• A 3-minute history of the USA National Phenology Network…Mark Schwartz.
The USA National Phenology Network

Phenology for science, management and education in a changing world

www.usanpn.org
• The Network - mission and function
• Applications, science, education
• Major accomplishments
• Example partnership
• Operational sustainability
A new data resource—a national network of integrated phenological observations across space and time
Key Goal

Understand how plants, animals and landscapes respond to environmental variation and climate change
Mission

Make phenology data, models, and related information available to scientists, resource managers, and the public
Encourage people of all ages and backgrounds to observe and record phenology
Strategic functions

• Develop a **national phenology information management system**

• Develop **partnerships** for implementation

• Facilitate phenology **science and research**

• Facilitate development of **decision support tools**

• Conduct and facilitate **education and outreach**

• Develop a **national phenology monitoring system**
• Health
• Resource management
• Conservation
• Agriculture
• Understanding hazards
• Recreation
Science and conservation

Predicting vulnerability, invasions and distributions

Willis et al. 2008 PNAS
Moller et al. 2008 PNAS
Willis et al. 2010 PLOS Biology
Hulme 2010 New Phyt.
Education and outreach
Major accomplishments

Multi-taxa, national-scale monitoring protocols
Major accomplishments

Nationally distributed observation sites

3160 observers at 4412 sites observing 5459 organisms
418731 records from 76304 observations
Major accomplishments

Real-time data now available

Download Data

Download contemporary phenology and metadata are available in web page or XML formats for the suite of six data sets below.

By downloading these data sets you acknowledge that you have read and agreed to both the USA-NPN Data Use and Data Attribution policies.

Download 2009 Plant Data Set - Definitions Excluded - 17MB
Download 2009 Plant Data Set - Definitions Included - 44MB
March 2, 2009 - December 31, 2009

Download 2010-11 Plant Data Set - Definitions Excluded - ~16MB
Download 2010-11 Plant Data Set - Definitions Included - ~43MB
January 1, 2010 - today

Download 2010-11 Animal Data Set - Definitions Excluded - ~2MB
Download 2010-11 Animal Data Set - Definitions Included - ~3MB
January 1, 2010 - today
Major accomplishments

Organization of critical historical datasets
Major accomplishments

Critical collaborations for implementation

The Great Sunflower Project
A Knowledge of Phenology Contributes to Achieving the NPS Mission...

John Gross
DOI Conf. on the Environ. 2010
Observing the Rhythms of Nature
Monitoring Phenology in the Northeast Temperate Network

• Link I & M, Research Learning Centers, staff and volunteers
• Monitor phenology at 13 NPS units
• Test and evaluate multiple methods
• Develop SOPs and full NPS Protocol
• Expand to include regional partners
Operational sustainability

Budget history

NSF RCN

USGS

2007  2008  2009  2010  2011  2012  2013

FWS

NPS
Operational sustainability

Annual Budget: $1M

- Contemporary spatial and temporal trends across nation
- Standardized methodologies and protocols
- Real-time data, metadata, documentation, web services, visualization tools
- Recruit & retain 5-10K observers
- Limited organization of historical datasets
- National community of practice for phenology
- Case-by-case development of partnerships - monitoring, research, decision-support, and education
Operational sustainability

Annual Budget: $2M

- Integrated real-time biological and physical datasets
- Recruit & retain total of 30K observers
- International community of practice for phenology
- Research on national spatial and temporal trends
- Facilitation of decision-support for mgmt and adaptation
- Education and outreach for climate and science literacy
- Support assessments of climate change impacts
- Targeted agency-level development of partnerships
Operational sustainability

Annual Budget: $3M

- Integrated contemporary/historical biological + physical data
- Recruit/retain total of 60K observers internationally
- Value-added modeling and information delivery for decision-support and forecasting
- National and int'l research through grants program and working groups
  - genetics, populations, communities, ecosystems
- Multi-agency development of partnerships
USA National Phenology Network

The USA National Phenology Network brings together citizen scientists, government agencies, non-profit groups, educators and students of all ages to monitor the impacts of climate change on plants and animals in the United States. The network harnesses the power of people and the Internet to collect and share information, providing researchers with far more data than they could collect alone.

What is phenology?

Phenology refers to recurring plant and animal life cycle stages, or phenophases, such as leafing and flowering, maturation of agricultural plants, emergence of insects, and migration of birds. Many of these events are sensitive to climatic variation and change, and are simple to observe and record. As an USA-NPN observer, you can help scientists identify and understand environmental trends so we can better adapt to climate change.

www.usanpn.org
The California Phenology Project

Tracking nature’s pulse to assess climate change response across California landscapes and national parks.

- Monitoring at all 19 NPS units
- Formalize species selection process
- Education and outreach tools
- Engage citizens in data collection
- Ensure data stewardship
- Document legacy phenology datasets
- Expand to include regional partners
Response to Climate Change

Modes of Action

Assess
- Risk/Vulnerability
- Policy
- Knowledge gaps
- Mgmt outcomes

Manage
- Adaptation
- Mitigation
- Sustainable consumption

Engage
- Education
- Science-mgmt partnerships
- Alliances

Perform. Scorecard Elements

Adaptation
- Reduce vulnerability
- Set priorities
- Monitor change

Mitigation & Sustainable Consumption
- Manage carbon
- Reduce environmental footprint

Adaptive Capacity
- Employee Education
- Designate climate change coordinators
- Develop program guidance & training

Partnerships & Education
- Integrate science & management
- Develop partnerships & alliances

Monitoring phenology: leaf to globe
Facilitating research
Developing decision support tools
Communication & Education

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