Identifying and harmonizing the priorities of environmental stakeholders within a water quality monitoring community

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Identifying and harmonizing the priorities of stakeholders in the Chesapeake Bay environmental monitoring community

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ABSTRACT

Research collaborations between volunteer monitoring groups and environmental scientists and managers are instrumental for understanding and managing complex socioecological systems. In the Chesapeake region, the Chesapeake Monitoring Cooperative (CMC) helps coordinate volunteer monitoring efforts throughout the watershed, and facilitates collaboration between environmental stakeholders. However, stakeholders perceive their environment and their own role in different ways, and these perceptions affect how they prioritize problems and respective solutions. We conducted a survey to explore the extent to which cultural knowledge about environmental monitoring was shared across the CMC community, pinpoint key similarities and differences in how stakeholder groups prioritized various environmental monitoring goals, and understand stakeholders' perspectives of the CMC's resources. We learned that stakeholders drew from a shared system of cultural knowledge surrounding environmental monitoring and prioritized goals related to collecting actionable data and improving environmental conditions. There were also compelling differences in how stakeholder groups prioritized increasing knowledge and building a sense of community. Furthermore, stakeholders especially valued CMC resources associated with increasing the quality, quantity, and accessibility of volunteer-collected data. Based on our results, we developed recommendations to inform the design and coordination of other collaborative environmental monitoring programs. We argue that cultural consensus can provide a foundation for collaboration, and stakeholders' highest-priority monitoring goals can inform organizational priorities and strategic outreach. Furthermore, efforts to build social capital and understand stakeholders' changing priorities over time will be important for ensuring the continued success of the research partnership.

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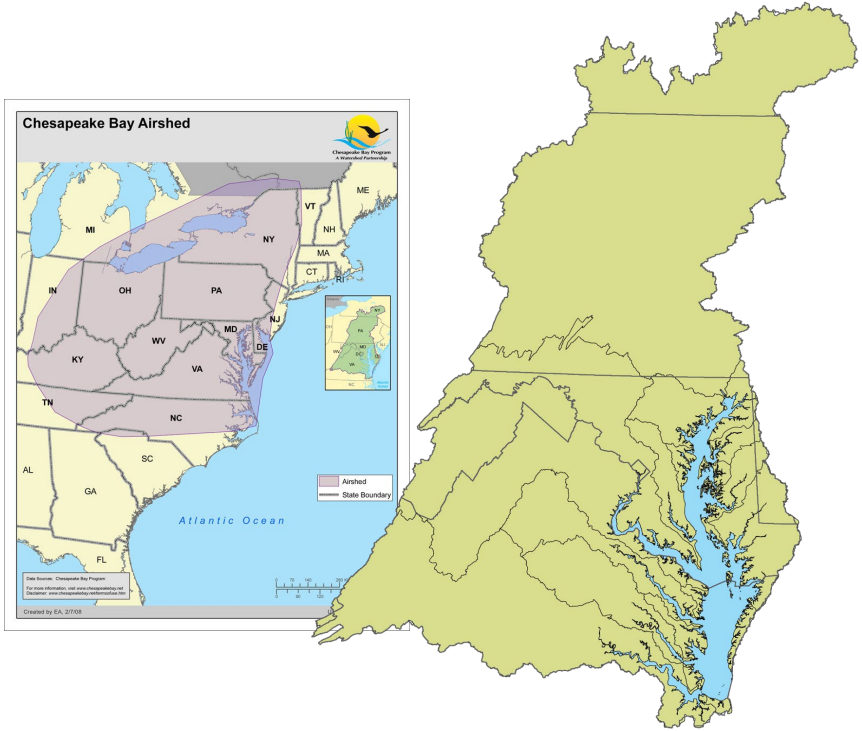
Overview of this presentation

- Brief background on Chesapeake Bay and citizen science
- Research objectives
- Methods and key results
- Recommendations on how this research can be applied in other contexts

