nature’s notebook

at

Barataria Preserve

Jean Lafitte National Historic Park and Preserve

March 2011
Outline

• What is phenology?

• Why is phenology important?

• What is the National Phenology Network?

• Monitoring phenology using *Nature's Notebook*
  • Overview
  • Field-trip
  • Data entry
Phenology is…

- Study of **timing** of plant & animal life cycle events

- Simply put, it's nature’s calendar
Examples of **phenology**…

- Timing of Migration
- Appearance of Wildflowers in Spring
- Timing of Autumn Color Change
Phenology is...

- Easy to observe
- Critical for plants and animals
- Critical for people
- Sensitive to environmental variation
Why is phenology important?

Phenology affects...

• Abundance and diversity of organisms
• Interactions of organisms with each other
• Seasonal behaviors of organisms
• Global-scale cycles of water, carbon, and other chemical elements
“Phenology...is perhaps the simplest process in which to track changes in the ecology of species in response to **climate change**.” (IPCC 2007)
Why is phenology important?

A three-way mismatch

English Oak EARLIER

Pied Flycatcher SAME TIME EACH YEAR

Winter Moth EARLIER

Both et al. 2006 Nature
How are phenology data used?

- Health
- Resource management
- Conservation
- Agriculture
- Understanding hazards
- Recreation
What is USA-NPN?
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.
Key Goal

• Understand how plants, animals and landscapes respond to environmental variation and climate change.
What is USA-NPN?

Vision

- Encourage people of all ages and backgrounds to observe and record phenology.

- Make phenology data, models, and related information available to scientists, resource managers, and the public.
What is USA-NPN?

Key sponsors and collaborators...
What is Nature’s Notebook?

nature’s notebook

a project of the USA-NPN
Nature’s Notebook is USA-NPN’s plant and animal phenology observation program.
Nature’s Notebook engages scientists and citizen scientists to collect phenology observations on:

- 258+ plant species
- 160+ animal species
Nature’s Notebook involves observers across the nation.
nature's notebook

usanpn.org
• Identify & Register a Site
• Select Plants & Animals
  – Animal Checklist
  – Register Individual Plants
• Make Observations in the Field
• Submit Observations Online
A site is:

• The area within which you’ll look for your animal species
• The area which encompasses any plants you plan to observe
Site Selection Guidelines

- Convenience
- Representative location
- Uniform habitat
- Appropriate size
- Proper permission
Edit Site

Enter the following information about your site. The map will adjust as you enter more information. Latitude, longitude and elevation will be calculated from the address, and appear in the boxes below the map. If your site does not have a street address, enter a nearby zip code and use the map below to pinpoint your site.

* Site Name: Barataria Preserve, JELA (e.g., home, office, my front yard, etc.)
Address: 6555 Barataria Boulevard
City: Marrero State: Louisiana Zip Code: 

You may also zoom in (++) or out (−) to pinpoint your site, then drag the marker to its approximate center.

Location:  
* Latitude: 29.804804
* Longitude: -90.11877
Elevation (ft): 
Overview

• Identify & Register a Site
• Select Plants & Animals
  – Animal Checklist
  – Register Individual Plants
• Make Observations in the Field
• Submit Observations
• **Animals**: create a checklist for your site, look and listen for all species each time you visit

• **Plants**: repeat observations of the same individual plants
Search Plants & Animals to Observe

Choose any combination of boxes, then click on 'Find Species.' For example, to see a list of Tennessee, choose Tennessee from the "Filter by State" menu and Grass from the "Filter by plant type" menu.

Species kingdom  ○ Both  ○ Plants  ○ Animals

Sort by  Common Name

Name contains:

□ Show me only USA-NPN plant calibration species
□ Show me only Cloned Plants Project species

Filter by...

State:  All States
Partner:  All Species
Plant type:  All Species
Animal group:  All Species

Find species  Clear filters
Create a list of animals you will look for at each site on each visit. Select species names in the box to the left and click 'copy' to move them into your checklist. Save your checklist when you switch between species groups and when you're finished.

