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Gaming the Past: The Theory and Practice of Historic Baselines in the Administrative State

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INTRODUCTION

In 1988, candidate George H. W. Bush was in a tight race for the presidency, behind in the polls to the Democratic challenger, Michael Dukakis. Stung by the D+ grade given by the League of

Conservation Voters, Bush was searching for a way to claw back some of the environmental vote.[1] He saw an opening in wetlands.

Perceived as worthless swamps and wasted development opportunities for most of our nation's history,[2] conversion of wetlands for agricultural and urban land uses has resulted in a staggering loss of resources.[3] Beginning in the 1970s, however, views started to change, with growing recognition of the valuable services wetlands provide to human populations—from flood protection and groundwater recharge to wildlife habitat.[4] As a result, wetlands loss has increasingly been denounced as the result of paving "paradise [to] put up a parking lot."[5]

Well aware of this widespread concern, Bush announced in a major policy statement a national goal of "no net loss" of our nation's wetlands.[6] This proved effective on the campaign trail, and, as President a year later, he adopted the goal as official government policy.[7] The Clinton Administration adopted this goal as well, going

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1. CRAIG PITTMAN & MATTHEW WAITE, PAVING PARADISE: FLORIDA'S VANISHING WETLANDS AND THE FAILURE OF NO NET LOSS 90 (2009).

2. *See* John Copeland Nagle, *From Swamp Drainage to Wetlands Regulation to Ecological Nuisances to Environmental Ethics*, 58 CASE. W. RES. L. REV. 787, 789–96 (2008) (reviewing the history of government programs to drain and fill wetlands and of the courts' low regard for swamps).

3. The U.S. Fish and Wildlife Service has estimated that the contiguous forty-eight states lost over half their wetlands land cover from the time of European settlement until the 1990s, going from over 220 million acres to 107 million acres. JEFFREY ZINN & CLAUDIA COPELAND, CONGRESSIONAL RESEARCH SERVICE, WETLANDS: AN OVERVIEW OF ISSUES 5 (2006). Conversion to agriculture accounts for over eighty percent of those losses, but in the past several decades loss to urbanization has taken over as the leading cause of wetland resource losses. T.E. DAHL, U.S. FISH AND WILDLIFE SERVICE, STATUS AND TRENDS OF WETLANDS IN THE COTERMINOUS UNITED STATES 1998–2004, at 47 (2006) [hereinafter STATUS AND TRENDS]; ZINN & COPELAND, *supra*, at 14. Even during the period from the mid-1950s to the mid-1970s, national wetland losses exceeded 450,000 acres annually. DAHL, *supra*, at 15.

4. *See* Brant Keller, *What We Always Knew: Wetlands Win Hands Down at Pollution Mitigation*, NAT'L WETLANDS NEWSL., Sept.–Oct. 2005, at 12, 12; Sandra Postel & Stephen Carpenter, *Freshwater Ecosystem Services*, *in* NATURE'S SERVICES: SOCIETAL DEPENDENCE ON NATURAL ECOSYSTEMS 195, 196 (Gretchen C. Daily ed., 1997). As Hurricane Katrina made all too evident, cumulative wetland loss along the Gulf coast degraded these services and led to loss of life and property. *See* AFTER THE STORM: RESTORING AMERICA'S GULF COAST WETLANDS, A SPECIAL REPORT OF THE NATIONAL WETLANDS NEWSLETTER 1 (Gwen Arnold ed., 2006). Not surprisingly, the most economically destructive flooding in New Orleans was on prior coastal wetland areas that had been drained and developed. *See Nature Destroys, But It Also Can Protect*, ENVTL. F., Sept.–Oct. 2005, at 18, 18.

5. JONI MITCHELL, *Big Yellow Taxi*, *on* LADIES OF THE CANYON (Reprise 1970).

6. The political origins of the "no net loss" policy are meticulously detailed in PITTMAN & WAITE, *supra* note 1, at 90–95. For more detail, see *infra* Part III.A.

7. *See, e.g.*, Memorandums of Agreement (MOA); Clean Water Act Section 404(b)(1); Corrections, 55 Fed. Reg. 9210, 9210 (Mar. 12, 1990) ("The Domestic Policy Council, through its Inter-Agency Task Force on Wetlands, of which both the Environmental Protection Agency and

one step further by announcing a policy to achieve net increases in wetlands of 100,000 acres per year by 2005.[8] In 2004, President George W. Bush set an even more challenging goal of a net increase of more than three million acres in five years.[9] The "no net loss" policy, with its various "net gain" additions, lived on in roughly the same form through four very different administrations, and remains intact in the Obama Administration.[10]

This story provides a nice case study of clever campaigning, but it raises an interesting question as well: Why has every president since 1988 framed the wetlands policy goal this way?

After all, when announcing the policy in 1988 Bush could just as easily have named other goals for wetlands with equally bold declarations. He might have called for conserving an absolute number of acres ("By the end of my first term, we will have 100 million acres of wetlands conserved."), protecting the most important wetlands for flood control ("At-risk cities such as New Orleans will remain protected by their natural buffers."), or some type of cost-benefit assessment of which wetlands to protect ("When development is most important then we will allow construction, and when conservation

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the Army Corps of Engineers are members, has been tasked by the President to develop recommendations regarding attainment of the goal of no net loss of the Nation's wetlands."). The original imprimatur of the "no net loss" policy is usually traced to a policy document the Environmental Protection Agency and Army Corps of Engineers issued in 1990. *See* Memorandum of Agreement Between the Department of the Army and the Environmental Protection Agency Concerning the Determination of Mitigation Under the Clean Water Act Section 404(B)(1) Guidelines, *reprinted at* 55 Fed. Reg. 9210 (Mar. 12, 1990) [hereinafter 1990 Memorandum of Agreement], *available at* http://water.epa.gov/lawsregs/guidance/wetlands/mitigate.cfm.

8. The specific proposal was included in the Clinton Administration's 1998 Clean Water Action Plan, which included "[a] coordinated strategy to achieve a net increase of 100,000 wetland acres a year by 2005, including a 50 percent increase in wetlands restored and enhanced by the Corps of Engineers." Press Release, EPA, Clean Water Action Plan (Feb. 19, 1998), *available at* http://www.epa.gov/history/topics/cwa/03.htm. Notably, no net gains were intended or expected to be achieved until 2005, that is, not during any Clinton Administration. *See* PITTMAN & WAITE, *supra* note 1, at 98.

9. Press Release, White House, President Announces Wetlands Initiative on Earth Day (Apr. 22, 2004), *available at* http://georgewbush-whitehouse.archives.gov/news/releases/2004/04/20040422-4.html. President Bush declared:

> I'm committing our government to a new policy. We will move beyond the no net loss of wetlands in America to having an overall increase of Americans' wetlands over the next five years. . . . We can achieve this goal . . . . To do so, we will work to restore and to improve and to protect at least three million acres of wetlands over the next five years. First, we will restore at least . . . one million acres of wetlands that do not exist today.

Id.

10. *See* Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. 19,594, 19,594 (Apr. 10, 2008) (describing "no net loss" of wetlands as a longstanding national goal guiding federal policy).

matters most the wetlands will be protected."). Despite these options, and each has its own particular merits, the "no net loss" goal, now in its third decade, remains firmly in place.

The goal of "no net loss" provides an example of a "historic baseline." Policymakers identify some point in the past (even the very recent past) whose conditions seem desirable today and going forward, and use that baseline to ground the policy goal. Historic baselines occur in a range of settings throughout regulatory law. For example:

> The U.S. Census serves as a rolling population distribution baseline for purposes of federal legislative allotments as well as the distribution baseline for many other federal benefits.[11]
>
> The Kyoto Protocol for reductions of greenhouse gas emissions uses 1990 as the baseline for its targets.[12]
>
> The Federal Sentencing Guidelines are largely based on averages of historic sentencing practices.[13]
>
> Wildlife refuge managers are committed to managing ecosystem resources based on "historic conditions."[14]

Historic baselines seem to work well in these settings and are used to frame policy standards across the government, from determining the number of federal judges[15] and the bandwidth law enforcement agencies can use for electronic surveillance[16] to tax reform,[17] immigration quotas,[18] and government budgets.[19] But here is

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11. *See About Us*, U.S. CENSUS BUREAU, http://www.census.gov/aboutus/ (last visited Nov. 4, 2010).

12. Kyoto Protocol to the United Nations Framework Convention on Climate Change art. 3, para. 1, *opened for signature* Dec. 11, 1997, 2303 U.N.T.S. 148, *available at* http://unfccc.int/essential_background/kyoto_protocol/items/1678.php.

13. Stephen Breyer, *The Federal Sentencing Guidelines and the Key Compromises Upon Which They Rest*, 17 HOFSTRA L. REV. 1, 17 (1988). *But see* Marc Miller & Robert Wright, *Your Cheatin' Heart(Land): The Long Search For Administrative Sentencing Justice*, 2 BUFF. CRIM. L. REV. 723, 754–55 (1999) (arguing that the Guidelines were based on a more complex set of factors).

14. *See* Policy on Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System, 66 Fed. Reg. 3,810, 3,818, 3,821 (Jan. 16, 2001).

15. The judicial council considers requests for adding judges to federal appellate circuits by comparing the court's current caseload (measured by adjusted filings) to the "reasonable" historical baseline of 500 adjusted filings per panel. *See* S. REP. NO. 110-427, at 8 (2008).

16. Law enforcement agencies can only seek a certain bandwidth capacity for electronic surveillance, and the amount they are able to seek is set by the historical baseline of capacity used. *See* H.R. REP. NO. 104-863, at 22 (1996) (Conf. Rep.).

17. In 1986, 2005, and 2009, the tax reform process was bounded by policy that had been set forth from above. In 2005, President Bush directed that the reform committee consider various alternatives (income tax, consumption tax, hybrid systems, etc.) but that the relative mix of tax burdens among each quintile remain the same. The distributive burden as of 2004 was thus used as the historic baseline. The

the key question: *Why* use historic baselines to frame the standard? After all, when deciding whether to conserve wetlands, reduce pollution, or pursue policy goals in many other settings, policymakers face a choice. They know where they want to go, but there are several routes they might take to get there. There is any number of ways to use regulation to move parties from A to Z but, so long as the regulated party ends up at Z, does it really matter how it got there? Put simply, in the regulatory context, how does form influence function?

Consider, for example, the regulation of a hazardous air pollutant. Congress might pass a statute calling for a seven percent reduction of Dimethyl Terrible below 1990 emission levels by the year 2020. This would be the historic baseline approach. But the policy could rely equally well on a range of different approaches:

Standard Setting Approach	**Expression of Standard**
Absolute target: Specify a quantitative limit	The United States will emit no more than 200 tons in the year 2020.
Risk-based: Specify acceptable risk levels	Emissions will be set at levels that protect the public health.
Technology-based: Specify required technological effort	Emissions will be set at levels achievable using best available technology.
Cost-based: Specify desired cost-benefit outcome	Emissions will be based at the economically efficient level, where benefits most exceed costs.

> idea was that by removing the political question of how to distribute the tax burden among rich, middle, and poor, the committee could focus on efficiency and administrability. Cynics noted that the baseline included Bush's recently enacted cuts, which were themselves a departure from historic baselines.

E-mail from Victor Fleischer, Assoc. Professor of Law, Univ. of Colo. Sch. of Law, to Jim Salzman, Samuel F. Mordecai Professor of Law, Nicholas Inst. Professor of Envtl. Pol'y, Duke Univ. (Feb. 13, 2010, 3:11 P.M.) (on file with Vanderbilt Law Review).

18. The Immigration Act of 1924 limited the number of immigrants to two percent of the number of people from that country already living in the United States in 1890. Office of the Historian, *Milestones: 1921–1936: The Immigration Act of 1924 (The Johnson-Reed Act)*, U.S. DEP'T OF STATE, http://history.state.gov/milestones/1921-1936/ImmigrationAct (last visited Nov. 4, 2010). This effectively ensured that roughly seventy-five percent of future immigration would come from Northwestern Europe. Office of the Historian, *Milestones: 1945–1952: The Immigration and Nationality Act of 1952 (The McCarran-Walter Act)*, U.S. DEP'T OF STATE, http://history.state.gov/milestones/1945-1952/ImmigrationAct (last visited Nov. 4, 2010).

19. The Congressional Budget Office baseline measures approximately what the federal budget would be for the next ten years if all of the current policies and laws remained in effect. BILL HENIFF JR., CONG. RESEARCH SERV. NO. IB10096, CRS BRIEF FOR CONGRESS: CONGRESSIONAL BUDGET ACTIONS IN 2002, at 4, 7 (2002), *available at* http://www.policyarchive.org/handle/10207/bitstreams/776.pdf.

Congress needs to settle on only one of these options. But how should it make this decision? In particular, if all of these different approaches yielded the same absolute levels of emissions, on what basis should Congress decide which approach to take, and would it even matter?

A great deal of scholarship exists on the theory and practice of absolute, risk-based, technology-based, and cost-based methods of defining regulatory standards, but that is not true of the historic baseline method. To be sure, historic baselines receive plenty of scholarly attention in other settings. The doctrine of stare decisis and the evolution of the common law are both premised on a notion of respect for the baseline of past decisions. So, too, in constitutional law does the interpretive theory of Originalism seek to determine and hew to the historic baseline meaning of constitutional text.[20] In the field of regulation, by contrast, we have found no systematic treatment of the theory and practice of historic baselines as a specific strategy of policy development.

One might ask, so what? Why can one not simply apply what is known about the other approaches to historic baselines? This Article addresses those questions directly, showing that the unique qualities of historic baselines establish them as distinct instruments in regulatory policy warranting close attention. Unless one believes that policymakers choose between alternative types of goals randomly, or that it simply does not matter which they choose, each approach deserves its own theoretical development in order to make better choices and predict the comparative potential for success and failure. This Article is the first to do so for historic baselines.

Our central inquiry is to examine what makes historic baselines so attractive to Congress and the President in some contexts but not in others. Historic baselines are found in many fields, from budgeting and criminal sentencing to environmental protection and land use, yet their particular attributes—what makes them potentially different from other approaches—remain unexamined. We do not see historic baselines used everywhere, so there must be a converse question: How does reliance on a historic baseline introduce constraints that might not be present with other types of goals? Put another way, when are absolute target, risk-based, technology-based, or cost-based standards more attractive than historic baselines?

To get at the heart of these questions, we use examples from wetlands policy, the Kyoto Protocol, the Endangered Species Act,

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20. *See, e.g.*, John O. McGinnis & Michael B. Rappaport, *A Pragmatic Defense of Originalism*, 101 NW. U. L. REV. 383, 395 (2007).

climate change policy, and other regulated fields to examine the attributes, design issues, and strategic uses and abuses of historic baselines. The sections that follow provide a wide-ranging analysis of historic baselines, identifying where they are used in the regulatory landscape, why they are particularly attractive or unattractive to policymakers, the different dimensions of such baselines and why these matter, different strategies to game historic baselines, and, taking this together, applying our insights to the emerging policy debate over climate change.

Part I unpacks the structure and design of historic baselines. Although not always made explicit, all historic baselines consist of four core attributes: (1) a regulatory goal, (2) a temporal reference point, (3) baseline metrics, and (4) a margin of deviation. Part I examines how each of these attributes contributes to the effective framing of the baseline, identifies the design issues particular to each, and demonstrates the different forms historic baselines can take.

Part II explores the attractiveness of historic baselines. It examines the features that make historic baselines preferable when compared to risk, technology, or cost-based standards, as well as what makes them relatively unattractive. Historic baselines surely offer rhetorical benefits—goals that most anyone can understand more readily than some measure of risk or parts per million. At the same time, historic baselines assume an understanding of prior conditions that may be unwarranted. They may also mask more than they reveal, creating opportunities for rent-seeking by interest groups.

Part III explores the mechanisms of rent-seeking in more detail, delving into the strategic gaming possibilities created by historic baselines. Of course, all standard-setting approaches are subject to gaming, but the temporal component of historic baselines sets them apart from the other approaches and opens up qualitatively different strategic opportunities. While historic baselines may seem like innocuous, inert dates from the past, it turns out they are well suited for intense gaming in ways that favor particular political or economic interests, potentially diluting the effectiveness of the baseline while appearing to anchor and guide regulatory policy. Strategic framing of the unit of the baseline or the way in which success toward achieving the target is measured can infuse malleability into the baseline over the long term.

