
THE ENVIRONMENT ON THE INTERNET:
THE CASE OF THE BP OIL SPILL

MARY L. LYNDON*

*“Nature . . . is an infinite sphere of which the center is everywhere
and the circumference nowhere.”¹*

INTRODUCTION

Ecosystems are local and global, immediate and far away. Understanding and managing society’s environmental effects requires patient, widespread collective action: local and centralized awareness, research, innovation and choice. How can we perform these tasks without a great deal of thoughtful communication? We need the internet. The internet is an environmental technology.

In 1997, James Boyle pointed to some intellectual and political strengths of the environmental movement and called for intellectual property scholars to learn from environmentalists.² In a symposium on

* Professor of Law, St. John’s University School of Law; J.S.D., Columbia University; J.D., Northeastern University; B.A., Manhattanville College

¹ Blaise Pascal, *PENSÉES: THE PROVINCIAL LETTERS* 22 (William Finlayson Trotter & Thomas M’Crie, trans., The Modern Library 1941) (1670).

² James Boyle, *A Politics of Intellectual Property: Environmentalism for the Net?*, 47 *DUKE L. J.* 87, 113 (1997). Boyle noted that ecology and welfare economics had provided useful analytical frameworks for environmental law. *Id.* at 108-09. Environmentalists’ excitement over the internet was expressed about the same time by Henry H. Perritt, Jr., in *Is the Environmental Movement a Critical Internet Technology?*, 8 *VILL. ENVTL. L. J.* 321 (1997). There are many synergies between intellectual property and environmental law. See generally Jim Chen, *Webs of Life: Biodiversity Conservation as a Species of Information Policy*, 89 *IOWA L. REV.* 495 (2004) (presenting an expansive exploration of the implications of scientific and social understanding of the biosphere); Mary L. Lyndon, *Secrecy and Access in an Innovation Intensive Economy: Reordering Information Privileges in Environmental, Health, and Safety Law*, 78 *U. COLO. L. REV.* 465, 470-91 (2007) (discussing the law concerned with access to commercially valuable information to manage environmental, health, and safety risks).

the tenth anniversary of Boyle's article, Susan Crawford linked the network neutrality debate to core dilemmas in intellectual property.³ In the same symposium, Julie Cohen recommended that network neutrality advocates develop the internet's success stories to help people see its functions and value.⁴ This article takes up Professor Cohen's suggestion and explores the connections between the internet and environmental practice. Their nearly symbiotic relationship should be a good source of stories to show the worth of a robust and fully available internet.

The BP Oil Spill ("the Spill") is one such story. At first glance, the Spill seems to have been predominantly a television story.⁵ However, the Pew Center reports that the public's interest in the Spill substantially exceeded mainstream media coverage, with very high levels of public attention persisting well after the two-month point when media coverage waned.⁶ Online services responded to the additional need. The more conventional uses of the internet – information retrieval,

³ Susan P. Crawford, *Network Rules*, 70 LAW & CONTEMP. PROBS. 51, 53 (2007). Here, Crawford draws particularly on James Boyle, SHAMANS, SOFTWARE, AND SPLEENS: LAW AND THE CONSTRUCTION OF THE INFORMATION SOCIETY (1996) and Boyle, *supra* note 2. Boyle's work and that of other scholars articulated a crisis in the distribution of cultural products under current economic and technological conditions. James Boyle, *Cultural Environmentalism and Beyond*, 70 LAW & CONTEMP. PROBS. 5 (2007).

⁴ Julie E. Cohen, *Network Stories*, 70 LAW & CONTEMP. PROBS. 91, 92 (2007) (recommending that scholars generate "richly detailed ethnographies of the experiences the network enables and the activities it supports," to support "a normative theory to explain what is good, and worth preserving, about those experiences and activities").

⁵ *How the Media Covered the Gulf Oil Spill Disaster*, PEW RESEARCH CENTER PUBLICATIONS (Aug. 25, 2010), <http://pewresearch.org/pubs/1707/media-coverage-analysis-gulf-oil-spill-disaster>. The Pew Research Center's Project on Excellence in Journalism found that the story "generated the most coverage in cable news (31% of the airtime studied), with CNN devoting considerably more attention (42% of its airtime) than cable rivals MSNBC and Fox News. The spill also accounted for 29% of the coverage on network news as the three big commercial broadcast networks—ABC, CBS and NBC—spent virtually the same amount of time on the story." *Id.*

⁶ *Id.* The Pew Center for People and the Press reports that, "between 50% and 60% of Americans said they were following the story 'very closely'" during the 100 days the Spill was active, which "surpassed the level of public interest during the most critical moments of the health care reform debate." *Id.* "Mainstream media attention to the story. . . began to level off in late June. . . [b]ut news consumers' interest stayed very high." *The Public Was Fascinated*, in *100 Days of Gushing Oil—Media Analysis and Quiz*, JOURNALISM.ORG (Aug. 25, 2010), http://www.journalism.org/analysis_report/public_had_huge_appetite_story. "In the month between June 28 and July 25, for example, spill coverage ranged between 12% and 20% of the weekly news hole studied. . . [but] the percentage of those paying very close attention remained at near peak levels—between 43% and 59%." *Id.*

archiving, and discussion – combined with novel visual presentations to amplify understanding and facilitate responses to the disaster.

Now, as research and commentary on the Spill's effects and debate over the appropriate legal response continues, online sources and interactions play a significant role.

Environmental regulation, science, and politics depend upon and are enhanced by internet-based education and dialogue. Indeed, recent innovations in regulation and environmental management assume an expanded role for internet-based participation and learning. This article outlines some aspects of the Spill as a demonstration of the "environmental internet." The addendum to this article, *The Story of the BP Oil Spill*, provides additional context and resources.⁷

Part I of the article describes the Spill as an educational experience. The scale and setting of the events and their slow progression seemed almost scripted to confront and perplex us about our relationship to high technology and the environment. We watched as technical, managerial, and ecological dynamics unfolded on our screens and a great many of us went to web-based resources to learn more.

The Spill also sparked a remarkable level of participatory fervor. In the environmental context we are not an audience. We really do need to see and know what is happening, and we are entitled to do so. Environmental law ratifies the sense of ownership that the public expressed in reaction to the Spill and describes some developments in public participation in environmental, health, and safety (EHS) matters. Part II outlines the public's right to know about EHS matters and describes some developments in public participation. With the emergence of the internet, scientific research and ecological practices are evolving in promising directions to support collaborative communication and ecosystem management. This is a good thing, as today's environmental problems are complex, widespread, and unfolding simultaneously at different scales and within different jurisdictions.

The public response to the Spill suggests that we have the desire and the capacity to learn more about and contribute to environmental management. Part III describes some ways that the Spill revealed the need for greater information access and participation in the future. We can enable access by experts and the public more fully, as well as find ways to re-think and redesign environmental management. The

⁷ See James E. Darling, *Addendum: The Story of the BP Oil Spill*, *infra*.

article concludes that a robust, fair, and open internet is necessary for sustainable environmental management.

I. THE SPILL ON THE INTERNET

A. *The Disaster*

In April 2010, as BP drilled for oil on the floor of the Gulf of Mexico, the operation spiraled out of control. The Deepwater Horizon rig erupted in flames and sank over the course of two days, twisting and breaking the drilling equipment 5,000 feet below.⁸ Many men were rescued, but eleven died and seventeen were seriously injured.⁹ For nearly three months, the seemingly bottomless Macondo Well spewed millions of gallons of oil and gas into the Gulf.¹⁰

Efforts to stop the discharge failed repeatedly. The Blowout Preventer (BOP) was the first line of defense at the well head, but it malfunctioned and the robots deployed to the site were unable to fix it. Other methods failed in their turn.¹¹ Relief wells could take months to put in place and the prospects for their success were uncertain.¹² BP began to spray thousands of gallons of the dispersant Corexit on the oil slick and later pumped even greater amounts directly at the well-head. This novel and risky use of dispersants continued until an unprecedented volume –1.8 million gallons –had been deployed.¹³

The idea that the Spill was an “accident” was soon undermined, as it became apparent that the events were entirely foreseeable. Widespread commentary by industry, academic and government insiders revealed that many technical failures and operational missteps led to the explosion and the failure to contain it.¹⁴

⁸ See Darling, *supra* note 7, for basic facts referred to in text.

⁹ WILLIAM R. FREUDENBERG & ROBERT GRAMLING, *BLOWOUT IN THE GULF: THE BP OIL SPILL DISASTER AND THE FUTURE OF ENERGY IN AMERICA* xi (2011). Freudenberg and Gramling describe the accident and put it in context, outlining the history of oil drilling, its role in the Gulf region, and its place in the contemporary energy system of the United States.

¹⁰ See Darling, *supra* note 7.

¹¹ FREUDENBERG & GRAMLING, *supra* note 9, at 10-11; Darling, *supra* note 7.

¹² Lea Winerman, *Relief Wells Will Work, Experts Say, but Will Take Time, Trial and Error*, PBS NEWSHOUR, June 2, 2010, <http://www.pbs.org/newshour/rundown/2010/06/relief-wells-will-work-experts-say-but-will-take-time-trial-and-error.html>.

¹³ Darling, *supra* note 7.

¹⁴ FREUDENBERG & GRAMLING, *supra* note 9; Mark Latham, *Five Thousand Feet and Below: The Failure to Adequately Regulate Deepwater Oil Production Technology*, 38 B.C. ENVTL. AFF. L. REV. 343 (2011) (detailing the history of blowout preventer failures and describing the technological and oversight problems that led to the Spill).

BP's early public statements on the rate of the well's discharge were reassuring, but after a video of the leak was shared with the government, the company's estimates were openly challenged.¹⁵ As oil and gas continued to gush into the Gulf, the video was made available to the public and became a household media fixture. BP's low estimates of the volume of discharge were just the start of conflicts over information, as questions about accuracy and transparency persisted. Restricted access to the identity and record of toxicity testing on Corexit, as well as questions about BP's compliance with federal authorizations to use it, raised the level of concern.¹⁶

The suspense grew. The size of the gusher became an obsession. How big was it? How long might it continue? Past spills entered the story and were compared in size. Would this be as bad as, or worse than, the Exxon Valdez?¹⁷

It was clear that the stakes were huge. Not only was the oil approaching the fragile shoreline, but it was near the Gulf's Atlantic Loop; the oil might be driven along the Florida coast and north up the Atlantic seaboard.¹⁸ Hurricane season was starting. Other "worst nightmare" scenarios hovered, including the possibility that the surface of the Macondo Well could collapse, releasing all of its contents into the Gulf.¹⁹

Watching the Spill was certainly instructive, though only time will reveal whether we have really learned its lessons. It was a grand demonstration of the consumption of the "ecosphere" by the "techno-

¹⁵ See *infra* text accompanying notes 52-56 (describing SkyTruth participation in reassessment of discharge) and text accompanying notes 157-162.

¹⁶ Abrahm Lustgarten, *Chemicals Meant to Break Up BP Oil Present New Environmental Concerns*, PROPUBLICA, April 30, 2010, <http://www.propublica.org/article/bp-gulf-oil-spill-dispersants-0430> (the exact makeup of Corexit is kept secret, but experts consider its ingredients and its effects in combination with oil to be toxic to at least some life forms); Darling, *supra* note 7.

¹⁷ Thomas J. Billitteri, *Offshore Drilling – Is tougher federal oversight needed?*, CQ RESEARCHER ONLINE, June 25, 2010, <http://library.cqpress.com/cqresearcher/document.php?id=cqresrre2010062500> (report on Gulf with chronology of Major spills worldwide).

¹⁸ Frank James, *BP Oil Spill's Potential Path Could Go Up East Coast*, THE TWO-WAY, June 4, 2010, http://www.npr.org/blogs/thetwo-way/2010/06/bp_oil_spills_potential_path_c.html.

¹⁹ See Darling, *supra* note 7 (regarding concerns about sea floor subsidence and collapse).

sphere,” to use Barry Commoner’s terms.²⁰ Commoner describes the ecosphere as “the thin global skin of air, water, and soil and the plants and animals that live in it.”²¹ The ecosphere functions through “cyclical, conservative and self-consistent processes.”²² In contrast, the technosphere unfolds through “linear, innovative, but ecologically disharmonious processes.”²³ These two modes of action are often incompatible. It is this poor fit that we are trying to adjust with environmental research and regulation.²⁴ With the Spill we saw in real

²⁰ BARRY COMMONER, MAKING PEACE WITH THE PLANET 3-13 (1990). Commoner’s distinction is useful and fits well with our common sense notions of “nature.” Environmental discourse often invokes a basic duality. See, e.g., Carolyn Merchant, *The BP Oil Spill: Economy versus Ecology*, ASEH NEWS, Summer 2010, available at <http://nature.berkeley.edu/departments/espm/env-hist/articles/95.pdf>. Merchant notes the irony of the conflict; the names of the two dimensions are both rooted in the Greek word *oikos*, which means home or household. She sees deep-well technology as “an experiment with Nature gone deadly.” “With the blowout, Nature is in revolt; economy at odds with ecology” and she wonders, where is the critique, the protest that followed the 1969 Santa Barbara spill?

Robert Bea, an engineer with extensive experience investigating drilling accidents, invokes a similar duality in one of his interviews about the Spill. After Katrina, he says, he has identified a new equation for disaster: $A + B = C$. A is “Mother Nature, doing what she has done for millions of years, including extreme pressures, temperatures, earthquakes,” and the like. B includes “people’s hubris, arrogance, greed, ignorance and a real killer called laziness.” C is the disaster that comes sooner or later. Robert Bea, *Explaining the equation behind the oil spill disaster*, SCIENCE NEWS, July 3, 2010, available at http://www.sciencenews.org/view/generic/id/60369/title/Comment__Explaining_the_equation_behind_the_oil_spill_disaster.

The social dimensions of the concept “nature” are the subject of substantial literature. See RETHINKING NATURE, ESSAYS IN ENVIRONMENTAL PHILOSOPHY (Bruce V. Foltz & Robert Frodeman, eds., Ind. Univ. Press 2004); LANGDON WINNER, THE WHALE AND THE REACTOR: A SEARCH FOR LIMITS IN AN AGE OF HIGH TECHNOLOGY 121-37 (Univ. of Chicago 1986).

²¹ COMMONER, *supra* note 20, at 7.

²² *Id.* at 15. Ecologists have challenged the conventional western notion of “nature.” See Daniel B. Botkin, *Adjusting Law to Nature’s Discordant Harmonies*, 7 DUKE ENVTL. L. & POL’Y F. 25, 26-27 (1996) (arguing that there is no “balance of nature,” no steady equilibrium to which ecosystems necessarily return). See also Daniel B. Botkin, DISCORDANT HARMONIES – A NEW ECOLOGY FOR THE TWENTY-FIRST CENTURY 4-7 (Oxford Univ. Press 1990) [hereinafter DISCORDANT HARMONIES]. Moreover, the physical qualities and character of ecosystems have always been shaped by human practice. On the symbiosis between humans and ecosystems, see DISCORDANT HARMONIES at 33-35 and Joachim Radkau, NATURE AND POWER, A GLOBAL HISTORY OF THE ENVIRONMENT 36 (Thomas Dunlap trans., Cambridge Univ. Press, 1st English ed. 2008).

²³ COMMONER, *supra* note 20, at 15.

²⁴ Technological change may intentionally disrupt ecosystems or establish new connections. See Janine M. Benyus, BIOMIMICRY – INNOVATION INSPIRED BY NATURE 2-4 (Harper Perennial 1997) (surveying current development of technologies and design based on close study of biological adaptations in nature); Charles Zerner, *Stealth Nature*

time some specific ways that economy poses enormous risks and causes substantial damage. Large scale energy technology failed repeatedly, in full view.²⁵

B. Responses on the Internet

Reaction to the Spill was extensive. Countless media, government, and private organizations and individuals devoted attention to it, issuing reports and commentary and deploying information online, including interactive graphics and satellite mapping and photography.²⁶

– *Biomimesis and the Weaponization of Life*, IN THE NAME OF HUMANITY: THE GOVERNMENT OF THREAT AND CARE 290, 292 (Ilana Feldman & Miriam Ticktin, eds., Duke Univ. Press 2010) (discussing the research and development of robotic “insects” for surveillance and attack on the battlefield), available at <http://pages.slc.edu/~czerner/images/biomimesis.pdf>.

²⁵ The fact that we are running out of oil added to the pain; this precious commodity was being thrown away and was also poisoning the Gulf. See David Lloyd Greene, *Oil Peak or Panic?*, 328 SCIENCE MAGAZINE 828 (2010) (reviewing Steven M. Gorelick, OIL PANIC AND THE GLOBAL CRISIS – PREDICTIONS AND MYTHS (2010) (noting that conventional oil sources are declining, while costs and feasibility of accessing new types of sources remain problematic)).

²⁶ For example, *The New York Times* website was active and interactive. See N.Y. TIMES, *Gulf of Mexico Oil Spill Multimedia Collection*, http://www.nytimes.com/interactive/us/spill_index.html?ref=politics. This included a map of documented wildlife injuries, as well as a video providing a short lesson on the ecosystems and economic vulnerability of the affected region. See *The Oil Spill’s Effect on Wildlife*, <http://www.nytimes.com/interactive/2010/04/28/us/20100428-spill-map.html>; *Oil Spill Threatens Wetlands’ Ecosystem*, <http://video.nytimes.com/video/2010/05/01/us/1247467754098/oil-spill-threatens-wetlands-ecosystem.html>.

Another site offered software that allowed viewers to comprehend the size of the Spill by laying an image of its expanse over their own homes, pointing out, “many in the media initially compared the spill to the size of Rhode Island or Delaware, America’s smallest states. But playing with this tool that follows NOAA data daily, one sees that if centered on Boston, the spill now would cover almost all of Rhode Island and Massachusetts, more than half of Connecticut, and parts of New Hampshire and Maine combined. That’s more than half of New England.” See Candace Lombardi, *Software layers BP oil spill over your home*, CNET News, June 3, 2010, available at http://news.cnet.com/8301-11128_3-20006680-54.html#ixzz1PsHKfcCS. The Environmental Defense Fund website presents a four minute video that encapsulates the cumulative impact of the oil industry in the Gulf and Mississippi River: 10,000 miles of dredged canals bringing saltwater into fresh water wetlands, nearly 4,000 wells and 40,000 miles of pipelines. See Environmental Defense Fund, *Louisiana’s Long-Troubled Wetlands Face Collapse Without Strong Action*, <http://www.edf.org/page.cfm?tagID=56450&link=homepromo>. The Right-to-Know Network hosts The Spills and Accidents database, which contains data on toxic chemical spills and other accidents reported to the National Response Center (NRC). See The Right-to-Know Network, *The Spills and Accidents Database*, <http://www.rtknet.org>. This database used to be called ERNS, the Emergency Response Notification System, available at <http://www.rtknet.org/db/erns>.

Some websites answered technical questions.²⁷ Others displayed reports and photos from witnesses in the Gulf.²⁸

Even with all this attention, it was difficult to grasp just what was going on. Visibility of the Spill's impact was a contentious issue from the beginning. BP worked to dominate public perception, purchasing top "oil" search spots on Google,²⁹ asserting physical control over affected coastal areas using private security firms³⁰ and local officials,³¹ and instructing its employees and contractors to limit their discussion and discourage photos.³² But the internet also supported disclosure and critique of these efforts. It facilitated connections that opened the events up to the broader community. For instance, whistleblowers and journalists could find each other through the internet,³³ an important function, since press access was limited.³⁴ Although BP hired some scientists to study the situation and then bound them by confidentiality agreements, this issue was aired, as were concerns about the time it was taking to get scientists into the field to assess the situation.³⁵

A remarkable "hide and seek" dimension of the Spill was the debate over the fate of the oil. In August, BP and NOAA officials an-

²⁷ The Science of the Spill at SpillScience.com answers questions about the oil spill. The site acknowledges that some of the most important questions regarding the impacts of the oil will take years to answer and declares, "This web site will keep pertinent questions alive until scientists can answer them." The Science of the Spill, *Key questions remain unanswered*, <http://www.spillscience.com>.

²⁸ For example, one of the few available images of Corexit is a photo of a drum's warning label, submitted to *The New York Times*. See *Readers' Photos: The Gulf Oil Spill*, Photo #17, <http://www.nytimes.com/slideshow/2010/05/26/us/20100527-gulf-usergen-slideshow-17.html>. USA Today's website displays more than 300 photos related to the BP Oil Spill. See USA Today, *Photos: Oil leak in the Gulf of Mexico*, <http://mediagallery.usatoday.com/Oil-leak-in-the-Gulf-of-Mexico/G1559,A6792>.

²⁹ Darling, *supra* note 7.

³⁰ See Adam Rawnsley, *BP Hires Mercs to Block Oily Beaches*, WIRE, June 15, 2010, <http://www.wired.com/dangerroom/2010/06/bp-hires-merc-to-block-oily-beaches/>.

³¹ Darling, *supra* note 7.

³² *Id.*

³³ Pro Publica, the online news organization, provided comprehensive coverage of the Spill. See PRO PUBLICA, *Articles Tagged with "Gulf Oil Spill, Deepwater Horizon, BP, Oil Industry"*, <http://www.propublica.org/tag/Gulf+oil+spill,+Deepwater+Horizon,+BP,+Oil+Industry>.

³⁴ See Darling, *supra* note 7. See also Ronald J. Krotoszynski, Jr., *Transparency, Accountability, and Competency: An Essay on the Obama Administration, Google Government, and the Difficulties of Securing Effective Governance*, 65 U. MIAMI L. REV. 449, 470 (2011).

³⁵ See Darling, *supra* note 7; Christopher Joyce, *'Quagmire of Bureaucracy' Stifles Gulf Spill Research* (NPR radio broadcast Apr. 20, 2011), available at <http://www.npr.org/2011/04/20/135573152/quagmire-of-bureaucracy-stifles-gulf-spill-research/>.

nounced the oil was “gone” – due to the effects of the dispersants, microbial action, and other natural forces.³⁶ These claims were modified after they were challenged, but questions continue over the amount of oil contamination that remains, as well as the ecological effects of BP’s use of dispersants.³⁷

Distress was palpable across the country, but was most acute in the Gulf region. Fishermen, officials and other residents of the Gulf were interviewed on television. For example, the BBC’s web site posted reports from the Gulf, as an “oil slick the size of Jamaica” approached the shoreline of the Gulf Coast on April 30.³⁸ One person wrote,

I am in the New Orleans area. This afternoon people here began to smell oil. Someone in a downtown elevator asked me, “Don’t you smell it?” At first I didn’t and was not bothered, but as soon as I was on the bridge over the river, I smelled that burning, oily smell . . . [a]rea residents are extremely concerned about what this will mean for the marshes, which have taken so long to recover post-Katrina. Some are saying the only way to get out the oil would be to burn it. Additionally, this may have dire consequences for the fishing industry and result in severe setbacks for the local economy. Concern and sadness here as we experience yet another setback.³⁹

Another wrote:

Honestly, this scares me. We’ve just recovered from two major Hurricanes and now *this* happens. I’m scared for our food industry and our economy. I’m afraid of the time lapsing while they are trying to implement all their solution tools and things like that. But I’m so glad that at least this is a big deal to the government. At least people are trying to do something. Louisiana is a resilient state. We will overcome this too.⁴⁰

And:

I’m in Gulfport MS and happen to know many shrimpers and oyster fishermen that will not only lose business due to this spill but in turn could lose their houses. I would concentrate on the wildlife lost but considering the damage is done what is the point? What will the government do about this?⁴¹

And:

³⁶ Deborah Zaborenko, *US Says Most BP Spill Oil is Gone or Degrading*, REUTERS, Aug. 4, 2010, <http://www.reuters.com/article/2010/08/04/oil-spill-risk-idUSN0424782620100804>.