View available animal species & profiles

Select the site for this checklist. Site: SGS LTER
Search for species to add by group. Species group: All

Species Available

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
<th>Spec</th>
</tr>
</thead>
<tbody>
<tr>
<td>American eel</td>
<td>Anguilla rostrata</td>
<td>F</td>
</tr>
<tr>
<td>American shad</td>
<td>Alosa sapidissima</td>
<td>F</td>
</tr>
<tr>
<td>American toad</td>
<td>Anaxyrus americanus</td>
<td>F</td>
</tr>
<tr>
<td>bicolored sallow moth</td>
<td>Sunira bicolorago</td>
<td>L</td>
</tr>
<tr>
<td>black-capped chickadee</td>
<td>Poecile atricapillus</td>
<td>E</td>
</tr>
<tr>
<td>brant</td>
<td>Branta bernica</td>
<td>E</td>
</tr>
<tr>
<td>Cascades frog</td>
<td>Lithobates cascadae</td>
<td>A</td>
</tr>
</tbody>
</table>

My Checklist

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>American goldfinch</td>
<td>Carc</td>
</tr>
<tr>
<td>American robin</td>
<td>Turd</td>
</tr>
<tr>
<td>bighorn sheep</td>
<td>Ovis</td>
</tr>
<tr>
<td>bumblebee</td>
<td>Bom</td>
</tr>
<tr>
<td>common green darter</td>
<td>Ana:</td>
</tr>
<tr>
<td>common whitetail</td>
<td>Plath</td>
</tr>
<tr>
<td>gopher snake</td>
<td>Pituc</td>
</tr>
</tbody>
</table>

Save checklist
nature’s notebook
a project of the USA-NPN

Your plants:
Add new plant

Your new plant...

New plant...

- Plant Species: red maple
- Nickname: red maple-1
- Shade status: Select
- Wild?: Unknown
- Watered?: Unknown
- Fertilized?: Unknown
- Planting date:
  - Month (MM): [input field]
  - Day (DD): [input field]
  - Year (YYYY): [input field]
• Identify & Register a Site
• Select Plants & Animals
  – Create Animal Checklist
  – Register Individual Plants
• Make Observations in the Field
• Submit Observations
Compare phenophases to what you observe.

Which phenophases should I observe?

<table>
<thead>
<tr>
<th>Activity</th>
<th>Do you see...?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active individuals</td>
<td>One or more individuals are seen moving about or at rest.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Do you hear...?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calls or song</td>
</tr>
<tr>
<td>Singing males</td>
</tr>
</tbody>
</table>
• **Yes (Y)** – if the phenophase *is* occurring

• **No (N)** – if the phenophase *is not* occurring

• **Unknown (?)** – if you did not or forgot to look for signs of this phenophase or not certain you heard or saw that animal species
An example:

• Site: your front yard
• Species on your animal checklist:
  – American robin
  – Black-capped chickadee
  – Bumblebee
• Plants registered:
  – One individual mayapple plant
On your site visit, you stand in one place and observe:

• A bumblebee visiting flowers

• One robin perched and singing

• You also make observations of your mayapple plant
<table>
<thead>
<tr>
<th>Do you see/hear...?</th>
<th>Date</th>
<th>Robin</th>
<th>Black-capped chickadee</th>
<th>Bumblebee</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5/5/10</td>
<td>y n ?</td>
<td>y n ?</td>
<td>y n ?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you see/hear...?</td>
<td>Date</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active individuals</td>
<td>5/5/10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calls or song</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Singing males</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit/seed consumption</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mating</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nest building</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dead individuals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individuals at a feeder</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Check when data entered online:

Comments:
Animal Phenophase Datasheet

Species: **Bumblebee**  
Site: **My front yard**  
Year: **2010**

**Directions:**
Fill in the date in the top row and circle the appropriate letter in the column below it:  
y (phenophase detected)  
n (phenophase not detected)  
? (phenophase possible)

<table>
<thead>
<tr>
<th>Do you see/hear...?</th>
<th>Date</th>
<th>5/5/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active adults</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individuals visiting flowers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dead individuals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Check when data entered online:  
☐  
☐  
☐

**Comments:**
**Do you see...?**

**Emerging growth**
New bright green growth of the plant is visible above the soil surface, either from aboveground buds with green tips, or new green or white shoots breaking through the soil surface. Growth is considered "emerging" until the first leaf has fully unfolded from that bud.

