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Jonathan Remy Nash

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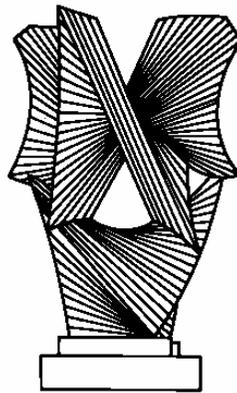
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STANDING AND THE PRECAUTIONARY PRINCIPLE

Jonathan Remy Nash

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Essay**Standing and the Precautionary Principle****Jonathan Remy Nash**[†]

In Massachusetts v. EPA, the Supreme Court upheld Massachusetts' standing to challenge EPA's refusal to regulate greenhouse gas emissions from mobile sources. The majority and dissent disputed whether the science of global warming was sufficient to establish standing. Absent from both opinions was discussion of whether there would be standing if the science were uncertain but the potential harms large and irreversible. This Essay argues that "precautionary-based standing"—grounded upon a fundamental principle of environmental law, the precautionary principle—should apply in such cases.

Precautionary-based standing would not upset existing standing doctrine. First, its application would be limited, and could further be limited to cases brought by a sovereign. Second, there already are less stringent standing requirements in areas where society has deemed precaution to be appropriate. Third, the catastrophic and uncertain nature of the injury in a precautionary-based standing would satisfy Article III.

The argument here is important in several ways. First, reliance upon the precautionary principle might attract the support of people who question the certainty of the science but recognize the large risks associated with global warming. Second, precautionary-based standing would be available to address future environmental crises where scientific understanding that the threat is real may lag. Third, precautionary-based standing eventually may generate a broader evolution of standing jurisprudence. Fourth, importation and application of the precautionary principle to questions of standing will provide a logical and stable setting in which the precautionary principle might develop and flourish.

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I. INTRODUCTION

In the heralded case of *Massachusetts v. EPA*,¹ the United States Supreme Court decided by a 5-4 vote that the state of Massachusetts had standing to challenge the Environmental Protection Agency's ("EPA") refusal to regulate greenhouse gas emissions from automobiles and other mobile sources.² The majority grounded its holding on EPA's failure to challenge Massachusetts' assertions about the likelihood, and likely effects, of global warming. The majority accepted (at least for purposes of determining the presence of standing) the plaintiffs' allegations—that, as the majority noted, were uncontested by EPA—that global warming was occurring as a result of anthropogenic greenhouse gas emissions, and that Massachusetts would suffer harm as a result. In effect, the majority accepted global warming and the risks associated with it as a fact in rendering its decision on standing. A dissent authored by the Chief Justice assailed the majority opinion, questioning whether the science of global warming was sufficient to establish standing.³

Both the majority and dissent, then, disputed only whether the science underlying the anthropogenic greenhouse effect was adequate to establish standing. Presumably, if the majority agreed with the dissent that the science was lacking, it would have agreed that there was no standing. Presumably, as well, had the dissenting Justices accepted the science, they would have agreed that there was standing.

Notably absent from either the majority or dissenting opinion was explicit discussion of how standing would be affected if, in fact, the science were uncertain but the potential harms large and irreversible. It would seem that the dissenting Justices would not think there was standing in such a case. The Justices in the majority seem ultimately to dodge the question by simply noting that EPA did not contest the validity of the underlying science.

In this Essay, I will argue that a fundamental principle of environmental law—the precautionary principle—should inform the question left unanswered in the *Massachusetts* case. The precautionary principle addresses situations such as this, and explains that the absence of certainty in the face of a large risk does not justify inaction. Application of the precautionary principle to the question of standing would suggest that what I will call “precautionary-based standing” should apply in cases in which it can be shown that there is uncertainty as to whether irreversible and catastrophic harms may occur.

¹ 127 S. Ct. 1438 (2007).

² The five-member majority also held that, contrary to the agency's claim, the EPA did have the authority so to act under the Clean Air Act, and that the agency's explanation for why it had not exercised its discretion to do so was inconsistent with the relevant legal standard. *See id.* at 1459-63.

³ *Id.* at 1463 (Roberts, C.J., dissenting). A separate dissent by Justice Scalia challenged the majority opinion on the merits, *see supra* note 2, arguing that EPA did not have authority to regulate greenhouse gas emissions and in any event justifiably exercised its discretion not to. *See id.* at 1471 (Scalia, J., dissenting).

Precautionary-based standing would not upset the existing general law of standing. First, precautionary-based standing would be limited, in that it would apply only in cases in which there is uncertainty as to the occurrence of catastrophic, irreversible harm. Precautionary-based standing could further be limited to cases brought by sovereign states.⁴ Second, there is already authority in standing jurisprudence to lessen the stringency of requirements of standing in other areas where society has deemed precaution to be appropriate: the First Amendment and declaratory judgment actions. Third, though not as imminent as typical injuries that give rise to standing, the catastrophic nature of the injury—and the uncertainty with which the injury might occur—in precautionary-based standing cases will be sufficient to satisfy Article III.

The argument I advance here is important in several ways. First, public reaction to the *Massachusetts* decision has been mixed. Several newspapers have featured editorials and op-ed pieces criticizing the Court's reasoning.⁵ The failure of the Court to address the question of precaution leaves the majority decision much more subject to criticism. Reliance upon the precautionary principle might attract the support of people who question the absolute certainty of the science but who recognize the large risks associated with global warming in the event that the science is in fact correct.

Second, the use of the precautionary principle is important even to people who are persuaded by the amount of scientific evidence of global warming and the number of scientists who accept that evidence. Even if global warming is now at a point where there is consensus, that was not always the case. The unavailability of precautionary-based standing has contributed to a delay, at least in terms of litigation of the issue. And, of course, it is likely that there will be other environmental crises down the line that will progress scientifically as did global warming, with more and more scientists coming around—as science advances and evidence is gathered—to the view that the threat is real. Application of the precautionary principle to standing thus will be important with respect to environmental challenges that arise in the future.

Third, reliance upon the precautionary principle to determine standing need not be limited to matters of environmental law. Environmental law has in recent years served to push the envelope of federal court standing doctrine, but the developments in standing jurisprudence that these environmental law cases have secured are not limited to environmental law cases. Similarly, it may be that precautionary-based standing eventually may generate a broader evolution of standing jurisprudence.

Fourth, importation and application of the precautionary principle to questions of standing will provide a logical, and stable setting in which the precautionary principle might develop and flourish. Many commentators have long lamented the lack of certainty underlying the principle and how the principle should be applied. Some have

⁴ Indeed, the majority in the *Massachusetts* case suggested this possibility, without making good use of special sovereign status; this reworking makes better use of the point than did the majority. See *infra* the text accompanying notes 68-71.

⁵ See, e.g., Editorial, *Jolly Green Justices*, Wall St. J., Apr. 3, 2007, at A14; Editorial, *Black Robes, Hot Air*, N.Y. POST, Apr. 4, 2007, at 28; Holman W. Jenkins, Jr., Op-Ed., *Climate of Opinion*, WALL ST. J., Apr. 4, 2007, at A14.

asserted that the principle is inherently contradictory. Other commentators have struggled to explain how the principle might be applied logically and coherently and legal practice. Because the question of standing generally comes before merits questions, and generally do not prejudice any ultimate determination on the merits, it stands to reason that the use of the precautionary principle as a gatekeeper to the merits question is its most logical role (at least preliminarily).

This Essay proceeds as follows. In Part I, I discuss the precautionary principle. I elaborate upon the principle's evolution and explain its various interpretations and contradictions. In Part II, I provide an overview of federal court standing doctrine, including the Court's recent decision in the *Massachusetts* case.

In Part III, I argue for the inclusion of the precautionary principle in standing jurisprudence. I begin by explaining how the precautionary-based standing would operate. I then discuss why this incorporation is normatively desirable. I conclude that the consideration of the precautionary principle in standing inquiries would benefit both standing jurisprudence as well as the logical and coherent development of the precautionary principle.

II. THE PRECAUTIONARY PRINCIPLE

The precautionary principle is a normative principle of environmental law.⁶ In its essence, the precautionary principle calls for the exercise of caution⁷ in the face of risk and uncertainty.⁸ While the principle can be applied in any setting in which risk and uncertainty are found, it has evolved predominantly in, and today remains most closely associated with, the environmental arena. This is not surprising: Environmental problems typically arise in settings of risk and uncertainty. For example, existing science and data may be inadequate to establish that (i) a particular activity or substance poses a hazard; (ii) assuming that it does, exactly what harmful effects will result from the activity or substance; and (iii) harmful effects that are observed today in fact resulted from the activity or substance in question, as opposed to some other source. Moreover, even if scientific evidence tends to support limiting (or even banning) an activity or the use of a substance, environmental harms often do not manifest themselves until an extended period of time has elapsed. This further complicates the scientific study, and validation, of environmental risks.

⁶ See Frank B. Cross, *Paradoxical Perils of the Precautionary Principle*, 53 WASH. & LEE L. REV. 851, 851 (1996) ("Few principles are better ensconced in the law and philosophy of environmentalism than is the 'precautionary principle.'"). On the history and evolution of the principle, see generally ARIE TROUWBORST, *EVOLUTION AND STATUS OF THE PRECAUTIONARY PRINCIPLE* 7-31 (2002).

⁷ David Dana explains: "Commentators trace the precautionary principle to the German concept of *Vorsorge*, which literally means 'beforehand or prior care and worry.' It connotes 'caring for or looking after, fretting or worrying about and obtaining provisions, or providing for.'" David A. Dana, *A Behavioral Economic Defense of the Precautionary Principle*, 97 NW. U. L. REV. 1315, 1315 n.3 (2003) (quoting Sonja Boehmer-Christiansen, *The Precautionary Principle in Germany—Enabling Government*, in INTERPRETING THE PRECAUTIONARY PRINCIPLE 31, 38 (Timothy O'Riordan & James Cameron eds., 1994).

⁸ Risk and uncertainty differ from one another, and in ways that may matter to application of the precautionary principle. See *infra* note 30.

The precautionary principle is nothing short of ascendant on the international stage,⁹ so much so that many categorize it constituting customary international law.¹⁰ It is recited in numerous international environmental statements and treaties.¹¹ While it has gained a solid foothold in European Union environmental treaties and law,¹² its success at infiltrating American environmental law has been far more limited.¹³

⁹ E.g., Cross, *supra* note 6, at 854 (“The precautionary principle has recently assumed added prominence with the growth of international environmental concern.”); James E. Hickey, Jr. & Vern R. Walker, *Refining the Precautionary Principle in International Environmental Law*, 14 VA. ENVTL. L.J. 423, 423-24 (1995) (noting that, since 1987, international environmental instruments have “increasingly” included references or allusions to the precautionary principle).

