2009

Publicity, Pressure, and Environmental Legislation: The Untold Story of Availability Campaigns

Molly J. Walker Wilson

SAINT LOUIS UNIVERSITY SCHOOL OF LAW
Legal Studies Research Paper Series

Saint Louis University School of Law Legal Studies Research Paper Series
No. 2009 - 13

PUBLICITY, PRESSURE, AND ENVIRONMENTAL LEGISLATION: THE UNTOLD STORY OF AVAILABILITY CAMPAIGNS

Molly J. Wilson
Saint Louis University School of Law
And
Megan P. Fuchs

PUBLICITY, PRESSURE, AND ENVIRONMENTAL LEGISLATION: THE UNTOLD STORY OF AVAILABILITY CAMPAIGNS

Molly J. Walker Wilson[*] *& Megan P. Fuchs*[**]

ABSTRACT

The availability heuristic—a cognitive rule of thumb whereby events that are easily brought to mind are judged to be more likely—is employed by decision-makers on a daily basis. Availability campaigns occur when individuals and groups strategically exploit this cognitive tendency in order to generate publicity for a particular issue, creating pressure to effect legislative change. This paper is the first to argue that environmental availability campaigns are more beneficial than they are harmful. Because they result in pressure on Congress, these campaigns serve as a catalyst for the enactment of critical new legislative initiatives. Specifically, these campaigns streamline the legislative process by: (1) determining in a transparent and non-arbitrary manner which issues receive attention; (2) overcoming some of the undesirable barriers to the enactment of new initiatives; and (3) encouraging efficient, bipartisan cooperation to pass vital legislation and regulation. Availability campaigns have resulted in critically valuable directives such as the DDT ban, Superfund, and the Oil Pollution Act. Although the primary focus of this paper is environmental legislation, availability campaigns may have benefits in a wide variety of other areas of law and regulation.

[*] Assistant Professor of Law, Saint Louis University School of Law. J.D., University of Virginia; Ph.D., University of Virginia. We are indebted to Jeff Rachlinski and other participants at the Washington University Law and Psychology Roundtable Workshop for feedback on an earlier draft of this Article. We also benefited from the comments of participants of the Saint Louis University School of Law Summer Workshop Series and University of Missouri School of Law Workshop Series.

[**] Associate, Husch Blackwell Sanders LLP. J.D., 2008, Saint Louis University School of Law.

CONTENTS

INTRODUCTION

The employment by various interest groups of the availability heuristic to push certain legislative agendas has been widely viewed as more harmful than beneficial. This paper argues that in spite of criticism aimed at so-called availability campaigns, such campaigns have the potential to generate surprisingly beneficial results. Our argument is informed by consideration of both the underlying process and the outcomes of such campaigns. First, we propose that when, as is often the case, other sources of data are unavailable, basing judgments about the likelihood of future harms upon past encounters with that harm—whether anecdotal or otherwise—is rational and adaptive. Second, we argue that availability campaigns have the potential to overcome legislative stagnation and spur important new governmental initiatives that would not, absent public pressure generated by the availability campaign, have been possible. Because availability

campaigns have been discussed predominantly in the context of environmental regulation, we make this area our primary focus.[1] However, issues in a wide variety of areas of law and regulation have the potential to serve as subjects of availability campaigns.[2]

The availability heuristic is a widely-used mental shortcut that leads people to assign a higher likelihood to events that are readily "available"—events that are particularly likely to come to mind due to their vividness, recency, or frequency.[3] Several years ago, Timur Kuran and Cass Sunstein published a paper in which they discussed the interaction of coordinated communication and the availability heuristic:

> We have described the instigators and manipulators of availability campaigns as availability entrepreneurs. Showing at least a working knowledge of the availability heuristic and other cognitive processes, these entrepreneurs seize on selected incidents and publicize them to make them generally salient to the masses.[4]

The availability heuristic often comes into play in the field of environmental law because of the particular nature of environmental disasters.[5] Individuals tend to assign high probabilities to dramatic, unusual, emotionally charged environmental events such as volcanic explosions or oil spills because of the saliency of such occurrences.[6] However, while certain types of environmental crises trigger the availability heuristic, others do not. Specifically, cumulative, long-term events such as industrial emissions or worsening water quality are relatively less salient, or memorable; as a result, people tend to

---

[1] *See, e.g.*, Christine Jolls et al., *A Behavioral Approach to Law and Economics*, 50 STAN. L. REV. 1471, 1518-19 (1998) (claiming that the use of heuristical reasoning increases demand for environmental regulation); Timur Kuran & Cass R. Sunstein, *Availability Cascades and Risk Regulation*, 51 STAN. L. REV. 683, 733 (1999) (arguing that availability campaigns have resulted in unnecessary and wasteful environmental legislation); Cass R. Sunstein, *Of Montreal and Kyoto: A Tale of Two Protocols*, 31 HARV. ENVTL. L. REV. 1 (2007) [hereinafter Sunstein, *Montreal*].

[2] For an example, see *infra* Part VI for a discussion of availability campaigns in the context of food safety.

[3] For more on the availability heuristic, see Christine Jolls, *On Law Enforcement with Boundedly Rational Actors*, *in* THE LAW AND ECONOMICS OF IRRATIONAL BEHAVIOR 268, 270-71 (Francesco Parisi & Vernon L. Smith eds., 2005); Jolls et al., *supra* note 1, at 1519; Russell B. Korobkin & Thomas S. Ulen, *Law and Behavioral Science: Removing the Rationality Assumption from Law and Economics*, 88 CAL. L. REV. 1051, 1091 (2000); Kuran & Sunstein, *supra* note 1, at 683-91; Justin Pidot, *The Applicability of Nuisance Law to Invasive Plants: Can Common Law Liability Inspire Government Action?*, 24 VA. ENVTL. L.J. 183, 222-23 (2005); Cass R. Sunstein, *Precautions Against What? The Availability Heuristic and Cross-Cultural Risk Perception*, 57 ALA. L. REV. 75, 77 (2005) [hereinafter Sunstein, *Precautions*].

[4] Kuran & Sunstein, *supra* note 1, at 733.

[5] *See* Jolls et al., *supra* note 1, at 1518 (indicating that in the context of environmental legislation, the availability heuristic "encourages the well-known 'pollutant of the month' syndrome, where regulation is driven by recent and memorable instances of harm").

[6] *See id.* at 1519 (explaining that people "underestimate the likelihood of low-probability or low-salience events" in the fields of health and the environment "because these threats do not make it onto people's 'radar screens'").

underestimate the potential for harm resulting from these sources.[7] Observers have bemoaned the fact that dramatic, vivid environmental events have received the lion's share of attention and funding at the expense of other environmental (and non-environmental) problems of arguably equal or greater importance.[8] An offshoot of the availability heuristic, the availability cascade, has been blamed for this perceived misallocation of resources.[9]

Availability cascades contribute to the strength of the availability heuristic: expressed perceptions regarding the risk of a particular event tend to be repeated, triggering a snowballing chain reaction through social networks in which the event becomes available to increasingly large numbers of people.[10] Such cascades appear to have particular force in influencing public perception regarding environmental issues.[11] Oftentimes, the media fuels an availability cascade.[12] In other instances, information and opinion are primarily conveyed not through the media, but instead, by word of mouth.[13] Regardless of the cascade's

[7] *See id.* (explaining that when a particular environmental or health-related threat, even an unlikely one, becomes available—such as when asbestos was discovered in schools—people then overestimate the likelihood of these events). An important exception is global warming, which we discuss at a later point in this paper. *See infra* Part IV.E.

[8] *See id.* (calling the result of availability campaigns "a patchwork of environmental laws characterized by both over- and under-regulation"); Kuran & Sunstein, *supra* note 1, at 685, 707; Cass R. Sunstein, *Cognition and Cost-Benefit Analysis*, 29 J. LEGAL STUD. 1059, 1067 (2000) [hereinafter Sunstein, *Cognition*] (noting that cascade effects caused by the availability heuristic can produce a public demand for regulation even though the relevant risks are trivial, while producing little or no demand for regulation of risks that are large in magnitude); Cass R. Sunstein, *Endogenous Preferences, Environmental Law*, 22 J. LEGAL STUD. 217, 241 (1993) [hereinafter Sunstein, *Endogenous*]; Charles Yablon, *The Meaning of Probability Judgments: An Essay on the Use and Misuse of Behavioral Economics*, 2004 U. ILL. L. REV. 899, 936 ("If people are mistaken about the fatalities associated with various activities, then they are likely to favor overexpenditure of funds to prevent damage from [less dangerous hazards] while underfunding efforts to reduce [more dangerous hazards], which they view as less dangerous."); *cf.* Robert S. Adler, *Flawed Thinking: Addressing Decision Biases in Negotiation*, 20 OHIO ST. J. ON DISP. RESOL. 683, 701 n.56 (2005) ("In some cases, [policymakers] may be prodded to regulate insignificant risks, and in others they may face apathy in promoting public health measures.").

[9] Kuran & Sunstein, *supra* note 1, at 685 ("Under certain circumstances . . . [availability cascades] generate persistent social availability errors—widespread mistaken beliefs grounded in interactions between the availability heuristic and the social mechanisms we describe. The resulting mass delusions may last indefinitely, and they may produce wasteful or even detrimental laws and policies." (citations omitted)).

[10] Sunstein, *Precautions*, *supra* note 3, at 95.

[11] Jeffrey J. Rachlinski, *The Psychology of Global Climate Change*, 2000 U. ILL. L. REV. 299, 313 (explaining that "the nature of availability cascades favors a rise in concern about environmental disasters").

[12] Recent Case, *Immigration Law – Administrative Adjudication – Third and Seventh Circuits Condemn Pattern of Error in Immigration Courts. –* Wang v. Attorney General*, 423 F.3d 260 (3d Cir. 2005), and* Benslimane v. Gonzales*, 430 F.3d 828 (7th Cir. 2005)*, 119 HARV. L. REV. 2596, 2601 (2006) [hereinafter *Immigration Law*] (explaining that "politicians and the media repeat salient examples in a self-reinforcing 'availability cascade'").

[13] Molly J. Walker Wilson, *A Behavioral Critique of Command-and-Control Environmental Regulation*, 16 FORDHAM ENVTL. L. REV. 223, 241 (2005).

medium, one thing seems clear: availability cascades are powerful mechanisms that have the ability to shape the thinking of vast numbers of people.[14] The resulting solidarity of thought is explained by one commentator: "[C]ascade effects will make group members more convinced of the strength of their position, reducing the possibility of breaking deadlock."[15]

In many cases, special interest groups and the media initiate and perpetuate the cascade.[16] Certain savvy groups recognized long ago that they could use the powerful effects of the availability heuristic to their advantage by launching availability *campaigns*.[17] These well-organized factions include the government, the media, nonprofit organizations, environmental groups, businesses, and others in the private sector.[18] Although efforts to publicize and galvanize are often attributable to group efforts, individuals—particularly highly visible individuals—also sometimes lead the charge.[19] Some actors who promote and perpetuate availability cascades, such as members of environmental protection groups, have been viewed as being motivated by altruistic goals. Others, such as businesses, certain politicians, and members of the media have, for the most part, been viewed as purely self-interested.[20] These "availability entrepreneurs" engage in "availability campaigns" in which they strategically focus the public's attention on certain environmental issues or events.[21] The goal is to put the particular issue

14 *Id.*

15 Gregory N. Mandel, *Technology Wars*: *The Failure of Democratic Discourse*, 11 MICH. TELECOMM. & TECH. L. REV. 117, 168 (2005).

16 *Immigration Law*, *supra* note 12, at 2601.

17 Jolls et al., *supra* note 1, at 1519; Mandel, *supra* note 15, at 168; Sunstein, *Cognition*, *supra* note 8, at 1067.

18 Jolls et al., *supra* note 1, at 1519; Sunstein, *Precautions*, *supra* note 3, at 98.

19 The most prominent current example of this is Former Vice President Al Gore, who has made it his life work to spread the word to the public regarding the threat of global warming. *See* Al Gore, http://www.algore.com (last visited Jan. 10, 2008); *see also infra* notes 429-445 and accompanying text. Actor Leonardo DiCaprio is another example: he produced and narrated *The 11th Hour*, a feature length documentary concerning the environmental crises caused by human actions and their impact on the planet. Leonardo DiCaprio: Eco-Site, http://www.leonardodicaprio.org (last visited Jan. 10, 2008); THE 11TH HOUR (Warner Brothers 2007). A third example in a non-environmental field is Bono, the lead singer of the Irish rock band U2, who is widely known for his activism concerning Africa. Josh Tyrangiel, *Bono's Mission*, TIME, Feb. 23, 2002, at 62. Bono co-founded DATA (which stands for Debt AIDS Trade Africa), an advocacy organization dedicated to eradicating extreme poverty and AIDS in Africa. DATA, Board of Directors, Bono, http://www.data.org/about/bod_bono.html (last visited Jan. 10, 2008); *see also* Sandra A. Waddock & James E. Post, *Social Entrepreneurs and Catalytic Change*, 51 PUB. ADMIN. REV. 393, 393-401 (1991).

20 Sunstein, *Precautions*, *supra* note 3, at 98; *see* Gregory R. Signer, *Is It Time to Bury the Environmental Movement?*, 20 NAT. RESOURCES & ENV'T 56, 57 (2006) ("Many in the environmental movement are genuinely motivated by altruism, but you see this most strongly at the grassroots level. The 'environment' is big business, and at the national level, there is substantial self-interest.").

21 Jolls et al., *supra* note 1, at 1519; Sunstein, *Precautions*, *supra* note 3, at 98.

or event front and center, expanding public exposure and increasing the saliency and the concomitant availability, ultimately creating overwhelming public demand for stricter environmental legislation and policy.[22] This push of the public influences the creation of new law through its effect on legislators, administrative agencies, and courts.[23] The effect is known by some as "anecdote-driven environmental legislation" or as the "pollutant of the month" syndrome.[24]

There has been substantial concern among legal scholars and social scientists that coordinated efforts to hype various dangers result in the distortion of public perception and result in more harm than good.[25] Although some commentary does cursorily acknowledge that availability campaigns may have nominal beneficial effects,[26] overwhelmingly, the message is that public pressure generated by availability entrepreneurs acts as a catalyst for hasty and inappropriate legislative initiatives.[27] This paper explores the adaptive nature of the

22 Jolls et al., *supra* note 1, at 1519; *see* Sunstein, *Precautions*, *supra* note 3, at 98 (noting that cascade effects caused by the availability heuristic can produce a public demand for regulation regardless of the actual risk).

23 Kuran & Sunstein, *supra* note 1, at 685.

24 Jolls et al., *supra* note 1, at 1518; Jeffrey J. Rachlinski, *Bottom-Up Versus Top-Down Lawmaking*, 73 U. CHI. L. REV. 933, 958 (2006) ("The notion of anecdote-driven legislation . . . refers to some exemplar of a social problem that becomes so vivid and salient, that it instills an exaggerated sense of urgency in the public eye."); Cass R. Sunstein, *How Law Constructs Preferences*, 86 GEO. L.J. 2637, 2650 (1998) ("'Availability cascades' can produce a large demand for law, as in the familiar 'pollutant of the month' syndrome in environmental law."); *see also* John Bachmann, *Will The Circle Be Unbroken: A History of the U.S. National Ambient Air Quality Standards*, 57 J. AIR & WASTE MGMT. ASS'N 652 (2007) (mentioning "the 'pollutant of the month' syndrome where research priorities shift from one concern to the next").

25 Not surprisingly, social psychologists spend a good deal of time discussing the effects of social perception and influence on belief systems and individual action. *See, e.g.*, Dale T. Miller & Deborah A. Prentice, *Collective Errors and Errors About the Collective*, 20 PERSONALITY & SOC. PSYCHOL. BULL. 541, 541, 547 (1994) (discussing pluralistic ignorance, whereby individuals attempt to align their own attitudes with the perceived, albeit incorrect, pervasive public attitude).

26 *See, e.g.*, Kuran & Sunstein, *supra* note 1, at 685, 700-01. The authors discuss the benefits of availability cascades or campaigns at several points: "The purpose of this article is to identify a set of interlinked social mechanisms that have important, *sometimes desirable*, but at other times harmful effects on risk regulation." *Id.* at 685 (emphasis added). Another commentator stated:

> [T]he survival benefit of the availability heuristic seems clear. If we are confronted with dangers similar to those previously encountered, the ability to recognize and react to them quickly is valuable. Of course, in the modern world, we use availability more broadly than just as a life-saving mechanism. Every day, decisions rely on this heuristic as well. If we had to process all potentially relevant information each time we drove our cars or took a walk, we would be frozen in indecision while we processed our voluminous memory databanks.

Adler, *supra* note 8, at 700-01 (citations omitted).

27 *See, e.g.*, Elizabeth A. Weeks, *Gauging the Cost of Loopholes: Health Care Pricing and Medicare Regulation in the Post-Enron Era*, 40 WAKE FOREST L. REV. 1215, 1224 (2005) ("Availability campaigns may benefit society by focusing attention on long-festering but ignored problems; however, they also can be harmful by redirecting societal resources to relatively trivial concerns."); *see also* Kuran & Sunstein, *supra* note 1, at 688 (acknowledging that availability campaigns can spark useful debate on neglected issues, but maintaining that "availability

availability heuristic and illustrates, both theoretically and through concrete historical example, the extraordinary and unique role availability campaigns play in generating vital new legislative initiatives. Although this paper primarily discusses availability campaigns in the context of environmental law, the principles discussed here illustrate the actual and potential impact of availability campaigns in other areas, such as securities, criminal law, health law, domestic relations, and international law, to name a few.

In Section I, we propose a model of availability campaigns. This phase-based model includes a *trigger phase*, *campaign phase*, *social movement phase*, and *action phase*. In Section II, we begin to build the case for a positive view of availability campaigns by demonstrating that responding to availability campaigns is evolutionarily adaptive. In other words, basing risk judgments on availability-campaign based information is rational, given the inevitable constraints on humans' information gathering and processing ability.[28] We argue that public demand for action to address and ameliorate these perceived dangers is sensible, rather than misguided, as some have suggested. In Section III, we expand our defense of availability campaigns to a discussion of the positive outcomes resulting from these campaigns. Specifically, we describe how availability campaigns offset the problem of legislative stagnation by generating sufficient social pressure to: (1) avoid lengthy debate and overcome partisan resistance, and (2) bypass the potentially endless search for scientific "truth." Section IV contains five examples of environmental availability campaigns. Four of these cases illustrate how public alarm and the accompanying pressure for change can create an efficient process resulting in important and valuable legislation. The fifth example is global warming; we discuss how global warming differs from the other cases of availability campaigns and explore the implications of these differences. In Section V we talk briefly about extra-legal benefits of availability campaigns, pointing to increases in funding for, and interest in, vital research and technologies. Finally, in Section VI we touch on availability campaigns in non-environmental fields. We conclude by expressing the hope that future discussion of availability campaigns will recognize the possibility of beneficial effects and will focus on developing methods for distinguishing between situations where pressure for legislation should motivate immediate action and those where immediate action should be suspended, pending further consideration.

campaigns sometimes do great harm by producing widespread availability errors").

[28] The premise that information provided by availability campaigns may rationally form the basis for risk assessment is explained and defended at length in Part II.

I. A PHASE MODEL OF AVAILABILITY CAMPAIGNS

Tversky and Kahneman,[29] Sutherland,[30] and others[31] have described the pervasive effect of the availability heuristic on ways in which individuals generate estimates about risk. Empirical investigations of this effect have repeatedly demonstrated that exposure to information about a particular event increases estimates of the risk associated with the event.[32] More recently, Kuran and Sunstein[33] have written on "availability cascades," which sometimes occur when members of society attempt either to obtain information (in the case of an informational cascade) or to earn social approval (the motivation underlying a reputational cascade).[34] As previously mentioned, cascades occur when the availability heuristic "interacts with identifiable social mechanisms to generate availability cascades—social cascades, or simply cascades, through which expressed perceptions trigger chains of individual responses that make these perceptions appear increasingly plausible through their rising availability in public discourse."[35] These cascades may occur spontaneously, but often they are manufactured or helped along by groups or individuals (availability entrepreneurs) who instigate and fuel availability cascades in an effort to create sufficient public pressure to generate change.[36]

Discussion of the availability heuristic has reached a critical mass in the legal literature; it is possible to find discussions of the availability heuristic in the context of securities regulation, racial bias in jury decision-making, public influence and judicial opinions, bankruptcy law

---

29 A. Tversky & D. Kahneman, *Availability: A Heuristic for Judging Frequency and Probability*, 5 COGNITIVE PSYCHOL. 207 (1973).

30 STUART SUTHERLAND, IRRATIONALITY: THE ENEMY WITHIN (1994).

31 *See, e.g.*, REID HASTIE & ROBYN M. DAWES, RATIONAL CHOICE IN AN UNCERTAIN WORLD: THE PSYCHOLOGY OF JUDGMENT AND DECISION MAKING 78-84 (2001); Norbert Schwarz & Leigh Ann Vaughn, *The Availability Heuristic Revisited: Ease of Recall and Content of Recall as Distinct Source of Information*, *in* HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT (Thomas Gilovich, Dale Griffin, & Daniel Kahneman, eds., 2002); John S. Carroll, *The Effect of Imagining an Event on Expectations for the Event: An Interpretation in Terms of the Availability Heuristic*, 14 J. EXPERIMENTAL SOC. PSYCHOL. 88 (1978); Sunstein, *Precautions*, *supra* note 3, at 89; Wilson, *supra* note 13, at 241-42.

32 *See supra* note 3 and accompanying text; *see also infra* note 37 and accompanying text.

33 Kuran & Sunstein, *supra* note 1, at 712.

34 *See id.* Kuran and Sunstein point out that there may be overlap between these two types of cascades, and that this overlap occurs when individuals affected by these cascades have dual underlying motivations: obtaining information *and* gaining social approval. *Id.*

35 *Id.* at 685. For more on availability cascades, see David Hirshleifer, *The Blind Leading the Blind: Social Influence, Fads, and Informational Cascades*, *in* THE NEW ECONOMICS OF HUMAN BEHAVIOR 188 (Mariano Tommasi & Kathyrn Ierulli eds., 1995), and Sushil Bikhchandani et al., *Learning from the Behavior of Others: Conformity, Fads, and Informational Cascades*, 12 J. ECON. PERSPS. 151 (1998).

36 *See* Kuran & Sunstein, *supra* note 1, at 713.

reform, and prosecutorial decision making, as well as many other areas.[37] Availability *campaigns* are less well recognized, although references to closely related social phenomena are sometimes referred to as herd behavior,[38] bandwagon effect,[39] groupthink,[40] or crowd psychology.[41] In-depth analysis of availability campaigns is virtually absent from the legal literature.[42] Moreover, commentary in the popular media sometimes misstates the availability heuristic and its offspring, the availability cascade and campaign.[43] We attempt to fill this void

[37] Susan Block-Lieb & Edward J. Janger, *The Myth of the Rational Borrower: Rationality, Behavioralism, and the Misguided "Reform" of Bankruptcy Law*, 84 TEX. L. REV. 1481 (2006) (bankruptcy law and behavioral biases); Alafair S. Burke, *Improving Prosecutorial Decision Making: Some Lessons of Cognitive Science*, 47 WM. & MARY L. REV. 1587 (2006) (heuristics and biases in the context of prosecutorial discretion); Justin D. Levinson, *Forgotten Racial Equality: Implicit Bias, Decisionmaking, and Misremembering*, 57 DUKE L.J. 345 (2007) (implicit consideration of race in jury determinations); Cass R. Sunstein, *If People Would be Outraged by Their Rulings, Should Judges Care?*, 60 STAN. L. REV. 155 (2007) (the role of public opinion in judicial decision-making); Steven Walt, *Underestimation Bias and the Regulation of Secured Consumer Debt*, 40 UCC L.J. 2 Art. 3 (2007) (regulation of consumer debt).

[38] *See* Laurens Rook, *An Economic Psychological Approach to Herd Behavior*, 40 J. ECON. ISSUES 75 (2006).

[39] *See* Richard Nadeau et al., *New Evidence About the Existence of a Bandwagon Effect in the Opinion Formation Process*, 14 INT'L POL. SCI. REV. 203 (1993).

[40] IRVING L. JANIS, VICTIMS OF GROUPTHINK: A PSYCHOLOGICAL STUDY OF FOREIGN-POLICY DECISIONS AND FIASCOES 9 (1972) (Groupthink is a "mode of thinking that people engage in when they are deeply involved in a cohesive in-group, when the members' strivings for unanimity override their motivation to realistically appraise alternative courses of action.").

[41] As one commentator stated:

> Under certain given circumstances, and only under those circumstances, an agglomeration of men presents new characteristics very different from those of the individuals composing it. The sentiments and ideas of all the persons in the gathering take one and the same direction, and their conscious personality vanishes. A collective mind is formed, doubtless transitory, but presenting very clearly defined characteristics. The gathering has thus become what, in the absence of a better expression, I will call an organised crowd, or, if the term is considered preferable, a psychological crowd. It forms a single being, and is subjected to the law of the mental unity of crowds.

GUSTAVE LE BON, THE CROWD: A STUDY OF THE POPULAR MIND 2 (1896) (emphasis omitted).

[42] Only a very small number of articles and essays have even mentioned availability campaigns by that name. At last count (as of February 24, 2008), a Westlaw search of "availability campaign" turned up only six articles. The most notable paper, and the one that provided the basis for our interest in the topic is Timur Kuran & Cass R. Sunstein, *Availability Cascades and Risk Regulation*, 51 STAN. L. REV. 683 (1999). Another is Cass R. Sunstein, *What's Available? Social Influences and Behavioral Economics*, 97 NW. U. L. REV. 1295 (2003). It has been argued that definitions of the availability heuristic have been applied inconsistently in the literature, and that "availability" has alternatively been understood as "salience" or as an overweighting of particularly memorable events—in other words, as an adjective (events that are available are salient) and as a reaction to that descriptor (taking action based upon those salient events). Gerd Gigerenzer, *Is the Mind Irrational or Ecologically Rational?*, *in* THE LAW AND ECONOMICS OF IRRATIONAL BEHAVIOR 37, 45-46 (Francesco Parisi & Vernon L. Smith eds., 2005).

[43] An example of a flawed definition is: "The simple definition of availability cascade is when we read and hear in the media about an issue so much that we accept it as reality." *Avoid Dangers of Availability Cascade*, TIMESDAILY.COM, Jan. 20 2008, http://www.timesdaily.com/

with a detailed analysis of a successful availability campaign.

We propose that availability campaigns have a specific structure and follow a predictable pattern, which we model here. From the outset, we acknowledge that this definition is solely our own. We feel confident in proposing a particular definition because the literature on availability *campaigns* is nascent, and as a result, there is as yet no consensus as to a working model of this phenomenon. Scholarship describing availability campaigns has defined them by how they function.[44] Our proposed model conceives of an "availability campaign" as a broad phenomenon that includes the efforts of the individuals behind the availability cascade, the cognitive and social mechanisms, and the resulting outcome. Rather than breaking the model down into these constituent parts, we take a phase approach, noting specific characteristics of availability campaigns in each phase. This treatment permits us to apply a historical framework, ascertaining the nature of availability campaigns by looking at events that have occurred in the past and measuring them against our model to see whether they fit.[45]

The model we advance here is circumscribed and conceives of a particular set of circumstances leading to the availability campaign. Notably, we limit our analysis and discussion to situations in which there is a relatively abrupt genesis. Many—perhaps most—social movements do not begin with a discrete event or discovery. Instead, they unfold over time, as consensus or discontent grows. Social movements tend to be a product of a series of events that become cumulative. However, the mechanism by which information is shared and influences collective perceptions is similar, regardless of whether there is a single precipitating episode or a series of episodes—perhaps each with its own availability cascade and related outcomes. In either case, availability campaigns have the potential to exert tremendous power and influence. The primary difference may simply be the fact that the event triggering the campaign is oriented in the context of a

article/20080120/NEWS50/801200326/1002. This is neither a definition, in the strict sense of the term, nor is it descriptively accurate. It is not the simple reading and hearing about an issue that creates an availability cascade. It is the reading and hearing about the assertion of a particular truth. To provide an example, if an individual were to read many stories asserting that global warming is a serious environmental crisis and to read an equal number of stories contending that global warming is not even really occurring, the individual might simply get the impression that the issue was one of popular debate. Alternatively, the individual might form an opinion of one sort or another. However, in the aggregate, over many individuals, the sides would be balanced, and the equal availability of opposing perspectives would not lead to a cascade.

