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COERCING COLLABORATION: THE CHESAPEAKE BAY EXPERIENCE

JAMISON E. COLBURN*

The Chesapeake Bay, America's largest and once most productive estuary has attracted the single most sustained, deeply financed, politically rooted ecosystem restoration partnership in American history. Troubles for the Bay were first recognized in the 1930s and serious efforts to restore it to its ecological baselines date to the 1970s. Its water quality problems stem largely from nutrient and sediment runoff and the overfeeding of its microorganisms, leading to hypertrophication and consequent oxygen depletion throughout the Bay.¹ With the average hypoxic zone now around 40% of the Bay's area during summers, this system's fate is being decided today.²

In 2009, the Obama Administration took unprecedented steps to knit together the Clean Water Act's traditional pollution control tools with decades of "collaborative" efforts that had been fashioned in the Chesapeake. What emerged was a synthesis of modeled targets, obligations, and steps to their fulfillment meant to bring most of the Bay's segments into water quality standard attainment by 2025.³ The questions surrounding the legality of this approach have been litigated and the courts' answers were a resounding endorsement.⁴ They are many of the same questions now being asked about the Administration's "Clean Power Plan."⁵

This Article uses a detailed case study of the Chesapeake to describe an emergent model of intergovernmental administration tailored to address our largest-scale environmental problems. The Obama EPA's

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¹ See ENVTL. PROT. AGENCY, CHESAPEAKE BAY TMDL EXECUTIVE SUMMARY ES-1 (Dec. 29, 2010), available at <http://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-document> [<https://perma.cc/E2NZ-MXSW>].

² Cheryl Lyn Dybas, *Dead Zones Spreading in World Oceans*, 7 *BIOSCIENCE* 552, 553 (2005).

³ CHESAPEAKE BAY TMDL EXECUTIVE SUMMARY, *supra* note 1, at ES-3.

⁴ See, e.g., *Am. Farm Bureau Fed'n v. U.S. E.P.A.*, 984 F. Supp. 2d 289 (M.D. Pa. 2013), *aff'd*, 792 F.3d 281 (3d Cir. 2015).

⁵ See Steven Cohen, *The Clean Power Plan Overcomes Another Attack*, HUFFPOST GREEN (Jan. 25, 2016), http://www.huffingtonpost.com/steven-cohen/the-clean-power-plan-over_b_9068144.html [<https://perma.cc/S5SX-FVC8>].

“total maximum daily load” (“TMDL”) in the Chesapeake has yet to be replicated. But it should be. The TMDL and its supporting norms were unique as an operational plan, achieving a level of transparency, accountability, means/ends rationality, and continuous improvement that were unprecedented at its scale. And whether this model can be replicated elsewhere turns out to be as much a question of law as of politics.

INTRODUCTION

The Chesapeake Bay experience has been unique but also, paradoxically, especially instructive. Beneath current events lay decades of “collaborative” effort, principally by the watershed states, to avert federalization of a steadily expanding problem. The problem is nutrient pollution—the excessive discharge of vital nutrients which literally overfeed microorganisms until they choke the rest of the system to death—specifically, its diffuse sources, uncertain fate and transport, and jurisdictional dispersion.⁶ In 2009, the Obama Administration announced a targeted focus on nutrients in the Chesapeake Bay and the problem will never look the same,⁷ for this experiment has yielded insights and outcomes worth wide consideration.

Generations ago uncertainty was a reason for inaction. Today, uncertainty remains the chief obstacle in the rational targeting of threats and risks worth regulating. Allocating its burdens, a task many wish to avoid,⁸ is a necessity. At our disposal today is a vast array of measures routinely lumped into orthodox piles like “legislation,” “regulations,” “guidance,” and other, supposedly sub-regulatory, measures.⁹ Another array, voluntary, “collaborative” measures, has been applied longer in the Chesapeake than any other ecosystem-wide restoration program in the world. The federal cost-share dollars that have subsidized these measures throughout the watershed, whether in the form of “best management practices” (“BMPs”), land acquisition, or civil infrastructure, are staggering.¹⁰ Some argue

⁶ See CHESAPEAKE BAY TMDL EXECUTIVE SUMMARY, *supra* note 1, at ES-3.

⁷ Exec. Order 13508, Chesapeake Bay Protection and Restoration, 74 FR 23099 (May 12, 2009).

⁸ See, e.g., Naomi Oreskes, *Science and Public Policy: What's Proof Got to Do With It?*, 7 ENVTL. SCI. & POL'Y 369 (2004) (arguing that science can never provide the amount of proof demanded by skeptics of regulation because the stakes are rarely about the science itself).

⁹ See, e.g., IAN AYRES & JOHN BRAITHWAITE, *RESPONSIVE REGULATION: TRANSCENDING THE DEREGULATION DEBATE* (1992); Christopher Carrigan & Cary Coglianese, *The Politics of Regulation: From New Institutionalism to New Governance*, 14 ANN. REV. POL. SCI. 107 (2011); Charles F. Sable & William H. Simon, *Minimalism and Experimentalism in the Administrative State*, 100 GEO. L.J. 53 (2011).

¹⁰ See NAT'L RESEARCH COUNCIL, *ACHIEVING NUTRIENT AND SEDIMENT REDUCTION GOALS*

that they have failed.¹¹ This Article argues that the differences between “regulatory” and “voluntary” are quickly eroding in our governance design practices. The tools of distributed governance, peer accountability, and estimative analysis are rendering these differences increasingly obsolete yet, paradoxically, they are a growing threat to clear thinking about our choices.¹²

Every system’s approach sits in some tension with law and democracy, because law (if not democracy) is essentially *jurisdictional* whereas systems (especially natural systems) are continuous and interconnected. Ecosystem approaches to pollution are doubly problematic given how little is known about many pollutants’ fate and transport. Nutrient pollution may be a singularly vicious problem in this light given its complex generation of system effects, ubiquity in nature, ties to our modern food systems and consequent profusion of sources.¹³

Fragmented jurisdictions and hypersensitivity to the supposed tyranny their consolidation would bring have been the Clean Water Act’s lived experience.¹⁴ The statute is structured around a division of “point”

IN THE CHESAPEAKE BAY: AN EVALUATION OF PROGRAM STRATEGIES AND IMPLEMENTATION (2011) [hereinafter NRC EVALUATION].

¹¹ See, e.g., HOWARD R. ERNST, FIGHT FOR THE BAY: WHY A DARK GREEN AWAKENING IS NEEDED TO SAVE THE CHESAPEAKE BAY XII (2010) [hereinafter ERNST, FIGHT FOR THE BAY].

¹² For general accounts of this peer-to-peer accountability, see Charles F. Sabel & Jonathan Zeitlin, *Learning from Difference: The New Architecture of Experimentalist Governance in the European Union*, in EXPERIMENTALIST GOVERNANCE IN THE EUROPEAN UNION: TOWARDS A NEW ARCHITECTURE 1 (Charles F. Sabel & Jonathan Zeitlin eds., 2010); Joanne Scott & Jane Holder, *Law and New Environmental Governance in the European Union*, in LAW AND NEW GOVERNANCE IN THE EU AND THE US 211 (Gráinne de Búrca & Joanne Scott eds., 2006); Bradley C. Karkkainen et al., *After Backyard Environmentalism: Toward A Performance-Based Regime of Environmental Regulation*, 44 AMER. BEHAV. SCI. 692, 693 (2000); Michael C. Dorf & Charles F. Sabel, *A Constitution of Democratic Experimentalism*, 98 COLUM. L. REV. 267 (1998).

¹³ See STATE-EPA NUTRIENT INNOVATIONS TASK GROUP, AN URGENT CALL TO ACTION: REPORT OF THE STATE-EPA NUTRIENT INNOVATIONS TASK GROUP (Aug. 2009) [hereinafter URGENT CALL TO ACTION]. Dewey argued that true public problems tend generally to have this structure. See JOHN DEWEY, THE PUBLIC AND ITS PROBLEMS (1927).

¹⁴ The Supreme Court has been particularly—some would say compulsively—concerned with the Act’s jurisdiction-defining terms. Jurisdictional “waters,” of course, were (not) sorted out in *United States v. Riverside Bayview Homes, Inc.*, 474 U.S. 121 (1985), *Solid Waste Agency of N. Cook Cnty. v. U.S. Army Corps of Eng’rs*, 531 U.S. 159 (2001), and *Rapanos v. United States*, 547 U.S. 715 (2006). But the list of other precedents construing jurisdictional terms is long. See *Los Angeles Cty. Floor Control Dist. v. Natural Res. Def. Council, Inc.*, 133 S. Ct. 710 (2013) (“discharge”); *Decker v. Nw. Env’tl. Def. Ctr.*, 133 S. Ct. 1326 (2013) (“point source”); *Coeur Alaska, Inc. v. Se. Alaska Conserv. Council*, 129 S. Ct. 2458 (2009) (“pollutant”); *S.D. Warren v. Maine*, 547 U.S. 370 (2006) (“discharge”); *S. Fla. Water Mgmt. Dist. v. Miccosukee Tribe*, 541 U.S. 95 (2004) (“addition” of a pollutant); PUD

(jurisdictional) from “nonpoint” (non-jurisdictional) pollutant sources, a fiction animating the Act as a whole.¹⁵ Other major extra-jurisdictional threats include air deposition, hydro-modifications and water withdrawals.¹⁶ Experiments in “cooperative federalism” have long been our norm,¹⁷ generating as much *uncooperation* as anything else.¹⁸ But some recent accounts of accountability have cast many of these arrangements in a harsh light, urging the courts to intervene.¹⁹ What can be called “dialogue”²⁰ can just as easily be regarded as liability-shifting, i.e., evading an electorate,²¹ leaving little coherent doctrine and even less sense of appropriate power sharing.²² Statutes that apportion discretion to state or federal regulators are alternatively interpreted to permit or to forbid one of them from imposing enforceable constraints on the regulated,²³ and no general equilibrium around which planning can be done has arisen.²⁴

No. 1 Jefferson Cnty. v. Wash. Dep't Ecology, 511 U.S. 700 (1994) (“water quality standard”); Arkansas v. Oklahoma, 503 U.S. 91 (1992) (“applicable” water quality standard).

¹⁵ See American Wildlands v. Browner, 260 F.3d 1192, 1197 (10th Cir. 2001) (EPA maintains that the Act does not grant it authority to regulate nonpoint sources of pollution . . .).

¹⁶ See NRC EVALUATION, *supra* note 10, at 42–45.

¹⁷ See, e.g., *Symposium on Cooperative Federalism: Foreword*, 23 IOWA L. REV. 455 (1938).

¹⁸ See Jessica Bullman-Pozen & Heather K. Gerkin, *Uncooperative Federalism*, 118 YALE L.J. 1256 (2009).

¹⁹ See, e.g., New York v. United States, 505 U.S. 144 (1992); Printz v. United States, 521 U.S. 898 (1997); Bond v. United States, 131 S. Ct. 2355 (2011); see generally JOHN HART ELY, *DEMOCRACY AND DISTRUST: A THEORY OF JUDICIAL REVIEW* (1980); Larry Kramer, *Putting the Politics Back in the Political Safeguards of Federalism*, 100 COLUM. L. REV. 215 (2000). For a variety of reasons, what looks like accountability-forcing judicial review can be to quite the opposite effect. See Jacob E. Gersen & Matthew C. Stephenson, *Over-Accountability*, 6 J. LEGAL ANALYSIS 185 (2014).

²⁰ See DAVID L. SHAPIRO, *FEDERALISM: A DIALOGUE* (1995).

²¹ See George A. Berman, *Taking Subsidiarity Seriously: Federalism in the European Community and the United States*, 94 COLUM. L. REV. 331, 413 (1994).

²² See Larry D. Kramer, *Understanding Federalism*, 47 VAND. L. REV. 1485 (1994); Kramer, *supra* note 19, at 288–89 (“The practical difficulties of working out the limits of Congress’s power through litigation are depressingly familiar, having been reproduced each time the Supreme Court has tried its hand at the problem.”).

²³ Compare Nat'l Ass'n of Homebuilders v. Defenders of Wildlife, 551 U.S. 644, 672–73 (2007) (holding that the Clean Water Act creates a nondiscretionary duty to delegate program authority to state if listed statutory factors are fulfilled), with EPA v. EME Homer City Gen., L.P., 134 S. Ct. 1584, 1601 (2014) (holding that EPA need not await a state’s attempt to regulate before promulgating a federal plan). The core case has long been where the state—not EPA—is to balance the costs and benefits of controlling the sources of pollution. See, e.g., Union Electric v. EPA, 427 U.S. 246 (1976).

²⁴ Cf. Robert Ahdieh, *The Visible Hand: Coordination Functions of the Regulatory States*, 95 MINN. L. REV. 578, 618–48 (2010) (showing how coordinated behaviors can converge

Most arguments about these forces eventually find Mancur Olson's "logic" of collective action and the thesis that smaller, concentrated groups tend to outperform larger, more diffuse ones in our political system.²⁵ Olson's logic was developed to be scaled: he contrasted the immensely successful, powerful Farm Bureau—with its federated structure—to the Grange, which grew meteorically but quickly failed as a national power.²⁶ Olson's argument is that those who seek something from the political system do best to align with stakeholders whose benefit/cost ratios on outcomes and contribution lie ahead of their own.²⁷ It gives little (if any) force to the argument that the federal government is more (or less) likely to enact public-regarding policies.²⁸

Indeed, in a system that divides the jurisdiction to prescribe legal rights and duties between two distinct sovereigns, the provision of public

on equilibriums of a regulator's choosing even without a coercive command as long as the right stabilities exist). Finally, once authority is left with states another struggle remains between state and local prerogatives. With over 1,600 local governments and four major metropolitan areas in the watershed, the state/local tensions have been just as defining as the federal/state. See ERNST, FIGHT FOR THE BAY, *supra* note 11, at 39–40.

²⁵ See MANCUR OLSON, THE LOGIC OF COLLECTIVE ACTION: PUBLIC GOODS AND THE THEORY OF GROUPS 5–52 (1965).

²⁶ *Id.* at 148–59. This essential point is often obscured in the vast literature on choosing jurisdictions for public goods/problems. See, e.g., Daniel C. Etsy, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570, 587–97 (1998).

²⁷ Olson's work may belong to a larger tradition grounding self-governance's limitations in the participants' self-interestedness. See, e.g., ROBERT A. DAHL, A PREFACE TO DEMOCRATIC THEORY (1956); ANTHONY DOWNS, AN ECONOMIC THEORY OF DEMOCRACY (1957); JAMES M. BUCHANAN & GORDON TULLOCK, THE CALCULUS OF CONSENT: LOGICAL FOUNDATIONS OF CONSTITUTIONAL DEMOCRACY 43–62 (2d ed. 1965).

²⁸ See, e.g., Jason Scott Johnston, *A Positive Political Economic Theory of Environmental Federalization*, 64 CASE W. L. REV. 1549 (2014) (arguing that the U.S. Senate only permits federalizing a policy where a majority of states will benefit); ILYA SOMIN, DEMOCRACY AND POLITICAL IGNORANCE: WHY SMALLER GOVERNMENT IS SMARTER (2013) (arguing that voters' "rational ignorance" is more likely in larger, aggregative jurisdictions than in smaller ones); KRISTIN A. GOSS, DISARMED: THE MISSING MOVEMENT FOR GUN CONTROL IN AMERICA (2006) (attributing the failure of gun control advocacy in the United States to, among other factors, national organizations' inability to agree on a unifying message, the gun industry's strength in Washington, and the failure to protect incremental gains at the state and local level); Richard L. Revesz, *Federalism and Environmental Regulation: A Public Choice Analysis*, 115 HARV. L. REV. 553 (2001); Richard L. Revesz, *Rehabilitating Interstate Competition: Rethinking the "Race to the Bottom" Rationale for Federal Environmental Regulation*, 67 N.Y.U. L. REV. 1210 (1992); E. Donald Elliott et al., *The Federalization of Environmental Law*, 1 J.L. ECON. & ORG. 313 (1985) (observing that many industrial sectors have pushed hard to federalize environmental law); Ralph K. Winter, Jr., *State Law, Shareholder Protection, and the Theory of the Corporation*, 6 J. LEGAL STUD. 251 (1977) (arguing that Delaware outcompeted other jurisdictions in benefitting the shareholders of companies incorporated there).

goods generally entails cooperation between the sovereigns—and their stakeholders.²⁹ Each sovereign is an internally plural agent;³⁰ each is subject to some form of electoral competition,³¹ and each is reciprocally influenced by the others.³² With regard to common pool resources, perhaps the best account of the basic predicament has been Derek Parfit's *contributors' dilemma*. These are many-party dilemmas involving “outcomes that benefit even those who do not help to produce them.”³³ The choice whether to contribute to the outcome, however, is unavoidably embedded in a context of many others' similarly structured choices.³⁴

²⁹ This can take the form of jurisdictional competition. See DALE D. MURPHY, *THE STRUCTURE OF REGULATORY COMPETITION: CORPORATIONS AND PUBLIC POLICIES IN A GLOBAL ECONOMY* 37–40 (2004). It can take the form of networked deliberation. See Jody Freeman, *Collaborative Governance in the Administrative State*, 45 UCLAL. REV. 1 (1997). And it can take the form of various hybrids of the two. See Charles F. Sabel & William H. Simon, *Contextualizing Regimes: Institutionalization as a Response to the Limits of Interpretation and Policy Engineering*, 110 MICH. L. REV. 1265 (2012).

³⁰ The institutions featuring in the Chesapeake Bay experience have included the President and Congress, the federal courts, EPA, the Department of Agriculture (“USDA”) and the U.S. Geological Survey (“USGS”), the governors and legislatures of Maryland, Pennsylvania, and Virginia and the several jurisdictional agencies thereof, the Chesapeake Bay Commission (“CBC”), the Chesapeake Bay Program (“CBP”) and a “Principals’ Staff Committee” thereof amalgamating state and EPA authorities. Of course, each of these institutions can be broken down into their own internal pluralities. See Kenneth A. Shepsle, *Congress Is a “They,” Not an “It”: Congressional Intent as Oxymoron*, 12 INT’L REV. L. & ECON. 239 (1992); Adrian Vermeule, *The Judiciary is a They, Not an It: Interpretive Theory and the Fallacy of Division*, 14 J. CONTEMP. LEGAL ISSUES 549 (2005). Nonetheless, each reaches its own conclusions and takes its own actions.