¹⁰ See, e.g., Mark Geistfeld, *Implementing the Precautionary Principle*, 31 ENVTL. L. REP. 11326, 11326 (2001) (noting that the principle is “considered by the European Union . . . to be a ‘full-fledged and general principle of international law’” (quoting Comm’n of the European Communities, *Communication from the Commission on the Precautionary Principle* 11 (2000))); John O. McGinnis, *The Appropriate Hierarchy of Global Multilateralism and Customary International Law: The Example of the WTO*, 44 VA. J. INT’L L. 229, 269 (2003) (“While not all scholars agree that the precautionary principle is a matter of customary international law, many respected scholars do.”); Richard B. Stewart, *Environmental Regulatory Decision Making under Uncertainty*, 20 RES. L. & ECON. 71, 75 (Timothy Swanson ed., 2002) (noting that “[i]t has been claimed that [the precautionary principle] is already, or is becoming established as[,] a binding principle of customary international law,” but also that critics and skeptics of the principle “deny that [it] has been established as customary international law”); Cass R. Sunstein, *Irreversible and Catastrophic*, 91 CORNELL L. REV. 841, 843 n.6 (2006) (citing TROUWBORST, *supra* note 6, as “discussing the Precautionary Principle as a foundational principle of international law”).

¹¹ For compilations and lists, see McGinnis, *supra* note 10, at 276-84; Sunstein, *supra* note 10, at 843-44; Hickey & Walker, *supra* note 9, at 432-36.

¹² See, e.g., Sunstein, *supra* note 10, at 849; Cass R. Sunstein, *Beyond the Precautionary Principle*, 151 U. PA. L. REV. 1003, 1015 (2003) (noting that the European Commission has formally adopted the precautionary principle). For discussion of European application of the principle, see generally Nicolas de Sadeleer, *The Precautionary Principle in EC Health and Environmental Law*, 12 EUR. L.J. 139 (2006).

¹³ See, e.g., Jonathan B. Wiener, *Regulation in a Multirisk World in HUMAN AND ECOLOGICAL RISK ASSESSMENT: THEORY AND PRACTICE* 1509, 1510 (Dennis D. Paustenbach ed., 2002) [hereinafter Wiener, *Regulation in a Multirisk World*] (“[A] common inference today is that Europe endorses the precautionary principle . . . and seeks proactively to regulate risks, while the United States opposes the precautionary principle and waits more circumspectly for evidence of actual harm before regulation . . .”). Still, the precautionary principle does underlie, if informally, certain aspects of United States environmental laws. See, e.g., *id.*; Sunstein, *supra* note 10, at 844-45; Cross, *supra* note 6, at 855-56. Moreover, Cass Sunstein and Jonathan Wiener have each argued that, even if Europe takes a more precautionary approach to environmental risks, the United States takes more precaution in dealing with other risks, such as terrorism. See Cass R. Sunstein, *On the Divergent American Reactions to Terrorism and Climate Change*, 107 COLUM. L. REV. 504 (2007); Cass R. Sunstein, *Irreversible and Catastrophic: Global Warming, Terrorism, and Other Problems*, 23 PACE ENVTL. L. REV. 3 (2005-2006); Jonathan B. Wiener, *Whose Precaution After All? A Comment on the Comparison and Evolution of Risk Regulatory Systems*, 13 DUKE J. COMP. & INT’L L. 207 (2003) [hereinafter Wiener, *Whose Precaution After All?*]. This juxtaposition suggests that neither region has a monopoly on precaution. See Wiener, *Regulation in a Multirisk World, supra*, at 1511; Wiener, *Whose Precaution After All?*, *supra*, at 209. Indeed, the some version of the precautionary principle arguably undergirds domestic views toward important issues such as freedom of speech and the criminal justice system. See *infra* the text accompanying note 76.

The precautionary principle has established a United States beachhead. The city of San Francisco has followed Europe’s lead and become “the first [city and county] in the nation to formally adopt a ‘precautionary principle.’” Carolyn Whetzel, *Scientists, Policy Makers Argue Benefits, Perils of Employing ‘Precautionary Principle’*, DAILY ENVT. REP. (BNA), Aug. 26, 2003, at A12.

In its basic form, the precautionary principle calls for the use of caution in making regulatory decisions when risk or uncertainty is present.¹⁴ But this formulation is, if unobjectionable,¹⁵ misleadingly simple as well as somewhat toothless.¹⁶ Some argue that spread of the precautionary principle—and, indeed, even its application beyond mere platitudes—is hampered by a lack of clarity,¹⁷ or at least agreement, as to the principle’s meaning.¹⁸ Professor Wiener has set out three possible versions of the principle.¹⁹ Professor Stewart has identified four possible interpretations of the principle.²⁰ Professor Sunstein explains that Professor Stewart’s four interpretations help to identify two axes along which the principle might vary: “the level of uncertainty that triggers a regulatory response,” and “the tool that will be chosen in the face of uncertainty.”²¹ This understanding, Professor Sunstein continues, allows for one to “easily imagine many

¹⁴ See Dana, *supra* note 7, at 1315 (“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.”).

¹⁵ See Sunstein, *supra* note 10, at 850 (“The weak versions of the Precautionary Principle are unobjectionable and important.”); Sunstein, *supra* note 12, at 1012 (noting that there are “weak versions” of the principle “to which no reasonable person could object”).

¹⁶ See, e.g., RICHARD A. POSNER, *CATASTROPHE: RISK AND RESPONSE* 140 (2004) (“The ‘precautionary principle’ (‘better safe than sorry’) . . . is not a satisfactory alternative to cost-benefit analysis, if only because of its sponginess. . . .” (footnote omitted)); Geistfeld, *supra* note 10, at 11326 (“[I]f the core aspects of the principle cannot yield a well-defined rule[,] . . . the hard question arises whether the precautionary principle is anything more than sentiment or political slogan.”).

¹⁷ See, e.g., Geistfeld, *supra* note 10, at 11326 (“The vagueness of the principle explains why it so hard to implement.”); Andrew Jordan & Timothy O’Riordan, *The Precautionary Principle in Contemporary Environmental Policy and Politics*, in *PROTECTING PUBLIC HEALTH AND THE ENVIRONMENT: IMPLEMENTING THE PRECAUTIONARY PRINCIPLE* 15, 22 (Carolyn Raffensperger & Joel A. Tickner, eds. 1999) (“Sceptics . . . claim [that the principle’s] popularity derives from its vagueness; that it fails to bind anyone to anything or to resolve any of the deep dilemmas that characterize modern environmental policy making.”).

¹⁸ See, e.g., McGinnis, *supra* note 10, at 272 (observing that “the multiplicity of . . . meanings” attributed to the principle “complicates the search for a general precautionary principle”); Sunstein, *supra* note 10, at 848 (“[T]here are twenty or more definitions of the Precautionary Principle, and they are not all compatible with one another.”); Stewart, *supra* note 10, at 75 (“With a few exceptions, there is a remarkable lack of analytic care or rigor regarding the substance of, and justification for, various versions of [the precautionary principle] by those who advocate or favor their adoption.”); Hickey & Walker, *supra* note 9, at 424 (“The assertion and ‘codification’ in international agreements and instruments of an ill-defined, ambiguous ‘[precautionary] principle’ has created uncertainty in international environmental law.”); see also Sunstein, *supra* note 12, at 1011 (noting that the principle has “numerous definitions” that “are not compatible with one another”); Wiener, *Regulation in a Multirisk World*, *supra* note 13, at 1513 (noting that “[s]tatements of the precautionary principle are varied and often vague,” and citing Per Sandin, *Dimensions of the Precautionary Principle*, 5 *HUM ECOLOGICAL RISK ASSESSMENT* 889 (1999), as identifying “19 different formulations” of the principle”); Stephen M. Gardiner, *A Core Precautionary Principle*, 14 *J. POL. PHIL.* 33, 37-45 (2006) (setting out various possible forms of the principle).

The precautionary principle is not alone in this regard. The “polluter pays principle” is another primary normative principle of environmental law—and, again, especially at the international level—that also suffers from lack of clarity. See Jonathan Remy Nash, *Too Much Market? Conflict between Tradable Pollution Allowances and the “Polluter Pays” Principle*, 24 *HARV. ENVTL. L. REV.* 465, 472-78 (2000) (elucidating various interpretations of the polluter pays principle).

¹⁹ See Wiener, *Regulation in a Multirisk World*, *supra* note 13, at 1513-21 (elucidating three variants of the principle).

²⁰ See Stewart, *supra* note 10, at 78.

²¹ Sunstein, *supra* note 12, at 1014. See Sandin, *supra* note 18, at 890-91 (elucidating four dimensions along which the precautionary principle might vary: threat, uncertainty, action, and command).

other variations on these themes.”²² And, having surveyed international declarations and agreements that include statements of the precautionary principle, Professor McGinnis concluded that “[s]ometimes” a single declaration or agreement itself “encompasses several meanings.”²³

Further complicating the spread of the precautionary principle is the fact that, in some of its forms, the principle becomes inherently contradictory. It is easy to say that one should take steps to avoid large and unnecessary risks, but this ignores the fact that there are likely are risks and uncertainties not only to allowing an activity to proceed or a substance to be used, but also to regulating that activity or substance.²⁴ Followed to its logical conclusion, the principle in such forms would utterly paralyze societal actors.²⁵

Along similar lines, the precautionary principle could, but should not, be read to halt virtually all potentially risky activities and the use of all potentially risky substances. While the precautionary principle may appropriately draw attention to risks and uncertainties in failing to regulate that governments and people tend to underestimate,²⁶ a precautionary principle that emphasizes those risks and uncertainties to the exclusion of the countervailing risks and uncertainties associated with regulation itself, reduces the risk of not regulating false negatives, but also—perhaps in some situations more dangerously—advocates regulating in the face of possible false positives. Taken to its logical extreme, it would “bring valuable activities to a halt,” and would “be impossible” to apply broadly.²⁷

²² Sunstein, *supra* note 12, at 1014. See *id.* at 1014-15 (describing as examples the “*Information Disclosure Precautionary Principle*” and the “*Economic Incentive Precautionary Principle*”).

²³ McGinnis, *supra* note 10, at 272. He also laments that “even a single strand of the precautionary principle is open to different operational meanings.” *Id.*

²⁴ See Sunstein, *supra* note 12, at 1020-29; Sunstein, *supra* note 10, at 862-63; see also Richard A. Epstein, *In Defense of the “Old” Public Health*, 69 BROOK. L. REV. 1421, 1458 (2004) (“[I]t is a mistake to rely on any version of a precautionary principle that attaches enormous weight to errors that allow dangerous activities to go forward while slighting the losses associated with the beneficial activities that turn out to be thwarted.”).

²⁵ See Sunstein, *supra* note 10, at 850-53. See generally Cross, *supra* note 6.

²⁶ See Dana, *supra* note 7 (arguing that the precautionary principle is a countervailing balance to cognitive biases that tend, wrongly, to influence public policy away from regulating activities and substances that pose large risks and uncertainties); Sunstein, *supra* note 10, at 870-71.

²⁷ Wiener, *Whose Precaution After All?*, *supra* note 13, at 224. Professor Wiener elucidates:

Precaution may avoid the harms of inaction on false negatives (risks thought to be minor that turn out to be serious) but incur the harms of overreaction to false positives (risks thought to be serious that turn out to be minor). Both types of errors are harmful to society. The harms of ignoring false negatives include the health and environmental damages from the unrestricted risk. The harms of regulating false positives include high costs to consumers and workers, unemployment, lost innovations of helpful new products, restrictions on personal choices, and public cynicism about exaggerated risks (“crying wolf”). An extreme policy of zero risk would bring valuable activities to a halt; applied broadly it would be impossible. The goal is not zero false negatives but the best balance of the two types of errors that we can achieve.

