

CITIZEN SCIENCE

VOLUNTEER MONITORING COMMUNITY-BASED MONITORING

PARTICIPATORY MONITORING

LOCALLY-BASED MONITORING

ENVIRONMENTAL COLLABORATIVE MONITORING

PUBLIC PARTICIPATION IN SCIENTIFIC RESEARCH



http://www.cleveland.com/science/index.ssf/2009/06/cuychogo_river_fire_40_years_a.htm

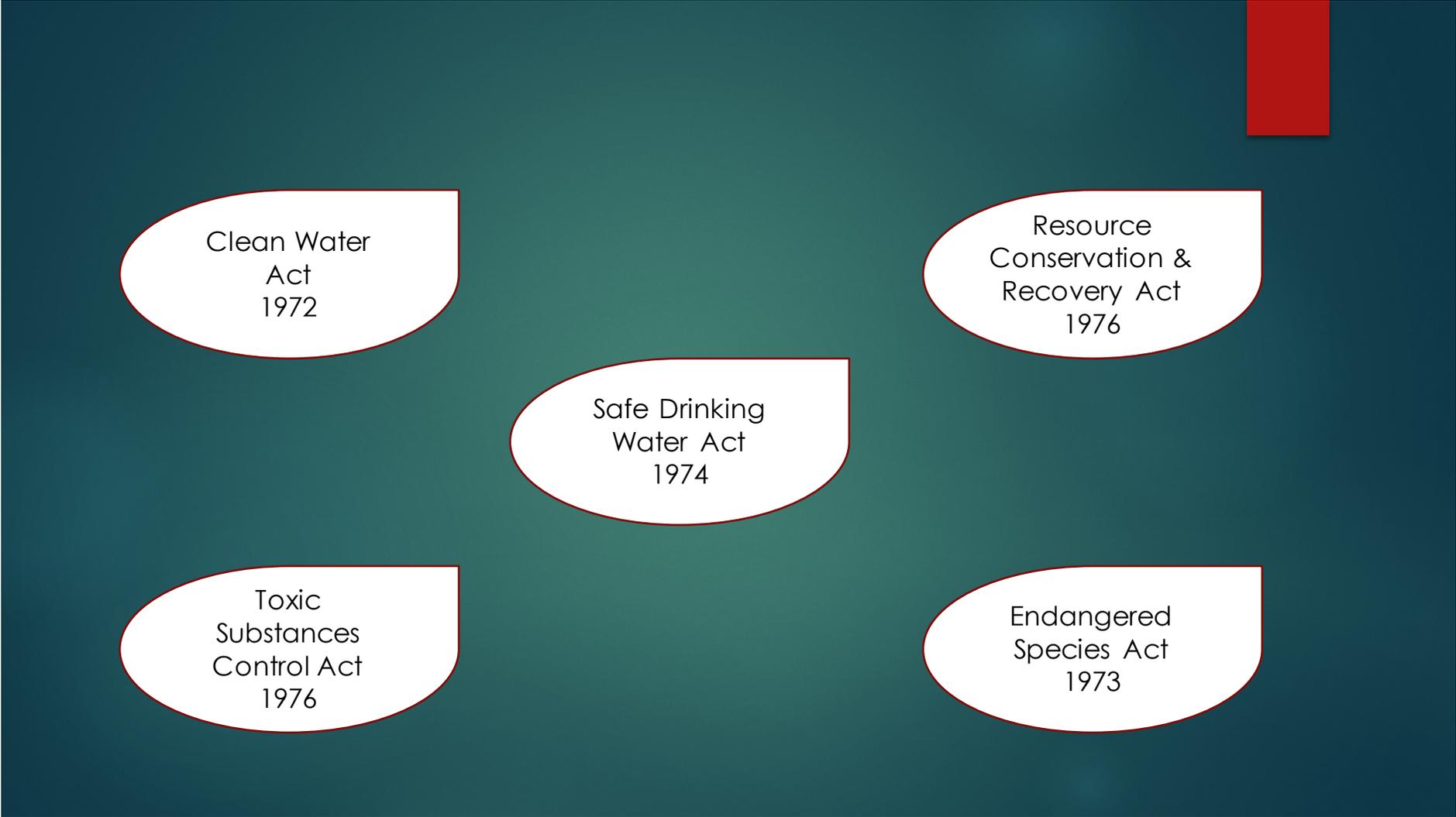


Jim Schafer

http://www.cleveland.com/science/index.ssf/2009/06/cuyahogo_river_fire_40_years_a.htm



http://www.cleveland.com/science/index.ssf/2009/06/cuychogo_river_fire_40_years_a.htm