³⁷ Darling, *supra* note 7.

³⁸ See BBC NEWS, *Oil spill on U.S. Gulf Coast: Your comments*, <http://news.bbc.co.uk/2/hi/americas/8653374.stm> (last visited Feb. 15, 2012).

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ *Id.*

Will the oil harm the fish and other sea animals of the lower Mississippi coast to where people can't eat fish and such? Will it be dangerous for us to eat fish and such out of the water after the oil spill?

Many people I know have just started experiencing headaches and allergy symptoms from some unknown irritant over the past two days. Many who say they've never experienced allergies before. No one has said one way or another how this spill is going to effect peoples' health. Everyone has been focusing on the health of the oil and seafood industries. I'm glad they are at least concerned about the wildlife.⁴²

The general state of pain and worry was evident in the media and online.

As uneasiness grew, the question "Who's in charge here?" was palpable. The top layers of BP management seemed eerily disconnected from reality. The CEO, Tony Hayward, projected no emotional ownership of the problem – as if he were a bystander.⁴³ The oil industry did not seem to have technology or equipment available to control the effects of a large accident. This perception gradually grew to a certainty: the industry had not invested in emergency response and clean up capacity.⁴⁴

The common sense of the Spill was that no one knew what to do, but in contrast to the dismal performance of those "in charge," many people did take action.⁴⁵ The community – local and national – was not passive, but directed efforts toward research and documentation,

⁴² *Id.*

⁴³ These reactions sometimes seemed to be part of a scripted, public relations response. They brought to the surface a central factor in the disaster, that is, much of our infrastructure is owned privately; only its owners understand it (if they do); and they do not need to share their knowledge. See *infra* Part III. David Levine has analyzed the effects of limited information access on public infrastructure and related resources. See David S. Levine, *Secrecy and Accountability: Trade Secrets in Our Public Infrastructure*, 59 FLA. L. REV. 135 (2007) (conflict between the values of trade secrecy and accountability and transparency are traditionally present in public infrastructure development). See also David S. Levine, *The Impact of Trade Secrecy on Public Transparency* and Mary L. Lyndon, *Trade Secrets and Information Access in Environmental Law*, in THE LAW AND THEORY OF TRADE SECRECY (Rochelle C. Dreyfuss & Katherine J. Strandburg eds., 2011).

⁴⁴ See, e.g., Darling, *supra* note 7. "The problem with Macondo was not the lack of technology," said Owen Kratz, chief executive of Helix Energy Solutions, an oil services firm that makes ships capable of capturing oil from a blown-out well. "It was a lack of readiness to do it. It wasn't organized and ready to deploy." Steve Mufson & Joel Achenbach, *When It Comes to Offshore Drilling, Still Treading in Deep Water*, THE WASHINGTON POST, Apr. 16, 2011, http://www.washingtonpost.com/national/when-it-comes-to-offshore-drilling-still-treading-in-deep-water/2011/04/15/AFWrB5qD_story_2.html. See also FREUDENBERG & GRAMLING, *supra* note 9; Latham, *supra* note 14.

⁴⁵ Darling, *supra* note 7.

as well as efforts to fix the well and to mitigate the Spill's impact. This was perhaps the most telling aspect of the disaster: the community energy it elicited.

Using the internet, people shared ideas about stopping the flow and cleaning up. More than 120,000 suggestions were submitted to the website that BP set up to receive and evaluate the ideas⁴⁶ and more were expressed in other settings. Some of the ideas were amateur and some were from professionals or networks of professionals.⁴⁷ They ranged from straightforward proposals for plugging broken pipes⁴⁸ to a nationwide beauty salon effort to collect hair, intended for booms to sop up oil.⁴⁹ Celebrities received special attention and some provided technical assistance.⁵⁰

Internet-based collaboration was evident at national, regional, and local levels. One small nonprofit, Skytruth, played an early role in the management of the Spill.⁵¹ Skytruth supplies satellite image technology to grassroots organizations to enhance their efforts to educate the public about environmental concerns.⁵² Based on satellite images, Skytruth questioned BP's early estimates of the discharge.⁵³ Its pictures then led to reassessment of BP's numbers, and officials revised their

⁴⁶ BP acknowledges receiving 120,000 ideas for containment and clean-up technology ideas from the public, which it asserts it will sort through and vet for possible use in the future. However, BP is no longer actively seeking input. See *Restorethegulf.gov*, Suggestion Site Closure, <http://www.restorethegulf.gov/release/2010/09/27/submit-suggestion> (last visited Aug. 15, 2011).

⁴⁷ See Yuki Noguchi, *Helping the Pros: Amateur Ideas to Stop the Oil Spill*, (NPR Radio Broadcast Jan. 4 2010) available at <http://www.npr.org/templates/story/story.php?storyId=127481460&ft=3&f=1135>.

⁴⁸ Posting of Hangshai, *Is BP Smarter Than A 10-year-old*, <http://www.youtube.com/watch?v=eo0mrSU3rO8&feature=related>; Posting of Oneideaatime, *BP Oil Spill In Gulf of Mexico Stopped by 9-year-old*, <http://www.youtube.com/watch?v=y5v-lwr6qxA&feature=related>. Some that received media attention purported to be the silver bullet solution, but were hard for the lay person to evaluate. See, e.g., Posting of Jogbird, *The REAL REASON Behind the Oil Spill in the Gulf of Mexico*, <http://www.youtube.com/watch?v=77pBcf0o444&feature=related> (stating that other countries require the acoustic switch system; \$500,000 "absolutely fail safe").

⁴⁹ Lisa Orkin Emmanuel, *Gulf Oil Cleanup: No Hair Donations Are Being Used*, THE HUFFINGTON POST, May 24, 2010, http://www.huffingtonpost.com/2010/05/24/gulf-oil-spill-cleanup-no_n_587801.html.

⁵⁰ James Cameron and Kevin Costner both offered technological assistance. See Darling, *supra* note 7.

⁵¹ *Id.*

⁵² Skytruth, www.skytruth.org (last visited Aug. 15, 2011).

⁵³ See Julie Cart, *Tiny Group has Big Impact on Spill Estimates*, May 1, 2010, <http://articles.latimes.com/2010/may/01/nation/la-na-oil-spill-measure-20100502>.

estimates of the volume of the discharge.⁵⁴ Later Skytruth collaborated with SouthWings and the Waterkeeper Alliance to monitor and publicize oil pollution in the Gulf of Mexico, with satellite images and mapping, aerial reconnaissance and photography, and on-the-water observation and sampling.⁵⁵ Skytruth continues to report on some Gulf oil wells that have been leaking since 2004.⁵⁶

Some organizations focused on local reporting and coordination. An ambitious effort was mounted by the Louisiana Bucket Brigade (LABB). LABB began monitoring local air quality in 2000, using an EPA-approved, community-friendly air quality monitoring tool.⁵⁷ The LABB website explains:

Taking air samples is a powerful experience for community members who are used to being ignored, overlooked, and disrespected by corporations and government. Dorothy Jenkins, President of Concerned Citizens of New Sarpy, used to call the refinery to complain about the odors. A low ranking operator would tell her not to worry, that the black plume of smoke that billowed for hours near her home was not harmful. Now Mrs. Jenkins has a bucket. When refinery managers and government regulators tell her that there is nothing to worry about, she answers, "Why, then, was there a benzene reading of 14 in my air sample, a reading that violates the state standards?" The bucket gives community members power

⁵⁴ See Justin Gillis, *Oil Spill, Redux: Revisiting A Mystery*, N.Y. TIMES, Feb. 4, 2011, <http://green.blogs.nytimes.com/2011/02/04/oil-spill-redux-revisiting-a-mystery/> (telling a story regarding the size of the spill). "Skytruth first analyzed satellite and radar data on the spill shortly after the Deepwater Horizon drilling rig sank after a fire April 22. It challenged initial estimates that 1,000 barrels of oil were gushing daily from the well-head . . . [f]ederal officials quickly revised the estimated daily rate to 5,000 barrels." Cart, *supra* note 53.

⁵⁵ See <http://www.skytruth.org/index.htm>. See also Jennifer Wabnitz, *Skytruth sheds light on Gulf oil spill*, SHEPHERDSTOWN CHRONICLE, Jan. 14, 2011, <http://shepherdstown-chronicle.com/page/content.detail/id/501600/Skytruth-sheds-light-on-Gulf-oil-spill.html>. For example, Skytruth monitors an unrelated oil slick in the Gulf that was first spotted during the BP disaster. This spill was not large, but continued to grow and appeared to be larger than official reports. John Amos, *Oil Slick at Platform 23051 Site, Gulf of Mexico*, SKYTRUTH, May 11, 2011, <http://blog.skytruth.org/2011/05/oil-slick-at-platform-23051-site-gulf.html>. Related work includes aerial monitoring of uranium mining in the western United States. Teri Biebel, *Our latest set to show you. . . . uranium mining!*, SKYTRUTH, May 26, 2011, <http://blog.skytruth.org/2011/05/our-latest-set-to-show-youuranium.html>.

⁵⁶ These are ten miles from the Deepwater Horizon site. Ben Raines, *Gulf oil wells 10 miles from Deepwater Horizon site leaking since 2004*, ALABAMA PRESS REGISTER, Feb. 13, 2011, http://blog.al.com/live/2011/02/wells_still_leaking_in_gulf.html.

⁵⁷ See further discussion of community "bucket brigades," *see infra* note 125.

to hold institutions accountable to provide a safe and healthy environment.⁵⁸

During the Spill, LABB mounted the capacity to receive and coordinate locally-gathered evidence about the Spill's effects.⁵⁹ In May 2010, LABB began working with Grassroots Mapping and the University of South Alabama, using balloon mapping to capture aerial imagery of spill-affected sites in Louisiana, Mississippi, Alabama, and Florida.⁶⁰ In July, LABB was able to evaluate EPA's air quality monitoring reports using its own local knowledge:

A new analysis of the Environmental Protection Agency's BP oil spill monitoring reveals that the EPA monitoring network, while unprecedented in its scope, has still fallen short of documenting exposure in Louisiana in the days since the oil spill. Meanwhile, thousands of people who are out of work could be trained to assist the EPA with its monitoring. "EPA can't be everywhere," said Anne Rolfes, Director of the Louisiana Bucket Brigade. "But you have a lot of fishermen, oystermen and shrimpers who are out of work. They know the environment. They should be trained to help with sampling."⁶¹

LABB also overlaid maps from its Oil Spill Crisis Map onto the EPA's fixed monitoring stations⁶² and identified some problems, including poor placement of EPA monitoring stations.⁶³ LABB provided an on-line map that identified local assistance resources.⁶⁴ In March of 2011,

⁵⁸ Louisiana Bucket Brigade, *The Bucket*, <http://www.labucketbrigade.org/article.php?list=type&type=4> (last visited Aug. 24, 2011).

⁵⁹ For the history of the Brigade and its relationship to other groups and sites, see <http://www.labucketbrigade.org/>. LABB kept an Oil Spill Crisis Map documenting reports of Spill contact and damage at <http://oilspill.labucketbrigade.org/>.

⁶⁰ The Public Laboratory for Open Technology and Science (PLOTS) is a community which develops and applies open-source tools to environmental exploration and investigation. By democratizing inexpensive and accessible "Do-It-Yourself" techniques, Public Laboratory creates a collaborative network of practitioners who actively re-imagine the human relationship with the environment. The core PLOTS program is focused on "civic science" in which we research open source hardware and software tools and methods to generate knowledge and share data about community environmental health. See *The Public Laboratory, Infrared Balloon Mapping*, <http://publiclaboratory.org/en/wiki/infrared-balloon-mapping> (last visited Aug. 24, 2011).

⁶¹ Louisiana Bucket Brigade, *Review of Data Reveals Gaps in EPA's Oil Spill Monitoring. Agency Urged to Empower Impacted Communities to Take Samples*, July 20, 2010, <http://www.labucketbrigade.org/article.php?id=630>.

⁶² *Id.*

⁶³ *Id.*

⁶⁴ See *Oil Spill Crisis Map*, Coastal Community Asset Database - Community resources for spill response and recovery, <http://oilspill.drlatulane.org/> (last visited Aug. 24, 2011).

LABB issued a report on the self-reported health impacts.⁶⁵ The study sought to assess the extent of the health impacts associated with the Spill and also was designed as a pilot for survey methods to be used in communities affected by environmental toxins.⁶⁶

Another active regional environmental organization is the Louisiana Environmental Action Network (LEAN). LEAN's mission is to protect Louisiana's unique environment and Louisianans' health and way of life by providing information about pollution and leading efforts to organizing.⁶⁷ LEAN supports a statewide network of 106 member groups and more than 1700 individual members and is a consulting resource for environmental regulators.⁶⁸ In the wake of Hurricane Katrina and the BP Oil Spill, LEAN coordinated emergency relief, disseminated accurate information about pollution and its impacts, and worked toward restoration of the region's habitats and cultures.⁶⁹

The descriptions in this section are only suggestive of the extent and variety of internet-based responses to the Spill.⁷⁰ However, they do illustrate the evolution and trajectory of ICT-enhanced environmental participation.⁷¹

⁶⁵ Louisiana Bucket Brigade, *The BP Oil Disaster: Results from a Health and Economic Impact Survey in Four Coastal Louisiana Parishes*, Mar. 3, 2011, <http://www.labucketbrigade.org/article.php?id=716>.

⁶⁶ The report collected data through 954 surveys conducted in seven coastal Louisiana oil spill-affected communities. *Id.* More recently, LABB has developed a dramatic visual presentation showing oil and gas industry infrastructure in the path of projected Mississippi River floods. Louisiana Environmental Action Network, About Us, <http://leanweb.org/about-us/about-us> (last visited Aug. 24, 2011). See Louisiana Bucket Brigade, Oil Industry Infrastructure in the Path of the Flood, <http://www.labucketbrigade.org/article.php?id=736> (last visited Aug. 24, 2011).

⁶⁷ LEAN (<http://leanweb.org>) and Lower Mississippi River Keeper (LMRK.org) monitor sediment and seafood for oil contaminants. See *BP Oil Spill Seafood Sampling Project Results Overview*, Jan. 3, 2011, <http://leanweb.org/our-work/water/bp-oil-spill/seafood-safety/bp-oil-spill-seafood-sampling-project-results-overview>. LEAN works with other groups across the following areas: Atchafalaya Basinkeeper (Basinkeeper.org), Louisiana Bayoukeeper (Bayoukeeper.org), Ouachita Riverkeeper (OuachitaRiverkeeper.org), The Waterkeeper Alliance (Waterkeeper.org), the MRGO Must Go Coalition (MRGOMustgo.org), Save Our Cypress Coalition (SaveOurCypress.org), Save Our Gulf (SaveOurGulf.org), and SouthWings (Southwings.org). Louisiana Environmental Action Network, Our Partners & Friends, <http://leanweb.org/about-us/our-partners-friends> (last visited Aug. 24, 2011).

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ See *infra* notes 121, 139 (describing lay scientific research in the Gulf).

⁷¹ See *infra* Part II.

II. THE INTERNET AND ENVIRONMENTAL MANAGEMENT

Environmental management is concerned with the physical condition of earth systems and their inhabitants. Development, pollution, and resource extraction trigger physical activity in ecosystems. They change the circumstances. Substances may travel long distances; they may be absorbed and become part of new processes.⁷² Effects often take time to appear, especially if they result from the synergy of multiple factors.⁷³ Will environmental effects be temporary or benign or will they be lasting and harmful? How can we understand and arrange our activities to optimize the outcomes?

Environmental law can be seen as a forty-year effort to build the institutional capacity to understand and manage the tensions between the technosphere and the ecosphere. This capacity entails three basic kinds of activities: learning, managing, and selecting the ways we learn and manage. The internet provides essential support for these processes. Broad participation enhances these processes, by increasing the visibility and understanding of the resources and by opening environmentally risky enterprises to critique and feedback. Both politically and morally, participation legitimizes the allocation of ecosystem uses.⁷⁴

⁷² Physical phenomena are inherently dynamic. Professor Terry Collins explains: "Imagine all of Earth's chemistry as a mail sorter's wall of letter slots in a post office, with the network of compartments extending toward infinity . . . Each compartment represents a separate chemistry so that, for example, thousands of compartments are associated with stratospheric chemistry or with a human cell. An environmentally mobile persistent pollutant can move from compartment to compartment, sampling a large number and finding those compartments that it can perturb. Many perturbations may be inconsequential, but others can cause unforeseen catastrophes, such as the ozone hole or some of the manifestations of endocrine disruption." Terry Collins, *Toward Sustainable Chemistry*, 291 SCIENCE 48 (2001), available at <http://www.sciencemag.org/content/291/5501/48.full>.

⁷³ For instance, low-level exposures to some pollutants increase the incidence of diseases that may not be detectable until time has passed. An example is a category of pollutants called endocrine disruptors, some of which apparently alter hormonal functions in humans and animals. See Carl F. Cranor, LEGALLY POISONED: HOW THE LAW PUTS US AT RISK TOXICANTS (2011); David A. Schwartz and Kenneth Korach, *Emerging Research on Endocrine Disruptors*, 115 ENVTL. HEALTH PERSPECTIVES A13 (2007) available at <http://ehp03.niehs.nih.gov/article/fetchArticle.action?articleURI=info%3Adoi%2F10.1289%2Fehp.115-a13>; The Endocrine Disruption Exchange, <http://www.endocrinedisruption.com/home.php> (last visited Aug. 24, 2011); National Institute of Environmental Health, Endocrine Disruptors, <http://www.niehs.nih.gov/health/topics/agents/endocrine/index.cfm> (last visited Aug. 24, 2011).

⁷⁴ See Victor B. Flatt, *This Land Is Your Land (Our Right to the Environment)*, 107 W. VA. L. REV. 1 (2004) (arguing that the right to our environment is the same as the right to

A. Community-Wide Research and Learning

A major limiting factor in environmental management has been a lack of information. The regulatory system functions as a clearinghouse, gathering and interpreting EHS information, and as a guide setting the research agenda; transparency and public participation in standard-setting and enforcement are core principles in environmental management.⁷⁵ Expert resources are necessary, but environmental quality can only be maintained with the active participation of the whole community. Both the sources and the need for data are distributed geographically, socially, and over time.⁷⁶ Exposure and hazard assessments depend upon threshold information indicating the existence of a problem. If risks are not identified early, they may grow, compounding the costs of understanding and remediation. Continual monitoring of environmental conditions is an important local function. A local detection and understanding of environmental changes is an essential first step in environmental response.

1. The Right to Know and Participate

Management of environmental learning processes cannot be unitary, top-down, or exclusively expert. Environmental law has embraced

protection of private property and bodily integrity, and thus should be considered the same as other rights we have at common law).

⁷⁵ NATIONAL RESEARCH COUNCIL, COMMITTEE ON GEOPHYSICAL AND ENVIRONMENTAL DATA, BOARD ON EARTH SCIENCES AND RESOURCES, RESOLVING CONFLICTS ARISING FROM THE PRIVATIZATION OF ENVIRONMENTAL DATA § 11 *et seq.* (2003) (modeling environmental information functions on tree's roots, trunk and branches). See, e.g., Rebecca S. Eisenberg, *Patents, Product Exclusivity, and Information Dissemination: How Law Directs Biopharmaceutical Research and Development*, 72 FORDHAM L. REV. 477 (2003).

⁷⁶ Useful EHS knowledge emerges from informal recognition of exposures and damage, formal disclosure, collection and assembly of data, expert interpretation, and scientific research. Relatively simple data describing the presence and movement of environmental or product materials may provide the basis for understanding exposures that affect human health and identify the ecological footprints of economic activity. Steven Shavell, *Liability for Harm Versus Regulation of Safety*, 13 J. LEGAL STUD. 357, 359-60 (1984). Shavell has noted that much regulation can be justified by common knowledge or non-expert information. *Village of Wilsonville v. SCA Services*, 426 N.E.2d 824 (Ill. 1981), illustrates the importance of "local knowledge." There, the state environmental agency granted a permit to a waste disposal firm, based on the agency's examination of the firm's application and its own review of the situation. The Village and its residents sued in nuisance, pointing out that the waste site was constructed over abandoned mine shafts, which substantially raised the likelihood of subsidence in the terrain and consequent leakage of hazardous waste. The presence of the mine shafts was local lore and not part of the agency's record when it granted the permit. *SCA Services*, 426 N.E.2d at 831-33.

this reality, though individual laws and cases fall short of the goal. Numerous environmental statutes explicitly provide for citizen participation in enforcement.⁷⁷ Some also establish explicitly information-based regulatory strategies, such as reporting and disclosure requirements.⁷⁸ These laws have proven their worth and are now essential parts of U.S. federal law, as well as the law of states and other nations.⁷⁹

Not only information, but responsibility for ecosystems, is broadly distributed. Environmental laws build on the recognition that markets function best with legal and organizational supports and limits.⁸⁰ Information about products and processes makes markets function more

⁷⁷ See WILLIAM H. RODGERS, ENVIRONMENTAL LAW § 7:6 (2006); James R. May, *Now More Than Ever: Trends in Environmental Citizens Suits at 30*, 10 WIDENER L. REV. 1 (2003) (citizen suits are important supplements to lagging environmental enforcement).

⁷⁸ Information distribution is widely seen as an important regulatory innovation. Administrative agencies coordinate research and deploy information, through reporting requirements, public listing of pollution discharges, ingredient labeling, and product rating and certification. These “information strategies” open up the conventional relationship between the agency and the regulated firm and use information to engage the market and public opinion in responses to pollution. Paul R. Kleindorfer & Eric W. Orts, *Informational Regulation of Environmental Risks*, 18 RISK ANALYSIS (No. 2) 155 (April 1998). See, e.g., JAMES T. HAMILTON, REGULATION THROUGH REVELATION: THE ORIGIN, POLITICS, AND IMPACTS OF THE TOXICS RELEASE INVENTORY PROGRAM (2005). See also John S. Applegate, *Bridging the Data Gap: Balancing the Supply and Demand for Chemical Information*, 86 TEX. L. REV. 1365, 1380-85 (2008); David C. Vladeck, *Information Access—Surveying the Current Legal Landscape of Federal Right-to-Know Laws*, 86 TEX. L. REV. 1787 (2008); David W. Case, *Corporate Environmental Reporting as Informational Regulation: A Law and Economics Perspective*, 76 U. COLO. L. REV. 379 (2005); Daniel C. Esty, *Environmental Protection in the Information Age*, 79 N.Y.U. L. REV. 115 (2004) (articulating a taxonomy of the information needs in many environmental management problems); Bradley C. Karkkainen, *Information as Environmental Regulation: TRI and Performance Benchmarking, Precursor to a New Paradigm?*, 89 GEO. L.J. 257 (2001); Lyndon, *supra* note 2; Peter S. Menell, *Structuring a Market-Oriented Federal Eco-Information Policy*, 54 MD. L. REV. 1435 (1995).

