Learning from Iowa's Premier Citizen Science Program

Can citizen science contribute to partnership-building?

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Citizen Science

• “Citizens” = volunteer, non scientists.
• Monitor birds, bees, water, mussels, whales.
• Iowater started 1999.
  Iowa Department of Natural Resources
• 5,000 trained
  2,000 active

Photos Staff of Iowater; other from Iowater Program, 2010.
To **protect** and **improve** Iowa’s water quality by **raising citizen awareness** about Iowa’s watersheds, **supporting** and **encouraging** the growth and networking of Iowa’s volunteer water monitoring communities, and **promoting water monitoring activities** as a means of **assessing** and **understanding** Iowa’s aquatic resources.
• Attend a workshop
• Get a monitoring kit
• Pick monitoring sites
• Pick monitoring frequency
• Pick monitoring pals
• [Get a t-shirt?]

• Use the protocol
• Sample and test water
• Record data and conditions
• Enter data on the web
• Check data for other sites
Other IOWATER Activities
Contributions to Society

- Lots and lots (and lots) of data.
- Scientists get help.
- Tackling catastrophes.

Iowa row-crop agriculture contributes to degradation of the Mississippi River Corridor. Water monitoring enables us to track Iowa water quality before it gets there. Image:NASA.
Do Citizens Produce Good Data?

- The data match professional scientists’.

- Why study volunteer accuracy?

- Crall et al., 2013 *invasive species*; Fore et al. 2001 *water quality*; Freitag et al. 2016 various; Muenich et al., 2016 *water quality*; Ratnieks et al., 2016 *insects*.
Impacts on Volunteers

- Volunteers gain *lots* of technical skills.
- Volunteers gain *some* science process skills.

Photos by Iowater staff
Effects on Partnership Ability

The mission of Iowater:

“supporting and encouraging the growth and networking of Iowa’s volunteer water monitoring communities.”

Do citizen science programs contribute to partnership skills?
<table>
<thead>
<tr>
<th>Our Organizations</th>
<th>Partnership Abilities</th>
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<tbody>
<tr>
<td>• Watershed Council</td>
<td>• Cooperative</td>
</tr>
<tr>
<td>• Town council</td>
<td>• Stay calm</td>
</tr>
<tr>
<td>• Technical Subcommittee</td>
<td>• Share information</td>
</tr>
<tr>
<td>• Zoning Board</td>
<td>• Welcome others</td>
</tr>
<tr>
<td>• Watershed Community</td>
<td>• Organize events</td>
</tr>
<tr>
<td>• Watershed Improvement Group</td>
<td>• Approach new people</td>
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<tr>
<td>• Watershed Management Authority</td>
<td>• Network</td>
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<td>• Give presentations (!)</td>
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How does a citizen *new to water quality associations* learn to network and collaborate within organizations?
Directions: Discuss with your neighbor.

- Learned in a skills-based program.
- Learned from others after joining.
- Mirrored “the savvy” beforehand.

Direct Instruction

Technical Water Quality Skills

Set objectives (by Iowater)
- Teach the objectives (workshop, kit)
- Learner practices (locally, joins activities)
- Arrange a performance (enter data into database)
No Direction Instruction for Partnership Behaviors

1. Was there evidence of an increase of skills and attitudes associated with partnership abilities anyway?
2. Could a learning theory that did not depend on direct instruction (no workshops, no facilitators) explain increase partnership skills?
3. What elements of citizen science matched the “different” theory?
Program Evaluation Survey

• 2016 Qualtrics on-line quantitative
• Sent to 1,782 volunteers.
• Not all verified as active.
• 36 questions (some with sub-questions)
• 611 responses.
• 34% response rate.
• 50-50 gender ratio.
Experience of Iowater Respondents

How many years have you been certified by Iowater?

- Green >8 years: 35%
- Orange 4 - 8 years: 30%
- Blue 3 or less: 26%
- Other: 9%
Partnership Abilities

- Network with others: 2.46 (Blue)
- Talk to family: 3.03 (Orange)
- Talk to colleagues: 2.96 (Blue)

p=0.0005, p=0.0005, and p=0.0000

Blue is Before lowater  Orange is After lowater
Networking is *Difficult*

How easy is it to network with members of other water-quality focused groups?

**BEFORE Iowater?** Hard/Very Hard 48%

**NOW** Hard/Very Hard 15%

**WOW!**
Has Iowater helped you to “do” something?

- **Participate** in a watershed group: 53%
- **Participate** in a clean up day: 49%
- Join any other conservation group: 30%
- Join a paddling or river group: 18%
Tiny but Mighty: The Partnership Ability to Organize

- Organize a clean-up day: 16%
- Organize a watershed group: 15%
- Organize a watershed authority: 6%
Social Learning
What Works in Programs?

- Mirror learning
- Small groups
- Work but problem-solving
- Brief “instruction”
- Bandura (1977)
Iowater Features

• Sample in teams of 5-8, break-out to 2-3.
• Share data changes year to year.
• Discuss changes in sites
• Bring guests
• Discuss upcoming meetings
Conclusions

- Partnering takes skill.
- We need more adults with added skills.
- Workshops and institutes are great.
- But other ways can expand our reach.
- Citizen science can assist adults to gain skills if social features are present.
- Citizen science can add value in addition to science data.
- Double value deserves double support.
The IOWATER Tenets

Partnerships

& YOU!
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References