³¹ With plausible assumptions about principal/agent dynamics in the electoral contests at the different levels, it can be shown that various agents will make rational choices that are not in their principals’ true interests. See Gersen & Stephenson, *supra* note 19, at 189–209.

³² See Robert A. Schapiro, *Toward a Theory of Interactive Federalism*, 91 IOWA L. REV. (2005); Barry G. Rabe, *Power to the States: The Promise and Pitfalls of Decentralization*, in ENVIRONMENTAL POLICY IN THE 1990S: REFORM OR REACTION 31 (Norman Vig & Michael E. Kraft eds., 2d ed. (1997)). The threat of strategic action which renders collective action incoherent has long informed the theory of good collective decision-making procedures. See BUCHANAN & TULLOCK, *supra* note 27, at 23–30. But the threat’s potency and exact scope have eluded rigorous quantification. See GERRY MACKIE, *DEMOCRACY DEFENDED* (2003).

³³ DEREK PARFIT, *REASONS AND PERSONS* 61 (1984). Parfit continued: “It can be true of each person that, if he helps, he will add to the sum of the benefits, or expected benefits. But only a very small portion of the benefit he adds will come back to *him*. Since his share of what he adds will be very small, it may not repay his contribution. It may thus be better for each if he does not contribute. This can be so whatever others do. But it will be worse for each if fewer others contribute. And if none contribute this will be worse for each than if all do.” *Id.*

³⁴ The interaction of payoffs and contributions distinguishes Parfit’s dilemma from simple prisoners’ dilemmas. Early analyses of that dilemma were careful to note the limits of its

Moreover, the contribution is often *self-restraint*, as with the commuters who go faster if they drive—unless they all drive in which case all would go faster by taking buses.³⁵ Collective contributory goods can thus elicit behaviors very different from those elicited by simpler goods.³⁶ Each contribution can, but might not, motivate others' contributions. And they may or may not involve *thresholds* beyond which enough contributions have been made to alter the significance of all contributions.³⁷ Most importantly, we have no reason to presume that individuals perform the calculations needed to assess these choices accurately.³⁸ Collective contributory goods, thus, challenge the very ideal of collective rationality. It is only in constructed environments with near-perfect information that we can plausibly assume a lack of objections means that business-as-usual is not costly or harmful *to someone*.³⁹ Individual contributors might even face a contributory burden which is smaller than the burden of calculating their (actual) position(s). We might realistically presume, thus, that the social dynamics here are simply too complex to map and certainly that they are richer than a one-dimensional game where payoffs and players remain predictable.⁴⁰ Cooperation and conflict do not reduce to any set of assumptions about people, selves, and others or their rationality. Real contributory projects typically entail a continuing series of choices between: (1) “defecting” and serving only oneself; (2) contributing irrespective of one’s own causal efficacy; (3) seeking some degree of cooperation in one’s contribution with some (ostensibly) sufficient number of others to achieve causal efficacy; and/or (4) learning how to measure the

utility in the real world. See, e.g., James Buchanan, *Ethical Rules, Expected Values, and Large Numbers*, 76 ETHICS 8 (1965). Too much recent work does not.

³⁵ See PARFIT, *supra* note 33, at 61.

³⁶ See, e.g., OLSON, *supra* note 25, at 57–58.

³⁷ On the role of such thresholds and the ways they factor into individual choices, see DAVID LYONS, *FORMS AND LIMITS OF UTILITARIANISM* (1965).

³⁸ See RICHARD TUCK, *FREE-RIDING* 30–62 (2008).

³⁹ Compare PARFIT, *supra* note 33, at 85–86 (“In small communities, it is a plausible claim that we cannot have harmed others if there is no one with an obvious complaint, or ground for resenting what we have done.”), with OLSON, *supra* note 25, at 166 (“The rational individual in the economic system does not curtail his spending to prevent inflation . . . because he knows, first, that his own efforts would not have a noticeable effect, and second, that he would get the benefits of any price stability that others achieved in any case.”).

⁴⁰ Thus, Parfit’s contributors remain in their dilemma despite being able to communicate—something the classic prisoners’ dilemma rules out. TUCK, *supra* note 38, at 23–24. In game theoretic terms, contributors will not know whether they are playing a “zero sum” or “non-zero sum” game, nor will they know the values of the expected utilities/“payoffs.” See MORTON D. DAVIS, *GAME THEORY: A NONTECHNICAL INTRODUCTION* 38, 68–78 (1970).

causal accumulation of contributions.⁴¹ Practical questions proliferate about each of these possibilities.⁴²

While environmental groups often get and take credit for having spurred rational collective action,⁴³ the truth is messier. What they can most often take credit for is upsetting an entrenched, inactive elite—a governance cartel—which refuses to confront its own failure.⁴⁴ Court orders, however, do little to create or sustain cooperation. Indeed, as risk regulation's struggle with uncertainty has given way to the era of computational modeling, the analytical methods themselves have had to shoulder that burden. Alternative tendencies to mistake models as “truth machines”⁴⁵ or to dismiss them as voodoo have long been at work in the Chesapeake. One of the major innovations examined below has been the rise of *crowd-sourced* models that improve continuously while still guiding high-stakes choices. The broad communication of these methods falls into a now familiar tug of war between experts, nonexperts and those who would arbitrate their respective roles.⁴⁶ And the Chesapeake may be revealing new high ground in that broader war.⁴⁷

This study proceeds in four parts. Part I explores the reality of statutes like the CWA and administrative agencies like EPA as sources of law today. Part II explains the rise of alternatives in the Chesapeake—the Bay's “collaborative” past. Part III examines the Obama Administration's

⁴¹ Cf. LYONS, *supra* note 37, at 71–96 (exploring the rationality of individual action when threshold effects are possible and noting that some actors are sometimes in position to measure contributions). “Rationality” is a *normative* concept and it is a contingent fact that people are actually rational. Thus to deny that it is in the last analysis rational to defect from a large-scale collaborative activity is not to deny that as a matter of fact people may fairly consistently do so.” TUCK, *supra* note 38, at 112–13.

⁴² See LYONS, *supra* note 37, at 161–62.

⁴³ See, e.g., JOHN CRONIN & ROBERT F. KENNEDY, JR., *THE RIVERKEEPERS* (1997).

⁴⁴ See Charles F. Sabel & William H. Simon, *Destabilization Rights: How Public Law Litigation Succeeds*, 117 HARV. L. REV. 1015, 1056–62 (2004).

⁴⁵ See Wendy Wagner et al., *Misunderstanding Models in Environmental and Public Health Regulation*, 18 N.Y.U. ENVTL. L.J. 293, 295 (2010); Elizabeth Fisher et al., *Understanding Environmental Models in Their Legal and Regulatory Context*, 22 J. ENVTL. L. 251, 266 (2010).

⁴⁶ See Dan Kahan et al., *Fear of Democracy: A Cultural Evaluation of Sunstein on Risk*, 119 HARV. L. REV. 1071 (2006). Kahan and colleagues argue, contrary to Sunstein and others, that “[i]ndividuals adopt stances toward risk that *express* their commitment to their particular ways of life. Their risk perceptions might or might not be accurate when evaluated from an actuarial standpoint; policies based on them might or might not be in the interest of society measured according to any welfarist metric,” but that this undermines neither their virtue nor validity. *Id.* at 1088.

⁴⁷ See *infra* notes 163–80 and accompanying text.

novel synthesis of these two, begun in 2009, while Part IV considers possibilities for the replication of this synthesis elsewhere.

I. STATUTORY INTRANSITIVITY: STATUTES AS GOALS AND DELEGATIONS

Legislation today is overwhelmingly *intransitive*: it is a delegation of authority that, in its ambiguity as to what rules ought to govern, leaves the law's content unspecified.⁴⁸ Pollution control statutes like the Clean Water Act ("CWA") have been its apotheosis: they entrench vaguely worded, programmatic goals, not firm rules of conduct, and delegate to others the responsibility of achieving them.⁴⁹ The statute is no less a statute for it, but the legal and normative character of such a collective act has slipped from its orthodox footings.⁵⁰ As the Supreme Court recognized long ago, if it is a subordinate source of some kind that actually specifies the law's meaning, neither is "complete without the other, and only together do they have any force."⁵¹ By these metrics, though, many environmental *regulations* are increasingly intransitive too, as section A explains about the CWA's water quality standards.⁵² And if it is the manuals and memos, guidance, orders, circulars, bulletins, and the like specifying actual legal purposes and determinate obligations,⁵³ the legal interpreter's job shifts significantly.

⁴⁸ See, e.g., Edward L. Rubin, *Law and Legislation in the Administrative State*, 89 COLUM. L. REV. 369, 380–85 (1989); EDWARD L. RUBIN, BEYOND CAMELOT: RETHINKING POLITICS AND LAW FOR THE MODERN STATE 210–21 (2005) [hereinafter RUBIN, BEYOND CAMELOT]. Intransitive legislation, instead of setting the rights and duties of A and B, directs C to specify their rights and duties, often on an evolving basis. Now an important caveat is that *some* legislation still has "striking specificity" for the world's A's and B's. Peter L. Strauss, *Legislative Theory and the Rule of Law: Some Comments on Rubin*, 89 COLUM. L. REV. 427, 434 (1989). These exceptions prove the rule which is, more than anything, a consequence of *scale*. Cf. *id.* at 431 ("One of the differences between the Congress of the transitive late-19th century and the Congress of the intransitive present is the simple fact of size The change reflects a dramatic alteration in the nature and possibilities of the legislative function.").

⁴⁹ See, e.g., Daniel Farber, *Taking Slippage Seriously: Noncompliance and Creative Compliance in Environmental Law*, 23 HARV. ENVTL. L. REV. 298 (1999).

⁵⁰ *But cf.* JEREMY WALDRON, THE DIGNITY OF LEGISLATION (1999) (arguing that legislation's *dignity* has been diminished in the eyes of contemporary jurisprudential theory without even a mention of its trend toward intransitivity).

⁵¹ *United States v. Mersky*, 361 U.S. 431, 438 (1960). See generally Henry P. Monaghan, *Marbury and the Administrative State*, 83 COLUM. L. REV. 1 (1983).

⁵² See *infra* notes 65–98 and accompanying text.

⁵³ See Todd D. Rakoff, *The Choice Between Formal and Informal Modes of Administrative Regulation*, 52 ADMIN. L. REV. 159 (2000); see also Sam Kalen, *The Transformation of*

The question is how and, more particularly, how is it relevant to public problem solving? The answer from legal philosophers has been: not much. To read the bulk of their literature, the single most prominent, institutionally entrenched trend of the last century—the growth of intransitive legislation and the rise of its administration by scores of regulatory agencies—is unimportant to law's foundations.⁵⁴ But in the real world, administrative authority lies at the law's core.⁵⁵ Given how that authority is split between, interspersed with, and checked by the authority of our states, indeed, administrative authority in a “cooperative federalist” model are, with little exaggeration, becoming everything.⁵⁶ EPA's “shared regulatory space” involves not only other parts of the executive establishment and the federal courts,⁵⁷ but scores of state environmental regulators as well.⁵⁸ Restoring something like the Chesapeake Bay means navigating highly elaborated institutional and jurisdictional boundaries and relations,⁵⁹ spread unevenly across a 64,000-square-mile area spanning six states and the District of Columbia.⁶⁰

A codicil—Congress's occasional choice to legislate with extreme specificity⁶¹—underscores the political context. A broadly delegative statute

Modern Administrative Law: Changing Administrations and Environmental Guidance Documents, 35 *ECOLOGY L.Q.* 101 (2009).

⁵⁴ Cf. Michael C. Dorf, *Legal Indeterminacy and Institutional Design*, 78 *N.Y.U. L. REV.* 875, 881 (2003) (arguing that “academic jurisprudence” and constitutional theory have kept focused on “desiccated abstractions” relative to the real world of law and governance).

⁵⁵ See RUBIN, *BEYOND CAMELOT*, *supra* note 48; Dorf, *supra* note 54, at 932 & n.216.

⁵⁶ See Robert R.M. Verchick & Nina Mendelson, *Preemption and Theories of Federalism*, in *PREEMPTION CHOICE: THE THEORY, LAW, AND REALITY OF FEDERALISM'S CORE QUESTION* 13 (William W. Buzbee ed., 2009). Indeed, if “[a]ccountability can be roughly defined as the ability of one actor to demand an explanation or justification of another actor for its actions and to reward or punish that second actor on the basis of its performance or its explanation,” then intergovernmental “accountability” is as vital as is electoral accountability to our system. Edward L. Rubin, *The Myth of Accountability and the Anti-Administrative Impulse*, 103 *MICH. L. REV.* 2073, 2098–2119 (2005) [hereinafter Rubin, *The Myth of Accountability*].

⁵⁷ See Jody Freeman & Jim Rossi, *Agency Coordination in Shared Regulatory Space*, 125 *HARV. L. REV.* 1131 (2012); see also William W. Buzbee, *Recognizing the Regulatory Commons: A Theory of Regulatory Gaps*, 89 *IOWA L. REV.* 1 (2003).

⁵⁸ See J. CLARENCE DAVIES & JAN MAZUREK, *POLLUTION CONTROL IN THE UNITED STATES: EVALUATING THE SYSTEM* 39–48 (1998).

⁵⁹ See HOWARD R. ERNST, *CHESAPEAKE BAY BLUES: SCIENCE, POLITICS, AND THE STRUGGLE TO SAVE THE BAY* (2003).

⁶⁰ *Id.* at 10.

⁶¹ See Michael Herz, *Judicial Textualism Meets Congressional Micromanagement: A Potential Collision in Clean Air Act Interpretation*, 16 *HARV. ENVTL. L. REV.* 175 (1992); Craig N. Oren, *Detail and Delegation: A Study in Statutory Specificity*, 15 *COLUM. J. ENVTL. L.* 143 (1990).

directing an administrator to pursue broadly stated goals can be implemented by an agency over extended intervals with only episodic, irregular interventions by later congresses.⁶² Of this central model, the Clean Water Act, particularly its operation in the Chesapeake, has been exemplary. As I argue below, iterated goal-setting and problem-solving are revealing important insights for other, similarly scaled environmental problems. Section A explains the CWA's "water quality standards" as law. Section B recounts an especially instructive attempt to make these standards clearer and more prescriptive.

A. *What Sort of Legal Norm Is a Water Quality Standard?*

The CWA's nebulous allocation of authority is nowhere more prominent than in the statute's water quality standards ("WQSs") provision, Section 303. By Sections 303(a)–(c), states must have WQSs for all surface waters—whether by state or EPA creation.⁶³ They must be set "taking into consideration [the waters'] use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes,"⁶⁴ and be reviewed regularly.⁶⁵ A WQS consists of "designated uses"⁶⁶ and the criteria meant to verify and protect them.⁶⁷ Importantly, EPA regulations provide that no discharge permit may be issued if it will cause *or contribute to* the violation of a

⁶² The literature on Congress's use of its tools is vast. *See, e.g.*, BRUCE A. ACKERMAN & WILLIAM T. HASSLER, CLEAN COAL/DIRTY AIR 56–57 (1981) (noting that a massive increase in congressional staff enable "strategically placed interest groups" to push parochial initiatives into law and appropriations regardless of overall congressional support).

⁶³ 33 U.S.C. § 1313(a)–(b) (2012). If EPA finds in its review that a state's WQS is insufficient or inconsistent with the Act's "requirements," it may promulgate substitutes. *Id.* § 1313(c)(4).

⁶⁴ *Id.* § 1313(c)(2)(A) (2012) (emphasis added).

⁶⁵ *Id.* § 1313(c)(1) (requiring that WQSs be reviewed in a public hearing at least once every three years).

⁶⁶ A "designated use" will, ideally, draw the criteria needed to protect it. States are free to adopt any "use classification system they see as appropriate, except that waste transport and assimilation is not an acceptable use in any case." U.S. EPA, WATER QUALITY STANDARDS HANDBOOK 2-1 (2d ed. 1994), available at <http://www.epa.gov/sites/production/files/2014-10/documents/handbook-chapter2.pdf> [<https://perma.cc/P5HQ-A2EB>]. But the predominant themes that emerged from most states' designated uses and use classifications has been imprecision and over-generality.

⁶⁷ The 1972 Amendments provided for the continuance of existing WQSs, *see* 33 U.S.C. § 1313(a) (2012), but also suggested that their triennial review and updating was to transition any extant standards into conformance with the new Section 303 approach. *See* N. William Hines, *History of the 1972 Clean Water Act: The Story Behind How the 1972 Act Became the Capstone on a Decade of Extraordinary Environmental Reform*, 4 GEO. WASH. J. ENERGY & ENVTL. L. 80, 101–02 (2013).

WQS.⁶⁸ The WQS's relative stringency is not directly decided by Section 303, though.⁶⁹ EPA has long maintained a rebuttable presumption that the uses named in § 101(a)(2) are attainable—that they must be designated uses until proven otherwise⁷⁰—and it has likewise maintained that “existing uses” be maintained until it is proven that they cannot be.⁷¹ This “bounded discretion mandate”⁷² has long allocated the burdens of uncertainty in a special way. Designated uses without criteria or protective rules would make no practical difference.⁷³ And as the science of measuring water quality and its impacts on aquatic flora and fauna has improved, metrics have evolved.⁷⁴ But the “criteria” EPA sets informing WQS developers,⁷⁵ like the “information” it is to publish for these same parties “on the measurement and classification of water quality,”⁷⁶ are not (with one exception) supposed to be *binding*.⁷⁷ Unlike the criteria EPA must set before

⁶⁸ See 40 C.F.R. § 122.4(i) (2015).

⁶⁹ Section 303(c)(2)(A), besides its long list of factors to balance, states that WQSs “shall consist of the [waters'] designated uses” and the “water quality criteria for such waters based upon such uses.” *Id.* § 1313(c)(2)(A). But it then disassembles in the following statement about stringency: “[s]uch standards shall be such as to protect the public health or welfare, enhance the quality of water and serve the purposes of this chapter.” *Id.* (emphasis added). The Act’s “purposes” from Section 101 include the restoration and maintenance of the chemical, physical, and biological integrity of the Nation’s waters,” *id.* § 1251(a), and that “wherever attainable,” water quality provide for the “protection and propagation of fish, shellfish, and wildlife” and “recreation in and on the water.” *Id.* § 1251(a)(2) (emphasis added). The conventional wisdom has long been that states enjoy wide latitude to choose the levels of water quality for their surface waters. See, e.g., *Mississippi Comm’n on Natural Res. v. Costle*, 624 F.2d 1269, 1275 (5th Cir. 1980).

