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MYTHS OF ENVIRONMENTAL LAW

Albert C. Lin*

Abstract

Environmental law is pervaded by myths—i.e., assumptions that are inaccurate, misleading, or false. These myths arise in various contexts, ranging from wetlands mitigation schemes and pollution credit trading programs to legal regimes premised on the concept of sustainability. This Article explores several myths of environmental law, their origins, and their roles. While political reasons explain in part the creation and prevalence of these myths, more is at work behind these myths than mere politics or failures to implement the law. The myths of environmental law facilitate the management of ecologically complex systems by providing a reductionist account of them. Beyond that, these myths serve important expressive functions in communicating social attitudes and values, legitimating social institutions and practices, and maintaining social solidarity. Awareness of myth's roles in environmental law can enable society to address legal shortcomings that are thereby revealed and to reject or replace those myths that undermine environmental law's goals.

I. INTRODUCTION

Environmental law is pervaded by myths and half-truths. By this, I mean that a number of its regulatory regimes rest on assumptions or beliefs that are inaccurate, unlikely, or arguably false. Perhaps the most obvious example—one that has been the subject of much recent scholarly handwringing—is the goal of sustainability, which plays an especially prominent role in international environmental law but often appears in domestic environmental discourse as well. At best, the concept of sustainability represents a lofty, though unrealistic, goal. At worst, it is a deceptive device that further entrenches existing practices of production and consumption.

Whereas sustainability remains largely an animating principle rather than a legal mandate, other myths are expressed more directly and explicitly in environmental law. For example, several statutes mandate regulation of environmental harms without regard to economic costs. The implementation of these statutes strays from these mandates, however, and calls into question the feasibility of cost-blind regulation. Another widespread myth minimizes the role of individuals

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in causing environmental problems. Many environmental statutes focus instead on industrial polluters. In doing so, these statutes neglect the contribution of individuals to environmental harm and thereby perpetuate the myth that pollution from individuals and other sources is negligible.

Other prominent myths involve frequently used environmental policy tools such as mitigation programs and pollution credits. Ideally, mitigation compensates for environmentally damaging activities such as the destruction of wetlands or habitat. However, scholars often have serious doubts as to whether mitigation truly compensates for the harm caused. Likewise, pollution credits theoretically represent the avoidance of pollution that would otherwise have occurred, and the trading of these credits within cap-and-trade regimes promises more cost-effective pollution reductions than might be achieved under command-and-control regulation. In the context of climate change, however, the efficacy of cap-and-trade regimes in actually reducing carbon emissions—and the validity of some carbon credits—has come into serious doubt.

On occasion, commentators have considered individual environmental myths and proposed explanations for their existence.¹ But to date there has been no systematic analysis of these myths or their implications. This Article explores several prominent myths of environmental law and their possible functions. In addition to the more obvious political reasons for the persistence of these myths, these myths often serve important expressive functions. Furthermore, though the term myth often has a negative connotation, it is important to remember that the laws in which environmental myths are embedded have dramatically reduced pollution, improved environmental quality, and protected valued resources. This Article thus considers the potential value of myth and suggests reforms to bring about a more effective and forthright system of environmental law.

Part II introduces six prominent myths of environmental law that arise in a variety of contexts. Part III considers the inaccuracies or failures that generate these myths. The myths of environmental law may involve shortcomings in implementing the law as well as conceptual flaws in the law itself. Part IV looks to sociology and anthropology for insights into the roles of myths more generally. Myths are not merely a form of primitive science, but perform important functions even in contemporary, complex societies. Part V applies the insights from the study of myths to the myths of environmental law. The analysis in this part reveals that environmental law's myths, like classical myths, explain complexities of the world around us, express social values, and legitimize legal arrangements and economic systems. Finally, Part VI considers implications for designing and implementing environmental law going forward.

¹ See, e.g., William H. Rodgers, Jr., *Deception, Self-Deception, and Myth: Evaluating Long-Term Environmental Settlements*, 29 U. RICH. L. REV. 567, 573–75 (1995).

II. SIX PROMINENT MYTHS OF ENVIRONMENTAL LAW

This Part introduces six areas of environmental law in which myths play a prominent role: wetlands mitigation schemes, pollution credit trading programs, risk assessment, legal standards that purport to regulate without regard to cost, regulatory programs that focus on industrial pollution sources, and sustainable development. The widespread presence of myths in environmental law suggests that their occurrence is not merely accidental and merits closer examination.

A. Wetlands Mitigation

Environmental mitigation refers to efforts to compensate for the negative effects human activities have on the environment. Mitigation programs may address the loss of specific environmental amenities, such as open space or habitat,² or the general environmental effects of a proposed project.³ Such programs may require project proponents to undertake compensatory measures directly or to pay fees to support such measures.

Wetlands mitigation provides a leading example of such programs. Wetlands perform important ecological functions, including moderating floods, filtering wastes, and providing habitat for numerous species.⁴ Federal wetlands protection occurs primarily through the Clean Water Act (CWA), which requires a property owner to obtain a Section 404 permit from the U.S. Army Corps of Engineers (Corps) prior to “the discharge of dredged or fill material into the navigable waters at specified disposal sites.”⁵ The Corps may not issue a permit “if there is a

² See 16 U.S.C. § 1539(a)(2) (2012) (authorizing issuance of incidental take permits under the Endangered Species Act where applicants have prepared a habitat conservation plan specifying steps to minimize and mitigate impacts on protected species); Fred Bosselman, *Swamp Swaps: The “Second Nature” of Wetlands*, 39 ENVTL. L. 577, 591–92 (2009) (discussing species conservation banks); David C. Levy & Jessica Owley Lippmann, *Preservation as Mitigation Under CEQA: Ho Hum or Uh-Oh?*, ENVTL. L. NEWS, Summer 2005, at 18, 18–19 (discussing the two most common forms of mitigation).

³ See, e.g., CAL. PUB. RES. CODE § 21002 (West 2007 & Supp. 2014) (requiring mitigation under the California Environmental Quality Act (CEQA)). While the National Environmental Policy Act (NEPA) does not contain a substantive mitigation requirement equivalent to that found in CEQA, a federal agency may avoid having to prepare a full-blown environmental impact statement if it adopts mitigation measures sufficient to avoid significant effects, referred to as a “mitigated FONSI.” See Final Guidance for Federal Departments and Agencies on the Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact, 76 Fed. Reg. 3843, 3848 (Jan. 21, 2011) (to be codified at 40 C.F.R. pts. 1500–02, 1505–08).

⁴ HOLLY DOREMUS ET AL., ENVIRONMENTAL POLICY LAW: PROBLEMS, CASES, AND READINGS 381–82 (6th ed. 2012); Philip Womble & Martin Doyle, *The Geography of Trading Ecosystem Services: A Case Study of Wetland and Stream Compensatory Mitigation Markets*, 36 HARV. ENVTL. L. REV. 229, 238–45 (2012).

⁵ 33 U.S.C. § 1344(a) (2012).

practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem.”⁶ Furthermore, the proposed discharge may not “cause or contribute to significant degradation of the waters of the United States,”⁷ and the applicant must take “appropriate and practicable steps . . . [to] minimize potential adverse impacts of the discharge on the aquatic ecosystem.”⁸ Finally, the applicant must compensate for those impacts that remain by replacing or providing substitute wetland habitat.⁹ Together, these requirements constitute a “mitigation sequence” for permit applicants to follow: avoidance of impacts, minimization of unavoidable impacts, and compensation.¹⁰

Since 1989, the United States has maintained a goal of “no net loss” of wetlands acreage and function.¹¹ If a proposed action will have unavoidable adverse impacts on aquatic resources, the government requires compensatory mitigation to ensure the no net loss goal is met.¹² Although the mitigation sequence prioritizes avoidance and minimization of adverse impacts over compensatory mitigation, landowners frequently opt for compensatory mitigation first.¹³ Such mitigation may involve restoring a previously existing wetland, enhancing an existing wetland’s functions, preserving an existing wetland, or creating a new wetland.¹⁴ A permittee may fulfill its mitigation responsibilities by conducting the mitigation itself or by contributing toward offsite mitigation through a mitigation bank or in-lieu fee mitigation program.¹⁵

Unfortunately, compensatory mitigation has failed to achieve the no net loss objective. A 2001 study by the National Research Council (NRC) concluded as much, notwithstanding the fact that the wetlands permits on paper required 1.8 acres

⁶ 40 C.F.R. § 230.10(a) (2013).

⁷ *Id.* § 230.10(c).

⁸ *Id.* § 230.10(d).

⁹ *See id.* § 230.75(d).

¹⁰ Palmer Hough & Morgan Robertson, *Mitigation Under Section 404 of the Clean Water Act: Where It Comes From, What It Means*, 17 WETLANDS ECOLOGY & MGMT. 15, 18–19 (2009); Memorandum of Agreement Between the Dep’t of the Army and the Env’tl. Prot. Agency, *The Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines* (Feb. 6, 1990), available at <http://water.epa.gov/lawsregs/guidance/wetlands/mitigate.cfm>, archived at <http://perma.cc/S7K-9S6H>. Even if these requirements are met, the Corps may deny a permit if the proposed activity is contrary to the public interest, 33 C.F.R. § 320.4(a)(1) (2014), and the EPA may veto a Corps-issued permit for activities having unacceptable adverse effects on the environment, 33 U.S.C. § 1344(c) (2012). The practice of mitigation grew out of these agencies’ respective unwillingness to exercise their authority to deny or veto permits. *See* Hough & Robertson, *supra* at 17.

¹¹ DOREMUS ET AL., *supra* note 4, at 382.

¹² Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. 19,594, 19,594 (Apr. 10, 2008) (to be codified at 40 C.F.R. pt. 230).

¹³ *See* Bonnie Malloy, *Symbolic Gestures or Our Saving Grace: The Relevance of Compensatory Mitigation for Florida’s Wetlands in the Climate Change Era*, 27 J. LAND USE & ENVTL. L. 103, 117 (2011); Bosselman, *supra* note 2, at 582–83.

¹⁴ Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. at 19,594.

¹⁵ *Id.* at 19,594–95.

to be mitigated for every acre lost.¹⁶ Factors contributing to this failure include unclear standards, standards that focus on easily measured parameters rather than overall viability, and inadequate implementation and enforcement.¹⁷ For example, more readily constructed open-water areas are often used to compensate for the loss of saturated or intermittently inundated wetlands, even though each of these wetland types tends to contain different species and perform different ecological functions.¹⁸ Summarizing the results of earlier studies, the NRC concluded that only “[b]etween 70% and 76% of the mitigation required in the permits is implemented, . . . about 50% to 53% of the implemented mitigation projects did not meet the permit requirements[, and] the estimate of functional equivalency of mitigation wetland was about 20% of that intended.”¹⁹

The federal government responded to the NRC study by issuing new regulations adopting many of the study’s recommendations.²⁰ Mitigation is to be “based on what is practicable and capable of compensating for the aquatic resource functions that will be lost as a result of the permitted activity,”²¹ and mitigation plans must contain ecologically based performance standards.²² The new rules also establish a preference for the use of mitigation banks, as opposed to in-lieu fee programs or permittee-responsible mitigation. Mitigation banks are offsite conservation areas designed to replace destroyed wetland resources; because their establishment typically occurs prior to wetlands destruction, they are considered to be less environmentally risky.²³ Moreover, they enable the consolidation of resources, expertise, and monitoring efforts in connection with large, ecologically valuable parcels.²⁴

One commentator nonetheless has criticized the new rules for allowing “far too much discretion . . . to allow mitigation to occur” instead of avoidance or

¹⁶ NAT’L RESEARCH COUNCIL, COMPENSATING FOR WETLAND LOSSES UNDER THE CLEAN WATER ACT 2–3 (2001).

¹⁷ *See id.* at 95–108.

¹⁸ *See id.* at 106.

¹⁹ *Id.* at 120; *see also* Royal C. Gardner et al., *Compensating for Wetland Losses Under the Clean Water Act (Redux): Evaluating the Federal Compensatory Mitigation Regulation*, 38 STETSON L. REV. 213, 219 nn.35–40 (2009) (citing studies exploring various mitigation methods).

²⁰ Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. at 19,594; *see also* National Defense Authorization Act for Fiscal Year 2004, Pub. L. No. 108-136, § 314(b), 117 Stat. 1392, 1431 (2003) (mandating issuance of these regulations).

²¹ 33 C.F.R. § 332.3(a)(1) (2013).

²² *Id.* § 332.5(a).

²³ *See* Jessica Owley, *The Increasing Privatization of Environmental Permitting*, 46 AKRON L. REV. 1091, 1108–10 (2013).

²⁴ 33 C.F.R. § 332.3(a)(1); Owley, *supra* note 23, at 1110. Empirical data, however, suggests that mitigation banks may not be more effective than mitigation performed by permittees. *See* Rebecca L. Kihslinger, *Success of Wetland Mitigation Projects*, NAT’L WETLANDS NEWSL., Mar.–Apr. 2008, at 14, 15.

minimization.²⁵ Further, the rules arguably “include[] too few safeguards to ensure that mitigation serves to successfully compensate for lost functions and values of impacted waters.”²⁶ For example, the rules allow preservation of wetlands other than the ones under permit to serve as compensatory mitigation where, among other conditions, the resources to be preserved have important ecological functions.²⁷ Preservation of valuable wetlands can be a critical objective. However, by definition, preservation creates no new resources to compensate for destroyed wetlands.²⁸ Nor does it even enhance or restore existing resources.²⁹ Accepting preservation as a form of mitigation thus runs counter to the basic principle that mitigation should compensate for destroyed or damaged resources. Finally, although the full effects of the new rules remain to be seen, the Corps’ past reluctance to deny permit applications³⁰ also warrants concern because it foreshadows a continuing failure to apply and enforce standards designed to protect the environment.

In many instances, mitigation does not truly compensate for ecological harm. Wetlands mitigation schemes assume that wetlands are fungible, yet ecological complexity calls into question this assumption. In addition, to the extent these schemes accept preservation as a form of mitigation, they require no compensation at all. Ultimately, the shortcomings of wetlands mitigation programs make it unlikely that the no net loss goal will be achieved.

B. Pollution Credit Trading Programs

Pollution credit trading programs rest on an assumption similar to that underlying wetlands mitigation: pollution emissions are fungible. Although this

²⁵ James Murphy et al., *New Mitigation Rule Promises More of the Same: Why the New Corps and EPA Mitigation Rule Will Fail to Protect Our Aquatic Resources Adequately*, 38 STETSON L. REV. 311, 313 (2009).

²⁶ *Id.*

²⁷ 33 C.F.R. § 332.3(h). Among these conditions are requirements that the preserved resources be “under threat of destruction or adverse modifications” and that the preserved site “be permanently protected.” *Id.* § 332.3(h)(1)(iv)–(v).

²⁸ See Murphy et al., *supra* note 25, at 332–33; see also Levy & Lippmann, *supra* note 2, at 19 (criticizing preservation as a form of mitigation because preservation “admits that destruction of the amenity will occur,” “results in an overall net loss in the amenity,” and only “seeks to prevent future harm”). The use of preservation as a form of mitigation under CEQA illustrates a similar dynamic. Under CEQA, projects requiring agency approval must incorporate feasible mitigation measures. CAL. PUB. RES. CODE § 21002 (West 2007 & Supp. 2014); CAL. CODE REGS. tit. 14, §§ 15092, 15096(h) (2014). CEQA’s implementing regulations define mitigation to include the preservation of offsite resources. *Id.* § 15370. Preservation is a commonly used method to meet CEQA mitigation requirements, notwithstanding the fact that preservation does not actually mitigate the present harms of a proposed project. See Levy & Lippmann, *supra* note 2, at 20.

²⁹ See Murphy et al., *supra* note 25, at 332.

³⁰ See Malloy, *supra* note 13, at 119–20 (noting that over 12,000 permits were issued and only one permit was denied between 1999 and 2003); Hough & Robertson, *supra* note 10, at 27 (reporting a 0.25% denial rate in 2004 and 2005).

assumption may be less problematic than in the wetlands context, these programs nevertheless are subject to controversy.

In the last two decades, cap-and-trade programs have become an increasingly popular mechanism for regulating air pollution.³¹ The key selling point behind cap-and-trade schemes is the promise to yield pollution reductions more cost effectively than conventional command-and-control regulation. Cap-and-trade programs require sources of pollution to possess pollution allowances in a quantity equivalent to the amount of pollution they emit. A program caps the total quantity of allowances, and program administrators distribute allowances to pollution sources either for free or via auction. A source may then purchase or sell allowances, and its decisions will depend on a comparison of allowance prices with the source's cost of reducing emissions directly.

