

A Defense of Cost-Benefit Analysis for Natural Resource Policy

by Shi-Ling Hsu and John Loomis

The recent flurry of scholarship and debate¹ over the use of cost-benefit analysis (CBA) in environmental policymaking is still largely academic. However strongly the academy feels one way or the other, the role of CBA in environmental policymaking does not appear to be changing dramatically. Even the Senate confirmation of the controversial John Graham to an important Office of Management and Budget (OMB) post² is not likely to substantially change policy, given the scrutiny his decisions will now receive. Undoing the U.S. Supreme Court decision in *Whitman v. American Trucking Ass'n*,³ which upheld a U.S. Environmental Protection Agency (EPA) interpretation of the Clean Air Act (CAA) to establish ambient air quality standards without regard to cost,⁴ will require an amendment of the CAA, an unlikely event given the persistence of congressional partisanship. This Dialogue seeks to contribute to the growing body of scholarship that argues for a wider use of CBA, in the hopes of winning over some of the last vestiges of resistance. Eventually, we hope that broader acceptance of CBA in the academy and among environmental advocates will lead to its broader use in policymaking. We will press a now-familiar argument that CBA is, if not an exact

science, a better tool for decisionmaking than the alternatives, but we will do so in a policy area that has heretofore been ignored: natural resource policy.

Fortunately for the economics profession, CBA has already insinuated itself into many environmental policy and policymaking processes. The case of the ambient air quality standards at issue in *American Trucking* is not necessarily representative of pollution control statutes; much statutory environmental law at least implicitly acknowledges a "balancing" or "reasonableness" approach to standard-setting processes, if not explicitly calling for the use of CBA.⁵ Even where statutes call for standards to be keyed to technological feasibility, there is often an indirect mandate for consideration of the costs and benefits of regulation.⁶ And in any case, President Ronald Reagan's Executive Order No. 12991, as modified by President William J. Clinton, requires CBA for any "major" rule or regulation, which is defined as any rule or regulation that is likely to result in "an annual effect" on the economy of more than \$100 million.⁷ Since most significant environmental regulations have at least such an impact, this Executive Order is thought to

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1. See, e.g., David M. Driesen, *Getting Our Priorities Straight: One Strand of the Regulatory Reform Debate*, 31 ELR 10003 (Jan. 2001). In addition, the *Administrative Law Review* recently published a series of four essays on the role of CBA in environmental policy. They included Stephen F. Williams, *Squaring the Vicious Circle*, 53 ADMIN. L. REV. 257 (2001); Matthew D. Adler, *Risk, Death, and Time: A Comment on Judge Williams' Defense of Cost-Benefit Analysis*, 53 ADMIN. L. REV. 271 (2001); Eric A. Posner, *Cost-Benefit Analysis as a Solution to a Principal-Agent Problem*, 53 ADMIN. L. REV. 289 (2001); and Cass R. Sunstein, *Is Cost-Benefit Analysis for Everyone?*, 53 ADMIN. L. REV. 299 (2001).
2. Dr. Graham's title is Administrator of the Office of Information and Regulatory Affairs of the Office of Management and Budget.
3. 531 U.S. 457, 31 ELR 20512 (2001). The Court refused to overrule *Lead Indus. Ass'n v. EPA*, 647 F.2d 1130, 10 ELR 20643 (D.C. Cir. 1980), cert. denied, 449 U.S. 1042 (1980), which upheld a U.S. Environmental Protection Agency (EPA) interpretation of the Clean Air Act (CAA) as precluding any considerations of cost in setting national ambient air quality standards under §109(b). See Sandra B. Zellmer, *The Nondelegation Doctrine: Fledgling Phoenix or Ill-Fated Albatross?*, 31 ELR 11151 (Oct. 2001); Patricia Ross McCubbin, *Looking to Upwind States to Reduce Interstate Ozone Pollution*, 31 ELR 11045 (Sept. 2001). For additional background on *American Trucking*, see Robert W. Adler, *American Trucking and the Revival (?) of the Nondelegation Doctrine*, 30 ELR 10233 (Apr. 2000); Craig N. Oren, *Run Over by American Trucking Part I: Can EPA Revive Its Air Quality Standards?*, 29 ELR 10653 (Nov. 1999); Craig N. Oren, *Run Over by American Trucking Part II: Can EPA Implement Revised Air Quality Standards?*, 30 ELR 10034 (Jan. 2000).
4. §109(b)(1), 42 U.S.C. §7409(b)(1), ELR STAT. CAA §109(b)(1), requires EPA to establish ambient air quality standards for "criteria air pollutants" are set at a level that would be "requisite to protect the public health." EPA interpreted this as precluding consideration of costs, an interpretation that was challenged in *Lead Indus.*