⁷⁹ See Amy Kapczynski, *The Access to Knowledge Movement and the New Politics of Intellectual Property*, 117 YALE L.J. 804 (2008); Lea Bishop Shaver, *Defining and Measuring A2K: A Blueprint for an Index of Access to Knowledge*, 4 I/S: J.L. & POL'Y FOR INFO. SOC. 235 (2008); Allen L. White, *Why We Need Global Standards for Corporate Disclosure*, 69 LAW & CONTEMP. PROBS. 167 (2006) (describing development of information function in EHS risk management).

⁸⁰ Despite rhetoric to the contrary, environmental regulation has been designed for minimum interference with private choices. There is a large literature on the economic rationales for environmental regulation. See, e.g., BRIAN ROACH, JONATHAN M. HARRIS, & ADRIAN WILLIAMSON, THE GULF OIL SPILL: ECONOMICS AND POLICY ISSUES (Global Development and Environment Institute, Tufts University 2010), available at http://ase.tufts.edu/gdae/education_materials/modules.html (A GDAE Teaching Module on Social and Environmental Issues in Economics applying basic principles of environmental economics to the BP Spill).

efficiently.⁸¹ Thus a key market-based regulatory approach has been to foster transparency about environmental and health effects. Information-sharing allows producers and consumers to choose well.⁸² Political processes also rely on a voting public that understands the real effects of economic behavior on our physical and environmental infrastructure.⁸³ Citizens need to collectively monitor and select among EHS options.⁸⁴

⁸¹ Health, safety, and environmental data describe a great range of phenomena and activities. Individuals must make informed decisions, such as which pharmaceuticals to rely upon, or where to work and buy a home, as well as what foods to consume. Social groups and institutions also need to understand risks to make decisions, such as what kinds of regulation to support or what products to produce. These choices are affected by risk considerations. Moreover, when the quality of some products is invisible, the entire market segment suffers. George A. Akerlof, *The Market for "Lemons": Quality Uncertainty and the Market Mechanism*, 84 Q. J. ECON. 488 (1970). See Kim JoDene Donat, *Engineering Akerlof Lemons: Information Asymmetry, Externalities, and Market Intervention in the Genetically Modified Food Market*, 12 MINN. J. INT'L L. 417 (2003) (applying the "lemons" model to the world market for genetically modified food products); Sandra S. Batie & David E. Ervin, *Transgenic Crops and the Environment: Missing Markets and Public Roles*, 6 ENV'T & DEV. ECON. 435 (2001); Mary L. Lyndon, *Information Economics and Chemical Toxicity: Designing Laws to Produce and Use Data*, 87 MICH. L. REV. 1795, 1831-32 (1989) (describing adverse effects of information asymmetries in the market for chemicals and related products) [hereinafter Lyndon, *Information Economics*].

⁸² See Lyndon, *Information Economics*, *supra* note 81, at 1830-32 (discussing efficiency of distributing toxicity information). For instance, in one case history a group of male workers at a pesticide manufacturing plant realized that none were fathering any children. Sperm counts confirmed their suspicion of sterility. Because of pesticide disclosure requirements, the workers were able to identify their exposures and their union's researchers were able to specify three chemicals that were possible causes of sterility. The company already had internal data suggesting that one of the three chemicals is a cause of infertility, confirmed the conclusion by further investigations and substituted a new chemical in the manufacturing process. The workers in this story were "comparison shoppers" who secured a benefit for all those in their class. Availability of chemical information also allows market responses to develop, such as third party information services.

⁸³ See Levine, *supra* note 43 (secrecy interferes with accountability and transparency necessary for public infrastructure management); Lyndon, *supra* notes 2 and 43.

⁸⁴ See Robert W. Collin & Robin Morris Collin, *The Role of Communities in Environmental Decisions: Communities Speaking for Themselves*, 13 J. ENVTL. L. & LITIG. 37 (1998); Janice Gorin, *Caught Between Action and Inaction: Public Participation Rights in Voluntary Approaches to Environmental Policy*, 24 STAN. ENVTL. L.J. 151 (2005); Frances Irwin & Carl Bruch, *Information, Public Participation, and Justice*, 32 ENVTL. L. REP. (BNA) No. 10784 (2002); Stephanie Tai, *Three Asymmetries of Informed Environmental Decisionmaking*, 78 TEMP. L. REV. 659 (2005). See also Dorothy Nelkin, *Science Controversies: The Dynamics of Public Disputes in the United States*, in HANDBOOK OF SCIENCE AND TECHNOLOGY STUDIES 445 (Shiela Jasanoff et al. eds., 1995).

Communities, landowners, and businesses have a stake in maintaining the ecosphere within livable parameters. Laws that provide for access to environmental information are rooted in long-standing norms concerned with responsibility. Their logic is clear: effects follow predictably from conscious decisions to extract resources or release pollution. Human and ecosystem exposure is expected, not surprising. The choice to act therefore triggers familiar obligations, with a minimum duty to warn. Both the common law⁸⁵ and regulation⁸⁶ affirm the importance of distributing information about risks.

⁸⁵ Risk communication is a strong requirement in the common law. Negligence law imposes a duty to act with reasonable care with respect to third parties. See RESTATEMENT (THIRD) OF TORTS: LIAB. PHYSICAL HARM § 7 (2005) (Duty, “[a]n actor ordinarily has a duty to exercise reasonable care when the actor’s conduct creates a risk of physical harm”). *Id.* § 12 (an actor’s skills or knowledge are to be taken into account in determining whether the actor has behaved as a reasonably careful person). There is a duty to warn those who may be affected by one’s actions. RESTATEMENT (THIRD) OF TORTS: LIAB. PHYSICAL HARM § 18 (2005). Negligent Failure To Warn provides that a defendant whose conduct creates a risk of harm fails to exercise reasonable care when it fails to warn of the danger, if the defendant knows or has reason to know of the risk; even if the defendant adequately warns of the risk, the defendant fails to exercise reasonable care by failing to adopt further precautions to protect against the risk, if it is foreseeable that despite the warning some risk of harm remains. Warning obligations have been strengthened by case law and also retained as a strong requirement in the RESTATEMENT (THIRD) OF TORTS: PRODUCTS LIABILITY, §§ 2(c), 10, 13 & 18 (1998). Related information entitlements include warranty, fraud, and the law of informed consent. Warranty law requires that information about latent risks be transmitted to buyers. Philip Weinberg, *Express and Implied Warranties*, 9 N.Y. PRAC., ENVIRONMENTAL LAW AND REGULATION IN NEW YORK § 2:9 (breach of implied warranty is closely related to the “duty to warn” cause of action in negligence and strict product liability). See, e.g., RESTATEMENT (FIRST) OF TORTS, §529 Representation Misleading Because Incomplete, *Comment a* (pointing out that a statement containing a half-truth may be as misleading as a statement wholly false; the recipient of the statement is entitled to know the undisclosed facts in so far as they are material). See Margaret A. Berger & Aaron D. Twersky, *Uncertainty and Informed Choice: Unmasking Daubert*, 104 MICH. L. REV. 257 (2005).

⁸⁶ A number of federal statutes expressly provide for public access to information in the possession of government agencies. In 1966 Congress enacted the federal Freedom of Information Act (“FOIA”), the overarching framework for regulatory disclosure law. FOIA has been copied by many states. In 1996, Congress enacted the Electronic Freedom of Information Act, or E-FOIA, which makes more categories of information available to the public and provides for electronic request processes and disclosure. Pub. L. No. 104-231, 110 Stat. 3048 (codified at 5 U.S.C. §552 (Supp. II 1996)). The justification for disclosure is great in the EHS setting, where risks are present and commercial camouflage incentives are strong. See, e.g., John Applegate & Katherine Baer, *Strategies for Closing the Chemical Data Gap*, CPR White Paper #602 (April 2006), http://progressivereform.org/articles/Closing_Data_Gaps_602.pdf.

Disclosure laws are an important advancement, but they are not self-implementing and “business as usual” may entail considerable ignorance. Businesses have strong incentives to postpone and obscure matters that don’t generate profit or cost money. Often the law has not required firms to research or disclose their environmental effects.⁸⁷ Incentives to keep secrets and maintain a low profile about impacts on health and the environment undermine regulation and the economy.⁸⁸ As a result, technologies have been widely deployed when the market was “ready,” even though understanding of their EHS effects has been inadequate. The Spill itself fits this pattern, as do several emerging technologies.⁸⁹

⁸⁷ The 19th century common law rule on the burden of proof is still influential; often the onus of research is on those who would challenge a polluting activity. See Thomas O. McGarity, Sidney Shapiro, & David Bollier, *SOPHISTICATED SABOTAGE – THE INTELLECTUAL GAMES USED TO SUBVERT RESPONSIBLE REGULATION*, 34-65 (2004); David Michaels, *Doubt Is Their Product*, 96 *SCIENTIFIC AMERICAN* 101 (June 2005). Firms also simply withhold information. In 2005, the EPA fined DuPont \$16.5 million for violating TSCA’s § 8(e) by not reporting data on the health risks posed by a chemical ingredient in Teflon. See also Marianne Lavelle, *Be Careful What You Ask For: E.P.A.’s Amnesty Has Become a Mixed Blessing*, *NAT’L L.J.*, Feb. 24, 1997, at A1 (under an amnesty program in place from 1991-1996, manufacturers handed in 11,000 old, unpublished studies and adverse reaction reports). See Lyndon, *Secrecy and Access*, *supra* note 2 at 515-21 (discussing factors that encourage firms to withhold information).

⁸⁸ Wendy Wagner has explained and documented the ways that access and transparency principles have been undermined in the regulatory setting. See Wendy E. Wagner, *Commons Ignorance: The Failure of Environmental Law to Produce Needed Information on Health and the Environment*, 53 *DUKE L.J.* 1619 (2004); see also Rena Steinzor & Matthew Shultz, *Sequestered Science: Secrets Threatening Public Health*, CPR White Paper #703 (April 2007), http://progressivereform.org/articles/Secrecy_703.pdf. Trade secrecy claims are common, even when public interests are concerned. See Mary L. Lyndon, *Trade Secrets and Information Access in Environmental Law*, in *THE LAW AND THEORY OF TRADE SECRECY* (2011). Also, the costs of research, the uncertainties of research outcomes, and the specter of liability discourage firms from researching or disclosing EHS effects. See Mary L. Lyndon, *Secrecy and Innovation in Tort Law and Regulation*, 23 *N.M. L. REV.* 1 (1993).

⁸⁹ See e.g., Mark Popovsky, *Nanotechnology and Environmental Insurance*, 36 *COLUM. J. ENVTL. L.* 125 (2011) (proposing an insurance and bonding scheme to maximize private research and safety incentives). Although little research has been done on long-term effects of nanomaterial exposure, evidence suggests that copper nanoparticles accumulate and cause injuries to gills in freshwater fish; respiratory distress in fish may be due to titanium oxide nanoparticles; significantly reduced fertility in freshwater crustaceans results from carbon fullerene nanoparticles; similar cumulative toxic effects can be expected up the food chain in both the marine and land environments; nanoparticles are persistent and far too small to be removed with any available filtering device. *Id.* at 129-134; Batie & Ervin, *supra* note 81, at 437-39 (discussing new transgenic crops being released prior to full study of their long term environmental and health effects).

2. Lay Research

As the examples in Part I suggest, environmental learning has grown, assisted by the internet.⁹⁰ The internet also makes possible expanded participation in scientific research—a capacity demonstrated by a number of responses to the Spill.⁹¹ We have moved beyond the early years of environmental activism, when lay efforts to assess environmental risks were dismissed, to greater recognition of the value of local and lay contributions to environmental learning. Indeed, there is a growing literature on the democratization of science, including work by social scientists and educators studying the best ways to invite and support lay researchers into science.⁹²

⁹⁰ For example, the Audubon Society has contributed to climate change research and continues work in the Gulf region to determine the effects of the Spill on bird populations and migratory bird residence in the Gulf marshes. See Audubon Coastal Bird Survey, <http://gulfoilspill.audubon.org/coastal-bird-survey>. The survey, a volunteer-based citizen science program, was established in response to the BP oil spill and gathers data on the conservation needs of coastal water birds. See also EARTH MONITORING AND PUBLIC ALERTS SYSTEM WITH DISTRIBUTED SENSORS (FACEBOOK PAGE), <http://www.facebook.com/group.php?gid=119386261434333&v=wall>; see also Jeff Radford, *Air Samples Test Positive for Intel Chemical Pollutants*, June 23, 2010, http://www.corralescomment.com/index.php?option=com_content&task=view&id=1550&Itemid=2 (analysis of air quality samples taken by the Southwest Organizing Project's bucket brigade near Intel's manufacturing facility led to confirmation of toxic exposures and involvement of the responsible government agencies, though the outcome is still uncertain). The EPA provides support for local efforts to monitor air quality. See, e.g., Community Based Air-Toxics Projects, <http://www.epa.gov/air/toxicair/community/> (last visited Aug. 21, 2011); Gregg P. Macey, *Coasean Blind Spots: Charting the Incomplete Institutionalism*, 98 GEO. L. J. 863 (2010) (describing context and origins of "bucket brigades").

⁹¹ The internet has affected the institutional shape of environmental advocacy. See Keith Harley & Holly D. Gordon, *Public Participation and Environmental Advocacy*, 16 NAT. RESOURCES & ENV'T. 296 (2001) (including description of web-based information resources). See, e.g., Sandy J. Andelman, Christy M. Bowles, Michael R. Willig & Robert B. Waide, *Understanding Environmental Complexity through a Distributed Knowledge Network*, 54 BIOSCIENCE 240 (2004) (describing National Center for Ecological Analysis and Synthesis which links eight universities in collaborative research projects). Ecologists are working to improve their use of the internet to encourage greater lay participation. Reichman, Jones & Schildhau, *Challenges and Opportunities of Open Data in Ecology*, 331 SCIENCE 703-05 (2011) (as a synthetic discipline, ecology benefits from open access to data from earth, life and social sciences; discusses challenges to implementing open access to data in ecology); Alison Ashlin & Richard J. Ladie, *Environmental Science Adrift in the Blogosphere*, 312 SCIENCE 201 (2006) (urging environmental scientists to actively blog to increase the presence of informed opinions in the blogosphere).

⁹² See Sheila Jasanoff, *Science and citizenship: a new synergy*, 31 SCI. AND PUB. POL'Y 90-94 (2004). In the same volume, see Rebecca Ellis & Claire Waterton, *Environmental Citizenship in the Making: The Participation Of Volunteer Naturalists in UK Biological Recording and Biodiversity Policy*, 31 SCI. AND PUB. POL'Y 95-105 (2004) (examining the beliefs and con-

The degree of change is evident when we consider the case of hazardous wastes in New York's Love Canal community. In 1978, Lois Gibbs, a Love Canal resident, wife and mother, led her community through a two-year struggle to gain recognition of the existence and health effects of large volumes of toxic wastes that were buried under the local school and many houses in her neighbourhood. The efforts to document the effects were guided by Dr. Beverly Paigen, a toxicologist with the New York State Department of Health, but the data was rejected as "housewife data," though the state did not do its own study until much later. Lois Gibbs went on to found one of the earliest grass-roots environmental organizations, the Citizens' Clearinghouse for Hazardous Waste, later renamed the Center for Health, Environment and Justice, and today there are environmental "bucket brigades" across the country.⁹³

3. Environmental Learning and the Spill

In the Gulf disaster there were two major instruments of environmental damage: the release of oil and gas from BP's drilling equipment and the deployment of large quantities of chemical dispersants.⁹⁴ The two kinds of discharge are regulated under different environmental laws, with different disclosure requirements.⁹⁵ Common to both aspects of the BP Spill was a striking level of ignorance and failure to plan. The statutes that cover accidental spills and the use of chemicals in the environment are both deeply flawed. Neither affords an adequate basis for public participation in environmental management.

cerns of lay participants in a state and NGO biodiversity survey and recommending greater reciprocity between the institutional participants in designing the program); Marybeth Long Martello, *Global Change Science and the Arctic Citizen*, 31 SCI. AND PUB. POL'Y 107-15 (2004) (globalization and the world-wide web are reconfiguring notions of citizenship); Robert Doubleday, *Consumer Relations*, 31 SCI. AND PUB. POL'Y 117-26 (2004) (examining the experiences of participants in Unilever's program to understand its customers' broader interests). See also Sheila Jasanoff, *Technologies of Humility: Citizen Participation in Governing Science*, 41 MINERVA 223-44 (2003) (policymakers need the perspective that citizens can provide on unknown and uncertain risks).

⁹³ See Lois Marie Gibbs, *LOVE CANAL AND THE BIRTH OF THE ENVIRONMENTAL HEALTH MOVEMENT*, 103-05 (Island Press 2011). Dr. Paigen was harassed and later vindicated; she completed her research under difficult conditions outside of New York. *Id.* at 218.

⁹⁴ See *supra* Part I.

⁹⁵ See text accompanying notes 92-99, 108-119.

a. *Accident Risks*

Many large scale enterprises pose accident risks. For the most part, the risks and appropriate responses are assessed and managed by the relevant industry in consultation, perhaps, with regulators. The difficulties of this close relationship were clearly on display in the BP spill and are the subject of extensive legal literature.⁹⁶ Risk assessment is a central methodology of environmental regulation. Three statutes that apply to ocean drilling mandate assessment of its risks. These are the National Environmental Policy Act (NEPA),⁹⁷ the Outer Continental Shelf Leasing Act (OCSLA),⁹⁸ and the Oil Pollution Act (OPA).⁹⁹ None prevented the BP Spill.

NEPA is the original environmental law mandating disclosure and participation in the planning of large scale projects.¹⁰⁰ NEPA requires agencies to assess environmental impacts before taking any “major federal action,” which includes projects funded or permitted by federal agencies.¹⁰¹ The assessments are to be developed with public input.¹⁰² However, NEPA’s effectiveness has decreased over time. The requirement that worst case scenarios risks be examined has been effectively removed from the process.¹⁰³

⁹⁶ See generally Sidney A. Shapiro & Rena Steinzor, *Capture Accountability, and Regulatory Metrics*, 86 TEX. L. REV. 1741 (2008). The risk of a large spill was marginalized in the administrative process that granted BP’s permit to drill in the Macondo Reserve. See FREUDENBERG & GRAMLING, *supra* note 9, at 361; Sidney Shapiro et al., *The BP Catastrophe: When Hobbled Law and Hollow Regulation Leaves Americans Unprotected*, CPR White Paper #1101 (Jan. 2011), http://progressivereform.org/articles/BP_Catastrophe_1101.pdf; Alyson Flournoy et al., *Regulatory Blowout: How Regulatory Failures Made the BP Disaster Possible, and How the System Can be Fixed to Avoid a Recurrence*, CPR White Paper #1007 (Oct. 2010), http://progressivereform.org/articles/BP_Reg_Blowout_1007.pdf.

⁹⁷ National Environmental Policy Act, 42 U.S.C. § 4321 (2006).

⁹⁸ Outer Continental Shelf Lands Act, 43 U.S.C. § 1331 (2006).

⁹⁹ Oil Pollution Act of 1990, 33 U.S.C. § 2701 *et seq.* (2006).

¹⁰⁰ See Oliver A. Houck, *Worst Case and the Deepwater Horizon Blowout: There Ought to Be a Law*, 24 TUL. ENVTL. L.J. 1, 7-17 (2010) (analyzing causes of the BP Spill and the ineffectiveness of the statutes).

¹⁰¹ 42 U.S.C. § 4332 (2006).

¹⁰² *Id.*

¹⁰³ See Houck, *supra* note 100, at 2 (regulatory programs under NEPA, the OCSLA, and OPA require the consideration of worst-case situations); Holly Doremus, *Through Another’s Eyes: Getting the Benefits of Outside Perspectives in Environmental Review*, 38 B.C. ENVTL. AFF. L. REV. 247 (2011) (describing the need for worst case analysis in Gulf drilling); Daniel Farber, *Probabilities Behaving Badly: Complexity Theory and Environmental Uncertainty*, 37 U.C. DAVIS L. REV. 145 (2003) (outlining the history of the removal of the worst case scenario requirement from NEPA regulations).

The removal of the worst case scenario from the NEPA process was a mistake. This is evident from the literature on accident prevention which suggests that continual review of risk factors is necessary. Large-scale accident risks have been the subject of critical study from a variety of perspectives. For example, in 1984, Charles Perrow proposed that the combination of complexity and tightly coupled components will produce accidents, in part because complex systems limit human capacity to anticipate and perceive the causes of malfunctions in this setting.¹⁰⁴ Perrow called such accidents “normal accidents,” because we should expect them to happen.¹⁰⁵ He and others have recommended greater attention to the design of industrial infrastructure and to behavioral and organizational patterns that contribute to accidents.¹⁰⁶

Professor Zygmunt Plater has examined the BP and the Exxon Valdez disasters from the perspective of organizational and technological complexity.¹⁰⁷ Plater chaired the State of Alaska Oil Commission’s legal task force after the 1989 wreck of the Exxon Valdez. Plater finds that both disasters were essentially inevitable, given the poor design of the present oil extraction system. This is a “mega system” that is technically and organizationally complex and therefore fragile. Its array of vulnerabilities is managed by private companies that have difficulty attending to interests other than those of the firms’ leadership. The

¹⁰⁴ CHARLES PERROW, *NORMAL ACCIDENTS – LIVING WITH HIGH-RISK TECHNOLOGIES* 71 (Basic Books 1984).

¹⁰⁵ *Id.* at 5. In the preface to the paperback edition of his more recent book, *THE NEXT CATASTROPHE – REDUCING OUR VULNERABILITIES TO NATURAL, INDUSTRIAL AND TERRORIST DISASTERS* (Princeton Univ. 2011), Perrow places the BP Spill in this frame.

¹⁰⁶ See PERROW, *supra* note 104, at 4-5; FREUDENBERG & GRAMLING, *supra* note 9; DIANE VAUGHN, *THE CHALLENGER LAUNCH DECISION – RISKY TECHNOLOGY, CULTURE AND DEVIANCE AT NASA*, (1996); *ON RISK AND DISASTER – LESSONS FROM HURRICANE KATRINA* (Ronald J. Daniels, Donald F. Kettl, & Howard Kunreuther eds., 2006). Thomas D. Beamish, *Accumulating Trouble: Complex Organization, a Culture of Silence, and a Secret Spill*, 47 *SOC. PROBLEMS* 473 (2000) describes a large spill caused over a period of thirty-eight years through the interaction of common dysfunctional behavior patterns and incremental spillage. See also Gregg P. Macey, *Coasean Blind Spots: Charting the Incomplete Institutionalism*, 98 *Geo. L.J.* 863 (2010) (examines the ways that operating “scripts” within firms can constrain their reactions, making clarity and flexibility unavailable when a system malfunctions).

