

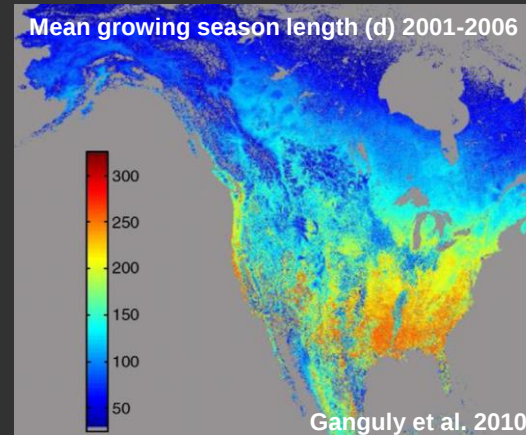


USA-NPN and *Nature's Notebook*: Indeed, many faces!

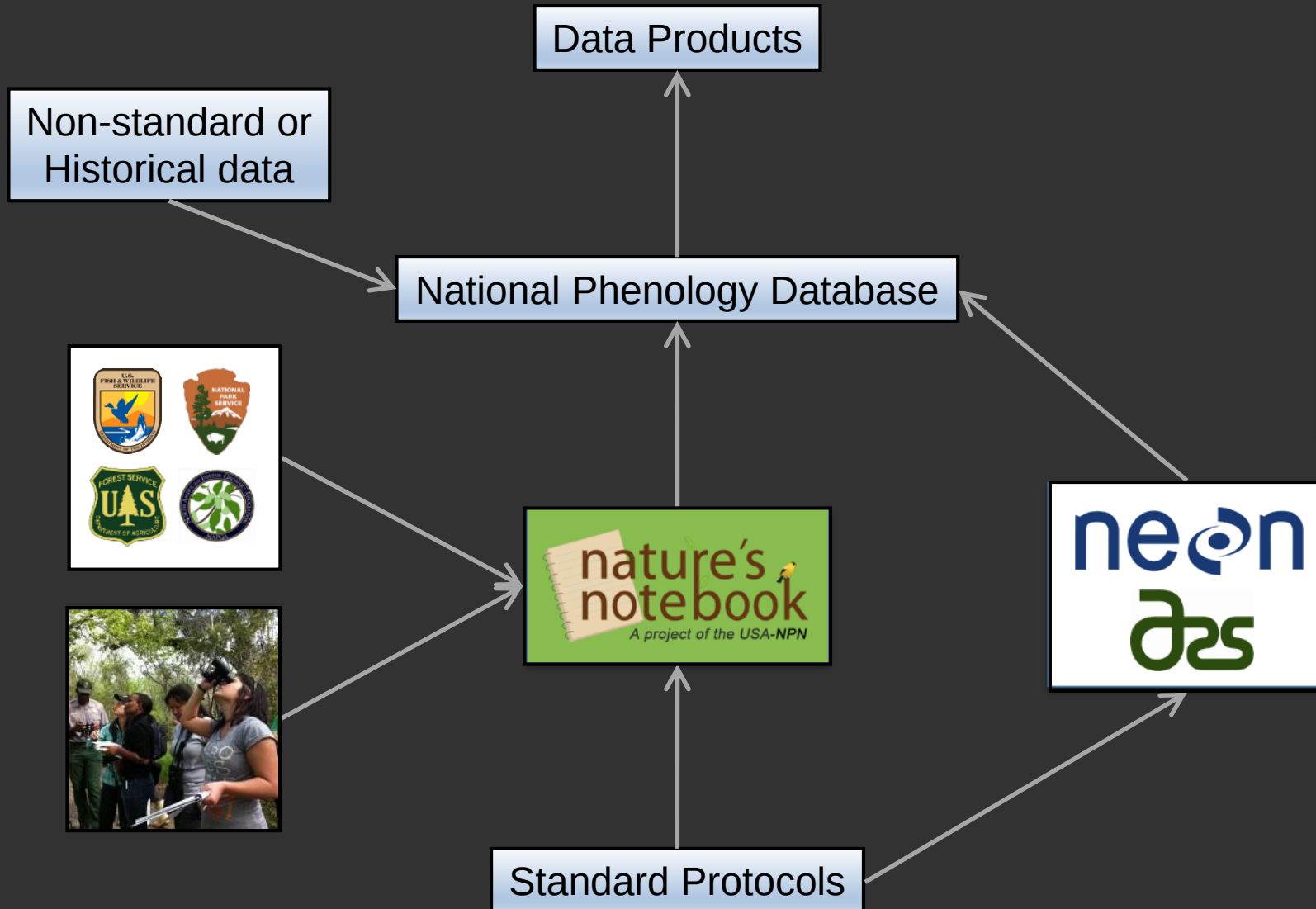


Theresa Crimmins and the Staff of the
National Coordinating Office,
USA National Phenology Network