5. The Toxic Substances Control Act, 15 U.S.C. §§2601-2692, ELR STAT. TSCA §§2-412, allows EPA to prohibit or limit the manufacturing, processing or distribution of a toxic substance, or impose other regulatory requirements if the substance presents an "unreasonable risk of injury to health or the environment." TSCA §4(a)(1)(A)(i), 15 U.S.C. §2603(a)(1)(A)(i), ELR STAT. TSCA §4(a)(1)(A)(i). See TSCA DESKBOOK (Envtl. L. Inst. 1999). Under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. §§136-136y, ELR STAT. FIFRA §§2-34, EPA may cancel the registration of a pesticide if it finds that it causes "unreasonable adverse effects on the environment." See PESTICIDES DESKBOOK (Envtl. L. Inst. 2000). The phrase is defined as "any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide. . . ." FIFRA §2(bb), 7 U.S.C. §136(bb), ELR STAT. FIFRA §2(bb).
6. In establishing effluent limitations for national pollutant discharge elimination system permits for point source dischargers under the Clean Water Act (CWA), EPA is required to establish them on the basis of the "best practicable control technology currently available." CWA §301(b)(1)(A), 33 U.S.C. §1301(b)(1)(A), ELR STAT. CWA §301(b)(1)(A). This determination shall "specify factors to be taken into account in determining the best measures and practices available [including] consideration of the total cost of application of technology in relation to the effluent reduction benefits. . . ." CWA §304(b)(1)(B), 33 U.S.C. §1304(b)(1)(B), ELR STAT. CWA §304(b)(1)(B). See also Rybacke v. EPA, 904 F.2d 1276, 20 ELR 20973 (9th Cir. 1990). The Safe Drinking Water Act, 42 U.S.C. §§300f to 300j-26, ELR STAT. SDWA §§1401-1465, is considered a feasibility-oriented statute, in that it requires the establishment of national drinking water standards that is as close as feasible to maximum contaminant level (MCL) goals. When a standard is proposed that includes a MCL, however, EPA is directed to consider costs and benefits of the proposed rule. 42 U.S.C. §300g-1(b)(3)(C)(i), ELR STAT. SDWA §1412(b)(3)(C)(i). The setting of national emission standards for hazardous air pollutants appears to be technologically based, but calls for EPA to consider the costs and benefits of emissions control measures. See *infra* note 30 and accompanying text.
7. 46 Fed. Reg. 13193 (Feb. 17, 1981); Exec. Order No. 12866, 58 Fed. Reg. 51375 (Sept. 30, 1993), ADMIN. MAT. 45070.

cover most new federal environmental regulatory decisions anyway.

CBA and Natural Resource Policy

Where CBA has yet to make significant inroads is in the area of natural resource policy. To date, the use of CBA has focused upon risk analysis applications and pollution prevention mandates. Yet it is in natural resource policy that CBA may be even better able to act as a guide for policymakers, in helping to determine the appropriateness of exploitation, preservation, or restoration of natural resources such as wildlife habitat, old growth forests, wetlands, recreation areas, free-flowing rivers, and rare species. Techniques for valuing the benefits of preserving or restoring nonmarketed natural resources have improved dramatically during the past three decades. The valuation of a broad range of direct and indirect passive use values has accelerated in the past decade, since a blue ribbon panel commissioned by the National Oceanic and Atmospheric Administration (which included Nobel laureate economists Kenneth Arrow and Robert Solow) lent its qualified endorsement of contingent valuation as a technique for the measurement of passive use values of natural resources.⁸ And yet this endorsement, and the vindication of contingent valuation in *Ohio v. Department of the Interior*,⁹ which upheld the U.S. Department of the Interior's (DOI's) use of contingent valuation as a *reasonable* means of assessing natural resource damages under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),¹⁰ have served only to make contingent valuation legitimate in the eyes of the judiciary. Its broader acceptance in the body politic and in agency practice has been slow in coming.

While the use of CBA is indeed a divisive issue, it has not been political partisanship that has stalled its widespread adoption and use. Instead, lingering distrust by environmental organizations and by some members of the academy have thwarted broader acceptance. The distrust is understandable, as past misuse of CBA has led to the approval of environmentally and economically dubious projects.¹¹ Indeed, one of the authors of this Dialogue was the author of a cost-benefit study that was nearly sabotaged by a naked political intervention seeking to affect the design of the cost-benefit study.¹² This unfortunate experience is not

enough, however, to dissuade the authors from advocating broader uses of CBA in natural resource policy. Without a formal decision analysis framework such as CBA, political influence on agency decisionmaking would be even worse.