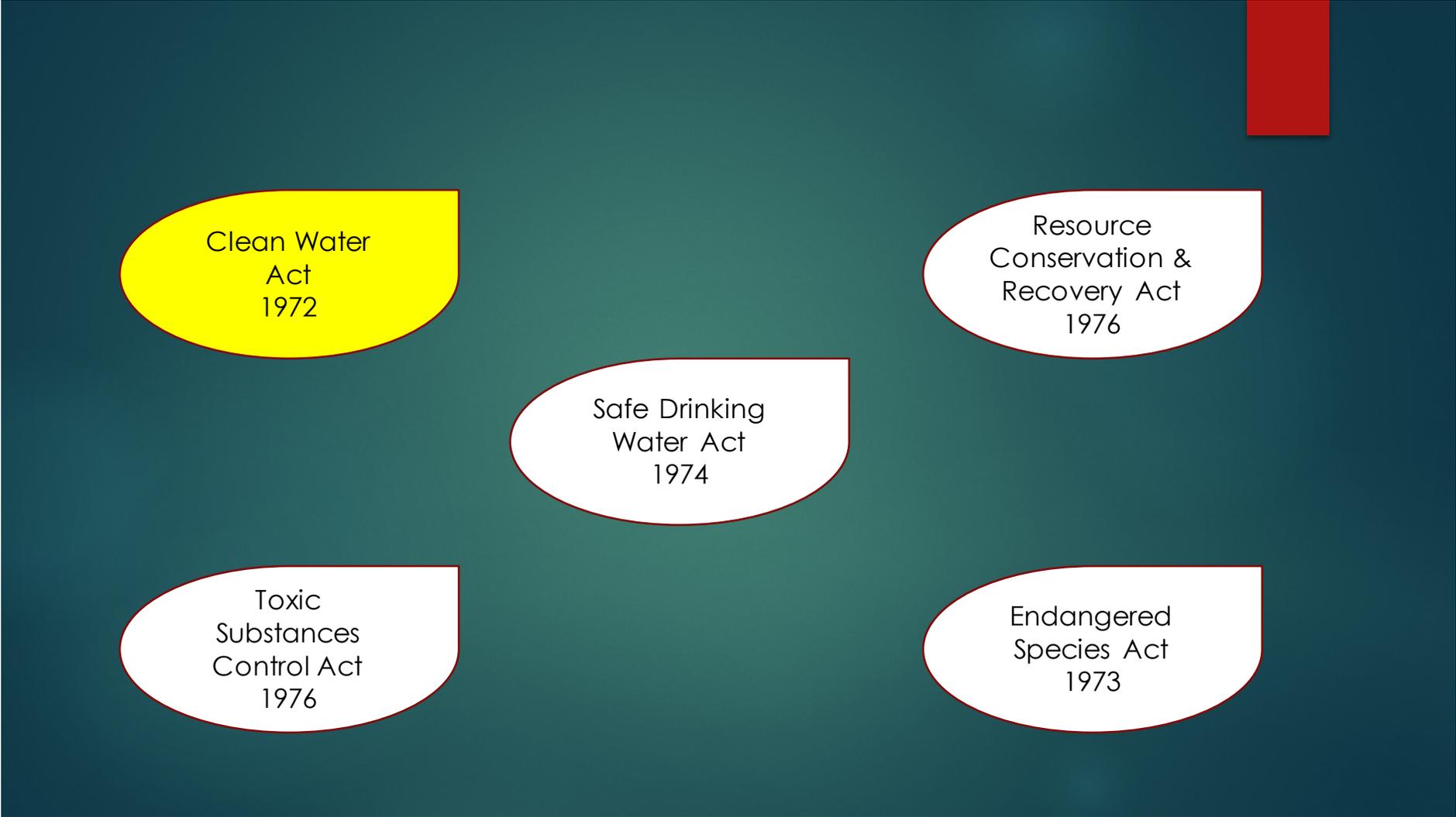
Clean Water
Act
1972

Resource
Conservation &
Recovery Act
1976

Safe Drinking
Water Act
1974

Toxic
Substances
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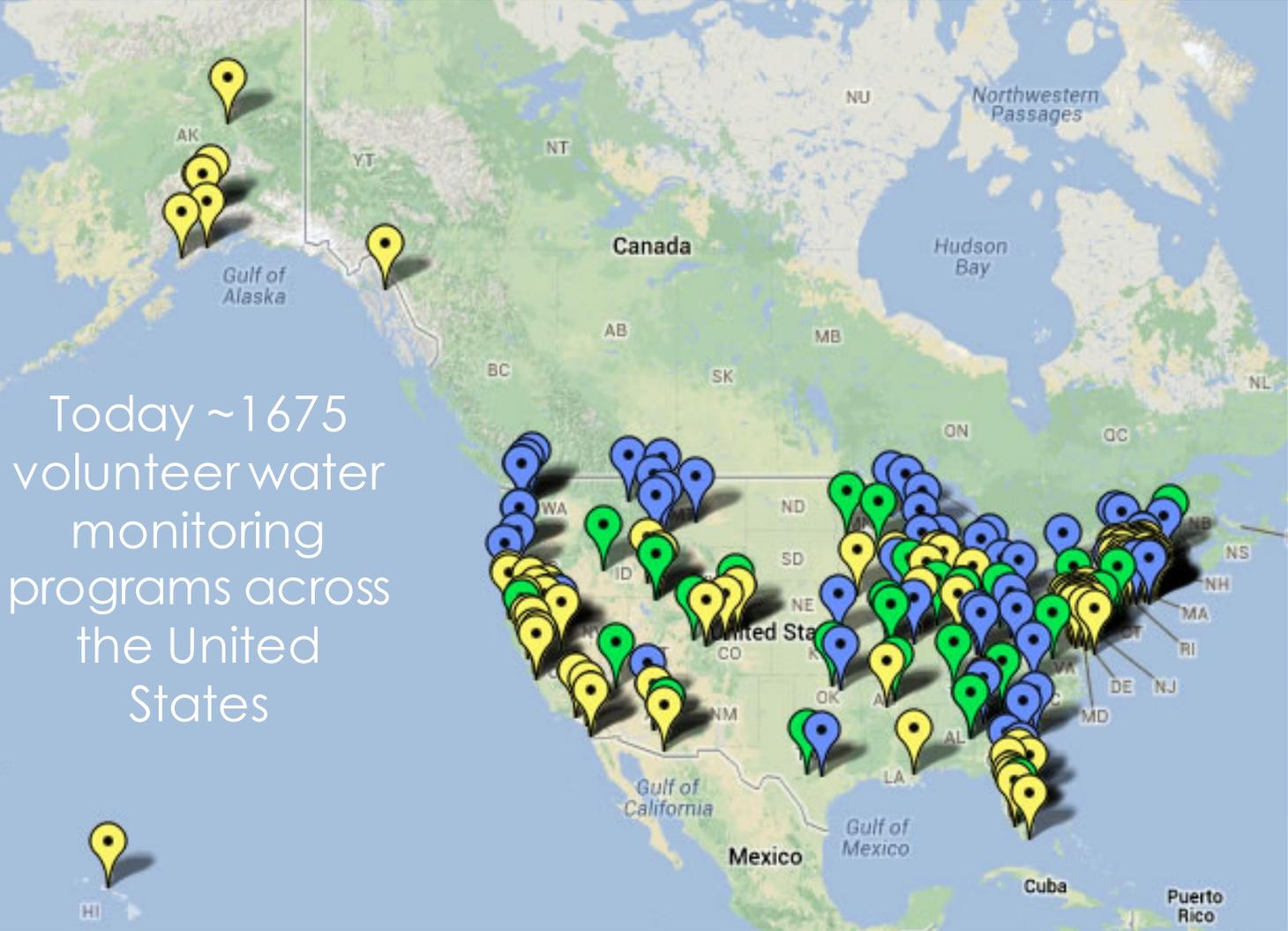
Toxic
Substances