The "no net loss" of wetlands baseline described above, for example, failed to specify what counts as a wetland, or even what counts as loss, much less how we measure these. As discussed in Part III, this imprecision has led to a debate ever since over the question, "No net less of what? Wetland acres? Wetland function?" Baselines

can also be used to favor particular interest groups by selecting reference points, conditions, or targets amenable to their circumstances. For example, the 1990 baseline commonly used for greenhouse gas reductions in the Kyoto Protocol favored Eastern European and former Soviet countries.[21] Given the collapse of their economies after the fall of the Iron Curtain, this baseline amounted to a subsidy to encourage these countries to sign. A baseline of 1985, for example, would have been far less attractive.

To be clear, our examination of gaming opportunities is not intended to generally praise or condemn historic baselines. In some contexts using historic baselines to set regulatory standards might be folly, and in others it might break policy logjams where no other approach could. Hence, while describing the attributes, design, and gaming of historic baselines is important for identifying how they operate as a distinct policy instrument, the real test for the analytical framework we build is whether it helps in understanding how policymakers might usefully employ historic baselines in current policy challenges.

To this end, Part IV aims the theoretical framework we have developed at a practical context by examining the potential role of historic baselines in climate change policy. Climate change poses tremendous disruptions of the human and natural environments over the coming decades, leading to social and environmental changes of a character and magnitude not experienced in modern history. The demand for action will require policymakers to consider a wide array of regulatory goals for controlling greenhouse gas emissions, sequestering carbon from the atmosphere, and adapting to climate change impacts that cannot be avoided. Our analysis shows that historic baselines will be an essential policy instrument for designing approaches to limit greenhouse gas emissions and enhance carbon sinks, but that they will prove unworkable or even counterproductive in the context of climate change adaptation policy.

Oscar Wilde wryly observed that "the one charm of the past is that it is the past."[22] Given the ubiquity of historic baselines in the administrative state, the past remains firmly in the present. Yet legal scholarship has not developed a sophisticated theory for the practice of historic baselines in the administrative state. This Article fills that gap by building an analytical framework for understanding how

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21. David G. Victor et al., *The Kyoto Protocol Emission Allocations: Windfall Surpluses for Russia and Ukraine*, 49 CLIMATIC CHANGE 263, 263 (2001).

22. OSCAR WILDE, THE PICTURE OF DORIAN GRAY 81 (Michael Patrick Gillsepie ed., W.W. Norton & Co. 2d ed. 2007) (1891).

historic baselines are designed and strategically employed in regulatory policy. Given the potentially transformative effects and massive scales of looming regulatory problems, such as climate change, a deeper understanding of how historic baselines operate is long overdue.

I. WHAT ARE HISTORIC BASELINES?

Suppose that Congress, as part of its national climate change policy initiative, decides that federal public lands should play a significant role in promoting carbon sequestration.[23] Congress could simply specify "promoting carbon sequestration" as yet another goal federal land management agencies must consider in management decisions, or it could establish more specific targets. For example, Congress could direct agencies to manage timber resources to sequester a specified quantity of carbon each year, to give management preference to the tree species with the greatest sequestration potential, or to use cost-benefit analysis to design a new management regime centered on carbon sequestration.

Assume, though, that Congress chose to use a historic baseline as the means of establishing the carbon sequestration management benchmark, much as President Bush did with wetlands. In this Section, we focus on how Congress and agencies would construct such a historic baseline. While using a point in time as a reference is a fundamental aspect of historic baselines, there is more to designing a baseline than just randomly picking a year from the past. Historic baselines actually have discrete qualities and specific attributes that

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23. Carbon sequestration is a form of climate change mitigation that focuses on increasing sinks of carbon rather than reducing sources of carbon emissions. *See* INT'L PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2001: WORKING GROUP III: MITIGATION, app. II, (2001) *available at* http://www.grida.no/publications/other/ipcc_tar/?src=/climate/ipcc_tar/wg3/454.htm ("[Sequestration is] the process of increasing the carbon content of a carbon reservoir other than the atmosphere. Biological approaches to sequestration include direct removal of carbon dioxide from the atmosphere through land-use change, afforestation, reforestation, and practices that enhance soil carbon in agriculture. Physical approaches include separation and disposal of carbon dioxide from flue gases or from processing fossil fuels to produce hydrogen- (H_2) and carbon dioxide-rich fractions and long-term storage underground in depleted oil and gas reservoirs, coal seams, and saline aquifers.") (emphasis omitted). Federal public land management policy has recently turned attention to how the federal government's vast land holdings could contribute to carbon sequestration through subsurface storage and through storage in vegetative land cover. *See* DEP'T OF INTERIOR, REPORT TO CONGRESS: FRAMEWORK FOR GEOLOGIC CARBON SEQUESTRATION ON PUBLIC LAND IN COMPLIANCE WITH SECTION 714 OF THE ENERGY INDEPENDENCE AND SECURITY ACT 1–2 (2009), *available at* http://groundwork.iogcc.org/sites/default/files/Framework%20for%20Geological%20Storage.pdf; ROSS W. GORTE, CONG. RESEARCH SERV. NO. RL31432, CRS REPORT FOR CONGRESS: CARBON SEQUESTRATION IN FORESTS 3 (2007), *available at* http://www.nationalaglawcenter.org/assets /crs/RL31432.pdf.

prove important in understanding their advantages and disadvantages compared to other types of standards. The chart below sets out the core attributes of historic baselines for carbon sequestration in national forests. These attributes and the design choices they provide are then explored in greater detail in the text that follows.

Attribute	**Design Questions**
Regulatory goal	What is the purpose of the goal in sequestering carbon on national forest lands? Can this be adequately captured by a historic baseline?
Temporal reference point	What set of conditions at a particular period in the past best represents these conditions on national forest lands?
Baseline metrics	What protocol and criteria should be used to measure those conditions at the temporal reference point and in the present and future?
Margin of deviation	What deviations from the conditions as they existed at the temporal reference point will be tolerated?

A. Attributes

To begin with, all standards express a *regulatory goal*. In the carbon sequestration scenario, the broad goal, of course, is to sequester carbon in vegetation, usually forests. The very nature of the goal may make historic baselines more or less attractive. If the goal is economic efficiency or equity, then a historic baseline approach may not make a lot of sense—a cost-benefit goal or multiple-use mandate would be more appropriate.[24]

An inherent feature of a historic baseline is that it does not use a specific quantitative standard to express the goal, such as so many million tons of carbon sequestered each year. Rather, a historic baseline implies that a point in the past can serve as the foundation for regulatory goals in the present and future. We may wish to sequester as much carbon on national forest lands each year as in 1990, or in some other year of peak sequestration capacity. This goal requires the creation of a *temporal reference point*.

Of course, a number of assumptions are embedded into such a reference point. First, historic baselines assume that an ideal

24. The Clean Air Act's National Ambient Air Quality Standards, for example, require the EPA to set standards that protect the public health within an adequate margin of safety. 42 U.S.C. § 7409(b)(1) (2008).

temporal reference point can be defined. For the wetlands "no net loss" baseline, that appeared easy—the temporal reference point was the day President Bush issued the policy in 1990. But had the goal been to restore wetlands to some past state of conditions, the question would have been which year or period in the past best matched the restoration goal.

The second assumption is that we actually know the conditions in place at the time of the reference point. This requires that the baseline incorporate a set of *baseline metrics* that define what regulators believe are both the essential characteristics of the regulatory goal and a reliable measurement of the past condition, which may not be as easy as it seems. For one thing, if the conditions occurred in the past, was monitoring at the time adequate to measure the important metrics? If the wetlands policy goal had been no net loss from wetlands coverage in 1950, there would have been significant estimation concerns if data from that period were incomplete or sketchy. In practice, the "no net loss" policy finessed the expression of the temporal reference point by using the date of the policy announcement. This policy choice avoids the problem of accurate measurement of past conditions, but does not speak to the more difficult questions—no net loss of what? What counts as a wetland, and what is it about wetlands the baseline is counting? There is a continuing debate over what exactly should be counted today as a wetland for purposes of evaluating success in achieving the "no net loss" goal.[25] Should the "no net loss" goal be considered no net loss of wetland services, wetland function, or wetland acreage?

Moreover, assuming that conditions at the time of the temporal reference point and thereafter can be reliably described and measured, another assumption inherent in a historic baseline is that those conditions can be achieved once again and maintained in the future within some *margin of deviation*. Of course, any type of standard assumes the regulatory goal can be successfully attained, but historic baselines carry with them the fundamental reality that the past seldom can be perfectly recreated and maintained. The "no net loss" policy, for example, very pointedly did not preclude loss of *any* wetland resources. Rather, it accommodated losses by requiring that they be mitigated through restoration, enhancement, or preservation of other wetland resources to achieve no net loss.[26] But does the policy allow net losses of one type of wetland if mitigated with restoration of another type of wetland? And does the policy allow net losses in one

25. *See infra* Part III.A.

26. *See infra* Part III.A.

area of a state if mitigated with restored wetlands in another part of the state? Depending on how these questions are decided, the actual wetland resources on the ground could deviate substantially from those present at the time the federal government adopted the policy, even while the "no net loss" goal is maintained in a broad sense.

To summarize, a historic baseline has four core attributes, irrespective of whether it is addressing wetlands, toxic chemicals, or budgets. The baseline must flow from a regulatory goal and be anchored in a temporal reference point, measured by metrics to assess progress toward the reference point, and cabined within a margin of deviation from the reference point. Using these attributes, policymakers have several design choices to make.

B. Design Choices

In practice, the historic baselines in our laws are shaped by three basic design choices: (1) whether the temporal point of reference is recent or ancient; (2) whether the baseline seeks to replicate conditions at the temporal reference date or uses the baseline conditions as a reference point from which to specify the regulatory standard; and (3) whether the baseline is static or fluid. These choices, in turn, are driven by the regulatory goals—different kinds of baselines serve different purposes.

1. Ancient Versus Recent Baselines

The fundamental purpose of a historic baseline is to "anchor" a standard using a reference point from the past. Our research revealed that Congress and agencies tend to do so by using either recent reference points or ancient reference points, with nothing in the middle. *Ancient baselines* are perhaps the most controversial examples of historic baselines, as they generally are associated with highly normative statements about humans and the environment—that both were somehow "better" a long, long time ago. As a result, they are also the most abstract form of baseline. For example, the U.S. Fish and Wildlife Service ("FWS") proposed national wildlife refuge regulations in 2000 to maintain the "biological integrity, diversity, and environmental health" of the refuges system.[27] To determine what constitutes these three conditions, the proposed regulations adopted

27. Draft Policy on Maintaining Ecological Integrity of the National Wildlife Refuge System, 65 Fed. Reg. 61,356, 61,356 (Oct. 17, 2000).

an ancient "natural conditions" baseline standard of implementation. As the agency explained:

> The holistic integration of these three qualities constitutes ecological integrity. The concept of ecological integrity requires a frame of reference for natural conditions. *Our frame of reference extends from 800 AD to 1800 AD.* The former date marked the beginning of an ecological transformation associated with higher temperatures; the latter approximates the advent of the industrial era, including drastic and widespread habitat loss. In areas where pre-industrial European settlement was particularly intensive, however, our frame of reference may be shorter. *Natural conditions also include those that would have persisted or evolved to the present time if European settlement and industrialization had not occurred.* At each refuge, we ascertain natural conditions, assess current conditions, *and strive to decrease the difference.*[28]

This kind of historic baseline has a clear goal and temporal reference point. Underlying these, however, are unstated assumptions that (1) the period from 800–1800 AD best defines natural conditions; (2) the agency can employ a set of metrics that reliably measures conditions of a particular refuge area in that period and compares them to conditions of the refuge in the present; and (3) the difference between then and now could be reduced to some acceptable margin of deviation.

Each of those assumptions is problematic, however, which helps explain why they were unstated. Indeed, in its final promulgation of the rule, the FWS reported that "this concept clearly created a catalyst for controversy among reviewers," with the "great majority express[ing] strong concern."[29] The agency attempted to address the concerns by being more straightforward, replacing "natural conditions" with the concept of "historic conditions," which the agency described as "composition, structure, and functioning of ecosystems resulting from natural processes that we believe, based on sound professional judgment, were present prior to substantial human related changes to the landscape."[30] Hence, while backing off the full implications of "natural conditions," the FWS stuck to the position that "a reference point is pivotal to compliance with the mandate [to] . . . ensure the maintenance of biological diversity, integrity, and environmental health."[31] The essence of this and other ancient baselines, therefore, is to differentiate between modern conditions and conditions from the distant and possibly even prehistoric past, in this case between ecological conditions before and after significant human-

28. *Id.* at 61,359–60 (emphasis added).

29. Policy on Maintaining the Biological Integrity, Diversity, and Environmental Health of the National Wildlife Refuge System, 66 Fed. Reg. 3,810, 3,811 (Jan. 16, 2001).

30. *Id.* at 3,818.

31. *Id.* at 3,811.

induced change, in order to define a pre-human environmental baseline.

Most historic baselines ground the temporal reference point in the recent past. The "no net loss" standard and rolling budget baselines are obvious examples. Interestingly, we could find no example of a historic baseline using a reference point between ancient and recent time frames relevant to current generations of people. Thus, for example, no regulatory baseline in effect today references "1910" or "pre-World War I." Even the baselines discussed in the context of climate change, where one might reasonably expect the goals to reference a time before industrial greenhouse gas emissions began to have effects on the climate system, fit the pattern through the convoluted route of basing reductions off of recent temporal reference points. In July 2009, for example, the G8 nations supported a target to keep global temperatures from rising more than two degrees Celsius from current levels.[32] A year earlier, the same group of leaders had called for halving greenhouse gas emissions by 2050.[33] This goal could have been framed much more directly as reductions that meet a baseline year of, say, 1900. As discussed in Part II, the reason for using this approach likely turns on the framing effect of recency—that is, that people living today can relate to 1990 as a reference point for additional reductions, whereas a baseline of 1900 would not resonate even though the two may be identical in terms of emissions levels.

2. Specific Date Versus Percentage Target

While a historic baseline must fix a temporal reference point, not all baselines stop there. Indeed, many historic baselines, particularly in the pollution context, use the baseline date as the fulcrum upon which percentage targets pivot. Thus the Kyoto Protocol mandates that the United States reduce its greenhouse gas emissions by 2012 to seven percent below the 1990 levels, while Australia is allowed to increase its emissions eight percent above 1990 levels by 2012. The National Wildlife Refuge regulations' "historic conditions" baseline described above, by contrast, is fixed. The FWS is not trying to achieve eighty percent of historic conditions. In general, these fixed baselines operate in the first instance as qualitative goals, such as the

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32. Patrick Wintour & Larry Elliott, *G8 Agrees to Climate Targets Despite Differences with Developing Nations*, GUARDIAN (London), July 8, 2009, at 14, *available at* http://www.guardian.co.uk/world/2009/jul/08/g8-climate-carbon-emission-targets.

33. *G8 Adopts Climate Change Goal for 2050*, BRIDGES TRADE BIORES, July 11, 2008, at 6, *available at* http://ictsd.org/i/news/biores/12755/.

wetlands "no net loss" policy. The agency must then determine the appropriate baseline metrics and margin of deviation to make this work in practice.

So why prefer a specific date versus a percentage target? As noted above, fixed dates work well when there are not good data about the actual baseline date and the year serves as a proxy for a qualitative state (for example, 1492 instead of pre-European colonization). The "fulcrum" approach of percentage targets, by contrast, allows a wide range of flexibility for goals that are quite independent of the actual baseline conditions (for example, sixty, eighty, or ninety-five percent of 1990 levels). Also, the percentage approach allows policymakers to select a date that fits in the recent past for purposes of providing a temporal reference point that resonates in the public mind and memory, but then use the percentage target to define the actual standard. As noted, for example, many of the greenhouse gas emission reduction targets use 1990 as the reference point and a percentage target to set a final emissions level. If, by contrast, the target for a national aggregate emissions level was keyed to the year in which the nation last met that level, the temporal reference point would be 1910, and if per capita emissions were the metric the temporal reference point would be 1875.[34] It is worth noting, as well, that baselines also imply deadlines. Meeting a 1990 emissions deadline is much harder in 2012 than in 2050. Therefore, the timing of the deadline plays a fundamental role in baseline design.

