs to provide real-time information regarding pest and disease potential. Additionally, existing surveillance and diagnostic networks for animal and plant health diseases (e.g., avian influenza, foot and mouth disease, citrus greening, fruit flies, etc.) may overwhelm existing capacities and increase risks to US agriculture.

Increased Demand for Plants Developed Using Genetic Engineering and Other APHIS Services.

APHIS expects an increase in the demand for 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. 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.

Furthermore, response to pest and disease outbreaks may require the increased use of treatment combinations, as well as the need for new treatments, and could therefore increase the complexity of environmental and risk analyses such as those required under the National Environmental Policy Act (NEPA).

Shocks Due to Extreme Climate Events

Climate change is causing more frequent and intense disruptive events including plant and animal health emergencies, as well as hurricanes, floods, drought, tornadoes, and fires—all of which can have significant impacts.

Emergency Response Systems.

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 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.



Animal safety and well-being during disasters is key to the safety and well-being of people. USDA photo by R. Anson Eaglin.

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 may also 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.

Food Distribution and Aid. APHIS regulations prohibit the importation of agricultural and food products that pose a risk to plant and animal 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).

Climate Adaptation Actions

The vulnerabilities noted in the prior section identify the climate change related impacts and associated risks that APHIS has determined may affect its ability to accomplish Agency policies and programs and continue Agency operations. The impacts of pests, diseases, and wildlife conflicts on agricultural production, commerce, and trade can be astronomical. APHIS employs emergency response activities that minimize threats and their impacts on agricultural industries, adapting to changes in agricultural and climate risk by adjusting available resources to address these threats. APHIS works with its partners to include mitigation strategies into international agreements and movement protocols and to conduct monitoring and surveillance efforts to quickly detect and implement response efforts to foreign pests and diseases that may have evaded prevention measures. By employing effective prevention and mitigation tactics, APHIS will reduce the impact of agricultural pests and diseases (including zoonotic diseases that threaten human



APHIS' Sterile Insect Rearing Facility, in Sarasota, Fla., where APHIS processes 100,000,000 sterile Mediterranean Fruit flies a week. USDA Photo by Preston Keres.

health) and wildlife damage to ensure that US farms and ranches remain healthy and productive.

APHIS has identified the following actions that address the Agency's climate vulnerabilities. These actions include ongoing, planned, and proposed new efforts to mitigate and adapt to the effects of climate change, as well as to build resilience in the Agency for the benefit of our employees, partners, and stakeholders.

Decreased agricultural productivity

Shifts in Geographic Distribution of Wildlife, Weeds, Pests, and Diseases. Develop methods and procedures to sample for new zoonotic or agriculturally significant diseases in wildlife.

In FY 2023, APHIS will develop methods and procedures to sample for new zoonotic or agriculturally significant diseases in wildlife. APHIS currently reports on 15 diseases in wildlife populations, including avian influenza, rabies variants, chronic wasting disease, and SARS-CoV-2. APHIS will add new sampling methods based on those diseases that pose the highest risk to agricultural health or human health, in the case of zoonotic diseases.

Complete climate suitability maps that predict the changing suitability of an area for pest or disease occurrence. By FY 2023, APHIS will complete eight climate suitability maps for a cumulative total of 22 maps. APHIS develops the maps using a modeling framework that predicts

the changing suitability of an area for pest or disease occurrence based on the likelihood of three favorable conditions specific to the pest or the disease occurring. The maps will help guide efforts to determine where to conduct surveys. Importantly, the maps will help APHIS and cooperators use survey resources more effectively by eliminating the need to survey for some high-risk pests if suitable environmental conditions do not exist in an area.

Identify, monitor, and prevent introduction of animal and plant pests and diseases into the United States. APHIS is increasing efforts to alert and check travelers to the United States at predeparture stations in airports and seaports to prevent the introduction of animal and plant pests and diseases. APHIS will direct and coordinate its surveillance, reporting, and mitigation initiatives with Federal, State, and Tribal stakeholders to maintain human, animal, and plant health.

Enhance systems for monitoring invasive species, as well as pest and disease spread. APHIS is improving monitoring systems and responses to pest (including vectors) and disease spread, incorporating state-of-the-art modeling to inform surveillance, developing early warning systems, and identifying better options for pest and disease control. 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.