⁷⁰ See *Idaho Mining Ass’n, Inc. v. Browner*, 90 F. Supp. 2d 1078, 1081–82, 1088–98 (D. Idaho 2000).

⁷¹ See 40 C.F.R. § 131.12 (2015) (anti-degradation). This anti-degradation norm puts added force behind any given “use” designation. See Jonathan A. Chilson, Note: *Keeping Clean Waters Clean: Making the Clean Water Act’s Anti-Degradation Policy Work*, 32 U. MICH. J.L. REF. 545 (1999).

⁷² See Evan H. Caminker, *State Sovereignty and Subordinacy: May Congress Commandeer State Officers to Implement Federal Law?*, 95 COLUM. L. REV. 1001, 1011 (1995) (“Bounded discretion mandates order state officials to reach a specified federal objective, but afford these officials some degree of discretion in deciding how to do so.”).

⁷³ Cf. James R. Karr & Daniel R. Dudley, *Ecological Perspective on Water Quality Goals*, 5 ENVTL. MGMT. 55 (1981) (arguing that the interim/provisional goals of “fishable” and “swimmable” are inadequately protective without specific measures like indices of biotic integrity).

⁷⁴ See R.J. Davies-Colley & D.G. Smith, *Turbidity, Suspended Sediment, and Water Clarity: A Review*, 37 J. AMER. WATER RES. ASS’N 1085 (2001) (reviewing literature and experimentation that led to turbidity’s replacement as a criterion of water clarity).

⁷⁵ 33 U.S.C. § 1314(a)(1) (2000).

⁷⁶ *Id.* § 1314(a)(2)(C).

⁷⁷ See, e.g., *Natural Res. Def. Council, Inc. v. EPA*, 16 F.3d 1395, 1398–99 (4th Cir. 1993). The

fixing its own national ambient air quality standards (“NAAQS”) under the Clean Air Act (“CAA”),⁷⁸ EPA’s water quality criteria are only ever “recommended,” no matter their precision, scientific grounds, or other merits.⁷⁹

So what kind of norm *is* a WQS—what is its practical difference? Section 302 vests EPA with authority to create water quality-derived “effluent limitations” without even mentioning Section 303’s WQSs.⁸⁰ Yet Section 303 WQSs are now the CWA’s main drivers.⁸¹ First, the nature of the WQS depends on its expression—the goal it entrenches. The more geographically, biologically, or purposively specified, the more the WQS *as a goal* makes a practical difference.⁸² Because EPA’s approval or substitution of any state WQS or its criteria is subject to arbitrariness review—a pressure point many litigants know well—specific goals typically become highly prescriptive.⁸³ Section 303(d)(1) requires states to identify waters where Subchapter III’s effluent limitations “are not stringent

exception is criteria for “pathogens and pathogen indicators for coastal recreation waters.” 33 U.S.C. § 1313(i)(2). Any criteria EPA adopts thereon must be adopted by states. *Id.*

⁷⁸ See 42 U.S.C. § 7408(a)(2) (1998).

⁷⁹ Section 304 does not specify the legal effect of the criteria but EPA has long held that they are “recommended.” See *Natural Res. Def. Council*, 16 F.3d at 1401–02. Still, in reviewing WQSs, EPA requires states deviating from any EPA § 304(a) criteria to demonstrate that their chosen criteria are at least as well grounded, scientifically. *Cf.* 40 C.F.R. §§ 131.11(a)(1), 131.11(b)(1) (“States must adopt those water quality criteria that protect the designated use. Such criteria must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use.”); Robert W. Adler, *Integrated Approaches to Water Pollution: Lessons from the Clean Air Act*, 23 HARV. ENVTL. L. REV. 203, 210 n.41 (1999) (“State adoption of criteria recommended by EPA under section 304(a) is usually sufficient, but is not always necessary, to meet the minimum requirements of the Act.”). EPA’s criteria must reflect “the latest scientific knowledge,” 33 U.S.C. § 1314(a)(1), but compliance with this standard has never been reviewed in a reported opinion.

⁸⁰ See 33 U.S.C. § 1312(a) (2000). Effluent limitations are any and all controls levied upon point sources. See *id.* § 1362(11).

⁸¹ As an amalgam of state and federal normative authority, the WQS is arguably a “polyphonic” norm. See Schapiro, *supra* note 32, at 285–300. Federalism as polyphony rejects preemption and the “truly local” versus “truly national” distinction in favor of “plurality, dialogue, and redundancy.” *Id.* at 285–88.

⁸² See Robert W. Adler, *The Decline and (Possible) Renewal of Aspiration in the Clean Water Act*, 88 WASH. L. REV. 759, 803–06 (2013).

⁸³ See, e.g., *Florida Wildlife Fed’n, Inc. v. Jackson*, 853 F. Supp. 2d 1138, 1167–69 (N.D. Fla. 2012) (reviewing and setting aside EPA’s substitute criteria for Florida’s streams); *Northwest Envtl. Advocates v. U.S. EPA*, 268 F. Supp. 2d 1255, 1264–69 (D. Or. 2003) (reviewing EPA failure to object to state’s WQS based on faulty criteria); *American Canoe Ass’n, Inc. v. U.S. EPA*, 30 F. Supp. 2d 908 (E.D. Va. 1998); *Idaho Conserv. League v. Browner*, 968 F. Supp. 546 (W.D. Wash. 1997); *Idaho Conserv. League, Inc. v. Russell*, 946 F.2d 717 (9th Cir. 1991).

enough” to attain any applicable WQS,⁸⁴ to prioritize such waters into a rank-ordering,⁸⁵ and to establish the “total maximum daily load” (“TMDL”) of pollutants “loaded” to listed waters.⁸⁶ EPA is to review each of these determinations, as well.⁸⁷ So even if the state sets the TMDL, EPA must approve it, subjecting itself to arbitrariness review in the event of a suit.⁸⁸ And these acts of submission, review, and resubmission—euphemistically referred to as a “partnership” by the Supreme Court⁸⁹—have become a growing source of litigation surrounding the CWA’s administration.⁹⁰

And what of WQS attainment? For decades, citizen-plaintiffs seeking real enforcement of WQS sued to force the creation of the auxiliary norm: the TMDL.⁹¹ The CWA provides that for listed impaired waters, the “load” of pollutants “[s]hall be established at a level necessary to implement the applicable [WQs] with seasonal variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality.”⁹² Judicial decrees that TMDLs be issued led to the program capacity to churn them out.⁹³ Courts were enlisted to ensure the TMDLs were “daily” on the belief

⁸⁴ 33 U.S.C. § 1313(d)(1)(A) (2000). Effluent limitations, at least by operation of the CWA, only control pollution from “point sources.” The threats to water quality without a “point source”—polluted runoff, principally—cannot have “effluent limitations” applied to them within the Act’s meaning of the term. This has led at least one court to the dubious conclusion that “the CWA does not require state to take regulatory action to limit the amount of non-point water pollution introduced into its waterways.” *Defenders of Wildlife v. U.S. EPA*, 415 F.3d 1121, 1124 (10th Cir. 2005).

⁸⁵ 33 U.S.C. § 1313(d)(1)(A) (2000).

⁸⁶ 33 U.S.C. § 1313(d)(1)(c) (2000).

⁸⁷ Section 303(d)(2) requires states to submit their listed waters and TMDLs to EPA for its approval/disapproval “not later than thirty days after the date of submission.” 33 U.S.C. § 1313(d)(2) (2000). If it disapproves, EPA is to list the waters and set their TMDLs as it “determines necessary to implement” the applicable WQs. *Id.*

⁸⁸ *See, e.g.,* *Annacostia Riverkeeper, Inc. v. Jackson*, 798 F. Supp. 2d 210 (D.D.C. 2011); *Friends of the Earth, Inc. v. EPA*, 446 F.3d 140 (D.C. Cir. 2006); *Amigos Bravos v. Green*, 306 F. Supp. 2d 48 (D.D.C. 2004); *Natural Res. Def. Council, Inc. v. Muszynski*, 268 F.3d 91 (2d Cir. 2001).

⁸⁹ *See* *Arkansas v. Oklahoma*, 503 U.S. 91, 101 (1992).

⁹⁰ *See, e.g.,* *Sierra Club v. Leavitt*, 488 F.3d 904 (11th Cir. 2007); *Florida Pub. Interest Res. Group v. U.S. EPA*, 386 F.3d 1070 (11th Cir. 2004); *Missouri Soybean Ass’n v. U.S. EPA*, 289 F.3d 509 (8th Cir. 2002); *Friends of the Wild San, Inc. v. U.S. EPA*, 130 F. Supp. 2d 1184 (D. Mont. 1999).

⁹¹ *See* OLIVER A. HOUCK, *THE CLEAN WATER ACT TMDL PROGRAM: LAW, POLICY, AND IMPLEMENTATION* 51–74 (1999). “By January 1999, litigation had challenged compliance in more than half the states . . . and yet more was brewing.” *Id.* at 76.

⁹² 33 U.S.C. § 1313(d)(1)(C) (2000).

⁹³ *See* James Boyd, *The New Face of the Clean Water Act: A Critical Review of the EPA’s New TMDL Rules*, 11 DUKE ENVTL. L. & POL’Y F. 39, 47 (2000). Holdings in the Seventh

that such parameterization was crucial.⁹⁴ They were enlisted to enforce EPA's regulation requiring discharge permits be conformed to the "assumptions" and "requirements" (if any) of any applicable TMDL⁹⁵ and its regulation requiring TMDLs provide for attainment of *all* uses in a WQS.⁹⁶ But these same citizens eventually learned a hard truth: neither the statute nor EPA's regulations say how—or even *that*—a TMDL is to be implemented beyond the point sources whose permits it intersects.⁹⁷ Indeed, nothing in EPA's regulations implementing Section 303(d) ever suggest a TMDL's having legal force upon completion.⁹⁸ By EPA's regulations, a TMDL is just an equation—until there are permitted discharges involved.⁹⁹ The

and Ninth Circuits to the effect that prolonged inaction by states on waters listed as impaired amounts to a "constructive submission" of a failed, i.e., to-be-disapproved TMDL—left the task to EPA in many cases. *See* *Scott v. City of Hammond*, 741 F.2d 992 (7th Cir. 1984); *Alaska Ctr. for the Env't v. Browner*, 20 F.3d 981 (9th Cir. 1994). By the late 1990s, this meant EPA was generating scores of TMDLs itself. *See* HOUCK, *supra* note 91, at 56–63. Such work-to-the-standard behavior is not an uncommon response to court orders in public law litigation. *See* *Sabel & Simon, supra* note 44, at 1028. By the end of 2013, with over 65,000 TMDLs in total having been prepared, EPA committed *itself*—unprompted by court order—to "developing a metric to replace . . . the simple tally of TMDLs completed. . . ." Nancy K. Stoner, Acting Assistant Adm'r, U.S. EPA, *Memorandum to Regional Adm'rs: A New Long-Term Vision for Assessment, Restoration, and Protection under [CWA] Section 303(d) Program*, Dec. 5, 2013, at 4.

⁹⁴ *See* *Friends of the Earth, Inc. v. EPA*, 446 F.3d 140, 144–48 (D.C. Cir. 2006). One district court clearly punted the claim that a loading calculated with an annualized model, which plaintiffs argued could not account for "seasonal variations," was inadequately protective. *See* *Natural Res. Def. Council, Inc. v. Fox*, 93 F. Supp. 2d 531, 556 & n.21 (S.D.N.Y. 2000).

⁹⁵ *See* *Friends of the Earth*, 446 F.3d at 147.

⁹⁶ *See* *Annacostia Riverkeeper, Inc. v. Jackson*, 798 F. Supp. 2d 210 (D.D.C. 2011).

⁹⁷ *See, e.g.,* *Sierra Club v. Meiburg*, 296 F.3d 1021, 1029–31 (11th Cir. 2002); *Amigos Bravos v. Green*, 306 F. Supp. 2d 48, 52 (D.D.C. 2004).

⁹⁸ Although minimum elements of WQSS were set in Part 131, *see* 40 C.F.R. § 131.6, no such elements were created for TMDLs. *Cf.* 40 C.F.R. § 130.7(c) (assuming TMDL is a calculated quantity and naming the values that must be included and substantiated therein, without specifying the means for turning a TMDL into "individual water quality based effluent limitations"—as the subsection is titled). EPA's definition is instructive: a TMDL is the sum of all allocations of the receiving water's "loading capacity" as between point sources, nonpoint sources, and "natural background." *See* 40 C.F.R. §§ 130.2(e), (i). Because in its view a TMDL "can be expressed in terms of either mass per time, toxicity, or other appropriate measure," 40 C.F.R. § 130.2(i), EPA originally took the position that TMDLs need not necessarily even be calculated as a "daily" quantity. It lost that argument in court. *See* *Friends of the Earth*, 446 F.3d at 144–46.

⁹⁹ *See* 40 C.F.R. § 130.7 (a TMDL is the sum of load allocations, wasteload allocations, and a margin of safety); *but cf. id.* § 122.44(d)(1)(vii)(B) (requiring any NPDES permit issued be "consistent with the assumptions and requirements of any available wasteload allocation for the discharge" in an applicable TMDL); § 122.4(i) (prohibiting the issuance of new NPDES permits where discharge will be to an impaired water).

irony with nutrient pollution and TMDLs, of course, is how often non-point sources are the chief threat.

More or less continually since 1998, thus, EPA has been weighing amending the balance of uniformity and flexibility for WQSs and TMDLs in its regulations.¹⁰⁰ EPA's rulemaking to make TMDLs more uniform, prescriptive and enforceable ended in a particularly instructive mess recounted in Section B. A 2013 Government Accountability Office report found the lack of uniform, prescriptive standards in TMDLs remains a major obstacle in WQSs attainment nationally.¹⁰¹ And EPA knows it. A notice of proposed rulemaking in 2013, while noting states' "broad discretion to determine the appropriate level of specificity to use in identifying and defining designated uses," acknowledged the tendency among states to adopt and maintain generic, unrefined use designations, which neither capture the state's objective(s) for a water body nor aid in its protection.¹⁰²

The practical differences between a designated use of "aquatic life" and one specifying the water course, the different species, their abundances, distributions, expected seasonal variations, etc., can be immense—assuming mechanism(s) for their attainment exist.¹⁰³ And assuming it survives the inevitable legal challenge(s).¹⁰⁴ That makes monitoring and

¹⁰⁰ See U.S. EPA, Advanced Notice of Proposed Rulemaking: Water Quality Standards Regulation, 63 Fed. Reg. 36742, 36744 (1998); U.S. EPA, Stakeholder Input; Revisions to Water Quality Standards Regulation, 75 Fed. Reg. 44930 (2010); U.S. EPA, Notice of Proposed Rulemaking: Water Quality Standards Regulatory Clarifications, 78 Fed. Reg. 54518, 54520 (2013).

¹⁰¹ See GOVERNMENT ACCOUNTABILITY OFFICE, CLEAN WATER ACT: CHANGES NEEDED IF KEY EPA PROGRAM IS TO HELP FULFILL THE NATION'S WATER QUALITY GOALS (2013) [hereinafter GAO REPORT].

¹⁰² Water Quality Standards Regulatory Clarifications, 78 Fed. Reg. 54523 (proposed Sept. 4, 2013) (to be codified at 40 C.F.R. pt. 131); see also NAT'L RESEARCH COUNCIL, ASSESSING THE TMDL APPROACH TO WATER QUALITY MANAGEMENT 23–30 (2001).

¹⁰³ Add in the tendency to adopt "narrative" instead of quantitative criteria, and the median WQS becomes difficult—if not impossible—to enforce without a surrogate norm. See, e.g., Florida Wildlife Fed'n v. Jackson, 853 F. Supp. 2d 1138 (N.D. Fla. 2012). For example, Massachusetts's criterion for nutrients is that surface waters be "free of nutrients in concentrations that would cause or contribute to impairment of existing or designated uses." See Upper Blackstone Water Pollution Abatement Dist. v. U.S. EPA, 690 F.3d 9, 15 (1st Cir. 2012), cert. denied, 133 S. Ct. 2382 (2013). EPA has long resisted setting numeric criteria for nutrients, see Roberta Parry, *Agricultural Phosphorus and Water Quality: A U.S. Environmental Protection Agency Perspective*, 27 J. ENVTL. QUAL. 258, 259 (1998), although it finally did so in Florida pursuant to its Section 303(c) authority. See *Jackson*, 853 F. Supp. 2d at 1142–44.

¹⁰⁴ In an otherwise deferential review the Florida district court hearing challenges to EPA's § 303(c)(4) criteria for Florida's streams set aside as arbitrary the values EPA had set in its nutrient criteria. EPA was either unwilling or unable to find specific *harms* associated

other data vital,¹⁰⁵ and it makes the steps connecting a TMDL to actual sources of pollution vital.¹⁰⁶ The 2000 TMDL rulemaking showed how sophisticated and attuned to scuttling such mechanisms many parties—both regulated and unregulated—have become. But what has emerged in the Chesapeake since is evidence that their strategic behaviors can be checked nevertheless.

B. The 2000 TMDL Rulemaking: Making TMDLs More than Math and Science?

TMDLs, once thought to be purely “informational,”¹⁰⁷ are becoming something fascinatingly unique in U.S. environmental law. They are some function of the applicable WQS, of course (although latent factual uncertainties surrounding most pollutants and receiving waters obscure that function).¹⁰⁸ As Section A showed, uses and criteria have become embroiled in a tug-of-war between information and norms, the expert and inexpert. TMDLs have further entangled EPA’s and the states’ relative powers: with tens of thousands of waters at issue, they are locked into a thick repeat-play relationship that is simultaneously cooperative and competitive.¹⁰⁹ It is in this light that EPA’s failed 2000 rulemaking aiming to firm up TMDLs’ legal force remains so instructive.

with its chosen nutrient concentrations, likely as a reflection of the “reference” methods it used in the rulemaking deriving the criteria from other, similar streams with less observable impairment. *See Florida Wildlife Fed’n v. Jackson*, 853 F. Supp. 2d 1138, 1167–69 (N.D. Fla. 2012).

