Plant Phenology Science Design

Authors: Sarah Elmendorf, Katie Jones

Acer saccharum phenophases dormant bud, bud burst, leaf emergence [1]; young leaves [2]; full size leaves [3]; fall color [4]

Design overview

- NEON will employ a *status based* monitoring strategy; occurrence and intensity of selected phenophases will be recorded in order to track *rates* of phenological transitions and trends in the annual *timing* of those transitions
- Data will be collected in a manner consistent with and therefore comparable to existing national citizen science campaigns (i.e. National Phenology Network, Project Budburst) thereby leveraging existing and ongoing efforts throughout the US to increase the potential for continental-scale analysis and forecasting
- Sampling will occur in two phases over the life of the observatory
    - **Phase I** – Phenology of dominants, aimed at capturing intraspecific variation in the timing of phenological transitions
    - **Phase II** – Community phenology, monitoring a range of species to detect interspecific responses to environmental conditions
- Seasonal sampling frequency ranges from 3 times a week to once every other week; higher frequency sampling tracks periods of rapid transition

Cornus florida inflorescence.
Photo credit: [5]

NEON's contribution to the field of Phenology

- Monitoring of replicate individuals per species in order to quantify intraspecific variation
- Measurement of multiple species to characterize the range of phenological response patterns;
- Establishing a high quality, long-term, standardized dataset recorded by trained technicians across the U.S.
- Collocation of these phenological measurements with an extensive array of meteorological, flux and ecosystem productivity data which may be used to understand linkages between climate, phenology, and ecosystem processes.

Scaling

Individual – Community
Observer based

Landscape
Tower mounted phenocam

Continent
Remote sensing satellite

Learn more

The full science design will be available soon at http://communities.neoninc.org/x/m4E-/

Sampling protocols will be available soon through the NEON website at www.neoninc.org

Emerging needles on a *Pinus strobus.*
Photo credit [6]

Photo credits

[1] Ellen Denny, National Phenology Network
[2] http://commons.wikimedia.org/wiki/File:Acer_saccharum_05.JPG
[3] http://commons.wikimedia.org/wiki/File:Acer_saccharum_leaves.jpg
[4] http://commons.wikimedia.org/wiki/File:Acer_saccharum_floridianum_BotGardBln1105LeavesFallA.JPG
[5] http://commons.wikimedia.org/wiki/File:Flowering_Dogwood_Cornus_florida_Lone_Flower_3008px.jpg
[6] Ellen Denny, National Phenology Network

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