¹⁰⁷ See Zygmunt J. B. Plater, *The Exxon Valdez Resurfaces in the Gulf of Mexico . . . and the Hazards of “Megasytem Centripetal Di-Polarity,”* 38 *B.C. ENVTL. AFF. L. REV.* 2 (2011).

only check on the industry is the regulatory framework, which is easily “captured.”¹⁰⁸

Risks of serious accidents routinely are downplayed or dismissed outright.¹⁰⁹ When an accident occurs, hearings, fines, and renewed “commitment to a culture of safety” follow in what has become a routine cycle. While the BP Spill has led to renewed interest in the behavioral and design causes of disasters, it seems that dramatic reforms will not be forthcoming in the near future.¹¹⁰ There have been some rearrangements in the federal agencies that provide industry oversight, but the industry-agency relationship is basically the same. Industry preparedness for the next major accident will now be provided by a nonprofit company formed by four major oil companies. The new company has displayed a collection of equipment and devices that are not dissimilar to what BP used in the Spill in 2010.¹¹¹ It remains to be seen whether these developments will effectively counteract the factors that have undermined safety in the past.

b. *Chemical Toxicity*

Chemical products, such as the dispersants that BP used in the Gulf, are regulated under the Toxic Substances Control Act (TSCA).¹¹² This 1976 statute directs the EPA to establish a comprehensive inventory of chemicals and to develop toxicity data.¹¹³ However, the statute

¹⁰⁸ *Id.* Other scholars agree. See, e.g., Alyson C. Flournoy, *Three Meta-Lessons Government and Industry Should Learn from the BP Deepwater Horizon Disaster and Why They Will Not*, 38 B.C. ENVTL. AFF. L. REV. 281, 290-93 (2011) (discussing BP Spill in light of social science literature that analyzes the dynamics and symptoms of systems that are primed for accidents). For a comparative analysis of U.S. regulatory approaches to drilling oversight see Rena Steinzor, *Lessons from the North Sea: Should “Safety Cases” Come to America?*, 38 B.C. ENVTL. AFF. L. REV. 417 (2011) and Victor B. Flatt, *Macondo Well Blow-Out – Lessons Learned*, SS028 ALL-ABA 367 (February 2-4, 2011) (detailing the history of laws affecting oil drilling at sea and the process by which safety requirements in the U.S. fell behind other nations).

¹⁰⁹ Not only are risks dismissed, they are obscured by elaborate documentation purporting to show that they are minimal or nonexistent. See LEE CLARKE, *MISSION IMPROBABLE – USING FANTASY DOCUMENTS TO TAME DISASTER* (1999). Clarke discusses the factors that encourage denial of risks, including catastrophic ones like the Spill. Companies and regulators indulge in ritual risk assessments and planning that is not practical or even reality based, translating uncertainties into “risks” and relying on their apparent low level of probability. See Lee Clarke, *Oil-Spill Fantasies*, THE ATLANTIC MONTHLY, November 1990, at 65-77.

¹¹⁰ See notes 100-105 and accompanying text.

¹¹¹ See Darling, *supra* note 7.

¹¹² 15 USC § 2601 (2006).

¹¹³ *Id.* § 2607(b)(1).

exempted from any research requirements the 62,000 chemicals that were in use in 1976 and it imposes only minimal reporting requirements for new chemicals. Indeed, TSCA makes it difficult for the EPA to require manufacturers to test their products.¹¹⁴ The statute creates a Catch-22 situation, in which the EPA must prove that a chemical “may present an unreasonable risk of injury to health or the environment” before it may require testing by the manufacturer. With respect to trade secrets, TSCA seems to require disclosure of health and safety studies relating to any chemical in commercial distribution.¹¹⁵ However, the EPA has not consistently implemented TSCA’s disclosure requirements and secrecy has been pervasive in chemicals regulation.¹¹⁶

TSCA’s weaknesses were apparent in the disputes over the safety of Corexit as a response to the Spill. BP applied 1.84 million gallons of it underwater, directly at the source of the oil, a technique that had not been used before. It was, in effect, a massive chemical experiment. Debate over the toxicity of Corexit and similar products continued for months, including in court, as demands for access to testing records and the identity of dispersant ingredients were disputed. The EPA eventually published the ingredients of all the dispersants but not information about what chemicals were found in each dispersant. In August 2011, Earthjustice and Toxipedia published all of the scientific literature on the potential health impacts of the full list of ingredients. Numerous toxic effects, ranging from cancer to eye irritation were identified,¹¹⁷ and there was no toxicity information at all on thirteen ingredients.¹¹⁸

The European Union (EU) is in the process of implementing a regulatory scheme that reverses the burden of proof on the toxicity of chemicals that are used in EU markets.¹¹⁹ The program—Registration,

¹¹⁴ *Id.* § 2603(a)(1)(A)(i).

¹¹⁵ *Id.* § 2613(b).

¹¹⁶ See Lyndon, *supra* note 88.

¹¹⁷ See Plater, *supra* note 107, at 15-20.

¹¹⁸ Joanna M. Foster, *Impact of Gulf Spill’s Underwater Dispersants Is Examined*, N.Y. TIMES, August 26, 2011, <http://green.logs.nytimes.com/2011/0826/impact-of-gulf-spills-underwater-dispersants-is-examined>. See also Susannah Rust and Meg Kissinger, *EPA veils hazardous substances*, MILWAUKEE-WISCONSIN JOURNAL SENTINEL, <http://www.jsonline.com/watchdog/watchdogreports/36514449.html> (the EPA routinely allows companies to keep information about their chemicals secret, including compounds that have been shown to cause cancer and respiratory problems).

¹¹⁹ Registration, Evaluation, Authorization and Restriction of Chemical Substances (REACH), EC 1907/2006, establishes a comprehensive set of requirements for chemicals and their safe use. REACH is forcing long-overdue change in the petrochemical

Evaluation, Authorization and Restriction of Chemical Substances (REACH), requires companies to research health effects before chemicals can be distributed. “No data, no market” is the REACH mantra.¹²⁰ The EU has established a new administrative agency to evaluate toxicity research and requires all companies that use a particular chemical to collaborate on research into its EHS effects, if existing data is insufficient.¹²¹ Several years into the new program, the EU is beginning to publish rankings of chemicals based upon their demonstrated risks.¹²² This stage of REACH provides, at last, incentives for firms to substitute less toxic chemicals in their products. In the United States, reforms to TSCA are under discussion.¹²³

REACH provides a new regulatory model for commercial chemicals. It requires research and knowledge before chemicals are distributed. It publicizes the results of research, in order to let the market react and choose. It limits the amount of wasteful research by requiring collaboration in testing and it uses ICT resources to support firms in this effort. REACH is designed to screen products entering the market, but in a larger sense it is an ecosystem management program. Its

industry and it makes the EU the pace-setter in the global chemicals market. Countries that do not follow the EU’s lead will fall behind and become dumping grounds for low-quality and hazardous chemicals. See Mark Schapiro, *EXPOSED: THE TOXIC CHEMISTRY OF EVERYDAY PRODUCTS AND WHAT’S AT STAKE FOR AMERICAN POWER* (2007).

¹²⁰ *Id.*

¹²¹ A special online platform supports required collaboration on toxicity research, allowing anonymity and some confidentiality. See Doaa Abdel Motaal, *Reaching REACH: The Challenge for Chemicals Entering International Trade*, 12 J. INT’L ECON. L. 643, 652-53 (2009); Eric Rieger, *Turning REACH into Practice – First Experiences in Setting Up Consortia*, 10 BUS. L. INT’L 166 (2009).

¹²² Allison Tracy, *ECHA adds seven more Substances of Very High Concern to REACH Candidate List*, June 2, 2011, available at <http://blogs.edf.org/nanotechnology/category/reach> (reporting that the European Chemicals Agency (ECHA) announced the addition of seven chemicals (all carcinogens, mutagens or reproductive toxicants) to the Candidate List of Substances of Very High Concern (SVHC) under the European Union’s REACH Regulation, bringing the total on the list to 53). Adding a chemical to REACH’s Candidate List is the first step toward subjecting it to REACH’s Authorization process; after listing, the chemical can be used only if specifically authorized by EU authorities.

¹²³ A number of legislative proposals in the United States would revise TSCA and follow the EU’s lead, as well as introduce other reforms, including expanded access to information. See, e.g., Richard A. Denison, *Ten Essential Elements in TSCA Reform*, 39 ENVTL. L. REP. NEWS & ANALYSIS 10020 (2009).

principles can be adapted to provide necessary information and limits in other environmental contexts.¹²⁴

While we have come a long way in the past three decades, the potential value of public participation is still limited by inadequate legal access to information and limited support for local and lay research.

B. *Community Environmental Management*

Taking care of the ecosystem is a basic social function. The internet not only supports environmental research and education; it also enhances environmental management. Today we are exploring ways to accommodate local efforts within the existing regulatory system.¹²⁵ New ways of thinking about planning and coordinating environmental activities, including “adaptive management” and “ecosystem manage-

¹²⁴ See Applegate, *supra* note 78. Holly Doremus examines data deficits in natural resources management in, *Data Gaps in Natural Management: Sniffing for Leaks Along the Information Pipeline*, 83 IND. L. J. 407 (2008). There are other important articles on point in the same volume. See *Symposium: Missing Information – the Scientific Data Gap in Conservation and Chemical Regulation*, 83 IND. L. J. 399-693 (2008).

¹²⁵ Environmental historians are charting the interactions of human societies with their physical surroundings. Elinor Ostrom and others have written on the history of human successes and failures at managing their own impacts on their lands. See, e.g., ELINOR OSTROM, *GOVERNING THE COMMONS – THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION* (Cambridge University Press 1990); JOACHIM RADKAU, *NATURE AND POWER, A GLOBAL HISTORY OF THE ENVIRONMENT* (Thomas Dunlap trans., Cambridge Univ. Press 2008); *COMMUNITIES AND CONSERVATION – HISTORIES AND POLITICS OF COMMUNITY-BASED NATURAL RESOURCE MANAGEMENT* (J. Peter Brosius, Anna Lowenhaupt Tsing & Charles Zerner eds., 2005). Today, community efforts to manage local environments take a variety of forms. See Gregg P. Macey & Dara O’Rourke, *Community Environmental Policing: Assessing New Strategies of Public Participation in Environmental Regulation*, 22 J. POL’Y ANALYSIS & MGMT. 383 (2003), available at <http://ssrn.com/abstract=1378083>. Macey looks at “bucket brigades” within the framework of “community policing,” examining the experiences of two “fenceline communities” with local industrial plants and regulatory agencies. *Id.* at 391-92. With adequate support, Macey suggests local efforts could be integrated into broader disclosure and education programs. “One could imagine a national network of community monitors connected to a larger, integrated system of citizen complaints, government monitoring efforts, toxic release data, and corporate accountability dialogues and mechanisms.” *Id.* at 409. See also Elizabeth Burleson & Diana Pei Wu, *Non-State Actor Access and Influence in International Legal and Policy Negotiations*, 21 FORDHAM ENVTL. L. REV. 193 (2010) (discussing the importance and history of efforts to increase participation in natural resources management and giving examples in an international context); Christine Overdeest & Brian Mayer, *Harnessing the Power of Information Through Community Monitoring: Insights from Social Science*, 86 TEX. L. REV. 1493 (2008) (reviewing social science literature to consider local efforts to document pollution and increase industry accountability).

ment” are promising. They can also be difficult to design and implement well. Both are information intensive and both require flexibility and collaboration. A robust and open internet is a threshold requirement for their success.

Adaptive management builds on the idea that, under conditions of uncertainty, it may be better not to articulate a detailed plan for a particular resource, but instead to remain flexible and adjust conditions as one learns from the process of trying to improve or protect it.¹²⁶ Adaptive management is not appropriate for all circumstances and can encourage postponement of necessary actions. However, in the right setting, parameters for its use may be developed.¹²⁷

Ecosystem management, or ecosystem-based management, is a developing perspective and methodology for addressing the full range of environmental issues together, rather than one environmental feature at a time.¹²⁸ When we look around and ask what we should do to care for environmental resources, we face a wide range of technical, social, and moral options.¹²⁹ People may disagree on what issues are appropriately included in the “environmental” agenda.¹³⁰ There is no one-

¹²⁶ Holly Doremus, et al., *Making Good Use of Adaptive Management*, available at http://www.progressivereform.org/articles/Adaptive_Management_1104.pdf.

¹²⁷ *Id.* at 5-8; John H. Davidson & Thomas Earl Geu, *The Missouri River and Adaptive Management: Protecting Ecological Function and Legal Process*, 80 NEB. L. REV. 816, 851-57 (2001).

¹²⁸ Ingrid Nugent & Laura Cantral, *Charting a Course Toward Ecosystem-Based Management in the Gulf of Mexico*, 16 DUKE ENVTL. L. & POL'Y F. 267, 274-76 (2006) (describing the challenges of managing marine environments, specifically the Gulf of Mexico). Nugent and Cantral provide a brief survey of the origins of the approach and assert that most experts agree on three key elements of ecosystem-based management: a systems framework, meaningful integration of people, that is, all stakeholders, and adaptive management. *Id.* at 270. They also describe the formation of the Gulf of Mexico Alliance 2005 Draft Governors' Action Plan for Healthy and Resilient Coasts (the Governors' final plan was issued in 2006 and is available at http://www.gulfofmexicoalliance.org/pdfs/gap_final2.pdf). *Id.* at 278-82.

¹²⁹ See Jim Chen, *supra* note 2, at 589-90; Fred Bosselman, *What Lawmakers Can Learn From Large-Scale Ecology*, 17 J. LAND USE & ENVTL. L. 207, 294-325 (2002).

¹³⁰ Ecosystem management can be framed simply as management of environmental resources, but this common perspective is in dispute. For example, Bruce Pardy has argued that the demise of the equilibrium model of nature. See DISCORDANT HARMONIES, *supra* note 22, at 106-08, has led to an unspoken assumption that there is “no nature” and that the Ecological Management is now a rudderless process, guided by unstated utilitarian and short- to medium-term goals. He argues for nature as a continuing substantive category and force in environmental law, as the source of rule-like guidance. Bruce Pardy, *Changing Nature: The Myth of the Inevitability of Ecosystem Management*, 20 PACE ENVTL. L. REV. 675 (2003). J.B. Ruhl has responded that Pardy does not

size fits all solution. Ecosystem management may be local or regional, but the choice of scale is based upon ecological characteristics rather than political jurisdictions.¹³¹ Increasingly, environmental problems demand more complex attention than conventional federalism affords.¹³²

If ecosystems are to be managed in partnerships that span conventional political and economic boundaries, then these processes will need to accommodate a range of perspectives and interests. One attempt to outline the design requirements for such a process is the 1997 Lisbon Principles for Sustainable Governance of the Oceans. The Lisbon statement calls for an integrated approach across disciplines, stakeholder groups, and generations, and it treats policymaking as an interactive experiment under conditions of uncertainty, that is, adaptive management. It proposes to manage resources according to core principles. Principle 1, Responsibility, states:

[A]ccess to environmental resources carries attendant responsibilities to use them in an ecologically sustainable, economically efficient, and socially fair manner. Individual and corporate responsibilities and incentives should be aligned with each other and with broad social and ecological goals.¹³³

accurately describe Ecosystem Management, which is inherently concerned with maintaining “nature” and ecosystems, according to fundamental ecological principles. J.B. Ruhl, *The Myth of What is Inevitable Under Ecosystem Management: A Response to Parody*, 21 PACE ENVTL. L. REV. 315 (2004). A dialogue between Parody and Ruhl over the parameters and purposes of Ecosystem Management continues in Bruce Parody, *Ecosystem Management in Question: A Reply to Ruhl*, 23 PACE ENVTL. L. REV. 209 (2005); J.B. Ruhl, *The Parody-Ruhl Dialogue on Ecosystem Management Part IV: Narrowing and Sharpening the Questions*, 24 PACE ENVTL. L. REV. 25 (2007); Bruce Parody, *The Parody-Ruhl Dialogue on Ecosystem Management Part V: Discretion, Complex-Adaptive Problem Solving and the Rule of Law*, 25 PACE ENVTL. L. REV. 341 (2008).

¹³¹ Climate change is the ultimate multi-scalar environmental problem. Hari M. Osofsky, *Diagonal Federalism and Climate Change: Implications for the Obama Administration*, 62 ALA. L. REV. 237, 241 (2011); Craig Anthony (Tony) Arnold, *Adaptive Watershed Planning and Climate Change*, 5 ENVTL. & ENERGY L. & POL’Y J. 417, 419-20 (2010); Alejandro E. Camacho, *Adapting Governance to Climate Change: Managing Uncertainty through a Learning Infrastructure*, 59 EMORY L. J. 1 (2009). See generally Bradley C. Karkkainen, *Collaborative Ecosystem Governance: Scale, Complexity, and Dynamism*, 21 VA. ENVTL. L. J. 189, 206-12 (2002).

¹³² Gary C. Bryner, *Policy Devolution and Environmental Law: Exploring the Transition to Sustainable Development*, 26 ENVIRONS ENVTL. L. & POL’Y J. 1, 1-9 (2002).

¹³³ See Robert Costanza et al., *Principles for Sustainable Governance of the Oceans*, 281 SCIENCE 198-99 (1998). At a workshop sponsored by the Independent World Commission on the Oceans (IWCO) and the Luso-American Development Foundation held in Portugal in 1997, a group of scientists developed principles for sustainable governance of the oceans. The Statement is general enough to apply to the governance of natural

Principle 6 is Participation:

All stakeholders should be engaged in the formulation and implementation of decisions concerning environmental resources. Full stakeholder awareness and participation contributes to credible, accepted rules that identify and assign the corresponding responsibilities appropriately.¹³⁴

The Lisbon statement's approach is both "holistic" and pragmatic. How can we apply these principles in particular cases?

One illustration is a collaborative project in Arizona, which enrolled local communities in forest thinning. U.S. Forest Service officials have stated that the project not only provided jobs, but also lessened the impacts of the fires in the area it covered. The Center for Biological Diversity, the Forest Service, local businesses and other community representatives collaborated to organize the work.¹³⁵ Does this project fit the Lisbon principles? Could it be scaled up and maintain a good fit?¹³⁶

In practice, the internet already supports ecosystem management, but it appears that environmental NGOs, such as the Center for Biological Diversity, and ecosystem management projects usually perform only educational roles, with some attempts at polling and feedback on issues.¹³⁷ Participation in direct environmental management requires

capital assets other than ocean resources. The six principles are responsibility, scale-matching, precaution, adaptive management, full cost allocation and participation. *Id.*

¹³⁴ *Id.*

¹³⁵ White Mountain Conservation League, *Collaborative Forest Restoration Project Has Lessened Damage, Severity of Arizona's Massive Wallow Fire*, June 10, 2011, <http://azwmcl.org/blog/general/collaborative-forest-restoration-project-has-lessened-damage-severity-of-arizonas-massive-wallow-fire> ("U.S. Forest Service officials say forest restoration work implemented under the White Mountains Stewardship Contract — part of a cooperative project among conservationists, local communities and government agencies — has lessened the severity of the Wallow fire and helped firefighters save towns threatened by the flames").

¹³⁶ Similar forestry projects on a larger scale are developing. For example, in November 2010 in Brunei Darussalam, the ASEAN Ministers on Agriculture and Forestry endorsed a program to facilitate forest conservation in South Asia by identifying where and when deforestation has occurred on a monthly basis; it is a deforestation alarm system and complements national forest monitoring programs and local forest conservation efforts. Forest Monitoring for Action (FORMA) in ASEAN Member States, http://www.aseanforest-chm.org/news/forest_monitoring_for_action_forma_in_asean_member_states (2011).

¹³⁷ See Kim Leeder, *Technology and Communication in the Environmental Movement*, 1 ELECTRONIC GREEN J. 1, 3 (2007), available at <http://escholarship.org/uc/item/9gt4h74z>. In agreement is Henrietta Bullinger, *Public Participation and Chesapeake Bay Watershed Restoration Policies: Mechanisms and development of e-participation* (Virginia, Maryland) (dissertation summary available at <http://sunzi.lib.hku.hk/ER/>

support from interactive and specific web-based instruments. These are apparently emerging.¹³⁸

Professional research can be expanded through distributed knowledge networks and sometimes these engage lay people in the work.¹³⁹ These efforts can be ambitious. In one project, participants will run advanced climate models while their PCs are idle, and the data will contribute to research on whether heat waves, floods and hurricanes can be attributed to greenhouse gas emissions caused by humans.¹⁴⁰ Some web applications provide local environmental services. A web-based alarm system will notify farmers of natural gas explosions in their region, preventing injury and illness from exposure to the gases.¹⁴¹ Web-supported advice to landowners about specific local environmental issues is another example.¹⁴² The internet also supports innovative

detail/hkul/2992134, University of Hong Kong) (“the potential for direct and meaningful participation can be realized, but . . . as of yet e-participation . . . is limited to information dissemination with some collection of public opinions, and does not extend to two-way communication and deliberative processes”).

¹³⁸ Alexey Voinov et al., *Community-based software tools to support participatory modelling: a vision*, 2 INT’L CONGRESS ON ENVTL. MODELLING & SOFTWARE 766 (2008), available at <http://www.iemss.org/iemss2008/index.php?n=Main.Proceedings> (describing an integrated modeling system for participatory environmental management); Tan Yigitcanlar, *Public-Oriented Interactive Environmental Decision Support System*, in GIS AND EVIDENCE-BASED POLICY MAKING 347, (Stephen Wise & Massimo Craglia eds., 2007) (discussing approaches to making spatial information more available online to encourage environmental understanding and participation in problem solving); Alexey Voinov & Robert Costanza, *Watershed Management and the Web*, 56 J. OF ENVTL. MGMT. 231 (1999) (discussing reasons and methods for using the internet in the context of watershed management).

¹³⁹ See *supra* Part II. Other examples of lay research around the Spill include Bethany Halford, *Scientists Use Social Networking to Study Spill*, CHEMICAL & ENGINEERING NEWS, June 14, 2010 at 24 (graduate students in chemistry established Project Tantalus, to use Facebook to organize collection and analysis of 100,000 water samples from the Gulf region, the Caribbean, and the east coast of the US). In response to the Spill, the EPA monitored air, water, sediment, and waste generated by the cleanup operations and presented the result on a map. See Environmental Protection Agency, EPA Response to BP Spill in the Gulf of Mexico, <http://www.epa.gov/bpspill/air.html#datarep> (last visited Sept. 14, 2011). Reports about ongoing response and restoration efforts are located at <http://www.RestoreTheGulf.gov>.

