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Symposium

Harnessing the Power of Information for the Next Generation of Environmental Law

Foreword: Making Sense of Information for Environmental Protection

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We live in the Information Age. We can peer into our neighbors' backyards through satellite imaging, catch the latest Australian cricket scores on our smart phones, track our loved ones' airline flights online, and correspond with people virtually anywhere on earth via e-mail. In the era of globalization, we have greater access to stock quotes, scientific reports, medical advice, celebrity gossip, and breaking events than ever before, and we can get this information by the terabyte. The importance placed on information, of course, is nothing new: access to information has long been the lifeblood of any highly complicated endeavor, whether commanding a battalion in wartime or constructing an aqueduct, and dissemination of information has been critical to organized society as long as humans have lived in groups. Today, however, information flows through our lives with a velocity and a pervasiveness never before experienced.

Despite this ubiquity of information, no one has proposed calling the present era the Knowledge Age. In fact, some would contend that the very pace and force with which information flows through our daily lives has outstripped our cognitive ability to comprehend and evaluate information in sensible ways. Knowledge depends not only on access to reliable information, but also on sound judgment regarding which information to

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access and how to situate that information in relation to the values and purposes that comprise the individual's or the social group's larger projects. This is certainly the case for wise and effective governance. A regulator *does* need accurate information to understand the nature of a problem and the consequences of potential responses. Likewise, the regulated community needs information to decide how best to comply with adopted rules, and the public needs information in order to accept the credibility and legitimacy of the regulatory regime. This is as true for antitrust policy and consumer-products safety as for military-base closings and controlling steroid use in professional sports.

But governance also requires judgment regarding how to manage information itself—how to structure burdens of proof in light of goals such as public safety or promotion of economic growth, how to balance the public's interest in disclosure against competing aims such as national security or the protection of trade secrets, whether to withhold information in the belief that it may actually be harmful to the recipient, and so on. These challenges of information management are posed with especial starkness in the context of environmental law. At its core, the field is concerned with the impacts of human activities on the natural environment and human health and safety; as such, theoretical and empirical uncertainty is an inescapable part of the environmental-law equation. Indeed, the scientific method—from which all environmental policy making must draw in one way or another—is built on the notion that knowledge is *never* complete. What we take to be scientific orthodoxy is better viewed as a set of contingent truth claims whose veracity *always* can be called into doubt by new investigations, experiments, and hypotheses.

Yet regulators cannot display the epistemological patience of the scientific method; they must make decisions today. Whether with respect to the impact of greenhouse-gas emissions on climate stability, synthetic chemicals on the human endocrine system, or planned developments on critical wetland habitat, information and understanding in the environmental arena arrive too late, if ever, to design "optimal" legal and policy responses. Moreover, most environmental problems involve not only highly complex and uncertain scientific matters, but also technical and economic ones. On such matters, decision makers rarely have anything approaching complete knowledge when asked to put in place rules and regulations. To many observers, this inherent need to make decisions under conditions of uncertainty—whether the decisions regard scientific, economic, or technological matters—is *the* defining feature of environmental law.[1]

The articles in this Symposium Issue were written in response to the topic "Harnessing the Power of Information for the Next Generation of

1. *See, e.g.*, RICHARD J. LAZARUS, THE MAKING OF ENVIRONMENTAL LAW 19–21 (2004) (noting ways in which scientific uncertainty is endemic to environmental law).

Environmental Law." The pieces range across an impressive breadth of topics, from litigation under the Freedom of Information Act and scientific integrity under the Endangered Species Act to climate-change modeling and monitoring of fugitive air emissions; they examine a wide array of decision makers, from the Environmental Protection Agency and other federal and state agencies to nongovernmental organizations and private litigants. The challenge for any symposium on such a broad topic, and particularly a topic this foundational to its field, is to ensure that the sum is greater than the parts. Put simply, how does this collection of articles teach us to think differently and usefully about the many roles and challenges of information in environmental protection? All of the following papers address various aspects of environmental information, but how do they fit together?

The old fable about a group of blind men and an elephant, made popular for Western audiences by John Godfrey Saxe's poem, describes the challenge well. The story goes that the blind men fall into an argument while examining an animal. Feeling the elephant's "squirming trunk," one reports that the animal "is very like a snake!" Another, touching the elephant's "strong and sturdy side," states that it "is very like a wall!" After all the men in the group have reported their findings in this manner, the poet provides the following lesson:

> And so these men of Indostan
> Disputed loud and long,
> Each in his own opinion
> Exceeding stiff and strong,
> Though each was partly in the right,
> And all were in the wrong![2]

