ESMWG Ecosystem Service Valuation (ESV)

Presentation to the NOAA Science Advisory Board
April 29, 2016
ESMWG Members on Task Force

- Vic Adamowicz, University of Alberta
- Dave Fluharty, University of Washington
- Robert Johnston, Clark University
- Support from Robert Ellis, Bridget Seegers and Laura Ferguson
Questions / Terms of Reference

• Review the use of ESV within the context of NOAA decision making
• Provide guidance on ESV methods for different types of applications
• Examine the relevance of ESV to different NOAA decision-making contexts
• Examine agency capacity
• Help prioritize ESV application across the agency
Methods

• Review applications of ESV across NOAA and how these were used (or not) to inform decisions
• Review enabling legislation and documents that (1) describe the decision-making contexts within which ESV might play a role, (2) explicitly encourage or restrict ESV, or (3) mandate considerations of economic benefits and costs.
• Semi-structured interviews with NOAA staff involved with the application of ESV across the agency
• The scientific literature describing ESV methods
• Federal guidance related to ESV and economic analysis
Report Structure

1. Executive Summary
2. Objectives / Terms of Reference
3. Methods
4. Overview
5. What are Ecosystem Service Values?
6. When does ESV apply to the decision-making context and when can it be used most productively?
7. The Context for ESV within NOAA
8. Examples of Ecosystem Service Valuation and Decision Making
   a. Klamath Dam Removal
   b. Fish Stock Rebuilding
   c. Coastal Habitat Restoration
   d. Green Infrastructure
9. Best Practices in ESV
10. Capacity for ESV within NOAA
11. Potential Future Applications of ESV within NOAA
12. Areas of Tension
13. Conclusions / Recommendations: What Should NOAA do?
RELEVANCE OF ESV TO NOAA

• State of the art methods for examining trade-offs developed in academia and in agency practice allow for valuation that includes market and non-market values in decision making.

• Ecosystem services and their valuation build off of evolution of non-market valuation methods developed in NOAA and other agencies (Lipton et al. 2014; Scarlett and Boyd 2011).

• Valuation should be considered alongside other information on ecosystem services.
RELEVANCE OF ESV TO NOAA

Is there an enforceable mandate to employ ESV?
• NOAA is generally permitted / encouraged to apply ESV but not required to do so.
• Decision making under NOAA’s [Mandates, ESA, MMPA, MSA, CZMA, NMSA, etc.] and other requirements, [NEPA, APA, RegFlex etc.] can benefit from appropriate application of ESV.
• Only with respect to parts of ESA and MMPA is there an enforceable requirement that NOAA not employ ESV.
RELEVANCE OF ESV TO NOAA

• There is strong encouragement to employ ESV from the Office of Management and Budget, Presidential Executive Orders and others culminating in the Joint OMB/CEQ/OSTP Memorandum (M-16-10) “Incorporating Ecosystem Services into Federal Decision-Making” (October 7, 2015).

• NOAA’s commitment to use of Best Available Scientific Information (NOAA Administrative Order (NAO) 202-735D: Scientific Integrity can be interpreted to require use of ESV when appropriate in decision making (March 7, 2009).
Key Findings

• NOAA has internal capacity for high-quality ESV in a few targeted areas (e.g., fisheries), but not across the agency as a whole.
  – Reliance on one-off, isolated studies—while useful to inform (or highlight the value of) NOAA activities in specific cases—is unlikely to have a broad influence on the way NOAA approaches its mission.
  – Highlighting individual ESV success stories obscures the fact that comprehensive ESV is uncommon.
  – Lack of capacity (e.g., in social science) precludes comprehensive, ongoing applications.
Key Findings

• The impact of federal mandates to incorporate ecosystem services information “where appropriate” is diminished by decision-making contexts which restrict the role of ESV.
  – There are tensions (e.g., legal, scale) between ESV and many NOAA decision-making contexts.
  – Capacity to use ESV to meet extant Line Office mandates determines relevance.
  – There is a need to clarify when and how ESV is relevant to specific decisions (and when not), and to reconcile decision contexts with the information provided by ESV.
  – Ideally, ESV should be implemented in a way that is organic and central to NOAA’s mission.
Key Findings

• Awareness is needed within NOAA on the validity and accuracy of different methods for ESV, as related to decision-making needs.

• The perceived validity of ESV methods within NOAA does not always reconcile with validity as evaluated by the scientific community.

• This distinction is particularly relevant for methods such as stated preference valuation and different benefit transfer methods.
Key Findings

• There is a need to better recognize the distinctions between well-defined measures of economic value and other economic measures (e.g., jobs, economic impacts), and when different information is relevant to ESV.

• There is a concern that too much emphasis is placed on off-the-shelf decision support tools.
  – can be black boxes, or effectively so for those with little ESV experience
  – often rely on very simple benefit transfer methods
Key Findings

• Accurate and responsive ESV requires the involvement of natural science and economic experts from the outset.
  – Ensure that integrated methods are applied from initial scoping through data collection and analysis.
  – Incorporate human behavioral responses as part of ESV.
  – Recognize that the construction of the “ecological production function” is among the most challenging issues limiting ESV applications.
Recommendations

• Develop formal guidance linking types and applications of ESV to particular agency needs. This guidance should also:
  – Specify cases in which ESV is not recommended or high priority at this time.
  – Reflect established standards regarding what type of insight can be provided by different types of ecosystem service information.
  – Address topics for which common perceptions within NOAA may not correspond with recommended practices.
  – Clearly distinguish measures that may be interpreted as appropriate measures of economic value.
  – Emphasize the need for direct involvement of natural science and economic experts from the outset.
Recommendations

• Develop cross-LO institutions and structures capable of promoting and informing the use of high-quality ESV across the agency
• Encourage institutional familiarity with the value of information provided by ESV within decision contexts encountered by the agency
• Identify key capacity enhancements that would lead to maximum benefits for the agency’s ability to conduct ongoing ESV as an organic aspect of decision-making
• Engage in dialogue with OMB (and other agencies, as appropriate) regarding expectations, approvals and constraints for ESV
• Implement these recommendations in close coordination with outside ESV communities of practice
Valuation Best Practices

• Agency-wide guidance for ESV best practices would be useful in all areas (revealed and stated preference valuation; benefit transfer)
• Guidance would be particularly helpful for:
  – stated preference valuation (reconcile perceptions & practice with consensus in the literature)
  – benefit transfer
  – valuation toolboxes and decision-support tools
  – development of “ecological production functions”
• Assistance matching decision contexts and types of values required to most appropriate methods
Examples Where NOAA Better Can Employ ESV in Decision Making?

• Valuation of Natural Capital (and determine when advisable)
• Modeling of Coastal Residence Choice (e.g., as related to climate change impacts)
• Analysis of Distribution of Impacts of Policy Change
• Indigenous Local Ecological Knowledge
• Ecosystem Services of Fisheries Beyond Harvests
• This is not a comprehensive list
Questions and Comments?

The ESMWG requests that NOAA SAB approve this report and transmit it to the NOAA Administrator