

US EPA Ecological Benefits Assessments Strategic Plan (EBASP) & Ecological Benefits Assessment in Air Programs

**Presentation for the
European Commission's
Workshop on Ecological Benefits Valuation**

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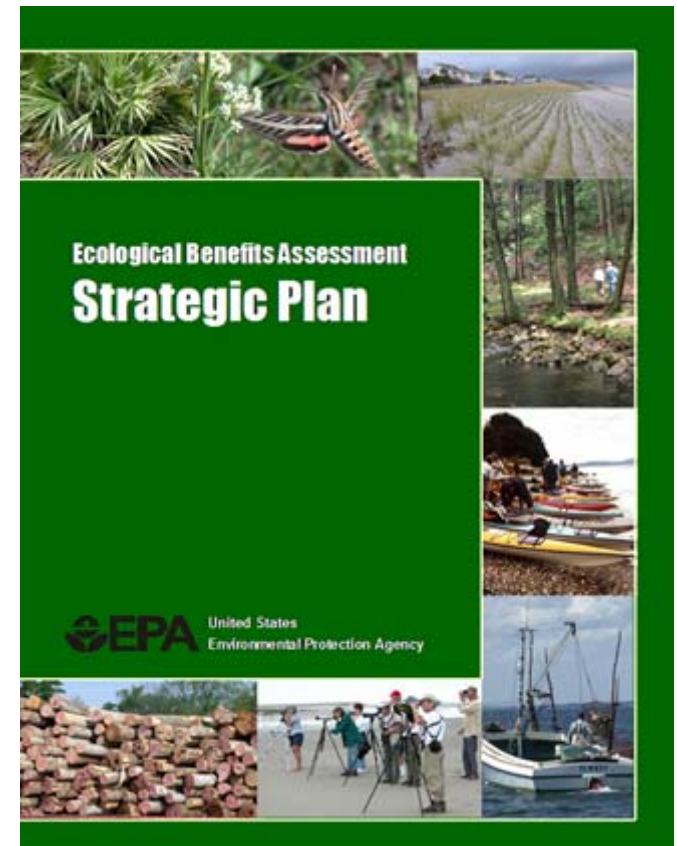
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Briefing Outline

- ◆ Motivation, Vision, and Goal
- ◆ Scope and Audience
- ◆ Developing the Plan
- ◆ Priority Actions
- ◆ Implementing Actions
- ◆ Recognizing Success
- ◆ Accessing the Plan
- ◆ Benefits Assessment of EPA Actions to Reduce Air Pollution