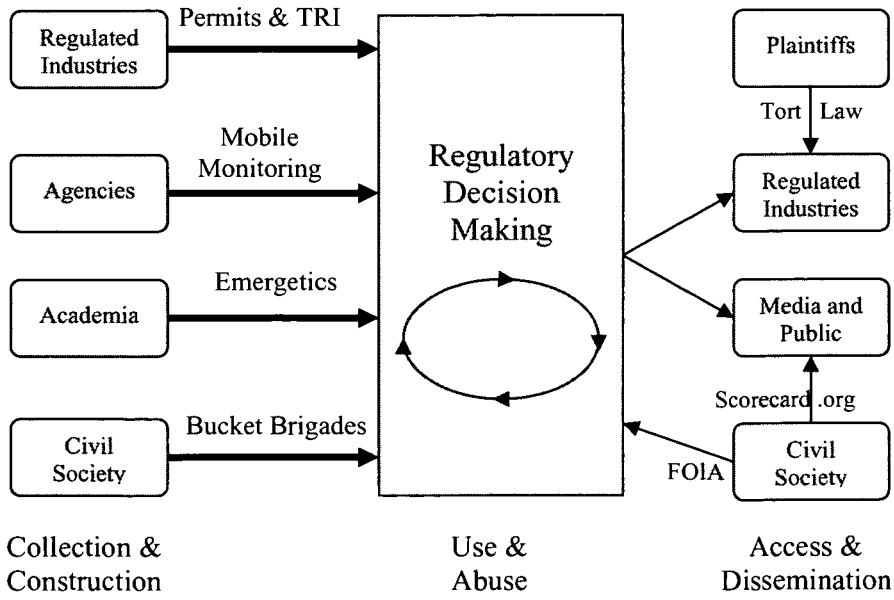
The role of information in environmental law is sufficiently elephantine that this fable may be instructive. Undoubtedly, academic research must focus on particular areas and applications in order to glean new insights regarding environmental information. Only through such detailed, careful analysis can we be sure that our more abstract, generalized understanding of information's role in environmental law and policy will remain an astute one. But it is also essential to pull the lens back periodically to a macro scale, allowing our detailed assessments and case studies to be fit within a coherent whole.

Without wishing to imply that our vision somehow encompasses the whole elephant or that the articles in this Issue are "in the wrong," we provide in this Introduction a macro-scale schematic within which to consider this Symposium Issue. While any model is necessarily—indeed intentionally—incomplete, the model below (Figure 1) provides a framework from which to understand the connections among the articles in this Issue. The model sets out three distinct—though related—processes or stages

2. JOHN GODFREY SAXE, *The Blind Men and the Elephant*, *in* THE POETICAL WORKS OF JOHN GODFREY SAXE 111, 112 (Houghton Mifflin 1882).

through which information flows in environmental protection: collection and construction; use and abuse; and access and dissemination. These processes can be seen, from a straightforward perspective, as efforts by government regulators to acquire, utilize, and share the information requisite to environmental decision making. From another perspective, the processes can be seen as structuring a balance of power and responsibility within various relationships, whether between market actors and regulators, government and citizens, or market actors and citizens. In this sense, the model reflects the fact that the articles in this Symposium Issue, unlike other recent and important contributions,[3] are mainly concerned with the institutions and arenas that shape, contest, and deploy information, rather than with the various technological advances that are expected to enable better monitoring and more precise predictions in the environmental policy-making arena (e.g., bioassays, Web-based monitoring, "smart dust," and genetic algorithms).

Figure 1: Information Processes in Environmental Protection



I. Collection and Construction

Decision makers need a wealth of information about the present and predicted state of the environment and its inhabitants in order to effectively shape policy. Is the climate changing? How does this affect polar bear

3. *See, e.g.*, Daniel C. Esty, *Environmental Protection in the Information Age*, 79 N.Y.U. L. REV. 115, 156–74 (2004) (describing advances in data collection, analysis, and dissemination).

habitats? How will it affect habitats in the future? Are emissions of benzene causing significant harms? If so, where and for which populations are the harms most serious? Assuming that the answers to such questions suggest the need for regulation, decision makers further require vast amounts of information regarding the anticipated effects of competing policy options. Will requiring a given pollution-control technology bankrupt the relevant industry? How would consumers respond to mandatory supermarket warnings regarding the mercury content of fish? Would a tax on greenhouse-gas emissions curb energy use? By how much?