**Unfolded leaves**
In at least one location on the plant, a fully unfolded leaf is visible. For seedlings, consider only true leaves and do not count the cotyledons (one or two small, round leaves) that are found on the stem almost immediately after the seedling emerges. More...
Species: **Mayapple**  
Plant Nickname: **Mayapple-front yard**

**Directions:**
Fill in the date in the top row and circle the appropriate letter in the column below it: *(ph)*

<table>
<thead>
<tr>
<th>Do you see...?</th>
<th>Date</th>
<th>5/5/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerging growth</td>
<td>y n ?</td>
<td></td>
</tr>
<tr>
<td>Unfolded leaves</td>
<td>y n ?</td>
<td></td>
</tr>
<tr>
<td>All leaves withered</td>
<td>y n ?</td>
<td></td>
</tr>
<tr>
<td>Open flowers</td>
<td>y n ?</td>
<td></td>
</tr>
<tr>
<td>Ripe fruits</td>
<td>y n ?</td>
<td></td>
</tr>
</tbody>
</table>

Check when data entered online: [ ] [ ] [ ] [ ] [ ] [ ] [ ]

**Comments:**
# Cover Sheet

<table>
<thead>
<tr>
<th>Site</th>
<th>Year</th>
<th>Observer</th>
</tr>
</thead>
</table>

## Date

Report your contribution of time

<table>
<thead>
<tr>
<th>Time spent observing</th>
<th>hr</th>
<th>min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time spent in travel</td>
<td>hr</td>
<td>min</td>
</tr>
</tbody>
</table>

Report your animal observation methods

| Time spent looking for animals | hr | min |
| Animal survey method | wsas |

Report on snow

| Is there snow on the ground? | y n | ? |
| % of ground covered | |
| Is there snow in the canopy? | y n | ? |
Observing animals

- **Walking** a single line through site
- **Stationary** at a single point
- **Area search:** multiple passes through site
<table>
<thead>
<tr>
<th>Date</th>
<th>4/1/10</th>
<th>4/3/10</th>
<th>4/9/10</th>
<th>4/11/10</th>
<th>4/15/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time spent observing</td>
<td>15 min</td>
<td>15 min</td>
<td>18 min</td>
<td>19 min</td>
<td>15 min</td>
</tr>
<tr>
<td>Time spent in travel</td>
<td>2 min</td>
<td>2 min</td>
<td>2 min</td>
<td>2 min</td>
<td>2 min</td>
</tr>
</tbody>
</table>

Report your animal observation methods

| Time spent looking for animals | 5 min | 5 min | 5 min | 5 min | 5 min |
| Animal survey method          | wsa   | wsa   | wsa   | wsa   | wsa   |

Report on snow

| % of ground covered         |       |       |       |       |       |       |       |       |       |
• Identify & Register a Site
• Select Plants & Animals
  – Animal Checklist
  – Register Individual Plants
• Make Observations in the Field
• Submit Observations Online
Select the site where your plant is located. Site: My back yard

Date: 06/02/2010

- **Report your contribution of time**
- **Report your animal observation methods**
- **Report on snow**

### creosote-1

<table>
<thead>
<tr>
<th></th>
<th>Circle all no</th>
<th>Circle all no</th>
<th>Circle all no</th>
<th>Circle all no</th>
<th>Circle all no</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emerging leaves</strong></td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
</tr>
<tr>
<td><strong>Young unfolded leaves</strong></td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
</tr>
<tr>
<td><strong>Open flowers</strong></td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
</tr>
<tr>
<td><strong>Ripe fruits</strong></td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
<td><img src="emoji" alt="Circle" /> n ?</td>
</tr>
</tbody>
</table>

**Comments**
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.

Learn more about us

Why is phenology important?

USA-NPN News  Phenology Feed  Join the Conversation

Introducing the USA-NPN Video

“How to Observe” Handbook for Nature’s Notebook

www.usanpn.org