# EPA Ecosystem Services Policy and Research Needs

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# Overview of Presentation

- Part 1 – EPA's Office of Water research priorities
- Part 2 – Why "Ecosystem Services" research matters…a lot
- Part 3 – Consuming R&D to inform policy-making
- Part 4 – Final thoughts

# Part 1 – EPA's Office of Water Research Priorities

# Broad Research Priorities

- Pollutants
  - Nitrogen, phosphorous, sediment, pathogens, emerging chemicals of concern (e.g., nanochemicals and particles, pharmaceuticals)
- Tools and technologies
  - To support drinking water and wastewater infrastructure
  - To conduct economic analysis to inform policy-making decisions
    - Benefit-Cost Analysis, Cost-Effectiveness Analyses, Distributional Impacts Analysis
- Climate change
  - Projected impacts, mitigation and adaptation strategies
- Policy and management strategies
  - Approaches to watershed protection and restoration that are dynamic, integrated, systems-based, efficient, effective, …

# Research Priorities Specific to Climate Change:
## *National Water Program Strategy: Response to Climate Change*

- 2008 Strategy
  - Described implications of climate change for water resources and EPA's water programs
  - Identified initial water program "key actions" to reduce GHGs and build resilience
- 2012 Strategy – *new!*
  - Designed around core parts of the National Water Program:
    - Water Infrastructure
    - Watersheds and Wetlands
    - Coastal and Ocean Waters
    - Protecting Water Quality
      - Surface Water, Drinking Water, and Ground Water
    - Working with Tribes
  - Each section includes long-term *Vision* & *Goals,* as well as mid-term (3-8 years) *Strategic Actions*
  - Expect release for public comment and Federal Register notice in Fall 2011
    - *www.EPA.gov/Water/SciTech/ClimateChange*

# Guiding Principles of 2012 Strategy

- Integrated Water Resources Management (IWRM)
- Adaptive Management
- Collaborative Learning and Capacity Development
- Long Term Planning (i.e., multi-decadal time horizon)
- Systems & Portfolio Approach
- Water/Energy Nexus
- Cost of Inaction
- Environmental Justice
- Performance Evaluation
- Mainstreaming Climate Change into Core Programs