3. Static Versus Fluid

The final design choice turns on whether the baseline is fixed in time or explicitly designed to change over time. A historic baseline can be made fluid through mechanisms such as rolling period averages or periodic adjustment using specified standards. To expressly recognize new knowledge and more precise measurement techniques, for example, the baseline could ratchet up every ten years. In principle, this approach builds flexibility into the baseline to accommodate changes in conditions. As a result, rolling baselines can have a longer life, making them both anchored and adaptive. This flexibility provides an effective way to keep the standard moving.

These baselines generally start with a specific benchmark period, but then move over time to reflect what might be natural

34. Steven F. Hayward & Kenneth P. Green, *Waxman-Markey: An Exercise in Unreality*, ENERGY & ENV'T. OUTLOOK (Am. Ent. Inst. Pub. Pol'y Research, Washington, D.C.), July 2009, at 1, 3–4, *available at* http://www.aei.org/docLib/EEO-03-July-09-g.pdf.

variability in conditions, budget levels, or changes in knowledge about whatever is being measured. A number of river management baselines, for example, account for variations in wet and dry years by using flow data averaged over rolling periods of consecutive years,[35] and the federal budgeting process has used a rolling baseline to estimate federal spending and receipts during a fiscal year under existing policies.[36]

Using the carbon sequestration scenario described at the beginning of Part I as an example, the baseline attributes and types outlined above can be meaningfully summarized in the chart below:

	Design Choice		
Attribute	*Ancient versus recent*	*Fixed versus percentage benchmark*	*Static versus fluid*
Regulatory goal	Manage national forests to achieve sequestration levels under "natural conditions" *versus* under conditions taking human presence into account	Manage national forests based on carbon sequestration conditions that existed at the reference point *versus* some percentage thereof	Manage each national forest to achieve and maintain its maximum past sequestration capacity *versus* allowing the level to change over time
Temporal reference point	Use a period of pre-European settlement or pre-human settlement *versus* a more recent date, such as 1995	Use the reference point as the level *versus* as the fulcrum from which to set percentage goals	Stick with the original reference point *versus* allow it to adjust under some formula, such as a rolling ten-year average
Baseline metrics	Likely the same under either approach, though metrics for recent reference points may allow more precise measurement	Likely the same under either approach	Likely the same under either approach
Margin of deviation	Likely higher for ancient baselines given the impossibility of replicating pre-European or pre-human conditions	Possibly high depending on how different year X is from present	Possibly high depending on how different year X is from present

35. *Monitoring and Data on Minnesota's Rivers*, MINN. SHORELINE MGMT. RESOURCE GUIDE, http://www.d.umn.edu/~seawww/depth/rivers/24.html (last visited Nov. 4, 2010).

36. *See* BILL HENIFF, JR., CONG. RESEARCH SERV. NO. 98-560 GOV, CRS REPORT FOR CONGRESS: BASELINES AND SCOREKEEPING IN THE FEDERAL BUDGET PROCESS 1–2 (rev. Dec. 8, 2006), *available at* http://www.rules.house.gov/archives/98-560.pdf ("Discretionary spending is assumed to continue at the level of the current year's spending level adjusted 'sequentially and cumulatively' for inflation and other factors.").

II. WHY HISTORIC BASELINES?

Assume, for a moment, that you are the legislative aide to the ranking Senator in the Committee on Environment and Public Works. You have been asked to draft a bill to reduce a particular pollutant. You know where you want to end up—reduce the twenty tons emitted today to fifteen tons of total emissions in 2012. Sitting down to translate the idea into statutory text, though, you realize that you can end up at fifteen tons using any number of goals. You wonder to yourself, "If the final endpoint is fifteen tons, does it really matter whether I use an absolute goal, a 25 percent reduction from the current level of twenty tons, a risk-based approach, or the best available technology? So long as the legislation gets the regulated community to the same final number, who cares how they get there?" You would also face very similar questions if you were conserving a natural resource, such as wetlands or forest cover.

In this thought experiment, why would you favor one type of goal over another? Surprisingly, in our discussions with legislative aides working in Congress, this type of explicit deliberation among types of goals rarely seems to take place, hence the reason for writing this Article. Make no mistake, though; an implicit calculation does occur. If all that mattered were the final number, then one might expect a random distribution of statutory goal types. Therefore, in practice, some types of goals must prove more suitable in particular circumstances than others. This Section explores why the form of the statutory goal makes a functional difference. In particular, it breaks out the likely benefits and disadvantages of using historic baselines to express statutory goals. As this Section will show, more generally the type of goal illuminates certain comparisons by suppressing others.

A. Why Use Historic Baselines?

1. If the Shoe Fits . . . .

The most obvious reason to choose a historic baseline as the statutory goal is that there is no choice but to do so. If the express goal is a qualitative state from the past, there is no obvious number to set. As described above, for example, the FWS strives to manage the nation's wildlife refuges toward a baseline of "historic conditions." This baseline does not lend itself to precise numbers of species assemblage or population numbers, at least not at the statutory level. There is no other way to manage for historic conditions than to use a historic baseline. Pointed toward the historical period, the agency,

whether the FWS or the Park Service, then can play its expert role to track disturbances and ecological succession back in time and figure out as best it can what the ecosystem looked like prior to 1492.

2. Understandability

Compared to other types of goals, historic baselines can be rhetorically effective. They offer a certain homespun understandability. The public gets the idea of returning Wildlife Refuges or National Parks to their state prior to European colonization. There is a "bumper-sticker appeal" to the phrase, "Save Our Wilderness." The implicit idea behind any historic baseline is that we (or at least our forebears) were there once before and, most important, can get there again. Historic baselines draw a line in the sand, but a line that everyone can understand and, more important, relate to. They reassure both those who seek increased environmental protection (that progress is being made) and those who seek reassurance from change (that the world as they know it is not being destroyed). The result is incremental change anchored in a known state.

Contrast, for example, the goal of returning carbon dioxide to pre-industrial levels with the goal of returning carbon dioxide concentrations to a level of 280 parts per million ("ppm"). In practical terms, these goals are saying the same thing but do so to very different effect. As Don Elliott has observed, "who will fight or sacrifice for 280 ppm?"[37] Indeed, much of the recent greenhouse gas debate has turned on whether the emissions target should be twice or three times pre-industrial levels, presumably for this very reason. To take another example, when describing the acid rain trading program under the Clean Air Act, one can equally talk about ten million tons of sulfur dioxide or a fifty percent reduction from 1990 levels.[38] In the public debate, the ten million tons figure gets much less play.

Moreover, while undoubtedly more precise, there is an arbitrariness to naked numbers. Why 280 ppm instead of 290 ppm? No one asks this type of question about pre-industrial America. The

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37. Telephone Interview with Donald Elliott, Partner at Wilkie, Farr & Gallagher and former General Counsel of the EPA (Oct. 7, 2009). However, the organization 350.org has been staging events around the globe supporting the absolute target goal of 350 ppm. *See* 350.ORG, http://www.350.org/ (last visited Nov. 4, 2010). Upon closer examination, however, the goal of 350 ppm turns out to be derived from a historic baseline. *See infra* notes 142–43 and accompanying text.

38. Clean Air Act Amendments of 1990, Pub. L. No. 101-549, § 401, 104 Stat. 2399, (codified as amended at 42 U.S.C. § 7651 (2006)).

meaning of that baseline, at least upon first glance, seems self-evident, certainly compared to an absolute concentration or risk-based calculation. From a political point of view, from the perspective of selling an idea to an electorate, this is no small matter. As a candidate in 1988, Bush sensed this public perception with his "no net loss" wetlands policy, and no president since him has dared to abandon that approach for an express number of acres.

As noted earlier, baselines often are coupled with deadlines, and distant targets off historic baselines are politically attractive. Negotiating any short- or medium-term international agreements to reduce greenhouse gases has proven remarkably challenging. Yet the G8 nations had no trouble agreeing by consensus in 2008 that they will reduce their emissions fifty percent by 2050.[39] Accountability helps explain the preference for historic baselines with targets far into the future over those with shorter-term obligations. By the time 2050 rolls around, the G8 leaders will surely not be in office, and may not even be alive.

3. Return to Eden

Scholars of the American environmental movement have often noted a clear strand of rhetoric that is hostile to technological and industrial development.[40] Whether romanticizing the noble savage of a simpler time or imagining a landscape untrammeled by humans, the message is clear: modern society has despoiled our landscape. It is no exaggeration to state that much environmentalist rhetoric harkens back to an ideal of a Golden Age. Environmental groups engaged in the perennial debates over drilling for oil in the Arctic National Wildlife Refuge, for example, routinely refer to the area as America's "Eden."[41]

Historian William Cronon has demonstrated this best, noting that many writers capitalize "Nature," as though it exists as a formal Platonic norm.

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39. Interestingly, they did not specify the baseline year, making the goal much more flexible than first appears. *See* Wintour & Elliott, *supra* note 32 ("In a fudge designed to recognise the difficulties different rich countries will face in meeting this target, the agreed G8 communique released at the L'Aquila summit set a fuzzy baseline for their 80% cut 'of 1990 or more later years.' The communique also acknowledges baselines may vary but 'efforts must be comparable.' ").

40. *See, e.g.*, Edward Abbey, THE MONKEY WRENCH GANG (1975); Roderick Nash, WILDERNESS AND THE AMERICAN MIND 222 (4th ed. 2001).

41. See, for example, the website on the Refuge from the group, Restoring Eden, http://www.restoringeden.org/campaigns/ANWR/ANWRQA. *See also, e.g.*, YELLOWSTONE: AMERICA'S EDEN (Scandinature Films 1997).

> [A] great many environmental controversies revolve around . . . . "Edenic narratives," in which an original pristine nature is lost through some culpable human act that results in environmental degradation and moral jeopardy. The tale may be one of paradise lost or paradise regained, but the role of the narrative is always to project onto actual physical nature one of the most powerful and value-laden fables in the Western intellectual tradition. The myth of Eden describes a perfect landscape, a place so benign and beautiful and good that the imperative to preserve or restore it could be questioned only by those who ally themselves with evil. Nature as Eden encourages us to celebrate a particular landscape as the ultimate garden of the world.[42]

Hence the common desire to turn back the clock and restore some public lands to a "natural state" implicitly defined the environment before Europeans. The unstated premise is that humans necessarily have negative effects on the environment. This logic helps explain the appeal of historic baselines. By analogy to a human body, historic baselines return things to a prior state of health. Yet there is a vast literature on the inherent difficulty of actually identifying a "natural conditions" reference point, as European colonists clearly transformed the environment but so, too, did Native Americans through hunting practices and their use of fire.[43] Beavers transformed

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42. UNCOMMON GROUND: RETHINKING THE HUMAN PLACE IN NATURE 37 (William Cronon ed., 1995); *see also* Jedediah Purdy, *Politics of Nature*, 119 YALE L.J. 1122, 1175 (2010) (noting that, for environmentalists, "a register of moral and aesthetic response elevated the wild and spectacular above the settled and mechanical, demoting the latter as ugly and uninspiring").

43. John A. Stanturf et al., *Fire in the Southern Forest Landscape*, *in* DEP'T OF AGRIC., FOREST SERV., SOUTHERN FOREST RESOURCE ASSESSMENT 608–09 (John G. Greis & David N. Wear eds., 2002), *available at* http://www.srs.fs.usda.gov/sustain/report/pdf//chapter_25e.pdf. The degree to which Native Americans altered grassland ecosystems prior to European settlement is controversial. *See* CHARLES MANN, 1491: NEW REVELATIONS OF THE AMERICAS BEFORE COLUMBUS (2005). There is a raging debate among ecological historians as to the impact early human inhabitants of the continent had on the surrounding flora and fauna. In particular, they disagree as to causes of the rapid extinction of the rich array of megafauna that were found on the continent around the time the first human migrations to North America are believed to have occurred (about 13,000 years ago). Was it the deadly Clovis point, used expertly by early native hunters, or climate change, or species competition, or an extraterrestrial object strike? *See, e.g.*, Jacquelyn L. Gill et al., *Pleistocene Megafaunal Collapse, Novel Plant Communities, and Enhanced Fire Regimes in North America*, 326 SCIENCE 1100, 1100–03 (2009) (arguing that megafaunal decline started prior to human intervention and triggered fires, not the reverse); Donald K. Grayson & John Alroy, *Did Human Hunting Cause Mass Extinction?*, 294 SCIENCE 1459, 1459–62 (2001) (presenting a series of letters debating the question); Vance Holliday, *Where Have All the Mammoth Gone?*, 300 SCIENCE 1373, 1373–74 (2003) (reviewing and questioning recent studies); Christopher Johnson, *Megafaunal Decline and Fall*, 326 SCIENCE 1072, 1072–73 (2009) (discussing different theories); Richard A. Kerr, *Megafauna Died from Big Kill, Not Big Chill*, 300 SCIENCE 885, 885 (2003) (discussing research suggesting that humans arrived in North America just before the time of the megafauna collapse, and that the collapse preceded the era of massive climate change beginning 10,000 years ago); Martyn Murray, *Overkill and Sustainable Use*, 299 SCIENCE 1851, 1851–53 (2003) (discussing evidence of unsustainable hunting). In any event, there is little debate that the largest set of impacts on the Great Plains has been the post-European settlement introductions of widespread irrigated agriculture, intensive domestic cattle and sheep grazing, and concerted fire suppression. Background on the ongoing degradation of North American grasslands attributable to these factors is available in NAT'L BIOLOGICAL SERV., U.S. DEP'T. OF INTERIOR, OUR

the forests of the Northeast.[44] When settling on a natural baseline, why privilege some particular states over others? Why define as optimal the carbon dioxide levels prior to the industrial age instead of thirty or forty years after the advent of the Industrial Revolution? These are valid, and difficult, questions but they are masked by reliance on a baselines approach.

Part of historic baselines' appeal also probably derives from the endowment effect. Clearly demonstrated in both experiments and everyday life, the endowment effect is a cognitive bias that values personal goods at a higher value than non-personal goods. The classic demonstration is an experiment asking subjects to identify their willingness to accept payment for a coffee mug they have just been given. Time and again, the payment they demand for the mug in hand proves higher than their willingness to pay for the same mug from someone else.[45] Parting with something they own, that has somehow become a part of them, adds a greater value to the object. Similarly, historic baselines build off a part of our past, whether imagined or real. Either we or our ancestors lived at the time of the reference point and experienced those conditions. Historic baselines thus harken back to our past in a personal way. This approach resonates far more deeply, far more personally, than absolute numbers or risk-based goals ever could.

Nor should this effect be surprising. There is extensive psychology and social science literature, and a growing focus in legal scholarship, on the importance of "framing effects," which occur "when individuals—often reasonably sophisticated and otherwise rational individuals—make and frequently maintain substantively inconsistent choices depending upon the manner in which the choices

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LIVING RESOURCES 295–307 (1995), *available at* http://biology.usgs.gov/status_trends/static_content/documents/olrdocs/Intro.pdf, and WORLD RES. INST., A GUIDE TO WORLD RESOURCES 2000–2001: PEOPLE AND ECOSYSTEMS 119–31 (2000), *available at* http://pdf.wri.org/world_resources_2000-2001_people_and_ecosystems.pdf. For epic accounts of the ecological history of our continent, including the interaction of early human inhabitants and their surroundings, see generally TIM FLANNERY, THE ETERNAL FRONTIER: AN ECOLOGICAL HISTORY OF NORTH AMERICA AND ITS PEOPLES (2001); DAVID S. WILCOVE, THE CONDOR'S SHADOW: THE LOSS AND RECOVERY OF WILDLIFE IN AMERICA (1999). An excellent history of the social, physical, and ecological conditions associated with grazing on the American rangelands is found in DEBRA L. DONAHUE, THE WESTERN RANGE REVISITED 1–160 (1999).

44. *See* Jamison E. Colburn, *Bioregional Conservation May Mean Taking Habitat*, 37 ENVTL. L. 249, 259–60 (2007) (noting that the beaver is a species with "extraordinary ecological impact").