¹⁴⁰ Damian Carrington, *Extreme Weather Forecasts: Web Users Unite to Power Climate Change Project*, GUARDIAN (London), Nov. 17, 2010, available at <http://www.guardian.co.uk/environment/2010/nov/17/weatherathome-climate-change-weather-project>.

¹⁴¹ Darcy Henton, *Internet monitoring system protects farmers from sour gas*, EDMONTON JOURNAL, May 18, 2011, <http://www.canada.com/edmontonjournal/news/story.html?id=e9ac172d-54d6-48d6-94df-ecbc9873661c>.

¹⁴² See, e.g., Lisa Song, *Inside Climate News*, <http://solveclimatenews.com/news/20110425/mit-web-tools-landowners-natural-gas-landmen> (May 1, 2011) (stating that online

marketing of technologies, changing products and services in environmentally friendly ways.¹⁴³

C. *Expanding Participation in Policy Deliberation*

Environmental law has been shaped by different legislative and regulatory strategies, as well as by diverse political and theoretical viewpoints.¹⁴⁴ Recently the law seems to be in a state of turmoil, though perhaps this is a sign of transition. It is commonly remarked that environmental legislation cannot be enacted today in the United States. One reason may be that environmental problems are inherently difficult to address.¹⁴⁵ Also, complex phenomena, like climate change and low-dose chemical toxicity, push hard on the limitations of existing approaches. In addition, there are troubling indications of excessive agency dependence upon regulated industries. Empirical research suggests that current regulation actually provides little real access for would-be participants, “outsiders” who are neither industry nor agency personnel.¹⁴⁶

technologies developed at MIT’s Center for Future Civic Media in 2008, in the midst of the Marcellus fracking boom, are gaining users confronted with land use choices).

¹⁴³ It is generating new forms of individual and collaborative consumer behavior, such as time-sharing of cars. It took Zipcar six years to build a fleet of 1000 cars, but it took WhipCar, which facilitates sharing of personal cars, only six months to put 1000 cars into service. Todd Woody, *Can peer-to-peer sharing green the planet?*, Grist, March 18, 2011, www.grist.org/cleantech/2011-03-17-can-peer-to-peer-sharing-green-the-planet.

¹⁴⁴ See Neil Gunningham, *Environmental Law, Regulation, and Governance: Shifting Architectures*, 21 J. ENVTL. L. 179 (2009) (overview of the development of environmental law); DANIEL J. FIORINO, *THE NEW ENVIRONMENTAL REGULATION* (MIT Press 2006); Craig Anthony (Tony) Arnold, *Fourth-Generation Environmental Law: Integrationist and Multimodal*, 35 WM. & MARY ENVTL. L. & POL’Y REV. 771 (2011) (identifies four stages in the evolution of environmental law, each one still functioning with the others).

¹⁴⁵ Talbot Page has provided a useful framework. Talbot Page, *A Generic View of Toxic Chemicals and Similar Risks*, 7 ECOLOGY L.Q. 207 (1978). Page discusses nine characteristics of environmental risk: four are related to the “zero-to-infinity” dilemma that such risks pose (ignorance of mechanism, the potential for catastrophic costs, relatively modest benefit of taking the risk and low subjective probability), and five are associated with institutional management (internal transfer of benefits, external transfer of costs, the collective nature of the risks borne by many people at once, latency of many years between initiation of a hazard and the appearance of its effects, and irreversibility). This array of factors hinders understanding and blocks an easy distribution of costs and benefits among different social groups. Both technical and political questions are salient in any environmental decision-making process.

¹⁴⁶ Wendy Wagner et al., *Rulemaking in the Shade: An Empirical Study of EPA’s Air Toxic Emission Standards*, 63 ADMIN. L. REV. 99 (2011). See Zygmut Plater’s discussion of local citizen involvement through regional councils, *supra* note 107.

In the absence of federal leadership, state and local governments have taken the initiative in legislating, regulating, and planning for climate change.¹⁴⁷ Federal innovations also are possible within existing statutes. For instance, it has been suggested that NEPA assessments could be more effective if they took advantage of information and computing technologies.¹⁴⁸ The “worst case scenario” dimension of regulated operations could be reinstated and updated to incorporate contemporary understanding of the ways that industry management and operators become habituated to risks.¹⁴⁹ Strengthening and clarifying existing approaches is a promising avenue.¹⁵⁰

A growing literature examines the promise and perils of implementing more “deliberative” processes in environmental management. Deliberative approaches make widespread participation an essential component of policy development. Democratic discourse seems promising in the environmental context, where distributed ecological and economic tensions require distributed responses.¹⁵¹ Yet adding process

¹⁴⁷ State, local and civil society initiatives to address climate change are surveyed in John R. Nolon and Patricia E. Salkin, *CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT LAW* (West 2011).

¹⁴⁸ Daniel A. Farber, *Adaptation Planning and Climate Impact Assessments: Learning From NEPA's Flaws*, 39 ELR 10605 (2009).

¹⁴⁹ See Houck, *supra* note 103.

¹⁵⁰ Shapiro & Steinzor, *supra* note 96; Karkkainen, *supra* note 78; Michael Ray Harris, *Environmental Deliberative Democracy and the Search for Administrative Legitimacy: A Legal Positivism Approach*, 44 U. MICH. J.L. REFORM 343 (2011); Richard J. Lazarus, *Congressional Descent: The Demise of Deliberative Democracy in Environmental Law*, 94 GEO. L.J. 619 (2006); Amy Sinden, *In Defense of Absolutes: Combating the Politics of Power in Environmental Law*, 90 IOWA L. REV. 1405 (2005); David M. Driesen & Amy Sinden, *The Missing Instrument: Dirty Input Limits*, 33 HARV. ENVTL. L. REV. 65 (2009).

There is an extended debate about what qualifies as “rational” decision-making in environmental law. Fundamental disagreement persists between advocates of incremental “balancing” approaches, and advocates of limits determined by ecological principles. This topic is beyond the scope of this article, but a useful introduction is provided by Daniel A. Farber, *Taking Responsibility for the Planet*, 89 TEX. L. REV. 147 (2010), reviewing Douglas A. Kysar, *REGULATING FROM NOWHERE: ENVIRONMENTAL LAW AND THE SEARCH FOR OBJECTIVITY* (Yale Univ. Press 2010).

¹⁵¹ When Henry Perritt called the internet “the ultimate civic tool,” he named the thing we want the most from it. Perritt, *supra* note 2, at 324. The National Research Council’s *PUBLIC PARTICIPATION IN ENVIRONMENTAL ASSESSMENT AND DECISION MAKING* (National Academy Press 2008) is an extended consideration of the value of participation and an assessment of the tools available to increase deliberation in environmental law and management. See also Andrew Long, *Global Climate Governance to Enhance Biodiversity and Well-Being: Integrating Non-State Networks and Public International Law in Tropical Forests*, 41 ENVTL. L. 95 (2011); Beth S. Noveck & David R. Johnson, *A Complex(ity) Strategy for Breaking the Logjam*, 17 N.Y.U. ENVTL. L.J. 170 (2008); Asher Alkoby, *Global*

in this way may not actually be effective; deliberative processes might distract from, and not improve, environmental performance.¹⁵² It is too soon to tell whether deliberative governance will succeed in the environmental field. Work is being done to design deliberative processes to function effectively in this setting.¹⁵³ We are also learning to see the institutional context of environmental law differently.¹⁵⁴ If environmental law is to succeed, it will have to address multiple complex interests and goals. To develop the capacity to deliberate and manage the next stage of environmental law, we will need to rely on the internet.

III. LESSONS FROM THE SPILL

“The Gulf of Mexico oil blowout carries the emotional wallop and learning potential of a near-death experience,” Dan Bednarz blogged in June 2010.¹⁵⁵ The metaphor resonates, but what did we learn? In

Networks and International Environmental Lawmaking: A Discourse Approach, 8 CHI. J. INT’L L. 377 (2008); Hari M. Osofsky & Janet Koven Levit, *The Scale of Networks?: Local Climate Change Coalitions*, 8 CHI. J. INT’L L. 409, 410 (2008) (explaining that many U.S. cities and counties played a crucial role in international coalitions of localities trying to make progress on greenhouse gas emissions); Hari M. Osofsky, *The Intersection of Scale, Science, and Law in Massachusetts v. EPA*, 101 AM. SOC’Y. INT’L L. PROC. 61 (2007) (suggesting that one of the greatest obstacles to effective regulation of climate change is that greenhouse gas emissions are foundationally multiscale – able to be studied and acted on either at large or smaller scales – making it difficult to properly frame a legal debate about them).

¹⁵² See Gregory N. Mandel, *Technology Wars: The Failure of Democratic Discourse*, 11 MICH. TELECOMM. & TECH. L. REV. 117 (2005) (surveying social and political debates over risky technologies, their sociological and psychological aspects, and proposed responses).

¹⁵³ See National Research Council, PUBLIC PARTICIPATION, *supra* note 151; Michael N. Widener, *Bridging the Gulf: Using Mediated, Consensus-Based Regulation to Reconcile Competing Public Policy Agendas in Disaster Mitigation*, 74 ALB. L. REV. 587 (2011) (suggesting adapting mediated collective bargaining to the environmental setting); Susan Sturm, *Activating Systemic Change Toward Full Participation: The Pivotal Role of Boundary Spanning Institutional Intermediaries*, 54 ST. LOUIS U. L.J. 1117 (2010); Noveck & Johnson, *supra* note 151; Beth Simone Noveck, *The Electronic Revolution in Rulemaking*, 53 EMORY L.J. 433 (2004).

¹⁵⁴ See Claire Moore Dickerson, *Corporations as Cities: Targeting the Nodes in Overlapping Networks*, 29 J. CORP. L. 533 (2004) (extending analysis of corporations to internal relationships beyond manager-shareholder duties).

¹⁵⁵ Bednarz continued, “First, it certifies that the age of cheap and plentiful oil is over. Second, it reveals that our collective faith in technology to overcome any challenge posed by nature is a dangerous delusion. Third, it may be the event that sets our nation on the path to genuine economic and ecological sustainability. . . .” Dan Bednarz, *Deepwater Horizon and the Addiction to Growth*, <http://healthafteroil.wordpress.com/2010/06/02/deepwater-horizon-and-our-addiction-to-growth>.

particular, what did the experience show us about the internet and environmental management?

Certainly the internet was extremely helpful. Online resources were important for public information, and they facilitated understanding. The situation yielded many stories that demonstrate the resourcefulness of community groups, scientists, and others who responded to the Spill's effects and educated each other and the public.

What about the main story – the Spill itself and its management? The internet allowed us to see how inadequate BP's response was, with limited and ineffectual resources brought to bear on the emergency. BP's response plan was "spectacularly at odds with reality."¹⁵⁶ Certainly it bore no resemblance to ecosystems-based management. Yet, while BP's performance was poor, it was not out of line with the industry record. Deep sea oil drilling is dangerous but profitable, and it has been largely sheltered from outside scrutiny. The likelihood of a major accident and the industry's lack of capacity to manage one have not usually been apparent to the larger community.

The market system that dominates environmental management not only shaped the management of the Spill, but it also limited our ability to consider what might (and in fact did) happen. The drilling technology itself was not public and therefore was difficult to assess. During the Spill, crucial information was withheld. For example, BP was reported to be reluctant to release video of the "leak," because the company considered it proprietary.¹⁵⁷ Also, BP did not seek assistance from other companies until the government pushed it to do so.¹⁵⁸ The

¹⁵⁶ FREUDENBERG & GRAMLING, *supra* note 9, at 157.

¹⁵⁷ *After Oil Rig Blast, BP Refused to Share Underwater Spill Footage*, ABC World News, May 12, 2010, <http://abcnews.go.com/Blotter/bp-oil-spill-oil-rig-blast-bp-refused/story?id=10624972> (footage that could help in independent assessments of the scope of the spill but would also do public relations damage to BP has remained closely guarded under the argument that it is "proprietary," according to Coast Guard officials). Similarly, Nalco, the manufacturer of Corexit, disclosed the ingredients in its product, but would not disclose the relative amounts of each ingredient; it did authorize EPA to disclose that information to outside labs for testing purposes. However, in light of the massive amounts being dumped into the Gulf, some lawmakers and others argued that Nalco should reveal all of the safety information it had. Anne C. Mulkern, *Maker of Controversial Dispersant Used in Gulf Oil Spill Hires Top Lobbyists*, N.Y. TIMES, June 25, 2010, <http://www.nytimes.com/gwire/2010/06/25/25greenwire-maker-of-controversial-dispersant-used-in-gulf-94328.html?pagewanted>.

¹⁵⁸ One senior Coast Guard official challenged BP's definition of "availability" of options. He suggested that BP did not consider other actions, such as procuring ships on

National Commission reported that during the Spill, BP limited its cooperation with the government's effort to evaluate response options. In mid- to late June, government teams began to seek more frequent input from other oil companies, primarily through conference calls of thirty or more people.¹⁵⁹ BP had previously asked other companies discrete questions about aspects of source control, but the government teams asked the industry to comment on BP's overall plans and to help force BP to consider contingencies.¹⁶⁰ BP did not appreciate the increased industry involvement. After one meeting in which its competitors aggressively challenged its plans, BP refused to meet with them again, forcing the government teams to schedule separate meetings.¹⁶¹

BP's failure to immediately disclose the amount of the discharge also illustrates the distortions of the current system. The Union of Concerned Scientists has reported that independent scientists always estimated that the discharge was greater than government scientists said.¹⁶² It has also been suggested that BP's early numbers were manipulated by BP to slow a drop in the company's stock price and that BP employees may have traded stock based on their knowledge of the size of the accident; the size of the Spill also affects the fines the company must pay.¹⁶³ Apparently, "normal" market-based responses to the market situation, including inter-firm rivalry, hindered responses to the Spill.¹⁶⁴

charter with other companies, until the government pushed it to do so. NATIONAL COMMISSION ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, *DEEP WATER: THE GULF OIL DISASTER AND THE FUTURE OF OFFSHORE DRILLING* 160-62 (2011).

¹⁵⁹ *Id.* at 161.

¹⁶⁰ *Id.* at 162.

¹⁶¹ *Id.* at 269.

¹⁶² A summary and timeline of the disclosure story is provided in Union of Concerned Scientists, *Deepwater Horizon Oil Spill: Amount of Oil*, http://www.ucsusa.org/scientific_integrity/abuses_of_science/deepwater-horizon-oil-spill.html. The role of Skytruth in the early events is reported by the New York Times. Justin Gillis, *Oil Spill, Redux: Revisiting a Mystery*, N.Y. TIMES, Feb. 4, 2011, <http://green.blogs.nytimes.com/2011/02/04/oil-spill-redux-revisiting-a-mystery>. A technical discussion of the estimate has been provided by Ian McDonald. Ian McDonald, *Deepwater Disaster: How the Oil Spill Estimates Got It Wrong*, SIGNIFICANCE, Dec. 2010, available at http://ocean.fsu.edu/faculty/macdonald/pubs/macdonald_significance_2010.pdf.

¹⁶³ Tom Fowler, *Feds Investigating BP Over Spill Estimates - Numbers Could Have Cushioned Stock Losses*, HOUSTON CHRONICLE, Feb. 18, 2011, <http://www.chron.com/disp/story.mpl/business/energy/7435460.html> (reporting that federal investigators were looking into whether BP misrepresented how much it knew and possible bases for liability).

¹⁶⁴ See Plater, *supra* note 107; Steinzor, *supra* note 108. It should be possible to provide tighter and more innovation-oriented framework, as the EU has done with REACH. See Motaal, *supra* note 121. Wendy Wagner has proposed another approach to limiting and

The new federal response plan, designed by a private consortium, continues in many respects with the current model, effectively relying on the expertise and management capacities of particular companies. What options may be ignored in this privately managed organization?¹⁶⁵

When the Spill happened, there should have been a way to get the facts out quickly and to have them evaluated by trusted sources. Processes should be transparent and speedy in a public emergency. Could we have a different process for disaster response in this kind of situation? Ryan Martens, associated with Engineers Without Borders, presents an alternative vision. In an essay he starts the clock over on the Spill and explores an “open source” approach to developing a response: full transparency, a team pulled together right away from the best engineering departments of academia, industry, and government, all open on the web for further review and participation.¹⁶⁶ Instead of a patchwork of private and government managers, with their limited information silos and conflicted priorities, and academic scientists with their hands tied by confidentiality agreements, why not have an independent body that has access to all of the information and all of the expertise?

When we want to invest in finding out difficult things, we do so.¹⁶⁷ However, we did not prepare to manage the Spill. As Professor Houck has put it, “Scarce information was available to provoke questions and there was no ready vehicle to ask them.”¹⁶⁸ Appropriate vehicles could

using existing incentives. See generally Wendy Wagner, *Using Competition-Based Regulation to Bridge the Toxics Data Gap*, 83 IND. L.J. 629 (2008) (outlining regulatory design that would harness rivalry in the interest of improving EHS performance).

¹⁶⁵ For instance, ocean spills from tanker accidents have been reduced in part because tankers must now have double hulls, a requirement the industry resisted for years. Why should deep sea drilling not be required to normally proceed with relief wells drilled simultaneously with the main well? See Arne Jernelöv, *How to defend against future oil spills*, NATURE, July 8, 2010, at 182-83.

¹⁶⁶ See Posting of Ryan Martens to Agile Blog, http://www.rallydev.com/agileblog/2010/06/what-would-a-citizen-engineer-do-the-gulf-coast-oil-spill/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+agilecommons%2Fcommonsblog+%28Agile+Blog%29 (June 2, 2010).

¹⁶⁷ Although environmental policy decisions are constructed as technical and scientific problems, they are fundamentally political. See BRUNO LATOUR, *POLITICS OF NATURE: HOW TO BRING THE SCIENCES INTO DEMOCRACY* 9-25 (Catherine Porter trans., Harvard Univ. Press 2004).

¹⁶⁸ Houck, *supra* note 100, at 16.

be put in place. Professor Plater describes the achievements and difficulties of RCACs in Alaska and points out that

Institutionalizing the presence of independent at-risk citizen monitors . . . fundamentally changes the centripetal tendency of bi-polar industry-agency structures, opening them to transparency, increased compliance, and care-enhancing public awareness.¹⁶⁹

Professor Steinzor recommends reforms that would mandate best available “failsafe” technology and require companies to train workers to use it. In addition, she points out that

compliance documents should be transparent and available not just to regulators, but to private sector overseers who can hold them accountable, including inspectors general, The Government Accountability Office, public interest groups, the insurance industry, and investment firms.¹⁷⁰

These suggestions are not novel, but consistent with the mainstream of regulatory practice and scholarship.¹⁷¹

Broad disclosure is resisted not only for commercial reasons, but also because of fears about how people will react. With more information, citizens might push for greater safety and, if an accident occurs, they might be difficult to manage. Yet when the Spill happened many citizens “owned” the situation and reacted in rational and organized ways. The reflex to take calm action is not what experts expect from ordinary people. Indeed, they expect panic and therefore restrict the information available to the public. But there is reason to believe that people do not panic and that it is worthwhile to include them in planning processes and in responses.¹⁷² The internet supports the capacity for planning and carrying out rational responses to emergencies.

We live within the larger system of disempowering and environmentally destructive technologies, but the internet empowers human ecological agency. It enables sustained consideration of the needs of

¹⁶⁹ Plater, *supra* note 107, at 26.

¹⁷⁰ Steinzor, *supra* note 108, at 421.

¹⁷¹ See *supra* text accompanying notes 75-89.

¹⁷² See ELAINE SCARRY ET AL., WHO DEFENDED THE COUNTRY? 20-34 (Joshua Cohen & Joel Rogers eds., Beacon Press 2003) (only the passengers on United Flight 93 had the information and the clear moral authority to act to defend the ground they were standing on); CLARKE, *supra* note 109, at 19, 24-25, 39-40 (officials planning for disasters misunderstand citizen reaction and so omit them from the plans); BARUCH FISCHHOFF, *Behaviorally Realistic Risk Management*, in ON RISK AND DISASTER: LESSONS FROM HURRICANE KATRINA, 77-88 (2006) (noting that risk managers’ and planners’ ordinary biases, including underestimating the public’s competence, affect planning and response systems).

the ecosphere under pressure from the technosphere. Andrew Feenberg has incisively described this moment:

Technological advance unleashes social tensions whenever it slights human and natural needs. Because the system is not a self-contained expression of pure technical rationality but emerged from two centuries of deskilling and abuse of the environment, such slights occur often. Vocal technical publics arise around the resulting problems. Demands for change reflect aspects of human and natural being denied by the technical code of the system. The internet provides a scene on which dystopia is overcome in a democratizing moment the full extent of which we cannot yet measure.¹⁷³

The responses to the Spill are an example of this phenomenon.

The March 2011 Fukushima nuclear disaster, which seemed to follow the Spill almost immediately, presents another such democratizing moment. Outside the immediate vicinity of the crippled Fukushima reactors, government monitoring stations were few and far between, at least through May of 2011.¹⁷⁴ Not trusting official announcements of radiation levels, civic groups and individuals began monitoring radiation levels. For example, Atshuhito Ennyu, a geochemist who was concerned about his children's exposure, spent his spare time for ten weeks taking his own measurements and posting them on a web site.¹⁷⁵ Local governments gradually began to order radiation checks in schools and other public places and posted the information on their sites. The new data changed the picture of contamination, showing some hot spots surprisingly far from the reactors. An anonymous volunteer plotted the available data points on a map, and a volcanologist at Gunma University, turned that plot into a radiation contour map.¹⁷⁶ It showed two belts of radiation, one reaching 225 kilometers to Tokyo and another extending to the southwest.¹⁷⁷ The risks of the radiation levels revealed were then debated, and the government increased its monitoring.¹⁷⁸ The Fukushima crisis replicates many of the themes of the Gulf Spill, both in its causes and the responses to it.

¹⁷³ ANDREW FEENBERG, *BETWEEN REASON AND EXPERIENCE: ESSAYS IN TECHNOLOGY AND MODERNITY* 61 (MIT Press 2010).

¹⁷⁴ In one 5150 square kilometer area adjacent to Tokyo, there was just one monitor. Dennis Normile, *Citizens Find Radiation Far From Fukushima*, *SCIENCE*, June 17, 2011, at 1368.

¹⁷⁵ *Id.*

¹⁷⁶ *Id.*

¹⁷⁷ *Id.*

¹⁷⁸ *Id.* See Deena Prichep, *Safecast Website Crowdsources and Aggregates Radiation Data on Japan*, *THE WORLD*, June 23, 2011, <http://www.theworld.org/2011/06/safecast-website-crowdsources-and-aggregates-radiation-data-on-japan/> (website aggregating and creat-

The experience of the Spill suggests the potential for greater public deliberation on environmental policy. Over time, the assertion that some aspects of our economy cannot be made entirely safe somehow has been translated into an assumption that we must live with numerous catastrophic risks. The fact that some big risks may be hard to eliminate should instead indicate that we should conduct an organized public discussion of the pros and cons of each technology that poses these risks. What is at stake? What are the alternatives?

