Crossing a threshold into solutions-oriented research

Strategies for linking interdisciplinary science with policy action for lake *resilience*

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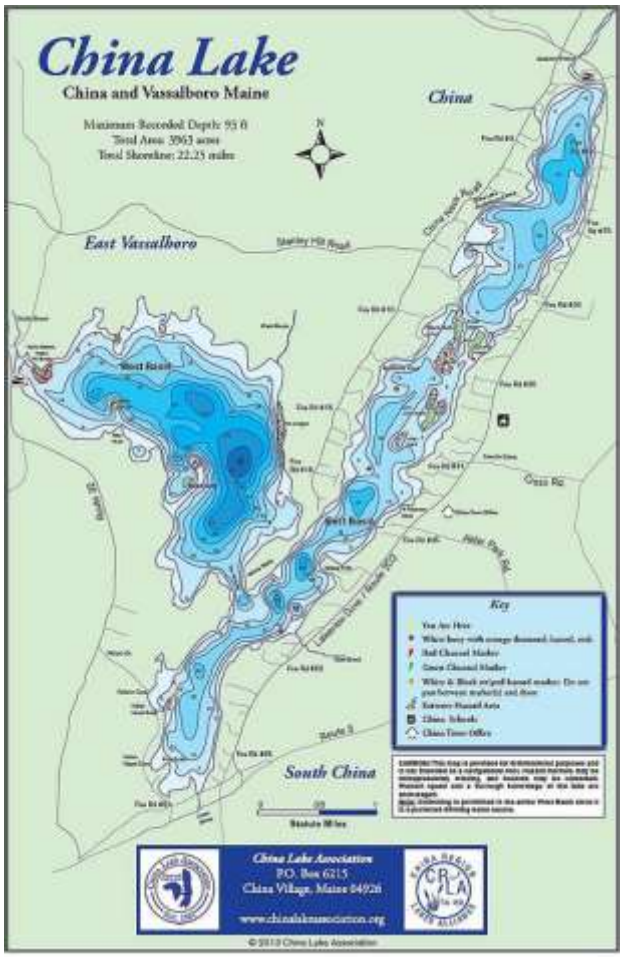
China Lake Case



- Tipping point or threshold example
- Cycles of algae bloom and phosphorus release
- Property value declines
- Solutions?

China Lake Assn. (http://chinalakeassociation.org)
Colby Environmental Assessment Team (2005)

FEASIBILITY STUDY AND ALTERNATIVES ANALYSIS FOR INTERNAL PHOSPHORUS REDUCTION IN CHINA LAKE

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What does it take to link these recommendations with action?

Social science and the human dimension

Objectives

(1) Introduce sustainability science & linking science with decision making for resilience

(2) Draw from examples to illustrate value of social science for:

-Constructing science

-Identifying needs for information

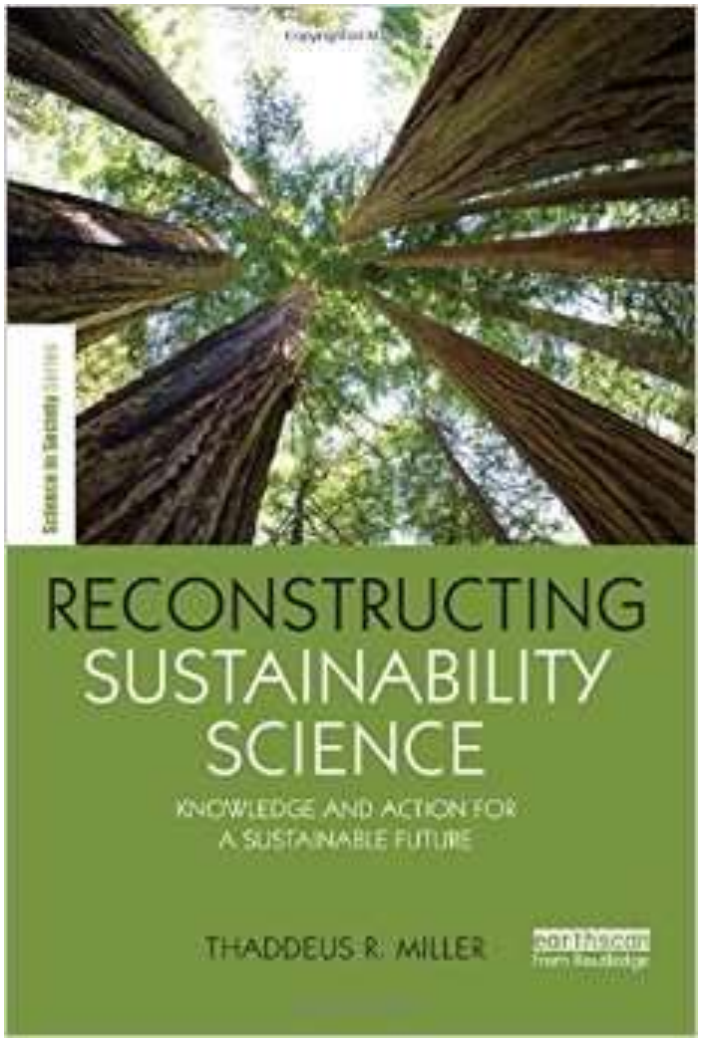
-Building relationships

-Listening and respecting diverse views

-Creating a learning organization

(3) Pose questions and methods for emerging research agenda for the Maine Lakes Collaborative