¹⁰⁵ Even assuming a citizen plaintiff sues to enforce Section 303, courts have held they lack power to force EPA or the states to perform water quality monitoring. *See, e.g., Alaska Ctr. for the Env’t v. Reilly*, 796 F. Supp. 1374, 1380 (W.D. Wash. 1992). If the data does not otherwise exist, it will not be forthcoming.

¹⁰⁶ *See infra* notes 285–301 and accompanying text.

¹⁰⁷ *See, e.g., Pronsolino v. Nastri*, 291 F.3d 1123, 1129 (9th Cir. 2002). It has always been an odd argument that the TMDL of Sections 303(d)(1)–(d)(2) is a *purely* informational tool when Section 303(d)(3) actually provides in terms for a *purely* informational, i.e., nonbinding, TMDL for waters not listed under 303(d)(1)(A) or (B) and not supporting “a balanced indigenous population of fish, shellfish, and wildlife,” whatever the applicable WQS requires. *See* 33 U.S.C. § 1313(d)(3) (“For the specific purpose of *developing information . . .*”) (emphasis added).

¹⁰⁸ *See* 33 U.S.C. § 1313(d)(3) (1972) (“For the specific purpose of developing information . . .”) (emphasis added).

¹⁰⁹ *Cf. Pronsolino v. Marcus*, 91 F. Supp. 2d 1337, 1355 (N.D. Cal. 2000) (noting the possibility that a state might “knuckle under” to EPA’s coercive conditioning of federal grant money on its implementation of TMDLs).

After a Federal Advisory Committee Act panel issued a laundry list of recommendations in 1998,¹¹⁰ EPA decided that TMDLs, whatever their faults or deficits, had to have at least a target water body, the major component values broken out from the aggregate pollutant “loading” being calculated, allocations to an inventory of actual sources of pollutant allowances, and an implementation plan complete with timelines, milestones, necessary controls, and the available state and local authorities to impose the controls.¹¹¹ In short, it proposed to transform TMDLs into practicable WQS-attainment plans.¹¹² For the single largest source of water quality impairments nationally—nutrients from polluted storm water runoff—this signaled an abrupt end to the ambiguity and anonymity theretofore providing legal refuge.¹¹³ Indeed, given the CWA’s jurisdictional fragmentation—its relative exemption of “nonpoint sources,” the significant atmospheric deposition of nitrogen, mercury, and some other pollutants, and its division of authority between EPA and the states—this move threatened a wholesale rejection of the status quo.¹¹⁴ No longer would TMDLs for waters impaired by different kinds of sources end up

¹¹⁰ See THE NAT’L ADVISORY COUNCIL FOR ENVTL. POLICY & TECH., REPORT OF THE FEDERAL ADVISORY COMMITTEE ON THE TOTAL MAXIMUM DAILY LOAD (TMDL) PROGRAM (July 1998), available at nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=400001OD.TXT. One of the recommendations was that every TMDL be accompanied by an implementation plan “specifying and quantifying control actions and implementation tools, methods, and authorities that will be used to achieve the allocations and eliminate the impairment, in addition to schedules and milestones for implementing the called-for actions . . .” *Id.* at 32.

¹¹¹ See U.S. EPA, Proposed Revisions to the Water Quality Planning and Management Regulation, 64 Fed. Reg. 46012, 46031–35 (1999), <https://www.gpo.gov/fdsys/pkg/FR-1999-10-01/pdf/99-25307.pdf> [<https://perma.cc/ZVZ4-LHJL>] [hereinafter NPRM]; U.S. EPA, Revisions to the Water Quality Planning and Management Regulation and Revisions to the National Pollutant Discharge Elimination System Program in Support of Revisions to the Water Quality Planning and Management Regulation, 65 Fed. Reg. 43586, 43595–43638 (2000) <https://www.gpo.gov/fdsys/pkg/FR-2000-07-13/pdf/00-17831.pdf> [<https://perma.cc/W6T8-RGGC>] [hereinafter Preamble].

¹¹² Compare NPRM, 64 Fed. Reg. at 46013 (“Existing regulations define a TMDL as a quantitative assessment of a water quality problem.”), with Preamble, 65 Fed. Reg. at 43588 (“The goal of establishing TMDLs is to assure that water quality standards are attained and maintained.”); see GAO REPORT, *supra* note 101, at 16–17.

¹¹³ See Boyd, *supra* note 93, at 60–61.

¹¹⁴ Boyd, *supra* note 93, at 47 (“The need to meet *in situ* [WQSs] set[] up a state-by-state confrontation between well-organized industrial interests—which can claim to have already paid their pollution control dues—and organized agricultural, silvicultural, and municipal interests that resist “expansion” of CWA-driven requirements to their hard-to-solve nonpoint problems.”).

as mere paper.¹¹⁵ Now they would ratchet states into regulating *any* source of degradation, whatever its origins, or face citizen suits or an EPA takeover under Section 303(d).¹¹⁶ And that is when Congress acted swiftly to scuttle the rule.¹¹⁷ After two appropriations riders barring its implementation, the Bush EPA quietly withdrew the rule in March 2003, leaving the extant Section 303 regulations in place.¹¹⁸

The 2000 rulemaking had few strong supporters, making its political undoing easier.¹¹⁹ Much of what the 2000 rulemaking aimed to require had long been recommended in EPA guidance.¹²⁰ For example, EPA had stated in 1991 that “[i]n order to allocate loads among both nonpoint and point sources, there must be *reasonable assurances* that nonpoint source reduction will in fact be achieved. Where there are not reasonable assurances, under the CWA, the entire load reduction must be assigned to point sources.”¹²¹ What EPA headquarters had not done is clarify to states, stakeholders or its regions that EPA would *disapprove* any TMDL lacking such elements as “reasonable assurances” or implementation plans.¹²² Consequently, different regional offices across EPA’s field infrastructure had fashioned different ways of assessing proposed TMDLs—different ways of working with others.¹²³

¹¹⁵ TMDLs making load allocations to nonpoint sources required “a demonstration that [it] will be implemented through regulatory or voluntary actions” meeting a four part test of specificity, reliability, practicability, and demonstrated program capacity. *See* Preamble, 65 Fed. Reg. at 43663. The unmistakable implication was that nonpoint sources were no longer going to be hidden within the gaps and ambiguities of paper TMDLs or generic WQS or criteria.

¹¹⁶ Revisions to the Water Quality Planning and Management Regulation and Revisions to the National Pollutant Discharge Elimination System Program in Support of Revisions to the Water Quality Planning and Management Regulation, 65 Fed. Reg. 43586, 43598 (2000), <https://www.gpo.gov/fdsys/pkg/FR-2000-07-13/pdf/00-17831.pdf> [<https://perma.cc/B86H-HQ4X>].

¹¹⁷ *See* GAO REPORT, *supra* note 101, at 16–17.

¹¹⁸ The EPA announcement withdrawing the rule said that it was to consider alternatives to improve it. *See* U.S. EPA, Final Rule: Withdrawal of Revisions to the Water Quality Planning and Management Regulation, 68 Fed. Reg. 13608, 13609 (2003).

¹¹⁹ *See* GAO REPORT, *supra* note 101, at 17 & n.27; *cf.* OLSON, *supra* note 25, at 165 (“The remaining type of group is the unorganized group—the group that has no lobby and takes no action. Groups of this kind fit the main argument of this book best of all.”).

¹²⁰ *See* ENVTL. PROT. AGENCY, GUIDANCE FOR WATER QUALITY-BASED DECISIONS: THE TMDL PROCESS EPA PROCESS OF WATER (1991) [hereinafter TMDL GUIDANCE].

¹²¹ *Id.* at 15 (emphasis added).

¹²² GAO REPORT, *supra* note 101, at 16.

¹²³ *Cf. id.* at 47–69 (finding extreme variability among states and EPA regions in how they prepare, utilize, update, and enforce TMDLs).

This diversity continued developing after 2000.¹²⁴ Some regional officials demand virtually everything that the 2000 rulemaking required.¹²⁵ Some are much less exacting.¹²⁶ EPA regional leadership in some places prompted states to put minimum TMDL requirements into *state* law and policy.¹²⁷ But all regional officials report that they need state partners' cooperation and that if a monitoring or implementation plan is beyond a state's willing contribution, they hit an impasse.¹²⁸ The many variables at work in these relationships are hard and soft, technical and political all at once. The outcomes are high stakes, though, which is why the Congressional Research Service still updates a report originally done analyzing the 2000 rulemaking.¹²⁹

For example, Vermont's original TMDL for phosphorous in Lake Champlain, approved by EPA in 2002, was later disapproved after a citizens' suit challenged EPA's approval as arbitrary and capricious.¹³⁰ In its disapproval, citing among other things the stringency and accuracy of the load allocations to nonpoint sources,¹³¹ EPA promised to provide contractor support to Vermont's Department of Environmental Conservation's development of its model while at the same time praising that agency's "knowledge and capabilities."¹³² The Vermont Governor's letter submitting the TMDL implementation plan EPA had demanded pled with EPA

¹²⁴ See *id.* at 18–65. Of the more than 50,000 TMDLs EPA has approved since 1996, GAO found that EPA lacked basic information about their implementation, that many long-established TMDLs had not been implemented, and that an alarmingly high share of the TMDLs reviewed by GAO's experts lacked key elements like an implementation or monitoring plan, reasonable assurances of nonpoint source controls, or identification of all likely stressors to water quality. *Id.*

¹²⁵ *Id.* at 48–49.

¹²⁶ *Id.* at 49 (Region 6 reports that monitoring plans appear in about 1% of all their approved TMDLs).

¹²⁷ GAO REPORT, *supra* note 101, at 26.

¹²⁸ *Id.* at 18–65.

¹²⁹ See CONGRESSIONAL RESEARCH SERV., CLEAN WATER ACT AND POLLUTANT TOTAL MAXIMUM DAILY LOADS (2012), available at <https://www.fas.org/sgp/crs/misc/R42752.pdf> [<https://perma.cc/NZ4Z-YGMH>].

¹³⁰ See U.S. EPA, *Reconsideration of EPA's Approval of Vermont's 2002 Lake Champlain Phosphorous Total Maximum Daily Load ("TMDL") and Determination to Disapprove the TMDL* at 2 (Jan. 24, 2011), <http://www.epa.gov/sites/production/files/2015-09/documents/2002-lake-champlain-tmdl-disapproval-decision.pdf> [<https://perma.cc/F5LP-CE4S>] [hereinafter *Champlain Reconsideration*]. EPA's takeover of TMDLs in the Chesapeake arguably originated in a similar citizen suit. See *Amer. Canoe Ass'n, Inc. v. U.S. EPA*, 30 F. Supp. 2d 908 (E.D. Va. 1998); *Amer. Canoe Ass'n, Inc. v. U.S. EPA*, 54 F. Supp. 2d 621 (E.D. Va. 1999).

¹³¹ See *Champlain Reconsideration*, *supra* note 130, at 3.

¹³² See *id.* at 1.

to remember that “Vermont has a small, rural population” that had been “working hard for the past forty years” to reduce phosphorous discharges to the lake.¹³³

In giving specific reasons for the disapproval, EPA relied both on its regulations¹³⁴ and its 1991 guidance¹³⁵ to argue that the region had to be sure (1) that nonpoint source control actions will occur, and (2) that these actions will achieve enough phosphorous reduction to meet the applicable water quality criteria.¹³⁶ Given how Vermont proposed to find its reductions, the region had *no* such assurances.

[T]he plan includes many recommendations for local government entities, and funding recommendations The strength of this plan is that it provides a detailed discussion of a wide range of actions needed to help implement the TMDL. Its weakness . . . is that nearly all of the recommendations are just that—recommendations.¹³⁷

As the Vermont example shows, the demand for “reasonable assurances” that point and nonpoint source reductions are stringent enough and will be implemented went below the waterline following the demise of the 2000 rulemaking. The fight over the detail and specificity of a TMDL’s implementation takes place in inter-agency dialogue, negotiation and bargaining where agency *guidance* is made to serve law-like functions without ever being standardized, codified, transparent in force or effect, and without being recognizable to a court as “the law.” Given Section 303’s history of combining normative intransitivity, state and federal powers, contemporary administrative law’s core doctrines and citizen suit litigation, this equilibration is perhaps not surprising. But its

¹³³ *Office of the Governor, Letter to Gina McCarthy, Adm’r, U.S. EPA et al.*, May 29, 2014, at 1–2, available at <http://www.watershedmanagement.vt.gov/erp/champlain/docs/SGOV-Copier14052911440.pdf#zoom=100> [<https://perma.cc/X4W2-46EV>].

¹³⁴ See *Champlain Reconsideration*, *supra* note 130, at 8 (stating that TMDLs with load allocations to nonpoint sources where best management practices or other controls are “practicable” can include correspondingly less stringent allocations to point sources) (citing 40 C.F.R. § 130.2(i) (2011)).

¹³⁵ See *Champlain Reconsideration*, *supra* note 130, at 8 (stating that a TMDL must provide reasonable assurances that nonpoint sources control measures will achieve expected load reductions in order for the TMDL to be “approvable”) (citing TMDL GUIDANCE, *supra* note 120).

¹³⁶ See *Champlain Reconsideration*, *supra* note 130, at 9–10 (observing that Vermont had premised its promised reductions on unverified estimates of averted phosphorous discharges and that this kind of estimative practice did not provide reasonable assurances).

¹³⁷ See *id.* at 11.

dynamics are quickly overtaking the law of water quality protection and restoration. The Chesapeake Bay TMDL has exemplified that evolution and what resulted from the 2000 rulemaking's implosion. Part II examines the TMDL's findings, legal basis and its implementation in the CWA context from which it grows.

II. PROBLEM-SOLVING IN THE CHESAPEAKE: FINDING A WATERSHED'S GOALS

Attenuated relationships may be nature's norm, but they create havoc in our jurisdictionally minded legal world. Latent factual uncertainty about these connections can sow even more of it. It took EPA decades to connect tributaries and wetlands to water quality tightly enough to sweep them within the CWA's jurisdiction.¹³⁸ These two facts of life have framed our definition and pursuit of goals in environmental regulation to a still underappreciated degree. Without measured purposes environmental regulation is rudderless, but refining purposes has inevitably devolved into a search for consensus that does not exist and rarely materializes.

Water quality criteria and WQSs in the Chesapeake have taken an irregular, but in a sense prototypical path from inchoate, estimative expressions of pollution tolerances to statistically derived planning parameters, including the Bay's distinct habitats and their variance, aimed at restoring an entire ecosystem starting with its principal species.¹³⁹ Section A reviews the Bay jurisdictions' "collaborative" record while Section B diagrams an innovative use of enforcement discretion to leverage local, state and federal power to a sum greater than its parts.

A. *The Bay Commission, Agreements and Program: Collaboration, Entrenched*

The principal watershed states—Virginia, Maryland and Pennsylvania—have entrenched an institutionally fungible, overtly experimental

¹³⁸ Juliet Eilperin & Darryl Fears, *EPA Proposes Greater Protections for Streams, Wetlands Under Clean Water Act*, WASH. POST (Mar 25, 2014), available at https://www.washingtonpost.com/national/health-science/epa-proposes-greater-protections-for-streams-wetlands-under-clean-water-act/2014/03/25/4811cd36-b42c-11e3-b899-20667de76985_story.html [<https://perma.cc/759E-NJNK>].

¹³⁹ CHESAPEAKE BAY PROGRAM, CHESAPEAKE BAY 2007 HEALTH AND RESTORATION ASSESSMENT (2007), available at http://www.chesapeakebay.net/documents/cbp_26038.pdf [<https://perma.cc/E9GP-833J>].

effort across the watershed. Beginning in 1980,¹⁴⁰ their Bay “commission” comprised of state legislators connected the states’ political leaders and eventually EPA’s Chesapeake Bay Program (“CBP”), in an unprecedented institutional form.¹⁴¹ The governors of those states, EPA, the mayor of D.C. and the chair of the commission signed a compact in 1983 promising to “implement coordinated plans to improve and protect water quality and living resources of the Chesapeake Bay estuarine systems.”¹⁴² That skeletal, three paragraph pact was replaced four years later by an agreement announcing thirty-one separate goals.¹⁴³ Chief among them was the reduction of nitrogen and phosphorous “entering the main stem” of the Bay by 40% in ten years.¹⁴⁴ That target’s origin is uncertain, but it had nothing to do with expertly calculated or exhaustively investigated knowledge of cause-to-effect in the Bay.¹⁴⁵ Like Section 303(d), though, it was a goal expressed as a pollutant “load”—a goal of unknown environmental value.¹⁴⁶

¹⁴⁰ See ERNST, *supra* note 59, at 13–14. In 1980, Virginia and Maryland formed the Chesapeake Bay Commission which Pennsylvania joined in 1985. *Id.*

¹⁴¹ The Commission’s composition from state legislators is unique. Its role has evolved and, although it has never been the one setting the goals, its capacity to deliver needed fiscal and other supports within the member states has been a key building block of program capacity. See ERNST, *supra* note 59, at 14–15, 133–34. Its major shortcoming, in the eyes of many, has been its refusal to build bridges in Washington and to Congress particularly. *Id.*

¹⁴² See CHESAPEAKE BAY PROGRAM, 1983 CHESAPEAKE BAY AGREEMENT, available at http://www.chesapeakebay.net/content/publications/cbp_12512.pdf [<https://perma.cc/ZS6S-9N95>] [hereinafter 1983 CHESAPEAKE BAY AGREEMENT].

¹⁴³ See 1987 CHESAPEAKE BAY AGREEMENT, available at http://www.chesapeakebay.net/content/publications/cbp_12510.pdf [<https://perma.cc/NLU9-G8RA>]; see also ERNST, *supra* note 59, at 15.

