



SIGNIFICANCE TO APHIS

USDA Climate Hubs

PURPOSE

The Climate Hubs reduce climate related risks to agriculture, forestry, and rural communities by working with and through USDA agencies and partners. The Hubs develop and deliver science-driven strategies and tools so that USDA programs, advisors, and land managers can make informed decisions to manage risk.

OUTCOME

Alongside APHIS, other USDA agencies, and our Federal and non-federal partners, the Climate Hubs supply their stakeholders with useful information about expected changes to the climate and associated natural hazards.

APHIS AGENCY BENEFITS

The USDA Climate Hubs **enhance APHIS' capacity** to deliver on its mission to protect the health and value of American agriculture and natural resources. This is accomplished through robust two-way **engagement** with stakeholders, **strengthened partnerships** with USDA agencies, and streamlined **delivery** of usable information to land managers and others.

The Climate Hubs effectively **connect climate research** to those making decisions for the **improvement of human networks and natural systems**.

Strengthening Partnerships and Collaboration

Increasing Awareness that Human-Health and Climate are Linked

Keeping up with Rapidly Advancing Science and Technology

Delivering Usable Information

Bridging Science and Management: Fulfilling the Agricultural Demand

ENHANCING APHIS CAPACITY

- Hub scientists are increasing APHIS knowledge of regional climate issues through targeted staff seminars and facilitating increased cooperation across USDA and other Federal agencies.
- Climate Hubs are increasing access to region-specific information on changing conditions and by further connecting the programs to regional stakeholder concerns. The Hubs help APHIS programs recognize and adapt to challenges in protecting livestock and crop health and anticipate new patterns of pest and diseases of agriculture.
- Hub personnel and the APHIS Liaison collaborate on predictive mapping projects for plant pests of mutual concern, e.g., *Drosophila suzukii*, in the near and long term.
- The Climate Hubs are able to deliver information to their stakeholders in response to USDA priorities: Climate Hub staff are providing regional leadership to the 4th National Climate Assessment incorporating potential insect and disease issues.
- The Climate Hubs are creating email alerts as part of the SERCH LIGHTS system specific for the emerald ash borer.
- The Climate Hubs have supported APHIS outreach by being a resource center to APHIS employees and customers via innovative webinars, workshops, and on-line resources.

RESEARCH: *Potential Geographical Range & Abundance of the Invasive Brown Marmorated Stink Bug (BMSB) under Climate Change Scenarios*

As climate changes so will growth, development, and distribution of plant pests. To safeguard US agriculture, forests and the environment from exotic invasive species under a changing climate, the Southeast and Northwest Climate Hubs are partnering with APHIS and North Carolina State University to develop forecast maps and reports for plant pests of concern for the continental US. These maps will predict pest establishment, phenology, and number of generations per growing season for the emerald ash borer, spotted winged drosophila, old world bollworm, and several other species.

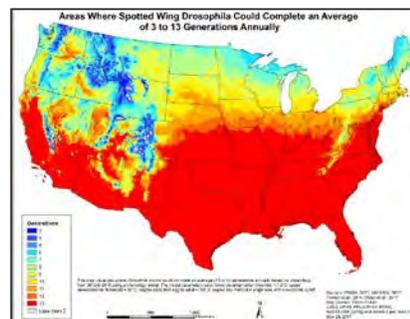
This will guide pest management decision making to reduce negative effects of invasive species on US agriculture and forests. To deliver useful information, the Southeast Hub is creating email alerts for emerald ash borer activity using the SERCH LIGHTS system.



BMSB eating an apple. Photo by Tracy Leskey, USDA-ARS.

PARTNERING: *Managing Invasive Plant Pests*

Climate change is predicted to exacerbate agricultural losses from crop pests and pathogens. The Midwest Climate Hub has employed bioclimatic simulations using the program CLIMEX to determine the potential geographic distribution and abundance of the invasive BMSB in the United States under different climate scenarios. With the shared goal of protecting the health of U.S. agricultural resources, this Hub research increases our understanding of how a changing climate will alter impacts of BMSBs on crops in the future.



Map of number of generations of the Spotted Winged Drosophila, a pest that effects cherries, blueberries, strawberries and grapes.

MAKING CONNECTIONS: *Climate Hubs Help APHIS Adapt to Climate Change*

A hands-on training session was facilitated by APHIS' Climate Change Working Group, the Forest Service (FS), Northern Forests Climate Hub and the Northern Institute of Applied Climate Science. It was designed to help APHIS employees incorporate climate change considerations into their projects. The workshop emphasized a structured yet flexible approach developed by the FS to integrate climate change considerations into project planning. Participants used this process to analyze how climate variability/uncertainty and shifting geography might affect APHIS' mission in addressing the presence and movement of agricultural pests and diseases. A majority of participants predicted they would apply the adaptation workbook process to another project in the next year. And nearly every respondent said they would share what they had learned with people inside and outside the agency.



The Northern Forests Hub held a climate training with APHIS employees to help them incorporate climate considerations into their projects.

CLIMATE HUB CONTACTS

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