Control Act
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Endangered
Species Act
1973

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





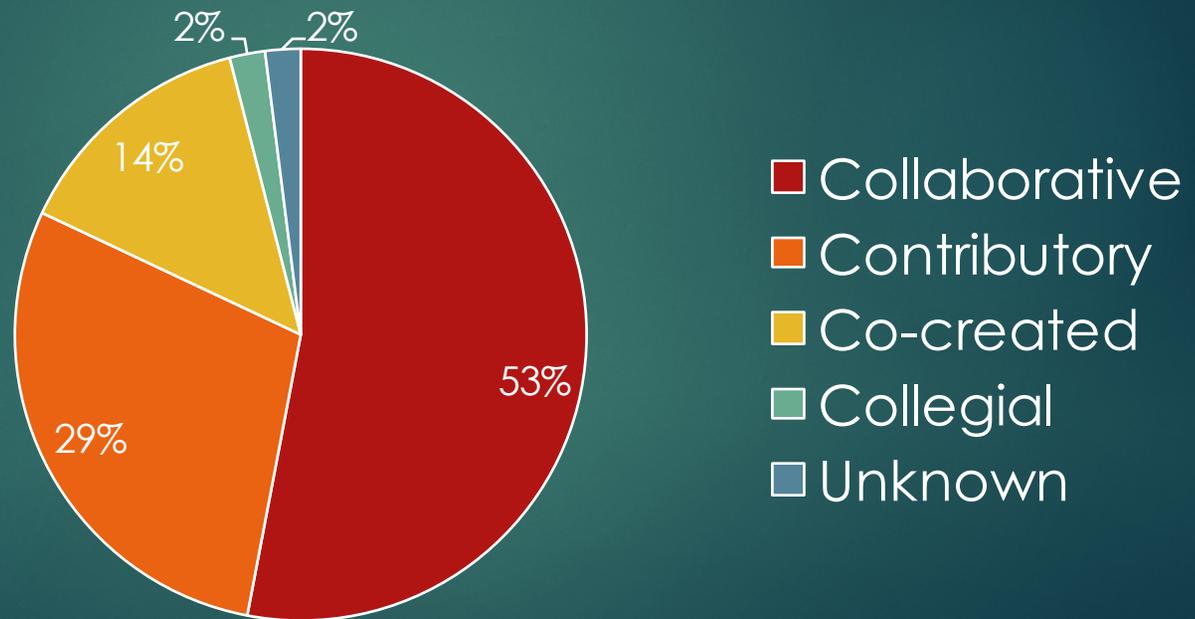
Today ~1675
volunteer water
monitoring
programs across
the United
States

