Systems Thinking Approach to Water Management and Stewardship

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MILWAUKEE WATER COMMONS

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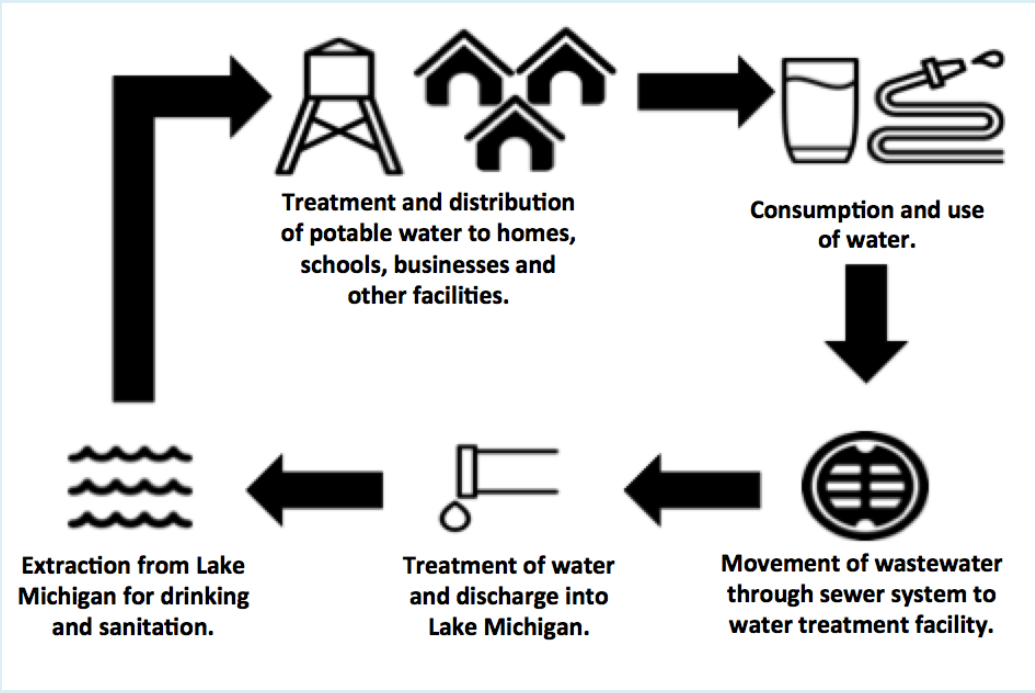
Outline

- **Why systems thinking?**
- **What is a social-ecological system (SES)?**
  - Domains
  - Thresholds
  - Feedbacks
- **How can it be applied to foster resilience and adaptation?**
  - Two step process
  - Examples in practice

Why systems thinking?

- Cannot manage water in simple stocks and flows
- Domains are linked
- Thresholds are intertwined and can produce a cascading effects

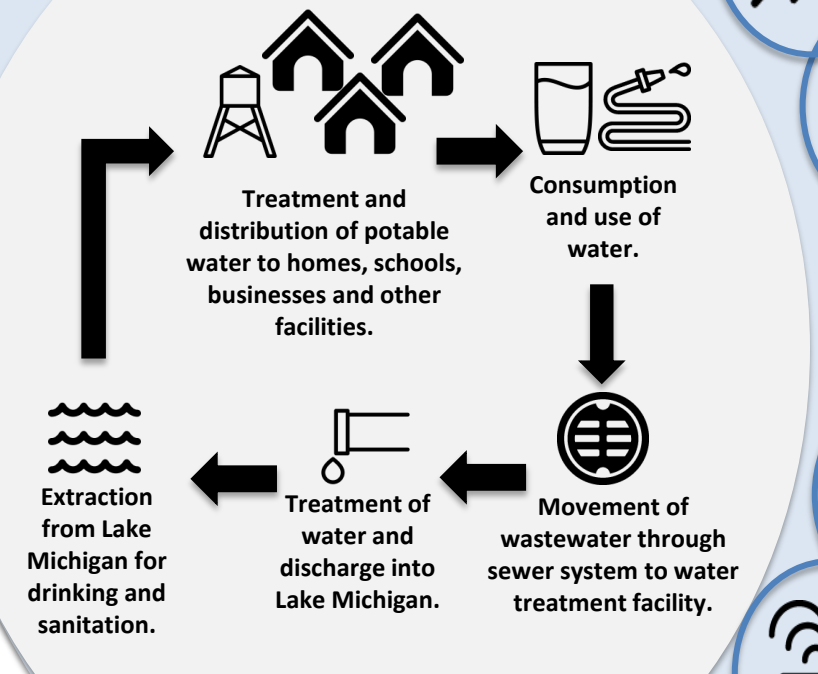


Schematic of traditional water management system in a city.

What is a SES?

- A system is an interconnected set of elements that is coherently organized in a way that achieves something (Meadows, 2008)
- A social-ecological system describes a complex environment that contains multiple domains, thresholds and feedbacks (Walker and Salt, 2012)
  - Domain: Sphere of knowledge or activity
  - Threshold: Limitation in the system
  - Feedback: Relationship between elements

There is more to water than management.



Water needs to be understood in terms of both social and ecological elements.

