

# Science Advisory Board

## March 22, 2012

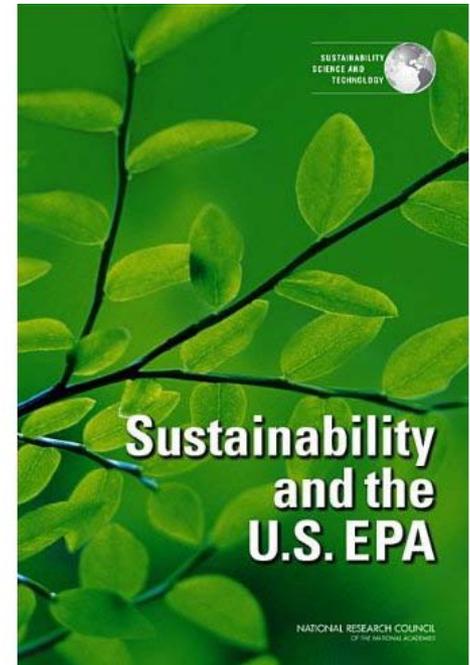
### Update on EPA Response to NRC Report and ORD Sustainability Science

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# Overview

- Why EPA requested the study:
  - “The Next Level of Environmental Research”
- The NRC charge and recommendations
- EPA response to the recommendations
- Actions across the federal government
- One ORD case study: Narragansett Bay Project
- Development of metrics and indicators



# EPA Rationale

## Meeting Future Challenges

“As we celebrate 40 years of incredible accomplishments, we find ourselves at a critical juncture. We have a **new awareness of environmental complexity** and, at the same time, we have new tools, insights, and experiences to guide our mission. **It is time to rise to the challenges of today**, using the best of what we have, to meet the needs of the current generation while preserving the ability of future generations to meet theirs as well.”

EPA Administrator Lisa Jackson  
November 30, 2010 speech to the  
National Academy of Sciences



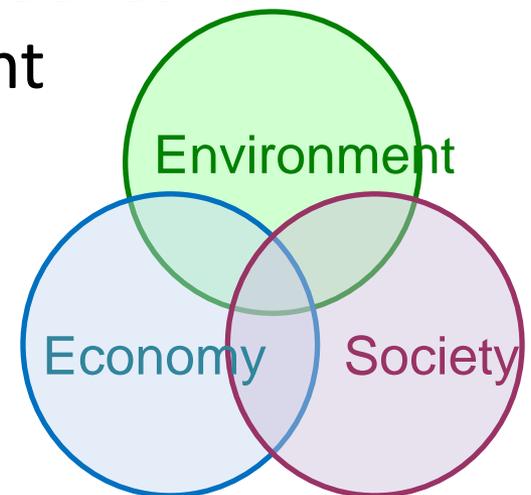
# Dr. Gro Brundtland Visit to EPA

## Release of UN Report: *Resilient People, Resilient Planet: A Future Worth Choosing*



# NRC Recommendations

- Sustainability (defined in NEPA and EO 13514) is both a goal and process
- Adopt the Sustainability Assessment and Management Framework, which enhances the Agency's mission
- Develop tools, methods and approaches for advancing sustainable development



# Sustainability Analytics

- ORD prepared first draft of inventory of existing tools and approaches
- STPC review (December-January)
- Second draft by April 2012
- Goal: provide guidance on how tools and approaches can be integrated to enable sustainability assessment



# EPA Response to NRC

- Initiate several months of EPA-wide listening sessions with stakeholders (November to April 2012)



- Prepare an implementation plan and recommendations for the Administrator (Summer 2012)
- Continue ongoing efforts to incorporate sustainability into EPA's work; coordinate across Agencies (NAS/Linkages, CENRS)
- Continue development of sustainability assessment and management tools (April 2012)
- Seek Guidance from NACEPT