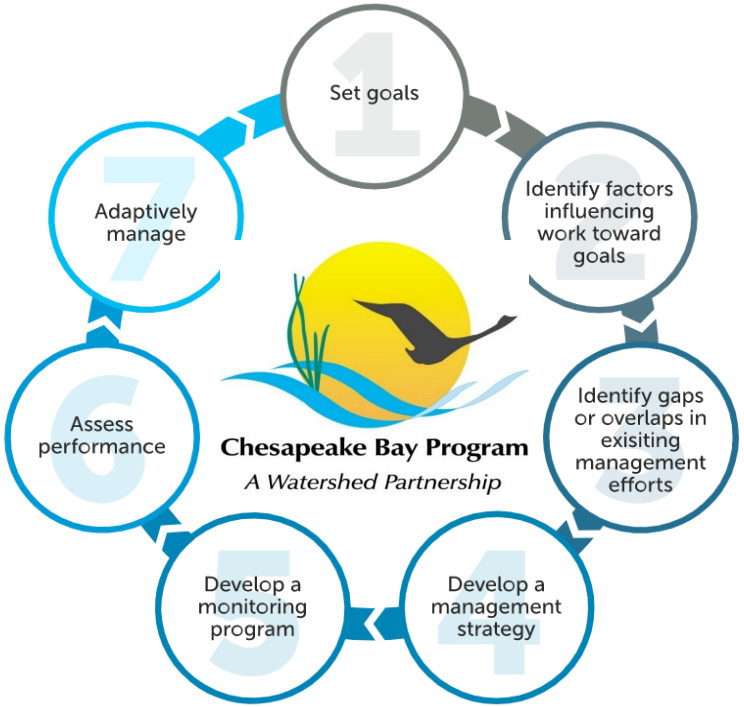
What makes the Chesapeake Bay special?

- Valuable natural resource
- Culturally rich landscape
- Significant human impacts
- Complex management
- Long research history
- Environmental stakeholders



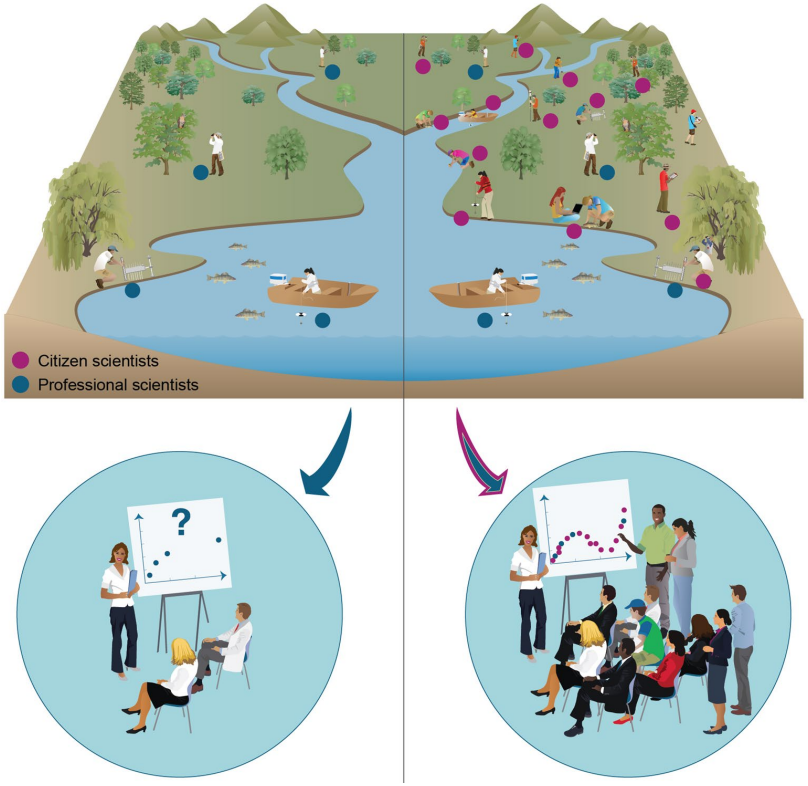
Management of the Chesapeake Bay

- Science and management tightly coupled
- Calls for:
  1) Additional monitoring data
  2) Increased stakeholder engagement



Citizen science

- “Projects in which volunteers partner with scientists to answer real-world questions” (Cornell Lab of Ornithology)



