Clean Water Act 1972
Safe Drinking Water Act 1974
Resource Conservation & Recovery Act 1976
Toxic Substances Control Act 1976
Endangered Species Act 1973
Clean Water Act 1972

Safe Drinking Water Act 1974

Toxic Substances Control Act 1976

Resource Conservation & Recovery Act 1976

Endangered Species Act 1973
Many of the Oldest Volunteer Water Monitoring Programs in the US Began in the 1970s

- 1969 Izaak Walton League Save Our Streams (national)
- 1970 TN Adopt-A-River Program
- 1970 Lakes Environmental Association (in Maine)
- 1971 Maine Volunteer Lake Monitoring Program
- 1973 Minnesota Citizen Lake Monitoring Program
- 1974 Michigan Self-help Monitoring Program
- 1978 New Hampshire Lakes Lay Monitoring Program
- 1979 Vermont Lay Monitoring Program
Today ~1675 volunteer water monitoring programs across the United States
How Do These Programs Fit the “CCC” Typology?

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Designed Protocols</th>
<th>Analyzed Data</th>
<th>Communicated Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contributory</td>
<td>Volunteer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientist/Paid Staff</td>
<td>X</td>
<td>and</td>
<td>X</td>
</tr>
<tr>
<td>Collaborative</td>
<td>Volunteer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientist/Paid Staff</td>
<td>X</td>
<td>or</td>
<td>X</td>
</tr>
<tr>
<td>Co-created</td>
<td>Volunteer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scientist/Paid Staff</td>
<td>X</td>
<td>and</td>
<td>X</td>
</tr>
<tr>
<td>Collegial</td>
<td>Volunteer</td>
<td></td>
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</tr>
<tr>
<td>Scientist/Paid Staff</td>
<td>X</td>
<td>and</td>
<td>X</td>
</tr>
</tbody>
</table>

Based on categories as defined by Shirk et al. 2012
Distribution of USA Volunteer Water Monitoring Program Types

Stepenuck and Genskow, in preparation
Based on categories as defined by Shirk et al. 2012
A Variety of Waterbody Types Are Monitored

- Streams: 86%
- Lakes: 43%
- Marine: 24%
- Wetlands: 20%
- Beaches: 13%
- GW: 4%

Images: Kris Stepenuck, Joanna Griffin, NH Sea Grant, Wisconsin Wetlands Association, WI DNR

Stepenuck, 2013
Most Monitoring is Focused Locally

- Local waterbody or single watershed: 41%
- Multi-watershed: 29%
- Multi-state or Regional: 18%
- Statewide: 4%
- National: 1%
- Other: 7%

Stepenuck, 2013
Programs Implement Many QA/QC Measures
Programs Have Varying Levels of Formal QA Plans

- No formal QA plan: 20%
- Written methods: 68%
- State-approved QAPP: 41%
- EPA-approved QAPP: 25%

Stepenuck, 2013
Outcomes Achieved Have Direct and Indirect Impacts on Policy and Management

Natural Resource Management Decisions

Waterbody Restoration & Protection

Volunteer Civic Engagement

Organizational
VM Has Impacted Waterbody Protection and Restoration

- Protect land from development
- Obtain protected status for a waterbody
- Data to justify altering land uses
- Funding to protect/restore waterbody

Percent of Programs

Stepenuck, 2013
VM Has Impacted Natural Resource Management Decisions

- Close/Open beach or fishing area
- Define/Modify a waq standard
- Develop a TMDL
- List/Delist an impaired water
- Develop/Change/Enforce a regulation
- Monitor for a TMDL
- ID where waq standard not met

Stepenuck, 2013
Volunteer Monitors Have Become Civically Engaged

- Testify before a legislative body
- Write a letter that includes data about a policy
- Write a letter about a policy (without data)
- Serve on a natural resources board
- Attend natural resources related public meeting

Stepenuck, 2013
VM Has Resulted in Changes in Organizational Activities

- Organization changed monitoring methods
- Organization changed monitoring locations
- Citizens given staff responsibilities

Stepenuck, 2013
Volunteer Monitoring

Environmental Collaborative Monitoring

Community-based Monitoring

Locally-based Monitoring

Participatory Monitoring

Citizen Observatories

Citizen Science
Established 2014

**Vision** – A world where people understand, value, and participate in science

**Mission** – Advance citizen science through communication, coordination, and education

**Goals**

- Establish global community of practice
- Advance the field through innovation and collaboration
- Promote value and impact
- Provide access to best tools and resources
- Support communication and professional development
- Foster diversity and inclusion
Membership
- 4000+ members
- 80 countries
- Currently free!

Conference
- May 17-20, 2017 in Minneapolis
- Abstracts due October 10, 2016
Great Resources To Learn More and Get Connected

- Listservs
  - EPA Volunteer Water Monitoring
  - Extension Volunteer Monitoring Network
  - Citizen Science Association
  - Federal Community of Practice on Crowdsourcing and Citizen Science
  - NOAA Citizen Science Community of Practice
  - eXtension Citizen Science Community of Practice

Learn more at: http://volunteermonitoring.org/resources
Great Resources To Learn More and Get Connected

- Websites
  - National Water Quality Monitoring Council
  - USA Volunteer Monitoring Network
    - http://volunteermonitoring.org
    - Twitter: @volmonitor
  - EPA Volunteer Monitoring
  - Citizen Science Association
    - http://citizenscience.org
  - Federal Crowdsourcing and Citizen Science Toolkit
    - https://crowdsourcing-toolkit.sites.usa.gov/
  - SciStarter.com
    - http://scistarter.com/add/water
Questions?

* Tina Phillips  
  Lab of Ornithology  
  Cornell University  
  tina.phillips@cornell.edu  
  607-254-2482

* Kris Stepenuck  
  Lake Champlain Sea Grant  
  University of Vermont  
  kris.stepenuck@uvm.edu  
  802-656-8504
References in which some results in this presentation are included
