

Providing National Capacity for Ecological Science and Monitoring

The mission of USA National Phenology Network (USA-NPN; www.usanpn.org) is to serve science and society by promoting broad understanding of plant and animal phenology and its relationship with environmental variability and climate change by developing and implementing services in support of national ecological science and monitoring programs.



A research priority of the USA-NPN is to determine relationships between phenology and population-, community- and ecosystem-level processes, goods and services.

USA-NPN is a consortium of individuals and organizations that collect, freely share, and use phenological and physical data, models, and related information to help scientists, resource managers and the public make informed decisions about climate change adaptation and mitigation.

Core Functions

- Create a scientifically based phenology network with federal and non-federal participation
- Create and maintain a national phenology information management system
 - Develop and promote standardized monitoring and reporting protocols and methodologies
 - Facilitate research that promotes the integrated observation of plants, animals, and landscapes across space and time
 - Create decision support tools using phenology and other relevant data sets

- Communicate research to diverse audiences and provide opportunities for public participation in phenology monitoring to improve science and climate literacy of the US public

Research Priorities

- Determine spatial and temporal trends in phenology across the nation
- Use phenology as an indicator of climate change impacts on plants and animals
- Determine relationships between phenology and population-, community- and ecosystem-level processes, goods and services
- Optimize and standardize methodologies and data for projects at local to international scales
- Integrate with existing research, decision-support and education/outreach programs (e.g., Climate Science Centers, Landscape Conservation Cooperatives, DOI and White House initiatives)

USA-NPN Activities Support USGS, DOI and Executive Strategies, Plans and Goals

- USGS Science Strategy
- Cross-cutting activity for Ecosystems, Climate and Water Mission Areas
- DOI Strategic Plan Goals and Strategies
 - › **Priority Goal:** Support climate change vulnerability assessments and adaptation
 - › Inform management and assessment of habitats and plant and animal species
 - › Identify, assess, and forecast change in ecosystems and effects of climate change
 - › Identify relationships between environments and wildlife and human health
 - › Integrate data and products for science-based stewardship of natural resources
 - › Provide for youth stewardship and engagement—*Youth in Great Outdoors*

- Executive
 - › Contribute to America's Great Outdoors and similar initiatives
 - › Support CENRS, Climate and Energy Working Group, USGCRP National Climate Assessment, IPCC, and Group on Earth Observations

Major Accomplishments (FY07–FY11)

- Developed databases, information management system, and the *Nature's Notebook* phenology monitoring system and on-line user interface
- Secured many intensive and extensive partnerships for implementation: science and resource management agencies, NGOs, academia, tribes, educators, planners
- Developed internationally standardized phenology monitoring protocols for over 500 plant and animal species
- Registered over 3000 volunteer observers at over 4000 sites across the nation who have contributed over 400,000 records
- Generated web-based, real-time contemporary data, metadata, documentation, and visualization tools
- Provided critical capacity to the North American Bird Phenology Program, resulting in digitally-available data for this 130-year-old program.
- Established National Coordinating Office; developed 5-year Strategic Plan and annual implementation plans

The USA-NPN has initiated development of a framework for organismal, habitat, and landscape monitoring for federal, state, and local adaptive management and strategic habitat conservation activities.

Major Outcomes

- Cultivated and curated historic and contemporary data on plant and animal phenology and related biological and physical variables for research and decision-support applications
- Developed and promoted internationally consistent terminology and definitions for monitoring phenology through growing community of practice
- Developed and promoted methodologies, standards, and protocols for phenology monitoring by existing or new monitoring programs
- Initiated development of a framework for organismal, habitat, and landscape monitoring for federal, state, and local adaptive management and strategic habitat conservation activities
- Integrated and displayed historic and contemporary biological and physical data in a dynamic visualization tool
- Improved science and climate literacy for thousands of Americans through public participation in science and research



Western Bluebird
Photo: Tom Grey

Resources

- FY07–FY09: USGS Shared Program Costs, \$275K/year + various supplements
- FY10: \$1.1M (Biology, Global Change, Human Capital)
- FY11: Cost center in Ecosystems, \$600K base; \$500K needed to reach FY11 target
- All years: funding leveraged through internal and external agreements and grants
- Estimated future budget needs for long-term sustainability: \$2.2M/ year

Sponsors and Partners

Ameriflux, Appalachian Mountain Club, Arbor Day Foundation, Arizona-Sonora Desert Museum, BLM, Clean Air-Cool Planet, CoCoRaHS, DOI: LCCs and CSCs, EPA, ESA, Environment for the Americas, Freshwater Society, HoneyBeeNet, Hummingbird Monitoring Network, LTER, Monarch Watch, NASA, NEON, NOAA, NPS, NSF, NatureServe, New York Botanical Garden, NAPPCC, ORNL, Picture Post, Project BudBurst, Science for Citizens, Swedish Phenology Network, Swiss Phenology Network, The Wilderness Society, The Wildlife Society, United Southern and Eastern Tribes, U Arizona, U Wisconsin—Milwaukee, USFWS, USDA-ARS, USDA-USFS, USGS

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