Cap-and-trade programs frequently allow pollution sources to satisfy program requirements by using offsets in lieu of allowances.³² Offsets are typically generated when sources *outside* the cap-and-trade program reduce their pollution.³³ Once these reductions are verified, the sources receive offset credits that may be used or sold like allowances.³⁴

Emission trading programs pose substantial challenges for enforcement: program effectiveness hinges on accurate emissions data, which is often difficult if not impossible to come by.³⁵ To make matters worse, the financial gains made possible by allowance trading create incentives for fraud.³⁶ These challenges expand when pollution sources are allowed to use offsets to satisfy program requirements.³⁷ The inclusion of offsets complicates the already demanding tasks of monitoring and verification because offsets originate from sources whose emissions tend to be especially difficult and costly to measure. Sources of offsets may include, for example, small-scale polluters not subject to emissions monitoring, as well as forestry, ranching, and other land-use activities whose emissions are not readily quantified.³⁸ They also may include sources located outside the jurisdiction of the agency that oversees the emissions trading program.³⁹ Unfortunately, offset

³¹ See Lesley K. McAllister, *The Overallocation Problem in Cap-and-Trade: Moving Toward Stringency*, 34 COLUM. J. ENVTL. L. 395, 396 (2009).

³² Lesley K. McAllister, *The Enforcement Challenge of Cap-and-Trade Regulation*, 40 ENVTL. L. 1195, 1216 (2010).

³³ *Id.* Offsets may also be generated by projects that sequester pollution. *See id.*

³⁴ *Id.*

³⁵ *Id.* at 1197–1216.

³⁶ *Id.* at 1200–02.

³⁷ *Id.* at 1216–17.

³⁸ *Id.*; see, e.g., *Compliance Offset Program*, AIR RESOURCES BOARD, <http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm>, archived at <http://perma.cc/V9E3-X7LE> (last visited Aug. 27, 2014) (describing California's adoption of carbon offset protocols governing forest and livestock projects, and elimination of ozone depleting substances).

³⁹ David M. Driesen, *Linkage and Multilevel Governance*, 19 DUKE J. COMP. & INT'L L. 389, 402–03 (2009). Cap-and-trade programs have also been plagued by a tendency to

programs can even undermine pollution reduction goals by “encourag[ing] project hosts to gain credit when net emissions happen to be declining (whether or not they are actually declining due to some additional effort) but leav[ing] the source unregulated when net emissions are rising.”⁴⁰

Notwithstanding these concerns, cap-and-trade programs addressing greenhouse gas (GHG) emissions have been adopted internationally (under the Kyoto Protocol), regionally (within the European Union), nationally (e.g., by Norway),⁴¹ and subnationally (e.g., by California in its implementation of AB 32).⁴² The stated appeal of these schemes is their ability to generate cost-effective emissions reductions. The extent to which these programs have actually reduced carbon emissions is open to debate, however. Indeed, their continued use despite accompanying doubts suggests that their appeal derives from appearing to tackle the problem while avoiding more onerous, systemic changes that might be necessary.

The Kyoto Protocol presents perhaps the most prominent example of the difficulties faced by carbon trading schemes. Under the Kyoto Protocol, industrialized nations—but not developing countries—committed to reduce their GHG emissions during a five-year commitment period (2008–2012) by approximately five percent from 1990 emission levels.⁴³ On paper, the agreement pushed nations primarily to reduce emissions themselves by requiring that any emissions trading be “supplemental to domestic actions.”⁴⁴ However, the Protocol contained several “flexibility mechanisms” designed to ease compliance, including the Clean Development Mechanism (CDM) and emissions trading. These mechanisms have proven critical to fulfilling industrialized nations’ commitments.

The offset system created by the CDM has had especially troubling effects. The CDM was intended to foster sustainable development in developing countries while reducing industrialized countries’ compliance costs.⁴⁵ Under the CDM, industrialized nations may obtain carbon credits (“certified emission reductions”) for funding activities in developing countries that reduce GHG emissions.⁴⁶ These credits essentially substitute carbon-reducing projects in developing countries for

over-allocate allowances, a problem that can defeat the purpose of these programs. McAllister, *supra* note 31, at 410–11.

⁴⁰ Michael W. Wara & David G. Victor, *A Realistic Policy on International Carbon Offsets* 15 (Program on Energy & Sustainable Dev., Working Paper No. 74, 2008).

⁴¹ Judson Jaffe et al., *Linking Tradable Permit Systems: A Key Element of Emerging International Climate Policy Architecture*, 36 *ECOLOGY L.Q.* 789, 793 (2009) (noting that Norway operated its own emissions trading system before joining the European Union Emission Trading System in 2008).

⁴² See Ann E. Carlson, *Regulatory Capacity and State Environmental Leadership: California’s Climate Policy*, 24 *FORDHAM ENVTL. L. REV.* 63, 70–75 (2013).

⁴³ Kyoto Protocol to the United Nations Framework Convention on Climate Change art. 3.1 & Annex B, Dec. 10, 1997, 37 *I.L.M.* 22 [hereinafter Kyoto Protocol].

⁴⁴ *Id.* art. 16 *bis*.

⁴⁵ *Id.* art. 12.2.

⁴⁶ *Id.* art. 12.3.

commitments to reduce existing emissions in industrialized nations.⁴⁷ Ensuring that CDM projects actually produce a net reduction in emissions is essential to the integrity of the system, especially as the Kyoto Protocol placed no limit on the number of carbon credits that may be generated through the CDM.⁴⁸

As an example of a CDM project, investment in switching a coal-fueled power plant in China to natural gas would generate certified credits if it can be shown that the project reduces emissions. These reductions must be real and additional to what would have happened in the absence of such investment. However, determining whether an activity and any associated emissions reductions are real and additional is controversial and problematic.⁴⁹ In the power plant example, it may be impossible to determine whether the switch to natural gas would have occurred in the absence of the CDM. Such a determination requires a hypothetical inquiry that has proven to be extremely susceptible to manipulation. Host governments, project investors, and third-party verifiers, on which the system relies, all face incentives—whether in gathering data, analyzing information, or certifying projects—that favor project approval.⁵⁰

Indeed, implementation of the CDM has increased net GHG emissions in some instances. Most notoriously, the easy availability of carbon credits prompted manufacturers of coolant gases (which happen to be powerful GHGs) to dramatically increase coolant production for the sole purpose of destroying waste gases (which are even more powerful GHGs), thereby generating carbon credits.⁵¹

⁴⁷ Gernot Klepper, *The Future of the European Emission Trading System and the Clean Development Mechanism in a Post-Kyoto World*, 33 ENERGY ECON. 687, 696 (2011).

⁴⁸ See Kyoto Protocol, *supra* note 43, at art. 12; David Campbell et al., *After Cancun: The Impossibility of Carbon Trading*, 29 U. QUEENSLAND L.J. 163, 171 (2010).

⁴⁹ Lambert Schneider, *Assessing the Additionality of CDM Projects: Practical Experiences and Lessons Learned*, 9 CLIMATE POL'Y 242, 243–47, 250 (2009); Wara & Victor, *supra* note 40, at 8 (“At root, the CDM and other offset schemes are unable to determine reliably whether credits are issued for activities that would have happened anyway while also keeping transaction costs under control and assuring investor certainty.”).

⁵⁰ Wara & Victor, *supra* note 40, at 11. The problems encountered in ensuring the additionality and legitimacy of offsets are not limited to the CDM. The offset portion of California’s carbon cap-and-trade program has prompted similar concerns. See Alan Ramo, *The California Offset Game: Who Wins and Who Loses?*, 20 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 109, 123–29 (2014).

⁵¹ Elisabeth Rosenthal & Andrew W. Lehren, *Profits on Carbon Credits Drive Output of a Harmful Gas*, N.Y. TIMES, Aug. 8, 2012, http://www.nytimes.com/2012/08/09/world/asia/incentive-to-slow-climate-change-drives-output-of-harmful-gases.html?pagewanted=all&_r=0, archived at <http://perma.cc/3UPM-4UZK>; Campbell et al., *supra* note 48, at 179–81 (noting that the majority of credits generated under the CDM have involved destruction of HFC₂₃, a by-product of refrigerant production with an extremely high global warming potential—and a correspondingly high value for purposes of generating emission credits); see also Barry D. Solomon & Michael K. Heiman, *Integrity of the Emerging Global Markets in Greenhouse Gases*, 100 ANNALS ASS’N AM. GEOGRAPHERS 973, 978 (2010) (discussing problems encountered in verifying and certifying emission reductions under the CDM).

These operations are responsible for nearly half of all credits awarded under the CDM, and efforts to rein them in have been stymied by concerns that manufacturers will release the waste gases directly into the atmosphere if they are not paid to destroy them.⁵²

Another flexibility mechanism of the Kyoto Protocol, emissions trading, has likewise undermined emissions reduction efforts. In particular, the shrinking of the economies in the former Soviet Republics and Eastern Europe left these nations with numerous excess allowances to sell, sometimes referred to as “hot air” allowances.⁵³ Although some countries have shunned the use of these hot air allowances to meet their Kyoto obligations, other nations have relied on them to avoid drastic cuts of their own.⁵⁴ Indeed, so many of these allowances were left over after the original Kyoto commitment period that they became the subject of contentious negotiations.⁵⁵ Although the developed countries collectively met their pledged Kyoto reductions, their emissions were not much lower than they would have been in the absence of Kyoto, thanks to emissions trading and the global economic downturn.⁵⁶

Carbon trading programs ultimately rest on two key assumptions: that emissions are fungible and that *calculated* emissions reductions represent *actual* emissions reductions. The first assumption—that emissions are fungible—is relatively unproblematic. In contrast to wetlands, whose value and function depend on their location and unique characteristics, the effects of carbon emissions are

⁵² See Rosenthal & Lehren, *supra* note 51.

⁵³ See Elizabeth Lokey Aldrich & Cassandra L. Koerner, *Unveiling Assigned Amount Unit (AAU) Trades: Current Market Impacts and Prospects for the Future*, 3 *ATMOSPHERE* 229, 231 (2012). Each party subject to binding emission limits under the Kyoto Protocol is issued one Assigned Amount Unit (AAU) for each metric ton of carbon dioxide it is allowed to emit. *See id.* at 229–30.

⁵⁴ Aldrich & Koerner, *supra* note 53, at 232–34; Quirin Schiermeier, *Hot Air*, 491 *NATURE* 656, 656–57 (2012). The Kyoto Protocol did not place any limit on the trading of AAUs other than to insist that emissions trading be a supplemental means for parties to meet their emission limits. Kyoto Protocol, *supra* note 43, at art. 16 *bis*. In contrast, the European Union has placed limits on members’ abilities to rely on offsets from the CDM and another of Kyoto’s project mechanisms, Joint Implementation. On average, parties can meet up to 13.5% of their allocations by surrendering credits from these programs. Raphael Trotignon, *Combining Cap-and-Trade with Offsets: Lessons from CER Use in the EU ETS in 2008 and 2009*, at 5 (Climate Econ. Chair Publ’ns, Working Paper Series No. 2011-03, 2011), available at <http://www.chaireconomieduclimat.org/wp-content/uploads/2011/02/11-01-19-Trotignon-Use-of-Offsets-in-the-EU-ETS-CEC1.pdf>, archived at <http://perma.cc/TSG3-8VNP>; Matthew Ranson & Robert N. Stavins, *Post-Durban Climate Policy Architecture Based on Linkage of Cap-and-Trade Systems*, 13 *CHI. J. INT’L L.* 403, 416, 437 (2013).

⁵⁵ See, e.g., Barbara Lewis, *EU Environment Ministers Clash Over ‘Hot Air,’* *REUTERS* (Oct. 25, 2012, 5:34 PM), <http://www.trust.org/item/20121025173400-nhe7g/?source=search>, archived at <http://perma.cc/887E-RAHM>.

⁵⁶ Aldrich & Koerner, *supra* note 53, at 231, 239; Schiermeier, *supra* note 54, at 657.

independent of their locale.⁵⁷ However, the second assumption—that *calculated* emissions reductions represent *actual* emissions reductions—is tenuous, particularly when it comes to offsets. Additionality is essential to ensuring that actual net reductions in pollution occur, yet has proven almost impossible to ensure. Moreover, hot air allowances and other accounting maneuvers call into question the sincerity of the international community in addressing climate change.

Generally speaking, pollution trading systems and other market-based mechanisms tap into fundamental beliefs regarding private property rights, utilitarianism, and virtues of the free market.⁵⁸ These beliefs do not constitute myths themselves so much as a system of values—values that are contested not only within environmental policy circles but also in society more broadly. But just as classical myths reflected and reinforced societal values in ancient societies, the mythology of pollution trading systems likewise bolsters market-oriented values today.

C. Risk Assessment

In systematizing the exchange of wetlands and pollution credits, mitigation and pollution trading schemes attempt to quantify phenomena that may not be readily subject to quantification. Such quantification reaches an extreme in risk assessment, the process of characterizing the probability and magnitude of potential harms from an event or occurrence.⁵⁹ Chemical risk assessment, for example, identifies potential hazards, estimates the probability and magnitude of injury at different exposure levels, and analyzes the likelihood of exposure.⁶⁰ The risk assessment process ultimately generates a risk characterization, which ideally includes a range of estimates to quantify identified hazards. Policymakers use the information generated by risk assessments to make risk management decisions ranging from inaction or further study to regulation or prohibition.⁶¹

Risk assessment is at the heart of many environmental statutes and regulatory actions. For example, risk assessment plays an important role in the setting of air pollution standards by the Environmental Protection Agency (EPA), which examines whether pollutants endanger the public health or cause adverse effects on public welfare.⁶² Risk assessment is also central to the regulation of toxic substances

⁵⁷ In some circumstances, however, co-pollutants that are emitted along with carbon can have locally concentrated effects. *See* Ramo, *supra* note 50, at 130–32.

⁵⁸ Harro van Asselt & Joyeeta Gupta, *Stretching Too Far? Developing Countries and the Role of Flexibility Mechanisms Beyond Kyoto*, 28 STAN. ENVTL. L.J. 311, 337–38 (2009); Todd B. Adams, *Is There a Legal Future for Sustainable Development in Global Warming? Justice, Economics, and Protecting the Environment*, 16 GEO. INT'L ENVTL. L. REV. 77, 113 (2003).

⁵⁹ *See* DOREMUS ET AL., *supra* note 4, at 414, 417–20.

⁶⁰ *See id.*

⁶¹ *See id.* at 421.

⁶² *See, e.g.*, 42 U.S.C. § 7409(b) (2012) (authorizing the EPA to set National Ambient Air Quality Standards); *id.* § 7521 (authorizing the EPA to regulate air pollutants from new motor vehicles or new motor vehicle engines).

under the Toxic Substances Control Act, which authorizes regulation of chemical substances where “there is a reasonable basis to conclude that . . . [they] present[] or will present an unreasonable risk of injury to health or the environment.”⁶³ And risk assessment is integral to the projection and analysis of environmental impacts under the National Environmental Policy Act (NEPA) and other statutes that mandate environmental assessments.⁶⁴

A consideration of the chemical risk assessment process illustrates the substantial uncertainty risk assessments often involve. Key uncertainties in chemical risk assessments surround the shape of the dose-response curve, generalizability of results from animal and in vitro studies to humans, extrapolation from high levels of exposure studied in controlled experiments to lower levels more typically encountered outside the lab, variations in individual susceptibility, and effects of exposure to complex chemical mixtures.⁶⁵ The undisputed uncertainty that pervades chemical risk assessments undermines the value of the data such assessments generate. Recognizing and communicating these uncertainties to decision makers and the public is thus critical to informed policymaking.⁶⁶

Unfortunately, however, such uncertainties often receive little attention in the policymaking process. The quantitative analyses typically generated by risk assessments tend to hinder the consideration of qualitative factors and other pertinent concerns less amenable to quantification.⁶⁷ Even worse, because regulatory statutes often require a degree of certainty as a precondition to regulate, the mere presence of uncertainty regarding harm provides a powerful lever for industry to argue against regulation.⁶⁸ Under the law, lack of evidence of risk is typically treated as evidence of lack of risk.⁶⁹

Risk assessments depend on a central assumption: that the study and quantification of hazards can capture relevant risks with reasonable accuracy. Risk

⁶³ 15 U.S.C. § 2605(a) (2012).

⁶⁴ See 42 U.S.C. § 4332(C) (outlining the NEPA requirement that federal agencies prepare an environmental impact statement); CAL. PUB. RES. CODE § 21080 (West Supp. 2014) (setting out the environmental impact analysis requirements of the CEQA).

⁶⁵ INST. OF MED., ENVIRONMENTAL DECISIONS IN THE FACE OF UNCERTAINTY 52–56 (2013).