A second source of resistance to CBA is the perception that benefits estimates are less robust or less legitimate than cost estimates, and that CBA therefore skews analysis away from environmental protection. Benefit estimations in risk analysis have always been viewed with suspicion because, as Mathew Adler has observed, "death is different."¹³ Lisa Heinzerling has also argued that risk reduction yields not just inchoate future benefits, but immediate ones in the form of reduction of dread of a painful future disease, fear of premature death, and other fears of future events generated by risk.¹⁴ These are objections that pose difficult, but not insurmountable, problems for economists. Similarly, benefit estimates of natural resources, especially when they are based on contingent valuation estimates, are viewed as being "soft." While such suspicion is understandable, we believe it is ultimately mistaken.

Economists are, of course, almost unanimous in supporting the broader use of CBA, but not necessarily for purposes of maximizing their employment prospects. Rather, the profession is devoted to CBA because it is united in the belief that information on benefits and costs will lead to better decisionmaking. Some experienced in environmental policymaking point out that the asymmetry of information presented to a regulatory agency—when regulated industries weigh in with their voluminous data on compliance costs against submissions from environmental organizations—does not necessarily lead to better decisionmaking. This is not an argument, however, for a full-bore retreat on CBA. The solution to faulty data and unbalanced information used as inputs is not to do away with CBA, but rather to correct the data problems and temper the imbalance. And this can be done. To fix misuses of CBA, procedures should be written into law that require agency compilation of information on the benefits and costs of natural resource preservation or restoration, and provide that the information be of a sufficient quantity and quality and commensurate with the magnitude of the decisions.¹⁵ This was the approach used by President Jimmy Carter when the U.S. Water Resources Council issued CBA procedures, published in the *Federal Register*, for evaluating water projects as legally enforce-

8. 58 Fed. Reg. 4601 (Jan. 15, 1993).

9. 880 F.2d 432, 19 ELR 21099 (D.C. Cir. 1989).

10. 42 U.S.C. §§9601-9675, ELR STAT. CERCLA §§101-405. Natural resources damages assessments are called for under §107(f)(1), ELR STAT. CERCLA §107(f)(1).

11. Numerous U.S. Army Corps of Engineers' (the Corps') projects seem to have benefitted from fairly unusual applications of CBA. See, e.g., E.A. Torriero, *St. Louis-Area Homes, Businesses Brace for Mississippi River Floods*, CHI. TRIB., Apr. 29, 2001, at A1; Micheal Grunwald, *Working to Please Hill Commanders*, WASH. POST, Sept. 10, 2000, at A1; Michael Grunwald, *In Miss. and Elsewhere, Lawmakers Call Shots*, WASH. POST, Sept. 11, 2000, at A1; Michael Grunwald, *A Race to the Bottom: With Flawed Analysis, Corps Dredges Ports Nationwide*, WASH. POST, Sept. 12, 2000, at A1; Michael Grunwald, *For Oil Projects, Corps' Answer Is Almost Always "Yes"*, WASH. POST, Sept. 13, 2000, at A1. Some work by Graham and his former student, Tammy Tengs, have come under criticism for alleged methodological irregularities. See, e.g., Testimony of Lisa Heinzerling, Professor of Law, Georgetown Univ., Before the Senate Governmental Affairs Committee (May 10, 2001).

12. John Loomis was one of the economists performing a cost-benefit study commissioned by the Corps which sought to determine the

nonmarket costs and benefits of breaching four dams on the Lower Snake River in Idaho. The primary objective of the proposed study was to restore the nearly extinct salmon native to the river. Then-Sen. Slade Gorton (R-Wash.) objected, and managed to convince the Corps that the survey methodology used to be used to ascertain the "passive use values" of a free-flowing Lower Snake River was inappropriate. Senator Gorton was, of course, afraid that the passive use values would be found to overwhelm the benefits of the dams. While Senator Gorton's effort to change the methodology was successful, the ultimate conclusions were unaffected, because a proxy measure was used to ascertain the passive use values.

13. Adler, *supra* note 1, at 272.

14. Lisa Heinzerling, *Environmental Law and the Present Future*, 87 GEO. L.J. 2025 (1999); *The Temporal Dimension in Environmental Law*, 31 ELR 11055 (Sept. 2001). Heinzerling is particularly critical of the practice of discounting future benefits in CBA. Yet her argument, even if accepted, is targeted at discounting, and does not justify the abandonment of CBA.

15. Cass Sunstein has recently made the argument that one instance in which CBA might be inappropriate is when the impact of the decision is not great enough to warrant the effort and expense of performing an analysis; in effect, when CBA itself would fail a CBA test. Sunstein, *supra* note 1, at 311.

able regulations.¹⁶ Since that time, both the OMB and EPA have issued CBA procedures.¹⁷ In the long run, more information does indeed make for better decisionmaking, and while CBA cannot be expected to always provide precise numbers, even approximations will much more often than not improve a process that is frequently driven by anecdotes and parochial politics.