How Do These Programs Fit the “CCC” Typology?

Program Type		Designed Protocols		Analyzed Data		Communicated Results
Contributory	Volunteer					
	Scientist/Paid Staff	X	and	X	and	X
Collaborative	Volunteer	X	or	X	or	X
	Scientist/Paid Staff	X	and	X	and	X
Co-created	Volunteer	X	and	X	and	X
	Scientist/Paid Staff	X	and	X	and	X
Collegial	Volunteer	X	and	X	and	X
	Scientist/Paid Staff					

Based on categories as defined by Shirk et al. 2012

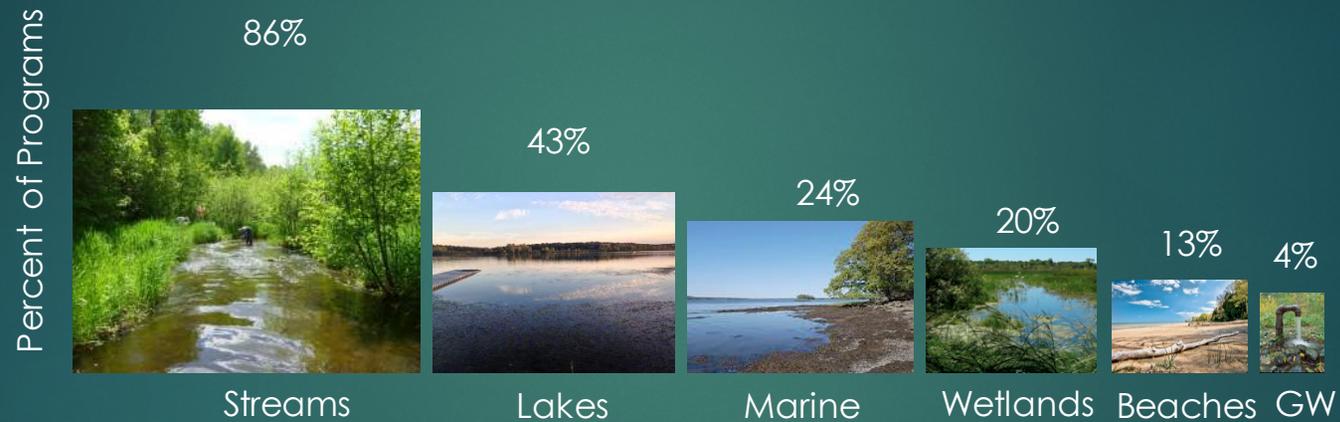
Distribution of USA Volunteer Water Monitoring Program Types



