Citizen Science Data Management Challenges and Opportunities

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Outline

1) Mohonk Preserve Amphibian Breeding Dataset
   1) Description
   2) Citizen Science Processes
   3) Takeaways

2) iNaturalist Occurrence Records and Image Dataset
   1) Centennial Bioblitzes
   2) Comparison with GBIF
   3) Takeaways
Mohonk Preserve Amphibian Breeding

- 11 vernal pools on Preserve lands that vary in size and are distributed across the landscape at a range of elevations (166 - 384 m).
- Monitors the seasonality and reproductive ecology of amphibians and provides holistic environmental context for occurrence records.
- Incorporates records from a swamp leading up to drying.
- Extends into the 1930s, allowing for investigations into the impacts of climate change, urbanization, and acid rain.
Legacy Data Collection

Daniel Smiley (1907 – 1989)
# Ongoing Monitoring

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## Vernal Pool Monitoring

<table>
<thead>
<tr>
<th>Date:</th>
<th>Vernal Pool Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time (Begin):</td>
<td>Time (End):</td>
</tr>
<tr>
<td>Sky Code:</td>
<td>Wind Code:</td>
</tr>
<tr>
<td>Water Depth (in):</td>
<td>Water Level % (circle):</td>
</tr>
<tr>
<td>Veg % (on surface):</td>
<td>Veg Species (circle):</td>
</tr>
<tr>
<td>Visibility Impaired? Yes / No:</td>
<td>Other (circle):</td>
</tr>
<tr>
<td>Water Temp (°F):</td>
<td>Water pH:</td>
</tr>
<tr>
<td>Water Nitrate (mg/L):</td>
<td>Water Chloride (mg/L):</td>
</tr>
<tr>
<td>Water DO (%):</td>
<td>Water Ammonium (mg/L):</td>
</tr>
<tr>
<td>Water Turbidity (msec):</td>
<td>Water Turbidity (msec):</td>
</tr>
</tbody>
</table>

| White eggs present in JEPF egg mashes? Yes / No: | Other: |

### Species

<table>
<thead>
<tr>
<th>Species</th>
<th># Adults</th>
<th># Egg Masses</th>
<th>Chorus Code</th>
<th>Chorus Count</th>
<th># Juveniles</th>
<th># Spent/Adults</th>
<th># Tadpoles/Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live</td>
<td>Dead</td>
<td>Amphibous</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Wood Frog</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Spotted Salamander</td>
<td>NA</td>
<td>NA</td>
<td></td>
<td></td>
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<tr>
<td>Jefferson Salamander</td>
<td>NA</td>
<td>NA</td>
<td></td>
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<tr>
<td>Marbled Salamander</td>
<td>NA</td>
<td>NA</td>
<td></td>
<td></td>
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<tr>
<td>Blue-Spotted Salamander</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>Red-Spotted Newt</td>
<td>NA</td>
<td>NA</td>
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<tr>
<td>Spring Peeper</td>
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<tr>
<td>Green Frog</td>
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<tr>
<td>Bullfrog</td>
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</tbody>
</table>

### Additional Notes:
Harmonized Dataset

2,480 sampling events and 151,701 individuals across all 9 species and 11 vernal pools

Mohonk Preserve et al., edi.398.1
Data Management Takeaways

**Challenges**
- Attribution & Ethical Attribution
  - Vulnerability
  - Post-humous consent
- Citation and credit is tricky
- Appropriate process documentation and metadata maintenance

**Opportunities**
- Diversify science data producers in terms of abilities, age, background etc.
- Provide skill-building opportunities in data management
- Greater depth of data coverage for research reuse
- Data rescue process optimization
- Leveraging community data to monitor community priorities
Common Eastern Bumble Bee (*Bombus impatiens*)

**Observed:**
Sep 7, 2018 · 10:23 AM EDT

**Submitted:**
Nov 22, 2019 · 1:09 AM EST

Location:
Gardiner, ME, USA
Spatial & Temporal Biases
Data Management Takeaways

**Challenges**
- Providing research-relevant collector characteristics and potentially identifying information may not be ethical and may put individuals at risk
- Quality metrics can be tricky and difficult to verify

**Opportunities**
- Diverse data contributors provide (often) complementary data
  - Both in terms of spatial/temporal extent and type
- Educational opportunities in the classroom for supporting learning goals
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