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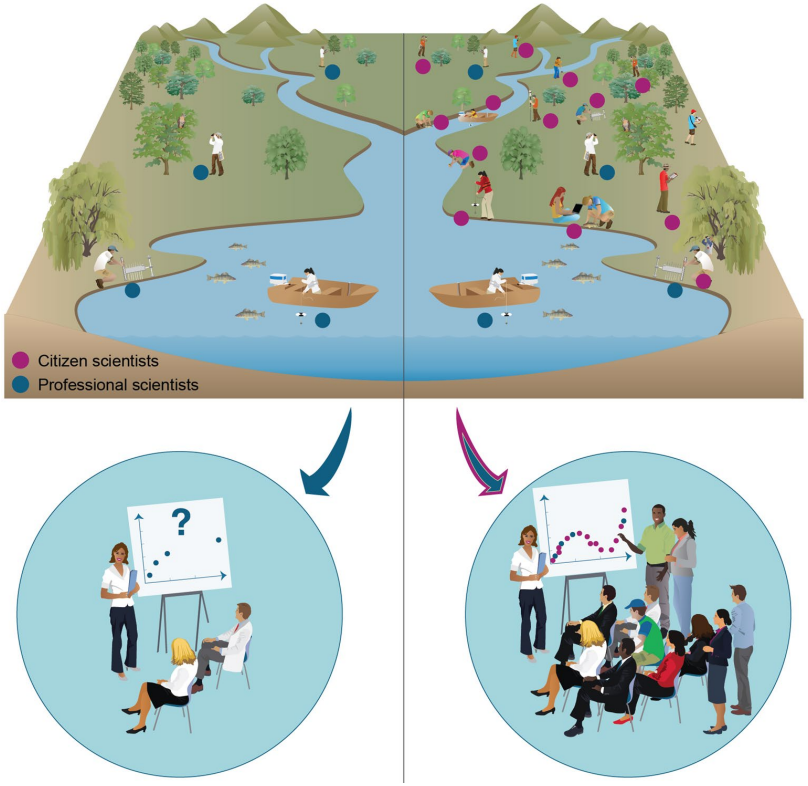
- Potential benefits include
  - New data fills gaps
  - Engages people in research and management



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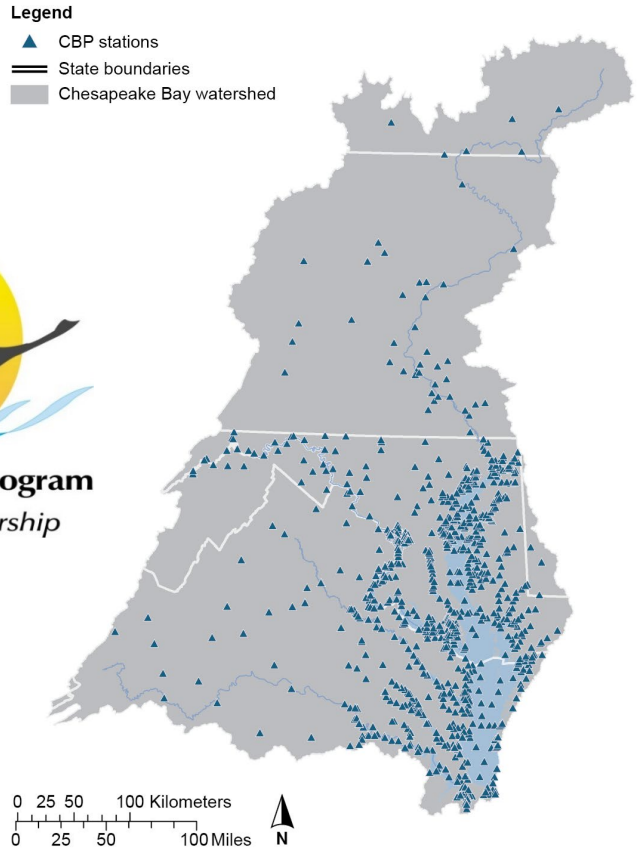
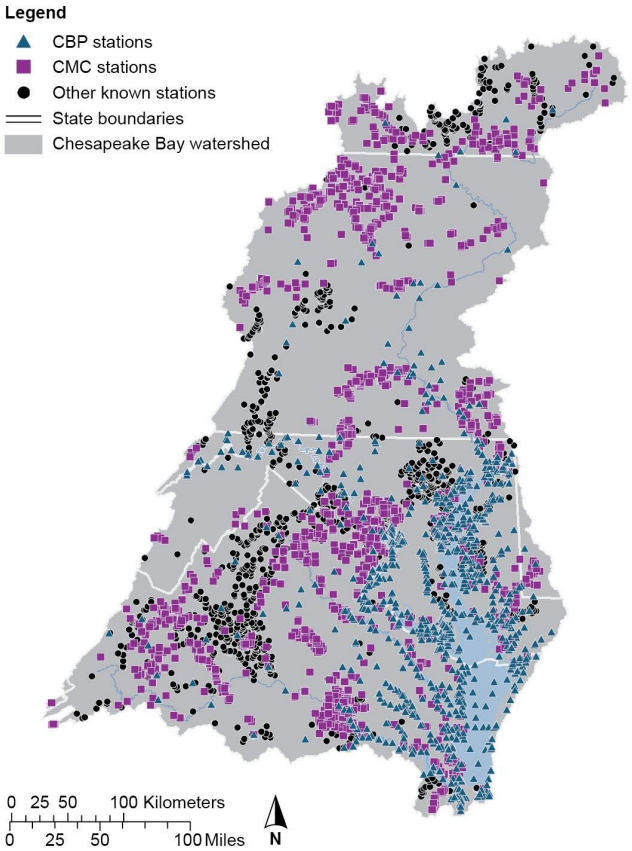
Monitoring in the watershed