- Advance science
- Inform management
- Communicate & connect



Collect • Store • Share
phenology data, data products & information



nature's notebook

- >6.5 M observation records
- > 8,000 sites
- Primarily 2009-present
- >1,000 plant and animal taxa
- Standardized protocols
(Denny et al., 2014)
- QA/QC documented
- 21 publications to date



www.nn.usanpn.org

USA-NPN protocols

Which phenophases should I observe?

LEAVES

Do you see...?

Breaking leaf buds

One or more breaking leaf buds bud is considered "breaking" on the end of the bud, but before it unfolded to expose the leaf stall *rubrum*, leaf tips may appear red

How many buds are breaking?

Less than 3;3 to 10;11 to 100;101 to 10,000

[More...](#)

Leaves

One or more live, unfolded leaves is considered "unfolded" once it from a breaking bud, stem node leaf stalk (petiole) or leaf base is attachment to the stem. Do not leaves.

What percentage of the potential leaves? Ignore dead branches in canopy space.

Less than 5%;5-24%;25-49%;50-

[More...](#)

Open flowers

One or more open, fresh flowers are visible on the plant. Flowers are considered "open" when the reproductive parts (male stamens or female pistils) are visible between or within unfolded or open flower parts (petals, floral tubes or sepals). Do not include wilted or dried flowers.

What percentage of all fresh flowers (buds plus unopened plus open) on the plant are open? For species in which individual flowers are clustered in flower heads, spikes or catkins (inflorescences), estimate the percentage of all individual flowers that are open.

Less than 5%;5-24%;25-49%;50-74%;75-94%;95% or more

[More...](#)

Pollen release

One or more flowers on the plant release visible pollen grains when gently shaken or blown into your palm or onto a dark surface.

How much pollen is released?

