



Promoting Sustainable Pollutant Control Policies through Consideration of Social and Biological Indicators: An Application to Mercury Control in New England



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Key Contributions to Sustainability:

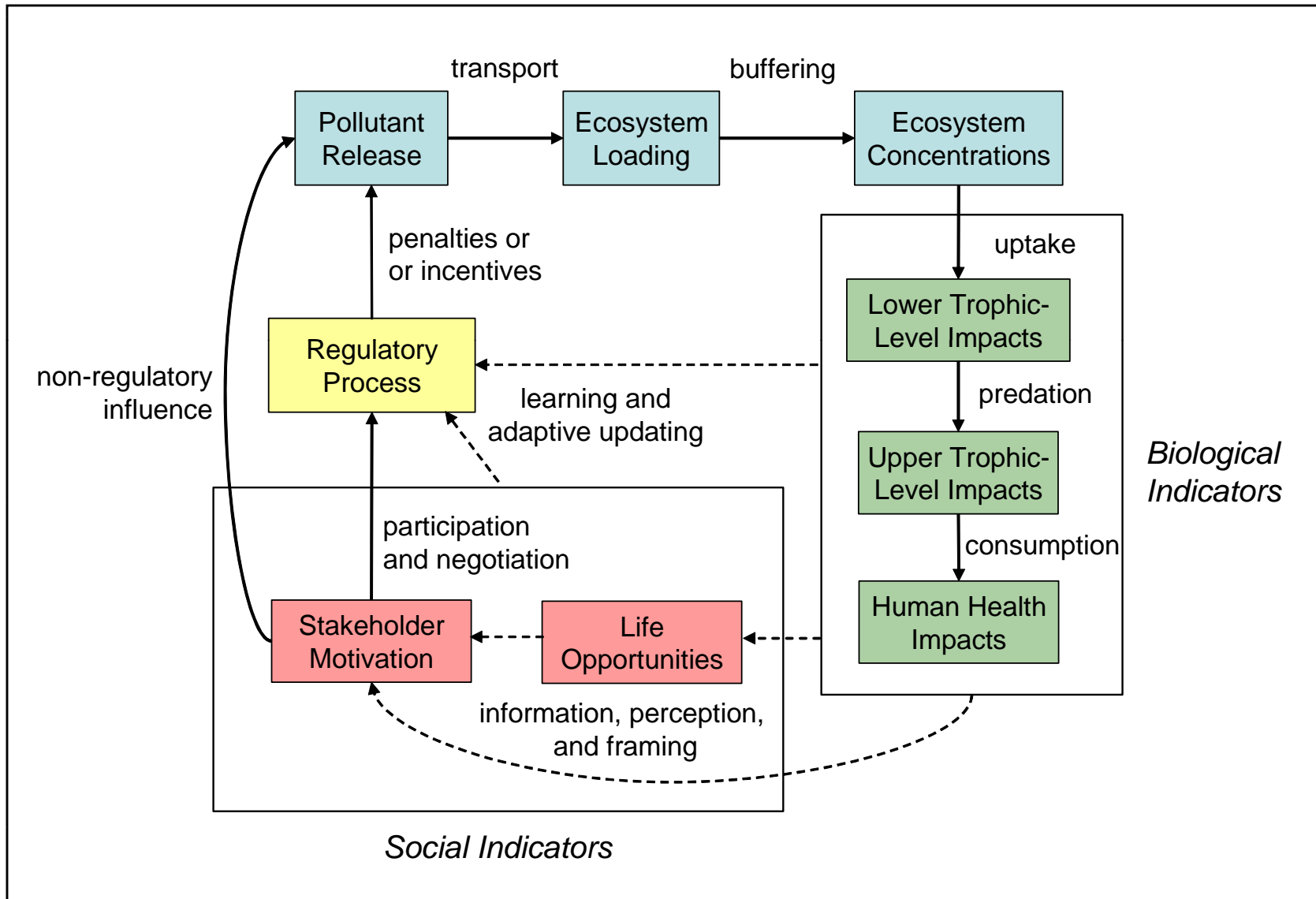
- Conceptually-supported indicators that represent both *process* and *outcome* for both *social* and *biological objectives* for a sustainable mercury policy in New England.
- Experimental tests of the hypothesis that an appropriate choice of indicators will fundamentally change the dynamics of stakeholder participation and regulatory enforcement and assessment in ways that promote sustainability.
- The development and demonstration of an integrative model to simulate mercury control policy options in New England to predict how they fare with regard to the regional sustainability indicators developed.

