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In the Congress

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Imagining Corporate Sustainability as a Public Good Rather Than a Corporate Bad

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2012-2013

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About ELR® . . .

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ELR invites readers to submit articles and comments, which are shorter features, for publication. Manuscripts may be on any subject of environmental, sustainability, natural resources, energy, toxic tort, or land use law or policy. Citations should conform to *A Uniform System of Citation* (the "Bluebook") and should include *ELR* citations for materials that we have published.

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The Environmental Law and Policy Annual Review

Dear Readers:

The Environmental Law and Policy Annual Review (ELPAR) is published by the Environmental Law Institute's (ELI's) *Environmental Law Reporter* (ELR) in partnership with Vanderbilt University Law School. ELPAR provides a forum for the presentation and discussion of the best law and policy-relevant ideas on the environment from the legal academic literature each year. The publication is designed to fill the same important niche as *ELR* by helping to bridge the gap between academic scholarship and environmental policymaking.

ELI and Vanderbilt formed ELPAR to accomplish three principal goals. The first is to provide a vehicle for the movement of ideas from the academy to the policymaking realm. Academicians in the environmental law and policy arena generate hundreds of articles each year, many of which are written in a dense, footnote-heavy style that is inaccessible to policymakers with strong time constraints. ELPAR selects the leading ideas from this large pool of articles and makes them digestible by reprinting them in a short, readable fashion accompanied by expert, balanced commentary. The second goal is to improve the quality of legal scholarship. Academicians have strong incentives to write theoretical work that ignores policy implications. ELPAR seeks to shift these incentives by recognizing scholars who write articles that not only advance legal theory, but also reach policy-relevant conclusions. By doing so, ELPAR seeks to induce academicians to generate new policy-relevant ideas and to improve theoretical scholarship by providing incentives for them to account for the hard choices and constraints faced by policymakers. The third and most important goal is to provide a first-rate educational experience to law students interested in environmental law and policy.

To nominate articles to be included in ELPAR, the ELPAR Editorial Board and Staff conducted a key word search for "environment!" in an electronic database. The search was limited to articles published from August 1, 2011, until July 31, 2012, in the law reviews from the top 100 *U.S. News and World Report*-ranked law schools and environmental law journals ranked by the Washington & Lee School of Law. Journals that are solely published online were searched separately. Student scholarship and non-substantive content were excluded.

The students then screened articles for consistency with the ELPAR selection criteria. Only those articles that met the threshold criteria of addressing an issue of environmental quality importance and offering a law or policy-relevant solution were included. The readability and persuasiveness of the articles, including feasibility and creativity, also were considered.

Through discussion and consultation, the students ultimately chose 20 articles for review by the ELPAR Advisory Board. The Advisory Board provided invaluable insights to the students on article selection. Vanderbilt University Law School Prof. Michael Vandenberg, ELI Senior Attorney Linda Breggin, and *ELR* Editor-in-Chief Scott Schang also assisted the students in the final selection process. Comments on the selected papers then were solicited from practicing experts in both the private and public sectors.

On February 18, 2013, at Vanderbilt University Law School, and on March 22, 2013, on Capitol Hill, ELI and Vanderbilt cosponsored conferences at which some of the authors of the articles and comments presented their ideas to an audience of business, government (federal, state, and local), think tank, media, and nonprofit representatives. The conferences were structured in a manner that encouraged dialogue among presenters and attendees. Audio recordings of these events are posted on the ELI and Vanderbilt University Law School ELPAR websites.

The students worked with the authors to shorten the original articles and to highlight the policy issues presented, as well as to edit the comments. Those articles and comments are presented as ELPAR, which is also the August issue of *ELR*. Also included in ELPAR is an article on trends in environmental legal scholarship that is based on the data collected through the ELPAR review process.

Linda K. Breggin, Senior Attorney, Environmental Law Institute,
Adjunct Professor of Law, Vanderbilt University Law School

Scott Schang, Editor-in-Chief, *Environmental Law Reporter*

Michael P. Vandenberg, Professor of Law,
Vanderbilt University Law School

Food, Agriculture, and Environmental Law

Mary Jane Angelo, Jason J. Czarnezki, and Bill Eubanks

In the groundbreaking *Food, Agriculture, and Environmental Law*, leading environmental legal scholars Angelo, Czarnezki, and Eubanks, along with five distinguished contributing authors, undertake an exploration of the challenging political and societal issues facing agricultural policy and modern food systems through the lens of environmental protection laws.

The authors seek to answer difficult questions about the need for new approaches to agricultural policy and environmental law to meet 21st century concerns surrounding climate change, sustainable agriculture, accessibility to healthy foods, and the conservation of natural resources and ecosystem services. This is the first book to examine both the impact of agricultural policy on the environment and the influence of environmental law on food and agriculture.

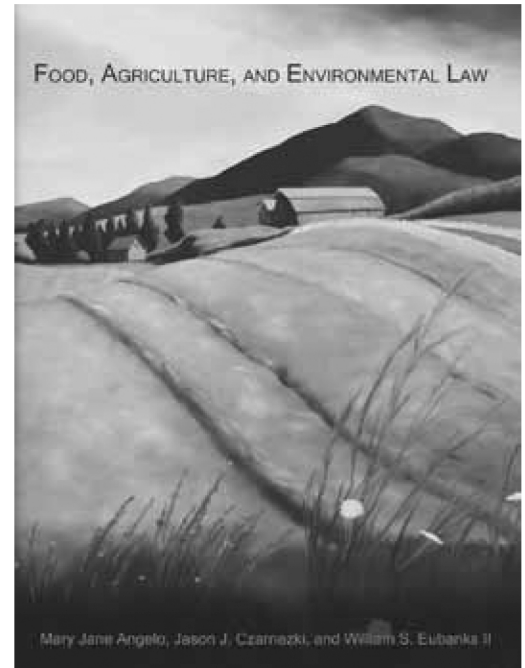
Food, Agriculture, and Environmental Law will serve as the quintessential text for bringing these issues to the classroom in a variety of fields, including law, public policy, agricultural economics, and environmental science.

About the Authors:

Mary Jane Angelo is a Professor of Law, Director of the Environmental and Land Use Law Program, and University of Florida Research Foundation Professor at the University of Florida Levin College of Law. She is also Affiliate Faculty in both the University of Florida School of Natural Resources and Water Institute.

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-Patrick A. Parenteau, Professor of Law and Senior Counsel to the Environmental and Natural Resources Law Clinic, Vermont Law School



C O M M E N T

Trends in Environmental Law Scholarship 2008-2012

by Linda K. Breggin, Jacob P. Byl, Lynsey R. Gaudio, Seamus T. Kelly, and Michael P. Vandenberg

Linda K. Breggin is a Senior Attorney with the Environmental Law Institute and an Adjunct Professor at Vanderbilt University Law School. Jacob P. Byl is a student at Vanderbilt University Law School. Lynsey R. Gaudio is a Research Associate at the Environmental Law Institute. Seamus T. Kelly is a recent graduate of Vanderbilt University Law School. Michael P. Vandenberg is Professor of Law and Co-Director of the Energy, Environment and Land Use Program at Vanderbilt University Law School.

The Environmental Law and Policy Annual Review (ELPAR) is published by the Environmental Law Institute's (ELI's) *Environmental Law Reporter* in partnership with Vanderbilt University Law School. ELPAR provides a forum for the presentation and discussion of the best ideas about environmental law and policy from the legal academic literature.

As part of the article selection process each year, Vanderbilt University Law School students assemble and review the environmental law articles published during the previous academic year. In this Article, we draw on the results of the ELPAR article selection process to report on trends in environmental legal scholarship for academic years 2008-2009, 2009-2010, 2010-2011, and 2011-2012.

Specifically, this Article reports on the number of environmental law articles published in general law reviews and environmental law journals. We find that although the total varied somewhat from year to year, more than 450 environmental law articles were published each year during the 2008-2012 period.¹ This Article also includes data on the topics included in the environmental law articles reviewed by the ELPAR staff. In future issues, ELPAR will track additional data, such as author affiliations and student scholarship. The goal is to provide an empirical snapshot of the environmental legal literature and to track trends over time.

I. Methodology

A detailed description of the methodology is posted on the Vanderbilt University Law School and Environ-

mental Law Institute ELPAR websites.² In brief, the ELPAR Editorial Board and Staff start with a keyword search for "environment!" in an electronic legal scholarship database. The search is limited to articles published from August 1 of the prior year to July 31 of the current year, roughly corresponding to the academic year. The search is conducted in law reviews from the top 100 law schools as ranked by *U.S. News and World Report* in its most recent report and environmental law journals as listed most recently by Washington & Lee University School of Law, with certain modifications. Articles without a connection to the natural environment (e.g., "work environment" or "political environment") are removed, as are book reviews and eulogies. Non-substantive symposia introductions, case studies and editors' notes also are removed. In addition, student scholarship is removed. We recognize that all ranking systems have shortcomings and that only examining top journals imposes limitations on the value of our results. Nevertheless, this approach provides a snapshot of leading scholarship in the field.

The keyword search is the first step in the process of selecting articles for inclusion in ELPAR each year. The full article selection process is described in the letter that introduces this issue of ELPAR. For purposes of tracking trends in environmental scholarship, the next step is to cull the list generated from the initial search in an effort to ensure that the list contains only those articles that qualify as environmental law articles.

Determining whether an article qualifies as an environmental article is more of an art than a science, and our conclusions should be interpreted in that light. We have

1. See Linda K. Breggin et al., *Trends in Environmental Law Scholarship: Academic Years 2008-2009, 2009-2010, and 2010-2011*, 42 ELR 10711 (Aug. 2012) (revised Apr. 2013) (comparing ELPAR results with other assessments of the quantity of environmental law scholarship).

2. *Environmental Law & Policy Annual Review*, Vand. L. Sch., <http://law.vanderbilt.edu/academics/academic-programs/environmental-law/environmental-law-policy-annual-review/index.aspx> (last visited Feb. 25, 2013); *Environmental Law & Policy Annual Review*, Evtl. L. Inst., http://www.eli.org/program_areas/environmental_law_policy_review.cfm (last visited Feb. 25, 2013).

attempted, however, to use a rigorous, transparent process. Specifically, an article is considered an “environmental law article” if environmental law and policy are a substantial focus of the article. The article need not focus exclusively on environmental law, but environmental topics should be given more than incidental treatment and should be integral to the main thrust of the article. Many articles in the initial pool, for example, address subjects that influence environmental law, including administrative law topics (e.g., executive power and standing), or tort law topics (e.g., punitive damages). Although these articles may be considered for inclusion in ELPAR, they are not included for purposes of tracking environmental law scholarship because the main thrust of the articles is not environmental law.

Each article in the data set is categorized by environmental topic to allow for tracking of trends by topic area. The ten topic categories from *Environmental Law Reporter’s* subject-matter index are air, climate change, energy, governance, land use, natural resources, toxic substances, waste, water, and wildlife. ELPAR editors assign articles into a primary topic category and, if appropriate, a secondary category.

The ELPAR Editorial Board and Staff work in consultation with the course instructors, Professor Michael P. Vandenbergh and ELI Senior Attorney Linda K. Breggin, to determine whether articles should be considered environmental law articles and how to categorize the articles by environmental topic for purposes of tracking scholarship. The articles included in the total for each year are identified on lists posted on the Vanderbilt University Law School and ELI ELPAR websites.

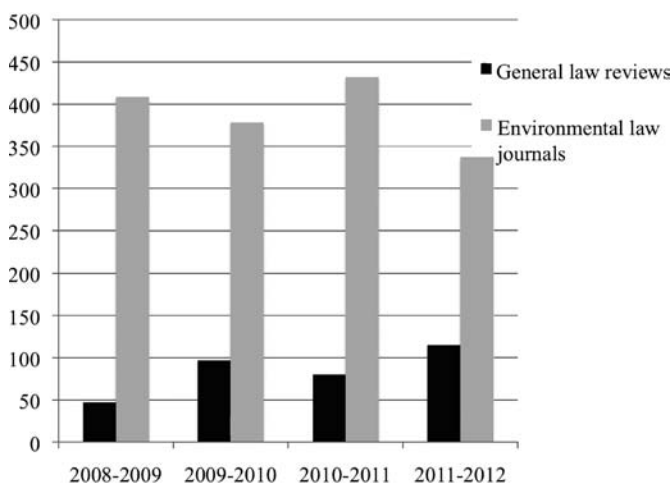
II. Data Analysis on Environmental Legal Scholarship

During the 2011-2012 ELPAR review period (July 31, 2011 to August 1, 2012), 452 environmental law articles written by professors or practitioners were published in top law reviews and environmental law journals. This is a decrease of 12 percent from the 512 articles in the previous ELPAR review cycle (2010-2011). By comparison, 475 articles were published in the 2009-2010 review cycle and 455 articles were published in the 2008-2009 review cycle. Of the 452 total environmental law articles published in 2011-2012, 337 were published in journals that focus on environmental law and 115 were published in general law reviews. The 115 environmental law articles published in general law reviews in 2011-2012 compares to 80 articles in 2010-2011, 97 articles in 2009-2010, and 47 articles in 2008-2009.

The primary topics of the 452 articles published in 2011-2012 are as follows: governance (125), climate change (71), water (60), energy (52), land use (48), natural resources (27), toxic substances (22), air (17), wildlife (17), and waste (13). When counting either primary or secondary topic categories of articles, there are 173 articles in governance, 98 in climate change, 74 in water, 70 in energy, 59 in land use, 39 in toxic substances, 36 in natural resources, 27 in wildlife, 22 in air, and 14 in waste.

Data on trends in primary topic categories over time indicate that climate change was the most common topic during the same time period (August 1 to July 31) for 2008-2009, 2009-2010, and 2010-2011. Governance was the second most common topic area, followed by water and land use, which alternate as the third and fourth most common. In 2011-2012, governance overtook climate change as the most common topic category and energy broke into the ranks of the top four by displacing land use.

Number of Environmental Law Articles by Year



Trends in Environmental Legal Scholarship

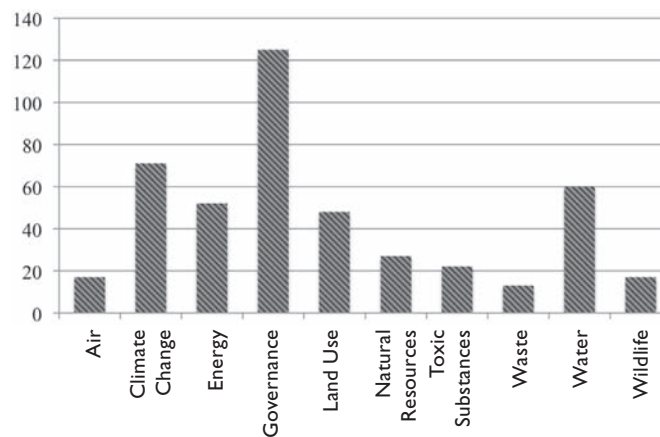
	2008-2009	2009-2010	2010-2011	2011-2012
General law reviews	47	97	80	115
Environmental law journals	408	378	432	337
Total	455	475	512	452

Number of Articles in Topic Categories by Year

	2008-2009	2009-2010	2010-2011	2011-2012
Air	5	7	10	17
Climate Change	126	151	91	71
Energy	28	44	60	52
Governance	116	87	82	125
Land Use	46	56	65	48
Natural Resources	26	22	26	27
Toxic Substances	12	20	57	22
Waste	11	14	13	13
Water	54	43	76	60
Wildlife	31	31	32	17

Note: Articles are categorized by primary topic. Please see methodology section for more details.

Number of Articles in Topic Categories



Note: Articles are categorized by primary topic. Please see methodology section for more details.

A R T I C L E

The Limits of Liability in Promoting Safe Geologic Sequestration of CO₂

by David E. Adelman and Ian J. Duncan

David E. Adelman holds the Harry Reasoner Regents Chair in Law at the University of Texas School of Law; Ian J. Duncan is a Research Scientist in the Bureau of Economic Geology at the University of Texas at Austin.

Carbon capture and sequestration (CCS) is promoted by a broad range of prominent stakeholders who assert avoiding climate change will be impossible without it.¹ The importance attached to CCS is strongly associated with its scale. However, the advantage of the enormous scale of CCS is also a source of concern because it suggests that the risks are large as well.²

Beyond concerns about the high costs of capturing CO₂, two issues have dominated the debate: (1) the risks posed by leakage of CO₂ from sequestration sites, and (2) management of the long-term liabilities associated with them.³ The CCS industry has reinforced fears by decrying the crippling effect that open-ended liability would have on CCS deployment,⁴ a position some prominent academics and advocates have accepted and often amplified.⁵ We will argue these fears are being fueled by misapprehensions about the risks posed by sequestration sites.

The scale involved in CCS and the indirect nature of the impacts will create unique challenges for effective regula-

tion and novel factual settings for liability. However, the large scale of CO₂ sequestration is not entirely a negative, as large operations also offer economies of scale for regulation. And while impacts from releases could occur over vast areas, these impacts are well understood and relatively straightforward to mitigate, if not to prevent.⁶ Put differently, the risks are remarkably small relative to the volume of CO₂ involved and the subsurface area covered by a typical sequestration site.

While the conventional belief among CCS advocates is that risks will decline rapidly in the decades after CO₂ injection ends,⁷ new scientific studies demonstrate that geologic features such as faults and reservoir permeability, and human infrastructure such as abandoned wells, will create a mix of near- and long-term risks, some of which could persist for many decades.⁸ The combination of risks with different temporal profiles will limit the role that liability can play. Economists have long recognized that market mechanisms are poorly suited to mitigate risks with long latency periods.⁹ Essentially, if long-term liability offers only nominal deterrence, then the specter of moral hazard and CCS industry fears about open-ended liability that have received so much attention are groundless.

This article proceeds in four parts. Part I provides an overview of CCS, and analyzes the scientific work on the potential for releases of CO₂ and brine from sequestration reservoirs. Part II evaluates the comparative advantages of government regulation and common law liability and criti-

The full version of this Article was originally published as: David E. Adelman and Ian J. Duncan, The Limits of Liability in Promoting Safe Geologic Sequestration of CO₂, 22 DUKE ENVTL. L. & POL'Y F. 1 (2011). It has been excerpted with permission of Duke Environmental Law and Policy Forum and David E. Adelman and Ian J. Duncan.

1. According to the International Energy Agency (IEA), the annual costs of cutting global CO₂ emissions in half by 2050 would increase by 71% (\$1.28 trillion per year) without CCS. INT'L ENERGY AGENCY, ENERGY TECHNOLOGY ANALYSIS: CO₂ CAPTURE AND STORAGE: A KEY CARBON ABATEMENT OPTION 16 (2008) [hereinafter IEA], available at http://www.iea.org/textbase/nppdf/free/2008/CCS_2008.pdf. The IEA concludes, "CCS is therefore essential to the achievement of deep emission cuts." *Id.* at 15.
2. See, e.g., GREENPEACE INT'L, FALSE HOPE: WHY CARBON CAPTURE AND STORAGE WON'T SAVE THE CLIMATE 30–31 (2008), available at <http://www.greenpeace.org/usa/en/media-center/reports/false-hope-why-carbon-capture/>.
3. See *infra* Part I.A.
4. James A. Holtkamp, *Models Studied for Long-Term Liability Risks in CCS*, 24 NAT. GAS & ELECTRICITY 12, 12 (2008).
5. See, e.g., David Hawkins et al., *Twelve Years After Sleipner: Moving CCS From Hype to Pipe*, 1 ENERGY PROCEDIA 4403, 4407 (2009); Elizabeth J. Wilson et al., *Assessing a Liability Regime for Carbon Capture and Storage*, 1 ENERGY PROCEDIA 4575, 4575 (2009).

6. See *infra* Part I.B.
7. See, e.g., ENVTL. PROT. AGENCY, EPA430-R-08-009, TECHNICAL SUPPORT DOCUMENT: VULNERABILITY EVALUATION FRAMEWORK FOR GEOLOGIC SEQUESTRATION OF CARBON DIOXIDE 44 (2008), available at http://www.epa.gov/climatechange/emissions/downloads/VEF-Technical_Document_072408.pdf.
8. See Frank B. Walton et al., *Geological Storage of CO₂: A Statistical Approach to Assessing Performance and Risk*, in PROCEEDINGS OF 7TH INTERNATIONAL CONFERENCE ON GREENHOUSE GAS CONTROL TECHNOLOGIES (E.S. Rubin et al. eds., 2004), available at <http://www.granite.mb.ca/sheppard/GHGT7.pdf>.
9. See Robert L. Rabin, *Environmental Liability and the Tort System*, 24 HOUS. L. REV. 27, 43 (1987).

cally analyzes current concerns about long-term liability and moral hazard. Part III examines the relative efficiencies of different doctrines of common law liability, finding support for negligence and strict liability, but noting the deterrence value of both doctrines will be limited to a subset of important near-term risks. These sections demonstrate that the current debate misdiagnoses the primary risks and overlooks operational factors simplifying application of common law liability. In Part IV we propose a hybrid legal framework combining a traditional regulatory regime with a two-tiered system of liability calibrated to objective site characteristics. This framework balances principles of economic efficiency and the realities of political viability.

I. Timing and Magnitude of the Risks Posed by Carbon Sequestration

The basic elements of CCS are straightforward. CO₂ is captured from the flue gas of an industrial source, compressed into a supercritical fluid for transportation to a sequestration site, and then injected into a deep brine reservoir for permanent disposal. Although the capture and compression of CO₂ are responsible for the bulk of the costs and many of the most challenging technological hurdles for CCS,¹⁰ geologic sequestration of CO₂ has raised the most contentious legal and policy issues.

The massive volumes of CO₂ produced globally are more than matched by the available subsurface storage space in geologic reservoirs.¹¹ Recent estimates indicate that depleted oil and gas reservoirs could store 900 to 1200 billion metric tons of CO₂, while the capacity of deep saline reservoirs is conservatively projected to exceed 1000 Gigatons (Gt) of CO₂.¹² Given that annual global emissions of CO₂ are currently about 30 Gt,¹³ the estimated capacity of deep brine reservoirs is sufficient to sequester the equivalent of thirty to forty years of total global CO₂ emissions or 75 to 125 years of the emissions from the power sector.¹⁴ Despite the large reservoir capacities available, constraints on carbon-capture technologies, funding, and construction costs will limit the use of CCS to a fraction of its stor-

age potential, making it viable as a bridge technology for substantially longer than these estimates suggest.¹⁵

A. Types of Risks

Like any complex engineering problem, CO₂ sequestration projects will not be risk-free. We will focus on the risks posed by releases of CO₂ and brine. The most significant form of environmental harm from such releases is predicted to be contamination of drinking water.¹⁶ Little or no evidence exists that direct atmospheric releases of CO₂ could be a significant threat to humans.¹⁷

B. CO₂ Plumes and Brine Displacement in Sequestration Reservoirs

The risks associated with leakage of CO₂ and movement of brine into aquifers will not be identical in magnitude or timing. Leakage of CO₂ will not be dependent on the elevated pressures around an injection well, as the buoyancy of CO₂ is sufficiently high to drive it to the surface and to propel it laterally.¹⁸ By contrast, because brine intrusion is driven by elevated pressure, the potential area of risk in the reservoir will continue to expand for many decades after CO₂ injection ceases as the pressure in the reservoir equilibrates.¹⁹

In a 2008 simulation study, researchers found that fifty years after the end of active CO₂ injection, the CO₂ plume would extend just three to five kilometers from the injection well, whereas the field of elevated pressure was projected to extend tens of kilometers from the well.²⁰ These results expose the heightened risks presented by releases of brine from sequestration reservoirs. They are more likely to be of longer duration than releases of CO₂, and the degree to which concerns about direct leakage of CO₂ have been overemphasized and should be reassessed.

10. Sally M. Benson & Terry Surles, *Carbon Dioxide Capture and Storage: An Overview With Emphasis on Capture and Storage in Deep Geological Formations*, 94 PROC. IEEE 1795, 1802 (2006).
 11. Franklin M. Orr Jr., *Onshore Geologic Storage of CO₂*, 325 SCI. 1656, 1656–57 (2009).
 12. Benson & Surles, *supra* note 10, at 1796; *see also* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, IPCC SPECIAL REPORT ON CARBON CAPTURE AND STORAGE 211 (Bert Metz et al. eds., 2005), *available at* http://www.ipcc.ch/pdf/special-reports/srccs/srccs_wholereport.pdf; INT'L ENERGY AGENCY, *supra* note 1, at 106.
 13. U.S. ENERGY INFO. ADMIN., INT'L ENERGY OUTLOOK 7 (2010).
 14. *See* INT'L ENERGY AGENCY, CO₂ EMISSIONS FROM FUEL COMBUSTION: HIGHLIGHTS 9 (2010), *available at* <http://www.iea.org/co2highlights/co2highlights.pdf>.

15. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, *supra* note 12, at 33, 43–46.
 16. *See* Ian J. Duncan et al., *Risk Assessment for Future CO₂ Sequestration Projects Based on CO₂ Enhanced Oil Recovery in the U.S.*, 1 ENERGY PROCEDIA 2037, 2037–38 (2009).
 17. *See, e.g.*, Karsten Pruess, *On CO₂ Fluid Flow and Heat Transfer Behavior in the Subsurface, Following Leakage From a Geologic Storage Reservoir*, 54 ENVTL. GEOLOGY 1677, 1684 (2008).
 18. Stefan Bachu, *CO₂ Storage in Geological Media: Role, Means, Status and Barriers to Deployment*, 34 PROGRESS ENERGY & COMBUSTION SCI. 254, 265 (2008).
 19. *See* JOHANNES E. KALUNKA ET AL., EFFECTS OF CO₂ STORAGE IN SALINE AQUIFERS ON GROUND WATER SUPPLIES 7–8 (2010) (prepared for Society of Petroleum Engineers International Conference on CO₂ Capture, Storage, and Utilization, New Orleans, Louisiana, Nov. 10–11, 2010), *available at* <http://www.onepetro.org/mslib/servlet/onepetroreview?id=SPE-139665-MS&soc=SPE>; Jens T. Birkholzer et al., *Large-Scale Impact of CO₂ Storage in Deep Saline Aquifers: A Sensitivity Study on Pressure Response in Stratified Systems*, 3 INT'L J. GREENHOUSE GAS CONTROL 188–90 (2009).
 20. Jean-Philippe Nicot, *Evaluation of Large-Scale CO₂ Storage on Fresh-Water Sections of Aquifers: An Example From the Texas Gulf Coast Basin*, 2 INT'L J. GREENHOUSE GAS CONTROL 582, 589–90 (2008).

II. The Importance of *Ex Ante* Regulation and the Absence of Moral Hazard

While there is broad consensus that responsibility for carbon sequestration sites should ultimately be transferred to the federal government, questions have been raised about how and when this should occur.²¹ Virtually all of the proposed policies are multilayered and tailored to specific stages in the lifecycle of a carbon sequestration site. Resolving the appropriate set of policy instruments for the final stage, long-term stewardship, has proven to be particularly contentious.

We will argue little or no tension exists between long-term liability and the environmentally sound development of carbon sequestration. Drawing on the technical details described above, it becomes clear that *ex ante* regulation is the single most important policy instrument for ensuring that latent impacts are factored into siting and operations decisions essential to the long-term safety of carbon sequestration sites.

A. Regulation Versus Common Law Liability

Steven Shavell, a leading economist writing in the area, was among the first to identify a set of governing criteria for tort liability and regulatory schemes. He identified four primary factors: (1) knowledge asymmetries between the private sector and regulatory agencies, (2) capital constraints of liable corporate defendants, (3) likelihood that suits will be brought against liable defendants, and (4) administrative costs of implementing regulatory programs versus litigating tort suits.²²

The basic principle of Shavell's framework is simple: if a defendant's capacity to pay is less than the damages it could inflict, its capacity to pay will operate as a *de facto* cap on potential liability, and the incentive for due care created by tort liability will be inefficiently weak.²³ Essentially, the efficiency of *ex post* liability will decline the more potential liabilities exceed the capital reserves of a defendant.²⁴

B. Implications for the Debate Over Long-Term Liability

With respect to carbon sequestration, the Achilles' heel of tort liability is latency, which will be a significant characteristic of the risks associated with CO₂ releases or brine. Only government regulation has the capacity to target

risks with long latency periods.²⁵ Yet, regulators are also subject to temporal myopia and political pressures eroding their willingness or ability to promulgate regulations that adequately consider long-term risks.²⁶ In contrast to most private entities, countervailing pressures from powerful organizations and individuals committed to environmental protection exist within and outside government.²⁷ Accordingly, the government is institutionally better placed than the private sector to factor long-term risks into its decision-making processes.²⁸

Neither fears about unbounded long-term liability nor concerns about limiting it should be impediments to the safe deployment of geologic carbon sequestration. Instead, concerns about ensuring carbon sequestration sites are selected and operated with due care ought to be focused on promulgating effective performance-based regulations.

III. The Appropriate Forms and Limited Role of Tort Liability

A. The Merits of Enhanced Tort Liability

Three supplementary tort doctrines—strict liability, proportional liability, and joint and several liability—have the potential to mitigate the challenges of establishing liability for harmful releases from sequestration sites. Strict liability eliminates the need to demonstrate negligence, proportional liability relaxes the standard for demonstrating causation under a theory of negligence, and joint and several liability makes defendants individually and collectively liable for the harms at issue regardless of their respective contributions. These doctrines increase both the likelihood that a plaintiff will prevail and the potential liability of defendants, and in so doing enhance the incentives for defendants to mitigate risks.

I. Subjecting Sequestration Sites to Enhanced Liability: Unilateral Harms

Subjecting sequestration sites to strict liability under circumstances of unilateral harm is economically efficient because site operators are the only parties capable of mitigating risks, and are thereby the lowest-cost risk avoiders.²⁹ Liability still has the potential to impact site-selection decisions.³⁰ Rough estimates of sequestration capacities in the United States suggest many high-quality sites will be available,³¹ indicating liability can be used to encourage facility owners to locate sequestration sites in low-risk

21. Alexandra B. Klass & Elizabeth J. Wilson, *Climate Change and Carbon Sequestration: Assessing a Liability Regime for Long-Term Storage of Carbon Dioxide*, 58 EMORY L.J. 103, 172–73 (2008); Chiara Trabucchi & Lindene Patton, *Storing Carbon: Options for Liability Risk Management, Financial Responsibility*, BUREAU OF NAT'L AFFAIRS, DAILY ENVT'L REP., Sept. 3, 2008, at 2-3, 14-15.

22. Steven Shavell, *Liability for Harm Versus Regulation of Safety*, 13 J. LEGAL STUD. 357, 359–64 (1984).

23. Donald G. Gifford, *The Peculiar Challenges Posed by Latent Diseases Resulting From Mass Products*, 64 MD. L. REV. 613, 617 (2005); Shavell, *supra* note 22, at 360–61.

24. Shavell, *supra* note 22, at 360–61.

25. See Gifford, *supra* note 23, at 697; Rabin, *supra* note 9, at 4.

26. Robert M. Solow, *The Economics of Resources or the Resources of Economics*, 64 AM. ECON. REV. 1, 12 (1974).

27. See, e.g., Maureen L. Cropper et al., *The Determinants of Pesticide Regulation: A Statistical Analysis of EPA Decision Making*, 100 J. POL. ECON. 175, 194–95 (1992).

28. See, e.g., Clayton P. Gillette & James E. Krier, *Risks, Courts, and Agencies*, 138 U. PA. L. REV. 1027, 1039–42, 1067–70 (1990).

29. STEVEN SHAVELL, *ECONOMIC ANALYSIS OF ACCIDENT LAW* 6–8 (1987).

30. See RICHARD A. POSNER, *ECONOMIC ANALYSIS OF LAW* 229 (8th ed. 2011).

31. Benson & Surlis, *supra* note 10, at 1796; Orr, *supra* note 11, at 1656.

regions. If geologic sequestration of CO₂ is successful, cost-premiums will increase for higher-quality sites, but by that time scientists may have a better understanding of harmful releases and perhaps improved methods for mitigating them. Tort liability is therefore likely to be most effective during the earlier stages of CCS deployment.

B. The Appropriate Role of Tort Liability

The timing of potential harms is central to the effectiveness of tort liability and turns on the nature of a release and the technical capacities to detect it. Subsurface monitoring can identify leakage from a sequestration reservoir long before impacts on risk receptors arise and before legally cognizable harms exist.³² Moreover, extended periods of latency could foreclose avenues for altering site operation and limit options to near-surface remediation or natural attenuation. In any event, latency would also greatly diminish the deterrence value of tort liability.

I. The Net Effect of Imposing Enhanced Liability

The case for enhanced liability is strong but requires a nuanced understanding of the circumstances under which harmful leakage from a sequestration site is likely. We believe the most important factor favoring enhanced liability is the unilateral nature of the harms; site operators are the least-cost avoiders because only they have the capacity to prevent or mitigate harm. However, the practical value of enhanced liability cannot be assessed without considering the overlapping standards of conventional tort doctrines of nuisance and trespass.

The net benefits of the doctrines will clearly differ depending on whether a release involves CO₂ or brine. Harmful releases of CO₂ will be subject to strict liability under the doctrine of trespass irrespective of whether enhanced forms of liability are available because CO₂ plumes from different injection wells are unlikely to overlap. Subjecting these types of releases to enhanced liability is unlikely to have any effect. On the other hand, pressure-driven releases of brine will rarely entail a trespass, and where multiple parties are involved, the pressure effects driving a release will not be attributable to a single injector. This result suggests that accountability for such releases will typically be foreclosed absent enhanced liability.

2. Negligence Versus Strict Liability

A critical factor in deciding between negligence and strict liability is the likelihood that courts will establish an efficient level of due care. In general, to the extent determining the level of due care is technically complex and site-specific, strict liability will be favored over negligence or propor-

tional liability.³³ We have already argued that the limits of geological data and the heterogeneity of site characteristics favor imposition of strict liability.³⁴ But these factors are most relevant to *ex ante* site selection, which differs in substance and information content from operational decisions.

Synthesizing our findings leads to the following conclusions. First, absent legislative intervention, releases of CO₂ will be subject to strict liability through trespass. Second, some form of enhanced liability should apply to releases of brine to overcome the indivisibility problems that could preclude plaintiffs from successfully bringing claims. Third, the deterrence value of liability will be limited to relatively near-term risks associated with releases through faults or abandoned wells. These findings reveal that the current debate over regulation of sites ignores the primary source of risk—brine intrusion—and misapprehends the legal issues in both the short and long term. In particular, the debate has overstated the potential role of tort liability as a policy instrument for promoting safe sequestration and the importance of liability in mitigating long-term risks.

This system would supplement a traditional *ex ante* regulatory regime, which is itself vulnerable to substantial informational gaps and asymmetries, by providing an added incentive for site owners to select higher-quality sequestration sites. We propose this hybrid approach both because it is normatively grounded on conservative economic principles and because it has political virtues that could mitigate industry opposition.

IV. A Two-Tiered System of Liability and Minimum Performance-Based Standards

Our hybrid policy framework for geologic sequestration of CO₂ exploits the complementary strengths of common law liability and traditional regulation. The framework uses enhanced liability in conjunction with regulatory standards and data: sites below a specified safety ranking would be subject to strict liability and possibly heightened regulatory requirements. This selective use of strict liability is designed to provide an incentive for site owners to select low-risk sequestration sites.

We believe that uncertainties about the technical, economic, and political viability of CCS are far more significant than the speculative concerns about long-term liability and alleged large-scale risks associated with CO₂ sequestration. However, the only way to begin the process of resolving these uncertainties about CCS viability is to construct full-scale CCS facilities. These efforts are being impeded by concerns about liability and risks to the environment and human health. Programs designed to promote deployment of CCS are unlikely to be successful without effective regulatory and liability policies, and ideally should be coordinated with them.

32. R.A. Chadwick et al., *Review of Monitoring Issues and Technologies Associated With the Long-Term Underground Storage of Carbon Dioxide*, 313 GEOLOGIC SOCIETY LONDON 257, 271–74 (2009).

33. See *supra* Part III.A.1.

34. See *supra* Part III.A.1.

A. *The Current Legal Environment: Federal Versus State Regulation*

None of the existing federal laws, on its own, provides a comprehensive regulatory framework for carbon sequestration. EPA currently regulates sequestration of CO₂ through its UIC program, designed to regulate traditional threats to ground and surface water from toxic contaminants.³⁵ EPA's authority to regulate underground injection under the Safe Drinking Water Act (SDWA) is limited to setting minimum standards³⁶ and does not provide any incentives for companies to go beyond the minimum.

On balance we believe the current regime of minimum performance-based standards under the SDWA should be retained. The critical importance of site selection to mitigating potential risks underscores the need for establishing a consistent set of minimum standards across the country. Consistent standards will help ensure that sites are selected for their merits rather than the regulatory environment.

Minimum federal standards alone will not ensure that the best sites are selected; instead, they will only exclude higher-risk sites from being developed. Tiered tort liability has the capacity to augment federal standards by providing an added incentive for operators to select high-quality sites. While a tiered framework could be implemented through a regulatory regime, this approach would entail broader federal preemption of state regulations and would be subject to the limitations of a pure regulatory approach. It would also require legislative action extending the existing regulatory system under the SDWA, which is likely to provoke strong opposition in Congress.³⁷

Our hybrid regime is less intrusive, although it would also require new legislation to establish a program for ranking sites and rules governing liability for releases from them. This hybrid approach has three primary virtues over a pure regulatory regime: First, the ranking system is a form of information-based regulation that is backed up by the incentives provided by common law liability, and avoids the trappings of "command and control" regulation likely to inspire the strongest opposition from regulatory critics. Second, our approach minimizes federal preemption of state programs.³⁸ Third, the imposition of enhanced liability on lower-ranked sequestration sites is supported by principles of economic efficiency and mitigated by the modest magnitude of the risks and liabilities at stake.

We have found tort liability will be limited to playing only a supplementary role to traditional performance-

based regulations. We have outlined how liability could be effectively leveraged in this secondary role; namely, to provide additional incentives for selection of low-risk sequestration sites.

B. *Creating Complementary Regulatory and Liability Regimes*

Similar to other commentators, we believe that regulation of sequestration sites should be structured around the different stages of site operations (active operation and injection of CO₂, site closure, a ten to thirty year period of post-closure monitoring and oversight, and finally long-term stewardship). We also agree that when a site transitions to long-term stewardship, it should be transferred to a government entity that will have sole responsibility for the sequestration site, including all liabilities.

Our approach differs from other proposals in two primary respects: First, it promotes selection of the safest sequestration sites and places less reliance on site monitoring and oversight by federal regulators. Second, our framework integrates a formal regulatory regime and common law liability through a comprehensive system of mapping and ranking potential sequestration sites. This ranking would be conducted by a federal agency and used to determine whether a site will be subject to strict liability.

We believe a rough ranking of sequestration sites would be neither technically demanding nor cost-prohibitive.³⁹ The limited risk assessments needed to support such a ranking would amount to a small fraction of the cost of a full site characterization.⁴⁰ Equally importantly, the ranking would be based on data that are quite accurate and straightforward to interpret.⁴¹

This informational approach draws on a hierarchical permitting system recently proposed by Jean-Philippe Nicot and Ian Duncan.⁴² Under their scheme, a government agency would map, characterize, and rank deep brine reservoirs that are candidates for geologic sequestration of CO₂.⁴³ Rather than linking this assessment to liability, Nicot and Duncan adopt a pure regulatory approach tying permitting requirements to the rank of each site, and suggesting regional-level permits could be developed under

35. Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide, 75 Fed. Reg. 77235 (Dec. 10, 2010) (to be codified at 40 C.F.R. pt. 124).

36. *Id.* at 77241.

37. *See, e.g.*, John M. Broder, *House Republicans Take E.P.A. Chief to Task*, N.Y. TIMES, Feb. 10, 2011, at A16; Paul Krugman, Op-Ed, *Party of Pollution*, N.Y. TIMES, Oct. 21, 2011, at A35.

38. Similar kinds of limited preemption of state common law are not unprecedented. For example, the 1986 SARA amendment to CERCLA added provisions that dictate the trigger date for statutes of limitations for certain common-law actions. 42 U.S.C. §9658 (2006).

39. *See* Curtis M. Oldenburg, *Screening and Ranking Framework for Geologic CO₂ Storage Site Selection on the Basis of Health, Safety, and Environmental Risk*, 54 ENVTL. GEOLOGY 1687, 1693 (2008); Yingqui Zhang et al., *Probability Estimation of CO₂ Leakage Through Faults at Geologic Carbon Sequestration Sites*, 1 ENERGY PROCEDIA 41, 42 (2009).