# EPA Roles Identified in Listening Sessions

- Mandate
- Evaluate
- Educate
- Innovate
- Collaborate
- Facilitate



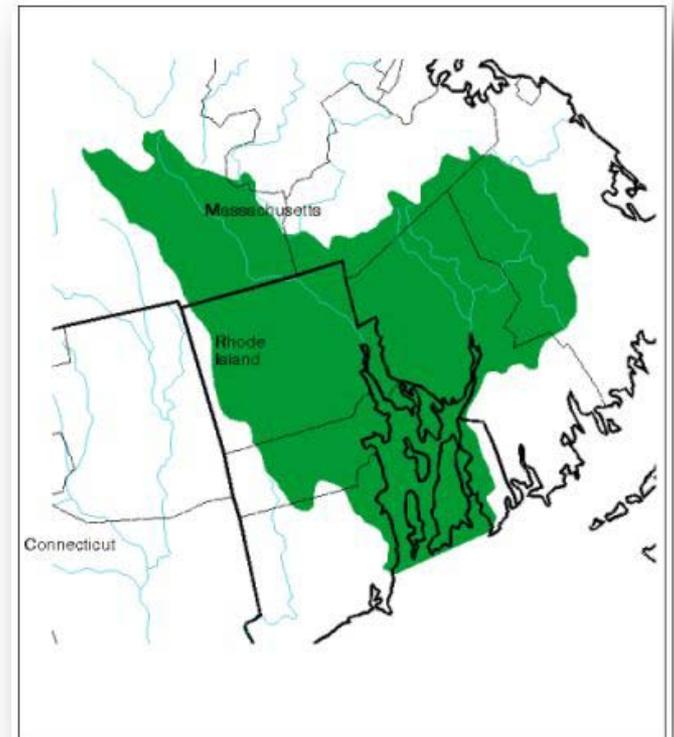
# What is Sustainability Science?

- Applying integrated systems thinking
- Anticipating and responding to stressors
- Adopting a transdisciplinary approach to problem-solving
- Promoting scientific innovation (e.g., green chemistry)
- Seeking realistic solutions
- Advancing the resilience of society (i.e., adaptive capacity)