44 Kuran & Sunstein, *supra* note 1.

45 Of course, this process goes both ways. Not only do we apply our model to past episodes to determine whether availability campaigns were at play, but we also use events that we feel confident were availability campaign-driven in order to come up with our model.

broader social movement.[46] The model we present here is basic. We base our initial analysis on a simple model in order to allow for the clearest examination of the fundamental components of an availability campaign.

Our model of an availability campaign includes four phases. The first phase is the *trigger phase*. In the trigger phase of an availability campaign, there is a precipitating event. Quite often, this "event" consists of a discovery.[47] The subject of the discovery could be new scientific data, such as evidence of a link between an activity and a harm, or it could be the unearthing of a material substance in a particular location, such as toxic waste. Generally, an availability campaign is triggered by a discrete discovery or series of discoveries over a relatively compact time period.[48] Importantly, the discovery has the real or imagined potential to harm a group of people. This group of people may either be large in number, or may be perceived as being particularly vulnerable.

Phase two is the *campaign phase*. In this second phase of the availability campaign, the cause is taken up, and an individual or group of individuals, working in concert, begins to spread the word. These availability entrepreneurs—through the use of various avenues, including print and broadcast media, public forums, and word-of-mouth—publicize the harms associated with the discovery. The presence of actors who strategically manipulate public perceptions is critical in distinguishing availability *campaigns* from simple availability *cascades*. In the first instance, the dissemination of information is strategic, while in the second, it is informational (and reputational). It is not necessary that the availability entrepreneurs be disingenuous. The human machine generating publicity for the cause can have the noblest of intentions and can perceive a real and impending crisis. Regardless of motive, by the end of phase two, thanks in large part to the efforts of the availability entrepreneurs, there is widespread knowledge of the discovered harm.

---

[46] Examples of discrete events within larger movements or contexts include the assassination of Martin Luther King leading to the passage of civil rights legislation and the tea tax leading to the Boston tea party and the American Revolution. In each of these cases, the event attracted widespread attention and discussion. In each of these cases, one might say that the threat (anti-civil-rights sentiment or British tyranny) became more salient because of the event. However, each of these events took place within the broader context of a large social movement, and the role they played in the eventual governmental action is difficult to ascertain.

[47] When the event is not a discovery, it is the action of an individual or group of individuals that draws the public's attention to some important, yet previously little-known information. In this sense, the public "discovers" the information, although technically the information was already available. The Bush administration's suspension of stricter arsenic standards is an example of this type of precipitating event. *See infra* Part IV.A.

[48] See the discussion of global warming, *infra* Part IV.E, for an example of an exception to this general rule.

The third phase is the *social movement phase*. This phase occurs when the public begins to agitate for change to address the problem. During this phase, public concern has grown to such a level that any continuing efforts of the availability entrepreneurs is largely additive and unnecessary. By this point, widespread concern has begun to generate its own energy. In this phase, any doubting voices have largely been quelled, and the notion that the danger is imminent is a widely held presumption.

By the fourth and final phase of an availability campaign, sufficient social consensus has been generated that fixing the problem becomes a moral imperative for policy-makers. The result is the *action phase*. Whether legislators believe that the danger is real or imagined, the political fallout from failing to act could be severe. In the *action phase* of an availability campaign, policy-makers engage in swift action to address the issue and to assuage the public's fears. The ultimate effect is new legislation or increased regulation.[49]

II. THE ADAPTIVE NATURE OF AVAILABILITY CAMPAIGNS

One way to view our claim is that we manage to identify a single benefit resulting from an otherwise wasteful and destructive phenomenon. This view would suggest that availability campaigns have unintended extrinsic benefits that are nothing more than incidental. Such a characterization of availability campaigns is misleading. The process of gauging risk by observing events and inferring overall trends is not only valuable, it is *essential to human survival*. The availability heuristic is one of a compilation of cognitive "shortcuts" essential to human functioning in a complex world, where quick decisions may make the difference between surviving and perishing.[50]

For some time now, behavioral theorists have been pointing out serious flaws in the neoclassical law and economic theory of rational choice.[51] Rational choice theory—which portrays human beings as

[49] A more complete model might include a fifth *evaluation phase*, when legislators and the public assess the worthiness of the legislation or regulation. This might occur shortly after the new legislation is put in place or may take years.

[50] *See* Hal R. Arkes, *Principles in Judgment/Decision Making Research Pertinent to Legal Proceedings*, 7 BEHAV. SCI. & L. 429, 486 (1989); *see also* Wolfgang Fikentscher, *The Evolutionary and Cultural Origins of Heuristics that Influence Lawmaking*, *in* HEURISTICS AND THE LAW 207, 216-19 (G. Gigerenzer & C. Engel eds., 2006); Gerd Gigerenzer & Peter M. Todd, *Fast and Frugal Heuristics: The Adaptive Toolbox*, *in* SIMPLE HEURISTICS THAT MAKE US SMART 3, 5 (Gerd Gigerenzer, Peter M. Todd & ABC Research Group eds., 1999).

[51] *See* Daniel Kahneman & Amos Tversky, *Choices, Values, and Frames*, 39 AM. PSYCHOLOGIST 341, 347-48 (1984); Daniel Kahneman & Amos Tversky, *Prospect Theory: An Analysis of Decision Under Risk*, 47 ECONOMETRICA 263, 263-91 (1979); Daniel Kahneman & Amos Tversky, *Subjective Probability: A Judgment of Representativeness*, 3 COGNITIVE

maximizers who compile every possible piece of information, consider all available options, and make a reasoned decision based solely upon the goal of maximizing personal gains—is *not* descriptive of human decision making.[52] Social scientists and scholars have identified a cadre of heuristics and biases characteristic of human decision making.[53] The empirical evidence for the presence of these cognitive shortcuts indicates that human beings are not "rational" in the neoclassical economic sense. Human beings do not possess limitless cognitive resources, nor do they have the ability to apply rules of logic perfectly. The non-rational characteristics of human reasoning were first proposed by Herbert Simon, who advanced the notion that human beings are "boundedly rational"—there are natural limitations to individuals' ability to make rational decisions.[54]

Importantly, Simon did not intend to propose that human decision making is *irrational*.[55] In fact, the use of these shortcuts is infinitely "rational" in the sense that they allow for quick, efficient information processing and choice allocation.[56] One outspoken critic of an irrational

PSYCHOL. 430, 430 (1972). For some early law review pieces discussing heuristical processing and responses in legal frameworks, see Alan Schwartz & Louis L. Wilde, *Imperfect Information in Markets for Contract Terms: The Examples of Warranties and Security Interests*, 69 VA. L. REV. 1387, 1436-42 (1983) (discussing the availability and representative heuristics), and Barbara D. Underwood, *Law and the Crystal Ball: Predicting Behavior with Statistical Inference and Individualized Judgment*, 88 YALE L.J. 1408, 1428 (1979) ("[S]tudies show that in making individualized judgments people rely primarily on information about the case at hand, paying relatively little attention to background information about other cases.").

[52] *See* Herbet A. Simon, *A Behavioral Model of Rational Choice*, 69 Q. J. ECON. 99, 99-118 (1955) (for an early discussion of behavioral decision making); *see also* BEHAVIORAL LAW AND ECONOMICS (Cass Sunstein ed., 2000); CHOICES, VALUES, AND FRAMES (Daniel Kahneman & Amos Tversky eds., 2000) (discussing empirical investigations of how human beings process information and make choices).

[53] These heuristics and biases have been discussed under the rubric of "behavioral decision theory" or "behavioral law and economics" and include anchoring and adjustment, optimism bias, representativeness heuristic, hindsight bias, conjunction fallacy, endowment effect and related status quo bias, risk aversion, and, of course, availability heuristic, to name a few.

[54] Herbert Simon introduced the notion of "bounded rationality" in the 1950s to account for the fact that human beings have finite computational resources available for making choices. Simon, *supra* note 52, at 99-118; *see also* HERBERT SIMON, MODELS OF BOUNDED RATIONALITY, VOL. 2: BEHAVIORAL ECONOMICS AND BUSINESS ORGANIZATION (1982).

[55] Herbert Simon has noted with approval:

> In the past few years, the theory of rational ("sensible") human behavior has broken loose from the illusory and empirically unsupported notion that deciding rationally means maximizing expected utility. Research has learned to take seriously and study empirically how real human beings . . . actually address the vast complexities of the world they inhabit.

Herbert Simon, SIMPLE HEURISTICS THAT MAKE US SMART back cover (Gerd Gigerenzer, Peter M. Todd & ABC Research Group eds., 1999)

[56] *See* Kuran & Sunstein, *supra* note 1, at 690 ("[W]e consider a society composed of boundedly rational individuals who benefit immensely from using cognitive rules of thumb."); *see also* Andreas Ortmann & Michal Ostatnicky, *Proper Experimental Design and Implementation Are Necessary Conditions for a Balanced Social Psychology*, 27 BEHAV. & BRAIN SCI. 352, 352 (2004) (noting that discussion of human choice and problem-solving has

view of heuristical processing is Gerd Gigerenzer.[57] Gigerenzer believes that Simon's concept of bounded rationality has been misinterpreted by scholars who focus on the failings of human cognition.[58] Gigerenzer argues for a revisionist notion of bounded rationality,[59] and in so doing, advances a model of human decision making based upon "ecological rationality", which involves an interaction between the environment and human cognition.[60] Ecological rationality is the notion that "[t]o behave adaptively in the face of environmental challenges, organisms must be able to make inferences that are fast, frugal, and accurate."[61] Gigerenzer's main thesis is that fast and frugal heuristics operate very well in many instances—and in fact, are often superior to more methodical methods.[62]

The availability heuristic is a perfect example of a fast and frugal heuristic used in judging risk under time constraints and with very little information. When an individual is making a judgment as to the likelihood or magnitude of a potential threat, he or she must generalize from personal experience. Events will be particularly "available" or easily brought to mind when they are: (a) frequent, (b) recent, and/or (c) vivid or negative.[63] There are obvious evolutionary advantages to

been overly pessimistic). This is not to say that people always make optimal choices. Certainly, there are many examples of situations in which reliance on rules of thumb lead to less than optimal choices. As Gilovich and Griffin point out, "[e]volutionary pressures acting on the bulk of human judgments are neither sufficiently direct nor intense to sculpt the kind of mental machinery that would guarantee error-free or bias-free judgment." Thomas Gilovich & Dale Griffin, *Introduction* to HEURISTICS AND BIASES: THE PSYCHOLOGY OF INTUITIVE JUDGMENT 9 (Thomas Gilovich, Dale Griffin, & Daniel Kahneman, eds., 2002).

57 Gigerenzer writes:

> The narrowly defined "fallacies" discussed by the heuristics-and-biases program have not only been deemed irrational, but have also been interpreted as signs of the bounded rationality of humans. Equating bounded rationality with irrationality in this way is as serious a confusion as equating it with optimization under constraints. Bounded rationality is neither limited optimality nor irrationality.

Gigerenzer & Todd, *supra* note 50, at 27 (citation omitted).

58 In fact, Gigerenzer argues that Kahneman and Tversky's conceptualization of Herbert Simon's bounded rationality is incorrect: "The view [that bounded rationality refers to the fact that human cognitive abilities are limited] is not Simon's, but Kahneman and Tverksy's. . . . Simon's bounded rationality is not the study of cognitive limitations." Gigerenzer, *supra* note 42, at 39. Gigerenzer also attributes this mistake to Jolls et al., Sunstein, and Thaler, along with others who advance the notion of a limited cognitive system. *Id.* at 38-39.

59 *See generally* Gigerenzer, *supra* note 42.

60 *See* Gerg Gigerenzer & Daniel G. Goldstein, *Reasoning the Fast and Frugal Way: Models of Bounded Rationality*, 103 PSYCHOL. REV. 650, 684 (1996).

61 Gigerenzer & Todd, *supra* note 50, at 18.

62 Admittedly, although it will suffice for our purposes here, this is a somewhat simplistic and incomplete explanation of Gigerenzer's theory. For a more complete picture, see generally SIMPLE HEURISTICS THAT MAKE US SMART (Gerd Gigerenzer, Peter M. Todd & ABC Research Group eds., 1999).

63 HASTIE & DAWES, *supra* note 31, at 78-84, 88-89 (illustrating the fact that vivid and negative information is more easily remembered and therefore more likely to influence judgments).

fearing events that have these characteristics.[64] In the case of events that have recently occurred or occurred multiple times, we have good reason to judge that they are likely to occur in the future. In fact, there is evidence that people who rely on this rule of thumb are often correct in their judgments about risks.[65] Vivid or negative events are likely to be events that proved dangerous in the past or are frightening for some other reason—and events that have these characteristics *are* particularly likely to be threatening.[66]

If, as some have convincingly argued, our cognitive system does not operate according to "rational" principles and therefore overreacts to a potential threat, we ought to consider whether, in the long run, this response may be advantageous.[67] In other words:

> [R]eacting immediately . . . substantially increases one's survival odds. . . . [H]euristics that predispose people to sense danger even when little risk may actually exist are clearly survival oriented and much preferred over those that operate in the opposite direction. . . . [L]ife-and-death evolutionary demands rewarded speedy decision making more than perfect judgment.[68]

A quick response to a potential threat is particularly important in instances where ongoing environmental damage might result in irreversible destruction to our habitat. Lengthy debates on the wisdom of implementing environmental legislation could be counterproductive from an evolutionary standpoint. After all, as humans have become increasingly sophisticated, they have also become more efficient at producing toxic substances and consuming limited natural resources, as

---

64 *See, e.g.*, Adler, *supra* note 8, at 693.

> If one sees another person die after being bitten by a poisonous snake, one quickly and vividly learns to hesitate when picking up snakes, especially any that bear a close resemblance to the one that killed the neighbor. Needless to say, having the ability to absorb lessons such as this quickly carries substantial life-saving benefits—reacting immediately at the sight of a dangerous reptile substantially increases one's survival odds. Social psychologists describe this strong reaction as an example of the "availability" heuristic.

Id.

65 For one empirical study demonstrating this, see Neal Feigenson et al., *Perceptions of Terrorism and Disease Risks: A Cross-National Comparison*, 69 MO. L. REV. 991 (2004) (comparing American and Canadian perceptions of risk with respect to terrorism and severe acute respiratory syndrome, or SARS).

66 *See* Lee Ross & Craig A. Anderson, *Shortcomings in the Attribution Process: On the Origins and Maintenance of Erroneous Social Assessments*, *in* JUDGMENT UNDER UNCERTAINTY: HEURISTICS AND BIASES 129, 152 (Daniel Kahneman, Paul Slovic & Amos Tversky eds., 1982) ("[C]hanges in outlook or belief . . . can be wrought by vivid, concrete, first-hand experience . . . ." (citation omitted)); *see also* Adler, *supra* note 8, at 693 (arguing that reacting to vivid information about risks is critical to survival).

67 From an evolutionary better-safe-than-sorry perspective, "you are less likely to survive and reproduce if you sometimes neglect to flee from a tiger than if you occasionally flee from a shadow that looks like a tiger." Eric A. Posner, *Law and the Emotions*, 89 GEO. L.J. 1977, 2003 (2001).

68 Adler, *supra* note 8, at 693-96.

well as creating myriad other harms.

The notion that "[i]t is evolutionarily more costly for an organism to fail to respond to a threat than it is for the organism to respond incorrectly"[69] is related to the precautionary principle.[70] The precautionary principle is based upon the notion that "[w]hen science cannot yet fully establish a cause-and-effect relationship, but can provide reasonable evidence of harm, [we should] take precautionary measures. . . . [I]f we wait until we're absolutely certain, we've probably waited too long."[71] In its decision to allow the Occupational Health and Safety Administration (OSHA) to impose stricter regulations regarding acceptable benzene levels in the workplace, the court in *Union Department, AFL-CIO v. American Petroleum Institute* reasoned that "risking error on the side of overprotection rather than underprotection" is the best option when interpreting data with respect to carcinogens.[72] So, while it is true that human cognition falls short of the law and economics perfect rationality because it is limited and takes shortcuts, these shortcuts do often produce very good results. While the availability heuristic does not lead to behavior that the law and economics model would predict, it does lead to behavior that is often well-suited to maximize the chance of survival.

Moreover, it is evolutionarily adaptive to act based upon information promulgated via an availability campaign. First, the trigger for an availability campaign is often a *real threat* which has the potential to cause injury of some magnitude. It is therefore inaccurate to conceive of availability campaigns as a "skewed assessment among the public . . . [regarding] virtually nonexistent harms."[73] Second, it is

69 Posner, *supra* note 67, at 2003.

70 For more on the precautionary principle and environmental law, see PROTECTING PUBLIC HEALTH & THE ENVIRONMENT 1 (Carolyn Raffensperger & Joel Tickner eds., 1999) ("In its simplest formulation, the Precautionary Principle has a dual trigger: If there is a potential for harm from an activity and if there is uncertainty about the magnitude of impacts or casualty, then anticipatory action should be taken to avoid harm."), and David A. Dana, *A Behavioral Economic Defense of the Precautionary Principle*, 97 NW. U. L. REV. 1315 (2003). For an argument that the precautionary principle can often suggest more than one course of action, see Cass R. Sunstein, *Beyond the Precautionary Principle*, 151 U. PA. L. REV. 1003, 1003 (2003).

71 Ruth Rosen, Editorial, *Better Safe Than Sorry*, SAN FRANCISCO CHRON., June 19, 2003, at A25; *see also* David A. Dana, *supra* note 70, at 1315 ("No single formulation of the principle has been uniformly accepted. As a general matter, the precautionary principle counsels serious contemplation of regulatory action in the face of evidence of health and environmental risk, even before the magnitude of risk is necessarily known or any harm manifested.").

72 Indus. Union Dep't, AFL-CIO v. Am. Petroleum Inst., 448 U.S. 607, 656 (1980).

73 Craig S. Lerner, *Legislators As the "American Criminal Class": Why Congress (Sometimes) Protects the Rights of Defendants*, 2004 U. ILL. L. REV. 599, 629 (2004). Richard Posner, a long-time defender of *homo economicus* (the "rational man"), finds sensible the link between fear and salient risks:

> Likewise, it seems rational to be more fearful about novel risks, such as that of nuclear power, than about old risks, such as that of pollution caused by the burning of coal, since when a risk is novel its mean and variance are difficult to estimate. . . . When

not maladaptive to obtain information through public channels of communication. After all, human beings are social creatures, and they very often rely upon one another (as other animals do) to communicate information about dangers. If individuals tend to lend credence to information that is anecdotal, it is because statistical data is rarely immediately available. Richard Posner, a self-professed champion of rational choice theory[74] has argued:

> It is entirely rational for people to rely on anecdotal evidence in the absence of better evidence, just as it is rational for them to rely on an advocate's known character for probity in the absence of evidence that would enable the truth of his proposals to be verified directly.[75]

Even reliance upon information provided by others as part of an availability campaign is not irrational because "the behavior of other people is often a reliable guide to what you should do to maximize your own welfare, unless you think you have very different preferences, or face different constraints . . . ."[76]

It is important reiterate that while the behavior we have been describing is "rational" from an adaptation standpoint, it is not the mode of reasoning predicted by rational choice theory. Without a doubt, choosing a course of action based upon anecdotal information involves making a less than fully-informed decision. However, decision-making based upon fast and frugal heuristics may well yield decisions that are systematically *better* than they would be if they were the result of a laborious process of information gathering and risk calculating.[77] Avoiding legislative stagnation is an example of why this is so.[78]

> some new horror occurs, like the first mass shooting of schoolchildren by fellow students, there is a natural concern that this may be the beginning of a trend, rather than an isolated occurrence; and in that particular case there is also a concern with the possibility of imitation, another legitimate source of alarm.

Richard A. Posner, *Cost Benefit Analysis: Legal, Economic, and Philosophical Perspectives*, 29 J. LEGAL STUD. 1153, 1161 (2000).

74 It is with some ambivalence that we adopt Posner's position here. Although we agree with Posner's view that the availability heuristic often leads people to make sensible inferences, we break with him over the usefulness of cost-benefit analysis and rational choice theory. Like others who write in the area of behavioral law and economics, we are deeply cynical about conventional law and economic notions of human behavior.

75 Richard A. Posner, *Rational Choice, Behavioral Economics, and the Law*, 50 STAN. L. REV. 1551, 1572-73 (1998). We are not alone in proposing the possibility that available events may correlate with real harms. *See* Korobkin & Ulen, *supra* note 3, at 1087 n.135 ("Note that, so long as available incidents are representative of base rates, relying on available anecdotes rather than statistical probabilities will not lead to sub-optimal decision making.").

76 Posner, *supra* note 75, at 1573.

77 Peter M. Todd & Gerd Gigerenzer, *What We Have Learned (so Far)*, *in* SIMPLE HEURISTICS THAT MAKE US SMART 358-59 (Gerd Gigerenzer, Peter M. Todd & ABC Research Group eds., 1999).

78 *See infra* Part III for a discussion on offsetting legislative stagnation.

III. AVAILABILITY CAMPAIGNS OFFSET LEGISLATIVE STAGNATION

Literature on the subject of the availability heuristic is replete with criticism,[79] particularly in connection with environmental law.[80] The availability heuristic is credited for systematic errors in environmental legislation: "People's reliance on the availability heuristic frequently produces mistaken assessments of the risks of environmental hazards."[81] In particular, the use of environmental availability campaigns to push for new environmental legislation is traditionally thought to be problematic for two reasons: 1) it results in mass anxiety with respect to activities that pose minimal actual hazard,[82] and 2) it causes inconsistency in the laws due to simultaneous over- and under-regulation.[83]

The latter effect—the "crazy quilt-pattern" of inconsistent regulation that is not closely associated with actual risk levels[84]—is explained as follows: "If people are mistaken about the fatalities associated with various activities, then they are likely to favor overexpenditure of funds to prevent damage from [less dangerous hazards] while underfunding efforts to reduce [more dangerous hazards], which they view as less dangerous."[85] This is traditionally viewed as a negative attribute that "can lead to bad and distorted

79 *See, e.g.*, Book Note, *Frontiers of Legal Theory*, 115 HARV. L. REV. 1525, 1529 (2002) (noting Judge Richard Posner's criticism of the availability heuristic and other biases due to their effects on legal decision-making: the "ultimate prescription is a strong dose of economic analysis of law, which [Posner] imagines to be cleansed of the availability heuristic"); *see also* Stephen J. Choi & A.C. Pritchard, *Behavioral Economics and the SEC*, 56 STAN. L. REV. 1, 25-26 (2003); Frederick Schauer, *Do Cases Make Bad Law?*, 73 U. CHI. L. REV. 883, 891 (2006).

80 *E.g.*, Cass R. Sunstein, *Economics & Real People*, 3 GREEN BAG 397, 400 (2000) [hereinafter Sunstein, *Economics*] (suggesting frustration that the legal system typically intervenes in the aftermath of a highly visible environmental hazard—regardless of whether or not the intervention will do more harm than good—but fails to do anything at all regarding incidents that are not visible).

81 Rachlinski, *supra* note 11, at 311; *see* Cass R. Sunstein, *Behavioral Analysis of Law*, 64 U. CHI. L. REV. 1175, 1188 (1997); Sunstein, *Endogenous*, *supra* note 8, at 241; Sunstein, *Montreal*, *supra* note 1, at 63 (commenting that the use of the availability heuristic can produce "serious errors": it affects judgments about probability, producing environmental legislation that does not accurately track cost-benefit analysis).

82 Kuran & Sunstein, *supra* note 1, at 685.

83 Jolls et al., *supra* note 1, at 1519; *cf.* Adler, *supra* note 8, at 701 n.56 ("In some cases, [policymakers] may be prodded to regulate insignificant risks, and in others they may face apathy in promoting public health measures.").

84 Sunstein, *Endogenous*, *supra* note 8, at 241; *see* Jolls et al., *supra* note 1, at 1519 (calling the result of availability campaigns "a patchwork of environmental laws characterized by both over- and under-regulation").

85 Yablon, *supra* note 8, at 936; *see* Sunstein, *Cognition*, *supra* note 8, at 1067 (noting that cascade effects caused by the availability heuristic can produce a public demand for regulation even though the relevant risks are trivial, while producing little or no demand for regulation of risks that are large in magnitude).

policymaking."[86] One commentator notes:

> [T]here is a burgeoning literature describing how the availability heuristic results in a skewed assessment among the public as to the relative likelihood of various calamities, and therefore *misplaced pressure on elected representatives to enact laws that will redress virtually nonexistent harms*.[87]

Another article tentatively acknowledges benefits but quickly counters the admission:

> [T]he use of particular instances might be necessary to move the public and legislatures in the right directions. Certainly the social processes that interact with salience and availability can promote reform where it is needed. *But* there is no assurance here, particularly if social influences are leading people to exaggerate a problem or to ignore the question of probability altogether.[88]

A third commentator acknowledges the presence of "desirable effects" and "social benefits" of such campaigns but is quick to cast those benefits aside: "It is undoubtedly true that in certain contexts cognitive heuristics will produce beneficial results . . . . But their redeeming features should not be overstated, for the results . . . can be very harmful."[89]

A. *The Filter Effect*

Availability campaigns serve a critical function in our legislative process. They get the wheels of government and agencies turning, promoting needed change in areas that have long been neglected.[90] By doing so, such campaigns eradicate what would otherwise be Congressional inertia towards environmental issues by winning a small handful of "anti-stagnation" battles each year. The result is still an inconsistent scene of stagnation for most environmental issues

86 Yablon, *supra* note 8, at 936.

87 Lerner, *supra* note 73, at 630 (emphasis added).

88 Sunstein, *Precautions*, *supra* note 3, at 98 (emphasis added).

89 Kuran & Sunstein, *supra* note 1, at 688, 707; *see* CASS R. SUNSTEIN, THE COST-BENEFIT STATE: THE FUTURE OF REGULATORY PROTECTION 9, 26-27 (2002) (calling the availability heuristic one of the "cognitive problems" affecting environmental decision-making); Michael Abramowicz, *Information Markets, Administrative Decisionmaking, and Predictive Cost-Benefit Analysis*, 71 U. CHI. L. REV. 933, 966 (2004) (using the terms "danger" and "a vicious cycle" when describing the effects of the availability heuristic and availability cascades).

90 Generally critical of availability campaigns, prominent legal scholars Sunstein and Kuran have noted that they "often produce social benefits by overcoming public torpor . . . on long-festering though rarely articulated problems." Kuran & Sunstein, *supra* note 1, at 688; *cf.* Christopher H. Schroeder, *Prophets, Priests, and Pragmatists*, 87 MINN. L. REV. 1065, 1068 (2003) ("The environmental movement of [the 1970s] transformed discourse about our environmental condition, driving from the public scene arguments that environmental problems ought not to be taken seriously.").

punctuated by legislative activity for a small number of issues.[91] However, for the reasons below, this scenario is the superior alternative.

Both over-regulation and under-regulation are thought to result from environmental availability campaigns: public attention tends to result in over-regulation of the "available" environmental topics and under-regulation of the other, less salient topics.[92] Those who advocate this characterization of effects of availability campaigns believe that without such campaigns, progress in the area of environmental law would occur in a more consistent, measured, and sensible fashion.[93] However, in the absence of such campaigns, environmental initiatives would *not* in fact be free from erratic movement or inconsistencies. Moreover, as we explain below, environmental law improves by virtue of environmental availability campaigns.

There are countless environmental issues facing us today.[94] For many of these issues, there is a substantial amount of environmental and

91 *See supra* notes 83-85 and accompanying text.