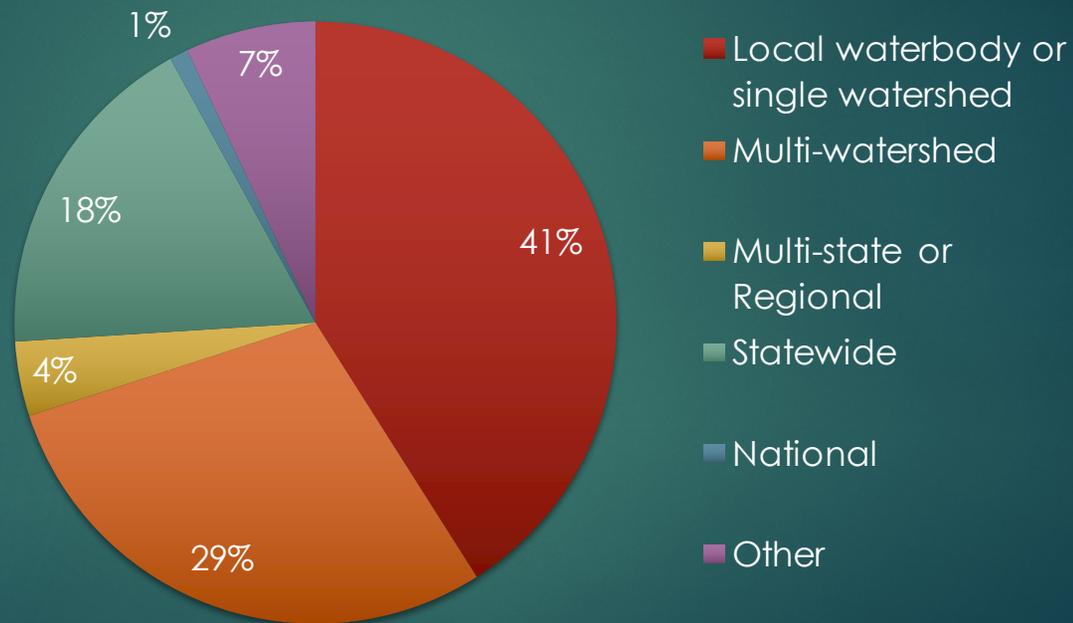
Stepenuck and Genskow, in preparation

Based on categories as defined by Shirk et al. 2012

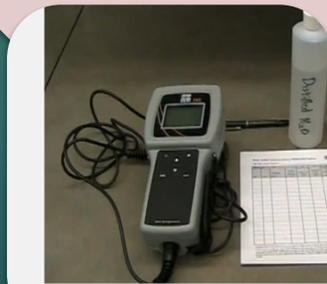
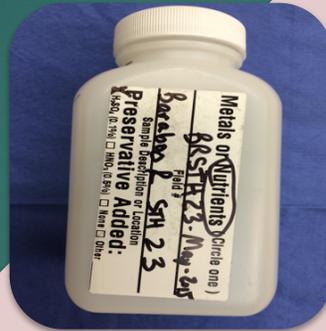
A Variety of Waterbody Types Are Monitored