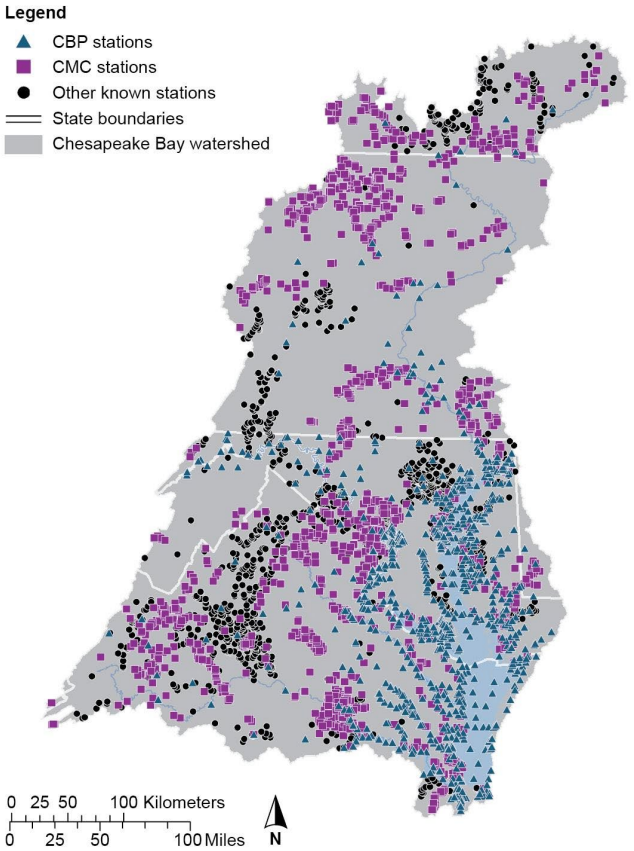
Chesapeake Bay Program
A Watershed Partnership

Monitoring in the watershed



Chesapeake Monitoring Cooperative

Objective: Aggregate high-quality volunteer-collected data so that it can be used for research and management



“What is your goal? How can we help?”

The CMC needs to understand stakeholders’ different monitoring goals in order to

- Recruit members
- Facilitate partnerships
- Meet members’ needs

Survey of CMC stakeholders

- Rate monitoring goals according to priority level (Likert 1-7)
- 75 respondents across 5 stakeholder groups:
  - Volunteers
  - Coordinators
  - Service Providers
  - Scientists
  - Managers

CMC
Chesapeake Monitoring Cooperative

View this email in your browser

We want to hear from you!