In one sense, these various needs for scientific, economic, and technical information simply require decision makers to collect relevant information from relevant information-holders. Permit requirements in pollution law, for instance, enable agencies to obtain pertinent data on emissions from industry in a simple and—due to the monetary fines imposed if data are not submitted or are falsified[4]—largely effective way. Pre-market approval requirements for prescription drugs and, to a lesser degree, pesticides, function similarly to "pull" information on anticipated health effects from firms as they attempt to market new products. With somewhat less stringency and effectiveness (as indicated by the thickness of the arrows on the left side of Figure 1), laws such as those establishing the Toxic Release Inventory require polluters to provide data on their annual releases of certain compounds above a threshold amount.[5]

Even from this relatively straightforward perspective, complicated questions arise. As John Applegate's treatment of chemical information as a problem of supply and demand helps us to see, information from both public and private providers can be thought of in market terms; accordingly, we also can consider how such information markets must be regulated to ensure the quality and volume of outputs.[6] Writing from a similar vantage point, Brad Karkkainen offers additional accounts of how regulation can be structured to satisfy informational demands through careful use of incentives, "penalty defaults," and other sophisticated design features.[7] As both authors make clear, a key argument in favor of precautionary approaches long has been that shifting the burden of proof in the environmental-law context off of public regulators and onto private actors works to counterbalance certain perceived structural asymmetries of the unregulated market. Rather than requiring agencies affirmatively to demonstrate key informational aspects of an

4. *See, e.g.*, 42 U.S.C. § 7413 (2000) (detailing the federal enforcement provisions of the Clean Air Act).

5. 42 U.S.C. § 11023(a) (2000).

6. John S. Applegate, *Bridging the Data Gap: Balancing the Supply and Demand for Chemical Information*, 86 TEXAS L. REV. 1365 (2008).

7. Bradley C. Karkkainen, *Bottlenecks and Baselines: Tackling Information Deficits in Environmental Regulation*, 86 TEXAS L. REV. 1409 (2008).

environmental policy problem, precautionary approaches instead actively deploy private actors in service of the public's informational needs.

Nevertheless, in many regulatory contexts, agencies must depend on their own modeling or experimentation, on existing academic work, or on entirely new work that the agencies sponsor or support as sources of needed information, rather than leverage legal authority to require private actors to generate that information for them. Such agency information-generation efforts recently have come under significant scrutiny, with proponents of regulatory-reform initiatives, such as the Data Quality Act and the Office of Management and Budget's agency-peer-review guidelines, contending that the scientific and informational practices of agencies need to be disciplined in order to ensure that they reflect "sound science."[8] Critics contend that such initiatives are less concerned with ensuring the collection of reliable information than with burdening agencies in order to limit their ability to regulate industry.[9] They raise the more general concern that agencies cannot always be required to comprehensively "fill" information gaps in environmental law, because such a demand in practice would be so costly or administratively burdensome as to amount to a deregulatory mandate. Instead, critics contend that agencies should be given tools with which to "bridge" information gaps (to use Applegate's felicitous term), allowing the burden of uncertainty to fall on regulated industries rather than on the public and the environment.

Conflict over regulatory-reform initiatives demonstrates that the process of collecting information for policy purposes also can be seen as a more active and strategic process of constructing which categories and sources of information are deemed relevant and reliable within environmental policy making. For instance, on one level, Tom McGarity's account of efforts by a state environmental agency's mobile-monitoring team to better assess air-pollutant emissions from large industrial facilities is a tale about the growing use and acceptance of a new environmental-monitoring technology.[10] By focusing on stationary rather than mobile sampling, traditional monitoring approaches gather information only from the "trunk" of a factory—its smokestacks—missing entirely the factory's "fugitive emissions." On another level, however, McGarity's account is a tale about how the mobile-monitoring team managed to navigate a relatively unfriendly legal and political context—both inside and outside of the agency—in order to

8. *See generally* J.B. Ruhl & James Salzman, *In Defense of Regulatory Peer Review*, 84 WASH. U. L. REV. 1 (2006) (discussing peer review as a principal demand of the "sound science" agenda).

9. *See generally* Wendy E. Wagner, *The "Bad Science" Fiction: Reclaiming the Debate over the Role of Science in Public Health and Environmental Regulation*, 66 LAW & CONTEMP. PROBS., Autumn 2003, at 63, 87–109 (mentioning several of the likely negative results from such initiatives, including the reduction of the number and quality of studies, the chilling of scientific innovation, and prohibitive costs and burdens).

10. Thomas O. McGarity, *Hazardous Air Pollutants, Migrating Hot Spots, and the Prospect of Data-Driven Regulation of Complex Industrial Complexes*, 86 TEXAS L. REV. 1445 (2008).

establish mobile-monitoring data as a relevant and potentially decisive factor in regulatory outcomes.

This perspective is even more evident in Christine Overdevest and Brian Mayer's fascinating account of community-led "bucket brigades."[11] Armed with relatively inexpensive air-quality-monitoring technologies, members of bucket brigades informally gathered sampling data on emissions from local plants in order to focus the attention of firms, regulators, and the public on pollution hot spots. Lacking the level of authority held by government agencies, bucket brigades can be seen instead as "information entrepreneurs," developing new information and injecting it into the policy process with hopes of altering existing equilibria regarding what counts as a demonstrated environmental harm. Mary Jane Angelo's article similarly depicts academics as information entrepreneurs, developing particular methodologies and theoretical frameworks that compete for acceptance not only in the academic realm, but also in the policy-making arena.[12] Angelo examines various extrascientific factors driving the selection and use of scientific approaches by government agencies, considering especially why the field of "emergetics" has never been broadly adopted by regulators.