Id. at 223-24 (footnote omitted). See also Sunstein, *supra* note 12, at 1035-54 (arguing that those who rely upon the precautionary principle to reach concrete conclusions often do so in tandem with various cognitive biases, and that this process tends to render the precautionary principle, used in this way, a blunt instrument with which to attain policy guidance). *But cf.* Douglas A. Kysar, *It Might Have Been: Risk, Precaution,*

The general absence of agreement over the proper scope of the principle notwithstanding, some commentators have endeavored to construct practically applicable, and normatively desirable, formulations of the precautionary principle. Recent commentary tend to advance narrower, more cabined versions of the principle, and to coalesce around three characteristics of settings in which the principle appropriately might be invoked:²⁸ (i) settings in which the risks of harm are uncertain; (ii) settings in which harm might be irreversible and what is lost irreplaceable; and (iii) settings in which the harm that might result would be catastrophic. First, the heartland of the precautionary principle encompasses situations where the risk cannot be effectively assessed or reliably cabined²⁹—i.e., settings in which there is uncertainty rather than simply risk.³⁰ Second, if a failure to regulate may result in irreversible harm, then an investment in regulation may be justified by a desire to retain flexibility by avoiding irreversible results. Put economically, regulation in the face of serious irreversible costs is equivalent to purchasing an option to preserve the opportunity to take steps to avoid the irreversible harm in the future.³¹ Third, the possibility of catastrophic harm may justify precautionary

and Opportunity Costs, 22 J. LAND USE & ENVTL. L. 1, 44-48 (2006) (arguing that there may be a moral basis on which to distinguish between acts and omissions).

²⁸ That some commentators may agree on when some version of the precautionary principle should apply does not mean that they necessarily agree on *what* version of the principle should apply, i.e., exactly what “directive” follows from the principle. For example, Professor Kysar presents the precautionary approach as an option distinct from cost-benefit analysis, *see generally* Kysar, *supra* note 27, while Judge Posner and Professors Stewart and Sunstein present the precautionary principle as an adjunct to traditional cost-benefit analysis. *E.g.*, POSNER, *supra* note 16, at 148 (calling for “a modest version of the precautionary principle” in cases of catastrophic risk that would “plac[e] a thumb on the cost side of the cost-benefit analysis.”). My proposal is limited to granting judicial standing and does not address to the substance of any claim should be addressed on the merits. *See infra* the text accompanying notes 63-64.

²⁹ Professor Kysar explains that the precautionary principle “can be defended as a pragmatic decisionmaking heuristic that is particularly well-suited to the task of fostering consideration of how best to safeguard life and the environment under conditions of uncertainty and ignorance.” Kysar, *supra* note 27, at 14. (He defines uncertainty as situations where probabilities are poorly defined and outcomes well defined, and ignorance as settings in which probabilities are also poorly defined but outcomes are poorly defined as well. *Id.*) *See also* Gardiner, *supra* note 18, at 50 (describing a Rawlsian version of the principle that would apply in cases of uncertainty, but not risk or ignorance); Sandin, *supra* note 18, at 892-93 (describing the “uncertainty dimension” of the precautionary principle).

Professor Sunstein argues that situations of uncertainty indeed come to pass and are not trivial. Sunstein, *supra* note 10, at 875-77, 882-92. He explains: “In my view, uncertainty is both real and rare in the environmental domain; but this is an empirical judgment, and it may be wrong.” *Id.* at 886.

With an apparent nod to some sort of precaution, Judge Posner suggests different ways that standard cost-benefit analysis might be adjusted to deal with situations of uncertainty. *See* POSNER, *supra* note 16, at 175-87.

³⁰ Under traditional definitions, “risk is variability in outcomes that can be captured by a probability distribution, but uncertainty cannot be quantified in this way.” Henry E. Smith, *Property and Property Rules*, 79 N.Y.U. L. REV. 1719, 1724 (2004).

Commentators who otherwise endorse the use of cost-benefit analysis as the preferred tool for regulatory guidance argue that the precautionary principle is least applicable where the risks of harm that may result are readily and accurately quantifiable. *E.g.*, Stewart, *supra* note 10, at 85-86; *see also id.* at 86-87 (recognizing other factors that may influence decisions). So, too, do they argue that is it not the realm of the precautionary principle where the risks may not be precisely quantifiable, but nonetheless susceptible to estimation within a reliable range. *See id.* at 87-90; POSNER, *supra* note 16, at 173.

³¹ As Judge Posner puts it in the context of the greenhouse effect, it may make sense for society to, in effect, “purchas[e] an option to enable global warming to be stopped or slowed at some future time at a

regulation. Even if the probability of a catastrophe occurring is low, “the incremental costs of the possible catastrophic byproducts of progress” may outweigh the associated benefits of the progress itself.³² Further, if the probability of the catastrophic result is low (or very uncertain), it may be improperly discounted because of heuristics upon which people rely to aid in situations (such as are presented by low probabilities) where our cognitive abilities are challenged. When these features—uncertainty, the possibility of irreversible harm, and the possibility of catastrophic harm—coincide, it would seem that the case for the precautionary principle is strongest.³³

III. STANDING

In this Part, I briefly explain the genesis and contours of federal court standing doctrine. I also discuss how and why environmental cases have often been on the outer edge, and at the forefront of the evolution, of standing over the last forty years. I then summarize the debate over standing between the majority and Chief Justice Roberts in dissent in the *Massachusetts* case, with a focus on the odd absence of discussion of the precautionary principle in the case.

A. In General

Federal court standing limitations arise directly out of the Constitution, and also out of prudential concerns.³⁴ Article III of the United States Constitution vests the federal judicial power with respect to “cases” and “controversies.”³⁵ The Court has interpreted the core constitutional standing requirement to call for a plaintiff to allege (i) personal injury that is both (ii) “fairly traceable” to the defendant’s unlawful conduct, and (iii) likely to be redressed by the requested relief.³⁶ The Court has elucidated that, to be sufficient to meet standing, an injury must be “distinct and palpable,” and not “abstract” or “conjectural.”³⁷ A generalized grievance is insufficient.³⁸

Beyond any constitutional requirements, the Court over the years has imposed limitations on federal courts’ ability to hear cases. For example, under the “political

lower cost” when the other option is to do nothing and risk harm that cannot be reversed. POSNER, *supra* note 16, at 162. “Should further research show at the problem of global warming is not a serious one, the option would not be exercised.” *Id.*

³² *Id.*

³³ See, e.g., Sunstein, *supra* note 10, at 894 (“It is possible to combine a concern about catastrophe with a focus on irreversible harm in a way that generates an Irreversible and Catastrophic Harm Precautionary Principle.”); see also Kenneth J. Arrow & Anthony C. Fisher, *Environmental Preservation, Uncertainty, and Irreversibility*, 88 Q.J. ECON. 312 (1974) (emphasizing the importance of uncertainty and irreversibility in environmental problems).

³⁴ E.g., *Allen v. Wright*, 468 U.S. 737, 751 (1984).

³⁵ U.S. CONST. art. III.

³⁶ *Allen*, 468 U.S. at 751. But cf. RICHARD H. FALLON, JR., DANIEL J. MELTZER & DAVID L. SHAPIRO, HART AND WECHSLER’S THE FEDERAL COURTS AND THE FEDERAL SYSTEM 131 (5th ed. 2003) (noting commentators who have questioned the claim that injury-in-fact is required by citizens suing the government to establish standing).

³⁷ E.g., *Allen*, 468 U.S. at 751.

³⁸ E.g., *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 575-76 (1992).

question doctrine,” the courts find that plaintiffs lack standing to pursue claims in court that would more appropriately be dealt with in the other, elected branches of government.³⁹

Real refinement of standing requirements is a relatively recent development. Before the middle of the last century, “most litigants asserted legal interests plainly recognized at common law.”⁴⁰ Among the trends that prompted courts to elucidate standing requirements was “the advent of the administrative state and the enactment of statutes to protect interests, unprotected at common law, that were shared by large numbers of people.”⁴¹ It is hardly surprising, then, that environmental law disputes have played a major role in raising issues on the edges of existing standing doctrine: While common law standing doctrine evolved out of and focused on economic injuries, the injuries in environmental law cases tend to be of a much more ephemeral nature.⁴²

The Supreme Court has explained that standing requirements serve the purpose of sharpening the issues for the court to decide by harnessing the presentation of those issues by true adversaries who care about the outcome in the case.⁴³ It also thus

³⁹ See, e.g., *Nixon v. United States*, 506 U.S. 224 (1993).

⁴⁰ FALLON ET AL., *supra* note 36, at 127.

⁴¹ *Id.*

⁴² See RICHARD J. LAZARUS, *THE MAKING OF ENVIRONMENTAL LAW* 82 (2004) (characterizing the Court’s early environmental standing jurisprudence as “fairly straightforward and flexible”). For example, it was in environmental cases that the Supreme Court was confronted with, and resolved, the following questions:

- Whether a non-economic, aesthetic interest may qualify as an “injury” for standing purposes and, if so, whether such an injury must be particular to the plaintiff. The Court answered both questions in the affirmative. See *Sierra Club v. Morton*, 405 U.S. 727, 734-35 (1972).
- Whether generalized allegations by a single member of an environmental organization that their recreational opportunities might be impinged by possible government action were sufficient to give the environmental organization standing. The Court held that they were not. See *Lujan v. National Wildlife Fed.*, 497 U.S. 871, 889 (1990).
- Whether standing to challenge a polluter’s alleged noncompliance with the Clean Water Act could rest upon allegations of the plaintiffs’ concern that their property had become polluted by virtue of the defendant’s actions. The Court held that it could. See *Friends of the Earth Inc. v. Laidlaw Environmental Servs. (TOC), Inc.*, 528 U.S. 167, 181 (2000).

Commentators in environmental law often advocate the expansion of standing to accommodate more environmental claims. See, e.g., David A. Dana, *Existence Value and Federal Preservation Regulation*, 28 HARV. ENVTL. L. REV. 343, 397-99 (2004) (arguing that standing doctrine should be expanded to recognize the “existence value” of environmental amenities, thus ridding standing doctrine of “rigid . . . geographic formalism” (quoting *Lujan v. Defenders of Wildlife*, 504 U.S. 555, 595 (1992) (Stevens, J., dissenting))); Robin Kundis Craig, *Removing “the Cloak of a Standing Inquiry”: Pollution Regulation, Public Health, and Private Risk in the Injury-in-Fact Analysis*, (manuscript; SSRN # 966232) (arguing that standing doctrine should be expanded to recognize probabilistic risks to health as sufficient to satisfy the injury-in-fact analysis); RICHARD J. LAZARUS, *THE MAKING OF ENVIRONMENTAL LAW* 134-35 (2004) (criticizing the modern Court’s requirement of individualized harm as particularly difficult to meet in environmental cases).