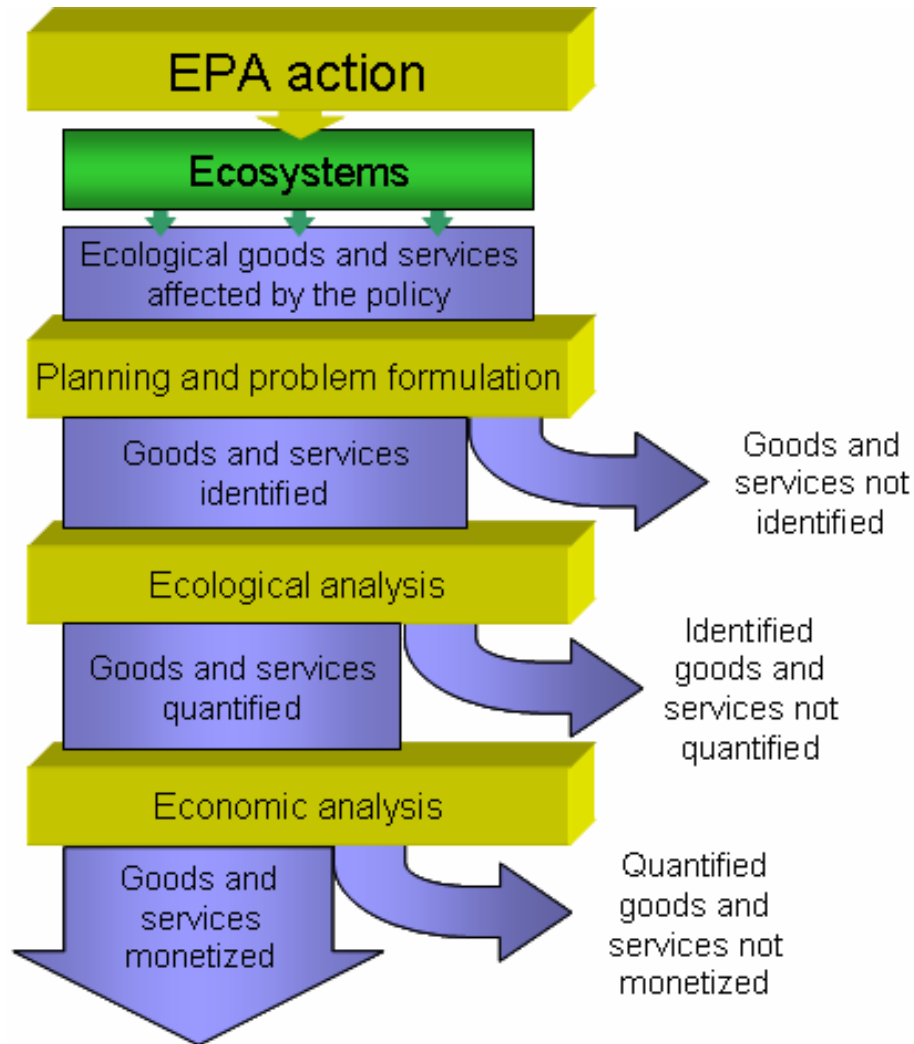




Motivation

- ◆ Increasing need to understand impacts (both positive & negative) of Agency actions
- ◆ Increasing need to communicate impacts & tradeoffs to the public
- ◆ Current states of the science & practice limit Agency's ability to quantify impacts & tradeoffs comprehensively

Nature of Challenge





Goal of This Effort

To help improve Agency decision-making by enhancing EPA's ability to identify, quantify, and estimate the value of the ecological benefits of existing and proposed policies.





Vision

- ◆ Natural and social sciences provide models, methods and information needed to support economic valuation & benefits assessment
- ◆ Ecological benefits assessments are multidisciplinary and based on good science
- ◆ Agency decisions are transparent and sound





Developing the Plan

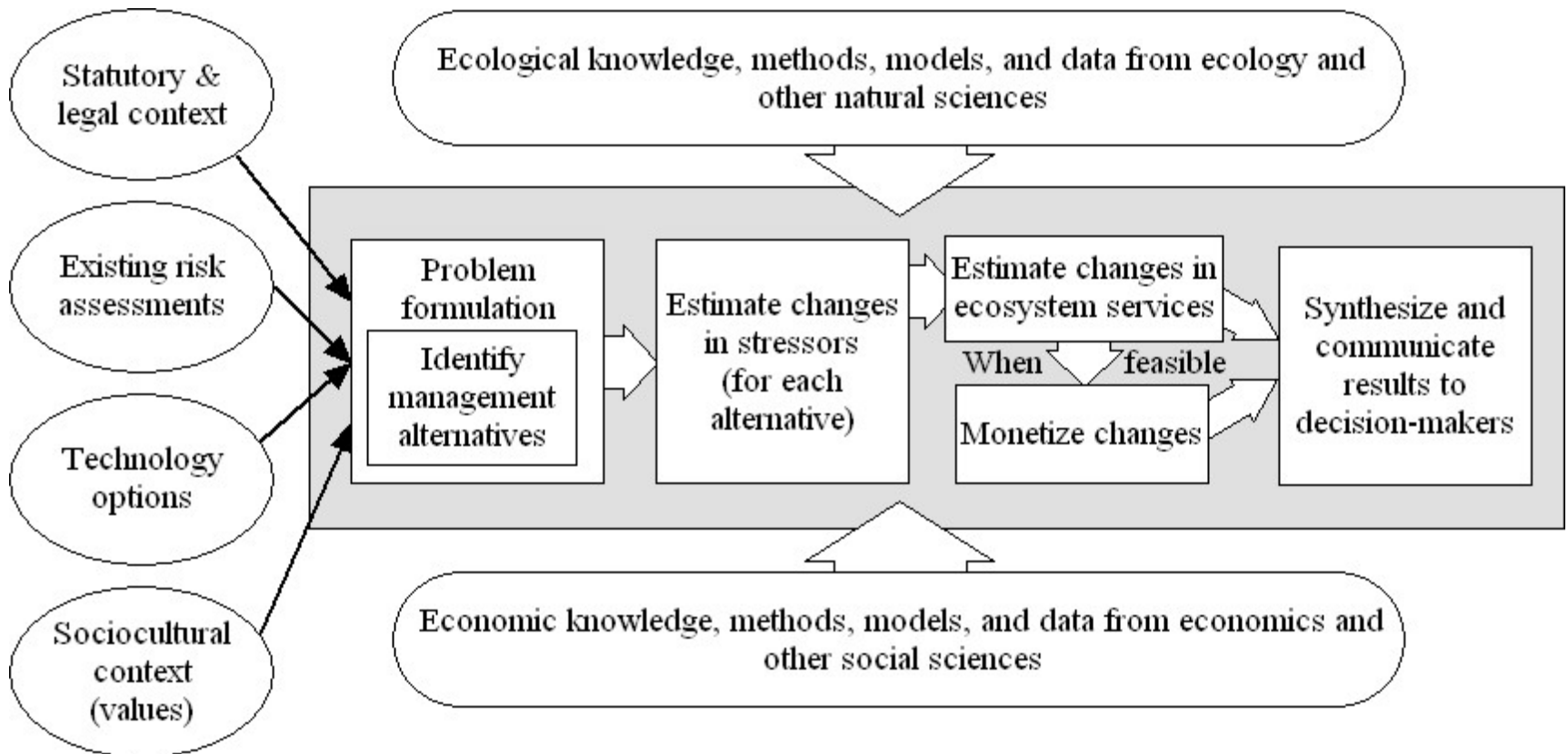
- ◆ Broad Agency participation involving multiple offices
- ◆ Information gathering meetings with EPA and other federal agency ecologists & economists
- ◆ Informal electronic questionnaire to Agency staff
- ◆ Broad issues analysis & action identification
- ◆ Workshop focusing on Office of Water programs
- ◆ Sponsorship of workshop on valuation & decision-making
- ◆ Broad Agency review
- ◆ Consultation with Science Advisory Board