92 *See supra* notes 83-85 and accompanying text.

93 As one commentator states, "[w]hen there is an upsurge of interest in addressing a particular risk, the government loses its ability to . . . enforce intertemporal consistency." Kuran & Sunstein, *supra* note 1, at 747. This statement directly implies that without the upsurge in interest, which is often caused by availability campaigns, there would be "intertemporal consistency" in environmental regulation.

94 The following list of environmental issues barely even begins to scratch the surface: 1) air pollution (including air quality, smog and haze, ozone depletion, industry and power plant operations and emissions, motor vehicles, oil refining, controlled burn practices, marine vessel emissions, indoor air quality, asbestos inhalation, and fumes from paint, varnish, aerosols, and other solvents); 2) water pollution (including water quality, drinking water quality and treatment, discharge of chemical wastes from industry and power plants, thermal pollution, acid rain, hypoxia, marine pollution, ocean acidification, oil spills, ship pollution, sewage, agricultural and farm runoff containing insecticides or fertilizers, surface runoff from construction sites and other impervious surfaces, eutrophication, underground storage tank leakage leading to aquifer contamination, tree and brush debris from logging operations, volatile organic compounds from improper storage of industrial solvents, waterborne diseases and bacteria, and lead and mercury poisoning); 3) energy (including power plant operations and renewable energy sources); 4) global warming (including fossil fuel combustion, desertification, species loss, and ocean acidification); 5) soil pollution (including underground storage tank leakage, insecticides and herbicides, and bioremediation and genetic engineering); 6) conservation and biodiversity (including coastal preservation, wetland protection, endangered species and species loss, invasive species and diseases, overfishing, logging and deforestation, overgrazing, resource use, and national forests and national parks); 7) waste management (including sanitation, waste collection, solid waste treatment, waste water treatment, sewage, landfills, radioactive waste treatment); 8) hazardous waste sites (including cleanup and storage); 9) light pollution; 10) noise pollution; 11) overpopulation; 12) development and urban sprawl; and 13) environmental events and disasters (including hurricanes, tornadoes, floods, tsunamis, earthquakes, volcanoes, forest fires, dust storms, droughts, water shortages, mudslides, and disease outbreaks), and health issues (including exposure to work site chemicals, asbestos poisoning, respiratory problems from air pollution, and indoor air pollution). ENVIRONMENTAL ENCYCLOPEDIA (William P. Cunningham et al. eds., 1994); KATHRYN HILGENKAMP, ENVIRONMENTAL HEALTH: ECOLOGICAL PERSPECTIVES (2005); Wikipedia, List of Environmental Issues, http://en.wikipedia.org/wiki/List_of_environmental_issues (last visited Jan. 10, 2008) (including internal links).

health-related data available.[95] Without environmental availability campaigns, the government would be presented with a broad spectrum of environmental problems, none more salient than the next in the public's eye, and thus none more urgent and legislation-worthy than the other.[96] Absent guidance from the public about how to allocate resources and which areas to tighten regulation, the government would be faced with four options regarding environmental law-making: first, engage in no law-making whatsoever; second, engage in some law-making based on arbitrary prioritizing of issues; third, engage in some law-making based on experts' prioritizing of issues; or fourth, engage in law-making for every environmental issue on the table.

The first scenario—no law-making at all—is one of total stagnation. While certainly a *consistent* approach in that all issues are under-regulated, this scenario is troubling for several reasons. First, a legislative standstill can often be self-perpetuating, resulting in long-term inertia in a particular area.[97] Second, as industry grows and develops new technologies, the potential for environmental corruption increases, and corporate America is unlikely to regulate itself, absent

[95] *See, e.g.*, Nat'l Oceanic & Atmospheric Admin., National Environmental Satellite, Data, and Information Service, http://www.nesdis.noaa.gov/index.html (last visited Jan. 10, 2008) (a data index providing direct access to environmental data and information descriptions); Science.gov, Environment and Environmental Quality, http://www.science.gov/browse/w_123.htm (last visited Jan. 10, 2008) (an online access point for many sites providing data and information on the environment and environmental quality); U.S. Department of Energy, Office of Biological & Environmental Research, Climate Modeling Program, http://www.science.doe.gov/ober/CCRD/model.html (last visited Jan. 10, 2008) (a site including scientific data on climate change); U.S. Envtl. Prot. Agency, Envirofacts Data Warehouse, http://www.epa.gov/enviro/ (last visited Jan. 10, 2008) (an access point to U.S. EPA environmental data that affects air, water, and land); U.S. Envtl. Prot. Agency, Human Exposure Database System, http://www.epa.gov/heds/aboutheds.htm (last visited Jan. 10, 2008) (a data repository for human exposure studies); U.S. Geological Survey, http://www.usgs.gov (last visited Jan. 10, 2008) (a site providing reliable scientific information on biology, geography, geology, geospatial information, and water); World Resource Institute EarthTrends: Environmental Information, http://earthtrends.wri.org (last visited Jan. 10, 2008) (a comprehensive online collection of information regarding environmental, social, and economic trends).

[96] When the public is presented with a non-salient environmental issue (due, for example, to the lack of an availability campaign), these non-threatening issues do not make it onto people's "radar screens." Jolls et al., *supra* note 1, at 1519.

[97] *See* Elizabeth Garrett, *Enhancing the Political Safeguards of Federalism? The Unfunded Mandates Reform Act of 1995*, 45 U. KAN. L. REV. 1113, 1177 (1997) (commenting that as "the inertia that characterizes the [legislative] process . . . become[s] further entrenched, [it is more and more] difficult to enact good laws"); John Copeland Nagle, *Corrections Day*, 43 UCLA L. REV. 1267, 1282-83 (1996) (noting the disadvantageous nature of legislative inertia); *cf.* Karen H. Norris, *The Stagnation of Texas Ground Water Law: A Political v. Environmental Stalemate*, 22 ST. MARY'S L.J. 493, 494 (1990) (highlighting the problems with legislative stagnation in the area of Texas groundwater law). *But see* Schroeder, *supra* note 90, at 1070 ("In times of highly divisive environmental politics, the benefits of the legislative inertia that comes simply as a consequence of the difficulties of moving bills through the legislative process cannot be underestimated.").

any incentive to do so. Moreover, production of pollutants and resource expenditure pose considerable threats to human and animal populations, natural resources, and the earth's climate.[98] Finally, opinion polls reveal a preference among Americans for environmental protection and regulation, enforcing the necessity for law-making in this area.[99]

The second scenario—engaging in some law-making based on arbitrary prioritizing of issues—is an unlikely one, given that the U.S. government prefers to make non-arbitrary decisions with public involvement and approval.[100] Arbitrary ordering of environmental priorities would result in undesirable inconsistency—over-regulation in some areas and under-regulation in others—*without* the benefit of satisfying the goals of any segment of the public. Moreover, randomness in the regulation process would almost certainly create wide-spread criticism and disenchantment on the part of concerned

[98] The notion that environmental regulation is crucial is so ubiquitous that it is difficult to find any debate on the matter. In other words, questions seem to center not on *whether* to regulate, but on *how* to regulate. For a discussion of the harms posed by laissez-faire or "wait until harm is proved" approaches to environmental regulation, see Albert C. Lin, *The Unifying Role of Harm in Environmental Law*, 2006 WIS. L. REV. 897, 898-902.

[99] *See* Sunstein, *Precautions*, *supra* note 3, at 99 (explaining that people "are predisposed to favor environmental protection"); Wendy E. Wagner, *Congress, Science, and Environmental Policy*, 1999 U. ILL. L. REV. 181, 282 n.354 (stating that trends that "slow if not stop the process of environmental lawmaking [cause] a result that could well be contrary to the wishes of the general public"). The Harris Poll, conducted in October of 2007, revealed that 53% of respondents believe that there is too little government regulation to protect the environment. PollingReport.com, Environment, The Harris Poll, http://www.pollingreport.com/enviro.htm (last visited Jan. 10, 2008). According to a poll conducted in April of 2007, when asked: "Do you think the federal government should do more than it's doing now to try to deal with global warming, should do less than it's doing now, or is it doing about the right amount?", 70% of those polled answered that the government should do more. PollingReport.com, Environment, ABC News/Washington Post/Stanford University Poll, http://www.pollingreport.com/enviro.htm (last visited Jan. 10, 2008). Sixty-four percent of adults polled indicated that they believed that there should be "immediate action" or "some action" when asked: "From what you know about global climate change or global warming, which one of the following statements comes closest to your opinion? Global climate change has been established as a serious problem, and immediate action is necessary. There is enough evidence that climate change is taking place and some action should be taken. We don't know enough about global climate change, and more research is necessary before we take any actions. Concern about global climate change is unwarranted." PollingReport.com, Environment, NBC News/Wall Street Journal Poll, http://www.pollingreport.com/enviro.htm (last visited Jan. 10, 2008). In Michigan, 74% of respondents polled believed that more land use planning was needed. Michigan Land Use Leadership Council, Summary of Public Opinion Polls on Land Use, http://www.michiganlanduse.org/resources/councilresources/Public_Opinion_Polls_%20on_%20Land_%20Use.pdf (last visited Jan. 10, 2008).

[100] Indicative of the government's desire to involve the public in its decisions is the fact that "[c]itizen suit provisions and notice and comment rulemaking [provisions are] common features of environmental statutes." Michael P. Vandenbergh, *An Alternative to Ready, Fire, Aim: A New Framework to Link Environmental Targets in Environmental Law*, 85 KY. L.J. 803, 827 (1997). The Clean Air Act is one example of an environmental statute containing a citizen suit provision. 42 U.S.C. § 7604 (2006). Notice-and-comment rulemaking allows for public participation in agency rulemaking: the Administrative Procedure Act specifies that "the agency shall give interested persons an opportunity to participate in the rule making through submission of written data, views, or arguments." 5 U.S.C. § 553(c) (2006).

Americans.[101]

The third scenario—engaging in some law-making based on experts' prioritizing of issues—would avoid many of the difficulties associated with legislative stagnation or an arbitrary approach. In fact, the involvement of experts might imbue the legislative process with a certain air of legitimacy.[102] However, experts would also be potential targets for politicians and special-interest groups, and any resulting inappropriate influence, whether real or perceived, would undermine the legislative process.[103] Moreover, because these experts would likely be appointed, they would escape public scrutiny and would not be held accountable for indiscretions or inappropriate favoritism.[104]

The fourth scenario—engaging in law-making for every environmental issue in existence—is unattainable. Regardless of the wisdom of such broad regulatory oversight, this hypothetical is just that, a hypothetical, and will remain so given the limited resources available to the U.S. government.[105]

In the absence of availability campaigns, of these four possible outcomes, inertia in the field of environmental law appears the most likely result.[106] This prediction is supported by literature indicating that

---

101 The public is often dissatisfied when the government makes seemingly arbitrary decisions without the public's input. For example, vehement public criticism broke out when the Bush Administration decided to suspend the EPA's new standard for arsenic in drinking water and the EPA did not allow for public comment on its decision since, according to the EPA, seeking public comment was impracticable, unnecessary, and contrary to the public interest. ROBERT V. PERCIVAL ET AL., ENVIRONMENTAL REGULATION: LAW, SCIENCE, AND POLICY 259-61 (2006).

102 *Cf.* Kuran & Sunstein, *supra* note 1, at 737 (indicating that in the ideal situation, "policy choices [on risk regulation] rest on sound knowledge of relevant evidence, [which requires] a measure of deference to the purely factual judgments of scientific experts. It also requires democratic policy makers to . . . pay special attention to trained experts who have had time to put claims in perspective" (citation omitted)).

103 Holly Doremus, *Listing Decisions Under the Endangered Species Act: Why Better Science Isn't Always Better Policy*, 75 WASH. U. L.Q. 1029, 1040 (1997) ("[There are] highly publicized accounts of scientists serving as hired guns, promoting the interests of groups that pay them or fund their research, rather than searching disinterestedly for the truth . . . ."); Michael J. Mortimer, *The Delegation of Law-Making Authority to the United States Forest Service: Implications in the Struggle for National Forest Management*, 54 ADMIN. L. REV. 907 (2002).

> It has become apparent since the Progressive Era that science cannot be insulated from politics. Special interest groups sway scientists as persuasively as laymen. Thus, when presented with the same set of information about the dangers of nuclear waste disposal, a scientist from the Sierra Club will often defend a significantly different position from that of a scientist from the Nuclear Regulatory Commission.

Id. at 970 (citation omitted).

104 *Cf.* Andre A. Moenssens, *Admissibility of Scientific Evidence—An Alternative to the Frye Rule*, 25 WM. & MARY L. REV. 545, 564 (1984) (explaining that experts must "avoid affiliation with any special interest group in order to ensure a demonstrably unbiased assessment").

105 The government cannot regulate all environmental issues simply due to the overwhelming number of environmental issues currently in existence. *See supra* note 91.

106 *Cf.* Sunstein, *Economics*, *supra* note 80, at 400 (explaining that "if incidents are not visible, the legal system may end up doing far too little").

legislative inertia is the norm.[107] One simple explanation for this stagnation is preference for the status quo.[108] "[P]olitically accountable officials have incentives to defer to the status quo and the political coalitions necessary for reform are hard to form."[109] Additionally, agencies have a deep-seated fear of adverse judicial or executive review, which "keeps agencies hemming close to the status quo, fearful of innovation."[110] Groups that have interests in preserving the status quo lobby energetically and keep campaigns funded in order to ensure that the status quo is maintained.[111] Environmental issues that do not receive public attention suffer from neglect. Literature overwhelmingly indicates that legislative stagnation is the default for non-salient, cumulative issues not bolstered by environmental availability campaigns.[112] Evidence of pervasive legislative stagnation for non-

[107] One commentator, for instance, discussed "the contemporary 'ossification' of the administrative state, exemplified by the lengthy and contentious rule-making/litigation process and the lack of recent congressional initiative in the area of environmental, health, and safety regulation." Michael A. Livermore, *Reviving Environmental Protection: Preference-Directed Regulation and Regulatory Ossification*, 25 VA. ENVTL. L.J. 311, 311 (2007). He stated, "[t]he regulatory state is not dead. . . . Still, the regulatory state certainly does feel awfully stagnant. The major environmental statutes were passed three decades ago." *Id.* at 313. Literature suggests that this legislative stagnation is not unique to environmental law but is also pervasive in other legal fields and in the U.S. legal system as a whole. *E.g.*, 3 WILLIAM H. RODGERS, JR., ENVIRONMENTAL LAW: PESTICIDES AND TOXIC SUBSTANCES § 5.2, at 23 (1988) (commenting on statutory inertia "limit[ing] the plasticity of future directional changes" and "giv[ing] every sign of being unchangeable or very nearly so"); Jonathan H. Adler, *Judicial Federalism and the Future of Federal Environmental Regulation*, 90 IOWA L. REV. 377, 472 (2005) ("The degree of inertia in the legislative process is substantial, and it is far easier to block legislation than to enact it."); Sandra Zellmer, Symposium, *A Preservation Paradox: Political Prestidigitation and an Enduring Resource of Wildness*, 34 ENVTL. L. 1015, 1083 (2004) ("Congress is simply not structured in a way that lends itself to expeditious resolution of policy choices. Congressional processes are largely static and inelastic."); Kenneth Rogoff, Remarks at the American Economic Association Annual Meetings, Social Institutions for Overcoming Monetary Policy Credibility Problems (Dec. 1986), *available at* http://www.economics.harvard.edu/faculty/rogoff/files/Social_Institutions.pdf ("[T]here is a tremendous amount of legislative inertia involved in making any major change in the status quo.").

[108] Livermore, *supra* note 107, at 311.

[109] *Id.*

[110] *Id.* at 338.

[111] *Id.* at 346-47.

[112] *See, e.g.*, Richard J. Lazarus, *Congressional Descent: The Demise of Deliberative Democracy in Environmental Law*, 94 GEO. L.J. 619, 629 (2006).(over the past fifteen years, "congressional passage of new significant environmental authorization legislation has virtually ground to a halt."); Quan B. Nghiem, Comment, *Using Equitable Discretion to Impose Supplemental Environmental Projects Under the Clean Water Act*, 24 B.C. ENVTL. AFF. L. REV. 561, 593-94 (1997) (commenting on the "legislative inertia that continues to dominate" in the area of water protection under the Clean Water Act due to Congressional "persist[ence] in withholding the explicit statutory authority necessary to fulfill [those] goals"); Zellmer, *supra* note 107, at 1083 (noting that between 1984 and 2004, "Congressional designations of official wilderness areas [were] slow to nonexistent. . . . in part due to general legislative inertia" and commenting on the inelastic and static qualities of Congressional processes "particularly when it comes to environmental issues"); *see also* Peggy Ann Brown, *Changing the Paradigm*, AM. FORESTS, Apr. 1, 2006, at 30, *available at* http://www.americanforests.org/productsandpubs/

salient environmental issues provides a window into a hypothetical world characterized by the absence of environmental availability campaigns. In such a world, new legislation to address resource depletion and the release of contaminants into the water, soil, and air would simply never be adopted.[113]

Environmental availability campaigns provide an alternative to this standstill. These campaigns facilitate the decision-making process with refreshingly simplicity, focusing the attention of law-makers on a manageable number of issues.[114] Environmental availability campaigns act as highly efficient, automated filters.[115] Where the public perceives a genuine, credible threat, powerful opponents of new initiatives can be quashed.[116] The efficient selection of certain problematic areas dramatically increases legislative efficiency, saving time that would otherwise need to be spent on cumbersome deliberation and decision-making.[117] The selection of a manageable handful of environmental issues each year out of thousands[118] results in real change and progress.[119] Environmental availability campaigns also eliminate

magazine/archives/2006spring/feature2_1.php ("Continuing challenges—from reducing the loss of biodiversity to reversing global warming—signal a stagnation in the legislative [and] litigious efforts of the last 35 years.").

113 As one commentator explains, "directing voter attention to a particular issue" causes a temporary demand for legislative results, "but the eye soon shifts elsewhere, before the fact that the legislature has not made any substantive progress becomes apparent. Continually reminding voters about some environmental concern keeps the issue in the public eye, making it difficult for legislators to escape blame for government failures." Livermore, *supra* note 107, at 360-61. Without the presence of an availability campaign, even "available" issues fail to capture the public's attention over the time span required for environmental legislation to be passed. It is only "[b]y maintaining a relatively high level of pressure over time on the political process to show results" that the public can "overcome the stagnating tendency of fragmented lawmaking power." *Id.* at 361.

114 Sunstein implies that the availability heuristic generates a systemized process regarding regulation of environmental hazards; according to Sunstein, the availability heuristic results in the legal system regularly intervening to regulate highly visible environmental hazards while engaging in very little intervention for non-visible hazards. Sunstein, *Economics*, *supra* note 80, at 400.

115 *See* Jonathon Simon, *Risk and Reflexivity: What Socio-Legal Studies Add to the Study of Risk and the Law*, 57 ALA. L. REV. 119, 138 (2005) (noting that the availability heuristic filters the risks to which people pay attention); *cf.* Neal Devins & Alan Meese, *Judicial Review and Nongeneralizable Cases*, 32 FLA. ST. U. L. REV. 323, 332 (2005) (explaining that the availability heuristic provides "default rules which make particularized cost-benefit assessments less necessary and, in this way, serve as shortcuts that reduce the amount of information that a decisionmaker must gather").

116 "[S]tatus quo forces can be expected to have the most success when opposed only by a divided, ill-informed, and uninterested public." Livermore, *supra* note 107, at 362.

117 See *infra* Part III.B for a discussion on the concept that environmental availability campaigns streamline the legislative process.

118 See *supra* note 94 for a skim-the-surface look at some environmental issues that currently exist.

119 Ann E. Carlson, *Standing for the Environment*, 45 UCLA L. REV. 931, 984 n.243 (1998) ("Poll after poll indicates that the American public favors environmental protection by wide margins."); *cf.* Marc Landy & Kyle D. Dell, *The Failure of Risk Reform Legislation in the 104th*

dissatisfaction associated with the perception of arbitrary or inappropriate prioritizing of issues because the issues that receive attention are the very issues most concerning the American public.[120]

B. *A Streamlined Legislative Process*

A critic of availability campaigns might argue that, in an ideal deliberative democracy, "policy choices should rest on sound knowledge of relevant evidence [based upon] the purely factual judgments of scientific experts."[121] Germane to this perspective is the notion that to streamline the legislative process would "undermine Congress as a deliberative institution" and "run counter to the very core of our system of representative democracy."[122] The two-part retort goes something like this: lengthy deliberation and reflection can exhaust resources and run out the clock,[123] while sound, conclusive scientific results are extremely difficult to obtain.[124] Environmental availability campaigns dramatically reduce the impact of these two realities by streamlining the legislative process and freeing it of the elusive search for scientific "truth," thereby creating efficient and productive avenues for lawmaking.[125]

Congress, 9 DUKE ENVTL. L. & POL'Y F. 113, 125 (1998) (recognizing "the public's longstanding support for environmental regulation").

120 Under a model involving environmental availability campaigns, both the usual lawmakers *and* the public are directly involved in the law-making process, which is arguably the ideal situation. *See* HOLMES ROLSTON III, ENVIRONMENTAL ETHICS: DUTIES TO AND VALUES IN THE NATURAL WORLD 246-62 (1988) (discussing the need for democratic decisionmaking in the development of environmental policy); MERRIAM-WEBSTER'S COLLEGIATE DICTIONARY (11th ed. 2006) (defining "democracy" as "government by the people"); Jayanth K. Krishnan, *Lawyering for a Cause and Experiences from Abroad*, 94 CAL. L. REV. 575, 609 (2006) (noting "the importance of blending formal and grassroots advocacy"); Lynn Loschin & Jennifer Anderson, *Massachusetts Challenges the Burmese Dictators: The Constitutionality of Selective Purchasing Laws*, 39 SANTA CLARA L. REV. 373, 408 (1999) ("Not only does [grassroots] involvement fail to harm the federal government, it actually helps by restoring a measure of faith in a participatory, honest democracy."); James Jay Carafano & Richard Weitz, *Learning from Disaster: The Role of Federalism and the Importance of Grassroots Response*, THE HERITAGE FOUNDATION, Mar. 21, 2006, http://www.heritage.org/Research/HomelandDefense/bg1923.cfm ("Embodied in the U.S. Constitution, the principles of limited government and federalism give citizens and local communities the greatest role in shaping their lives. . . . This just makes sense: [t]he people closest to the problem are the ones best equipped to find the best solution.").

121 Kuran & Sunstein, *supra* note 1, at 737.

122 David Dreier, *We've Come a Long Way . . . Maybe*, *in* CONGRESS AND THE INTERNET 52, 56 (James A. Thurber & Colton C. Campbell eds., 2003) (an earlier version is available at http://www.rules.house.gov/archives/congress_andthe_internet.pdf).

123 Christopher H. Schroeder, *Deliberative Democracy's Attempt to Turn Politics into Law*, 65 LAW & CONTEMP. PROBS. 95, 115 (2002) (stating frankly that "full deliberations [are] complicated and time-consuming" and acknowledging the presence of costs involved in deliberation).

124 See *infra* Part III.C for a detailed discussion on this concept.

125 The 1978 ban on Chlorofuorocarbons in the U.S. is one example of the power of

The U.S. legislative process is one of high complexity, length, and cost,[126] frequently characterized by litigation and political disputes.[127] As one commentator explained:

> Developing and justifying complex regulations can take years—even decades; sometimes the important regulations stall altogether in this process. Rules are accompanied by lengthy preambles, setting out justifications for agency action, as well as expensive and time consuming regulatory impact analysis, including cost-benefit analysis. The public notice and comment process has become a drag on agency resources, as staff time is devoted to analyzing and responding to arguments from opponents from across the political spectrum. Agency initiative is stifled by risk-averse bureaucratic culture and the knowledge that innovation carries significant costs in time and resources.[128]

It has been argued that the process is in dire need of simplification and increased efficiency.[129] With respect to environmental legislation in particular, the availability heuristic streamlines the legislative process

availability campaigns to affect efficient law-passing. As prominent law professor Cass Sunstein remarked, "[a] significant reduction in the American contribution to ozone depletion was achieved in a way that 'was remarkably *fast*, simple, and seemingly rational.'" Sunstein, *Montreal*, *supra* note 1, at 11 (emphasis added) (citing EDWARD A. PARSON, PROTECTING THE OZONE LAWYER: SCIENCE AND STRATEGY 40 (2003)). Yet another example of the streamlining effect is the Deposit of Poisonous Wastes Act of 1972, which was enacted just weeks after cyanide drums were dumped in the United Kingdom and public outrage ensued. *See* PAUL T. WILLIAMS, WASTE TREATMENT AND DISPOSAL 4 (2d ed. 2005). One commentator at the time stated, "[t]hat rare phenomenon—all-party agreement—enabled the present enactment to be passed with unusual expedition." *Recent Legislation*, 1 INDUS. L.J. 159, 161 (1972).

126 Jason M. Horst, Comment, *Imaginary Intent: The California Supreme Court's Search for a Specific Legislative Intent That Does Not Exist*, 39 U.S.F. L. REV. 1045, 1063 (2005) ("The legislative process is long and complicated."); Timothy P. Loper, *Substantive Due Process and Discourse Ethics: Rethinking Fundamental Rights Analysis*, 13 WASH. & LEE J. CIVIL RTS. & SOC. JUST. 41, 75 (2006) ("[L]egislatively made law is the product of a complex legislative process that involves 'committees, fighting for time on the floor, compromise because some members want some unrelated objective, passage, [and] exposure to veto.'" (citing John Manning, *The Absurdity Doctrine*, 116 HARV. L. REV. 2387, 2409 (2003))); Charles W. Johnson, *Forward* to How Our Laws Are Made, H.R. Doc. No. 108-93, at v (2003), *available at* http://usgovinfo.about.com/gi/dynamic/offsite.htm?site=http://thomas.loc.gov/home/lawsmade.toc.html (a fifty-nine page detailed look at how laws are made, noting that in the U.S., there is "an exceedingly complex . . . legislative process"); *see* John Yoo, *War, Responsibility, and the Age of Terrorism*, 57 STAN. L. REV. 793, 806-07 (2004) (explaining the hefty decision costs inherent in the legislative process and noting that "[t]he legislative process increases the costs of government action").

127 Livermore, *supra* note 107, at 313.

128 *Id.* at 337 (citation omitted).

129 *Improving the Legislative Process: Federal Regulation of Lobbying*, 56 YALE L.J. 304, 304 (1947) (noting that "Congress has recognized the need for reorganizing and streamlining the decision-making process"); Livermore, *supra* note 107, at 342-43 (discussing the need for mechanisms to "de-ossify" environmental protection); *cf. The Government Performance and Results Act and the Legislative Process of House Committees: Hearing on Before the H. Subcomm. on Rules and Organization of the H. Comm. on Rules*, 106th Cong. (2000), *available at* http://www.rules.house.gov/archives/rules_hear10.htm (noting that Congress has a responsibility to improve the efficiency and economy of governmental operations).

by encouraging the swift passage of environmental laws.[130] Rapid response to a public outcry saves time and resources and avoids a lengthy, costly process of evidence-gathering, pontificating, equivocating, and debating.[131] Streamlining means cost-cutting; as one commentator remarked, "[i]t is undoubtedly true that in certain contexts cognitive heuristics [such as the availability heuristic] . . . economiz[e] on decision costs."[132] More specifically, "excessive data gathering, analysis, and long-winded explanations, often of marginal points . . . impose[] unnecessary costs and delays upon . . . regulatory programs."[133] Efficiency in the legislative process is important for three reasons. The first reason is financial.[134] Minimizing the costs of passing laws is crucial because the legislature does not have endless money to spend on the process.[135] The second reason to prefer an efficient process relates to time constraints. Excessive time spent debating one bill results in neglect of other bills.[136] Moreover, legislative delays risk compounding harm from the very dangers the legislation seeks to ameliorate because while the debate rages, the problem remains unaddressed.[137]

By streamlining the legislative process, availability campaigns may also *indirectly* result in fiscal restraint. When Congress moves slowly, there is an increased likelihood of omnibus bills, and this can lead to

130 As Yu An, a professor of administrative law at Tsinghua University Law School in China, noted, "[p]ublic participation has . . . helped increase the efficiency of legislation." *Legislative Process Aids Democracy*, CHINA DAILY, Oct. 31, 2002, *available at* http://www.china.org.cn/english/government/47274.htm.