⁴³ See, e.g., *Valley Forge Christian College v. Americans United for Separation of Church and State, Inc.*, 454 U.S. 464, 472 (1982) (noting that standing’s injury requirement “tends to assure that the legal questions presented to the court will be resolved, not in the rarified atmosphere of a debating society, but in a concrete factual context conducive to a realistic appreciation of the consequences of judicial action.”).

precludes courts from issuing unconstitutional advisory opinions.⁴⁴ The Court has also emphasized the role of standing in bolstering the separation of powers between the judicial branches and the other branches of government.⁴⁵ Commentators have recently suggested that standing serves other purposes as well. Professor Stearns, for example, argues that standing rules have developed, and are desirable, because they make it difficult for ideologically motivated plaintiffs opportunistically to manipulate courts' dockets,⁴⁶ while Professor Kontorovich suggests that the absence of standing would short-circuit private bargaining by people who would be affected by broad court decisions.⁴⁷

B. Standing in *Massachusetts v. EPA*

The Supreme Court grappled with standing in the case of *Massachusetts v. EPA*, where environmental organizations and governmental entities—Massachusetts, among them—claimed that EPA's failure to regulate greenhouse gas emissions from motor vehicles violated the Clean Air Act.⁴⁸ The issue of greenhouse gas emissions has risen to the forefront of environmental concerns over the past decade. Over time, a growing consensus of scientists has argued that the increasing presence of anthropogenic greenhouse gases in the upper atmosphere has acted as a shield that acts, much like a greenhouse, to retain heat instead of allowing it to radiate out into space. The greenhouse effect, then, results—and, according to many scientific predictions, will continue to result more and more—in increasing temperatures on the earth, with concomitant melting of the polar ice caps, rises in the world's ocean levels, and flooding of low lying areas.

Recent American public debate over greenhouse gases and the greenhouse effect has focused on the question of whether scientific evidence of the greenhouse effect is sufficient to warrant remedial action.⁴⁹ Some question the validity of scientific studies

⁴⁴ See, e.g., *FEC v. Akins*, 524 U.S. 11, 23-24 (1998).

⁴⁵ See *Allen*, at 750; see also Antonin Scalia, *The Doctrine of Standing as an Essential Element of the Separation of Powers*, 17 SUFFOLK L. REV. 881 (1983).

⁴⁶ See Maxwell L. Stearns, *Standing Back from the Forest: Justiciability and Social Choice*, 83 CALIF. L. REV. 1309 (1995); see also Maxwell L. Stearns, *Standing and Social Choice: Historical Evidence*, 144 U. PA. L. REV. 309 (drawing on historical evidence and caselaw to bolster this point). See also Kenneth E. Scott, *Standing in the Supreme Court – A Functional Analysis*, 86 HARV. L. REV. 645 (1973) (arguing that standing serves the purpose of rationing scarce judicial resources and defining the courts' policymaking role).

⁴⁷ See Eugene Kontorovich, *What Standing is Good for*, 93 VA. L. REV. (forthcoming 2007).

⁴⁸ The original rulemaking petition was brought by various environmental interest groups. The governmental entities, including Massachusetts, subsequently intervened as plaintiffs. See *Massachusetts*, 126 S. Ct. at 1451.

⁴⁹ There has also been much public debate on a second issue—whether, even if global warming is validly a matter of world concern, the United States should act to reduce its greenhouse gas emissions when other countries do not. In 1992, the United States and 153 other countries entered into a treaty—the Framework Convention on Climate Change. Five years later, the meeting of the parties to the Convention drafted a follow-up protocol—the Kyoto Protocol. While the original Convention set up only a framework for dealing with greenhouse gas emissions, it did not impose upon signatories any substantive obligations with respect to emissions. In contrast, the Kyoto Protocol does impose emissions reductions on developed countries, but not on developing countries. Many in the United States argued that, insofar as global warming is a global problem that results from a global pollutant—i.e., a pollutant for which the place of

that validate the greenhouse effect, or demand a larger consensus of scientists on the issue.⁵⁰ This debate, which one might have expected to dominate a current Supreme Court opinion on global warming, was strangely absent from the opinions in the *Massachusetts* case.

The majority in *Massachusetts* adhered to the view that EPA did not contest either that anthropogenic emissions were exacerbating the greenhouse effect, or that over time major ramifications would occur as a result. In noting that “[t]he harms associated with climate change are serious and well recognized,” the Court observed that “EPA regards as an ‘objective and independent assessment of the relevant science’ a report by the National Research Council that ‘identifies a number of environmental changes that have already inflicted significant harms.’”⁵¹ In response to the Chief Justice’s dissent’s assertion that Massachusetts’ alleged harm was “conjectural,” Justice Stevens, implicitly referencing EPA’s acquiescence in Massachusetts’ allegations of current and prospective harm, noted that “[n]o one, save perhaps the dissenters, disputes those allegations.”⁵² And, summing up its resolution of the standing issue, the majority observed that “the rise

origin is irrelevant to the ultimate environmental effect, which is global—it made little sense for the United States to commit to reduce its greenhouse gas emissions when developing countries—especially China and India, whose greenhouse gas emissions are predicted to rise substantially in the coming decades—undertook no such obligations. The United States Senate unanimously passed a resolution expressing the view that the United States should not enter into the Kyoto Protocol as drafted. S. Res. 98, 105th Cong., 1st Sess. (July 25, 1997). President Clinton never forwarded the Kyoto Protocol to the Senate for possible ratification. *Massachusetts*, 126 S. Ct. at 1449.

The issue of whether the United States should undertake emissions reductions while other countries do not also arose in the context of standing in the *Massachusetts* case. EPA argued that the expectation that increased emissions from countries like China and India would exacerbate the greenhouse effect even if the United States undertook cuts meant that the relief that the plaintiffs sought would not in fact solve the problem of which they complained, meaning that the standing doctrine’s redressability prong was not met. The majority opinion dismissed that argument, explaining that “[a] reduction in domestic emissions would slow the pace of global emissions increases, no matter what happens elsewhere.” 126 S. Ct. at 1458. In dissent, Chief Justice Roberts argued that the fact that emissions from other countries “are likely to be overwhelmed many times over by emissions increases elsewhere in the world,” *id.* at 1469 (Roberts, C.J., dissenting), made it not *likely*—as required by standing doctrine—that the relief the plaintiffs sought would redress the problems they alleged, *id.* at 1470 (Roberts, C.J., dissenting).

⁵⁰ Professor Kysar has explained:

[U]ncertainty pervades, we might even say defines, the climate change problem. We are unsure how much of the observed warming is attributable to greenhouse gas emissions. We do not know with certainty what the size of the human population will become over the next century. We do not know what the reference case of economic growth will be. We do not understand and therefore cannot model how sulfate particles, water vapor, and clouds interact in the atmosphere to mitigate or to enhance warming effects. We do not know with any degree of precision how temperature increases will impact agriculture, forests, vector-related diseases, heat-related deaths, flood zones, coastlines, storm intensity levels, freshwater supplies, or species extinctions. Perhaps most troubling, we cannot begin to pinpoint the likelihood of catastrophic climate-related events such as the disintegration of the West Antarctic Ice Sheet, the shutdown of thermohaline circulation in the Atlantic, or the release of frozen methane deposits. In short, we do not know with anything other than an anemic level of confidence what will be the consequences of our atmospheric experiment.

Douglas A. Kysar, *Climate Change, Cultural Transformation, and Comprehensive Rationality*, 31 B.C. ENVTL. AFF. L. REV. 555, 563-64 (2004) (footnotes omitted).

⁵¹ 126 S. Ct. at 1455.

⁵² *Id.* at 1456 n.21.

in sea levels associated with global warming has already harmed and will continue to harm Massachusetts.”⁵³ In support of this proposition, the opinion cites the petitioners’ affidavits which, the opinion notes, were “uncontested.”⁵⁴

The only allusion in the majority opinion to reasoning grounded in some version of the precautionary principle is Justice Stevens’ statement that “[t]he risk of catastrophic harm, though remote, is nevertheless real.”⁵⁵ This lone statement, however, appears only in the concluding paragraph of the Court’s discussion of standing. Nowhere in the meat of the majority’s standing analysis is there consideration given to the facts as presenting a harm that may or may not occur but that, if it does occur, would be catastrophic. Nor is there discussion of, or reliance upon, the existence of uncertainty⁵⁶ or the potential for irreversibility. Rather, the majority presented global warming as a problem that is already occurring, and is virtually certain to worsen.

Chief Justice Roberts’ dissenting opinion took strong issue with the majority opinion’s presentation of the facts underlying global warming. Chief Justice Roberts criticized the majority for basing its conclusions about the likely loss by Massachusetts of coastal lowlands on a lone, unelaborated statement in one affidavit.⁵⁷ The Chief Justice also assailed the majority for concluding that future harm was “imminent” based upon computer models that had margins of error that rendered the majority’s conclusion, in his view, questionable. He emphasized that “accepting a century-long time horizon and a series of compounded estimates renders requirements of imminence and immediacy utterly toothless.”⁵⁸

Chief Justice Roberts’ dissent, then, expressly adheres to the traditional view that harms that have not been shown to be either actual or imminent are not sufficient to support standing. Implicit in the dissent is the additional point that that rule holds *even if* the harm that may occur (albeit not harm that is, based upon the available evidence, *imminent*) would be catastrophic. In effect, then, the Chief Justice’s dissent rejects incorporation of the precautionary principle into standing jurisprudence. But it dismisses the notion summarily, with no analysis of whether either the Constitution would admit such an incorporation, or whether such an incorporation would vindicate the policies that underlie standing.

⁵³ *Id.* at 1458.

⁵⁴ *Id.* The lone judge to find standing in the court below followed similar reasoning. See *Massachusetts v. EPA*, 415 F.3d 50, 66 (D.C. Cir. 2005) (Tatel, J., dissenting) (“[I]f EPA wants to challenge the facts petitioners have set forth in their affidavits, it has an obligation to respond to the petitioners . . . EPA makes no such challenge.”), *rev’d*, 127 S. Ct. 1438 (2007); *id.* at 67 (Tatel, J., dissenting) (“EPA nowhere challenges petitioners’ declarations . . .”).

⁵⁵ 127 S. Ct. at 1458.

⁵⁶ Perhaps related to uncertainty is Justice Stevens comment—found in a footnote—that Chief Justice Roberts characterized Massachusetts’ assertions as “conclusory,” *id.* at 1467 (Roberts, C.J., dissenting), “presumably because they do not quantify Massachusetts’ land loss with the exactitude he would prefer. . . . Yet the likelihood that Massachusetts’ coastline will recede has nothing to do with whether petitions have determined the precise metes and bounds of their soon-to-be-flooded land.” *Id.* at 1456 n.21.

⁵⁷ *Id.* at 1467 (Roberts, C.J., dissenting).

⁵⁸ *Id.* at 1468 (Roberts, C.J., dissenting).

In sum, the dissent rejected the application of the precautionary principle implicitly and without discussion. The majority treated the case as if existing standing doctrine controlled the outcome.⁵⁹ It had no need to discuss the possible application of the precautionary principle because, on its presentation of the facts, the presence of standing was clear.

IV. INCORPORATING THE PRECAUTIONARY PRINCIPLE INTO STANDING DOCTRINE

In this Part, I discuss the incorporation of the precautionary principle into standing jurisprudence. I begin with an explanation of how the principle could have been used by the Court in the *Massachusetts* case to support its conclusion that there was standing. I then explain how the incorporation of the precautionary principle would not upset existing standing jurisprudence; to the contrary, it is consistent with it. Last, I elucidate why the importation of the principle is not simply possible, but in fact is normatively desirable.