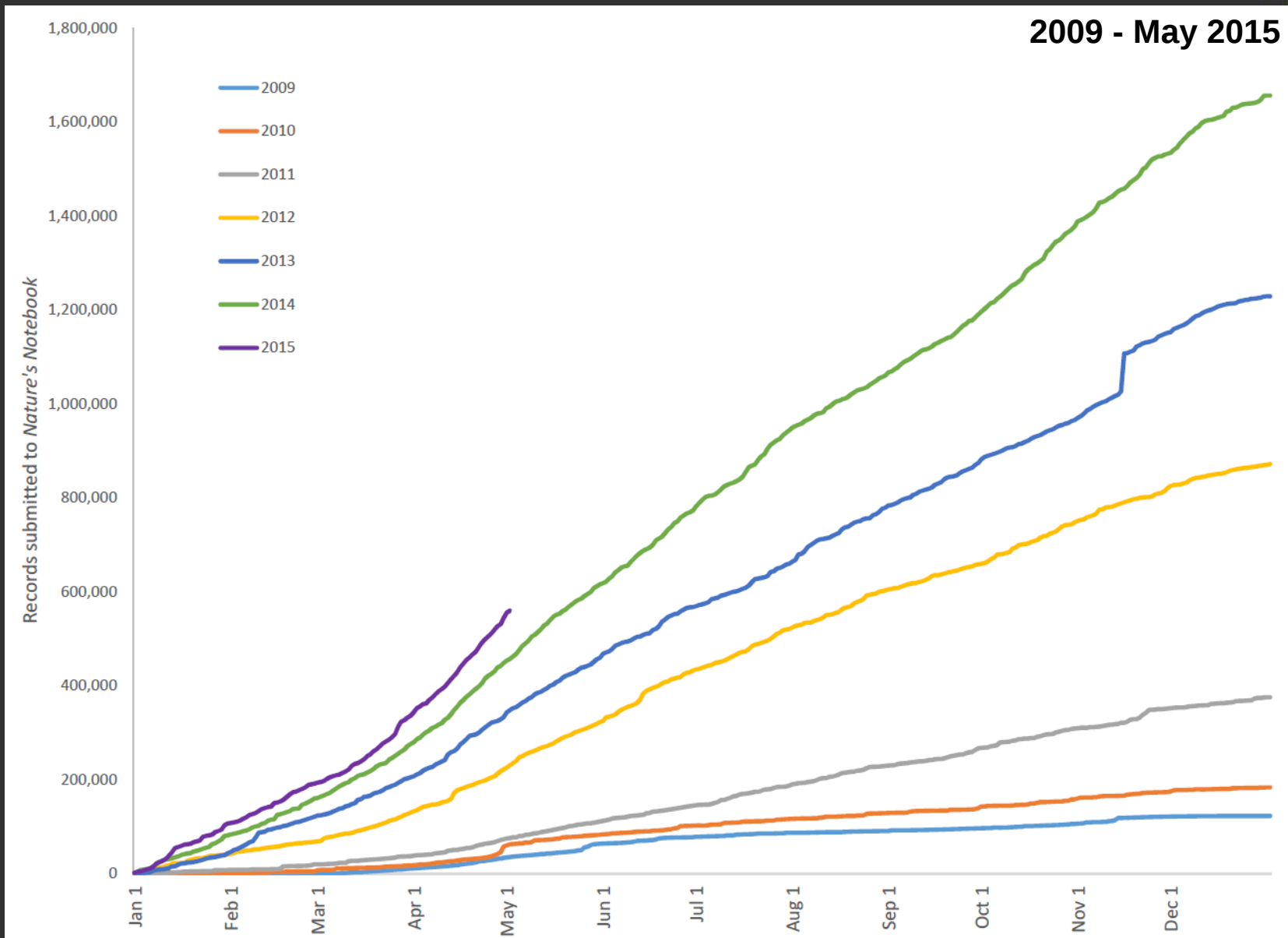
Little: Only a few grains are released.;**Some:** Many grains are released.;**Lots:** A layer of pollen covers your palm, or a cloud of pollen can be seen in the air when the wind blows

FRUITS

Do you see...?

Fruits

Growth in records



Access those data!

- Data download tool:
www.usanpn.org/results/data

USA npn
National Phenology Network *Taking the Pulse of Our Planet*

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Home » Get Data » Download Phenology Data