While skeptics have on their side an impressive collection of horror stories of the misuse of CBA and of projects that have gone forward despite an unfavorable analysis, they often overlook the positive role that it has played in environmental policy. For one thing, one wonders if we would, as a general public, have even known about how silly some of these projects were if it were not for CBA. CBA lends transparency to environmental policymaking. Indeed, CBA has at least raised our awareness of important natural resource issues, such as below-cost timber sales and below-market livestock grazing permits on federal lands. Why do these lose-lose projects persist? It is *not* because CBA has propped them up. Even horror stories of bad projects for which CBA were done raise the question: would we even have appreciated how bad they were without the CBA? Even if one persists with the argument that CBA has had an overall negative effect on the environment so far, it is hard to see any alternatives that would be less so, including the status quo.

A recent example of the transparency of CBA involved a project to expand a system of locks and dams for navigation on the Mississippi River between Minneapolis, Minnesota, and Cairo, Illinois. The current size of the locks results in delays for very large barge convoys, and the barge operators had pushed the U.S. Army Corps of Engineers (the Corps) for larger locks. The original economic analysis concluded that neither current delays of a few hours nor increased delays of up to a day would justify the \$1 billion lock expansion. Wanting badly to justify the project, however, the Corps sought to convince their own economist, Donald Sweeney, to alter his CBA to make the analysis support the project. When Sweeney refused to do so, and when the Corps replaced him with a panel of economists brought in to perform the analysis, Sweeney contacted the Office of Special Counsel (an office that investigates allegations of federal agency misconduct from employees). Sweeney's affidavit stated that the "new" economic analysis performed after he was removed from the study made the project look feasible by unrealistically inflating the benefits and reducing the costs.¹⁸ Embarrassed by the incident, the Corps

asked the National Research Council (NRC) to review the CBA, and suspended further work on its own. In February 2001, the NRC concluded that the Corps should evaluate nonstructural alternatives to increase the efficiency of the current locks and make more realistic projections of barge traffic before it considers expanding the locks.¹⁹ In August 2001, the Corps refocused its study to emphasize environmentally more sustainable alternatives and the alternatives suggested by the NRC.²⁰

In order to avoid such pitfalls up front, both the Corps and EPA now rely on outside panel review as a check on the misuse of CBA before a whistleblower embarrasses the agencies. Both agencies have established boards of outside economists, typically academics, that are sometimes called upon to review commissioned CBAs. Such a board reviewed the CBA pertaining to the proposed breaching of the Lower Snake River dams,²¹ and recommended numerous revisions and refinements in the economic analysis.

Some Misconceptions About CBA

Some of the resistance to CBA stems from misconceptions about process and techniques, and a failure on the part of the economics profession to vigorously respond. We seek to rectify that failure, at least in part.

Economists have been able to not only separate out *use values* of natural resources (such as the benefits of increased or improved recreation stemming from an environmental improvement, or the benefits of improved human health attributable to an environmental improvement) and the *passive use values* of natural resources (such as the value of knowing that a particular species will continue to exist), but have developed sophisticated techniques to measure them.

Estimates of use values, or values stemming from tangible "consumption" of some natural resource, are considered more reliable, because they are often based upon actual behavioral data. For example, if there is a consistent differential in air quality within a region, differences in housing prices are apt to reflect a willingness to pay, or a use valuation for cleaner air. This is true even when one statistically separates out other neighborhood effects, such as crime rates, the quality of schools, and commuting distances.²² The value that people hold for job safety can be estimated by measuring the premiums required to attract workers to a

Grunwald, *How Corps Turned Doubt Into a Lock*, WASH. POST, Feb. 13, 2000, at A1.

16. U.S. WATER RESOURCES COUNCIL, PROCEDURES FOR EVALUATION OF NATIONAL ECONOMIC DEVELOPMENT (NED) BENEFITS AND COSTS IN WATER RESOURCES PLANNING (LEVEL C) (1979). See also 44 Fed. Reg. 72892 (Dec. 14, 1979). It is worth noting that it was the Reagan Administration's desire to avoid legally enforceable CBA procedures which led them to rescind those regulations and reissue them as principles and suggested guidelines for agencies. In 1983, the Reagan Administration withdrew the regulatory status of these procedures and reissued them as guiding principles to guide CBA.
17. OMB, Guidelines to Standardize Measures of Costs and Benefits and the Format of Accounting Statements, Memorandum M-00-008, from Director of Office of Management and Budget to Heads of Departments and Agencies (Mar. 22, 2000); OFFICE OF POLICY, U.S. EPA, ECONOMICS, AND INNOVATION, GUIDELINES FOR PREPARING ECONOMIC ANALYSES (2000) (EPA 240-F-00-002).
18. Affidavit of Donald C. Sweeney, Office of Special Counsel, at http://www.environmentaldefense.org/programs/Ecosystems/Mississippi/ms_affidavit.html. (Feb. 1, 2000) See also Michael