40. *See generally* J.G. KALDI & C.M. GIBSON-POOLE, COOP. RESEARCH CTR. FOR GREENHOUSE GAS TECH., STORAGE CAPACITY ESTIMATION, SITE SELECTION AND CHARACTERIZATION FOR CO₂ STORAGE PROJECTS 19–21 (2008), available at http://www.co2erc.com.au/dls/pubs/08-1001_final.pdf.

41. *See, e.g.*, CURTIS M. OLDENBURG ET AL., RISK ASSESSMENT FRAMEWORK FOR GEOLOGIC CARBON SEQUESTRATION SITES 10 (2010), available at <http://escholarship.org/uc/item/8297g3k2>; Lisa Bacanskas et al., *Toward Practical Application of the Vulnerability Evaluation Framework for Geological Sequestration of Carbon Dioxide*, 1 ENERGY PROCEDIA 2565, 2566 (2009).

42. Philippe Nicot & Ian J. Duncan, *Science-Based Permitting of Geological Sequestration of CO₂ in Brine Reservoirs in the U.S.*, 11 ENVTL. SCI. & POL'Y 14, 21 (2008).

43. *Id.* at 17–18.

which site-specific permits be fast-tracked.⁴⁴ Consistent with our approach, their framework emphasizes passive geological safety characteristics and is intended to complement EPA's minimum performance-based standards.⁴⁵

Two factors are critical to assessing the relative virtues of regulation versus liability: the latency of environmental harms and the information asymmetries between the private sector and the government. The greater the latency of leakage from carbon sequestration sites, the stronger the case for a pure regulatory regime and the less effective traditional common law liability. In opposition to this factor, the greater the information asymmetries between the private sector and the government, the more a liability regime is favored.

While significant uncertainties remain, scientific modeling has shown the latency for leakage of CO₂ is likely to last for many decades after injection, whereas releases of brine could arise within a decade.⁴⁶ If these projections prove accurate, the effectiveness of common law liability is likely to turn on the near-term risks associated with brine releases. In general, lower-ranked sites will be more likely to leak early than highly ranked sites. As such, these characteristics would enhance the relative deterrence value of a liability regime for lower-quality sites.

Information asymmetries will nevertheless persist with a federal site-ranking program. More detailed and new site information will become available only during the active CO₂ injection phase of a sequestration site.⁴⁷ While government regulations will require site operators to disclose at least some of this information, EPA's capacity to monitor operations and emerging reservoir data will be limited by resources and time. Consequently, information asymmetries could increase as operations at sequestration sites evolve and site operators gain direct experience.

The countervailing effects of latency and information asymmetries suggest three possible legal frameworks for the period spanning site selection, operation, and active post-closure. To the extent that latency is dominant, and thus liability largely ineffective, the Nicot-Duncan regulatory regime would be favored. Under this scheme, sites with lower scores could be subject to more stringent regulatory review and higher permitting fees, CO₂ mitigation credits could be discounted (if a U.S. market were established), or there could be some combination of both mechanisms.⁴⁸ If information asymmetries were dominant and latency minimal, a pure liability regime incorporating a system of strict liability for all sites would be favored.

By using strict liability to promote selection of higher quality sequestration sites but making selection contingent on well-established criteria for site quality, the hybrid approach has the potential to mitigate industry opposition without sacrificing safety or efficiency. This approach is viable because a surplus of high-quality sites will exist

for the next several decades, and it will be most effective during the early stages of CCS deployment when knowledge is still being gained about the risks and reliability of sequestration sites. As the quality of information increases and the surplus of sites falls, we expect that the balance between regulation and liability will shift as more refined regulations become possible.

C. Early-Stage Carbon Sequestration Projects

The urgency surrounding mitigation of CO₂ emissions places a premium on facilitating rapid development of CCS. The need for additional incentives to encourage early entrants is significant, but the primary barriers to CCS deployment are the large upfront economic costs and remaining technological uncertainties, particularly with respect to capturing CO₂. Addressing them will require creative use of public-private partnerships, tax incentives, and direct subsidies, each of which has been incorporated into prior climate change bills in Congress, most notably the Waxman-Markey bill.⁴⁹ Tort liability is directed at negative externalities, whereas the primary barriers to deployment of CCS involve unrelated technological uncertainties that will not be affected by a liability cap.

The complementary roles that regulation and tort liability can play are of particular importance to geologic carbon sequestration. Overcoming public fears surrounding carbon sequestration will require concerted efforts by the industry, government, and non-governmental organizations to promote operational transparency and public understanding.

Transparency can be compelled through regulations or liability suits.⁵⁰ Tort liability also creates disincentives for companies to collect information that could be used against them in a lawsuit.⁵¹ Ensuring regulations and tort liability are harmonized to promote transparency will be important because the industry will possess detailed site information that will not be available to state and federal agencies.⁵² Reporting requirements applying to all CO₂ emissions ought to ensure that most of the relevant information is public, but it will be imperative that sequestration-site-specific reporting requirements are in place and rigorously enforced to ensure that regulations keep up with evolving sequestration technologies and knowledge.⁵³

44. *Id.* at 18–19.

45. *Id.*

46. *See supra* Part I.B.

47. Chadwick, *supra* note 32, at 272–73.

48. Nicot & Duncan, *supra* note 42, at 18.

49. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009) (as passed by the House of Representatives on June 26, 2009).

50. Thomas O. McGarity, *The Complementary Roles of Common Law Courts and Federal Agencies in Producing and Using Policy-Relevant Scientific Information*, 37 ENVTL. L. 1027, 1029 (2007); Wendy E. Wagner, *When All Else Fails: Regulating Risky Products Through Tort Litigation*, 95 GEO. L.J. 693, 695–97 (2007).

51. *See, e.g.*, Wagner, *supra* note 50, at 697–98.

52. Tracey R. Lewis, *Protecting the Environment When Costs and Benefits Are Privately Known*, 27 RAND J. ECON. 819, 826–31 (1996).

53. Robert V. Percival, *Responding to Environmental Risk: A Pluralistic Perspective*, 14 PACE ENVTL. L. REV. 513, 528 (1997).

V. Conclusions

This Article challenges several misconceptions about the risks associated with geologic sequestration of CO₂ and the significance of open-ended legal liability. We have shown that the current debate is overly focused on the risks associated with CO₂ leakage and insufficiently attentive to the primary source of risk—releases of brine into drinking water aquifers. As a general rule, releases of brine are much more likely and are projected to occur much earlier in the lifecycle of a sequestration site than releases of CO₂.

Understanding the nature of these risks, particularly their modest impacts and relative simplicity, ought to diffuse the controversy over legal liability for CCS. As we have demonstrated, loss of incentives provided by long-term

liability is ultimately of negligible importance. Nevertheless, near-term liability can play a meaningful role, albeit a limited one, if it is directed primarily at risks associated with releases of brine.

Our analysis also reveals principles of economic efficiency support imposing either strict liability or negligence, although a stronger case exists for strict liability. We advocate a two-tiered system of liability based on two distinct classes of decisions—site selection and operational judgments—operating in parallel with minimum federal performance standards. This tiered hybrid approach leverages public and private information to enhance efficiency; however, we ultimately advocate this approach to mitigate problems with low political viability that would be associated with an effort to impose strict liability on owners or operators of sequestration sites.

C O M M E N T

The Layered Approach to Liability for Geologic Sequestration of CO₂

by Fred Eames and Scott Anderson

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Does the brief history of carbon capture and sequestration (“CCS”) teach that we need to make wholesale changes in liability rules to make sure people do it right, or that we need favorable economic conditions within a normal liability framework to get people to do it at all? The arguments of Professors Adelman and Duncan¹ proceed from the former notion; we submit the latter.

CCS is viewed as essential if mankind is going to make a serious attempt to limit atmospheric CO₂ emissions.² Yet despite the fact that the technology of both carbon capture and sequestration have been shown at demonstration scale, we have only a limited number of permitted geologic sequestration projects in the United States and internationally. There are many oil and gas wells into which CO₂ has been injected, and will in most cases remain, for enhanced recovery. We set those aside for this discussion because in those wells, something goes in and something comes back out. They do not pose significant groundwater contamination risks from brine displacement. The Adelman-Duncan article focuses on brine displacement from saline aquifers.

Adelman and Duncan argue for ranking potential sequestration sites based on risk factors, and imposing strict liability—i.e., liability even in the case of exemplary conduct—for what they term “lower-quality sites (such as sites with poor cap rock or valuable overlying aquifers).”³

There are many reasons we don’t yet have a facility permitted to inject CO₂ into a deep saline aquifer under the U.S. Environmental Protection Agency’s Class VI Underground Injection Control rules (the principal rules that apply to geologic sequestration of CO₂ in the U.S.), but in the opinion of some observers the reasons include the

specter of liability and that the Class VI rules are viewed as onerous, particularly the rules regarding site selection.⁴

But let us not argue that industry views are the proof of sufficiency. Adelman and Duncan posit that industry concerns are unfounded. Without agreeing or disagreeing, we contend that there are means to encourage safe geologic sequestration. Let us first state the facts about the UIC Class VI regulatory structure. Following that, we will discuss a liability structure we helped devise several years ago.

I. UIC Class VI Regulatory Structure

Professors Adelman and Duncan premise their recommendations on a view that the EPA’s UIC Class VI regulatory structure, which the EPA has described as a set of “minimum Federal requirements,”⁵ is insufficient to ensure that sequestration will be done safely. In particular, they believe that sites may be selected that are not sufficiently safe to prevent contamination of underground sources of drinking water (“USDWs”).

We acknowledge there may be compelling incentives for selection of a geologic sequestration site that meets Class VI standards that is near an industrial source, even if a site with additional indicia of safety (thickness of caprock, absence of USDWs nearby) may be available further away. It has become exceedingly difficult to construct linear infrastructure in many areas, and geologic sequestration of CO₂ will need to rely on pipelines from industrial sources to sequestration facilities. Shorter pipelines are easier and cheaper to build than longer ones.

However, the description of Class VI UIC standards as “minimum standards” can be misleading. Many major federal environmental laws are written so that States may administer the federal law, or their own law in lieu of the

1. David E. Adelman & Ian J. Duncan, *The Limits of Liability in Promoting Safe Geologic Sequestration of CO₂*, 22 DUKE ENVTL. L. & POL’Y F. 1 (2011).
2. “The Intergovernmental Panel on Climate Change (IPCC) has concluded that CCS can contribute between 15-55% of the cumulative emission reduction effort to 2100, providing it with a central role within a portfolio of low carbon technologies needed to address climate change.” *The Role of CCS*, World Coal Ass’n, <http://www.worldcoal.org/coal-the-environment/carbon-capture-storage/the-role-of-ccs/> (accessed Mar. 18, 2013).
3. Adelman & Duncan, *supra* note 1, at 53.

4. To be fair, in most circumstances there also is little economic motivation for such projects at present. Also, a small number of Class VI permit applications are pending.
5. Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO₂) Geologic Sequestration (GS) Wells, 75 Fed. Reg. 77230, 77233, (Dec. 10, 2010).

federal one, so long as State law is no less stringent than federal law, and so long as EPA approves their administration and enforcement program. The UIC program operates in this manner.

That does not mean the standards are minimal. The Class VI UIC rule requires “a detailed assessment of the geologic, hydrogeologic, geochemical, and geomechanical properties of the proposed [sequestration] site to ensure that . . . wells are sited in appropriate locations and inject into suitable formations.”⁶ Among numerous other things, permit applicants must submit:

- A map showing “location of all injection wells, producing wells, abandoned wells, plugged wells or dry holes, deep stratigraphic boreholes, State- or EPA-approved subsurface cleanup sites, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells, other pertinent surface features, including structures intended for human occupancy, State, Tribal, and Territorial boundaries, and roads. The map should also show faults, if known or suspected.”⁷
- “Information on the compatibility of the carbon dioxide stream with fluids in the injection zone(s) and minerals in both the injection and the confining zone(s), based on the results of the formation testing program, and with the materials used to construct the well.”⁸
- A demonstration of mechanical integrity, which must show among other things that there is no significant fluid movement into a USDW, and must include continuous monitoring to evaluate the absence of significant leaks.⁹

This and other information submitted by applicants must be sufficient to “demonstrate that the geologic system comprises . . . [a]n injection zone(s) of sufficient areal extent, thickness, porosity, and permeability to receive the total anticipate volume of the carbon dioxide stream [and] [c]onfining zone(s) free of transmissive faults or fractures and of sufficient areal extent and integrity to contain the injected carbon dioxide stream *and displaced formation fluids* and allow injection at proposed maximum pressures and volumes without initiating or propagating fractures in the confining zone(s).”¹⁰

In many respects the Class VI regulations are similar to or were modeled after EPA’s Class I regulations applicable to underground injections of hazardous wastes. Injections of CO₂ justify risk controls similar to those for injections of hazardous waste in some respects (the need to limit injection pressure, for example). In some important respects CO₂ injections pose much less risk

than hazardous waste injections.¹¹ The bottom line is that the Class VI rules are quite robust, including in aspects related to site selection.

Furthermore, ordinary business incentives encourage appropriate site selection. Sequestration facilities must be financed, and lenders and investors insist on precautions to ensure that they get their money back with interest. Sequestration site owners/operators are required to provide financial assurances to regulators in one of several forms, such as sureties, insurance, letters of credit, or self-insurance. Issuers of such instruments likewise want low-risk sites. Risk management has a valuable function in directing developers toward lower-risk sites, truncating higher-risk sites from the market. This is especially true with a fledgling and very large-scale industrial activity, arguably the first to come along in the era of modern environmental law.

Nevertheless, we concur that there is room to provide additional incentives for good site selection, which we will discuss below as we describe the CCS risk management structure we helped devise.

II. The “Layered Approach”

With similar aims, we proceed with a carrot where Professors Adelman and Duncan proceed with a stick. We want to encourage good site selection for geologic sequestration and to minimize risk. We do not want to incite “moral hazard” and thus favor maintaining alignment between risk-generating behavior and its consequences. However, we also emphasize that the liability and regulatory atmosphere should not deter safe geologic sequestration as an option to reduce atmospheric carbon emissions. Furthermore, we believe that risk management for geologic sequestration should be economically efficient.

Our approach applies layers of risk management obligations that address risks across all phases of geologic sequestration (operation, post-injection site care, and post-closure). For projects initiated during a period when the data necessary for a mature risk management market is still emerging, the approach provides both developers *and* the government with incentives to assure safe *and* economically efficient siting, operation, and post-injection management of sequestration facilities.

The Layered Approach institutes a structure under which the Secretary of Energy may enter into cooperative agreements with owners/operators of roughly 80 sequestration facilities to manage risk. Under a cooperative agreement, the Secretary agrees to share risk at the site throughout all phases, rather than solely in the post-closure phase. However, the Secretary’s liability would be dollar limited, and would arise only if an incident caused damages in excess of the initial layers, for which first the facility owner/oper-

6. *Id.* at 77247.

7. 40 C.F.R. §146.82 (2010).

8. *Id.*

9. *Id.* §§146.82, 146.89.

10. *Id.* §146.83.

11. We are thinking here about risks to the local environment. The potential for large scale loss of carbon dioxide to the atmosphere is certainly a risk unique to Class VI injections, but the International Panel on Climate Change believes that well-selected, well-managed locations will retain at least 99 per cent of the injectate for 1,000 years.

tor and then cooperative agreement holders collectively would be responsible. Thus, one might think of the Layered Approach as liable parties in a vertical stack that share responsibility over time, as opposed to horizontally-linked time periods that allocate liability to industry in the earlier phases and the government after a closure certificate is issued.

The Layered Approach places the site owner/operator with a cooperative agreement in the position of first-dollar liability throughout all phases, up to a per incident dollar limit, including after a facility has received a certificate of closure. If damages result from the sequestration facility, whether they arise 10 years after the site has commenced operation or 100 years after it has received a certificate of closure, the facility owner/operator is potentially liable. The owner/operator can choose to manage the first layer liability by purchasing a commercial risk management product, such as an insurance policy, or by self-insurance.

The second layer binds all cooperative agreement recipients to share liability if damages arise at any cooperative agreement facility that exceed the owner/operator's first layer obligation. For example, if damages caused by the facility are \$70 million and the owner/operator's first layer limit is \$50 million, each other cooperative agreement holder would pay a pro rata share of the additional \$20 million.¹²

The market may develop a risk pool to manage the "second layer" risks in an economically efficient manner. The Layered Approach requires that to enter the cooperative agreement program, an applicant cannot have been rejected from the risk pool. In other words, the Layered Approach builds in a feature whereby the market may register its opposition to a site because it is too risky. Under the Layered Approach, there are thus no fewer than four limits on site selection in addition to the developer's good sense: EPA's Class VI regulations; the financiers and insurers of the project; the Secretary of Energy, who is not compelled to enter into any cooperative agreement, let alone one he deems too risky; and participants in the risk pool, should one develop.

Should damages from an incident exhaust the first and second layers, the federal government would hold third layer responsibility. As with the first two layers, third layer liability is capped at a set amount. However, unlike the first two, the third layer is a "lifetime" limit, rather than a per incident limit. If the government pays \$20 million for an incident in year 10, the cap on its obligation is reduced by that amount.

If an incident is so substantial that all of the first three layers are exhausted, any remaining liability is the responsibility of the owner/operator. This is the fourth and final layer.

Owners or operators who enter the cooperative agreement program early receive a better deal than do those who enter later, with the idea that as more experience is gained with geologic sequestration, less incentive will be needed to encourage it. There are many other features to the Layered Approach that we do not have space to discuss here.

The prevailing notion for managing risk from geologic sequestration—holding the government responsible for all risks and establishing a trust fund to pay if any damages should arise—accumulates the most money at a time when risks are widely expected to be lowest. This is not economically efficient. Even if one accepts the contention Adelman and Duncan submit, that brine intrusion is a more likely fortuity than CO₂ leakage, and that brine intrusion may continue many decades after injections have ceased at a facility, society should want to maintain efficient options for dealing with what is still expected to be a low probability outcome.

The Layered Approach was devised in 2010 in a collaborative effort between two of the nation's largest electric utilities, Southern Company and Duke Energy, Environmental Defense Fund, and international insurer Zurich. Each party had different reasons for preferring the Layered Approach to other liability schemes. Other than economic efficiency and prevention of moral hazard, which have been mentioned, one other rationale is of note. Some companies expect that regardless of proposals to relieve them of liability, there always will be attempts to make them pay if damages arise. Thus, a trust fund covering post-closure liabilities may be a cost with little or no benefit.

An essential premise of the Adelman-Duncan structure is that enhanced liability is required because under the prevailing concept for geologic sequestration liability, companies will be let off the hook for post-closure liabilities, and post-closure is a time when they assert liabilities are likely to arise (through brine intrusion). The Layered Approach obviates this premise because owners/operators will remain potentially liable even during post-closure. However, it does not obviate a second Adelman-Duncan premise, which is that even if companies remain liable, post-closure liability is too remote to factor into current decisions. As noted above, the cooperative agreement mechanism of the Layered Approach addresses this concern by requiring the Secretary of Energy's approval to gain the risk management benefits of the approach. A carrot, but only for worthy horses.

12. This "industry pool" concept is modeled after the Price Anderson Nuclear Industries Indemnity Act (42 U.S.C. §2210), which applies to damages caused by commercial nuclear facilities. While geologic sequestration supporters have been hesitant to refer to Price Anderson for fear of unintentionally equating damages from CO₂ sequestration with much more costly potential damages from commercial nuclear operation, nevertheless it is a useful model.

C O M M E N T

A Comment on *The Limits of Liability in Promoting Safe Geologic Sequestration of CO₂*

by Raymond B. Ludwiszewski and Karyn B. Marsh

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David Adelman and Ian Duncan provide a reality-check for potential liability arising out of geologic sequestration in their article, *The Limits of Liability in Promoting Safe Geologic Sequestration of CO₂*.¹ As a Research Scientist in the Bureau of Economic Geology at the University of Texas at Austin, Ian Duncan gives a much-needed scientific perspective on the material risks that geologic sequestration of carbon dioxide (“CO₂”) actually poses, and using law and economic analysis, Professor Adelman, the Harry Reasoner Chair in Law at the University of Texas, adeptly translates how these risks might be mitigated through common law and *ex ante* regulation. Their proposed approach, new federal legislation that combines regulation and tiered-tort liability, is sensible given the technical characteristics of geologic sequestration, and would adequately address the probable risks.

Yet, while acknowledging the current anti-regulatory sentiment in Washington, D.C. and concerns over federalism, the authors fail to supply either sufficient detail on the proposed federal legislation embodying their approach or practical suggestions for overcoming the lack of general consensus among lawmakers for the need to address climate change nationally, which is the fundamental hurdle for geologic sequestration.

I. The Real Risks of Geologic Sequestration

The lack of effective regulatory and liability policies with respect to long-term legal liabilities for CO₂ releases has been cited as one of the greatest barriers to deployment of carbon capture and storage (“CCS”) via geologic sequestration.² The public reaction to geologic sequestration has

generally been fear of catastrophic environmental damage or personal injury, either from leakage of CO₂ into drinking water supplies or sudden releases of CO₂ to the ground surface.³ On that assumption, commentators, advocates and both federal and state regulators have proposed regulatory and legal frameworks addressing primarily the risk of CO₂ releases.

Interestingly, injection of CO₂ (albeit in smaller quantities than for geologic sequestration) into oil bearing formations at similar depths (e.g., over 5,000 feet) has been conducted safely for enhanced oil recovery for over 40 years, and natural gas is routinely stored in underground reservoirs similar to those proposed for geologic sequestration (although for shorter periods). Under the Safe Drinking Water Act (“SDWA”) Underground Injection Control (“UIC”) Program, EPA has been regulating the disposal of industrial hazardous wastes into deep wells for over 30 years.

Duncan and Adelman largely dispel the fears regarding CO₂ leakage by providing a reasoned examination of the data and conclusions of recent studies on geologic sequestration.⁴ In so doing, however, they paint a more complex picture of the risk landscape that geologic sequestration poses.⁵

Up to this point, most scientists supposed that the CO₂ plume would move quickly during active injection operations, but would gradually slow down after injection ceased as the CO₂ dissolved into the formation and associated water or brine. This physical retardation and chemical trapping of the CO₂ meant that the risk of CO₂ leakage to

1. David E. Adelman & Ian J. Duncan, *The Limits of Liability in Promoting Safe Geologic Sequestration of CO₂*, 22 DUKE ENVTL. L. & POL’Y F. 1 (2011).
2. See U.S. GOV’T ACCOUNTABILITY OFFICE, GAO-08-1080 REPORT TO THE CHAIRMAN OF THE SELECT COMMITTEE ON ENERGY INDEPENDENCE AND GLOBAL WARMING, HOUSE OF REPRESENTATIVES: CLIMATE CHANGE, FED-

ERAL ACTIONS WILL GREATLY AFFECT THE VIABILITY OF CARBON CAPTURE AND STORAGE AS A KEY MITIGATION OPTION 15 (Sept. 2008).

3. See, e.g., GREENPEACE INT’L, FALSE HOPE: WHY CARBON CAPTURE AND STORAGE WON’T SAVE THE CLIMATE 30 (2008), available at <http://www.greenpeace.org/international/en/publications/reports/false-hope/> (last visited Mar. 4, 2013) (discussing the release of CO₂ from volcanic Lake Nyos in Cameroon, which was due to a natural phenomenon not related to geologic sequestration).
4. Adelman & Duncan, *supra* note 1, at 4-5.
5. *Id.* at 14.

the surface decreased significantly over time after cessation of injection operations. Advocates for geologic sequestration would often cite this expected behavior to quell fears of release of CO₂ in the distant future, e.g., 50 years after the last injection of CO₂. The recent studies bear this concept out: showing that migration of the CO₂ plume would be very slow, moving about 11 feet on average per year, and that 87 percent of the injected CO₂ would be immobilized in the rock formation after 200 years.⁶ Thus, the average areal limit of the CO₂ plume would be less than three miles around an injection site after 50 years and about eight miles after 200 years.

In contrast, however, these recent studies also show that the *brine* displaced by the CO₂ moves more quickly and further over time. Simulations of the pressure front driving brine movement would extend to around 93 miles from the injection well after 50 years of injection operations.⁷ Furthermore, if there are other CO₂ injection wells in the area, simulations using 20 injection wells in one brine reservoir indicate that the pressure fronts from these individual wells would interact with each other within a *half-year* and the net pressure front from all the wells would extend to approximately a 170-mile radius after only 50 years of injection operations.⁸ Factoring in abandoned oil and gas wells or faults in the large areas impacted by the pressure front, the simulations indicate that brine leakage through these conduits would occur from 50 to 150 years after CO₂ injection ceased.⁹ Thus, the intrusion of brine, as opposed to CO₂, into drinking water aquifers appears to be the more probable risk arising out of geologic sequestration,¹⁰ and these fundamental differences between the behavior of brine and that of CO₂ in the subsurface have significant implications for the effective regulation of CCS.¹¹

II. Adelman and Duncan's Suggested Legal Framework

Both the federal and state agencies have enacted regulations addressing geologic sequestration. In December 2010, the United States Environmental Protection Agency ("EPA") promulgated final rules for CO₂ injection wells under the UIC Program. These rules include standards for siting, construction, operation, monitoring and closure of CO₂ injection wells.¹² Additionally, EPA issued a draft guidance, which provides that operators must

conduct post-closure care and monitoring for 50 years unless they can show that the CO₂ plume and pressure fronts no longer pose a risk of endangerment to drinking water sources.¹³ Several states, including Wyoming, Texas, Oklahoma, Kansas, and North Dakota, have also promulgated similar regulations.

The Sword of Damocles in all of this is the imposition of liability under State common law or federal environmental law for releases of CO₂ or brine into drinking water aquifers. The CCS industry argues that the prospect of open-ended and debilitating liability for releases in the distant future is deterring the implementation of CCS today.¹⁴ Consequently, transfer of long-term liability for these sites to a governmental agency after a certain amount of time has been proposed to encourage implementation of CCS.¹⁵ Shifting the risk for environmental harm to innocent parties, however, raises the concern that it will disincentivize CCS operators from taking all precautions to prevent future releases.

Adelman and Duncan, however, challenge this concern by arguing that fear of long-term and latent tort liability has a minimal deterrent effect on current behavior, and that tort liability's utility arises only when the prospect of loss is in the near term.¹⁶ Thus, to the extent brine intrusion occurs during the period of active CO₂ injection or the first few years after cessation of CO₂ injection, the CCS operator will be motivated to exercise due care in siting, operating and monitoring the injection well. However, to the extent a release of either brine or CO₂ occurs beyond the operational and closure phases, the only effective tool for limiting this long-term risk is governmental regulation.¹⁷

When it comes to geologic sequestration, the bottom line is that the actions or omissions of CCS operators in the present will largely determine the long-term liabilities. Adelman and Duncan support the use of federal regulations because they can establish baseline standards of care for the siting, operation, and closure of geologic sequestration sites, provide expertise to States that may not have the resources to formulate effective regulations, and prevent the creation of a patchwork of standards by individual States. Nevertheless, the authors point out that the geologic sequestration rules set by EPA do not motivate CCS operators to exceed minimum standards¹⁸ or to develop the best sites with the lowest risk profile.¹⁹ That motivation, they argue, can only come from the threat of tort liability.

6. Quanlin Zhou et al., *Modeling Basin- and Plume-Scale Processes of CO₂ Storage for Full-Scale Deployment*, 48 GROUND WATER 494, 500 (2010).

7. *Id.* at 506-507.

8. *Id.* at 509-10.

9. *Id.*

10. Adelman & Duncan, *supra* note 1, at 5.

11. *Id.* at 10.

12. Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO₂) Geologic Sequestration (GS) Wells, 75 Fed. Reg. 77230 (Dec. 10, 2010).

13. EPA Draft Financial Responsibility Guidance for UIC Class VI Program, Dec. 2010, 99-100.

14. Adelman & Duncan, *supra* note 1, at 1.

15. See, e.g., WENDY B. JACOBS & DEBRA STUMP, PROPOSED LIABILITY FRAMEWORK FOR GEOLOGICAL SEQUESTRATION OF CARBON DIOXIDE (Harvard Law Sch., Emmett Envtl. Law & Pol'y Clinic, Working Paper, 2010).

16. Adelman & Duncan, *supra* note 1, at 2-3.

17. *Id.* at 7.

18. *Id.* at 11.

19. *Id.*

Accordingly, they suggest that the best approach will ensure that geologic sequestration sites are properly selected and operated and to that end, propose a complementary system of *ex ante* regulation that ranks potential geologic sequestration sites and tort liability, which assigns essentially a negligence standard to high-quality, low-risk sites and a strict liability standard to lower-quality, but high-risk sites.²⁰

III. Implementing a Pragmatic Approach

If we are to promulgate effective regulation of geologic sequestration, we must have an understanding of the probable risks. Adelman and Duncan's article provides important insights into these risks. In light of these scientific studies, their proposed legal framework recognizes the inability of State common law to mitigate long-term risks posed by geologic sequestration, particularly if the reservoir extends across State lines and is utilized by several operators, and the efficiency of uniform federal standards, while allowing flexibility for a State's regulation of its natural resources.

Unfortunately, although Adelman and Duncan provide a strong theoretical basis for their approach, they do not provide specifics on the actual federal legislation that might be introduced in Congress. For example, they recommend retention of the current SDWA UIC regulations for geologic sequestration wells,²¹ but do not provide further details. Will the new legislation's geologic sequestration site ranking be similar to the site ranking system promulgated under the Comprehensive Environmental

Response, Compensation and Liability Act ("CERCLA")? Will the United States Geological Survey or the EPA be the primary agency? What role will State agencies have in enforcing the new federal law? Will the federal law provide a cause of action against CCS operators, like CERCLA's cost recovery or contribution provisions, sections 107(a) and 113? If so, who would be able to sue and for what damages? How would differences in State property law regarding mineral estates and pore space be addressed? How would State regulations for geologic sequestration relate to federal regulations? Would the new law exempt geologic sequestration from federal laws, like the Resource Conservation and Recovery Act and CERCLA? Would the current UIC regulations need to be amended to address the issue of brine intrusion? These and other questions will be essential considerations for lawmakers devising, debating and amending a draft bill.

CCS and geologic sequestration are intimately bound up with greenhouse gas regulation. In spite of the attention President Obama gave to climate change in his second inaugural speech, the prospect of any new federal law addressing CO₂ emissions passing in the 113th Congress remains doubtful. Powerful elements in Congress believe any federal climate change regulation would be detrimental to the United States' economy and intrude on the prerogatives of the States. Adelman and Duncan acknowledge the debate over federalism and environmental regulation, but go no further in addressing the issue.²² Yet, it is this key opposition to greenhouse gas regulation that is the true barrier to the implementation of CCS and geologic sequestration. Until Congress comes to some agreement on greenhouse gas regulation, national efforts to promote CCS and geologic sequestration will continue to flounder.

20. *Id.* at 9, 12-13.

21. *Id.* at 11.

22. *Id.*

C O M M E N T

Long-Term Stewardship of Geologic Sequestration of CO₂

by John Pendergrass

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David Adelman and Ian Duncan propose to combine liability with regulation of geologic sequestration of CO₂,¹ providing a useful discussion of the relative advantages and disadvantages of each policy instrument as applied to carbon capture and sequestration (CCS). Further details of how their proposal would be implemented are essential to fully evaluating its merits and likelihood of success. The authors make a valuable contribution to interdisciplinary understanding of the technical and legal issues associated with geologic sequestration of carbon dioxide (CO₂) by reviewing and explaining the scientific literature of sequestration preliminary to concluding that risks associated with the technology are misunderstood. They suggest that the risk of release of CO₂ is likely to have a longer latency period than advocates of carbon capture and sequestration assert, but that such releases of CO₂ to the atmosphere will not pose a significant threat to humans.² According to the authors, the most significant harm to the environment will be contamination of drinking water due to brine intrusion.

Through their extensive discussion of the low risks of CO₂ leakage the authors seem to suggest that there is little need to design a system to prevent or govern releases of CO₂ into the atmosphere. The authors and the IPCC Special Report discuss the technology of CCS in terms of its likelihood of containing the injected CO₂ in the geologic formations and minimizing the potential for releasing CO₂. Both the authors and the IPCC also assert that monitoring and detection technologies are likely to discover such releases in a relatively short time after the release begins or even before it reaches the surface. These may indeed be unlikely events, but experience in other fields suggests that uncertainty is a given and that technology and human endeavors do not always operate as expected or intended.

The technology for CCS has the potential to sequester a large percentage of CO₂ emissions over the next few

decades. In part this is due to the large number of sites that are asserted to be suitable for CCS. The combination of the large number of sites and quantity of CO₂ sequestered with the long time periods essential to making CCS viable increases the significance of the effects that even a low probability event might have. The system for governing this technology should be designed to deal with these risks.

Latency is the key issue for governing CCS, which the authors note is the “Achilles heel of tort liability.”³ Having explained why liability is inadequate to promote good decision making in site selection and operation, the authors assert that “government regulation has the capacity to target risks with long latency periods.”⁴ The focus on design of a regulatory system is too narrow. Implementation of regulations is as important to the success of a regulatory system as the drafting of the regulations. Assuming that it is possible to pass legislation to authorize an appropriate regulatory system,⁵ drafting “effective performance-based regulations” is a difficult and uncertain task, but it is at least a discrete and likely a one-time task. Assuming further that such regulations are promulgated, implementation will be critical. The decades over which it will be necessary to implement these regulations is when the “temporal myopia and political pressures” are more likely to manifest and be more debilitating than during promulgation of regulations. The regulatory aspect of the preferred hybrid system can be successful only if it is implemented consistently over the required decades by a large number of actors.

The Safe Drinking Water Act, like most federal pollution control statutes, is delegable to the states. State implementation of federal minimum standards under federal environmental statutes is a significant strength of the federal system, but it also is much more complicated than

1. David E. Adelman & Ian J. Duncan, *The Limits of Liability in Promoting Safe Geologic Sequestration of CO₂*, 22 DUKE ENVTL. L. & POL'Y F. 1 (2011).
2. *Id.* at 2. *But see* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, SPECIAL REPORT ON CARBON DIOXIDE CAPTURE AND STORAGE 34 (listing several potential human exposure pathways and risks to human health and life).

3. Adelman and Duncan, *supra* note 1, at 6.

4. *Id.*

5. *Id.* at 10-11 (EPA authority under the Safe Drinking Water Act is limited to setting minimum standards and additional authority would be required to authorize a program to rank sites and to establish liability for releases of brine). Legislation would also be required to provide for government assumption of long-term stewardship.

the system as laid out by the authors. Delegation to states mitigates some of the difficulties raised by the authors, particularly the assumed lack of capacity of EPA staff to monitor site operations. By assuming responsibility for implementing federal statutes, states substantially amplify the number of staff available to implement those laws. As much as 90 percent of enforcement of federal environmental laws is by state officials. But such delegation also makes it more difficult to achieve consistent implementation of the minimum federal standards for site selection and operation. Monitoring and enforcement by states also varies substantially, both among states and over time within a particular state. Federal oversight is an imperfect means for assuring consistent implementation of federal laws and is a nearly constant source of tension between states and the federal government. This is the reality that must be considered in determining what approach to coping with risk is most appropriate—not just what are the best instruments in theory, but what can be implemented under the existing system.

In particular, increased attention is needed to long-term stewardship of CCS “sites” after the post-closure period of responsibility that EPA guidance suggests is appropriate. The authors devote relatively little attention to this aspect of long-term stewardship, asserting that there is consensus in favor of government assumption of this responsibility, but acknowledging controversy exists over how this should be accomplished.⁶ Experience with contaminated sites, buried pipelines and electric lines, and storage of nuclear waste, among other long-lasting underground risks demonstrates that long-term stewardship is a complex undertaking.⁷ The lessons learned from these programs indicate that long-term stewardship deserves the same attention to its design and implementation as does the regulatory system for CCS.

Long-term stewardship encompasses all activities required to maintain an adequate level of protection to human health and the environment from the hazards posed by a particular activity, in this case CCS.⁸ In order to be effective, long-term stewardship must meet objectives based on the risks against which it is intended to provide protection.⁹ In the case of CCS, it would need to operate for as long as the risk remains, or approximately 100 years for the risk of brine intrusion. It would need to minimize human and environmental exposure; provide information to future users of the CCS field and potentially affected aquifers of the risks associated with activities that might increase the risk of brine intrusion; maintain records and information about the CCS field and its potential effects on surrounding resources in a manner that will allow future

regulators and users to reevaluate the risk to determine if different measures are needed (or the existing ones may be relaxed); and be effective even if future users ignore or are not aware of the available information.¹⁰

It is too simple to say that long-term stewardship of CCS sites should be the responsibility of the federal government. First, that ignores that the federal government has generally asserted that it should not be responsible for long-term stewardship of contaminated sites, unless it owned the land or was responsible for the contamination. In the case of contaminated sites, the federal government prefers that owners and operators of sites be responsible for long-term stewardship with states assuming primary responsibility for oversight. The Waste Isolation Pilot Project and the federal responsibility for a disposal facility for waste nuclear fuel are exceptions based on statutory requirements passed to facilitate development of civilian nuclear power. Similar legislation would be necessary to establish federal government responsibility for CCS sites.

Long-term stewardship implicates too many entities and levels of government for it to be fully assigned to the federal government, or to any single entity. CCS will affect such large areas and in such different manners that it is misleading to refer to a CCS “site”. There is the limited area covered by the borehole, the larger underground area where CO₂ is injected and eventually will migrate to fill, and there is the even larger area subject to increased pressures. Each of these presents different functions for monitoring, recordkeeping, and providing warnings to potential users of those spaces. Information about the CO₂ field will need to be provided to anyone who might consider drilling in those areas. Precedents for such systems exist in the “Miss Utility” programs warning people to check for buried utilities before they dig. But, such programs regularly and consistently fail, though those failures relatively rarely result in injury or death.¹¹ These systems are mandated by federal rules, but implemented by the states and private parties.

Similarly, long-term stewardship to protect against intrusion of brine into drinking water supplies will necessarily involve the public and private suppliers who use potentially affected aquifers as well as the states that regulate such suppliers. In many parts of the country the potential users of such aquifers will include homeowners, some of whom can be expected to drill without first consulting any authority. Moreover, in some states property owners will have the right to drill to obtain water for individual use. It is highly unlikely that any federal legislation on CCS will attempt to preempt state laws relating to regulation of groundwater.

Long-term stewardship of CCS will require a spectrum of activities from setting performance standards, to keeping records of injection sites, to monitoring pressures and movement of CO₂ and brine plumes, to provision of information to property owners and users, water suppliers, drillers, and others. Those activities cannot, and should not, all

6. *Id.* at 5.

7. See ENVIRONMENTAL LAW INSTITUTE, INSTITUTIONAL CONTROLS IN USE (1995).

8. See, e.g., ENVIRONMENTAL LAW INSTITUTE AND ENERGY COMMUNITIES ALLIANCE, THE ROLE OF LOCAL GOVERNMENTS IN LONG-TERM STEWARDSHIP AT DOE FACILITIES (2001).

9. See John Pendergrass, *Institutional Controls in the States: What Is and Can Be Done to Protect Public Health at Brounfields*, 35 CONN. L. REV. 1303, 1313 (2003).

10. *Id.* at 1313-14.

11. INSTITUTIONAL CONTROLS IN USE, *supra* note 7.

be undertaken by a single entity. Adelman and Duncan note that most proposals for long-term stewardship of CCS are multilayered, which is appropriate given the nature of the activities involved and the variety of people and entities

affected by those activities. To be effective long-term stewardship must be multilayered because experience has shown that no single measure is sufficient to protect against risks that have long latency periods and are not easily observed.