Please consider participating in an important survey about the goals and data uses of the Chesapeake Monitoring Cooperative and its members. We want to know how the CMC can best help you reach your monitoring goals! Your responses will inform ongoing research on Chesapeake Bay science and management, as well as future improvements to the CMC. Please complete the survey by Friday, February 14th.

This survey is part of a PhD dissertation study at the University of Maryland Center for Environmental Science. The survey will take approximately 15 to 20 minutes to complete. Your responses will be completely anonymous.

Follow the link here to participate!

Stakeholders have shared cultural understanding of environmental monitoring goals

- There was cultural consensus among all CMC stakeholders as one group
- Evidence of shared appreciate for a wide variety of monitoring goals

Grouping	Number of respondents	Eigenvalue ratio	Consensus? (EV ratio > 3.0)
All stakeholders	75	3.25	yes
Stakeholder groups			
Coordinators	15	5.22	yes
Volunteers	27	3.11	yes
Service providers	8	4.29	yes
Scientists	9	1.93	no
Managers	9	2.61	no
Other	7	NA	NA

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- There was cultural consensus among all CMC stakeholders as one group
- Evidence of shared appreciate for a wide variety of monitoring goals
- **Cultural consensus provides a foundation for collaboration**

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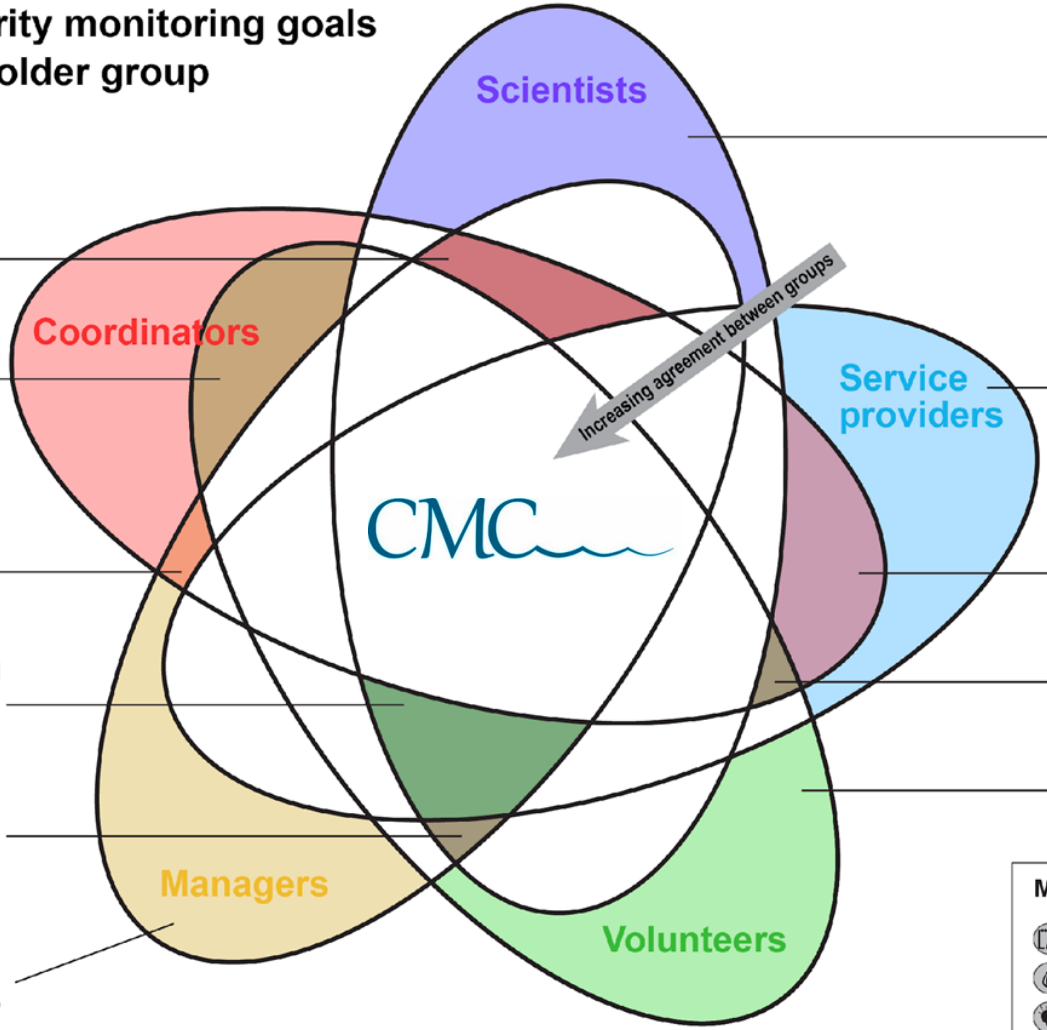
Other	7	NA	NA