Enhance information sharing on forest pest and diseases. APHIS will collaborate with partners, such as the U.S. Forest Service, and share information (e.g., risk assessments, forecast maps, pest surveys) to control invasive plant pests and diseases in national forests and grasslands.

U.S. Agricultural Production and Trade. Monitor and accelerate work related to pollinator health. APHIS will continue to monitor pollinator health through the annual National Honey Bee Disease Survey. APHIS will also work with USDA's Office of the Scientist (OCS) and USDA's Agricultural Research Service (ARS) to review actions to prevent population decline of pollinators due to invasive species and other threats, which may increase due to the impacts of climate change.

Research alternatives to methyl bromide. Climate change will foster some new pests and invasive species in our farms in the future. Agricultural trade requires that US send products that are free of invasive species and pests to other countries. APHIS must improve the process to guarantee clean agricultural products. Methyl bromide is a broad-spectrum biocide capable of effectively disinfecting commodities, structures, and soil from plant pests, including insects, plant pathogens, weeds, and nematodes. APHIS uses methyl bromide as a quarantine fumigation treatment to eliminate exotic plant pests in or on imported commodities. However, methyl bromide has been identified as an ozone-depleting compound that exacerbates the impacts of climate change. APHIS has been researching chemical and non-chemical alternatives that will continue to ensure safe agricultural trade while limiting contributions to climate change and adhering to NEPA requirements.

Continue to research and safely release biological control agents. APHIS will continue to collaborate with international partners and academia to support research and secure natural enemies that may be tested for biological control of invasive species in the United States. APHIS will also provide guidance to scientists working on biological controls to

ensure compliance with NEPA and the Endangered Species Act before organisms are approved for testing and release into the environment.

Continue the implementation of trade policies that encourage legal trade of timber and timber products. Climate change will alter the boundaries of forests and the species in their ecosystem. Forests are essential to capture carbon from the atmosphere and store it for decades. Using the Convention on International Trade on Endangered Species and the Lacey Act, APHIS will prevent illegal timber harvested from protected forests from being introduced to the United States. Prohibiting trade with the US on illegal timber closes an important market and promotes countries to foster forest conservation, management and legal harvest of timber. By this action, we are minimizing the destruction of forests around the world, which will allow them to provide the ecosystem services important to delay negative impacts of climate change.

Encourage collaboration with the World Organization for Animal Health (OIE) on climate change-related initiatives. APHIS will promote discussions and propose coordinated actions to mitigate the effects of climate change at the OIE. For example, APHIS will share the challenges, opportunities, and lessons learned from managing zoonotic diseases such as avian influenza and African swine fever with other countries and promote the adoption of similar strategies internationally.

Continue collaboration with the International Plant Protection Convention (IPPC) on climate change-related initiatives. APHIS will promote discussions and coordinated actions to mitigate the effects of climate change at the IPPC. For example, APHIS personnel are on the IPPC Focus Group on Climate Change and Phytosanitary Issues. From 2022 to 2025, this Focus Group will implement an action plan that raises awareness about the effects of climate change on plant health, enhances the evaluation and management of the risks climate change poses to plant health, and enhances recognition of phytosanitary matters in international climate change discussions. Examples

of implementation actions the Focus Group will conduct include giving webinars on climate change effects on plant health, exploring ways for countries to share information regarding changes in pest distributions due to climate change, and developing ways to incorporate climate change into pest risk analyses that are used to inform phytosanitary policy.

Seek additional collaboration with trading partners on climate change-related initiatives. Find opportunities to engage trading partners, bilaterally or multilaterally, to build capacity to identify, control, manage, and eradicate certain pests and diseases, as well as establish and manage sustainable animal and plant health programs that are consistent with the USDA and APHIS Climate Adaptation Plans.

Increased Demand for Plants Developed Using Genetic Engineering and Other APHIS Services. Evaluate APHIS' regulatory framework for the movement and release of organisms developed using genetic engineering and support the development of climate-adapted crops. There is an increased interest in developing modified microorganisms, which can be used to enhance plant growth, combat biotic stresses and abiotic stresses, and help plants adapt to climate change. APHIS will develop guidance to clarify the regulatory review process for these modified microbes. Additionally, APHIS may provide regulatory exemptions, when appropriate, for climate-change resilient crops and forest tree species that include simple modifications that could be achieved through conventional breeding.

Explore and use forecasting models to assess potential changes in the distribution of modified organisms. APHIS has developed prediction models for the climate suitability of some crop species across the United States and its territories. The program will continue developing prediction models for more plant species.