A. A Proposal for Precautionary-Based Standing

My basic proposal for incorporating the precautionary principle into standing doctrine is relatively straightforward.⁶⁰ Courts should find that the “injury” prong of standing is satisfied where the plaintiff can show that the harm that it might suffer would be catastrophic and irreversible, and that its occurrence is subject to great uncertainty.⁶¹

Application of precautionary-based standing to the facts in *Massachusetts* would change the reasoning, but not the outcome, of the case. The emission by humans of

⁵⁹ The one area where the majority suggested that the case at bar differed from run-of-the-mill standing cases was the fact that the plaintiff as to whom standing was found was a sovereign state. *See id.* at 1454 (“It is of considerable relevance that the party seeking review here is a sovereign State and not . . . a private individual.”); *id.* at 1455 (noting that Massachusetts “is entitled [Massachusetts] to special solicitude in our standing analysis.”). Oddly, however, the majority soon thereafter described the basis for Massachusetts’ standing as its actual ownership of title in lands that might be submerged as a result of global warming. *See id.* at 1456 (“Because the Commonwealth ‘owns a substantial portion of the state’s coastal property,’ it has alleged a particularized injury in its capacity as a landowner.” (footnote omitted; quoting *Standing Appendix* 171 (declaration of the Karst R. Hogeboom)). Given that ownership of land that might itself be harmed is an accepted basis for standing and not a status that is particular to sovereigns, one is left to wonder why the majority thought it necessary to invoke Massachusetts’ special status as sovereign in the first instance. As the Chief Justice’s dissent comments, while “[i]t is not at all clear how the Court’s ‘special solicitude’ for Massachusetts plays out in the standing analysis, except as an implicit concession that petitioners cannot establish standing on traditional terms,” *id.* at 1466 (Roberts, C.J., dissenting), “[t]he good news is that the Court’s ‘special solicitude’ for Massachusetts limits the future applicability of the diluted standing requirement applied in this case,” *id.* at 1471 (Roberts, C.J., dissenting).

Below, I explain that it might make sense to limit application of the precautionary principle in the standing inquiry to cases in which sovereigns assert claims. *See infra* the text accompanying notes 68-71. In this sense, my proposed incorporation of the precautionary principle makes better use of the special sovereign status in standing doctrine than does the majority opinion.

⁶⁰ Below I explain that the basic proposal could be narrowed to apply only in cases in which the plaintiff is a state sovereign. *See infra* the text accompanying notes 68-71.

⁶¹ Courts also might use precautionary standing to find the “causation” prong to be met where the relevant causal link is subject to uncertainty. Arguments similar to those advanced in the text for the “injury” prong would apply.

greenhouse gases presents the possibility of catastrophic and irreversible harms the occurrence of which is, under current scientific understandings, uncertain.⁶² Thus, the proposal would allow courts to conclude that there is standing without having to decide definitively whether in fact those harms are actually “concrete” and “imminent” in the traditional sense.

Invocation of precautionary-based standing would in no way affect the litigation of the issues in the case on the merits. For this reason, some of the interpretive problems that have dogged the implementation of the precautionary principle in other—generally merit-based—contexts would not arise here. For example, while the possibility of competing irreversibilities—that is, irreversibilities both with government action and without it—makes application of the precautionary principle difficult to determine in fact whether to undertake steps today to reduce greenhouse gas emissions,⁶³ such potential conflicts ought not to paralyze applications of the principle in aid of determining standing, insofar as standing is merely a preliminary hurdle on the way *to* a determination on the merits.⁶⁴ And, since the use of the principle in aid of determining standing would in no way require that the principle also be used at the subsequent merits stage, the proposal also would not itself raise the specter of such conflicts at a later stage in any litigation.

Since it relies upon a narrow construction of the precautionary principle, the proposal is consistent with the principle. Situations in which there is uncertainty as to which catastrophic and irreversible harm may occur fall within the heartland of the precautionary principle.⁶⁵ While some might prefer broader application of the principle—in terms of either the trigger or the set of situations in which it applies, or both⁶⁶—the limited application of the principle called for under the proposal surely does not expand the reach of the precautionary principle.

The proposal is also largely consistent with existing standing doctrine. To be sure, it would work a change in some cases. But the set of cases in which there is

⁶² See *supra* 49-50 and accompanying text.

⁶³ See, e.g., Sunstein, *supra* note 10, at 863 (noting a conflict between Judge Posner, who advocates such steps, and “many economists [who] have concluded, unlike Judge Posner, that the existence of uncertainty and irreversibility argue for less, not more, in way of investments in reducing greenhouse-gas emissions”).

⁶⁴ Any consideration of precaution in the face of irreversible harm should consider the possibility of irreversible harm that might result from the exercise of that precaution; in other words, irreversible harm might result from regulation as well as from the absence of regulation. See *supra* the text accompanying notes 24-25. Because a grant of standing to pursue a lawsuit does not resolve the case on the merits, this concern, though valid, would not seem to be of import in the setting of standing. The possibility of conflicting irreversibilities would be considered at the merits stage, and the adoption of the precautionary principle to aid in determining standing would in no way require the merits also to be determined with reference to any version of the precautionary principle.

⁶⁵ See *supra* the text accompanying notes 28-33.

⁶⁶ See *supra* note 28.

uncertainty as to whether catastrophic, irreversible harm will occur is a limited one. Indeed, it is likely the minority of environmental cases that fall within this category.⁶⁷

At the same time, one justifiably might be concerned that, even if the proposal would not in fact result in standing being achieved many more cases and thus in many more cases proceeding to the merits, the proposal might suboptimally encourage more people to file suit and *try* to prove standing under the slightly more relaxed, if limitedly applicable, standard. In other words, one might be concerned not with the floodgates of litigation, but rather with the floodgates of standing that lead to the floodgates of litigation, and that opening the floodgates of standing itself might to some degree overwhelm the courts.

In response to this concern—and to the related concern that concern that the proposal as structured would effect too large a change in existing standing doctrine—there is a way in which the proposal can further be cabined. The relaxed standing rule under circumstances of precaution could be made available only to state governments who bring lawsuits in their sovereign capacity.⁶⁸ To justify this additional possible restriction, I need to demonstrate that it accords with existing standing doctrine, and also that the additional restriction responds logically to the criticisms of the basic proposal that I have identified.

First, the Court since the *Lochner* era has recognized that a state's sovereignty confers upon it greater latitude, than private actors typically enjoy, in seeking relief grounded in that sovereignty in the federal courts.⁶⁹ Indeed, the majority in *Massachusetts* went out of its way to recognize the “special solicitude” due states who advance claims in federal court in their capacity as sovereigns.⁷⁰

⁶⁷ See Sunstein, *supra* note 10, at 886 (“In my view, uncertainty is both real and rare in the environmental domain; but this is an empirical judgment, and it may be wrong.”). Cf. Craig, *supra* note 42, at 20-25 (noting that health risks—though perhaps not catastrophic in nature—generally pervade federal clean air and clean water regulation).

⁶⁸ In addition, Congress could always narrow the availability of standing generally by narrowing the relevant statutory “zone of interest.” The drawback to such a blunderbuss approach is that it would narrow the availability of standing in all cases, not just those in which precautionary standing would be invoked. Presumably, however, Congress could simply narrow the “zone of interest” only as it relates to parties seeking to invoke precautionary standing. The justifications for such congressional action would be the same as those discussed in the text for the courts to impose such a restriction.

⁶⁹ See Ann Woolhandler & Michael G. Collins, *State Standing*, 81 VA. L. REV. 387, 450-64 (1995) (describing the evolution of standing doctrine during the *Lochner* era to allow states to advance claims based upon their sovereignty). In comparison, the early Court only recognized state standing where states could bring claims grounded in the common law. *See id.* at 397-434.

⁷⁰ 127 S. Ct. at 1455. *See supra* note 59; Thomas W. Merrill, *Global Warming as a Public Nuisance*, 30 COLUM. J. ENVTL. L. 293 299-305 (2005) (arguing in favor of a less stringent standing hurdles in cases brought by public officials). While Justice Stevens was correct in drawing this distinction, the majority opinion's actual use of the distinction to resolve the *Massachusetts* case remains obscure. *See* 127 S. Ct. at 1455. Ironically, then, the proposal in this respect would make better use of this distinction than did the majority that purported to rely upon it.

Second, there is a certain logic to restricting access to precautionary-based standing to sovereigns.⁷¹ Even if one is concerned that people are likely to believe that precautionary-based standing applies in a host of cases where it in fact does not, one might be more sanguine that states will take a more deliberative approach and be more hesitant to try to invoke a court's jurisdiction. And, even if that is not entirely true, the restriction would in any event constrain the number of cases in which standing would be found on the basis of precaution.

Finally, I note that precautionary-based standing provides a workable standard for courts to apply. While the courts would have to develop notions of catastrophic and irreversible harms, that is hardly an insurmountable task.⁷² Moreover, to whatever extent application of precautionary-based standing may prove to present a challenge to courts, it does not seem to present any more of a challenge than does existing standing doctrine. Indeed, existing standing doctrine may demand *more* of courts. After all, existing standing doctrine calls upon courts to decide when an injury is "concrete" and "imminent." In many environmental cases, this requires courts to examine, and reach conclusions with respect to, scientific evidence, which is generally not the forte of

⁷¹ Cf. Woolhandler & Collins, *supra* note 69, at 502-17 (arguing in favor of limits on sovereign authority to file suit, in part on the ground that sovereigns should not be allowed standing when private individuals would have standing to file similar claims).

One also might consider extending (whether initially or at some point later) the availability of precautionary standing to localities. This would depend on the frequency with which localities seek to pursue relief even while the states of which they are a part do not, on the desirability of allowing them so to act, and on the costs of allowing additional actions to be litigated in federal court.

⁷² Cf. POSNER, *supra* note 16, at 5-6 (offering a preliminary definition of catastrophic harm). Courts are already called upon to make analogous judgments. For example, tort law allows one to enter onto land possessed by someone else, and to commit an act which would otherwise be a trespass to a chattel or a conversion, if such actions are necessary to, or are reasonably believed to be necessary to avoid "a public disaster." RESTATEMENT (SECOND) OF TORTS §§ 196, 262; *see id.* § 196 cmt. a (identifying "a conflagration, flood, earthquake, or pestilence" as examples of a "public disaster"). *See, e.g.,* Commonwealth v. Capitolo, 471 A.2d 462, 480 (Pa. Super. 1984) (noting that the harms alleged—"that at any given moment the Shippingport Plant may break down and another Three Mile Island incident ensue, and that radiation from the plant is causing cancer and poisoning the reservoir—are comparable to the harms caused by 'conflagration, flood, earthquake, or pestilence,'" and "[t]hus met the 'public disaster' requirement of the Restatement"), *rev'd on other grounds*, 508 A.2d 372 (1985).

