



Project Title: Taking the Pulse of Our Planet: Tracking plant and animal phenology to inform natural resource decision-making

Headline Title: National climate-smart phenology monitoring

Brief Summary: The USA National Phenology Network (USA-NPN) is a national-scale, multi-taxa science and monitoring initiative focused on phenology -- the study of seasonal life-cycle events such as leafing, flowering, reproduction and migration -- as a tool to understanding how plants, animals and landscapes respond to environmental variation and change.

Project Location: National, including islands and territories; terrestrial, aquatic and marine systems

Partners: US Geological Survey, University of Arizona, University of Wisconsin–Milwaukee, The Wildlife Society, US National Park Service, National Oceanic and Atmospheric Administration, National Aeronautics and Space Administration, National Science Foundation – National Ecological Observatory Network and Long-term Ecological Research Programs, Oak Ridge National Laboratory, US Fish and Wildlife Service, USDA Agricultural Research Service and United States Forest Service.

Background: Timely and widely-distributed phenological information is critical for the management of wildlife, invasive species, and agricultural pests, understanding drought wildfire risk, and managing risks to human health and welfare, including allergies, asthma, and vector-borne diseases. Because of the lack of regional, let alone national data on phenology, the USA-NPN was established in 2007 -- by the USGS in collaboration with other governmental and non-governmental organizations – as a national-scale science and monitoring initiative focused on phenology as a tool to understanding how plants, animals and landscapes respond to environmental variation and change. Stakeholders include researchers, resource managers, educators, communication specialists, non-profit organizations, human health organizations, science networks, and the public who make decisions about resource management and adaptation to variable and changing climates and environments.

Project Goals: The goal of USA-NPN is to collect, synthesize, deliver and apply high-quality phenological data and information to address fundamental science and societal needs, and to facilitate decision-making relative to ecosystem services and climate change adaptation for natural resource management, agricultural systems, and human well-being.

Strategy Goals Implemented:

4.1.2: Use available long term monitoring programs at appropriate scales (local to international) as baselines for population and migration changes that could be affected by climate change (e.g., International Waterfowl Surveys).

4.1.3: Work through existing distributed efforts (e.g., NCA, National Estuarine Research Reserve System’s system-wide monitoring program, State Natural Heritage Programs, National Wildlife Refuge System, and National Park Service inventory and monitoring programs) to support integrated national observation and information systems that inform climate adaptation.



NATIONAL *fish, wildlife & plants*
CLIMATE ADAPTATION STRATEGY

4.1.4: Expand and develop as necessary a network of sentinel sites (e.g., tribal lands, National Estuarine Research Reserves, and National Wildlife Refuges) for integrated climate change inventory, monitoring, research, and education.

4.1.5: Develop consensus standards and protocols that enable multi-partner use and data discovery, as well as interoperability of databases and analysis tools related to fish, wildlife, and plant observation, inventory, and monitoring.

4.1.6: Develop, refine, and implement monitoring protocols that provide key information needed for managing and conserving species and ecosystems in a changing climate.

4.1.7: Use existing or define new indicators at appropriate scales that can be used to monitor the response of fish, wildlife, plants, and ecosystems to climate change.

4.1.9: Collaborate with the National Phenology Network to facilitate monitoring of phenology; create an analogous National Population Network to catalog the changes in distribution and abundance of fish, wildlife, and plants that have been identified as most vulnerable to climate change.

4.2.8: Use observation and monitoring systems in an adaptive management framework to evaluate the effectiveness of specific management actions and adapt management approaches appropriately.