Most Monitoring is Focused Locally



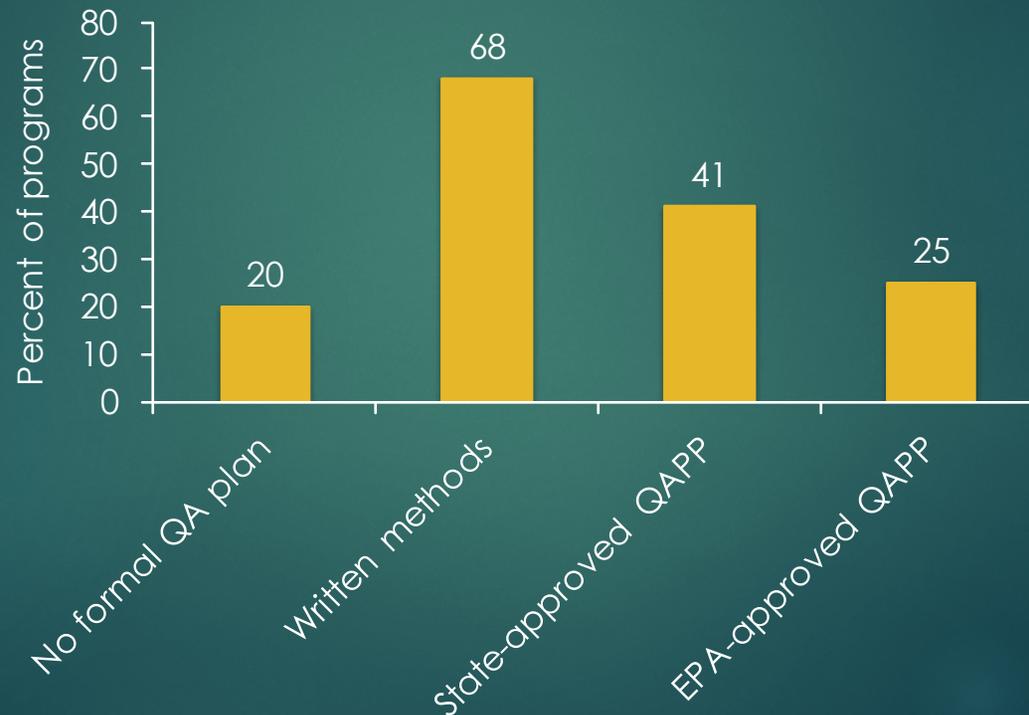
Programs Implement Many QA/QC Measures



Dissolved Oxygen Meter Calibration



Programs Have Varying Levels of Formal QA Plans



Outcomes Achieved Have Direct and Indirect Impacts on Policy and Management

Natural Resource Management Decisions



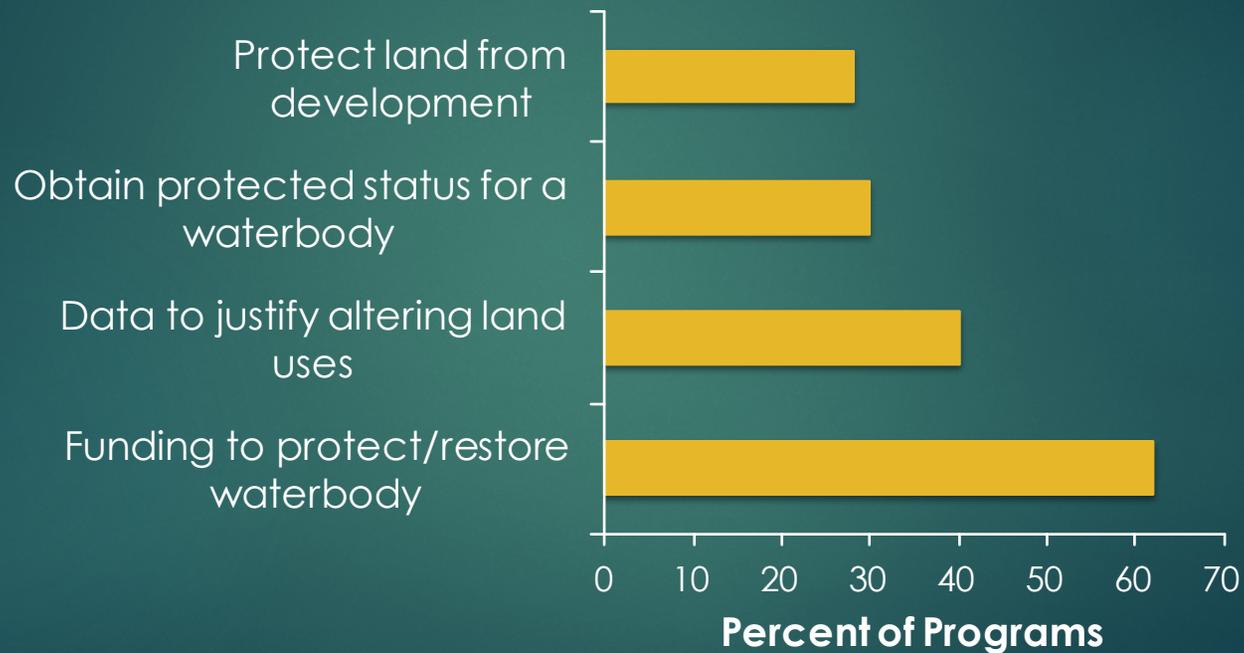
Volunteer Civic Engagement

Waterbody Restoration & Protection



Organizational

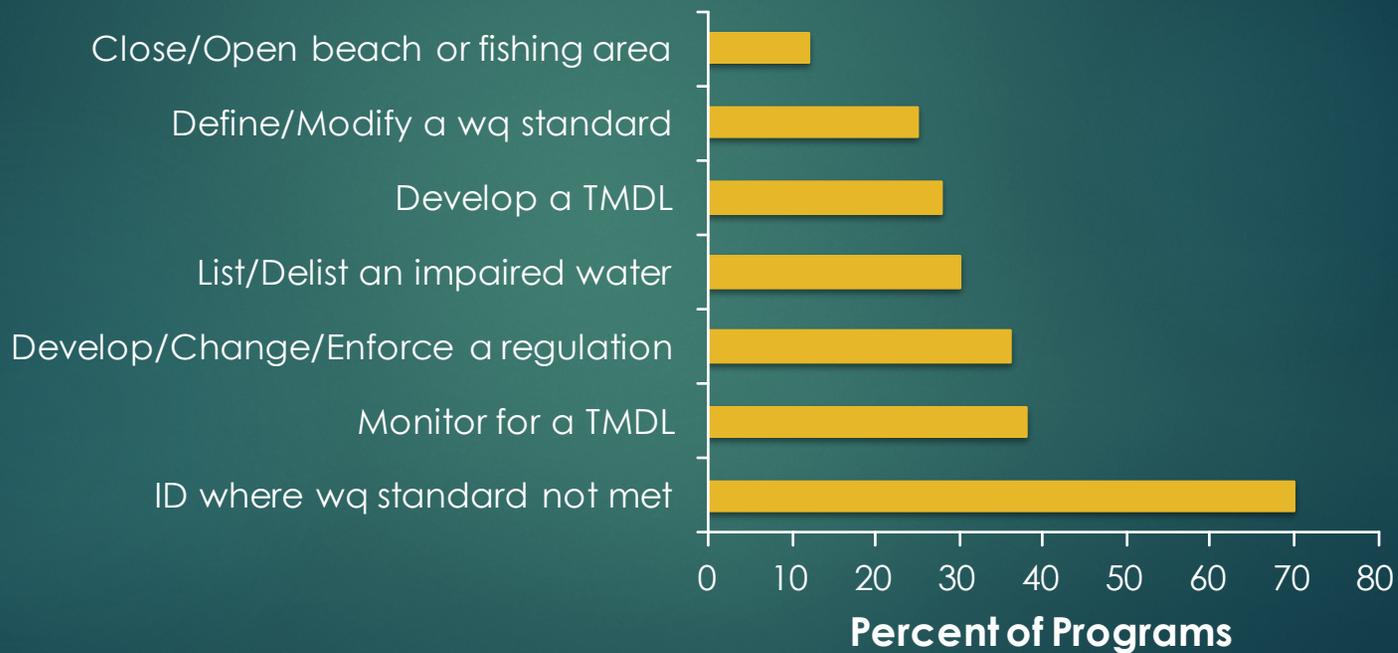
VM Has Impacted Waterbody Protection and Restoration