19. NRC, CORPS OF ENGINEERS SHOULD CONSIDER ALTERNATIVES TO EXTENDING LOCKS ON UPPER MISSISSIPPI-ILLINOIS WATERWAY SYSTEM (2001).
20. Press Release, U.S. Army Corps of Engineers, Public Affairs Office, Rock Island District, Rock Island, Illinois, Upper Mississippi River-Illinois Waterway System Navigation Study: Navigation Study Resumes (Aug. 2, 2001) (on file with authors).
21. See *supra* note 12 (discussion of Loomis study). The analysis performed by Loomis and other economists for the Corps was reviewed by the Independent Economic Advisory Board. Economists were required to either revise the analysis to reflect the advisory board's comments or make a strong case for not doing so.
22. See, e.g., Kurt Beron et al., *The Benefits of Visibility Improvement: New Evidence From the Los Angeles Metropolitan Area*, 22 J. REAL EST. FIN. & ECON. 319 (2001); KENNETH CHAY & MICHAEL GREENSTONE, DOES AIR QUALITY MATTER? EVIDENCE FROM THE HOUSING MARKET (Nat'l Bureau of Econ. Research Working Paper No. 6826, 1998); David Brookshire et al., *Valuing Public Goods: A Comparison of Survey and Hedonic Approaches*, 72 AM. ECON. REV. 165 (1982).

risky occupation. Again, it is a straightforward statistical matter to separate out possible confounding factors, such as the degree of physical effort, the number of hours worked, and the education level required. In addition, when restoration of natural resources results in increased and improved recreational opportunities, the economic benefits of better recreation are measured by looking at how much additional money people would spend on recreation to visit the restored site. This is accomplished by comparing the amount of money that people are willing to spend to visit clean water recreation sites as opposed to dirty ones. Since travel costs are often the largest part of such a recreational trip, differences in valuation can be teased out by looking at how much further that people travel to visit the cleaner site. It is thus a relatively straightforward calculation to measure how much more people *would* spend on improved recreational opportunities.

A common misconception is that CBA stops there. It does not. Much effort and research is devoted to the measurement of nonuse or passive use values. These values are somewhat more difficult to measure, although much progress has been made recently. Here economists have contributed to policymaking by defining different types of passive uses, and by forcing us to think about the many reasons we value natural resources. They have introduced such concepts as *existence value*, the benefit derived from knowing that a particular natural resource exists in an unimpaired state, even if the individual does not visit or use the resource on-site, and *bequest value*, the benefit the current generation derives from knowing that protection of natural resources today will provide future generations with unimpaired natural resources.²³

Economic analysis also recognizes the benefits accruing from ecological services provided by natural resources. Indeed, sound economic analysis explicitly *includes* consideration of the value of inputs to production, such as the ecosystem services provided by natural resources. For example, the benefits of healthy estuaries are inferred from their service as nurseries for commercially important fish species. Interdisciplinary teams of economists and ecologists are at the forefront of developing indicators of wetland health, as expressed in terms of the multiple ecological functions provided by wetlands.²⁴ Even the federal government's insurer for imprudent land uses, the Federal Emergency Management Agency (FEMA), has recently shown signs of awakening to the considerable costs of local developer obstinacy. It has begun to object to projects that it knows it will have to

pay to rebuild when the next 100-year flood occurs in 5 or 10 years' time.²⁵ Among the benefits considered by FEMA of prohibiting a risky project include benefits of protecting the natural resources from development.

In particular, the survey technique of contingent valuation is often criticized, even parodied as "a dartboard of valuation techniques."²⁶ Flippant caricatures of contingent valuation are a disservice to the scores of economists that have devoted their careers to developing ways of asking questions so as to elicit economic preferences. While there is still much work yet to be done, it is worth taking note of the strides that have been made thus far. To deal with the problem of the hypothetical nature of contingent valuation surveys, economists have compared responses given to surveys that posed hypothetical payments, and to surveys that would require respondents to actually pay up.²⁷ To calibrate the survey responses to better match the actual cash amounts, respondent certainty scales are elicited and applied to the survey responses.²⁸ To deal with the problem that respondents often do not adequately consider their budgetary constraints, economists have reminded respondents of their constraints.²⁹ To deal with the problem that respondents have difficulty placing natural resources in a proper perspective, e.g., properly considering the saving of one endangered species in the context of the larger problem of conserving biological diversity generally, economists have developed surveys that present substitute environmental goods.³⁰ Perfect fixes for all of the problems associated with contingent valuation have not been developed, but there are adequate means for dealing with them. Moreover, contingent valuation can make the modest but important claim that its results are consistent with economic theory, in this respect: the higher the price individuals are asked to pay for protection of a natural resources, the less likely respondents are to be in favor of it. Contingent valuation surveys do in fact show downward sloping demand curves, as predicted by economic theory.