Scope & Audience

- ◆ Focuses on institutional & technical considerations arising most often in national-level ecological benefits assessments and where statutory requirements for conducting benefit-cost analyses exist
- ◆ Primary audiences:
 - Program Offices of EPA
 - EPA's natural and social scientists
 - Other Federal agencies
 - External partners of EPA's research
- ◆ Applicable to regional, state & local issues and in many contexts

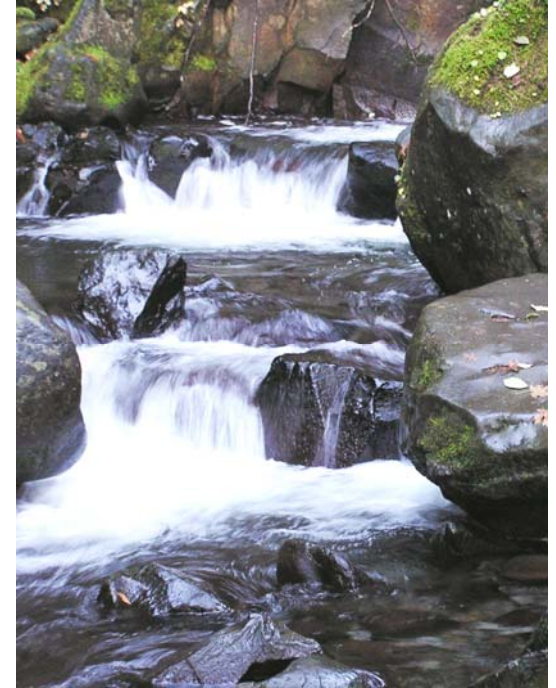
Building on Strengths of Economic Analysis





Priority Actions to Improve Benefits Assessment

- ◆ Institutional arrangements
 - Promoting interdisciplinary assessments
 - Cross-discipline communication & training
 - Encourage interdisciplinary participation
 - Expand use of ecological information
 - Conduct problem formulation workshops
 - Promoting rigorous & comprehensive assessments
 - Develop assessment guidelines
 - Update Analytical Blueprints guidelines
 - Develop generic ecological benefits assessment endpoints





Priority Actions to Improve Benefits Assessment

- ◆ Interdisciplinary research – organized around framework
 - Addressing overarching issues
 - Designs & relevant indicators in environmental monitoring programs
 - Inherent variability & uncertainty
 - Understanding policy impacts on stressors
 - Behavioral responses to environmental policy
 - Capacity for relative risk assessment
 - Effectiveness of ecologically-based pollution controls
 - Attention to ex-post analysis