131 Catherine Fisk & Erwin Chemerinsky, *The Filibuster*, 49 STAN. L. REV. 181, 217 n.198 (1997) (noting the time-consuming nature of delay, deliberation, and debate) (citing 2 ROBERT C. BYRD, THE SENATE, 1789-1989: ADDRESSES ON THE HISTORY OF THE UNITED STATES SENATE 162 (1991)).

132 Kuran & Sunstein, *supra* note 1, at 707.

133 Glen Staszewski, *Rejecting the Myth of Popular Sovereignty and Applying an Agency Model to Direct Democracy*, 56 VAND. L. REV. 395, 487 n.300 (2003) (citing William S. Jordan, III, *Ossification Revisited: Does Arbitrary and Capricious Review Significantly Interfere with Agency Ability to Achieve Regulatory Goals Through Informal Rulemaking?*, 94 NW. U. L. REV. 393, 394-95 (2000)).

134 *See infra* notes 138-142 and accompanying text.

135 For example, the budget for the U.S. Legislative Branch for 2007 is $3.7 billion. GPO Access, Budget of the United States Government: Summary Tables, at 5, tbl. S-3 http://www.gpoaccess.gov/usbudget/fy08/pdf/budget/tables.pdf (last visited Jan. 10, 2008). Each dollar appropriated to the legislative branch is assigned to fund salaries of the Congressional members and committee members, Congressional child care centers, Congressional printing and binding, Capitol building maintenance, and much, much more. WHITE HOUSE, OFFICE OF MGMT. & BUDGET, BUDGET 2008 APPENDIX: LEGISLATIVE BRANCH, http://www.whitehouse.gov/omb/budget/fy2008/pdf/appendix/leg.pdf (last visited Jan. 10, 2008).

136 This is an inference that is difficult to support, given the inherent complexity of the legislative process.

137 Rosen, *supra* note 71, at A25 (writing that, when it comes to regulating environmental health issues, "if we wait until we're absolutely certain, we've probably waited too long" and indicating that acting sooner sometimes means sparing many lives).

more pork barrel spending.[138] Moreover, the more public pressure there is to pass a particular piece of legislation, the less likely it is that congressional members who sponsor the bill will have to make costly concessions.[139] Although some have argued that earmarking is not the evil it is perceived to be,[140] the overwhelming sentiment is that "[t]he American people have *had it* with earmarks."[141] Fewer dollars allocated for congressional pet projects is likely to increase the transparency of congressional spending and, by extension, the public's confidence in our government.[142]

C. *Bypassing the Endless Search for Scientific "Truth"*

It is a well-accepted principle that an environmental law should be supported by science.[143] However, creating the science behind the law can take a staggering amount of time. The search for sufficiently conclusive scientific evidence to support an environmental bill can cause delays, sometimes resulting in abandonment of the proposed regulation.[144] Part of the difficulty stems from disagreement regarding

---

[138] Brian DeBose, *Slow Senate Likely to Force Omnibus Bill: GOP Fears a Pork-Barrel Buffet*, WASH. TIMES, Aug. 9, 2006, at A01.

> Fiscal conservatives in Congress fear the Senate's failure to get a handle on appropriation bills will lead to a pork-barrel spending spree this fall, undermining repeated promises for fiscal reform. The Senate left for summer recess after completing one of 12 spending bills needed to keep government agencies operating next year, all but assuring the need for an omnibus package, which are typically laden with pet projects never discussed or voted on.

Id.

[139] Senators can ask for earmarked funds for local projects in exchange for their vote on a particular bill. Although earmarking has come under fire, "lawmakers avidly seek them and boast of success in securing money for constituents." Robert Pear, *President Won't Fight Lawmakers' Pet Projects: Congressional Leaders Warn on 'Earmarks'*, INT'L HERALD TRIB., Jan. 22, 2008, at 8, *available at* http://www.iht.com/articles/2008/01/22/america/prexy.php.

[140] "Earmarks are only pork when someone else is feasting on them. On your plate, they're veggies. They are the train that takes you to visit Aunt Betty, or the health clinic down the street, or the waste treatment plant that makes your water safer to drink." Calvin Woodward, *Pork Barrel or Veggie Bin? Depends*, ASSOCIATED PRESS, Feb. 2, 2008.

[141] Kenneth Blackwell, *Tossing Out the Bacon*, N.Y. SUN, June 20, 2007, at 9 (emphasis added); *see also id.* ("Polls show that one of the reasons driving Congress's near record-low poll numbers is their out of control spending.").

[142] Presidential hopeful John McCain racked up big points with voters when he told them: "No earmarks . . . . Not 10,000. Not one. Zero." Woodward, *supra* note 140 (quoting John McCain).

[143] *Cf.* PERCIVAL ET AL., *supra* note 101, at 280 ("With respect to regulatory toxic substances, scientific conclusions are critical to the modern process of qualitative risk assessment."); Carl B. Meyer, *Science and Law: The Quest for the Neutral Expert Witness. A View from the Trenches*, 12 J. NAT. RESOURCES & ENVTL. L. 35, 36 (1997) ("Successful environmental management and regulation depends on compatibility between scientific facts and law.").

[144] *See* Meyer, *supra* note 143, at 36 ("[T]he relationship between science and law remains as uneasy and remote as ever . . . . One reason for this schism is that science and law use different tools and methodologies to pursue distinctly different goals." (citation omitted)); *see also*

the level of scientific proof required before new environmental legislation is appropriate.[145] After all, "the nature of scientific information virtually ensures its manipulability in multiple directions. Even where scientific understanding is relatively well developed, risks tend to be stated in ranges, predictions presented with confidence levels, and causal connections drawn with only tentative strokes."[146]

Public pressure generated by environmental availability campaigns provides the legislature with implicit permission to bypass this often unfruitful search for (and accompanying debate over) "scientific truth" and accept the reality of scientific uncertainty.[147]

Scientific uncertainty in the arena of environmental health issues relates to limitations on human testing. For ethical reasons, scientists do not include human subjects in experiments designed to test the effects of toxic substances.[148] Data on human responses to these substances generally come either from bioassays (extrapolation of toxicological experiments on laboratory animals) or from epidemiological data (studies of human populations that have already exhibited health

PERCIVAL ET AL., *supra* note 101, at 280 ("If the lack of a definitive answer can be used to cast the scientific basis of a regulatory action into enough doubt, the action may have to be delayed or even abandoned.").

145 PERCIVAL ET AL., *supra* note 101, at 214 (noting the presence of "debate over what constitutes good science in regulatory proceedings").

146 Douglas A. Kysar & James Salzman, *Environmental Tribalism*, 87 MINN. L. REV. 1099, 1125 (2003).

147 As an indication that the search for scientific truth is endless and thus unfruitful, one commentator wrote: "Truth is that concordance of an abstract statement with the ideal limit towards which *endless investigation* would tend to bring scientific belief." Charles S. Peirce, *Truth and Falsity and Error*, *in* 2 JAMES MARK BALDWIN, DICTIONARY OF PHILOSOPHY AND PSYCHOLOGY 718-20 (1901) (emphasis added). The majority of scientists take as given the reality of scientific uncertainty. PERCIVAL ET AL., *supra* note 101, at 280 ("With respect to regulatory toxic substances, . . . science seldom if ever can provide a definite answer to significant questions that arise at each stage of the risk assessment process."); David E. Adelman, *Scientific Activism and Restraint: The Interplay of Statistics, Judgment, and Procedure in Environmental Law*, 79 NOTRE DAME L. REV. 497, 535 (2004) (noting that many skeptics challenge whether scientific truths exist at all); Joanna A. Albers et al., *Toward a Model Expert Witness Act: An Examination of the Use of Expert Witnesses and a Proposal for Reform*, 80 IOWA L. REV. 1269, 1322 (1995) ("[T]he idea that scientific truths exist in a sufficiently reliable state . . . is flawed. To the contrary, it has been demonstrated repeatedly throughout history that the belief of the scientific community at any given time concerning any given topic is subject to valid criticism and alternative theories."); Michael C. Mason, *The Scientific Evidence Problem: A Philosophical Approach*, 33 ARIZ. ST. L.J. 887, 899 (2001) ("Scientific truths are rare, and under some models do not even exist."); A. Dan Tarlock, *Who Owns Science?*, 10 PENN ST. ENVTL. L. REV. 135, 147 (2002) (refuting one man's assumption that objective scientific truth exists by arguing that "[f]or better or for worse, all knowledge is contingent and experimental"); AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, PUBLIC HEALTH ASSESSMENT, ROYAL OAKS COMMUNITY (2004), http://www.atsdr.cdc.gov/HAC/PHA/royaloaks100504/royaloaks100504-p3.html [hereinafter ATSDR, ROYAL OAKS] ("All risk assessments, to varying degrees, require the use of assumptions, judgments, and incomplete data. These contribute to the uncertainty of the final risk estimates.").

148 PERCIVAL ET AL., *supra* note 101, at 204.

problems potentially due to previous exposure to certain substances).[149] However, drawing conclusions based upon data from these two sources is problematic.[150] Furthermore, difficulties arise because certain subgroups of a population (pregnant females and the young, for example) are more susceptible to health effects than other subgroups, and attempts to account for this fact can be problematic.[151]

Problems arising in the use of bioassays are numerous. First, data resulting from bioassays are necessarily limited due to the large sample sizes necessary to measure results and the time-consuming and costly nature of such experiments.[152] Second, it is impossible to definitively draw connections between health effects in animals and those in humans. Human beings are not biologically equivalent to laboratory animals, and they may react quite differently to a given substance.[153] How to account for this disconnect is the subject of much scientific debate. Until this dilemma is resolved, the scientific community must rely upon tentative inferences.[154]

The use of bioassays creates additional problems. In order to induce measurable results within a reasonable time frame, scientists must expose the animals to much higher doses of the potentially toxic substance than an organism would typically experience in everyday life.[155] Scientists debate the validity of correlating the responses of lab animals to high doses of a substance with the responses of those animals to low doses.[156] Extrapolation becomes even more tenuous when drawing conclusions about the response of humans to low, everyday doses.[157] Moreover, scientists generally assume that the relationship between dosage and health effects is linear, but this is not always the case.[158] The correlation can be nonlinear if a substance (such as chloroform) exhibits a safe, zero-risk threshold level[159] or if small

149 *Id.*

150 These problems are thoroughly explained in *Hazard Identification Then and Now: Exploding Boilers versus Cancer-Causing Substances*, *in* PERCIVAL ET AL., *supra* note 101, at 202-08.

151 *Id.* at 205.

152 For example, a single rodent bioassay takes approximately two years and 2.5 million dollars. *Id.* at 204-05.

153 *Id.* at 204.

154 *Id.* at 205.

155 *Id.*

156 Drawing conclusions in this area is particularly difficult with respect to carcinogenic substances, which operate via mechanisms that are little understood.

157 PERCIVAL ET AL., *supra* note 101, at 205; Kristin L. Meier et al., *A Measure of Tumorigenic Potency Incorporating Dose-Response Shape*, 49 BIOMETRICS 917, 918 (1993) (noting that most human exposures to toxic environmental substances are at low doses).

158 PERCIVAL ET AL., *supra* note 101, at 257. The shape of the dose-response relationship is particularly important since most human exposures to chemical agents of environmental concern are at low doses. Meier, *supra* note 157, at 918.

159 Chlorine Chemistry Council v. Envtl. Prot. Agency, 206 F.3d 1286, 1287 (D.C. Cir. 2000).

amounts of a toxic substance (such as arsenic) can actually be beneficial.[160] However, it is exceedingly difficult to determine the shape of the dose-response curve.[161]

Epidemiological studies involve numerous problems as well. Obtaining quality epidemiological data is challenging because of the difficulty in identifying populations that share identical characteristics save exposure to the potentially toxic substance.[162] In the rare case that such a subgroup can be identified (most often in occupational settings), it is challenging to determine with precision the level of exposure for the individuals, and it is also difficult to account for other contributing factors such as family histories of particular health problems or exposures to other chemicals outside of work.[163] Additionally, in cases where the subgroup was exposed to irregularly high levels of the substance, the high to low-dose extrapolation issues described in connection with bioassays arise. This was an issue in the study providing the basis for the National Academy of Sciences' National Research Council's (NRC) 1999 report on arsenic in drinking water, discussed later in this paper.[164] The population subgroup had been exposed to irregularly high concentrations of arsenic (over 100 ppb), and the committee found that more research was needed to draw conclusions from the high-dose data about the effects of low-dose exposure.[165]

For the foregoing reasons, scientific data on a potentially toxic substance derived from bioassays or epidemiological studies is often hotly debated and open to speculation and criticism. It is virtually impossible to establish the "scientific truth" that is sought to provide the basis for legislation. "Scientific truth" acts much like a mathematical asymptote that can never be attained.

The unfruitful search for scientific truth and the legislature's

160 PERCIVAL ET AL., *supra* note 101, at 255.

161 Kenny S. Crump, *Dose Response Problems in Carcinogensis*, 35 BIOMETRICS 157, 157 (1979) (explaining that dose-response problems are abound in relation to carcinogens: "[t]wo dose-response models may fit experimental data about equally well and yet predict responses that differ by many orders of magnitude at low doses," and "[m]echanisms of carcinogenesis are not sufficiently understood so that the shape of the dose-response curve at low doses can be satisfactorily predicted"); *see* ATSDR, ROYAL OAKS, *supra* note 147 ("[T]he actual shape of the dose-response curve requires scientific knowledge of how a hazardous substance affects different cells in the human body."); *cf.* Stephen J. Rothenberg & Jesse C. Rothenberg, *Testing the Dose-Response Specification in Epidemiology: Public Health and Policy Consequences for Lead*, 113 ENVTL. HEALTH PERSPS. 1190, 1190 (2005) (noting that "statistical evaluation of the dose-response function in lead epidemiology is rarely attempted" and going on to study and determine the shape of the dose-response relationship).

162 PERCIVAL ET AL., *supra* note 101, at 204.

163 *Id.*

164 *See infra* text accompanying note 196.

165 PERCIVAL ET AL., *supra* note 101, at 255-56 (citing generally NAT'L RES. COUNCIL, ARSENIC IN DRINKING WATER (1999)).

denouncement of scientific uncertainty is problematic for multiple reasons. First, it causes many delays in the legislative process of passing an environmental regulatory bill and sometimes results in total abandonment of such bills.[166] These delays generate their own problems, as previously discussed.[167] Moreover, abandonment of potential environmental legislation is problematic considering the public's acknowledgement of the need for environmental legislation.[168]

Another significant problem with the legislature's habit of striving for ephemeral scientific proof rests in the manipulation of this ephemeral nature. Exploitation of the uncertain nature of scientific methods occurs when opponents of environmental regulation use this uncertainty to block new environmental legislation in pursuit of questionable goals.[169] For example, the Bush administration professed concern about the quality of scientific science repeatedly during its tenure.[170] One example of an occasion when the Bush administration rejected new measures was with respect to arsenic in drinking water. This case was built almost entirely upon an ostensible need for more "sound science,"[171] and was questionable at best. Also questionable was the White House directive instructing the EPA to replace references to a sharp increase in global temperature in a 2003 report with excerpts from a study debating temperature increases.[172] Most recently, in April of 2007, the United States joined China and Saudi Arabia in seeking to tone down the certainty of some of the more dire projections in the final Intergovernmental Panel on Climate Change (IPCC) report on climate change, a move that angered many in the scientific community.[173]

Fortunately, environmental availability campaigns beneficially

166 *See supra* notes 133-137 and accompanying text.

167 *See supra* notes 133-137 and accompanying text.

168 *See supra* note 99 and accompanying text.

169 PERCIVAL ET AL., *supra* note 101, at 280 ("[Some] take advantage of the inevitable disagreements in science about important conclusions to argue that an insufficient consensus exists to justify government action. . . . such opportunities present themselves frequently in regulatory decision making.").

170 *Id.* at 284.

171 *Id.* at 260-61.

172 *Id.* at 281 (citing Andrew C. Revkin & Katharine Q. Seelye, *Report by EPA Leaves Out Data on Climate Change*, N.Y. TIMES, June 19, 2003, at A1).

173 During negotiations over the wording of the IPCC final report, "[a]greement came after an all-night session during which key sections were deleted from the [IPCC] draft and scientists angrily confronted government negotiators who they feared were watering down their findings." *Climate Report: World's Poorest Will Suffer Most*, CNN.COM, http://www.cnn.com/2007/TECH/science/04/06/climate.report.ap/index.html (last visited Apr. 6, 2008). For instance, the IPCC report stated: "There is very high confidence that many natural systems are being affected by regional climate changes, particularly temperature increases." *Id.* The Chinese government "insisted on striking the word 'very,' injecting doubt into what the scientists argued were indisputable observations. The report's three authors refused to go along with the change, resulting in an hours-long deadlock that was broken by a U.S. compromise to delete any reference to confidence levels." *Id.*

counteract the problems inherent in the unfruitful search for scientific truth. When such campaigns generate sufficient public pressure for legislation, governmental actors accept scientific uncertainty, forego the time-consuming and often fruitless search for scientific truth, and pass needed legislation.

IV. THE END RESULT OF HIGHLY BENEFICIAL LEGISLATION AND POLICY: FOUR ILLUSTRATIVE EXAMPLES OF LEGISLATIVE STREAMLINING

Commentators suggest that environmental availability campaigns lead to "wasteful or even detrimental laws and policies,"[174] the "enact[ment of] laws that will redress virtually nonexistent harms,"[175] and "bad and distorted policymaking."[176] Critics indicate that these laws "do little good and possibly considerable harm," that they are "scientifically unnecessary, ineffective, even counterproductive," and that they have a negative net benefit "in most or all cases."[177] While some portion of legislation resulting from these campaigns may in fact be wasteful and address nonexistent harms, we argue that the potential for this result has been greatly exaggerated. By way of illustration, we offer a number of pieces of crucial legislation the existence of which is largely attributable to availability campaigns. Below, we describe four occurrences in which availability campaigns fueled public support for environmental regulation.

A. *Arsenic in Drinking Water*

The attempt to promulgate stricter arsenic standards in drinking water is one infamous example of the streamlining effect of environmental availability campaign. Arsenic is a naturally occurring element that enters drinking water supplies from natural deposits in the earth or from agricultural and industrial practices.[178] When consumed by humans, arsenic has serious adverse health effects, including "thickening and discoloration of the skin, stomach pain, nausea, vomiting, diarrhea, numbness in hands and feet, partial paralysis, and blindness,"[179] as well as harm to the human vascular system and the

174 Kuran & Sunstein, *supra* note 1, at 685, 703, 742, 753.
175 Lerner, *supra* note 73, at 630.
176 Yablon, *supra* note 8, at 936.
177 Kuran & Sunstein, *supra* note 1, at 703, 742, 753.
178 U.S. Envtl. Prot. Agency, Arsenic in Drinking Water, http://www.epa.gov/safewater/arsenic/index.html (last visited Jan. 10, 2008) [hereinafter EPA, Arsenic].
179 *Id.*

development of diabetes.[180] Even more considerable is the conclusive determination by the International Agency for Research on Cancer (IARC) that "[a]rsenic and arsenic compounds are *carcinogenic to humans*."[181] Arsenic is "strongly associated" with lung and skin cancer and has been associated with bladder, kidney, nasal passages, liver, and prostate cancer as well.[182]

The original arsenic standard in drinking water, established by the World Health Organization in 1958, was 200 parts per billion (ppb).[183] In 1943, the Public Health Service recommended the standard be lowered to 50 ppb.[184] More than three decades later, in 1975, the EPA dropped the arsenic standard to an interim level of 50 ppb.[185] The somewhat stunning spectacle that followed, as described in detail below, is illustrative of the drawn-out nature of the legislative process without the presence of environmental availability campaigns. It was not until an availability campaign emerged that the process sped up dramatically and a lower arsenic drinking water standard was finally realized.[186] The absence of an arsenic availability campaign until the midnight hour is most likely due to the nature of arsenic poisoning; the substance itself is imperceptible and health effects may take some time to surface.[187]

What follows is a description of the extensive, circus-like process that took place between 1975 and 2001 regarding the lowering of the arsenic standard.[188] After the EPA set its interim arsenic standard of 50 ppb in 1975, the standard remained just that—an interim level—until 1985.[189] The interim standard was to be converted into a final standard

180 PERCIVAL ET AL., *supra* note 101, at 253.

181 World Health Org., *Arsenic and Arsenic Compounds*, *in* IARC MONOGRAPHS ON THE EVALUATION OF CARCINOGENIC RISKS TO HUMANS; OVERALL EVALUATIONS OF CARCINOGENICITY: AN UPDATE OF *IARC MONOGRAPHS* 1 TO 42, Suppl. 7, 100-03 (1987) (emphasis in original).

182 Agency for Toxic Substances & Disease Registry, Case Studies in Environmental Medicine (CSEM), Arsenic Toxicity: Physiologic Effects, http://www.atsdr.cdc.gov/csem/arsenic/physiologic_effects.html#intro (last visited Feb. 9, 2009); EPA, Arsenic, *supra* note 178.

183 PERCIVAL ET AL., *supra* note 101, at 254.

184 *Id.* at 254. It is interesting to note that in 1999, the National Resources Defense Council determined that the risk of dying of cancer from ingesting arsenic at a level of 50 ppb in drinking water was a shocking *one in one hundred*. *Id.* at 256 (citing Paul Mushak, *Arsenic and Old Laws: A Scientific and Public Health Analysis of Arsenic Occurrence in Drinking Water, Its Health Effects, and EPA's Outdated Arsenic Tap Water Standard*, NAT'L RES. DEF. COUNCIL (2000), *available at* http://www.nrdc.org/water/drinking/arsenic/aolinx.asp).

185 PERCIVAL ET AL., *supra* note 101, at 254.

186 *See infra* text accompanying notes 202-217.

187 *See Taming an Invisible Menace: Protecting Myanmar's Families from Arsenic*, UNICEF, Apr. 11, 2005, http://www.unicef.org/myanmar/water_sanitation_1417.html (explaining that arsenic is an invisible, imperceptible hazard that cannot be seen, tasted, or smelled).

188 This description is adapted primarily from *Case Study: Regulation of Arsenic in Drinking Water*, *in* PERCIVAL ET AL., *supra* note 101, at 253-62.

189 *Id.* at 254.

for the 1986 Amendments to the Safe Drinking Water Act (SDWA),[190] but the EPA did not take the necessary action to bring this to fruition.[191] In 1989, the EPA missed its deadline to revise the arsenic standard, largely due to disagreements about the EPA's risk assessments for arsenic.[192] Responding to the lapse, a citizen suit was filed and settled by a consent decree extending the EPA's deadline to revise the standard to 1995.[193] The EPA missed this deadline as well, and in 1996, the SDWA Amendments required the EPA to propose a final standard by January 1, 2000 and to promulgate a final standard by January 1, 2001.[194] The EPA held public meetings regarding the arsenic standard for years but took no additional action.[195]

In 1999, NRC released a report recommending that the EPA develop a stricter national arsenic standard in drinking water as soon as possible.[196] Again, the EPA missed a deadline—and the January 2000 cut-off for proposing a new arsenic standard came and went.[197] A month later, the Natural Resources Defense Council (NRDC) issued a report estimating that thirty-four million Americans drank tap water containing levels of arsenic that posed an unacceptable cancer risk.[198] In 2000, the EPA worked in conjunction with the U.S. Geological Survey (USGS) to gather data on arsenic levels in groundwater, and on June 20, 2000—eleven years past its original deadline to propose a new standard—the EPA finally proposed a new standard of 5 ppb.[199] Congress extended the deadline for the EPA to promulgate its final standard until June 22, 2001, and in a seemingly final legislative victory in January 2001, the EPA adopted a final arsenic standard of 10 ppb and gave all water supply systems until January 23, 2006 to comply.[200]

The victory, however, was fleeting. On March 20, 2001, the Bush administration announced that it had decided to delay the effective date of the EPA's new arsenic standard until May 22, 2001 so that the administration could determine whether the standard was based upon "sound science."[201] This bold move by the Bush administration served

190 42 U.S.C. §§ 300i-1, 300g-6, 300h-5 to -7, 300j-11 (2006).
191 PERCIVAL ET AL., *supra* note 101, at 254.
192 *Id.*
193 *Id.*
194 *Id.* at 255.
195 *Id.* at 256.
196 *Id.* at 255 (citing generally NAT'L RES. COUNCIL, ARSENIC IN DRINKING WATER (1999)).
197 *Id.* at 256.
198 *Id.* (citing Paul Mushak, *Arsenic and Old Laws: A Scientific and Public Health Analysis of Arsenic Occurrence in Drinking Water, Its Health Effects, and EPA's Outdated Arsenic Tap Water Standard*, NAT'L RES. DEF. COUNCIL (2000), *available at* http://www.nrdc.org/water/drinking/arsenic/aolinx.asp).
199 PERCIVAL ET AL., *supra* note 101, at 256.
200 *Id.* at 257 (citing 66 Fed. Reg. 6,976 (2001)).
201 *Id.* at 259-61.

as the trigger for a powerful availability campaign.[202] Word of the administration's suspension of the arsenic standard spread like wildfire, while the media and environmental groups fanned the flames.[203] The result was intense public criticism.[204] Public opinion polls indicated that the decision was unpopular: a "national survey, conducted between April 21 and April 26, 2001, found that fifty-six percent of Americans rejected the Bush decision, [while] only thirty-four percent approved of it."[205] Countless editorial writers sharply criticized the move; one respected journalist jabbed: "How callous can you get, Mr. Compassionate Conservative?"[206] The Democratic Party aired a television commercial denouncing the decision by showing a young child asking her mother for more arsenic.[207] The public channeled its fury into thousands of letters and emails to the government; in the two weeks that the Bush administration provided for public input, between April 23 and May 7, 2001, it received more than twelve thousand comments, overwhelmingly in opposition of the arsenic standard suspension.[208] Time Magazine echoed the public response in a political cartoon called "Safety is for Sissies" ridiculing the Bush administration's decision.[209]

In response to the public outcry, the U.S. House of Representatives barred the EPA from spending any funds to block the arsenic standard from going into effect, an action which has been characterized as "a stunning legislative defeat for the Bush administration."[210] Such "stunning" legislative action is typical of what follows an environmental availability campaign.[211]

---

202 *Id.* at 261.

203 *See, e.g.*, Douglas Jehl, *E.P.A. Delays Its Decision on Arsenic*, N.Y. TIMES, Apr. 19, 2001, at A6; *EPA Delays Lower Arsenic Standards for Water*, CNN.COM, http://archives.cnn.com/2001/HEALTH/03/20/epa.arsenic/index.html (last visited Mar. 21, 2008).

204 *Id.*

205 Cass R. Sunstein, *The Arithmetic of Arsenic*, 90 GEO. L.J. 2255, 2261 (2002) (citing Mark Barabak, *Bush Criticized As Fear of Environment Grows*, L.A. TIMES, Apr. 30, 2001, at A1).

206 Sunstein, *supra* note 205, at 2261 (citing Michael Kinsley, *Bush Decision on Arsenic Tough to Swallow*, TIMES UNION, Apr. 16, 2001, at A9); *see also* PERCIVAL ET AL., *supra* note 101, at 261.

207 PERCIVAL ET AL., *supra* note 101, at 261.

208 Press Release, Consumer Fed'n of Am., EPA Holds the Line on Arsenic in Drinking Water: Public Outcry Effective in Halting Move to Weaken Standard (Nov. 1, 2001), *available at* http://www.consumerfed.org/pdfs/arsenic_pr_web_110201.pdf; Press Release, Nat'l Res. Def. Council, NRDC Denounces Bush Administration Suspension of Arsenic-in-Drinking-Water Protections (May 22, 2001), *available at* http://www.nrdc.org/media/pressReleases/010522a.asp.