A R T I C L E

Critical Habitat and the Challenge of Regulating Small Harms

by Dave Owen

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I. Statutory Requirements for Critical Habitat Protection

The ESA is the most important U.S. law protecting biodiversity. The Act is designed to prevent the extinction of imperiled animal and plant species and to promote those species' recovery.¹ To those ends, it requires the services to list species that are in danger of extinction² and to designate critical habitat for those species.³ That critical habitat should include both occupied and unoccupied habitat with "physical or biological features . . . essential to the conservation of the species."⁴

Once critical habitat is designated, its protection comes from ESA section 7. Section 7 requires federal agencies taking actions ("action agencies," in ESA terminology) that might adversely affect listed species to consult with the relevant service⁵ and obtain a written report known as a "biological opinion."⁶ A biological opinion expresses the service's opinion about whether the project will "jeopardize" the survival of listed species (a concept explained in

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1. See 16 U.S.C. §1531(b) (2006) (defining "conservation" of species as the core statutory goal); *id.* §1532(3) (defining "conservation" in terms of recovery (internal quotation marks omitted)).
2. See *id.* §1533(a).
3. *Id.* §1533(a)(3).
4. 16 U.S.C. §1532(5). The ESA defines "conservation" in terms of recovery, and critical habitat therefore is habitat with features that make it essential to species' survival or recovery. See *id.* §1532(3).
5. With some exceptions, NMFS holds jurisdiction over marine and anadromous fish species, and FWS holds jurisdiction over terrestrial and freshwater species.
6. 16 U.S.C. §1536(b).

more detail below) or will result in adverse modification.⁷ Once the action agency has received a biological opinion, it theoretically has the discretion to follow or to disregard the opinion's recommendations.⁸ In practice, however, action agencies rarely proceed with an action that the services predict will cause adverse modification or jeopardy.⁹ This "formal consultation" process is usually preceded by and often intertwined with a more informal process in which the action agency and the services negotiate changes to the project.¹⁰ Every year, thousands of actions are subject to this consultation process. Section 7 applies only to federal agencies, and therefore purely state, local, and private actions do not require consultation.¹¹

The adverse modification prohibition is not the ESA's only regulatory protection for habitat. First, section 7 also precludes federal agencies from performing actions "likely to jeopardize the continued existence of any [listed] species. . . ." ¹² This prohibition is implemented through the same consultation process.¹³ The jeopardy analysis should encompass any threat a project poses to listed species, including but not limited to habitat degradation.¹⁴ Second, ESA section 9 makes it unlawful for "any person" to "take" any endangered species.¹⁵ The Act defines "take" broadly, and the Supreme Court has upheld agency regulations that treat some forms of habitat modification as prohibited "takes."¹⁶ Though far-reaching, the take prohibition is not absolute. Private parties may obtain incidental take permits if they prepare "habitat conservation plans" that meet the requirements of ESA section 10.¹⁷ Federal agencies (and recipients

7. *Id.* §1536(a)(2).
8. 50 C.F.R. §402.15(a) (2010).
9. See *Bennett v. Spear*, 520 U.S. 154, 170 (1997).
10. See generally U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., ENDANGERED SPECIES ACT CONSULTATION HANDBOOK (1998) [hereinafter CONSULTATION HANDBOOK].
11. 16 U.S.C. §1536(a)(2) (2006) (imposing obligations on "[e]ach federal agency").
12. 16 U.S.C. §1536(a)(2).
13. CONSULTATION HANDBOOK, *supra* note 10, at 4-33 to -34.
14. See *id.* at 4-23 to -43 (describing the scope of the project impacts analysis).
15. 16 U.S.C. §1538(a)(1) (2006). By regulation, the services have extended these protections to many threatened species. *Id.*
16. *Babbitt v. Sweet Home Chapter of Cmty. for a Great Or.*, 515 U.S. 687, 704-06 (1995).
17. 16 U.S.C. §1539; see also J.B. Ruhl, *How to Kill Endangered Species, Legally: The Nuts and Bolts of Endangered Species Act "HCP" Permits for Real Estate*

of permits or funding from federal agencies) may also obtain “incidental take authorization” if they complete the section 7 consultation process and implement the “reasonable and prudent measures” specified in the biological opinion.¹⁸

A. The Combination of Approaches and the Adverse Modification Prohibition’s Potentially Unique Role

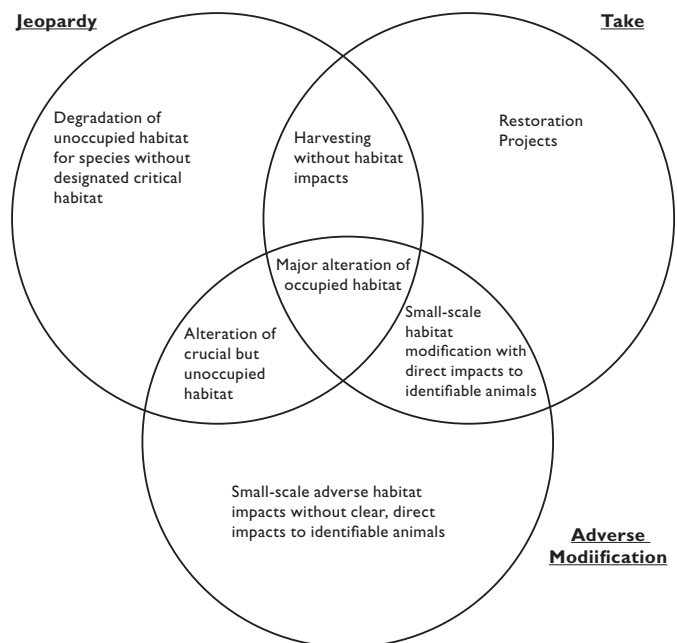
The potential for the take and jeopardy prohibitions to overlap with the adverse modification prohibition is obvious. If a federal agency action is likely to cause major negative impacts to listed species, the jeopardy prohibition should apply, and the critical habitat provisions will simply offer an overlapping layer of protection. Similarly, if an action will lead to clear and discernible impacts to identifiable animals, the take prohibition should apply,¹⁹ and the critical habitat protections again offer a redundant layer of protection. Nevertheless, there would appear, at least on paper, to be circumstances in which the adverse modification prohibition alone would apply.²⁰

The adverse modification prohibition appears to go beyond the jeopardy prohibition in two categories of actions.²¹ First, some federal actions may adversely modify habitat but not cause enough harm to create a likelihood of jeopardy. The services have consistently asserted that even after a species has been listed, it is generally possible to cause additional harm to the species without pushing it over the brink into jeopardy.²² At least in some circumstances, this is a plausible statutory interpretation.²³ The adverse modification prohibition, by contrast, is more absolute. The statute’s plain language precludes federal agency actions from causing negative changes to critical habitat, even if the change is small.²⁴ Second, some federal actions will adversely modify

habitat but will have uncertain impacts upon species’ survival. Consequently, determining whether an individual project might pose enough risk to create jeopardy can be quite difficult, even if the project clearly will have adverse impacts on critical habitat.²⁵

The take prohibition also overlaps significantly, but not completely, with the ESA’s prohibition on adverse modification. Many actions that modify habitat also directly take listed species. But, as the Supreme Court’s *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon* decision illustrates, not every habitat modification will result in take.²⁶ In that case, both the majority opinion and Justice O’Connor’s concurrence emphasized the need for a proximate causal relationship between the activity and harm to specific animals. In theory, that relationship might be absent even where harm to critical habitat clearly is occurring, either because species are absent from the action area at the time of the activity or because the action affects habitat but has uncertain causal connections to harm to identifiable animals.²⁷

Figure 1: The ESA’s Prohibitions



This diagram shows examples of types of actions to which each of the ESA’s regulatory prohibitions would apply. It also illustrates areas of potential overlap and, based on the plain language of the statute, unique application of each prohibition.

Development, 5 ENVTL. L. 345, 345 (1999).

18. *Id.* §1536(b)(4).

19. See *infra* notes 70–71 and accompanying text.

20. But see *infra* Part III (discussing the services’ apparent determination that these circumstances do not actually exist).

21. For a parallel analysis of the relationship between jeopardy and adverse modification, see Houck, *infra* note 67, at 300–01.

22. See CONSULTATION HANDBOOK, *supra* note 10, at 4–36 (explaining that not all adverse effects will rise to the level of causing jeopardy); Daniel J. Rohlf, *Jeopardy Under the Endangered Species Act: Playing a Game Protected Species Can’t Win*, 41 WASHBURN L.J. 114, 141–42 (2001) (describing the services’ willingness to allocate the “cushion” of tolerable harm).

23. If a species’ population is stable or improving, it could absorb some harm from individual actions without jeopardizing its existence. If habitat conditions are generally declining, and the individual project is contributing to that cumulative trend, a jeopardy finding seems less appropriate. But unlike the Council on Environmental Quality, which in its National Environmental Policy Act regulations has clearly required federal agencies to address such cumulative impacts, the services have been ambivalent at best about adopting a cumulative impacts approach to jeopardy findings. See 40 C.F.R. §1508.27(b)(7) (2010) (distinguishing between those actions that create environmental impacts that are “individually insignificant but cumulatively significant”); Rohlf, *supra* note 22, at 137–43 (discussing the services’ shifting approaches to cumulative impact analyses).

24. See William H. Rodgers Jr., *Indian Tribes*, in 1 THE ENDANGERED SPECIES ACT AT THIRTY: RENEWING THE CONSERVATION PROMISE 161, 170 (Dale D. Goble et al. eds., 2005) (“Backing the tractor over a single salmon redd

is an actionable deed of ‘destruction’ or ‘modification’ if the necessary paperwork is done.”).

25. The statutory language does not require certainty as a predicate to a jeopardy finding; it instead prohibits actions “likely” to cause jeopardy. See 16 U.S.C. §1536(a)(2) (2006). But as a practical matter, the services are probably much less likely to impose the constraints associated with a jeopardy finding in circumstances where they are highly uncertain about an action’s future effects.

26. 515 U.S. 687 (1995).

27. *Id.* at 690, 700 n.13 (quoting the services’ joint regulations) (internal quotation marks omitted).

At first blush, these categories of actions to which the adverse modification provision alone applies might seem trivial.²⁸ In actuality, they are probably enormous.²⁹ Whether the threat arises from creeping development or climate change, to provide just two examples, many species are imperiled by the incremental consequences of hundreds, if not thousands, of small habitat modifications. Attributing jeopardy or take to any one individual action could be quite difficult. Consequently, for some of the most extensive threats to species, the adverse modification prohibition seems to be the ESA's primary answer.

II. The Prohibition in Practice

While on paper the adverse modification prohibition appears to be one of the most powerful and far-reaching provisions in environmental law, the law in practice is not always the same as the law on the books. Therefore, to explore actual practices, I pursued a series of inquiries. First, I compiled a database of over 4,000 biological opinions and tracked the frequency of adverse modification and jeopardy findings. Next, I compiled smaller databases of biological opinions for roughly comparable species with and without critical habitat and examined whether a critical habitat designation made any discernible difference in the consultation approach or outcomes. Third, in a series of semi-structured interviews, I asked FWS and NOAA Fisheries staff about their experiences implementing the adverse modification prohibition. Finally, I reviewed court cases considering the adverse modification prohibition. The bullet points and tables below summarize the key findings.

A. Documentary Evidence of Implementation of the Adverse Modification Prohibition

Like several prior studies, I found that jeopardy and adverse modification determinations are very rare. I also found little evidence that a critical habitat designation increased the odds of a negative biological opinion. In fact, my data set did not include a single opinion in which either NMFS or FWS found adverse modification without finding jeopardy.³⁰

28. See, e.g., Barton H. Thompson Jr., *People or Prairie Chickens: The Uncertain Search for Optimal Biodiversity*, 51 STAN. L. REV. 1127, 1141 (explaining why the critical habitat provisions rarely assume independent significance).

29. See generally William E. Odum, *Environmental Degradation and the Tyranny of Small Decisions*, 32 BIOSCIENCE 728, 728 ("Each threatened and endangered species, with a few exceptions, owes its special status to a series of small decisions.").

30. To calculate the overall frequency of jeopardy determinations, I divided the total number of jeopardy determinations by the total number of biological opinions. To calculate the frequency of jeopardy determinations for species with designated critical habitat, I divided the total number of jeopardy determinations for those species by the number of biological opinions for those species. To calculate the frequency of jeopardy determinations for species without critical habitat, I divided the number of jeopardy opinions for such species by the total number of biological opinions for such species. To calculate the frequency of adverse modification decisions, I divided the total number of adverse modification opinions by the total number of

Table 1: Frequency of Jeopardy (J) and Adverse Modification (AM) Determinations

	NMFS (2962 opinions total)			FWS (1085 opinions total; 786 non-Utah opinions)		
	Total	Bush Admin.	Obama Admin.	Total	Bush Admin.	Obama Admin.
Frequency of J determinations	0.54%	0.66%	0%	7.2%	8.5%	0%
w/o Utah				2.4%	2.9%	0%
Frequency of AM determinations	0.64%	0.81%	0%	6.7%	8.2%	0%
w/o Utah				0.67%	1.0%	0%
# AM determinations w/o jeopardy	0	0	0	0	0	0
Jeopardy percentage for species w/o CH	0.13%	0.15%	0%	3.7%	4.1%	0%
w/o Utah				3.7%	4.1%	0%
Jeopardy percentage for species w/ CH	0.68%	0.87%	0%	7.9%	9.5%	0%
w/o Utah				3.2%	3.7%	0%

Throughout this table, I used the following short forms: Jeopardy (J); Adverse Modification (AM); Critical Habitat (CH).

In my comparison of subsets of biological opinions, I found no evidence, qualitative or quantitative, that the services were approaching consultation differently in critical habitat areas. In that comparative analysis, I also found that the services routinely declined to find adverse modification even where they anticipated adverse impacts on habitat, and even where they concluded that those adverse habitat impacts would result in takes.

The opinions also indicate *why* the agencies were never finding adverse modification. Quite simply, the services do not construe the adverse modification prohibition as applying to minor alterations to habitat. And in the 138 opinions I closely reviewed, all negative alterations were described—sometimes convincingly, sometimes not—as minor.

B. Documentary Evidence of Alternative Habitat Protection Measures

While the services seemed reluctant to invoke the adverse modification prohibition—this was only half of the story. They were taking steps to protect habitat. Biological opinions almost always predict that proposed projects will cause take of listed species, which they usually find to be at least partly due to habitat modifications.³¹ In almost all of the opinions that anticipated take through habitat modification, the relevant service tried to limit that take by imposing “reasonable and prudent measure[s]” at least partially designed to protect habitat. They also imposed

opinions for species with designated critical habitat. The data tables supporting these calculations are available on request from the author.

31. See *infra* Table 2.

Table 2: Frequency of Jeopardy (J), Adverse Modification (AM), and Take Findings for Selected Subsets of Biological Opinions

Species group	Total # opinions	Percent predicting positive (+), negative (-), neutral (=) / uncertain (?) habitat trends	J findings	AM findings	Percent finding “take” partly or entirely due to habitat modification (for opinions predicting negative habitat trend and for all opinions)	Percent imposing “reasonable and prudent measures”
Coho (CH)	47	32% + 36% - 32% ?	0	0	94% - 94% overall	96%
Coho (no CH)	13	46% + 23% - 31% =/?	0	0	100% - 77% overall	90%
Rio Grande silv. minnow (CH)	18	56% + 39% - 6% =/?	0	0	14% - 56% overall	100%
Gila topminnow (no CH)	9	44% + 22% - 33% =/?	0	0	100% - 89% overall	89%
Oregon (CH)	18	56% + 39% - 6% =/?	0	0	100% - 94% overall	100%
Oregon (no CH)	29	48% + 28% - 24% =/?	0	0	88% - 66% overall	90%
Oregon (mixed)	4	75% + 0% - 25% ?	0	0	NA 75% overall	100%
All non-CH opinions	51	47% + 25.5% - 27.5% =/?	0	0	92% - 73% overall	90%
All CH opinions	83	42% + 37% - 20% =/?	0	0	76% - 86% overall	98%
All mixed opinions	4	75% + 0% — 25% ?	0	0	NA 75% overall	100%
All opinions	138	45% + 32% - 23% =/?	0	0	80% 81% overall	96%

The raw data supporting this table are available upon request from the author.

“conservation measures” to similar effect.³² And while the biological opinions did not reveal these changes, biologists told me that the services routinely ask agencies to modify their project descriptions in ways designed to protect species.³³ Despite variations in the nature of those conditions and the extent to which they were tailored to specific sites, one common theme emerged: the services expected many of the conditions to provide significant benefits to the species.³⁴ While a rigorous evaluation of the accuracy of those predictions is impossible without monitoring data and knowledge of the specific context of each project, most of the claims easily pass a straight-face test.³⁵

32. See, e.g., U.S. FISH & WILDLIFE SERV., N.M. ECOLOGICAL SERVS., ALBUQUERQUE, N.M., BIOLOGICAL OPINION ON THE EFFECTS OF THE TIFFANY SEDIMENT PLUG REMOVAL 5, 27 (2005).

33. See, e.g., Telephone Interview with FWS Biologist (Dec. 21, 2010) (explaining that FWS’ “preference always is to get conservation up front”).

34. E.g., Telephone Interview with NMFS Biologist (Nov. 16, 2010) (describing some of the conditions as “pretty much bombproof”).

35. For an exception to this generalization, see Memorandum from Field Supervisor, U.S. Fish & Wildlife Serv., N.M. Ecological Servs. Field Office, Albuquerque, N.M., to Dist. Ranger, Española Ranger Dist., Santa Fe Nat’l Forest, Española, N.M., at 44–45 (June 25, 2007) (requiring the future development of measures to address the adverse impacts of the project); see also *Ctr. for Biological Diversity v. Salazar*, No. CV 07–484 TUC–AWT,

C. Interviews

Despite documentary evidence suggesting that the critical habitat prohibition has little relevance, the interviews revealed that critical habitat designations have some subtle effects. Some, though not all, of the biologists believed that critical habitat designations slightly increased the likelihood that action agencies would engage in informal consultation prior to proceeding with projects. Some, though again not all, of the biologists thought that the process of designating critical habitat spurred the services to think more carefully about species’ habitat needs and that the resulting additional knowledge could help them develop more protective conditions. Many of the biologists thought that a critical habitat designation gave the services more leverage to negotiate habitat conditions. With one exception, none of the biologists thought the changes were large, and any assertion of major across-the-board effects would be difficult to reconcile with the

2011 WL 2160254, at **11–14 (D. Ariz. 2011) (describing, and rejecting as legally insufficient, reliance on uncertain mitigation measures).

Table 3: Summary of Agency Biologist Responses

Question	Answers by the numbers	Representative answers
Do you think CH designations affect the frequency with which action agencies engage in informal consultations?	Yes: 2 Yes, slightly: 4 Possibly: 2 No: 7	<ul style="list-style-type: none"> A few biologists thought designations sensitize action agencies to effects on habitat, leading to more consultations. Several biologists perceived a change in the frequency of informal consultations for unoccupied habitat.
Do you think CH designations make projects more likely to proceed to formal consultation?	Yes: 2 Yes, slightly: 3 Possibly: 2 No: 8	<ul style="list-style-type: none"> Several biologists mentioned consultations for unoccupied habitat. One biologist who said “no” noted that she was starting to question that approach.
Do you think CH designations affect the choice of conservation measures?	Yes: 5 Maybe: 2 Occasionally: 3 No: 5	<ul style="list-style-type: none"> People are “more willing to negotiate and mitigate.” “It makes a really big difference.” “Maybe, but not much.” “In any section 7 consultation, we strive to protect the species and the ecosystem it depends upon.”
Do you think CH designations affect the choice of RPMs?	Yes: 1 Possibly, or Occasionally: 2 No: 11	<ul style="list-style-type: none"> Many biologists asserted that RPMs should focus on mitigating take, not on independently protecting critical habitat. Two biologists who said “no” thought that might change.
Do you think CH designations affect the choice of RPAs?	Yes: 3 It should: 1 Maybe: 1 No: 7 No experience: 3	<ul style="list-style-type: none"> If an RPA came specifically out of an adverse modification determination, that would be a big deal.
Do you think CH designations increase the likelihood of jeopardy determinations?	Yes: 4 Maybe: 2 Hard to say: 1 No: 5 No experience: 3	<ul style="list-style-type: none"> Some biologists thought designations increase focus on habitat, which could change the outcome of the jeopardy analysis. Others argued that the jeopardy analysis was always focused on habitat and expected no change in outcomes.
Do you think CH designations affect outcomes in other ways?		<ul style="list-style-type: none"> They focus attention on particularly important areas. They help the services develop a better understanding of habitat needs. They cause actors “to take the ESA a little more seriously.” They create the inaccurate impression that nondesignated areas are unimportant. “Critical habitat has proved to be useful in negotiating regional conservation strategies for section 10(a)(1)(B) permits.”
Have you seen a change over time in the ways in which CH designations affect implementation?		<ul style="list-style-type: none"> Yes; it’s an “evolving concept.” More internal scrutiny of adverse modification questions. Greater willingness to designate unoccupied habitat. Biologists are increasingly able to get project proponents to change projects; “it didn’t used to be that way.” No, it’s still not that important in my region.

biological opinions. But all of the biologists thought that subtle effects do exist.³⁶

D. Adverse Modification in the Courts

Consultation processes occasionally culminate in litigation, and the courts therefore help to determine the effect of the adverse modification prohibition. I therefore also reviewed all published judicial decisions addressing the adverse modification prohibition, and found the following:

- For the entire thirty-eight year history of the ESA, LexisNexis and Westlaw’s databases contain only twenty-six decisions specifically invoking the

adverse modification prohibition to challenge federal agency actions.³⁷

36. The table that follows in the text should be read with a few caveats in mind. First, I did not ask for specific “yes,” “no,” or “I don’t know” answers, and consequently, the categories for the “by the numbers” column reflect the range of answers I received. Second, comments that do not appear in quotes are paraphrased. Third, one regional office provided me an e-mail combining the responses of multiple biologists in several field offices, and I have treated that as a single response. In short, this is a sampling of views, not a formal survey.

37. *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 173, 179, 184 (1978); *Sierra Club v. U.S. Army Corps of Engineers*, 645 F.3d 978, 991–92 (8th Cir. 2011); *Ctr. for Biological Diversity v. U.S. Forest Serv.*, 408 Fed. App’x 64, 65–66 (9th Cir. 2011); *Butte Envtl. Council v. U.S. Army Corps of Engrs.*, 620 F.3d 936, 947–48 (9th Cir. 2010); *Miccosukee Tribe v. U.S.*, 566 F.3d 1257, 1262–63 (11th Cir. 2009); *Nat’l Wildlife Fed’n v. Nat’l Marine Fisheries Serv.*, 524 F.3d 917, 924 (9th Cir. 2008); *Ctr. for Native Ecosystems v. Cables*, 509 F.3d 1310, 1322 (10th Cir. 2007); *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1063 (9th Cir. 2004); *Am. Rivers v. Nat’l Marine Fisheries Serv.*, No. 97-36159, 1999 U.S. App. LEXIS 3860, at **3–4 (9th Cir. Jan. 11, 1999); *Nat’l Wildlife Fed’n v. Coleman*, 529 F.2d 359, 361 (5th Cir. 1976); *Ctr. for Biological Diversity v. U.S. Bureau of Land Mgmt.*, No. 09–CV–8011–PCT–PGR, 2011 WL 4551175 (D. Ariz. 2011); *Ctr. for Biological Diversity v. Salazar*, No. CV 07–484 TUC–AWT, 2011 WL 2160254 (D. Ariz. 2011); *In re Consol. Salmonid Cases*, Nos. 1:09–CV–01053, 1:09–CV–01090, 1:09–CV–01373, 1:09–CV–01520, 1:09–CV–01580, 1:09–CV–01625, 2011 WL 4552293 (E.D. Cal. 2011); *San Luis & Delta-Mendota Water Auth. v. Salazar*, 760 F. Supp. 2d 855, 943–47 (E.D. Cal. 2010); *Forest Serv. Emps. for Envtl. Ethics v. U.S. Forest Serv.*, 726 F. Supp. 2d 1195, 1224–26 (D. Mont. 2010); *S. Yuba River Citizens League v. Nat’l Marine Fisheries Serv.*, 723 F. Supp. 2d 1247, 1276–79 (E.D. Cal. 2010); *Rock Creek Alliance v. U.S. Fish & Wildlife Serv.*, 703 F. Supp. 2d 1152, 1162 (D. Mont. 2010); *Pac. Coast Fed’n of Fishermen’s Ass’n v. Gutierrez*, 606 F. Supp. 2d 1122, 1145 (E.D. Cal. 2008); *Nez Perce Tribe v. NOAA Fisheries*, No. CV-07-247-N-BLW, 2008 U.S. Dist. LEXIS 28107, at **4–5 (D. Idaho Apr. 7,

- Despite the small overall number of cases, the amount of critical habitat litigation is increasing dramatically, with nineteen of the adverse modification decisions issued in just the last six years.³⁸
- In those cases, courts are giving independent significance to the adverse modification prohibition. This contravenes older assertions that at least in court, the adverse modification prohibition served primarily to bolster the jeopardy prohibition.
- Environmental plaintiffs have won most of the adverse modification cases.
- Courts are unsure how much habitat degradation is too much, and some will allow measurable degradation of critical habitat notwithstanding section 7's prohibition on adverse modification or destruction of that habitat.

III. Critical Habitat and the Challenges of Incremental Degradation

My study presents a mixed view of the services' protection of critical habitat. On the one hand, the services have done little with the adverse modification prohibition, and judicial intervention has been rare. The prohibition does influence some outcomes, but that influence is subtle and by some measures is hard to discern at all. Moreover, the services often decline to find adverse modification even where they clearly anticipate negative effects upon, and even destruction of, critical habitat. But while the services have accorded little weight to the adverse modification prohibition, they are consistently taking steps to protect habitat, and are demanding, and obtaining, modifications of nearly every project that is subject to consultation. Whether those modifications are sufficient, in the aggregate, to help species survive and recover is hard to say, but the services' consis-

tent tolerance of incremental habitat degradation suggests the answer is probably negative. Nevertheless, those modifications clearly provide species with much more protection than would exist in the absence of the ESA.

That mixed picture undercuts two widespread critiques of the ESA. One of these views, which assails the statute's alleged inflexibility, is difficult to reconcile with the agencies' selective non-implementation of an important statutory mandate, and with their preference for negotiating adjustments to projects rather than establishing stark prohibitions. A contrary narrative, in which the ESA is a "paper tiger" weakly implemented by captured regulators, is difficult to reconcile with the extensive habitat protection efforts in which the services are engaged. Both of these narratives often form the basis for calls for comprehensive, even drastic, statutory or administrative reforms. The inaccuracy of these narratives suggests that such drastic reforms may be unnecessary, and that there is much worth preserving in existing implementation approaches.

But that does not mean there is no need for more modest reforms. This part therefore considers adjustments that could improve ESA implementation.

A. The Core Dilemma and the Critical Habitat Response

Any effort to regulate incremental environmental degradation must address a crucial question: When are harms too small to trigger regulation?³⁹ Yet neither the ESA itself, which suggests a stringent and prohibitory regulatory system, nor the services, which have taken a more permissive course, have developed an effective response.

This dilemma is difficult to resolve partly because each of the obvious answers is flawed. One possibility is to try to prohibit every contribution to the environmental problem, no matter how small. But in practice, the administrative costs of such an approach could be extraordinary, the burdens imposed might outweigh any environmental gain, and both the regulators and the regulated would likely resist implementation.⁴⁰ Alternatively, regulators might prohibit only those actions that cause major harm (or prohibit nothing at all). But if the environmental problem is primarily caused by small actors, a regulatory approach focusing only on a few major actors will solve little.⁴¹ Moreover, any system that distinguishes between regulated "large" contributors and unregulated "small" ones faces a line-drawing problem. Environmental harms often exist on a continuum of scales, and if there is no clear distinction between small and large

2008); *Natural Res. Def. Council v. Kempthorne*, 506 F. Supp. 2d 322, 328 (E.D. Cal. 2007); *Or. Natural Desert Ass'n v. Lohn*, 485 F. Supp. 2d 1190, 1194 (D. Or. 2007); *Ctr. for Biological Diversity v. Bureau of Land Mgmt.*, 422 F. Supp. 2d 1115, 1121 (N.D. Cal. 2006); *Natural Res. Def. Council v. Rodgers*, 381 F. Supp. 2d 1212, 1219 (E.D. Cal. 2005); *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 235 F. Supp. 2d 1143, 1159 (W.D. Wash. 2002); *Idaho Rivers United v. Nat'l Marine Fisheries Serv.*, No. C94-1576R, 1995 WL 877502, at *3 (W.D. Wash. Nov. 9, 1995). Because the case includes an independent analysis of critical habitat impacts, I have also included *Preserve Our Island v. Army Corps of Engineers*, No. C08-1353RSM, 2009 WL 2511953, at **1, 4 (W.D. Wash. Aug. 13, 2009), in which the plaintiffs successfully challenged a determination that formal consultation was unnecessary, in this group. However, in general I have not included cases challenging alleged failures to consult, because in most of those decisions the court makes no attempt to provide a separate analysis for critical habitat protection. See, e.g., *W. Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 496-97 (9th Cir. 2011).

38. See *supra* note 37 (listing cases). I also have not included cases involving jurisdictional motions or other procedural litigation, and instead have listed only cases decided on the merits. The table below shows when adverse modification cases were decided. The 2011 numbers extend only through October 28.

Time Period	1973-1976	1976-1980	1981-1985	1986-1990	1991-1995	1996-2000	2001-2005	2006-2010	2011
Cases	1	1	0	0	1	1	2	14	5

39. See, e.g., Kevin M. Stack & Michael P. Vandenberg, *The One Percent Problem*, 111 COLUM. L. REV. 1385 (2011) (describing the prevalence of these challenges); Madeline June Kass, *A NEPA Climate Paradox: Taking Greenhouse Gases Into Account in Threshold Significance Determinations*, 42 IND. L. REV. 47, 62-63, 67, 85 (2009) (analyzing similar questions that arise in NEPA compliance).

40. See Kass, *supra* note 39, at 71.

41. See Michael P. Vandenberg, *From Smokestack to SUV: The Individual as Regulated Entity in the New Era of Environmental Law*, 57 VAND. L. REV. 515, 533-34 (2004).

harms, any line will seem somewhat arbitrary.⁴² The distinction is even harder to draw if, as is often the case, no one knows how much harm each action will cause.⁴³

This problem has been the Achilles heel of critical habitat protection. The statute itself suggests a very low regulatory threshold, under which the services would prohibit any federally approved worsening of critical habitat, no matter how minor.⁴⁴ But without some creative additional measures, such an approach cannot work. The services already are politically embattled and administratively swamped—“barely keeping our heads above water,” as one biologist put it—and it is difficult to imagine them performing individualized consultations on, let alone vetoing, many additional projects.⁴⁵ Congress, which has preferred using its power of the purse to *undercut* ESA implementation, is unlikely to appropriate the funds necessary to support a larger workload.⁴⁶ Also, the political backlash against more extensive regulatory prohibitions would almost certainly be intense. Unsurprisingly, the services have not embraced this approach, and they have sometimes assured the world that they never will.⁴⁷ Instead, they have chosen to prohibit a few major habitat modifications, to allow smaller modifications to proceed subject to conditions, to let other modifications proceed without any regulation at all, and to use a case-by-case approach to drawing the lines. That approach has several positive features, but it substitutes other problems.

First, the services' chosen approach necessitates distinguishing among levels of harm, and the services have struggled to define, let alone justify, the lines. As a practical matter, individual field offices and individual courts have been left to find thresholds on an ad hoc basis. Their choices have often been permissive, and their justifications sometimes seem premised on the dubious assumption that small harms pose no real threat to species.⁴⁸

The services' chosen approach also may be insufficiently protective. Recovering species is a core goal of the ESA.⁴⁹ But if a species was listed primarily because of the threat of habitat degradation—and, with most species, that was a primary, if not the primary, threat⁵⁰—then allowing additional habitat degradation is fundamentally inconsistent with that goal. In the absence of a rigorous effort to

relate individual consultation outcomes to broader species trends, it is very difficult to know if the services are doing enough.⁵¹ And even if their efforts are producing positive trends, they are doing so by shifting to a subset of regulated projects—and, to a large extent, to the taxpayer—the burden of compensating for the many projects that escape the adverse modification prohibition.

If critical habitat protection is to assume greater significance, and if the gap between the services' implementation approach and statutory requirements is to be reduced, if not closed, the services and the courts must resolve this regulatory thresholds dilemma. The discussion below explains two promising possibilities.⁵²

I. Low Thresholds and Offsite Mitigation

While reviewing biological opinions, I found very few uses of offsite mitigation to compensate for onsite environmental impacts.⁵³ If a project was going to degrade location A, the services generally imposed conditions to minimize (and sometimes eliminate) that degradation at location A, but they did not require compensatory restoration work at location B. Individual biologists did mention using this approach, but not extensively, and in their experience it was relatively new.⁵⁴ In taking this approach, they were working with little direction or guidance. The services' joint consultation regulations say nothing about offsite mitigation, and their consultation handbook does not prescribe any such

42. See generally Malcolm L. Hunter Jr. et al., *Thresholds and the Mismatch Between Environmental Laws and Ecosystems*, 23 CONSERVATION BIOLOGY 1053, 1053 (2009) (commenting on the difficulties of finding regulatory thresholds that correspond to well-defined ecological thresholds).

43. See, e.g., *supra* note 40 and accompanying text (discussing the impossibility of linking greenhouse gas emissions from specific activities to specific increments of habitat change).

44. See *supra* note 19 and accompanying text.

45. Telephone Interview with FWS Biologists (Nov. 3, 2010).

46. See Holly Doremus, *Scientific and Political Integrity in Environmental Policy*, 86 TEX. L. REV. 1601, 1611, 1628, 1630 (2008) (describing congressional efforts to hamstring ESA implementation).

47. See INDUS. ECON., INC. & N. ECON., ECONOMIC ANALYSIS OF CRITICAL HABITAT DESIGNATION FOR THE POLAR BEAR IN THE UNITED STATES ES-6 (2010) (stating that FWS will not use the polar bear critical habitat designation as a basis for regulating climate change).

48. See, e.g., notes 31-35 and accompanying text.

49. 16 U.S.C. §1531(a)(4) (2006).

50. See David S. Wilcove et al., *Quantifying Threats to Imperiled Species in the United States*, 48 BIOSCIENCE 607, 609 (1998).

51. See generally Carol M. Rose, *Environmental Law Grows Up (More or Less), and What Science Can Do to Help*, 9 LEWIS & CLARK L. REV. 273, 279 (2005) (“In focusing on individual actors' behavior, [behavior-based] measures were inattentive to the fact that even small amounts can add up.”).

52. A third possibility, which merits more extensive discussion than this Article has space to provide, would be to integrate the services' efforts with other agencies' initiatives to address major problems like climate change or urban sprawl. Such integration might blunt common criticisms of the ESA, which sometimes suggest that the statute pits species protection against all other important social values. See, e.g., CHARLES C. MANN & MARK L. PLUMMER, NOAH'S CHOICE: THE FUTURE OF ENDANGERED SPECIES 213 (1995) (“[I]t is not possible to [protect species] and simultaneously ensure that good housing is available and affordable to everyone. Or good health care, for that matter, or a good education.”). But while numerous scholars have emphasized the importance of such integration, the challenges of achieving it are substantial. See, e.g., James E. Krier & Mark Brownstein, *On Integrated Pollution Control*, 22 ENVTL. L. 119, 121-22 (1991) (explaining some of the practical considerations that led EPA to reject an integrated regulatory approach); J.B. Ruhl & James Salzman, *Climate Change, Dead Zones, and Massive Problems in the Administrative State: A Guide for Whittling Away*, 98 CAL. L. REV. 59, 70-71 (2010) (praising the “worthy aspiration” toward a collaborative decision-making model, while subsequently noting the model's impracticality).

53. In the pool of 138 biological opinions that I closely reviewed, only a handful called for or referred to offsite mitigation measures. Those measures might have been prescribed in other documents—some biological opinions refer to conditions set forth in the action agency's biological assessment—but the rarity of references to offsite mitigation demonstrates that it is not common practice. One case—*Butte Environmental Council v. U.S. Army Corps of Engineers*—did briefly mention the use of this approach. 620 F.3d 936, 944 (9th Cir. 2010). But the offset program only addressed impacts to wetlands, not to all of the affected critical habitat, suggesting that it may have been driven by the Army Corps' wetland permitting requirements rather than by the ESA's requirements for critical habitat protection. See *id.*

54. E.g., Telephone Interview with NMFS Biologist (Nov. 22, 2010) (explaining that this method is becoming “increasingly prevalent”).

approach, let alone provide guidance for its implementation.⁵⁵ Nor do the services track the use of such measures.⁵⁶

In the absence of an offsite trading program, many small environmental harms will simply escape regulatory coverage. If a project has significant social utility—if, to use an example cited by one NMFS biologist, it is a small repair that will allow an important existing roadway to remain functional—but will unavoidably harm a small habitat area, a biologist must choose between enforcing the letter of the statute at significant social cost or, alternatively, allowing habitat degradation to proceed without mitigation. It is not hard to imagine what most biologists will choose. Nor is it hard to understand why courts, confronted with what they perceive to be an unyielding mandate to prohibit even the smallest-scale degradation, might try to carve out de minimis exemptions that appear nowhere in the statutory text. Yet those same impacts might be cheaply mitigated, perhaps by contributing to a dam removal, wetlands restoration project, or purchase of environmental water rights elsewhere on the same river, and the action agency and project proponent might be willing to support those efforts as a condition for proceeding with the project. Designing such an offsite mitigation program is no easy task; the extensive critiques of existing programs amply demonstrate that mitigation trading programs require careful design and oversight. But for critical habitat protection, even modestly effective mitigation efforts should improve upon the status quo.

2. Planning and Standardized Threshold-Setting

Another distinctive feature of the services' current approach is its ad hoc, project-by-project selection of regulatory thresholds. As of this writing, the services have no regulation or even guidance that defines the line between adverse modification and permissible habitat degradation. Nor do they have any process, outside of individual consultations, for drawing that distinction. To add to the challenge, current agency regulations and guidance place partial blinders on biologists seeking to resolve this question. When conducting consultations, the services may not consider the cumulative impacts of other future projects also subject to consultation.⁵⁷

That approach places field biologists in difficult positions. To determine whether an individual project contributes significantly to a larger problem, a field biologist would need to understand the impacts of the full set of activities likely to affect the species. Performing that kind

of broader analysis is likely to be impossible, particularly if agency guidance tells that biologist to ignore many future projects.⁵⁸ In the absence of that broader perspective, and without the backing of a centralized policy on cumulative impacts, a decision to impose a prohibitive regulatory regime on a project with seemingly minor impacts will be very difficult to make.⁵⁹

Again, other environmental laws offer better alternatives, with the most robust example coming from air quality planning. Every year, air quality planners in non-attainment zones across the country confront a challenge like the habitat degradation problems faced by FWS and NMFS.⁶⁰ Air pollution problems typically derive from many sources, which interact in complex and nonlinear ways.⁶¹ Consequently, determining on an ad hoc, project-by-project basis what level of emissions should trigger regulation would be nearly impossible, and the Clean Air Act instead compels states to develop “state implementation plans” (SIPs) that address all emission sources, and it only allows approval of plans that simulation models predict will attain the ultimate air quality goal.⁶²

This comprehensive approach presents several obvious advantages. First, rather than addressing each individual action in an analytical vacuum, it gives planners an opportunity to consider the aggregate consequence of all of the actions threatening to cause environmental degradation. Second, it compels them to think through the implications of setting regulatory thresholds at a particular level. If those thresholds are set too high and the modeling is reasonably accurate,⁶³ the model will not predict attainment and the planners must return to the drawing board.⁶⁴ Third, this approach gives regulators opportunities to develop programs

55. The handbook does mention the possibility of offsite mitigation in its discussion of conservation measures. See CONSULTATION HANDBOOK, *supra* note 10, at 4-19. But the discussion is not at all extensive.

56. See Jessica B. Wilkinson & Robert Bendick, *The Next Generation of Mitigation: Advancing Conservation Planning Through Landscape-Level Mitigation Planning*, 40 ELR 10023, 10034 (Jan. 2010) (“Our research revealed that the Services do very little in the way of tracking the nature or amount of compensatory mitigation required under §7 of the ESA.”).

57. CONSULTATION HANDBOOK, *supra* note 10, at 4-31 (excluding future federal actions and any other action that is not “reasonably certain to occur” from the analysis); see also Rohlf, *supra* note 22, at 156 (criticizing this approach as “virtually unworkable”).

58. See CONSULTATION HANDBOOK, *supra* note 10, at 4-31 (noting that in creating a cumulative effects analysis, a Federal action agency must not consider any “[f]uture Federal actions requiring separate consultation”).

59. See David M. Theobald et al., *Ecological Support for Rural Land-Use Planning*, 15 ECOLOGICAL APPLICATIONS 1906, 1909 (2005) (explaining the difficulty of finding changes to be significant when each proposed project will cause only a small change). Agency biologists readily acknowledged that adverse modification findings were not encouraged. See Interview with NMFS Biologist (Dec. 7, 2010) (“[Y]ou write this, you’re going to have to defend it and support it and come up with an alternative.”).

60. Non-attainment zones are areas that do not comply with national ambient air quality standards. See 42 U.S.C. §7501(2) (2006) (defining “non-attainment area[s]”).

61. See James D. Fine & Dave Owen, *Technocracy and Democracy: Conflicts Between Models and Participation in Environmental Law and Planning*, 56 HASTINGS L.J. 901, 914, 944-45 (2005) (describing mechanisms of ozone creation).