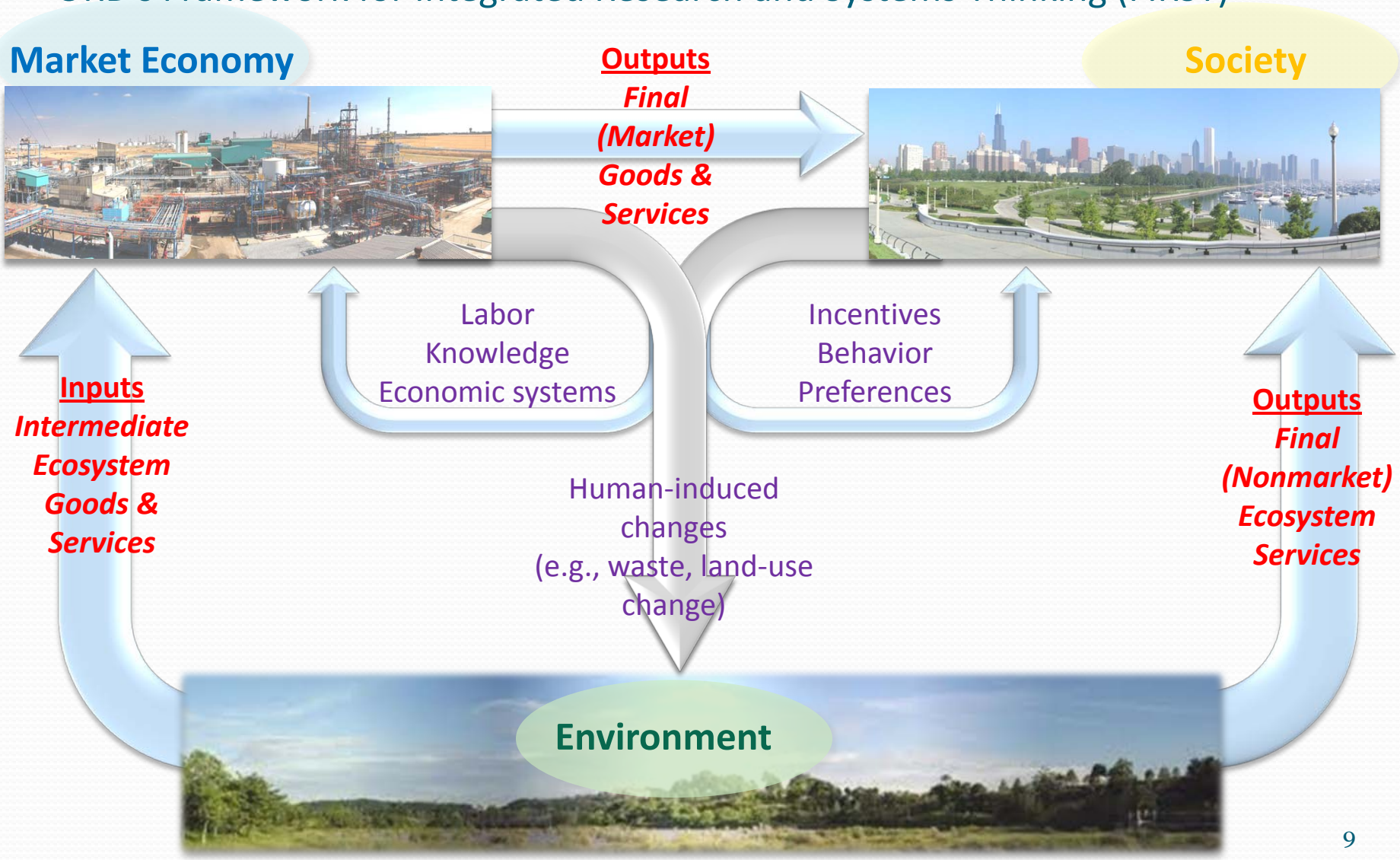
# Some examples of how the National Water Program is impacted by Ecosystem Services research

- Regulatory benefit-cost analysis
- Water quality-based approaches under CWA
  - Designated Uses ≈ Aquatic Ecosystem Services
    - Water Quality Criteria, Water Quality Standards, monitoring, TMDLs
- Market-based approaches
  - Wetlands mitigation banking
  - Water quality trading