45. Daniel Kahneman et al., *Experimental Tests of the Endowment Effect and the Coase Theorem*, 98 J. POL. ECON. 1325, 1329–36 (1990).

are framed."[46] Experiments in the early 1980s by Amos Tversky and Daniel Kahneman focused on how the expression, or framing, of problems adopted by decisionmakers results in part from extrinsic manipulation of the decision options offered and in part from forces intrinsic to the decisionmakers, such as their norms and biases.[47] Different framings can send vastly different messages and can lead to different outcomes, an effect politicians have not overlooked.[48]

Historic baselines offer political institutions another framing option for articulating policy goals in a way that conveys a different context to the public than the alternatives of absolute, risk-based, technology-based, or cost-based targets. Curiously, as noted earlier, historic baselines either are set in the recent past (such as 1990) or the ancient past (pre-industrial). We have not found any baselines in between, that is, between several hundred years ago and one generation ago. American law does not rely on baselines from 1820 or 1930. One reason behind this pattern may be that we relate much more strongly to reference points drawn from our own past or from an imagined, Edenic past than from the years in between. Historic baselines are likely of greatest framing value when the policy goal can be expressed through an ancient or recent historic reference point.

4. Managing Uncertainty

Use of historic baselines also provides a useful way to set a goal in the face of uncertainty. Setting a greenhouse gas goal at the pre-industrial baseline or, more realistically, at twice the pre-industrial baseline provides a specific target when broader policy goals, such as a "safe" or "optimal" level of gases, are fraught with uncertainty. Climate modeling is simply too imprecise to provide a single, generally-agreed upon number for what constitutes safe or economically efficient atmospheric concentrations. Reliance on a historic baseline, by contrast, sidesteps this technical challenge. In simple terms, reliance on historic baselines allows policymakers to

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46. Edward A. Zelinsky, *Do Tax Expenditures Create Framing Effects? Volunteer Firefighters, Property Tax Exemptions, and the Paradox of Tax Expenditure Analysis*, 24 VA. TAX REV. 797, 798 (2005).

47. Amos Tversky & Daniel Kahneman, *The Framing of Decisions and the Psychology of Choice*, 211 SCIENCE 453, 453–58 (1981).

48. Zelinski, for example, recounts the story of the Michigan legislature, in the summer of 2003, "decree[ing] that the state's 'tax expenditure' budget shall henceforth be denoted as the governor's report on 'tax credits, deductions, and exemptions.' " Zelinski, *supra* note 46, at 798. Zelinski contends that "[t]his name change was not an inadvertent or technical adjustment but reflected a concerted effort by Michigan opponents of tax expenditure analysis to jettison what they believe is a misleading label." *Id.*

start with a back-of-the-envelope estimate based on common understandings of a qualitative goal and then go from there. That was the essence of the wetlands "no net loss" policy at its origins. This approach masks uncertainty.

5. Halting Degradation

Another way that historic baselines can manage uncertainty is through a static or "no net loss" approach. Here the advantage is one of a defensive posture. Just as the Hippocratic Oath directs doctors to "first, do no harm," so, too, can historic baselines fixed at the present or recent past serve to halt an undesirable trend. When a policymaker does not yet know what the "right" number is but is confident things are heading in the wrong direction, "no net loss" serves as an attractive heuristic to stop making things worse. Again, candidate Bush tapped into a nerve of the public consciousness with those three simple words.

6. Managing Regulated Party Strategic Behavior

Historic baselines also can serve a "hold everything" purpose as policymakers attempt to preclude strategic behavior of regulated entities in dynamic regulatory environments. As David Dana has identified in the land development context, for example, developers who believe a local jurisdiction is likely to adopt more restrictive regulations in the near future will engage in a "race to develop" to avoid the new restrictions.[49] Anticipating this move, many local jurisdictions have countered by adopting development moratoria as soon as the prospect of new regulation is put on the table.[50] This form of "no net loss" historic baseline prohibits new development pending the adoption of the new regulations, at which point the moratorium is lifted. These temporary moratoria "prevent developers and landowners from racing to carry out development that is destructive of the community's interests before a new plan goes into effect."[51] Recognizing these and other planning benefits, the courts generally have rejected the argument that such moratoria inherently constitute

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49. David A. Dana, *Natural Preservation and the Race to Develop*, 143 U. PA. L. REV. 655, 656 (1995).

50. *See, e.g.*, Bradfordville Phipps Ltd. P'ship v. Leon Cnty., 804 So. 2d 464, 465–66 (Fla. Dist. Ct. App. 2001) (adopting a moratorium while considering zoning changes).

51. Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency, 216 F.3d 764, 777 (9th Cir. 2000), *aff'd* 535 U.S. 302 (2002).

temporary takings of property for which compensation must be provided.[52]

B. The Disadvantages of Historic Baselines

Given all the advantages of historic baselines described in the preceding Section, one might assume that historic baselines should serve as the default approach for regulatory goals. In practice, though, while baselines are common, they are hardly universal. Why don't we see baselines everywhere? This Section explores some of the downsides to reliance on a historic baseline.

1. If the Shoe Doesn't Fit . . . .

In contrast to when historic baselines are an obvious choice, in some situations they are obviously a poor choice. If there are overriding policy concerns about safety, cost, or risk, then historic baselines may prove a clumsy or ineffective goal. It is difficult to use a historic baseline goal that maximizes safety. If one is concerned about exposure to toxics such as benzene, for example, then the goal should be to limit exposure to benzene levels that are safe or present cancer risks of, say, one in one million, not a goal of reducing exposure to workplace levels in 1970, or even of reducing exposure by ninety percent compared to 1990 levels. Similarly, baseline goals do not account well for costs or technical feasibility (a proxy of cost). A best available technology standard may work much better for emissions than aiming for particular historic levels achieved by what surely is no longer the best available technology. Put simply, if concerns over safety, efficiency, technological adequacy, or risk are paramount, then baseline goals may be poor substitutes for safety-based, cost-based, or other types of standards.

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52. *See* Tahoe-Sierra Pres. Council, Inc. v. Tahoe Reg'l Planning Agency, 535 U.S. 302, 336–40 (2002) (rejecting the argument that a temporary moratorium is a "per se" taking of property under the Fifth Amendment). The *Tahoe-Sierra* Court left open the possibility that the moratorium device could be abused and thus constitute a taking. *See* Laurel A. Firestone, Comment, *Temporary Moratoria And Regulatory Takings Jurisprudence After* Tahoe-Sierra Preservation Council, Inc. v. Tahoe Regional Planning Agency, 27 HARV. ENVTL. L. REV. 277, 287–88 (2003) (discussing the advantages of an ad hoc analysis). Some state courts have found moratoria to violate state constitutional protections. *See, e.g.*, Biggers v. City of Bainbridge Island, 169 P.3d 14 (2007) (striking down the temporary shoreline development moratorium at issue and dividing on the broader question of whether a local government has authority to adopt a moratorium during long-term land-use planning).

2. Inadequate Knowledge

Setting a historic baseline implicitly assumes we know what the conditions were at that point. This assumption is sometimes advantageous because we have more confidence about historic conditions than about what constitutes safe or efficient conditions. However, reliance on baselines can be counterproductive. This can occur because the wrong date is chosen or because the wrong assumptions are made about the past. As Randy Olsen has described in the context of fisheries:

> Among environmentalists, a baseline is an important reference point for measuring the health of ecosystems. It provides information against which to evaluate change. It's how things used to be. It is the tall grass prairies filled with buffalo, the swamps of Florida teeming with bird life and the rivers of the Northwest packed with salmon. In an ideal world, the baseline for any given habitat would be what was there before humans had much impact. If we know the baseline for a degraded ecosystem, we can work to restore it. But if the baseline shifted before we really had a chance to chart it, then we can end up accepting a degraded state as normal—or even as an improvement.
>
> The number of salmon in the Pacific Northwest's Columbia River today is twice what it was in the 1930s. That sounds great—if the 1930s are your baseline. But salmon in the Columbia River in the 1930s were only 10% of what they were in the 1800s. The 1930s numbers reflect a baseline that had already shifted. . .
>
> One of scientists' biggest concerns is that the baselines have shifted for many ocean ecosystems. What this means is that people are now visiting degraded coastal environments and calling them beautiful, unaware of how they used to look.
>
> People go diving today in California kelp beds that are devoid of the large black sea bass, broomtailed groupers and sheephead that used to fill them. And they surface with big smiles on their faces because it is still a visually stunning experience to dive in a kelp bed. But all the veterans can think is, 'You should have seen it in the old days.'[53]

In the case of the Colorado Compact, for example, western states allocated Colorado River water based on the flow years of 1899-1920.[54] Each state's allocation was an absolute amount. The problem, however, was that this temporal reference point represented a historically high period of river flow. In normal years, well before the clear impacts of climate change, the mean river flow was much less.

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53. Randy Olson, Op-Ed., *Shifting Baselines: Slow Motion Disaster in the Sea*, L.A. TIMES, Nov. 17, 2002, at M2, *available at* www.actionbioscience.org/environment/olson.html; *see also* Thomas T. Ankersen & Kevin E. Regan, *Shifting Baselines and Backsliding Benchmarks: The Need for a National Environmental Legacy Act to Address the Ecologies of Restoration, Resilience, and Reconciliation*, *in* BEYOND ENVIRONMENTAL LAW: POLICY PROPOSALS FOR A BETTER ENVIRONMENTAL FUTURE 53 (David M. Driesen & Alyson C. Flournoy eds., 2010) (describing the problems associated with shifting baselines generally).

54. Minutes of the Sixth Meeting of the Colo. River Comm'n 73 (Jan. 30, 1922), *available at* http://www.colorado.edu/colorado_river/docs/compact/meeting06.pdf.

As a result, lower river states locked themselves into an unfair allocation from the outset.[55]

In these cases and others, setting the reference point assumes a conception of what was desirable when, in fact, the wrong period had been chosen. We may be identifying a past that was already terrible and that we do not, in fact, want to reach or, conversely, was unusually good and that the environment will not reach again. In this respect, baselines can sell themselves short.

3. Arbitrary Nature and Lack of Transparency

Just as absolute goals can have an arbitrary appearance, so, too, can historic baselines. While historic baselines may sound ambitious or desirable, they may not prove so at all. For example, why not assess how close we can get to zero deaths from typhoid, instead of a ninety percent reduction compared to 1930 levels? For some types of harms, historic baselines may not provide any useful anchoring. What were typhoid deaths in 1930? This date is too far back from contemporary reference yet not far back enough to provide a comprehensible qualitative goal (such as pre-industrial).

As Leon Billings has observed, environmental policy is all about making practical compromises in moving toward risk-free goals.[56] Using numeric targets and qualitative goals based on cost or risk make these compromises and trade-offs explicit. This is arguably a more honest and open approach than relying on historic baselines, which can hide more than they show.

Similarly, it may be politically easier not to settle on a baseline. In particular, as explained below in Part III, certain dates may favor one interest over another. In the case of baseline years for the Kyoto Protocol, a date before 1990 effectively provided a subsidy for former Soviet countries while a later baseline would have removed this benefit. If a political deal could not have been reached about this subsidy, then a different type of goal, such as technology transfer, could have ensured agreement while pushing off this dispute for resolution at a later date.

And baselines can be contested. Consider, for example, a controversy currently playing out in the Point Reyes National

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55. *See, e.g.*, *The Compact and Lees Ferry*, WESTERN WATER ASSESSMENT, http://wwa.colorado.edu/treeflow/lees/compact.html (last visited Nov. 4, 2010) ("In other words, the Colorado River has been over-allocated. There is not enough water in the river, on average, to fulfill all of the legal entitlements.").

56. Telephone Interview with Donald Elliott, Partner at Wilkie, Farr & Gallagher and former General Counsel of the EPA (Oct. 7, 2009).

Seashore, just north of San Francisco.[57] The National Park Service has decided not to renew the permit of the Drakes Bay Oyster Company when it expires in 2012. Because the land is designated as "potential wilderness," the Park Service has an obligation to eliminate intrusive commercial activity. Drakes Bay is a seventy year-old oyster farm, predating creation of the National Seashore. It argues that it is "part of the historical working landscape of the area—and every bit in need of protection as the harbor seals and eelgrass that share the bay."[58] Is the proper baseline the historic use of the area or pre-human history?[59]

III. GAMING HISTORIC BASELINES

We have left for its own separate consideration a critical aspect of historic baselines that can provide both benefit and disadvantage. Historic baselines can furnish significant political cover for gaming, hiding a wide range of decisions that provide flexibility to decisionmakers, either significantly softening or strengthening the goal. Viewed in a positive light, this cover creates space for making deals and, in a negative light, maximizes opportunities for rent-seeking. In answering the question to which we keep returning—why would a legislator, government executive, or agency official prefer one type of standard over another?—a significant part of the answer lies in the opportunities for gaming that are particular to historic baselines, to which this Article now turns in Part III.

We use the term "gaming" in a specific sense. We do not mean the ability to interpret language in different ways. As H.L.A. Hart famously showed in his example of "no vehicles in the park," any rule allows for a range of interpretative meanings.[60] That is inherent in the use of language. Rather, by gaming we mean the deliberate selection and design of a standard that will allow regulators significant flexibility to maneuver policy as desired while appearing to establish and abide by a seemingly inflexible standard. Gaming allows regulators and legislators to satisfy multiple constituencies at the same time by appearing to set a specific goal and then making it harder or easier to attain than would first appear.

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57. Leslie Kaufman, *Debate Flares on Limits of Nature and Commerce in Parks*, N.Y. TIMES, Nov. 1, 2009, at A24. The authors thank Rob Glicksman for his assistance in identifying this example.

58. *Id.*

59. *Id.*

60. H.L.A. HART, THE CONCEPT OF LAW 125–27 (Penelope A. Bulloch & Joseph Raz eds., 2d ed. 1994) (1961).

To be sure, all standards provide for a certain level of gaming. Our focus, though, is on whether historic baselines provide for *more* or *different* gaming opportunities. Framed in a practical example, this Section seeks to determine whether the "no net loss" wetlands historic baseline over the past twenty years has provided a different and, for the circumstances, more useful quality of policy flexibility than could have been achieved under alternatives such as a quantitative standard (conserve 100 million acres) or a qualitative standard (conserve the best wetlands).

This Section draws from the practice of historic baselines to explore the opportunities for gaming. It starts with an in-depth case study of the "no net loss" wetlands policy goal. It then examines how each of the other three attributes identified in Part I—(1) the conditions at the temporal reference point; (2) the baseline metrics for describing the standard; and (3) the margin of deviation—was gamed in the "no net loss" policy. To show that the analysis is representative of other cases, similar examples of historic baseline gaming are also presented from the Kyoto Protocol, the Clean Air Act, the Wilderness Act, and the Endangered Species Act. As detailed below, what sets historic baselines apart from the other types of standards is the use of the past to guide the future. By adopting a temporal reference point, historic baselines create additional flexibility for regulators to maneuver policy outcomes.

A. The History of the "No Net Loss" Wetlands Loss Policy

As described in the Introduction, in his 1988 campaign, locked in a tight race for the presidency, candidate George H. W. Bush "was just hungry for environmental ideas."[61] Bush, an avid duck hunter, regretted some of his environmental responsibilities as Vice President and the resulting bad press.[62] With advisors telling him that water was a promising front for innovation in environmental policy, candidate Bush declared to *Sports Afield* magazine, "My position on wetlands is straightforward. All existing wetlands, no matter how small, should be preserved."[63] From this bold statement grew the "no net loss" policy.

Conveniently for the campaign, the work of the National Wetlands Policy Forum task force, which had several Bush advisors in

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61. PITTMAN & WAITE, *supra* note 1, at 93 (quoting William K. Reilly, then an advisor to the campaign).

62. *Id.* at 90.

63. *Id.* at 91 (quoting presidential candidate George H.W. Bush).

its ranks, was nearing completion.[64] The task force had been formed to review Section 404 of the Clean Water Act ("CWA"), the target of significant controversy during the Reagan Administration.[65] Section 404(a) of the CWA authorizes the Secretary of the Army, through the Corps of Engineers ("Corps"), to "issue permits for the discharge of dredged or fill material in the navigable waters of the United States at specified disposal sites."[66] Although the Corps is the front-line regulatory agency for administering this permit program, pursuant to Section 404(b)(1) of the CWA, the EPA must promulgate substantive permitting standards focused on environmental factors, known as the "404(b)(1) Guidelines," which the Corps must follow when issuing permits for disposal of dredged or fill material.[67] Under Section 404(c), the EPA also may deny (or "veto") any disposal site if the discharge "will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas."[68] Thus, under Section 404, and subject to specified exceptions, wetlands subject to federal jurisdiction may be filled only if the Corps grants a permit in accordance with the EPA's 404(b)(1) Guidelines. These permits, known ubiquitously as "404 permits," "wetland permits," or "Corps permits," have become the cornerstone for federal protection of wetland resources, and many states implement similar programs to cover wetland resources not within the scope of the federal program.[69]

By the end of the Reagan Administration, the Section 404 program had become vilified by development industry interests and a political target in Congress. In 1987, EPA Administrator Lee Thomas asked the Conservation Foundation think tank to convene a task force, the previously mentioned National Wetlands Policy Forum, to forge a solution.[70] Borrowing from New Jersey's experience with aquatic resource protection policy, the task force's report adopted the simple idea that "any taking of wetlands would be replaced by the

64. For a complete history of the task force, a group of twenty state and local officials, environmentalists, and land developers, see RESOLVE, INC., CASE: NATIONAL WETLANDS POLICY FORUM (2003), *available at* http://www.resolv.org/experience/cases/pdfs/wetlands.pdf (describing the task force process in detail).