62. 42 U.S.C. §7410. For detailed descriptions of this approach, see Arnold W. Reitze Jr., *Air Quality Protection Using State Implementation Plans—Thirty-Seven Years of Increasing Complexity*, 15 VILL. ENVTL. L.J. 209, 226-41, 268 (2004), and Fine & Owen, *supra* note 342, at 903, 949-62. These SIPs are not the Clean Air Act’s exclusive regulatory program; it also relies extensively on technology-based controls.

63. Sometimes it is, and sometimes it is not. See James D. Fine & Dave Owen, *Technocracy and Democracy: Conflicts Between Models and Participation in Environmental Law and Planning*, 56 HASTINGS L.J. 901, 949-62 (describing an unsuccessful monitoring exercise); Dave Owen, *Probabilities, Planning Failures, and Environmental Law*, 84 TUL. L. REV. 265, 282 n.93 (2009) (quoting EPA employees describing some of their models as “very accurate”).

64. See James D. Fine & Dave Owen, *supra* note 63, at 914 (noting that the Clean Air Act requires attainment demonstrations as a prerequisite to SIP approval).

to compensate if they do choose to set regulatory thresholds that exempt some contributors.⁶⁵ Rather than addressing each project's incremental impacts in an analytical vacuum, this approach compels regulators to ask, "How are we going to fit our approach to incremental harms into a larger strategy for achieving the outcome we want?"⁶⁶

Though the services may never develop an approach as intensive as the SIP process, planning processes already prescribed by other sections of the ESA provide useful starting points. First, ESA section 4 already prescribes recovery plans for listed species.⁶⁷ That recovery planning creates an opportunity to develop regulatory thresholds and to integrate those thresholds into a broader strategy for recovery.⁶⁸ Second, and more ambitiously, the services could integrate critical habitat protection into large-scale "habitat conservation plans" (HCPs) prepared pursuant to sections 9 and 10 of the ESA.⁶⁹ These plans allow otherwise prohibited "takes" of endangered species so long as the entity responsible for the take is participating in a plan expected to provide a net benefit to the impacted species.⁷⁰ The services could offer the same deal for projects causing small adverse changes to habitat: if the project proponent participates in a broader HCP that will create an overall improvement in habitat conditions, the services would not find adverse modification. A coordinated conservation approach could provide much more conservation benefit than many isolated and partial minimization efforts, and more extensive enforcement of the adverse modification prohibition could create an important incentive for participation in large-scale HCPs.

IV. Conclusion

Climate change is likely to lead to many other species listings, and dozens of species initially listed for other reasons also face climate change as a major threat.⁷¹ Climate change is just one of many major environmental impacts caused by an accumulation of seemingly minor actions. The central regulatory challenge addressed by this Article is large and continuing to grow.

Current regulatory approaches are only partially equipped to address that challenge. The services have taken substantial steps to address habitat degradation, and their efforts undermine critiques alleging that ESA implementation is characterized by rigid inflexibility or alternatively by regulatory capture. But the empirical record still indicates a substantial gap between statutory requirements and actual performance, and the gap is particularly acute where incremental degradation is occurring. That gap need not be quite so large; tools to address some of those tensions exist and could be exploited with only modest adjustments to existing regulatory systems. The services, and any other regulator seeking to address incremental environmental degradation, can and should take advantage of those opportunities.

65. See *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 470 (2001) ("It is to the States that the CAA assigns initial and primary responsibility for deciding what emissions reductions will be required from which sources.").

66. Many critics allege that this type of comprehensive planning is prone to manipulation and requires more information than regulators realistically can obtain. See, e.g., OLIVER A. HOUCK, *THE CLEAN WATER ACT TMDL PROGRAM: LAW, POLICY & IMPLEMENTATION* 207 (2d ed. 2002) ("[O]ne would not wish the CAA SIP program on one's worst enemy."); Reitze, *supra* note 343, at 362–63, 365 (dismissing the SIP program as a "failure," largely because many areas remain in non-attainment). Both problems are clearly real, and the track record of these planning approaches includes many failures. See, e.g., Fine & Owen, *supra* note 64, at 956–57, 960–62 (discussing a planning process marked by misleading treatment of uncertainties and questionable tweaking of assumptions). But it also includes successes, and some regulators believe their planning approaches have worked reasonably well. See, e.g., Owen, *supra* note 63, at 283 n.101 (noting that EPA employees involved in SIP planning viewed the process as reasonably successful).

67. 16 U.S.C. §1533(f) (2006) (describing the recovery plan requirements).

68. That shift would significantly change recovery planning, which critics allege has traditionally involved vague plans and modest goals. See, e.g., Federico Cheever, *The Road to Recovery: A New Way of Thinking About the Endangered Species Act*, 23 *ECOLOGY L.Q.* 1, 16 & n.64 (1996).

69. See 16 U.S.C. §1539(a)(2)(A) (identifying plan regulations).

70. See James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 *STAN. L. REV.* 607, 648–49 (explaining the program).

71. For just a few of the many possible examples, see Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Georgia Pigtoe Mussel, Interrupted Rocksnail, and Rough Hornsnail and Designation of Critical Habitat, 75 Fed. Reg. 67512, 67523 (Nov. 2, 2010) (to be codified at 50 C.F.R. pt. 17) (identifying climate change as a threat); Endangered and Threatened Wildlife and Plants: Threatened Status for the Puget Sound/Georgia Basin Distinct Population Segments of Yelloweye and Canary Rockfish and Endangered Status for the Puget Sound/Georgia Basin Distinct Population Segment of Bocaccio Rockfish, 75 Fed. Reg. 22276, 22282 (Apr. 28, 2010) (to be codified at 50 C.F.R. pts. 223 & 224) (acknowledging climate change as a potentially major threat); Endangered and Threatened Wildlife and Plants: Threatened Status for Southern Distinct Population Segment of Eulachon, 75 Fed. Reg. 13012, 13015 (Mar. 18, 2010) (to be codified at 50 C.F.R. pt. 223) ("We also recognize that climate change impact on ocean conditions is likely the most serious threat to persistence of eulachon in all four sub-areas of the DPS . . .").

C O M M E N T

A Modest Role for a Bold Term: “Critical Habitat” Under the Endangered Species Act

A Comment on *Critical Habitat and the Challenge of Regulating Small Harms*

by David J. Hayes, Michael J. Bean, and Martha Williams

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Each year the Interior Department’s Fish & Wildlife Service (FWS) and its sister agency, the National Marine Fisheries Service (NMFS), spend a significant portion of their limited resources—and engender substantial controversy—in identifying critical habitat¹ for various species as required by the Endangered Species Act, 16 U.S.C. §§1531-1544 (ESA).² Professor Owen has done a great service in developing and analyzing empirical evidence suggesting that both the expense and controversy may be out of proportion to the actual effect of critical habitat designations.³ More specifically, although federal agencies have a legal duty to ensure that actions they authorize, fund, or carry out are not likely to result in the destruction or adverse modification of critical habitat,⁴ Owen found in

reviewing over 4,000 interagency consultations from FWS and NMFS in 2009 that *not one of them* concluded that the federal action under review would adversely modify critical habitat without also jeopardizing the continued existence of the affected species. In other words, the critical habitat prohibition did not impose a regulatory barrier to any federal action *that would not have been barred anyway* as a result of the duty to ensure that those same actions do not jeopardize the continued existence of any listed species.⁵

Professor Owen also comprehensively examined case law concerning the implementation of Section 7 of the ESA and reached a similar conclusion. After citing earlier scholarly analysis that failed to find any case in which a court found “adverse modification” of critical habitat without also finding “jeopardy” to the species, Professor Owen reaches the further conclusion that “judicial decisions provide little support for the assertion that critical habitat designations add stringency to judicial review of no-jeopardy determinations.”⁶ That is, the designation of critical habitat appears to make little difference in the outcome of cases challenging jeopardy or no-jeopardy determinations.

While these conclusions are likely to come as a surprise to many readers who assume that “critical habitat” designations are a key operative feature of the ESA, they come as no surprise to those of us who work closely with

Authors’ note: The opinions stated herein are the personal opinions of the authors and do not purport to represent official positions of the U.S. government.

1. The term “critical habitat” for a threatened or endangered species is defined by the ESA to mean geographical areas occupied by a species at the time of listing “on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection” and specific other areas determined by the Secretary to be “essential for the conservation of the species.” 16 U.S.C. §1532(5)(A) (2006).
2. *See id.* §1533(a)(3)(A)(i)-(ii) (“The Secretary, by regulation . . . and to the maximum extent prudent and determinable— . . . shall, concurrently with making a determination . . . that a species is an endangered species or a threatened species, designate any habitat of such species which is then considered to be critical habitat; and . . . may, from time-to-time thereafter as appropriate, revise such designation.”).
3. *See Dave Owen, Critical Habitat and the Challenge of Regulating Small Harms*, 64 FLA. L. REV. 141 (2012).
4. 16 U.S.C. §1536(a)(2) (“Each Federal agency shall, in consultation with and with the assistance of the Secretary [of the Department of the Interior or Commerce, as appropriate], insure that any action authorized, funded, or carried out by such agency . . . is not likely to . . . result in the destruction

- or adverse modification of habitat of such species which is determined by the Secretary . . . to be critical . . .”).
5. *Id.* (“Each Federal agency shall, in consultation with and with the assistance of the Secretary [of the Department of the Interior or Commerce, as appropriate], insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species . . .”).
6. Owen, *supra* note 3, at 177.

FWS and NMFS in administering the Endangered Species Act. Those agencies have maintained for years that the ESA's critical habitat requirements generally have very little impact, either from an economic or conservation perspective.⁷

I. Listing Decisions—and Not Critical Habitat Determinations—Matter the Most

Critical habitat designations typically have modest impacts primarily because the regulatory consequences of listing a species in the first place are so far-reaching. Regardless of whether or where critical habitat lines are drawn, both federal and private actors need to be concerned, first, about whether they are taking action that “may affect” a listed species. Informal consultation as well as formal consultation triggered by a “may affect” determination provide the Services the opportunity to work with the action agency or the applicant to incorporate certain conservation measures into a proposed action and avoid a jeopardy finding.

Indeed, the ESA arguably is working best when the Services work with the action agency or applicant early in the planning process whether through informal consultation or when a preliminary determination that a proposed action “may affect” a listed species triggers the consultation process, and the question of an impact on critical habitat is overtaken by the more important question of what steps can be taken to minimize any negative impacts on the listed species. That is, when the consultation process keys off the potential impact on a listed species—whether or not it gets to the question of whether there is an adverse modification of critical habitat—the process can generate good results for the species. Early interactions with the Service can help agencies shift their plans and propose modified actions that will not trigger a jeopardy call. Thus, for example, if an agency proposes an action that would occur during a critical time for nesting, the Service can work with the action agency to see if there is flexibility with regard to timing of the action. Rather than push the action forward just to produce a jeopardy call, the action agency will usually opt for modifying the action at the early stages of consultation. In most cases, it is the potential impact *on a listed species itself* that is getting the attention during the consultation process—not whether the impact is affecting an area that has been delineated as critical habitat.

There are other indications that the question of whether a species is listed as threatened or endangered under the ESA matters far more in terms of ESA operability than whether critical habitat has been designated, or not, for a listed species. In recent months, for example, significant conservation initiatives have been triggered by the poten-

tial listing of the dunes sagebrush lizard, the Gunnison sage grouse, the lesser prairie chicken, and the greater sage grouse. Innovative tools like candidate conservation agreements and “candidate conservation agreements with assurances” have been used to establish a baseline of conserved lands and practices that potentially can contribute to a scientific showing that the species is not in such danger that it needs to be listed. This is precisely what happened with the dunes sagebrush lizard, and the substantial conservation activities undertaken in both Texas and New Mexico enabled FWS to conclude that the lizard did not need to be listed.⁸ Similar efforts are now under way to address threats to the greater sage grouse, a species whose listing could have significant ramifications in eleven Western states.

II. Exceptions to the Rule: When Critical Habitat Can Matter

The conclusion that critical habitat determinations typically have limited incremental impact on ESA obligations (over and above those already triggered by the listing of the species in question) is not to say that the designation of critical habitat has no importance. Professor Owen notes that there is at least the potential for both conservation and economic impact when critical habitat includes areas not actually occupied by the species.⁹ Absent critical habitat designation, federal actions in unoccupied areas are unlikely to undergo the interagency consultation process prescribed by Section 7 and even less likely to result in a prohibited “taking” of listed wildlife.

As Professor Owen also notes, however, agency practice has been to find no adverse modification of critical habitat when only a small portion of total critical habitat is affected by a federal action.¹⁰ Thus, ironically, the larger the area designated as critical habitat, the less likely that any particular federal action will be deemed to adversely modify it.

While the tendency to use acreage impacted as a measure of whether there may be adverse modification to critical habitat may be an appropriate short-hand in some cases, it cannot be the only factor considered. The relevant question is whether an impact on critical habitat has some import to the conservation role that critical habitat plays for the species. In some cases, a relatively small modification, even of a “large” area of critical habitat, could constitute adverse modification. For example, if critical habitat were designated, in part, because it allows a passageway for connectivity between two areas inhabited by the species, a small modification to that area could constitute adverse modification. On the other hand, if a relatively large area had a short-term modification that in no way impacted the connectivity conservation role of the critical habitat, there may be no “adverse modification” to the habitat.

7. That said, it is important to note that the Services' view on critical habitat has been tempered somewhat by the decision in *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059 (9th Cir. 2004). In *Gifford Pinchot*, the Ninth Circuit invalidated the Services' regulatory definition of “destruction or adverse modification” of critical habitat. *Id.* at 1069-70. The Services continue to work on promulgating a new regulatory definition.

8. See Withdrawal of the Proposed Rule to List Dunes Sagebrush Lizard, 77 Fed. Reg. 36872 (June 19, 2012).

9. Owen, *supra* note 3, at 154-59.

10. *Id.* at 168.

III. Using Exemptions to Limit Unintended Consequences of Critical Habitat

Unlike some of the other provisions of the ESA, the Fish and Wildlife Service is expressly required to consider economic and other impacts when designating critical habitat.¹¹ Based on that required consideration, the Service can exclude particular areas from critical habitat under certain circumstances.¹² This provides a tool that can limit certain unintended consequences associated with some critical habitat designations—namely, disincentives to applying sound conservation practices.

Some unintended consequences can flow, for example, from the *perception* that critical habitat designations can have substantial negative impact on land values and/or a private landowners' use of his or her lands. This perception may have little or no basis in fact, but it may persist nonetheless. (On private lands, for example, critical habitat designations arguably have limited impact since the federal actions that might trigger adverse modifications to critical habitat typically rarely occur on, or impact, private lands.) Under such circumstances, where such negative views may trigger a backlash that undercuts private landowners' interests in pursuing conservation measures or otherwise cooperating under the ESA, it may be appropriate for FWS to use its discretion not to designate some private lands as critical habitat and/or to apply a liberal approach when not designating private lands due to the existence of some types of protections, existing land uses that are compatible with species use, etc.

Similarly, federal agencies may design projects to avoid critical habitat, even if the prohibition against adverse modification of critical habitat would not have barred a project within critical habitat. Indeed, the tendency to read too much into critical habitat designations ironically can inhibit smart, landscape-level planning efforts that are not co-extensive with "critical habitat" and that, in fact, could impinge on some areas that are labeled as critical habitat, but which produce strongholds for species that provide significantly more conservation benefits for the species.

Here again, the exemption process can provide some relief against the potential for critical habitat determinations to work against landscape-level conservation approaches. Professor Owen draws attention to this point when discussing the potential for critical habitat policy to encourage greater participation in large-scale habitat conservation plans (HCPs).¹³ HCPs were an innovation added

to the ESA in 1982.¹⁴ They have proven to be an effective means of facilitating large-scale conservation planning, which both Professor Owen and we believe is highly desirable. Through HCPs, individual landowners or local governmental jurisdictions (e.g., counties, cities, "joint powers" agencies, etc.) agree to mitigate the impacts of future development actions by carrying out agreed-upon conservation measures. In return, they secure authorization to take listed species incidental to those same future development actions. Since the taking of listed wildlife species is otherwise prohibited, HCPs provide perhaps the ESA's most effective mechanism for achieving both development and conservation objectives in a particular locale.

As noted above, the economic impacts of designating critical habitat are often modest, and yet the perceived impact is often much greater. As a result, the willingness of landowners and local governmental agencies to develop HCPs is enhanced by the expectation that critical habitat designations will not be superimposed on an area once a conservation plan for that area has been completed. Because of the very substantial conservation benefits that large-scale HCPs have been able to secure, the Service has frequently used its authority to exclude particular areas from a designation by excluding areas covered by existing HCPs. The recent revision of critical habitat for the northern spotted owl is an example.

IV. Synching Up Critical Habitat Proposals and Economic Analyses

Although, as described above, the economic impacts of critical habitat designation are typically modest, the formal assessment of those impacts has heretofore been made available months after a formal proposal to designate critical habitat is published. That practice would be changed by a recently proposed change in the regulation of FWS and NMFS.¹⁵ That proposal was precipitated by a Presidential Memorandum issued by President Obama during the effort to revise the critical habitat designation for the northern spotted owl.¹⁶ By providing an opportunity to review both a critical habitat proposal and the relevant Service's assessment of its economic impact concurrently, the regulatory change should improve both opportunities for public participation and the quality of resulting critical habitat designations.

11. See 16 U.S.C. §1533(b)(2) (2006) ("The Secretary shall designate critical habitat, and make revisions thereto . . . on the basis of the best scientific data available and after taking into consideration the economic impact . . .").

12. *Id.* ("The Secretary may exclude any area from critical habitat if he determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned.")

13. Owen, *supra* note 3, at 196-97.

14. See Endangered Species Act Amendments of 1982, Pub. L. No. 97-304, §6, 96 Stat. 1411, 1422 (1982); see also 16 U.S.C. §1539(a)(2) (2006); U.S. FISH & WILDLIFE SERV. & NAT'L MARINE FISHERIES SERV., ENDANGERED SPECIES CONSULTATION HANDBOOK 2-4 (1998) ("Habitat conservation planning—[ESA] section 10(a)(1)(B)").

15. Endangered and Threatened Wildlife and Plants; Revisions to the Regulations for Impact Analyses of Critical Habitat, 77 Fed. Reg. 51503 (Aug. 24, 2012).

16. Memorandum for the Secretary of the Interior, Proposed Revised Habitat for the Spotted Owl: Minimizing Regulatory Burdens, 2012 Daily Comp. Pres. Doc. 133 (Feb. 28, 2012), 77 Fed. Reg. 12985 (Mar. 5, 2012).

V. Critical Habitat and Recovery Plans

Professor Owen makes passing reference to the recovery plans required by the ESA, but does not explore in detail the potential relationship between recovery planning and critical habitat designation. It is one of the ironies of the ESA that it requires the designation of critical habitat concurrently with the listing of a species, typically years before a recovery plan is written for that same species. Recovery plans are intended to reflect a carefully thought-out strategy for improving the status of a species to the point at which it no longer needs the protection of the ESA. They represent the larger conservation strategy into which critical habitat ought to fit.

When critical habitat precedes a recovery plan, however, there is a missed opportunity to explore how alternative habitat configurations might fit into a larger conservation strategy, precisely because that larger conservation strategy does not yet exist. For most listed species, there are potentially many alternative configurations of protected or purposely managed habitats that could achieve the goal of recovery. Some configurations may provide a speedier or slower route to recovery. Some may rely to a greater or lesser degree on federal lands. Particular areas may be a necessary part of every possible configuration, while other areas are not. Recovery planning provides a means of making these determinations and assessing tradeoffs.

Integrating a recovery plan strategy into the designation of critical habitat was a key purpose of the revision of critical habitat for the northern spotted owl last year. To develop that critical habitat, the Fish and Wildlife Service modeled the conservation effectiveness of alternative habitat configurations, some of which sought to emphasize reliance on federal lands, others of which sought to minimize total acres to be designated. The impacts of including or excluding particular areas could then be evaluated in order to produce an outcome that optimizes conservation and other objectives required by law to be taken into account when designating critical habitat.

This approach to critical habitat designation represents an innovation that can most easily be accomplished when critical habitats are designated concurrently with, or after, development of a recovery plan. If there is ever again a serious effort to revise the ESA, this is one area in which a legislative amendment would be helpful. Critical habitat

designations would be much more meaningful and effective if they were developed in concert with recovery plans, rather than at the front end of the listing process, when scientists have yet to identify the key factors—and key habitat—needed to recover a recently-listed species. Such a legislative proposal enjoyed widespread support in the 105th Congress,¹⁷ but it ultimately failed for unrelated reasons.

VI. Conclusion

Professor Owen's careful analysis of a large set of data regarding ESA implementation leads to the conclusion that the boldness of the term—"critical habitat"—is not matched by the importance of its role under the ESA. To date, critical habitat determinations have played only a modest role in the important work of avoiding negative impacts to listed species and promoting their recovery. That is why we must not lose sight of other strategies that are often the most successful in conserving habitat because they enlist the help of the private sector in one way or another. For example, the Fish and Wildlife Service's Candidate Conservation Agreement program protects habitat for candidate species and assures private landowners that their conservation contributions will be recognized if the species is listed. Small federal grants facilitate partnerships between private landowners, conservation organizations, and government agencies to restore habitat in severely damaged ecosystems. Conservation easements donated by private landowners to government agencies or non-profits can protect key tracts of habitat. Economic incentives like green-forest certification and the carbon-credit market can help conserve large swaths of forest habitat. The bottom line is that we cannot take a single approach to habitat conservation. There is a place and need for a wide spectrum of tools, including critical habitat.

Professor Owen has made an important contribution to the literature by demonstrating, with data, the point that critical habitat determinations made under the ESA are largely supplanted, in terms of operative effect, by listing decisions themselves, and the obligations that flow from such listings. Given this reality, we would all be wise to devote more of our limited resources to some of the more effective tools that bring active, more meaningful, on-the-ground conservation initiatives to important habitats for listed species.

17. See Endangered Species Recovery Act of 1997, S. 1180, 105th Cong. §5(n) (1997); see also A Bill to Amend the Endangered Species Act of 1973, S. 1100, 106th Cong. (1999).

C O M M E N T

A Comment on Critical Habitat and the Challenge of Regulating Small Harms

by Michael Senatore

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Professor Dave Owen's insightful empirical analysis of the Endangered Species Act's ("ESA") prohibition on destruction of critical habitat should be useful in improving the Act's effectiveness.¹ The title of his paper, *Critical Habitat and the Challenge of Regulating Small Harms*, however, is misleading in its characterization of impacts addressed in U.S. Fish and Wildlife Service ("FWS") and National Marine Fisheries Service (collectively "the Services") "biological opinions." A biological opinion is the culmination of "formal" consultation. The overwhelming majority of consultations, however, are "informal" and do not conclude with the issuance of a biological opinion.² The two types of consultations are quite different. Formal consultation must be initiated on any federal agency action that "may affect" listed species or critical habitat; however, if the Services subsequently determine that the action is "not likely to adversely affect" listed species or critical habitat, consultation may conclude informally.³ Accordingly, there already exists a threshold—"may affect, not likely to adversely affect"—for addressing "small harms." Furthermore, formal consultation addresses adverse impacts to species already "in danger of extinction throughout all or a significant portion of its range," or "likely to become so in the foreseeable future."⁴ Any action with the potential to further degrade a listed species' status or its critical habitat—defined as that habitat

"essential to the conservation of the species"⁵—should, as a threshold matter, be considered significant. As described further below, unfortunately, initiation of formal consultation is no guarantee that species will get the protections they require to survive and recover.

Professor Owen is correct that the Services have utilized formal consultation to achieve important habitat and other mitigation commitments benefitting listed species. These outcomes, achieved by Service biologists operating frequently without adequate resources or scientific information and in the face of intense political pressures, should be commended. Indeed, Professor Owen's analysis under-represents the conservation gains achieved through consultation in that it focuses exclusively on formal consultations affecting critical habitat, and does not account for conservation gains secured through the far greater number of informal consultations not involving critical habitat. Nonetheless, in several significant ways agency practice has too often been contrary to statutory language and the recovery of listed species.

First, section 7's underlying substantive protections—to avoid jeopardizing a species' continued existence and destroying or adversely modifying its critical habitat—have too often been administered in a manner that is inconsistent with species recovery.⁶ In the case of the jeopardy standard, while regulations define jeopardy as an appreciable reduction in the likelihood of "the survival and recovery of a listed species,"⁷ the Services often green-light actions causing the very impacts responsible for threatening a species' continued existence and its listing under the ESA in the first instance. The Services' approach to implementing the jeopardy standard can allow a continual deterioration

1. 16 U.S.C. §1536(a)(2) (requiring that "[e]ach Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency . . . is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat. . . .").

2. 50 C.F.R. §402.13(a) (stating that "[i]nformal consultation is an optional process that includes all discussions, correspondence, etc., between the Service and Federal agency . . . in determining whether Formal consultation . . . is required."). In 2011, FWS data shows that it completed approximately 10,455 consultations, of which 9,783 were informal and 672 were formal.

3. *Id.* §402.14(a)

4. 16 U.S.C. §1532(6) and (20) (defining "endangered species" and "threatened species," respectively).

5. Because section 4(b)(2) further authorizes the Services to exclude habitat essential to the species' conservation from being designated as "critical habitat" based on economic or other factors, what is designated as "critical habitat" may be less than what is needed for recovery of the species.

6. See Daniel J. Rohlf, *Jeopardy Under the Endangered Species Act: Playing a Game Protected Species Can't Win*, 41 WASHBURN L.J. 114 (2001), for a comprehensive analysis of the Services' interpretation and administration of section 7(a)(2).

7. See 50 C.F.R. §402.02 (defining "jeopardize the continued existence of").

in a species' status so long as the proverbial straw-that-breaks-the-camel's-back is avoided and the species' survival is not immediately threatened. This "how-low-can-you-go?" approach to administering what is arguably the ESA's most important provision is contrary to the ESA's primary goal of recovery and its underlying policy of "institutionalized caution."⁸ It is also patently illogical because for endangered species, survival and recovery are flip sides of the same coin—any action that negatively affects one will also affect the other.

Perhaps the most glaring example of agency implementation conflicting with species recovery has been the administration of the ESA's critical habitat provisions. Despite a clear statutory mandate to designate critical habitat at the time of listing, and equally clear legislative history establishing the central role of critical habitat in achieving recovery, the FWS virtually ignored the duty to designate critical habitat until conservation advocates began suing to enforce compliance. The Services also operated for years with an interpretation of the "adverse modification" standard that was eventually ruled inconsistent with the ESA for failing to align with critical habitat's intended role in protecting habitat needed for species recovery.⁹ Unfortunately, in the years since the Services' definition was declared unlawful, the agencies have failed to develop a new definition and have continued to undermine critical habitat's role in protecting habitat and recovering listed species.¹⁰

Second, the Services' effects analysis during consultation often occurs in a vacuum, with little or no meaningful assessment of a given action's effect on listed species or critical habitat in light of all other factors threatening a species' recovery. For example, the Services illogically restrict "cumulative effects" to "reasonably certain to occur" future non-federal actions.¹¹ Meanwhile, the Services limit consideration of cumulative effects and the "environmental baseline," which is intended to account for past and ongoing impacts to a species, to the "action area," which is often less than a species' entire range. The Services' effects analyses, upon which jeopardy and adverse modification findings are based, therefore, often fail to provide a comprehensive and meaningful cumulative assessment of all factors impacting species recovery, which in turn can subject species to a death-by-a-thousand-cuts. This scope of analysis, in fact, has been described as "virtually unworkable" and running "a substantial risk of nickeling and dimming species toward extinction."¹²

As Professor Owen suggests, much can be done within the current framework of the Act to improve the Services' approach to protecting listed species and their habitat. Needed administrative changes can be characterized as refocusing implementation on the Act's central goal of recovering species. For example, Professor Owen recommends integration of recovery planning into administration of the ESA's regulatory provisions "to develop regulatory thresholds and to integrate those thresholds into a broader strategy for recovery."¹³ I could not agree more. Unfortunately, current policy actually discourages this practice. While suggesting that recovery plans "provide context and a framework for implementation of other provisions of the ESA with respect to a particular species, such as section 7(a)(2) consultations," the Services have traditionally viewed recovery plans as "guidance documents, not regulatory documents."¹⁴ The practical effect of this has been that recovery plans are often not utilized in regulatory implementation. Indeed, it is commonplace for actions to be approved through consultation, which flatly contradict recovery plan goals.¹⁵

Similarly, section 10 "habitat conservation plans" or "HCPs" also provide an opportunity to improve the conservation of habitat for endangered and threatened species. To be sure, large-scale habitat conservation planning has occurred, particularly in the mid- to late-1990s, although whether these plans have assisted the recovery of listed species remains an open question. As with recovery planning, existing Service HCP policy discourages administration of the section 10 program in a manner that promotes species recovery by providing that HCPs need not contribute to recovery, be consistent with recovery plan objectives or even benefit an endangered or threatened species.¹⁶

The threatened desert tortoise is a discouraging example of how poor section 7 implementation can undermine the recovery and even survival of listed species. The desert tortoise was listed as threatened in 1990 based on numerous threats, including the destruction and fragmentation of its habitat.¹⁷ In the over 20 years since listing, the FWS has issued dozens of no-jeopardy/no adverse modification biological opinions authorizing the destruction or adverse modification of tens of thousands of acres of tortoise habitat, including critical habitat, and take of thousands of individual tortoises. Absent from these biological opinions

8. *Tennessee Valley Authority v. Hill*, 437 U.S. 153, 194 (1978).

9. *See Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059 (9th Cir. 2004).

10. *See Butte Envtl. Council v. U.S. Army Corps of Eng'rs.*, 620 F.3d 936 (9th Cir. 2010).

11. Compare with National Environmental Policy Act regulations definition of cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." 40 C.F.R. §1508.7.

12. Rohlf, *supra* note 6, at 156.

13. Dave Owen, *Critical Habitat and the Challenge of Regulating Small Harms*, 64 FLA. L. REV. 141, 196 (2012).

14. *See NAT'L MARINE FISHERIES SERV., INTERIM ENDANGERED AND THREATENED SPECIES RECOVERY PLANNING GUIDANCE 1.1-1* (2004).

15. Even in the context of determining whether a species has recovered and qualifies for delisting, the FWS views recovery plans as discretionary, using them where it suits a desired outcome and ignoring them when it does not. *Compare* 74 Fed. Reg. 15123, 15130-38 (Apr. 2, 2009) (relying on achievement of 20-year old recovery plan criteria to delist the Northern Rocky Mountain Gray Wolf Distinct Population Segment), *with* 73 Fed. Reg. 50226, 50238 (dismissing unachieved 18-year-old recovery plan criteria as "out-of-date" in delisting the Virginia northern flying squirrel).

16. *See U.S. FISH & WILDLIFE SERV., HABITAT CONSERVATION PLANNING HANDBOOK 3.20-21* (1996).

17. *See Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Mojave Population of the Desert Tortoise*, 55 Fed. Reg. 12178 (Apr. 2, 1990).

is any meaningful analyses of the cumulative effect this piecemeal destruction of habitat and loss of individual tortoises is having on the species, much less any rational connection between these impacts and the many FWS no jeopardy/no adverse modifications opinions. These impacts continue to be sanctioned in biological opinions notwithstanding a recovery plan that identifies the protection of existing populations and habitat as a primary recovery objective.¹⁸ Given this 20-plus year track record of federally sanctioned habitat destruction and degradation of a species determined to be at risk of extinction because of habitat loss, it should come as no surprise that the desert tortoise is worse off today than when it was listed.¹⁹

Finally, I offer a cautionary note on the call for greater use of offsite mitigation to address impacts to listed species and critical habitat. While more effective mitigation is a necessary tool in implementation of the ESA's regulatory provisions, it should be utilized in the broader context of species recovery and not simply as a streamlined track through the ESA's section 7 requirements. The ESA has been described as an emergency room for imperiled species, with the first priority to stop the hemorrhaging. In the case of imperiled species, this means the ESA's regulatory provisions and, in

particular, section 7, must stem the hemorrhaging of habitat and individual members driving listed species to extinction. Mitigation should ensure that a species and its habitat comes through the consultation process in better shape than when it entered, because for many listed species the status quo means eventual extinction. Unfortunately, for the desert tortoise, in the absence of a willingness to "just say no" to more loss of habitat and tortoises, there has been an overreliance on unproven mitigation that is undermining the species' survival and recovery. Literally tens of thousands of acres of tortoise habitat has been converted to industrial and other uses, and thousands of individual tortoises have been either removed from existing habitat or left in place to be crushed by vehicles and pavement, based on the notion that such impacts can be minimized or mitigated by protecting or improving habitat elsewhere, or by relocating individual tortoises to other areas. The ongoing reliance on these strategies to facilitate additional loss of habitat and tortoises does not bode well for a species whose habitat can take thousands of years to recover from disturbances, and for which translocation, the principle tortoise mitigation strategy, has been labeled unproven, ineffective and potentially detrimental to the species.²⁰

18. U.S. FISH & WILDLIFE SERV., REVISED RECOVERY PLAN FOR THE MOJAVE POPULATION OF THE DESERT TORTOISE 34 (2011).

19. *See generally* U.S. FISH & WILDLIFE SERV., MOJAVE POPULATION OF THE DESERT TORTOISE, 5-YEAR REVIEW: STATUS AND EVALUATION (Sept. 30, 2010).

20. *See* THE DRECP INDEP. SCIENCE ADVISORS, RECOMMENDATIONS OF THE INDEPENDENT SCIENCE ADVISORS FOR THE CALIFORNIA DESERT RENEWABLE ENERGY CONSERVATION PLAN 80 (Oct. 2010).

C O M M E N T

A Wider View of the Impacts of Critical Habitat Designation

A Comment on *Critical Habitat and the Challenge of Regulating Small Harms*

by Andrew J. Turner and Kerry L. McGrath

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The designation of critical habitat under the Endangered Species Act (ESA) can result in significant and costly consequences for landowners, industry, government, and other entities—often with little if any evidence of a commensurate benefit to the species involved. In *Critical Habitat and the Challenge of Regulating Small Harms*, Professor Dave Owen provides a valuable contribution to assessing the role of critical habitat during consultation on federal agency actions under ESA section 7.¹ Specifically, in reviewing and analyzing over 4,000 biological opinions, Professor Owen devotes substantial time and resources to developing a better understanding of critical habitat in formal consultation between agencies undertaking federal actions, such as issuing permits or rules or providing project funding, and the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) (together, the Services). Although his analysis is limited to information contained in the Services' biological opinions, Professor Owen provides valuable, hard data showing the on-the-ground impacts of critical habitat on the consultation process, which is useful for understanding and weighing policy choices associated with critical habitat designation. Finding that the Services construe the ESA prohibition against adverse modification of critical habitat to exclude "minor alterations" of habitat, Professor Owen concludes that the ESA's prohibition of "adverse modification" of critical habitat thus has little effect upon the consultation process.

In order to understand the full impacts and costs of critical habitat designation, however, it is necessary to view critical habitat from a wider perspective that considers the effect of critical habitat designation outside of the formal ESA section 7 consultation process. This broader perspective is especially important in light of the Services' recent

efforts to undertake an unprecedented number of ESA listing actions that are likely to involve decisions on critical habitat designation, and in light of related regulatory and policy decisions that the Services are facing on topics such as "adverse modification,"² "significant portion of range,"³ and voluntary landowner conservation initiatives.⁴

I. Biological Opinions Provide Only a Partial Picture of the Impact of Critical Habitat

Professor Owen's review of 4,000 biological opinions presents a valuable but partial picture of the effects of critical habitat designation. Efforts are undertaken by landowners, project proponents, government agencies, and others to ensure compliance with critical habitat provisions both prior to and after consultation. Indeed, while potentially time-consuming and expensive, such actions are often undertaken in order to avoid the even greater costs and burdens of formal consultation.

Section 7 of the ESA requires a federal agency to ensure, through consultation with FWS or NMFS as appropriate, that a proposed action "is not likely to jeopardize the con-

1. Dave Owen, *Critical Habitat and the Challenge of Regulating Small Harms*, 64 FLA. L. REV. 141 (2012).

2. See Memorandum from Marshall Jones, Acting Director, FWS, to Regional Directors, Application of the "Destruction or Adverse Modification" Standard Under Section 7(a)(2) of the ESA (Dec. 9, 2004), available at <http://www.fws.gov/midwest/endangered/permits/hcp/pdf/AdverseModGuidance.pdf> (because of recent litigation finding the Service's regulatory definition of "destruction or adverse modification" was contrary to law, FWS provided guidance for applying the adverse modification standard in section 7 consultations pending adoption of a new regulatory definition).
3. See 76 Fed. Reg. 76987 (Dec. 9, 2011) (draft policy of interpretation of "significant portion of its range" in the ESA's definitions of "endangered species" and "threatened species"). The Services have not yet issued their final policy.
4. See 77 Fed. Reg. 15352 (Mar. 15, 2012) (FWS is considering proposals for amendments to ESA's implementing regulation that would create incentives for landowners to take voluntary conservation actions to benefits species that may be likely to become threatened or endangered species).

tinued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species.”⁵ However, where an action agency (such as the U.S. Army Corps of Engineers) determines that its action (such as the issuance of a Clean Water Act section 404 permit) will have “no effect” on listed species or critical habitat,⁶ or where the action agency determines and the Service concurs that the proposed action is “not likely to adversely affect” listed species or designated critical habitat,⁷ formal consultation is not required, and a biological opinion typically will not be prepared by the Service. Indeed, to avoid the difficulties and expense of formal consultation under section 7, many action agencies and private entities will undertake significant efforts to either avoid siting projects in designated critical habitat areas, or to avoid any impact at all to the primary constituent elements of critical habitat, thereby avoiding a “may affect” determination that would trigger formal consultation over impacts to the critical habitat and the potential for an adverse modification finding. As Professor Owen notes, landowners and action agencies are generally well acquainted with the lines on a map that depict designated critical habitat,⁸ and the mere existence of designated critical habitat will often deter activities that might otherwise affect protected species. For example, when a real estate development company that planned to develop portions of a 2,400-acre property north of Sacramento, California, learned that much of the property was critical habitat for threatened vernal pool fairy shrimp and endangered vernal pool tadpole shrimp, it gave up plans to develop the property and decided instead to (in coordination with the Service) establish a conservation bank on the property.⁹ This type of avoidance of potential impacts due to critical habitat designation will often avoid the need for consultation and thus would not be evident from an examination of biological opinions.

In addition to efforts taken to avoid potential impacts to critical habitat and thereby avoid formal consultation, it is also important to consider measures taken after the conclusion of formal consultation to implement reasonable and prudent alternatives (RPAs),¹⁰ reasonable and prudent

measures (RPMs),¹¹ and other mitigation that have the effect of avoiding or mitigating impacts to critical habitat, even without a determination of adverse modification of critical habitat. For example, in its recent consultation with EPA regarding the Pesticide General Permit, NMFS provided a multi-pronged RPA that included measures such as a prohibition on the application of pesticide products within specified buffers of salmonid habitats.¹² EPA agreed to implement these measures identified by NMFS, with some modifications, to avoid both jeopardy and adverse modification of critical habitat.¹³ In addition, Habitat Conservation Plans (HCPs), which must accompany applications for incidental take permits, include steps the applicant will take to minimize and mitigate impacts to species and their critical habitat.¹⁴ The Wisconsin Department of Natural Resources, for example, holds an incidental take permit for the Karner blue butterfly and operates under an HCP that has 38 partners, including forestry and utility companies, that commit to minimization and mitigation of critical habitat impacts by taking measures such as avoiding disturbance of the butterflies’ host plant, lupine.¹⁵ Moreover, designated critical habitat is included in Recovery Plans developed by the Services, which outline proactive measures to achieve species’ recovery and also provide a framework for implementation of other provisions of the ESA, such as section 7 consultations on Federal agency activities. As these examples demonstrate, the designation of critical habitat has a practical impact on a wide range of activities that may never be the subject of an adverse modification analysis in a biological opinion.

Professor Owen acknowledges that agencies still provide “substantial habitat protection through other means.”¹⁶ Yet, as Professor Owen points out, the agencies have not developed a method for monitoring the results of voluntary or required minimization and mitigation efforts.¹⁷ Thus, it is difficult to assess how, if at all, any of the problems Professor Owen has described with respect to protection of critical habitat translate into actual effects on species recovery. Professor Owen’s analysis of biological opinions provides a valuable look at one aspect of the role of critical

5. 16 U.S.C. §1536(a)(2).

6. *See, e.g.*, *Ctr. for Biological Diversity v. Dept. of Interior*, 563 F.3d 466, 475 (D.C. Cir. 2009); *Pacific Rivers Council v. Thomas*, 30 F.3d 1050, 1054 n.8 (9th Cir. 1996).