Ensure that proposed regulated field trials remain outside of environmentally sensitive areas. As climate change impacts the geographic occurrence of species, APHIS will review data on the constantly changing range and status of the United States'

threatened and endangered flora and fauna to evaluate conditions at proposed field trial locations and will review permits related to confined field trials of regulated modified organisms.

Shocks Due to Extreme Climate Events

Emergency Response Systems. 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 (e.g., telework, remote work, maxi-flex schedule) to assist employees impacted by disasters related to climate change (e.g., floods, hurricanes, wildfires) so that they may return to work as quickly and safely as possible.

Reinforce animal and plant health emergency frameworks. APHIS has established, and will continue to review and update as needed, animal and plant health emergency frameworks to facilitate coordinated, timely responses to disease and pest emergencies. APHIS also has established frameworks to respond to extreme weather events (e.g., hurricanes, floods, wildfires), which may impact plant and animal health and prompt needs for technical assistance with agriculture emergency management. APHIS will coordinate assistance from other USDA and DHS emergency response resources in the event of wide-range climatic disruption events to bolster our response in the event that APHIS capacity is limited. Additionally, 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.



USDA APHIS staff in the APHIS Emergency Operations Center coordinate resources and information to support Hurricane Harvey relief efforts. USDA photo by R. Anson Eaglin.

Prepare responses to assist producers in advance of a pending severe weather event. In coordination with extension offices, APHIS will assist producers in planning for pending weather-related impacts such as power and water disruptions to their farms that will affect their crops or livestock. APHIS will also work with producers and Federal, State, and Tribal partners in planning for potential large-scale animal mortality events that will require transportation and disposal plans.

Develop a web page to help with contingency plans for the handling of animals during emergencies. A critical part of ensuring animal welfare is making sure that facilities can continue to provide food, water, housing, protection, and appropriate veterinary care for animals during an emergency, especially if facilities are damaged or animal handlers cannot get to the facility. APHIS will develop a web page with information focused on specific contingency planning issues associated with various extreme weather events, such as hurricanes, fires, floods, and managing temperature extremes. This resource could be used by facilities regulated by the Animal Welfare Act to help update their required contingency plans and train their employees on implementing those plans during an emergency.

Food Distribution and Aid. Enhance capacity to meet the challenges related to food distribution and aid. Climate change will increase the number and frequency of devastating weather events that will impact food security in different countries. The US government has a robust food aid program that responds to alleviate the famine after disasters. APHIS regulations prohibit the importation and exportation of agricultural and food products that pose a risk to plant, human or animal health. Disaster relief (including food distribution) efforts associated with increased frequency of extreme weather events require prompt and intense efforts by the agency. APHIS will work with Federal, State, and Tribal partners to enhance capacity to meet the challenges encountered with export and import requirements related to food distribution and aid. Additionally, this cooperation with partners will be necessary to safely store and distribute aid locally.

Cross-Cutting Adaptation Issues and Considerations

Environmental Justice



Many people now keep backyard poultry. Good bio-security practices are imperative for managing disease impacts. Photo by Adobe Stock.

APHIS recognizes that those in underserved communities are particularly vulnerable to extreme weather events due to a greater direct dependency on agriculture, forestry, and outdoor recreation for income and employment. These communities may have existing challenges with infrastructure and connectivity and limited capacity to prepare and respond to extreme events, likely leading to long-lasting shifts in community structure and composition. To address some of the current and future needs, APHIS proposes taking actions to better identify (1) underserved communities and specific issues within those communities related to climate change and (2) opportunities to support and encourage (via funding programs, guidance, etc.) more climate-resilient investments in communities.

Identify underserved communities and specific issues within those communities related to climate change. Review internal and external data to identify underserved communities and climate change issues related to APHIS programs. APHIS has some existing data sets to review demographics and equity issues for underserved communities. APHIS may also be able to use the Environmental Protection Agency's Environmental Justice Mapping and Screening Tool, data from USDA's National Agricultural Statistics Service, and information from academia



Vaqueria Ceiba Del Mar, in Arecibo, Puerto Rico, is one of the largest dairy producers on the island. USDA Photo by Preston Keres.

to help identify underserved communities and issues that APHIS would be able to help address.