DOWNLOAD PHENOLOGY DATA

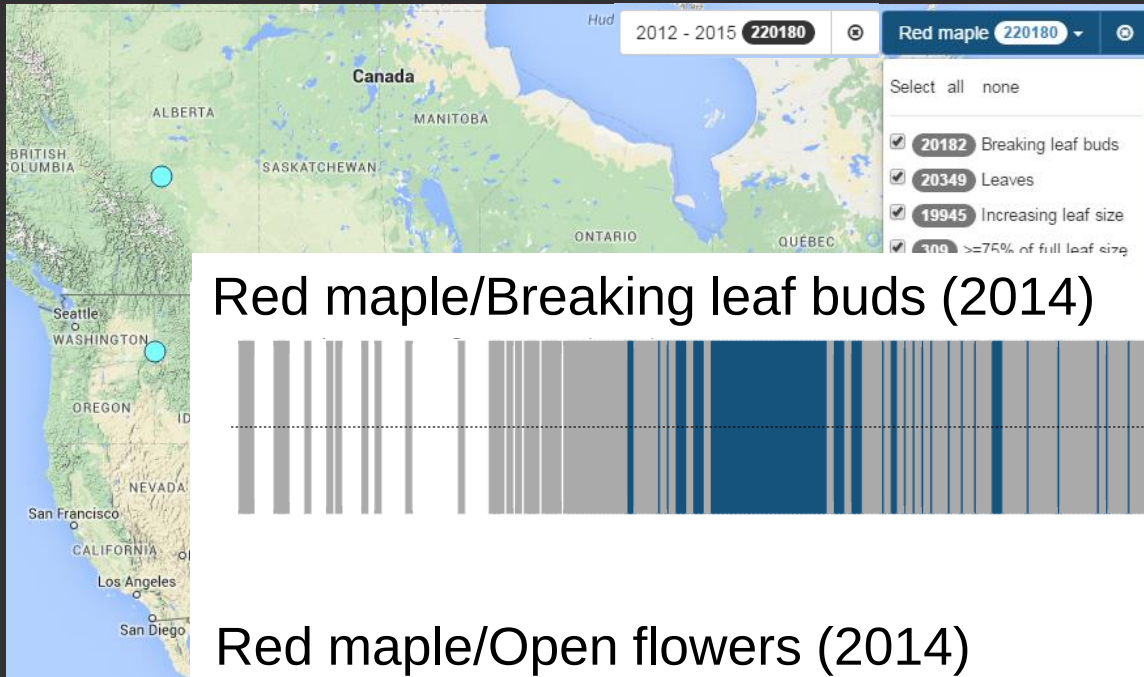
Optional Fields
Climate Data Fields

☐ Dataset ID	☐ Plant Nickname
☐ ObservedBy Person ID	☐ Patch
☐ Partner Group	☐ Phenophase Category
☐ Site Name	☐ NumYs in Series
☐ Kingdom	☐ NumDays in Series
☐ Species Functional Type	☐ Multiple Observers
☐ Species Category	☐ Multiple FirstY
☐ USDA PLANTS Symbol	☐ Observed Status Conflict Flag
☐ ITIS Number	

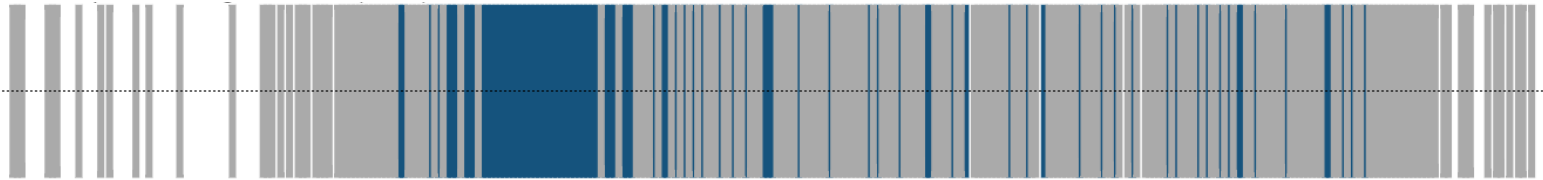
Get Data

- Phenology Data Overview
- Data Dashboard
- Phenology Visualization Tool
- Download Phenology Data**
- Gridded Spring Indices
- Data Search Tools
- Share Existing Data

Access those data!



Red maple/Breaking leaf buds (2014)