T. Stepenuck

Stepenuck, 2013

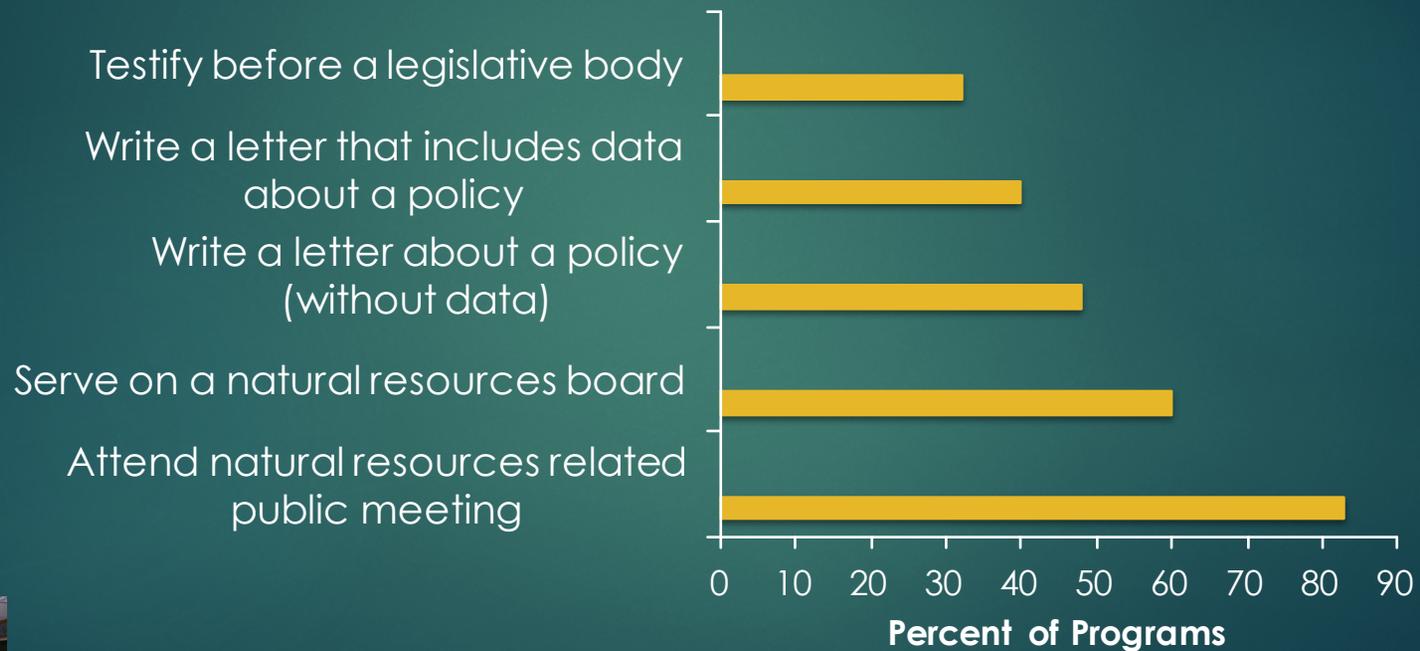
VM Has Impacted Natural Resource Management Decisions