Maarten Hajer has proposed a format for deliberation, a “societal inquiry” on important public questions, in order to explore them fully.¹⁷⁹ He suggests that the process take place in a formal, open-ended setting that would draw together all the relevant strands of discussion to allow extended interplay among viewpoints.¹⁸⁰ This would be a more focused version of what we are trying to do, piece by piece, in the environmental movement. Yet in the United States, at least, there has been little dialogue among different viewpoints.¹⁸¹ The methods being developed for “deliberate democracy” could facilitate dialogue.¹⁸² They might help us get beyond episodic glimpses of complex facts and the procession of panels that “balance” opposing positions on complex issues. Such a forum could address our larger options going forward.

For instance, energy conservation, including individual and local initiatives, holds great promise as a “new” energy source, yet debates on energy policy frequently limit the options narrowly, considering only big technologies.¹⁸³ An important lesson from the EU’s REACH

ing Japanese radiation data is coming from a small advertising studio in Portland, Oregon; the project just completed fundraising to send 600 Geiger counters to Japan).

¹⁷⁹ See MAARTEN A. HAJER, *THE POLITICS OF ENVIRONMENTAL DISCOURSE: ECOLOGICAL MODERNIZATION AND THE POLICY PROCESS* 288 (Oxford Univ. Press 1995).

¹⁸⁰ See *id.* at 288-92.

¹⁸¹ See generally Mary L. Lyndon, *Climate Change, Opinions, and Imagination: Toward a New Ethic of Curiosity*, in *MORAL IMPERIALISM: A CRITICAL ANTHOLOGY* 320 (Berta Esperanza Hernández-Truyol ed., NYU Press 2002).

¹⁸² The emerging literature on deliberative collaboration will be helpful in the design of such processes (See text accompanying notes 151-154).

¹⁸³ See, e.g., PERROW, *THE NEXT CATASTROPHE*, *supra* note 104, at xxix – xlviii; FREUDENBERG & GRAMLING, *supra* note 9, at 182-184; see also Philip Cafaro, *Beyond Business as Usual: Alternative Wedges to Avoid Catastrophic Climate Change and Create Sustainable Societies*, in *THE ETHICS OF GLOBAL CLIMATE CHANGE* (Denis G. Arnold ed., Cambridge Univ. Press 2011). Cafaro points out that most treatments of climate change mitigation options take current projections of economic growth for granted and limit the discussion to technological alternatives. See, e.g., Stephen Pacala & Robert H. Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies*, *SCIENCE*, Aug. 13, 2004, at 968-72. Yet, argues Cafaro, other adjustments (increased

program is that taking a whole complex problem and developing a plan for it is still possible, especially once the need for limits is accepted. The internet could support such a “societal inquiry,” with the kind of platform that the SIEFs provide in the REACH scheme, but designed instead to involve wide segments of the society in learning and problem solving.¹⁸⁴

According to Sheila Jasanoff, “the question confronting the governance of science is how to bring knowledgeable publics into the front end of scientific and technological production – a place from which they have historically been strictly excluded.”¹⁸⁵ Indeed, she maintains, “Scattered and private knowledge has to be amalgamated, perhaps even disciplined, into a dependable civic epistemology.”¹⁸⁶ Dr. Jasanoff calls attention to the

‘technologies of humility’ to complement the predictive approaches: to make apparent the possibility of unforeseen consequences; to make explicit the normative that lurks within the technical; and to acknowledge from the start the need for plural viewpoints and collective learning.¹⁸⁷

Accomplishing this shift seems to be imperative. To do it, we will need to maintain network neutrality and improve the availability of online

energy conservation, adjusting rates of consumption and growth, and strategies to limit population) are also promising. The internet itself provides an example of energy use and conservation. Does the internet use too much energy? See Bobbie Johnson, *How much energy does the internet really use?*, THE GUARDIAN, May 14, 2009, <http://www.guardian.co.uk/technology/2009/may/14/internet-energy-savings>; Posting of Joe Romm to Think Progress, <http://thinkprogress.org/romm/2010/06/21/206254/internet-energy-use-myth> (June 21, 2010, 12:28 p.m.). Do different information technologies and applications have different energy footprints and can innovations affect their impacts? See Posting of Gabriel to Info Green Global, <http://infogreenglobal.com/energy-efficiency-for-internet-servers-with-new-computer-memory-device/> (Jan. 20, 2011); Tiffany Hsu, *Cloud computing and Internet use suck energy, emit CO2, says Greenpeace*, L.A. TIMES, Apr. 22, 2011, <http://latimesblogs.latimes.com/technology/2011/04/greenpeace-report-cloud-and-internet-use-sucks-energy-emits-co2.html>.

¹⁸⁴ The internet already supports similar projects. See, e.g., Valerie J. Brown, *Are We on the Same Page? Action Agenda of the National Conversation on Public Health and Chemical Exposures*, 119 Environmental Health Perspectives a484-a487 (Nov. 1, 2011) (two-year broad-based dialogue, led by leaders in the field of chemical regulation and health, aimed to revitalize management of hazardous industrial and naturally occurring chemicals and produced report with recommendations for changes in law and practice of chemical management).

¹⁸⁵ Jasanoff, *supra* note 92, at 235.

¹⁸⁶ *Id.* at 240.

¹⁸⁷ *Id.*

resources. Internet “objectivity” is also an essential principle.¹⁸⁸ Once the environmental role of the internet is understood, it becomes clear that it would be foolhardy to restrict its many uses.

CONCLUSION

Pascal’s words, quoted at the start of this essay, evoke the awe and uncertainty of living in an infinitely connected, living world.¹⁸⁹ This is the subject matter of ecosystem management and environmental law.¹⁹⁰ Historically, human societies have needed to know the conditions of their geographic situation. Place-based strategies for ecological management, with dynamic flows of information and policy, are necessary. The question is how to make them work.

When the internet emerged, it generated excitement and relief. “Just in time!” It was what we needed and there was a distinct pleasure in feeling the disabilities of distance lessen: we could begin to see and study human ecological impacts in fine detail and also at larger scales. Environmental practice has quickly evolved with the support of the internet. Certainly, we do not want to return to pre-internet limitations on participation and understanding. The environmental stories with an open internet are infinitely better than those without it.

¹⁸⁸ Frank Pasquale has examined the problem of search engines’ effects on public debate, such as BP’s purchase of strategic search positions during the Spill. See generally Frank Pasquale, *Search, Speech, and Secrecy: Corporate Strategies for Inverting Net Neutrality Debates*, 29 *YALE L. & POL’Y REV. INTER ALIA* 25 (2010) (personalization of search results shapes the content of the information different groups receive). Assertions of proprietary rights over information that should be in the public domain are also a pervasive problem. Pasquale has examined secrecy and transparency on the Web. See generally Frank Pasquale, *Restoring Transparency to Automated Authority*, 9 *J. TELECOMM. & HIGH TECH. L.* 235 (2011). See also Levine, *Secrecy and Unaccountability*, *supra* note 43; Lyndon, *supra* note 2, at 470-90.

¹⁸⁹ See Pascal, *supra* note 1.

¹⁹⁰ See generally Todd Aagaard, *Environmental Law as a Legal Field: An Inquiry in Legal Taxonomy*, 95 *CORNELL L. REV.* 221 (2010); Daniel A. Farber, *Probabilities Behaving Badly: Complexity Theory and Environmental Uncertainty*, 37 *U.C. DAVIS L. REV.* 145 (2003); Pardy, *supra* note 130; Chen, *supra* note 2.

Addendum: The Story of the BP Oil Spill

JAMES E. DARLING*

The Blowout

On April 20, 2010, the Deepwater Horizon Rig was located forty-two miles south of Venice, Louisiana, in the Gulf of Mexico.¹ Its crew was capping a well they had drilled 13,000 feet into the seabed under 5,000 feet of water.² At 11 p.m. EST, the rig exploded leaving eleven people dead.³ The Deepwater Horizon, valued at over \$560 million, was built by Hyundai Heavy Industries in South Korea and delivered to its owner, Transocean, in 2001.⁴ It was considered the pinnacle of Transocean's fleet,⁵ a state of the art facility with an excellent safety record.⁶

The explosion was later found to be a direct result of a methane bubble that escaped from the well into the drill column and leaked through a faulty cement job before igniting – a “blowout.”⁷ Prior to the explosion, the Deepwater crew conducted pressure tests which should have led them to discover the methane bubble. Moreover, the rig was equipped with a blowout preventer (“BOP”), a five-story,

* Student, St. John's University School of Law

¹ Erwin Seba et al., *Timeline: Gulf of Mexico oil spill*, REUTERS, June 1, 2010, <http://www.reuters.com/article/idUSTRE6503IJ20100601>.

² NATIONAL COMMISSION ON THE BP DEEPWATER HORIZON OIL SPILL AND OFFSHORE DRILLING, *DEEP WATER: THE GULF OIL DISASTER AND THE FUTURE OF OFFSHORE DRILLING* 103 (2011) [hereinafter *BP Commission Report*], available at http://www.oilspillcommission.gov/sites/default/files/documents/DEEPWATER_ReporttothePresident_FINAL.pdf.

³ Seba et al., *supra* note 1.

⁴ *BP Oil Spill Timeline*, THE GUARDIAN, July 22, 2010, <http://www.guardian.co.uk/environment/2010/jun/29/bp-oil-spill-timeline-deepwater-horizon>.

⁵ *BP Commission Report*, *supra* note 2, at 3.

⁶ WILLIAM R. FREUDENBERG & ROBERT GRAMLING, *BLOWOUT IN THE GULF – THE BP OIL SPILL DISASTER AND THE FUTURE OF ENERGY IN AMERICA* ix (2010).

⁷ *BP blowout preventer brought aboard vessel*, MSNBC, Sept. 5, 2010, http://msnbc.msn.com/id/39005773/ns/us_news-environment/.

900,000-ton device on the sea floor.⁸ The BOP was intended to seal the well pipe at the ocean floor if it received an emergency signal from the rig.⁹ A signal was sent after the initial explosion, but the BOP never activated.¹⁰ The BOP also was set to automatically seal the well if it lost contact with the rig, but failed to do so.¹¹

In early May, BP began a series of efforts to stop the leak. BP first tried to stop the leak by sending submersible robots to manually activate the malfunctioning blowout preventer. The sources of the leaks were three holes in the riser pipe above the BOP, so activating the BOP would completely stop the spill.¹² The robots failed to shut the BOP and BP subsequently gave up on that strategy.¹³ BP also prepared to install a shut-off valve on one of the three leaks on the riser pipe underwater,¹⁴ and began to dig a relief well designed to alleviate the oil pressure causing the leak on the sunken rig.¹⁵

On May 5, BP announced that it had successfully installed the shutoff valve and capped one of the three leaks.¹⁶ The cap was not expected to reduce oil flow; rather, it was intended to reduce the number of leak points on the ocean floor, enabling BP to drop a 100-ton containment dome over the remaining leaks.¹⁷ On May 6, the containment dome arrived and was placed over the remaining leaks, but could not be kept in place and was deemed a failure.¹⁸ Hydrates, which are

⁸ Brian Ross, *BP Releases Oil Spill Video After Pressure From White House and Media*, ABC NEWS, May 12, 2010, <http://abcnews.go.com/Blotter/bp-releases-oil-spill-video-pressure-white-house/story?id=10629165>.

⁹ *BP Commission Report*, *supra* note 2, at 114.

¹⁰ *Id.* at 105-09, 114.

¹¹ *Id.* at 114-15. A government-funded investigation recently concluded that the BOP malfunctioned as a result of a design flaw. The force of the blowout bent the drill pipe, jamming the device and preventing the BOP from closing. This raises serious questions about the efficacy of BOPs, most of which have the same basic design as Deepwater Horizon's. See Ben Casselman & Russell Gold, *Device's Design Flaw Let Oil Spill Freely*, WALL ST. J., Mar. 24, 2011, <http://online.wsj.com/article/SB10001424052748704050204576218653335935720.html>.

¹² Campbell Robertson & Henry Fountain, *BP Moves to Fix a Leak as Obama Warns of Damage*, N.Y. TIMES, May 3, 2010, at A1, available at <http://www.nytimes.com/2010/05/03/us/03spill.html?>

¹³ *BP Commission Report*, *supra* note 2, at 137-38.

¹⁴ *Id.*

¹⁵ *Id.* at 132.

¹⁶ *BP stems one of three Deepwater Horizon oil leaks, US coastguard says*, THE GUARDIAN, May 5, 2010, <http://www.guardian.co.uk/environment/2010/may/05/bp-stems-oil-leak-deepwater-horizon>.

¹⁷ *Id.*

¹⁸ *BP Commission Report*, *supra* note 2, at 145-46.

ice-like crystals that are lighter than water, had formed inside of the dome and prevented the dome from functioning properly.¹⁹

Following the failure of the containment dome, BP's next plan was to use a "junk shot" in conjunction with a top kill.²⁰ A junk shot inserts plastic debris into the bottom of a BOP to clog it and stop or slow the flow of oil.²¹ A top kill is a technique in which drilling mud is pumped into the BOP at pressures high enough to counteract the flow of oil and force it back into the reservoir.²² BP attempted the top kill three times in conjunction with numerous junk shots between May 26 and 28, but failed to plug the leak.²³ President Obama, upon being briefed by aides of the failure, stated, "Plug the damn hole."²⁴

BP had some success using devices to collect the flowing oil. On May 14 it threaded a smaller tube into the leaking riser pipe in order to siphon the oil,²⁵ and on May 17 it announced that the threaded tube was successfully siphoning oil to the surface.²⁶ BP was only able to collect 22,000 barrels over its nine days of use, a figurative drop in the bucket.²⁷ On June 1, BP installed a new collection device, the "top hat," on the BOP.²⁸ The "top hat" was similar to the containment dome, but engineers prevented hydrates from forming on it by pumping methanol into it.²⁹ By June 8 the top hat was collecting 15,000 barrels per day via a new riser.³⁰ BP also developed a system to collect

¹⁹ *Id.*

²⁰ *Id.* at 149. The techniques had been used to plug leaks in shallow-water wells, but had never been attempted in deep water.

²¹ Adam Gabbatt, *Gulf oil spill: plugging the leak*, THE GUARDIAN, May 10, 2010, <http://www.guardian.co.uk/environment/blog/2010/may/10/deepwater-horizon-oil-spill-oil-spills>.

²² *BP Commission Report*, *supra* note 2, at 149.

²³ *Id.* at 150.

²⁴ Steve Holland, *Obama wants to "plug the damn hole"*, REUTERS, May 25, 2010, <http://www.reuters.com/article/idUSTRE64O6Z720100526>.

²⁵ *BP using undersea robots to try to plug Gulf oil leak*, THE GUARDIAN, May 14, 2010, <http://www.guardian.co.uk/environment/2010/may/14/bp-robots-gulf-oil-leak>.

²⁶ Ed Pilkington, *Submerged oil plumes suggest gulf spill is worse than BP claims*, THE GUARDIAN, May 17, 2010, at 13, available at <http://www.guardian.co.uk/environment/2010/may/16/gulf-oil-spill-bp>.

²⁷ *BP Commission Report*, *supra* note 2, at 146.

²⁸ *Id.* at 159.

²⁹ Clifford Krauss & Michael Cooper, *Cap Slows Gulf Oil Leak as Engineers Move Cautiously*, N.Y. TIMES, June 6, 2010, at A20, available at <http://www.nytimes.com/2010/06/06/us/06spill.html>.

³⁰ *BP Commission Report*, *supra* note 2, at 159.

an additional 10,000 barrels per day via the choke line of the BOP.³¹ However, these efforts proved insufficient to stop the flow.³²

Following the failure of the top kill, BP and the government decided to try to attach a “capping stack” to the top of the BOP. A capping stack is essentially a smaller version of a BOP and, once properly installed, can seal a well.³³ On July 9, the Coast Guard gave BP the go-ahead to install, but not to close, the capping stack.³⁴ On July 12, in what was described as an extremely complicated operation, BP successfully installed the stack.³⁵ BP next wanted to temporarily close the capping stack as part of a “well integrity test” to determine whether the increase in pressure to the well would cause oil to leak out of the blowout preventer into the surrounding bedrock. The government, warned by other oil companies that the move could cause permanent damage to the well, delayed the test.³⁶ Industry experts feared the added pressure might even cause an underground blowout that could liquefy the sand around the blowout preventer and cause it to fall into the sea floor, resulting in a significant portion of the reservoir’s remaining oil flooding the Gulf.³⁷

Despite the extreme risk associated with closing the well, the government ultimately decided to allow the test to proceed, and on July 15, the stack was shut, stopping the flow of oil eighty-seven days after it began.³⁸ Though the closing was meant as an initial test of the well, the stack was never reopened; encouraged by pressure readings consistent with no oil leaking into the sea floor, the amount of time the well was to be closed was increased by twenty-four-hour increments until it became clear to the Coast Guard that the sea floor would remain intact and that the closing had been successful.³⁹

With the oil stopped and the well stable, BP pressed the government for permission to perform a “static kill” to pump heavy cement into the well, permanently sealing it.⁴⁰ Despite warnings from industry

³¹ *Id.*

³² *Id.*

³³ *Id.* at 162.

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.* at 164.

³⁷ *Id.* at 165.

³⁸ *Id.*

³⁹ *Id.* at 166.

⁴⁰ A static kill differs from a top kill because the oil in the well is not moving, meaning the mud can be pumped into the well at a much lower pressure. *Id.* at 166.

experts that it would be risky to increase pressure on the well any further, the government approved BP's plan, and on August 3, BP pumped mud and cement into the well, sealing it.⁴¹ The sealing was not finalized until the relief well was completed in mid-September.⁴² A final plug of cement was pumped in from the relief well on September 19.⁴³

The Dispersants

Dispersants are chemical solvents that break oil into droplets, accelerating the rate at which energy from wind and waves dilutes the oil.⁴⁴ Beginning in April, BP sprayed the dispersant Corexit on the surface oil slick, spraying almost 15,000 gallons during the week of April 20 and ramping up to over 140,000 gallons the following week.⁴⁵ BP pushed for EPA authorization to apply dispersants underwater to pump them directly at the wellhead. Undersea application of dispersants had not previously been attempted, and the risks associated with doing so were unknown.⁴⁶ On May 10, the EPA issued a directive to BP allowing it to apply dispersants to the wellhead and directing it to monitor its environmental impact,⁴⁷ approving subsea application of up to 15,000 gallons of dispersants a day.⁴⁸

The EPA grew concerned that BP may be using dispersants excessively, and on May 26 issued a directive ordering BP to reduce the total dispersant applied per day by 75% and not to apply dispersants to the surface.⁴⁹ The directive allowed BP to request, "[i]n rare cases when there may have to be an exemption," to be allowed to apply dispersants

⁴¹ *Id.* at 167.

⁴² Chris McGreal, *Five months after BP oil rig disaster, US government declares well 'dead'*, THE GUARDIAN, Sept. 20, 2010, at 23, available at <http://www.guardian.co.uk/environment/2010/sep/20/us-oil-spill-fixed>.

⁴³ *Id.*

⁴⁴ *BP Commission Report*, *supra* note 2, at 143.

⁴⁵ *Id.* at 143-44.

⁴⁶ *Id.* at 144-45.

⁴⁷ The EPA required, among other things, daily testing of dissolved oxygen levels at various intervals from surface to sea floor, water sampling from surface to 550 meters for PAH analysis, and aerial visual observation. See Environmental Protection Agency, Dispersant Monitoring and Assessment Directive for Subsurface Dispersant Application, May 10, 2010, available at <http://www.epa.gov/bpspill/dispersants/subsurface-dispersant-directive-final.pdf>.

⁴⁸ *BP Commission Report*, *supra* note 2, at 144-45.

⁴⁹ Environmental Protection Agency, Dispersant Monitoring and Assessment Directive – Addendum 3, May 26, 2010, available at <http://www.epa.gov/bpspill/dispersants/directive-addendum3.pdf>.

to the surface.⁵⁰ Such requests would have to be made to the Coast Guard in writing, specifying the amount to be applied; they would also have to include information relevant to justify that use and would have to be granted before BP could apply the dispersants.⁵¹

The Coast Guard, however, approved the great majority of BP's requests, even doing so when BP failed to set an upper limit on the amount of Corexit it planned to use.⁵² BP even sprayed first and applied for an exemption later in some cases, prompting criticism from Representative Ed Markey.⁵³ BP continued to apply undersea dispersants at the EPA approved rate until the leak was ultimately stopped.⁵⁴ In total 1.8 million gallons of dispersants were used,⁵⁵ an unprecedented volume.⁵⁶

BP's choice to use Corexit was controversial. Use of Corexit is banned in the U.K. because it is harmful to marine life.⁵⁷ It is also known to cause human health problems including respiratory, nervous system, liver, kidney and blood disorders.⁵⁸ The extent of its toxicity, including effects of long-term exposure, is not clear.⁵⁹ Scientists blame the lack of data on the Toxic Substances Control Act,⁶⁰ which does not

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² Matthew L. Wald, *Despite Rule, BP Used Dispersant, Panel Finds*, N.Y. TIMES, Aug. 1, 2010, at A20, available at <http://www.nytimes.com/2010/08/01/science/earth/01dispersants.html>.

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ RestoretheGulf.org, *One Year Later Press Pack*, Apr. 10, 2011, <http://www.restorethegulf.gov/release/2011/04/10/one-year-later-press-pack>.

⁵⁶ Justin Gillis, *Giant Plumes of Oil Forming Under the Gulf*, N.Y. TIMES, May 16, 2010, at A1, available at http://www.nytimes.com/2010/05/16/us/16oil.html?_r=1.

⁵⁷ Amy Lou Jenkins, *Oil dispersant Corexit known to be toxic 20 years ago*, EXAMINER.COM, May 21, 2010, <http://www.examiner.com/green-living-in-national/oil-dispersant-corexit-known-to-be-toxic-20-years-ago-videos#ixzz1P53AAzBH>.

⁵⁸ Marian Wang, *In Gulf Spill, BP Using Dispersants Banned in U.K.*, PROPUBLICA, May 18, 2010, <http://www.propublica.org/blog/item/In-Gulf-Spill-BP-Using-Dispersants-Banned-in-UK>.

⁵⁹ David Biello, *Is Using Dispersants on the BP Gulf Oil Spill Fighting Pollution with Pollution?*, SCIENTIFIC AMERICAN, June 18, 2010, <http://www.scientificamerican.com/article.cfm?id=using-dispersants-fighting-pollution-with-pollution>.