Mercury Hotspots in the Northeast



Source: Mercury Connections. 2005. BioDiversity Research Institute. Gorham, ME.

System Schematic



Project Partners

Investigators:

Mark Borsuk, Engineering, Dartmouth – Integrated Modeling

Richard Howarth, Environmental Economist, Dartmouth - Sustainability Indicators and Economics

Andrew King, Business Policy and Strategy, Harvard/Dartmouth – Experimental Games

Darren Ranco, Native American Studies, Dartmouth – Stakeholder Interviews

Rama Mohana Turaga, Research Associate, Dartmouth – Modeling and Stakeholder Analysis

Collaborators:

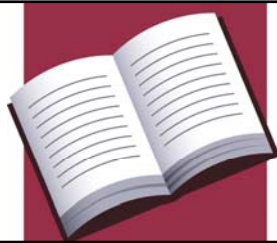
MERGANSER Team: Alison C. Simcox, EPA Region 1

John M. Johnston, EPA ORD, Athens

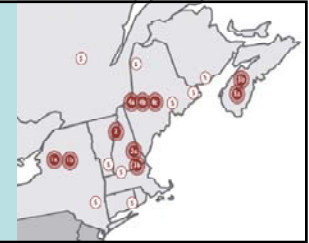
- US EPA: Alan VanArsdale, Dwight Atkinson, Tom Braverman, Ruth Chemery, Glynis Lough, Diane Nacci, Randy Waite, Jeri Weiss
- USGS: Keith Robinson, Richard Moore, Richard Smith
- Biodiversity Research Institute (BRI): David Evers
- Ecosystems Research Group, Ltd.: Eric Miller
- VT Agency of Natural Resources (VT ANR): Neil Kamman
- Clean Air Association of the Northeast States (NESCAUM): John Graham
- NE Interstate Water Pollution Control Commission (NEIWPC): Susannah King

New England Environmental Justice Groups:

- Penobscot Indian Nation of Maine
- Alternatives for Community and Environment (ACE) of Boston



Work on Four Main Tasks



- **Sustainability Concepts:** Literature review on prevailing definitions
 - Inter- and intra-generational equality of opportunity
- **Sustainability Indicators:** Literature review with the aim of identifying existing frameworks and gaps that can be addressed by our project
 - Top-down vs. bottom-up approaches
 - Importance of scale and salience
- **Mercury:** Review of exposure pathways, human health and ecological impacts, and regulatory framework
 - Current regulations focus on human health endpoints only; no provision for protection of ecosystem health, wildlife, or life opportunities
 - Our review of public comments on the Clean Air Mercury Rule (CAMR) has revealed a surprising level of participation from Native American tribes.
- **Models and Data:** SERAFM, MERGANSER, NERC, GIS data



Interesting Recent Developments



- A new category (5m) for waters listed as impaired by atmospheric mercury under Clean Water Act Section 303(d) was introduced in March 2007, acknowledging the transboundary challenges involved in mercury control.
- New England has taken the lead in addressing mercury pollution through a coordinated regional TMDL, recently approved by EPA.
- In February 2008, a federal appeals court rejected CAMR on the basis of the regulatory approach followed by EPA.



Goals for This Meeting

- Discuss with other participants concepts of sustainability and criteria for selecting appropriate indicators at the regional scale
- Learn more about previous stakeholder elicitation or analysis efforts related to mercury or other contaminants
- Connect with human health scientists to identify predictable indicators of human health impacts of mercury
- Understand what policy options the EPA is considering in response to the court ruling against CAMR
- Share experiences with other grantees regarding the challenges of interdisciplinary research projects