The five highest-priority monitoring goals…

Monitoring goal	Overall rank	Average rating (N=75)
Collect data that are useful for watershed managers and decision-makers	1	6.51 (0.96)
Contribute credible data to environmental assessments and reports	2	6.43 (1.02)
Learn more about the health of a local waterway	3	6.37 (1.05)
Improve water quality or waterway habitats	4	6.31 (1.08)
Collect long-term data on waterways	5	6.20 (1.01)

CMC stakeholder groups have shared and unique priorities

The five highest-priority monitoring goals for each CMC stakeholder group



Collect data as part of an agreement with county, state, or federal agencies

Show where water quality is poor

Inspire people to become stewards of their local waterways

Protect the resources that local waterways provide for communities

Raise public awareness of environmental issues

Learn more about the health of local waterways

Provide a baseline status of our stream health

Make environmental conditions better for future generations

Improve water quality or waterway habitats

Collect long-term data on waterways

Collect data that is useful for watershed managers and decision-makers

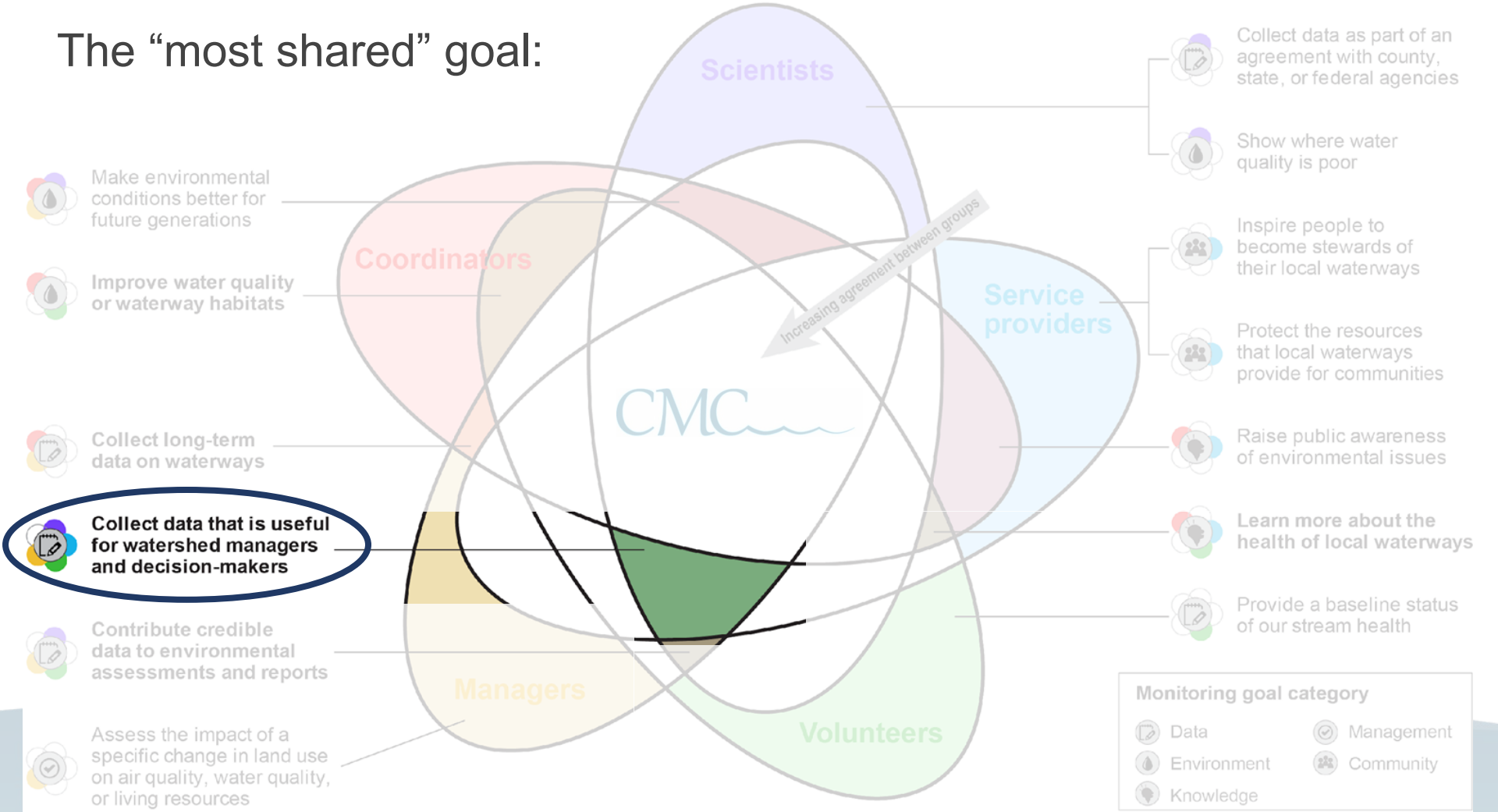
Contribute credible data to environmental assessments and reports