⁶⁶ *Id.* at 181; David Kriebel, *How Much Evidence Is Enough? Conventions of Causal Inference*, 72 LAW & CONTEMP. PROBS. 121, 133–35 (2009).

⁶⁷ See ULRICH BECK, THE RISK SOCIETY: TOWARDS A NEW MODERNITY 71 (Mark Ritter trans., 1992) (criticizing assumption of scientific rationality “that so long as risks are not recognized scientifically, *they do not exist*—at least not legally, medically, technologically, or socially, and they are thus not prevented, treated or compensated for”); SHEILA JASANOFF, DESIGNS ON NATURE: SCIENCE AND DEMOCRACY IN EUROPE AND THE UNITED STATES 265 (2005) (“In the United States, a preferred method for displaying objectivity in public decisions has been to clothe the reasons for allocative choices as far as possible in the language of numbers.”).

⁶⁸ Kriebel, *supra* note 66, at 123; see Alyson C. Flournoy, *Coping with Complexity*, 27 LOY. L.A. L. REV. 809, 819–20 (1994).

⁶⁹ See Alyson C. Flournoy, *Legislating Inaction: Asking the Wrong Questions in Protective Environmental Decisionmaking*, 15 HARV. ENVTL. L. REV. 327, 366 (1991).

assessments are mythical in that they offer a sense of control, certainty, and objectivity in situations of ignorance, doubt, and subjective judgment. Thanks to the numerous sources of uncertainty and subjectivity involved in the assessment process, one critic goes so far as to assert that risk assessments “generate[] numbers that are meaningless” and “anything but scientific, objective, and credible.”⁷⁰ “The unreliability of risk assessment is an open secret. . . . This open secret about risk assessment has not, however, reached the administrative agencies or the courts, which continue to speak in precise terms about the number of lives purportedly ‘saved’ by various regulations.”⁷¹ In other words, although risk assessments do not fully or accurately describe the environmental hazards around us, we—society and its institutions—act as if they do.

D. Regulation Without Regard to Costs

While almost all environmental statutes are in some way concerned with risk, the standards in some statutes purport to focus solely on risk regardless of economic costs. Section 109 of the Clean Air Act (CAA), for example, instructs the EPA to set National Ambient Air Quality Standards (NAAQS) at a level that “protect[s] the public health” with “an adequate margin of safety.”⁷² Similarly, Section 7 of the Endangered Species Act (ESA) commands federal agencies to “insure that any action authorized, funded, or carried out” by them does not jeopardize the continued existence of any protected species or adversely modify such species’ critical habitat.⁷³ Neither of these provisions explicitly mentions costs.⁷⁴ Indeed, the Supreme Court has interpreted both provisions to preclude agencies from taking costs into account. As to CAA Section 109, the Court declared in *Whitman v. American Trucking Ass’ns, Inc.*,⁷⁵ that it is “fairly clear that [the text of the statute]

⁷⁰ Mark Eliot Shere, *The Myth of Meaningful Environmental Risk Assessment*, 19 HARV. ENVTL. L. REV. 409, 413–14 (1995).

⁷¹ *Id.* at 414.

⁷² Clean Air Act § 109, 42 U.S.C. § 7409(b)(1) (2012). Prior to the 1990 Clean Air Act Amendments, Section 112 of the Act similarly required the EPA to regulate hazardous air pollutants without regard to cost. See John P. Dwyer, *The Pathology of Symbolic Legislation*, 17 ECOLOGY L.Q. 233, 237 (1990).

⁷³ Endangered Species Act § 7, 16 U.S.C. § 1536(a)(2) (2012).

⁷⁴ There are other statutory provisions that purport to regulate without regard to cost. Section 101 of the Clean Water Act establishes a “national goal that the discharge of pollutants into the navigable waters be eliminated by 1985.” Clean Water Act § 101, 33 U.S.C. § 1251(a)(1) (2012). *But cf.* Jonathan Remy Nash, *Framing Effects and Regulatory Choice*, 82 NOTRE DAME L. REV. 313, 340 & n.105 (2006) (describing this language as “a societal aspiration,” suggesting that the statute does not quite mean what it says (emphasis omitted)). In addition, the Delaney Clause in the Food and Drug Act prohibits food and color additives that are found to be carcinogenic. See 21 U.S.C. §§ 348(c)(3)(A), 379e(b)(5)(B) (2012); Wendy E. Wagner, *The Science Charade in Toxic Risk Regulation*, 95 COLUM. L. REV. 1613, 1668 n.201 (1995).

⁷⁵ 531 U.S. 457 (2001).

does not permit the EPA to consider costs in setting the standards.”⁷⁶ And as to ESA Section 7, the Court found in *Tennessee Valley Authority v. Hill*⁷⁷ that the statute “admits of no exception,” in accord with Congress’ intent “to halt and reverse the trend toward species extinction, whatever the cost.”⁷⁸

None of this is to say that costs are irrelevant to the implementation of these statutes, however. A careful examination of NAAQS implementation under the CAA, for example, reveals a significant role for costs.⁷⁹ The CAA holds states responsible for achieving the NAAQS by adopting and carrying out state implementation plans.⁸⁰ States may consider claims of infeasibility, as well as costs, in the course of developing those plans.⁸¹

Furthermore, notwithstanding the text of Section 109, it is virtually inevitable that the EPA incorporate cost considerations in the course of developing, setting, and revising NAAQS⁸²—though the agency emphatically denies doing so.⁸³ The

⁷⁶ *Id.* at 465.

⁷⁷ 437 U.S. 153 (1978).

⁷⁸ *Id.* at 173, 184. The ESA does authorize the government to consider costs in the designation of critical habitats. *See* 16 U.S.C. § 1533(b)(2). And a post-*Tennessee Valley Authority v. Hill* amendment to the ESA establishes a procedure for granting exemptions from the requirements of Section 7(a)(2). *See id.* § 1536(h).

⁷⁹ A similar analysis could be undertaken with respect to Section 7 of the ESA. Federal wildlife agencies have implemented Section 7 in such a way as to avoid many of the potentially drastic implications of a truly cost-blind approach. For one, the agencies have interpreted the mandate to avoid adverse modification of critical habitat as redundant with the mandate to avoid jeopardy. Daniel J. Rohlf, *Jeopardy Under the Endangered Species Act: Playing a Game Protected Species Can’t Win*, 41 WASHBURN L.J. 114, 118 (2001). In addition, for many species, these agencies have made no critical habitat designation at all. *Id.* at 117. Furthermore, the rarity of jeopardy findings suggests the wildlife agencies are reluctant to act on the basis of biological data alone. *See id.* at 115.

⁸⁰ 42 U.S.C. § 7410 (2012).

⁸¹ *Am. Trucking*, 531 U.S. at 470–71; *see* David M. Driesen, *Should Congress Direct the EPA to Allow Serious Harms to Public Health to Continue?: Cost-Benefit Tests and NAAQS Under the Clean Air Act*, 11 TUL. ENVTL. L.J. 217, 219 (1998) (distinguishing between consideration of cost when defining “clean air” from consideration of costs when determining how to reach the NAAQS, and suggesting that the CAA permits the latter, not the former).

⁸² Cary Coglianese & Gary E. Marchant, *Shifting Sands: The Limits of Science in Setting Risk Standards*, 152 U. PA. L. REV. 1255, 1341 n.372 (2004) (listing a multitude of sources that reach this conclusion).

⁸³ *See, e.g.*, National Ambient Air Quality Standards for Particulate Matter, 78 Fed. Reg. 3086, 3089 (Jan. 15, 2013) (to be codified at 40 C.F.R. pts. 50–53, 58) (explaining that the EPA conducted a regulatory impact analysis to provide information on potential costs and benefits of alternative standards, but affirming “the EPA may not consider the costs of implementing the standards”); Coglianese & Marchant, *supra* note 82, at 1269–73 (recounting EPA statements justifying NAAQS revisions in terms of scientific evidence alone); *see also* Cass R. Sunstein, *Is the Clean Air Act Unconstitutional?*, 98 MICH. L. REV. 303, 317 n.51 (1999) (“[The] EPA’s failure to require more stringent regulation of particulates provides some evidence of cost consideration.”).

EPA has at least two avenues to consider costs. First, the CAA requires the EPA to set NAAQS only for criteria pollutants—pollutants that the agency has identified as “caus[ing] or contribut[ing] to air pollution which may reasonably be anticipated to endanger public health or welfare” and “the presence of which in the ambient air results from numerous or diverse mobile or stationary sources.”⁸⁴ Although this language does not reference costs, it gives the EPA broad discretion to determine what substances qualify as criteria pollutants in the first instance.⁸⁵ The fact that the EPA has not identified any new criteria pollutants since 1976—when it added lead to the criteria pollutant list in response to a court order⁸⁶—suggests the EPA is reluctant to act because of the costs that listing a new pollutant might impose.⁸⁷ Second, the EPA has repeatedly rejected the option of setting a zero-level standard for criteria pollutants, notwithstanding the widespread view that many criteria pollutants have no threshold for safe exposure.⁸⁸ Indeed, the House Report on the 1977 CAA Amendments recognized as much, admitting that it is a “necessary myth” that such pollutants have a safe threshold for exposure.⁸⁹ Thus, at least at the margins, cost considerations and political realities have precluded the EPA from identifying criteria pollutants and selecting standards that would impose excessive

⁸⁴ 42 U.S.C. § 7408(a)(1)(A)–(B).

⁸⁵ Irma S. Russell, *The Sustainability Principle in Sustainable Energy*, 44 TULSA L. REV. 121, 129 (2008) (noting the EPA’s discretion to revise its list of criteria pollutants). In *Natural Resources Defense Council, Inc. v. Train*, the Second Circuit held the EPA was required to identify lead as a criteria pollutant. 545 F.2d 320, 324–28 (2d Cir. 1976). However, the EPA stipulated in that case that lead has an adverse effect on public health and welfare and that its presence results from numerous or diverse sources. *Id.* at 324.

⁸⁶ ARNOLD W. REITZE JR., *STATIONARY SOURCE AIR POLLUTION LAW* 42 (2005).

⁸⁷ *Cf.* Dwyer, *supra* note 72, at 277–81 (contending a statutory mandate to regulate based solely on health considerations retards agency standard-setting because the agency resists literal implementation and seeks to avoid judicial review).

⁸⁸ Coglianesi & Marchant, *supra* note 82, at 1286 (“It turns out that few, if any, criteria pollutants regulated under the Clean Air Act exhibit a clear threshold.”); Bill Pedersen & David Schoenbrod, *The Overwhelming Case for Clean Air Act Reform*, [2013] 43 *Env’tl. L. Rep.* (Env’tl. Law Inst.) 10,969, 10,970 (noting that adverse health effects occur at all studied levels of exposure to fine particulates and ozone); Sunstein, *supra* note 83, at 317 (suggesting the EPA’s recognition of economic and social impacts of setting NAAQS at a very low level causes the EPA to reject a zero-level standard); *see also* David Schoenbrod, *Politics and the Principle that Elected Legislators Should Make the Laws*, 26 HARV. J.L. & PUB. POL’Y 239, 270 (2003) (“The Clean Air Act is based on the assumption, although we knew at the time it was inaccurate, that there is a threshold” (quoting *Clean Air Act Amendments of 1977: Hearings Before the Subcomm. on Env’tl. Pollution of the S. Comm. on Env’t & Pub. Works*, 95th Cong. 8 (1977) (statement of Sen. Edmund Muskie))).

⁸⁹ Coglianesi & Marchant, *supra* note 82, at 1289 (quoting H.R. REP. NO. 95-294, at 111 (1977)).

economic burdens.⁹⁰ The EPA's unspoken contemplation of costs has in turn distorted the regulatory process and reduced its transparency.⁹¹

The EPA's implementation of NAAQS operates under the "fundamental fiction that costs do not and should not enter into the Agency's decision making."⁹² Does the EPA's sub rosa incorporation of cost considerations thereby contravene Section 109 and *American Trucking*? A more charitable reading of matters would be to interpret Section 109 as merely precluding judicial review of cost considerations in the NAAQS-setting process.⁹³ The statute, in other words, grants the EPA broad discretion as to costs and neither requires nor prohibits their consideration by the EPA. "This way," one commentator suggests, "the agency need not justify how it takes costs into account and so has maximum flexibility to bend with the changing political winds."⁹⁴ Consequently, the EPA can cloak its decisions solely in terms of scientific data and avoid articulating the economic, social, and other factors that are actually at play.⁹⁵ Such an approach may be legally defensible, but it is misleading to those who take the statute at face value.

The myth of regulation without regard to cost declares that safeguarding public health and protecting endangered species are of utmost importance, to be pursued whatever the cost, yet economic considerations ultimately compromise these goals. The perpetuation of this myth demands an explanation. One possibility proposes that Congress desires to make a statement on society's behalf, a symbolic commitment to protecting human health.⁹⁶ A more cynical account might describe the myth as a form of deception in which Congress and regulators fool the public into believing that their health and environment are receiving absolute protection based on

⁹⁰ See *id.* at 1290; Schoenbrod, *supra* note 88, at 271 ("[I]t is widely understood that the [EPA] does consider costs [in setting NAAQS] while maintaining an official posture of not doing so."); see also Jason Scott Johnston, *A Game Theoretic Analysis of Alternative Institutions for Regulatory Cost-Benefit Analysis*, 150 U. PA. L. REV. 1343, 1365–66 (2002) (discussing an agency's incentive to consider and minimize firms' compliance costs in order to reduce the likelihood that the firms will challenge a regulation).

⁹¹ Coglianesse & Marchant, *supra* note 82, at 1345–46 (asserting that "an open consideration of costs [in the NAAQS setting process] would not only likely ensure more cost-effective policy decisions, it would also better serve some of the core principles that undergird administrative law"); see also Dwyer, *supra* note 72, at 282 (contending that unrealistic and "symbolic legislation tends to force an agency to misrepresent its position to Congress, the courts, and the public").

⁹² Coglianesse & Marchant, *supra* note 82, at 1325.

⁹³ Johnston, *supra* note 90, at 1396–98.

⁹⁴ Schoenbrod, *supra* note 88, at 271; see also Amy Sinden, *Cass Sunstein's Cost-Benefit Lite: Economics for Liberals*, 29 COLUM. J. ENVTL. L. 191, 221 (2004) (explaining Professor Sunstein's view that statutory standards that incorporate cost-benefit balancing are more susceptible to legal challenges).

⁹⁵ Coglianesse & Marchant, *supra* note 82, at 1291–92; Wagner, *supra* note 74, at 1655–66.

⁹⁶ See Dwyer, *supra* note 72, at 248–49 (discussing idealistic legislation with unattainable goals that "symbolizes the government's commitment to certain public values").

scientific factors alone.⁹⁷ The preceding discussion suggests a further, more nuanced explanation: the myth shields the agency from judicial review when it exercises discretion to consider costs. For obvious reasons, the agency may prefer such an arrangement. Legislators also may find such schemes attractive because they encourage regulatory targets to direct their attention—and campaign contributions—to legislators who can intervene on the targets' behalf.⁹⁸ And while regulatory targets might prefer standards that reference cost considerations explicitly, the myth may serve their interests as well by shielding them from even more stringent or more readily established standards.⁹⁹ In the end, these parties all have a stake in promoting the myth of regulation without regard to cost.

E. The Sources of Environmental Problems

Just as law defines environmental problems through regulatory schemes and risk management processes, it also defines the causes of those problems by singling out targets for regulation. Historically, environmental regulation has focused on large industrial polluters.¹⁰⁰ For example, the CWA imposes permit and pollution control requirements on “point sources,” defined as “discernible, confined and discrete conveyance[s],” like those typically found at a factory or paper mill,¹⁰¹ and largely gives a pass to other sources of pollution. The CAA allows states some flexibility in deciding which sources to regulate in order to achieve mandated air quality standards, but major provisions of the CAA impose permitting requirements and emissions limits solely on large industrial sources.¹⁰²

At the dawn of federal environmental regulation, industrial sources were widely perceived as the cause of pollution problems, and Congress concentrated on them accordingly.¹⁰³ Several practical reasons explain the continued focus on industrial sources today: large polluters are generally responsible for substantial pollution, regulation of a few large sources rather than numerous small sources is simpler and

⁹⁷ See Wagner, *supra* note 74, at 1640 (discussing “intentional charade,” where “agency bureaucrats consciously disguise policy choices as science”); cf. Sunstein, *supra* note 83, at 315 (noting political dynamic of an era when major federal environmental laws were enacted “in which citizens wanted air to be ‘safe’ and politicians who failed to respond were at great risk”).

⁹⁸ Johnston, *supra* note 90, at 1400–01.

⁹⁹ Cf. Wagner, *supra* note 74, at 1678–81 (discussing delays in promulgating science-based standards).