Priority Actions to Improve Benefits Assessment

- Understanding stressor effects on ecological endpoints
 - Capacity for population & community modeling
 - Modeling changes across spatial scales
 - Capacity for ecological/economic modeling
- Understanding linkages among ecological endpoints & social welfare
 - Valuation methods
 - Survey methods validity testing
 - Capacity for benefits transfer
 - Capacity for supplemental methods



Priority Actions to Improve Benefits Assessment

- ◆ Fostering partnerships
 - Supporting studies relevant to Agency policies
 - Communicating Agency research needs
 - Coordinating data collection & research
 - Expediting collection of information about public values





Facilitating Implementation

- ◆ Oversight Committee
 - Ultimate implementation responsible
 - Identifying cross-Agency priorities
 - Leveraging resources to support priorities
 - Developing performance measures & tracking the success
 - Technical & management representation from across the Agency

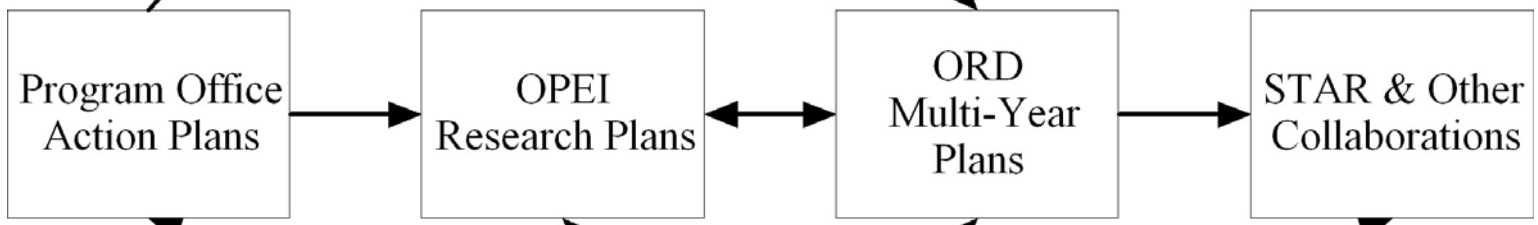
- ◆ Ecological Benefits Assessment Forum
 - Promoting good practices across the Agency
 - Providing expertise advice & assistance
 - Facilitating information exchange
 - Developing guidelines & special projects
 - Open staff-level forum

Implementing Actions

- actions tailored to office needs
- identify resource needs
- align resources & track progress

- core & problem-driven research
- identify resource needs
- align resources & track progress

- needs communicated through research requests
- advances are investigator-initiated



Ecological Benefits Assessment Strategic Plan (EBASP)

- communicates goal & desired state
- communicates improved approach
- communicates actions broadly
- identifies mechanisms to enhance success



Recognizing Success

- ◆ In an accountability sense:
 - Development & implementation of Office-specific Action Plans
 - Incorporation and attainment of relevant performance measures in EPA office plans
- ◆ In an operational sense:
 - Agency's benefits assessments become increasingly quantitative & comprehensive of valued ecological services
 - Agency decisions become more transparent and supportable

Example of Air Regulation Benefit-Cost Analysis - Clean Air Interstate Rule

Table 1-1. Summary of Annual Benefits, Costs, and Net Benefits of the Clean Air Interstate Rule^a (billions of 1999\$)

Description	2010	2015
Social costs^b		
3 percent discount rate	\$1.91	\$2.56
7 percent discount rate	\$2.14	\$3.07
Social benefits^{c,d,e}		
3 percent discount rate	73.3 + B	101 + B
7 percent discount rate	62.6 + B	86.3 + B
Health-related benefits:		
3 percent discount rate	72.1	99.3
7 percent discount rate	61.4	84.5
Visibility benefits	1.14	1.78
Net benefits (benefits-costs)^{e,f}		
3 percent discount rate	\$71.4 + B	\$98.5 + B
7 percent discount rate	\$60.4 + B	\$83.2 + B

