See what we accomplished together in 2016

Submitted **2.4 million** records to *Nature's Notebook*

Submitted observations to **6** *Nature's Notebook* campaigns

Average of **3.5 plant species** observed per observer

Average of **4 animal species** observed per observer

Increased the number of days observed per observer by **32%**

Submitted **23%** of records by **mobile app**

Informed management of multiple **invasive species**

Started **97** new *Nature's Notebook* groups

Photos: Robert Taylor, Brian F Powell, Erynn Maynard

USA NPN National Phenology Network

Thank you!

nature's notebook A project of the USA-NPN

What did we learn from the *Nature's Notebook* campaigns in 2016?

- Observers with the **Green Wave**, **Cloned and common lilacs**, and **Cloned and native flowering dogwoods Campaigns** reported breaking leaf buds, leaves, and/or flowering earlier in 2016 than 2015, which may be a reflection of the cooler preceding winter of 2015
- Observers for the **Shady Invaders Campaign** reported breaking leaf buds for invasive species an average of 21 days earlier than for natives, and colored leaves an average of 49 days layer than for native species
- Observers for the **Southwest Season Trackers Campaign** reported activity of leaf and flower phenophases for drought-deciduous and evergreen shrubs periodically thorought the year
- **Mayfly Watch** observers did not report large emergences, but predicted emergences were validated for 4 of 8 Pools observed

In 2016, data submitted to the National Phenology Database helped us learn that:

Spring is advancing in three of every four National Parks, and half of Parks are experiencing extreme early springs that exceed 95% of historical conditions

Monahan et al 2016 *Ecosphere*

By mid-century, early springs and late-season freezes will likely become the new normal, which may result in more large-scale plant tissue damage and agricultural losses

Labe et al 2016 *Climate Dynam*ics

Invasive buffelgrass responds quickly to rain, helping managers know when to conduct treatment
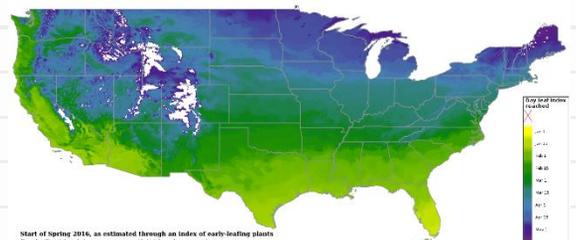
Wallace et al 2016 *Remote Sensing*

Nature's Notebook observations can be combined with satellite information to provide a more complete picture of leaf phenology

Elmore et al 2016 *Remote Sensing*

We also introduced a new suite of phenology maps, to allow you to explore Accumulated Growing Degree Days and spring onset dates

Photos: Brian F Powell, Geoff Henebry