23. People may also place a value upon preservation of a natural resource due to the possibility of their visiting in the future, the "option value." While this seems similar to existence value, it is actually based upon the possibility of future *use* of the resource, and is thus considered more of a use value. Its elicitation is often obtained by contingent valuation, however. See, e.g., ROBERT CAMERON MITCHELL & RICHARD T. CARSON, USING SURVEYS TO VALUE PUBLIC GOODS: THE CONTINGENT VALUATION METHOD 70-72 (Resources for the Future 1989); A. MYRICK FREEMAN, THE MEASUREMENT OF ENVIRONMENTAL AND RESOURCE VALUES: THEORY AND METHODS 261-64 (1993).

24. Dennis M. King, *Valuing Wetlands for Watershed Planning*, NAT'L WETLANDS NEWSL., May/June 1997, at 5; Dennis M. King & Luke W. Herbert, *The Fungibility of Wetlands*, NAT'L WETLANDS NEWSL., Sept./Oct. 1997, at 10; James Boyd et al., *Compensation for Lost Ecosystem Services: The Need for Benefit-Based Transfer Ratios and Restoration Criteria*, 20 STAN. ENVTL. L.J. 393 (2001); Lisa A. Wainger et al., *Wetlands Value Indicators for Scoring Mitigation Trades*, 20 STAN. ENVTL. L.J. 413 (2001).

25. U.S. Newswire, *Administration Looks Backward on Mississippi River Floods, Says American Rivers' Control Efforts Often Aggravate Flood Loss*, Apr. 26, 2001, 2001 WL 4142642; NBC News, Transcript of newscast April 24, 2001, *Residents of Davenport, Iowa, Hoping Their Sandbag Levees Will Hold as Mississippi River Is Set to Crest Later Today*, 2001 WL 23797912. Stephen Titus, *One Year After the Flood*, COLO. BUS., July 1, 2001, 2000 WL 10496211; Ovetta Wiggins, *Buyout Plan for Flooded Property Makes Headway in the Assembly*, BERGEN (N.J.) RECORD, June 2, 2000, 2000 WL 15816957.

26. *Ask a Silly Question, Get a Silly Answer*, 105 HARV. L. REV. 1981, 1990 (1992).

27. Ronald G. Cummings & Laura O. Taylor, *Unbiased Value Estimates for Environmental Goods: A Cheap Talk Design for the Contingent Valuation Method*, 89 AM. ECON. REV. 649 (1999).

28. Patricia Champ et al., *Using Donation Mechanisms to Value Nonuse Benefits From Public Goods*, 33 J. ENVTL. ECON. & MGMT. 33 (1997); Robert Ethier et al., *A Comparison of Hypothetical Phone and Mail Contingent Valuation Responses for Green Pricing Electricity Programs*, 76 LAND ECON. 54 (2000).

29. See Cummings & Taylor, *supra* note 27; John B. Loomis et al., *Do Reminders of Substitutes and Budget Constraints Influence Contingent Valuation Estimates?*, 70 LAND ECON. 499 (1994); John B. Loomis, *Improving Validity Experiments of Contingent Valuation Methods: Results of Efforts to Reduce the Disparity of Hypothetical and Actual Willingness to Pay*, 72 LAND ECON. 450 (1996).

30. John Hoehn & John B. Loomis, *Substitution Effects in the Valuation of Multiple Environmental Programs*, 25 J. ENVTL. ECON. & MGMT. 56 (1993).

Our checkered history of natural resource management could have been much better had CBA been utilized to act as a check on, for example, U.S. Forest Service below-cost timber sales, public land below-market grazing permits, or our past frenzy of dam construction. Estimating the monetary benefits of preserving timber stands or a wildlife refuge provides balance to political lobbying by industry that often muddies the policy process by touting additional local jobs as a primary economic benefit of a resource extraction project. Further, industry frequently focuses largely on the cost of complying with resource protection policies such as roadless area protection. The real economic question is not, however, whether an increase in environmental quality will cost businesses or consumers money. In most cases it will. But the legitimate economic question is whether the gain in environmental quality is greater than that cost. Without CBA, the focus in Congress will continue to be on the costs of environmental regulation, to the exclusion of consideration of benefits.