# Part 2 – Why "Ecosystem Services" Research Matters…a lot

# Characterizing the Systems of "Sustainability":

## ORD's Framework for Integrated Research and Systems Thinking (FIRST)

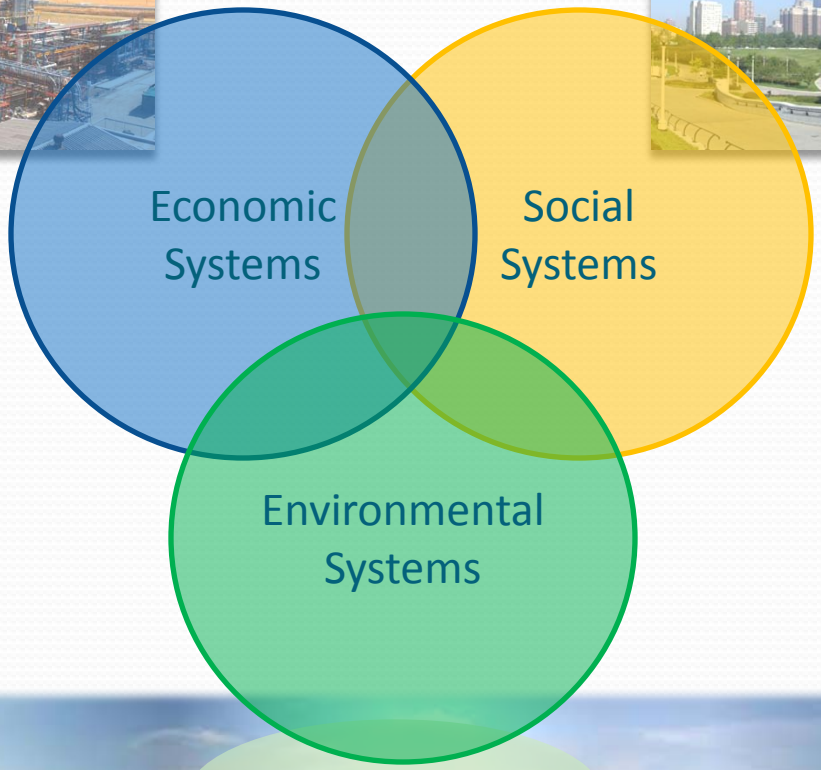


# Pursuing "Sustainability" through Policy-making:

## Characterizing the impacts of policies on societal welfare

**Market Economy**

**Society**




**Environment**

# Ecosystem Services and Sustainability

## *Integrated, Systems-based Information*

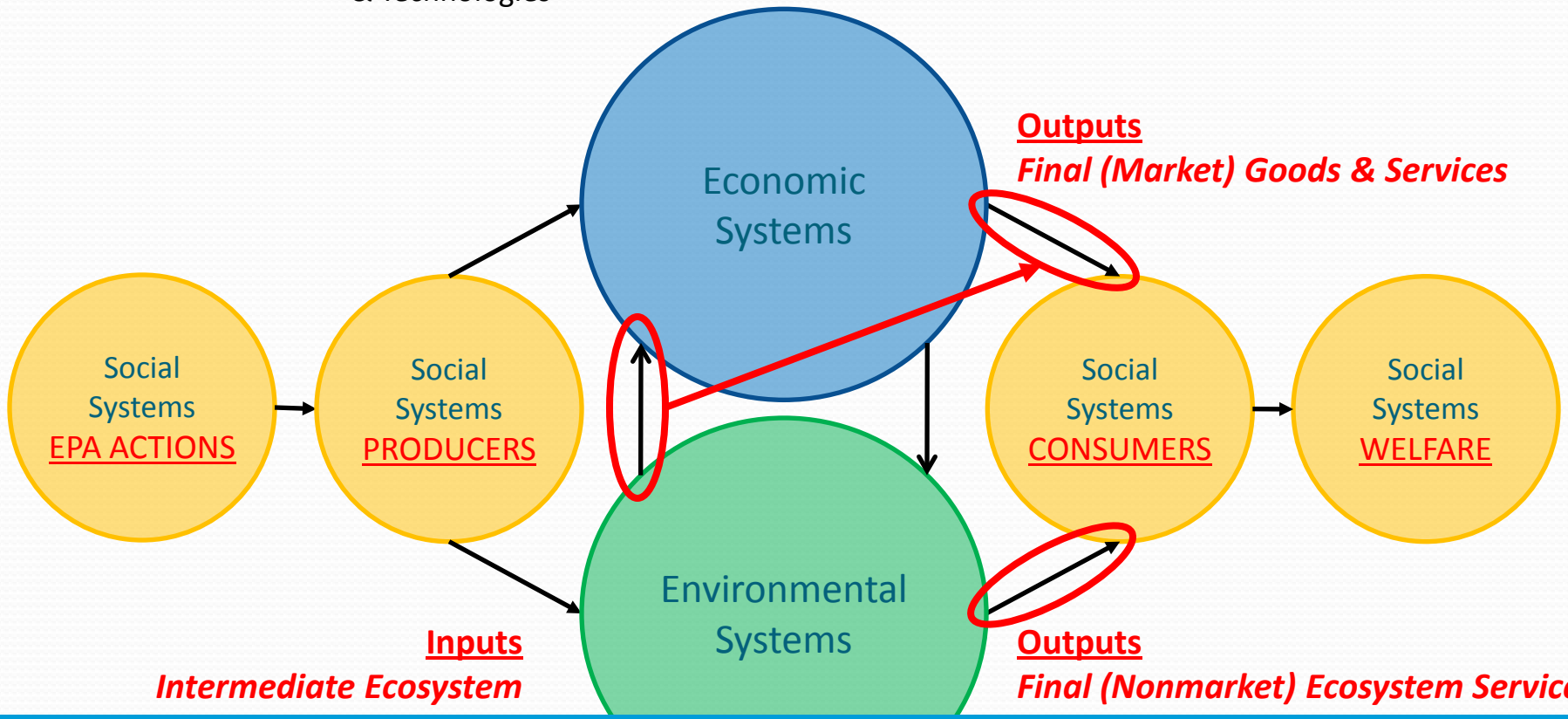
Policy Design & Analysis

"Source" Incentives, Behavior & Technologies

Systems Shocks & Responses

Final Goods & Services Produced & Consumed

Societal Well-being




**Ecosystem Services: (1) describe the impacts of EPA Actions on Societal Welfare and (2) link together the three systems of sustainability**

# Ecosystem Services and Sustainability

## *Integrated, Systems-based Information Can Improve…*

- "Systems-knowledge"
  - Knowledge about direct and indirect impacts of policy options