7. 50 C.F.R. §402.12.

8. Owen, *supra* note 1, at 180.

9. *See U.S. FISH & WILDLIFE SERV., TOOLS FOR HELPING IMPERILED WILDLIFE ON PRIVATE LANDS 10* (Dec. 2005), *available at* www.fws.gov/endangered/esa-library/pdf/ImperiledWildlifeFinalDec2005.pdf. From the information available to the authors, it is not clear that the use of the land as a conservation bank was as profitable for the landowners as the previously planned development would have been.

10. Where a biological opinion concludes that a proposed agency action will jeopardize listed species *or* modify designated critical habitat, the Services can propose RPAs that will avoid jeopardy to listed species or adverse modification of critical habitat. 16 U.S.C. §1536(b)(3)(A).

11. In biological opinions that contain an incidental take statement, it will also include mandatory RPMs that the Services consider necessary or appropriate to minimize the impact of the taking. 50 C.F.R. §402.02.

12. National Marine Fisheries Service, Biological Opinion on the Effects of the Proposed Registration of Pesticide Products Containing Carbaryl, Carbofuran, and Methomyl (Apr. 2009), *available at* <http://www.nmfs.noaa.gov/pr/pdfs/carbamate.pdf>.

13. Letter from Richard P. Keigwin, Director, USEPA Pesticide Re-evaluation Division, to James H. Lecky, Director, NMFS Office of Protected Resources (May 14, 2010), *available at* http://www.nmfs.noaa.gov/pr/pdfs/consultations/epa_response_biop2.pdf.

14. 16 U.S.C. §1539(a)(2). An HCP is a plan that outlines ways of maintaining, enhancing, and protecting a given habitat type needed to protect species.

15. *See TOOLS FOR HELPING IMPERILED WILDLIFE*, *supra* note 9, at 8.

16. Owen, *supra* note 1, at 141.

17. *Id.* at 184-85.

habitat. To take his analysis one step further and develop a more complete understanding of the practical effects of critical habitat designations, it would be useful to examine wider practical impacts by, for example: (1) comparing the recovery trends of species before and after designation of critical habitat and those with and without designated critical habitat; (2) surveying action agencies for a description of activities undertaken by permit applicants to avoid formal consultation over impacts critical habitat; or (3) conducting an economic analysis of the full practical and legal impacts of critical habitat designation to assess whether—for the same or less money—more effective species conservation efforts could be achieved through voluntary rather than coercive means.¹⁸

II. Assertions as to the Limited Influence of Critical Habitat on Formal Consultation Stand in Stark Contrast to the High Costs It Imposes on Land Use and Ownership

Professor Owen's premise that critical habitat designation has only a weak influence on formal ESA section 7 consultation underscores the likelihood that the cost of critical habitat designation will be disproportionate to its limited benefits for species conservation and recovery. From both policy and rulemaking standpoints, the economic and regulatory burdens imposed by critical habitat designation are important considerations. Congress established two discrete provisions for the Services to consider economic impacts during rulemaking to designate critical habitat. First, ESA section 4(b)(2) provides that the "Secretary shall designate critical habitat" only "after taking into consideration the economic impact" of such designation.¹⁹ The Service's mandatory consideration of economic impacts informs its statutory determination whether designation

is "prudent."²⁰ Second, ESA section 4(b)(2) authorizes the Service to "exclude any area from critical habitat if [the Secretary] determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless he determines, based on the best scientific and commercial data available, that the failure to designate such area as critical habitat will result in the extinction of the species concerned."²¹

Considerable regulatory burdens and corresponding economic costs are borne by landowners, companies, state and local governments, and other entities as a result of critical habitat designation.²² These burdens begin *before* critical habitat is designated. Once the Service proposes a rule to designate critical habitat, landowners and others with an interest in the lands identified for critical habitat designation must participate in the rulemaking by presenting information to the Service during the rulemaking process if they want to ensure that the Service considers impacts to those interests and other relevant information.²³ In addition, the mere proposal of critical habitat triggers ESA conference requirements for any federal agency action (such as a U.S. Army Corps of Engineers permit for a stream crossing on private land) if that action is deemed "likely to . . . result in the destruction or adverse modification of [the] proposed critical habitat."²⁴ Once critical habitat is designated, persons who own or otherwise have lease, permit, or other interests in the designated land face immediate and significant restrictions on their otherwise lawful uses of that land; expensive and time-consuming new procedural requirements on ongoing and future projects; litigation risk; and significant diminution in the value of the property.

The ESA prohibits any federal "agency action" (*e.g.*, an activity authorized by a federal permit) that results in the "destruction" or "adverse modification" of critical habitat.²⁵ Projects undertaken on or near designated lands which require federal authorization, or which receive fed-

18. Indeed, FWS has recently been undertaking more efforts to work cooperatively with the public and increase incentives for voluntary efforts by private landowners and other land stewards to conserve species. See *Improving ESA Implementation: Landowner Incentives*, U.S. FISH & WILDLIFE SERV., www.fws.gov/endangered/improving_ESA/landowner_incentives.html. Many private landowners have welcomed the Service's increased focus on voluntary measures. According to Bob Stallman, American Farm Bureau Federation President, the "Farm Bureau believes the goals of the Endangered Species Act can best be accomplished when farm and ranch families and other private landowners work with government agencies through voluntary incentives to promote listed species on private lands. This approach has a proven track record of success in the areas where it has been used, and we are pleased the Interior Department is recognizing the positive role farmers and ranchers can play in species conservation." See *What They're Saying About Expanding Incentives for Voluntary Conservation Actions Under the Endangered Species Act*, U.S. FISH & WILDLIFE SERV., www.fws.gov/endangered/improving_ESA/What_they're_saying.pdf. It was just the type of voluntary landowner initiative in Florida that led to broad stakeholder support by government agencies and wildlife organizations which helped demonstrate, in a case worked on by the authors, that critical habitat is not needed for the Florida panther. See *Conservancy of SW Florida v. U.S. Fish and Wildlife Serv.*, 677 F.3d 1073, 1083-84 (11th Cir. 2012); see FLORIDA PANTHER PROTECTION PROGRAM, <http://www.floridapantherprotection.com/> (last viewed June 30, 2013).

19. 16 U.S.C. §1533(b)(2).

20. 16 U.S.C. §1533(a)(3)(A) (indicating that the Secretary shall designate and may revise critical habitat "to the maximum extent prudent and determinable").

21. 16 U.S.C. §1533(b)(2).

22. The public also faces indirect costs of critical habitat designation not addressed here, such as the costs to taxpayers of funding efforts by the Service to designate, defend, and implement critical habitat.

23. Under 50 C.F.R. Part 424, members of the public who face negative consequences as a result of critical habitat designation may provide information on "any significant activities that would . . . likely . . . be affected by the designation" and the "probable economic and other impacts of the designation upon proposed or ongoing activities," and may address whether the Service should "exclude any portion of such an area from the critical habitat if the benefits of such exclusion outweigh the benefits of specifying the area as part of the critical habitat." *Id.* at §424.19.

24. 50 C.F.R. §402.10(a). Because the term is undefined and often urged to have few if any limits, simply determining what "adverse modification" means in the context of a particular project can be daunting and time consuming (and thus very costly). And the procedures involved in a conference can be extensive and uncertain. During a conference, the Service must advise the action agency and applicant of any recommended "ways to minimize or avoid adverse effects," and the Service must subsequently issue a report of conclusions and recommendations reached during the conference, the "style and magnitude of [which] will vary with the complexity of the conference." *Id.* §402.10(c), (e).

25. 16 U.S.C. §1536(a)(2).

eral funding or otherwise have a federal nexus, are subject to critical habitat prohibitions and requirements. The ESA requires federal agencies to engage in section 7 consultation for any action that “may” affect critical habitat.²⁶ Section 7 consultation often takes months or years, significantly delaying projects and resulting in substantial additional project costs, if not destroying the projects’ economic viability. Furthermore, because the definition of “adverse modification” has been the subject of much litigation and is uncertain, members of the public cannot determine with confidence what activities would actually constitute “adverse modification.”²⁷ Indeed, the premise for Professor Owen’s conclusion that the Services depart from statutory consultation requirements rests largely on his view that small impacts to critical habitat violate the adverse modification standard.²⁸ Professor Owen suggests, in fact, that “federal actions authorizing, permitting or directly causing increases in greenhouse gas emissions” adversely affect polar bear critical habitat.²⁹ Finally, designation imposes significant additional litigation risks over application of critical habitat prohibitions and requirements, and can be expected to cause a substantial decline in the value of the land.³⁰

The expanse of a critical habitat designation for a species can be extensive and can overlap with critical habitat for other species, often covering thousands or millions of acres of land. For example, USFWS recently revised its designated critical habitat for the marbled murrelet and, even with the Service’s removal of certain areas from the designation, the designation covers 3,698,100 acres of land in Washington, Oregon, and northern California.³¹ Despite data and views well presented by Professor Owen which suggest that critical habitat designation has little effect on regulatory outcomes,³² critical habitat designation imposes significant costs on land use and ownership. The combination of this limited effect on the consultation process for which critical habitat designation is designed, and the high cost of critical habitat borne by the regulated public, can draw into question whether a critical habitat designation meets the “prudent” standard established by Congress.³³

III. Conclusion

Professor Owen’s analysis demonstrates that the benefits of critical habitat designation can be questionable in the context of its intended role in ESA section 7 consultation. In contrast, the costs and burdens of critical habitat designation are tangible and substantial. Policy makers and regulators should undertake a broad consideration of the full range of practical and legal impacts of critical habitat designation when considering individual critical habitat designations and broader regulatory changes.

26. 16 U.S.C. §1536(a)(2); 50 C.F.R. §402.14(a).

27. See *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1069-71 (9th Cir. 2004) (citing *N.M. Cattle Growers Ass’n v. U.S. Fish & Wildlife Serv.*, 248 F.3d 1277 (10th Cir. 2001); *Sierra Club v. U.S. Fish & Wildlife Serv.*, 245 F.3d 434 (5th Cir. 2001)). Wildlife and other organizations have urged the FWS to define “adverse modification” to include any action resulting in habitat of “perceptibly . . . less value,” which could be read to mean any change whatsoever resulting from any of the routine land management activities undertaken by landowners. See Letter from the Center for Biological Diversity, to Secretary of Interior Ken Salazar and Secretary of Commerce Gary Locke (Mar. 10, 2010), available at http://www.biologicaldiversity.org/programs/biodiversity/endangered_species_act/protecting_critical_habitat/pdfs/Adverse_Mod_sign-on_letter.pdf.

28. See Owen, *supra* note 1, at 147 (“The statute’s plain language . . . precludes federal agency actions from causing negative changes to critical habitat, even if the change is small”). The notion that any small negative impact constitutes adverse modification is not stated in the plain language of the ESA, nor may the ESA be interpreted to reach the extreme result that any negative impact to critical habitat, however inconsequential to the species, constitutes an adverse modification that is prohibited unless exempted by the Endangered Species Committee. 16 U.S.C. §1536(a)(2). Moreover, this notion is inconsistent with the case law. See, e.g., *Butte Environmental Council v. U.S. Army Corps of Eng’rs*, 620 F.3d 936 (9th Cir. 2010) (noting that “adverse modification” occurs only when an alteration “appreciably diminishes the value of critical habitat,” court upheld FWS determination of no adverse modification despite fact that project would destroy over 230 acres of critical habitat in light of the relatively small percentage of critical habitat affected) (citing 50 C.F.R. §402.02; *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1070 (9th Cir. 2004)).

29. See Owen, *supra* note 1, at 145. According to prior agency analyses for the polar bear, the available science does not support Professor Owen’s suggestion with respect to greenhouse gas emissions. See U.S. Fish & Wildlife Service, Draft Environmental Assessment for Proposed Endangered Species Act 4(d) Regulations for Threatened Polar Bears 56 (Apr. 16, 2012), available at <http://alaska.fws.gov/fisheries/mmm/polarbear/pdf/Draft%20EA%20for%20the%20Polar%20Bear%20Special%20Rule%20April%2013%202012.pdf> (noting that greenhouse gas emissions “from a given facility cannot be linked” to effects on polar bear critical habitat, and “point sources of greenhouse gases should not be subject to prohibitions under the ESA and its implementing regulations given the current state of the science”); see also 78 Fed. Reg. 11766, 11785 (Feb. 20, 2013).

30. See M. Auffhammer et al., *Economic Impacts of Critical Habitat Designation: Evidence From the Market for Vacant Land*, J.L. & ECON. (2009) (to be revised and resubmitted), available at www.webmeets.com/files/papers/AERE/2011/564/AOS.pdf.

31. Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Marbled Murrelet, 76 Fed. Reg. 61599 (Oct. 5, 2011).

32. Owen, *supra* note 1, at 166.

33. 16 U.S.C. §1533(a)(3)(A).

A R T I C L E

A Federal Act to Promote Integrated Water Management: Is the CZMA a Useful Model?

by Barton H. Thompson Jr.

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I. Introduction

Fragmentation poses a major challenge to effective water management in the United States. The water sector currently suffers from both substantive fragmentation (with separate agencies responsible for different but often closely related substantive issues) and geographic fragmentation (with a single watershed often crisscrossed by multiple geographic boundaries). To overcome this fragmentation, various jurisdictions have experimented with more-integrated forms of management, ranging from informal watershed planning to Integrated Water Resource Management (IWRM). These experiments have only reduced, not eliminated, fragmentation, which remains the norm in most of the United States.

The history and success of the Coastal Zone Management Act (CZMA)¹ suggest that the federal government could play a valuable role in addressing this fragmentation. Congress passed the CZMA in 1972 to address the similar fragmentation that plagued coastal management. While Congress decided that the federal government should not itself manage the nation's coasts or tell the states how to manage them, Congress concluded that the federal government could usefully encourage and enable states to engage in more integrated coastal management by (1) providing incentives, and (2) agreeing to act consistently with state coastal plans.

The CZMA provides a potential model for national legislation promoting more-integrated water management by the states. The federal government has a strong interest in effective management. Poor water planning in one state

can impact national water needs, the water management of neighboring states, and national economic markets. As in the case of coastal management, the federal government can help encourage more-integrated and effective water management by offering incentives to states that pursue integrated plans and by agreeing to comply with such plans.

II. Fragmentation and Integration

A. The Problem of Fragmentation

Fragmentation, both substantive and geographic, has long undermined effective water management in the United States.² Governments ideally would manage water resources on a holistic basis. Decisions regarding surface water and groundwater withdrawals would account for the fact that surface water and groundwater are often interlinked. In deciding whether or not to permit water diversions, water managers would consider the potential impact on water quality. They also would look at options for using reclaimed wastewater or storm water to supplement other local or imported supplies. Land-use managers would examine the impact of their decisions on water demand, groundwater infiltration, water quality, and other water-related concerns. Flood control and water supply would be closely integrated. Despite the need for such integration, different governmental agencies handle these various substantive issues in most jurisdictions today, and the varying agencies often do not work together to solve problems on

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1. See Coastal Zone Management Act of 1972, 16 U.S.C. §§1451–1466 (2006).

2. See, e.g., ELLEN HANAK ET AL., MANAGING CALIFORNIA'S WATER: FROM CONFLICT TO RECONCILIATION 195, 358–61 (2011); Mark Lubell & Lucas Lippert, *Integrated Regional Water Management: A Study of Collaboration or Water Politics-as-Usual in California, USA*, 77 INT'L REV. ADMIN. SCI. 76, 80 (2011); A. Dan Tarlock, *Putting Rivers Back in the Landscape: The Revival of Watershed Management in the United States*, 6 HASTINGS W.-N.W. J. ENVTL. L. & POL'Y 167, 182 (2000); Barton H. Thompson Jr., *Water Federalism: Governmental Competition and Conflict Over Western Waters*, in ENVIRONMENTAL FEDERALISM 175, 214 (Terry L. Anderson & Peter J. Hill eds., 1997).

a holistic basis.³ Within any watershed, moreover, multiple agencies often divide authority geographically.⁴

To see the problems of substantive fragmentation, consider the physical connection between groundwater and surface water.⁵ Conjunctive management of surface water and groundwater, a system in which users can switch from one source to another and in which surface water can be stored in groundwater aquifers, can significantly increase overall water availability.⁶ Yet, in the West, about one-third of the states do not integrate groundwater and surface-water rights at a statewide level, either through legislation or judicial action.⁷ No state has comprehensively integrated groundwater and surface water in all watersheds, and exceptions often exist to state rules integrating the two water sources.⁸ As a result, one resource that should be managed as an integrated whole—water—is often managed as two—groundwater and surface water—by different entities.

Another example of substantive fragmentation is the division of responsibility between water management and land-use planning.⁹ Land-use decisions can affect both the demand for water in a region and the availability and quality of supply. For example, impervious surfaces can not only degrade groundwater quality but also reduce recharge into an aquifer and increase flood risks.¹⁰ In most areas, however, different agencies are typically responsible for land-use decisions, water provision, and water-quality protection.¹¹

Geographic fragmentation further complicates effective water management.¹² In California, for example, thousands of different agencies manage water at a local level. A single watershed can be split between scores of agencies, including wholesalers, retailers, groundwater management districts, wastewater managers, and flood-control agencies.¹³

B. State Efforts to Promote Integration

States have taken several different approaches to try to overcome the problems that fragmentation presents. Some states have created new regional agencies designed to provide integrated management on specific substantive issues (e.g., conjunctive management of groundwater and surface water).¹⁴ Although such agencies can reduce fragmentation within their substantive and geographic jurisdictions,¹⁵ they do not provide comprehensive integration and, by creating yet another entity, can add to overall fragmentation.

States have increasingly encouraged local water and land-use agencies and their stakeholders to engage in watershed planning through informal watershed groups, watershed planning councils, and interagency working groups.¹⁶ Most such efforts, however, again have been limited both in scope and authority. Watershed planning, for example, has focused more on water-quality protection than on broad integrated management.¹⁷ Moreover, most watershed planning efforts have been ad hoc efforts involving single watersheds.¹⁸ Few have provided watershed planning groups with the legal authority needed to implement plans.¹⁹ As one set of experts has concluded, “[o]n a spectrum from ‘strong’ to ‘weak,’” most watershed planning has been “at the ‘weaker’ end.”²⁰

A growing number of governmental agencies, non-governmental organizations, and academic experts have shown interest in IWRM.²¹ Under IWRM, multiple agencies—local, state, and national, and with different substantive jurisdictions—work together in a region to address a broad range of water issues on an integrated basis,²² including water supplies (surface water, groundwater, and other sources such as recycling and desalination), water quality, aquatic protection, and land use. Participating agencies

3. HANAK ET AL., *supra* note 2, at 358–61 & fig.8.1.

4. J.B. Ruhl et al., *Proposal for a Model State Watershed Management Act*, 33 ENVTL. L. 929, 938 & n.46 (2003).

5. See generally Barton H. Thompson Jr., *Beyond Connections: Pursuing Multi-dimensional Conjunctive Management*, 47 IDAHO L. REV. 273 (2011).

6. Allison Evans, *The Groundwater/Surface Water Dilemma in Arizona: A Look Back and a Look Ahead Toward Conjunctive Management Reform*, 3 PHOENIX L. REV. 269, 275 (2010).

7. See Barbara Tellman, *Why Has Integrated Management Succeeded in Some States but Not in Others?*, 106 WATER RESOURCES UPDATE 13, 14–16 (1996); Thompson, *supra* note 5.

8. See, e.g., W. WATER PROJECT, TROUT UNLIMITED, *GONE TO THE WELL ONCE TOO OFTEN: THE IMPORTANCE OF GROUNDWATER TO RIVERS IN THE WEST* 8 (2d prtg. 2007).

9. See generally Craig Anthony (Tony) Arnold, *Introduction: Integrating Water Controls and Land Use Controls: New Ideas and Old Obstacles*, in WET GROWTH: SHOULD WATER LAW CONTROL LAND USE? 1, 1–55 (Craig Anthony (Tony) Arnold ed., 2005); Barton H. Thompson Jr., *Water Management and Land Use Planning: Is It Time for Closer Coordination?*, in WET GROWTH: SHOULD WATER LAW CONTROL LAND USE?, *supra*, at 95–118.

10. Arnold, *supra* note 9, at 28–29; Thompson, *supra* note 5, at 289–90; BETSY OTTO ET AL., AMERICAN RIVERS, *PAVING OUR WAY TO WATER SHORTAGES: HOW SPRAWL AGGRAVATES DROUGHT* 4–5 (2002).

11. For details, see Arnold, *supra* note 9, at 34–44.

12. See, e.g., Barton H. Thompson Jr., *Institutional Perspectives on Water Policy and Markets*, 81 CALIF. L. REV. 671, 754 (1993).

13. HANAK ET AL., *supra* note 2, at 107–08.

14. See William Blomquist et al., *Institutions and Conjunctive Water Management Among Three Western States*, 41 NAT. RESOURCES J. 653, 654, 659 (2001); Thompson, *supra* note 5, at 303, 318.

15. See Thompson, *supra* note 5, at 318 (citing Blomquist et al., *supra* note 14, at 670).

16. See, e.g., William Blomquist & Edella Schlager, *Political Pitfalls of Integrated Watershed Management*, 18 SOC'Y & NAT. RESOURCES 101, 103 (2005); Ruhl et al., *supra* note 4, at 930–31; Tarlock, *supra* note 2, at 167; see also Mark Lubell et al., *Watershed Partnerships and the Emergence of Collective Action Institutions*, 46 AM. J. POL. SCI. 148, 150 (2002); Thompson, *supra* note 2, at 214–15.

17. Thompson, *supra* note 5, at 321; Ruhl et al., *supra* note 4, at 932.

18. Tarlock, *supra* note 2, at 187; Thompson, *supra* note 5, at 321; see also Matthew D. Davis, *Integrated Water Resource Management and Water Sharing*, 133 J. WATER RESOURCES PLAN. & MGMT. 427, 438 (2007).

19. Blomquist & Schlager, *supra* note 16, at 103; Davis, *supra* note 18, at 438; Thompson, *supra* note 5, at 321; see also Tarlock, *supra* note 2, at 187–89.

20. Blomquist & Schlager, *supra* note 16, at 103.

21. For general overviews of IWRM, see INTEGRATED WATER RESOURCES MANAGEMENT (Miguel A. Marino & Slobodan P. Simonovic eds., 2001); GORDON YOUNG, UN-WATER, *STATUS REPORT ON INTEGRATED WATER RESOURCES MANAGEMENT AND WATER EFFICIENCY PLANS* (2008).

22. See Wietske Medema et al., *From Promise to Practice: A Critical Assessment of Integrated Water Resources Management and Adaptive Management Approaches in the Water Sector*, 12 ECOLOGY & SOC'Y 29, 39 tbl. 1 (2008).

manage these issues together, in consultation with local stakeholders, to maximize regional objectives.²³ IWRM promotes not only integrated management but also healthy collaboration among stakeholders by actively involving them in planning and implementation.²⁴

California has recently tried to promote IWRM, although in a confusing twist, California has decided to name its approach “Integrated Regional Water Management” (IRWM), rather than IWRM.²⁵ California found that increased coordination is “necessary to maximize the quality and quantity of water available to meet the state’s agricultural, domestic, industrial, and environmental needs”²⁶ Therefore, California’s Integrated Regional Water Management Planning Act of 2002 authorizes regional groups of agencies to prepare and adopt integrated water plans addressing any matters over which the agencies have authority, including urban water management, water recycling, agricultural water management, ground-water management, water conservation, water quality, ecosystem health, and flood control.²⁷ To encourage IRWM, California has offered more than \$350 million in matching grants.²⁸ In one of the most successful examples of IRWM, the Santa Ana Watershed Project Authority, which brings together more than one hundred local, regional, state, and federal agencies in three different counties, has developed a “One Water One Watershed Plan”—a “living document” that will permit ongoing integration and coordination.²⁹

III. The CZMA as a Potential Model

The federal government can play an important role in promoting increased integration. States clearly have the authority and expertise to integrate their water management. California’s effort to encourage IRWM shows one state’s progress in this regard. Yet, progress is likely to be slow and ultimately ineffective without federal support and involvement. The CZMA provides a useful model for such federal intervention.

A. The History and Provisions of the CZMA

Congress enacted the CZMA in 1972 to promote effective state-level protection of the nation’s coasts. Congress and other supporters of national legislation believed that the national government had a strong interest in promoting

effective management of the coastal zone.³⁰ Coastal management, however, suffered from fragmentation similar to that confronting water management today. Local governments held only limited authority over the issues confronting them and had to coordinate with multiple state and federal agencies in carrying out their responsibilities.³¹ The solution, in Congress’s view, was comprehensive state-level management of the coastal zone.³²

Congress designed the CZMA to encourage state coastal planning and ensure federal coordination with state plans.³³ Unlike other federal environmental legislation passed during the same time period, the CZMA does not require states to do anything. Instead, the CZMA promotes state planning through incentives. First, the CZMA provides matching financial assistance for the administration of state coastal-management programs that the Secretary of Commerce has approved as meeting the requirements of the Act.³⁴ In a novel step, the CZMA also promises federal consistency with approved state plans.³⁵ This promise not only serves as another important incentive, but also ensures that federal actions do not undermine state planning efforts.³⁶ The CZMA also provides for technical assistance to states in developing and implementing plans.³⁷

B. Should the National Government Take a CZMA-Like Approach to Integrated Water Management?

The national government has at least three reasons, each paralleling an argument made forty years ago in support of the CZMA, to facilitate and promote more integrated water management. First, because of the national government’s significant role in the management of freshwater in the United States, efforts to integrate water management need legislation instructing national agencies to cooperate in integrated planning and comply with resulting plans. The national government is involved in many aspects of water management, including regulation of water quality, protection of wetlands and endangered species, licensing of hydroelectric facilities, and provision of reclamation water. Any attempt to integrate freshwater management across substantive issues and at a watershed or similar scale therefore must incorporate relevant national agencies, responsibilities, and programs. Although many national agencies already coordinate with states by law or practice, legislation can help ensure fuller consistency.

23. See YOUNG, *supra* note 21, at 5.

24. Lubell & Lippert, *supra* note 2, at 81.

25. California is the first state to promote IWRM, although a number of foreign countries and the European Union have done so. *Id.* at 76, 82.

26. Integrated Regional Water Management Planning Act of 2002, CAL. WATER CODE §10531(b) (West 2008).

27. *Id.* §§10540(a)–(c).

28. Thompson, *supra* note 5, at 319; see also CAL. DEP’T OF WATER RES. & STATE WATER RES. CONTROL BD., INTEGRATED REGIONAL WATER MANAGEMENT GRANT PROGRAM GUIDELINES 3–4 (2004). More than \$2 billion in funding from state bonds has been allocated to date. HANAK ET AL., *supra* note 2, at 259.

29. See HANAK, *supra* note 2, at 308; Thompson, *supra* note 5, at 319–21; see also SANTA ANA WATERSHED PROJECT AUTH., ONE WATER ONE WATERSHED: 2010 INTEGRATED REGIONAL WATER MANAGEMENT PLAN 16 (2010).

30. See Coastal Zone Management Act of 1972, 16 U.S.C. §1451(a) (2006).

31. COMM’N ON MARINE SCI., ENGR & RES., OUR NATION AND THE SEA: A PLAN FOR NATIONAL ACTION 56 (1969).

32. 16 U.S.C. §1451(i).

33. See *id.* §1452(2).

34. *Id.* §1455(a)–(b).

35. *Id.* §1456(c); see generally Thomas J. Schoenbaum & Frank Parker Jr., *Federalism in the Coastal Zone: Three Models of State Jurisdiction and Control*, 57 N.C. L. REV. 231, 238–39 (1979).

36. To protect federal interests, the CZMA requires that the Secretary of Commerce consult with federal agencies “principally affected” by state coastal programs before approving them, 16 U.S.C. §1456(b), and also provides for a variety of exceptions, *id.* §1456(c)(1)(B).

37. *Id.* §1456(c).

Second, the national government has a strong interest in how states and local governments manage water resources. Public federal lands not only are a source of water but also depend on both instream flows and adequate quantities of consumptive water.³⁸ A variety of federal energy facilities, ranging from nationally managed hydropower plants to energy projects on national lands, also require substantial and reliable water resources.³⁹ The achievement of various federal energy goals, such as increased production of biofuels, similarly depends on adequate and sustainable supplies of water.⁴⁰

Finally, poor water management in one state can impact water supplies in other states, as well as interstate markets. Interstate rivers and aquifers provide over 95 percent of the available freshwater in the United States.⁴¹ Transboundary impacts, however, do not stop with interstate rivers and watersheds. Where regions exhaust their local water supplies, they often look farther away for additional freshwater, even to other states.⁴²

IV. A Sustainable Water Integrated Management Act

What would new federal legislation designed to encourage more integrated water management actually provide? The remainder of this Article considers the potential provisions of a Sustainable Water Integrated Management Act (SWIM). Like the CZMA, SWIM would encourage and enable existing units of government, at the federal, state, and local levels, to cooperate in managing water resources in a more integrated fashion. Rather than imposing integrated management on states, SWIM would promote integration through voluntary incentives, including funding for planning and implementation, as well as a promise of federal consistency.

Under SWIM, states would develop integrated water management plans and submit them for approval to the federal government. Of the many federal agencies that potentially could administer SWIM, the Department of the Interior (DOI) would seem the most appropriate. DOI not only has major water responsibilities in connection with reclamation, Indian water rights, federal lands, and endangered species, but it also has long been involved in efforts to improve national and regional water policy.⁴³

States would have significant freedom under SWIM in how they approach integrated management, just as the CZMA provides significant freedom to states in how they develop coastal plans. For example, states could (and presumably would) delegate planning authority to local regions but would have the ultimate responsibility of ensuring statewide integration. Rather than dictating exactly what substantive issues must be included in integrated plans, SWIM would establish broad guidelines and minimum requirements.⁴⁴ SWIM would require that state plans integrate those issues necessary to ensure effective water management, including a minimum list of issues likely to be relevant in all watersheds and basins, such as:

- Allocation of groundwater and surface water;
- Water quality;
- Ecological protection;
- Water-related land-use planning; and
- Stormwater and wastewater disposal and reclamation.

The states could decide what other issues, if any, to integrate, unless the administering national agency determines that such integration is critical to effective water management.

At least three different approaches could be taken to the tricky issue of interstate watersheds and groundwater basins, which, as noted earlier, provide 95 percent of the freshwater in the United States. First, SWIM could require states to provide for interstate integration in watersheds and groundwater basins that cross state borders, through either formal interstate compacts, such as the Delaware River Basin Compact,⁴⁵ or more informal administrative agreements.⁴⁶ Second, SWIM could allow states to submit plans that address only intrastate waters, but provide that federal consistency and other incentives apply only to those waters. Finally, SWIM could provide merely that state plans provide for interstate notice, consultation, and coordination in the management of interstate waterways.⁴⁷ SWIM also

WESTERN WATER POLICY REVIEW ADVISORY COMM'N, *WATER IN THE WEST: CHALLENGE FOR THE NEXT CENTURY* (June 1998), available at http://www.preventionweb.net/files/1785_VL102318.pdf.

38. Thompson, *supra* note 2, at 175, 212.

39. See U.S. GEN. ACCOUNTING OFFICE, GAO/RCED-97-48, *FEDERAL POWER: ISSUES RELATED TO THE DIVESTITURE OF FEDERAL HYDROPOWER RESOURCES* 20 (1997); Peter H. Gleick, *Water and Energy*, 19 ANN. REV. ENERGY & ENV'T 267, 278-95 (1994).

40. See, e.g., R. Dominguez-Faus et al., *The Water Footprint of Biofuels: A Drink or Drive Issue?*, 43 ENVTL. SCI. & TECH. 3005, 3005 (2009).

41. Noah D. Hall, *Interstate Water Compacts and Climate Change Adaptation*, 5 ENVTL. & ENERGY L. & POL'Y J. 237, 239 (2010).

42. Texas water users, for example, are seeking to import water from various sources in Oklahoma. See *Tarrant Reg'l Water Dist. v. Herrmann*, 656 F.3d 1222 (10th Cir. 2011), cert. granted, 81 U.S.L.W. 3364 (U.S. Jan. 4, 2013) (No. 11-889); Matthew Tresaugue, *Texas Water Supply for the Future Is Uncertain*, HOUSTON CHRON., Nov. 13, 2011.

43. For example, DOI created the Western Water Policy Review Advisory Commission during the Clinton Administration. See REPORT OF THE

44. California's IRWM program takes a similar approach; local IRWM plans "must address major water related objectives and conflicts within the region, including, at a minimum, water supply, groundwater management, ecosystem restoration, and water quality." CAL. DEP'T OF WATER RES. & STATE WATER RES. CONTROL BD., *supra* note 28, at 14 (emphasis added).

45. See BARTON H. THOMPSON JR. ET AL., *LEGAL CONTROL OF WATER RESOURCES: CASES AND MATERIALS* 920-25 (5th ed. 2013). SWIM ideally would provide advance congressional authority for states to negotiate and agree to relevant interstate compacts, just as the Clean Water Act does in the context of water pollution. 33 U.S.C. §1253(b) (2006).

46. See Ann O'M. Bowman, *Horizontal Federalism: Exploring Interstate Interactions*, 14 J. PUB. ADMIN. RES. & THEORY 535, 536-38 (2004).

47. This would be a variant of provisions of the Clean Air Act and Clean Water Act that require states administering the statutes to notify neighboring states if their actions might impact air or water quality in the other state, and to refrain from taking any action that could interfere with the neighboring state's pollution standards. See JAMES SALZMAN & BARTON H. THOMPSON JR., *ENVIRONMENTAL LAW AND POLICY* 171-72 (3d ed. 2010) (explaining the Clean Water Act provisions); see also 42 U.S.C. §7410(a)(2)(D)(i)(I) (Clean Air Act).

could require the national agency administering the statute to work with states to promote formal agreements for interstate integration in the management of interstate waters.⁴⁸

V. Federal Incentives

The major purpose of SWIM, just like the CZMA, would be to encourage states to provide for the integrated management of their waters and to help them overcome the current obstacles to such management. Greater integration can be costly and complex and may have to overcome significant political hurdles.⁴⁹ Incentives can help states overcome these obstacles. SWIM also can assure states that the federal government will facilitate and comply with state integration efforts.

A. Federal Funding

The most tried and true incentive in the federal arsenal is funding.⁵⁰ Matching funds for both the planning and implementation of state coastal plans has been the central incentive under the CZMA. California has also enticed many of its local governments to engage in IRWM through the promise of funding. Because federal budgetary constraints may limit the availability of new funding, SWIM might leverage existing federal conservation programs that provide state funding, like the federal Farm Bill, by giving states that have approved plans under SWIM a priority in the allocation of those funds.

B. Federal Consistency

The other major incentive in the CZMA is the promise of federal consistency.⁵¹ Because the federal government already acts consistently with state water laws, regulations, and policies in a broad range of its programs, the potential value to states of a comprehensive promise of consistency may be less important than under the CZMA. In the Reclamation Act of 1902, for example, the federal government already agrees to carry out its activities in “conformity with” state laws “relating to the control, appropriation, use, or distribution of water used in irrigation.”⁵² The Clean Water Act permits states to condition federal licenses and permits so as to ensure that federal projects do not violate state water-quality standards.⁵³ Federal consistency with state water policy, however, is still far from complete

and is likely to prove attractive to many states. No matter what the incentive value, moreover, a federal consistency requirement is necessary to ensure full integration of water management across all levels of government.

C. Federal Technical Assistance

Technical assistance in planning and managing water resources on an integrated basis can also be an important method of encouraging state participation in SWIM. The CZMA provides for technical assistance, although only for amendments to plans already adopted and approved under the CZMA.⁵⁴ Technical challenges pose a substantial hurdle to the integrated management of many water issues, including the integration of surface-water and groundwater rights.⁵⁵ A federal offer to provide technical information and models needed in such management could be attractive, particularly to states with limited technical capabilities of their own. The United States Geological Survey, in particular, could help significantly in the development of hydrologic information and models.

D. Streamlined Permitting

Various actions that states might wish to take in implementing more integrated water management might require permits from the federal government or agencies enjoying delegated federal authority—for example, improvements to wetlands or reclamation of storm waters. Local agencies often complain that one of the major obstacles to such projects is the complexity and time involved in obtaining requisite federal approval.⁵⁶ SWIM therefore could also encourage states to participate in developing more integrated water management by promising to streamline and simplify any federal permits or approvals needed for projects developed through integrated planning efforts.

E. Federal Delegation

More controversially, SWIM might delegate various types of federal regulatory authority to state governments that develop integrated water management programs that provide the functional equivalent of the federal authority. States, of course, already exercise significant delegated authority in specific settings, such as implementation and enforcement of the Clean Water Act.⁵⁷ In the case of other relevant federal statutes, however, federal agencies either do

48. The Clean Water Act includes similar provisions. See 33 U.S.C. §1253(a) (“[EPA] shall . . . encourage compacts between States for the prevention and control of pollution.”).

49. Davis, *supra* note 18, at 427, 442; Lubell & Lippert, *supra* note 2, at 92 tbl. 4; Medema, *supra* note 22, at 33–34, 38–41; Thompson, *supra* note 5, at 320–21; Thompson, *supra* note 2, at 214–15.

50. See, e.g., Susan Welch & Kay Thompson, *The Impact of Federal Incentives on State Policy Innovation*, 24 AM. J. POL. SCI. 715, 717 (1980).

51. See Tim Eichenberg & Jack Archer, *The Federal Consistency Doctrine: Coastal Zone Management and “New Federalism”*, 14 ECOLOGY L.Q. 9, 14 (1987).

52. Reclamation Act of 1902, 43 U.S.C. §383; see also *California v. United States*, 438 U.S. 645, 678–79 (1978).

53. See Federal Water Pollution Control Act, 33 U.S.C. §1341(a)(1), (d); see also *S.D. Warren Co. v. Me. Bd. of Envtl. Prot.*, 547 U.S. 370, 374 n.1

(2006); PUD No. 1 of Jefferson Cnty. v. Wash. Dep’t of Ecology, 511 U.S. 700, 713–14 (1994).

54. Coastal Zone Management Act of 1972, 16 U.S.C. §1456c(a).

55. See Thompson, *supra* note 5, at 279–86.

56. See, e.g., Robert L. Glicksman, *From Cooperative to Inoperative Federalism: The Perverse Mutation of Environmental Law and Policy*, 41 WAKE FOREST L. REV. 719, 720–21, 778–800 (2006).

57. See SALZMAN & THOMPSON, *supra* note 47, at 152–53; J.B. Ruhl, *Cooperative Federalism and the Endangered Species Act: A Comparative Assessment and Call for Change*, in *THE ENDANGERED SPECIES ACT AND FEDERALISM: EFFECTIVE CONSERVATION THROUGH GREATER STATE COMMITMENT* 35, 43–44 (Kaush Arha & Barton H. Thompson Jr. eds., 2011).

not have clear authority to delegate or infrequently exercise that authority. For example, although §6 of the Endangered Species Act arguably permits the delegation of regulatory authority to states that have established functionally equivalent programs, the federal government has not actively delegated that authority (in large part because of lower-court decisions narrowly interpreting the statute).⁵⁸ This is also the case under §404 of the Clean Water Act, which protects and regulates wetlands.⁵⁹ Delegated authority would not only serve as another major incentive for states to participate in SWIM but also help both to integrate management and to allow states to play a more active role in key aspects of water management.

VI. Conclusions

The federal government has both an interest in promoting more integrated management of the nation's waters and the ability to encourage and enable such management. Geographic and substantive fragmentation has long hobbled effective water management in the United States. More integrated management approaches, such as watershed planning and IWRM, can help overcome this fragmentation and, in the process, improve water management along multiple dimensions. Integrated water management, however, also faces significant political, administrative, and economic obstacles, which helps explain why it has not been adopted more widely. While some states such as

California have played an increasingly active role in promoting such management, other states have not, and there is a limit to what states by themselves can accomplish, in part because states have no authority over many federal actions. By agreeing to act consistently with integrated water management programs developed by states and by providing other incentives for states interested in doing so, the federal government can both encourage and ensure greater integration.

The CZMA provides a useful model for federal legislation designed to encourage and enable more-integrated water management. As set out above, a "Sustainable Water Integrated Management Act" (SWIM) would provide matching funds to states wishing to develop a statewide, locally implemented program for more integrated water management, as well as priority in seeking existing conservation funding from the federal government. If the federal government approves a state plan after review, SWIM would require federal agencies and their permittees to act in a manner consistent with plans developed as part of the program. SWIM could also provide additional incentives for state participation, including federal technical assistance, a streamlined permitting process for projects implemented as part of the state program, and perhaps even delegation of federal regulatory authority where the state program provides functionally equivalent protection to federal environmental or other interests.