These various examples suggest that environmental law must concern itself intimately with the processes by which information for regulatory decision making is developed. This concern must encompass questions about how accurate and reliable ensuing information is likely to be *and* how inclusive, transparent, and legitimate the processes of information collection are. Relevant questions raised by the articles along these lines include:

- Should there be a greater reliance on information-gathering by civil society? If so, who should be the primary audiences for this information: government, local communities, environmental groups, or others? What incentives can be crafted to increase the collection of information by nonstate actors?
- Under what circumstances, if any, should government agencies use civil-society-generated information as the basis for enforcement actions? Apart from reliability concerns, what are the dangers in democratizing the development of knowledge?
- To what extent is the community-monitoring model generalizable? Could we imagine water-quality tests being conducted by citizens groups to buttress total maximum daily loads? Could we use Google Earth 5.0 to make sure that landowners are not violating their habitat conservation plans?

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11. Christine Overdevest & Brian Mayer, *Harnessing the Power of Information Through Community Monitoring: Insights from Social Science*, 86 TEXAS L. REV. 1493 (2008).

12. Mary Jane Angelo, *Harnessing the Power of Science in Environmental Law: Why We Should, Why We Don't, and How We Can*, 86 TEXAS L. REV. 1527 (2008).

- To what extent do we find the outsourcing of scientific research and data collection to citizens' groups less troubling than the outsourcing to industry and other for-profit entities? If we do feel less troubled, how do we justify that reaction?
- More information is presumably a good thing, but how should one balance the marginal costs of collecting more or different types of information with the added benefits? Are "bridging" approaches to regulation—which, as described by Applegate, circumvent Herculean information challenges by establishing standards or targets in an alternative, more achievable fashion—preferable to approaches that aim for comprehensive information?
- Does the traditional precautionary "tilt" of environmental law, as manifested in burden-shifting statutes and similar proposals, ignore the fact that risks exist on both sides of the regulatory equation, as critics have charged? Is it responsive to asymmetries of power and information, rather than merely to asymmetries of environmental, health, or safety concerns?
- Are agencies better modeled as inherently self-aggrandizing bureaucracies, as implicitly suggested by many proponents of peer-review requirements and other regulatory reforms, or as sincerely motivated but overburdened promoters of the public interest, as suggested by critics of such measures?

II. Use and Abuse

Distinguishing between the collection of information and its use in policy formation and implementation is not always a clear-cut exercise. The types of information sought, and the manner in which it is gathered, can be affected heavily by the perceived uses to which it will be put. Conversely, the anticipated use for which information is collected may need to be reformulated once the content of that information has been revealed. The National Environmental Policy Act of 1969[13] (NEPA), especially as interpreted by the courts to impose only procedural requirements, seems to have been premised on this notion of reciprocal influence between information collection and use.[14] Merely by forcing the compilation of environmental-impact information and prompting its consideration in some unspecified but nontrivial way, NEPA was supposed to transform government decision making.

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13. 42 U.S.C. §§ 4321–4370 (2000).

14. *See generally* J.B. RUHL ET AL., THE PRACTICE AND POLICY OF ENVIRONMENTAL LAW 433 (2008) (noting that NEPA's reliance on simple information generation and gathering reflects a "belief that government will do the right thing if it has all of the relevant information before it").

As Karkkainen notes, this promise has been imperfectly realized in the NEPA context: more information alone, without clear directives as to how agencies should use that information, seems to be insufficient to ensure environmentally sustainable decision making. For these reasons, Alyson Flournoy offers a legislative proposal for a National Environmental Legacy Act—a sort of NEPA on steroids—in which society would be required to (a) define the legacy we wish to leave future generations; (b) undertake systematic investigation of how proposed actions would affect our resource legacy; (c) proscribe inconsistent actions; and (d) utilize ongoing monitoring to ensure that we are on the desired path.[15] Unlike NEPA, Flournoy's Act would have substantive bite: it would, for instance, place the burden of proof on opponents of government regulation to demonstrate that new technologies or substitute resources will be available should a threatened natural resource be lost.

As Flournoy's example demonstrates, a critical question concerning the role of information in environmental policy making is how to address its nonavailability. As noted above, several contributors analyze different ways in which burdens of proof within environmental law and policy can be manipulated in order to help generate more complete information regarding environmental, health, and safety threats. Even with careful management of the information-producing potential of regulation, decision makers still will often find themselves in the position of needing to adopt rules or prescribe standards with nowhere near the level of information that they would ideally hold for the task. Moreover, even the information that decision makers *do* have will be subject to political interference and abuse. The article by Holly Doremus, for example, recounts numerous recent examples where scientific integrity has been compromised for political expediency.[16] Such potential for abuse again underscores the significance of process: absent transparency concerning how decisions are being made *about* information and uncertainty (e.g., clear specification of assumptions, disclosure of confidence intervals, and undertaking of robustness analysis), there can be a great deal of skepticism over the role that politics played in decisions masked by the veneer of science.