Conduct outreach to and increase access for underserved communities to better understand and address issues. APHIS would like to increase our outreach to and access for underserved populations. APHIS will ensure inclusive stakeholder consultation on changes to the Agency's programs, policies, and operations, as well as promoting diversity in the workplace and in the composition of Federal Advisory Committees. APHIS hopes to effectively use a network of community organizations and groups to increase the Agency's presence at outreach events to underrepresented groups, such as in Minorities in Agricultural, Natural Resources and Related Sciences and Hispanic Association of Colleges and Universities. APHIS will expand partnerships with our minority serving institutions, such as Hispanic Serving Institutions, Tribal College and Universities, and Historically Black College and Universities. Additionally, APHIS intends to establish new networks with minority farming organizations.

Develop a unified approach on how to address climate change impacts in environmental compliance documents. APHIS will develop guidance on how to address impacts associated with climate change, including those on low income, minority, and Tribal communities in environmental

compliance documents. APHIS will develop an analytical framework to assess impacts associated with climate change for Agency actions subject to the National Environmental Policy Act, consistent with Council on Environmental Quality guidance.

Identify opportunities to support and encourage more climate-resilient investments in underserved communities. Increase opportunities and climate-resilient investments in underserved communities. APHIS will encourage diverse and inclusive participation in the cooperative agreement process to ensure that the Agency is responsive to increased demand for collaboration and partnerships with others on climate change issues. APHIS intends to host presentations at various stakeholder conferences to share funding opportunities for underrepresented groups.

Workforce Climate Literacy

APHIS seeks to enhance climate literacy for APHIS employees, producers, farmers, and other stakeholders. APHIS currently relies on resources within USDA and plans to provide training opportunities for the APHIS workforce to learn more about climate change and its impacts. Additionally, APHIS will build external partnerships to further enhance training and availability of informational resources.

Identify potential training and informational resources for APHIS employees. Identify existing and develop new training modules regarding climate change to incorporate into AgLearn.

APHIS will reach out to Federal partners to gather existing training modules that seeks to inform workforces about climate change and add the modules to AgLearn. APHIS, in coordination with the USDA Climate Hubs, will also develop new training that is more specific to the USDA mission, employees, and stakeholders.

Develop informational resources on USDA and APHIS related climate change actions and initiatives.

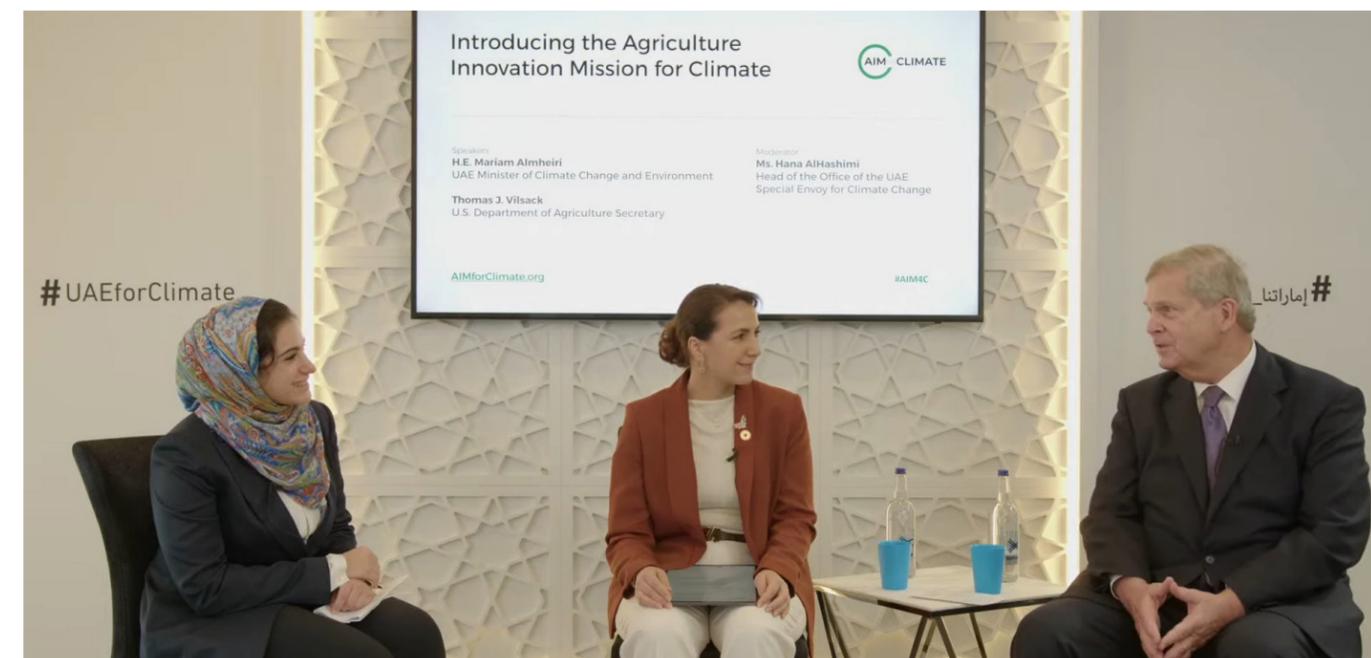
In coordination with the USDA Climate Hubs, APHIS will develop reader-friendly informational resources on recent Executive Orders regarding climate change actions and initiatives. APHIS will also promote the USDA Action Plan for Climate Adaptation and Resilience, as well as the APHIS Climate Change Adaptation Plan.