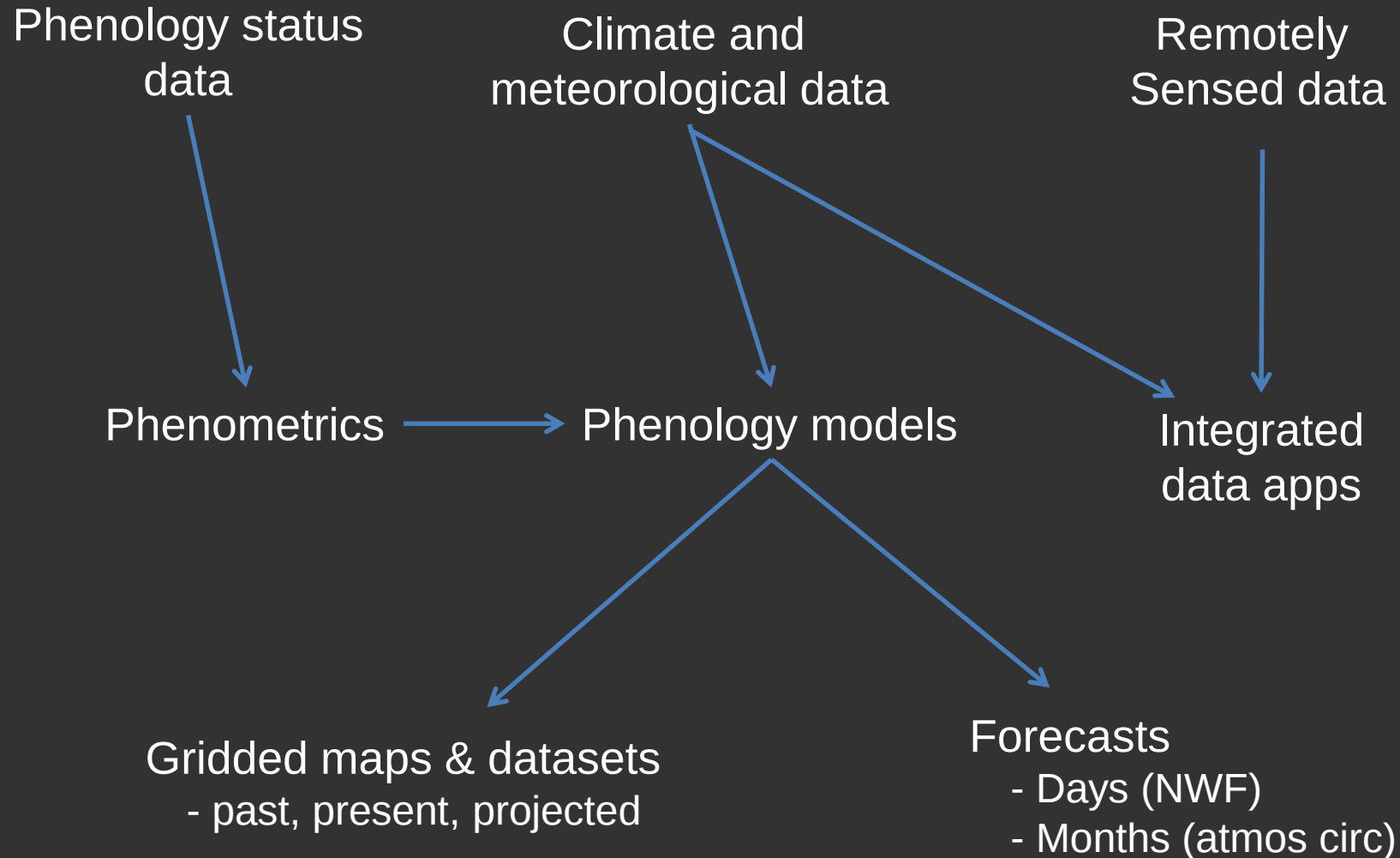
Red maple/Open flowers (2014)



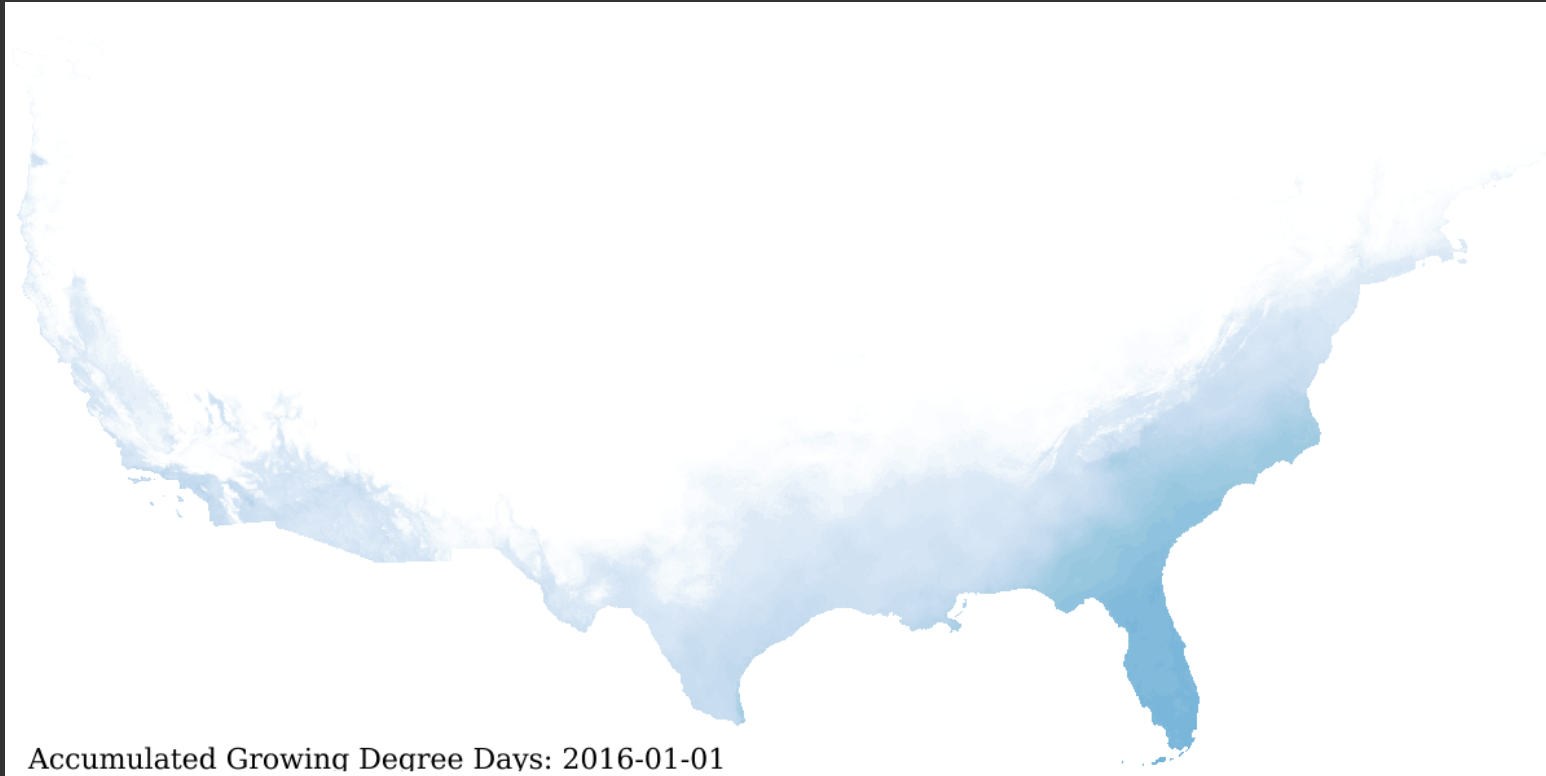
January February March April May June July August September October November December