65. PITTMAN & WAITE, *supra* note 1, at 92.

66. 33 U.S.C. § 1344(a) (2008).

67. *Id.* § 1344(b).

68. *Id.* § 1344(c).

69. For background on the scope of federal wetlands regulation, see Douglas R. Williams & Kim Dana Connolly, *Federal Wetlands Regulation: An Overview*, *in* WETLANDS LAW AND POLICY: UNDERSTANDING SECTION 404, at 1, 1–26 (Kim Dana Connolly et al. eds., 2005).

70. *See* PITTMAN & WAITE, *supra* note 1, at 91–93 (describing the Foundation's initial efforts).

addition of wetlands somewhere else."[71] The brilliance of the idea was that it would drive policy toward an "equilibrium between losses and gains" to achieve "no overall net loss of the nation's remaining wetland base."[72] With this as an interim goal, the task force recommended net increases in the long term.[73]

The Bush campaign gravitated immediately to the flexibility of the "no net loss" component of the task force recommendation. On August 31, 1988, while fishing in Lake Erie, Bush spoke about how important wetlands are to hunters and fishers, then proclaimed that "one state has a policy of 'no net loss' of wetlands, and it has worked . . . . [a]nd that state is not a no-growth, no development state. I believe this should be our national goal—no net loss of wetlands."[74] Candidate Michael Dukakis ridiculed the speech as an "election year conversion," but the next day Bush famously toured the murky waters of Boston Harbor to slam his opponent's own environmental performance.[75] "No net loss" thereafter was never far from candidate Bush's lips; indeed, candidate Bush was reportedly far out in front of his advisors in committing to "no net loss."[76]

Bush undoubtedly saw advantages in "no net loss" he could not have achieved in the election by committing to another standard. It allowed him to appeal to multiple constituencies without alienating any: conservative and independent conservationists such as hunting and fishing enthusiasts would endorse the conservation message, while land development and property rights supporters would endorse the flexibility of the macro-scaled national standard that did not explicitly incorporate a restoration goal. But the real gaming began almost immediately after Bush won the election.

In implementing a "no net loss" policy, the EPA and the Corps added four additional twists to the campaign promises, each of which parallels the essential baseline attributes identified in Part I. First, to solidify the policy as a fixed baseline, the agencies described it as "the national goal of no overall net loss of the nation's remaining wetlands base,"[77] with no mention of future net gains as a goal.[78] This addressed

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71. *Id.* at 93.

72. *Id.*

73. *Id.*

74. *Id.* at 94 (quoting from various original sources).

75. *Id.* at 95.

76. *See id.* ("It was, in fact, beyond what the other members of Bush's administration would put up with.").

77. Memorandums of Agreement (MOA); Clean Water Act Section 404(b)(1); Corrections, 55 Fed. Reg. 9,210, 9,211 (Mar. 12, 1990).

78. *Id.* at 9,210–13 (no mention of restoration).

the *regulatory goal* attribute. Second, the agencies explained that their contribution toward "no net loss" would be through implementation of a Section 404 "goal of no net loss of values and functions,"[79] thus blurring whether the baseline metrics would be functional values or acreage. This addressed the *baseline metrics* attribute. Third, the agencies drove home the macro scale of the policy by stating that "it is recognized that no net loss of wetlands functions and values may not be achieved in each and every permit action."[80] This addressed the *margin of deviation* attribute.

In the final and most significant strategic move of joint implementation, the agencies enshrined compensatory mitigation and opened the door to the new concept of wetlands mitigation banking ("WMB"), which addressed all of the baseline attributes. WMB does not merely allow but depends on replacement of wetlands filled at one site by restoration of large contiguous areas of wetlands at potentially distant locations.[81] When a land development project involves filling of wetland areas regulated under Section 404 of the CWA, the Corps usually requires compensatory mitigation for the loss of wetland functions as a condition of approval.[82] Permittees traditionally have accomplished this compensatory mitigation directly through creation or enhancement of wetlands on the development site (onsite mitigation) or on an offsite location (offsite mitigation), or by paying a fee to fund wetland mitigation by a third party conservation entity in lieu of providing direct mitigation (in-lieu fee mitigation).[83] WMB, which arose in the mid-1990s and is now a dominant mitigation method, provides a third-party variation on offsite mitigation by allowing the developer to compensate for the resource loss by purchasing "credits" from another landowner—the wetland banker—who has created or enhanced wetland resources elsewhere.[84] As a

79. *Id.* at 9,211.

80. *Id.*

81. *Id.* at 9,212.

82. For history and background on the compensatory mitigation program, see JESSICA WILKINSON & JARED THOMPSON, ENVTL. L. INST., 2005 STATUS REPORT ON COMPENSATORY MITIGATION IN THE UNITED STATES (2006); 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 (2009).

83. For detailed explanations of each type of compensatory mitigation, see ENVTL L. INST., BANKS AND FEES: THE STATUS OF OFF-SITE MITIGATION IN THE UNITED STATES (2002); WILKINSON & THOMPSON, *supra* note 82; Royal C. Gardner, *Mitigation*, *in* WETLANDS LAW AND POLICY: UNDERSTANDING SECTION 404, at 253, 253–82 (Kim Dana Connolly et al. eds., 2005).

84. For the history and structure of wetland mitigation banking, see MICHAEL BEAN ET AL., ENVTL. L. INST. & ENVTL. DEF., DESIGN OF U.S. HABITAT BANKING SYSTEMS TO SUPPORT THE CONSERVATION OF WILDLIFE HABITAT AND AT-RISK SPECIES 29–120 (2008) (including survey of

result of these four moves, just months after Bush had taken office the "no net loss" historic baseline was infused with tremendous policy flexibility.

The office of the Vice President sought to get involved as well, though in a less nuanced approach to gaming that sought to redefine the baseline metrics. Vice President Dan Quayle, chairing the Competitiveness Council, tried to change what counted as a wetland. Quayle coordinated an effort to have the Corps revise what is known as the "wetlands delineation manual."[85] Wetlands, left undefined in the CWA, were defined in Corps regulations at the time as lands "inundated or saturated by surface or ground water at a frequency or duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."[86] The Corps implemented this water-plants-soils test in the field through the delineation manual. Simply changing the definition in the manual, therefore, could dramatically change the "no net loss" baseline. In August 1991, the Corps and the EPA did just that,[87] promptly igniting a firestorm of controversy with the charge this time being that the rules were too restrictive.[88] Facing relentless criticism, the Corps and the EPA did not finalize the proposal and reverted to the 1987 Manual, which Congress later mandated be used

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state practices and comprehensive bibliographies); ENVTL. L. INST., WETLAND MITIGATION BANKING (1993); Royal C. Gardner, *Banking on Entrepreneurs: Wetlands, Mitigation Banking, and Takings*, 81 IOWA L. REV. 527 (1993).

85. The Wetlands Delineation Manual is a guidance document for determining the presence of wetlands at a project site. Its tortured history begins with its first published version in 1987, which was applied on an ad hoc basis around the nation in Corps field offices. *See* ENVTL. LAB., U.S. ARMY CORPS OF ENG'RS, TECHNICAL REPORT NO. Y-87-1, CORPS OF ENGINEERS WETLANDS DELINEATION MANUAL (1987), *available at* http://www.mvn.usace.army.mil/ops/regulatory/reg_manual.asp. In 1989, the Corps and several other federal agencies issued an Interagency Wetlands Delineation Manual in response to criticism that the agencies were using inconsistent standards to identify jurisdictional wetlands under various statutes. Critics of the 1989 manual claimed that it greatly expanded regulatory jurisdiction, which was borne out by its application. *See, e.g.*, Norman v. United States, 429 F.3d 1081, 1085 (Fed. Cir. 2005) (noting that the Corps found 230 acres of jurisdiction wetlands on a 470-acre parcel under the 1989 manual after revoking a prior delineation under the 1987 manual that found only seventeen acres of jurisdictional wetlands). This controversy set the stage for a reversal by the Bush Administration.

86. 33 C.F.R. § 328.3(b) (2010).

87. Proposed Revisions to 1989 Wetlands Manual, 56 Fed. Reg. 40,446 (Aug. 14, 1991); *see also* United States v. Ellen, 961 F.2d 462, 464 (4th Cir. 1992) (discussing history).

88. *See* WHITE HOUSE OFFICE ON ENVTL. POL'Y, PROTECTING AMERICA'S WETLANDS: A FAIR, FLEXIBLE, AND EFFECTIVE APPROACH (1993) (discussing history), *available at* http://www.wetlands.com/fed/aug93wet.htm. The new manual's approach to delineation, it was estimated by one Corps biologist at the time, would have excluded half of the Everglades from coverage under Section 404. PITTMAN & WAITE, *supra* note 1, at 97.

until a final manual is adopted.[89] The 1987 Manual remains in effect to this day.[90]

President Clinton made no similar mistake, promising even to produce net gains in wetlands. Like him, his successors in the Oval Office have also left "no let loss" alone, relying on its inherent flexibility to provide room for the agencies to implement the compensatory mitigation program. Indeed, over time the workhorse of the "no net loss" policy—mitigation banking—has only strengthened in its position.[91] Given the amount of gaming in how the policy was designed and applied, however, one must go beyond the mere fact of longevity and ask a harder question—has no net loss really worked?

That question can be answered on several levels. The first is the obvious: Has there been no net loss of wetlands? Focusing on *acres* as the metric, the answer is, roughly, yes. Separate studies by the Fish & Wildlife Service and the National Resource Conservation Service have demonstrated that the annual net loss rate had fallen from 500,000 acres annually thirty years before to slight gains under the "no net loss policy."[92]

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89. Energy and Water Development Appropriations Act of 1993, Pub. L. No. 102-377, 106 Stat. 1315, 1324 (1992). For President Bush the plan backfired as well, as candidate Bill Clinton relentlessly pinned Bush's environmental record to the effort to hand over half of the nation's wetlands to developers. PITTMAN & WAITE, *supra* note 1, at 100.

90. *See* United States. v. Bailey, 571 F.3d 791, 803 n.7 (8th Cir. 2009) (deferring to the 1987 manual).

91. In 2008 the Corps and the EPA jointly published rules overhauling their compensatory mitigation program under Section 404 and securing mitigation banking as the preferred approach. *See* 33 C.F.R. §§ 325, 332 (2010); 40 C.F.R. § 230; *see also* Compensatory Mitigation for Losses of Aquatic Resources, 73 Fed. Reg. 19,594 (Apr. 10, 2008) (to be codified at 33 C.F.R. pts. 325, 332, and 40 C.F.R. pt. 230) (describing the final rule). For a comprehensive review of the new rules, see Symposium, *Biodiversity Protection and Mitigation: Mitigation Regulation Articles*, 38 STETSON L. REV. 213 (2009).

92. As the Congressional Research Service has summarized:

> The U.S. Fish and Wildlife Service periodically surveys national net trends in wetland acreage using the National Wetlands Inventory (NWI). It has estimated that when European settlers first arrived, wetland acreage in the area that would become the 48 states was more than 220 million acres, or about 5% of the total land area. By 2004, total wetland acreage was estimated to be 107.7 million acres, according to data it presented in its most recent survey. Data compiled by the NRCS and the FWS in separate surveys and using different methodologies have identified similar trends. Both show that the annual net loss rate dropped from almost 500,000 acres annually nearly three decades ago to slight net annual gains in recent years. The FWS survey estimated the average annual gain between 1998 and 2004 was 32,000 acres, primarily associated with the expansion of shallow ponds, while NRCS (using its Natural Resources Inventory (NRI) of privately-owned lands) estimated that there was an average annual gain of 26,000 acres between 1997 and 2002. NRCS cautioned against making precise claims of net increases because of statistical uncertainties. Some environmentalists caution that the increases identified in the latest FWS data are tied to a proliferation of small ponds rather than natural wetlands.

ZINN & COPELAND, *supra* note 3, at 5 (footnote call number omitted).

The official policy of the EPA and the Corps, however, is to count "values and functions," and on those metrics intense disagreement remains over whether the standard has been met. A study we compiled in 2000 demonstrated that the agencies had no coherent methodology for counting functions or values, and rendered the vast majority of their compensatory mitigation decisions by simply counting acres.[93] Indeed, to this day no national accounting of wetland functions and values exists to reliably evaluate whether no net loss has occurred, and Corps officials have openly conceded that the agency "cannot demonstrate or document we have achieved it."[94] Local and regional case studies invariably show net losses at those scales,[95] and the National Research Council concluded in 2001 that the compensatory mitigation system was essentially a failure in this respect.[96]

Moreover, the distribution of functions and values across the landscape unquestionably has been transformed. In 2006, we conducted a comprehensive study of WMB-based compensatory mitigation in Florida, which showed that wetlands systematically had been filled in densely-populated coastal urban areas and "replaced" with wetlands in sparsely-populated rural areas, with an average distance between fill and mitigation sites of over fifteen miles.[97] Our findings have since been replicated in other states.[98] Compensatory mitigation thus has led to widespread wetlands migration. Whether this trend should be cause for concern is a complex question. There is no question, though, that the "no net loss" policy, pitched as a national approach tied to 1990 levels, has provided the Corps and the EPA ample flexibility to implement the policy according to a wide array of agency objectives while still technically abiding by the standard. One cynically might say, therefore, the "no net loss" historic baseline has "worked" on all levels—exactly the way it was intended.

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93. James Salzman & J.B. Ruhl, *Currencies and the Commodification of Environmental Law*, 53 STAN. L. REV. 607, 611–12 (2000).

94. PITTMAN & WAITE, *supra* note 1, at 100 (quoting then-Assistant Secretary of the Army John Paul Woodley, Jr.).

95. *See*, *e.g.*, R. Eugene Turner et al., *Count It by Acre or Function—Mitigation Adds up to Net Losses of Wetlands*, NAT'L WETLANDS NEWSL., Nov.–Dec. 2001, at 5, 5.

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

97. *See* J.B. Ruhl & James Salzman, *The Effects of Wetlands Mitigation Banking on People*, NAT'L WETLANDS NEWSL., Mar.–Apr. 2006, at 1, 8–13.

98. *See* J.B. Ruhl, James Salzman & Iris Goodman, *Implementing the New Ecosystem Services Mandate of the Section 404 Compensatory Mitigation Program—A Catalyst for Advancing Science and Policy*, 38 STETSON L. REV. 251, 258–59 (2009) (summarizing studies that demonstrate similar findings in other states).

B. The Strategy of Gaming Historic Baselines

We now turn to a closer examination of the specific gaming strategies, starting in each case with the "no net loss" example but adding cases from other settings as well, to illustrate the different ways such a strategy can be used.

1. Gaming the Temporal Reference Point

Perhaps the most important gaming opportunity provided by historic baselines that other types of standards cannot employ is history itself—in particular, the malleability and obscurity of history. In addition to using the "no net loss" policy to illustrate this point, we provide two other cases below.

a. No Net Loss, After Losing 100 Million Acres

In the wetlands policy context, any attempt to fix a numeric- or risk-based standard in 1990 likely would have touched off a political battle. If the number proposed had been, for example, 100 million acres of wetlands, which was roughly what was thought to be the number of acres at the time, questions about the right number, proper metric, and desired focus (for example, why not focus on restoration to a larger number) all would have been spotlighted. If the proposal had been to provide a sliding scale of protection based on quality of wetlands, questions about the scale, the qualities that matter most, and whether to focus on enhancing the quality of wetlands all would have been raised. Had the policy adopted a historic baseline date of 1900, there would have been the question of how many acres (or functions and values) existed in 1900. There is little agreement even to this day about any of those questions, hence those approaches would not likely have given candidate Bush or his successors much of a policy with which to work.