Presumably, the legal standard for catastrophic harm would consider both the scope and extent of possible harm. In addition, the framing of the harm could affect the extent to which the harm is seen as catastrophic. Cf. Daryl J. Levinson, *Framing Transactions in Constitutional Law*, 111 YALE L.J. 1311 (2002) (arguing that the frames through which matters are seen has an effect upon the legal outcome); Robert V. Percival, "Greening" the Constitution—Harmonizing Environmental and Constitutional Values, 32 ENVTL. L. 809, 859-60 (2002) (critiquing extant standing doctrine on the ground that, by focusing on individualized injury, it erroneously omits the broader impact of environmental regulatory regimes). In particular, the loss of any one thing could be seen as catastrophic if the thing in question is viewed in isolation. Takings jurisprudence solves the analogous problem of "conceptual severance," *see* Margaret Jane Radin, *The Liberal Conception of Property: Cross Currents in the Jurisprudence of Takings*, 88 Colum. L. Rev. 1667, 1676 (1988), by viewing property on a broader scale and generally rejecting narrow framings of property rights, *see, e.g.,* Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency, 535 U.S. 302, 331 (2002). Similarly, the legal inquiry into whether harm is catastrophic should require that the harm in question have effect on an objectively broad scale.

courts.⁷³ On the other hand, precautionary-based standing asks courts to examine scientific evidence only, in effect, to determine whether the question of injury has been sufficiently “put at issue” by that evidence, a task to which courts would seem equally, if not better, suited.

B. Consistency of Precautionary-Based Standing with Existing Standing Doctrine

In this Section, I consider whether precautionary-based standing is consistent with existing law. I first highlight applications of precaution under American law to demonstrate that the importation of the precautionary principle to the law of standing has precedent in American jurisprudence. I then turn to the particular question of whether the proposal for precautionary-based standing is consistent with standing jurisprudence. I consider the proposal’s fidelity to the policies underlying standing and also the proposal’s consistency with the strictures of Article III.

To begin, the incorporation of the precautionary principle is foreign neither to domestic law, nor indeed to the law of standing. The Supreme Court has fashioned numerous “prophylactic rules”⁷⁴ that are not called for by the language of the Constitution but are designed to minimize the chances that constitutional violations will in fact occur.⁷⁵ Further, the precautionary principle can be said to undergird the American approach to criminal law. In addition to the criminal law’s various prophylactic rules, “[t]he presumption of innocence, the right to remain silent, the right to a public trial by an impartial jury, and the requirement that the prosecutor must prove each case beyond a reasonable doubt all reinforce the public’s perception that the criminal justice system operates under the precautionary principle announced by Blackstone more than two hundred years ago: ‘better that ten guilty persons escape than

⁷³ See, e.g., *FPC v. Fla. Power & Light Co.*, 404 U.S. 453, 463 (1972) (“Particularly when we consider a purely factual question within the area of competence of an administrative agency created by Congress, and when resolution of that question depends on ‘engineering and scientific’ considerations, we recognize the relevant agency’s technical expertise and experience, and defer to its analysis unless it is without substantial basis in fact.”); *NRDC v. U.S. EPA*, 16 F.3d 1395, 1401 (4th Cir. 1993) (“[I]n reviewing EPA’s actions . . . , this court does not sit as a scientific body, meticulously reviewing all data under a laboratory microscope.”).

⁷⁴ See generally David A. Strauss, *The Ubiquity of Prophylactic Rules*, 55 U. CHI. L. REV. 190 (1988).

⁷⁵ See Brian K. Landsberg, *Safeguarding Constitutional Rights: The Uses and Limits of Prophylactic Rules*, 66 TENN. L. REV. 925, 926 (1999) (defining “prophylactic rules” to mean “those risk-avoidance rules that are not directly sanctioned or required by the Constitution, but that are adopted to ensure that the government follows constitutionally sanctioned or required rules”); Joseph D. Grano, *Prophylactic Rules in Criminal Procedure: A Question of Article III Legitimacy*, 80 NW. U. L. REV. 100, 105 (1985) (defining a “prophylactic constitutional rule” as “a rule that functions as a preventive safeguard to insure that constitutional violations will not occur”); WEBSTER’S THIRD NEW INTERNATIONAL DICTIONARY 1818 (1986) (defining “prophylactic” as “preventing or contributing to the prevention of disease” or “tending to prevent or ward off: preventative, cautionary”); see also Evan H. Caminker, *Miranda and Some Puzzles of “Prophylactic” Rules*, 70 U. CIN. L. REV. 1, 2, (2001) (“[B]ecause courts frequently cannot determine with much certainty whether or not a constitutional violation has occurred in a given case, and yet courts are charged with trying to protect against constitutional violations, it is sometimes entirely appropriate for the Supreme Court to develop prophylactic rules safeguarding constitutional rights.”).

that one innocent suffer.”⁷⁶ The First Amendment directs that government—and courts—take a cautionary view toward regulation of speech.⁷⁷ For example, the doctrine of prior restraints imposes a heavy presumption against attempts to regulate speech before it in fact occurs.⁷⁸ Indeed, the Court has explained, in language quite reminiscent of the precautionary principle, that the justification for the doctrine of prior restraints is that, as compared to punishment after the fact, “[a] prior restraint, . . . by definition, has an immediate and irreversible sanction. If it can be said that a threat of criminal or civil sanctions after publication ‘chills’ speech, prior restraint ‘freezes’ it at least for the time.”⁷⁹ While these areas of law generally take a precautionary view *against* government regulation (as opposed to environmental law’s precautionary principle, which generally takes a precautionary view against the *absence* of government regulation), the reliance upon a precautionary approach remains.

There are several procedural devices that also adopt a precautionary approach. In determining whether to grant preliminary injunctions and temporary restraining orders, courts are directed to weigh, among other things, the irreparable harm to the defendant if the injunction issues against the irreparable harm to the plaintiff if the injunction does not issue.⁸⁰ In criminal procedure (and in a reverse of the usual precautionary approach in

⁷⁶ Peter A. Joy, *The Relationship between Prosecutorial Misconduct and Wrongful Convictions: Shaping Remedies for a Broken System*, 2006 WIS. L. REV. 399, 404-05 (footnotes omitted; quoting WILLIAM BLACKSTONE, 4 COMMENTARIES *358.)). One also might consider the rule of lenity and the requirement of a unanimous jury verdict in this regard.

⁷⁷ See, e.g., MATTHEW D. BUNKER, CRITIQUING FREE SPEECH: FIRST AMENDMENT THEORY AND THE CHALLENGE OF INTERDISCIPLINARITY 2, 8 (2001) (The practice of freedom of speech and of the press in the U.S. “leads us to exercise great caution before silencing viewpoints with which we disagree.”); cf. Stuart Minor Benjamin, *Proactive Legislation and the First Amendment*, 99 MICH. L. REV. 281, 326 n.158 (2000) (“The very uncertainty that leads courts and commentators to err on the side of safety (i.e., environmental protection) should similarly lead us, in the First Amendment context, to err on the side of protecting speech interests.”).

⁷⁸ See, e.g., *New York Times Co. v. United States*, 403 U.S. 713, 714 (1971); KEITH WERHAN, FREEDOM OF SPEECH: A REFERENCE GUIDE TO THE UNITED STATES CONSTITUTION 141 (2004).

⁷⁹ *Nebraska Press Ass’n v. Stuart*, 427 U.S. 539, 559 (1976).

The doctrine of prior restraints bears a feature in common with standing. Just because the doctrine of prior restraints dictates that speech must be allowed to go forward, that does not mean that the speech will ultimately be found to be protected by the First Amendment, and thus that the speaker will emerge unpunished. In other words, the applicability of the doctrine of prior restraints does not speak to the ultimate question of whether the First Amendment applies to the speech in question. Similarly, simply because a court decides that a party has standing to litigate an issue does not speak to the ultimate success with which the plaintiff will meet on the merits. See *supra* the text accompanying notes 63-64.

⁸⁰ See, e.g., *Amer. Hosp. Supply Corp. v. Hosp. Prods. Ltd.*, 780 F.2d 589, 593 (7th Cir. 1986); see also Sunstein, *supra* note 10, at 866-69 (discussing preliminary injunctions in environmental cases in the context of the irreversible harm precautionary principle). For an argument that courts should take their own uncertainty as to final outcome into account in fashioning injunctive relief, see Joshua P. Davis, *Taking Uncertainty Seriously: Revising Injunction Doctrine*, 34 RUTGERS L.J. 363 (2003).

In a recent Essay, Professor Lichtman critiques traditional preliminary injunction analysis for assessing irreparable harm while ignoring the counterpart “irreparable benefits.” See Douglas Lichtman, *Irreparable Benefits*, 116 YALE L.J. 1284 (2007). Putting Professor Lichtman’s observation in precautionary terms, traditional preliminary injunction analysis takes a precautionary approach to harms that may result in the event that an injunction issues or does not issue. His argument that benefits may also result both from the issuance of an injunction and from the failure of an injunction to issue translates to the point that an

criminal law that militates against government action), bail requirements guard against the risk of irreparable harm that would result if the defendant were to flee the jurisdiction and avoid trial. And, at the appeals stage, the “collateral order doctrine” provides an exception to the usual rule in federal court that appeals may only be had once a final order has been entered in cases where the occasion of a delayed appeal might *itself* constitute an irreparable harm.⁸¹

The rules governing preliminary injunctions, interlocutory appeals, and bail requirements are all directed against the possibility of some sort of irreversible harm, the occurrence of which may be uncertain.⁸² Importantly, they also share in common another characteristic: They all resolve matters preliminarily but without, by that resolution, prejudicing the ultimate outcome on the merits. That is true of standing as well: The use of precautionary-based standing would neither predetermine an outcome on the merits, nor even mandate that the precautionary principle would be used to determine the merits.⁸³ Thus, the application of the precautionary principle in other “preliminary” procedural doctrines strongly suggests that it would be at home as well in standing jurisprudence.

In fact, standing jurisprudence itself is already a home to special rules that are premised upon precaution. First, while the ordinary rule in standing is that one does not have standing to raise the rights of others, a special rule applies in First Amendment cases.⁸⁴ Overbreadth doctrine allows parties to raise objections to speech regulations that are overbroad, even if the regulations do not by their terms reach the parties’ speech. In effect, then, overbreadth doctrine recognizes the standing of parties to raise other parties’ claims in First Amendment cases.⁸⁵ The justification for this special rule is the concern that overbroad speech restrictions might chill constitutionally protected speech, to the detriment of all.⁸⁶ Thus can a precautionary approach justify an appropriate limited expansion of standing doctrine, much as would the proposal here.

approach that is pervasively precautionary will often identify large risks on both sides of a possible action, and may thus often result in inherent contradiction. *See supra* the text accompanying notes 24-25.

⁸¹ *See, e.g.,* *Cohen v. Beneficial Indus. Loan Corp.*, 337 U.S. 541, 546 (1949) (approving of an interlocutory appeal despite statutory language authorizing only appeals of final judgments on the ground that, after a final order was entered, “it [would] be too late effectively to review the present order and the rights conferred by the [state] statute [calling for the posting of a bond by the plaintiff], if it is applicable, will have been lost, probably irreparably”); *Mathews v. Eldridge*, 424 U.S. 319, 331 n.11 (1976) (noting “the core principle that statutorily created finality requirements should, if possible, be construed so as not to cause crucial collateral claims to be lost and potentially irreparable injuries to be suffered”).

⁸² The same may be said, as I explain below, of standing in declaratory judgment actions. *See infra* the text accompanying notes 87-90.

⁸³ *See supra* the text accompanying notes 63-64. The same can be said of the applicability of the doctrine of prior restraints as compared to the ultimate question of the applicability of the First Amendment to the speech in question. *See supra* note 79.