Dan Farber addresses this challenge head-on in the heavily politicized context of climate change.[17] Because of its "wicked" features, the climate-change problem is forcing careful thinking about the problem of regulating in the face of radical uncertainty concerning potentially significant, even catastrophic, harms. In fact, our awareness of the degree of uncertainty

15. Alyson C. Flournoy et al., *Harnessing the Power of Information to Protect Our Public Natural Resource Legacy*, 86 TEXAS L. REV. 1575 (2008).

16. Holly Doremus, *Scientific and Political Integrity in Environmental Policy*, 86 TEXAS L. REV. 1601 (2008).

17. Daniel A. Farber, *Modeling Climate Change and Its Impacts: Law, Policy, and Science*, 86 TEXAS L. REV. 1655 (2008).

characterizing climate change often has paradoxically *increased* as our understanding of the phenomenon deepens. Thus, unlike regulatory cost–benefit analysis, which is premised on the notion that regulators can generate more-or-less comprehensive numerical estimates of the effects of policies, climate-change policy making must reflect an awareness that probabilistic sophistication cannot always be obtained in advance of the moment that policies must be adopted.

This is not to say that economic cost–benefit models cannot be constructed for the climate-change situation; in fact, in addition to his valuable "user's guide" to climate-impact models, Farber also provides an overview of such ambitious integrated-assessment models. He finds, however, that the economic models at this juncture are less sophisticated than the physical models because the economic models are riddled with subjective assumptions, ad hoc exclusions, and other highly debatable techniques for "taming" climate change's radical uncertainty. For that reason, alternative policy approaches to cost–benefit optimization—such as scenario-based planning or the adoption of safe minimum standards—may be commendable simply because they have a greater degree of transparency regarding how they handle the unavoidable uncertainties of climate policy. As David Adelman noted in a presentation at this Symposium, scenario-based approaches in particular offer a high degree of accessibility to the public, especially when tailored to a geographic focus—such as the American Southwest—that can resonate strongly with readers. These examples again illustrate the fact that the generation of information and understanding in the environmental-law context must be attentive to a broader range of concerns than would a purely academic exercise—including the need to engender public awareness of environmental threats and to avoid unduly technical or otherwise inaccessible renderings of environmental information.

In addition to democratic sensitivity, effective environmental policy making also requires the possibility of flexible, adaptive rulemaking—a demand that may well be in tension with the former need.[18] Because policies typically must be established on the basis of highly incomplete and imperfect information, and because the underlying natural, economic, and social systems are themselves highly complex and adaptive, regulators must remain on the lookout for new information, changes to ecosystems, technological breakthroughs, and other factors that might significantly alter regulatory equilibriums. In their contribution, Lynn Blais and Wendy Wagner consider how changes in information and, particularly, the availability and cost of pollution-control technology should be integrated into the rulemaking

18. *See* J.B. Ruhl, *Regulation by Adaptive Management—Is It Possible?*, 7 MINN. J. L. SCI. & TECH. 21, 31 (2005) (noting that agencies have not been able to use adaptive management because legislatures have not empowered them to—and interest groups have not let them—do so).

process.[19] They note that, despite the promise of technology-based standards to force deployment and even the development of cutting-edge pollution-control technologies, in fact agencies rarely if ever update such standards, even decades after they are passed. This "aging" of technology-based standards strongly suggests they are not adequately responsive to changing circumstances. It is hard to believe that decades-old technologies still reflect the "best" available control methods. In light of this problem, Blais and Wagner propose "contemporaneous revision planning" as a way for agencies to precommit to later review and revision of major rules.

Blais and Wagner's proposal may be thought of as a form of "meta-regulation," the term used by Overdevest and Mayer to capture the increasing role of agencies as managers or overseers of subregulatory processes, such as information-gathering by civil-society organizations or scientific experimentation by private contractors. From the meta-regulation perspective, agencies must become more self-reflective and deliberate in the way they manage their information needs and rulemaking activities. Blais and Wagner's proposal for contemporaneous revision planning embodies such critical self-attention by acknowledging imperfection up front and by tying the agency's hands in a way that ensures future reevaluation. From a somewhat similar vantage point, Sidney Shapiro and Rena Steinzor examine the Government Performance and Results Act, a statute that seeks to increase accountability by requiring agencies to establish strategic plans that then form a basis for review of agency performance.[20] Shapiro and Steinzor contend that this effort at institutionalizing performance review for agencies has failed in practice, generating a great deal of self-serving paperwork but little actual accountability. They propose a variety of changes that would better align the statute's requirements with the overarching goal of enabling agencies to effectuate the public interest.