With a "no net loss" standard pegged to the date of implementation (1990), by contrast, no president using the policy has ever had to pin down a number or differentiate between wetlands. The baseline is whatever wetlands were there in 1990. Knowing the absolute number of acres in 1990 may not even be necessary, because applying "no net loss" means the number—whatever it was—theoretically stays constant and one simply measures subsequent gains and losses. The vexing questions surrounding restoration and enhancement were rhetorically obscured beneath this bold line in history the policy drew. The 100 million acres of wetlands the nation

had lost up until 1990 were in the unfortunate past. "No net loss" drew a line in the sand. It triumphantly put an end to more losses and would keep it that way in perpetuity.

An even more telling effect of "no net loss" on wetlands policy is that it has allowed administrations to proclaim "net gain" policies.[99] Viewed through a longer time horizon, however, claims of any "gain" are deceptive. At best, it is just a small recoupment of wetlands lost prior to 1990. Moreover, the fundamental question remains—no net loss or net gain of what? Nonetheless, the policy and WMB remain standing proud. As far as gaming a standard on its face goes, "no net loss" has been nothing short of brilliant—its flexibility made possible by the temporal reference point.

b. The Kyoto Protocol and the Magic of 1990

The Kyoto Protocol and climate change offer another example of the gaming made possible through temporal reference points. Although the Kyoto Protocol was negotiated in 1997, the baseline year was up for grabs. Data sufficient for establishing baselines went back several years. As with many international environmental negotiations, a fundamental challenge lies in ensuring that a sufficient number of countries become parties to the treaty. There must be sufficient inducements for parties to join, all the while not undermining the very goals of the treaty in the first place.

As described earlier, the Kyoto Protocol set 1990 as the baseline year for carbon dioxide emissions reductions. Parties to the Protocol chose this date explicitly because it pre-dated the fall of the Iron Curtain. The collapse of Soviet economies after 1990 meant that these countries had effectively been given emissions reduction credits they could sell at a later date.[100]

Put another way, because countries in economic transition currently emit at levels far below their levels in 1990, many of these countries will not emit their assigned amounts under the Kyoto Protocol, even assuming they take no steps to reduce greenhouse gases. Under the Protocol, these countries may be permitted to sell this so-called "hot air" to other Kyoto parties with emissions reduction obligations. Elimination of this "loophole" would have increased the amount of emissions reduction actually needed to reach the target level.

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99. *See supra* note 9 and accompanying text.

100. It is interesting to note that a later baseline was chosen for different gases. In fact, 1995 was set as the baseline year for three relatively minor but potent greenhouse gases (hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride).

It is likely that, without the availability of "hot air" credits, the United States and several other countries would have adopted less stringent targets. Thus, the choice of baseline year in 1990 served both as an inducement for former Soviet bloc countries to sign the treaty and as a general subsidy to kick-start the program into effect.

c. Salmon and the Endangered Species Act

The Endangered Species Act ("ESA") offers a minefield of historic baselines ripe for this kind of gaming. For example, Section 4 of the ESA requires the FWS and the National Marine Fisheries Service ("NMFS") to identify endangered species,[101] which the statute defines as any species "in danger of extinction throughout all or a significant portion of its range."[102] Although this mandate is forward-looking, it is difficult to know where a species is headed without also looking into its past and recent trends. Nevertheless, a battle ensued between courts and the agencies during the Bush Administration over how to select historical baseline reference points for the "range" component of the standard. The Ninth Circuit explained in 2001 that a species "can be extinct 'throughout . . . a significant portion of its range' if there are any major geographical areas in which it was no longer viable but once was."[103] On behalf of the FWS, however, the Solicitor of the Department of the Interior took the position that the plain meaning of the statute required "range" to mean "current range", not "historical range." This is because "to say a species 'is in danger' in an area where it no longer exists—i.e., in its historical range—would be inconsistent with common usage."[104] Of course, a sign that a species might be endangered may be that it no longer exists in many places it used to call its range. Moreover, the agency's "current range" approach means that a species' range could be shrinking continuously but that would never show up in the significant portion of range analysis, making the approach even less demanding than a "no net loss" baseline. Indeed, the Ninth Circuit has since reiterated that it expects the FWS "first to quantify . . . historical range in order to establish a 'temporal baseline,' and then to determine whether the lost habitat, measured against that baseline,

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101. 16 U.S.C. § 1533(a)(1) (2008).

102. *Id.* § 1532(6).

103. Defenders of Wildlife v. Norton, 258 F.3d 1136, 1145 (9th Cir. 2001).

104. Memorandum from Solicitor, U.S. Dep't of the Interior, to Director, U.S. Fish and Wildlife Serv., On the Meaning of "In Danger of Extinction Throughout All or a Significant Portion of its Range" 7–8, (Mar. 16, 2007), *available at* http://www.doi.gov/solicitor/opinions/M-37013.pdf.

amounts to a significant portion of the species' overall range."[105] Also, a long list of scientists has urged the Obama Administration to adopt the "historic range" baseline approach.[106] Regardless of which statutory interpretation is most faithful to text and congressional intent, the episode speaks volumes about the impact gaming of reference points can have on implementation of historic baselines.

Also subject to reference point gaming is the baseline approach taken under Section 7(a)(2) of the ESA, which prohibits federal agencies from engaging in or approving actions that jeopardize the continued existence of a species listed under Section 4.[107] An agency contemplating such an action must consult with the FWS or the NMFS (if the species is a marine species or anadromous fish) and request an opinion on whether the actions are prohibited under the Act.[108] These so-called "biological opinions" must assess the impacts of the proposed activity when added to an "environmental baseline," which is defined as "the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area . . . and the impact of State or private actions which are contemporaneous with the consultation in progress."[109] By incorporating "the past," this baseline opens the door to reference point gaming. For example, when preparing a 1993 biological opinion on the salmon mortality effects of hydropower dam operations in the Columbia River basin, the NMFS measured the projected effects of the operations against an environmental baseline period of 1986–1990, which the agency justified as a period of "consistent management practices" for the dams.[110] That period, however, was unusually short compared to baselines the agency had used in previous consultations on the dams, and it just so happened to encompass a period of low salmon abundance.

The combined effect was to make the comparison between baseline period salmon population and projected 1993 salmon population look more favorable than had the NMFS used a longer

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105. Tucson Herpetological Soc'y v. Salazar, 566 F.3d 870, 875–76 (9th Cir. 2009).

106. Letter from Erica Antill et al. to Ken Salazar, Sec'y, Dep't of the Interior (Dec. 10, 2009), *available at* http://www.biologicaldiversity.org/campaigns/cleaning_up_the_bush_legacy/pdfs/Scientists_letter_on_SPOIR_Memo.pdf (arguing that the current range approach "sharply limits the scope of the ESA").

107. 16 U.S.C. § 1536(a)(2).

108. *Id.* § 1536(b).

109. 50 C.F.R. § 402.02 (2010).

110. Idaho Dep't of Fish & Game v. Nat'l Marine Fisheries Serv., 850 F. Supp. 886, 892 (D. Or. 1994), *vacated as moot*, 56 F.3d 1071 (9th Cir. 1995).

baseline period, which would have included years of higher salmon abundance. The reference point gaming thus allowed the NMFS to conclude that no jeopardy would occur. The court reviewing the action described the agency as having "selected this critical variable in its jeopardy equation by reference to 'consistent management practices,' a factor which necessarily focuses more upon system capability than upon the needs of the species."[111] Putting it more frankly, Professor Michael Blumm has described the agency's move as a manipulation that "finessed its jeopardy analysis, blinding itself from scientific reality."[112] It was also not an isolated example, with the FWS and the NMFS several years later committing the same "finessing" of the baseline reference period for consultations over irrigation reservoir operations in the Klamath River Basin.[113]

2. Gaming the Baseline Metrics

Gaming the temporal reference point depends in part on the relative uncertainty about the past compared to the present. But even if perfect knowledge is available about conditions in the past, historic baselines can still be gamed by manipulating the baseline metrics. The most blatant example is Quayle's failed effort to alter the wetlands delineation criteria. But "no net loss" was a shell game from the start. The Corps and the EPA quickly gamed the metrics by claiming to measure "functions and values," all the while counting acres as their proxies.[114] While easy to measure, acres are a poor proxy for value or function, since they tell nothing about the type of wetland, its location, or its service provision.[115] Pinning down whether "no net loss" has been achieved has thus remained an ongoing debate. Every administration has nonetheless claimed success and produced numbers and reports purporting to show it.

Moreover, the metrics of the "no net loss" policy were scaled at the national level while the metrics of agency implementation were scaled at the project permit level. By adopting a nationally scaled historic baseline, "no net loss" established a macro perspective so that

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111. *Id.* at 893.

112. Michael C. Blumm et al., *Practiced in the Art of Deception: The Failure of Columbia Basin Salmon Recovery Under the Endangered Species Act*, 36 ENVTL. L. 709, 736–37 (2006).

113. *See* A. Dan Tarlock, *Ecosystem Services in the Klamath Basin: Battlefield Casualties or the Future?*, 22 J. LAND USE & ENVTL. L. 207, 240 (2007) (explaining that the FWS "designated a relatively wet period . . . as the baseline").

114. *See supra* note 85 and accompanying text.

115. *See* Salzman & Ruhl, *supra* note 93, at 648–67 (examining market constraints in wetlands mitigation banking).

not every individual project would necessarily come out at no net loss. This took pressure off of individual project permit decisions and opened the door to compensatory mitigation through WMB.[116]

Similarly, the environmental baseline approach used in the ESA consultation process discussed above is susceptible to manipulation of baseline metrics. The purpose of the baseline is to serve as the reference point for impact analysis, with the question being whether the new impacts caused by the project under consultation, when added to the baseline impacts, would jeopardize the species. Therefore, even when the temporal reference point for the baseline is set appropriately, "what information is included in the environmental baseline often determines whether the agency will find that the action jeopardizes a listed species."[117] For example, in litigation reviewing several of the NMFS's Columbia River salmon "no jeopardy" biological opinions, courts have rejected the agency's rationales for excluding different kinds of ongoing impacts from the environmental baseline. The concern has been that the exclusions would render the environmental baseline a "vacuum," all but assuring that the additional impacts of dam operations under review in the consultation would not tip the species to jeopardy.[118]

3. Gaming the Margin of Deviation

Everyone knows that the past never completely repeats itself, so historic baselines inherently contain some margin of deviation from the standard. But how much deviation is tolerable? Adopting numeric- or risk-based standards brings the slippage question to center stage. Historic baselines, by contrast, can allow a more nuanced approach to margins of deviation. For example, with "no net loss," policy success was assessed only at the national scale, and no individual project was invariably held accountable to the national policy. The incorporation of wetlands mitigation banking also suspended any requirement that compensatory wetlands had to be close to the filled wetlands. As a result, the national "no net loss" baseline was detached from any

116. *See supra* note 80 and accompanying text.

117. Matthew Gerhart, *Climate Change and the Endangered Species Act: The Difficulty of Proving Causation*, 36 ECOLOGY L.Q. 167, 177 (2009) (examining the difficulty of baseline metrics for climate change impacts).

118. Nat'l. Wildlife Fed'n. v. Nat'l Marine Fisheries Serv., 524 F.3d 917, 929–30 (9th Cir. 2008) (discussing similar cases). *See generally* Michael C. Blumm & Hallison T. Putnam, *Imposing Judicial Restraints on the "Art of Deception": The Courts Cast a Skeptical Eye on Columbia Basin Salmon Restoration Efforts*, 38 ENVTL. L. 47, 52–53 (2008) (discussing the Ninth Circuit's reasoning).

potential local "no net loss" baseline. As our studies and others have shown, this has led to significant net losses of wetlands on numerous local and regional scales.[119] It is only when net gains experienced in the other areas through compensatory mitigation are counted that the "no net loss" standard (in acres) is achieved at the national scale. In short, no net loss nationally does not mean no net loss everywhere in the nation—a margin of deviation intentionally incorporated into the policy to facilitate the permitting process.

a. Grandfathering Under the Clean Air Act

Under the Clean Air Act ("CAA"), whenever a new source with significant emissions arises or an existing source undergoes major modification that results in significant emissions of a criteria pollutant, the facility must undergo a process known as New Source Review ("NSR"). In simple terms, this review determines which pollution control technologies must be installed. NSR is generally an expensive proposition and one that industry would like to avoid. In the 1977 amendments to the CAA, plants operating prior to 1970 were exempted from NSR.[120] This exemption created a whole category of so-called "grandfathered" sources that did not have to comply with more stringent CAA requirements going forward.

Why were new and existing stationary sources treated differently? Part of the reason was clearly political. Existing source owners and operators had much more clout in Congress than parties who would operate plants in the future. Part was fairness, given the high cost of retro-fitting an existing plant. And part was convenience, since it was assumed that this exemption would not be of long-term importance. The grandfathered plants would shut down over time to make way for more modern, efficient, and cleaner facilities.

One can also view the story of grandfathering as an extreme baseline gaming strategy. The grandfathering provision effectively says that plants operating prior to 1970 have a 100 percent margin of deviation privilege. So long as the new source and major modification emissions thresholds are not triggered, the plants operate in the pre-1977 CAA world and are exempted from NSR. Indeed, in practice the law was extensively gamed. Grandfathering created an incentive to keep older facilities operating as long as possible, and many coal-fired

119. *See* Karl Blankenship, *'No Net Loss' Proves to Be an Elusive Wetlands Goal*, 4 CHESAPEAKE BAY J., Apr. 1994, para. 4, *available at* http://www.bayjournal.com/article.cfm?article=168 (examining the "no net loss" baseline in the Chesapeake Bay wetland program).

120. 42 U.S.C. § 7411(a)(2) (2008).

utilities did just this. Under the guise of minor modifications, utilities quite literally rebuilt their facilities to extend their life, all the while continuing to benefit from being grandfathered.[121]

b. The Clean Air Act and Dirty Old Cars

As part of the CAA of 1970, Congress used a historic baseline to set a strikingly ambitious goal. Car manufacturers were required to reduce ninety percent of carbon monoxide ("CO") and hydrocarbon ("HC") emissions by 1975.[122] Ambitious goals are uncommon in environmental law, but certainly not unheard of. What was unheard of, however, was the authority granted to the EPA effectively to shut down the auto industry if the goals were not met. The "technology-forcing" story is the subject of the famous case, *International Harvester v. Ruckelshaus*.[123] Our interest is less in the game of high-stakes chicken between the EPA and the Big Three automakers than in how the goal was gamed.

As Jon-Mark Stensvaag has well described, the EPA's guidelines for assessing compliance significantly favored the auto industry. For starters, the baseline levels of CO and HC were not the regulatory standards for these emissions already in place in 1970, but rather actual vehicle emissions. As a result, "this approach put a premium on noncompliance in 1970, and resulted in more lenient standards for 1975."[124] Second, in testing compliance, inspectors examined prototype models built specifically for testing, not cars off the production line. Third, compliance was met by averaging the test results rather than requiring each car to pass. When cars off the assembly line were tested, up to forty percent of the cars were allowed to fail. Perhaps most surprising, during the testing of prototypes for the 50,000 mile test, manufacturers were allowed to replace the catalytic converter once—something that rarely happens in practice. Stensvaag points out other favorable testing protocols as well, but the point is clear: the use of a target based off a historic baseline introduced enormous flexibility to take what appeared to be an

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121. *See, e.g.*, United States v. Duke Energy Corp., 411 F.3d 539, 544–45 (4th Cir. 2005) *vacated*, 549 U.S. 561 (holding that revisions over a twelve-year period, some costing many times the price of the original facility, did not trigger the major modifications emissions threshold).

122. 42 U.S.C. § 7521(b)(1)(A).