58. See Robert P. Davison, *The Evolution of Federalism Under Section 6 of the Endangered Species Act*, in *THE ENDANGERED SPECIES ACT AND FEDERALISM: EFFECTIVE CONSERVATION THROUGH GREATER STATE COMMITMENT*, *supra* note 57, at 89, 111; see also Kaush Arha & Barton H. Thompson Jr., *Toward Greater State and Local Commitment*, in *THE ENDANGERED SPECIES ACT AND FEDERALISM: EFFECTIVE CONSERVATION THROUGH GREATER STATE COMMITMENT*, *supra* note 57, at 307, 316–17.

59. See Oliver A. Houck & Michael Rolland, *Federalism in Wetlands Regulation: A Consideration of Delegation of Clean Water Act Section 404 and Related Programs to the States*, 54 *Md. L. Rev.* 1242 (1995).

C O M M E N T

A Comment on A Federal Act to Promote Integrated Water Management: Is the CZMA a Useful Model?

by Bradley M. Campbell

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I. Introduction

Fragmentation, calcified in the media-specific nature of federal and state statutes, in the silo-by-silo regulatory approach of environmental and natural resource agencies, and in the arbitrary jurisdictional fiefs that begin in the committee structure of the U.S. Congress and radiate out through the budgets and missions of agencies, has long been the bane of sound environmental policy. Professor Thompson, in *A Federal Act to Promote Integrated Water Management: Is the CZMA a Useful Model*,¹ persuasively reminds us that this remains of particular importance in water-resource management.

That said, I would question whether a new federal oversight role—whether in the form of Professor Thompson’s proposed “Sustainable Water Integrated Management Act,” with its appealing acronym (SWIM), or in some other form—would solve the current problem of fragmentation in water-resource policy, because I question a number of Professor Thompson’s fundamentals. First, “integration” in itself by no means assures optimal or even better planning and regulatory outcomes, whether one is concerned with under- or over-regulation, especially in the absence of meaningful standards. Second, the success and incentives of the largely hortatory Coastal Zone Management Act (CZMA)² have been limited in practice. Third, there is a mismatch between the core competencies of federal agencies and the most significant challenges to integrated

water-resource management, which mostly concern land use. Professor Thompson has too-limited a sense of integration progress at the state level, and overlooks the efficacy of existing federal mandates in driving that progress.

II. Integration: Process or Substance?

Professor Thompson’s concern is with fragmentation, “both substantive and geographic,”³ but his proposed solution seems devoid of meaningful substantive standards and indifferent to geography. Professor Thompson urges a voluntary, incentive-based process in which states would determine specific standards and any geographic variation, and would be given “significant freedom under SWIM in how they approach integrated management.”⁴ According to Professor Thompson: “Rather than dictating exactly what substantive issues must be included in integrated plans, SWIM would establish broad guidelines and minimum requirements,” making clear that the “minimum requirements” would dictate issues that must be addressed rather than standards that must be met.⁵

There is little reason to assume that a federal integration process would result in an improvement in substantive outcomes in water-resource regulation and management in the absence of substantive standards. Professor Thompson implicitly recognizes, and wisely avoids, the difficulty of incorporating specific standards into a federal integrated management model⁶—can Congress really articulate useful integration standards to suit the arid West and the wet Northeast alike? Still, it is hard to understand how, without meaningful standards, imposing an additional pro-

Author’s note: This response benefitted substantially from conversations with Anthony McDonald, director of Monmouth University’s Urban Coast Institute and former director of the Coastal States Organization. Any flaws remain my own.

1. Barton H Thompson Jr., *A Federal Act to Promote Integrated Water Management: Is the CZMA a Useful Model?*, 42 ENVTL. L. 201 (2012).
2. Coastal Zone Management Act of 1972, 16 U.S.C. §§1451–1466 (2006).

3. Thompson, *supra* note 1, at 205.
4. Barton H. Thompson Jr., *A Federal Act to Promote Integrated Water Management: Is the CZMA a Useful Model*, 43 ELR 10682, 10685 (Aug. 2013).
5. *Id.* at 10685.
6. *See, e.g., id.*

cess hoop on state programs would improve the quality of water-resource decision-making or otherwise add significant value.

There are at least two possible answers to this criticism. First, Professor Thompson may simply be more of a process optimist than I, and, to be sure, there are other federal statutes—the National Environmental Policy Act (NEPA)⁷ being the landmark example—that share the premise that additional process can improve substantive outcomes. NEPA’s history, of course, provides ample fodder for both process-optimists and process-pessimists.⁸ But it is not clear that SWIM even contemplates the robust public process that NEPA dictates for major federal actions, or that judicial review of SWIM program approvals or SWIM consistency determinations would be as available or as effective as it sometimes has been under NEPA.⁹ If CZMA were the model, one would have to conclude that judicial review is unlikely to provide the same discipline to SWIM decisions that it has brought to the environmental review process under NEPA.

Second, because policy integration inherently requires resource management for multiple and equally legitimate objectives and uses, establishing substantive accountability standards at the federal level may be nearly impossible. In considering an integrated management approach for a river basin, for example, is there an objective basis for preferring a plan that favors wilderness values over recreational uses? Or one that favors drinking water supply and industrial use over ecological uses? Once the SWIM process ensures that all the relevant objectives have been “integrated,” which likely means only that they have been considered, what would it really add?

Moreover, to the extent that a state’s “integrated” approach leads to results that are incompatible with established federal objectives—for instance, fishable and swimmable waters under the Clean Water Act (CWA),¹⁰ or habitat protection under the Endangered Species Act (ESA)¹¹—what merit would there be in subordinating federal standards that honor these objectives in the name of “consistency,” as Professor Thompson would have us do to encourage state participation.¹²

III. The Limits of CZMA “Integration” and “Success”

The lack of meaningful substantive standards is, of course, a failing of the CZMA itself, and not a minor one. The statute has certainly been a “success” in the sense that it has moved states to have comprehensive coastal policies in place, but the quality and efficacy of those policies, which ought to be the true measure of success, vary widely. CZMA management for multiple objectives tends to preclude enforcement of any particular objective. The CZMA does have numerous, apparently stringent requirements for coastal zone management plan approval,¹³ such as the requirement that state plans and authorities include power “to administer land use and water use regulations to control development to ensure compliance with the management program, and to resolve conflicts among competing uses”¹⁴ But the apparent stringency is belied by the fact that the plan need only be “adequate to carry out the purposes of this chapter . . . consistent with the policy declared” in the CZMA,¹⁵ and the stated policy is to “develop” as well as to “preserve” and “protect” coastal resources.¹⁶ This provides little basis on which to deny approval to a plan that strikes a balance in favor of excessive development, or one that strikes a balance too restrictive of development.

Not only does the CZMA lack “sticks” to ensure accountability, the “carrots” for better coastal planning tend to be weak in practice. While technical assistance and matching funds from NOAA under the CZMA may spur improvement in state programs at the margins—a proposition for which there seems scant evidence either way—both tend to be regarded as entitlements once a state has its initial CZMA approval in hand rather than resources that must be earned through continual improvement.

And under SWIM these incentives would be even more attenuated than under the CZMA. Recognizing current budget constraints, Professor Thompson assumes no new money will be available for SWIM, and offers “priority in the allocation” of existing funds as an alternate incentive.¹⁷ This seems unlikely to spur participation, especially since there will be “winner” and “loser” states in any reallocation of existing funding. In this regard, the experience of states in the National Estuary Program,¹⁸ under which state and federal agencies undertook extensive planning and priority-setting efforts well-integrated across program areas, but found that federal support for planning was not followed by “priority” in funds for implementation, will likely dampen enthusiasm for the SWIM model.

7. National Environmental Policy Act of 1969, 42 U.S.C. §§4321–4370h (2006).

8. See Joseph L. Sax, *The (Unhappy) Truth About NEPA*, 26 OKLA. L. REV. 239 (1973).

9. The CZMA does require public hearings on coastal plan development, 16 U.S.C. §1455(d)(4), arguably a minimal requirement when compared to the procedures of NEPA.

10. 33 U.S.C. §§1251–1387.

11. 16 U.S.C. §§1531–1544.

12. Thompson, *supra* note 1, at 203.

13. See generally 16 U.S.C. §1455(d).

14. *Id.* §1455(d)(10)(A).

15. *Id.* §1455(d)(1).

16. *Id.* §1452(1).

17. Thompson, *supra* note 1, at 235–36.

18. 33 U.S.C. §1330.

Nor would streamlined permitting and consistency seem likely to be significant incentives. Many states rely on the presence of often more stringent federal standards and review procedures in setting their own policies, so eliminating those standards and procedures will likely appeal only to states whose priority is project approval as opposed to better resource management.

IV. Federal and State Competencies

As Professor Thompson acknowledges, one of the central, preeminent, and cross-cutting challenges in contemporary management of water resources is the planning, management, and regulation of land use and development.¹⁹ Both water supply and water quality are critically affected by the amount, location, and design of development and impervious cover; the design, type, and location of crops; the type, location, and management practices of farm, livestock, and forestry operations; and so on. These are inherently state and local decisions in which the federal government historically has disavowed any direct role, and for which federal agencies have little expertise. To be sure, SWIM does not anticipate direct federal authority to second-guess local land use decisions or to disapprove a state's water-resource management plans for failure adequately to control land use and its impacts on water quality. But absent such authority, what's the point?

There also is sufficient progress among states in using existing tools to integrate water-resource management, and take on the issue of land use, to cast doubt on whether additional federal intervention is necessary or salutary.

Professor Thompson lauds California for its Integrated Regional Water Management Planning Act (IRWM),²⁰ but a new statute specifically mandating integrated resource management is not the only means to achieve the integration Professor Thompson seeks. New York's landmark watershed agreement, under which federal and state agencies integrated land use, water quality, and water supply objectives, and in the process avoided billions of dollars in additional drinking-water treatment costs, emerged from collaborative work under existing authorities.²¹ Neighboring New Jersey established a comprehensive and integrated planning and regulatory regime to control land use and protect water supply and water quality in the state's Highlands watershed.²² New Jersey also revised both its storm water management program and its antidegradation policies under the Clean Water Act to integrate water supply

and habitat concerns by setting a no-net-loss-of-recharge standard and broadening stream buffer requirements to protect drinking water sources.²³ In Florida, the Everglades Restoration Plan integrates objectives from urban drinking water supply for Miami to rural agricultural runoff management, from habitat protection in the Everglades preserve to water quality improvement in Florida Bay; Congress later blessed this initiative in the Federal Water Resource Development Act.²⁴ The Bay Delta Restoration Plan, integrating water-resource management work among eight federal and state agencies in a comprehensive plan initiated outside the auspices of California's IRWM,²⁵ promises similar integration benefits for water resources and living resources of the Sacramento-San Joaquin ecosystem.²⁶

A statute of general applicability like SWIM would add little to these efforts focused on particular watersheds or resources. To the contrary, because the pressure of compliance with CWA or ESA mandates drives many of these efforts, and SWIM could attenuate the impact of those mandates, SWIM might retard rather than accelerate the progress of water-resource policy integration. Perhaps SWIM could make such efforts more prevalent, but it takes a leap of faith to conclude that the results for water-resource management would justify the costs in a time of scarce and diminishing resources for environmental and natural resource programs and enforcement. Devoting more resources to enforcement of the existing mandates that have driven integration success seems a better bet than SWIM.

Professor Thompson is closer to the mark when he suggests a stronger federal role or other mechanism to better integrate management, and to resolve conflicts, between and among states sharing common water resources. Here again, though, the CZMA and other existing models have proved deficient. Witness the longstanding dispute over deepening the Delaware River, in which New Jersey and Delaware unsuccessfully invoked their coastal policies under the CZMA to demand further review of a project long sought by Pennsylvania.²⁷ Witness the failure of states invoking their coastal policies under the CZMA to affect oil and gas development in neighboring states or in federal waters.²⁸

Nor are the basin commissions that Professor Thompson cites, like the Delaware River Basin Commission (DRBC),²⁹ exemplars of success in terms of resolving water-resource management conflicts between and among states. Faced with divergent views of states concerning the water-resource impacts of hydraulic fracturing, DRBC has

19. See Thompson, *supra* note 1, at 209-10; see also Craig Anthony (Tony) Arnold, *Introduction: Integrating Water Controls and Land Use Controls: New Ideas and Old Obstacles*, in *WET GROWTH: SHOULD WATER LAW CONTROL LAND USE?* 1, 1-55 (Craig Anthony (Tony) Arnold ed., 2005); Barton H. Thompson Jr., *Water Management and Land Use Planning: Is It Time for Closer Coordination?*, in *WET GROWTH: SHOULD WATER LAW CONTROL LAND USE?*, *supra*, at 95-118.

20. Thompson, *supra* note 1, at 213-18.

21. See *NYC Watershed Memorandum of Agreement*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/region2/water/nycshed/nycmoa.htm> (last updated Apr. 5, 2011) (collecting materials).

22. See N.J. STAT. ANN. §13:20-1-35 (West 2013).

23. N.J. ADMIN. CODE §§7:8, 7:9:B (2013).

24. Water Resources Development Act of 2000, §601, 114 Stat. 2572 (2000) (codified at 33 U.S.C. §892a). See Lake Tahoe Restoration Act of 2011, Pub. L. No. 106-506, 114 Stat. 2351 (2000); see generally *THE COMPREHENSIVE EVERGLADES RESTORATION PLAN*, www.evergladesplan.org (last visited Apr. 4, 2013).

25. CAL. WATER CODE §10531(b) (West 2008).

26. See generally *BDCP News and Events*, BAY DELTA CONSERVATION PLAN, www.baydeltaconservationplan.com (last visited Apr. 6, 2013).

27. *Delaware Dep't of Nat. Res. & Envtl. Control v. United States Army Corps of Eng'rs*, 685 F.3d 259, 286-87 (3d Cir. 2012).

28. *E.g., California v. Norton*, 311 F.3d 1162 (9th Cir. 2002).

29. Thompson, *supra* note 1, at 233.

been paralyzed on the issue for over two years, without the votes either to approve regulations or to make permanent a provisional ban on hydraulic fracturing in the basin.³⁰ By contrast, the Susquehanna River Basin Commission largely ducked the challenge of policy integration altogether when it came to “fracing,” by limiting its scrutiny of such operations to the impact of water withdrawals rather than taking on a the broader—“integrated”—approach of considering water-quality impacts (including water-quality impacts of land use) as well.³¹

These examples suggest that if there is to be a federal initiative to improve integration of water-resource management policy, it would be better focused on more effective standards and processes for the management and resolution of water-resource disputes between jurisdictions, and on an effort to get the objectives of water-resource management “integrated” into the missions of federal agencies that are not natural resource managers but nonetheless have enormous impact on the success or failure of water-resource policy at every level, such as the Department of Transportation and the Department of Agriculture. The federal agencies might get their own house in order first,

before trying to “solve” state and local water-resource management problems that may not be especially significant.

V. Conclusion

The need for better integration of water-resource management, both substantively and geographically, is as compelling as Professor Thompson suggests. But state- and regionally-oriented integration programs, tailored both to the resources under management and to the institutional, cultural, and political features that bear on water-resource management decisions, appear to have greater promise and momentum in terms of on-the-ground change and political feasibility than an additional federal mandate or program of general applicability like SWIM. Existing federal mandates under the CWA, the ESA, and other federal laws are in many cases already the forcing mechanism for integration of water-resource policies at the regional and state level. Strengthened enforcement of those mandates, coupled with greater support for the collaborations that result and better mechanisms to resolve interstate conflicts, would accelerate the trend.

30. See *Natural Gas Drilling Index Page*, DELAWARE RIVER BASIN COMM'N, <http://www.state.nj.us/drbc/programs/natural> (last modified Oct. 24, 2012).

31. See SUSQUEHANNA RIVER BASIN COMM'N, NATURAL GAS WELL DEVELOPMENT IN THE SUSQUEHANNA RIVER BASIN (2010), available at http://www.srbc.net/programs/docs/ProjectReviewMarcellusShale%28NEW%29%281_2010%29.pdf.

C O M M E N T

The Balancing Act: A Comment on A Federal Act to Promote Integrated Water Management: Is the CZMA a Useful Model?

by Adam Schempp

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I. Introduction

In *A Federal Act to Promote Integrated Water Management: Is the CZMA a Useful Model?*, Prof. Barton Thompson addresses the significant challenge of substantive and geographic fragmentation in water management. He proposes using the characteristics of the Coastal Zone Management Act (CZMA) as a blueprint for greater integration of water management across the United States. This approach has promise; but the laws, interests, economics, politics, and practice surrounding freshwater are sufficiently dissimilar from those facing coastal management to raise questions as to its likelihood of success.

The CZMA established an offer to states: the federal government will support state coastal programs through financial and technical assistance, as well as compliance with state enforceable policies, if states develop and implement those programs. Since coastal-program development is optional, the CZMA's success depended in large part on the attractiveness of the offer to states: if a state did not like the offer, it would not "accept" it. Without substantial state participation, the law would accomplish little. Though it took forty years, all eligible states have now joined the National Coastal Management Program.¹

Professor Thompson's Sustainable Water Integrated Management Act (SWIM) likewise must attract states to be successful. Fortunately, like coastal management under the CZMA, many states support integrated water resource management and seek federal assistance with it.² But the

increased federal role in water management, specifically water quantity, in SWIM would deter at least some states. In addition, states may not find the two key incentives of the CZMA, federal consistency and financial support, as enticing under SWIM as under the CZMA. SWIM simply may not be as attractive to states as the CZMA has been, which would limit its potential impact.

II. The Federal Role

Under the CZMA, states develop their respective coastal plans, but with federal direction and review. For example, coastal management programs must contain nine elements, such as designating areas of particular concern; creating guidelines on use priorities in specific areas, particularly noting those uses of lowest priority; identifying how the state will exert control over land and water uses, including a list of judicial decisions, regulations, laws, and state constitutional provisions; developing a planning process for assessing the effects of, and ways to control and restore, shoreline erosion; and a description of the organizational structure for coastal-program implementation, "including the responsibilities and interrelationships of local, area-wide, State, regional, and interstate agencies in the management process."³ The National Oceanic and Atmospheric Administration (NOAA) decides whether the nine elements are adequately included in the coastal program applications.⁴ NOAA also decides whether to approve any proposed changes to existing state programs.⁵ Thus, the federal government has a significant role, and the instructions to states are rather detailed.

States, particularly those in the western United States, have strongly defended their historical authorities over

1. *Celebrating the 40th Anniversary of the Coastal Zone Management Act of 1972*, OFFICE OF OCEAN & COASTAL RESOURCE MGMT., <http://coastal-management.noaa.gov/about/czma40.html#timeline> (last visited Mar. 14, 2013). Illinois joined on January 31, 2012. *Id.* Alaska allowed its coastal program to sunset in 2011. *Id.* Thirty-five states and territories are eligible to participate. *Id.*

2. *See, e.g.*, W. GOVERNORS' ASS'N, POLICY RESOLUTION 11-7, WATER RESOURCE MANAGEMENT IN THE WEST (2011), available at www.westgov.org/component/docman/doc_download/1441-11-7?Itemid.

3. 16 U.S.C. §1455(d) (2006).

4. *Id.*

5. 16 U.S.C. §1455(e).

water quantity management against federal involvement.⁶ Since water quantity is a critical component of integrated water resource management, federal direction and oversight like that in the CZMA likely would deter state participation in SWIM.

This is not to say that the federal government cannot play a role. To the contrary, as suggested by Professor Thompson, federal involvement is important, if not critical, to the success of integrated water resource management. The Western Governors appear to agree in their policy resolution regarding water resource management, but with the federal government assisting the states, not overseeing them.⁷ SWIM could include fewer instructions and less federal oversight than CZMA in order to reduce concern about federal influence on water quantity management and thus make the “offer” more attractive to states. But at some point SWIM would then be little more than a federal appropriation, reducing the value of a CZMA-like structure.

III. Financial Support

Federal funding has been one of the most attractive aspects of the CZMA “offer” for states.⁸ This likely would be true for SWIM as well. States have called for greater federal investment in data collection, drought response, and infrastructure development.⁹ But the question arises as to how much money would be enough to support the states in implementing integrated water management plans. Professor Thompson notes that California has offered in excess of \$350 million in matching grants for implementation of its Integrated Regional Water Management program. By comparison, in FY2010, Congress provided a total of \$68.1 million for all three CZMA grant programs nationwide: to implement coastal programs (Section 306), to address four specific topics (Section 306A), and for nine specified enhancement areas (Section 309).¹⁰ Add to this disparity Professor Thompson’s suggested incentive of federal technical assistance, which primarily would be a matter of

increased funding for data-collection programs through the U.S. Geological Survey, National Aeronautics and Space Administration, and other agencies, potentially with a very large price tag in order to provide sufficient information for informed planning. Thus, the financial incentives of SWIM may need to be much more significant than those of the CZMA to be as attractive to states.

IV. Federal Consistency

Federal consistency is the other significant incentive of the CZMA “offer” for states.¹¹ Around the time of CZMA authorization, the federal government was undertaking many construction projects on coastal lands. States did not necessarily have much say in these activities. The incentive of federal consistency was deference to state enforceable policies regarding the what, where, when, and how of planning, developing, and operating these federal facilities, as well as in conducting permitting and other federal actions. Although the federal government retained an override option,¹² this incentive was, and for the most part still is, significant.

As Professor Thompson himself notes, federal consistency likely would not be as enticing to states in SWIM as it has been under the CZMA. He cites the de facto consistency with which the federal government already operates relative to state water laws and policies. Under the CZMA, the “state enforceable policies,” with which federal agencies and activities must be consistent, primarily protect the environment and human uses of the coastal zone. But in freshwater management, much of the friction between federal and state authorities actually stems from the inverse: the application of federal environmental laws to state and private activities. Hence, Professor Thompson suggests upping the ante in SWIM by using as incentives streamlined federal permitting and even delegation of federal regulatory authorities under the Clean Water Act and Endangered Species Act. These two incentives may begin to provide the type of “consistency” that states desire in the freshwater context, but they would need to be very enticing to states to compensate for the other aforementioned differences between the CZMA and SWIM “offers.”

V. Conclusion

Professor Thompson has advanced the conversation regarding integrated water resource management in the United States. If this concept is ever going to be fostered by the federal government, a CZMA-like approach may be the most rational means. But the value to states of the “offer” in SWIM likely would need to be increased since the law

6. See, e.g., David H. Getches, *The Metamorphosis of Western Water Policy: Have Federal Laws and Local Decisions Eclipsed the States' Role?*, 20 STAN. ENVTL. L.J. 3 (2001); W. STATES WATER COUNCIL, RESOLUTION OF THE WESTERN STATES WATER COUNCIL REGARDING PREEMPTION OF STATE LAW IN FEDERAL LEGISLATION (July 29, 2011), available at <http://www.westgov.org/wswcl-331%20resolution%20re%20preemption%20of%20state%20law%20in%20federal%20legislation%202011july29.pdf>.

7. See, e.g., W. GOVERNORS' ASS'N, *supra* note 2.

8. HAROLD F. UPTON, COASTAL ZONE MANAGEMENT: BACKGROUND AND REAUTHORIZATION ISSUES, RL34339 2–3 (2010), available at <http://crs.ncsionline.org/nle/crsreports/10Oct/RL34339.pdf>.

9. See, e.g., Letter from Ryan Mueller, Chairman, Interstate Council on Water Policy et al., to Congressmen Simpson and Moran (Feb. 4, 2013), <http://www.icwp.org/2012/legpol/StreamgageLtrsFeb2013.pdf>; Policies, W. STATES WATER COUNCIL, <http://www.westernstateswater.org/policies-2> (last visited Mar. 14, 2013) (documents stating positions of the Western States Water Council).

10. UPTON, *supra* note 8, at 4–5.

11. *Id.* at 2–3.

12. See 16 U.S.C. §1456(c) (2006).

cannot be effective without voluntary state participation. Yet, state participation is only the first step. The full test of the law is in its accomplishment of its outlined objectives, in the case of SWIM, integration of land and water governance and ultimately improved water security. Thus, one

cannot completely sacrifice the substantive content of the law in the name of attracting participation. It is a delicate balance. Forty years after passage of the CZMA, and with all states having joined, the outcome of that law's approach is still inconclusive.¹³

13. See, e.g., UPTON, *supra* note 8, at 18 ("After more than 30 years of effort and numerous studies, the magnitude or dimensions of the impact that the federal program or any of the participants' programs have had on either the rate and pattern of coastal development, or on protection of important coastal resources, is still uncertain.").

A R T I C L E

The Problem of Environmental Monitoring

by Eric Biber

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Environmental law depends on the regular collection of accurate information about the state of the natural environment (“ambient monitoring”) in order to assess the effectiveness of current regulatory and management policies and to develop new reforms. Despite the central role that ambient monitoring plays in environmental law and policy, the scholarly literature has almost ignored the question of whether and how effective ambient monitoring will take place—even though there is ample evidence that our current ambient monitoring data has significant flaws. Moreover, the importance of ambient monitoring will increase in the future with the shift to a new paradigm of adaptive management in which regulatory decisionmaking is kept purposefully flexible for future adjustment.

There are a few key characteristics of ambient monitoring that make ensuring high-quality monitoring particularly challenging. First, the geographic and temporal scale of an ambient monitoring program will often be much larger than the scale of the actions of most private parties, such as regulated industry. This means that effective ambient monitoring will usually need to be pursued by public agencies. Second, ambient monitoring usually must be pursued continuously over an extended period of time if it is to be effective. Third, ambient monitoring has to be focused on the right questions that are necessary for environmental decisionmaking; measurements have to be made at the right geographic and temporal scale; and, enough data has to be collected to meet minimum requirements for statistical analysis of the data. All of these requirements are difficult to meet. They are also difficult for outside parties to assess whether they have been met. Thus, effective monitoring programs must be continuous over time, and they are often opaque to outside supervision or accountability. They are also frequently costly.

Continuity and opacity mean that ambient monitoring programs must overcome a range of legal, political, and institutional obstacles. For instance, continuity and opac-

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ity mean that it is usually quite costly and difficult for outside groups to assess whether a monitoring program is effective. The parties with higher stakes (often regulated industry) therefore usually have an advantage in supervising monitoring programs compared to the general public. The long-term and costly nature of monitoring programs means that monitoring budgets are often the first cut when hard times hit. Courts generally defer to the monitoring data produced by agencies because of the daunting nature of the expert knowledge needed to evaluate that data; this deference can encourage substandard information collection by agencies. Public agencies might be wary of collecting ambient monitoring data because better environmental information might allow outside actors to hold the agency accountable, might produce political or legal pressures that conflict with the goals the agency wishes to pursue, or might reduce the discretion the agency has in decisionmaking. Finally, the long-term nature of ambient monitoring means that monitoring is frequently professionally unrewarding for the scientists that are key staff in many environmental agencies.

How might we try to solve the problems of ambient monitoring in environmental law? One of the more promising solutions is to rely on public agencies that are primarily focused on monitoring. Public agencies are more likely than other alternatives to have the institutional continuity to undertake effective long-term monitoring. Public agencies that primarily focus on monitoring also can develop the expertise needed to deal with the technically difficult tasks of monitoring. Their focus on monitoring can create strong institutional incentives for them to do a good job in conducting effective monitoring. With a separate agency, we have an institution with an incentive to conduct effective monitoring because of administrative separation from other potentially conflicting activities.

A large organization that combines monitoring with other tasks might, if budget cuts come, cut monitoring budgets disproportionately in order to protect other jobs. Cuts may be worse to the extent that monitoring is disfavored within an agency (perhaps because of potential conflicts with the agency’s mission). If the only activity the agency pursues is monitoring, then there is no such possibility for

a trade-off. In order to ensure its institutional survival, the agency has to maintain its monitoring budget. Government agencies tend to fight hard for institutional survival. A separate monitoring agency might fight for more consistent funding over time, and resist some of the short-term efforts to cut monitoring budgets.

The largest disadvantage of separating monitoring activities is the institutional distance it might create between the regulatory or management decision-makers and those conducting monitoring. Monitoring is often more effective and efficient if it is closely coordinated with the decisions that monitoring is supposed to inform. Close consultation can avoid waste that might arise if the monitoring is either too precise (with unnecessary measurements) or not precise enough (such that the program cannot help answer the relevant management question).

We must make a trade-off between the relative importance of coordination versus the reduction of conflicts between monitoring and management. Resolving that trade-off will depend on the particular context of the resources being monitored and the interaction between monitoring and other management or regulatory goals. One possibility is that regulatory agencies might have fewer conflicts between most kinds of monitoring and other goals than management agencies. Regulatory agencies are more likely to be organized around an agency mission of identifying environmental problems that require regulatory solutions and would more likely need monitoring data in order to justify new regulations against legal or political challenges. Management agencies are more likely to be focused around missions that involve development projects rather than environmental goals and therefore, monitoring data are more likely to raise the risk of identifying new or emerging environmental problems that might interfere with proposed development activities.

Another possibility is that certain activities require less coordination between monitoring and management—for instance, the imposition of strict environmental standards. There is no need to tailor the monitoring program to the particulars of the individual management decisions, since the standards must be met regardless. On the other hand, if the object is to measure whether a particular management option has achieved environmental quality goals, then it may be crucial to calibrate the monitoring program to the specifics of the management option selected and the goals to be achieved.

Is it politically feasible to create stand-alone monitoring agencies in the first place? There is a risk that the agency might be seen as producing politically dangerous information. For instance, in the 1990s property rights advocates successfully eliminated the National Biological Survey (“NBS”) (intended to produce information about at-risk species) because of concerns that the information it produced might lead to greater regulation under the Endangered Species Act.

There are separate organizations that have survived the political gauntlet, such as the monitoring programs for the

Grand Canyon and Everglades restoration efforts. The difference between these organizations and NBS might be that they were created as part of a larger ecological restoration project that was itself politically popular.

To address the risk that small, isolated monitoring agencies might not have significant political clout, one could combine a range of monitoring activities into one single agency, rather than have a number of separate monitoring agencies conducting different activities. Another solution might be to change the perception of how monitoring might benefit various interest groups. To the extent that the results of monitoring information are seen as not necessarily helping or hurting particular political actors *ex ante*, there might be less resistance. For instance, improved monitoring might lead to less regulation by reducing uncertainty about the status of an environmental resource, or by providing evidence of improving conditions for the resource. Finally, broad participation of actors in deciding what resources to measure and how to measure them may help build trust in the monitoring program and reduce political opposition.

One way to reduce coordination problems would be to provide some connections between the monitoring agency and the relevant management or regulatory agencies. The management or regulatory agency might be more willing to cooperate if some sort of approval from the monitoring agency is required for the management or regulatory agency to initiate certain actions.

Another option would be to allow the management or regulatory agency to conduct its own monitoring. If a management or regulatory agency concluded that the monitoring program implemented by the separate agency was not adequately answering the relevant questions, it could initiate its own monitoring program. The result would be redundant monitoring, and while redundancy may be a waste of resources, it can also provide benefits by creating resilience in an organizational system. For instance, we might be concerned that ineffective monitoring programs might miss important, emerging environmental problems. Multiple programs can reduce that risk, assuming that each program is relatively independent of the other.

As a way of tying these different points together, I turn to an emerging example in the federal government of an independent monitoring agency—the United States Geological Survey (“USGS”). Historically, USGS was an agency focused on mapping and geological research and had a strong reputation. Over the decades, USGS has expanded into research on water quantity and quality, land-use changes, and, since the absorption of NBS in the 1990s, biological resources. In the past 15 years, USGS has conducted more monitoring activities and has presented itself to Congress and the public as a leading provider of environmental monitoring services. The prominence of monitoring in USGS’s portfolio of activities might give it an institutional incentive to protect monitoring budgets to a greater degree than other agencies for whom monitoring is less important.

A possible challenge is that USGS does conduct other activities besides monitoring—primarily scientific research. One of USGS's primary self-conceptions is as a science agency. Scientific research does not usually result in direct conflicts with monitoring activities. But as noted above, there is a risk that scientists might see monitoring as “not scientific” and not leading to professional advancement. USGS scientists generally are more closely tied to their respective disciplinary organizations than their colleagues in other agencies and seem to believe that USGS emphasizes scientific professional engagement, recognition, and advancement.

The risk, then, is that USGS will underperform in conducting effective monitoring because the scientists within the agency do not value it professionally. To its credit, USGS has itself acknowledged that USGS scientists may be reluctant to undertake monitoring programs and has emphasized that “these perceptions” that monitoring is not suitable for scientists “should change.” Time will tell the success of those efforts.

This discussion is only tentative, and there is a great deal of room for additional research: Has USGS been and will it be successful in conducting effective monitoring? What kinds of cross-institutional comparisons could we make among the various large-scale ecosystem restoration programs in the Everglades, Grand Canyon, and elsewhere to learn more about whether and why effective monitoring can be successfully pursued? Are separate monitoring agencies really more effective? Moreover, there is also a great deal of work to be done to apply the general principles in this paper to the tremendously diverse range of environmental resource management problems, each with their own ecological, economic, and political contexts. The monitoring problems and solutions will be very different in the context of clean air versus range management. But, to this point, there has been almost no research on these kinds of questions, questions that are essential to a successful transition to a new world of adaptive ecosystem management.

A R T I C L E

Imagining Corporate Sustainability as a Public Good Rather Than a Corporate Bad

by Wendy E. Wagner

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Corporations have been criticized for their environmental misdeeds for over a century, so it is not surprising that many view corporate approaches to sustainability with skepticism. Reports of green-washing and other forms of misleading advertising by a handful of corporations only serve to reinforce this negative perception.

Based on this evidence of poor corporate behavior, a number of analysts have concluded that sustainability should be regulated in the same way as other industrial polluting activities. Just as laws require corporations to disclose information on their polluting activities because these activities are wrongs to society, so the thinking goes, corporations should be required to engage in an internal accounting of their unsustainable practices. Specifically, corporations should be required to assess the sustainability of their operations in standardized disclosures and take their resulting, publicly administered medicine, whether it involves being shamed in the marketplace or subjected to greater regulatory control with respect to resource use or disposal practices.

This Article argues that addressing corporate sustainability by putting the onus on corporations to assess the sustainability of their operations may get the solution exactly backwards, at least at this early stage in advancing sustainability. Rather than view the lack of sustainability efforts as another corporate bad that individual corporations should be required to redress, this Article suggests that corporate sustainability should be treated instead as a public good that becomes the government's responsibility to address, at least initially, by advancing knowledge and generating baseline information. Information about an industrial sector's sustainability profile—for example, a life cycle analysis of a typical facility—has clear public good

qualities associated with it. This type of assessment allows for cross comparisons between competitors, identifies areas for possible synergies among producing companies, and highlights areas that may ultimately deserve further regulatory oversight. Equally important, if sustainability analyses concerning various production processes and services are produced in the first instance by publicly funded, third-party experts rather than extracted from private actors, the resulting reports are more likely to be reliable, complete, and accessible to a wide range of stakeholders who can use them in public-benefitting ways.

Clearly, a key component to such a government sustainability program is greater information about corporate practices, and life cycle analysis ("LCA") offers a particularly robust measure for assessing sustainability. LCA begins where raw materials are produced, and follows the production process through transport and manufacturing to ultimate disposal of the product.¹ Its goal is to identify materials and burdens at each stage of the production process. By focusing on the design of production processes, rather than simple output adjustments, much greater environmental gains, as well as cost savings, are possible.²

The resulting information on corporate sustainability generated by robust LCA can provide valuable information to downstream consumers, insurers, investors, corporate partners, and others who ultimately keep the corporation in business. It can also inform internal practices; enhanced corporate self-assessment is one of the primary virtues of mandating information disclosures. Moreover, individual corporate decisions about production processes, when amalgamated, may yield a global market of goods and services which may be environmentally unsustainable. Until the relevant information is gathered and synthesized, how-

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1. See SCIENTIFIC APPLICATIONS INTERNATIONAL CORPORATION, LIFE CYCLE ASSESSMENT: PRINCIPLES AND PRACTICE 15 (May 2006) [hereinafter SAIC], available at <http://www.epa.gov/nrmrl/lcaccess/pdfs/600r06060.pdf>.
2. Nike, for example, redesigned shoes to reduce the use of glues or solvents. See, e.g., DELOITTE, LIFECYCLE ASSESSMENT: WHERE IS IT ON YOUR SUSTAINABILITY AGENDA? 2 (2009), available at http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_es_LifecycleAssessment.pdf.

ever, the overall impact of corporate practices and the most promising areas for gains are obscured.

Given its virtues, many commentators are clamoring for greater incorporation of LCA into sustainability calculations. But just as LCAs offer great potential for advancing corporate sustainability, their information-intensive features introduce some formidable challenges. The first, and most significant, challenge lies in the fact that a great deal of the information needed to conduct LCAs is in the hands of companies, which may lack incentives to collect, analyze, or share information in a comprehensive way. A second challenge for LCAs lies in the considerable discretion of companies that select the methods for conducting them. Numerous international and nonprofit organizations have worked to improve the methods for conducting LCAs in ways that guard against sponsor discretion. Nevertheless, developing a prescriptive method that guards against all forms of bias is difficult, and methods that are too rigid run the risk of sacrificing innovation in the drive for reduced analyst discretion. A third feature of a robust LCA is its comprehensibility to a wide range of users, that, when left to the discretion of an interested party, may be manipulated. If a corporation conducts an LCA that reveals embarrassing information, for example, it enjoys considerable discretion to obscure the negative findings.³ Even when results are communicated clearly, the comprehensibility of LCA may be impaired if analyses cannot be cross-compared. Yet in most cases, this cross-comparison will only occur when facilities use the same models for their assessments, which they may not be inclined to do without external pressure.

Extracting reliable life cycle analyses from corporations is thus fraught with difficulty,⁴ but one simple move can help avoid this impasse: sustainability analysis can be reconceived as a public good rather than a responsibility that should be shouldered by corporations. Reconceptualizing life cycle assessments as public information helps sidestep the impediments to collecting reliable and comprehensible information identified above. It also manages to produce considerably more relevant, accurate, and potentially path-breaking types of analyses and recommendations in forms that would not occur if individual firms, who have a clear stake in the findings, were the primary source of this information.

At least four features of industrial LCAs closely associate them with public goods. First, it is not clear what LCA will reveal for any given industrial sector. As such, a LCA is just

as likely to provide general information about industrial practices and highlight issues for further study, rather than to expose specific information about the environmentally irresponsible practices of a particular company. Second, conducting LCAs and developing innovative solutions for more sustainable approaches constitute a type of good for which a firm is unlikely to realize a sufficient return on its investment, creating an incentive problem. Third, just as the benefits of LCA are broadly dispersed, the costs are concentrated. Data collection can be costly, and applying the methods of LCA requires expertise. Utilizing the outputs of LCA also requires an organizational structure that can act on the results, which adds still more costs. Last, the large-scale cost associated with developing methods, models, and databases and viewing problems more synoptically also favors a public good approach to LCA, since publicly produced assessments can identify areas for cross-fertilization and better allow for the diffusion of information as compared with private assessments.

Since LCAs come closer to being public goods than negative externalities, a disinterested public organization may be the most appropriate entity to produce them. Publicly administered LCAs would be based on an average firm within a particular industrial sector, much as is currently done by the Environmental Protection Agency (“EPA”) in setting technology-based air and water pollution standards under the Clean Water and Clean Air Acts. If this generic assessment reveals reasonable areas for improvements, then consumers, investors, shareholders, and regulators may begin to demand sustainability progress from firms. Individual facilities themselves will also learn of ways to operate more sustainably.

LCAs would be completed by respected experts who are independent but have access to internal corporate information. Ideally, much of the analysis would be done cooperatively with firms since the goal is to identify areas for improvement and possible cost savings. To the extent that life cycle analysts face opposition, information extraction tools could be used to secure reliable internal records.⁵ Because EPA has legal authority to access private records, it is perhaps best situated to conduct these life cycle assessments. It could also subcontract the work to a respected nonprofit body. The resulting industrial-sector LCAs could be peer reviewed and subjected to comments from the industry, and the expert assessor group would have complete independence in how to respond. Much like technology-based standards, the LCAs would also be updated at regular intervals or could be subject to more informal updating processes.

3. See, e.g., BRUCE M. OWEN & RONALD BRAEUTIGAM, *THE REGULATION GAME: STRATEGIC USE OF THE ADMINISTRATIVE PROCESS* 4–5 (1978) (describing these and other types of information-based strategies for controlling the message).

4. Cf. Sanford Gaines, *Reflexive Law as a Legal Paradigm for Sustainable Development*, 10 *BUFF. ENVTL. L.J.* 1, 9, 21 (2002) (noting that “mechanisms for dealing with uncertainty, ambiguity, and inequity in the distribution of information are poorly developed in both theory and practice”).