Implicit Versus Explicit CBA

Even in cases in which the consideration of costs is supposedly prohibited, CBA is often quietly and implicitly conducted by the agency. The prohibition on explicit consideration of costs in those cases frequently merely serves to drive the process underground. When first enacted, the CAA program to control emissions of hazardous air pollutants³¹ called for health-based national emission standards for hazardous air pollutants (NESHAPs), without consideration of cost. Twenty years later, EPA had completed only seven NESHAPs. Congress gave up on EPA, and changed the NESHAP-setting process to be technologically based, but with explicit consideration of costs and benefits.³² What had been happening all along, it was clear, was that EPA had been effectively conducting CBA to aid in the establishment of NESHAPs, and the 1990 Amendments that effected this change simply guaranteed that the process would thereafter be subject to public scrutiny. Another example can be found in the legal contortions undertaken by the DOI under the Reagan and Bush Administrations to avoid enacting protections for the northern spotted owl. Separate lawsuits were filed by environmental organizations to compel then-Secretary of the Interior Donald Hodel to list the owl under the Endangered Species Act (ESA),³³ and to compel Secretary Manuel Lujan to designate a critical habitat for the owl.³⁴ Nobody thinks that the ESA's prohibition on consideration of cost in the listing process had any effect at all, except to allow Hodel to mask his nakedly political preferences.³⁵

31. 42 U.S.C. §7412, ELR STAT. CAA §112.

32. NESHAPs are to be based upon the "best system of emission reduction . . . taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements. . . ." *Id.* §7412(a)(1), ELR STAT. CAA §112(a)(1).

33. Northern Spotted Owl v. Hodel, 716 F. Supp. 479, 19 ELR 20277 (W.D. Wash. 1988).

34. Northern Spotted Owl v. Lujan, 758 F. Supp. 621, 21 ELR 20914 (W.D. Wash. 1991).

35. Cost considerations are not to be part of the listing process. ESA §4(b)(1)(A), 16 U.S.C. §1533(b)(1)(A), ELR STAT. ESA §4(b)(1)(A); Tennessee Valley Auth. v. Hill, 437 U.S. 153, 8 ELR 20513 (1978). However, in the designation of critical habitat, economic impact is to be taken into consideration. ESA §4(b)(2), 16

Thus, perhaps the strongest argument that can be put forward on behalf of formal CBA is on *process* grounds. Just as the National Environmental Policy Act indirectly effected profound substantive changes in environmental policy, CBA has the power to dramatically alter the way we think of environmental protection. Eric Posner's article insightfully captures the basic problem that environmental advocates have with CBA, a belief that agency bureaucrats such as those at EPA are fundamentally more pro-regulation than the general public, and that CBA will inevitably have the effect of pulling agency decisions "rightward."³⁶ This is not necessarily the case. For one thing, EPA and the DOI have been sued not only by regulated industry groups but also by environmental advocacy organizations, quite frequently. Perhaps the memories of Anne Gorsuch and James Watt are not fresh enough in our minds. Secondly, this fear is based upon the perception that cost estimates will continue to dominate benefit estimates. This is also not necessarily true. Estimates of passive use values of Mono Lake as a habitat for birds were much greater than the foregone value of the water for use by Los Angeles.³⁷ Similarly, the passive use values of the free-flowing Elwha River, which provided salmon habitat, were found to outweigh the foregone benefits of the Elwha Dam.³⁸ Skepticism of benefits estimates is due largely to misconceptions and the undeserved caricaturing of the benefit estimation process, particularly as it involves contingent valuation. While no one claims that benefits estimation is an exact science, it has clearly become a well-developed science. Benefits estimates yield useful information in the policymaking process. Also, CBA helps to lay bare industry arguments against more stringent regulation or natural resource preservation or restoration. We have learned from CBA how to be skeptical of industry cost estimates. A recent Resources for the Future study found that cost estimates are consistently overestimated,³⁹ which should not come as a great surprise given the influential role that regulated industries have to play in this process.⁴⁰ Again, this is reason to engage in independently conducted cost and benefit analyses, rather than to simply give up on CBA. We should more carefully scrutinize cost estimates, and refine methodologies for estimating benefits.

There is a caveat to our appeal to greater use of CBA for natural resource problems, which pertains to inter-

U.S.C. §1533(b)(2), ELR STAT. ESA §4(b)(2). In practice, the difference is virtually nil. The U.S. Fish and Wildlife Service has simply avoided designating critical habitat in cases in which it thought it would encounter too much political resistance.

36. Posner, *supra* note 1, at 296.

37. John B. Loomis, *Balancing Public Trust Resources of Mono Lake and Los Angeles' Water Right: An Economic Approach*, 23 WATER RESOURCES RES. 1449 (1987).

38. John B. Loomis, *Measuring the Economic Benefits of Removing Dams and Restoring the Elwha River: Results of a Contingent Valuation Survey*, 32 WATER RESOURCES RES. 441 (1996).

39. WINSTON HARRINGTON ET AL., ON THE ACCURACY OF REGULATORY COST ESTIMATES (Resources for the Future, Discussion Paper No. 99-18, 1999), available at http://www.rff.org/disc_papers/PDF_files/9918.pdf (last visited Nov. 21, 2001). See also Lisa Heinzerling, *Regulatory Costs of Mythic Proportions*, 107 YALE L.J. 1981 (1998).