  - Trade-offs
  - Status and trends of market and nonmarket (environmental) contributions to societal well-being (welfare)
- Decision-making
  - Strategic planning
  - Policy design
  - Policy analysis
  - Policy coordination
  - Policy implementation
- Bottom-line performance
  - Efficiency, Effectiveness, Equity

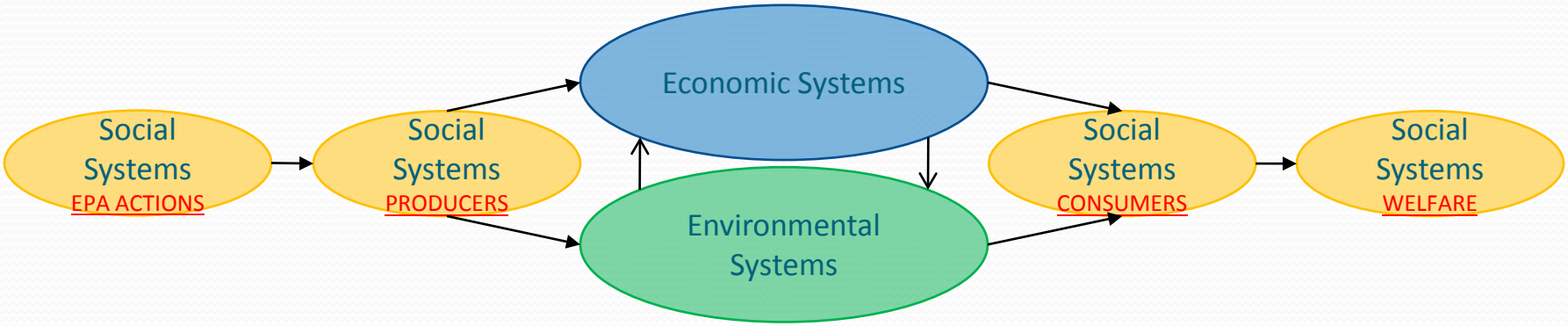
# However…

- …we must address key economic issues associated with producing and consuming this information…primarily in nonmarket settings
- On the supply-side
  - Produce information efficiently
  - Achieve economies of scale and scope
    - Standardization, integration, IT/IM systems
  - Align investments to meet demand for information
    - "Integrated supply-chain management"
- On the demand-side
  - Consume information efficiently
  - Provide well-defined "targets" (i.e., R&D/info needs)
    - Plan strategically
  - Provide a "price signal" in nonmarket (e.g., bureaucratic) settings