- Conservation
- Equity
- Stewardship
- Public Health
- Community Resilience
- Celebration

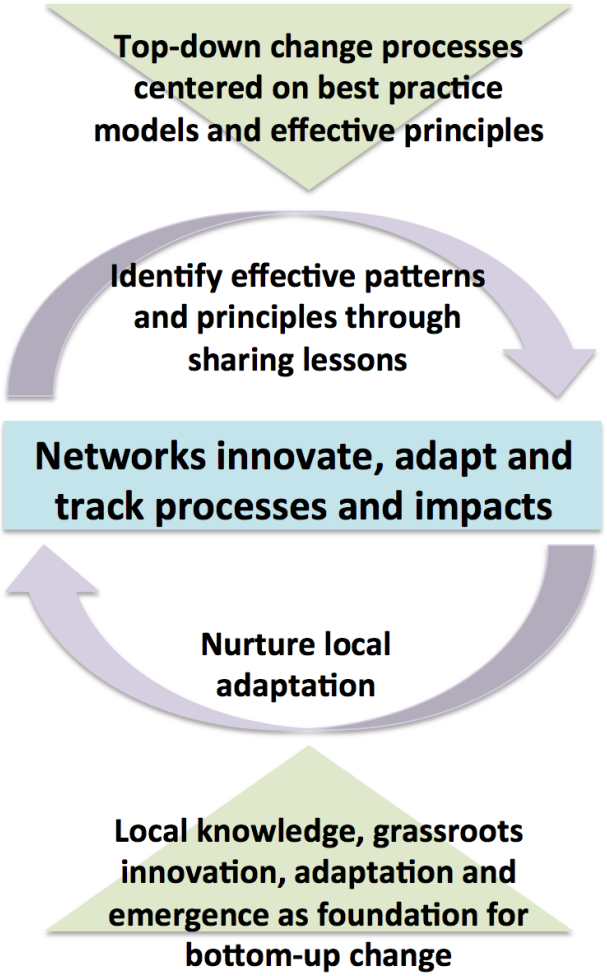
How can systems thinking foster resilience or adaptation?

Two step process:

1. **Gather Knowledge:** Understand feedbacks and thresholds
2. **Design Interventions:** Use understanding to strategically intervene in the system

Step One: Gather Knowledge

- Build networks – Know who, what, and where!
- Share expertise and experience
- Collaborate beyond the "usual suspects"



Adapted from Michael Quinn Patton, 2011.

Step Two: Design Intervention

- Identify key feedbacks and cascading thresholds
- Design interventions that foster the intended response in the system

Step One: Knowledge Generation

Water City 3.0

Milwaukee Water Commons

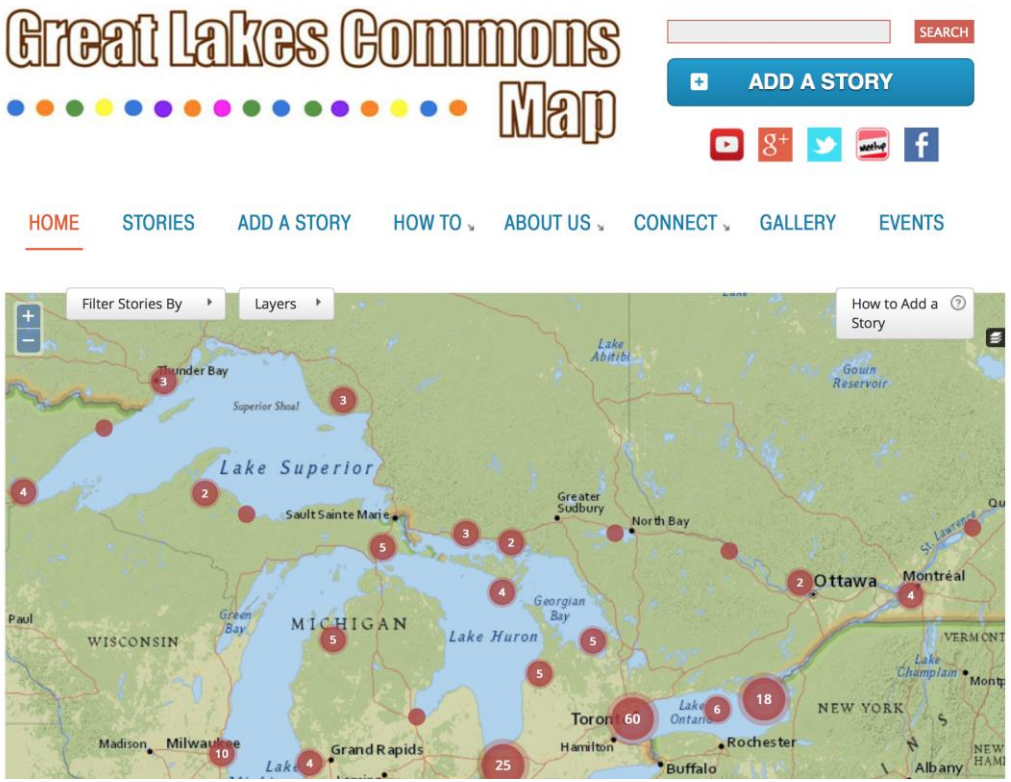
- City scale
- Multi-sector collaboration
- Two-year initiatives and ten-year vision

Step One: Knowledge Generation

Water Story Map

Great Lakes Commons

- Regional scale
- Transdisciplinary knowledge generation
- Real-time updates



Step Two: Design Interventions

Water School

Milwaukee Water Commons

- Engagement with adults and children
- Often first time seeing Lake Michigan

Step Two: Design Interventions In Progress…

- Every child learns to swim – Modeled after New York
- Great Lakes Water Walk
- Youth Water Innovation Center
- Water Festival – Expansion of “We Are Water”

Conclusions

- Consider all ways of knowing water – Not just scientific knowledge
- Create spaces for collaboration – locally and regionally