Assess the impact of a specific change in land use on air quality, water quality, or living resources

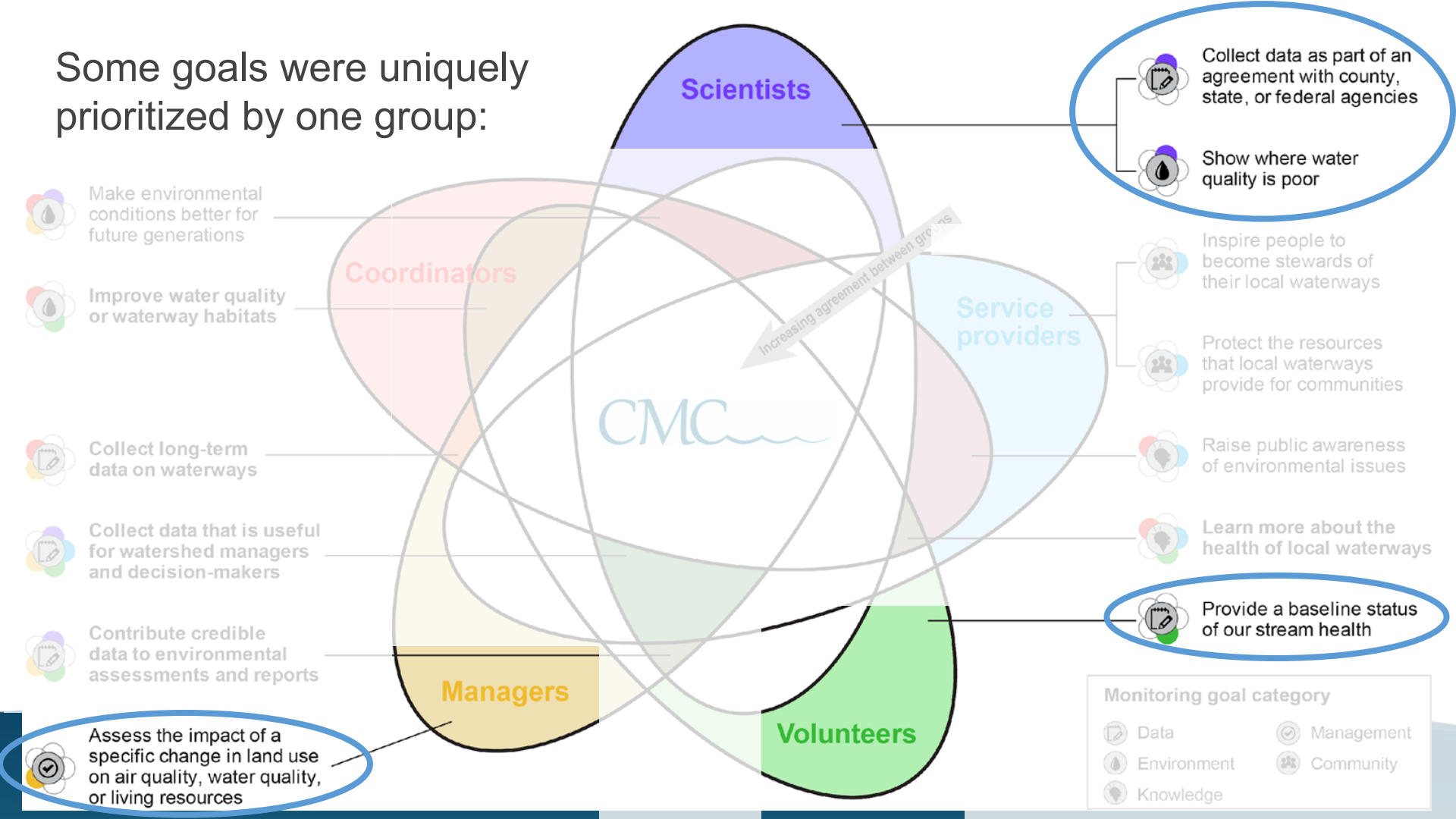
Monitoring goal category

- Data
- Management
- Environment
- Community
- Knowledge

The “most shared” goal:



Some goals were uniquely prioritized by one group:



All stakeholder groups prioritized environment-related goals

Highest priority

Second-highest priority

	Data	Environment	Knowledge	Community	Management
Scientists	5.92 (0.76)	5.41 (0.97)	4.80 (1.30)	4.16 (1.22)	4.90 (0.83)
Managers	5.33 (0.70)	5.24 (0.91)	4.78 (1.09)	4.73 (1.18)	4.98 (0.97)
Volunteers	5.66 (0.77)	5.63 (1.01)	5.33 (1.06)	5.18 (1.25)	5.07 (1.41)
Coordinators	5.88 (0.94)	5.92 (0.94)	5.93 (0.76)	5.76 (0.81)	4.99 (1.34)
Service providers	5.73 (0.89)	5.83 (0.71)	5.63 (0.79)	6.28 (0.39)	5.06 (1.37)

*based on average ratings

Stakeholders' goals can inform organizational priorities and strategic outreach

Understanding **shared** and unique stakeholder priorities can help the CMC focus on services that incentivize participation

Monitoring goal	Overall rank
Collect data that are useful for watershed managers and decision-makers	1
Contribute credible data to environmental assessments and reports	2
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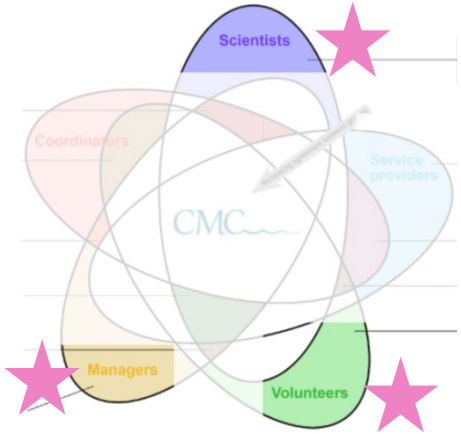
Prioritize services that

1. Increase data usability
2. Improve environmental condition

Stakeholder goals can inform organizational priorities and strategic outreach

Understanding shared and **unique** stakeholder priorities can help the CMC focus on services that incentivize participation

Empower stakeholders to achieve high-priority goals that are unique to their group



This approach can improve other citizen science efforts

- Take the time to understand stakeholders' goals

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- Take the time to understand stakeholders' goals
- Use knowledge of goals to enhance collaboration

This approach can improve other citizen science efforts

- Take the time to understand stakeholders' goals
- Use knowledge of goals to enhance collaboration
- Priorities can shift over time, so keep listening

Concluding thoughts

- More engagement means more people contributing towards shared goals
- Citizen science is an underutilized tool with proven potential
- Collaborations will shape future research and decisions

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  - Liz Chudoba
  - Dr. Christy Miller Hesed
  - Dr. Michael Paolisso
  - Dr. Bill Dennison

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