209 Bruce Handy & Glynis Sweeny, *Safety is for Sissies; If the Bush Team Really Had its Way with Those Pesky Regulations . . .* , TIME, Apr. 16, 2001, at 88.

210 PERCIVAL ET AL., *supra* note 101, at 261-62.

211 For example, the passage of the Oil Pollution Act of 1990 (OPA) was a stunning and rare case in that all members of both houses of Congress supported the bill. J. William Futrell, *Foreword* to OIL POLLUTION DESKBOOK, at v (1991). As discussed *infra* Part IV.D, the passage of the OPA was brought about by an environmental availability campaign.

In spite of the messages of the public and Congress, on May 22, the EPA announced its decision to delay the effective date of the arsenic standard until February 22, 2002.[212] The EPA's decision resulted in its failure to meet its June 22, 2001 deadline to promulgate a final standard, prompting the NRDC to file suit in federal court against the EPA.[213] The lawsuit, followed by an EPA advisory council reassessment of the arsenic risks and standard, culminated at last in the successful promulgation of a 10 ppb standard on October 31, 2001.[214] All water systems were required to comply with this standard by January 23, 2006, and this arsenic level for drinking water is the current national standard in effect.[215]

An analysis of these dizzying events demonstrates clearly the power of availability campaigns. Prior to the onset of an availability campaign, over the fifty-eight-year period between the 1943 Public Health Service recommendation that the standard be lowered[216] and the Bush administration's arsenic standard suspension on March 22, 2001,[217] the legislative process was replete with inaction, missed deadlines, delays and suspensions, indecision, and zero results. However, when an environmental availability campaign finally resulted in public outcry, as observed during the seven months between the Bush administration's suspension of lower standards and the adoption of the lower standard,[218] the legislative process was streamlined, efficient, and productive.[219] In summary, the legislative process for the promulgation of a stricter standard for arsenic levels in drinking water crept along at an agonizingly slow pace (or, some might say, stood entirely still) for almost *six decades* without the presence of an environmental availability campaign, and raced furiously to the finish line in just *seven months* when such a campaign emerged in full force.

Some call for the government to engage in long-range planning regarding specific environmental risks instead of making "myopic, unduly quick, and poorly reasoned" legislative decisions on those

212 PERCIVAL ET AL., *supra* note 101, at 262.

213 *Id.*

214 *Id.* (citing Press Release, U.S. Envtl. Prot. Agency, EPA Announces Arsenic Standard for Drinking Water of 10 Parts per Billion (Oct. 31, 2001), *available at* http://yosemite.epa.gov/opa/admpress.nsf/b1ab9f485b098972852562e7004dc686/6d26c015b807156e85256af6007b9bed?OpenDocument).

215 EPA, Arsenic, *supra* note 178.

216 PERCIVAL ET AL., *supra* note 101, at 254.

217 *Id.* at 261.

218 *Id.* at 261.

219 Examples of legislation that passed in a near-unified fashion by Congress include Superfund and the Oil Pollution Act. Futrell, *supra* note 211, at v (noting that the OPA was a rare case in which there were unanimous votes in the U.S. Senate or of the U.S. House of Representatives in support of the bill); Jolls et al., *supra* note 1, at 1520 (commenting on how little opposition Superfund provoked).

risks.[220] These individuals argue that the need for scientific certainty warrants delays.[221] Debates and scientific studies on an environmental issue can in fact be enlightening; however, there is a point where it all becomes *dangerous*.[222] The case of arsenic in drinking water is a prime example of why long-range range deliberation is inefficient and time-consuming,[223] is not supportive of progressive environmental regulation,[224] and is sometimes only effective at a very late hour, at which point many lives may have been lost.[225] Often, environmental availability campaigns prevent "strik[ing] when the iron is cold",[226] ultimately saving time, money, natural resources, and human lives.[227]

B. *"Silent Spring" and the DDT Ban*

When, in 1945, the synthetic pesticide Dichloro-Diphenyl-Trichloroethane (DDT) was approved for civilian use,[228] U.S. farmers responded by applying an estimated 1.35 billion pounds of DDT over

220 Kuran & Sunstein, *supra* note 1, at 752; *see* Daniel C. Esty, *Environmental Protection in the Information Age*, 79 N.Y.U. L. REV. 115 (2004).

> A more empirical and data-driven approach to environmental protection . . . offers a promising avenue for overcoming the exaggerated emphasis given to sensational or emotion-laden problems and mitigating the effects of "availability cascades" triggered by the media or those with special interests to advance. [This approach] will ease the human tendency to focus on the "here and now," reduce the impact of the availability heuristic, and mitigate other cognitive failures.

Id. at 183.

221 *E.g.*, Charles Davies et al., *Moving Pictures: How Satellites, the Internet, and International Environmental Law Can Help Promote Sustainable Development*, 28 STETSON L. REV. 1091, 1103 (1999).

222 Global warming is one example of a situation where the time for the debates to end has come and gone. As one commentator from the National Center for Atmospheric Research indicates, the global warming debate is between two "now-comfortable positions held fast for many years." Roger A. Pielke, Jr. & Daniel Sarewitz, *Winning and Losing the Global Warming Debate*, EARTH AFF., Feb. 2000, *available at* http://sciencepolicy.colorado.edu/about_us/meet_us/roger_pielke/hp_roger/debate.html (last visited Jan. 10, 2008). The same commentator argues that this long-standing debate "has lost much of its usefulness. It is now distracting us from what needs to be done." *Id.* For this reason, too much debate over certain environmental issues is problematic.

223 Sergei V. Vinogradov, *Observations on the International Law Commission's Draft Rules on the Non-Navigational Uses of International Watercourses: "Management and Domestic Remedies"*, 3 COLO. J. INT'L ENVTL. L. & POL'Y 235, 239 (1992) (indicating that deliberation can be time-consuming and unproductive).

224 Davies et al., *supra* note 221, at 1103 (explaining that progress in environmental protection and regulation "will be hindered by claims that scientific uncertainty always warrants delay").

225 Rosen, *supra* note 71 (writing that, when it comes to regulating environmental health issues, "if we wait until we're absolutely certain, we've probably waited too long" and indicating that acting sooner sometimes means sparing many lives).

226 Kuran & Sunstein, *supra* note 1, at 752 (citation omitted).

227 *See supra* Parts II & III.B, C.

228 Sedina Banks, *The "Erin Brockovich Effect": How Media Shapes Toxics Policy*, 26 ENVIRONS ENVTL. L. & POL'Y J. 219, 221 (2003).

the next three decades to control insect pests on their crops and forest lands.[229] Some of the harmful effects of DDT were known in the 1940s.[230] However, the dangers were not widely known by the general public until scientist Rachel Carson published *Silent Spring*[231] in 1962, which discussed in detail the long-term, detrimental health and environmental effects of chemicals such as DDT.[232]

Carson's book served as the trigger for an availability campaign, and "catapulted an issue that had typically belonged to urban environmentalism into the mainstream."[233] The book "mesmerized the nation," receiving immense and immediate attention from both the press and the public.[234] The impact was impressive. *Silent Spring* was the subject of an hour-long program on CBS and an article written by Supreme Court Justice William O. Douglas in the Book-of-the-Month Club newsletter.[235] Carson's message was promulgated by environmentalists, the media, and concerned Americans. The American public became outraged,[236] and Americans penned thousands of letters

229 Press Release, U.S. Envtl. Prot. Agency, DDT Ban Takes Effect (Dec. 31, 1972), *available at* http://www.epa.gov/history/topics/ddt/01.htm [hereinafter EPA, DDT Ban]; U.S. ENVTL. PROT. AGENCY, DDT REGULATORY HISTORY: A BRIEF SURVEY (TO 1975) (1975), http://www.epa.gov/history/topics/ddt/02.htm [hereinafter EPA, DDT REGULATORY HISTORY]; *see also* J. Brooks Flippen, *Pests, Pollution, and Politics: The Nixon Administration's Pesticide Policy*, 71 AGRIC. HIST. 442, 442 (1997) ("[B]y the late 1960s, total American use [of DDT] surpassed 640,000 tons."); Robert Gillette, *DDT: Its Days Are Numbered, Except Perhaps in Pepper Fields*, 176 SCI. 1313, 1313 (1972) ("12 to 14 million pounds of DDT [was] sprayed in the United States in 1970.").

230 Banks, *supra* note 228, at 221.

231 RACHEL CARSON, SILENT SPRING (1962).

232 Banks, *supra* note 228, at 221. Carson writes, for example:

> These sprays, dusts, and aerosols are now applied almost universally to farms, gardens, forests, and homes—nonselective chemicals that have the power to kill every insect, the "good" and the "bad," to still the song of birds and the leaping of fish in the streams, to coat the leaves with a deadly film, and to linger on in soil—all this though the intended target may be only a few weeds or insects. Can anyone believe it is possible to lay down such a barrage of poisons on the surface of the earth without making it unfit for all life? They should not be called "insecticides," but "biocides."

CARSON, *supra* note 231, at 7-8.

233 Lincoln L. Davies, *Lessons for An Endangered Movement: What a Historical Juxtaposition of the Legal Response to Civil Rights and Environmentalism Has to Teach Environmentalists Today*, 31 ENVTL. L. 229, 283 (2001).

234 *Id.* at 282. *Silent Spring* sold 40,000 advance copies, and the Book of the Month Club ordered 150,000 copies. Banks, *supra* note 228, at 221. A total of 500,000 copies were sold within the first five months. *See* J. E. DE STEIGUER, AGE OF ENVIRONMENTALISM 29, 37-41 (1997). The book remained a bestseller for a year and was eventually translated into many languages. Banks, *supra* note 228, at 221.

235 Andrew P. Morriss & Roger E. Meiners, *Property Rights, Pesticides, & Public Health: Explaining the Paradox of Modern Pesticide Policy*, 14 FORDHAM ENVTL. L.J. 1, 23 (2002).

236 Mary Jane Angelo, *Embracing Uncertainty, Complexity, and Change: An Eco-Pragmatic Reinvention of a First-Generation Environmental Law*, 33 ECOLOGY L.Q. 105, 155 (2006). Interestingly, as one commentator explained, this public outcry resulted in an environmental push much broader than just DDT: "This outrage sparked a mass mobilization drive that resulted in cleaner air, rivers, and lakes for many Americans [and] euphoria over the new environmental

to the federal government demanding answers about the environmental and health effects of DDT and demanding a halt to its use.[237] Numerous environmental organizations responded to public concern by stepping up efforts to address concerns about DDT.[238] Starting in 1967, the Environmental Defense Fund, the National Audubon Society, the National Wildlife Federation, the Izaak Walton League, and various other environmental groups became increasingly active in initiating court proceedings at both local and federal levels to restrict the use of DDT.[239] Public outrage and worry manifested itself in another powerful way: DDT use declined in the U.S. from eighty million pounds in 1959 to twelve million pounds in the early 1970s.[240] A group of scientists sought a ban on DDT and founded the Environmental Defense Fund, one of the most prominent environmental organizations today.[241]

This formidable environmental availability campaign effectuated "the plunge of DDT from miracle pesticide to executioner of birds" marking an "astonishing reversal of beliefs that had seemed sacred for decades."[242] Even before environmental groups began the court battle, public concern over DDT gained the attention of the federal government. In 1963, a government committee issued a report endorsing Carson's findings and recommended limiting the use of toxic chemicals.[243] Over the next decade, growing public concern and mounting scientific evidence placed enormous pressure on the federal government.[244] In 1972, the EPA banned the general use of DDT.[245]

consciousness sweeping the country . . . ." Dorceta E. Taylor, *Women of Color, Environmental Justice, and Ecofeminism*, *in* ECOFEMINISM: WOMEN, CULTURE, NATURE 38, 39 (Karen J. Warren & Nisvan Erkal eds., 1997). Another commentator wrote, "[i]ndeed, by aptly demonstrating how resource use and misuse could affect every individual, Silent Spring put environmental issues on the national agenda in a way unprecedented throughout the movement's long history. Moreover, the book drastically shifted the landscape of environmentalism." Davies, *supra* note 233, at 283.

237 Davies, *supra* note 233, at 283.

238 EPA, DDT REGULATORY HISTORY, *supra* note 229.

239 *Id.*; *see also* Richard Gilluly, *Taking Polluters to the Courts*, 98 SCI. NEWS 273, 274 (1970) (discussing the Environmental Defense Fund and its involvement in the local issue of DDT in Suffolk County, New York); Luther J. Carter, *Environmental Pollution: Scientists Go to Court*, 158 SCI. 1552, 1554 (1967) (noting that "[i]n November [of 1967], EDF brought its first court action in its own name," and further stating that "[t]he Audubon Society . . . contributed about $7600 to EDF to cover the cost of reproducing the trial record in the Suffolk County case.").

240 EPA, DDT REGULATORY HISTORY, *supra* note 229.

241 Banks, *supra* note 228, at 222.

242 Richard D. Cudahy, *Coming of Age in the Environment*, 30 ENVTL. L. 15, 16 (2000).

243 Banks, *supra* note 228, at 222-23; Davies, *supra* note 233, at 283.

244 Banks, *supra* note 228, at 223; Brandy E. Fisher, *Most Unwanted*, 107 ENVTL HEALTH PERSPS. A18, A20 (1999) ("DDT and related compounds are very persistent in the environment; up to 50% of an application can remain in the soil for 10-15 years.").

245 Flippen, *supra* note 229, at 453. Public health, quarantine, a few minor crop uses, and export of the material were excepted from the ban. EPA, DDT Ban, *supra* note 229. The time gap between the 1962 publication of *Silent Spring* and the 1972 DDT ban despite the presence of an extremely strong environmental availability campaign is easily explained by the fact that

In the years following the banning of DDT, studies have confirmed DDT as a probable human carcinogen that causes damage to the liver, nervous system, and reproductive system.[246] Moreover, DDT is incredibly persistent—it takes a minimum of fifteen years to break down in the environment.[247] However, decades after the ban, many question the benefits to human health. Doubts relate to the usefulness of DDT as a malaria prevention method, and skeptics argue that banning DDT has resulted in the deaths of millions of people in impoverished, malaria-inflicted nations.[248] While it is clear that DDT is effective in killing malaria-transmitting mosquitoes,[249] the viability of DDT as a long-term option for malaria control is questionable. Of the between thirty and seventy species capable of transmitting malaria,[250] nineteen species of mosquitoes were resistant to DDT at the time of the

Rachel Carson's *Silent Spring* is often credited as spurring the U.S. environmental movement. *E.g.*, Cass R. Sunstein, *On the Divergent American Reactions to Terrorism and Climate Change*, 107 COLUM. L. REV. 503, 538 (2007). Naturally, what was one of the first environmental availability campaigns resulted in a slower political and legislative reaction than the environmental availability campaigns we see today.

246 Vladimir Turusov et al., *Dichlorodiphenyltrichloroethane (DDT): Ubiquity, Persistence, and Risks*, 110 ENVTL. HEALTH PERSPS. 125, 126 (2002) (DDT increases the risk of pancreatic cancer, liver cancer, and multiple myeloma); U.S. Envtl. Prot. Agency, Persistent Bioaccumulative and Toxic (PBT) Chemical Program, DDT, http://www.epa.gov/pbt/pubs/ddt.htm (last visited Jan. 10, 2008) [hereinafter EPA, Persistent DDT]. The Agency for Toxic Substances and Disease Registry states that:

> DDT affects the nervous system. People who accidentally swallowed large amounts of DDT became excitable and had tremors and seizures. . . . [W]omen who had high amounts of DDE in breast milk had an increased chance of having premature babies.
>
> In animals, short-term exposure to large amounts of DDT in food affected the nervous system, while long-term exposure to smaller amounts affected the liver. Also in animals, short-term oral exposure to small amounts of DDT or its breakdown products may also have harmful effects on reproduction. . . .

AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, TOXFAQS: DDT, DDE, AND DDD (2002), *available at* http://www.atsdr.cdc.gov/tfacts35.pdf.

247 EPA, Persistent DDT, *supra* note 246.

248 M.D. Harmon, *In Assessing Rachel Carson's Legacy, Don't Just Look at Eagles*, PORTLAND PRESS HERALD, June 15, 2007, at A11.

249 *See* May Berenbaum, *If Malaria's the Problem, DDT's Not the Only Answer*, WASH. POST, June 5, 2005, at B03.

250 Dayfield Technology, Malaria, http://www.dayfield.co.uk/page4.html (last visited Jan. 10, 2008) (noting that only a small fraction of the 3,200 different species of mosquitoes can transmit malaria, and all are Anopheles); Medical Entomology Centre, Mosquitoes, http://www.insectresearch.com/ps_mosquitoes.htm (last visited Jan. 10, 2008) (noting that, out of the 3,500 species of mosquitoes, only the Anopheles genus can transmit malaria, and there are only about thirty species within this genus that transmit malaria); Jeffrey Shaman, *Malaria Mapping and Prevention*, GEOTIMES, http://www.geotimes.org/may05/feature_malariamap.html (last visited Jan. 10, 2008) (noting that more than seventy species of Anopheles can transmit human malaria); WHO/TDR Malaria Database: Malaria Parasites, http://www.wehi.edu.au/MalDB-www/intro.html (last visited Jan. 10, 2008) (noting that only the Anopheline mosquito transmits malaria, and out of the 380 species of Anopheline mosquito, only sixty can transmit malaria).

ban in 1972, and this resistance increases with use of the substance.[251] Furthermore, DDT alternatives—including application of safer pesticides such as methoprene and neem; sustainable biological control methods, including releasing natural enemies of mosquitoes such as larvivorous fish; elimination and control of breeding sites; habitat management, such as changing water levels and controlling vegetation growth; use of physical barriers such as clothing and screens; public education; and use of prophylactic anti-malarial drugs, vaccines, and insect repellents—provide safer methods for reducing mosquito populations.[252] As researchers have explained, "[i]n the past, overreliance on one or two interventions, such as DDT, resulted in the rapid emergence of insecticide resistance. There is no one fit-all solution for tackling malaria."[253]

Those who argue that DDT's power to kill malaria-carrying insects outweighs the chemical's effects on wildlife[254] miss a crucial message

---

[251] Berenbaum, *supra* note 249. In an article in *Science*, one scientist explained:

> By the 1960s, mosquitoes resistant to DDT effectively prevented the worldwide eradication of malaria, and by 1990, over 500 species had evolved resistance to at least one insecticide. Insects often evolve resistance within about a decade after introduction of a new pesticide, and many species are resistant to so many pesticides that they are difficult or impossible to control.

Stephen R. Palumbi, *Humans as the World's Greatest Evolutionary Force*, 293 SCI. 1786 (2001) (citations omitted). As another commentator explains in detail:

> [I]n many places, [DDT] failed to eradicate malaria not because of environmentalist restrictions on its use but because it simply stopped working. Insects have a phenomenal capacity to adapt to new poisons; anything that kills a large proportion of a population ends up changing the insects' genetic composition so as to favor those few individuals that manage to survive due to random mutation. . . . Spraying DDT on the interior walls of houses—the form of chemical use advocated as the solution to Africa's malaria problem—led to the evolution of resistance 40 years ago and will almost certainly lead to it again in many places . . . . In fact, pockets of resistance to DDT in some mosquito species in Africa are already well-documented. There are strains of mosquitoes that can metabolize DDT into harmless byproducts and mosquitoes whose nervous systems are immune to DDT. There are even mosquitoes who avoid the toxic effects of DDT by resting between meals not on the interior walls of houses, where chemicals are sprayed, but on the exterior walls, where they don't encounter the chemical at all.

Berenbaum, *supra* note 249.

[252] Mark Grabowsky, *The Billion-Dollar Malaria Moment*, 451 NATURE 1051, 1051 (2008), *available at* http://www.nature.com/nature/journal/v451/n7182/full/4511051a.html (methods of controlling malaria include "sleeping under insecticide-treated bed nets, spraying houses with insecticides, preventive treatment for pregnant women, and timely treatment of the sick with effective drugs"); Letter to the Editor, *The 'Plague' of R&D*, WASH. TIMES, Sept. 27, 2006, at A20; *Talking Points: Providing Sustainable Alternatives to DDT for Malaria Vector Control in Mexico and Central America*, GLOBAL ENV'T FACILITY, Apr. 2007, http://www.gefweb.org/Outreach/Talking_Points/06/november/english/Alternatives_to_DDT_story.html.

[253] David N. Nabarro & Elizabeth M. Tayle, *The "Roll Back Malaria" Campaign*, 280 SCI. 2067 (1998).

[254] Harmon, *supra* note 248. This is not to belittle the malaria crisis in impoverished nations, since it is certainly real and formidable: at least one million people around the world die from malaria each year. Angela Logomasini, *A Deadly Legacy: Rachel Carson on DDT*, WASH. TIMES, May 31, 2007, at A19.

that environmentalists have been verbalizing for decades; while humans are undoubtedly important, other organisms play crucial parts in the ecosystems of our earth.[255] Without them, the delicate balance of nature is disturbed, leading to sometimes disastrous results for other organisms including humans.[256]

Meanwhile, the benefits of the DDT ban on animal populations have been substantial. The resurgence of bird populations has been particularly notable. In 1975, at a time when the use of DDT was widespread, a comprehensive search of historic breeding sites in the lower forty-eight U.S. states and southern Canada turned up only sixty-two pairs of peregrine falcons.[257] No peregrine had been seen east of the Great Plains since 1970, when a sole male peregrine was spotted in Vermont unsuccessfully scanning the skies for a mate.[258] In that same year, the peregrine was placed on the Endangered Species List.[259] Some of the peregrines had died directly from eating DDT-contaminated prey, but most of the population decline was due to DDT-caused hatching failure, abnormal reproductive behavior by parent birds, and shell

255 Various species of fish, birds, and other animals have rebounded from near extinction following the DDT ban. As one legislative commentator stated, "[m]ost animals are worth very little in terms of dollars and cents. However, . . . the integral part they play in preserving the delicate balance of nature cannot be ignored." CONG. RESEARCH SERV., 97TH CONG., LEGISLATIVE HISTORY OF THE ENDANGERED SPECIES ACT OF 1973, at 374 (Comm. Print 1982). A Senate Report delivered a similar message: "Consideration of th[e] need to protect endangered species goes beyond the aesthetic. . . . [M]any of these animals perform vital biological services to maintain a 'balance of nature' within their environments." S. Rep. No. 93-307 (1973), *as reprinted in* 1973 U.S.C.C.A.N. 2989, 2990. Similar arguments are made for the importance of various natural habitats, as a Wisconsin court stated:

> Swamps and wetlands were once considered wasteland, undesirable, and not picturesque. But as the people became more sophisticated, an appreciation was acquired that swamps and wetlands serve a vital role in nature, are part of the balance of nature and are essential to the purity of the water in our lakes and streams.

Just v. Marinette County, 201 N.W.2d 761, 768 (Wis. 1972).

256 One article explains:

> [P]eople may think there is nothing there to lose [but] . . . eliminating wildlife habitats can have disastrous results. It's more of a tight-knit ecosystem and if you kill off one thing, it can affect the rest . . . . [I]t can be difficult for wildlife to adapt to even a slight change in the ecosystem.

Adam Peck, *Arctic Expedition Trip of a Lifetime*, GUELPH TRIB., Sept. 4, 2007, at 10 (quotations omitted). Another article gives the following example:

> In Thailand the ancient coastline mangrove forests have been badly affected by pollution, tourist development and shrimp farming. Once the balance of nature is disturbed, the results can be disastrous. The dying mangrove forests are also home to some of the region's marine wildlife which in turn provides food for the local bird population.

Destruction of Natural World 'Speeding Up', BBC NEWS, Oct. 1, 1998, http://news.bbc.co.uk/1/hi/world/183982.stm.

257 Les Line, *Symbol of Hope?*, NAT'L WILDLIFE FED'N, Oct./Nov. 1996, http://www.nwf.org/nationalwildlife/article.cfm?articleid=634&issueid=50.

258 *Id.*

259 Brian A. Millsap et al., *Review of the Proposal to De-List the American Peregrine Falcon*, 26 WILDLIFE SOC'Y BULL. 522, 523 (1998).

thinning that resulted in eggs being crushed during incubation.[260] However, by 1994, more than two decades after the general use of DDT was banned, at least 875 pairs of peregrines were found to occupy areas in the U.S., and it was estimated that at least 6,500 pairs existed in all of North America.[261] Wildlife biologists believe that the most significant factor in the recovery of the peregrine falcon was restrictions placed on the use of organochlorine pesticides such as DDT.[262]

Birds other than the peregrine falcon have benefited as well. In the 1960s, bald eagle numbers south of Canada had dropped to only five hundred nesting pairs, and the bald eagle was placed on the Endangered Species List in 1973.[263] As of 2005, the bald eagle population had rebounded to more than seven thousand pairs.[264] Scientists credit the ban on DDT, in conjunction with protection from the Endangered Species Act, for the recovery of the bald eagle.[265] The brown pelican's story is similar to that of the bald eagle. The brown pelican population plummeted due to DDT use and recovered substantially following the DDT ban.[266] Countless other bird species, such as bluebirds, osprey, and the double-crested cormorant, have experienced similar comebacks in the post-DDT era.[267] These results are no surprise considering the slow but steady decline in DDT levels in the environment. For

260 Endangered and Threatened Wildlife and Plants; Final Rule to Remove the American Peregrine Falcon From the Federal List of Endangered and Threatened Wildlife, and to Remove the Similarity of Appearance Provision for Free-Flying Peregrines in the Conterminous United States, 64 Fed. Reg. 46,542, at 46542 (Aug. 25, 1999) [hereinafter Peregrine Falcon]. Scientists have determined the reason for the egg thinning: DDT's metabolite, DDE, blocks normal calcium deposition during eggshell formation. *Id.*

261 Line, *supra* note 257.

262 Peregrine Falcon, *supra* note 260, at 46,544.

263 Andrea Easter-Pilcher, *Implementing the Endangered Species Act*, 46 BIOSCIENCE 355, 355 (1996) (noting that the bald eagle was listed on the Endangered Species Act signed into law on December 28, 1973); Rene Ebersole, *Where the Eagles Are*, NAT'L WILDLIFE FED'N, Dec./Jan. 2005, http://www.nwf.org/nationalwildlife/article.cfm?issueID=72&articleId=1003.

264 Ebersole, *supra* note 263; *see also* Robert G. Anthony et al., *Environmental Contaminants in Bald Eagles in the Columbia River Estuary*, 57 J. WILDLIFE MGMT. 10, 10 (1993) ("Since the banning of DDT . . . , bald eagle populations have increased throughout most of the contiguous United States.").

265 *Id.*

266 Endangered and Threatened Wildlife and Plants; Removal of the Brown Pelican in the Southeastern United States from the List of Endangered and Threatened Wildlife, 50 Fed. Reg. 4,938, at 4938-39 (Feb. 4, 1985).