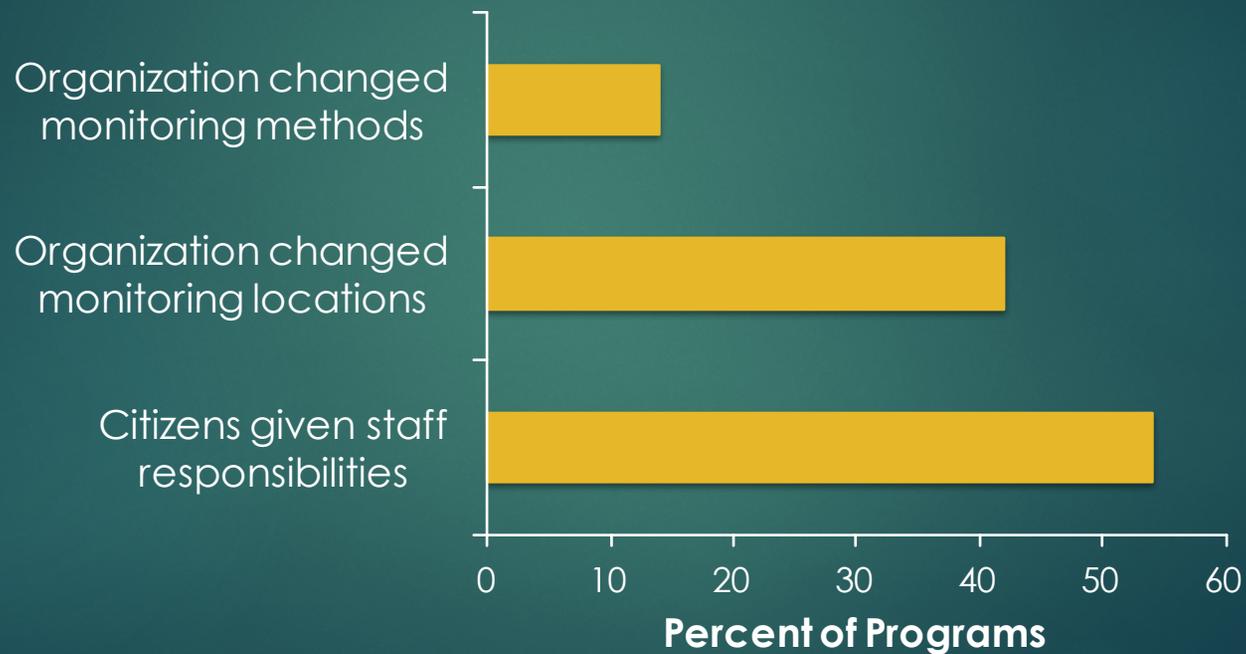
FOCALPAGES.COM

Stepenuck, 2013

Volunteer Monitors Have Become Civically Engaged



VM Has Resulted in Changes in Organizational Activities



Jim Beecher

Volunteer
Monitoring

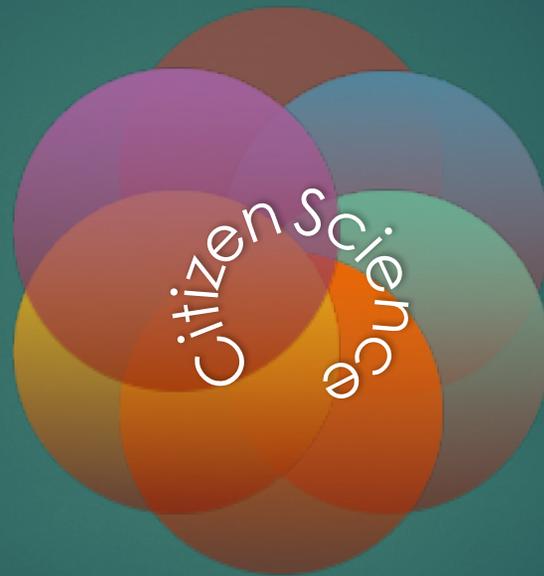
Environmental
Collaborative
Monitoring

Community-
based
Monitoring

Locally-based
Monitoring

Participatory
Monitoring

Citizen
Observatories





CITIZEN SCIENCE ASSOCIATION

CitizenScience.org | info@citizenscienceassociation.org | @CitSciAssoc

- ▶ 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



CITIZEN SCIENCE
ASSOCIATION



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Membership

- ▶ 4000+ members
- ▶ 80 countries
- ▶ Currently free!

Conference

- ▶ May 17-20, 2017 in Minneapolis
- ▶ Abstracts due October 10, 2016
 - ▶ <http://citizenscience.org/association/conferences/citsci2017/>



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
 - ▶ <http://acwi.gov/monitoring/vm/index.html>
- ▶ USA Volunteer Monitoring Network
 - ▶ <http://volunteermonitoring.org>
 - ▶ Twitter: @volmonitor
- ▶ EPA Volunteer Monitoring
 - ▶ <https://www.epa.gov/polluted-runoff-nonpoint-source-pollution/nonpoint-source-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?

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References in which some results in this presentation are included

- ▶ Stepenuck, K. F. (2013). *Improving understanding of outcomes and credibility of volunteer environmental monitoring programs* (Doctoral dissertation, THE UNIVERSITY OF WISCONSIN-MADISON).
- ▶ McKinley, D. C., A. J. Miller-Rushing, H. L. Ballard, R. E. Bonney, H. Brown, D. M. Evans, R. A. French, J. K. Parrish, T.B. Phillips, S. F. Ryan, L. A. Shanley, J. L. Shirk, K. F. Stepenuck, J. F. Weltzin, A. Wiggins, O. D. Boyle, R. D. Briggs, S. F. Chapin III, D. A. Hewitt, P. W. Preuss, and M. A. Soukup. 2015. *Investing in citizen science can improve natural resource management and environmental protection. Issues in Ecology*. Report Number 19.