¹⁴⁴ See 1987 CHESAPEAKE BAY AGREEMENT, *supra* note 143. The stated goal—“reduce and control point and non-point sources of pollution to attain the water quality condition necessary to support the living resources of the Bay”—indirectly linked the 40% targets to the group’s desired water quality outcomes. *Id.*

¹⁴⁵ It was common knowledge that hypertrophication—the overfeeding of the system with nutrients—was causing low dissolved oxygen levels in Bay waters by the time of the original Bay agreement. See Ben A. Franklin, *Chesapeake Bay Study Citing Pollution Threats*, N.Y. TIMES, Sept. 27, 1983, at A10. Data collected from 1950 forward “easily resolve[d] the major spatial patterns in [dissolved oxygen] along the main axis of the Bay” by 1984. James D. Hagy et al., *Hypoxia in Chesapeake Bay, 1950–2001: Long-Term Change in Relation to Nutrient Loading and River Flow*, 27 ESTUARIES 634, 648 (2004). What was missing was any knowledge quantifying an acceptable level of eutrophication. *Cf. id.* at 636 (“One may suspect that N loading from the Susquehanna River may have increased 2- to 3-fold since 1950.”).

¹⁴⁶ This was (and is) true of many TMDLs, however, to whatever extent the pollutant concentrations yielding the “load” calculation(s) are not derived directly from the receiving water and with high confidence. *Cf. Nat. Res. Def. Council, Inc. v. Fox*, 93 F. Supp. 2d 531

The Chesapeake Bay Commission (“CBC”), EPA and the governors’ 1987 agreement cemented that commitment and began supplying the science that promised to sort cause from effect.¹⁴⁷ That was followed up by Congress’s addition of Section 117 to the CWA, funding and directing EPA’s CBP to “coordinate state and federal efforts to improve Bay water quality.”¹⁴⁸ Program capacity soon followed, expanding to become an exemplar of “collaborative management for large multijurisdictional watersheds and for ecosystem management more generally.”¹⁴⁹

Whatever the progress in intergovernmental relations, though, water quality in the Bay kept declining, forcing amendments to the agreement in 1992.¹⁵⁰ The partners expanded their focus to major tributaries, enhanced monitoring and the addition of submerged aquatic vegetation (“SAV”) as an environmental quality metric.¹⁵¹ By 1998, the information

(S.D.N.Y. 2000) (upholding use of phosphorus concentrations created for “aesthetic” purposes as “guidance value” in TMDL for “water supply” designated use because no other values were available).

¹⁴⁷ See U.S. EPA REGION III ET AL., CHESAPEAKE BAY TOTAL MAXIMUM DAILY LOAD FOR NITROGEN, PHOSPHORUS AND SEDIMENT at 1–4 (Dec. 29, 2010) [hereinafter CHESAPEAKE TMDL].

¹⁴⁸ See Pub. L. No. 100-4, § 103, 101 Stat. 10 (1987), (codified at 33 U.S.C. § 1267). Section 117 was overhauled in 2000 giving it its present form as a mandate/authorization to EPA to “ensure that management plans are developed and implementation is begun by signatories to the [2000] Chesapeake Bay Agreement to achieve and maintain . . . [among other things] the nutrient goals of [any Bay Agreement] for the quantity of nitrogen and phosphorus entering the Chesapeake Bay and its watershed.” *Id.* § 1267(g) (added by Pub. L. No. 106-457, § 203, 114 Stat. 1967 (2000)).

¹⁴⁹ Jonathan Cannon, *Checking in on the Chesapeake: Some Questions of Design*, 40 U. RICH. L. REV. 1131, 1131 (2006). Others have reached similar conclusions. See, e.g., Bradley C. Karkkainen, *Collaborative Ecosystem Governance: Scale, Complexity, and Dynamism*, 21 VA. ENVTL. L.J. 189, 191 (2002); Andrea K. Gerlak & Tanya Heikkila, *Comparing Collaborative Mechanisms in Large-Scale Ecosystem Governance*, 46 NAT. RES. J. 657, 673–75 (2006); Annecoos Wiersema, *A Train without Tracks: Rethinking the Place of Law and Goals in Environmental and Natural Resources Law*, 38 ENVTL. L. 1239, 1272–75 (2008). Some are more critical of the “collaboration” that has predominated. See, e.g., Oliver A. Houck, *The Clean Water Act Returns (Again): Part I, TMDLs and the Chesapeake Bay*, 41 ENVTL. L. RPT. 10208 (2011); Shana Campbell Jones, *Making Regional and Local TMDLs Work: The Chesapeake Bay TMDL and Lessons from the Lynnhaven River*, 38 WM. & MARY ENVTL. L. & POL'Y REV. 277, 280–89 (2014); Rena Steinzor & Shana Campbell Jones, *Collaborating to Nowhere: The Imperative of Government Accountability for Restoring the Chesapeake Bay*, 4 GEO. WASH. J. ENERGY & ENVTL. L. 51 (2013).

¹⁵⁰ CHESAPEAKE TMDL, *supra* note 147, at § 1.2.1.

¹⁵¹ See *id.* With SAV’s addition to the water quality concerns, visibility and clarity became as prominent in the watershed’s goals as hypertrophication had been from the outset. See William C. Dennison et al., *Assessing Water Quality with Submersed Aquatic Vegetation*, 43 BIOSCIENCE 86 (1993). The “tributary strategies” aimed at the largest of the Bay’s 100,000 tributaries were the first effort of the sort to comprehensively map, inventory, calibrate,

the program and partners had gathered forced virtually all of the tidal Bay segments onto the states' Section 303(d) lists of impaired waters.¹⁵² Yet another agreement was crafted in 2000 in the shadow of what seemed increasingly likely: a Bay-wide TMDL.¹⁵³ Two categories of targets now loomed largest: animal agriculture and municipal sewerage.¹⁵⁴ Each was a growing contributor of nitrogen, phosphorus, or sediment;¹⁵⁵ each had many subtypes spread unevenly throughout the watershed;¹⁵⁶ each involved stakeholders both familiar and vital to the watershed's political leaders.¹⁵⁷ The information gathered and organized by the CBP, CBC and states' enhanced program capacities—unmatched in depth and reach—proved the cause-and-effect relationships with increasing rigor.¹⁵⁸ Still,

and model accurately each major sub-basin of an aggregate watershed for its contributions of pollutants and the fate thereof in the larger system. *See* CHESAPEAKE TMDL, *supra* note 147, at § 1.2.2.

¹⁵² CHESAPEAKE TMDL, *supra* note 147, at § 1.2.2.

¹⁵³ *See* Cannon, *supra* note 149, at 1144–45.

¹⁵⁴ Water clarity improved for a time and a resurgence in SAV was tracked beginning in 1983—likely as a result of improved sewage treatment and unusual weather conditions. *See* Dennison et al., *supra* note 151, at 89. The “habitat requirements approach” began with SAV as data were collected mapping its extent, variance over time, and experimental survival rates. *Id.* at 90–91. This coincided with a growing focus on animal agriculture and unregulated sewerage discharges as decadal-scale increases in summer hypoxic volume were found. *See* Hagy et al., *supra* note 145, at 648–54; *see also* Rebecca Murphy et al., *Long-Term Trends in Chesapeake Bay Seasonal Hypoxia, Stratification, and Nutrient Loading*, 34 *ESTUARIES & COASTS* 1293 (2011).

¹⁵⁵ Municipal storm sewers, like industrial-scale animal agriculture, have both point-and nonpoint-characteristics as pollution sources. While each can be fairly characterized by the land use practices within any given parcel/jurisdiction, the fate and transport of their pollution can be by conveyance and hydraulic flow at the same time. Growth in storm sewers and industrial-scale animal agriculture was consistent throughout the watershed from 1983 to 2003. *See* NRC EVALUATION, *supra* note 10, at 22–41.

¹⁵⁶ For some, this juncture was where to declare victory in an ideological battle over the relative efficacy of collaboration versus regulation. *See* Houck, *supra* note 149, at 10215 (deriding a “cherished political theory dismissive of regulation and wedded to the notion that stakeholders would and could band together to solve common problems”); Steinzor & Jones, *supra* note 149, at 53–55 (arguing that the Bay’s collaborative approaches were doomed because of free-rider and right-of-exit problems faced by the watershed states in how they govern agriculture and urban development, especially given Pennsylvania’s relatively small stake in restoration).

¹⁵⁷ *See* ERNST, FIGHT FOR THE BAY, *supra* note 11, at 1–23 (arguing that Olson’s logic of small groups with concentrated interests versus larger groups with diffuse interests will explain the Bay’s continuing decline until the collective stakes in the Bay’s restoration outweigh agriculture and urbanization politically and economically).

¹⁵⁸ *See generally* U.S. EPA REGION III, AMBIENT WATER QUALITY CRITERIA FOR DISSOLVED OXYGEN, WATER CLARITY AND CHLOROPHYLL A FOR THE CHESAPEAKE BAY AND ITS TIDAL TRIBUTARIES (April 2003) (EPA 903-R-03-002) [hereinafter 2003 WQC Guidance].

the focus on pollutant “loading” necessitated an equally unprecedented reliance on computational models of the systems’ workings.¹⁵⁹ By April 2003, EPA could publish a massive guidance setting forth recommended numeric criteria in a “habitat requirements approach,”¹⁶⁰ secure in the knowledge that it was backed by unprecedentedly deep data sets and modeling.¹⁶¹ EPA had delivered its end of the bargain: the benchmarks describing the dissolved oxygen, clarity and other conditions necessary to protect the Bay’s “recreationally, commercially, and ecologically important species and biological communities.”¹⁶²

With lawsuits forcing its hand, though, EPA began work on a Bay-wide TMDL for nitrogen, phosphorus and sediment.¹⁶³ The largest, most spatially explicit TMDL ever developed resulted,¹⁶⁴ as did persistent questions about the TMDL’s basis in fact versus mathematical fabrication.¹⁶⁵ Comprised of ninety-two distinct sub-basin TMDLs and grounded in EPA’s 2003 criteria,¹⁶⁶ the TMDL is predicated upon a “community” model¹⁶⁷ resolving the watershed into 309 separate land segments and

¹⁵⁹ See *id.* at 194–97; Peter J. Tango & Richard A. Batiuk, *Deriving Chesapeake Bay Water Quality Standards*, 49 J. AM. WATER RES. ASS’N 1007, 1015–16 (2013).

¹⁶⁰ See 2003 WQC Guidance, *supra* note 158, at 82; Tango & Batiuk, *supra* note 159, at 1010–11.

¹⁶¹ See Richard Batiuk et al., *Derivation of Habitat-Specific Dissolved Oxygen Criteria for Chesapeake Bay and Its Tidal Tributaries*, 381 J. EXP. MAR. BIO. & ECOL. S204, S213 (2009). The 2003 criteria divide the Bay into five habitat types (or “designated uses”) and then establish recommended values for dissolved oxygen (“D.O.”) by sensitive species in each habitat, water clarity by salinity regions (in Secchi depth readings and light penetration depths), and chlorophyll a in various concentrations and locations. See 2003 WQC Guidance, *supra* note 158, at x–xvii. See Tango & Batiuk, *supra* note 159; Robert M. Hirsch et al., *Weighted Regressions on Time Discharge, and Season (WRTDS), with an Application to the Chesapeake Bay River Inputs*, 46 J. AM. WATER RES. ASS’N. 857, 858 (2010). Unfortunately, even painstaking work to set criteria for one tributary or Bay segment does not easily translate elsewhere in the Bay given the number of variables at work, making even the massive 2003 document incomplete. See Tango & Batiuk, *supra* note 159, at 1022.

¹⁶² Batiuk et al., *supra* note 161, at S206. Each of the Bay tidal jurisdictions thereafter adopted the criteria into their WQS. *Id.* at S205.

¹⁶³ See CHESAPEAKE TMDL, *supra* note 147, at § 1.4.2.

¹⁶⁴ See Lewis C. Linker et al., *Development of the Chesapeake Bay Watershed Total Maximum Daily Load Allocation*, 49 J. AM. WATER RES. ASS’N 986 (2013).

¹⁶⁵ See Michael Paolisso et al., *Environmental Models and Public Stakeholders in the Chesapeake Bay Watershed*, 38 ESTUARIES & COASTS S97 (2013). Even the 2003 criteria were heavily dependent on computational modeling of the different species’ responses to stressors, reproductive resilience, etc. See Batiuk et al., *supra* note 161, at S205–07.

¹⁶⁶ See Tango & Batiuk, *supra* note 159, at 1008; Linker et al., *supra* note 164, at 992.

¹⁶⁷ See Gary W. Shenk & Lewis C. Linker, *Development and Application of 2010 Chesapeake Bay Watershed Total Maximum Daily Load Model*, 49 J. AM. WATER RES. ASS’N 1042 (2013). A “community” model is, in effect, crowd-sourced and continuously improving.

1,063 separate river segments.¹⁶⁸ By 2009, Bay scientists were able to rough out the relative effectiveness of controlling pollutants from the nineteen major tributaries.¹⁶⁹ The results were troubling: some tributaries were much bigger problems, pound for pound, than others.¹⁷⁰ The allocations had to reflect that knowledge, as problematic as it could be politically.¹⁷¹ And with an online decision-support tool known as Scenario Builder, state and local officials could translate land use and other choices into changes in nitrogen, phosphorus and sediment loads and compare them to the TMDL's load and wasteload allocations ("LA/WLAs") for their segment(s).¹⁷²

Id. at 1044. As a "mechanistic" model, however, the Chesapeake's Hydrologic Simulation Program—Fortran ("HSPF"), Phase 5.3, from which the load—and wasteload allocations were derived, introduces a layer of discretionary choice—or knowledge-based ordering—for every physical process/mechanism it incorporates. *Cf.* Wagner et al., *supra* note 45, at 306–07 (comparing mechanistic to statistical models and observing that mechanistic models are supposedly based on known constants). By contrast, statistical/phenomenological models tend to offer more specific predictions of end-state conditions without differentiating between mechanisms. Finally, HSPF is a "lumped parameter" model which means that it cannot represent spatial locations of specific land use categories in the many sub-watersheds within the overall basin and neither will it time lag responses to change. NRC EVALUATION, *supra* note 10, at 18–19.

¹⁶⁸ Shenk & Linker, *supra* note 167, at 1046. Of the 1,063 river segments, 287 had available and representative streamflow observations for use in calibrating Phase 5.3—which was an order of magnitude greater than the 20 used to calibrate Phase 4.3. *Id.* Still, with only 27% of river segments having streamflow data available, and the fact that the Bay's circulation naturally renders northern and eastern-shore tributaries more influential within the Bay, Linker et al., *supra* note 164, at 997, there is reason to doubt the model's predictive accuracy in its resolution of LA/WLA as between different regions of the watershed. *Id.* ¹⁶⁹ See Ping Wang et al., *Monitored and Modeled Correlations of Sediment and Nutrients with Chesapeake Bay Water Clarity*, 49 J. AM. WATER RES. ASS'N 1103 (2013). Establishing correlations between pollutant loadings and Bay water quality has always been complicated by the long lag times of responses to inputs. *Id.* at 1104. The HSPF is linked to a "three dimensional curvilinear hydrodynamic model (CH3D) [and] an eutrophication model (CE-QUAL-ICM)" to compute the "concentrations of nutrients and suspended sediments that result from the [HSPF's] inputs, the quantity of phytoplankton that grow and decay, and the resulting water clarity and dissolved oxygen (DO) concentrations." NRC EVALUATION, *supra* note 10, at 18.

¹⁷⁰ See CHESAPEAKE TMDL, *supra* note 147, at § 6.3.1; Linker et al., *supra* note 164, at 993.

¹⁷¹ See CHESAPEAKE TMDL, *supra* note 147, at § 6.3.1; *cf.* Linker et al., *supra* note 164, at 992 ("A key objective of the nitrogen and phosphorus allocation methodology was to first find a process, based on an equitable distribution of loads for which the basinwide load for nitrogen and phosphorus could be distributed among the basin jurisdictions while achieving the deep-water and deep-channel [dissolved oxygen WQSs] and then to achieve the more locally influenced [WQSs] of chlorophyll *a* and SAV-clarity.").

¹⁷² Shenk & Linker, *supra* note 167, at 1046. "Scenario Builder converts the numerous BMPs, which have various pollution reduction efficiencies depending on type and location

Shortly after its rollout the TMDL was challenged by the Farm Bureau and others. It was upheld in all respects in *American Farm Bureau Fed'n v. EPA*.¹⁷³ Plaintiffs argued that EPA had taken over the states' prerogatives, coercing them into using their authority over nonpoint sources to pursue federal ends.¹⁷⁴ They argued that the TMDL's specificity as to LAs and WLAs was contrary to the "cooperative" spirit of § 303—which is, of course, highly ambiguous about who is to do what in the event EPA, not the state, sets a TMDL.¹⁷⁵ As Part III explains, though, the Chesapeake TMDL not only allocated LAs and WLAs to nonpoint and point sources, respectively; it required and then incorporated implementation plans from each jurisdiction which also had to demonstrate "reasonable assurances" that they would meet their stated goals.¹⁷⁶ More compelling, thus, was the Farm Bureau's claim that EPA's demand of "reasonable assurances" from the Bay jurisdictions that they would achieve the TMDL's goals was illegal.¹⁷⁷ The court's answer—that neither the allocations nor the plans were "binding"¹⁷⁸—rang hollow, though. For the Chesapeake TMDL is more than just an "informational" tool.¹⁷⁹ It is an *operational plan* to attain the applicable WQS¹⁸⁰—grounded as those standards are in EPA's water quality criteria and promises of real consequences for the states if they fail. Section B maps this intersection in the Chesapeake.

in the watershed, to a common currency of nitrogen and phosphorus load that will be generated by a given land use and estimates the area of soil available to be eroded." NRC EVALUATION, *supra* note 10, at 19.

¹⁷³ *Am. Farm Bureau Fed'n v. U.S. EPA*, 984 F. Supp. 2d 289 (M.D. Pa. 2013). An appeal to the Third Circuit was rejected unanimously. *See Am. Farm Bureau Fed'n v. U.S. EPA*, 792 F.3d 281 (3d Cir. 2015).

¹⁷⁴ *See Am. Farm Bureau Fed'n*, 984 F. Supp. 2d at 313–15. No watershed state joined the plaintiffs in the suit, although twenty-one other states joined the Farm's Bureau's Third Circuit appeal as *amici*. *See* Brief of the States of Kansas, Indiana et al., *Am. Farm Bureau Fed'n v. EPA*, In the United States Court of Appeals for the Third Circuit No. 13-4079 (Feb. 3, 2014) [hereinafter States' Amicus Brief].