⁸⁴ *See generally* WERHAN, *supra* note 78, at 144-45; Richard H. Fallon, Jr., *Making Sense of Overbreadth*, 100 YALE L.J. 853, 898-90 (1991); Michael C. Dorf, *Facial Challenges to State and Federal Statutes*, 46 STAN. L. REV. 235, 263-64 (1994). *But see* Henry Paul Monaghan, *Overbreadth*, 1981 S. CT. REV. 1, 21-30 (arguing that the standing rules that apply in First Amendment overbreadth cases are not special).

⁸⁵ *See, e.g.,* *Gooding v. Wilson*, 405 U.S. 518, 521 (1972).

⁸⁶ *See id.*

A second special standing rule that is premised upon precaution is the notion of standing in declaratory judgment actions. The Declaratory Judgment Act permits federal courts to “declare the rights and other legal relations of any interested party seeking such declaration, whether or not further relief is or could be sought.”⁸⁷ Professor Borchard’s justification for declaratory judgments rested on the ground that a “prospective victim” ought not to be told “that the only way to determine whether the suspect is a mushroom or a toadstool is to eat it.”⁸⁸ Just this past Term, the Supreme Court underscored the precautionary anchor of the Act by recognizing as a basic proposition that,

where threatened action by *government* is concerned, we do not require a plaintiff to expose himself to liability before bringing suit to challenge the basis for the threat The plaintiff’s own action (or inaction) in failing to violate the law eliminates the imminent threat of prosecution, but nonetheless does not eliminate Article III jurisdiction.⁸⁹

The Court then affirmed that the same reasoning applies “to situations in which the plaintiff’s self-avoidance of imminent injury is coerced by threatened enforcement action of a *private party* rather than the government.”⁹⁰

Having established that precaution is not foreign to standing jurisprudence, I turn to the specific question of whether precautionary-based standing is consistent with existing standing doctrine. As an initial matter, the precautionary-based standing proposal (whether in its basic form, or as further limited to state sovereigns) would not undermine the purposes underlying the doctrine of standing. First, there is little doubt that there would be true disputation of issues with a live adversarial process in a case in which precautionary-based standing would be found. To whatever extent that the uncertainty with which any risks in such a case may reduce a party’s incentive to litigate the matter with zeal, that would be outweighed by the fact that the harms in the case would also have to be shown to be irreversible and catastrophic.

Second, though it would expand standing to a few more cases where it might not exist under existing doctrine, precautionary-based standing would not throw open the floodgates of litigation—especially if access to it is restricted to states in their sovereign capacity. Thus, standing would continue to function, as Professor Stearns argues, to frustrate attempts by private litigants to manipulate courts’ dockets and thus to take advantage of the path-dependence of law.⁹¹ Nor, moreover, would this slight expansion of standing undermine the role that, as Professor Kontorovich has argued, standing serves to preserve private parties’ rights to negotiate around, rather than assert, their rights (which, he in any event argues, applies in the constitutional setting).⁹² And, to the extent that, as Professor Carlson has argued, existing standing doctrine in the long run aids environmentalists by forcing them to relate environmental problems to human beings and

⁸⁷ 28 U.S.C. § 2201(a) (2006).

⁸⁸ Edwin M. Borchard, *The Constitutionality of Declaratory Judgments*, 31 COLUM. L. REV. 561, 589 (1931).

⁸⁹ *MedImmune, Inc. v. Genentech, Inc.*, 127 S. Ct. 764, 772 (2007).

⁹⁰ *Id.* at 773; *see id.* at 773-74.

⁹¹ *See supra* the text accompanying note 46.

⁹² *See supra* the text accompanying note 47.

institutions,⁹³ precautionary-based standing would not alter the anthropocentricity of the standing inquiry.

Moreover, while precautionary-based standing presumably would not displace, and instead would coexist with, the political question doctrine, it seems that the doctrine would be at low ebb in cases where precautionary-based standing is likely to apply. Political economy predicts—and experience unfortunately often bears out⁹⁴—that the political branches are generally unlikely to respond *ex ante* to catastrophic risks. The benefits of expenditures *ex ante* are less tangible and more uncertain than benefits associated with government expenditures *in general*.⁹⁵ As such, government actors are comparatively unlikely to supply such expenditures. Public demand for *ex ante* planning and expenditures is also likely to be muted. People often tend to undervalue the likely occurrence of low-risk events, and a similar down-valuing may result from people's desire to avoid contemplating catastrophic events and damage.⁹⁶ To the extent that the political branches are thus less likely to confront possible catastrophic events, the notion of relying upon standing to assure deference to those branches seems misplaced.

The question remains whether application of precautionary-based standing would be consistent with Article III requirements for standing. One answer to this question is that, as some have argued, the Court has been too stringent in its interpretation of Article III in constructing the current “injury” component of standing.⁹⁷ Under this view, while precautionary-based standing may not be consistent with the current “injury” jurisprudence, that jurisprudence calls for more than is required by the Constitution.

Precautionary-based standing can be seen, however, to be essentially consistent with the Court's current “injury” jurisprudence. To begin, the Court's recognition of

⁹³ See Ann E. Carlson, *Standing for the Environment*, 45 UCLA L. REV. 931 (1998) (arguing that standing rules may force environmental advocates to rethink environmental problems and express them in terms of how they may affect human beings, and that the resulting refocusing of environmental advocacy would benefit courts, the public, and ultimately the environment).

⁹⁴ See generally William F. Shughart II, *Katrinanomics: The Politics and Economics of Disaster Relief*, 127 PUBLIC CHOICE 31 (2006).

⁹⁵ See Ben Depoorter, *Horizontal Political Externalities: The Supply and Demand of Disaster Management*, 56 DUKE L.J. 101, 111 (2006).

One might argue that the absence of public demand for the government to address potential disasters, *see generally* Ann E. Carlson, *Heat Waves, Global Warming & Mitigation*, in CATASTROPHIC RISKS: PREVENTION, COMPENSATION, AND RECOVERY (forthcoming 2007) (SSRN paper # 998899) (explaining why the public does not demand government action to mitigate heat waves), bolsters the case that such a question is a matter of policy that should be committed to the political branches. At the same time, the salient aspect of the “absence of public demand” is that groups that demand action are not powerful enough to effect political action, meaning that policymakers are not encouraged to undertake action. *See id.*; Depoorter, *supra*, at 111. Thus, the point remains that the political branches are suboptimally unlikely to take action, which in turns makes judicial intervention more appropriate.

⁹⁶ *See* Depoorter, *supra* note 95, at 121-22; *see also* Jeffrey J. Rachlinski, *The Psychology of Global Climate Change*, 2000 U. ILL. L. REV. 299, 303-313.

⁹⁷ *See, e.g.*, David M. Driesen, *Standing for Nothing: The Paradox of Demanding Concrete Context for Formalist Adjudication*, 89 CORNELL L. REV. 808 (2004); Percival, *supra* at 859-60; Michael Herz, *The Rehnquist Court and Administrative Law*, 99 NW. U. L. REV. 297, 348-54 (2004) (criticizing the Court's standing jurisprudence as result-oriented and as asymmetrically biased in favor of regulated entities and against regulatory beneficiaries).

standing to issue declaratory judgments⁹⁸ suggests that Article III tolerates some attenuation between an injury and a possible victim.

Further, in particular, the fact that uncertainty surrounds an injury's occurrence, but also that the injury, if it occurs, would be catastrophic and irreversible, creates an especially strong argument for an injury sufficient to satisfy Article III. Consider first uncertainty. Professor Farber has advanced the view that the mere imposition of uncertainty may sometimes itself rise to the level of injury sufficient to satisfy Article III's requirements. He explains that societal actors often take affirmative steps in the face of uncertainty, and that indeed an entire industry—insurance—has arisen to allow actors to mitigate uncertainty.⁹⁹ Thus, he suggests, the presence of a market for insurance to address an uncertainty should be used as a guide for whether standing grounded on that uncertainty may exist.¹⁰⁰

Next consider the catastrophic nature of injury.¹⁰¹ That an injury is catastrophic means that, even if the odds that the injury will come to pass are small and the time horizon large, the “expected value” of the injury will likely remain of great magnitude. The requirement that, for standing to exist, there must be injury that is “actual” and “imminent” is designed to ensure that litigants have a true incentive vigorously to pursue their claims.¹⁰² Viewed economically, these factors can be understood to affect the value of the injury, and thus the incentive of the litigants: The less “imminent” the injury, the less valuable, thanks to discounting, the injury can be said to be. The same can be said as the injury becomes less “actual”—i.e., more contingent. For garden variety injuries, a remote, highly contingent injury is likely to be worth little, and thus to provide litigants with little incentive to pursue a claim in relation thereto. This is because the ratio of the “expected value” of the injury to the full value of the injury is substantially less than one.¹⁰³ The same cannot be said for potentially catastrophic injuries. In such cases,

⁹⁸ See *supra* the text accompanying notes 87-90.

⁹⁹ See Daniel A. Farber, *Uncertainty as a Basis for Standing*, 33 HOFSTRA L. REV. 1123 (2005).

¹⁰⁰ See *id.* at 1126-29.

¹⁰¹ The Court has never held that the possibility of catastrophic damage may not form the basis of a constitutionally sufficient injury, even if the damage is not traditionally concrete or imminent. See *Duke Power Co. v. Carolina Envtl. Study Group, Inc.*, 438 U.S. 59, 73 (1978) (“For purposes of the present inquiry, we need not determine whether all the putative injuries identified by the District Court, particularly those based on the possibility of a nuclear accident and the present apprehension generated by this future uncertainty, are sufficiently concrete to satisfy constitutional requirements.”).

¹⁰² See *supra* the text accompanying note 43.

¹⁰³ To see this mathematically, let I = the magnitude of the injury, p = the likelihood that the injury will come to pass, r = the applicable discount rate, and t = the amount of time over which discounting is to occur (i.e., the amount of time until the injury will occur if it in fact occurs). Then the expected value of the injury is expressed as $(pI)/(1+r)^t$. Thus, the ratio of the expected value of the injury to the full value of the injury is $p/(1+r)^t$. Traditional standing doctrine, then, allows standing only when the value of this ratio is close to 1. (This is consistent with the notion that the actual magnitude of the injury is not relevant to the standing inquiry. An injury of one dollar is sufficient to confer standing, provided that it is concrete and imminent.)

(I present this mathematical representation of how standing analysis generally proceeds simply to illustrate the point in the text, not to suggest that standing analysis might effectively be reduced to some simple mathematical formulae. See *Allen v. Wright*, 468 U.S. 750, 751 (1984) (observing that “the constitutional component of standing doctrine incorporates concepts concededly not susceptible of precise

while a low likelihood of the injury occurring and a longer time horizon will tend to reduce the expected value of the injury,¹⁰⁴ the enormity of the injury's magnitude may serve to offset this reduction such that the ratio between the injury's expected value and full value is not substantially less than one. Put another (if somewhat less precise) way, a catastrophe is of such large magnitude and scope that one percent of it standing alone is still a catastrophe.¹⁰⁵

The combination of catastrophic and irreversible injury the likely occurrence of which is uncertain puts the argument for standing at its apex. Even if a low probability of a catastrophic, irreversible harm is not generally sufficient to meet Article III's requirements, the fact that a catastrophic, irreversible harm's likelihood of occurring is

definition"); ERWIN CHEMERINSKY, *FEDERAL JURISDICTION* 68 (4th ed. 2003) (explaining that "no formula exists for determining what types of injuries are adequate to allow a plaintiff standing to sue in federal court"). Compare *Amer. Hosp. Supply Corp. v. Hosp. Prods. Ltd.*, 780 F.2d 589, 593 (7th Cir. 1986) (Posner, J.) (developing a formula to describe dispositions of preliminary injunction requests) with Linda J. Silberman, *Injunctions by the Numbers: Less than the Sum of its Parts*, 63 CHI.-KENT L. REV. 279 (1987) (criticizing Judge Posner's formula). For a general argument against reducing civil procedure to formulae, see Linda S. Mullenix, *Burying (with Kindness) the Felicific Calculus of Civil Procedure*, 40 VAND. L. REV. 541 (1987); see also *id.* at 579 (impliedly lamenting attempts to develop economic rationales for standing doctrine.)