123. Int'l Harvester Co. v. Ruckelshaus, 478 F.2d 615, 626–27 (D.C. Cir. 1973).

124. JOHN-MARK STENSVAAG, TEACHER'S MANUAL TO ACCOMPANY MATERIALS ON ENVIRONMENTAL LAW 283–286 (1999).

extremely strict target and weaken it in application, all the while hiding this from the general public.[125]

c. The Wilderness Act

Signed into law in 1964, the Wilderness Act contains some of the most lyrical language found in any environmental law, calling for the protection of natural areas "where the earth and community of life are untrammeled by man, where man himself is a visitor who does not remain."[126] In particular, Congress declared that undeveloped public lands would be managed to retain their "primeval character and influence, without permanent improvements of human habitation, which . . . [are] protected and managed so as to preserve . . . [their] natural conditions."[127] The baseline of wilderness seemed self-evident. A closer look, however, reveals a wide margin of deviation. Despite the general prohibition on commercial or development activity in wilderness areas, the statute contains exemptions for a wide range of heavy impact activities resulting from pre-existing uses at the time of the designation. Thus road building, livestock grazing, and motorized recreation are allowed to continue.[128] One might argue that these are not margins of deviation but, rather, the true baseline since they existed at the time of wilderness designation. This brings to mind the earlier example of commercial oyster harvesting in the Point Reyes National Seashore.[129] Keep in mind, though, that the Wilderness Act went so far as to allow *new* mining activities in some wilderness areas located in national forests for twenty years after the Act was adopted.[130]

C. Is Gaming Good or Bad?

This Section has provided detailed examples of gaming historic baselines, but gaming is by no means restricted to historic baselines. Any kind of standard is susceptible to gaming through use of a healthy margin of deviation. The same can be said of performance metrics. A risk-based standard can be softened by adding "to the extent feasible," or a technology-based standard could be expressed through loose metrics such as "industry standards." As the ninety percent mobile

125. *Id.* at 283–86.
126. 16 U.S.C. § 1131(c).
127. *Id.*
128. *Id.* § 1133(d).
129. *See supra* notes 57–59 and accompanying text.
130. 16 U.S.C. § 1131(d).

sources reduction story makes clear, gaming can take place in the definition of compliance, and can occur even if the goal is an absolute emissions cap with no baseline at all. The same is true for the current climate change debate over carbon taxes versus a cap-and-trade system.[131] Both systems are susceptible to gaming, with or without baselines.

It is not the opportunity for gaming that sets historic baselines apart but, rather, the fact that only historic baselines *also* have a temporal reference point. This characteristic adds an additional dimension for gaming that is lacking in other types of goals. Historic baselines may not always provide the best fit for particular policies, but they do provide a qualitatively different opportunity for gaming than other types of standards. In other words, as the examples in this Section demonstrate, gaming the temporal reference point can provide significant political opportunity and administrative flexibility. In this sense, in many contexts historic baselines should provide greater capacity for gaming than other standards, and the gaming may be more easily obscured.

But is a greater or different opportunity for gaming a positive or negative attribute? To be sure, the story related by Stensvaag is sobering (and often met with outrage by students in our environmental law classes). It is not at all clear, however, that this was a bad result. After all, by the end of the 1970s, catalytic converters were standard features in cars and trucks, and mobile source emissions had reduced dramatically. In effect, the testing methodologies provided a subsidy of sorts to the auto industry, making compliance easier in the short term. The gaming of the Kyoto baseline served a similar purpose, placing hot air reductions in the market and making it easier for parties to meet their reduction obligations.

As a result of gaming historic baselines, political deals have been reached and laws adopted. As these examples demonstrate, gaming provides the policy space to address the needs of competing interests and come up with a final result that works in practice. The weaker goal that results is surely a downside, but one that must be balanced against the concrete achievement of a goal fixed in law. Of course, there can also be too much flexibility in the administration of a standard, where politics undermine the goal. As with other instruments and approaches in the policy toolkit, gaming baselines is

131. Tax advocates point out that the allocation of allowances and use of generous offsets can undermine the cap-and-trade program's integrity, while cap-and-trade proponents argue that tax credits, deductions, and exemptions can neuter the impacts of carbon taxes. Unfortunately, both sides are right.

neither inherently good nor bad; it depends on their specific application.

IV. HISTORIC BASELINES AND CLIMATE CHANGE POLICY

This Article has now identified the basic features of historic baselines and assessed their respective benefits and costs in setting regulatory goals, with a focus on the potential for gaming. The question remains, however, whether this is a useful exercise. How does a better understanding of historic baselines inform our understanding of regulatory policy design and implementation?

In answering this "so what?" challenge, this Section turns to the most pressing regulatory challenge of our time—climate change. The climate debate has largely evolved into two separate though related arenas—mitigation and adaptation. *Mitigation* focuses on reducing the threats of climate change by reducing the atmospheric concentration of greenhouse gases. It can be achieved either through emissions reduction at the source or sequestration of greenhouse gases through vegetation or technology. *Adaptation* focuses on minimizing the harms posed by the climate change that do occur. This is primarily an engineering or landscape management approach. There is increasing interest on both these fronts, with governments and interest groups pushing their own particular goals. In the sections below, we apply our analysis of historic baselines in the context of climate change mitigation and adaptation policy.

A. Climate Change Mitigation—Turning Back the Clock

Broadly speaking, mitigation strategies comprise three types of emissions reduction goals. Interestingly, each of these relies on historic baselines. The most common goal relies explicitly on *a target based off of a historic baseline*. As mentioned above, the Kyoto Protocol allocated reduction percentages among parties referenced to a 1990 baseline. This strategy also proved popular in negotiations leading up to the Copenhagen climate summit. Heads of the richest nations, the G8, called for measures that will avoid a global temperature rise greater than two degrees centigrade compared to pre-industrial levels,[132] supplemented by a commitment to collectively reduce emissions eighty percent by 2050, in the expectation that cuts by

132. Wintour & Elliott, *supra* note 32, at 14.

developing countries will result in an overall reduction of fifty percent.[133]

Other nations have also called for targets off baselines. In the run-up to the Fourteenth Conference of the Parties in 2008, for example, the Alliance for Small Island States, a coalition of nations most threatened by climate change, called for global emissions reductions of over eighty-five percent by 2050 from a 1990 baseline, with developed countries' reductions over forty percent by 2020 and ninety-five percent by 2050.[134] These reduction targets are anchored in the goal of limiting temperature increases to below 1.5°C. Though using different numbers, the European Union, Norway, Iceland, African nations, and Chile have called for reductions to keep temperature increases below 2°C. In terms of emissions reductions, they have called for a fifty percent reduction by 2050 with a 1990 baseline.[135] As negotiations proceed, these numbers will surely change but the approach of historic baselines likely will not.[136] All of these targets could have been expressed as tons of emissions at a specified date in the future, yet every nation feels compelled to introduce historic baselines as a way of providing a reference point. Historic baselines are the framing method of choice for mitigation policy.

A second strategy relies on a *qualitative target*. The United Nations Framework Convention on Climate Change called on countries to stabilize greenhouse gases below levels that would cause "dangerous anthropogenic interference" ("DAI").[137] As Michael Mann has pointed out, this goal is not a simple scientific measure. Instead, it leaves open a number of fundamental policy questions—dangerous to

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133. *Id.*

134. ALLIANCE OF SMALL ISLAND STATES (AOSIS), DECLARATION ON CLIMATE CHANGE 2009 para. 6.b (Sept. 21, 2009), *available at* http://www.sidsnet.org/aosis/documents/AOSIS%20Summit%20Declaration%20Sept%2021%20FINAL.pdf.

135. *Id.* para. 6.b.v.; *see also* European Union Communication to the U.N., Limiting Global Climate Change to 2 Degrees Celsius (Jan. 10, 2007), *available at* http://www.europa-eu-un.org/articles/en/article_6666_en.htm (proposing the same).

136. Indeed, historic baselines have become the universal language of climate change mitigation policy, as virtually every nation has expressed its preferred greenhouse gas reduction targets through one or another form of historic baseline using all variety of reference points and percentages. Canada, for example, has targeted a twenty percent cut from 2006 levels by 2020; Mexico has targeted a fifty percent cut from 2000 levels by 2050; Japan a twenty-five percent cut from 1990 levels by 2020; South Korea a four percent cut from 2005 levels by 2020; Russia to maintain emissions thirty percent below 1990 levels through 2030; and so on. Dean Scott & Eric J. Lyman, *As Hope for Binding Climate Deal Fades, Copenhagen Aims to Be Springboard to 2010*, 40 Env't Rep. (BNA) 2733, 2734–35 (Nov. 27, 2009).

137. Michael E. Mann, *Defining Dangerous Anthropogenic Interference*, 106 PROC. NAT'L ACAD. SCI. 4065, 4065–66 (2009).

whom, where, and when?[138] Hence this approach leaves ample room for gaming as well. In practice, efforts to establish DAI targets have resorted to historic baselines. An advisory group created in the late 1980s by the World Meteorological Organization, the International Council of Scientific Union, and the United Nations Environment Program, for example, determined that the threshold for DAI was an increase of 2°C global mean surface warming.[139] Importantly, this temperature increase was measured from a baseline of pre-industrial levels. Noted atmospheric physicist James Hansen has more recently identified a one degree increase as the appropriate threshold measure, compared to pre-industrial temperatures.[140]

The last strategy seems, on its face, to make no use of historic baselines. This approach sets an *absolute target*. The best example of this can be found in the group 350.org. On October 24, 2009, it sponsored 5,200 events in 181 countries. According to 350.org's website, this was the most widespread day of environmental action in history. The goal of all these events was a universal call for binding emissions targets of 350 ppm. As the group's website makes clear, this number is not arbitrary: "350 is more than a number—it's a symbol of where we need to head as a planet,"[141] and "[i]t's the safety zone for planet earth."[142] Even here, however, the number comes from a historic baseline. The website goes on to explain that the purpose of the 350 ppm goal is "to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted."[143] In other words, the 350 ppm level is calibrated to return the planet to pre-industrial conditions—a historic baseline in all but name.

The main policy approach for sequestration, the flip side of reducing emissions, also relies on historic baselines. Popularly known as REDD (for Reduced Emissions from Deforestation and Degradation), this approach would provide reduction credits to countries that reverse trends of deforestation and land degradation.[144] In a simple example, if a country has had an annual deforestation loss

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138. *Id.*

139. V. Ramanathan & Y. Feng, *On Avoiding Dangerous Anthropogenic Interference with the Climate System: Formidable Challenges Ahead*, 105 PROC. NAT'L ACAD. SCI., 14,245, 14,245 (2008).

140. *Id.*

141. *Mission*, 350.ORG, http://www.350.org/en/mission (last visited Nov. 4, 2010).

142. *350 Science*, 350.ORG, http://www.350.org/en/about/science (last visited Nov. 4, 2010).

143. *Id.*

144. For a general explanation of REDD, *see REDD: Protecting Climate, Forests and Livelihoods*, INT'L INST. ENV'T & DEV., http://www.iied.org/natural-resources/key-issues/forestry/redd-protecting-climate-forests-and-livelihoods (last visited Nov. 4, 2010).

of three percent over the last ten years, it would gain credits or be paid for reducing this rate of loss (for example, down to a one percent annual loss or even an increase in forest cover). There is strong support for variants of this approach, and REDD will likely be an integral part of any future climate treaty. Obviously, in order to determine the relative improvements in deforestation rates, REDD will have to be based on a historic baseline approach.

In all instances, therefore, mitigation strategies build off historic baselines. The target and REDD approaches do so explicitly. Even the qualitative target of DAI and the absolute target of 350 ppm are implicitly tied to a time in our history when the greenhouse gas concentrations were not dangerous. This is then projected forward for current emissions targets. In the world of mitigation, then, historic baselines are inevitable. The situation is far different with adaptation.

B. Adaptation Policy—Hitting the Reset Button

Climate change adaptation "refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities."[145] As early as 1990, many held the view that "[i]t is likely that no matter what policy actions we take, fully arresting the climate warming is just not in the cards. . . . And so the likelihood is that humanity will have to adapt to some climate changes."[146] Until recently, however, the domestic policy pendulum has swung sharply in mitigation's direction, and "interest in adaptation was overwhelmed by concern about the need to reduce greenhouse gas emissions and stabilize atmospheric greenhouse gas concentrations."[147] Indeed, the need for an effective mitigation policy increasingly was portrayed as so pressing that talk of adaptation became taboo, an admission of surrender to the goal of reducing emissions.[148] Today, however, it is clear that so-called committed warming—the climate change already built into the system as a result of past greenhouse gas emissions—

145. *Glossary of Climate Change Terms*, EPA http://www.epa.gov/climatechange/glossary.html (last visited Nov. 4, 2010).

146. Robert M. White, *The Great Climate Debate*, 84 AM. SOC'Y INT'L L. PROC. 346, 355 (1990).

147. E. Lisa F. Schipper & Ian Burton, *Understanding Adaptation: Origins, Concepts, Practice and Policy*, *in* THE EARTHSCAN READER ON ADAPTATION TO CLIMATE CHANGE 1, 7 (E. Lisa F. Schipper & Ian Burton eds., 2009).

148. *See id.* (" '[A]daptationists' were distrusted because their proposals seemed to undermine the need for mitigation. Critics felt that belief in the potential value of adaptation would soften the resolve of governments to grasp the nettle of mitigation and thus play into the hands of the fossils fuel interests and the climate change sceptics.").

will play out for many decades, even if a political or technological mitigation breakthrough happened yesterday.[149] Recent policy dialogue has thus increasingly recognized that formulating and implementing adaptation strategies must be an urgent and prominent component of our domestic climate change law and policy.[150]

What role can historic baselines play in closing this "adaptation deficit"?[151] As outlined above, mitigation policy has with good reason depended on historic baselines to establish emission reduction and sequestration goals, and is likely to continue to do so. This Section outlines reasons why, as attractive as historic baselines may be to policymakers forging new climate change adaptation strategies, ultimately such baselines will fail to deliver the same foundation for adaptation policy that they have built in the mitigation policy context.

First, consider the policy goals. Climate change adaptation is designed to facilitate one or more of the following outcomes for local and regional human populations and for other species and their ecosystems:

(1) *resist* the effects of climate change to maintain the status quo;

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149. *See* Richard A. Kerr, *How Urgent Is Climate Change?*, 318 SCIENCE 1230, 1230 (2007) ("The system has built in time lags. Ice sheets take centuries to melt after a warming. The atmosphere takes decades to be warmed by today's greenhouse gas emissions."); Ramanathan & Feng, *supra* note 139, at 14,251 (estimating committed warming of 2.4 degrees Celsius even if greenhouse gas concentrations are held to 2005 levels); Susan Solomon et al., *Irreversible Climate Change Due to Carbon Dioxide Emissions*, 106 PROC. NAT'L ACAD. SCI. 1704, 1704 (2009) (estimating a 1000-year committed warming effect). For an in-depth examination of this lag effect and the resistance it is likely to generate against costly mitigation policy measures that may take decades to produce results, see Eric Biber, *Climate Change and Backlash*, 17 N.Y.U. ENVTL. L.J. 1295, 1301–05, 1311–34 (2009).

150. *See, e.g.*, Alejandro E. Camacho, *Adapting Governance to Climate Change: Managing Uncertainty Through a Learning Infrastructure*, 59 EMORY L.J. 1, 17 (2009) ("Unfortunately, legislators and regulators in the United States and elsewhere have only begun to consider the role of adaptation in combating climate change."); Daniel A. Farber, *Adapting to Climate Change: Who Should Pay*, 23 J. LAND USE & ENVTL. L. 1, 2 (2007) ("Adaptation has been a neglected topic. . . . In my view, this is a mistake."); Peter Hayes, *Resilience as Emergent Behavior*, 15 HASTINGS W.-NW. J. ENVTL. L. & POL'Y 175, 175 (2009) ("[T]he main game is now adaptation which renders mitigation no less urgent, but shifts the political equation in dramatic ways that cannot be ignored any longer."); Thomas Lovejoy, *Mitigation and Adaptation for Ecosystem Protection*, 39 Envtl. L. Rep. (Envtl. Law Inst.) 10,072, 10,073 (2009) ("The adaptation part of the climate change agenda is only just beginning to get attention, and needs much more right away."); Ileana M. Porras, *The City and International Law: In Pursuit of Sustainable Development*, 36 FORDHAM URB. L.J. 537, 593 (2009) ("Most climate change experts and policy-makers recognize that adaptation and mitigation are not mutually exclusive strategies but must, on the contrary be employed in tandem.").

151. For the term "adaptation deficit," (losses incurred by ineffective use of available knowledge about climate change), see Ian Burton, *Climate Change and the Adaptation Deficit*, *in* THE EARTHSCAN READER ON ADAPTATION TO CLIMATE CHANGE, *supra* note 147, at 90–92.