As with the articles concerning the collection and construction of information, these contributions raise a number of further questions for research and consideration:

- What alternative decision-making approaches—such as the precautionary principle, the safe-minimum-standards approach, the minimax criterion, or scenario-based decision making—are best equipped to grapple with the policy stakes and the level of uncertainty at issue in a case like climate change?
- Are universities now viewed as just another interest group? What hopes are there for the new transdisciplinary field of law–science that Angelo posits in her contribution? What, if

19. Lynn E. Blais & Wendy E. Wagner, *Emerging Science, Adaptive Regulation, and the Problem of Rulemaking Ruts*, 86 TEXAS L. REV. 1701 (2008).

20. Sidney A. Shapiro & Rena Steinzor, *Capture, Accountability, and Regulatory Metrics*, 86 TEXAS L. REV. 1741 (2008).

anything, can universities do to stop or to slow the demise of scientific integrity in policy making that Doremus observes?

- From a historical vantage point, have we made significant progress in our efforts to harness information for environmental protection? Is the government using environmental information better or more effectively than ten or twenty years ago? Is the government abusing environmental information more now than in the past?

III. Access and Dissemination

Apart from the issue of how agencies collect relevant information for regulatory decision making is the issue of how nongovernmental entities, such as civil-society representatives, the media, or victims of environmental harm, gain access to information. Much of the work of information dissemination is, again, performed by governmental entities. Having gathered, digested, and in some sense used information relating to an environmental policy issue, regulators then face the questions of whether and how to communicate results outside of the government. Obviously, regulated industries themselves will be a primary target of government communications because those industries must have relevant information to guide their conduct and, relatedly, have a legitimate claim to see and evaluate the informational basis on which regulations were premised. But regulators also often package information for broader public consumption, as evidenced by the EPA's Envirofacts Data Warehouse Web site[21] and the joint online effort of the EPA and the Occupational Safety and Health Administration to release pertinent information on occupational chemicals.[22] In many contexts, the provision of such information is believed to be a low-cost, nonintrusive way of regulating markets such that they better replicate the competitive-market ideal.

Perhaps not surprisingly, dissemination of information by agencies also generates efforts by private actors to reframe the underlying information in some fashion relevant to the actors' goals. This has been particularly true as the expansion of the Internet and improvement of computing-platform interoperability have made the task of capturing and manipulating data much easier. For instance, Scorecard.org, a Web site managed by the environmental organization Green Media Toolshed, utilizes information disclosed through the Toxics Release Inventory and other government databases to generate publicly accessible, user-friendly environmental information.[23] The Scorecard Web site allows users to type in their postal

21. EPA, Envirofacts Data Warehouse, http://www.epa.gov/enviro (last updated Feb. 21, 2008).

22. OSHA, OSHA/EPA Occupational Chemical Database, http://www.osha.gov/web/dep/chemicaldata.

23. Scorecard: The Pollution Information Site, http://scorecard.org.

code and assess the major environmental harms in their community's backyard. The fact that raw statistical data can be repackaged in such a powerful and empowering way reveals the incompleteness of the simple informational regulation account: information provision never merely serves to correct a narrowly delineated and self-contained market failure; it also works, at least in part, to redefine the market in which it intervenes.

In light of the potential for civil society to scrutinize and reuse (and perhaps distort) government information in this manner, it is not surprising that public officials and agencies often have mixed feelings about releasing information concerning the hazards they have discovered or the regulations they have chosen to address those hazards. Nevertheless, just as the government's collection of information about impacts on the natural world serves a vital function in ensuring the effectiveness of its regulatory efforts, the public's collection of information about the government serves the function of ensuring the legitimacy, credibility, and, ultimately, the effectiveness of the regulatory regime. Encapsulated in the powerful phrase "the public's right to know," and embodied in statutes such as the Freedom of Information Act[24] (FOIA) or treaties such as the Aarhus Convention,[25] a right of access to government information is considered to be an essential prong of good governance.

David Vladeck's article details the development of FOIA in the United States and the roadblocks that have increasingly obstructed public access to government information.[26] Whether these obstacles are justified by the security concerns raised by the War on Terror or the need to protect confidential business information—two key arguments offered in opposition to disclosure—remains the subject of considerable debate, but any benefits from restricting the flow of information to the public must surely be weighed against the costs of government in the shadows. Indeed, it is worth recalling that environmental information in the former Soviet Union was regarded as a state secret, and its disclosure was a criminal offense.[27]

As Vladeck's article discusses the use of FOIA to extract information from government officials, Timothy Lytton's article addresses the use of civil litigation by private actors to force disclosure of information regarding harms that, however real, are not being acknowledged by established channels of

24. 5 U.S.C. § 552 (2000).

25. Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, June 25, 1998, 2161 U.N.T.S. 447.

26. David C. Vladeck, *Information Access—Surveying the Current Legal Landscape of Federal Right-to-Know Laws*, 86 TEXAS L. REV. 1787 (2008).

27. *See, e.g.*, Phil Reeves, *Nuclear Whistle-Blower Goes on Trial*, INDEPENDENT, Oct. 20, 1998, at 15 (describing the trial of Alexander Nikitin, a Russian naval officer arrested and charged with treason for revealing details of Russia's handling of radioactive materials from its Northern submarine fleet).

authority and influence.[28] Although ultimately such litigation may aim to accomplish direct changes in harmful behavior—hence its common characterization as "regulation through litigation"—it also serves the more immediate purpose of simply shining a light on wrongs, such as clergy sexual abuse or black-market handgun sales, that are not being addressed within the current regulatory context. As with the use of FOIA, such actions are premised on Justice Brandeis's familiar notion that "[s]unlight is said to be the best of disinfectants."[29]

Both Vladeck's account of FOIA litigation and Lytton's depiction of the use of the tort system to pry information from its unwilling holders reflect an adversarial, competitive model of interaction. Although somewhat paradigmatic of the American legal system, this model is not exclusive. Many domestic efforts to reform regulation have sought a more cooperative, flexible dynamic, and new models of governance on the international level frequently emphasize the need for collaborative responsibility-sharing among stakeholders, with the government serving a more limited role of managerial oversight than traditionally conceived—again, recalling Overdevest and Mayer's notion of meta-regulation. Although much scholarly attention, both supportive and critical, has been devoted to these reformulated depictions of regulation, the particular role of information in the collaborative-governance context has perhaps been understudied. Again, further questions arise, both with respect to the notion of meta-regulation and to the issue of information access and dissemination more generally:

- What strategies for information dissemination are most likely to engage the public in environmental protection, especially in light of new technologies and capabilities for involvement? Can Web-based participatory programs serve not only to gather valuable information, but also to promote environmental citizenship?
- Is there a significant potential danger that disseminators of information will *misinform* and distort the debate, as some charge has been occurring in the climate-change debate? Does the potential for information to be misleading justify its restriction, as has been proposed in the case of some controversial food technologies such as genetically modified agriculture?[30]

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28. Timothy D. Lytton, *Using Tort Litigation to Enhance Policymaking: Evaluating Climate-Change Litigation in Light of Lessons from Gun-Industry and Clergy-Sexual-Abuse Lawsuits*, 86 TEXAS L. REV. 1837 (2008).

29. LOUIS D. BRANDEIS, OTHER PEOPLE'S MONEY AND HOW THE BANKERS USE IT 62 (Richard M. Abrams ed., Harper Torchbooks 1967) (1914).

30. *See* Douglas A. Kysar, *Preferences for Processes: The Process/Product Distinction and the Regulation of Consumer Choice*, 118 HARV. L. REV. 526, 561–62 (2004) (mentioning that the FDA's justification for not requiring labeling of genetically modified foods is that the labels might be incorrect or misleading).

- How would our conceptual toolbox change if we think of agencies as managers of subregulatory processes rather than as direct regulators? What is the complementary set of instruments to standards, prices, and permits if the agency conceives of itself as a meta-regulator rather than a direct regulator? How should judicial review change? What personnel and resource needs do agencies have in this reformulated vision of the agency mission?

IV. Conclusion

As noted at the outset, our attempt to provide a big-picture model of the role of information in environmental law is necessarily incomplete. Indeed, our picture of the elephant could be paired with numerous other attempts to capture the elephant only to reveal yet another, even larger and more mysterious, creature. To *thoroughly* mangle our metaphors, we might even suggest that any attempt to fully model information in environmental protection is necessarily incomplete, for it is elephants all the way down.

By way of illustration, Figure 2 reproduces a model developed by Philip Morris to show how the company seeks to influence legislative decisions. The model formed part of an internal Philip Morris corporate-affairs document from 1993 that was eventually released during tort litigation against the company.[31] Its contrast with our model is striking. Its focus is on "ideology and beliefs," "special constituents," and "media," all of which it sees as "tools" to affect government decisions. Philip Morris's understanding of how to influence legislators surely is sophisticated and warrants serious attention if we really want to understand the different forces at work in translating information into government action. Two differences with our model stand out.

While our information model represents government decision makers as the operative forces determining regulatory outcomes, subject to various attempted interventions and influences by other actors, the Philip Morris diagram depicts the company itself as the primary determinant of government action. It obviously believes it can create and shape the relevant information flow.