267 Helen I. Driggs, *Birding at the Beach: A Guide to Common New Jersey Species*, PHILA. DAILY NEWS, Aug. 1, 2002, at 42 (noting that osprey "have staged a successful comeback since the ban on DDT in the mid-1970s"); David Figura, *Pet Groomer Likes Her High Adventure*, POST STANDARD, Sept. 7, 2007, at C2 ("[B]y the early 1970s the double-crested cormorant had almost been wiped out in the Great Lakes, the victim of DDT and other pesticides. However, a ban on DDT and other pesticides, combined with the introduction of non-native species, has been partially responsible for the birds' comeback."); Eileen Stegemann, *New York State Symbols: How Something Becomes a State Symbol*, N.Y. STATE CONSERVATIONIST, Oct. 2007, at 15 ("Once considered rare, the Eastern bluebird is more common today because of factors that include the ban of the pesticide DDT . . . .").

example, since the 1970s, DDE (a metabolite of DDT) has dropped from ten to four parts per billion in the Upper Peninsula of the Great Lakes, and from twenty-five to thirteen parts per billion at Lake Superior.[268]

The DDT ban has substantially benefited animals other than birds as well. During the period of time in which DDT was widely used, large-scale deaths of fish were a common occurrence.[269] In June 1954, when a million acres in New Brunswick were sprayed with DDT, the watershed supplying water to the Mirmamichi Fish Hatchery was sprayed to control the pest budworm.[270] The effects were staggering: approximately twenty-five percent—just under one million—of the hatchery's salmon died within two weeks from DDT poisoning.[271] Today, while DDT levels persist in fish, they are slowly dropping due to the DDT ban, resulting in fewer fish fatalities and related problems.[272]

The tremendous "success story" of California's sea lions[273] is also indicative of the enormous benefits of the DDT ban. Between 1949 and 1970, Montrose Chemical Corporation dumped thousands of tons of DDT into the California waters between Los Angeles and the Channel Islands.[274] The Channel Islands serve as the hunting, breeding, and birthing grounds for California sea lions.[275] When a marine biologist visited sea lion breeding grounds in the late 1960s, he witnessed a disturbing trend: "[T]here were scores, in some places hundreds of aborted fetuses that were strewn on the beaches, half-finished and dead."[276] Of all of the pups born that year, half of them were stillborn.[277] An analysis of sea lion blubber samples revealed a shocking quarter-pound of DDE in each sea lion; females who aborted their pups contained at least eight times more DDT than the ones who

268 Roger Di Silvestro, *Greatest Lakes in the World*, NAT'L WILDLIFE FED'N, June/July 2004, http://www.nwf.org/nationalwildlife/article.cfm?articleId=929&issueId=68. The slow nature of the decline is no doubt due to the incredible persistence of DDT in the environment. Persistent DDT, *supra* note 246. Thirty years after the ban, DDT deposits in sediments remain a threat to some bird populations; only over time will the DDT concentrations subside. Peregrine Falcon, *supra* note 260.

269 Philip Shabecoff, *'Silent Spring' Led to Safer Pesticides, But Use It Up*, N.Y. TIMES, Apr. 21, 1986, at A14.

270 Miramichi Salmon Conservation Center, DDT – Mirmamichi Fish Hatchery, http://www.salmoncentre.ca/ddt.html (last visited Jan. 10, 2008).

271 *Id.*

272 In 1998, a study released by the EPA found a ninety-five percent decrease in DDT concentrations in the livers of certain fish, but it also found DDT in nearly all the fish tested; "[t]he bad news is that it's still fairly prevalent." Deborah Schoch, *Lower Levels of Pollutants Found in Fish*, L.A. TIMES, Feb. 13, 1998, at B1.

273 Beth Martin, *The Good News About DDT*, SCI. NOTES, Summer 1996, http://scicom.ucsc.edu/SciNotes/9601/SeaLion/00Intro.html.

274 *Id.*

275 *Id.*

276 *Id.*

277 *Id.*

had full-term pups.[278] In 1992, twenty years after the DDT ban, DDT concentrations in these animals had dropped to less than one percent of the concentrations measured in 1970.[279] Today, population effects due to DDT are no longer seen.[280] These post-DDT wildlife success stories make the case that the DDT ban was a crucial piece of legislation brought about by the environmental availability campaigns following *Silent Spring*.

C. *Love Canal and Superfund*

Between 1942 and 1952, a chemical company filled Love Canal, an area located in Niagara Falls, New York, with an estimated twenty-two thousand tons of drummed liquid and chemical wastes.[281] A school and approximately one hundred homes were built on the dump site and the land adjacent to the site.[282] Over two decades later, in 1978, chemicals began seeping out of the dump site, and residents started to notice an odor and residues.[283] These residents soon drew a connection between these strange observations and the seizures, blood disease, liver damage, and other health problems suffered by area residents, and they became alarmed.[284] Their discovery triggered an availability campaign, led by area residents with one woman, Lois Gibbs, at the charge.

State and federal agencies confirmed what the residents had feared. In 1978, the New York State Department of Health issued a health order, recommending that the school be closed, that pregnant women and children under the age of two be evacuated, that residents not eat out of their home gardens, and that residents spend limited time in their basements.[285] In 1978, the EPA sampled air in the basements of homes in the area, and the New York Department of Conservation sampled basement residues.[286] The results indicated the presence of toxic

278 *Id.*

279 *Id.*

280 *Id.*

281 Eric R. Poque, *The Catastrophe Model of Risk Regulation and the Regulatory Legacy of Three Mile Island and Love Canal*, 15 PENN ST. ENVTL. L. REV. 463, 473 (2007).

282 *Id.*

283 *Id.*

284 *Id.*; Jason Stone, *The Law of Ecosystem Restoration: National Policy Implications of the Clark Fork River Basin Natural Resource Damage Program*, 28 PUB. LAND & RESOURCES L. REV. 1, 2 (2007).

285 Rae Tyson, *The Intergovernmental Cleanup at Love Canal: A First Crack at "The Sleeping Giant of the Decade"*, 10 PUBLIUS 101, 103 (1980) ("State Health Commissioner Dr. Robert Whalen issued an order on August 2, 1978, recommending that all pregnant women, and children under the age of two be relocated."); Lois Marie Gibbs, *History: Love Canal: The Start of a Movement*, B.U. SCH. OF PUB. HEALTH, http://www.bu.edu/lovecanal/canal/index.html (last visited Jan. 10, 2008).

286 ALLAN MAZUR, A HAZARDOUS INQUIRY: THE *RASHOMON* EFFECT AT LOVE CANAL 11, 14

benzene, among other carcinogenic chemicals.[287] A 1980 study by the EPA found chromosome damages in eleven of the thirty-six Love Canal residents who had been tested and yet, shockingly, these residents had not been informed of the results.[288]

Meanwhile, Lois Gibbs, along with her Love Canal area neighbors, had organized and were pressuring the source of the pollution and the federal government to recognize the health emergency and provide relief.[289] In 1978, Gibbs and other residents formed the Love Canal Homeowners Association, electing officers and holding regular public meetings to discuss the crisis.[290] Residents engaged in public protests in which mothers, fathers, children, and the elderly marched. The protestors carried symbolic coffins to the state capitol on Mother's Day, they held prayer vigils, and they picketed each day for weeks in the middle of the New York winter.[291] There were more dramatic acts of civil disobedience.[292] Homeowners, led by Gibbs, took two EPA officials hostage on May 19, 1980, urging the federal government to relocate all of the residents by noon on May 21 or, in the words of Gibbs, "[w]hat we've done here today, will look like a Sesame Street picnic [in] compar[ison]."[293] The EPA was burned in effigy,[294] and when, in mid-May of 1980, hapless EPA representatives flew to Niagara Falls, they found the entire outraged community on the verge of riot.[295]

Thanks to the efforts of Gibbs and her neighbors, word spread quickly throughout the nation. Stories of the Love Canal toxic waste site saturated the media, and vivid descriptions of toxins and resulting health effects increased the salience of the issue. Between 1978 and 1980, the Love Canal story was prominently featured in the national news, and accounts of the situation referred to Love Canal as a "ticking time bomb."[296] In 1980, Love Canal was the cover story of magazines and the topic of numerous network documentaries.[297] In spite of the relatively local nature of the crisis, the availability campaign propelled the powerful story across the country. Thousands of Americans wrote

(1998).

287 *Id.*

288 *Id.* at 15.

289 Stone, *supra* note 284, at 3.

290 Gibbs, *supra* note 285.

291 *Id.*

292 MAZUR, *supra* note 286, at 15.

293 EnviroJustice, Case Studies – The Love Canal Story, http://www.envirojustice.org/community/lovecanal.html (last visited Jan. 10, 2008); *see also* MAZUR, *supra* note 286, at 15; Poque, *supra* note 281, at 473.

294 *Love Canal: A Federal Emergency*, 117 SCI. NEWS 340, 340 (1980); Poque, *supra* note 281, at 473.

295 MAZUR, *supra* note 286, at 15.

296 Jolls et al., *supra* note 1, at 1519, 1521.

297 *Id.* at 1521.

letters to the New York governor, legislators, and President Carter, demanding swift government action.[298] As the salience of the Love Canal disaster increased, so did the salience of hazardous waste more generally. Public opinion polls revealed that eighty percent of Americans wanted immediate government action to identify and clean up potentially hazardous abandoned waste sites.[299]

With a vocal segment of the nation clamoring for action, the government responded. On May 21, 1980, President Carter declared the Love Canal area a federal emergency, and seven hundred area families were temporarily relocated.[300] A more permanent home buyout occurred in October of the same year.[301] Most significantly, as a result of widespread public concern over hazards posed by toxic waste sites, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA),[302] also know as the "Superfund Act" (Superfund).[303] CERCLA grants the EPA broad federal authority to respond to abandoned, accidentally spilled, or illegally dumped hazardous waste.[304] Under CERCLA, the EPA may also hold responsible parties liable for releases of hazardous waste.[305] Finally, CERCLA provides a trust fund for site cleanup of the sites when no responsible party can be identified, and includes a National Contingency Plan setting forth guidelines and procedures for responding to releases and threatened releases of hazardous

298 Gibbs, *supra* note 285; *see also* Tyson, *supra* note 285, at 102 ("In New York State, legislators from the Niagara Falls area who personally witnessed the incredible Love Canal tragedy are leading a movement to tighten the control over toxic wastes and to develop strategies for government-controlled disposal facilities.").

299 Jolls et al., *supra* note 1, at 1521.

300 MAZUR, *supra* note 286, at 15; *see also* Lois Marie Gibbs, *The Need for Effective Governmental Response to Hazardous Waste Sites*, 2 J. PUB. HEALTH POL'Y 42, 42 (1981); Constance Holden, *Love Canal Residents Under Stress*, 208 SCI. 1242, 1242-43 (1980) ("[T]he Love Canal Homeowners Association, formed in August 1978, has emerged as the primary cohesive force and source of help and information to the community.").

301 MAZUR, *supra* note 286, at 15.

302 42 U.S.C. §§ 9601-9628, 9651-52, 9654-75, 6911a (2006); 26 U.S.C. §§ 4611-12, 4661-62 (2006).

303 E^2 INC., SUPERFUND BENEFITS ANALYSIS 1-1 (2005), *available at* http://www.epa.gov/superfund/news/benefits.pdf (partial draft prepared for U.S. EPA and Office of Superfund Remediation Technology Innovation) (noting that the national controversy in the 1970s over hazardous waste sites such as Love Canal led to the creation of CERCLA); Jolls et al., *supra* note 1, at 1521 (writing "[t]here can be no doubt that the Love Canal publicity was pivotal to [Superfund's] passage in 1980" and explaining how Congress followed the public outcry by quickly passing the statute).

304 U.S. Envtl. Prot. Agency, Superfund, CERCLA Overview, http://www.epa.gov/superfund/policy/cercla.htm (last visited Jan. 10, 2008) [hereinafter EPA, CERCLA Overview]; U.S. Envtl. Prot. Agency, Superfund, Superfund's 25th Anniversary: Capturing the Past, Charting the Future, http://www.epa.gov/superfund/25anniversary/ (last visited Jan. 10, 2008) [hereinafter EPA, Superfund's 25th Anniversary].

305 EPA, CERCLA Overview, *supra* note 304; EPA, Superfund's 25th Anniversary, *supra* note 304.

substances.[306]

Most remarkable was the swiftness with which the legislation was enacted. The Love Canal crisis climaxed on August 7, 1978 when U.S. President Jimmy Carter declared the area a federal emergency,[307] and CERCLA was enacted by Congress just over *sixteen months* later on December 11, 1980.[308] One article comments, "what is remarkable is how little opposition the statute provoked"[309]—evidence of the power of the environmental availability campaigns following the disaster.

Decades after the Love Canal disaster, questions have emerged regarding the events and their aftermath. Some have expressed concern over conflicting data regarding the level of threat posed by Love Canal waste.[310] Critics have also asserted that Superfund results in under-regulation and over-regulation of environmental issues.[311] Regardless of whether Love Canal was the disaster it was perceived to be or whether Superfund works perfectly, one thing seems clear: we are better off for having enacted CERCLA. This legislation is far from "wasteful" or "detrimental,"[312] but is instead an important initiative[313] that

306 EPA, Superfund's 25th Anniversary, *supra* note 304; *see also* Harold C. Barnett, *Crimes Against the Environment: Superfund Enforcement at Last*, 525 ANNALS AM. ACAD. POL. & SOC. SCI. 119, 120 (1993) ("The Superfund Act of 1980, amended in 1986, was intended to clean up some of the nation's worst uncontrolled hazardous waste sites.").

307 MAZUR, *supra* note 286, at 15.

308 EPA, CERCLA Overview, *supra* note 304.

309 Jolls et al., *supra* note 1, at 1520.

310 *Id.* at 1520-21 (commenting on the "uncertain empirical support" for the severity of Love Canal and stating that "it remains unproven that Love Canal created significant health risks at any stage").

311 Polls have indicated that there is greater public concern for hazardous waste sites than other environmental problems. *E.g.*, Hart-Teeter Research Companies/NBC News/Wall Street Journal Poll, Which one of the following environmental problems do you think is the most serious facing the country today? (Apr. 1990) (finding hazardous or toxic waste sites to be the most serious environmental problem facing the nation today, over air pollution, water pollution, solid waste/garbage, destruction of our natural areas, and global warming). This became a concern for some when an EPA study revealed that experts believed hazardous waste sites posed only low to moderate environmental and health risks. U.S. ENVTL. PROT. AGENCY, UNFINISHED BUSINESS: A COMPARATIVE ASSESSMENT OF ENVIRONMENTAL PROBLEMS (1987). In response to its study, the EPA recommended that its long-range planning reflect an accurate comparison of environmental risks and commented that it should focus budget resources at those environmental problems that pose the most serious risks. Press Release, Envtl. Prot. Agency, Reducing Risk: Setting Priorities and Strategies for Environmental Protection (Sept. 26, 1990).

312 Kuran & Sunstein, *supra* note 1, at 685.

313 *See* E^2 INC., *supra* note 303, at 1-1, 7-1 (explaining that Superfund actions "have halted the exposure or potential exposure of millions of people to hazardous substances" and concluding that "[i]t is clear that the Superfund program creates a broad array of benefits associated with protection of human health, welfare, and the environment"); RICHARD N. L. ANDREWS, MANAGING THE ENVIRONMENT, MANAGING OURSELVES: A HISTORY OF AMERICAN ENVIRONMENTAL POLICY 249 (1999) (describing the history of American environmental policy and stating in relation to CERCLA that "the transformation of waste management practices was one of the most impressive yet least noted successes of American environmental policy"); Richard L. Brodsky & John L. Parker, *Enhancing Environmental Remediation in New York by Strengthening the Superfund Program and Expanding the Brownfields Program*, 11 FORDHAM

addresses a persistent, serious source of harm.[314]

Claims that hazardous waste sites pose little threat are undermined by data from the EPA and the NRC, which reveal that one in four Americans today live within three miles of a Superfund site[315] and that more than six billion tons of waste is produced in the U.S. each year.[316] The health risks of exposure to hazardous substances include acute effects such as poisoning or injuries from fires or explosions and long-term effects.[317] The potential long-term effects include acute illness and death as evidenced by the increased risk of cancer, cardiac anomalies, liver diseases, a variety of neurobehavioral problems, spontaneous abortion, birth defects, and low birth weight.[318] A study of 148 sites on the Superfund National Priorities List found that eighty-one percent of the sites had maximum cancer risks that exceeded EPA acceptable standards, and that seventy-four percent of the sites had non-cancer health risks that also exceeded the standards.[319] Another study found that nearly half of the sites had non-cancer risks ten times the EPA standard, and almost one-fifth of the sites had non-cancer risks *one*

ENVTL. L.J. 705, 707 (2000) (commenting on the "already successful Superfund Program"); Clifford J. Villa, *Superfund vs. Mega-Sites: The Coeur D'Alene River Basin Story*, 28 COLUM. J. ENVTL. L. 255, 321 n.402 (2003) (noting that "Superfund has proven fairly successful in making polluters pay for cleanup"). Kuran and Sunstein present a different view of Superfund, arguing that the funds used to implement Superfund would have been better spent elsewhere. They argue, in pertinent part:

> In view of the billions spent on the Superfund program, the social significance of the analytical challenge should be clear. . . . Approximately 400,000 Americans die each year as a result of tobacco use, 300,000 die from poor diet and insufficient exercise, and many thousands more die each year from other preventable causes. The scientific evidence is overwhelming that poor diet produces far more cancers than abandoned hazardous waste sites.

Kuran & Sunstein, *supra* note 1, at 698 (citation omitted). What this analysis fails to account for is the differences in these types of risks. Smoking and poor diet are largely within the control of the individuals whose health is affected. As a result, public funds spent to address these issues may be of limited usefulness—certainly, the utility cannot be predicted in advance. Moreover, people living near Superfund sites did not create the pollution, are likely ignorant of the dangers to their health and the health of their children, and may not have the resources required to relocate once the harm is revealed. They are victims in every sense of the word. Finally, a Superfund site, if left unaddressed, could pose a threat not only to current local residents, but also to the ecosystem and future generations.

314 E^2 INC., *supra* note 303, at 1-1 ("Contamination with hazardous substances is a massive problem.").

315 1 NAT'L RES. COUNCIL, ENVIRONMENTAL EPIDEMIOLOGY, PUBLIC HEALTH AND HAZARDOUS WASTES 2 (1991) (noting that more than forty million people live within four miles of a Superfund site and about four million within one mile); EPA, Superfund's 25th Anniversary, *supra* note 304.

316 E^2 INC., *supra* note 303, *supra* note 301, at 1-2.

317 *Id.* at 5-1.

318 NAT'L RES. COUNCIL, *supra* note 315, at 12, 14, 15, 19-20.

319 Katherine D. Walker et al., *Confronting Superfund Mythology: The Case of Risk Assessment and Management*, *in* ANALYZING SUPERFUND: ECONOMICS, SCIENCE AND LAW 25 (Richard L. Revesz & Richard B. Stewart eds., 1995).

hundred times the EPA standard.[320]

A 1991 NRC study predicted serious future risks of hazardous waste sits as well: "[S]tudies show that millions of tons of hazardous materials are slowly migrating into groundwater in areas where they could pose problems in the future."[321] This prediction is supported by a 1984 NRC study of ninety-three California Superfund sites, in which forty-nine percent of the sites evaluated showed evidence of waste release into groundwater.[322] Of those guilty sites, the groundwater at sixty-nine percent of the sites was used for human consumption, and at each of these sites, more than ten thousand people were potentially exposed to the hazardous substances.[323] A 1999 review of over 450 journal articles, books, reports, and other sources revealed evidence that future exposure is a very real threat.[324] Despite the fact that only twenty-three percent of sites on the Superfund National Priorities List present an "urgent hazard" or a "hazard,"[325] most of the sites required action to reduce ongoing and future exposure.[326] While the present risks of hazardous waste sites may seem less than calamitous: "Most of [the] risks are to future populations."[327] What one article calls "unthreatening waste dumps"[328] do not seem so unthreatening after all. One commentator, expressing how pleased he was with the government's cooperation and swiftness in addressing the Love Canal disaster, stated:

> But this is not really where the story ends. Quite the contrary. We suspect that there are hundreds of such chemical dumpsites across this Nation. Unlike Love Canal, few are situated so close to human settlements. But without a doubt, many of these old dumpsites are time bombs with burning fuses—their contents slowly leaching out. And the next victim cold [sic] be a water supply, or a sensitive wetland.[329]

Not only is Superfund a necessary statute, but it is a highly successful statute. As of December 2005, 1388 hazardous waste sites have been identified nationally, and cleanup work has been completed on sixty-two percent of those sites.[330] Superfund responds to over three hundred new or newly discovered releases each year,[331] and the General

320 Walker, *Confronting*, *supra* note 319, at 31.
321 NAT'L RES. COUNCIL, *supra* note 315, at 259.
322 *Id.*
323 *Id.*
324 BARRY L. JOHNSON, IMPACT OF HAZARDOUS WASTE ON HUMAN HEALTH: HAZARD, HEALTH EFFECTS, EQUITY, AND COMMUNICATIONS ISSUES 33 (1999).
325 *Id.*
326 *Id.* at 38.
327 E^2 INC., *supra* note 303, at 2-8.
328 Kuran & Sunstein, *supra* note 1, at 703.
329 Eckardt C. Beck, *The Love Canal Tragedy*, ENVTL. PROT. AGENCY J., Jan. 1979, *available at* http://www.epa.gov/history/topics/lovecanal/01.htm.
330 EPA, Superfund's 25th Anniversary, *supra* note 304.
331 E^2 INC., *supra* note 303, at 1-1.

Accounting Office estimates that a staggering 425,000 potential Superfund sites still exist nationwide.[332] Without the massive response work of Superfund, these waste sites would go largely unnoticed and unattended.[333] Since Superfund's enactment, the statute's emergency response program has mitigated immediate threats to human health at thousands of waste sites. Most notably, the program played substantial roles in the World Trade Center and Pentagon Attacks, the 2001 Anthrax Attacks, the Columbia Space Shuttle Disaster, and Hurricane Katrina.[334]

Superfund has generated other significant benefits as well. As the EPA notes, "Superfund has many areas of accomplishment."[335] The EPA has elaborated on the success of the program, noting that:

> [T]he Superfund program has led to many benefits. These include reduced human health risks for cancer, lead poisoning, acute injuries involving hazardous substances, and probably birth defects. These benefits also include improved environmental quality at thousands of sites across the country, and the protection of a substantial portion of the nation's groundwater. CERCLA [has] also increased knowledge about and capability to deal with accidents involving hazardous substances through research, development, and training. Recently, these capabilities have proven useful in counter-terrorism planning and response.[336]

Additional benefits include deterrence of possible hazardous releases via its liability provisions,[337] "psychological benefits associated with reducing the uncertainty and fear of unknown risks that might exist

---

[332] John A. Hird, *Environmental Policy and Equity: The Case of Superfund*, 12 J. POL'Y ANALYSIS & MGMT. 323, 324 n.3 (1993).

[333] Envtl. Prot. Agency, Superfund (CERLCIS), http://www.epa.gov/enviro/html/cerclis (last visited Jan. 10, 2008) ("Before Superfund . . . [h]azardous wastes were often left in the open, where they seeped into the ground, flowed into rivers and lakes, and contaminated soil and groundwater. Consequently, where these practices were intensive or continuous, there were uncontrolled or abandoned hazardous waste sites.").

[334] EPA, Superfund's 25th Anniversary, *supra* note 304. *See generally* John S. Manuel, *NIEHS Responds to World Trade Center Attacks*, 109 ENVTL. HEALTH PERSPS. A526 (2001) (the National Institute of Environmental Health Sciences responded to the September 11 attacks through various programs, including the Superfund program).

[335] E^2 INC., *supra* note 303, at 1-1.

> [Superfund] led to support for communities that were burdened with hazardous material sites so they could better understand and participate in decisions about what to do with them. Superfund created a program for developing and deploying knowledge and technologies to better manage hazardous substances. It provided training for thousands of first responders (fire fighters, police, emergency room nurses, etc.) so they could detect and identify hazardous substances in order to protect themselves and the public. It has enabled the restoration of hundreds of communities and ecosystems. . . .

Id.

[336] *Id.*

[337] *Id.* at 6-12.

at nearby hazardous substance facilities,"[338] and empowerment of the public.[339] Moreover, the property-related benefits are immense: Superfund results in the removal of unsightly, often abandoned facilities[340] and the "conver[sion] of unusable commercial and industrial properties back into productive real estate."[341] Moreover, current owners or operators of Superfund sites being remediated benefit from cleanup that adds to the value of, adapts, or prolong the useful life of their property.[342] Superfund's Redevelopment Initiative has resulted in the conversion of many Superfund sites into beneficial airports, major department stores, soccer fields, golf courses, wildlife refuges, and parks, to name a few.[343]

D. *The Exxon Valdez Oil Spill and the Oil Pollution Act*

Oil is lethal to a wide variety of marine life. Oil spills have the potential to injure or destroy marine mammals, such as otters; marine reptiles, such as turtles; shore birds that dive or form flocks on the sea; sedentary animals in shallow waters, such as oysters, mussels, and clams; plankton; marsh vegetation, such as mangrove trees; and live coral.[344] Marine ecosystems are harmed both by the physical nature (physical contamination and smothering) and by the chemical components (toxic effects and accumulation) of the oil.[345] Harms to animals and plants resulting from oil spills occur directly, during clean-up operations, or indirectly by virtue of physical damage to habitat.[346]

Shortly after midnight on March 24, 1989, the 987-foot oil tanker *Exxon Valdez* struck a reef in Prince William Sound, Alaska, spilling eleven million gallons of crude oil and making this oil spill the largest in U.S. history.[347] The oil slick spread over three thousand square miles

338 *Id.* at 6-2.

339 *Id.* at 6-8.

340 *Id.* at 6-2.

341 *Id.* at 6-3.

342 Elliott Milhollin, *Taxation of Superfund Cleanup Costs: How the IRS Continues to Frustrate CERCLA's Twin Policy Goals*, 5 WIS. ENVTL. L.J. 213, 227 (1998).

343 EPA, Superfund's 25th Anniversary, *supra* note 304; Fredric L. Ouivik, *Integrating the Preservation of Cultural Resources with Remediation of Hazardous Materials: An Assessment of Superfund's Record*, 23 PUB. HISTORIAN 47, 58-59 (2001) (discussing the creation of an Old Works Golf Course as a remediation at a Superfund project).

344 The Int'l Tanker Owners Pollution Fed'n Ltd., About Marine Spills: Environmental Impact, http://www.itopf.com/marine-spills/effects/environmental-impact/index.html (last visited Jan. 10, 2008).

345 *Id*.

346 The Int'l Tanker Owners Pollution Fed'n Ltd., About Marine Spills: Effects of Oil Spills http://www.itopf.com/marine-spills/effects (last visited Jan. 10, 2008).

347 U.S. ENVTL. PROT. AGENCY, THE EXXON VALDEZ OIL SPILL: A REPORT TO THE PRESIDENT (EXECUTIVE SUMMARY) (1989), *available at* http://www.epa.gov/history/topics/

and onto over 350 miles of beaches in Prince William Sound.[348] Large-scale cleanup efforts took place following the spill, but 250,000 migratory shore birds and waterfowl, 300 harbor seals, 2,800 sea otters, up to 13 whales, and many other species were killed or seriously injured.[349] As major newspaper reported: "The oil spill disrupted entire fishing communities, forcing shops to close, fishermen to declare bankruptcy, and people to move from their hometowns."[350]

The disaster triggered an environmental availability campaign of colossal proportions. Groups that had fought oil development in Alaska prior to the spill were most active in mobilizing the public.[351] These disparate groups consisting of consumer, fishing, labor, and environmental organizations were unlikely allies, brought together by common interests and outrage over the spill.[352] Armed with data and already organized, the assemblage of groups mobilized quickly.[353] What followed was an exceedingly effective campaign during which the interest groups, in concert with the media, educated the public and marshaled support for accountability and change.[354] The *Exxon Valdez* oil spill was mentioned in 577 news stories in the major national print media between the day of the spill and the end of May 1989, and it was the subject of twenty-two network evening news stories between March 27 and March 31 of 1989.[355] It was the focus of seventy additional stories in April and May of the same year, and it was discussed in nearly one thousand print news stories and sixty-nine network news stories between June of 1989 and the one-year anniversary of the spill.[356] The media used powerful symbols to show the public the horror of the spill: dying otters coated in oil, lifeless seabirds, and idle fishing boats.[357] These television images became "archetypes of corporate rapacity and incompetence, associating Exxon permanently in the public mind with

valdez/04.htm [hereinafter EPA, EXXON OIL SPILL REPORT]; John A. Wiens, *Oil, Seabirds, and Science*, 46 BIOSCIENCE 587, 587 (1996); *Oil Spill at High Court*, CINCINNATI POST, Oct. 30, 2007, at B8.