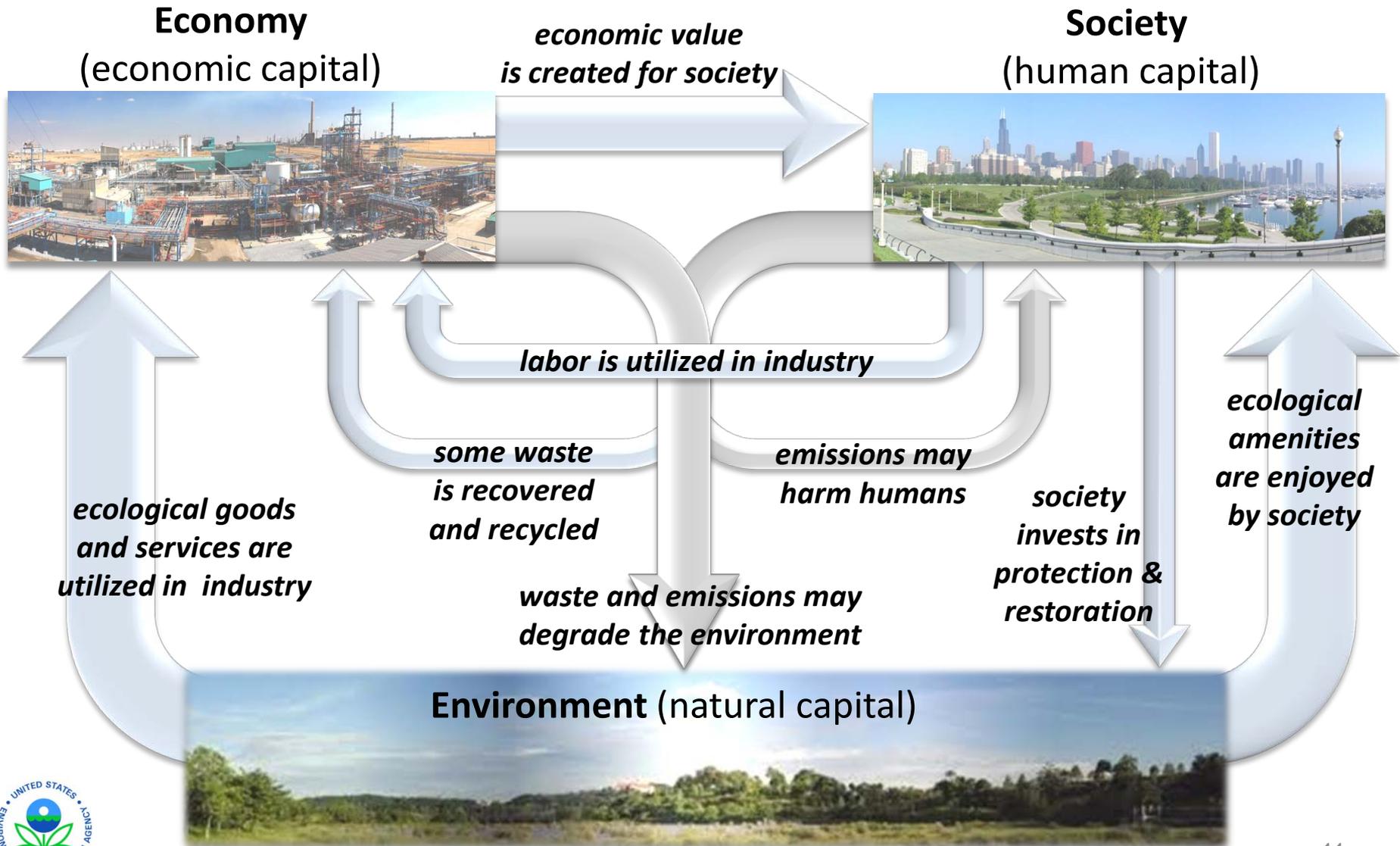


# Narragansett Pilot Project

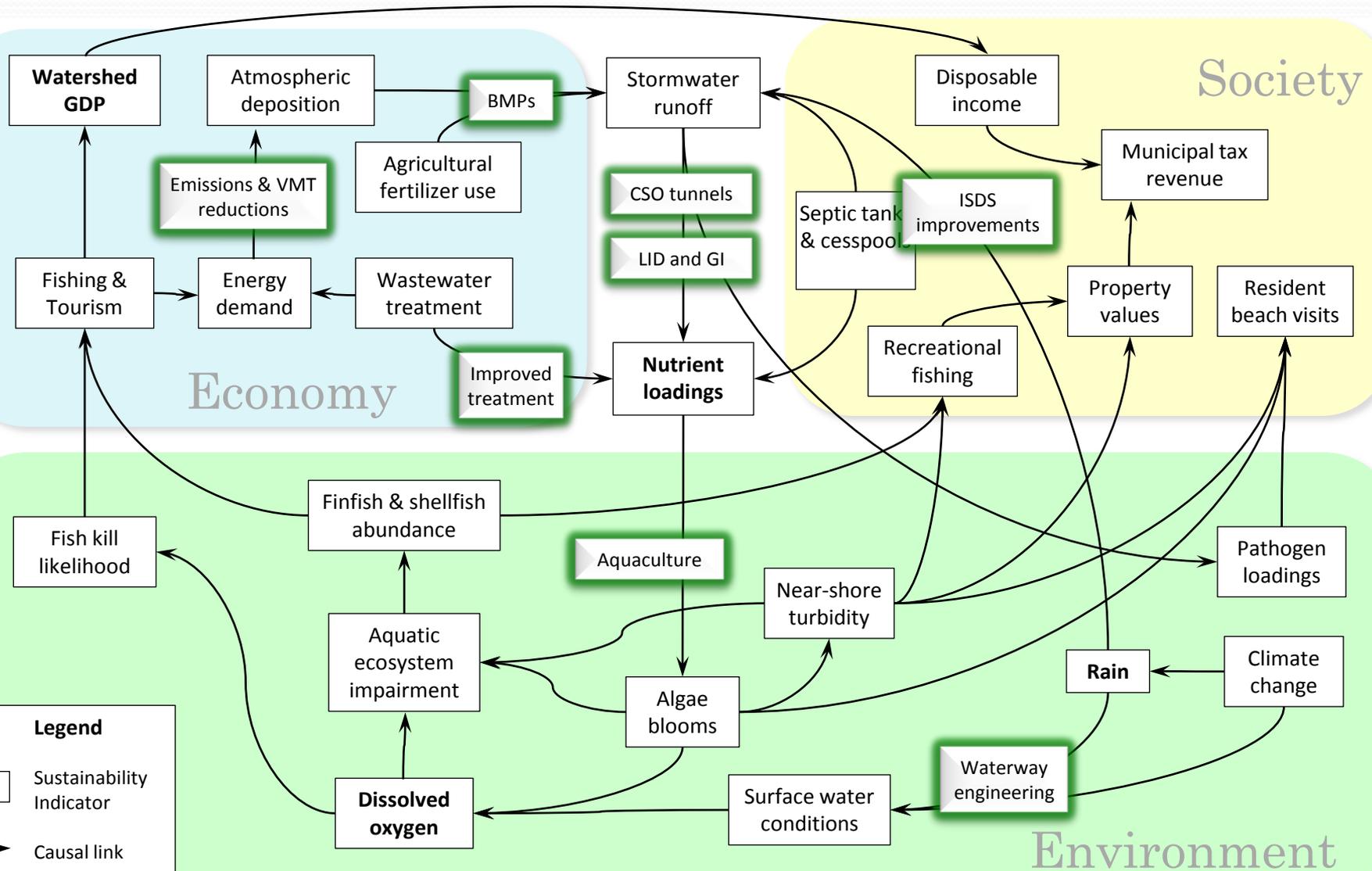
- Apply “systems thinking” to the problem of nitrogen and phosphorus pollution in New England waters
- Collaborate with stakeholders to address sustainability goals
- Explore integrated strategies for nutrient mitigation
  - Regulatory influence
  - Voluntary innovation
- Provide a replicable approach for other EPA Regions
- Coordinate with other projects in Narragansett Bay watershed