⁶⁰ The Toxic Substances Control Act (TSCA) directs the EPA to compile an inventory of chemicals in use and to develop toxicity data. However, TSCA exempted the 62,000 chemicals that were in use in 1976 when it was enacted and imposes only minimal reporting requirements for new chemicals. See TSCA §4, 15 U.S.C. § 2603 (2006). The statute also makes it difficult for the EPA to demand testing by manufacturers. TSCA §§ 4-6, 15 U.S.C. § 2603-26-5. TSCA seems to require disclosure of health and safety studies whether they are claimed as proprietary or not. 15 U.S.C. § 2613(b). However,

require companies to assess the long-term impact of a dispersant or even require companies to disclose its ingredients.⁶¹

Concern over the potentially harmful effects of dispersants has prompted political action. The Louisiana State Senate's Environmental Quality Committee recently approved a bill that would prohibit the use of dispersants unless they are classified as "Practically Non-Toxic" under the EPA's National Contingency Plan Product Schedule and break down into carbon dioxide and water.⁶²

The use of dispersants also served to obscure the severity of the leak by keeping some oil from the surface and possibly contributing to the volume of the large underwater plumes of dispersed oil droplets.⁶³ When the plumes were first detected, one was ten miles long, three miles wide and 300 feet thick. *The New York Times* reported that scientists calculated the oil leak rate to be 80,000 barrels a day.⁶⁴ *The Guardian* reported a possible 100,000 barrels a day but "because BP was not releasing vital data, it was difficult to make an accurate estimate."⁶⁵

the EPA has not consistently implemented this mandate and secrecy is pervasive in chemicals regulation. See John Applegate and Katherine Baer, *Strategies for Closing the Chemical Data Gap*, CPR White Paper #602 (April 2006), available at <http://www.progressivereform.org/whitePapers.cfm>; Rena Steinzor and Matthew Shudtz, *Sequestered Science: Secrets Threatening Public Health*, CPR White Paper #703 (April 2007), available at <http://www.progressivereform.org/whitePapers.cfm>.

⁶¹ Kate Shepard, *BP's Bad Breakup: How Toxic Is Corexit?*, MOTHER JONES, <http://motherjones.com/environment/2010/09/bp-ocean-dispersant-corexit>. "If you think the data on COREXIT is bad, try to find any decent toxicology data on the alternatives," says toxicologist Carys Mitchelmore of the University of Maryland's Chesapeake Biological Laboratory, who helped write a 2005 National Research Council (NRC) report on dispersants. "I couldn't compare and contrast which one was more toxic than the other based on that." Biello, *supra* note 59.

⁶² Molly Davis, *Louisiana Senate panel OKs ban on Gulf oil spill dispersants*, THE TIMES-PICAYUNE, http://www.nola.com/news/gulf-oil-spill/index.ssf/2011/05/louisiana_senate_panel_oks_ban.html; see also S. 97, 2011 Reg. Sess. (La. 2011), available at <http://www.legis.state.la.us/billdata/streamdocument.asp?did=741054>. National Contingency Plan Product Schedule – Subpart J, EPA, available at <http://www.epa.gov/osweroe1/content/ncp/#schedule>. The bill was subsequently voted down 21-10 by the full Senate. Times-Picayune Staff, *Senate Rejects Ban on Oil Dispersants*, THE TIMES-PICAYUNE, Jun. 16, 2011, http://www.nola.com/politics/index.ssf/2011/06/senate_rejects_ban_on_oil_disp.html.

⁶³ BP Commission Report, *supra* note 2, at 182.

⁶⁴ Justin Gillis, *Giant Plumes of Oil Forming Under the Gulf*, N.Y. TIMES, May 16, 2010, at A1, available at http://www.nytimes.com/2010/05/16/us/16oil.html?_r=1.

⁶⁵ Richard Adams, *Gulf oil spill: How big is the slick from BP's Deepwater Horizon?*, THE GUARDIAN, May 20, 2010, <http://www.guardian.co.uk/world/richard-adams-blog/2010/may/19/deepwater-horizon-gulf-oil-spill-size>.

The dispersants used in the Gulf were expected to break down fairly rapidly, but according to a January 2011 report they have lingered underwater for months without biodegrading.⁶⁶

The Clean Up

Near the end of April, BP began a program it titled “Vessels of Opportunity.” The program was designed to give newly out-of-work fishermen and boat operators a source of income.⁶⁷ Boats registered in the Vessels of Opportunity program would patrol for oil sheens and slicks, skim oil, and deploy boom.⁶⁸ Participating boats made between \$1,200 to \$3,000 a day per boat; individual crew members made \$200 for an eight-hour day.⁶⁹ However, the program did not particularly increase the effectiveness of the cleanup.⁷⁰ Perhaps unsurprisingly, the Coast Guard and BP eventually began deploying boom in response to local political pressure rather than focusing exclusively on operational objectives.⁷¹

BP also hired crews of workers to clean up beaches as oil washed ashore. Tens of thousands of workers were hired at \$12 per hour to shovel oil-contaminated sand into bags for disposal.⁷² Though the massive hiring was an economic boon for the Gulf, the effectiveness of the cleanup has been questioned; civil engineers claim that BP’s untested methods were not only ineffective but also spread oil to previously uncontaminated sand.⁷³

At the same time, BP extended aid to local governments, giving them almost \$800 million in emergency grants and exerting little over-

⁶⁶ *News Release : First Study of Dispersants in Gulf Spill Suggests a Prolonged Deepwater Fate*, WOODS HOLE OCEANOGRAPHIC INSTITUTION, <http://www.whoi.edu/page.do?pid=7545&tid=282&cid=89188&ct=162>; E.B. Kujawinski et al., *Fate of dispersants associated with the Deepwater Horizon oil spill*, 45 ENVTL. SCI. & TECH. 1298 (2011).

⁶⁷ BP Commission Report, *supra* note 2, at 140.

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ *Id.* at 141.

⁷¹ Pressure from localities was so extreme that Parish Presidents went so far as to issue orders prohibiting the removal of response equipment from their parishes and even threatened Coast Guard responders with arrest. *Id.* at 154.

⁷² Louis Sahagun, *Beach cleanup crews' work is tedious and hot; locals fret over slow pace*, L.A. TIMES, July 4, 2010, http://www.cleveland.com/nation/index.ssf/2010/07/beach_cleanup_crews_work_is_te.html.

⁷³ Daniel Cressey, *BP's beach clean-up 'contaminated clean sand'*, NATURE, Apr. 28, 2011, http://blogs.nature.com/news/2011/04/bps_beach_cleanup_contaminated.html.

sight into how it was spent.⁷⁴ Some local governments have come under fire for dubious spending decisions. The town of Biloxi, for example, purchased a new Chevy Tahoe for the mayor to drive (replacing his 2006 GMC Yukon).⁷⁵

Information Restricted

While BP was conducting its cleanup it was also trying to limit media and public access to information about the spill's effects. Spill workers were instructed not to talk to the media.⁷⁶ Master Charter Agreements for BP's Vessels of Opportunity program initially forbade contractors to speak about the disaster or cleanup efforts without prior approval.⁷⁷ Some if not all of the contractors cleaning beaches were told they would be fired if they talked to the media.⁷⁸ Local law enforcement helped BP hinder media access to public beaches where oil had washed ashore.⁷⁹ Reporters from CBS News were even threatened with arrest by local law enforcement.⁸⁰ On June 2, one contract worker for BP reported that BP had banned its workers from sharing pictures from the spill site.⁸¹ He went on to say, "There is a lot of cover-up for BP. They specifically informed us that they don't want these pictures

⁷⁴ Geoff Pender, *Government officials defend questionable use of BP oil spill grants*, BILOXI SUN HERALD, Apr. 20, 2011, <http://www.miamiherald.com/2011/04/20/2177013/biloxi-local-government-defending.html>.

⁷⁵ *Id.*

⁷⁶ Mac McClelland, "It's BP's Oil", MOTHER JONES, May 24, 2010, <http://motherjones.com/environment/2010/05/oil-spill-bp-grand-isle-beach>.

⁷⁷ Matthew McDermott, *Court Stops BP Forcing Oil Spill Clean-Up Volunteers to Sign Away Their Rights*, TREEHUGGER, May 3, 2010, <http://www.treehugger.com/files/2010/05/court-stops-bp-forcing-oil-spill-clean-up-volunteers-signing-away-rights.php>. Vessel operators challenged some of the contract provisions in court and obtained a consent judgment that invalidated the clause restricting communication, a copy of which may be found at <http://www.kreweoftruth.com/web/data/documents/ConsentJudgment.pdf>.

⁷⁸ Mac McClelland, *My BP Mole Spills the Secrets of BP's Cleanup Ops*, MOTHER JONES, June 3, 2010, <http://motherjones.com/rights-stuff/2010/06/BP-spill-worker-elmers-island>.

⁷⁹ *Id.*

⁸⁰ In response to the incident, Unified Command insisted that it had no rules in place that would deny the media access to impacted areas. See *BP, Coast Guard Officers Block Journalists From Filming Oil-Covered Beach (VIDEO)*, THE HUFFINGTON POST, May 19, 2010, http://www.huffingtonpost.com/2010/05/19/bp-coast-guard-officers-b_n_581779.html.

⁸¹ Matthew Lysiak & Helen Kennedy, *Dying, dead marine wildlife paint dark, morbid picture of Gulf Coast following oil spill*, N.Y. DAILY NEWS, June 2, 2010, http://www.nydailynews.com/news/national/2010/06/02/2010-06-02_the_hidden_death_in_the_gulf.html.

of the dead animals. They know the ocean will wipe away most of the evidence.”⁸²

Government agencies also imposed restrictive rules on the media that made it difficult to photograph the environmental effects of the spill.⁸³ The Coast Guard established a twenty-meter “safety zone” around all boom and oil response operations, including beach clean-up, which members of the public, including the media, were forbidden to enter.⁸⁴ Willful violators could be fined up to \$40,000 or be charged with a Class D felony.⁸⁵ The Coast Guard also routinely denied permission for planes to fly low over restricted airspace in the Gulf of Mexico, frustrating members of the media seeking to photograph the spill.⁸⁶ These restrictions prompted criticism from politicians and the media.⁸⁷ “I think they’ve been trying to limit access,” said Representative Ed Markey, a Massachusetts Democrat, who went on to call BP “a company that was not used to transparency. It was not used to having public scrutiny of what it did.”⁸⁸ The Coast Guard responded to the criticism in July 2010, and amended its rules to accommodate journalists.⁸⁹

In June, BP also began seeking to sign research contracts with prominent scientists.⁹⁰ The terms of these contracts would prevent the scientists from publishing their work or sharing it with other scientists for three years, and also would prevent them from testifying against BP in any litigation over the spill.⁹¹ They also provided that all instructions scientists took from BP would be communicated through BP’s

⁸² *Id.*

⁸³ Ronald J. Krotoszynski, Jr., *Transparency, Accountability, and Competency: an Essay on the Obama Administration, Google Government, and the Difficulties of Securing Effective Governance*, 65 U. MIAMI L. REV. 449, 470 (2011).

⁸⁴ *Coast Guard establishes 20-meter safety zone around all Deepwater Horizon protective boom; operations*, June 30, 2010, <http://www.restorethegulf.gov/release/2010/06/30/coast-guard-establishes-20-meter-safety-zone-around-all-deepwater-horizon-protect>.

⁸⁵ *Id.*

⁸⁶ Jeremy W. Peters, *Efforts to Limit the Flow of Spill News*, N.Y. TIMES, June 10, 2010, at A20, available at <http://www.nytimes.com/2010/06/10/us/10access.html?hp=&adxn1=1&adxnlx=1306818423-A91E/Lady2/VQjRGMPrVvg>.

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ *Coast Guard Announces New Procedures for Media Access to Boom Safety Zones*, July 12, 2010, <http://www.restorethegulf.gov/release/2010/07/12/coast-guard-announces-new-procedures-media-access-boom-safety-zones>.

⁹⁰ Ben Raines, *BP buys up Gulf scientists for legal defense, roiling academic community*, MOBILE PRESS-REGISTER, July 16, 2010, http://blog.al.com/live/2010/07/bp_buys_up_gulf_scientists_for.html.

⁹¹ *Id.*

attorneys.⁹² One scientist who had been solicited by BP characterized the arrangement as “not an agreement to do research for BP” but rather “an agreement to join BP’s legal team.”⁹³ Another scientist, whose entire lab was approached by BP, remarked, “It makes me feel like they were more interested in making sure we couldn’t testify against them than in having us testify for them.”⁹⁴ Despite such concerns, some scientists did sign on with BP. Irv Mendelsohn, who agreed to do research for BP, defended the move, stating, “What I’m doing wouldn’t be any different than if I was consulting with one of the natural resource trustees. I am giving my objective opinion about recovery. Good scientists, they’re going to be giving their opinions based on the facts and they are not going to bias their opinions.”⁹⁵

BP’s Media Campaign

In June, BP unveiled its U.S. advertising campaign in which it pledged to “make things right.”⁹⁶ BP bought the search term “oil spill” on major search engines so that people searching that term would see BP’s official site at the top of their search results.⁹⁷ However, BP’s success was limited by a stream of public relations mistakes and negative news stories.⁹⁸ On May 4, *The New York Times* reported that the potential for disasters due to a lack of back-up systems to activate blowout preventers had been made clear ten years ago, and that Minerals Management Service had ordered operators to have reliable back-up systems in place.⁹⁹ Later that month, it was revealed that BP’s 2009

⁹² Robyn Bresnahan, *BP accused of ‘buying academic silence’*, BBC NEWS, July 22, 2010, <http://www.bbc.co.uk/news/world-us-canada-10731408>.

⁹³ *Id.*

⁹⁴ *Report: BP Looks To Buy Up Gulf Coast Scientists*, CBS NEWS, July 16, 2010, <http://www.cbsnews.com/stories/2010/07/16/national/main6684607.shtml>.

⁹⁵ *Id.*

⁹⁶ Andrew Clark, *America’s toughest job: fronting BP’s television commercials*, THE GUARDIAN, June 25, 2010, <http://www.guardian.co.uk/business/andrew-clark-on-america/2010/jun/25/bp-oil-spill-bp>.

⁹⁷ Michael Graham Richard, *BP Buys “Oil Spill” Search Terms on Google, Yahoo, and Bing*, TREEHUGGER, June 8, 2010, <http://www.treehugger.com/files/2010/06/bp-buys-oil-spill-keywords-ads-google-yahoo-bing.php>.

⁹⁸ Erin McClam & Harry R. Weber, *BP’s failures made worse by PR mistakes*, MSNBC, June 11, 2010, http://www.msnbc.msn.com/id/37647218/ns/business-world_business/t/bps-failures-made-worse-pr-mistakes/.

⁹⁹ Mike Soraghan, *Warnings on Backup Systems for Oil Rigs Sounded 10 Years Ago*, N.Y. TIMES, May 4, 2010, <http://www.nytimes.com/gwire/2010/05/04/04greenwire-warnings-on-backup-systems-for-oil-rigs-sounded-30452.html>.

response plan for a Gulf oil spill was riddled with errors;¹⁰⁰ it listed walruses, sea otters, and sea lions as “sensitive biological resources” despite none of those species living anywhere near the Gulf, and listed as a wildlife expert a scientist who had died in 2005.¹⁰¹

In late May, when President Obama visited Grand Isle, BP bussed in hundreds of temp workers for the day, prompting accusations from local politicians that BP was embellishing their cleanup effort.¹⁰² This event contributed to the perception that BP’s beach cleanup effort was primarily about improving BP’s public image.¹⁰³ On July 21, BP admitted to posting on its website a photo that exaggerated the activity at its Gulf oil spill command center.¹⁰⁴ BP had shown workers monitoring ten video screens, however three of them turned out to have been blank; BP had Photoshopped images onto them.¹⁰⁵ On July 23, a BP oil-rig worker revealed that alarms on the rig were partially disabled on the day of the explosion so that crew members could sleep,¹⁰⁶ and on July 31, *The New York Times* reported on BP’s extensive use of dispersants in the Gulf.¹⁰⁷

A series of gaffes by CEO Tony Hayward further frustrated BP’s efforts to rehabilitate its public image. In May, Hayward commented, “[t]he Gulf of Mexico is a very big ocean. The amount of volume of oil and dispersant we are putting into it is tiny in relation to the total water volume,” a tone-deaf attempt to downplay the environmental impact of the spill.¹⁰⁸ Hayward later stated in an interview that “there’s no

¹⁰⁰ Deborah Zabarenko, *Walruses in Louisiana? Eyebrow-raising details of BP’s spill response plan*, REUTERS, May 27, 2010, <http://blogs.reuters.com/environment/2010/05/27/walruses-in-louisiana-eyebrow-raising-details-of-bps-spill-response-plan/>.

¹⁰¹ Holbrook Mohr et al., *BP’s gulf oil spill response plan lists the walrus as a local species. Louisiana Gov. Bobby Jindal is furious.*, THE CHRISTIAN SCIENCE MONITOR, <http://www.csmonitor.com/From-the-news-wires/2010/0609/BP-s-gulf-oil-spill-response-plan-lists-the-walrus-as-a-local-species.-Louisiana-Gov.-Bobby-Jindal-is-furious?>

¹⁰² *BP Buses In 400 Workers During Obama’s Visit*, WDSU NEW ORLEANS, May 29, 2010, <http://www.wdsu.com/news/23711711/detail.html#ixzz1P3ArhHJ4>.

¹⁰³ Sahagun, *supra* note 72.

¹⁰⁴ *BP admits using Photoshop to exaggerate oil spill command centre activity*, THE GUARDIAN, July 21, 2010, <http://www.guardian.co.uk/environment/2010/jul/21/bp-oil-spill-oil-spills>.

¹⁰⁵ *Id.*

¹⁰⁶ *Day 94: The Latest on the Oil Spill*, N.Y. TIMES, July 24, 2010, at A10, available at <http://www.nytimes.com/2010/07/24/us/24latest.html>.

¹⁰⁷ Wald, *supra* note 52.

¹⁰⁸ mikeg, *So what if the waiter spit in your soup?*, GREENPEACE, May 19, 2010, <http://www.greenpeace.org/usa/en/news-and-blogs/campaign-blog/so-what-if-the-waiter-spit-in-your-soup/blog/26022>.

one who wants this over more than I do. I'd like my life back," words that seemed to indicate a lack of compassion for Gulf residents or concern about the damage to the environment.¹⁰⁹ Hayward also denied the existence of an oil plume underwater, claiming that all the oil was making its way up to the surface¹¹⁰ despite the undersea dispersants BP was known to be using to prevent that result.¹¹¹ On June 17, Tony Hayward was questioned by Congress.¹¹² He was subsequently criticized for taking a vacation with his son during the crisis.¹¹³ By July, BP began to contemplate a change in management.¹¹⁴ BP's board had been unhappy with Hayward's management of the disaster and had found his answers to Congress unsatisfactory.¹¹⁵ Within three weeks, Robert Dudley, an American, replaced Hayward as CEO of BP.¹¹⁶

Even after being sacked, Hayward continued to demonstrate the tone-deafness of the industry; in an interview on November 11 he said, "[o]ur efforts involved amazing feats of engineering – tasks completed in days that would normally take months, numerous major innovations with lasting benefits. . . [b]ut because every move was scrutinized around the world, what the public thought they saw was fumbling and incompetence."¹¹⁷ His attitude that BP should be applauded for its quick engineering during a crisis demonstrated a lack of understanding that BP was being blamed for failing to have made adequate advances in safety prior to the disaster.

¹⁰⁹ Tim Webb, *BP's clumsy response to oil spill threatens to make a bad situation worse*, THE GUARDIAN, June 2, 2010, at 16, available at <http://www.guardian.co.uk/business/2010/jun/01/bp-response-oil-spill-tony-hayward>.

¹¹⁰ Matthew Brown, *Underwater Oil Plumes Disputed By BP CEO Tony Hayward*, THE HUFFINGTON POST, May 30, 2010, http://www.huffingtonpost.com/2010/05/30/underwater-oil-plumes-dis_n_595015.html.

¹¹¹ *BP Commission Report*, *supra* note 2, at 143-44.

¹¹² *BP CEO Tony Hayward "Deeply Sorry" for Oil Spill*, CBS NEWS, June 17, 2010, <http://www.cbsnews.com/stories/2010/06/17/national/main6591008.shtml>.

¹¹³ Philip Sherwell, *US anger as BP oil spill chief Tony Hayward watches his yacht sail round the Isle of Wight*, THE TELEGRAPH, June 19, 2010, <http://www.telegraph.co.uk/news/worldnews/northamerica/usa/7840720/US-anger-as-BP-oil-spill-chief-Tony-Hayward-watches-his-yacht-sail-round-the-Isle-of-Wight.html>.

¹¹⁴ *FT: BP Braces For Management Shake-up*, RTTNEWS, July 7, 2010, <http://www.rttnews.com/Content/BreakingNews.aspx?Id=1350658&SM=1>.

¹¹⁵ *Id.*

¹¹⁶ Julia Werdigier & Jad Mouawad, *Road to New Confidence at BP Runs Through U.S.*, N.Y. TIMES, July 27, 2010, at B1, available at <http://www.nytimes.com/2010/07/27/business/27dudley.html?src=mv>.

¹¹⁷ Terry Macalister, *Tony Hayward: Public saw us as 'fumbling and incompetent'*, THE GUARDIAN, Nov. 11, 2010, at 30, available at <http://www.guardian.co.uk/environment/2010/nov/11/tony-hayward-bp-oil-spill>.

Ecological Aftermath

In August, with the well finally sealed, the Obama administration claimed that three quarters of the oil was “gone.”¹¹⁸ This statement was based on the Deepwater Horizon Oil Budget, an internal government document the administration decided to publish. The administration was immediately criticized for its rosy assessment, chiefly because they implied that the 25% of the oil categorized as “evaporated or dissolved” was no longer a problem, a claim scientists disagreed with.¹¹⁹ Researchers at the University of Georgia stated that between 70% and 79% of the oil and its toxic byproducts were still present under the surface of the Gulf.¹²⁰

The amount of oil left in the Gulf remains in dispute, with some scientists asserting that a large portion of it remains and others finding little evidence of it.¹²¹ The full measure of its ecological impact will take years to uncover.¹²² The spill has affected human health as well. At one point after the spill, medical diagnoses of clinical depression were up nearly 25% above pre-spill levels.¹²³ Some cleanup workers have gotten sick from exposure to the oil, suffering dizziness and nausea.¹²⁴ Gulf Coast residents who believe they have come in contact with oil or dispersant report an unusual increase in health symptoms – coughing, skin and eye irritation, headaches – consistent with chemical exposure.¹²⁵ It is of course too soon to say what the long-term effects of exposure will be.

¹¹⁸ *BP Commission Report*, *supra* note 2, at 167.

¹¹⁹ Robert Lee Hotz, *Much Oil Remains in Gulf, Researchers Estimate*, WALL ST. J., Aug. 17, 2010, http://online.wsj.com/article/SB10001424052748704868604575434074237252604.html?mod=WSJ_hpp_MIDDLETopStories. UGA marine scientist Charles Hopkinson stated, “One major misconception is that oil that has dissolved into water is gone and, therefore, harmless The oil is still out there, and it will likely take years to completely degrade.”