348 EPA, EXXON OIL SPILL REPORT, *supra* note 347.

349 M. LYNNE CORN ET AL., ARCTIC NATIONAL WILDLIFE REFUGE: BACKGROUND AND ISSUES 87 (2003).

350 Evelyn Nieves, *Court Overturns Jury Award in '89 Exxon Valdez Spill*, N.Y. TIMES, Nov. 8, 2001, at A14.

351 Brooke Findley, *Critical Junctures in Environmental Policy: The Exxon Valdez Oil Spill*, DRAKE UNDERGRADUATE SOC. SCI. J., Spring 2002, *available at* http://www.drake.edu/artsci/PolSci/ssjrnl/2002/Findleyrevised.htm.

352 *Id.*

353 *Id.*

354 *Id.*

355 Thomas A. Birkland & Regina G. Lawrence, *The Social and Political Meaning of the Exxon Valdez Oil Spill*, 7 SPILL SCI. & TECH. BULL. 17, 18 (2002).

356 *Id.*

357 NICHOL BRYAN, EXXON VALDEZ: OIL SPILL 8 (2004); Findley, *supra* note 351.

blackened beaches and drunken sea captains."[358]

The campaign succeeded in capturing an extraordinary amount of public attention. A 1997 study found that the spill ranked among the top twenty news stories gaining close public attention in the previous decade.[359] Citizens nationwide reacted in outrage over the fouling of the Alaska wilderness.[360] The salient nature of the oil spill contributed to the effect of the availability campaign facilitating the efforts of the interest groups—"oil spills are one of the most highly visible and emotion-causing forms of ocean pollution."[361] Public involvement increased markedly as time passed. Private citizens contributed money and time to assist environmental groups, and elected officials joined in, expressing outrage over the spill.[362] Native villages and fishing groups launched a legal battle against the Exxon Corporation, resulting in a $150 million fine—the largest fine ever imposed for an environmental crime—and $100 million in restitution for the fish, wildlife, and lands misuse.[363]

A combination of the vividness of the disaster, the proliferation of information about the harm, and the resulting overwhelming reaction of the public resulted in the swift passage of new legislation. The resulting law, the Oil Pollution Act of 1990 (OPA),[364] is an example of a crucial statute that resulted from an environmental availability campaign.[365] Before the *Exxon Valdez* spill, oil pollution legislation had been stalled in Congress for fifteen years due to the successful lobbying efforts of the oil industry.[366] According to the EPA, the enactment of the OPA after the *Exxon Valdez* spill was "largely in response to rising public

358 Dashka Slater, *Dress Rehearsal for Disaster: Petroleum Industry Oil Spill Management Drill*, 79 SIERRA 52, 53-57 (1994).

359 Birkland & Lawrence, *supra* note 355, at 18 (compared with an average of 25% for most major news stories, 52% of respondents reported having followed the Exxon Valdez story "very closely") (citing KIMBERLY PARKER & CLAUDIA DEANE, TEN YEARS OF THE PEW NEWS INTEREST INDEX, PEW RESEARCH CTR. FOR THE PEOPLE AND THE PRESS (1997), *available at* http://people-press.org/reports/pdf/107.pdf).

360 BRYAN, *supra* note 357, at 8.

361 THOMAS A. BIRKLAND, AFTER DISASTER: AGENDA SETTING, PUBLIC POLICY, AND FOCUSING EVENTS 97 (1997) (citing INTERAGENCY COMM. ON OIL POLLUTION RESEARCH, DEV. & MKTG., NATIONAL MARINE POLLUTION PROGRAM PLAN 76-77 (1981)).

362 Thomas A. Birkland, *In the Wake of the Exxon Valdez: How Environmental Disasters Influence Policy*, ENV'T, Sept. 1, 1998, at 5.

363 Exxon Valdez Oil Spill Trustee Council, Settlement, http://www.evostc.state.ak.us/facts/settlement.cfm (last visited Feb. 8, 2009).

364 33 U.S.C. §§ 2701-2716, 2716-a, 2717-2719, 2731-2738, 2751-2752, 2761-2762 (2006); 43 U.S.C. §§ 1642, 1656 (2006); 46 U.S.C. §§ 3703a, 7505 (2006), 46 U.S.C. app. § 1274(a) (2006).

365 OIL COS. INT'L MARINE FORUM, THE US OIL POLLUTION ACT OF 1990: WHY HAS IT BEEN SO SUCCESSFUL AT REDUCING SPILLS? 1, 6 (2003), *available at* http://www.ocimf.com/view_document.cfm?id=383 (considering why OPA has been "so successful" and writing of "OPA 90's success") [hereinafter OCIMF].

366 Birkland, *supra* note 362, at 5 (the passage of the OPA "ended a nearly 14-year-long deadlock over how to improve federal oil pollution laws"); Findley, *supra* note 351.

concern following the *Exxon Valdez* incident."[367] Remarkably, the *Exxon Valdez* oil spill occurred on March 24, 1989,[368] and the OPA was signed into law in August 1990,[369] just over *sixteen months* after the spill.

The OPA was enacted in part to reduce the occurrence of future oil spills in the United States through preventive measures such as improved tanker design and operational changes.[370] To meet this end, many preventative measures were put in place,[371] including the new requirement that single-hulled oil-transporting vessels be replaced with double-hulled vessels according to a gradual phase-out schedule in order to reduce the risk and impact of spills caused by punctures.[372] Another goal of OPA was to minimize the impact and damage of future oil spills through heightened preparedness and by responding effectively to spills.[373] The OPA expanded the federal government's authority to respond to oil spills and provided the funding and resources necessary to do so. Thanks to the passage of OPA, a trust fund now exists providing up to one billion dollars to be used for each spill, government and industry must meet certain requirements regarding contingency plans, and larger noncompliance penalties are in place.[374]

The present and future benefits of the OPA have become clear, particularly after the publication of two NRC reports on the effects of the OPA: an interim report in 1996[375] and a conclusive report in 1998.[376] Between 1973 and the passage of the OPA in 1990, oil spills from tank vessels (tankers and barges) accounted for ninety percent of the total volume of oil lost from all vessels.[377] The NRC examined oil spill statistics from the U.S. Coast Guard, the U.S. Department of the Interior Minerals Management Service, the International Tanker Owners Pollution Federation, and two journals, *Oil Spill Intelligence Report* and

367 U.S. Envtl. Prot. Agency, Emergency Management: Oil Pollution Act Overview, http://www.epa.gov/OEM/content/lawsregs/opaover.htm (last visited Jan. 10, 2008) [hereinafter EPA, OPA Overview]; *see also* Birkland, *supra* note 362, at 5 ("This quick shift from deadlock to action makes the *Exxon Valdez* spill a particularly apt example of how a focusing event can spur greater attention to problems and can sometimes lead to policy change.").

368 EPA, EXXON OIL SPILL REPORT, *supra* note 347.

369 EPA, OPA Overview, *supra* note 367.

370 NAT'L RESEARCH COUNCIL, COMM. ON OIL POLLUTION ACT OF 1990 (SECTION 4115) IMPLEMENTATION REVIEW, EFFECTS OF DOUBLE-HULL REQUIREMENTS ON OIL SPILL PREVENTION: INTERIM REPORT 3 (1996) [hereinafter INTERIM REPORT].

371 *See* 46 U.S.C. § 3703a (2006).

372 INTERIM REPORT, *supra* note 370, at 4.

373 *Id.* at 3, 14.

374 EPA, OPA Overview, *supra* note 367.

375 INTERIM REPORT, *supra* note 370.

376 NAT'L RESEARCH COUNCIL, COMM. ON OIL POLLUTION ACT OF 1990 (SECTION 4115) IMPLEMENTATION REVIEW, DOUBLE-HULL TANKER LEGISLATION: AN ASSESSMENT OF THE OIL POLLUTION ACT OF 1990 (1998) [hereinafter FINAL REPORT].

377 *Id.* at 19.

Golob's Oil Pollution Bulletin.[378] What the NRC found was encouraging: all of the sources reported a decline in the number and severity of oil spill accidents between 1991 and 1995.[379] Moreover, the NRC found that while eighteen large spills (spills involving losses of more than one million gallons of oil) occurred in the United States between 1973 and 1990 (averaging 1.06 large spills each year), there were no large spills in the four-year period between 1991 and 1995.[380] In 2003, the Oil Companies International Marine Forum found that between 1990, when OPA was enacted, and 2003, the volume of oil spilled from tankers into U.S. waters fell from an average of seventy thousand barrels per year to an average of four thousand barrels per year, a decrease of ninety-five percent.[381] This reduction in oil spills could not be largely attributed to the double-hull requirement since the phase-out schedule had not yet reached full force and since other factors were at work, such as:

> [A]n increased awareness among vessel owners and operators of the financial consequences of oil spills and a resulting increase in attention to policies and procedures aimed at eliminating vessel accidents; actions by port states to ensure the safety of vessels using their ports; increased efforts by ship classification societies to ensure that vessels under their classification meet or exceed existing requirements; improved audit and inspection programs by charterers and terminals; and the increased liability, financial responsibility, and other provisions of OPA 90.[382]

While the effects of the double-hull requirement of the OPA have not yet been fully realized due to the timeline of the phase-out process,[383] the early data is encouraging, and the projected future benefits are promising. Historically, punctures due to collisions and groundings were responsible for a staggering seventy percent of the oil spilled from tankers and tank barges.[384] A 1991 study found that the double-hull design reduces outflow of oil in the event of a puncture, resulting in fewer or less severe oil spills than a single-hull tanker design.[385] Furthermore, in its interim report, the NRC found that between 1990 and 1994, there was a substantial reduction in the number

---

378 INTERIM REPORT, *supra* note 370, at 16.

379 *Id.*

380 FINAL REPORT, *supra* note 376, at 19.

381 OCIMF, *supra* note 365, at 1.

382 FINAL REPORT, *supra* note 376, at 2-3; *see* OCIMF, *supra* note 365, at 6 ("The phased move from single to double hulls is an important element in the [OPA] but has had less effect than some of the other provisions, which focus on standards of operation, the human element and liability.").

383 *See* FINAL REPORT, *supra* note 376, at 2.

384 *Id.* at 24.

385 INTERIM REPORT, *supra* note 370, at 4.

and severity of collisions and groundings of oil vessels.[386] The NRC conclusive report projected that once the single-hull to double-hull phase-out is fully implemented (projected to occur by 2020),[387] four out of every five oil spills attributable to collisions and groundings will be eliminated, and there will be a two-thirds reduction in the total volume of oil spilled from collisions and groundings.[388]

Other benefits of OPA have been realized as well. In response to the OPA, the International Maritime Organization now mandates that vessels be inspected every five years, with each inspection becoming increasingly strict as the vessel ages; this inspection program is in place to prevent the operation of substandard vessels that could cause oil spills due to structural failures.[389] Sharing of information between ports and with the public has increased dramatically. Like Australia, which published the "Ships of Shame" list of still-operating ships in appalling states of disrepair, the U.S. now makes similar information available to the public about its vessels.[390] Public perception has also improved. As of 1996, there was a general agreement within the maritime oil transportation community that the quality of U.S. vessels had improved after the passage of the OPA.[391] Overall, the benefits of the OPA are vast: as the NRC summarized in its conclusive report: "It is clear . . . that the prevention of a single large spill can offer not only protection for the environment but also reduced costs for the vessel owner, the industry, and the nation as a whole."[392]

The postscript to the *Exxon Valdez* disaster underscores the importance of OPA. Alaska Fisheries Science Center (part of the National Oceanic and Atmospheric Administration) conducted a survey of the *Exxon Valdez* oil spill area in 2001, more than twelve years after the spill occurred.[393] Oil was found at fifty-eight percent of the ninety-one sites assessed in Prince William Sound, and the survey results indicated that twenty acres of shoreline in the Sound were still contaminated with oil, which is the linear equivalent of 3.6 miles of contaminated shoreline.[394] Most of the oil found was classified as "lightly oiled" (as opposed to "heavily oiled") but was still easily observed once it was uncovered, exhibiting sheening, strong odor, and

386 *Id.* at 15.
387 FINAL REPORT, *supra* note 376, at 1.
388 *Id.* at 24.
389 INTERIM REPORT, *supra* note 370, at 11.
390 *Id.*
391 FINAL REPORT, *supra* note 376, at 3.
392 *Id.* at 21, 23.
393 Jeff Short et al., *The Exxon Valdez Oil Spill: How Much Oil Remains?*, NOAA ALASKA FISHERIES SCI. CTR. Q. RES. REP. (July-Sept. 2001), *available at* http://www.afsc.noaa.gov/quarterly/jas2001/feature_jas01.htm.
394 *Id.*

stickiness.[395] The sites with the most oil were low in the intertidal zone, closest to the zone of biological production.[396] Most striking is the data concerning the animals in the Prince William Sound area. Ten years after the spill, "only two species, the bald eagle and the river otter, had fully recovered, while [ten] species had shown no significant recovery."[397] The long-term devastation following a single oil spill evinces the necessity of a measure like OPA. Due in large part to efforts of environmental groups to move the public, we may well be able to prevent the widespread damage that too often results from oil spills such as the *Exxon Valdez* spill.

E. *Global Warming*

Earlier in this paper, we advanced a model of availability campaigns that included a *trigger phase*, *campaign phase*, *social movement phase*, and *action phase*.[398] We acknowledged that in proposing a particular model, we limited our analysis to availability campaigns that start with a discrete event or discovery (or a series of discoveries or events that occur within a short period of time).[399] For the time being, our model precludes availability campaigns that may occur within the context of a larger movement. This bears repeating in the context of a discussion of global warming because of the particular history of this environmental issue. Having provided some clear examples of environmental availability campaigns that fit nicely within our model, we turn to an environmental issue that does not perfectly fit our model, in part because concern over global warming does not have a clear point of origin. Our discussion below is in keeping with our proposed model. However, this particular environmental issue may serve best as a bridge to a later discussion of availability campaigns in other contexts—specifically, as mechanisms occurring within broader social movements.

The problem of global warming has become exceedingly available within the past several years. As a United Nations adviser summarized, "[a]lthough global warming has yet to kill a single human being and may not do so for centuries, it has received enormous attention and resources."[400] Global warming is an unusual example in more ways

395 *Id.*
396 *Id.*
397 Nieves, *supra* note 350, at A14.
398 *See supra* Part I.
399 *See supra* Part I (noting that we limit our analysis and discussion to situations in which there is a relatively abrupt genesis despite the fact that many social movements do not begin with a discrete event or discovery and instead unfold over time, as consensus or discontent builds).
400 Jeffrey L. Dunoff, *From Green to Global: Toward the Transformation of International*

than one.[401] First, global warming is unusual because it exhibits both similarities to and differences from traditional environmental availability campaigns and the resulting pushes for environmental legislation. It is different from most environmental issues in that global temperature increases and the associated rising sea levels are cumulative, long-term, "non-available" events[402] that are punctuated by a very few dramatic, short-term, "available" events such as intense hurricanes.[403]

Recall that our model of availability campaigns includes, in phase one, a precipitating "trigger."[404] This trigger is often either an environmental or climatic disaster[405] or an environmentally relevant scientific discovery.[406] Likely, *because* of the absence of the dramatic or sudden-onset precipitating event or discovery, the global warming cascade has mounted slowly,[407] and the campaign has lacked the swift power of availability campaigns in other instances.[408] Because momentum has been slow to build, substantial push-back from a variety of sources has successfully held the campaign at bay. For example, in the face of substantial efforts by individuals and environmental groups to spread the word and to inflame criticism of current policy, the Bush

Environmental Law, 19 HARV. ENVTL. L. REV. 241, 288 (1995).

401 Sunstein, *Montreal*, *supra* note 1, at 11 ("[T]here is no parallel to date in the context of climate change.").

402 Global temperature increases and rising sea levels are gradual, long-term events. Lisa A. St. Amand, *Sea Level Rise and Coastal Wetlands: Opportunities for a Peaceful Migration*, 19 B.C. ENVTL. AFF. L. REV. 1, 1 (1991) (noting the gradual nature of global warming and noting that seas that will rise up to seven feet in the next century); U.S. Envtl. Prot. Agency, Climate Change: Coastal Zones and Sea Level Rise, http://www.epa.gov/climatechange/effects/coastal/ (last visited Jan. 10, 2008) [hereinafter EPA, Climate Change Coastal] (giving current IPCC estimates that the global average sea level will rise between 0.6 and 2 feet in the next century).

403 More intense hurricanes, which are sudden, dramatic events, are a phenomenon which some attribute to global warming. EPA, Climate Change Coastal, *supra* note 402 (noting that one possible effect of global warming is an increase in the intensity of tropical storms); U.S. Envtl. Prot. Agency, Climate Change: Extreme Events, http://www.epa.gov/climatechange/effects/extreme.html (last visited Jan. 10, 2008) (noting that directly linking any one specific severe hurricane to global warming is not possible, but that global warming may increase the probability of ordinary weather events reaching extreme levels or of some extreme events becoming more extreme).

404 *See supra* notes 47-48 and surrounding text.

405 See, for example, *supra* text accompanying notes 351-363 on the public's response to one environmental disaster: the *Exxon Valdez* Oil Spill.

406 See, for example, *supra* Part IV.C for a discussion on the public's response to the sudden environmental revelation in the Love Canal disaster.

407 The nation's first brush with global warming came decades ago: "[G]lobal warming first garnered worldwide attention during the mid-1980s. . . ." Kevin Simonsen, *The Heat is On: The High Stakes Battle over Earth's Threatened Climate*, 25 ECOLOGY L.Q. 317, 317 (1998). Since then, global warming has been attracting more and more attention. Ling Zhong, *Nuclear Energy: China's Approach Towards Addressing Global Warming*, 12 GEO. INT'L ENVTL. L. REV. 493, 516 (2000).

408 See *supra* Parts IV.C & D for a discussion of the swift nature of the public and legislative responses to Love Canal and the *Exxon Valdez* Oil Spill, for example.

administration's position was consistent, denying that global warming was a problem warranting attention.[409] Another cause of the movement's sluggish pace stems from the "massive, industry funded propaganda and disinformation campaign."[410] Some corporations, such as Exxon Mobil, have invested substantial resources in challenging the notion that global warming is caused in part by the burning of fossil fuels.[411]

Finally, global warming is unique in light of the potential overall costs of new legislation and its noticeable impacts on the general population.[412] A ban on aerosol sprays containing chlorofluorocarbons or a ban on lead-based paint is not likely to place a heavy financial burden on the industry or dramatically alter the lives of general population in a noticeable way.[413] Tighter laws on carbon dioxide emissions, however, would place financial burdens on various industries, might very well affect the economy,[414] and would likely

409 *See* Editorial, *Backward on Global Warming*, N.Y. TIMES, Feb. 16, 2002, at A18 (explaining how President Bush rejected the Kyoto Protocol, which placed mandatory caps on nation's greenhouse gas emissions, and instead came up with his own plan that would require little emission reduction effort from U.S. businesses); Jim Jeffords, Op-Ed., *Unhealthy Air*, N.Y. TIMES, June 30, 2002, § 4, at 15 (explaining how President Bush criticized a National Academy of Sciences report calling global warming a "real" and "significant" threat and proposed rollbacks of the Clean Air Act new source review provisions that would allow old power plants to continue to emit large amounts of carbon dioxide); Jeffrey Kluger et al., *Polar Ice Caps Are Melting Faster than Ever*, TIME, Apr. 3, 2006, at 28 (commenting that the Bush Administration's treatment of global warming, consisting of research initiatives and voluntary emissions controls, is "not exactly the laws with teeth scientists are calling for"); Editorial, *New Players on Global Warming*, N.Y. TIMES, Jan. 15, 2003, at A20 (describing President Bush's treatment of global warming as a "let's-wait-for-more-research stance"); Editorial, *The State of Energy*, N.Y. TIMES, Feb. 1, 2006, at A24 (noting that while President Bush "seems finally to have signed on to the idea that the earth is warming, and that humans are heavily responsible, he has rejected serious proposals to do anything about it and allowed his advisers on the issue to engage in a calculated program of disinformation").

410 Bob Berwyn, *Global Warming Story Hits Critical Mass*, SUMMIT DAILY NEWS, Mar. 13, 2007, *available at* http://www.summitdaily.com/article/20070313/NEWS/103130045&parent profile=search.

411 UNION OF CONCERNED SCIENTISTS, SMOKE, MIRRORS & HOT AIR: HOW EXXONMOBIL USES BIG TOBACCO'S TACTICS TO MANUFACTURE UNCERTAINTY ON CLIMATE SCIENCE 1 (2007), *available at* http://www.ucsusa.org/assets/documents/global_warming/exxon_report.pdf (finding that Exxon Mobil spent nearly $16 million to fund skeptic groups and create confusion about global warming); Gregory N. Mandel & James Thuo Gathii, *Cost-Benefit Analysis Versus the Precautionary Principle: Beyond Cass Sunstein's Laws of Fear*, 2006 U. ILL. L. REV. 1037, 1063.

412 Sunstein, *Montreal*, *supra* note 1, at 11.

413 *See id.*

414 *See* Letter from the President George W. Bush to Senators Hagel, Helms, Craig, and Roberts (Mar. 13, 2001), *available at* http://www.climateark.org/shared/reader/welcome .aspx?linkid=76209. When asked for the Bush Administration's views on global climate change and the Kyoto Protocol in particular as an effort to regulate carbon dioxide, President Bush wrote, "I oppose the Kyoto Protocol because . . . [it] would cause serious harm to the U.S. economy." *Id.*

result in considerable changes to the day-to-day lives of the public.[415] Fear of personal costs and inconvenience may cause individuals to hesitate to accept human-caused global warming as a reality: "[P]eople [are] reluctant to endure economic losses to reduce the risk of global climate change."[416]

For several reasons, it is unfortunate that efforts to make global warming "available" have taken so long. First, it is the granddaddy of environmental issues, trumping all others due to the potential for irreversible harm on a world-wide scale.[417] Second, the connection between global warming and other environmental issues is unprecedented: global warming has numerous contributors[418] and has a direct impact on a myriad of other environmental issues.[419] Third, unlike other environmental problems that emerge on a local, state-wide, or national scale, no single nation is able to eliminate, or even make significant progress on, the problem of global warming in isolation.[420] Therefore, if an environmental availability campaign is to culminate in tangible results, it will have to operate on a larger scale than ever before.[421]

Global warming exemplifies the difficulties inherent in the call for

415 *See* Sunstein, *Montreal*, *supra* note 1, at 11. Since individuals produce greenhouse gas emissions through everyday activities such as driving and using air conditioning and heating, U.S. Envtl. Prot. Agency, Climate Change, Greenhouse Gas Emissions, http://www.epa.gov/climatechange/emissions/index.html (last visited Jan. 10, 2008), it is reasonable to assume that future regulations on carbon dioxide emissions would include laws regarding automobile fuel sources and mass transit, as well as on household energy use and appliances.

416 Rachlinski, *supra* note 11, at 313.

417 *See* Sunstein, *Montreal*, *supra* note 1, at 1, 2 (noting that global warming threatens to cause large-scale harm that is difficult to reverse).

418 These contributors include fossil fuel combustion by power plants, automobiles, and industry; industrial processes such as the production of cement, steel, and aluminum; agriculture, forestry, and other land use, as well as waste management. U.S. Envtl. Prot. Agency, Climate Change, Basic Information, http://www.epa.gov/climatechange/basicinfo.html (last visited Jan. 10, 2008).

419 These environmental and health issues include human health issues related to increased prevalence of diseases and air quality problems; agricultural issues due to droughts, floods, severe storms, changes in rainfall amounts and patterns, and alterations in the growing season; coastal issues related to changing water patterns, more severe storms, rising sea levels, and loss of coastal marshes and swamps; and natural ecosystems and biodiversity issues related to acidification of the ocean, shifts in the start and end of animal breeding seasons and the earlier flowering of trees, shifts in animal migration patterns, changes in animal body size and population numbers, and shifts in animal and plant distributions to higher elevations and towards the poles. U.S. Envtl. Prot. Agency, Climate Change, Health and Environmental Effects, http://www.epa.gov/climatechange/effects/index.html (last visited Jan. 10, 2008) (including internal links).

420 Sunstein, *Montreal*, *supra* note 1, at 2.

421 *See* James L. Huffman, *The Past and Future of Environmental Law*, 30 ENVTL. L. 23, 30-32 (2000) (predicting expanded reliance on collaborative approaches to the resolution of environmental disputes in the near future); Sunstein, *Montreal*, *supra* note 1, at 2 ("Because of the diversity of contributors, both problems seem to be best handled through international agreements.").

"scientific truth" as a basis for legislative action. A 2000 article noted that "scientists will surely continue to generate conflicting evidence on the dangers posed by global climate change, thereby making it difficult to form a consensus on the issue."[422] This prediction proved true: even though the 2007 IPCC report said that climate change was "very likely" caused by humans[423] and defined "very likely" as greater than a ninety percent probability,[424] there are still, and likely will always be, a handful of dissenters.[425] In 2007, a panel of journalists used the word "consensus" to describe the view on the connection between the warming of the planet and human activity; the lone dissenter on the panel argued that there isn't so much a consensus as a "prevailing view."[426] Dissent is not a bad thing: it plays an essential role in scientific research, and science often invites the contributions of skeptics. However, so long as there are a number of scientists who support the minority viewpoint, there will never be scientific "truth."[427] As one fiction writer suggests, there is no such thing as consensus science: "If it's consensus, it isn't science. If it's science, it isn't consensus."[428]

Notwithstanding the unusual characteristics of global warming, an environmental availability campaign appears to be developing and gaining momentum.[429] Despite its slow start, the potential strength of the global warming issue was apparent as early as the year 2000, when an article predicted that global warming would be the subject of an availability cascade by virtue of observed changes in weather patterns and events:

> The threat of global climate change provides more than adequate opportunity to create an availability cascade. The climate itself is

422 Rachlinski, *supra* note 11, at 313.

423 *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT 39, 72 (2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf.

424 *Id.* at 27.

425 As one commentator explains, despite the current use of the word "consensus" when referring to the science on global warming, there are dissenting voices. Sunstein, *Montreal*, *supra* note 1, at 2 n.6 (citing Nir J. Shaviv, *The Spiral Structure of the Milky Way, Cosmic Rays, and Ice Age Epochs on Earth*, 8 NEW ASTRONOMY 39 (2003)). Another commentator writes that "there is one prediction of which we can be confident: . . . debate over scientific uncertainties about global warming will rage on." Pielke & Sarewitz, *supra* note 222.

426 A.B.A. Section of Env't, Energy, & Res., "Covering Climate": Telling the Unfolding Story of Global Warming (with the Society of Environmental Journalists), 36th Annual Conference on Environmental Law (Mar. 10, 2007).

427 *Cf.* Gunther Teubner, *How the Law Thinks: Toward a Constructivist Epistemology of Law*, 23 LAW & SOC'Y REV. 727, 733 (1989) (explaining that, under the consensus theory of truth, truth requires a consensus or potential consensus regarding a particular idea or belief).

428 Harold Evans, *Crichton's Conspiracy Theory*, BBC NEWS, Oct. 7, 2005, http://news.bbc.co.uk/1/hi/magazine/4319574.stm (quoting Michael Crichton).

429 *Cf.* Mandel & Gathii, *supra* note 411, at 1063 (noting that nongovernmental organizations and private actors have been bringing much attention to the adverse effects of global warming).

> difficult for laypersons to track, but the alleged symptoms of global climate change are easy to imagine. With or without a dramatic change in climate, bad weather constantly finds its way into the news. Droughts, tornadoes, hurricanes, floods, and heat waves consistently receive coverage on the nightly news, whether or not they are the products of global climate change. This attention makes it easier to recall instances of weather-related tragedies, making the prospect of a disastrous change in the climate seem likely.[430]

Today, it is apparent that a global warming availability campaign is underway. Although this campaign lacks a clear, dramatic precipitating event, it is possible to conceive of the release of Former Vice President Al Gore's documentary, *An Inconvenient Truth*,[431] as the trigger, because many people first learned of the gravity of the problem by seeing that film.[432] When asked why global warming has taken so long to catch a hold of the public's attention, a 2007 panel of climate change journalists credited Al Gore's film as one of the main fueling factors behind the public's current, strong interest in the issue.[433] Alternatively, one could credit the scientific reports for serving as the trigger. In particular, the series of reports by the IPCC[434] linking human activity to increasing global temperatures has sparked much commentary and concern. In this second scenario, *An Inconvenient Truth* is most appropriately viewed as propaganda delivered to the public as part of the global warming availability campaign.[435] Gore's film has acted as a "tipping point" of sorts—before the film, the movement slowly progressed up a seemingly steep hill, then the film's debut pushed the movement over the peak of the hill and marked the beginning of its speedy, downward descent.