¹⁷⁵ *See Am. Farm Bureau Fed'n*, 984 F. Supp. 2d at 315–25.

¹⁷⁶ *See* CHESAPEAKE TMDL, *supra* note 147, at § 7.

¹⁷⁷ *See Am. Farm Bureau Fed'n*, 984 F. Supp. 2d at 325 ("Plaintiffs contend that this requirement lacks any basis in the CWA and is therefore *ultra vires*. In support, Plaintiffs note that Congress blocked EPA's previous attempt to implement revised TMDL regulations that incorporate a 'reasonable assurance' requirement.").

¹⁷⁸ *See id.* at 327–29.

¹⁷⁹ *See id.* at 327.

¹⁸⁰ *Cf.* CHESAPEAKE TMDL, *supra* note 147, at § 1.4.2 (citing CWA § 117(g)(1) and stating that "[b]ecause it establishes the Bay and tidal tributaries' nutrient and sediment loading and allocation targets, the Chesapeake Bay TMDL is itself such a 'management plan'").

B. *Executive Order 13508: Guiding Enforcement Discretion By Public Directive*

The Act's Sections 117 and 303 present a dilemma: Section 117(g) arguably overrides 303(d) with Chesapeake-specific law.¹⁸¹ But it does so in particularly opaque terms grounded in the Bay's unique past.¹⁸² The district court finessed the overlapping mandates,¹⁸³ perhaps recognizing the sort of problem EPA was attempting to solve.¹⁸⁴ Without credible commitments from each of its peers that strict limits on agriculture and municipalities would finally be imposed, no partner had enough incentive to burden its own powerful stakeholders.¹⁸⁵ And without sufficient cause to believe that WQSs in the Bay might finally be attained, the incentives would also fail. So only the federal government—whether by its courts, President or other authority—could fashion the solution.¹⁸⁶ But that solution is needed in more places than the Chesapeake.

In May 2009, Executive Order 13508 was issued, creating a “federal leadership committee” chaired by EPA, and ordering it to develop a

¹⁸¹ Section 117 directs/empowers EPA to “ensure that management plans are developed and implementation is begun” by the partners. 33 U.S.C. § 1267(g)(1). EPA, recognizing this aspect of § 117, demanded implementation plans from the states that were party to the 2000 Agreement and *requested* them from the others in planning the TMDL. When it was defending its actions in AFBF, EPA's brief relied upon § 117—while also arguing that everything done in the TMDL and in support of the TMDL was “consistent with” CWA § 303(d). *See* EPA's Memorandum in Opposition to Plaintiffs' Motion for Summary Judgment and in Support of EPA's Cross-Motion for Summary Judgment, *Am. Farm Bureau Fed'n v. U.S. EPA*, No. 1:11-CV-0067 (M.D. Pa. 2012), at 43.

¹⁸² *See supra* note 148.

¹⁸³ *See Am. Farm Bureau Fed'n*, 984 F. Supp. 2d 289, 325 (M.D. Pa. 2013) (citing both §§ 117 and 303 as “support” for the TMDL).

¹⁸⁴ Although plaintiffs had argued that establishing LA/WLAs for upstream watershed states was illegal, the court rightly related Bay water quality to tributary flow, especially that of the Susquehanna River and its massive watershed. *See Am. Farm Bureau Fed'n*, 984 F. Supp. 2d at 329–32 (citing *Arkansas v. Oklahoma*, 503 U.S. 91 (1992)). Oddly, the plaintiffs had argued that EPA should only be allowed to control NPDES permitting in the upstream states, *see id.* at 332 n.23, which is precisely the kind of “coercion” EPA used in setting the TMDL's gross allocations imposed on those states. *See infra* notes 217–81 and accompanying text.

¹⁸⁵ *Cf. Steinzor & Jones, supra* note 149, at 53 (arguing that Pennsylvania has always been insufficiently motivated to participate and that Maryland and Virginia, while they bemoan the fact, find Pennsylvania a “convenient scapegoat and plausible cover for their own lack of progress, delaying the hard choices they must also make if the Bay is to be restored.”).

¹⁸⁶ The Third Circuit rejected the Farm Bureau's appeal on precisely these grounds as well. *See Am. Farm Bureau Fed'n v. U.S. EPA*, 792 F.3d 281, 299–301 (3d Cir. 2015).

“strategy for coordinated implementation of existing programs and projects.”¹⁸⁷ It further ordered that the strategy, “*to the extent permitted by law . . .* define environmental goals for the [Bay] and describe milestones for making progress toward attainment of these goals.”¹⁸⁸ This was the beginning of the “accountability framework” the federal government has sought in the Chesapeake. The final strategy released in May 2010¹⁸⁹ aimed to have 60% of all Bay segments attaining the applicable WQSSs by 2025,¹⁹⁰ to have 70% of sampled streams throughout the watershed rate well under the Index of Biotic Integrity by 2025,¹⁹¹ to restore 30,000 acres of wetlands in the watershed by 2025¹⁹² and to restore riparian forest buffers to 63% (181,000 miles) of all riparian miles in the watershed by 2025,¹⁹³ among other goals. All of the TMDL’s goals are similarly pegged to 2025.¹⁹⁴

The President’s statutory and constitutional powers to issue such an order raise hard questions of degree. Had the White House ordered EPA to make affirmative “necessity” determinations under CWA § 303(c)(4)¹⁹⁵—a provision empowering the Administrator to do so—the President would

¹⁸⁷ Exec. Order No. 13508, Chesapeake Bay Protection and Restoration, 74 Fed. Reg. 23099, 23100 (2009). The other lead agency, the Department of Agriculture (“USDA”), administers the wetlands reserve, “swampbuster” and other agriculture-subsidy programs. See Jacob Hughes, *Dredged, Filled, Plowed, and Planted: The Deficiencies of Wetland Protection in the United States*, 18 DRAKE J. AGRIC. L. 619, 631–40 (2013).

¹⁸⁸ Executive Order 13508, Chesapeake Bay Protection and Restoration, 74 Fed. Reg. at 23100.

¹⁸⁹ See FEDERAL LEADERSHIP COMM., EXEC. ORDER 13508: STRATEGY FOR PROTECTING AND RESTORING THE CHESAPEAKE BAY WATERSHED (2010) [hereinafter STRATEGY]. The Strategy also references the Bay TMDL at length, intertwining its goals, both in water quality and in other metrics, with those of the TMDL.

¹⁹⁰ *Id.* at 4. By then, eighty-nine of ninety-two Bay segments were listed as “impaired.” *Id.*

¹⁹¹ *Id.* at 22.

¹⁹² *Id.* at 49.

¹⁹³ *Id.* at 51.

¹⁹⁴ A fourth Agreement among the watershed governors in June 2014 similarly set 2025 as the relevant deadline. Critically, the 2014 Agreement only aimed to have “60 percent of the nutrient and sediment pollution load reductions necessary to achieve applicable [WQSSs] compared to 2009 levels” in place by 2025—not that 60% of Bay segments would actually meet their applicable WQSSs by then. See the Chesapeake Bay Watershed Agreement 2014 at ‘Water Quality Goals and Outcomes.’ Given the uncertainty separating LA/WLAs and WQSSs attainment, the Agreement’s commitments, thus, seem less ambitious than the TMDL’s. See *infra* notes 295 and accompanying text. Nonetheless, the Agreement referenced the TMDL and its implementation plans as “the foundation for water quality improvements embodied in this Agreement.” *Id.* And the TMDL aims to have 60% of needed actions completed by 2017. See CHESAPEAKE TMDL, *supra* note 147, at ES-1.

¹⁹⁵ 33 U.S.C. § 1313(c)(4).

arguably be encroaching upon Congress's power to choose who shall make a judgment that is as much environmental science as intergovernmental politics.¹⁹⁶ On the other hand, the President, who under Article II, § 3 must "take care that the laws be faithfully executed,"¹⁹⁷ often sets priorities among many laws to be executed given resource constraints.¹⁹⁸ May the President (or EPA) set 2025 as the target date for a little more than *half* of the Bay's impaired waters to meet their WQSs? That seems less like law enforcement than an order to subordinates that they *ignore* §§ 303(d)–(e).¹⁹⁹ Even assuming the executive order itself is immune from judicial review,²⁰⁰ any directives issued by its "leadership committee" or any of its component agencies acting pursuant to that order would be reviewable.²⁰¹

This is where *permanently* provisional environmental quality norms like WQSs render the often porous boundary between lawmaking and

¹⁹⁶ See *supra* notes 84–86 and accompanying text.

¹⁹⁷ U.S. CONST. Art. II, § 3.

¹⁹⁸ See OFFICE OF LEGAL COUNSEL, THE DEPARTMENT OF HOMELAND SECURITY'S AUTHORITY TO PRIORITIZE REMOVAL OF CERTAIN ALIENS UNLAWFULLY PRESENT IN THE UNITED STATES AND TO DEFER REMOVAL OF OTHERS, 38 OP. O.L.C. 1, 6–7 (2014) [hereinafter OLC Memo on DACA].

¹⁹⁹ *Cf. id.* at 7 ("[T]he Executive Branch ordinarily cannot . . . 'consciously and expressly adopt[] a general policy' that is so extreme as to amount to an abdication of its statutory responsibilities.") (quoting *Heckler v. Chaney*, 470 U.S. 821, 833 n.4 (1985)). Note that agencies which use "general statements of policy" as a means of articulating internal norms, where those norms end up binding agency personnel, must ordinarily treat those rules as "legislative" in nature. See, e.g., *Cnty. Nutrition Inst. v. Young*, 818 F.2d 943 (D.C. Cir. 1987); *Hector v. USDA*, 82 F.3d 165 (7th Cir. 1996).

²⁰⁰ There is no presumption of reviewability where the President's actions are concerned. See *Mississippi v. Johnson*, 71 U.S. 475, 501 (1866); *Chicago & Southern Air Lines v. Waterman S.S. Corp.*, 333 U.S. 103, 108–14 (1948); *Nixon v. Fitzgerald*, 457 U.S. 731 (1982); *Franklin v. Massachusetts*, 505 U.S. 788, 796–801 (1992); *Dalton v. Specter*, 511 U.S. 462, 468–77 (1994). And the Supreme Court has held that the Administrative Procedure Act's cause of action does not reach the President. *Id.* at 468–69. Finally, simpler paths to court seem inapposite to 13508, although a variety of nonstatutory possibilities arguably remain. See Kevin Stack, *The Reviewability of the President's Statutory Powers*, 62 VAND. L. REV. 1171, 1192–1212 (2009) (arguing that a variety of nonstatutory forms of *ultra vires* review remain valid even after the APA's effective bar to the review of presidential action under the standard forms of statutory review).

²⁰¹ Agency rulemakings have become subject to a rather flexible presumption of reviewability under the APA. See *Abbott Laboratories v. Gardner*, 387 U.S. 136, 149 (1967); *Gardner v. Toilet Goods Ass'n*, 387 U.S. 167, 170 (1967); cf. Ronald M. Levin, *The Story of the Abbott Labs Trilogy: the Seeds of the Ripeness Doctrine*, in ADMINISTRATIVE LAW STORIES 431, 477 (Peter L. Strauss ed., 2005) ("[O]nce the Court had made clear that there was no presumption *against* pre-enforcement review, a combination of factors . . . induced courts to find that the *Abbott Labs* balance favors such review in most instances.").

law enforcement more trouble perhaps than it is worth. Ideally, the boundary serves accountability's purposes and checks the abuse of power.²⁰² But where "execution" consists in "mingled assessments of fact, policy, and law",²⁰³ which are both constitutive of and uniquely fit to an administrator's discretion, the mere act of organizing the discretion into a detailed plan, publicly transmitted to subordinates with clear instructions on how to prioritize limited resources,²⁰⁴ cannot be illegal *per se*. And yet, the rule of law in our traditions demands at least that this kind of "execution" not be *per se* immune from judicial review either.²⁰⁵ Refining an account of this spectrum that enables appropriate review and real accountability is one of Parts III and IV's burdens. The other is describing how that needle was threaded in the Chesapeake where an unprecedented investment has been made in organizing multiple sovereigns around a continuously evolving set of environmental quality goals.

III. WHEN THE LAW AND ITS GOALS CO-EVOLVE

Pollution statutes like the CWA are known for leaving to (or vesting in) states the presumptive right to balance the benefits and costs of regulating particular source categories or firms—whatever the goal(s). Their role has traditionally been to do the equally political and technical job of picking regulatory targets—those who will face stringent regulation. Their challenge stems from having to balance disparate social and economic factors. When states subtly shift this role to one of *protecting* their sources from stringent controls and letting others bear the brunt of the costs, cooperation fails. The Chesapeake TMDL regimented this discretion but not, as Part IV argues, in any way contrary to law. Indeed, the plan in the Chesapeake suggests an innovative, effective way to engineer our federal-state relations and their interrelated authorities to say what the law is. This should be of wider interest given how many of our biggest environmental problems today share the Chesapeake's basic features.

²⁰² See HAROLD H. BRUFF, *BALANCES OF FORCES: SEPARATION OF POWERS LAW IN THE ADMINISTRATIVE STATE* 73–76 (2006).

²⁰³ OLC Memo on DACA, *supra* note 198, at 7.

²⁰⁴ Part III argues that the TMDL and its associated planning tools did just this. See *infra* notes 239–41 and accompanying text.

²⁰⁵ See M.J.C. VILE, *CONSTITUTIONALISM AND THE SEPARATION OF POWERS* 25–57 (Liberty Fund, Inc., 2d ed. 1998).

A. *The Chesapeake's Watershed Implementation Plans: Numbers that Bind?*

The Farm Bureau argued, quite plausibly, that the Chesapeake TMDL is different because its numbers—the allocations of pollutants within the “total” load—*bind* the partnering states.²⁰⁶ But what does binding mean here? Were the partners legally obliged by the TMDL? Neither Section 117 nor Section 303 gives EPA that authority in so many terms.²⁰⁷ But what of the consequences of failing to meet the TMDL's scheduled targets?²⁰⁸ A general “compliance and enforcement strategy” announced targeting the Chesapeake watershed²⁰⁹ was one thing. But a detailed, explicit tit for tat, like EPA Region III published in December 2009, was something else altogether.²¹⁰ That letter seemed to coerce—and quite effectively.²¹¹ The right to submit better information and seek revision of a norm, i.e., what the district court believed kept the TMDL from being “binding,”²¹² does not make it any less obligatory. Every law can be

²⁰⁶ See *Am. Farm Bureau Fed'n v. U.S. EPA*, 984 F. Supp. 2d 289, 316–33 (M.D. Pa. 2013). The district court concluded that neither EPA's “backstop measures” nor the WLAs and LAs are “binding on the states.” *Id.* at 325. In a separate case, plaintiffs Friends of the Earth and others argued that the TMDL, by coercing the jurisdictions into using pollution trading schemes, would create uneven water quality in the watershed and thereby harm their members. The district court rejected their claims as failing to raise an Article III “injury in fact,” mostly because—in the court's view—the TMDL was not sufficiently mandatory or coercive. See *Food and Water Watch v. U.S. EPA*, 5 F. Supp. 3d 62 (D.D.C. 2013).

²⁰⁷ *Am. Farm Bureau Fed'n v. U.S. EPA*, 984 F. Supp. 2d 289, 299–301, 313–14, 324–26.

²⁰⁸ Under § 303(d), any EPA-created TMDL is, in some sense, “binding” on the subject state that either refused or failed to submit a satisfactory TMDL. Cf. *Pronsolino v. Marcus*, 91 F. Supp. 2d 1337, 1340 (N.D. Cal. 2000) (state acknowledging the consequences that could follow from its failing to “implement” EPA's TMDL).

²⁰⁹ See U.S. EPA OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE, CHESAPEAKE BAY COMPLIANCE AND ENFORCEMENT STRATEGY (May 2010) [hereinafter OECA STRATEGY].

²¹⁰ Sophisticated players in a repeat-play, non-zero-sum game where the choices are either to cooperate or to defect have available to them a wide variety of possible strategies. See DAVIS, *supra* note 40, at 146–47. The dominant strategy, however, is to cooperate until a partner defects, to sanction a defecting partner but resume cooperation as soon as possible, and—as long as one's partner is not acting at random—to elevate the severity of sanctions in response to the severity of the partner's defection(s). *Id.* at 147–48. This came to be known as the “tit-for-tat” strategy. *Id.*

²¹¹ Cf. *Am. Farm Bureau Fed'n*, 984 F. Supp. 2d at 323 (reviewing correspondence between EPA and partners conveying a sense of coercive sanctions for failures to generate, pursue, or accomplish the WIP goals).

²¹² See *Am. Farm Bureau Fed'n*, 984 F. Supp. 2d at 327. Likewise, the court hearing the challenge to the TMDL for its treatment of pollution trading found, on its way to concluding the plaintiffs lacked standing, that the TMDL did not “coerce States into implementing any

revised.²¹³ What EPA did was constrain the states by manipulating the burdens of uncertainty in a particularly shrewd way. It pooled the jurisdictions' own best available information as to both sources and their relative potency, dared them to do better than it had in figuring an overall pollution "diet," and announced a collective dieting plan backed by leverage EPA most assuredly possesses: the authority to enforce the CWA and its regulations intentionally and purposefully in proportion to any partner's failure(s).²¹⁴ The plan's being public made the "accountability" as much horizontal as vertical.²¹⁵ And the partners have followed the TMDL jointly and severally.²¹⁶ To call the Chesapeake TMDL "nonbinding," thus, is to ignore a great deal about this experience that may prove quite valuable beyond its borders.

The TMDL's specificity and determinacy is what sources (and many state officials) found so menacing.²¹⁷ By resolving pollutant allocations and caps down to the sub-basin, estimating extant contributors sectorally and, in some cases, individually, and calculating how they would all have to compensate if the criteria were to be attained, EPA's

programs they would not consider implementing on their own." See *Food & Water Watch v. EPA*, 5 F. Supp. 3d 62, 78 (D.D.C. 2013).