- ^a All estimates are rounded to three significant digits and represent annualized benefits and costs anticipated for the year 2010 and 2015. Estimates relate to the complete CAIR program including the CAIR promulgated rule and the proposal to include SO₂ and annual NO_x controls for New Jersey and Delaware. Modeling used to develop these estimates assumes annual SO₂ and NO_x controls for Arkansas resulting in a slight overstatement of the reported benefits and costs for the complete CAIR program.
- ^b Note that costs are the annualized total costs of reducing pollutants including NO_x and SO₂ for the EGU source category in the CAIR region.
- ^c As this table indicates, total benefits are driven primarily by PM-related health benefits. The reduction in premature fatalities each year accounts for over 90 percent of total monetized benefits in 2015. Benefit estimates in this table are nation wide (with the exception of ozone and visibility) and reflect NO_x and SO₂ reductions. The analysis assumes that States will choose to achieve CAIR caps solely from the EGU source category. Ozone benefits represent benefits in the eastern United States. Visibility benefits represent benefits in Class I areas in the southeastern United States.
- ^d Not all possible benefits or disbenefits are quantified and monetized in this analysis. B is the sum of all unquantified benefits and disbenefits. Potential benefit categories that have not been quantified and monetized are listed in Table 1-4.
- ^e Valuation assumes discounting over the SAB-recommended 20-year segmented lag structure described in Chapter 4. Results reflect 3 percent and 7 percent discount rates consistent with EPA and OMB guidelines for preparing economic analyses (U.S. EPA, 2000; OMB, 2003).
- ^f Net benefits are rounded to the nearest \$100 million. Columnar totals may not sum due to rounding.

Example Continued - Clean Air Interstate Rule



Pollutant/ Effects	Quantified and Monetized in Base Estimate	Quantified in Sensitivity Analyses	Unquantified Effects – Changes in:
Ozone/ Welfare	Decreased outdoor worker productivity		Yields for: <ul style="list-style-type: none"> - Commercial forests - Fruits and vegetables, and - Other commercial and noncommercial crops Damage to urban ornamental plants Recreational demand from damaged forest aesthetics Ecosystem functions Increased exposure to UVb
PM/Welfare	Visibility in Southeastern Class I areas	Visibility in northeastern and Midwestern Class I areas Household soiling	Visibility in western U.S. Class I areas Visibility in residential and non-Class I areas UVb exposure (+/-)

Example Continued - Clean Air Interstate Rule



Pollutant/ Effects	Quantified and Monetized in Base Estimate	Quantified in Sensitivity Analyses	Unquantified Effects – Changes in:
Nitrogen and Sulfate Deposition/ Welfare			<p>Commercial forests due to acidic sulfate and nitrate deposition</p> <p>Commercial freshwater fishing due to acidic deposition</p> <p>Recreation in terrestrial ecosystems due to acidic deposition</p> <p>Commercial fishing, agriculture, and forests due to nitrogen deposition</p> <p>Recreation in estuarine ecosystems due to nitrogen deposition</p> <p>Ecosystem functions</p> <p>Passive fertilization</p>
Mercury Deposition Welfare			<p>Impact on birds and mammals (e.g., reproductive effects)</p> <p>Impacts to commercial, subsistence, and recreational fishing</p>



Actions Taken Since Publication of EBASP

- ◆ Workshop on Ecosystem Valuation held in April 2007 and recent ecological benefits research sponsored by US EPA NCEE (see links at: <http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/homepage>)
- ◆ ORD has restructured its Ecological Research Program into an ecosystem services focus and named a National Program Director – Rick Linthurst (linthurst.rick@epa.gov)
 - The mission statement for the ORD Ecological Research Program is:
“To advance a more comprehensive theory and practice for quantifying ecosystem services and their relationship to human health and wellbeing.”
 - ORD is working collaboratively with program offices to make its ecological research relevant and useful for ecological benefits assessment
 - From the air pollution perspective, OAR is working collaboratively with ORD on the upcoming review of the Nitrogen Dioxide and Sulfur Dioxide National Ambient Air Quality Standards
- ◆ The Office of Air Quality Planning and Standards has restructured to establish a new group that focuses upon ecosystem issues and works collaboratively with economists in the office.

The group leader of this new ecosystem focused group is Dale Evarts (evarts.dale@epa.gov)

 - One of the objectives of this group is examining current and alternative clean air related policies and programs to develop approaches that advance protection of ecosystems and the environment.



EBASP and Other resources

- ◆ EBASP is posted at the following website:
<http://yosemite.epa.gov/ee/epa/eed.nsf/webpages/EcologBenefitPlan.html>
- ◆ Air regulation economic analyses website:
 - <http://www.epa.gov/ttn/ecas/report.html>
- ◆ Contact information
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