

WHY PHENOLOGY? From the Nature's Notebook USA National Phenology Network site

Phenology is nature's calendar—when cherry trees bloom, when a robin builds its nest and when leaves turn color in the fall.

Phenology is a key component of life on earth. Many birds time their nesting so that eggs hatch when insects are available to feed nestlings. Likewise, insect emergence is often synchronized with leaf out in host plants. For people, earlier flowering means earlier allergies. Farmers and gardeners need to know the schedule of plant and insect development to decide when to apply fertilizers and pesticides and when to plant to avoid frosts. Phenology influences the abundance and distribution of organisms, ecosystem services, food webs, and global cycles of water and carbon. In turn, phenology may be altered by changes in temperature and precipitation.

Changes in phenological events like flowering and animal migration are among the most sensitive biological responses to climate change. Across the world, many spring events are occurring earlier—and fall events are happening later—than they did in the past. However, not all species are changing at the same rate or direction, leading to mismatches. How plants and animals respond can help us predict whether their populations will grow or shrink – making phenology a “leading indicator” of climate change impacts.

CRITICAL APPLICATIONS OF PHENOLOGY INCLUDE:

- Management of invasive species and forest pests
- Predictions of human health-related events, such as allergies and mosquito season
- Optimization of when to plant, fertilize, and harvest crops
- Understanding the timing of ecosystem processes, such as carbon cycling
- Assessment of the vulnerability of species, populations, and ecological communities to ongoing climate change

Home Phenology Monitoring- Map and Species Inventory

Last week you all reported some interesting plant and animal sightings. Your task this week is to dig into the next layer of phenology observation, which involves beginning to track change in species over time.

1. **First, create a map of your phenology monitoring area.** Draw a map of the space (that ideally includes your sit spot) that you will be observing this spring. If you have a very large property (10+ acres) choose a part of it that is convenient to access, that ideally has some trees, shrubs, and other plants within it.

You'll want to **measure the perimeter** of your phenology location by using the pacing method. An average pace is about 2 ft., but you can also measure the length of your pace first if you want accuracy. Make sure you record the final measurements on your map.

See if you can also **calculate the size of the inner area you are observing.**

1 acre= 43,560 square feet.

If you have a square yard that is 200 ft. x 200 ft., your property would be 40,000 square feet (40,000/43,560), or 0.918 acres.

If your yard is 100 ft. x 100 ft., or 10,000 square feet (10,000/43,560), you would have 0.23 square acres.

2. **Take a look at your whole site.** If the area where you'd like to monitor has multiple habitats within it, consider breaking it down into smaller sections by plant type. It's helpful to look at areas that are relatively uniform when monitoring change. Divide your map into smaller sections to separate these areas (this may relate to distinctions such as field, lawn, garden, forest, marsh, pond, river, conifer or deciduous areas, or even wild or planted trees and shrubs).

3. **Do a species inventory.** When tracking phenological change, it's important to notice both specific species of plants and the overall distribution of these plants within the entire area you are monitoring. Start with the tree species, and to your best ability, identify the type and number of each. This may be difficult without leaves, so do your best! You can at least categorize by deciduous or coniferous.

If you have any bushes, shrubs, flowering plants, etc., make sure you record those as well. Some great ones to monitor for phenology are forsythia and lilac- these are indicator species in terms of our changing climate.

You can mark these on your map with symbols or labels (hint: you will need a key for your map!).

4. **Get familiar with the plants.** Plants are easier to track than animals, for the obvious reason that they don't move and you will be able to keep observing the same individual plant (unless it dies). Since animals move around, you will likely be observing different individuals each time you go out.

This week, get as familiar as you can with the trees and other plants in your yard. By the end of the week you will be keying in on exactly where these plants are at in terms of the phenophase (leaf out).

5. **You can always record the animals!**

When you are outside, feel free to record any animals you see. Be as specific as possible with descriptions of both the animal itself and the activity you notice (is the animal searching for food? Looking for material for a nest? Moving quickly or slowly?)