²¹³ Cf. *Sackett v. EPA*, 132 S. Ct. 1367, 1372 (2012) ("The mere possibility that an agency might reconsider in light of "informal discussion" and invited contentions of inaccuracy does not suffice to make an otherwise final agency action nonfinal.").

²¹⁴ See *infra* notes 215–25 and accompanying text. Even the district court acknowledged that it was a close call. See *Am. Farm Bureau Fed'n*, 984 F. Supp. 2d at 324 ("Although there may be a fine line between collaboration and coercion, the court finds this framework to be more indicative of collaboration.").

²¹⁵ Region III's "consequences letter" tracked in substance, if not in form, an earlier draft report from EPA headquarters on "tools and actions" as ordered by Executive Order 13508. See U.S. EPA, *THE NEXT GENERATION OF TOOLS AND ACTIONS TO RESTORE WATER QUALITY IN THE CHESAPEAKE BAY: A DRAFT REPORT FULFILLING SECTION 202A OF EXECUTIVE ORDER 13508* (Sept. 2009) [hereinafter *TOOLS AND ACTIONS REPORT*] (copy on file with author); see letter from William C. Early, Acting Regional Administrator, U.S. EPA Region III, to The Hon. L. Preston Bryant, Jr., Secretary of Nat. Res., Va. (Nov. 4, 2009) [hereinafter *Consequences Letter*].

²¹⁶ The 2014 Chesapeake Bay Watershed Agreement calls the TMDL the "foundation for water quality improvements embodied in th[e] Agreement." See *CHESAPEAKE WATERSHED AGREEMENT 2014*, available at <http://www.chesapeakebay.net/chesapeakebaywatershedagreement/page> [<https://perma.cc/5FXV-N78M>].

²¹⁷ In their amicus brief on appeal, the states complained at length that EPA exceeded its statutory authority in setting detailed allocations and demanding the assurances it did. See Brief of the States et al. in Support of Reversal, *supra* note 174, at 33–59. Interestingly, AFBF eventually abandoned the argument that the allocations' detail invalidated them in favor of the argument that their being fixed and "locked in" invalidated them. See *Am. Farm Bureau Fed'n v. U.S. EPA*, 984 F. Supp. 2d 289, 316–17 n.316 (M.D. Pa. 2013).

TMDL orchestrated an ecosystem-wide plan, comprised of seven distinct sub-plans.²¹⁸ Deviation would be met with sanctions, like most laws.²¹⁹ Many TMDLs simply recapitulate an underlying WQS's deficits, failing to generate any real action or accountability.²²⁰ Rounding out its "consequences letter" detailing expectations for the Bay jurisdictions' Watershed Implementation Plans ("WIPs"), EPA recited eight "options" from its existing authorities which it could exercise in the event a jurisdiction faltered.²²¹ All of the options stemmed from authority the CWA vests in EPA²²² and six were some form of tightening standards on that jurisdiction's point sources.²²³ To an extent, these were reminders of discretion EPA clearly retains.²²⁴ And they were likely unreviewable as such.²²⁵

²¹⁸ Vital to the plan, but omitted from my discussion for purposes of space, was EPA's commitment to significantly reduce the atmospheric deposition of nitrogen throughout the watershed—a *federal* commitment made in the TMDL itself. See Consequences Letter, *supra* note 215, at 6. Air deposition, estimated to contribute up to 30% of the Bay's nitrogen, could otherwise have remained a convenient excuse for some.

²¹⁹ Coercive sanctions for noncompliance, though perhaps neither necessary nor sufficient properties of law, are nevertheless pervasive and characteristic thereof. See FREDERICK SCHAUER, *THE FORCE OF LAW* 124–39 (2015).

²²⁰ Skeptics have long argued that setting environmental quality norms is more trouble than it is worth. See, e.g., BRUCE ACKERMAN ET AL., *THE UNCERTAIN SEARCH FOR ENVIRONMENTAL QUALITY* (1974). Without the administrator's confidence that the norm is worth attaining, though, a norm like a WQS is even less useful. See Adler, *supra* note 82, at 788–89. Beginning with the 2009 Tools and Actions report, EPA was determined to replace "voluntary efforts" by partners with "strong commitments by all six watershed states and [D.C.] because achieving [WQSs] in the Bay requires significant reductions in loads from all source sectors throughout the Bay's watershed and airshed." TOOLS AND ACTIONS REPORT, *supra* note 215, at 15.

²²¹ See Letter from William C. Early, Acting Regional Administrator to The Honorable Preston L. Bryant, Jr., Secretary of Natural Resources of Virginia (Dec. 29, 2009) (Enclosure B). A subsequent guidance document of April 2010 set out the expected elements of the Phase I WIPs. See U.S. EPA, *A GUIDE FOR EPA'S EVALUATION OF PHASE I WATERSHED IMPLEMENTATION PLANS* (Apr. 2, 2010) [hereinafter PHASE I WIP GUIDANCE], and then another a year after that did so for Phase II WIPs. See U.S. EPA, *GUIDE FOR CHESAPEAKE BAY JURISDICTIONS FOR THE DEVELOPMENT OF PHASE II WATERSHED IMPLEMENTATION PLANS* (Mar. 30, 2011) [hereinafter PHASE II WIP GUIDANCE].

²²² See TOOLS AND ACTIONS REPORT, *supra* note 215, at 15–18, 20–40.

²²³ Option 1 is a representative example. It threatened to expand NPDES permit coverage to "currently unregulated sources" such as concentrated animal feeding operations ("CAFOs"), smaller animal feeding operations ("AFOs") and small municipal separate storm sewer systems ("MS4s"). See Consequences Letter, *supra* note 215, at 8 (Enclosure B Option 1).

²²⁴ One exception may have been the options discussing CAFO permitting. EPA has encountered great resistance to regulating CAFOs—of whatever size—and may not do so without clear proof of an operation's discharge of pollution to jurisdictional waters. See, e.g., *National Pork Producers Council v. U.S. EPA*, 635 F.3d 738, 749–56 (5th Cir. 2011).

²²⁵ Such "enforcement discretion," not having been previously constrained by rule, was most likely "committed to agency discretion by law," and thus not subject to the APA

CWA § 301(b)(1)(C) requires that every NPDES permit's effluent limits be as stringent as necessary to meet applicable WQSs,²²⁶ and CWA § 301(a) logically reaches *any* "point source," no matter how trivial.²²⁷ Congress may not have been aware of the diversity of threats to water quality beyond point sources when it legislated the CWA, but until it amends § 301, that is its reach.²²⁸ EPA has for decades crafted rules setting size thresholds for NPDES permitting with sources like concentrated animal feeding operations ("CAFOs"),²²⁹ commercial and industrial sites²³⁰ and oil and gas drilling.²³¹ It has made the permitting of municipal storm sewers into a summary, largely self-executing affair.²³² And it has deferred to states in their selection of effluent limitations for publicly owned treatment works ("POTWs") where it might have insisted that a "more stringent limitation" be imposed.²³³ Each of these norms, however, has come with the caveat that applicable WQSs might necessitate stricter controls.²³⁴ And the threat that such relative *immunities* would be replaced by targeted and searching EPA scrutiny, like a threat that

cause of action. *See* Heckler v. Chaney, 470 U.S. 821 (1985); Young v. Cmty. Nutrition Inst., 476 U.S. 974 (1986); *see infra* notes 398–401 and accompanying text.

²²⁶ 33 U.S.C. § 1311(b)(1)(C).

²²⁷ *Cf.* 33 U.S.C. § 1311(a) ("Except as in compliance with [standards EPA is authorized to set] the discharge of any pollutant [from any "point source"] by any person shall be unlawful.").

²²⁸ At least, that is, until EPA adopts regulations confining the reach of the term "point source" which withstand the inevitable legal challenges. *See, e.g.,* Decker v. Northwest Env'tl. Defense Ctr., 133 S. Ct. 1326 (2013).

²²⁹ *See* Waterkeeper Alliance, Inc. v. U.S. EPA, 399 F.3d 486, 492–93 (2d Cir. 2005) (reviewing EPA's history of regulating only the largest CAFOs).

²³⁰ *See* Jeffrey M. Gaba, *Generally Illegal: NPDES General Permits Under the Clean Water Act*, 31 HARV. ENVTL. L. REV. 409, 429–32 (2007).

²³¹ *Id.* at 431–32; *see also* Jeffrey M. Gaba, *Flowback: Federal Regulation of Wastewater from Hydraulic Fracturing*, 39 COLUM. J. ENVTL. L. 215, 283–317 (2014).

²³² *Cf.* Environmental Defense Ctr., Inc. v. EPA, 344 F.3d 832, 852–58 (9th Cir. 2003) (remanding portions of EPA's Phase II Stormwater Rule for failure to provide an adequate public hearing in compliance with CWA §§ 301 and 402); Natural Res. Defense Council, Inc. v. EPA, 966 F.2d 1292, 1305–06 (9th Cir. 1992) (remanding EPA's exclusion of construction sites of less than five acres from original stormwater rule as inadequately justified). The "Phase II" municipal separate storm sewer system ("MS4") permitting rules, which apply to "small regulated" systems, provide for relatively minimal permit conditions. *See* 33 U.S.C. § 1342(p)(3)(B); 40 C.F.R. §§ 122.33–34 (2014).

²³³ 33 U.S.C. § 1311(b)(1)(C).

²³⁴ For MS4s, EPA requires that any permitting authority retain the right to designate otherwise exempt small MS4s as "regulated" MS4s should local conditions demand it. *See* 40 C.F.R. 122.26(a)(9). This "residual designation authority" is specifically protected in the Act. *See* 33 U.S.C. § 402(p)(2)(E).

deference will be denied in setting WQSs,²³⁵ was as much *leverage* as reminder.²³⁶ It put a jurisdiction's point sources (stakeholders) in jeopardy of suffering disadvantage vis-à-vis their counterparts and, thus, changed their posture toward the host jurisdiction. The same strategic dynamics that had previously locked in the watershed's collective inaction became each jurisdiction's own penalty for default.²³⁷ The consequences letter, thus, put a certain *force* behind EPA's demands for the WIPs and their implementation.²³⁸

²³⁵ The eighth option of the Consequences Letter—"Federal Promulgation of local nutrient water quality standards"—first noted that "the Bay watershed [jurisdictions] generally have narrative nutrient criteria to protect local, fresh water stream water quality." See Consequences Letter, *supra* note 215, at 12. It then made the threat explicit: "EPA regulations require the States or the District to adopt water quality criteria that are sufficient to protect the designated use, . . . [sic] In its review of the States or the District's water quality standards, EPA may determine that a jurisdiction's local water quality criteria do not protect local or downstream designated uses EPA has the authority to promulgate federal standards where EPA has made a determination that existing . . . [WQSs] are not sufficient to protect the designated water uses. EPA may use this authority to promulgate numeric criteria for nutrients as appropriate" [citations omitted].

²³⁶ See, e.g., *Barrick Goldstrike Mines, Inc. v. Browner*, 215 F.3d 45, 50 (D.C. Cir. 2000) (finding that agency communication to the regulated party was reviewable because "legal consequences" attached once the regulated party would have to risk an enforcement action and subsequent liability in acting contrary to the agency's guidance).

²³⁷ With each jurisdiction having disclosed in its WIPs where it believed the major sources were to be found, it notified its peers (and EPA) where its actions had to focus and, at least approximately, *how* to target its own limited enforcement resources. This, in turn, empowered those others to monitor the discloser's enforcement discretion. See DOUGLAS G. BAIRD ET AL., *GAME THEORY AND THE LAW* 89 (1994). EPA, thus, linked both large and small scale implementation choices to developments in the field as monitored by third parties—something adaptive managers have long advocated. See Carl J. Walters & C.S. Holling, *Large-Scale Management Experiments and Learning by Doing*, 71 *ECOLOGY* 2060 (1990).

²³⁸ Cf. SCHAUER, *supra* note 219, at 127–39 (arguing that the force of law is less about its adherents having personally internalized the law's mandates than it is about legal institutions' uses of coercive measures to assure everyone's compliance). Quite unlike most other cooperative federalist schemes where EPA is empowered to sanction underperforming states, the Consequences Letter shrewdly set out a variety of measures to account for the variations across the watershed and among the political leadership's priorities in the different jurisdictions. This was more advantageous to EPA than sanctions so big they are practically unusable or so small that they neither motivate others nor correct for their deficiencies. See DAVIS, *supra* note 40, at 148 (noting the importance in tit-for-tat strategies of not allowing any defection to go unpunished). EPA's advantage thereafter became each jurisdiction's assurance against its peers' defection. Cf. SCHAUER, *supra* note 219, at 91–92 (arguing that any law governing officials "exists in part to keep bad officials from doing bad things, but it also, and more importantly, exists to keep good officials from doing what they think are good things, or may even be good things in the short run, to the detriment of the long-run public interest.").

What were those demands? By phased approach, EPA directed each jurisdiction to distribute its nutrient and sediment target loads set out in the draft TMDL, to track and verify reductions of existing and to offset future loads, and to set program milestones “to allow EPA to assess progress . . . and determine whether federal actions may be warranted”²³⁹ In short, the TMDL’s explicit numbers pushed the states to make definite plans, which they could and would execute, shifting the burdens of uncertainty onto the states. When draft Phase I WIPs arrived, EPA found that only two of the seven jurisdictions’ drafts would meet nitrogen and phosphorus goals and only five would meet the sediment goals.²⁴⁰ After being remanded back with this EPA feedback, the jurisdictions’ final Phase I WIPs were completed and incorporated into the TMDL’s own gross LA/WLA assumptions at the end of 2010.²⁴¹

Phase II WIPs were due quickly thereafter, again based on guidance provided by EPA from, among other things, its models.²⁴² Taking what it had learned from the Phase I WIPs, EPA then doubled down on the strategy, informing the jurisdictions that much of what was “necessary to meet the Bay TMDL allocations will be implemented at the *local* level by partners including conservation districts, local governments, planning commissions, utilities and watershed associations.”²⁴³ So Phase II WIPs were to detail the jurisdictions’ planned “collaboration with these key local partners.”²⁴⁴ The WIPs were to *explain* in detail how these “partners are going to reduce loads delivered to the Bay” and give them an “opportunity” to “identify what resources, authorities and assistance they need to implement actions that achieve their respective share of the Bay jurisdictions’ WIP strategies and TMDL allocations.”²⁴⁵ Phase II WIPs

²³⁹ See PHASE I WIP GUIDANCE, *supra* note 221, at 1.

²⁴⁰ See CHESAPEAKE TMDL, *supra* note 147, at § 8.0.

²⁴¹ See CHESAPEAKE TMDL, *supra* note 147, at § 7.2.

²⁴² See PHASE II WIP GUIDANCE, *supra* note 221, at 1 (“EPA’s role is to provide support and technical guidance, ensure that the Phase II WIPs provide at least as strong a demonstration of reasonable assurance as in the Phase I WIPs, and assess whether any refinements to the Bay TMDL are necessary.”).

²⁴³ See PHASE II WIP GUIDANCE, *supra* note 221, at 2.

²⁴⁴ *Id.* Maryland’s “very strong county government system,” for example, means counties “make many decisions regarding land use, zoning and development, implementation of stormwater permits, and construction and operation of wastewater treatment plants that are critical to water quality in general and to the Bay Restoration.” MARYLAND’S PHASE II WATERSHED IMPLEMENTATION PLAN FOR THE CHESAPEAKE BAY TMDL 59 (Oct. 2012) [hereinafter MARYLAND’S PHASE II WIP].

²⁴⁵ PHASE II WIP GUIDANCE, *supra* note 221, at 2.

were to set definite, quantified goals resolving the gross segment allocations from the watershed model down to particular locations and sectors.²⁴⁶ But they were also to plan out execution to 2017, making the “two-year milestones” required of the jurisdictions key to accountability—key to everyone’s “reasonable assurances.”²⁴⁷ Reasonable assurances took the form of detailed targets, defined timelines and a credible threat of consequences for failure.²⁴⁸

Of course, as constraints develop, regulated parties often push back, sometimes with information aimed at undermining the reasoning identifying them as the target. This can be deliberative and healthy.²⁴⁹ The CWA arguably expects *states* to find the best means, i.e., whom to target, in pursuing WQSs.²⁵⁰ The assumption always was that the WIPs—especially given their phased approach and, thus, a built-in excuse to put costly measures off to the future—would involve deeply political choices.²⁵¹ But as the process unfolded, ostensible losers have identified their own

²⁴⁶ *Id.* at 3.

²⁴⁷ EPA’s “reasonable assurances” demands never differentiated between interstate and intra-state situations, although an “applicable” WQS can be that of a downstream state. See *Arkansas v. Oklahoma*, 503 U.S. 91, 107 (1992).

²⁴⁸ The TMDL included 33 pages of allocations by segment, pollutant, and source category. See *CHESAPEAKE TMDL*, *supra* note 147, at § 9.1. For example, Maryland’s Phase II WIP, which included WIPs from each of its counties and the City of Baltimore, was built around what it called the Maryland Assessment and Scenario Tool (“MAST”), a simplified version of the Chesapeake watershed model allowing state and local agencies to explore alternative reduction scenarios. See *MARYLAND’S PHASE II WIP*, *supra* note 244, at 4. MAST generates both outputs helping planners to try alternative scenarios among its major sectors and “input decks” therefrom to be fed back into the Bay watershed model. *Id.* According to the state, “[u]sing MAST to develop local Phase II WIP strategies has illustrated the practicality and transparency of modeling. It has empowered stakeholders by enabling them to see the underlying input information and quickly predict the results of their proposed load reduction strategies. . . . The process of utilizing the MAST tool to mimic the EPA watershed model has also led to some further refinements in the EPA model.” *Id.* at 4–5. Its major sectors are agriculture, forest, wastewater, septic and stormwater.

²⁴⁹ *Cf.* Bradley C. Karkkainen, *Information-Forcing Environmental Regulation*, 33 FLA. ST. U.L. REV. 861, 875–93 (2006) (arguing that strong, categorical controls can act as a “penalty default” for the regulated parties possessing the best information and incentivize them to share that information, improving the public’s understanding of and approach to environmental quality problems).

²⁵⁰ See Adler, *supra* note 79, at 209–30.