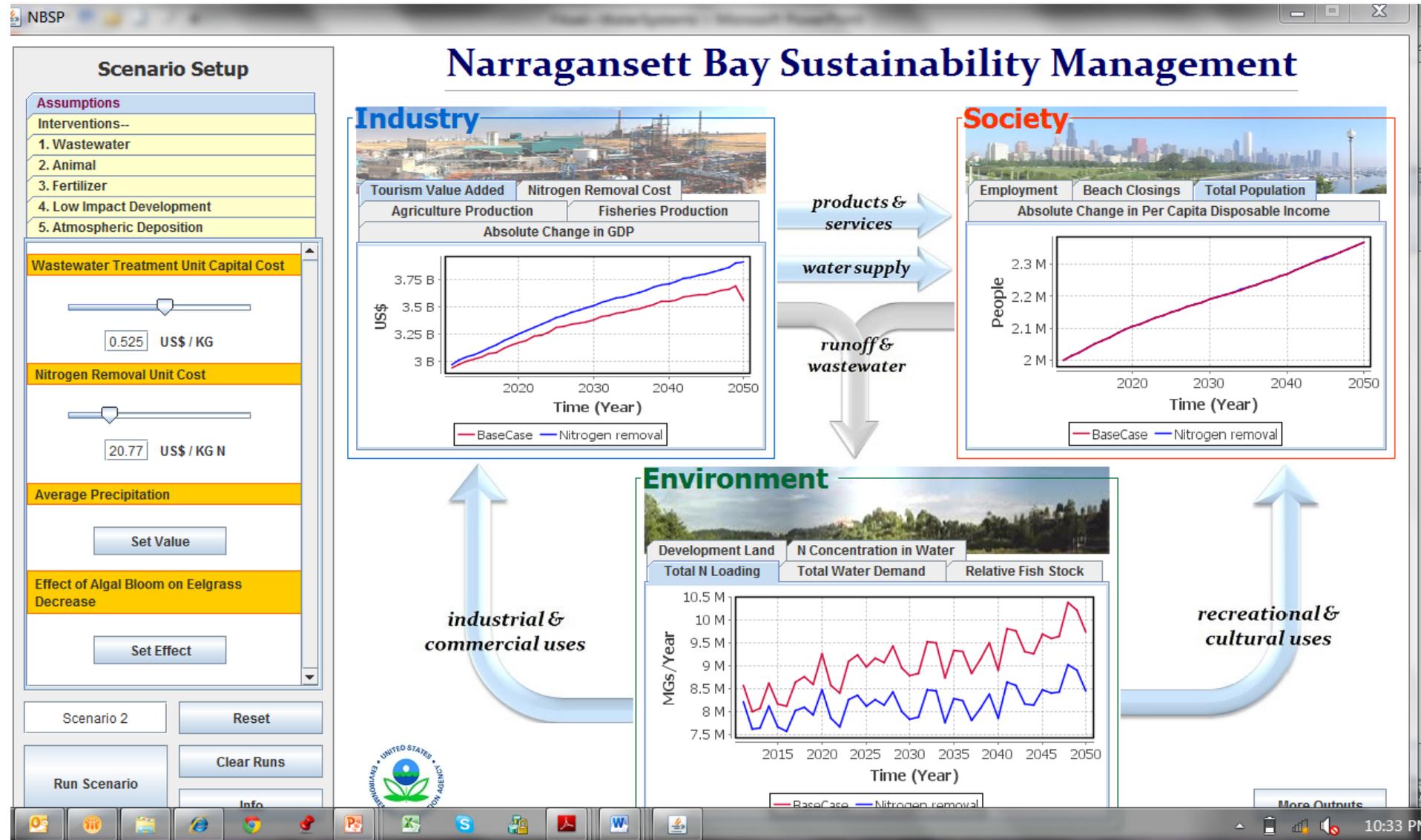
# Triple Value (3V) Model



# Causal Relationships for Nutrient Model



# Graphical Interface



# Metrics and Indicators

- Green Book recommends that EPA adopt and track sustainability indicators
- Consistently emphasized in the listening sessions
- Initial pilot: “flow intensity” indicators added to the 2012 Report on the Environment
  - U.S. freshwater withdrawals—billion gallons/day (total, per capita, per \$GDP)
  - U.S. RCRA hazardous waste generation—million tons/yr (total, per capita, per \$GDP)
  - U.S. municipal solid waste generation—million tons/yr (total, per capita, per \$GDP)
  - U.S. energy consumption—billion BTU/yr (total, per capita, per \$GDP)



# Summary

- Led by OP, ORD is working with a cross-Agency team to respond to the Green Book
- Sustainability science and systems thinking provide fundamental principles for an integrated approach
- Each of the six ORD research programs provides a different “lens” on economic, social, and environmental systems
- Pilot projects are under way to implement the systems approach and indicators