¹⁰⁰ Michael P. Vandenbergh, *From Smokestack to SUV: The Individual as Regulated Entity in the New Era of Environmental Law*, 57 VAND. L. REV. 515, 524–33 (2004).

¹⁰¹ See 33 U.S.C. § 1362(14) (2012) (defining point source).

¹⁰² See, e.g., 42 U.S.C. § 7411(a)–(b) (2012) (authorizing the EPA to establish new source performance standards for categories of stationary sources that contribute significantly to air pollution and defining stationary source as “any building, structure, facility, or installation which emits or may emit any air pollutant”); *id.* § 7475 (establishing preconstruction requirements for new major emitting facilities).

¹⁰³ See Vandenbergh, *supra* note 100, at 524, 526 (describing how Congress has targeted large industrial facilities to achieve its environmental goals).

often more cost-effective, and direct regulation of individuals may be politically infeasible.¹⁰⁴ The framing of pollution as primarily an industrial problem shapes the policy tools lawmakers adopt in response. For instance, the CAA applies technology-based standards to power plants and automobiles rather than seeking to limit household energy consumption or individual vehicle use.¹⁰⁵ Similarly, the CWA imposes technology-based standards on sewage treatment plants rather than attempting to restrict homeowners' use of fertilizers or pesticides that end up in storm sewer systems.¹⁰⁶ And while the emphasis on industrial sources has produced significant improvements in environmental quality, this somewhat narrow approach has overlooked opportunities to cultivate changes in practices and values in broader society.¹⁰⁷

Indeed, environmental law's focus on industrial sources rests on a myth regarding the insignificance of individual patterns of behavior to environmental problems. Nonindustrial sources, including individuals, account for "a large and growing proportion of" environmental harms.¹⁰⁸ By one estimate, individuals are responsible for approximately one-third of carbon emissions in the United States, a share larger than that of industry.¹⁰⁹ Individuals make significant contributions to other environmental problems as well, including smog, mercury pollution, pesticide use, and petroleum releases.¹¹⁰ To complicate the management of such problems, harms caused by individuals tend to be invisible and involve multiple sources, small quantities, and cumulative effects.¹¹¹

Recognizing the political and practical difficulty of regulating individuals directly, governments and commentators have looked primarily toward economic incentives, information provision, and voluntary efforts as means of changing

¹⁰⁴ See *id.* at 598, 617.

¹⁰⁵ See Michael P. Vandenbergh & Anne C. Steinemann, *The Carbon-Neutral Individual*, 82 N.Y.U. L. REV. 1673, 1688–89 (2007).

¹⁰⁶ See 33 U.S.C. § 1311(b)(1)(B) (2012) (requiring publicly owned treatment works to adopt secondary treatment standards to further remove water pollutants).

¹⁰⁷ Jedediah Purdy, *Our Place in the World: A New Relationship for Environmental Ethics and Law*, 62 DUKE L.J. 857, 909 (2013) ("The new environmental laws [enacted in the 1970s] . . . did little to secure new modes of practice. Working at the scale of the industrial economy—power-plant emissions, fuel-efficiency standards, pre-use review of toxins, and ambient pollution standards—these laws made their changes invisible from the point of view of anyone outside the regulated industries."); Bradley C. Bobertz, *Legitimizing Pollution Through Pollution Control Laws: Reflections on Scapegoat Theory*, 73 TEX. L. REV. 711, 718 (1995) ("[B]ecause we deal harshly with culturally accepted symbols of environmental problems [such as aerosol cans, toxic waste, and large factories], it is less likely that we will deal with the problems (and their causes) themselves.").

¹⁰⁸ Vandenbergh, *supra* note 100, at 534; see also JASON J. CZARNEZKI, EVERYDAY ENVIRONMENTALISM: LAW, NATURE & INDIVIDUAL BEHAVIOR 33–35 (2011); Hope M. Babcock, *Assuming Personal Responsibility for Improving the Environment: Moving Toward a New Environmental Norm*, 33 HARV. ENVTL. L. REV. 117, 120–21 (2009).

¹⁰⁹ Vandenbergh & Steinemann, *supra* note 105, at 1694.

¹¹⁰ Vandenbergh, *supra* note 100, at 542.

¹¹¹ *Id.* at 589.

individual environmental behavior.¹¹² However, the existence of littering ordinances, recycling requirements, and other individual environmental mandates—particularly at the local level—suggests that in some circumstances at least, direct regulation of individuals is administratively and politically feasible.¹¹³ Such regulation may become a more attractive option as new technologies facilitate the information gathering and enforcement efforts that individual regulation may require.¹¹⁴

Unfortunately, environmental law's focus on industrial sources has perpetuated and even strengthened the myth that individuals do not contribute significantly to environmental problems.¹¹⁵ "Polluters" are responsible for these problems, individuals are not.¹¹⁶ This distinction is further engrained through citizen suit provisions found in many federal environmental statutes.¹¹⁷ Ostensibly, the plaintiffs bringing these suits are acting as good citizens to defend the public from the harms done by industrial polluters. As individuals play an increasingly significant role in problems ranging from water pollution to climate change, the public's belief that individuals are not at fault will hinder their solution.¹¹⁸

F. Sustainability

Finally, the myth of environmental law that has received perhaps the closest scrutiny is the foundational concept of sustainability.¹¹⁹ Sustainability generally refers to the ability to maintain an activity (such as harvesting a resource) or a system

¹¹² Babcock, *supra* note 108, at 174–75 (advocating a combination of education, market-based incentives, and shaming to create norms of environmental responsibility); *see generally* Michael P. Vandenbergh et al., *Individual Carbon Emissions: The Low-Hanging Fruit*, 55 UCLA L. REV. 1701, 1705–50 (2008) (identifying individual actions with potential to achieve large reductions in greenhouse gas emissions).

¹¹³ Katrina Fischer Kuh, *When Government Intrudes: Regulating Individual Behaviors that Harm the Environment*, 61 DUKE L.J. 1111, 1176–77 (2012) ("Direct regulation of environmentally significant individual behaviors, although less common than indirect regulation, occurs daily in a variety of forms in different communities, from recycling laws to burn limitations to vehicle inspections.").

¹¹⁴ *Id.* at 1121–22. Furthermore, designing mandates to avoid imposing disproportionate or substantial burdens and to limit their intrusion into the home can allay the objection that such regulation is too invasive. *See id.* at 1177.

¹¹⁵ Michael P. Vandenbergh, *The Social Meaning of Environmental Command and Control*, 20 VA. ENVTL. L.J. 191, 212–14 (2001) (contending that failure of environmental law to address individual sources of harm has bolstered the myth that individuals are not significant sources of harm).

¹¹⁶ *Id.* at 192–93.

¹¹⁷ *See, e.g.*, 33 U.S.C. § 1365 (2012) (authorizing citizen suits under the Clean Water Act); 42 U.S.C. § 7604 (2012) (authorizing citizen suits under the Clean Air Act).

¹¹⁸ *See* Vandenbergh, *supra* note 115, at 192–93.

¹¹⁹ Professor Michael Burger has described sustainability as "the most influential environmental idea of the last 30 years." Michael Burger, *The Story with Sustainability*, [2013] 43 Env'tl. L. Rep. (Env'tl. Law Inst.) 10,356, 10,356.

over time. The concept is often expressed in terms of sustainable development, which the Brundtland Commission famously defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”¹²⁰ Another description notes that sustainability “integrat[es] environmental protection and restoration into economic, social, and national security decisions and goals.”¹²¹

The sustainability concept exists throughout environmental law. The concept plays an especially prominent role in international law: it is an animating principle of the Rio Declaration,¹²² Agenda 21,¹²³ and the Millennium Development Goals;¹²⁴ it is reflected in important instruments such as the Framework Convention on Climate Change¹²⁵ and the Convention on Biological Diversity;¹²⁶ and it “has received nearly universal acceptance,” at least rhetorically, “among every sector of international society.”¹²⁷ Direct references to sustainability in domestic environmental laws can be found in resource management statutes governing the national forests and other multiple-use public lands.¹²⁸ Other environmental statutes

¹²⁰ Rep. of the World Comm’n on Env’t & Dev., *Our Common Future*, pt. 1, ch. 2, ¶ 1, U.N. Doc. A/42/427 (1987) [hereinafter *The Brundtland Report*], available at <http://www.un-documents.net/wced-ocf.htm>, archived at <http://perma.cc/5X6P-ECDG>.

¹²¹ JOHN C. DERNBACH, *ACTING AS IF TOMORROW MATTERS: ACCELERATING THE TRANSITION TO SUSTAINABILITY* 4 (2012).

¹²² See, e.g., United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3–14, 1992, *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. I), Annex I, princ. 1 (Aug. 12, 1992), available at <http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>, archived at <http://perma.cc/Z2QS-ZR6U> (“Human beings are at the centre of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature.”); see also *id.* princ. 3–5, 8.

¹²³ See generally United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3–14, 1992, *Agenda 21*, U.N. Doc. A/CONF.151/26/Rev.1 (Vol. I), Annex II (1993), available at <http://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>, archived at <http://perma.cc/X6PS-JFVL> (emphasizing the importance of sustainable development).

¹²⁴ U.N. Dep’t of Public Information, *We Can End Poverty: Millennium Development Goals and Beyond 2015: Goal 7: Ensure Environmental Sustainability* (Sept. 2013), http://www.un.org/millenniumgoals/pdf/Goal_7_fs.pdf, archived at <http://perma.cc/Q3Q6-FPP6>.

¹²⁵ See United Nations Framework Convention on Climate Change art. 2, May 9, 1992, 1771 U.N.T.S. 107 (setting out the objective of stabilizing GHG concentrations while “enabl[ing] economic development to proceed in a sustainable manner”).

¹²⁶ See United Nations Convention on Biological Diversity art. 1, June 5, 1992, 1760 U.N.T.S. 143 (setting out “sustainable use” of biological diversity as one of the treaty’s objectives).

¹²⁷ See DAVID HUNTER ET AL., *INTERNATIONAL ENVIRONMENTAL LAW AND POLICY* 172 (4th ed. 2011).

¹²⁸ See, e.g., 16 U.S.C. § 529 (2012) (directing the secretary of agriculture to administer renewable surface resources of national forests for multiple use and sustained yield); 43 U.S.C. § 1732 (2012) (directing the secretary of the interior to manage Bureau of Land

that do not explicitly use the term nevertheless rest on notions of sustainability—for example, NEPA declares a policy of seeking “to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans.”¹²⁹ Indeed, some commentators contend that virtually all major federal environmental statutes share with sustainability an assumption that “management of human uses of the environment lies largely within human control” and that the effects of human activity are generally reversible.¹³⁰

Various reasons explain the widespread appeal of sustainability and sustainable development. Sustainability is grounded in a fundamental truth: the Earth has a limited carrying capacity, and human activity threatens to exceed it.¹³¹ More importantly, sustainable development’s “brilliant ambiguity”¹³² enables different constituencies to read into the concept whatever they find most compelling: it is a “‘big tent,’ spacious enough to accommodate three usually disparate factions—development proponents, environmental groups, and social justice advocates.”¹³³ A concrete example of sustainability’s unifying force can be found in the Kyoto Protocol’s CDM, which simultaneously promises growth to developing countries and environmental salvation (as well as cost savings) to industrialized nations.¹³⁴ In such ways, sustainable development offers to reconcile the interests of present and future generations and of the rich and poor, assuring us in the meanwhile that we can have it all.¹³⁵

Management (BLM) public lands under principles of multiple use and sustained yield); Robert L. Glicksman, *Sustainable Federal Land Management: Protecting Ecological Integrity and Preserving Environmental Principal*, 44 TULSA L. REV. 147, 156–67 (2008) (discussing the sustained yield mandates of the Forest Service and BLM).

¹²⁹ 42 U.S.C. § 4331(a) (2012).

¹³⁰ Robin Kundis Craig & Melinda Harm Benson, *Replacing Sustainability*, 46 AKRON L. REV. 841, 848 (2013).

¹³¹ DERNBACH, *supra* note 121, at 1; Elizabeth Burleson, *Climate Sustainability Through Ethics, Economics, and Environmental Coordination*, [2013] 43 Env’tl. L. Rep. (Env’tl. Law Inst.) 10,350, 10,351; Patrick Parenteau, *It’s the Biosphere, Stupid*, [2013] 43 Env’tl. L. Rep. (Env’tl. Law Inst.) 10,347, 10,347.

¹³² HUNTER ET AL., *supra* note 127, at 148.

¹³³ Alison Peck, *Sustainable Development and the Reconciliation of Opposites*, 57 ST. LOUIS U. L.J. 151, 158 (2012); *see also* Charles A. S. Hall, *The Myth of Sustainable Development: Personal Reflections on Energy, its Relation to Neoclassical Economics, and Stanley Jevons*, 126 J. ENERGY RESOURCES TECH. 85, 86–87 (2004) (noting various definitions of sustainable development); J.B. Ruhl, *Law for Sustainable Development: Work Continues on the Rubik’s Cube*, 44 TULSA L. REV. 1, 1–2 (2008) (observing the varied meanings of sustainable development).

¹³⁴ Kyoto Protocol, *supra* note 43, at art. 12; GRANT A. KIRKMAN ET AL., UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, BENEFITS OF THE CLEAN DEVELOPMENT MECHANISM 2012, at 7–10 (2012), *available at* http://cdm.unfccc.int/about/dev_ben/about/dev_ben/ABC_2012.pdf, *archived at* <http://perma.cc/F5XF-BU8J>.

¹³⁵ Rebecca M. Bratspies, *Sustainability Is the Answer—Now What Was the Question?*, [2013] 43 Env’tl. L. Rep. (Env’tl. Law Inst.) 10,352, 10,352 (“As a marketing ploy,

Unfortunately, evidence of actual sustainability remains sparse. One popular measure of sustainability, the ecological footprint, indicates that humans are consuming the Earth's resources at a rate fifty percent greater than the rate at which such resources are being regenerated.¹³⁶ Extinction rates as well as data regarding land use and biomass consumption likewise suggest that sustainability remains a pious yet possibly unrealistic goal.¹³⁷ In the two decades since the concept of sustainability has come to dominate international environmental law, global population—and per capita consumption rates—have continued to rise while the state of the global environment has worsened.¹³⁸ The integration of truly sustainable development into international, national, and local policies has been limited.¹³⁹ Even sustainability's proponents concede the urgent need for wider and more effective implementation of policies to promote sustainability.¹⁴⁰

Against such facts, the concept of sustainability has come under attack. Over a decade ago, Professor William H. Rodgers, Jr., attacked “the conviction that gains from economic development could be enjoyed without sacrifice of the natural world” as “a convenient, powerful, and serviceable myth [that] . . . happens to be faulty at its foundations.”¹⁴¹ More recently, Professor David Barnhizer characterized sustainability as an “impossible dream” due to its “extraordinary complexity and the fact that it does not fit how we think and organize . . . [and] because we lack the

sustainability encapsulates our fantasy of a sudden technological breakthrough that will allow 7 billion, or 10 billion, humans to live the typical American consumption-based lifestyle, only without destroying the earth in the process.”); Burger, *supra* note 119, at 10,356 (“Sustainability promises that humanity—operating on scales from global civilization to local enclaves—can achieve simultaneous economic development, environmental protection, and social equity, a kind of holistic harmony that requires hard labor but no sacrifice.”).

¹³⁶ See *World Footprint: Do We Fit on the Planet?*, GLOBAL FOOTPRINT NETWORK, http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/, archived at <http://perma.cc/YXT2-WF5K> (last updated Mar. 28, 2014). For a summary of environmental trends in the United States, see DERNBACH, *supra* note 121, at 15–38.

¹³⁷ See Parenteau, *supra* note 131, at 10,347.

¹³⁸ John C. Dernbach, *Navigating the U.S. Transition to Sustainability: Matching National Governance Challenges with Appropriate Legal Tools*, 44 TULSA L. REV. 93, 95–96 (2008).

¹³⁹ See F. Biermann et al., *Navigating the Anthropocene: Improving Earth System Governance*, 335 SCIENCE 1306, 1306 (2012) (noting that to “steer away from critical tipping points in the Earth system that might lead to rapid and irreversible change . . . requires fundamental reorientation and restructuring of national and international institutions toward more effective Earth system governance and planetary stewardship”).

¹⁴⁰ See, e.g., DERNBACH, *supra* note 121, at 229–30 (“Achieving sustainability requires much more rapid progress than we have seen to date.”).