# Part 3 – Consuming R&D to inform policy-making

## How should EPA consume integrated, systems-based information?

- Expect increased productivity within ORD and with external researchers
  - Information produced may be complex and present challenges to using in real-world policy-making settings
  - Could overwhelm the decision-making process without preparation
  - Need to prepare for "success"
- A good "lens" might help manage complexity - here's one option

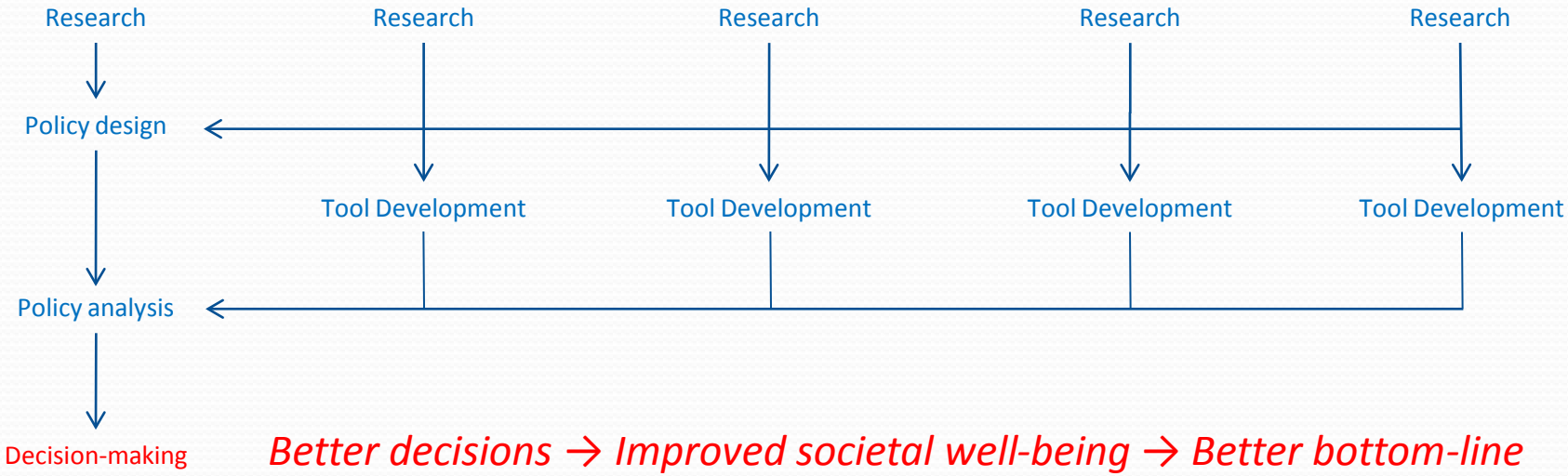



***Group 1***
*Policy Design, Analysis, & Decision-making*

***Group 2***
*Source Incentives, Behavior & Technologies*

***Group 3***
*Ecological Systems Monitoring & Modeling*

***Group 4***
*Impacts on Human Well-being*




*Better decisions → Improved societal well-being → Better bottom-line*

# Part 4 – Final thoughts

# Recommendations for making your research "policy relevant"

- See the "big picture"
  - Use the frameworks described above
  - Connect the details of your research to other parts of the framework
  - Collaborate across disciplines, but retain the comparative advantages of the disciplines
- Stay connected
  - To EPA – especially ORD
    - Through STAR grants
    - *www.EPA.gov/ORD*
  - To others - through professional associations, including those that are "multi-disciplinary"
- Anticipate change
  - Standardization to facilitate integration
  - Development of large integrated data and modeling systems
  - "Multi-"…