¹²⁰ *Id.*

¹²¹ Suzanne Goldenberg, *Has BP really cleaned up the Gulf oil spill?*, THE GUARDIAN, Apr. 13, 2011, at 6, available at <http://www.guardian.co.uk/environment/2011/apr/13/deepwater-horizon-gulf-mexico-oil-spill>.

¹²² *Id.*

¹²³ *Id.* at 194.

¹²⁴ Brian Merchant, *Oil Cleanup Workers Getting Sick: BP Not Providing Safety Gear*, TREEHUGGER, May 26, 2010, <http://www.treehugger.com/files/2010/05/oil-cleanup-workers-getting-sick-bp-not-providing-safety-gear.php>.

¹²⁵ Louisiana Bucket Brigade, *The BP Oil Disaster: Results from a Health and Economic Impact Survey in Four Coastal Louisiana Parishes*, 2010, http://www.labucketbrigade.org/downloads/2010_HEStudy_ShortFINAL.pdf.

Public Activism

During the crisis, a number of citizens and environmental groups dedicated their attention to the spill and its aftermath. The Louisiana Bucket Brigade, a group that facilitates chemical air sampling by citizen activists, created an “Oil Spill Crisis Map.” The Brigade encourages citizens to report any oil sightings, negative health effects, odors, affected animals, and property damage suspected to be the result of the spill, then makes the times and locations of any such reports available on their website. Even at this early stage, independent analyses disputed official estimates. Skytruth, a not-for profit organization that specializes in analyzing aerial images, made waves on May 1, at a time when the official estimate remained 5,000 barrels per day. Skytruth used satellite images of the spill to estimate that oil was leaking at a rate of 25,000.¹²⁶ This and other independent estimates¹²⁷ prompted the government to devote more attention to the flow rate and ultimately to raise its own estimate of the rate at which oil was leaking.¹²⁸ Project Gulf Impact, a news organization, was created “to document the economic, environmental and human health impacts of the Deepwater Horizon oil spill . . . [and] provide a unifying voice for residents of the Gulf.”¹²⁹ It “hopes to capture the social, political and environmental climate surrounding one of the greatest environmental disasters of our time.”¹³⁰

The general public reacted to the disaster in a number of visible ways. Though the effort was initially disorganized, thousands of volunteers eventually had the opportunity to participate in the cleanup.¹³¹ Government and environmental groups organized volunteers to wash

¹²⁶ John Amos, *Gulf Oil Spill - New Spill Calculation - Exxon Valdez Surpassed Today*, SKYTRUTH, May 1, 2010, <http://blog.skytruth.org/2010/05/gulf-oil-spill-new-spill-rate.html> (using data on the size of the oil slick to interpolate the total oil and rate of release).

¹²⁷ Another important development for independent evaluators of the spill was the release of a 30-second clip of oil spewing from the leak, which BP released under heavy pressure from the media and government. See Ross, *supra* note 8.

¹²⁸ The government responded to these independent analyses by creating the Flow Rate Technical Group on May 19, which on May 27 estimated the flow rate to be between 12,000 and 25,000 barrels per day. *BP Commission Report*, *supra* note 2, at 146-47.

¹²⁹ OUR MISSION, PROJECT GULF IMPACT, <http://www.projectgulfimpact.org/mission-statement/> (last visited Sept. 6, 2011).

¹³⁰ *Id.*

¹³¹ Robert J. Rosenthal, *Rapid Response Volunteering After the BP Oil Spill*, THE HUFFINGTON POST, Apr. 22, 2011, http://www.huffingtonpost.com/robert-j-rosenthal/bp-oil-spill-volunteering_b_851806.html.

and attempt to rehabilitate oiled animals.¹³² Recognizing a groundswell of amateurs with ideas for how to plug the leak, both the government and BP set up websites to take submissions.¹³³ On the shallow end of participation, as of this writing 813,073 Facebook users have “liked” the “Boycott BP” Facebook page.¹³⁴

Celebrities also became involved. In mid-May, James Cameron, considered an expert in the technology of deep-sea diving, offered BP the use of his fleet of private submarines.¹³⁵ Also in May, Kevin Costner debuted an oil clean-up machine, which uses centrifugal force to separate oil from water and dumps the oil into a nearby tank.¹³⁶ BP agreed to test the machine and ultimately purchased and used thirty-two units.¹³⁷ In mid-July, a “be the one” video debuted featuring celebrities including Sandra Bullock, Drew Brees, Eli Manning, and Lenny Kravitz.¹³⁸ The message of the video was to “[s]ign a petition demanding more money to restore Gulf Coast ecosystems in the wake of the BP oil spill.”¹³⁹ The Backstreet Boys, Lady Gaga, Korn, and a number of other musicians also said they planned to boycott BP on their national tours.¹⁴⁰

Anger at BP took a number of forms. Hundreds attended protests coordinated by Code Pink, notably outside BP’s Houston headquarter-

¹³² *BP Commission Report*, *supra* note 2, at 141.

¹³³ *Id.* at 142; Submit a Technology Solution - Environmental Protection Agency, <http://www.epa.gov/BPSpill/techsolution.html>; *All Things Considered: Helping The Pros: Amateur Ideas To Stop The Oil Spill* (National Public Radio broadcast June 4, 2010) (transcript available at <http://www.npr.org/templates/story/story.php?storyId=127481460&ft=3&f=1013,1017,1025,1027,1028,1029,1030,1031,1053,1054,1066,1128,1133,1134,1135>).

¹³⁴ Boycott BP, <https://www.facebook.com/pages/Boycott-BP/119101198107726> (last visited Sept. 7, 2011).

¹³⁵ Ed Pilkington, *Top kill meets Titanic: James Cameron enters fight against oil spill*, *THE GUARDIAN*, June 3, 2010, at 18, available at <http://www.guardian.co.uk/film/2010/jun/02/james-cameron-underwater-oil-spill>.

¹³⁶ Ray Sanchez, *Kevin Costner’s Machine Heads to BP’s Oil Spill Clean Up*, *ABC NEWS*, May 19, 2010, <http://abcnews.go.com/Technology/kevin-costner-machine-bp-oil-clean/story?id=10689928>.

¹³⁷ Adam Gabbatt, *BP oil spill: Kevin Costner’s oil-water separation machines help with clean-up*, *THE GUARDIAN*, June 16, 2010, <http://www.guardian.co.uk/environment/2010/jun/16/kevin-costner-oil-spill-machines>.

¹³⁸ Cindy Chang, *In ‘Be the One’ video, Sandra Bullock, Drew Brees, Lenny Kravitz come together for the Gulf*, *THE TIMES-PICAYUNE*, July 20, 2010, http://www.nola.com/news/gulf-oil-spill/index.ssf/2010/07/in_be_the_one_video_celebrity.html.

¹³⁹ *Id.*

¹⁴⁰ John Vidal, *Artists prepare for BP protest at Tate Britain*, *THE GUARDIAN*, June 25, 2010, <http://www.guardian.co.uk/environment/2010/jun/24/artists-bp-protest-tate>.

ters¹⁴¹ and in New York.¹⁴² In London, Greenpeace supporters coordinated to steal parts of safety equipment at BP gas stations, forcing some of them to close temporarily.¹⁴³ Banksy, world-famous street artist, converted a dolphin-shaped kiddie ride into a statement on BP.¹⁴⁴ Artists in London organized a campaign against the Tate Britain and other major museums in a bid to pressure them to refuse BP's sponsorship.¹⁴⁵ Protesters picketed Tate events, handed out leaflets, and even released dozens of black helium balloons attached to dead fish inside a gallery in protest against the Gulf oil spill.¹⁴⁶

National Commission Report

On January 11, 2011, the National Commission on the BP Deepwater Horizon Oil Spill published its final report ("the Report").¹⁴⁷ The Commission had been established by the President in May 2010 to identify the "root causes" of the explosion and spill, and provide recommendations to guard against and mitigate the impact of future spills.¹⁴⁸ The Report concluded that the blowout and subsequent explosion could have been prevented, that it was "the product of several individual missteps and oversights by BP, Halliburton, and Transocean, which government regulators lacked the authority, the necessary resources, and the technical expertise to prevent,"¹⁴⁹ and that the incident revealed "such systematic failures in risk management that they place[d] in doubt the safety culture of the entire industry." The Report also concluded that scientific understanding of the deepwater environments in which drilling take place was inadequate, that the industry was woefully unprepared for the risks of deepwater drilling, and that the government's regulatory structure was inadequate to address

¹⁴¹ Chris Baltimore, *Protesters bare nearly all at BP's Houston office*, REUTERS, May 24, 2010, <http://www.reuters.com/article/2010/05/25/us-oil-rig-protest-idUSTRE64O00N20100525>.

¹⁴² Jaya Saxena, *Update: Hundreds Protest BP on Houston Street*, GOTHAMIST, May 29, 2010, http://gothamist.com/2010/05/29/bp_protest.php#photo-1.

¹⁴³ James Meikle, *BP petrol stations have pumps closed by Greenpeace activists*, THE GUARDIAN, July 27, 2010, <http://www.guardian.co.uk/environment/2010/jul/27/bp-stations-pumps-closed-greenpeace>.

¹⁴⁴ Michael Graham Richard, *Banksy Turns Kiddie Ride Into Anti-BP Statement*, TREEHUGGER, Sept. 30, 2010, <http://www.treehugger.com/files/2010/09/banksy-bp-oil-spill-kiddie-ride-dolphin.php>.

¹⁴⁵ Vidal, *supra* note 140.

¹⁴⁶ *Id.* Gallery staff were forced to shoot the balloons down with air rifles.

¹⁴⁷ See *BP Commission Report*, *supra* note 2.

¹⁴⁸ Exec. Order No. 13,543, 75 Fed. Reg. 29,397 (May 21, 2010).

¹⁴⁹ *BP Commission Report*, *supra* note 2, at 115.

environmental protection concerns.¹⁵⁰ The Report recommended that Congress create an independent safety agency within the Department of the Interior.¹⁵¹

The Report determined that a series of mistakes created an unreasonably high risk of an accident.¹⁵² It criticized a series of decisions made by Halliburton and BP regarding the cement job which ultimately proved to be faulty, including both companies having failed to perform adequate tests on the cement, having failed to communicate important information to each other which should have raised concerns about the cement job, and having failed ever to perform an adequate analysis of the combined impact of the risk factors particular to the Macondo well.¹⁵³ The Report also criticized Transocean and BP employees on the rig for failing to properly interpret a pressure test that should have indicated a leak, and failing to detect the gas bubble as it worked its way up the pipe.¹⁵⁴ The Report characterized this series of errors as an overarching failure of management, stating that “BP, Halliburton, and Transocean would almost certainly have prevented the blowout by improving the ability of individuals involved to identify the risks they faced, and to properly evaluate, communicate, and address them.”¹⁵⁵

The Report has been met with some criticism. Some Gulf coast politicians have made the case that by criticizing government oversight, the Report laid too little of the blame on industry actors.¹⁵⁶ Before the Report was even released, liberals raised concerns about the Commission’s lack of subpoena power, calling the commission “toothless.”¹⁵⁷ Representatives Ed Markey (D-Massachusetts) and Lois Capps (D-California) sponsored a House bill to give the Commission the authority to issue subpoenas. It passed 420-1 in the House, but Senate Republicans blocked it and the Senate version never reached a floor

¹⁵⁰ *Id.* at vii.

¹⁵¹ *Id.*

¹⁵² *Id.* at 115.

¹⁵³ *Id.* at 115-18.

¹⁵⁴ *Id.* at 119-21.

¹⁵⁵ *Id.* at 90.

¹⁵⁶ James Gordon, *Critics Take Aim at Deepwater Horizon Report*, WPMI-TV, Jan. 11, 2011, <http://www.local15tv.com/news/local/story/Critics-Take-Aim-at-Deepwater-Horizon-Report/TqkBluYupkGlvBzmZUAgoQ.csp>.

¹⁵⁷ Siddhartha Mahanta, *On Not Letting BP Investigators Do Their Job*, MOTHER JONES, Dec. 8, 2010, <http://motherjones.com/blue-marble/2010/12/not-letting-bp-investigators-do-their-job>.

vote.¹⁵⁸ Industry veteran Bob Cavnar criticized the report's focus on the bad cement job, saying faulty cement jobs were common and could be remediated after the fact.¹⁵⁹ He also called the Commission "a missed opportunity" for not including "representatives from the technical disciplines and the industry," because he felt that though reform was badly needed, the industry would not be receptive to calls for it from an outside group.¹⁶⁰

Following the Commission's Report, the BP spill fell from the headlines of major news outlets.¹⁶¹ Despite the dearth of national coverage, a number of citizens groups continue to dedicate their attention to it. The Louisiana Bucket Brigade continues to update its map of the effects of the spill; Project Gulf Impact continues to report on the aftermath; and in May 2011, Skytruth reported evidence of an eighteen-mile-long oil slick originating from the Macondo site, suggesting a significant leak from the plugged well.¹⁶²

Industry Response/Moratorium

In April 2010, shortly after the disaster, the President banned new deepwater drilling in the Gulf of Mexico.¹⁶³ The industry's response to the catastrophe was shaped in large part by this moratorium on deepwater drilling. In August of 2010, the Obama administration indicated that the moratorium might be lifted before it expired on November 30, if the industry could demonstrate that the drilling would be safe.¹⁶⁴

¹⁵⁸ *Id.* Terry Garcia, a member of the commission, later stated that the commission was able to obtain all of the information that it needed despite the lack of subpoena authority. Andrew Restuccia, *Oil spill commission: Lack of subpoena power did not hinder investigation*, THE HILL.COM, Jan. 11, 2011, <http://thehill.com/blogs/e2-wire/677-e2-wire/137197-oil-spill-commission-lac-of-subpoena-power-did-not-impinge-investigation>.

¹⁵⁹ Bob Cavnar, *Memo to Spill Commission: Bad Cement Does Not Equal Blowout*, THE DAILY HURRICANE, Oct. 30, 2010, <http://dailyhurricane.com/2010/10/memo-to-spill-commission-bad-cement-does-not-equal-blowout.html>.

¹⁶⁰ Bob Cavnar, *Missed Opportunity: Spill Commission Rejected by Drillers*, THE HUFFINGTON POST, Jan. 12, 2011, http://www.huffingtonpost.com/robert-l-cavnar/missed-opportunity-spill_b_807763.html.

¹⁶¹ For example, the last event in The Guardian's BP Oil Spill Timeline is the Report's release. See *BP Oil Spill Timeline*, THE GUARDIAN, Jan. 7, 2011, <http://www.guardian.co.uk/environment/2010/jun/29/bp-oil-spill-timeline-deepwater-horizon>.

¹⁶² John Amos, *Oil Slick at Platform 23051 Site, Gulf of Mexico*, SKYTRUTH, May 11, 2011, <http://blog.skytruth.org/2011/05/oil-slick-at-platform-23051-site-gulf.html>.

¹⁶³ *BP Commission Report*, *supra* note 2, at 152.

¹⁶⁴ Jonathan Tilove, *Deepwater drilling moratorium could end sooner if facts support doing so, federal official says*, THE TIMES-PICAYUNE, Aug. 3, 2010, http://www.nola.com/news/gulf-oil-spill/index.ssf/2010/08/deepwater_drilling_moratorium_10.html.

To that end, four major oil companies formed an industry nonprofit, the Marine Well Containment Company, with the purpose of creating, maintaining, and operating a blowout containment system to be used for future deep sea blowouts.¹⁶⁵ The company was funded with \$1 billion and promised an interim system in six months and a permanent one in eighteen.¹⁶⁶ In response, the administration officially lifted the ban on October 12.¹⁶⁷ However, the Bureau of Ocean Energy Management Regulation and Enforcement (“BOEMRE”) refused to issue new deep water drilling permits until operators could demonstrate that they would be capable of deploying resources adequate to deal with a well blowout, and for months no new permits were issued.¹⁶⁸ On February 4, 2011, Michael Bromwich, the director of BOEMRE, sent a letter to industry leaders expressing concern that the new blowout containment system was behind schedule.¹⁶⁹ The letter made it clear that the system was a *de facto* prerequisite for future permits.¹⁷⁰

On February 11, the industry unveiled its new system: an emergency capping stack, a fleet of oil collection tankers, miles of tubing for sucking pollutants to the surface, and devices for shooting chemical dispersants into a subsea leak.¹⁷¹ The system has been criticized as being nothing more than a rote copy of the capping stack that eventually plugged the Macando well.¹⁷² BOEMRE approved the sys-

¹⁶⁵ David Hammer, *Oil companies say their containment plans will improve drilling safety in 6 months*, THE TIMES-PICAYUNE, Aug. 4, 2010, http://www.nola.com/news/gulf-oil-spill/index.ssf/2010/08/oil_companies_say_their_plans.html.

¹⁶⁶ *Id.*

¹⁶⁷ Tom Cohen, *Obama administration lifts deep-water drilling moratorium*, CNN, Oct. 12, 2010, http://articles.cnn.com/2010-10-12/us/drilling.moratorium_1_deep-water-drilling-drilling-rig-oil-drilling?_s=PM:US.

¹⁶⁸ Lucia Graves, *Michael Bromwich Spars With House GOP Over Gulf Oil Spill Response*, THE HUFFINGTON POST, June 2, 2011, http://www.huffingtonpost.com/2011/06/02/gulf-oil-spill-response-house-gop_n_870645.html?ir=Politics.

¹⁶⁹ David Hammer, *Feds: Lack of oil spill containment system is holding up drilling permits*, THE TIMES-PICAYUNE, Feb. 4, 2011, http://www.nola.com/news/gulf-oil-spill/index.ssf/2011/02/feds_lack_of_spill_containment.html.

¹⁷⁰ *Id.*

¹⁷¹ David Hammer, *Oil industry declares temporary capping stack ready in case of Gulf oil blowouts*, THE TIMES-PICAYUNE, Feb. 17, 2011, http://www.nola.com/news/gulf-oil-spill/index.ssf/2011/02/oil_industry_declares_temporar.html.

¹⁷² Bob Cavnar, *Bob on Rachel Maddow – April 20, 2011*, THE DAILY HURRICANE, Apr. 20, 2011, <http://dailyhurricane.com/2011/04/bob-on-rachel-maddow—april-20-2011-1.html>.

tem and began issuing deepwater well permits in late February of 2011.¹⁷³

Republicans have applied political pressure to try to convince BOEMRE to issue permits. In February, before any permits were issued, Senator David Vitter placed a hold on Obama's nominee to head the Fish and Wildlife Service, stating that he would only lift the hold once BOEMRE issued fifteen permits. Vitter lifted his hold when BOEMRE hit that mark on June 1.¹⁷⁴ Industry officials say that though the Deepwater Horizon tragedy still looms large, resumption of drilling inspires a sense of optimism they say is returning to the industry.¹⁷⁵

Epilogue

For BP, the future remains uncertain. Barclays Capital recently estimated the chance that BP will be held grossly negligent under the Oil Pollution Act at 80%, a discouraging sign for the company.¹⁷⁶ BP has continued its public relations campaign, recently agreeing to give Gulf states one billion dollars to fund early restoration projects before any legal obligation for them to do so arose.¹⁷⁷ BP has also continued to block media access to affected beaches throughout its cleanup. As of April 2011, journalists reported that BP's private security was turning them away from public beaches where cleanups were taking place.¹⁷⁸ Through its claims process BP has awarded over four billion dollars in settlements for claims of those who suffered economically from the spill, but will have to contend with thousands of lawsuits from those whose claims were rejected or who declined to participate.¹⁷⁹ In March it was revealed that federal prosecutors were considering crimi-

¹⁷³ Richard Thompson & Jonathan Tilove, *Sen. David Vitter lifts hold on Obama nominee as feds approve 15th drilling permit*, THE TIMES-PICAYUNE, June 1, 2011, http://www.nola.com/news/gulf-oil-spill/index.ssf/2011/06/sen_david_vitter_lifts_hold_on.html.

¹⁷⁴ *Id.*

¹⁷⁵ *OTC objectives: Year after BP spill, optimism warranted, but so is firm commitment to stewardship*, HOUSTON CHRONICLE, May 7, 2011, <http://www.chron.com/default/article/OTC-objectives-Year-after-BP-spill-optimism-1369942.php>.

¹⁷⁶ Andrew Peaple, *BP Still Mired in Legal Uncertainty*, WALL ST. J., May 20, 2011, <http://online.wsj.com/article/SB10001424052748704904604576334963103233524.html>.

¹⁷⁷ *BP to give \$1 billion for Gulf restoration; each state to select \$100 million in projects*, THE PRESS-REGISTER, Apr. 21, 2011, http://blog.al.com/live/2011/04/bp_to_give_1_billion_for_gulf.html.

¹⁷⁸ John Sepulvado, *What's under Elmer's Island?*, CNN, Apr. 15, 2011, http://articles.cnn.com/2011-04-15/us/gulf.spill.elmers.island_1_deepwater-horizon-bp-elmer-s-island?s=PM:US.

¹⁷⁹ Richard Blackden & Rowena Mason, *BP's Gulf of Mexico oil victim fund closes some offices as it pays out just a fifth of its \$20bn total*, THE TELEGRAPH, May 29, 2011, <http://>

nal manslaughter charges against BP executives, including Tony Hayward, for their roles in the disaster.¹⁸⁰

For the Gulf region, the effects of the spill will be long-felt. A number of people in the Gulf region are getting sick, and compounds in the oil and BP's dispersants are the likely culprits.¹⁸¹ The oil on the sea floor doesn't seem to be degrading as hoped.¹⁸² Underscoring the continuing complexity and tragedy of the spill, a number of dead dolphins have unexpectedly washed ashore in the Gulf this year. Because of the ongoing case against BP, government scientists have been ordered to keep their findings relating to the deaths confidential.¹⁸³

www.telegraph.co.uk/finance/newsbysector/energy/oilandgas/8543957/BPs-Gulf-of-Mexico-oil-victim-fund-closes-some-offices-as-it-pays-out-just-a-fifth-of-its-20bn-total.html.

¹⁸⁰ Justin Blum & Alison Fitzgerald, *BP Is Said to Face U.S. Review for Manslaughter Charges*, BLOOMBERG, Mar. 29, 2011, <http://www.bloomberg.com/news/2011-03-29/bp-managers-said-to-face-u-s-review-for-manslaughter-charges.html>.

¹⁸¹ Dahr Jamail, *Illness Plagues Gulf Residents in BP's Aftermath*, IPS, Nov. 15, 2010, <http://ipsnews.net/news.asp?idnews=53557>.

¹⁸² Seth Borenstein, *Gulf Oil Spill Update: Scientist Finds Gulf Bottom Still Oily, Dead*, THE HUFFINGTON POST, Feb. 19, 2011, http://www.huffingtonpost.com/2011/02/20/gulf-oil-spill-update-sci_n_825634.html.

¹⁸³ Steve Gorman, *Government Orders Findings in Dolphin Death Probe Confidential*, WKRG NEWS 5, Mar. 25, 2011, http://www.wkrq.com/gulf_oil_spill/article/government-orders-findings-in-dolphin-death-probe-confidential/1205749/Mar-25-2011_2-18-pm/.