www.usanpn.org/data/visualizations

Data products

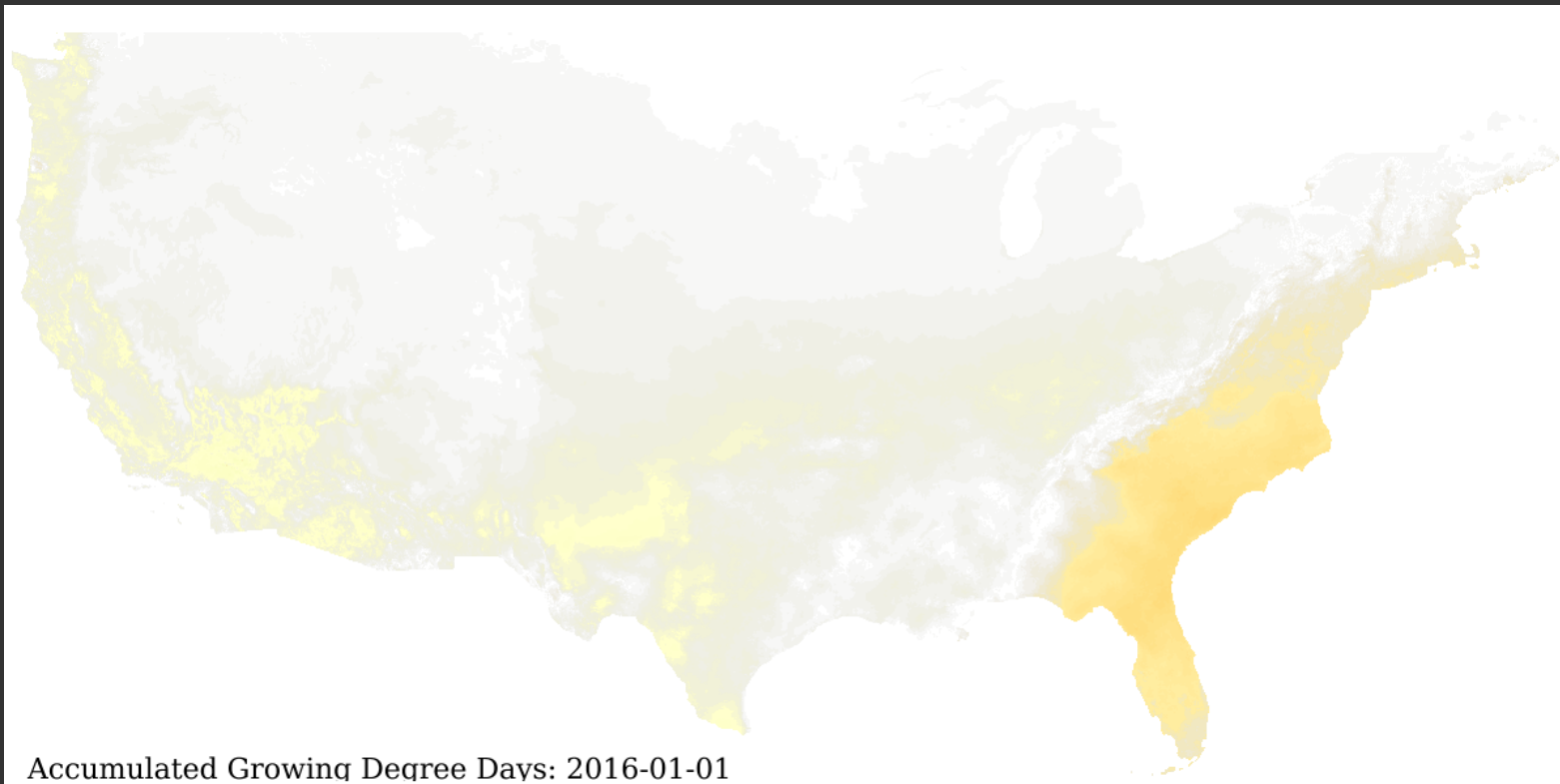


2016 Accumulated Growing Degree Days



*USA-NPN producing phenology relevant bioclimatic maps to characterize seasonality
Can use to evaluate how spring is progressing across continent*

2016 Accumulated Growing Degree Day Anomalies Compared to 30 year average (1981-2010)



Is it an “early” or “late” spring? Can evaluate how spring is progressing across continent relative to average conditions

[Home](#) » [Get Data](#) » Gridded Spring Indices

www.usanpn.org/data/spring

GRIDDED SPRING INDICES

HOW IS SPRING UNFOLDING THIS YEAR?

The Extended Spring Index models are a powerful way to track the progression of spring across the continent. This year, we are applying these models to gridded temperature data to map the start of spring, as represented by these models, on a fine scale.

The top map at right show locations that have reached the requirements for the leaf-out Spring Index model (based on NCEP [Real-Time Mesoscale Analysis Products](#)). The bottom map shows how different this year's progress of the leaf index is from the long-term (1981-2010) average (calculated using

2-15-2016 Leaf Out - Click to Enlarge

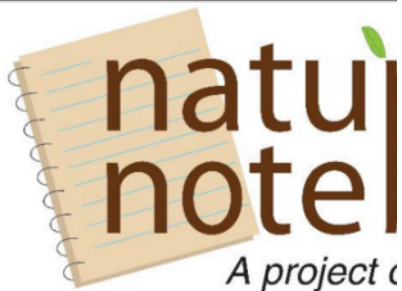


2-15-2016 Leaf Anomaly - Click to Enlarge



Research partnerships

- We'll promote your research
- Need data? Consider a campaign...



Dear USA-NPN,

Are the poplars you watch
log your observations in **Na**

Will warmer winter nights be
is a feature article in the special
PopClock newsletter.

Also in this newsletter...
PopClock researchers are
verify what they see from space
are proving very valuable for

Stay abreast of project updates

FUTURE SPRINGS MAY ARRIVE THREE WEEKS EARLIER ACROSS THE US



In a nutshell

The earlier springs seen in recent decades, particularly in the Northeast and Great Lakes regions, may become a permanent change. Researchers at the University of Wisconsin – Madison predict that by the end of this century, spring will appear approximately three weeks earlier across the continental U.S. Even larger shifts of up to a month are likely across the Great Plains and mountainous regions of the Western U.S. False springs, or the return of freezing temperatures after initial spring growth in plants, are also likely to increase in the Great Plains and portions of the Midwest.

What is special about this study?

This study used models of leaf out and flowering, called the Spring Indices, to predict changes in the start of spring. The Spring Indices were constructed using observations of cloned lilac and honeysuckle phenology, hosted in the USA-NPN's National Phenology Database, and provide a useful general model of plant phenology for native and agricultural plants. The authors

Thank you!

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