¹⁴¹ William H. Rodgers, Jr., *The Myth of the Win-Win: Misdiagnosis in the Business of Reassembling Nature*, 42 ARIZ. L. REV. 297, 297 (2000).

political will to implement [it].”¹⁴² Professor Douglas A. Kysar similarly observed that sustainability is not only too vague to guide concrete policy choices, but also stands in an unresolved and unacknowledged conflict with liberal market economics, in terms of accounting for intergenerational equity, intragenerational equity, and the effects of liberalized trade regimes.¹⁴³ Sustainable development, in other words, remains rooted in the dominant and environmentally problematic paradigm of economic growth.¹⁴⁴ Adoption of the concept is potentially counterproductive because it masks continuing harm and reinforces and perpetuates existing power dynamics.¹⁴⁵ The concept of sustainability, Professors Robin Kundis Craig and Melinda Harm Benson argue further, is practically meaningless in the face of climate change because it calls for maintaining stability in a world of uncertainty and unavoidable change.¹⁴⁶ Notwithstanding its optimistic promises, Professor Annie Rochette warns, sustainable development “fails to question the assumption that continuous economic growth will eventually lead to the destruction of the planet.”¹⁴⁷ At best, the concept of sustainability represents an unrealistic goal; at worst, it further entrenches existing beliefs and practices pertaining to production and consumption.

Even if unattainable, supporters of sustainability nonetheless contend that it may “provid[e] a powerful ideal and an aspirational goal that, if honestly adhered to

¹⁴² David Barnhizer, *Waking from Sustainability’s “Impossible Dream”: The Decisionmaking Realities of Business and Government*, 18 GEO. INT’L ENVTL. L. REV. 595, 616 (2006).

¹⁴³ Douglas A. Kysar, *Sustainable Development and Private Global Governance*, 83 TEX. L. REV. 2109, 2117–47 (2005).

¹⁴⁴ William E. Rees, *The Ecological Crisis and Self-Delusion: Implications for the Building Sector*, 37 BUILDING RES. & INFO. 300, 303 (2009); see also Hall, *supra* note 133, at 89 (contending that population and economic growth necessarily “undermine[] future sustainability because new technologies have not in fact decreased per capita dependence upon finite resources”); Donald K. Anton, *The “Thirty-Percent Solution” and the Future of International Environmental Law*, 10 SANTA CLARA J. INT’L L. 209, 215 (2013) (lamenting that sustainable development represents a “misplaced faith (or wish) that continued economic growth and development will drive effective protection of the global environment”).

¹⁴⁵ See Barnhizer, *supra* note 142, at 616; see also Burger, *supra* note 119, at 10,356 (describing the “sustainability is bad” storyline).

¹⁴⁶ Craig & Benson, *supra* note 130, at 843–44. *But cf.* Jessica Owley, *Adaptive Management, Resiliency, and Why Sustainability Discussions Give Me a Headache*, [2013] 43 Env’tl. L. Rep. (Env’tl. Law Inst.) 10,348, 10,348 (“Climate change does not change our view of sustainability; it heightens the importance of sustainability thinking.”). Professor Robin Kundis Craig has advocated that the concept be replaced with the concepts of adaptability and resilience. Robin Kundis Craig, *Climate Change Means the Death of Sustainability*, [2013] 43 Env’tl. L. Rep. (Env’tl. Law Inst.) 10,354, 10,355.

¹⁴⁷ Annie Rochette, *Stop the Rape of the World: An Ecofeminist Critique of Sustainable Development*, 51 U.N.B. L.J. 145, 162 (2002); see also Rees, *supra* note 144, at 304 (“[T]oday’s global society essentially equates sustainability with maintaining growth through technological innovation and greater material and economic efficiency.”).

and pursued, could substantially improve our world.”¹⁴⁸ More than that, sustainability may be a “vital and necessary” theme to motivate essential changes in policies and behavior.¹⁴⁹ Towards this end, various commentators have suggested that sustainability be interpreted as more of a process than a goal: a sustainability process entails thinking about the future and taking an adaptive approach,¹⁵⁰ more honestly and thoroughly pursuing economic, environmental, and equitable concerns into our policies;¹⁵¹ and replacing a focus on short-term efficiency with attention to systemic risk.¹⁵²

III. A TYPOLOGY OF FAILURES UNDERLYING THE MYTHS

In one way or another, the myths discussed in the preceding Part all involve the failure of environmental law to achieve its objectives and ideals. Wetlands loss continues in the United States, albeit at a reduced pace, notwithstanding the institution of a no net loss policy.¹⁵³ Atmospheric GHG concentrations are still rising steadily despite the establishment of various cap-and-trade systems.¹⁵⁴ People and the environment continue to be subjected to unregulated and unknown risks despite the widespread adoption of risk assessment. Regulators persist in taking costs into account, despite explicit instructions to the contrary. Meanwhile, individuals largely escape regulation, notwithstanding their significant contributions to environmental problems. And finally, overall human impacts on the Earth and its life-sustaining systems have only expanded since the introduction of the concept of sustainable development. Closer examination reveals two basic types of failures at work: failures of implementation and conceptual flaws.

A. Failures of Implementation

The above-mentioned failures are in part failures of implementation resulting from inadequate resources, poor support, technical errors in design, and the like. In most instances, developing solutions to failures of implementation is conceptually straightforward—though not necessarily easy in practice. Providing greater

¹⁴⁸ Burger, *supra* note 119, at 10,356.

¹⁴⁹ *Id.*; see DERNBACH, *supra* note 121, at 11.

¹⁵⁰ Owley, *supra* note 146, at 10,348–49; see also DERNBACH, *supra* note 121, at 6–7 (characterizing sustainability as both a destination and a journey).

¹⁵¹ Keith H. Hirokawa, *Sustainability as Process: Seeing Climate Change Opportunities in Sustainability Approaches*, [2013] 43 *Envtl. L. Rep. (Envtl. Law Inst.)* 10,353, 10,353; Ruhl, *supra* note 133, at 2.

¹⁵² David M. Driesen, *What Does Sustainability Mean in the Age of Climate Disruption?*, [2013] 43 *Envtl. L. Rep. (Envtl. Law Inst.)* 10,351, 10,352.

¹⁵³ T.E. DAHL, U.S. FISH & WILDLIFE SERV., STATUS AND TRENDS OF WETLANDS IN THE COTERMINOUS UNITED STATES: 2004 TO 2009, at 40–72 (2011) (finding especially notable losses in salt marsh and freshwater forested wetlands).

¹⁵⁴ See EPA, CLIMATE CHANGE INDICATORS IN THE UNITED STATES, 2012 at 16–19 (2d ed. 2012).

attention, manpower, and funding can address problems of inadequate resources and support. More careful oversight, monitoring, and enforcement can improve implementation. Amendments and modifications may alleviate technical errors in design, as the new wetlands mitigation regulations illustrate. These regulations focus on wetland functionality rather than acreage, and they attempt to steer compensation projects to locations where they will best preserve aquatic functions.¹⁵⁵ Similarly, cap-and-trade regimes can be made more effective by ratcheting down pollution caps or closing loopholes. Each of these fixes may be politically difficult to achieve, but is conceptually quite simple.

B. Conceptual Flaws

While problematic, failures of implementation hardly give rise to environmental myths by themselves. Rather, environmental myths often involve inherent and more intractable factors as well. For instance, an environmental myth may involve unavoidable imperfections in translating theory into practice. Risk assessment, for example, ideally would identify all hazards related to an activity and provide specific quantitative estimates of their magnitude and probability. This omniscient sort of risk assessment is impossible, of course. We can never eliminate uncertainty and ignorance—though our approaches to environmental risk often assume these phenomena away. Similarly, wetlands mitigation assumes the ability to identify and replicate all of a wetland's ecological functions, despite the impossibility of doing so.¹⁵⁶

Thus, beyond the failures of implementation, environmental myths often involve conceptual flaws that go to the very heart of the myths. Conceptual flaws refer to flaws in logic or in the inferential chains that connect a policy measure with a desired policy outcome. Conceptual flaws make impossible the achievement of stated objectives, even under conditions of perfect knowledge and fully supported implementation. A review of the myths described above reveals conceptual flaws at work with respect to each.

Take the first myth of wetlands mitigation and specifically the use of preservation measures as a form of mitigation. The acceptance of preservation as mitigation conveniently ignores the fact that preservation of resource A does nothing to compensate for the loss of a distinct and separate resource, resource B. The inevitable result of the tradeoff is a net loss of wetlands. More generally, the

¹⁵⁵ See generally Gardner et al., *supra* note 19, at 221–49 (discussing the extent to which the regulations reflect the NRC report recommendations); Womble & Doyle, *supra* note 4, at 258–60 (discussing watershed approach in the regulations).

¹⁵⁶ Under the new regulatory provisions regarding stream mitigation, engineered streams may serve as mitigation for the loss of existing streams, despite doubts about the ability of the former to carry out the functions of the latter. See Erik Stokstad, *New Rules on Saving Wetlands Push the Limits of the Science*, 320 SCIENCE 162, 162–63 (2008); Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. 19,594, 19,596 (April 10, 2008) (to be codified at 33 C.F.R. pts. 325, 332) (acknowledging that the “science of stream restoration is still evolving and that more research is needed”).

wetlands mitigation program is unlikely to achieve its no net loss goal, as the very term “mitigation” implies that the measures being adopted only ameliorate—but do not fully compensate for—the harm being caused.

With respect to the second myth, the trading of pollution credits, the acceptance of pollution offsets in lieu of allowances involves conceptual difficulties as well. As explained above, offsets—as opposed to allowances—often arise from activities whose pollution-reducing benefits are difficult to measure or monitor. But if these activities are too difficult to quantify for cap-and-trade schemes’ allowance requirements, it is equally difficult to justify the recognition of offsets for any asserted pollution reduction benefits from these sources. Unfortunately, the inclusion of offsets in pollution trading systems can undermine their integrity.

The third myth, risk assessment, fosters an illusory sense of control by purporting to quantify phenomena that often are not quantifiable. The conceptual flaw in our use of risk assessment is to assume that the results of risk assessments fully and accurately account for the hazards that may be present. Although risk assessment may be the most powerful tool available to analyze health and environmental hazards, it has important limitations. Such limitations are often forgotten or ignored in the risk management process, however, when statutes demand quantification as a prerequisite for oversight and do little to account for uncertainty.

The fourth myth, regulation without regard to costs, obscures a basic conflict between modern industrial society and environmental quality. On the one hand, the language of CAA Section 109 and other cost-disregarding statutes demands absolute protection of health and the environment. On the other hand, implicit in these statutes is a baseline understanding that our economy will continue to provide necessary goods and services (however one defines “necessary”).¹⁵⁷ As much as we might desire otherwise, in some circumstances it may be impossible to truly protect the public health with “an adequate margin of safety”¹⁵⁸ without causing severe economic disruption. We must then choose between the economy and the environment, and it is a conceptual flaw to assume we can avoid making this choice.

The fifth myth, that individuals do not contribute significantly to environmental problems, ignores bare facts demonstrating that individual behavior indeed has a central role in many of our environmental dilemmas. Regulating industry more stringently, or even absolutely, simply will not solve these dilemmas without regulating or otherwise changing individual conduct as well.

¹⁵⁷ *Cf.* *Union Elec. Co. v. EPA*, 427 U.S. 246, 270 n.1 (1976) (Powell, J., concurring) (“What this means in this case, if the allegations of Union Electric Co. prove to be correct, is that—in the interest of public health—the utility will be ordered to discontinue electric service to the public. As one cannot believe this would be allowed, I suppose that the State or Federal Government would find some basis for continuing to operate the company’s facilities to serve the public”); *Whitman v. Am. Trucking Ass’ns*, 531 U.S. 457, 496 (2001) (Breyer, J., concurring) (“Nor need regulation lead to deindustrialization. Preindustrial society was not a very healthy society; hence a standard demanding the return of the Stone Age would not prove ‘requisite to protect the public health.’”).

¹⁵⁸ 42 U.S.C. § 7409(b)(1) (2012).

Finally, the myth of sustainable development is conceptually flawed in its inherent inability to resolve conflicts between economic development and ecological principles. Though more a goal than an operative legal doctrine, the myth is an important driver of modern environmental law, and its conceptual failures threaten to undermine the entire enterprise of environmental law. At its core, sustainable development presumes development: economic growth, increased consumption, and higher standards of living. Understood as such, development makes increasing demands on the environment and inevitably requires a sacrifice of the natural world. Absent a drastic reconceptualization, sustainable development cannot be sustained indefinitely into the future.

In sum, the conceptual flaws present in the myths of environmental law indicate that, sociologically, something interesting is at work. The myths do not involve mere failures in implementation, but rather deliberate deception—and even self-deception—by society. Most of these myths, moreover, concern an underlying tension between environmental protection and economic interests. To understand the functions and social significance of myths, the next Part turns to the general study of myths in society.

IV. ANALYZING MYTH

A. *The Nature of Myth*

The environmental myths discussed above hardly resemble the classic stories that the term “myth” typically evokes. Ancient Greek and Roman myths engaged gods and heroes in struggles and experiences that carried significance and meaning beyond their literal plotlines.¹⁵⁹ Likewise, creation myths—think Adam and Eve—are sacred stories that express important values and beliefs, even if not taken to be literally true.¹⁶⁰ In contrast, the myths of environmental law do not contain larger-than-life protagonists, nor do they carry the social significance that classical myths once did or that contemporary myths still carry in more traditional societies. Thus it would be erroneous to analyze environmental law’s myths in precisely the same way as anthropologists and sociologists analyze myth.

A closer examination of modern American law, however, reveals numerous fictitious or mythological elements. Accounts of its origins refer to a purely theoretical social contract¹⁶¹ and to larger-than-life Founding Fathers who not only

¹⁵⁹ ROBERT A. SEGAL, MYTH: A VERY SHORT INTRODUCTION 4–6 (2004).

¹⁶⁰ PETER FITZPATRICK, THE MYTHOLOGY OF MODERN LAW 18–19 (1992).

¹⁶¹ Kevin C. Mulder, Note, *The Extension of Comity: Fair Assessment in Real Estate Association v. McNary*, 32 AM. U. L. REV. 1123, 1123 n.1 (1983) (noting the influence of political theorists, such as Locke and Rousseau, on the Framers of the Constitution); see LON L. FULLER, LEGAL FICTIONS 98 (1967) (“In theories of the state there appears the constantly recurring notion of the Social Compact, a notion which perhaps was never given full credence as a historical fact by anyone, but which has nevertheless had the most profound, and perhaps beneficial, influence on the history of human thought.”); C. B. Macpherson, *Editor’s Introduction* to JOHN LOCKE, SECOND TREATISE OF GOVERNMENT vi, xxi (C. B.

are pivotal historical figures but also serve as sources of contemporary wisdom.¹⁶² Nor are the mythological aspects of American law confined to stories of its genesis. Basic doctrines of tort, contract, and criminal law assume the existence of a mythical reasonable person and impose liability by measuring the conduct of individual persons against this fictional construct.¹⁶³ Similarly, legal fictions of constructive notice and corporate personhood make presumptions that depart far from reality. One commentator even argues that law itself has attained a mythic status in contemporary society as an “autonomous” and “ideal” entity having “quasi-religious transcendence,” situated both apart from and within society.¹⁶⁴

The pervasive presence of myth in American law suggests the value of looking beyond the popular usage of the term “myth” merely to refer to something false or deceptive. Scholars commonly define myth as a story or, more broadly, as a belief tenaciously held by its adherents.¹⁶⁵ Myths feature personalities—divine, human, or animal—that may serve as the agents or objects of actions.¹⁶⁶ Yet myths are distinguishable from simple “lies” or “detached stories.”¹⁶⁷ The narrative of the myth has a sacred quality, is symbolic in nature, and often contains events and objects that do not exist in the nonmythical world.¹⁶⁸ Accordingly, myths tend to be characterized as imaginative and fictional rather than as scientific and historical.¹⁶⁹ At the same time, myths are not purely fictitious, as consideration of the biblical creation myth illustrates. Many Christians do not take the creation myth to be literally true.¹⁷⁰ Nonetheless, these adherents accept the myth as containing important truths about the human condition.¹⁷¹ Ultimately, myths possess a social

Macpherson ed., Hackett Publ’g Co. 1980) (1690) (noting that Locke’s doctrine “was neatly and quite properly turned against the British state by the American colonists[, a]nd ever since . . . it has been an invaluable ideological support for the liberal constitutional state and the market society on which the liberal state has been built”); *see generally* LOCKE, *supra* §§ 6, 95, 123 (focusing on the natural liberty of man and his right not to be governed without consent); JEAN-JACQUES ROUSSEAU, *THE SOCIAL CONTRACT* 9 (Charles Frankel ed., Hafner Publ’g Co. 1947) (1762) (“[A]ll justifiable authority among men must be established on the basis of conventions.”).