---

430 Rachlinski, *supra* note 11, at 312.

431 AN INCONVENIENT TRUTH (Paramount Pictures 2006).

432 The film ominously predicts:

> Humanity is sitting on a ticking time bomb. If the vast majority of the world's scientists are right, we have just ten years to avert a major catastrophe that could send our entire planet into a tail-spin of epic destruction involving extreme weather, floods, droughts, epidemics and killer heat waves beyond anything we have ever experienced.

An Inconvenient Truth: About the Film, http://www.climatecrisis.net/aboutthefilm (last visited Jan. 10, 2008).

433 Berwyn, *supra* note 410.

434 According to the Technical Summary of the IPCC Working Group Report I (2001):

> The atmospheric abundances of greenhouse gases were increasing, due largely to human activities. Continued future growth in greenhouse gas emissions was predicted to lead to significant increases in the average surface temperature of the planet, increases that would exceed the natural variation of the past several millennia and that could be reversed only slowly.

INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2001: THE SCIENTIFIC BASIS § A2 (2001), *available at* http://www.ipcc.ch/ipccreports/tar/wg1/011.htm.

435 Certainly, Al Gore constitutes an "availability entrepreneur" in this scenario. He is joined by other environmental activists and environmental groups, of which there are too many to name here.

An Inconvenient Truth may be the most visible manifestation of the availability campaign, but it is far from the only one. For example, on July 7, 2007, the group SOS—Save Our Selves (led in part by Vice President Al Gore)—held seven "Live Earth" concerts, one on each continent worldwide, to combat climate change.[436] The hope was that the audience of two billion people and the proceeds from the concert would "create the foundation for a new, multi-year global effort to combat the climate crisis awareness."[437] Religious groups across the United States are engaged in initiatives to address global warming.[438] Thanks in part to the power of all of these efforts, countervailing efforts appear to be losing ground.[439]

The public response to Gore's film and other efforts has been substantial. Millions of people have viewed *An Inconvenient Truth*

---

436 *See, e.g.*, The Concerts for a Climate in Crisis, http://liveearth.org/070707_liveearth/ (last visited Feb. 11, 2009).

> Live Earth was a monumental music event that brought together a global audience on July 7, 2007 to combat the climate crisis. Live Earth staged concerts in New York, London, Sydney, Tokyo, Shanghai, Rio de Janeiro, Johannesburg and Hamburg—as well as special broadcast events in Antarctica, Kyoto and Washington, DC—and featured more than 150 of the world's best music acts—a mix of both legendary music acts . . . with the latest headliners . . . . Live Earth's 24 hours of music across 7 continents delivered a worldwide call to action and the solutions necessary to answer that call. Live Earth launched a multi-year campaign to drive individuals, corporations and governments to take action to solve the climate crisis.

Id.

437 *See, e.g.*, Live Earth: The Concert for a Climate in Crisis, http://www.climateprotect.org/about/partners (last visited Feb. 11, 2009).

> Live Earth will use the global reach of music to engage people on a mass scale to combat our climate crisis. Live Earth will bring together more than 150 of the world's top musicians for 24-hours of music from 7 concerts across all 7 continents. Live Earth will bring together an audience of more than 2 billion at the concerts and through television, radio, film, and the Internet.

Id.

438 Mandel & Gathii, *supra* note 411, at 1063-64.

439 *See, e.g.*, Marc Gunther, *Exxon Mobil Greens up Its Act*, CNNMONEY.COM, Jan. 26, 2007, http://money.cnn.com/2007/01/25/magazines/fortune/pluggedin_gunther_exxonmobil.fortune (explaining that these days, Exxon Mobil "is talking about what actions should be taken to reduce greenhouse gas emissions, instead of questioning the science of climate change," which is "a turnabout from the late 1990s and early 2000s when Exxon . . . led the opposition to the Kyoto Protocols and provided funding for think tanks that challenged mainstream science"). Another factor behind the growing global warming movement is political. In November 2006, Democrats, who are traditionally more pro-environment than their Republican counterparts, took control of both houses of Congress, an event that has precipitated greater congressional attention to global warming issues. *See* Andrew P. Morriss et al., *Choosing How to Regulate*, 29 HARV. ENVTL. L. REV. 179, 227 (2005) (noting voters' awareness that "Democrats want to protect the environment"); John M. Broder, *Democrats Take Senate*, N.Y. TIMES, Nov. 10, 2006, at A1; Adam Nagourney, *Democrats Take House*, N.Y. TIMES, Nov. 8, 2006, at A1; Jack Torry, *County Officials Issue a Plea on Global Warming*, COLUMBUS DISPATCH, Mar. 6, 2007, at 3A ("The issue of global warming has taken on greater urgency since Democrats won control of the House and Senate in November. House Speaker Nancy Pelosi . . . wants the House to consider a global-warming bill by midsummer.").

since its debut in May 2006,[440] making it the third highest grossing documentary in the United States to date.[441] Global warming has become a headline story for many newspapers and magazines.[442] When Gore testified before Congress on March 21, 2007 regarding global warming, he brought with him twelve boxes of petitions with over 500,000 signatures from the public demanding immediate action to solve the climate crisis.[443] On April 14, 2007, named National Day of Climate Action, tens of thousands of people participated in 1,400 "Step it Up" events across the United States.[444] Following the event, the main website for the events read: "On this historic day, Americans called on their leaders to act immediately to stop global warming. In all 50 states . . . we have united around a common call to action: 'Step It Up Congress: Cut Carbon 80% by 2050.' Your move, Congress."[445] This flurry of activity marks a substantial departure from the situation in 1997, when a public opinion poll revealed that fifteen percent of respondents were "not too familiar" with the term "global warming," and another thirteen percent were "not familiar at all" with the term—a collective percentage representing almost a third of the individuals polled.[446] The legislative response to public pressure has been equally impressive. "Issues such as the integrity of the global climate, which attracted negligible interest among the public and policy makers as

440 Seth Borenstein, *Scientists OK Gore's Movie for Accuracy*, WASHINGTONPOST.COM, June 27, 2006, http://www.washingtonpost.com/wp-dyn/content/article/2006/06/27/AR2006062700780.html (stating that there were one million viewers of the film within the month following its release).

441 Tina Daunt, *Green Is Gold for Gore and His Celeb Pals*, L.A. TIMES, Feb. 26, 2007, at E1.

442 For instance, as the buzz of Al Gore's upcoming film strengthened, an April 2006 issue of TIME Magazine was titled "Special Report: Global Warming"; its cover read in giant caps read "Be Worried. Be Very Worried" and featured a polar bear on thinning ice. TIME, Apr. 3, 2006. In May 2006, just after Al Gore's film hit theaters, the cover of a May 2006 "Special Green Issue" of Vanity Fair read in large caps "A Threat Graver Than Terrorism: Global Warming." VANITY FAIR, May 2006. Even Sports Illustrated Magazine followed suit in March of 2007: its cover warned "As the Planet Changes, So Do the Games We Play: Time to Pay Attention" and showed a doctored photo of baseball pitcher Dontrelle Willis standing in a stadium full of water in Florida. SPORTS ILLUSTRATED, Mar. 12, 2007. As one commentator remarked, the "greening of the newsstand comes just weeks after global warming swept through the mainstream movie industry" when *An Inconvenient Truth* won two Oscars at the Academy Awards. Mary Milliken, *U.S. Magazines Go Green with Global Warming Issues*, PLANET ARK, Mar. 12, 2007, http://www.planetark.com/dailynewsstory.cfm/newsid/40778/story.htm.

443 Shailagh Murray, *Gore Returns to Capitol Hill a Hero and a Target*, WASH. POST, Mar. 21, 2007, at A6.

444 Step It Up 2007: National Days of Climate Action, http://stepitup2007.org (last visited Jan. 10, 2008).

445 Step It Up 2007: April 14, 2007—National Day of Climate Action, http://april.stepitup2007.org/ (last visited Feb. 11, 2009).

446 SANKEI SHIMBUN & USA TODAY, KYOTO ENVIRONMENTAL CONFERENCE POLL (1997) *available at* http://brain.gallup.com/documents/questionnaire.aspx?STUDY=MISC120132 (Question 4: "How familiar are you with the environmental issue known as 'global warming'—are you very familiar, somewhat familiar, not too familiar, or not familiar at all with that term and what it means?").

recently as the middle of the last decade, now command attention at the highest levels of government."[447] As of winter 2007, Congress had before it nearly a dozen bills that called for reductions in carbon dioxide and other greenhouse gases.[448] In addition, the legislative Committee on Oversight and Government Reform held hearings in January 2007 regarding political interference with the work of government climate change scientists.[449] Even the judiciary is responding by interpreting laws in ways that allow regulation of global warming. In March of 2007, the United States Supreme Court held that the Clean Air Act gives the EPA the authority to regulate motor vehicle greenhouse gas emissions.[450]

The question seems to be when—not whether—Congress will pass any of the pending legislation. Perhaps the global warming issue is similar to the decades-long attempt to regulate arsenic in drinking water.[451] Much like the arsenic case, before Gore's film and the accompanying environmental availability campaign began to exert influence regulation of global warming in the United States was at a standstill. Although lowering the arsenic standards was infinitesimally simpler than the arduous task of combating global warming, perhaps the power of this availability campaign will motivate policy makers to move aggressively to take steps to reverse the current damage.

V. THE EXTRA-LEGAL BENEFIT OF SCIENTIFIC INFORMATION AND INNOVATION

The examples above provide evidence of the role of availability campaigns in facilitating the passage of legislative initiatives. However, environmental availability campaigns have striking extra-legal benefits as well. A prime example of availability campaigns spurring scientific innovation occurred in the wake of Superfund.[452] As many have noted,

447 David A. Wirth, *Teaching and Research in International Environmental Law*, 23 HARV. ENVTL. L. REV. 423, 423 (1999).

448 *Gore Urges Quick U.S. Action to Avert Global Warming Catastrophe*, ASSOCIATED PRESS, Mar. 21, 2007, *available at* http://www.keprtv.com/news/national/6612642.html; *see Five Recent Senate Bills Set Mandatory Greenhouse Gap Caps*, RESOURCES FOR THE FUTURE, http://rff.org/rff/News/Features/FiveRecentSenateBills.cfm (last visited Jan. 10, 2008) (explaining that as of February 16, 2007, four bills setting mandatory caps on economy-wide greenhouse gas emission are under active discussion in the U.S. Senate, along with one narrower bill that restrict emissions from the electricity and automobile sectors).

449 Press Release, Comm. on Oversight & Gov't Reform, Committee Examines Political Interference with Climate Science (Mar. 19, 2007), *available at* http://oversight.house.gov/story.asp?ID=1214.

450 Massachusetts v. Envtl. Prot. Agency, 549 U.S. 497, 532 (2007).

451 See *supra* Part IV.A for a discussion on the attempt to regulate arsenic in drinking water.

452 42 U.S.C. §§ 9601-9628, 9651-52, 9654-75, 6911a (2006); 26 U.S.C. §§ 4611-12, 4661-62 (2006).

"Superfund created a powerful incentive for *innovation* to reduce the need for hazardous substances in the economy and the amount of hazardous waste that is generated."[453] Since the enactment of Superfund in 1980, for example, the EPA has been involved in research examining how contamination migrates into groundwater, and new technologies have been developed to provide improved methods to treat, store, and dispose of wastes.[454] Additional information and innovations include "basic research into the toxicology and environmental processes associated with hazardous substances in the environment; epidemiology and health impacts information associated with contaminated sites; and technology innovation and transfer associated with various cleanup methods."[455]

Moreover, the Superfund Basic Research Program, a federally funded, university-based program, supports research in the areas of ecology, fate and transport, and human health.[456] This research develops "methods and technologies to detect hazardous substances in the environment, advanced techniques for the detection, assessment, and evaluation of the effects on human health of hazardous substances, methods to assess the risks to human health presented by hazardous substances, and basic biological, chemical, and physical methods to reduce the amount and toxicity of hazardous substances."[457] The information generated can, in turn, be utilized by other organizations and individuals such as universities, state agencies, and private firms.[458]

Furthermore, the Agency for Toxic Substances and Disease Registry (ATSDR) is "required under [Superfund] to produce toxicological profiles for hazardous substances."[459] As of 2004, 275

---

453 E^2 INC., *supra* note 303, ch. 1 (emphasis added).

454 EPA, Superfund's 25th Anniversary, *supra* note 304.

455 E^2 INC., *supra* note 303, ch. 6, § 6-17. Other qualitative benefits of EPA research are chronicled in detail:

> [R]esearch and demonstration work on soil vapor extraction in the 1980s led to implementation of a highly cost-effective alternative to excavation and disposal of contaminated soils. Research on bioremediation in the 1980s and 1990s has led to increased applications of this technology for soil, both *in situ* and *ex situ*, and for ground water. Research on bioremediation also led to the development of monitored natural attenuation, which is now widely used for ground water remediation, either alone or in combination with source control, and is recommended as a component of remedies to be selected for contaminated sediment sites. More recent research on source control technologies for dense non-aqueous phase liquids (DNAPLs), such as thermal enhancement and dual phase extraction, is barely reflected yet in the ROD analysis. Similarly, phytoremediation and permeable reactive barriers are showing small increases in application that could accelerate as research and demonstration continue to document the performance and cost savings of these approaches.

Id. § 6-1.

456 *Id.* § 6-19.

457 *Id.* § 6-18 (alteration to the original).

458 *Id.* § 6-18.

459 *Id.* § 6-20. See *id.* § 6-17 § 6-23 for a review of other Superfund benefits related to

toxicological profiles on over 250 substances have been published or are under development.[460] These toxicological profiles are distributed to health professionals, academics, special interest groups, and the general public.[461] ATSDR has drafted 185 "ToxFAQs," helpful answers to frequently asked questions concerning the health effects of exposure to certain hazardous substances.[462] Superfund is only one of a number of legislative initiatives born of availability campaigns that have generated scientific information and innovation.

VI. AVAILABILITY CAMPAIGNS IN NON-ENVIRONMENTAL FIELDS: AN EXAMPLE

Availability campaigns have proved beneficial in fields other than the environmental arena. Food and drug safety is one of those fields. A case in point is Upton Sinclair's *The Jungle*,[463] a book that triggered an availability campaign that led to the passage of the Meat Inspection Act of 1906 (MIA)[464] and the Pure Food and Drug Act of 1906 (PFDA).[465] Prior to the release of Sinclair's book, almost two hundred bills concerning the marketing of adulterated food in interstate commerce were defeated within a thirty-year span.[466] In late February of 1906, Sinclair's book was published, and the public's eyes were opened to the realities of meat processing.[467] Chronicling working conditions in urban areas, the book contains twelve pages of vivid descriptions of filthy conditions and unsanitary practices at slaughterhouses.[468]

After three decades of a public, political, and legislative standstill, *The Jungle* triggered a firestorm of concern and public agitation. In this case, the availability entrepreneurs consisted primarily of readers, who launched a powerful availability campaign, spreading the word, and

information and innovation.

460 Agency for Toxic Substances & Disease Registry, Toxicological Profile Information Sheet, http://www.atsdr.cdc.gov/toxpro2.html (last visited Jan. 10, 2008).

461 E^2 INC., *supra* note 303, ch. 6, § 6-20.

462 Agency for Toxic Substances & Disease Registry, ToxFAQs: Hazardous Substance Fact Sheets, http://www.atsdr.cdc.gov/toxfaq.html (last visited Jan. 10, 2008).

463 UPTON SINCLAIR, THE JUNGLE (Seven Treasures Publications 2008) (1906).

464 Federal Meat Inspection Act, 21 U.S.C. §§ 601-613, 615-625, 641-645, 661, 671-679, 679-a, 680, 683 (2006).

465 Pure Food and Drug Act of 1906, *superseded by* Federal Food, Drug, and Cosmetic Act, 21 U.S.C. § 301 (2006).

466 Richard A. Merrill & Jeffrey K. Francer, *Organizing Federal Food Safety Regulation*, 31 SETON HALL L. REV. 61, 79 (2000).

467 SINCLAIR, *supra* note 463.

468 *See* Dennis R. Johnson & Jolyda O. Swaim, *The Food Safety and Inspection Service's Lack of Statutory Authority to Suspend Inspection for Failure to Comply with HACCP Regulations*, 1 J. FOOD L. & POL'Y 337, 340 (2005).

advocating for change.[469] The resulting "widespread enmity"[470] towards meat-packers led to the plummeting of meat sales by fifty percent.[471] President Roosevelt responded swiftly to the snowballing availability campaign by ordering an investigation of the Chicago Stockyards.[472] Within three weeks, investigators had confirmed Sinclair's description of conditions.[473] Less than four months after the publication Sinclair's book, MIA and PFDA were signed into law on the same day in June of 1906.[474]

The provisions of the new laws directly addressed the public's concerns. The MIA required that all meat or meat food product prepared for interstate or foreign commerce in meat packing and slaughtering facilities be inspected by federal government officials for proper sanitation, the presence of contaminated meat, and meat by-products.[475] The PFDA made it a misdemeanor to place adulterated food in interstate commerce, gave the Secretary of Agriculture the authority to inspect food specimens for possible adulteration, and directed the Secretary to report violations to the Department of Justice.[476] The 1906 program established by MIA persists to this day, and its essence has been virtually unchanged.[477] While some argue that American food safety laws are outdated and in need of major review,[478] the long shelf lives of these laws are strong indicators of their successes. It is unimaginable to think of the "Jungle"-like state meat safety would

469 *Id.*; *see also* Neil D. Fortin, *The Hang-Up with HACCP: The Resistance to Translating Science into Food Safety Law*, 58 FOOD & DRUG L.J. 565, 584 (2003) (describing the "public outrage vented on the meat industry" following the publication of *The Jungle*); Thomas O. McGarity, *Federal Regulation of Mad Cow Disease Risks*, 57 ADMIN. L. REV. 289, 310 (2005) (describing the reaction to Sinclair's book as a "public uproar").

470 Robert L. Rabin, *Federal Regulation in Historical Perspective*, 38 STAN. L. REV. 1189, 1225 (1986).

471 *Earthquake and Fire Devastate San Francisco*, N.J. RECORD, June 4, 1995, at 16.

472 Kerri E. Machado, *'Unfit for Human Consumption': Why American Beef Is Making Us Sick*, 13 ALB. L.J. SCI. & TECH. 801, 802 (2003).

473 *Id.*

474 *See* MARION NESTLE, SAFE FOOD: BACTERIA, BIOTECHNOLOGY, AND BIOTERRORISM 50-51 (2003) ("[C]omplacency ended abruptly in 1906 when Upton Sinclair published his dramatic exposé of the meat industry."); Merrill & Francer, *supra* note 466, at 79 (the two laws were passed on the same day).

475 21 U.S.C.A. § 607 (1996); 21 U.S.C. §§ 608-609 (2006).

476 Merrill & Francer, *supra* note 466, at 79 n.90.

477 Johnson & Swaim, *supra* note 468, at 341; Merrill & Francer, *supra* note 466, at 79; *see also* Denis Stearns, *Preempting Food Safety: An Examination of USDA Rulelmaking and Its E. Coli 0157:H7 Policy in Light of* Estate of Kriefall ex rel. Kriefall v. Excel Corporation, 1 J. FOOD L. POL'Y 375, 388 (2005) (commenting on the first laws regulating the meat-packing industry passed in 1906 and noting that "[s]ince then, little has changed").

478 Press Release, Office of U.S. Sen. Richard J. Durbin, Durbin Introduces Amendment to Require Modernization of Nation's Food Safety Policies (Dec. 11, 2007), *available at* http://durbin.senate.gov/showRelease.cfm?releaseId=288682; *see also* James A. Albert, *A History of Attempts by the Department of Agriculture to Reduce Federal Inspection of Poultry Processing Plants: A Return to the Jungle*, 51 LA. L. REV. 1183, 1187 (1991).

be in without the solid base of MIA and PFDA.[479]

The connection between Sinclair's book and the passage of the laws is undisputed. As one commentator matter-of-factly wrote, "[t]he first mandatory federal meat inspection program had its genesis in fiction, specifically, *The Jungle* by Upton Sinclair."[480] The MIA's legislative history itself offers proof that the Act was passed directly in response to this public outcry. The purpose of the federal meat inspection program was the "*restoration of public confidence*, not only in our own country but in other countries, in the purity and wholesomeness of American meat and meat food products."[481] As in the case of arsenic in drinking water, the timeline of events in the food safety arena—thirty years devoid of legislation without an availability campaign followed by a four-month race to the legislative finish line *with* an availability campaign—is a clear indicator of the power and efficiency of availability campaigns.

CONCLUSION

An eye-opening event occurs, and suddenly the world has more information. Once an availability campaign is triggered, the human information machine takes over. There is a perceived danger, individuals *en masse* learn of the danger, and they begin agitating for

479 One news article paints a picture of the frenzy in modern day processing plants:

> In the evisceration room, thousands of freshly slaughtered, defeathered and decapitated chickens hang by their drumsticks, zipping along a production line at 91 birds per minute. Beneath the roar of machinery, six U.S. Department of Agriculture inspectors work side by side with $8.50-an-hour employees in a filthy fight against food-borne disease. . . . When a diseased, feces-stained carcass rolls down the line, an inspector throws it in a trash bin, rinses his hands, and quickly turns back to his station. If respiratory infection renders certain parts inedible, the inspectors move the chicken to a reprocessing line, where workers trim away mucus-covered flesh, vacuum the cavity, and salvage the remaining meat. . . . Such tasks take place each day in 6,500 meat plants across the country, where 7,600 inspectors handle the dirty work behind the USDA's seal of approval. They examine cow carcasses for fecal contamination that could poison hamburger with E. coli, identify moisture leaks that could transfer listeria onto deli meats, and make sure grinding machines are not clogged with old meat particles that could mix with fresh products.

Oliver Prichard, *Food Processing: Fast and Furious: Inspectors Scan a Blur of Carcasses, Trying to Weed out the Ones that Could Spread Disease*, PHILA. INQUIRER, May 19, 2003, at C1.

480 Johnson & Swaim, *supra* note 468, at 340; *see also* Roger Roots, *A Muckraker's Aftermath: The Jungle of Meat-Packing Regulation After a Century*, 27 WM. MITCHELL L. REV. 2413, 2413 (2001) ("If Harriet Beecher Stowe can be blamed for the Civil War, then Upton Sinclair must be blamed for the entirety of the government's interdiction into American meat quality regulation during the twentieth century.").

481 H.R. REP. NO. 59-4935, at 7 (1906) (emphasis added); *see also* 21 U.S.C. § 602 (2006) ("It is essential *in the public interest* that the health and welfare of consumers be protected by assuring that meat and meat food products distributed to them are wholesome, not adulterated, and properly marked, labeled, and packaged.") (emphasis added).

change. This timeless process of social and political change has been occurring for as long as human history has been recorded, and likely longer.[482] Behavioral theorists have attempted to describe and study empirically the process that leads individuals to make assessments about risk without having complete information, and these theorists have named the phenomenon the availability heuristic. This mental shortcut allows individuals to make quick risk assessments. When the social environment perpetuates a belief about a certain risk, this risk becomes many times more cognitively available, and individual (as well as collective) judgments about the likelihood of harm from this risk increase. Metacognitive awareness[483] about this process has evolved, but the process itself remains much as it has been throughout history.[484]

Within the past decade, legal scholars have attributed negative consequences to availability cascades and campaigns, arguing that they serve as mechanisms by which misinformation is disseminated. Particularly when savvy availability entrepreneurs are at the helm, these commentators fear widespread manipulation of public perceptions. Because of the vivid nature of many environmental disasters, availability campaigns are prevalent in the environmental law arena, where they have been credited with hasty legislation based upon questionable assessments of risk.

We have argued that availability campaigns are not the evil they have been deemed to be. First, from an evolutionary standpoint, fear of recent, frequent, or vivid harms is adaptive. In other words, the public is not wrong to worry about harms that have an "in-your-face" quality. When a danger is publicized, and individuals are exposed to frightening information about the danger, it is eminently *rational* for those individuals to fear the danger. This is particularly so when

---

482 *See* Charles Dobson, *Social Movements: A Summary of What Works*, *in* THE CITIZEN'S HANDBOOK: A GUIDE TO BUILDING COMMUNITY IN VANCOUVER, Aug. 2001, http://www.vcn.bc.ca/citizens-handbook/movements.pdf (discussing social movements throughout history). "Dramatic, highly publicized, unexpected events can lead to public outrage and major shifts in public attitudes. Huge oil spills, nuclear accidents, revelations of serious government misconduct, official violence against dissenters, or the sudden loss of employment serve to foment social movement." *Id.*

483 For a discussion of metacognition, see John H. Flavell, *Metacognition and Cognitive Monitoring: A New Area of Cognitive-Developmental Inquiry*, 34 AM. PSYCHOLOGIST 906 (1979); *see also* Ann Brown, *Metacognition, Excutive Control, Self-Regulation, and Other More Mysterious Mechanisms*, *in* METACOGNITION, MOTIVATION, AND UNDERSTANDING: PSYCHOLOGY OF EDUCATION AND INSTRUCTION 65-116 (Franz E. Weinert & Rainer H. Kluwe eds., 1987).

484 Interestingly, availability campaigns do not have to center on judgments of *risk*. Any time an individual is asked to make a judgment about how frequent an occurrence is or how likely a future event, that person is subject to the availability heuristic. For an illustrative, historic example of an availability campaign—that of the California gold rush—see KEVIN STARR, CALIFORNIA: A HISTORY 80 (2005) (discussing President Polk's confirmation of the finding of gold to Congress). For more on the historical events surrounding the gold rush, see KENNETH N. OWENS, RICHES FOR ALL: THE CALIFORNIA GOLD RUSH AND THE WORLD (2002).

countervailing information is unavailable, as it often is immediately following a crisis. A great deal of valuable information is conveyed through the media and social contact. It is difficult to imagine a world in which individuals fail to act on information from these sources. Moreover, human beings would not survive long in this hypothetical world. Finally, the public's desire to see a swift action following the discovery of a previously unknown or previously unrealized risk is also adaptive. Waiting to gather all pertinent information before taking action could result in irreparable harm.

Not only do we argue that the process accompanying availability campaigns is adaptive, but we also propose that the *outcomes* are beneficial. In light of the staggering amount of force required to move the congressional machine to generate new legislation, the potency of public pressure generated by availability campaigns may be the only way to effectual swift change when it is needed. Although certainly some legislation passed on the heels of an availability campaign may be hasty, evidence from past campaigns and congressional action suggests a net positive result. In sum, benefits of availability campaigns include prevention of environmental stagnation; the passage of valuable legislation, such as the environmentally focused Superfund and the Oil Pollution Act; and the streamlining of the legislative process. Moreover, results from availability campaigns and the ensuing push for action generate important non-legal benefits, such as new research, innovations, and technologies.

Among other beneficial effects, the availability campaigns provide an avenue for citizen involvement. When Congress acts on the will of the people, the populace gains a voice and the people assume a direct role in government. Legislators' response to public concern can serve to overcome perceptions of disenfranchisement of the American people, and can help to restore the public's faith in their government. Action following an availability campaign is perhaps the clearest indication that the people have a voice and can effectuate change.

Much work is still to be done in the area of availability campaigns. We anticipate that this paper will serve as a starting point for future research and dialogue. In particular, we hope that this analysis will spark future discussion regarding methods for assessing pressures generated by availability campaigns, so that eventually, we might have better methods for determining when the public's perception of harm merits a swift response, and when additional research and debate is necessary.

APPENDIX: FIGURE 1—AVAILABILITY CAMPAIGN STAGES