5. EPA, for example, has extensively used its information collection power under Section 114 of the Clean Air Act to obtain internal, industry information about processes that inform its selection of best technologies under the Clean Air Act. 42 U.S.C. §7414(a) (2006).

In conducting the assessment, the expert assessor should produce two different, bookend life cycle analyses for each industrial sector: (1) a reasonable worst-case life-cycle assessment and (2) the very best life-cycle assessment. The reasonable worst-case analysis would present the assessment for a typical facility that falls in the bottom third relative to its competitors with respect to the sustainability of its operations. The very best-case analysis would be based on the sustainability profile of an imaginary facility that employs all of the best sustainable innovations and process inventions that are reasonably available. This best-case sustainability profile serves not only to set a high bar but also to showcase the types of innovations that are possible.

Publicly prepared LCAs would operate much like penalty defaults. Using the worst-case assessment as a baseline, corporations would be able to distinguish their processes or boast of accomplishments that go beyond the laggard facilities in their sector. Corporations can then use this positive comparison in the market to gain a competitive edge with insurers, investors, and the public at large. A process for validating a corporation's claims in making these positive distinctions should also be established to provide added reliability to the firm's efforts to compare its processes against the publicly produced sustainability assessments. One difficulty that front-mover firms face is the challenge of distinguishing themselves in the marketplace in ways that can be trusted by outsiders. The public assessments suggested here should help limit the ability of facilities to exaggerate or green-wash, since they offer specific baselines against which a firm's boasting can be more readily compared.

A central entity could use these public LCAs to identify innovations across multiple industrial sectors, as well as gain a bird's-eye view of American production processes. The assessments are also likely to identify blind spots that are otherwise missed by regulatory approaches or voluntary incentives. For example, the assessments may highlight goods or services that are so costly to the environment that they should be significantly curtailed or even eliminated. Finally, centralized LCA can help identify and compare national differences in the sustainability of industrial operations.

There are a variety of supplemental LCA tools that could be developed by a centralized expert analyst body to reduce the costs to firms of conducting their own facility-based assessments. For example, a web-based model for a facility-specific LCA could be developed with user-friendly interfaces that allow corporations to insert a few parameters and then run the model. Commentators observe that "companies frequently look for simplified assessment tools that offer quick, approximate results," such as checklists and simplified calculators, and this type of model could fill that niche.⁶ Educational materials, including guides,

workshops, and symposia, might also be provided to help firms use the generic, industry-specific LCA for their facilities as a springboard to improving sustainability. EPA has already made progress in preparing these types of guides, but further outreach and education is needed since "[m]any companies do not see how life-cycle thinking can be applied to their specific operations—or even the benefits of doing so."⁷

In order to produce meaningful incentives for corporations to take sustainability seriously, the LCA could also be used as a baseline for imposing additional regulatory controls that encourage or require specific improvements. Firms might be "commanded" to reach certain sustainability goals in ways that parallel the technology-based standards of the Clean Water and Clean Air Acts. For example, all firms would be required to reach some mid- or best-available level of sustainability within their industrial sector through legislation. Alternatively, all firms in a sector could be charged a sustainability tax based on resource use and waste production of the reasonable worst-case life cycle (perhaps further adjusted by the size or production volume of the facility). Facilities that provide validated accounts of how they accomplish sustainability above this baseline could then earn tax credits. Companies that pioneer innovations in sustainable technologies or operations might not only enjoy even greater tax credits but also reputational benefits—for example, being officially certified by the EPA or a nonprofit as a leader in sustainable innovation.

The United States "does not have a sustainability strategy."⁸ The most promising proposals in the current economically and politically fragile climate are those that can be accomplished without political warfare and that build on progress in incremental ways. The proposal here could be a modest first step in the long march towards corporate sustainability. This information-generation approach develops a partnership with business that is in line with larger goals for enhancing corporate social responsibility in ways that go beyond what specific legal requirements can accomplish alone. By trading off detail and specificity in individual firm LCAs for comprehensiveness and more general illumination of the sustainability of diverse practices through industry-wide LCAs, progress can be made on the sustainability front more quickly. By producing large amounts of fresh and relevant information about corporate sustainability, consumers, investors, and other actors will be better able to evaluate the sustainability of corporations and, if necessary, demand change.

6. Claire Early et al., *Informing Packaging Design Decisions at Toyota Motor Sales Using Life Cycle Assessment and Costing*, 13 J. INDUS. ECOLOGY 592, 595 (2009).

7. D. ELCOCK, LIFE-CYCLE THINKING FOR THE OIL AND GAS EXPLORATION AND PRODUCTION INDUSTRY 72 (2007), available at http://www.evs.anl.gov/pub/dsp_detail.cfm?PubID=2154.

8. Alan Hecht, *The Next Level of Environmental Protection: Business Strategies and Government Policies Converging on Sustainability*, 8 SUSTAINABLE DEV. L. & POL'Y 19, 23 (2007).

RECENT DEVELOPMENTS

In the Congress

“In the Congress” entries cover activities reported in the *Congressional Record* from June 1, 2013, through June 30, 2013. Entries are arranged by bill number, with Senate bills listed first. “In the Congress” covers all environment-related bills that are introduced, reported out of committee, passed by either house, or signed by the President. “In the Congress” also covers all environmental treaties ratified by the Senate. This material is updated monthly. For archived materials, visit <http://www.elr.info/legislative>.

Chamber Action

S. 23 (land use), which would designate as wilderness certain land and inland water within the Sleeping Bear Dunes National Lakeshore in the state of Michigan, was passed by the Senate. 159 Cong. Rec. S4717 (daily ed. June 19, 2013).

S. 26 (energy), which would authorize the Secretary of the Interior to facilitate the development of hydroelectric power on the Diamond Fork System of the Central Utah Project, was passed by the Senate. 159 Cong. Rec. S4717 (daily ed. June 19, 2013).

S. 112 (land use), which would expand the Alpine Lakes Wilderness in the state of Washington and designate the Middle Fork Snoqualmie River and Pratt River as wild and scenic rivers, was passed by the Senate. 159 Cong. Rec. S2844 (daily ed. June 19, 2013).

S. 130 (land use), which would require the Secretary of the Interior to convey certain federal land to the Powell Recreation District in the state of Wyoming, was passed by the Senate. 159 Cong. Rec. S4717 (daily ed. June 19, 2013).

S. 157 (land use), which would provide for certain improvements to the Denali National Park and Preserve in the state of Alaska, was passed by the Senate. 159 Cong. Rec. S4717 (daily ed. June 19, 2013).

S. 244 (energy), which would amend the Energy Policy Act of 2005 to modi-

fy the Pilot Project offices of the Federal Permit Streamlining Pilot Project, was passed by the Senate. 159 Cong. Rec. S4717 (daily ed. June 19, 2013).

S. 276 (energy), which would reinstate and extend the deadline for commencement of construction of a hydroelectric project involving the American Falls Reservoir, was passed by the Senate. 159 Cong. Rec. S4717 (daily ed. June 19, 2013).

S. 304 (land use), which would direct the Secretary of the Interior to convey two parcels of surplus land within the boundary of the Natchez Trace Parkway to the state of Mississippi, was passed by the Senate. 159 Cong. Rec. S4717 (daily ed. June 19, 2013).

S. 352 (land use), which would designate the Devil’s Staircase Wilderness Area in the state of Oregon and designate segments of Wasson and Franklin Creeks as wild rivers, was passed by the Senate. 159 Cong. Rec. S4717 (daily ed. June 19, 2013).

S. 383 (water), which would amend the Wild and Scenic Rivers Act to designate a segment of Illabot Creek in Skagit County, Washington, as a component of the National Wild and Scenic Rivers System, was passed by the Senate. 159 Cong. Rec. S4717 (daily ed. June 19, 2013).

S. 393 (water), which would designate additional segments and tributaries of White Clay Creek in Delaware and Pennsylvania as a component of the National Wild and Scenic Rivers System, was passed by the Senate. 159

Cong. Rec. S4717 (daily ed. June 19, 2013).

S. 459 (land use), which would modify the boundary of the Minuteman Missile National Historic Site in South Dakota, was passed by the Senate. 159 Cong. Rec. S4717 (daily ed. June 19, 2013).

H.R. 253 (land use), which would provide for the conveyance of a small parcel of National Forest System land in the Uinta-Wasatch-Cache National Forest in Utah to Brigham Young University, was passed by the House. 159 Cong. Rec. H3661 (daily ed. June 17, 2013).

H.R. 674 (land use), which would authorize the Secretary of the Interior to study the suitability and feasibility of designating prehistoric, historic, and limestone forest sites on Rota, Commonwealth of the Northern Mariana Islands, as a unit of the National Park System, was passed by the House. 159 Cong. Rec. H3663 (daily ed. June 17, 2013).

H.R. 723 (water), which would amend the Wild and Scenic Rivers Act to designate segments of the Beaver, Chipuxet, Queen, Wood, and Pawcatuck Rivers in the states of Connecticut and Rhode Island for study for potential addition to the National Wild and Scenic Rivers System, was passed by the House. 159 Cong. Rec. H3268 (daily ed. June 11, 2013).

H.R. 862 (land use), which would authorize the conveyance of two small parcels of land within the boundaries of the Coconino National Forest con-

taining private improvements that were developed based upon the reliance of the landowners in an erroneous survey conducted in May 1960, was passed by the House. 159 Cong. Rec. H3664 (daily ed. June 17, 2013).

H.R. 876 (natural resources), which would authorize the continued use of certain water diversions located on National Forest System land in the Frank Church-River of No Return Wilderness and the Selway-Bitterroot Wilderness in Idaho, was passed by the House. 159 Cong. Rec. H3659 (daily ed. June 17, 2013).

H.R. 885 (land use), which would expand the boundary of San Antonio Missions National Historical Park and conduct a study of potential land acquisitions, was passed by the House. 159 Cong. Rec. H9496 (daily ed. June 3, 2013).

H.R. 993 (land use), which would provide for the conveyance of certain parcels of National Forest System land to the city of Fruit Heights, Utah, was passed by the House. 159 Cong. Rec. H3265 (daily ed. June 11, 2013).

H.R. 1613 (water), which would amend the Outer Continental Shelf Lands Act regarding the federal management and oversight of transboundary hydrocarbon reservoirs, was passed by the House. 159 Cong. Rec. H4096 (daily ed. June 27, 2013).

Committee Action

S. 156 (land use) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-51, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would allow for the harvest of gull eggs by the Huna Tlingit people within Glacier Bay National Park in the state of Alaska.

S. 211 (water) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-52, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would amend certain definitions contained in the Provo River Project Transfer Act to clarify certain property descriptions.

S. 241 (land use) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-54, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would establish the Rio Grande del Norte National Conservation Area in the state of New Mexico.

S. 284 (land use) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-56, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would transfer certain facilities, easements, and rights-of-way to Fort Sumner Irrigation District, New Mexico.

S. 312 (land use) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-58, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would adjust the boundary of the Carson National Forest.

S. 342 (land use) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-59, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would designate the Pine Forest Range Wilderness area in Humboldt County, Nevada.

S. 349 (water) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-60, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would amend the Wild and Scenic Rivers Act to designate a segment of the Beaver, Chipuxet, Queen, Wood, and Pawcatuck Rivers in the states of Connecticut and Rhode Island for study for potential addition to the National Wild and Scenic Rivers System.

S. 368 (land use) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-61, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would reauthorize the Federal Land Transaction Facilitation Act.

S. 371 (land use) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-62, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would establish the Blackstone River Valley National Historical Park and dedicate the Park to John H. Chafee.

S. 447 (land use) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-63, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would convey certain cemeteries located on National Forest System land in Black Hills National Forest.

S. 476 (land use) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-64, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would amend the Chesapeake and Ohio Canal Development Act to extend to the Chesapeake and Ohio Canal National Historical Park Commission.

S. 507 (land use) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-65, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would establish the Manhattan Project National Historical Park in Oak Ridge, Tennessee; Los Alamos, New Mexico; and Hanford, Washington.

S. 609 (land use) was reported by the Committee on Natural Resources. S. Rep. No. 113-66, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would authorize the Secretary of the Interior to convey certain federal land in San Juan County, New Mexico.

S. 757 (land use) was reported by the Committee on Energy and Natural Resources. S. Rep. No. 113-68, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would provide for the implementation of the multispecies habitat conservation plan for the Virgin River, Nevada, and Lincoln County, Nevada, and extend the authority to purchase certain parcels of public land.

S. 1245 (governance) was reported by the Committee on Appropriations. S. Rep. No. 113-47, 159 Cong. Rec. S5497 (daily ed. June 27, 2013). The bill would make appropriations for energy and water development and related agencies for the fiscal year ending September 30, 2014.

H.R. 253 (land use) was reported by the Committee on Natural Resources. H. Rep. No. 113-98, 159 Cong. Rec. H3250 (daily ed. June 6, 2013). The bill would provide for the conveyance of a small parcel of National Forest Sys-

tem land in the Uinta-Wasatch-Cache National Forest in Utah to Brigham Young University.

H.R. 1169 (land use) was reported by the Committee on Natural Resources. H. Rep. No. 113-111, 159 Cong. Rec. H3686 (daily ed. June 17, 2013). The bill would direct the Secretary of the Interior to transfer to the Secretary of the Navy certain federal land in Churchill County, Nevada.

H.R. 1299 (land use) was reported by the Committee on Natural Resources. H. Rep. No. 113-120, 159 Cong. Rec. H3994 (daily ed. June 24, 2013). The bill would provide for the transfer of certain public land currently administered by BLM to the administrative jurisdiction of the Secretary of the Army for inclusion in White Sands Missile Range, New Mexico.

H.R. 1300 (wildlife) was reported by the Committee on Natural Resources. H. Rep. No. 113-112, 159 Cong. Rec. H3686 (daily ed. June 17, 2013). The bill would amend the Fish and Wildlife Act of 1956 to reauthorize the volunteer programs and community partnerships for the benefit of national wildlife refuges.

H.R. 1672 (land use) was reported by the Committee on Natural Resources. H. Rep. No. 113-121, 159 Cong. Rec. H3994 (daily ed. June 24, 2013). The bill would withdraw and reserve certain public lands administered by BLM for exclusive military use as part of the Limestone Hills Training Area, Montana.

H.R. 1673 (land use) was reported by the Committee on Natural Resources. H. Rep. No. 113-122, 159 Cong. Rec. H3994 (daily ed. June 24, 2013). The bill would transfer certain public land currently administered by BLM to the administrative jurisdiction of the Secretary of the Navy for inclusion in Naval Air Weapons Station China Lake, California.

H.R. 1691 (land use) was reported by the Committee on Natural Resources. H. Rep. No. 113-124, 159 Cong. Rec. H3994 (daily ed. June 24, 2013). The bill would transfer certain public land currently administered by BLM to the

administrative jurisdiction of the Secretary of the Navy for inclusion in the Chocolate Mountain Aerial Gunnery Range, California.

H.R. 2231 (water) was reported by the Committee on Natural Resources. H. Rep. No. 113-125, 159 Cong. Rec. H3994 (daily ed. June 24, 2013). The bill would amend the Outer Continental Shelf Lands Act to increase energy exploration and production on the Outer Continental Shelf, provide for equitable revenue sharing for all coastal states, and reorganize the functions of the former Minerals Management Service into distinct and separate agencies.

Bills Introduced

S. 1084 (Udall, D-Colo.) (energy) would amend the Energy Policy and Conservation Act to establish the Office of Energy Efficiency and Renewable Energy as the lead federal agency for coordinating federal, state, and local assistance provided to promote the energy retrofitting of schools. 159 Cong. Rec. S3905 (daily ed. June 3, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1103 (Bennet, D-Colo.) (energy) would amend the Internal Revenue Code of 1986 to provide for the equalization of the excise tax on liquefied natural gas and per energy equivalent of diesel. 159 Cong. Rec. S3987 (daily ed. June 6, 2013). The bill was referred to the Committee on Finance.

S. 1124 (Feinstein, D-Cal.) (toxic substances) would establish requirements with respect to bisphenol A. 159 Cong. Rec. S4058 (daily ed. June 10, 2013). The bill was referred to the Committee on Health, Education, Labor, and Pensions.

S. 1125 (Cornyn, R-Tex.) (water) would require the Secretary of State to submit to Congress reports on water sharing with Mexico. 159 Cong. Rec. S4058 (daily ed. June 10, 2013). The bill was referred to the Committee on Foreign Relations.

S. 1135 (Casey, D-Pa.) (water) would amend the SDWA to repeal a certain

exemption for hydraulic fracturing. 159 Cong. Rec. S4212 (daily ed. June 11, 2013). The bill was referred to the Committee on Environment and Public Works.

S. 1138 (Gillibrand, D-N.Y.) (land use) would reauthorize the Hudson River Valley National Heritage Area. 159 Cong. Rec. S4212 (daily ed. June 11, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1139 (Gillibrand, D-N.Y.) (land use) would authorize the Secretary of the Interior to conduct a special resource study of the Hudson River Valley, New York. 159 Cong. Rec. S4213 (daily ed. June 11, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1140 (Gillibrand, D-N.Y.) (land use) would extend the authorization of the Highlands Conservation Act through 2024. 159 Cong. Rec. S4213 (daily ed. June 11, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1146 (Kirk, R-Ill.) (land use) would amend Title 23, U.S. Code, to protect states that have in effect laws or orders with respect to pay-to-play reform. 159 Cong. Rec. S4405 (daily ed. June 12, 2013). The bill was referred to the Committee on Environment and Public Works.

S. 1153 (Gillibrand, D-N.Y.) (wildlife) would establish an improved regulatory process for injurious wildlife to prevent the introduction and establishment of non-native wildlife and wild animal pathogens and parasites. 159 Cong. Rec. S4406 (daily ed. June 12, 2013). The bill was referred to the Committee on Environment and Public Works.

S. 1157 (Casey, D-Pa.) (land use) would reauthorize the Schuylkill River Valley and the Steel, Lackawanna, Delaware, and Lehigh Rivers as National Heritage Areas. 159 Cong. Rec. S4481 (daily ed. June 13, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1160 (Blumenthal, D-Conn.) (land use) would amend the Internal Revenue Code of 1986 to allow a credit against income tax for qualified conservation contributions that include National Scenic Trails. 159 Cong. Rec. S4481 (daily ed. June 13, 2013). The bill was referred to the Committee on Finance.

S. 1161 (Landrieu, D-La.) (wildlife) would provide for the development of a fishery management plan for the Gulf of Mexico red snapper. 159 Cong. Rec. S4481 (daily ed. June 13, 2013). The bill was referred to the Committee on Commerce, Science, and Transportation.

S. 1162 (Merkley, D-Or.) (water) would authorize the Administrator of NOAA to provide certain funds to eligible entities for activities undertaken to address the marine debris impacts of the March 2011 Tohoku earthquake and subsequent tsunamis. 159 Cong. Rec. S4481 (daily ed. June 13, 2013). The bill was referred to the Committee on Commerce, Science, and Transportation.

S. 1167 (Heller, R-Nev.) (land use) would require the Secretary of the Interior to convey certain federal land to Elko County, Nevada, and to take land into trust for the Te-moak Tribe of Western Shoshone Indians of Nevada. 159 Cong. Rec. S4481 (daily ed. June 13, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1169 (Baucus, D-Mont.) (land use) would withdraw and reserve certain public land in the state of Montana for the Limestone Hills Training Area. 159 Cong. Rec. S4481 (daily ed. June 13, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1175 (Feinstein, D-Cal.) (wildlife) would require the Secretary of the Treasury to establish a program to provide loans and loan guarantees to enable eligible public entities to acquire interests in real property that are in compliance with habitat conservation plans approved by the Secretary of the Interior under the ESA. 159 Cong. Rec. S4585

(daily ed. June 18, 2013). The bill was referred to the Committee on Environment and Public Works.

S. 1186 (Warren, D-Mass.) (land use) would reauthorize the Essex National Heritage Area. 159 Cong. Rec. S4673 (daily ed. June 19, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1189 (Menendez, D-N.J.) (land use) would adjust the boundaries of Paterson Great Falls National Historical Park to include Hinchliffe Stadium. 159 Cong. Rec. S4673 (daily ed. June 19, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1191 (Bennet, D-Colo.) (energy) would facilitate better alignment, cooperation, and best practices between commercial real estate landlords and tenants regarding energy efficiency in buildings. 159 Cong. Rec. S4673 (daily ed. June 19, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1195 (Barrasso, R-Wyo.) (energy) would repeal the renewable fuel standard. 159 Cong. Rec. S4792 (daily ed. June 20, 2013). The bill was referred to the Committee on Environment and Public Works.

S. 1199 (Hoeven, R-N.D.) (energy) would improve energy performance in federal buildings. 159 Cong. Rec. S4792 (daily ed. June 20, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1200 (Sanders, I-Vt.) (energy) would amend the Energy Policy and Conservation Act to promote energy efficiency and energy savings in residential buildings. 159 Cong. Rec. S4792 (daily ed. June 20, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1205 (Franken, D-Minn.) (energy) would help public and private entities to assess and implement energy systems that recover and use waste heat and local renewable energy resources. 159 Cong. Rec. S4792 (daily ed. June 20, 2013). The bill was

referred to the Committee on Energy and Natural Resources.

S. 1206 (Franken, D-Minn.) (energy) would encourage benchmarking and disclosure of energy information for commercial buildings. 159 Cong. Rec. S4793 (daily ed. June 20, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1209 (Warner, D-Va.) (energy) would establish a State Energy Race to the Top Initiative to assist energy policy innovation in the states to promote the goal of doubling electric and thermal energy productivity by January 1, 2030. 159 Cong. Rec. S4793 (daily ed. June 20, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1212 (Udall, D-Colo.) (wildlife) would amend the Pittman-Robertson Wildlife Restoration Act to facilitate the establishment of additional or expanded public target ranges in certain states. 159 Cong. Rec. S4793 (daily ed. June 20, 2013). The bill was referred to the Committee on Environment and Public Works.

S. 1213 (Coons, D-Del.) (energy) would reauthorize weatherization and state energy programs. 159 Cong. Rec. S4793 (daily ed. June 20, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1218 (Warner, D-Va.) (energy) would establish a State Energy Race to the Top Initiative to assist energy policy innovation in the states to promote the goal of doubling electric and thermal energy productivity by January 1, 2030. 159 Cong. Rec. S5149 (daily ed. June 25, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1219 (Boxer, D-Cal.) (water) would authorize the Pechanga Band of Luiseño Mission Indians Water Rights Settlement. 159 Cong. Rec. S5149 (daily ed. June 25, 2013). The bill was referred to the Committee on Indian Affairs.

S. 1225 (Udall, D-Colo.) (energy) would amend the Internal Revenue Code of 1986 to provide that solar energy property need not be located on

the property with respect to which it is generating electricity in order to qualify for the residential energy-efficient property credit. 159 Cong. Rec. S5264 (daily ed. June 26, 2013). The bill was referred to the Committee on Finance.

S. 1232 (Levin, D-Mich.) (water) would amend the Federal Water Pollution Control Act to protect and restore the Great Lakes. 159 Cong. Rec. S5264 (daily ed. June 26, 2013). The bill was referred to the Committee on Environment and Public Works.

S. 1233 (Inhofe, R-Okla.) (energy) would allow states to control the development and production of all forms of energy on all available federal land. 159 Cong. Rec. S5264 (daily ed. June 26, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1234 (Inhofe, R-Okla.) (energy) would clarify that a state has the sole authority to regulate hydraulic fracturing on federal land within the boundaries of the state. 159 Cong. Rec. S5264 (daily ed. June 26, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1240 (Wyden, D-Or.) (waste) would establish a new organization to manage nuclear waste, provide a consensual process for siting nuclear waste facilities, and ensure adequate funding for managing nuclear waste. 159 Cong. Rec. S5498 (daily ed. June 27, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1245 (Feinstein, D-Cal.) (governance) would make appropriations for energy and water development and related agencies for the fiscal year ending September 30, 2014. 159 Cong. Rec. S5498 (daily ed. June 27, 2013). The bill was referred to the Committee on Appropriations.

S. 1252 (Sanders, I-Vt.) (water) would amend the Wild and Scenic Rivers Act to designate segments of the Missisquoi River and the Trout River in the state of Vermont as components of the National Wild and Scenic Rivers System. 159 Cong. Rec. S5498 (daily ed. June 27, 2013). The

bill was referred to the Committee on Energy and Natural Resources.

S. 1253 (Murphy, D-Conn.) (water) would amend the Wild and Scenic Rivers Act to designate certain segments of the Farmington River and Salmon Brook in the state of Connecticut as components of the National Wild and Scenic Rivers System. 159 Cong. Rec. S5498 (daily ed. June 27, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1254 (Nelson, D-Fla.) (wildlife) would amend the Harmful Algal Blooms and Hypoxia Research and Control Act of 1998. 159 Cong. Rec. S5498 (daily ed. June 27, 2013). The bill was referred to the Committee on Commerce, Science, and Transportation.

S. 1261 (Udall, D-Colo.) (energy) would amend the National Energy Conservation Policy Act and the Energy Independence and Security Act of 2007 to promote energy efficiency via information and computing technologies. 159 Cong. Rec. S5499 (daily ed. June 27, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1263 (Heller, R-Nev.) (land use) would establish a wilderness area, promote conservation, and provide for development in Douglas County, Nevada. 159 Cong. Rec. S5499 (daily ed. June 27, 2013). The bill was referred to the Committee on Energy and Natural Resources.

S. 1264 (Casey, D-Pa.) (energy) would foster market development of clean energy fueling facilities by steering infrastructure installation toward designated Clean Vehicle Corridors. 159 Cong. Rec. S5499 (daily ed. June 27, 2013). The bill was referred to the Committee on Environment and Public Works.

S. 1267 (Stabenow, D-Mich.) (toxic substances) would cut taxes for innovative businesses that produce renewable chemicals. 159 Cong. Rec. S5499 (daily ed. June 27, 2013). The bill was referred to the Committee on Finance.

H.R. 2218 (McKinley, R-W. Va.) (waste) would amend Subtitle D of the SWDA to encourage recovery and beneficial use of coal combustion residuals and establish requirements for the proper management and disposal of coal combustion residuals. 159 Cong. Rec. H3014 (daily ed. June 3, 2013). The bill was referred to the Committee on Energy and Commerce.

H.R. 2219 (Young, R-Alaska) (water) would reauthorize the Integrated Coastal and Ocean Observation System Act of 2009. 159 Cong. Rec. H3014 (daily ed. June 3, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2226 (Johnson, R-Ohio) (waste) would amend CERCLA relating to state consultation on removal and remedial actions, state concurrence with listing on the NPL, and state credit for contributions to the removal or remedial action. 159 Cong. Rec. H3014 (daily ed. June 3, 2013). The bill was referred to the Committee on Energy and Commerce.

H.R. 2231 (Hastings, R-Wash.) (water) would amend the OCSLA to increase energy exploration and production on the outer continental shelf, provide for equitable revenue sharing for all coastal states, and reorganize the functions of the former Minerals Management Service into distinct and separate agencies. 159 Cong. Rec. H3094 (daily ed. June 4, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2242 (Engel, D-N.Y.) (energy) would enable state and local promotion of natural gas, flexible fuel, and high-efficiency motor vehicle fleets. 159 Cong. Rec. H3094 (daily ed. June 4, 2013). The bill was referred to the Committee on Energy and Commerce.

H.R. 2248 (Markey, D-Mass.) (toxic substances) would ban the use of bisphenol A in food containers. 159 Cong. Rec. H3095 (daily ed. June 4, 2013). The bill was referred to the Committee on Energy and Commerce.

H.R. 2254 (Sewell, D-Ala.) (land use) would establish the Alabama Black Belt National Heritage Area. 159 Cong. Rec. H3095 (daily ed. June 4, 2013).

The bill was referred to the Committee on Natural Resources.

H.R. 2255 (Van Hollen, D-Md.) (land use) would amend the Chesapeake and Ohio Canal Development Act to extend to the Chesapeake and Ohio Canal National Historical Park Commission. 159 Cong. Rec. H3095 (daily ed. June 4, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2259 (Daines, R-Mont.) (energy) would withdraw certain federal land and interests in that land from location, entry, and patent under the mining laws and disposition under the mineral and geothermal leasing laws and preserve existing uses. 159 Cong. Rec. H3215 (daily ed. June 5, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2261 (Crawford, R-Ark.) (wild-life) would ensure the continuation of successful fisheries mitigation programs. 159 Cong. Rec. H3215 (daily ed. June 5, 2013). The bill was referred to the Committee on Transportation and Infrastructure.

H.R. 2265 (Brady, R-Tex.) (water) would direct the Secretary of the Interior to issue an oil and gas leasing program under §18 of the OCSLA for 2016 through 2020. 159 Cong. Rec. H3215 (daily ed. June 5, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2276 (Horsford, D-Nev.) (land use) would preserve the Lake Mead Area in Clark County, Nevada, and designate wilderness areas. 159 Cong. Rec. H3250 (daily ed. June 6, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2279 (Gardner, R-Colo.) (waste) would amend the SWDA relating to review of regulations under such Act and amend CERCLA relating to financial responsibility for classes of facilities. 159 Cong. Rec. H3250 (daily ed. June 6, 2013). The bill was referred to the Committee on Energy and Commerce.

H.R. 2294 (McIntyre, D-N.C.) (water) would remove certain properties

in North Carolina from the John H. Chafee Coastal Barrier Resources System. 159 Cong. Rec. H3251 (daily ed. June 6, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2298 (Peters, D-Mich.) (waste) would require the Secretary of Health and Human Services, in consultation with the Administrator of EPA, to conduct a study on the public health and environmental impacts of the production, transportation, storage, and use of petroleum coke. 159 Cong. Rec. H3251 (daily ed. June 6, 2013). The bill was referred to the Committee on Energy and Commerce.

H.R. 2303 (Shea-Porter, D-N.H.) (waste) would define the term “covered waste” for purposes of the U.S. Department of Defense prohibition on the disposal of certain waste in open-air burn pits. 159 Cong. Rec. H3251 (daily ed. June 6, 2013). The bill was referred to the Committee on Armed Services.

H.R. 2307 (Vela, D-Tex.) (water) would require the Secretary of State to submit to Congress reports on water sharing with Mexico. 159 Cong. Rec. H3256 (daily ed. June 10, 2013). The bill was referred to the Committee on Foreign Affairs.

H.R. 2318 (Latta, R-Ohio) (waste) would amend CERCLA with respect to the applicability of the Act to federal facilities. 159 Cong. Rec. H3287 (daily ed. June 11, 2013). The bill was referred to the Committee on Energy and Commerce.

H.R. 2331 (Griffith, R-Va.) (land use) would convey a small parcel of National Forest System land in Pound, Virginia. 159 Cong. Rec. H3356 (daily ed. June 12, 2013). The bill was referred to the Committee on Agriculture.

H.R. 2337 (Polis, D-Colo.) (land use) would convey the Forest Service Lake Hill Administrative Site in Summit County, Colorado. 159 Cong. Rec. H3356 (daily ed. June 12, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2340 (Quigley, D-Ill.) (land use) would amend Title 23, U.S. Code, to protect states that have in effect laws

or orders with respect to pay-to-play reform. 159 Cong. Rec. H3356 (daily ed. June 11, 2013). The bill was referred to the Committee on Transportation and Infrastructure.

H.R. 2351 (Whitfield, R-Ky.) (energy) would repeal the fossil-fuel consumption-percentage reduction requirements for federal buildings under the Energy Conservation and Production Act. 159 Cong. Rec. H3590 (daily ed. June 13, 2013). The bill was referred to the Committee on Energy and Commerce.

H.R. 2360 (Fitzpatrick, R-Pa.) (land use) would reauthorize the Steel, Lackawanna Valley, Delaware, and Lehigh Rivers and the Schuylkill River Valley National Heritage Areas. 159 Cong. Rec. H3590 (daily ed. June 13, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2388 (McClintock, R-Cal.) (land use) would authorize the Secretary of the Interior to take certain federal lands located in El Dorado County, California, into trust for the benefit of the Shingle Springs Band of Miwok Indians. 159 Cong. Rec. H3653 (daily ed. June 14, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2396 (McDermott, D-Wash.) (waste) would amend the Internal Revenue Code of 1986 to establish the Coal Mitigation Trust Fund funded by a tax on coal extraction. 159 Cong. Rec. H3687 (daily ed. June 17, 2013). The bill was referred to the Committee on Ways and Means.

H.R. 2400 (Capps, D-Cal.) (toxic substances) would amend the Organic Foods Production Act of 1990 to require recordkeeping and authorize investigations and enforcement actions for violations of such Act. 159 Cong. Rec. H3687 (daily ed. June 17, 2013). The bill was referred to the Committee on Agriculture.

H.R. 2401 (Cotton, R-Ark.) (natural resources) would authorize the Secretary of Agriculture and the Secretary of the Interior to enter into cooperative agreements with state foresters authorizing foresters to provide certain forest,

rangeland, and watershed restoration and protection services. 159 Cong. Rec. H3687 (daily ed. June 17, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2421 (Peters, D-Cal.) (energy) would provide biorefinery assistance eligibility to renewable chemicals projects. 159 Cong. Rec. H3758 (daily ed. June 18, 2013). The bill was referred to the Committee on Agriculture.

H.R. 2430 (Pascrell, D-N.J.) (land use) would adjust the boundaries of Paterson Great Falls National Historical Park to include Hinchliffe Stadium. 159 Cong. Rec. H3927 (daily ed. June 19, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2431 (Hall, R-Tex.) (water) would reauthorize the National Integrated Drought Information System. 159 Cong. Rec. H3927 (daily ed. June 19, 2013). The bill was referred to the Committee on Science, Space, and Technology.

H.R. 2436 (Chu, D-Cal.) (water) would prepare a feasibility study and implement demonstration projects to restore the San Gabriel River Watershed in California. 159 Cong. Rec. H3927 (daily ed. June 19, 2013). The bill was referred to the Committee on Transportation and Infrastructure.

H.R. 2445 (Williams, R-Tex.) (energy) would repeal the corporate average fuel economy standards. 159 Cong. Rec. H3928 (daily ed. June 19, 2013). The bill was referred to the Committee on Energy and Commerce.

H.R. 2455 (Amodei, R-Nev.) (land use) would provide for the sale or transfer of certain federal lands in Nevada. 159 Cong. Rec. H3988 (daily ed. June 20, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2463 (Hunter, R-Cal.) (wild-life) would amend the Pittman-Robertson Wildlife Restoration Act to facilitate the establishment of additional or expanded public target ranges in certain states. 159 Cong. Rec. H3988 (daily ed. June 20, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2471 (Poe, R-Tex.) (energy) would amend the Department of Energy Organization Act to transfer regulatory authority over exports of natural gas from the Secretary of Energy to the Federal Energy Regulatory Commission. 159 Cong. Rec. H3989 (daily ed. June 20, 2013). The bill was referred to the Committee on Energy and Commerce.

H.R. 2478 (Conaway, R-Tex.) (energy) would repeal a limitation on federal procurement of certain fuels. 159 Cong. Rec. H4037 (daily ed. June 25, 2013). The bill was referred to the Committee on Oversight and Government Reform.

H.R. 2486 (Capps, D-Cal.) (energy) would permanently prohibit oil and gas leasing off the coast of California. 159 Cong. Rec. H4037 (daily ed. June 25, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2488 (DeFazio, D-Or.) (land use) would expand the Wild Rogue Wilderness Area in the state of Oregon, make additional wild and scenic river designations in the Rogue River area, and provide additional protections for Rogue River tributaries. 159 Cong. Rec. H4037 (daily ed. June 25, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2491 (DeFazio, D-Or.) (land use) would provide for the designation of the Devil's Staircase Wilderness Area in the state of Oregon to designate segments of Wasson and Franklin Creeks in Oregon as wild or recreation rivers. 159 Cong. Rec. H4037 (daily ed. June 25, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2493 (Engel, D-N.Y.) (energy) would amend 49 U.S. Code ch. 329 to ensure that new vehicles enable fuel competition to reduce the strategic importance of oil to the United States. 159 Cong. Rec. H4037 (daily ed. June 25, 2013). The bill was referred to the Committee on Energy and Commerce.

H.R. 2497 (Kirkpatrick, D-Ariz.) (land use) would modify the boundary of the Casa Grande Ruins National Monument. 159 Cong. Rec. H4037 (daily ed. June 25, 2013). The

bill was referred to the Committee on Natural Resources.

H.R. 2502 (Thompson, D-Cal.) (energy) would amend the Internal Revenue Code of 1986 to extend the energy credit for certain property under construction. 159 Cong. Rec. H4038 (daily ed. June 25, 2013). The bill was referred to the Committee on Ways and Means.

H.R. 2508 (Calvert, R-Cal.) (water) would authorize the Pechanga Band of Luiseño Mission Indians Water Rights Settlement. 159 Cong. Rec. H4078 (daily ed. June 26, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2511 (Black, R-Tenn.) (energy) would allow states to control the development and production of all forms of energy on all available federal land. 159 Cong. Rec. H4078 (daily ed. June 26, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2513 (Gohmert, R-Tex.) (energy) would clarify that a state has the sole authority to regulate hydraulic fracturing on federal land within the boundaries of the state. 159 Cong. Rec. H4078 (daily ed. June 26, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2534 (Whitfield, R-Ky.) (land use) would provide \$50,000,000,000 in new transportation infrastructure funding through bonding to allow states and local governments to complete significant infrastructure projects across all modes of transportation, including roads, bridges, rail and transit systems, ports, and inland waterways. 159 Cong. Rec. H4141 (daily ed. June 27, 2013). The bill was referred to the Committee on Ways and Means.

H.R. 2539 (Schakowsky, D-Ill.) (energy) would amend the Internal Revenue Code of 1986 to extend certain provisions of the renewable energy credit. 159 Cong. Rec. H4142 (daily ed. June 27, 2013). The bill was referred to the Committee on Ways and Means.

H.R. 2552 (DeGette, D-Colo.) (land use) would designate certain lands in the state of Colorado as components of the National Wilderness

Preservation System. 159 Cong. Rec. H4142 (daily ed. June 27, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2554 (Denham, R-Cal.) (water) would increase water storage availability at the New Melones Reservoir to provide additional water for areas served below the reservoir. 159 Cong. Rec. H4142 (daily ed. June 27, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2555 (Esty, D-Conn.) (water) would amend the Wild and Scenic Riv-

ers Act to designate certain segments of the Farmington River and Salmon Brook in the state of Connecticut as components of the National Wild and Scenic Rivers System. 159 Cong. Rec. H4142 (daily ed. June 27, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2564 (Rangel, D-N.Y.) (energy) would extend the additional duty on ethanol. 159 Cong. Rec. H4143 (daily ed. June 27, 2013). The bill was referred to the Committee on Ways and Means.

H.R. 2568 (Tierney, D-Mass.) (land use) would reauthorize the Essex National Heritage Area. 159 Cong. Rec. H4143 (daily ed. June 27, 2013). The bill was referred to the Committee on Natural Resources.

H.R. 2569 (Welch, D-Vt.) (water) would amend the Wild and Scenic Rivers Act to designate segments of the Missisquoi River and the Trout River in the state of Vermont as components of the National Wild and Scenic Rivers System. 159 Cong. Rec. H4143 (daily ed. June 27, 2013). The bill was referred to the Committee on Natural Resources.

In the Courts

These entries summarize recent cases under the following categories: Air, Climate Change, Energy, Land Use, Natural Resources, Toxic Substances, Waste, Water, and Wildlife. The entries are arranged alphabetically by case name within each category. This material is updated monthly. For archived materials, visit <http://www.elr.info/judicial>.

AIR

American Trucking Ass'n v. Los Angeles, City of, No. 11-798, 43 ELR 20128 (U.S. June 13, 2013). The U.S. Supreme Court struck down portions of the Los Angeles port's "Clean Truck Program," which was designed in part to reduce emissions related to port operations, including emissions from trucks.

Association of Battery Recyclers, Inc. v. Environmental Protection Agency, No. 12-1129, 43 ELR 20113 (D.C. Cir. May 28, 2013). The D.C. Circuit upheld EPA's revised NESHAPs for secondary lead smelting facilities.

Association of Taxicab Operators USA v. Dallas, City of, No. 12-10470, 43 ELR 20137 (5th Cir. June 13, 2013). The Fifth Circuit held that the CAA does not preempt a local ordinance that allows taxicabs certified to run on compressed natural gas to cut ahead of gasoline-powered taxis in the queue for picking up passengers at Love Field Airport in Dallas.

Louisiana Generating L.L.C. v. Illinois Union Insurance Co., No. 12-30651,

43 ELR 20120 (5th Cir. May 15, 2013). The Fifth Circuit held that under New York law, an insurance company has a duty to defend a power company in an underlying lawsuit filed against it by EPA and Louisiana's environmental agency for alleged CAA and state-law violations.