¹⁶² *See, e.g.*, *United States v. Lopez*, 514 U.S. 549, 590–93 (1995) (Thomas, J., concurring) (referring to intent and understanding of Founding Fathers in interpreting the Commerce Clause); *Sch. Dist. of Abington Twp. v. Schempp*, 374 U.S. 203, 213–14 (1963) (considering the Founding Fathers’ views on religion and religious freedom in applying the Establishment Clause to Bible readings in public schools).

¹⁶³ *See* Douglas Litowitz, *The Corporation as God*, 30 J. CORP. L. 501, 511 (2005).

¹⁶⁴ FITZPATRICK, *supra* note 160, at x.

¹⁶⁵ *See* WILLIAM G. DOTY, *MYTHOGRAPHY: THE STUDY OF MYTHS AND RITUALS* 6–7 (2d ed. 2000); SEGAL, *supra* note 159, at 4–6.

¹⁶⁶ SEGAL, *supra* note 159, at 5.

¹⁶⁷ MARY MIDGLEY, *THE MYTHS WE LIVE BY* 1 (2003).

¹⁶⁸ Percy S. Cohen, *Theories of Myth*, 4 MAN 337, 337 (1969).

¹⁶⁹ DOTY, *supra* note 165, at 7.

¹⁷⁰ *See* Roland Mushat Frye, *So-Called “Creation-Science” and Mainstream Christian Rejections*, 127 PROC. AM. PHIL. SOC’Y 61, 62–63 (1983).

¹⁷¹ *See* DOTY, *supra* note 165, at 19.

significance that ordinary stories do not; one commentator describes myth as “the legitimation of a social phenomenon by portraying it as natural or inevitable.”¹⁷²

Just as myths are distinguishable from mere stories, mythmaking differs from mere self-deception. Self-deception involves the telling of lies to oneself, and these lies arguably enable the more effective deception of those around us.¹⁷³ To some degree, the myths of environmental law do involve deception of others and of self. The actors who make or interpret the laws at hand engage in misleading others in order to advance their narrow political interests, and, in some instances, those actors may sincerely accept the suppositions underlying the myths. The deep-rooted nature of these myths suggests that more than mere deception is at work here, however. While mythmaking may involve the telling of lies, it also incorporates “enduring human truths,”¹⁷⁴ as myths are experienced “as both true and crucial to those who perceive through [them] their experienced world.”¹⁷⁵ Myths are often existential in nature and typically concern matters of individual and social significance.¹⁷⁶ These characterizations of myth arguably fit many of the myths of environmental law, as will be explained further below.

Finally, myths can be distinguished not only from stories and self-deception but also from legal fictions. Well-known legal fictions include the personhood of corporations, which treats corporations for certain legal purposes as if they were real persons, and the attractive nuisance doctrine, which posits a fictional invitation to children to visit a defendant’s premises.¹⁷⁷ “The classic common law legal fiction treat[s] as true a factual assertion that plainly [is] false, generally as a means to avoid changing a legal rule that require[s] a particular factual predicate for its application.”¹⁷⁸ In contrast to a myth, a legal fiction is obviously not true, and everyone knows it.¹⁷⁹ Another distinction lies in the fact that legal fictions are primarily the domain of courts—i.e., courts use these fictitious suppositions to modify or refuse to modify existing legal rules.¹⁸⁰ By comparison, a wider range of actors, including legislatures, agencies, and policymakers, engage in constructing

¹⁷² Thomas W. Joo, *Narrative, Myth, and Morality in Corporate Legal Theory*, 2009 MICH. ST. L. REV. 1091, 1096.

¹⁷³ ROBERT TRIVERS, *THE FOLLY OF FOOLS: THE LOGIC OF DECEIT AND SELF-DECEPTION IN HUMAN LIFE* 3 (2011).

¹⁷⁴ DAN P. MCADAMS, *THE STORIES WE LIVE BY: PERSONAL MYTHS AND THE MAKING OF THE SELF* 11 (1993).

¹⁷⁵ DOTY, *supra* note 165, at 14 (emphasis omitted).

¹⁷⁶ Donald C. Langevoort, *Taking Myths Seriously: An Essay for Lawyers*, 74 CHI.-KENT L. REV. 1569, 1569 n.1 (2000).

¹⁷⁷ FULLER, *supra* note 161, at 12.

¹⁷⁸ Peter J. Smith, *New Legal Fictions*, 95 GEO. L.J. 1435, 1437 (2007).

¹⁷⁹ See FULLER, *supra* note 161, at 9 (defining legal fiction as “either (1) a statement propounded with a complete or partial consciousness of its falsity, or (2) a false statement recognized as having utility”); Nancy J. Knauer, *Legal Fictions and Juristic Truth*, 23 ST. THOMAS L. REV. 1, 6 (2010).

¹⁸⁰ See Smith, *supra* note 178, at 1441. *But cf.* Knauer, *supra* note 179, at 17 (noting use of legal fictions in statutes and regulations in addition to their use by courts).

and perpetuating legal myths. Notwithstanding their falsity, legal fictions remain useful in enabling the application of law to new or difficult circumstances.¹⁸¹ Moreover, the semblance between legal fictions and legal myths suggests that the latter may have some utility as well, and perhaps to a broad array of interests in society.

B. Functions of Myth

Mythography—the study of myths and their functions—can facilitate a deeper understanding of environmental myths, their roles, and their persistence. This section highlights the most pertinent of the functions of myths that scholars have identified. These functions include explaining natural phenomena, expressing social attitudes, legitimating social institutions, and promoting administrative efficiency.

1. Myth as Explanation

Creation myths illustrate that myths can furnish explanations for how things came to be, provide interpretive frames for understanding, and offer potential avenues for controlling external events.¹⁸² In their explanatory and event-shaping role, these sorts of myths function in a manner akin to science and are sometimes branded as a primitive counterpart to modern science.¹⁸³

This skeptical and somewhat condescending view of myth, however, does not reflect the full social context in which myths exist.¹⁸⁴ It also fails to account for the persistence of myth in modern, “enlightened” society.¹⁸⁵ Rather than substituting for science, myth may serve as an alternative yet not exclusive means of “rationaliz[ing] complexity.”¹⁸⁶ Whereas science explains through objective experimentation and hypothesis testing, myth “attempt[s] to express the quality and range of human existence, its emotional, aesthetic, and moral aspects.”¹⁸⁷ Myth “provid[es] the illusion of rational intention and action[,] . . . creat[es] predictability in the face of random and evolutionary forces[,]”¹⁸⁸ and fosters acceptance of uncontrollable

¹⁸¹ Knauer, *supra* note 179, at 9, 22.

¹⁸² See SEGAL, *supra* note 159, at 11–35; DOTY, *supra* note 165, at 132–39; MIDGLEY, *supra* note 167, at 1.

¹⁸³ See SEGAL, *supra* note 159, at 3.

¹⁸⁴ See, e.g., *id.* at 14–25 (discussing the views of anthropologists E.B. Tylor and J.G. Frazer who believe that myth is the “primitive counterpart to science” and that myth is used “to explain physical events”); Cohen, *supra* note 168, at 339 (contending that E.B. Tylor believed that myths were used “by primitive man to personalise the forces of the natural world which he seeks to understand and control” (emphasis omitted)).

¹⁸⁵ SEGAL, *supra* note 159, at 14–25.

¹⁸⁶ See David M. Boje et al., *Myth Making: A Qualitative Step in OD Interventions*, 18 J. APPLIED BEHAV. SCI. 17, 19–21 (1982).

¹⁸⁷ DOTY, *supra* note 165, at 93–94.

¹⁸⁸ Boje et al., *supra* note 186, at 21.

phenomena such as natural disasters and death.¹⁸⁹ Viewed in this regard, science and myth are complementary and somewhat overlapping. Indeed, science itself may be viewed as a mythological system “tied to all the imagery and promise of progress,” and individual scientific theories as individual myths not subject to indisputable proof.¹⁹⁰

Myth’s persistence in the face of modern rationality nonetheless calls for further discussion. At a personal level, cognitive psychology offers one account for why we accept mythical explanations: uncertainty generates stress and anxiety that myths can ease by offering order and predictability.¹⁹¹ In particular, self-serving biases give rise to stories and myths that “inflate feelings of efficacy and control,” and these biases come to permeate our judgments and decisions.¹⁹² Ultimately, rationality does cabin our willingness to accept myth, especially when we receive immediate and unambiguous negative feedback to mistaken myths. But when the consequences of adhering to myths are uncertain, myths tend to persist.¹⁹³ Environmental problems frequently involve substantial uncertainty¹⁹⁴ and thus provide fertile ground for myth to flourish.

In recognizing the explanatory functions of myth, it should be emphasized that myths provide more than mere illusions of control. Myths can serve as a means of mediating otherwise unresolvable contradictions.¹⁹⁵ Most pertinent to environmental law’s myths is that humans experience a fundamental contradiction between nature and culture, existing as a part of the natural world yet also standing outside it and seeking to control it.¹⁹⁶ In this context, myths can enable tolerance of such contradictions or even appreciation of the impossibility of resolving them.¹⁹⁷ Furthermore, myths can provide socially valuable knowledge, “not so much the knowledge of the scientific laboratory as the knowledge of communal experience that has proved itself useful and nurturing.”¹⁹⁸

¹⁸⁹ SEGAL, *supra* note 159, at 28 (discussing the views of anthropologist Bronislaw Malinowski).

¹⁹⁰ DOTY, *supra* note 165, at 18 (quoting JAMES ROBERTSON, *AMERICAN MYTH, AMERICAN REALITY* 280 (1980)); *see also* SEGAL, *supra* note 159, at 33–34 (discussing the views of philosopher Karl Popper).

¹⁹¹ *See* Langevoort, *supra* note 176, at 1572–73.

¹⁹² *Id.* at 1575.

¹⁹³ *See id.* at 1574.

¹⁹⁴ *See* Richard J. Lazarus, *Restoring What’s Environmental About Environmental Law in the Supreme Court*, 47 *UCLA L. REV.* 703, 747 (2000).

¹⁹⁵ Cohen, *supra* note 168, at 346; SEGAL, *supra* note 159, at 114–15 (describing the views of anthropologist Claude Levi-Strauss).

¹⁹⁶ SEGAL, *supra* note 159, at 114–15.

¹⁹⁷ *See id.* at 116–17.

¹⁹⁸ DOTY, *supra* note 165, at 94.

2. *Expressive and Legitimizing Functions of Myth*

Explanation is an important function of myth, but not the only one. Sociological theories of myth explore the social functions of myth—namely, myth’s role in expressing social attitudes and values, legitimating social institutions and practices, and creating and maintaining social solidarity.¹⁹⁹

Myth can have an expressive function at an individual or societal level. At an individual level, myths may operate in a manner akin to the making of music: mythmaking can be an end in itself, an emotional and creative expression of the individual.²⁰⁰ At a societal level, myths can serve as descriptive or normative expressions of values.²⁰¹ Descriptively, myths may reflect shared values, social hierarchies, and other elements of the existing social order.²⁰² Normatively, myths may “support[] particular types of behavior and association [while] rejecting other exemplary models.”²⁰³

Perhaps the most important expressive function of myths is to legitimate existing social practices and institutions. This is often accomplished by connecting present practices with the past or with a higher order.²⁰⁴ Through appeals to tradition and long-standing practice, myths provide a justificatory explanation for social institutions and phenomena.²⁰⁵ In fulfilling such functions, myths intertwine with the exercise of power, as well as the struggle for power. Dominant interests may use myths to defend the status quo or justify self-serving actions, whereas opposing interests may employ myths to motivate resistance.²⁰⁶ The critical theory approach to myth emphasizes the role of mythology in legitimating social injustices.²⁰⁷ In this role, myth “presents the current world as the only possible world, papering over the historical struggles that simmer beneath the surface,” and “consecrates the existing order as common sense, thereby disabling alternatives.”²⁰⁸ The psychological tendency to expect just outcomes suggests that people are especially receptive to myths supporting the existing order.²⁰⁹

An overlapping function of myth is the maintenance of social solidarity: myth serves “as social glue and a major source of cultural identity.”²¹⁰ This function is

¹⁹⁹ *See id.*

²⁰⁰ *See* Cohen, *supra* note 168, at 339.

²⁰¹ *See* DOTY, *supra* note 165, at 68.

²⁰² *See id.*

²⁰³ *Id.*

²⁰⁴ *See* Cohen, *supra* note 168, at 349; DOTY, *supra* note 165, at 143.

²⁰⁵ *See* SEGAL, *supra* note 159, at 126–27; Joo, *supra* note 172, at 1098 (contending that myth “attempts to legitimate a social institution by obscuring the fact that the institution, like all social institutions, is historically contingent”).

²⁰⁶ *See* Boje et al., *supra* note 186, at 19–20; SEGAL, *supra* note 159, at 128–29.

²⁰⁷ *See* Litowitz, *supra* note 163, at 502, 507.

²⁰⁸ *Id.* at 518.

²⁰⁹ Joo, *supra* note 172, at 1100.

²¹⁰ Rees, *supra* note 144, at 303.

often expressed through ritual, including legal rituals such as wedding vows or *Miranda* warnings.²¹¹ Myth generally differs from ritual in that the former involves a statement and the latter an action.²¹² Nonetheless, ritual may be viewed as the application of myth in an effort to control external events or relieve social tensions.²¹³ The content of the myth or ritual reflects social values and structures.²¹⁴ The truth of the myth or ritual, however, is less important than the belief in its underlying values.²¹⁵ Thus, a ritual as described may differ substantially from actual behavior, and participants in a ritual may openly acknowledge its inefficacy in controlling external events.²¹⁶ In hunting societies, for example, hunters often depart from the ritual proscriptions they claim to follow.²¹⁷ In such circumstances, ritual represents an idealized account that “highlight[s] the incongruities between the actual and the ideal.”²¹⁸ Modern myths, such as the “rags to riches” theme embedded in American culture, similarly set out ideals that reality may not reflect. Likewise, the ritual of giving *Miranda* warnings apparently does little to achieve its express purpose of reducing coerced confessions.²¹⁹ These myths and rituals nevertheless affirm basic values that forge social identity and define social structure.²²⁰

3. *Practical Functions of Myth*

Finally, myths may serve practical goals such as promoting administrability.²²¹ Professor Peter J. Smith offers as examples the judicial reliance on modern myths regarding eyewitness identifications and jury instructions.²²² Notwithstanding empirical evidence indicating that eyewitness identifications are unreliable, judges routinely exclude expert testimony to that effect.²²³ Likewise, judges rely heavily on

²¹¹ See Peter A. Winn, *Legal Ritual*, 2 LAW & CRITIQUE 207, 213–14, 230–31 (1991).

²¹² See SEGAL, *supra* note 159, at 61, 63; DOTY, *supra* note 165, at 136–37.

²¹³ See SEGAL, *supra* note 159, at 61, 63; DOTY, *supra* note 165, at 136–37; *see also* Winn, *supra* note 211, at 209 (describing ritual as “characterized by standardized, repetitive interpersonal symbolic actions, patterned according to social customs, which involve constant form over time, and which influence or orient human affairs”).

²¹⁴ See Cohen, *supra* note 168, at 343; DOTY, *supra* note 165, at 68.

²¹⁵ See SEGAL, *supra* note 159, at 4.

²¹⁶ See Winn, *supra* note 211, at 210.

²¹⁷ See DOTY, *supra* note 165, at 114.

²¹⁸ See *id.* (emphasis omitted).

²¹⁹ See Winn, *supra* note 211, at 231.

²²⁰ SEGAL, *supra* note 159, at 139–40 (suggesting that the rags to riches myth can be seen “not as a false characterization of American life but as a hoped-for one”); *see also* Winn, *supra* note 211, at 231–32 (discussing symbolic value of *Miranda* warnings).

²²¹ Cf. Smith, *supra* note 178, at 1440 (suggesting that legal fictions, broadly defined, “serve functional goals and promote administrability in judicial process”).

²²² *Id.* at 1476. Smith uses the term “new legal fiction” to describe courts’ usage of descriptively inaccurate factual suppositions as the basis for choosing a legal role. *Id.* at 1441. As such, the term overlaps with my usage of the term “environmental myth.”

²²³ *Id.* at 1476.

jury instructions despite evidence that they are often ineffective.²²⁴ In both instances, courts apparently deem the practical consequences of relinquishing the myths—countless mistrials on the reliability of individual pieces of evidence or a proliferation of mistrials—as simply too damaging to the administration of justice and the functioning of the legal system.²²⁵

The multiple functions of myth underscore the distinction between myths and mere stories. Myths, unlike stories, are socially significant beliefs that mediate relationships among humans and their institutions and between humanity and the external environment.