40. For a discussion on the declining compliance cost estimates of the Acid Rain Program, see ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 596 (3d ed. 2000); Shi-Ling Hsu, *Reducing Emissions From the Electricity Generating Industry: Can We Finally Do It?*, 14 TUL. ENVTL. L.J. 427, 448-49 n.111 (2001).

generational issues. While bequest value is capable of capturing the value that we, the present generation, place on leaving our environment in the same condition as we received, the valuation of future generations is assumed to be equal to a continuation of our preferences over the life of the project or policy. In theory, it is conceivable that an ethics-based approach⁴¹ would better represent the politically unrepresented future generations. However, the political reality of an ethics-based approach is quite different. Even were we to agree as a society that intergenerational equity should serve as a guiding principle in environmental and natural resource policy,⁴² there are simply too many avenues of political circumvention that would defeat the ultimate achievement of such an objective.

Thus, for a variety of reasons, CBA is not appropriate as a hard and fast decision rule. CBA does not purport to and should not attempt to displace a variety of other considerations. For example, bequest value and existence value may not completely capture the value of the Arctic National Wildlife Refuge (ANWR), or any risk of loss thereof.⁴³ The value of the ANWR as an ecological "reference site"⁴⁴ may trump measurable economic benefits associated with preservation.⁴⁵ That the ANWR may provide research benefits

and ecosystem services that are immeasurable (at least for now) does not mean that CBA should not be done. It should be performed, but with responsible caveats noting the possibility of many as-yet unknown values, and the irreversibilities of moving forward with exploration. If CBA is made to serve the same purpose as an environmental impact statement (EIS)—as an important *procedural* step in policymaking—then it is hard to see how the process could be the worse off for it. CBA should serve as an explicit acknowledgment that an agency has considered the cost and benefits of its proposed actions, and considered alternatives that may yield the same result with lower costs or higher benefits or both. In the case of ANWR, it is likely that there are an array of other energy policy options that could safely replace the oil and gas not retrieved from the refuge. At the same time, while CBA need not be binding as a decision rule, it should also, like the findings of EIS, be taken seriously and be the subject of public scrutiny and debate.

Ultimately, increased use of CBA is a movement toward government by laws, not men. We should embrace CBA, not because it is an exact science, but because it improves the decisionmaking *process*. CBA represents the interests of taxpayers and consumers, who often foot the bill in special interest projects or through legislation that is not in the national interest. Moreover, even a bad CBA, skewed in favor of exploitation of natural resources, is worth looking at, if only to focus on what is wrong with exploiting the natural resource. It is harder work to object to a bad CBA than it is to counter with a "poignant anecdote to suggest an approach that promotes . . . parochial interests."⁴⁶ But it is a more honest and constructive way of dealing with such issues than to re-use or repackage some rhetoric such as "it is a bad day for the environment, and it is a great day for industry." It is time that we stopped avoiding looking at CBA for fear of becoming pregnant with information that we do not want. The demagogic politics of environmental and natural resource policy should give us a clue as to how difficult these problems are. We need all the help we can get in solving them.

41. Edith Brown Weiss, *Our Rights and Obligations to Future Generations for the Environment*, 84 AM. J. INT'L L. 198 (1990).

42. For an extended discussion, see Duncan A. French, *International Environmental Law and the Achievement of Intragenerational Equity*, 31 ELR 10469 (May 2001).

43. This is not to concede, of course, that such benefits would not be greater than the value of the oil and gas reserves beneath the ANWR.

44. The authors are indebted to Barrett Walker for bringing this point to our attention. A reference site, in ecological parlance, is one that has been relatively untouched by human intervention. The usefulness of such sites lies in their role in ecological research as a control site for comparison with a site that has suffered some disturbance. By comparing the disturbed site with a relatively undisturbed reference site, the effects of the disturbance can be isolated. See BIOLOGICAL ASSESSMENT AND CRITERIA: TOOLS FOR WATER RESOURCE PLANNING AND DECISION MAKING (Wayne S. Davis & Thomas P. Simon eds., 1995); GLENN W. SUTER & LAWRENCE W. BARNHOUSE, *ECOLOGICAL RISK ASSESSMENT* (1993); U.S. EPA, *ESTUARINE AND COASTAL MARINE WATERS: BIOASSESSMENT AND BIOCRITERIA TECHNICAL GUIDANCE G-4* (2000) (EPA-822-B-00-024).

45. The ANWR may be a very important reference site if, as climatologists predict, much of the effects of global warming will be most

acute at the polar extremes. W. Wyatt Gibbs, *The Arctic Oil and Wildlife Refuge*, SCI. AM., May 2001, at 63.

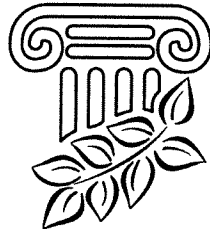
46. Cass Sunstein makes the process argument for CBA as well. Sunstein, *supra* note 1, at 311.

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