Sustainability science



- Pragmatic approach (Miller, 2015)
- Problem-solution focus
- Interdisciplinary and transdisciplinary
  - Inter: Multiple types of knowledge
  - Trans: Societal transformation
- Iterative

Hart et al. (2015); Kates et al. (2001); Miller (2015)

Resilience approach

- Origins in lake science (Holling, 1973)
- Flexible, interdisciplinary framework
- Threshold *vs.* Resilience
- Adaptive capacities: learning, leadership, policy
- Applied orientation

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Learning from Examples

Mercury and fish consumption

Solid waste management

Vernal pool policy development

Shellfish management and decision support systems

Silka, McGreavy, & Hart (under review); Sprain & Timpson (2012)

Mercury and fish in Lowell, MA

- Immigrants to New England
- Contaminated waters
- Fishing traditions
- Cultural values about rivers, fish, and food
- How understand the risks and ways to reduce these risks for diverse people?
- Innovative approaches to collaboration

Solid waste management

- Waste stream: more complex and toxic
- Siting challenges: water contamination
- How draw on diverse perspectives to solve what appear to be intractable problems?
- What would an “effective solution” mean for solid waste management?

Vernal pool policy

- How conserve vernal pools and adopt landscape scale approach to vernal pool policy?
- Portfolio of social science >10 years
- Studies of municipal official attitudes, landowner perceptions, networks among institutions, citizen science programs and leadership

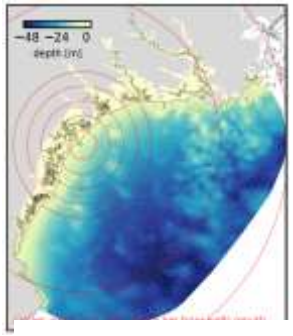
- Citizen science
- Leadership
- Policy transformation

Shellfish management

- Water quality and public health
- How create a tailored decision support system to protect public health and shellfishing livelihoods?
- Social science: interdisciplinary collaboration, epistemic authority, stakeholder needs

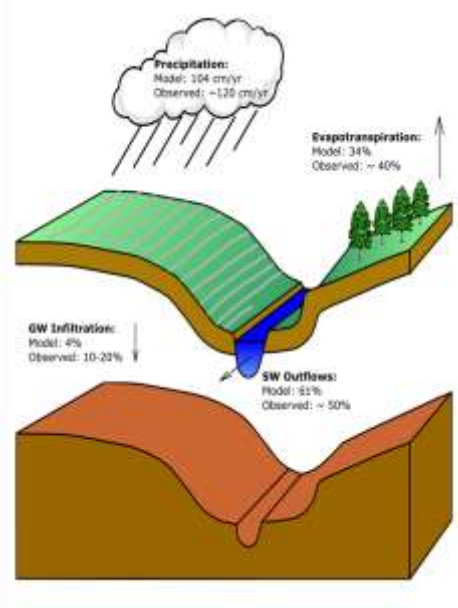
Decision Support System

Communication and shellfish management recommendations (McGreavy, et al. 2016)



Tidal modeling in Wells, Machias,
& Medomak (Brady & Cole)

Rainfall water quality station pattern analysis (McGill & Parmentier)



Coastal Maine Watershed Cluster Analysis
(Smith, Roy, et al.)

Economic impact of short term water quality closures
(Evans et al., 2016)

Social Science and Learning

- More than messages
- Integral to research design
- Information systems and adaptive design
- Learn from failure
- Clarify and work through differences
- Tailored partnership strategies
- Data-driven recommendations and analyses

Maine Lakes Collaborative Social science research agenda

- Pressing policy & management Q's?
  - Lake vulnerability index
- Who involve and why?
- How partners want/need to be involved? Tailored design
- What are changes in social constructs over time?
  - Ethnographic approach, surveys & interviews
  - Social network analysis
  - Discourse analysis

What are the factors that enable and constrain our ability to link science with decision making?

- Needs: Salience and utility
- Trust: how build and maintain?
  - Presence
- Identities: group and lake-related
- Motivations
- Power

Conclusion

- Tipping points useful metaphor
  - Limits for human dimension
- Examples close at hand for connecting social science with sustainability policy
- Social science integral to research design
  - Not add on and not outreach
- Fundamental, integrated questions for SES lake resilience

Maine Lakes Collaborative listserve
UMaine EC CooP
Calling all citizen scientists and students!