V. APPLYING MYTHOGRAPHY TO ENVIRONMENTAL LAW

What does the study of myth reveal about the myths of environmental law? Like the myths examined by sociologists and anthropologists, the myths of environmental law explain the world around us, express social values, and legitimize social, legal, and economic arrangements.

A. *Myth as Explanation*

As described above, myths explain, typically by setting out a narrative, an ordering of events.²²⁶ The biblical Garden of Eden and other creation myths provide an obvious example of myth as narrative: they offer an account of how things came to be and why things are the way they are. Environmental law, which seeks to mediate the relationship between humans and the external environment, possesses its own secular counterpart to the Garden of Eden: the wilderness narrative, which depicts a time and state prior to human presence and activity.²²⁷ Both expressive and explanatory in nature, the wilderness narrative reflects “core values such as authenticity, freedom and purity.”²²⁸

The myth of sustainable development serves a function similar to creation myths: it relates human beings to the rest of the universe, though in a different timeframe. In contrast to the wilderness narrative, which concerns idealized origins,

²²⁴ *Id.*

²²⁵ *Id.* at 1476–77.

²²⁶ See *supra* Part IV.B.1; see DOTY, *supra* note 165, at 42.

²²⁷ The concept of wilderness and the valence associated with it has changed over time. See Peter A. Appel, *Wilderness and the Courts*, 29 STAN. ENVTL. L.J. 62, 90 (2010) (contrasting American colonists’ view of “wilderness as a threatening place” with subsequent “belief that wilderness offered desirable solitude and spiritual renewal”). See generally RODERICK NASH, *WILDERNESS AND THE AMERICAN MIND* (1967) (discussing various conceptions of wilderness).

²²⁸ Michael Burger, *Environmental Law/Environmental Literature*, 40 ECOLOGY L.Q. 1, 17 (2013).

the sustainable development narrative points toward an idealized future.²²⁹ Specifically, sustainable development describes a path to a state in which humans live in harmony with nature; it offers a redemptive vision of how humanity can enjoy the fruits of economic development without destroying the natural systems essential to such development and to life. Acknowledging the impossibility of returning to an Edenic paradise, sustainable development nevertheless suggests the possibility of peaceful coexistence.

Other myths of environmental law are explanatory in that they assume—and present as true—a reductionist account of ecologically complex systems. Compensatory mitigation schemes rest on simplifying assumptions regarding the functional equivalence of existing wetlands and newly created ones. These schemes assume a seemingly heroic capacity to identify and reproduce all relevant wetland functions, yet at the same time they undervalue the environmental context in which specific wetlands exist.²³⁰ Carbon trading systems similarly involve drastic simplifications of complexity. In theory, carbon trading is attractive because climate change effects are indifferent to the exact location of carbon emissions, and trading schemes capitalize on the market's ability to identify where emissions reductions can occur at lowest cost. In practice, however, complex systems of offsets and allowances are riddled with difficulties—conceptual and in implementation—that undercut the promised benefits of carbon trading schemes.

Both pollution control schemes focused on industrial polluters and regulatory efforts premised on quantitative risk assessment techniques likewise rest on reductionist accounts. These myths bracket and disregard hazards or concerns that policymakers deem too difficult to address. The CWA and CAA hone in on major industrial sources, largely ignoring the significant contributions of individuals and other small sources.²³¹ This seemingly reasonable approach fails to capture the complexities of pollution problems and does little to address the underlying social processes that generate pollution.²³² Similarly, substantial uncertainties pervade the risk assessment process, yet existing regulatory schemes generally give them little or no weight.²³³ Such schemes proclaim established, quantified risks to be the only hazards worth worrying about, and assume away the existence of other, uncertain and therefore invisible hazards.²³⁴ These schemes also treat each source of risk as

²²⁹ Cf. DOTY, *supra* note 165, at 94 (“Inasmuch as myths model possibilities—both positive and negative—we should not expect them to function along the lines of a how-to booklet.” (emphasis omitted)).

²³⁰ See Robin Kundis Craig, *Learning to Think About Complex Environmental Systems in Environmental and Natural Resource Law and Legal Scholarship: A Twenty-Year Retrospective*, 24 *FORDHAM ENVTL. L. REV.* 87, 97 (2013).

²³¹ See Bobertz, *supra* note 107, at 737–39.

²³² See *id.* at 749 (criticizing American environmental law’s “preoccupation with pollution *qua* pollution”).

²³³ Flournoy, *supra* note 68, at 820.

²³⁴ *Id.*

discrete and thereby disregard cumulative and synergistic effects that would complicate regulatory oversight.²³⁵

In each of these areas—wetlands mitigation, carbon markets, pollution control, and risk management—prediction plays a central role. Indeed, almost all of environmental law depends heavily on prediction, whether in anticipating the effects of development projects, determining whether an action will jeopardize a protected species, or constructing models for combating air or water pollution. Yet, as Professor Rodgers has observed: “In the art of predicting, self-deception is given free reign, especially as time-frames are stretched out, complicating factors are multiplied and condition-dependent qualifiers are enacted.”²³⁶ The self-deception reflected in environmental myths flourishes amid the uncertainty and complexity surrounding environmental problems and the difficulty of detecting and measuring environmental harm.²³⁷

The reductionism common to these myths runs counter to the foundational insights of ecology. Ecology teaches that the environment consists of complex, interconnected, and dynamic systems that are more than the sum of their parts.²³⁸ Indeed, the “uncertainty and unpredictability [of the environment] are inherent limitations on the legal system’s ability to perfectly control and regulate its subjects.”²³⁹ The myths embodied in reductionist accounts may make the challenges of environmental regulation more manageable, but they leave our regulatory regimes vulnerable to surprise and error.²⁴⁰

One danger consequently posed by explanatory myths is that we will lose sight of the complexities leading to the myths. Compounding that danger are the incentives of vested interests to promote explanatory myths that weaken the case for careful oversight. However, laws and policies can be modified to counter these concerns. Thus, while risk assessment is essential to the management of toxic risks, such management should consider and in some instances act upon the uncertain hazards that risk assessment fails to quantify. Similarly, the tradeoffs reflected in wetlands mitigation schemes may be worthwhile from society’s perspective, but the loss of natural wetlands should be understood as the loss of a unique resource and not as the loss of a commodity that can be readily exchanged and replaced. Even the

²³⁵ *Id.*

²³⁶ Rodgers, *supra* note 1, at 573; *see also* James D. Fine & Dave Owen, *Technocracy and Democracy: Conflicts Between Models and Participation in Environmental Law and Planning*, 56 HASTINGS L.J. 901, 960 (2005) (discussing various sources of uncertainty in modeling of air quality).

²³⁷ Rodgers, *supra* note 141, at 299.

²³⁸ *See* Craig, *supra* note 230, at 88–92; *see also* J.B. Ruhl, *Law’s Complexity: A Primer*, 24 GA. ST. U. L. REV. 885, 891–93 (2008) (describing complex adaptive systems).

²³⁹ Craig, *supra* note 230, at 92.

²⁴⁰ J.B. Ruhl, *The Fitness of Law: Using Complexity Theory to Describe the Evolution of Law and Society and Its Practical Meaning for Democracy*, 49 VAND. L. REV. 1407, 1444 (1996) (“[I]t is precisely because we have approached the regulation of the environment . . . in the reductionist manner of Classical Science that we have encountered more surprises than the legal system can bear in the long run.”).

concept of sustainable development poses the danger of oversimplification and warrants close scrutiny. From one point of view, sustainable development articulates an idealized, vastly improved relationship between humanity and nature. Nonetheless, the concept fails to question the necessity for development itself and threatens to lead to a state of affairs that is not truly sustainable.

B. The Expressive Functions of Environmental Myths

Laws do not merely govern behavior; they also express social values.²⁴¹ More than declarative statements, these expressions reinforce, change, or create social norms.²⁴² Specific examples from environmental law include the Endangered Species Act, which represents “a certain conception of the relationship between human beings and their environment,” and mandatory recycling laws, which make a social statement regarding recycling’s importance.²⁴³

More generally, Professor Bradley C. Bobertz has sketched out an expressive theory of environmental law that highlights its “scapegoating” function.²⁴⁴ This theory proposes that environmental laws scapegoat industry and other readily identifiable sources of pollution, thereby externalizing blame for pollution on outside forces.²⁴⁵ This scapegoating process reinforces the myth that individuals are not a significant cause of environmental problems and allows “us”—the individuals whose activities are ultimately responsible for the pollution—to continue with our environmentally destructive lifestyles.²⁴⁶

Other myths of environmental law express social values as well. Emissions trading systems provide an instructive example. These market-based mechanisms arguably set forth a particular conception of the environment as a commodity, leading many in the environmental community to object to them.²⁴⁷ Some critics argue that the commodification of emissions is intrinsically problematic in that it expresses an inaccurate or wrongful view of environmental pollution.²⁴⁸ Others argue that the commodification of emissions undermines social norms of environmental protection, particularly the norm that pollution deserves moral condemnation.²⁴⁹ Indeed, while emissions trading schemes could be viewed as condemning pollution sources for imposing environmental externalities, the ease with which polluters can atone for those externalities—by holding or obtaining allowances—suggests that any condemnation is little more than a slap on the wrist.

²⁴¹ See Cass R. Sunstein, *On the Expressive Function of Law*, 144 U. PA. L. REV. 2021, 2022–25 (1996).

²⁴² See *id.* at 2051.

²⁴³ *Id.* at 2024.

²⁴⁴ See Bobertz, *supra* note 107, at 714–15.

²⁴⁵ *Id.* at 714–16.

²⁴⁶ *Id.*

²⁴⁷ See Sunstein, *supra* note 241, at 2045–46.

²⁴⁸ See Vandenberg, *supra* note 115, at 192, 201–02.

²⁴⁹ See *id.*

Pollution trading systems not only express views about the environment as a commodity; they also make statements about different sources of pollution through offset provisions and the like. On the one hand, carbon offset mechanisms incorporate many pollution sources otherwise excluded from regulation, thereby sending a message about the significance of these various sources in contributing to climate change.²⁵⁰ On the other hand, the favorable treatment these sources often receive implies that emissions from these sources are not very important. Furthermore, the willingness to credit offsets for questionable emission reductions—a particularly mythical aspect of these schemes—makes a mockery of more direct but costly efforts to reduce emissions. Notwithstanding offsets’ dubious environmental benefits and the difficulties in their implementation, carbon emission trading systems continue to use them widely. This fact ultimately reveals society’s unwillingness to undertake serious emission reductions, as well as its reluctance to admit to this unwillingness.

The law’s use of risk assessment likewise conveys a message regarding the risks that matter to society. The predominant legal treatment of risk, under which safety is assumed in the absence of demonstrated risk, declares that uncertain risks simply do not matter. In addition to offering an illusory sense of control and objectivity, such an approach affirms innovation, entrepreneurship, and experimental endeavors.²⁵¹ Yet as the myth of regulation without regard to cost suggests, even risks that are demonstrated to be significant may not matter to us as much as we claim they do. Consider the history of regulation under CAA Section 109.²⁵² The text of the statute focuses solely on protecting public health with “an adequate margin of safety,” without regard to cost, feasibility, or other factors.²⁵³ By enacting this law, Congress asserted the imperative of protecting public health and the environment, while condemning polluters and their activities.²⁵⁴ The fact that the EPA considers costs, notwithstanding this imperative, reveals a society torn between protecting health and avoiding substantial economic costs. When forced to choose between the two, society almost invariably favors economic interests, or at least gives them significant weight.²⁵⁵ At the same time, the myth of regulation without

²⁵⁰ Cf. *id.* at 209–11 (contending that failure of environmental law to address individual sources of harm has bolstered the myth that individuals are not significant sources of harm); Babcock, *supra* note 108, at 125–26 (explaining that creating a new environment norm is particularly challenging because the American people believe numerous environmental myths).

²⁵¹ Bobertz, *supra* note 107, at 748; see INST. OF MED., *supra* note 65; see also Howard Latin, *Good Science, Bad Regulation, and Toxic Risk Assessment*, 5 YALE J. REG. 89, 129 (1988) (noting industry incentive to use uncertainty in risk assessment to obstruct regulation).

²⁵² See *supra* Part II.D.

²⁵³ Clean Air Act § 109, 42 U.S.C. § 7409(b)(1) (2012).

²⁵⁴ *Id.* § 7409(b)(2); see also Vandenberg, *supra* note 115, at 204–06 (discussing the social meaning of environmental statutes enacted in the 1970s); Dwyer, *supra* note 72, at 248–49 (discussing symbolic environmental legislation).

²⁵⁵ Cf. Driesen, *supra* note 81, at 223 (noting the believed tendency of government agencies “to undervalue environmental harms when implementing a cost/harm standard”);

regard to cost enables society to pay lip service to health and environmental concerns. As one commentator bluntly characterized this tension, “We wish to exorcise our demons, but still retain the pleasures of their company.”²⁵⁶

Finally, the myth of sustainable development may be best understood in terms of its expressive function. No one would seriously contend that sustainable development accurately describes present practices. Nonetheless, numerous treaties, laws, and official documents proclaim sustainable development as an important goal. Sustainable development expresses society’s aspiration for achieving balance: balance between present generations and future generations, and balance between humanity and nature. These are goals society can agree on, even if the means for achieving these goals remain uncertain or controverted.

One might argue, moreover, that sustainable development may be a useful framework even if it represents an unrealizable ideal. Sustainable development could serve as a catalyst for radical and necessary changes *if* it were to prompt a wholesale reconsideration of problematic systems and processes.²⁵⁷ Short of that, it could still bring about significant improvements to our world if honestly pursued.²⁵⁸ Unfortunately, however, sustainable development is unlikely to prompt a drastic reconsideration of the status quo. Rooted in the dominant paradigm of economic growth, sustainable development proclaims that capitalism and globalization can continue, albeit with a few tweaks.²⁵⁹ These tweaks may reduce the damage inflicted on the environment at the margins, but in reality will not be enough to stave off climate change or other looming ecological disasters. Ultimately, sustainable development not only reinforces environmentally problematic practices, but even blesses economic systems and growth imperatives that have caused tremendous environmental damage.²⁶⁰

Adam Babich, *The Supremacy Clause, Cooperative Federalism, and the Full Federal Regulatory Purpose*, 64 ADMIN. L. REV. 1, 3 n.7 (2012) (“It is . . . not unusual for the law to favor economic interests over those favoring health protection and quality of life.”).

²⁵⁶ Bobertz, *supra* note 107, at 748.

²⁵⁷ See Markku Lehtonen & Florian Kern, *Deliberative Socio-Technical Transitions*, in ENERGY FOR THE FUTURE: A NEW AGENDA 103, 114 (Ivan Scrase & Gordon MacKerron eds., 2009) (“Utopian thinking may be a necessary condition for deliberate historical change, as it enables thinking of ‘alternative solutions to the festering problems of the present.’” (quoting ZYGMUNT BAUMAN, SOCIALISM: THE ACTIVE UTOPIA 13 (1976))).

²⁵⁸ See Burger, *supra* note 119, at 10,356 (discussing the view that sustainability is “mostly harmless”).

²⁵⁹ See Anton, *supra* note 144, at 218 (contending that present formulation of sustainable development “renders the environment a mere instrument of development and, presumably, today, of the green economy”).

²⁶⁰ See Burger, *supra* note 119, at 10,356 (discussing the view that the concept of sustainable development “brackets big-ticket items like capitalism and consumerism, reifies existing actors and hierarchies, and affirms basic patterns of social organization, production, and consumption”).

C. The Legitimizing and Ritualistic Functions of Environmental Myths

Indeed, the myth of sustainable development illustrates how the explanatory function of environmental legal myths intersects with their legitimizing and ritualistic functions. Retracing the history of sustainable development, Professor Donald K. Anton argues that the concept gradually has been “co-opted by environmentally ambivalent or hostile agendas” into a philosophy for continued economic growth.²⁶¹ Sustainable development simultaneously expresses a societal goal; explains how to achieve that goal; and legitimizes systems of capitalism, economic development, and consumerism as consistent with the goal. Thus, sustainable development’s descriptive explanation of how things are, as well as its normative account of how things should be, reinforces existing social practices and institutions.

The myth that individuals are not a significant cause of environmental problems similarly legitimizes the status quo. The myth instructs that environmental problems can be resolved by regulating utilities, manufacturers, businesses, government agencies, and other nations—anyone but ourselves. The reality is that individuals contribute to these problems through their personal patterns of behavior as well as their participation in global economic and social systems.²⁶² Yet like sustainable development, the myth of individual insignificance reassures us that personal sacrifices for the common good or for the future are not necessary. Rather, by shifting the regulatory burden to others, we can have our cake and eat it too.