¹⁰⁴ One might formulate an argument that militates against discounting catastrophic and irreversible harm against an extended time horizon. Dean Revesz has argued, in the context of the treatment of the loss of human lives under cost-benefit analysis, that the dread, and involuntary, nature of the result of exposure to environmental hazards may justify discounting future harms at a discount rate less than the rate one would use for simply financial obligations. See Richard L. Revesz, *Environmental Regulation, Cost-Benefit Analysis, and the Discounting of Human Lives*, 99 COLUM. L. REV. 941, 968-74 (1999); but see Matthew D. Adler, *Fear Assessment: Cost-Benefit Analysis and the Pricing of Fear and Anxiety*, 79 CHI.-KENT L. REV. 977, 1005 n.97 (2004) (noting that the suggestion of discounting at a lower rate because of dread was considered and rejected by EPA's Science Advisory Board "for lack of sufficient evidence about the size of the fear premium"). Perhaps the dread nature of impending catastrophe, combined with the fact that exposure to catastrophe is generally involuntary, similarly justifies a reduction in the discount rate in the context of standing. Cf. Albert C. Lin, *The Unifying Role of Harm in Environmental Law*, 2006 WIS. L. REV. 897, 949 ("The latent hazards characteristic of environmental problems are dreaded not only because of their involuntary nature, catastrophic potential, and fatal consequences, but also because they often have no clearly defined end." (footnote omitted)).

Dean Revesz also has argued that the discounting of human lives is ethically unjustified where the harm will occur so far in the future that it will affect future generations. See Revesz, *supra*, at 989-1007. Once again, perhaps catastrophic harm that will affect future generations similarly ought not to be discounted in the standing analysis.

¹⁰⁵ Following the mathematical notations *supra* in footnote 103, if the probability of an injury occurring is especially small and/or the time until the injury occurs is large, then p will be a small number, i.e., a fraction with a numerator of 1 and a very large denominator. If the injury is catastrophic, then the injury I , which falls in the numerator of the expected value formula, will also be very large. Mathematically, the quotient of a very large number divided by another very large number may either be very small, very large, or anything in between. For example, the limit, as n goes to infinity, of n/n^2 is 0, the limit of n/n is 1, and the limit of n^2/n is infinity. The last example is one in which the magnitude of the numerator compared to the denominator is so large (even they both the numerator and denominator standing alone are themselves large) that the division by the denominator has no reductive effect as the limit approaches infinity. Interpreting this example in light of the expected value formula, this a situation in which the injury is so catastrophic that even a low probability of occurrence and substantial time horizon do not meaningfully reduce the catastrophic impact of the expected value. Loosely speaking, a fraction of a catastrophe (with damage approaching infinity) may still be catastrophic (and itself still be infinite).

uncertain means that one cannot confidently state that the expected value of the injury is so low that Article III will not be satisfied. On this basis, then, precautionary-based standing ought to meet Article III's strictures.

A final objection to Article III compatibility with the application of precautionary-based standing is that, insofar as catastrophic harm is broad in scope, the harm might be said to be "generalized" in many cases in which precautionary standing might be invoked. The policy reasons I discussed above, however, demonstrate why the usual justification for not allowing standing with respect to generalized harms—that generalized harms are best left to the political branches rather than judicial determination—are not persuasive in the context of catastrophic harms.¹⁰⁶ Moreover, to the extent that the bar against assertion of generalized harms is compelled by Article III,¹⁰⁷ the restriction of precautionary-based standing to states would presumably allow the states to elaborate upon the potential for catastrophic harm that would be less likely to be generalized (even among prospective plaintiff states).

C. The Normative Desirability of Precautionary-Based Standing

Having established that precautionary-based standing can be implemented and would not be inconsistent with existing standing doctrine or its underpinnings, I turn to the question of whether it is a good idea to implement the proposal. I argue that precautionary-based standing is normatively desirable for several ways.

First, consider the *Massachusetts* case itself. Many commentators have criticized the Court's opinion for improperly weighing in on scientific evidence, and for thus intruding upon questions that are inherently policy-based and political in nature. The Court would have avoided criticisms of this sort had it embraced precautionary-based standing. Reliance upon precaution also would have garnered support for the Court's holding on standing among people who question the strength of scientific evidence establishing global warming, yet who recognize that global warming poses the possibility of extreme harm in the event that some predictions are accurate.

Invocation of precautionary-based standing would have lessened the need for the Court to draw strong conclusions about the science of global warming. Some have expressed concern that the Court's holding on standing leaves the EPA little room on remand to address scientific questions.¹⁰⁸ While the Court may ultimately be right on the scientific issues, the use of precautionary-based standing would have afforded the Court

¹⁰⁶ See *supra* notes 94-96 and accompanying text.

¹⁰⁷ The exception for taxpayer challenges to congressional expenditures under the Establishment Clause draws this at least somewhat into question. See *Flast v. Cohen*, 392 U.S. 83 (1968) (announcing availability of standing in such cases); compare *Hein v. Freedom from Religion Found., Inc.*, 127 S. Ct. 2553, 2565-68 (2007) (opinion per Alito, J.) (recognizing the continued vitality of *Flast*, but holding that challenge to federal agency's expenditures did not fall within *Flast*'s "narrow exception") with *id.* at 2572 (Kennedy, J., concurring) (defending the distinction and the continued vitality of *Flast*) and *id.* at 2573 (Scalia, J., concurring) (calling for *Flast* to be overruled as inconsistent with Article III) and *id.* at 2584 (Souter, J., dissenting) (finding no basis for the plurality's decision that *Flast* did not apply).

¹⁰⁸ See *supra* note 5.

wider berth in avoiding the heart of the scientific controversy, in keeping with the general restraint of courts on such matters.¹⁰⁹

Second, consider the import of precautionary-based standing for environmental problems in the future. In this regard, even those who fully support the Court's holding in *Massachusetts* may feel the majority missed an important opportunity to integrate precaution into the standing inquiry. It may well be that there is now adequate scientific consensus to justify action now, but that was not always the case. On this understanding, the absence of precautionary-based standing has already delayed a response to global warming.¹¹⁰ There likely are other environmental problems lurking down the line where, again, the timing of a response may be of the essence. To the extent that precautionary-based standing at least forces government to address problems at an earlier juncture, its availability is likely to be of recurring importance.

Third, there is in theory no reason why precautionary-based standing needs to be limited to cases raising environmental problems. For example, commentators have argued in favor of extending standing to more cases that raise allegations of stigmatic harm.¹¹¹ And stigmatic harm, like some environmental harm, might at least sometimes and in some ways be characterized as irreversible and catastrophic.¹¹² Perhaps experience with precautionary-based standing in the environmental context will ultimately convince courts to extend its reach to other areas.

I realize that there is some degree of inconsistency in arguing, as I have, on the one hand that precautionary-based standing is consistent with existing standing doctrine in part because it is so limited,¹¹³ and on the other hand that precautionary-based standing might be desirable because it might eventually be used as a vehicle to expand standing on a broader scale. While the points may be somewhat inconsistent, however, they are not incompatible. The introduction of precautionary-based standing in environmental cases would be a very limited step. And, it may well be that experience shows that it should not be extended to other areas. Certainly, the Court has been circumspect about extending overbreadth doctrine beyond First Amendment cases, emphasizing that the doctrine constitutes "strong medicine."¹¹⁴ And it may well be that that attitude should apply as well to precautionary-based standing, in that courts should be reticent to invoke it except in appropriate cases. On the other hand, experience may show that the precautionary-based standing provides a valid basis for the evolution of standing doctrine on a broader scale.

That brings us to a fourth normative justification for introducing precautionary-based standing. Development and implementation of the precautionary principle has

¹⁰⁹ See *supra* note 73 and accompanying text.

¹¹⁰ As Chief Justice Roberts noted in dissent, "it may be that governments have done too little to address" global warming. 127 S. Ct. at 1463 (Roberts, C.J., dissenting).

¹¹¹ See, e.g., Thomas Healy, *Stigmatic Harm and Standing*, 92 IOWA L. REV. 417 (2007).

¹¹² See *id.* at 447-63 (elucidating stigmatic harm).

¹¹³ See *supra* the text accompanying note 91.

¹¹⁴ E.g., *Broadrick v. Oklahoma*, 413 U.S. 601, 613 (1973).

lagged, not in small part because of uncertainty as to exactly what the principle means.¹¹⁵ In some sense, there is a vicious cycle: The absence of development in the principle's meaning deters others from implementing the principle, which in turn feeds the absence of development in the principle's meaning. The introduction of the principle into standing would be a progressive step at explicitly establishing the principle in American jurisprudence and then at eliciting judicial interpretations of the principle. Those interpretations, in turn, may provide a base upon which further development and expansion of the principle might take place. Although scholars have produced thoughtful and useful analyses of the precautionary principle, nothing can truly substitute for enshrining the principle in the law and having the principle scrutinized and fleshed out by courts. As Professor Geistfeld has explained:

The vagueness of the precautionary principle suggests that its development and implementation will proceed in stages. Initially, implementation is likely to involve the least controversial aspects of the principle. If these minimal requirements of the principle can be turned into a regulatory decision rule, the rule would at least partially satisfy most proponents of the precautionary principle. Disagreements about other aspects of the principle can then be framed in terms of alterations to the regulatory decision rule.¹¹⁶

Thus may the introduction of precautionary-based standing facilitate the development and spread of the precautionary principle in other contexts.

V. CONCLUSION

In this Essay, I have argued that the Supreme Court in *Massachusetts v. EPA* missed an opportunity to recognize precautionary-based standing. Precautionary-based standing would enable courts to hear cases where it can be shown that harm that might result would be catastrophic and irreversible, and that the likelihood of such harm coming to pass is subject to great uncertainty. Reliance on precautionary-based standing would have garnered greater support for the Court's decision in the *Massachusetts* case.

The use of precautionary-based standing would have a very limited impact on existing standing doctrine. At the same time, the introduction of precautionary-based standing would provide two long-term benefits. First, even though the mere introduction of precautionary-based standing would be limited, it would provide a model for broader relaxation of standing requirements, were that to be deemed to be desirable. More importantly, the introduction of precautionary-based standing would enshrine the precautionary principle in the legal system. The courts, over time, would generate over time judicial interpretations of the precautionary principle, which in turn could be used to further applications of the principle in areas beyond standing.

¹¹⁵ See *supra* the text accompanying notes 17-23.

¹¹⁶ Geistfeld, *supra* note 10, at 11326.

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