Encourage APHIS staff participation in USDA's Climate Science Seminar Series. Coordinated by the USDA's Office of Energy and Environmental Policy

and the USDA Agriculture, Forestry, and Climate Science Working Group, APHIS will participate in these monthly seminars. The series will be science-focused, accessible to a general audience, and will provide opportunities for employees to ask questions to dispel misconceptions related to climate change. Potential subjects include greenhouse gases in agriculture, climate impacts on crop production and animal agriculture, options for climate adaptation and mitigation, and human preparedness and resiliency.

USDA Climate Hubs

APHIS will partner with the USDA Climate Hubs to support the enhancement of workforce climate literacy; the delivery of climate adaptation science, technology, and tools; to increase APHIS ability to recognize vulnerabilities to the Agency as a result of climate-related impacts; and to synthesize and interpret data, develop new technology and tools; and discuss possible initiatives that can be implemented across the Department to adopt climate-smart, sustainable strategies for the USDA facilities, fleet, and administrative policies.



Agriculture Secretary Tom Vilsack joins with UAE minister of Climate Change and Environment Mariam bint Mohammed Almheiri and Ms. Hana AlHashimi, Head of the Office of the UAE Special Envoy for Climate Change at the COP26 in Glasgow, Scotland in November 2021. USDA photo.

Table 1 APHIS adaptation actions to address climate change effects and vulnerabilities

Climate Vulnerability	Action Title/Description	Type of Activity	Lead Office	Time-frame	APHIS External Coordination	Progress Metrics	Accomplishments to Date
Impacts to agricultural productivity	Develop methods and procedures to sample for new zoonotic or agriculturally significant diseases in wildlife	Ongoing	Veterinary Services, Wildlife Services	Ongoing	NA	# of zoonotic and agricultural diseases sampled in wildlife	APHIS currently reports on 15 diseases in wildlife populations
Impacts to agricultural productivity	Complete climate suitability maps that predict the changing suitability of an area for pest or disease occurrence	Ongoing	Plant Protection and Quarantine	Ongoing	Academia	# of priority pests for which climate suitability maps have been completed	APHIS currently has 6 climate suitability maps
Impacts to agricultural productivity	Identify, monitor, and prevent introduction of animal and plant pests and diseases into the United States	Ongoing	Plant Protection and Quarantine, Veterinary Services	Ongoing	U.S. Customs and Border Protection (CBP), and other Federal, State, and Tribal Partners	# of inspections, # of seizures, # of outreach events and materials	Ongoing work
Impacts to agricultural productivity	Enhance systems for monitoring invasive species, as well as vector and disease spread	Ongoing	Plant Protection and Quarantine, Veterinary Services, Wildlife Services	Ongoing	International Partners	# of system enhancements	Ongoing work
Impacts to agricultural productivity	Enhance information sharing on forest pest and diseases	Ongoing	Plant Protection and Quarantine	Ongoing	U.S. Forest Service	# of info resources shared	Ongoing work
Impacts to agricultural productivity	Monitor and accelerate work related to pollinator health	Ongoing	Plant Protection and Quarantine	Ongoing	OCS, ARS, State Partners, Academia	# of National Honey Bee Disease Surveys	Annual survey since 2009
Impacts to agricultural productivity	Research alternatives to methyl bromide	Ongoing	Plant Protection and Quarantine, Policy and Program Development	Ongoing	ARS, Academia	# of alternatives researched	Ongoing work
Impacts to agricultural productivity	Continue to research and safely release biological control agents	Ongoing	Plant Protection and Quarantine, Policy and Program Development	Ongoing	ARS, Academia	# of biological controls under testing and released	Ongoing work
Impacts to agricultural productivity	Continue the implementation of trade policies that encourage legal trade of timber and timber products	Ongoing	Plant Protection and Quarantine	Ongoing	U.S. Fish and Wildlife Service, CBP	# of declarations, # of seizures	Ongoing work
Impacts to agricultural productivity	Encourage collaboration with the OIE on climate change-related initiatives	Proposed	Veterinary Services	TBD	OIE	# of meetings, # of actions	NA
Impacts to agricultural productivity	Continue collaboration with the IPPC on climate change-related initiatives	Ongoing	Plant Protection and Quarantine	Ongoing	IPPC	# of meetings, # of actions	Focus Group on Climate Change and Phytosanitary Issues was established in April 2021
Impacts to agricultural productivity	Seek additional collaboration with trading partners on climate change-related initiatives	Proposed	International Services	TBD	International Partners	TBD	NA
Impacts to agricultural productivity	Evaluate APHIS regulatory framework for the movement and release of organisms developed using genetic engineering and support the development of climate-adapted crops	Proposed	Biotechnology Regulatory Services	TBD	NA	TBD	NA