Moreover, while not explicitly identified in our diagram, a naturalistic assumption underlies its construction: the environment is taken to be a source of potentially objective empirical information that merely needs to be transmitted by reliable scientists and other observers to government decision makers. This would seem a strange world, indeed, compared to that modeled by Philip Morris. Here, information directed to the decision maker is actively manufactured and framed by media, allied interest groups, and other

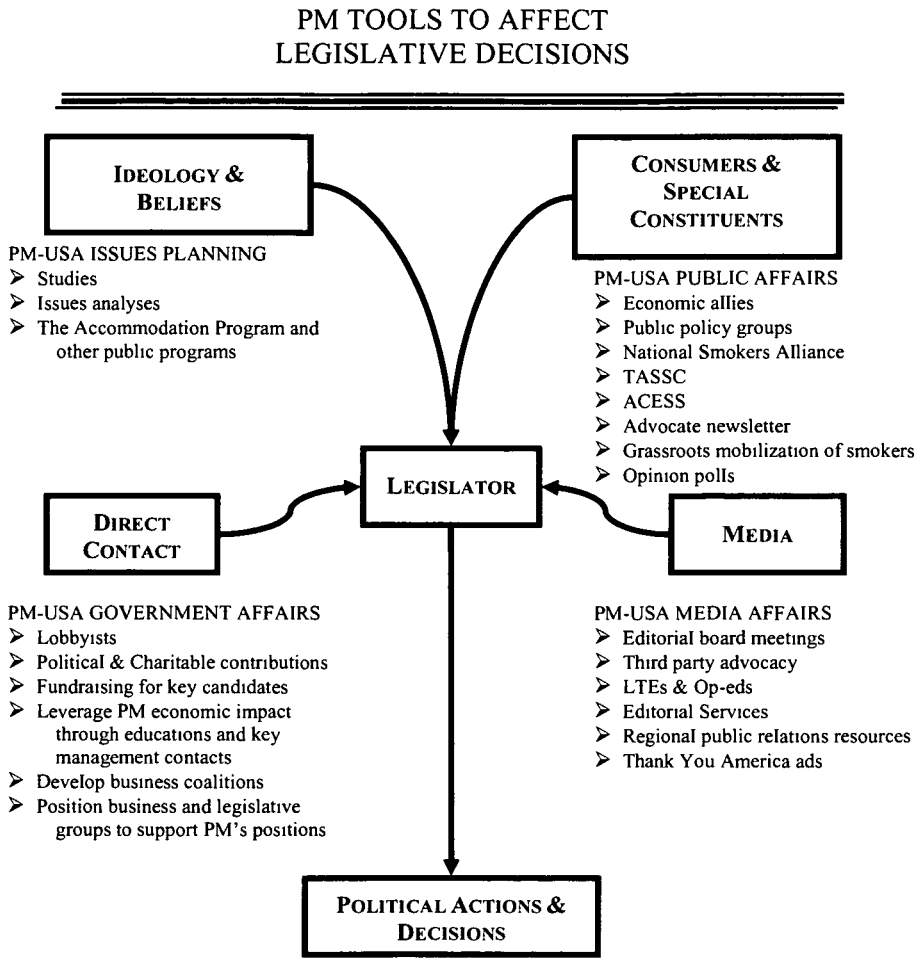
31. The complete document in high-quality viewing format is available at http://legacy.library.ucsf.edu/tid/trm65e00.

influential shapers of perception. There appears to be no solid epistemological ground in which to anchor oneself: even science itself is depicted as just another location for active political intervention and manipulation. The reference to "TASSC" in Figure 2, for instance, refers to a lobbying effort of commercial and industrial firms that Philip Morris organized under the sobriquet "The Advancement of Sound Science Coalition." This organization played a significant role in turning the political climate against conventional precautionary approaches to environmental, health, and safety regulation, in substantial part by re-signifying industry-supported policy approaches as uniquely associated with "sound science."[32]

Although ultimately the tobacco companies' fortunes declined in the face of litigation by progressive state attorneys general in the 1990s, the point of the Philip Morris model remains relevant in many respects, for the successful efforts of the tobacco industry to perpetuate controversy over scientific and medical information has been a model public-relations strategy for other high-stakes policy disputes. Thus, by failing to include within our model the role of interest groups (both corporate and environmental) in influencing regulatory policy—and indeed in shaping the understanding of what constitutes "sound science," "data quality," and other such seemingly positivistic notions associated with the use of information in policy making—we may well have captured only a trunk or a tail, leaving much of the elephant before us still to view.

32. *See, e.g.*, J.B. Ruhl, *Prescribing the Right Dose of Peer Review for the Endangered Species Act*, 83 NEB. L. REV. 398, 399 n.2 (2004) (describing the origins and role of TASSC).

Figure 2: Phillip Morris Model for Influencing Legislative Decisions



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