CLIMATE CHANGE

Alec L. v. Perciasepe, No. 11-cv-2235, 43 ELR 20117 (D.D.C. May 22, 2013). A district court denied a motion to reconsider its earlier dismissal of a lawsuit seeking declaratory and injunctive relief based on the federal government's alleged failure to reduce greenhouse gas emissions.

Montana Environmental Information Center v. United States Bureau of Land Management, No. CV-11-15-GF-SEH, 43 ELR 20131 (D. Mont. June 14, 2013). A district court dismissed environmental groups' claims that BLM failed to adequately consider climate change, global warming, and greenhouse gases in violation of NEPA before it approved oil and gas leases on federal land in Montana in 2008 and 2010.

ENERGY

Illinois Commerce Commission v. Federal Energy Regulatory Commission, Nos. 11-3421 et al., 43 ELR 20124 (7th Cir. June 7, 2013). The Seventh Circuit upheld a FERC order allowing a regional electricity transmission system to apportion costs for new power lines necessary to bring power generated from wind farms in the Great Plains to urban centers among all the utilities drawing electricity from the grid.

LAND USE

Arlington, Texas, City of v. Federal Communications Comm'n, No. 11-1545, 43 ELR 20112 (U.S. May 20, 2013). The U.S. Supreme Court upheld an FCC declaratory ruling that state and local zoning authorities have 150 days to process siting applications for new wireless towers and antennas.

Gila River Indian Community v. McComish, Nos. 11-15631 et al., 43 ELR 20115 (9th Cir. May 20, 2013). The Ninth Circuit affirmed in part and reversed and remanded in part a lower court decision granting summary judgment in favor of the government in a

city's lawsuit seeking to set aside DOI's decision to accept in trust, for the benefit of the Tohono O'odham Nation, a 54-acre parcel of land on which the Nation hopes to build a resort and casino.

Horne v. Department of Agriculture, No. 12-123, 43 ELR 20122 (U.S. June 10, 2013). The U.S. Supreme Court reversed the Ninth Circuit's decision that it lacked jurisdiction to hear a raisin grower's claim that a marketing order under the Agricultural Marketing Agreement Act of 1937 requiring handlers to participate in a raisin reserve program violates the Fifth Amendment's prohibition against taking property without just compensation.

Organic Seed Growers & Trade Ass'n v. Monsanto Co., No. 2012-1298, 43 ELR 20125 (Fed. Cir. June 10, 2013). The Federal Circuit held that organic farmers lack standing to seek a declaratory judgment of non-infringement with respect to 23 patents owned by a large seed manufacturer.

NATURAL RESOURCES

Conservation Congress v. United States Forest Service, No. 12-16452, 43 ELR 20129 (9th Cir. June 13, 2013). The Ninth Circuit affirmed a lower court decision denying an environmental group's request to preliminarily enjoin the U.S. Forest Service's approval of a timber sale in the Shasta-Trinity National Forest.

Cumberland Coal Resources, LP v. Federal Mine Safety & Health Review Commission, No. 11-1464, 43 ELR 20123 (D.C. Cir. June 7, 2013). The D.C. Circuit held that a mining company's failure to maintain adequate emergency lifelines in its mine's escapeways was a significant and substantial violation of the Federal Mine Safety and Health Act of 1977, thereby affirming the Department of Labor's Federal Mine Safety & Health Review Commission.

Sierra Club v. United States Department of Agriculture, No. 12-5095, 43 ELR 20116 (D.C. Cir. May 28, 2013). The D.C. Circuit held that a power company may not appeal a lower court decision that USDA's Rural Utilities Service violated NEPA before granting

approvals and financial assistance to the company's expansion of its coal-fired power plant.

TOXIC SUBSTANCES

Center for Food Safety v. Vilsack, No. 12-15052, 43 ELR 20111 (9th Cir. May 17, 2013). The Ninth Circuit upheld the Animal Plant and Health Inspection Service's unconditional deregulation of Roundup Ready Alfalfa, a genetically modified plant that allows farmers to control weeds through herbicide application without harming the alfalfa plant.

Chlorine Institute, Inc. v. Federal Rail Administration, No. 12-1298, 43 ELR 20126 (D.C. Cir. June 11, 2013). The D.C. Circuit dismissed as unripe a trade association's lawsuit challenging portions of a Federal Rail Administration rule that requires qualifying rail carriers to submit an implementation plan to install a "positive train control" system no later than December 31, 2015, on certain tracks used for passenger service or for transporting "poison- or toxic-by-inhalation" hazardous material.

Doe Run Resources Corp. v. Lexington Insurance Co., No. 12-2215, 43 ELR 20135 (8th Cir. June 13, 2013). The Eighth Circuit held that under Missouri law, an insurance company has no duty to defend a lead producer in an underlying lawsuit alleging environmental property damage resulting from the lead producer's mine and mill operations.

Doe Run Resources Corp. v. Lexington Insurance Co., No. 12-3498, 43 ELR 20136 (8th Cir. June 13, 2013). The Eighth Circuit held that pollution exclusion clauses preclude an insurance company's duty to defend a lead producer in an underlying lawsuit alleging damages stemming from the release of hazardous wastes or toxic substances, but they do not preclude coverage in a lawsuit alleging that the lead producer distributed toxic substances for use as fill material and for use on roads, streets, and buildings.

WASTE

Bridger Lake, LLC v. Seneca Insurance Co., No. 11-0342, 43 ELR 20130

(W.D. La. June 6, 2013). A district court held that under Wyoming law, an insurance company need not cover a pipeline operator for damages resulting from a ruptured pipeline that discharged more than 4,000 barrels of crude oil over a five-day period.

Evergreen Partnering Group, Inc. v. Pacific Corp., No. 12-1730, 43 ELR 20139 (1st Cir. June 19, 2013). The First Circuit vacated and remanded a lower court decision dismissing a recycling company's lawsuit that disposable food container manufacturers and two trade associations refused in concert to deal with the company in a closed-loop recycling business method for polystyrene food service products.

United States v. D.S.C. of Newark Enterprises, Inc., No. 09-2270, 43 ELR 20134 (D.N.J. June 12, 2013). A district court held, in an unpublished opinion, that a company that sold its facility, including equipment that contained asbestos dust and waste, may not be held liable as an owner or operator or as an arranger under CERCLA.

WATER

Applewood Properties, LLC v. New South Properties, LLC, No. 161A12, 43 ELR 20138 (N.C. June 13, 2013). The North Carolina Supreme Court held an injured person may not bring a civil action against a defendant under the Sedimentation Pollution Control Act of 1973 when the defendant has received notices of noncompliance but has not been cited for a violation of a relevant law, rule, order, or erosion and sedimentation control plan.

Miccosukee Tribe of Indians of Florida v. United States, No. 10-14271, 43 ELR 20119 (11th Cir. May 15, 2013). The Eleventh Circuit upheld the dismissal of a Native American tribe's lawsuit challenging the government's management of the Central and Southern Florida Project for Flood Control in the Everglades.

National Wildlife Federation v. United States Environmental Protection Agency, No. 13-617, 43 ELR 20118 (D.D.C. May 16, 2013). A district court dismissed an environmental group's APA

lawsuit against EPA challenging 40 C.F.R. §124.55(b), which pertains to state certification of discharge permits issued by the Agency under the CWA.

In re Quantitative Settlement Agreement Coordinated Civil Cases, No. JCCP 4353, 43 ELR 20121 (Super. Ct. Cal. June 4, 2013). A California court validated a settlement agreement and 11 related agreements concerning the conservation, transfer, and exchange of Colorado River water diverted for beneficial consumptive use among Southern California water agencies.

Tarrant Regional Water District v. Herrmann, No. 11-889, 43 ELR 20127 (U.S. June 13, 2013). The U.S. Supreme Court held that Oklahoma statutes that

favor in-state water appropriation permit applicants over out-of-state permit applicants do not violate the Commerce Clause and are not preempted by the Red River Water Compact—an interstate water compact that allocates water among Arkansas, Louisiana, Oklahoma, and Texas.

WILDLIFE

Institute of Cetacean Research v. Sea Shepherd Conservation Society, No. 12-35266, 43 ELR 20014 (9th Cir. May 24, 2013). The Ninth Circuit reversed a lower court decision dismissing a Japanese whaling research organization's piracy claims against an environmental activist group.

In re Polar Bear Endangered Species Act Listing, No. 11-5353, 43 ELR 20132 (D.C. Cir. June 18, 2013). The D.C. Circuit upheld FWS' determination that sport-hunted polar bear "trophies" may no longer be imported into the United States under the Marine Mammals Protection Act as of the effective date of the ESA listing rule for the species.

United States v. Bengis, No. 1-03-cr-00308, 43 ELR 20133 (S.D.N.Y. June 14, 2013). A district court ordered three men to pay South Africa \$29.5 million in restitution for illegally harvesting and importing into the United States large quantities of West Coast rock lobsters from South African waters in violation of the Lacey Act.

In the Federal Agencies

These entries cover the period June 1, 2013, through June 30, 2013. Citations are to the *Federal Register* (FR). Entries below are organized by Final Rules, Proposed Rules, and Notices. Within each section, entries are further subdivided by subject matter area, with entries listed chronologically. This material is updated monthly. For archived materials, visit <http://www.elr.info/daily-update/archives>.

FINAL RULES

AIR

EPA removed over 50 unnecessary, obsolete, or outdated rules in the state regulations for Delaware, the District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia. 78 FR 33977 (6/6/13).

EPA approved Indiana's plan to control air pollutants from sewage sludge incinerators. 78 FR 34918 (6/11/13).

EPA and the National Highway Traffic Safety Administration amended their respective rulemakings of September 15, 2011, on medium- and heavy-duty greenhouse gas emissions and fuel efficiency. 78 FR 36369 (6/17/13).

EPA amended the NESHAP for heat exchange systems at petroleum refineries as the result of a petition for reconsideration of maximum achievable

control technology rules. 78 FR 37133 (6/20/13).

SIP Approvals: California (redesignation to attainment for the San Diego County nonattainment area and 10-year maintenance plan) 78 FR 33230 (6/4/13); (volatile organic compounds for the San Diego air pollution control district) 78 FR 37130 (6/20/13); (deferral of sanctions related to contingency measure requirements for the Los Angeles-South Coast air basin) 78 FR 37719 (6/24/13); (redesignation to attainment for the Los Angeles-South Coast air basin, transportation conformity requirements, and emissions inventory) 78 FR 38223 (6/26/13). Connecticut (reasonably available control technology requirements) 78 FR 38587 (6/27/13). Kansas (infrastructure submissions and associated requirements) 78 FR 37126 (6/20/13). Kentucky (motor vehicle emissions budgets for the northern Kentucky maintenance area) 78 FR 33726 (6/5/13). Maryland (revisions to low-emission vehicle program) 78

FR 34911 (6/11/13). Missouri (infrastructure submissions and associated requirements) 78 FR 37457 (6/21/13). New Jersey (infrastructure submission) 78 FR 35764 (6/14/13). New York (infrastructure revisions) 78 FR 37122 (6/20/13). North Carolina (maintenance plan updates for the Charlotte, Raleigh/Durham, and Winston-Salem areas) 78 FR 37118 (6/20/13). Ohio (replacement of motor vehicle emissions budgets for the Belmont County area) 78 FR 34903 (6/11/13); (replacement of motor vehicle emissions budgets for the Lima area) 78 FR 34906 (6/11/13). Oregon (Heat Smart program and enforcement procedures for fuel burning) 78 FR 37124 (6/20/13). Pennsylvania (reasonably available control technology requirements) 78 FR 34584 (6/10/13). Tennessee (partial approval of infrastructure submission) 78 FR 36440 (6/18/13). Virginia (reclassification to marginal for the Northern Virginia nonattainment area and amendment of the transportation conformity NAAQS) 78 FR 34915 (6/11/13).

LAND USE

The National Park Service amended its interim regulations governing demonstrations and the sale or distribution of printed matter in areas of the National Park System. 78 FR 37713 (6/24/13).

WATER

EPA, in response to a 2009 decision by the Sixth Circuit, removed language contained in its 2006 NPDES Pesticides Rule that exempted the application of pesticides from NPDES permit requirements. 78 FR 38591 (6/27/13).

WILDLIFE

FWS authorized the nonlethal, incidental, unintentional take of small numbers of Pacific walrus and polar bears during oil and gas exploration activities in the Chukchi Sea and adjacent western coast of Alaska for a five-year period. 78 FR 35363 (6/12/13).

FWS reclassified the Argentine distinct population segment of the broad-snouted caiman as endangered under the ESA. 78 FR 38161 (6/25/13).

PROPOSED RULES

AIR

EPA proposed changes to the new source review program in Indian country, including exemptions, definitions, and advance notification for relocation. 78 FR 33266 (6/4/13).

EPA proposed to remove over 50 unnecessary, obsolete, or outdated rules in the state regulations for Delaware, the District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia. 78 FR 34013 (6/6/13).

EPA proposed to approve Indiana's plan to control air pollutants from sewage sludge incinerators. 78 FR 34973 (6/11/13).

EPA proposed amendments to the renewable fuels standard program, to the

E15 misfueling mitigation regulations, and to the survey requirements for the ultra-low sulfur diesel program. 78 FR 36041 (6/14/13).

EPA and the National Highway Traffic Safety Administration proposed to amend their respective rulemakings of September 15, 2011, on medium- and heavy-duty greenhouse gas emissions and fuel efficiency. 78 FR 36135 (6/17/13).

EPA proposed changes to the existing air emission inventory reporting requirements for lead by state, local, and tribal agencies. 78 FR 37164 (6/20/13).

SIP Proposals: California (volatile organic compounds for the San Diego air pollution control district) 78 FR 37176 (6/20/13); (contingency measure requirements for the Los Angeles-South Coast air basin) 78 FR 37741 (6/24/13); (volatile organic compound, nitrogen oxide, and particulate matter emissions for the South Coast air quality management district) 78 FR 37757 (6/24/13). Florida (removal of provision on synthetic organic fiber production) 78 FR 35599 (6/13/13). Idaho (best available control technology determination and alternative control measures for The Amalgamated Sugar Company, LLC) 78 FR 38872 (6/28/13). Kentucky (motor vehicle emissions budgets for the northern Kentucky maintenance area) 78 FR 33784 (6/5/13). New Jersey (redesignation to attainment for two New Jersey areas, maintenance plan, and supplement to the 2007 emission inventory) 78 FR 38648 (6/27/13). North Carolina (removal of Stage II vapor control requirements for new and upgraded gasoline dispensing facilities) 78 FR 34303 (6/7/13); (full approval of reasonably available control technology revisions for the bi-state Charlotte area) 78 FR 34306 (6/7/13). Ohio (replacement of motor vehicle emissions budgets for the Belmont County area) 78 FR 34965 (6/11/13); (replacement of motor vehicle emissions budgets for the Lima area) 78 FR 34965 (6/11/13); (supplement to redesignation to attainment for the Ohio area and to emission inventories) 78 FR 38247 (6/26/13); (supplement to redesignation to attainment for the Ohio area and to emission inventories) 78 FR 38256 (6/26/13).

Pennsylvania (withdrawal of 2008 reasonably available control technology revision for Philadelphia County and conditional approval of 2010 revision). 78 FR 36716 (6/19/13). Utah (partial approval of air quality permit revisions) 78 FR 35181 (6/12/13). Virginia (infrastructure submission) 78 FR 34970 (6/11/13); (reclassification of the Northern Virginia nonattainment area and amendment of the transportation conformity NAAQS) 78 FR 34972 (6/11/13). Wisconsin (removal of Stage II vapor requirements for the southeast Wisconsin area) 78 FR 34966 (6/11/13). Wyoming (partial approval of regional haze program and federal implementation plan to address deficiencies) 78 FR 34737 (6/10/13); (PSD permitting requirement revisions and rescission of federal implementation plan) 78 FR 37752 (6/24/13).

GOVERNANCE

USDA proposed to revoke its July 24, 1971, rulemaking titled Public Participation in Rule Making that mandates notice-and-comment procedures be implemented even in cases where the APA does not require it. 78 FR 33045 (6/3/13).

NATURAL RESOURCES

NOAA proposed to expand the boundary of Thunder Bay National Marine Sanctuary to 4,300 square miles and to extend protection to 47 additional known historic shipwrecks of national significance. 78 FR 35776 (6/14/13).

TOXIC SUBSTANCES

EPA proposed a framework for a third-party certification program for composite wood products under TSCA to reduce formaldehyde emissions. 78 FR 34795 (6/10/13).

EPA proposed composite wood product formaldehyde emission standards under TSCA based upon those currently in place in California. 78 FR 34820 (6/10/13).

EPA proposed to add a nonylphenol category to the list of toxic chemicals

subject to reporting under EPCRA and the Pollution Prevention Act. 78 FR 37176 (6/20/13).

WASTE

EPA proposed to approve revisions to North Carolina's hazardous waste management program under RCRA. 78 FR 35837 (6/14/13).

WATER

EPA proposed to revise effluent limitations guidelines and standards for the steam electric power-generating point source category to reduce pollutant discharges to surface waters. 78 FR 34431 (6/7/13).

WILDLIFE

FWS proposed to designate 1,110 acres in eastern Nebraska as critical habitat for the Salt Creek tiger beetle under the ESA. 78 FR 33282 (6/4/13).

NOAA-Fisheries proposed to eliminate the expiration date on vessel speed restrictions to reduce the likelihood of lethal collisions with North Atlantic right whales. 78 FR 34024 (6/6/13).

FWS proposed to list all chimpanzees as endangered under the ESA and seeks public comment. 78 FR 35201 (6/12/13).

FWS proposed to remove the gray wolf from the list of endangered and threatened wildlife under the ESA but to maintain endangered status for the Mexican wolf as a subspecies. 78 FR 35663 (6/13/13).

FWS proposed to revise the nonessential experimental population designation of the Mexican wolf under the ESA in conjunction with listing as an endangered subspecies. 78 FR 35719 (6/13/13).

FWS proposed to designate approximately 193.1 miles in Arizona, Colorado, and New Mexico as critical habitat for the New Mexico meadow jumping mouse under the ESA. 78 FR 37327 (6/20/13).

FWS proposed to list the New Mexico meadow jumping mouse as endangered under the ESA. 78 FR 37363 (6/20/13).

NOTICES

AIR

EPA determined that the 2009 and 2025 motor vehicle emissions budgets for the New Jersey and the Philadelphia-Wilmington nonattainment areas are adequate for transportation conformity purposes. 78 FR 37717 (6/24/13).

NATURAL RESOURCES

The president proclaimed June 2013 as Great Outdoors Month. 78 FR 33955 (6/6/13).

WASTE

EPA authorized revisions to Indiana's hazardous waste management program under RCRA. 78 FR 33986 (6/6/13).

EPA authorized revisions to North Carolina's hazardous waste management program under RCRA. 78 FR 35766 (6/14/13).

EPA entered into a proposed administrative settlement under CERCLA that requires the settling party to pay \$372,217.14 plus interest in U.S. response costs incurred at the Jefferson City Residential Yards Superfund site in Jefferson City, Montana. 78 FR 36545 (6/18/13).

EPA entered into a proposed administrative settlement under CERCLA that requires the settling party to pay certain U.S. response costs incurred at the Lightman Drum Company Superfund site in Winslow Township, New Jersey. 78 FR 36547 (6/18/13).

EPA entered into a proposed settlement under CERCLA concerning the Columbia Organic Chemical Company Superfund site in Columbia, South Carolina, that addresses cost incurred by the Agency in conducting a fund-lead removal. 78 FR 37222 (6/20/13).

WATER

The president proclaimed June 2013 as National Oceans Month. 78 FR 33961 (6/6/13).

EPA announced final policies and procedures for requiring Tier 1 screening under the Endocrine Disruptor Screening Program to determine whether certain chemicals may have hormonal effects. 78 FR 35909 (6/14/13).

EPA Region 5 announced the availability of 125 TMDLs and 139 associated metal impairments for waters listed in Indiana under CWA §303(d). 78 FR 35929 (6/14/13).

EPA proposed to designate four new ocean dredged material disposal sites offshore of Texas under the Marine Protection, Research and Sanctuaries Act. 78 FR 38672 (6/27/13).

EPA proposed to approve revisions to Illinois' public water system supervision program. 78 FR 38714 (6/27/13).

NOAA proposed to amend its regulations governing the process for nominating and evaluating sites for eligibility as a national marine sanctuary. 78 FR 38848 (6/28/13).

WILDLIFE

NOAA announced a 90-day finding on a petition to list six sawfish species as endangered under the ESA; the agency found that listing the narrow sawfish, dwarf sawfish, largetooth sawfish, green sawfish, and the non-listed population(s) of smalltooth sawfish may be warranted. 78 FR 33300 (6/4/13).

FWS announced 12-month findings on two petitions to remove the scimitar-horned oryx, dama gazelle, and addax from the list of endangered and threatened species under the ESA; the agency found that delisting is not warranted. 78 FR 33790 (6/5/13).

NOAA-Fisheries announced proposed revisions to the Code of Federal Regulations to clarify and update the descriptions of threatened or endangered

species under the ESA. 78 FR 38270 (6/26/13).

DOJ NOTICES OF SETTLEMENT

United States v. Cooper Industries, No. 1:13-cv-12064 (S.D. W. Va. May 23, 2013). A settling CERCLA defendant responsible for violations at the Lin-Electric Superfund site in Bluefield, West Virginia, must pay \$340,000 in U.S. response costs incurred at the site. 78 FR 33437 (6/4/13).

United States v. Tesoro Corp., No. 1:10-cv-00211 (JEB) (D.D.C. May 30, 2013). Settling CAA defendants responsible for violations at gasoline refineries in Alaska, North Dakota, Utah, and Washington must pay a \$1,100,000 civil penalty. 78 FR 34132 (6/6/13).

United States v. PCS Nitrogen Fertilizer, L.P., No. 2:13-cv-03660-LMA-ALC (E.D. La. May 22, 2013). Settling CAA defendants responsible for violations at a phosphoric acid plant in Geismar, Louisiana, must pay a penalty of \$198,825.30 and must disable two pre-scrubber elements as injunctive relief. 78 FR 34405 (6/7/13).

United States v. Davisco Foods International, Inc., No. 11-cv-00458-EJL CV-1291-JTM-JPO (D. Idaho June 3, 2013). A settling CWA defendant that violated NPDES permit requirements

by discharging excess phosphorus at its cheese and whey-isolation plant in Jerome, Idaho, must pay a \$304,000 civil penalty. 78 FR 34406 (6/7/13).

United States v. Atlantic Richfield Co., No. CV-89-39-BU-SEH (D. Mont. June 6, 2013). A settling CERCLA defendant responsible for violations at the Anaconda Smelter NPL Superfund site and the Warm Springs Ponds Operable Units near Anaconda, Montana, must pay \$21,030,000 in U.S. response costs and related enforcement efforts. 78 FR 35314 (6/12/13).

United States v. Miami-Dade County, No. 1:12-cv-24400-FAM (S.D. Fla. June 6, 2013). A settling CWA defendant responsible for discharges of untreated sewage and various NPDES permit violations must pay a penalty of \$978,100 to the United States and Florida, must complete a supplemental environmental project valued at \$2,047,200, and must make an estimated \$1.55 billion in capital improvements to its wastewater collection and transmission system over the next 15 years to reduce the incidence and severity of sanitary sewer overflows. 78 FR 35315 (6/12/13).

United States v. New River Royalty, LLC, No. 3:13-cv-00584-JPG-SCW (S.D. Ill. June 18, 2013). A settling CWA defendant responsible for discharges of pollutants near Johnston City, Illinois, must pay an \$820,000 penalty, must perform injunctive relief,

and must perform off-site mitigation of the harm caused. 78 FR 37847 (6/24/13).

United States v. American Honda Motor Co., Inc., No. 1:13-cv-912 (D.D.C. June 18, 2013). A settling CAA defendant responsible for the importation of uncertified small non-road gasoline engines must pay a \$580,000 civil penalty and must retire 55 tons of pollution credits to address the environmental harm. 78 FR 38073 (6/25/13).

United States v. Ash Grove Cement Co., No. 2:13-cv-02299-JTM-DJW (D. Kan. June 19, 2013). A settling CAA defendant responsible for violations at nine of its cement manufacturing plants in nine states must pay \$2.5 million in civil penalties, must replace diesel truck engines at some of its plants, and must achieve substantial reductions of nitrogen oxide, sulfur dioxide, and particulate matter at all of its facilities. 78 FR 38074 (6/25/13).

United States v. American Sugar Refining, Inc., No. JKB-12-1408 (D. Md. June 11, 2013). Under a proposed modification to a consent decree, a settling CAA defendant responsible for violations at its sugar refinery in Baltimore, Maryland, will be given additional time to install one ultra low-nitrogen oxide burner, to collect and submit certain data regarding emissions, and to further reduce annual emissions. 78 FR 38362 (6/26/13).

In the State Agencies

The entries below cover state regulatory developments during the month of June 2013. The entries are arranged by state, and within each section, entries are further subdivided by subject matter area. For material previously reported, visit <http://www.elr.info/administrative/state-updates/archive>.

CALIFORNIA

TOXIC SUBSTANCES

The Office of Environmental Health Hazard Assessment amended 27 CAL. CODE REGS. §25902 to add clomiphene citrate to the list of chemicals known to cause cancer or reproductive toxicity. The listing took effect May 24, 2013. See <http://www.oal.ca.gov/res/docs/pdf/notice/21z-2013.pdf> (pp. 766-85).

COLORADO

AIR

The Department of Public Health and Environment amended 6 COLO. CODE REGS. §1001.15, Reduction of Diesel Fuel Emissions. Changes would alter the Diesel-Fleet Self Certification Program. There will be a public hearing August 15, 2013. See <http://www.sos.state.co.us/CCR/DisplayHearingDetails.do?trackingNumber=2013-00477>.

WATER

The Department of Public Health and Environment amended 5 COLO. CODE REGS. §1002.55, Water Quality Improvement Fund. The regulation relates to project prioritization for nutrient management grants. Changes took effect June 30, 2013. See <http://www.sos.state.co.us/CCR/RegisterContents.do?publicationDay=06/10/2013&Volume=36&yearPublishNumber=11&Month=6&Year=2013#21>.

FLORIDA

WATER

The Department of Water Management Districts amended 40E FLA. ADMIN. CODE §§0.113 & 1.600, Exceptions to the Uniform Rules of Procedure. Changes streamline the rules and make Department regulations consistent with those of the Department of Environmental Protection. See https://www.flrules.org/Gateway/View_notice.asp?id=13069118.

The Department of Environmental Protection amended 62 FLA. ADMIN. CODE §4, Permits. Changes reduce the application fee for establishing a site-specific alternative criterion in surface waters. See https://www.flrules.org/Gateway/View_notice.asp?id=13028184.

IOWA

AIR

The Environmental Protection Commission proposed to amend IOWA ADMIN. CODE Chs. 22, Controlling Pollution, & 28, Ambient Air Quality Standards. Changes would allow for the implementation of new and revised air quality standards. See <https://www.legis.iowa.gov/DOCS/ACO/IAC/LINC/06-12-2013.Bulletin.pdf> (pp. 1911-20).

CLIMATE CHANGE

The Environmental Protection Commission amended IOWA ADMIN. CODE

Ch. 33, Special Regulations and Construction Permit Requirements for Major Stationary Sources—Prevention of Significant Deterioration of Air Quality. Changes adopt amendments to federal rules related to greenhouse gases. Amendments took effect July 17, 2013. See <https://www.legis.iowa.gov/DOCS/ACO/IAC/LINC/06-12-2013.Bulletin.pdf> (pp. 1947-50).

MISSOURI

WATER

The Department of Natural Resources proposed to amend MO. CODE REGS. ANN. Title 10, §§20.7.015, Effluent Regulations. Amendments update bacteria limits, alter language regarding “bypasses,” and require quarterly effluent monitoring of nutrient concentrations, among other changes. There will be a public hearing September 11, 2013, and the deadline for comment is September 18, 2013. See <http://www.sos.mo.gov/adrules/moreg/current/v38n12/v38n12a.pdf> (pp. 913-22).

NEW HAMPSHIRE

AIR

The Department of Environmental Services amended Env-A 1100, Prevention, Abatement, and Control of Mobile Sources of Air Pollution, to readopt rules set to expire. Changes took effect May 22, 2013. See <http://www.gen-court.state.nh.us/rules/register/2013/june-13-13.pdf> (p. 9).

TOXIC SUBSTANCES

The Department of Environmental Services amended Env-Wq 306, Management of Mercury Containing Amalgam. The rules, which implement a state law that requires the use of environmentally appropriate equipment and methods to dispose of mercury in dental amalgam waste, were set to expire. The readoption took effect May 22, 2013. *See* <http://www.gencourt.state.nh.us/rules/register/2013/june-13-13.pdf> (p. 9).

WATER

The Department of Environmental Services proposed to readopt and amend Env-Wr 900, Official List of Public Waters. The rulemaking would alter the rule to require the procedure for listing public waters to apply only when the Department receives conflicting information from credible sources. *See* <http://www.gencourt.state.nh.us/rules/register/2013/june-20-13.pdf> (pp. 11-12).

The Department of Environmental Services amended Env-Wq 301, State Surface Water Discharge. The amendments add three requirements in the application section to address situations that have arisen in Department permitting programs. Changes took effect May 22, 2013. *See* <http://www.gencourt.state.nh.us/rules/register/2013/june-13-13.pdf> (p. 9).

NORTH CAROLINA

WILDLIFE

The Environmental Management Commission proposed to amend 15A N.C. ADMIN. CODE 10C .0306-.0320, Inland Fishing Regulations. Changes alter language to reduce the amount of information on species of game fish given to help rules meet the criteria of "clear and unambiguous." The comment period ends August 16, 2013. *See* <http://www.ncoah.com/rules/register/Volume27Issue24June172013.pdf> (pp. 2312-21).

OKLAHOMA

AIR

The Department of Environmental Quality amended OKLA. ADMIN. CODE §252.100, Air Pollution Control, to incorporate changes to EPA regulations. Amendments took effect July 1, 2013. *See* http://www.oar.state.ok.us/register/Volume-30_Issue-19.htm#a175884.

ENERGY

The Department of Environmental Quality proposed to amend OKLA. ADMIN. CODE §252.100.7, Permits for Minor Facilities. Changes add a permit by rule for minor facilities and area sources in the oil and natural gas sector. There will be a public hearing August 20, 2013. *See* http://www.oar.state.ok.us/register/Volume-30_Issue-19.htm#a18442.

GOVERNANCE

The Department of Environmental Quality amended OKLA. ADMIN. CODE §252.4, Rules of Practice and Procedure. Changes update the rules to conform to recent revisions by the state legislature. Amendments took effect July 1, 2013. *See* http://www.oar.state.ok.us/register/Volume-30_Issue-19.htm#a167182.

WASTE

The Department of Environmental Quality amended OKLA. ADMIN. CODE §252.515, Management of Solid Waste. Amendments remove the phrase "roofing material recycling facilities and used tire recycling facilities" from the definition of "Land Disposal Facilities" and add a new subchapter in response to recent legislative changes. Changes took effect July 1, 2013. *See* http://www.oar.state.ok.us/register/Volume-30_Issue-19.htm#a185619.

WATER

The Department of Environmental Quality proposed to amend OKLA. ADMIN. CODE §252.606.1, Oklahoma Pollutant Discharge Elimination System Requirements. The rulemaking adopts EPA regulations by reference. Amendments took effect July 1, 2013. *See* http://www.oar.state.ok.us/register/Volume-30_Issue-19.htm#a198193.

The Department of Environmental Quality amended OKLA. ADMIN. CODE §252.616, Industrial Wastewater Systems. Changes update definitions and clarify rules. Amendments took effect July 1, 2013. *See* http://www.oar.state.ok.us/register/Volume-30_Issue-19.htm#a199446.

The Department of Environmental Quality amended OKLA. ADMIN. CODE §§252.631, Public Water Supply Operation, & 252.690, Water Quality Standards Implementation. Changes incorporate changes to federal regulations. Amendments took effect July 1, 2013. *See* http://www.oar.state.ok.us/register/Volume-30_Issue-19.htm#a208149.

SOUTH DAKOTA

WASTE

The Department of Environment and Natural Resources proposed to amend the state's hazardous waste rules to incorporate changes to federal regulations. Changes establish procedures for identifying and managing certain hazardous secondary materials. There will be a public hearing August 15, 2013. *See* <http://legis.state.sd.us/rules/register/05282013.pdf>.

TEXAS

AIR

The Commission on Environmental Quality amended 30 TEX. ADMIN. CODE §101, Failure to Attain Fee. Changes add sections relating

to the imposition of fees. Amendments took effect June 11, 2013. *See* <http://www.sos.state.tx.us/texreg/pdf/backview/0607/0607is.pdf> (pp. 3610-44).

VERMONT

WATER

The Watershed Management Division adopted a new general permit to ensure all stream alteration activities are regulated. The permit was issued May 15, 2013. *See* http://www.vtwaterquality.org/permits/htm/pm_streamalt.htm.

VIRGINIA

WASTE

The Waste Management Board proposed to amend 9 VA. ADMIN. CODE §20.60, Virginia Hazardous Waste Management Regulations. Changes would remove the annual report for hazardous waste transporters. The proposed effective date was July 4, 2013. *See* <http://register.dls.virginia.gov/details.aspx?id=3539>.

WATER

The State Water Control Board proposed to amend 9 VA. ADMIN. CODE §25.240, Procedures for Applications, for Issuance, and for Requests for Modification or Revocation. Changes would repeal an existing regulation that has been superseded. The proposed effective date was July 4, 2013. *See* <http://register.dls.virginia.gov/details.aspx?id=3541>.

WYOMING

WASTE

The Department of Environmental Quality amended Chs. 1, 2, and 7 of the Solid Waste Rules and Regulations. Changes incorporate revisions to state law and simplify and streamline permitting requirements for solid waste transfer facilities and facilities storing used oil. *See* <http://soswy.state.wy.us/Rules/RULES/9055.pdf>, <http://soswy.state.wy.us/Rules/RULES/9056.pdf>, and <http://soswy.state.wy.us/Rules/RULES/9057.pdf>.

RECENT JOURNAL LITERATURE

“Recent Journal Literature” lists recently published law review and other legal periodical articles. Within subject-matter categories, entries are listed alphabetically by author or title. Articles are listed first, followed by comments, notes, symposia, surveys, and bibliographies.

Air

- Baldwin, Elizabeth & Kenneth R. Richards, *REDD, PINC, and Other Shades of Green: Institutional Requirements for an International Forest Carbon Sequestration Treaty in a Post-Kyoto World*, 52 NAT. RESOURCES J. 1 (2012).
- Rowell, Arden, *Allocating Pollution*, 79 U. CHI. L. REV. 985 (2012).
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Climate Change

- Adelman, David E. & Ian J. Duncan, *The Limits of Liability in Promoting Safe Geologic Sequestration of CO₂*, 43 ELR 10646 (Aug. 2013).
- Blomquist, Robert F., *Comparative Climate Change Torts*, 46 VAL. U. L. REV. 1053 (2012).
- Eames, Fred & Scott Anderson, *The Layered Approach to Liability for Geologic Sequestration of CO₂*, 43 ELR 10653 (Aug. 2013).
- Esty, Daniel C. & Anthony L.I. Moffa, *Why Climate Change Collective Action Has Failed and What Needs to Be Done Within and Without the Trade Regime*, 15 J. INT’L ECON. L. 777 (2012).
- Ludwiszewski, Raymond B. & Karyn B. Marsh, *A Comment on The Limits of Liability in Promoting Safe Geologic Sequestration of CO₂*, 43 ELR 10656 (Aug. 2013).
- McAnaney, Sheila C., *Sinking Islands? Formulating a Realistic Solution to Climate Change Displacement*, 87 N.Y.U. L. REV. 1172 (2012).
- Pendergrass, John, *Long-Term Stewardship of Geologic Sequestration of CO₂*, 43 ELR 10659 (Aug. 2013).
- Symposium, *The Sustainability Conference*, 13 VT. J. ENVTL. L. 417 (2012).
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Energy

- Dicharry, Sarah Y., *Wind Energy Production Compensation Scheme: Oil-Like Royalties or Oyster-Like Rent?*, 58 LOY. L. REV. 179 (2012).
- Endres, Jody M., *Clearing the Air: The Meta-Standard Approach to Ensuring Biofuels Environmental and Social Sustainability*, 28 VA. ENVTL. L.J. 73 (2010).

- LeCesne, Blaine, *Crude Decisions: Re-Examining Degrees of Negligence in the Context of the BP Oil Spill*, 2012 MICH. ST. L. REV. 103 (2012).
- Lees, Zachary, *Anticipated Harm, Precautionary Regulation and Hydraulic Fracturing*, 13 VT. J. ENVTL. L. 575 (2012).
- Lieben, Ivan & Ian Boisvert, *Making Renewable Energy FiT: A Feed-in-Tariff Certifying Body Could Accelerate Renewable Energy Deployment in the United States*, 52 NAT. RESOURCES J. 157 (2012).
- Marandola, Tyler, *Promoting Wind Energy Development Through Anti-Nuisance Legislation*, 84 TEMP. L. REV. 955 (2012).
- Symposium, *Land and Water Law Symposium: Corporate Social Responsibility in the Energy and Extractive Industries*, 12 WYO. L. REV. 275 (2012).
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Governance

- Biber, Eric, *The Problem of Environmental Monitoring*, 43 ELR 10695 (Aug. 2013).
- Breggin, Linda K. et al., *Trends in Environmental Law Scholarship 2008-2012*, 43 ELR 10643 (Aug. 2013).
- Deatherage, Scott D. & James Voelker, *Environmental Law*, 65 SMU L. REV. 447 (2012).
- Olds, Louisa, *Curb Your E-Waste: Why the United States Should Control Its Electronic Waste Exports*, 20 CARDOZO J. INT’L & COMP. L. 827 (2012).
- Smith, Freedom S.N. et al., *2010-2011 Environmental Law Survey*, 45 IND. L. REV. 1101 (2012).
- Wagner, Wendy E., *Imagining Corporate Sustainability as a Public Good Rather Than a Corporate Bad*, 43 ELR 10698 (Aug. 2013).
- Symposium, *Environment, Energy, Human Rights and Corporate Responsibility*, 50 COLUM. J. TRANSNAT’L L. 682 (2012).
- Symposium, *Perspectives on Environmental Justice*, 58 LOY. L. REV. 301 (2012).
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Land Use

- Bates, Sarah, *Bridging the Governance Gap: Emerging Strategies to Integrate Water and Land Use Planning*, 52 NAT. RESOURCES J. 61 (2012).
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- Tai, Stephanie, *The Rise of U.S. Food Sustainability Litigation*, 85 S. CAL. L. REV. 1069 (2012).
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- Ezroj, Aaron, *How the European Union's WEEE & ROHS Directives Can Help the United States Develop a Successful National E-Waste Strategy*, 28 VA. ENVTL. L.J. 45 (2010).

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- Campbell, Bradley M., *A Comment on A Federal Act to Promote Integrated Water Management: Is the CZMA a Useful Model?*, 43 ELR 10688 (Aug. 2013).
- Edwards, Jeffrey A. et al., *Building a Simple General Model of Municipal Water Conservation Policy for Communities Overlying the Ogallala Aquifer*, 52 NAT. RESOURCES J. 135 (2012).
- Kwasniak, Arlene, *Inflating and Deflating: Courts and State/Crown Ownership and Management of Water*, 33 PUB. LAND & RESOURCES L. REV. 95 (2012).
- Schempp, Adam, *The Balancing Act: A Comment on A Federal Act to Promote Integrated Water Management: Is the CZMA a Useful Model?*, 43 ELR 10692 (Aug. 2013).
- Thompson, Barton H. Jr., *A Federal Act to Promote Integrated Water Management: Is the CZMA A Useful Model?*, 43 ELR 10682 (Aug. 2013).
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- Owen, Dave, *Critical Habitat and the Challenge of Regulating Small Harms*, 43 ELR 10662 (Aug. 2013).
- Hayes, David J. et al, *A Modest Role for a Bold Term: "Critical Habitat" Under the Endangered Species Act: A Comment on Critical Habitat and the Challenge of Regulating Small Harms*, 43 ELR 10671 (Aug. 2013).
- Senatore, Michael, *A Comment on Critical Habitat and the Challenge of Regulating Small Harms*, 43 ELR 10675 (Aug. 2013).
- Turner, Andrew J. & Kerry L. McGrath, *A Wider View of the Impacts of Critical Habitat Designation: A Comment on Critical Habitat and the Challenge of Regulating Small Harms*, 43 ELR 10678 (Aug. 2013).

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