Climate Vulnerability	Action Title/Description	Type of Activity	Lead Office	Time-frame	APHIS External Coordination	Progress Metrics	Accomplishments to Date
Impacts to agricultural productivity	Explore and use forecasting models to assess potential changes in the distribution of modified organisms.	Proposed	Biotechnology Regulatory Services	TBD	TBD	TBD	NA
Impacts to agricultural productivity	Ensure that proposed regulated field trials remain outside of environmentally sensitive areas	Ongoing	Biotechnology Regulatory Services	Ongoing	NA	# of reviews	Ongoing work
Shocks Due to Extreme Climate Events	Ensure continuity of operations	Ongoing	Emergency and Regulatory Compliance Services	Ongoing	NA	NA	Ongoing work
Shocks Due to Extreme Climate Events	Prepare responses to assist producers in advance of pending a severe weather event.	Ongoing	Emergency and Regulatory Compliance Services	Ongoing	Federal, State, Tribal Partners	TBD	Ongoing work
Shocks Due to Extreme Climate Events	Develop a webpage to help with contingency plans for the handling of animals during emergencies	Proposed	Animal Care, Legislative and Public Affairs	TBD	TBD	TBD	NA
Shocks Due to Extreme Climate Events	Enhance capacity to meet the challenges related to food distribution and aid	Proposed	Emergency and Regulatory Compliance Services	TBD	Federal, State, Tribal Partners	TBD	NA
Environmental Justice	Review internal and external data to identify underserved communities and issues related to APHIS programs	Proposed	Office of Civil Rights, Diversity, and Inclusion; Policy and Program Development	TBD	Federal, State, Tribal Partners, and Academia	TBD	NA
Environmental Justice	Conduct outreach to and increase access for underserved communities to better understand and address issues.	Ongoing	Office of Civil Rights, Diversity, and Inclusion; Legislative and Public Affairs	Ongoing	Federal, State, Tribal Partners, and Academia	# of events attended, # of stakeholder consultations	Ongoing work
Environmental Justice	Develop a unified approach on how to address climate change impacts in environmental compliance documents	Proposed	Policy and Program Development	TBD	TBD	TBD	NA
Environmental Justice	Increase opportunities and climate-resilient investments in underserved communities	Ongoing	Office of Civil Rights, Diversity, and Inclusion; Legislative and Public Affairs; Marketing and Regulatory Programs Business Services	Ongoing	Federal, State, Tribal Partners, and Academia	# of events attended, # of cooperative agreements	Ongoing work
Climate Literacy	Identify existing and develop new training modules regarding climate change to incorporate into AgLearn	Proposed	Marketing and Regulatory Programs Business Services	TBD	TBD	TBD	NA
Climate Literacy	Develop informational resources on USDA and APHIS related climate change actions and initiatives	Proposed	Office of the Administrator, Legislative and Public Affairs	TBD	TBD	TBD	NA
Climate Literacy	Participate in USDA's climate literacy working group	Proposed	Office of the Administrator	TBD	TBD	TBD	NA

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APHIS-22-024

Issued May 2022