Other environmental myths also legitimize activities that might otherwise be subject to societal condemnation. Laws that prohibit the destruction of wetlands or other habitat express a valuation for these environmental goods and condemn their destruction. For actors who undertake these destructive activities, however, mitigation programs offer a form of penance.²⁶³ The frequent failure of mitigation to truly make up for resource damage suggests that these programs have aims apart from ensuring no net harm to the environment. These programs have an important ritualistic purpose as well: mitigation offers a means for reintegrating into good society the offender of environmental norms.

A similar analysis applies to pollution trading programs. These programs recognize pollution as harmful and perhaps even wrongful, but offer a ritual—the possession and eventual surrender of allowances—to absolve polluters of their wrongs. This is not to say that these programs are solely ritualistic. If properly implemented, they can make strides towards reducing pollution. The incorporation of offsets into such programs, however, has tended to undermine their environmental effectiveness and indicates that goals other than pollution reduction are also at work.

²⁶¹ Anton, *supra* note 144, at 215.

²⁶² See Bobertz, *supra* note 107, at 748.

²⁶³ For a discussion of the concept of penance, see Marc O. DeGirolami, *The New Religious Prisons and Their Retributivist Commitments*, 59 ARK. L. REV. 1, 21–23 (2006).

As mythographic analysis reveals, these programs gently condemn various sources of pollution while simultaneously offering a method for erasing that condemnation.

Risk assessment is yet another form of ritual. Risk assessments are of course essential to the rational operation of environmental law and other bodies of regulatory law. They enable the development of protective measures and rules to address identified risks and, more rarely, lead to the prohibition of activities deemed to be too hazardous. At the same time, risk assessments also serve to legitimize the activities of modern industrial society. Incorporated into the risk management process, risk assessments declare that such activities may continue, subject to some limits. In this context, risk assessments become important rituals for describing the indescribable and controlling the uncontrollable.

Professor Bobertz contends that environmental lawmaking in general has become a ritual for expiating our collective guilt for destroying our environment:

Without commonly accepted religious ceremonies to expiate guilt, Americans turn instead to the sanctifying rituals of lawmaking. . . . In environmental law, we have our own sacred clerics, scapegoats, and rites of redemption, even though they inhabit the seemingly asectarian world of law and politics. Indeed, the inherent spiritualism associated with nature provides a special religiosity to environmental lawmaking, as twenty-five years of incantatory rhetoric from the mouths of our leaders amply prove.²⁶⁴

The environmental laws we have enacted—like the concept of sustainable development—allow us to avoid questioning the fundamental processes of capitalism and consumerism that drive modern society.²⁶⁵

Indeed, reflection on the environmental myths discussed above reveals that in one way or another, each myth facilitates the continuation of “business as usual.” Wetland mitigation programs, carbon cap-and-trade systems, risk assessment, and even sustainable development largely do not disturb existing economic practices. The myths of regulation without regard to cost and of individual insignificance likewise mask the absence of the radical transformation that may be needed. While softening the sharpest edges of existing practices and extracting modest compensation in the process, all these myths leave intact the global systems of production and consumption that are at the root of many environmental problems. Moreover, by regularizing market exchanges of environmental amenities, these myths further strengthen the capitalist foundations of modern society. Monetization of environmental resources becomes a norm, as does the assumption that resources are fungible, subject to exchange for other environmental—or nonenvironmental—resources. The result is an even greater dominance of environmental law by a

²⁶⁴ Bobertz, *supra* note 107, at 748.

²⁶⁵ *Cf. id.* (“By acting with righteous vehemence against the visible end-products of pollution, we avoid asking harder questions about global resource allocation and the sustainability of existing industrial, agricultural, and personal patterns of behavior.”).

market-based, consequentialist paradigm featuring cost-benefit analysis as its leading analytical tool.²⁶⁶

VI. IMPLICATIONS

Myth's common presence in environmental law and beyond suggests that the existence of myth may be inevitable. Myths offer an empowering response to the unavoidable uncertainty societies and individuals face in confronting environmental problems and other challenges. If myths are inevitable, what can or should we do about them? This Part offers several recommendations: developing a greater awareness of myth in environmental law, addressing shortcomings in the law thereby revealed by applying an "Environmental Hippocratic principle," and rejecting or replacing those myths that undermine environmental law's goals.

A. Awareness of Myth and Lessons for Existing Environmental Law

Notwithstanding its critical tone, this Article does not seek to discredit environmental law or to call for its complete overhaul. Environmental law has halted or reversed many destructive trends and provides important protections to public health and the environment. It is flawed, but perhaps no more so than other areas of law.

An awareness of the myths at work in environmental law, however, can enable stronger implementation of existing laws and better design of future laws. In some instances, the myths describe failures in implementation. To fix these failures is conceptually easy, though perhaps politically difficult.²⁶⁷ Even where conceptual flaws are at work, there may be ways to counter some of the law's shortcomings. In wetlands mitigation, for example, demanding higher mitigation ratios can increase the likelihood that mitigation projects will effectively compensate for the functions lost through the destruction of a natural wetland. Likewise, discounting of carbon offsets can reflect the uncertainty that the offsets actually represent avoided or reduced carbon emissions. Implementing and monitoring stringent certification requirements for offsets also can promote offset integrity.²⁶⁸

Moreover, a healthy appreciation of environmental law's myths can prompt more vigorous engagement with the problems that the law seeks to address. We can ask probing questions and have a more transparent dialogue about the means and ends of environmental law.²⁶⁹ With respect to statutes that purport to regulate without regard to cost, for instance, we might debate the desirability of eliminating particular risks without considering the price of doing so. On the one hand, the cost-

²⁶⁶ See Purdy, *supra* note 107, at 860.

²⁶⁷ See *supra* Part III.A.

²⁶⁸ See Ramo, *supra* note 50, at 152–53.

²⁶⁹ Cf. Flournoy, *supra* note 68, at 823 (noting that "[a]nalytic techniques that present what we know while acknowledging the limits of our knowledge" can "make regulatory decisions more accessible to the public and thus more democratic").

benefit paradigm that dominates modern policy discourse makes the weighing of costs seem natural. On the other hand, the language of cost-blind statutes has an appealing ring to it, absolute and almost rights-like in nature. Contemplating what the CAA seeks to achieve may initiate a process of eventually recognizing a right to clean air or other environmental goods.²⁷⁰ Similarly, the ESA might be read to imply a right of individual plant and animal species to exist.²⁷¹

Likewise, deconstructing the myth of sustainable development can lead us to reconsider the fundamental assumptions that underlie our modern economic and social systems. In addition to adopting concrete measures that actually are sustainable, we might think about alternatives to sustainability. Rather than taking a “cradle to grave” approach to designing products and processes, innovators might take a “cradle to cradle” approach in which products and their components are designed with repurpose and reuse in mind.²⁷² Beyond that, we might reevaluate the adequacy of income, wealth, and consumption as indices of national and global well-being and look instead to alternatives that can better measure life satisfaction and quality of life.²⁷³ We might even question the imperative of economic growth and ponder what sort of society and world we want to live in.²⁷⁴

Ultimately, awareness of the myths of environmental law at least can cultivate a healthy skepticism toward the legal solutions we adopt. The myths remind us that law serves not only as a system for organizing behavior towards social ends, but also as an exercise of political power by competing interests. Awareness of the myths of environmental law can also engender a fitting sense of humility. No matter the effort and resources that society pours into risk assessments, pollution trading systems, and the like, environmental law cannot control all aspects of the natural world. We

²⁷⁰ Cf. Driesen, *supra* note 81, at 220 (suggesting the health protection goal of CAA section 109 may reflect the belief that people “have a right to breathe air that will not cause them to become ill or die”).

²⁷¹ Cf. Andrea Olive & Leigh Raymond, *Reconciling Norm Conflict in Endangered Species Conservation on Private Land*, 50 NAT. RESOURCES J. 431, 432 (2010) (suggesting that ESA protections could be framed in terms of a “species’ intrinsic right to exist”).

²⁷² See WILLIAM MCDONOUGH & MICHAEL BRAUNGART, *THE UPCYCLE: BEYOND SUSTAINABILITY—DESIGNING FOR ABUNDANCE* 7–13 (2013) (advocating moving beyond sustainability to a system of “upcycling”).

²⁷³ See Ben S. Bernanke, Chairman, Bd. of Governors of the Fed. Reserve Sys., Remarks at the 32nd General Conference of the International Association for Research in Income and Wealth: Economic Measurement 4 (Aug. 6, 2012), *available at* <http://www.federalreserve.gov/newsevents/speech/bernanke20120806a.pdf>, *archived at* <http://perma.cc/LAL9-QKU3>.

²⁷⁴ See, e.g., JAMES GUSTAVE SPETH, *THE BRIDGE AT THE EDGE OF THE WORLD: CAPITALISM, THE ENVIRONMENT, AND CROSSING FROM CRISIS TO SUSTAINABILITY* 7–13 (2008) (“[M]ost environmental deterioration is a result of systemic failures of the capitalism that we have today[,] and . . . long-term solutions must seek transformative change in the key features of this contemporary capitalism.”).

should expect surprises and accordingly temper our actions, while developing capabilities of resilience.²⁷⁵

B. Developing and Applying an Environmental Hippocratic Principle

Further, our appreciation of the myths of environmental law may warrant the application of a general rule of thumb for dealing with environmental problems. The environmental myths reveal the shortcomings of the tools of environmental law: mitigation schemes fail to make up for lost resources, risk assessments fail to account for relevant hazards, and cost considerations dilute nominally health-based standards. One means of countering these shortcomings is to apply to environmental policymaking processes a presumption in favor of less disruptive and less harmful actions. Such a presumption would recognize the seemingly inevitable slippage that occurs when valuable environmental resources are destroyed. We might call this presumption the Environmental Hippocratic principle: avoiding harm to the environment to the extent possible.²⁷⁶

How might this principle be implemented in a concrete way? The mitigation sequence for CWA Section 404 provides a useful starting point to consider: applicants are to first seek to avoid impacts, then to minimize impacts that are unavoidable, and finally to compensate for impacts that remain.²⁷⁷ In contrast to current practice, however, compensatory mitigation should be treated as a last resort, rather than as an option readily subject to government approval.

Similarly, the federal government might apply the Environmental Hippocratic principle to its planning processes under the National Environmental Policy Act (NEPA). As written, NEPA requires the federal government to analyze the environmental impacts of its actions and to consider a reasonable range of alternative actions, including a no-action alternative; it does not mandate any substantive result.²⁷⁸ Forceful application of the Environmental Hippocratic principle could give rise to a substantive requirement that the government adopt less environmentally destructive actions that achieve a desired goal in lieu of more destructive alternatives.²⁷⁹ But even a more modest application of the principle could have

²⁷⁵ See Craig & Benson, *supra* note 130, at 862–68; see generally J.B. Ruhl, *General Design Principles for Resilience and Adaptive Capacity in Legal Systems—With Applications to Climate Change Adaptation*, 89 N.C. L. REV. 1373 (2011) (examining resilience and how to design for it in legal systems).

²⁷⁶ The Hippocratic Oath is commonly believed to reflect the principle that physicians should do no harm, although those exact words do not actually appear in the oath. See Howard Markel, *“I Swear by Apollo”—On Taking the Hippocratic Oath*, 350 NEW ENG. J. MED. 2026, 2026 (2004). A similar oath has been proposed to govern scientists. See Joseph Rotblat, *A Hippocratic Oath for Scientists*, 286 SCIENCE 1475, 1475 (1999).

²⁷⁷ See *supra* Part II.A.

²⁷⁸ 42 U.S.C. § 4332(C) (2012); *Vt. Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 557–58 (1978); 40 C.F.R. § 1502.14(d) (2013).

²⁷⁹ This would be comparable to the CEQA prohibition on an agency approving a project with adverse environmental impacts if there exist feasible alternatives or mitigation

positive effects by requiring the government to take a hard look at less environmentally destructive alternatives and if appropriate, to justify their rejection.

The Environmental Hippocratic principle could apply to risk management decisions as well and help to recognize the limitations of risk assessment. One concrete way of doing so would be to incorporate a preference for options involving greater environmental certainty over those involving lesser certainty into risk management decisions. Such a preference could be considered along with other, more typical decision-making criteria. Current environmental policy discussions already reflect this preference to some degree. For example, one reason for climate change policymakers to prefer mitigation over adaptation is the greater uncertainty associated with adapting to new and indeterminate climate regimes.²⁸⁰ Similarly, in geoengineering policy debates, the general preference for carbon dioxide removal techniques—which reduce atmospheric carbon concentrations—over solar radiation management techniques—which seek to block solar radiation but do nothing to reduce carbon concentrations—reflects a preference for greater environmental certainty.²⁸¹ Such a preference could be applied in other environmental policy areas as well. For example, all else being equal, chemical regulation could favor the use of well-studied substances with no known harmful effects over substances with little toxicity data.

Another approach would be to identify a policy option's consequences that are plausible yet unacceptable, to give weighted consideration to those consequences, and perhaps even to prefer options that avoid those consequences.²⁸² Applying just such an approach to climate change, Professor Daniel A. Farber argues that “[c]limate policy cannot be based simply on the outcomes we consider most likely,” but must find a way to “take seriously that there is even a small possibility that climate change could wipe out our present society.”²⁸³ Under this analysis, strong mitigation efforts would be justified even if most people believe catastrophic climate consequences unlikely.²⁸⁴

measures to reduce those impacts. CAL. PUB. RES. CODE §§ 21002, 21081 (West 2007 & Supp. 2014).

²⁸⁰ See Alejandro E. Camacho, *Transforming the Means and Ends of Natural Resources Management*, 89 N.C. L. REV. 1405, 1411 (2011).

²⁸¹ See ALBERT C. LIN, *PROMETHEUS REIMAGINED: TECHNOLOGY, ENVIRONMENT, AND LAW IN THE TWENTY-FIRST CENTURY* 139–40 (2013).

²⁸² Daniel A. Farber, *Uncertainty*, 99 GEO. L.J. 901, 943–44 (2011).

²⁸³ *Id.*

²⁸⁴ *Id.* To some degree, application of an Environmental Hippocratic principle may overlap with application of the precautionary principle insofar as both principles explicitly recognize the importance of uncertainty. However, the former provides more concrete guidance than the latter, which has been criticized for involving little more than a general admonition to “take care.” *Id.* at 917, 958.

C. *Developing Better Myths*

Finally, armed with our understanding of the importance of myths, we should develop new, more functional myths. Legal myths create and reinforce perceptions of reality: the law's focus on industrial polluters has reinforced the myth that individuals do not contribute significantly to environmental problems, just as mitigation schemes have bolstered the assumption that environmental resources are readily fungible. In some instances, deconstructing the myth and removing its traces from the law may suffice. For example, reducing or eliminating the use of carbon offsets could be an adequate response to the questionable emissions reductions associated with these offsets. In other instances, however, further actions may be necessary. As the concept of sustainable development illustrates, myths can be powerful narratives that attract support, become incorporated into law, and motivate action, notwithstanding the fictions that lie just beneath the surface. At the heart of the sustainable development myth is not only a conceptual error, but also a broad paradigm for all human activity.

We will have to cultivate more compelling and powerful narratives to displace foundational myths like sustainable development.²⁸⁵ Sustainable development seems to have lost much of its value as a driving force for the changes needed to address environmental threats.²⁸⁶ It nonetheless fills a deep need for a way to conceptualize the relationship between humanity and the environment. We must brainstorm and explore alternative ways of thinking about this relationship, perhaps building on existing ideas—whether Gaia theory,²⁸⁷ creation myths, or other notions—or constructing myths that are completely new. Ultimately, coming up with a successor to sustainable development and other myths is no easy task and lies beyond the scope of this Article. But it is essential for scholars and practitioners of environmental law and environmentalism to take on this challenge in the years ahead.

VII. CONCLUSION

Myths are widespread in environmental law. While it may be tempting to dismiss their significance, these myths explain ecologically complex systems, express social values, and reinforce social structures and economic systems. Moreover, the myths of environmental law involve more than easily fixed errors in legal design, mere shortcomings in implementing the law, or harmless stories concerning the world around us. The myths rest on conceptual flaws that make impossible the achievement of specific statutory and societal goals. Indeed, the conceptual flaws themselves reveal disguised policy choices and unresolved conflicts that threaten the entire enterprise of environmental law. Deconstructing and

²⁸⁵ See Langevoort, *supra* note 176, at 1597.

²⁸⁶ See Anton, *supra* note 144, at 217–19.

²⁸⁷ See James Lovelock, *Gaia: The Living Earth*, 426 NATURE 769, 769–70 (2003).

understanding the myths is an important first step towards countering this threat. Moving beyond these myths and, where appropriate, constructing new myths will be critical for the future of environmental law and humanity's relationship with the natural world.