(2) *transform* physical, social, environmental, or economic conditions to minimize harm or maximize benefits associated with climate change impacts; or
(3) *move* humans or other species to areas with better adaptive capacities.

Take as examples the city of Miami, Florida, and the nearby Biscayne Bay Aquatic Preserve, which the state of Florida established in 1974 "to be preserved in an essentially natural condition so that its biological and aesthetic values may endure for the enjoyment of future generations."[152] These human and natural environments face substantial threats from climate change impacts, such as sea level rise, introduction and loss of species, loss of coastal resources, and more frequent and intensive storm events. Miami's city managers and the Preserve's resource managers could adopt any of the three adaptation policy goals. Each could rely on historic baselines. In each case, however, historic baselines will not prove as effective as other types of standards. To be sure, historic baselines are quite appealing to policies aimed at resisting climate change to secure the status quo. After all, historic baselines such as "no net loss" seem to do just that; so why not use them if we want Miami and the Preserve to stay just the way they are through the era of climate change? The answer is simple—it is not possible to keep Miami and the Preserve just the way they are through the era of climate change.

Natural resources managers have come to the sober conclusion that climate change is fundamentally different from the kind of ecological change they are used to managing. Resource management has evolved well past conceptions of nature as static and "balanced." With ecology in particular, the trend over the past half-century has been increasingly to focus on the complex flux qualities of ecosystems and to place less emphasis on conceptions of stasis and natural stability.[153] Nevertheless, the "dynamic equilibrium" model that is now firmly in place in ecology is based on the assumption of "stationarity," which, as P.C.D. Milly explains, is "the idea that natural systems fluctuate within an unchanging envelope of variability."[154] Although ecologists understand that the envelope can be stretched by natural and anthropogenic events, "justifiably or not,

152. FLA. STAT. § 258.397 (2010).

153. *See* Bryan Norton, *Change, Constancy, and Creativity: The New Ecology and Some Old Problems*, 7 DUKE ENVTL. L. & POL'Y F. 49, 53–55 (1996) (discussing the increased focus on ecological change over the last fifty years).

154. P.C.D. Milly et al., *Stationarity Is Dead: Whither Water Management?*, 319 SCIENCE 573, 573 (2008).

they generally have considered natural change and variability to be sufficiently small to allow stationarity-based design."[155] Thus, conservation programs, such as the ESA, the Wilderness Act, and the National Wildlife Refuge System, to this day depend heavily on the strategy of setting aside habitat reserves to preserve the status quo,[156] and even newer, more flexible conservation orientations, such as ecosystem-based management, depend strongly on the stationarity premise and its appeal to "natural" and "native" models of ecosystem dynamics.[157]

But the stationarity premise is on shaky ground in the era of climate change. Ecologists now warn of the no-analog future—ecological variability unprecedented in the history of ecology, riddled with nonlinear feedback and feed-forward loops, previously unknown emergent properties, and new thresholds of irreversible change.[158] The

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155. *Id.*

156. *See* Holly Doremus, *The Endangered Species Act: Static Law Meets Dynamic World*, 32 WASH U. J.L. & POL'Y 175, 204–10 (arguing that nature preserves strive to create a static environment that minimizes future human interference with natural habitats).

157. *See* R. Edward Grumbine, *What Is Ecosystem Management?*, 8 CONSERVATION BIOLOGY 27, 30–31 (1994) (advocating describing a feature of ecosystem management as management of ecosystems for their "native" properties); Bruce Pardy, *Ecosystem Management in Question: A Reply to Ruhl*, 23 PACE ENVTL. L. REV. 209, 213–14 (2005) (proposing management of ecosystems for "natural" conditions). For arguments against retaining these conceptions of "nature" as the policy driver in environmental law, see J.B. Ruhl, *The Myth of What Is Inevitable Under Ecosystem Management: A Response to Pardy*, 21 PACE ENVTL. L. REV. 315, 319–23 (2005); J.B. Ruhl, *The Pardy-Ruhl Dialogue on Ecosystem Management, Part IV: Narrowing and Sharpening the Questions*, 24 PACE ENVTL. L. REV. 25, 30–31 (2007).

158. Matthew C. Fitzpatrick & William W. Hargrove, *The Projection of Species Distribution Models and the Problem of Non-Analog Climate*, 18 BIODIVERSITY & CONSERVATION 2255, 2255 (2009) ("By 2100, a quarter or more of the Earth's land surface may experience climatic conditions that have no modern analog . . . ."); Douglas Fox, *Back to the No-Analog Future?*, 316 SCIENCE 823, 823 (2007) ("[I]f the climate changes over the next 100 years as current models predict, surviving species throughout much of Earth's land area . . . are likely to be reshuffled into novel ecosystems unknown today."); Douglas Fox, *When Worlds Collide*, CONSERVATION, Jan.–Mar. 2007, at 28 (arguing that it is likely that the world will enter into a no-analog future within 100–200 years). The scientific literature exploring these complex dynamics and exposing our lack of understanding about what lies ahead as temperature rises is legion. *See, e.g.*, Almut Arneth et al., *Clean the Air, Heat the Planet?*, 326 SCIENCE 672, 672–73 (2009) (examining the feedback effects between conventional air pollution control and climate change mitigation and concluding that complex positive and negative feedback links exist and that, on balance, the evidence and models suggest that "air pollution control will accelerate warming in the coming decades"); Gordon B. Bonan, *Forests and Climate Change: Forcings, Feedbacks, and the Climate Benefits of Forests*, 320 SCIENCE 1444, 1444–48 (2008) (explaining the complex and nonlinear forest-climate interactions); I. Eisenman & J.S. Wettlaufer, *Nonlinear Threshold Behavior During the Loss of Arctic Sea Ice*, 106 PROC. NAT'L ACAD. SCI. 28 (2009) (describing the nonlinear "tipping points" in the ice-albedo feedback effect); Jerome Gaillardet & Albert Galy, *Himalaya—Carbon Sink or Source?*, 320 SCIENCE 1727, 1727–28 (2008) (explaining the uncertainties of the sinks and sources of the carbon geological cycle); Steven W. Running, *Ecosystem Disturbance, Carbon, and Climate*, 321 SCIENCE 652, 653 (2008) (explaining the uncertainties of ecological

"envelope" of variability will not merely grow in size, it will change in basic structure, and no analog exists in the history of ecology, including paleoecology for that matter, for predicting its new ground rules. Thus, climate change, in the words of the FWS, "is the transformational conservation challenge of our time, not only because of its direct effects, but also because of its influence on the other stressors that have been and will continue to be, major conservation priorities."[159] As biologist Young Choi emphatically sums up the challenge of climate change adaptation, "[w]e need to admit our inability to restore an ecosystem to its very original state. We cannot go back to our nostalgic past!"[160]

Building adaptation strategies around historic baselines to resist climate change thus is a losing proposition.[161] Miami, for example, might build seawalls, use pesticides to control invasive disease-bearing insects and parasites, import more sand, energy, and water to support its beach tourism industry, and establish health management systems to deal with increased disease. Even well before climate change became a concern, coastal communities in particular tenaciously clung to the status quo through such measures, so there is little reason to believe they will abandon the status quo willingly in the face of climate change.[162] Similarly, the Preserve managers, whose mission has been to maintain a historic baseline, might work tirelessly

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sinks and sources such as fires and insect epidemics); Daniel B. Fagre et al., Thresholds of Change in Ecosystems 36–74 (draft, Aug. 14, 2008), *available at* http://www.climatescience.gov/Library/sap/sap4-2/public-review-draft/sap4-2-prd.pdf (examining numerous positive feedback properties leading to nonlinear thresholds in climate change dynamics).

159. U.S. FISH & WILDLIFE SERV., RISING TO THE CHALLENGE: STRATEGIC PLAN FOR RESPONDING TO ACCELERATING CLIMATE CHANGE 7 (draft, Sept. 21, 2009).

160. Yong D. Choi, *Restoration Ecology to the Future: A Call for New Paradigm*, 15 RESTORATION ECOLOGY 351, 351 (2007).

161. For an extensive discussion in the context of species conservation, see Alejandro E. Camacho, *Assisted Migration: Redefining Nature and Natural Resource Law Under Climate Change*, 27 YALE J. ON REG. 171, 225–43 (2010). Camacho concludes that "the goal of preserving or restoring resources to a historic baseline that currently dominates natural resource policy will be increasingly difficult if not impossible to sustain." *Id.* at 244.

162. For example, beach renourishment projects, while not generally motivated today by climate change concerns, are representative of the property disputes likely to arise as communities take measures to enhance coastal technological and natural resources to defend against sea level rise and more frequent and more intense storm surges. *See* Stop the Beach Renourishment, Inc. v. Fla. Dep't of Envtl. Prot., 130 S. Ct. 2592, 2597–600 (2010) (describing such a dispute). The case arose out of the Florida Supreme Court's decision in *Walton County v. Stop the Beach Renourishment, Inc.*, 998 So. 2d 1102 (Fla. 2008), in which the court found a state beach renourishment statute that fixed property boundaries for littoral property owners did not constitute a taking of property without just compensation. *Id.* at 2600. For an in-depth discussion of the case, see Donna R. Christie, *Of Beaches, Boundaries and SOBs*, 25 J. LAND USE & ENVTL. L. 19, 45–51 (2009).

to import water, soils, and other resources to prop up wetlands and corals diminished from climate change. They may intervene to prevent species from moving into or out of Biscayne Bay in response to climate change. But in neither case are these strategies likely to work in the long run. For Miami and the Preserve, the cost of maintaining the status quo with no margin of deviation is likely to become prohibitive at the very least, and infeasible in many respects. Sticking rigidly to historic baselines could become counterproductive to other policy goals in those circumstances. On a macro regional or national scale, moreover, the "resist" strategy cannot be uniformly maintained—to the extent managing numerous areas such as Miami and the Preserve for the status quo depends on importing water, energy, or other resources from somewhere else, then obviously not every human and natural environment can be managed for the status quo.

The transformative effects climate change will have on conceptions of variability and change in human and natural environments thus undermines the very premise of resist strategies. If status quo were nonetheless the expressed goal of an adaptation policy for places like Miami and the Preserve, the use of historic baselines would have to place primary design emphasis on the margin of deviation, which would need to accommodate significant departures from the temporal reference point conditions. It would be as if the "no net loss" policy had been framed as the "lots of net loss" policy, at which point the adaptation goal looks less like resisting to maintain the status quo and more like transforming to deal with change. Resist strategies and their historic baselines, in other words, will be swamped by climate change into a focus on how far off the status quo conditions have moved.

Given that resist strategies in areas such as Miami and Biscayne Bay are likely to devolve into "transform" strategies, historic baselines seem particularly inappropriate. Transform strategies assume that maintaining the status quo or restoring conditions to a past state are either not feasible or not desirable policy goals. A standard like "no net loss" or "pre-European conditions" has little meaning in that context. Rather, transform strategies *assume* that transition and change are integral parts of the program and set goals for the future, irrespective of the past. Is a historic baseline approach even possible when climate change has obliterated the baseline?

Miami's city managers, for example, may hope to replace beach tourism with some other form of tourism, and the Preserve's managers may decide to replace species-specific goals with goals such as conserving an overall mix of biodiversity without regard to species assemblage. What passes as "natural conditions," in other words, is no

longer referenced from the past but rather from the anticipated future. Historic baselines, though, could be designed around such policies. For example, a rolling baseline could be used to measure average changes in tourism categories or species categories. But in that context the historic baseline is simply a "soft" regulatory instrument, a measurement tool used to test implementation techniques, not a "hard" regulatory tool used to establish and enforce implementation goals. It is far more likely that standards based on risk, technological feasibility, and cost will drive policy decisions in a dynamic environment with only partially informed conceptions of what the world is supposed to look like on the "other side" of climate change, other than it will not look anything like the past.

An even more compelling case can be made against using historic baselines in support of move strategies for climate change adaptation. If people decide to leave Miami or other areas, or if resource managers decide to engage actively in assisted migration of species, that reflects a decision that the status quo or restoration to a past set of conditions are not feasible goals *and* that transformation with change in situ is not viable either.[163] History and the status quo are at that point irrelevant policy tools. Even using historic baselines to guide carrying capacity decisions—for example, to establish how many people or species members can move out of an area or into an area—is not useful when the carrying capacities also are changing due to climate change. Using historic baselines in these adaptation settings could prove foolish if not dangerous.

C. Going Forward

Our examination of historic baselines in climate change policy thus suggests that (1) mitigation and adaptation polices are distinct and must be designed with their respective attributes in mind, and (2) historic baselines provide a very good match with the attributes of mitigation policy, but not with those of adaptation policy. Put another way, even though people often speak of mitigation and adaptation as two sides of the same coin, they are actually very different, even to the level of goal structure, and we need to be careful not to let the facility of baselines in mitigation shift over to adaptation without recognizing these fundamental differences. Historic baselines are directly implicated in only one side of the climate debate. For climate

163. *See* Camacho, *supra* note 161, at 223 ("Assisted migration directly contradicts this focal management goal of preserving or restoring natural resources to a static historic baseline.").

mitigation, they are unavoidable, and that is probably a good thing. For adaptation policies, by contrast, they are maladapted.

Our concern is that, notwithstanding these limitations of historic baselines in support of resist, transform, and move strategies for climate change adaptation, historic baselines will prove irresistible to policymakers designing adaptation standards. The gaming success historic baselines have had thus far in mitigation policy could delude policymakers into believing that they can also finesse adaptation policies from historic baselines. Adaptation policy, moreover, is directly about the kind of change people fear, making explicit discussion of risk, technology, and cost less palatable for politicians. Just as with "no net loss," historic baselines could be attractive to policymakers as a means of masking and deferring the tough policy decisions on risk, technology, and cost. As the "no net loss" experience has shown, however, unless carefully designed and monitored, gaming can creep in to make performance measurement less reliable and thus distort long-term assessment of the standard's performance. As difficult as it has been thus far to assess whether "no net loss" has been a successful wetlands conservation standard, imagine how difficult it will be to evaluate after fifty years of accelerated climate change whether "natural" wetland conditions around the nation have fundamentally changed.[164] Policymakers therefore should resist the temptation to assume that the facility of historic baselines in mitigation policy can be imported to adaptation policy, and should instead build adaptation policy on explicit risk, technology, and cost standards.

CONCLUSION

Every method of standard setting in regulatory policy leverages its own unique attribute. An extensive scholarship explores how risk-based standards use risk analysis; how absolute standards use hard quantification; how technology-based standards use engineering knowledge; and how cost-based standards use economic cost-benefit analysis. By contrast, there has been virtually no consideration of how

164. Some researchers believe that, while wetland conditions at any one location are likely to degrade or improve with climate change, overall the United States will experience no net loss and perhaps even some gain of wetland resources as a result of climate change. *See* Matthew L. Kirwan et al., *Latitudinal Trends in* Spartina Alterniflora *Productivity and the Response of Coastal Marshes to Global Climate Change*, 15 GLOBAL CLIMATE BIOLOGY 1982, 1986–87 (2009) (climate change may increase total productivity and ecosystem services of coastal wetlands). This assumes, of course, that areas likely to transition into new or expanded wetlands are not converted to some other land use before then.

historic baselines operate—a serious gap given the widespread use of historic baselines by Congress and agencies.

To fill that gap, this Article has explored in detail the attributes and operation of historic baselines. That historic baselines are found throughout regulatory law is no accident. Particularly when the policy goal involves turning back the clock or halting an undesirable trend, historic baselines have distinct advantages compared to alternative techniques for standard setting. These advantages include rhetoric, familiarity, and flexibility. The use of the temporal reference point lies at the heart of what makes historic baselines distinct in this respect, yet it is also what makes them qualitatively different for purposes of gaming. Leveraging the past provides an additional dimension to the gaming potential found in other techniques, such as technology- or cost-based goals.

This very attraction, however, equally limits historic baselines in some contexts. This limitation is most evident in climate change adaptation policy, where baselines simply do not easily fit because the policy goal is fundamentally about resetting the clock, not turning it back. There is no past to leverage when it comes to climate change adaptation. This may be true in other cases where massively transformative forces are at work, such as with the global financial crisis. Going back to the past may be appealing in these settings, but it is ultimately infeasible. Policymakers reaching for a more forward-looking policy thus should eye warily the appeal to the past embedded in historic baselines.