²⁵¹ See, e.g., Zach Kaufman et al., *Agricultural Costs of the Chesapeake Bay Total Maximum Daily Load*, 48 ENVTL. SCI. & TECH. 14131, 14132 (2014) (“Significant concerns have emerged about the costs of achieving the Chesapeake Bay TMDL [with Phase II WIPs in place] and who will pay for them.”).

best target: the Bay model and the thousands of assumptions enabling its computations.²⁵² A well-worn trench aligns those working to define and refine the “best available science” against those who would be saddled with the costs of any solutions their science suggests.²⁵³ The no-man’s land in between is held, increasingly, by models.

Take, for example, the Delmarva poultry industry which, in concert with the Farm Bureau, seems to have fought virtually every step Maryland and Delaware have taken to control poultry manure,²⁵⁴ the Bay’s single largest source of phosphorus.²⁵⁵ By amendments to their feed, their animals’ genetics and their rearing practices, producers claim the phosphorus content of their manure is significantly below average.²⁵⁶ Because the CBP modelers used standard averages to calculate phosphorus tonnage from the volume of chickens being produced in the region,²⁵⁷ it was a coarse estimate underlying the Eastern Shore phosphorus allocations. According to some data gathering by an engineering professor at the University of Delaware, though, CBP estimates were significantly higher than the local results.²⁵⁸ Once this localized analysis went public, the chicken

²⁵² Cf. Wagner et al., *supra* note 45, at 342 (“[D]iscrediting a model by picking at every instance of error or uncertainty offers critics of regulation the easiest path to attack policies based on model results when models are misunderstood as answer machines.”); Paolisso et al., *supra* note 165, at S108 (“The practice of modeling is different in many ways from traditional scientific research, and it poses a number of difficult questions. First modeling is done on computers rather than in the laboratory or in the field.”).

²⁵³ Compare Kahan et al., *supra* note 46, at 1073 (“If risk disputes are really disputes over the good life, then the challenge that risk regulation poses for democracy is less how to reconcile public sensibilities with science than how to accommodate diverse visions of the good within a popular system of regulation.”), with ADRIAN VERMEULE, *THE CONSTITUTION OF RISK* 165 (2014) (“[G]roups of experts can suffer both from the pathologies intrinsic to all group decision making—the “folly of (expert) crowds”—as well as pathologies distinctive to professional expertise. Groups of experts may suffer from overconfidence, technocratic myopia, false consensus, and insufficient motivation, to name only a few of the relevant problems.”).

²⁵⁴ See Steinzor & Jones, *supra* note 149, at 55. Environmental groups have begun to step up their own counter-offensives to the industry, though. See ENVTL. INTEGRITY PROJECT, *PHOSPHORUS PROBLEM ON THE EASTERN SHORE* (2014).

²⁵⁵ See CHESAPEAKE TMDL, *supra* note 147, at § 4.6.1.

²⁵⁶ See Alison Fairbrother, *Fowling the Bay? Media Reports Absolving Poultry Industry of Pollution are Premature*, THE PUBLIC TRUST PROJECT, May 31, 2013, available at <http://publictrustproject.org/blog/environment/2013/fowling-the-bay-media-reports-absolving-poultry-industry-of-pollution-are-premature/> [<https://perma.cc/57VR-JHJZ>].

²⁵⁷ See CHESAPEAKE TMDL, *supra* note 147, at § 4.6.1.

²⁵⁸ See Fairbrother, *supra* note 256. See also CHESAPEAKE TMDL, *supra* note 147, at § 4.6.1. Glancey has not published his data or analysis nor had them peer reviewed.

industry had a meme.²⁵⁹ In using averaging techniques, CBP and the TMDL were alleged to have overestimated the chicken manure threat.²⁶⁰

But precision cuts both ways. After decades of over-applying chicken manure to croplands, many Eastern Shore soils are saturated with phosphorus.²⁶¹ Indeed, NRCS and others had begun work in 1990 on a site indexing tool using available information to evaluate the relative risk of phosphorus transport from agricultural fields.²⁶² The Phosphorus Site Index (“PSI”) they built combined spatially explicit soil and landscape characteristics into an averaged risk for off-site transport, which could be combined with source characteristics for a loss risk rating.²⁶³ Further refinements of transport mechanisms, obstructions (such as buffers) and “source characteristics” led to what was billed as a Phosphorus Management Tool (“PMT”).²⁶⁴ Under the rules Maryland regulators drafted, farms where the risk of transport off-site was high enough would be barred from applying chicken manure.²⁶⁵ This “tool,” which had featured in the state’s Phase II WIP,²⁶⁶ became a lightning rod in Maryland politics where its implementation stalled.²⁶⁷ A Republican Governor made

²⁵⁹ See Jeff Montgomery, *Study: Water Pollution from Poultry Farms Overestimated*, USA TODAY, May 15, 2013 (One *Delaware Journal* piece republished by *USA Today*).

²⁶⁰ Legal claims against modeling inaccuracies have long been a mixed bag. See Fisher et al., *supra* note 45, at 259–62.

²⁶¹ See, e.g., Peter Kleinman et al., *Dynamics of Phosphorus Transfers from Heavily Manured Coastal Plain Soils to Drainage Ditches*, 62 J. SOIL & WATER CONSERV. 225 (2007). If soils are saturated with phosphorus, crops cannot incorporate further applications and phosphorus transport off-site grows more likely. *Id.*

²⁶² See generally J.L. Lemunyon & R.G. Gilbert, *Concept and Need for a Phosphorus Assessment Tool*, 6 J. PROD. AGRIC. 483 (1993).

²⁶³ See Frank J. Coale et al., *Accelerated Deployment of an Agricultural Nutrient Management Tool: The Maryland Phosphorus Site Index*, 31 J. ENVTL. QUALITY 1471, 1472–73 (2002).

²⁶⁴ The 2013 PMT became a series of eight equations and a scaling factor, made available for farmer use and supported by the University of Maryland Extension. See Joshua M. McGrath et al., *University of Maryland Phosphorus Management Tool: Technical User’s Guide*, UNIV. OF MARYLAND EXTENSION, available at https://extension.umd.edu/sites/default/files/_docs/articles/EB-405%20UMD%20Phosphorus%20Management%20Tool-Technical%20Users%20Guide.pdf [<https://perma.cc/R523-FHQR>] (last visited Mar. 20, 2016). “Source characteristics” refer to the manure itself and a coefficient for its extractable phosphorus. *Id.*

²⁶⁵ See Maryland Dep’t of Agric., *Subtitle 20: Soil and Water Conservation: Notice of Proposed Action*, 41 Md. Reg. 1432, 1436 (2014).

²⁶⁶ See MARYLAND’S PHASE II WIP, *supra* note 45, at 51.

²⁶⁷ The O’Malley Administration tried three times to implement the PMT and was blocked by the legislature’s Eastern Shore delegation. See Rona Kobell, *Study: MD Phosphorus Rule Could Cost \$22–52 Million to Implement*, BAY JOURNAL (Nov. 8, 2014), available at http://www.bayjournal.com/article/study_md_phosphorus_rule_could_cost_2252_million_to_implement [<https://perma.cc/GEW2-UXEY>]. A final effort was a rider requiring the State

the PMT his administration's first reversal of the O'Malley Administration's WIP.²⁶⁸ But once the data were collected and indexing was possible, others joined the fray. A July 2014 analysis by the Environmental Integrity Project showed phosphorus concentrations *increasing* in three of eight Eastern Shore rivers from 2003–13.²⁶⁹ They attributed it to the legacy of over-manuring croplands in those counties.²⁷⁰

Modeled values, injected into the fires of partisan politics, can ignite chain reactions of attack and counter-attack which never actually refine the estimative methods to which they pertain.²⁷¹ The Hogan Administration was able to delay the PMT, but it ultimately had no alternative. Theorists who argue these exchanges are “information forcing”²⁷² should take a close look at the Chesapeake experience. Winners and losers churn and uncertainty's strategic value can be diminished.²⁷³ But quantification is a hard game to win consistently.

Indeed, the gross phosphorus allocations to Maryland's Eastern Shore tributaries and Bay segments amount to about 5% of the total Bay-wide reductions scheduled.²⁷⁴ Some of this is allocated to point sources,

to determine the PMT's costs to farmers if implemented as proposed, a study that was released in November 2014 to wide acclaim in the poultry industry and wide disparagement among most others. *Id.*

²⁶⁸ See Rona Kobell, *Newly Minted Maryland Governor Pulls Stronger Phosphorus Regs at Last Moment*, BAY JOURNAL (Jan. 21, 2015), available at http://www.bayjournal.com/article/newly_minted_maryland_governor_pulls_stronger_phosphorus_regs_hours_at_last [<https://perma.cc/6NA7-K46M>]. In June 2015, the Hogan Administration quietly finalized an “enhanced” PMT with minor changes and a promise to study the economic effects on Maryland farmers.

²⁶⁹ See ENVTL. INTEGRITY PROJECT, *Manure Overload on Maryland's Eastern Shore*, <http://environmentalintegrity.org/wp-content/uploads/POULTRY-REPORT.pdf> [<https://perma.cc/EZY4-73BU>] (last visited Mar. 20, 2016).

²⁷⁰ See *id.*

²⁷¹ Cf. Fisher et al., *supra* note 45, at 279–82 (observing that many models’ “evaluative complexity” makes *ex post* scrutiny of their underlying data, assumptions or computations more difficult).

²⁷² Cf. Karkkainen, *supra* note 249, at 891–92 (observing that the use of a formal TMDL as a “penalty default” to spur necessary collaboration and experimentation in the Chesapeake should lead to the progressive refinement of everyone’s information on implementation tools, costs, etc.).

²⁷³ Sequential challenges to a model may create what game theorists call “network externalities,” i.e., network effects from an assumption/calculation’s being rejected prematurely (“excess momentum”) or from its being retained too long (“excess inertia”). BAIRD ET AL., *supra* note 237, at 208–09. Because the challenges are sequential, it is possible for them to take on a trajectory contrary to the interests of the group which does not reflect the information available to all. *Id.* at 215.

²⁷⁴ A back-of-the-envelope count from the TMDL’s Table 9-2’s scheduled reductions from segments CHSTF, CHSOH, CHSMH, EASMH, CHOTF, CHOOH, CHOMH2, CHOMH1,

but not much.²⁷⁵ Thus, EPA's options in response to the Eastern Shore manure impasse become highly instructive—especially to those convinced that EPA or the CBP are too bent on “collaboration” to be effective. EPA is without jurisdiction to restrict the spread of chicken manure on croplands, even where it is convinced that that manure presents a high risk of eventual transport to the Bay.²⁷⁶ EPA could perhaps begin objecting to every municipal separate storm sewer (“MS4”) and POTW permit on the Eastern Shore,²⁷⁷ forcing every “practicable” BMP on the former²⁷⁸ and costly “enhanced nutrient recovery” on the latter.²⁷⁹ But

LCHMH, HNGMH, FSBMH, NANTF_MD, NANOH, NANMH, WICMH, MANMH, BIGMH, POCTF, POCOH_MD, TANMH_HD, CB2OH, CB3MH, CB4MH, and CB5MH_MD yields almost 185,000 pounds per year. That is 4.7% of the total phosphorus reductions needed watershed wide (~3.92 million pounds).

²⁷⁵ In the segments listed in note 259, the LA (nonpoint) to WLA (point) ratio is typically 9:1 or higher. *See* CHESAPEAKE TMDL, *supra* note 147, at § 9.1 (Table 9-2).

²⁷⁶ *Nat'l Pork Producers Council v. EPA*, 635 F.3d 738, 750–51 (5th Cir. 2011) (requiring that EPA regulate CAFOs only where an “actual discharge” of a pollutant to navigable waters is present); *Service Oil, Inc. v. EPA*, 590 F.3d 545, 550 (8th Cir. 2009) (invalidating EPA penalty order to construction site and holding that until there is a discharge of a pollutant by a point source to a navigable water, there can be no violation of the CWA; *Alt v. EPA*, 2013 WL 4520030 (N.D. W.Va. 2013).

²⁷⁷ Every MOA between an authorized state and the EPA region must provide EPA an opportunity to object to any permit issued. *See* 40 C.F.R. § 123.44 (2014).

²⁷⁸ Small, Phase II MS4s—like virtually all of those on Maryland's Eastern Shore—are generally required to meet six “minimum control measures,” a unique standard stemming from municipal storm sewers' unique treatment in the CWA. *See* 33 U.S.C. § 1342(p)(3). EPA is there directed to “require controls to reduce the discharge of pollutants to the maximum extent practicable,” § 1342(p)(3)(B)(iii), a control standard found nowhere else in the Act. Indeed, the Ninth Circuit once concluded that this special provision effectively immunized MS4s from the more general requirements of CWA § 301, i.e., compliance with receiving waters' WQS. *See* *Defenders of Wildlife v. Browner*, 191 F.3d 1159, 1165 (9th Cir. 1999). EPA has implemented § 402(p)(3) with a complex set of defaults which generally require permitted MS4s to select and implement measures from among a list of approved management practices. With so many MS4s effectively unregulated, EPA can proclaim that “[o]nly approximately two percent of the nitrogen, six percent of the phosphorus, and four percent of the sediment delivered to the bay through urban/suburban storm water discharge outfalls are regulated by EPA and the Bay state under the NPDES MS4 program.” OECA STRATEGY, *supra* note 209, at 8.

²⁷⁹ Under 40 C.F.R. § 122.44(d)(1), a POTW discharging to waters or downstream waters where the applicable water quality standards are not being attained must be as stringently controlled as is necessary to keep it from “contribut[ing]” to the nonattainment. That regulation, already upheld over vehement objection, *see* *Am. Paper Inst., Inc. v. EPA*, 996 F.2d 346 (D.C. Cir. 1993), directs permit writers confronting narrative water quality criteria like Maryland's to fashion whatever limits are actually calculated as necessary to attain the applicable WQSs. *See, e.g., In re Alexandria Lake Area Sanitary Dist.*, 763 N.W.2d 303, 312–18 (Minn. 2009) (upholding permitting authority's application

would that capture enough phosphorus to offset the excess manure's contributions? Would it do so at an acceptable cost to *EPA*? It takes program capacity to object sensibly to each such permit. Targeting a larger population could dilute the sanction's deterrent effect.²⁸⁰ In some sense, though, the target is less about the ecosystem than about properly motivating the jurisdictional "partners."²⁸¹ For that kind of accountability, the targets' political or economic salience with the jurisdictional partners is probably most important.²⁸² Section B explains how these gaps have been bridged in the Chesapeake.

B. Continuously Becoming: Phased Data, Models and Contributions

It is common knowledge that the Bay model is due for a major "recalibration" in 2017.²⁸³ Indeed, even the Phase II WIPs were prepared from a revision of the model (version 5.3.2²⁸⁴) used to calibrate the first

of § 122.44(d)(1) to NPDES permitting to leave effluent limitations in draft until TMDL was completed and WLA was set).

²⁸⁰ Cf. AYRES & BRAITHWAITE, *supra* note 9, at 36 ("Regulatory agencies have maximum capacity to lever cooperation when they can escalate deterrence in a way that is responsive to the degree of uncooperativeness . . . and to the moral and political acceptability of the response.").

²⁸¹ Cf. Kevin M. Stack & Michael P. Vandenberg, *The One Percent Problem*, 111 COLUM. L. REV. 1385, 1387 (2011) ("[I]f the marginal cost of regulatory compliance by relatively small . . . contributors exceeds the marginal benefits, exempting [them] may be advisable. Not surprisingly, many statutes and regulations include exemptions for small actions or entities.") (internal citations omitted).

²⁸² Cf. Bullman-Pozen & Gerkin, *supra* note 18, at 1266–68 (noting that delegation entails reliance on the "servant" and that the mutual dependence that emerges is at least as common in "cooperative federalism" as is any simple principal/agent relationship); Rubin, *The Myth of Accountability*, *supra* note 56, at 2122 ("[A]dministrative hierarchies typically display a feature that can be described as second-order accountability. Those who supervise subordinates and hold these subordinates accountable in various ways, are themselves accountable to those superior to them, and specifically, they are accountable for the way in which they hold their subordinates accountable.").

²⁸³ David Lewis's logical exposition of "common knowledge" wherein for something between A, B, and C to constitute common knowledge it must be true that it is known to A, B, and C, that A, B, and C know that it is known, and so on, see DAVID LEWIS, CONVENTION 52–57 (1969), alerted students of collective action to the strategic significance of an *infinite regression*. Since no human agent can actually work through the infinity of steps, what they must be doing cognitively is reaching their own logical results. *Id.* at 53. Yet their logic can be misleading in the presence of real agents, real states of belief/knowledge, etc.

²⁸⁴ See CHESAPEAKE TMDL, *supra* note 147, at 1–3.

WIPs.²⁸⁵ Although virtually everyone is on the “adaptive management” bandwagon, few distinguish it from run-of-the-mill trial and error and even fewer distinguish that from the gradual accumulation of knowledge.²⁸⁶ Thus, with everyone expected continuously to improve in pursuit of ambient environmental quality goals—which must, themselves, routinely improve—it becomes exceedingly difficult to distinguish a partner’s warranted adjustments from free-riding.²⁸⁷ Indeed, so little is known about BMPs—their effectiveness, relative efficiencies, adoption rates, quality controls, etc.—that years after becoming the Chesapeake’s core strategy, they present the perfect cipher.²⁸⁸ With no shared metrics no one knows how much confidence to put in any given level of (claimed) performance.²⁸⁹

²⁸⁵ See Linker et al., *supra* note 164, at 1–3.

²⁸⁶ The NRC found that, while “effective adaptive management involves deliberate management experiments, a carefully planned monitoring program, assessment of the results and a process by which management decisions are modified based on new knowledge,” little evidence existed of its incorporation into CBP or partner operations. NRC EVALUATION, *supra* note 10, at 121.

²⁸⁷ For example, Maryland’s Department of the Environment (“MDE”) knows that Pennsylvania’s Department of Environmental Protection (“PADEP”) knows that the Bay model is to be overhauled in 2017. And PADEP knows that MDE knows that it knows, etc. If MDE generally believes that PADEP “has too little incentive to cooperate,” see Steinzor & Jones, *supra* note 149, at 54, MDE should invest in monitoring PADEP—with, for example, ambient concentration testing of the Susquehanna as it enters Maryland—on the belief that PADEP is shirking. But the result, especially given the long lag times separating management measures and ambient water quality changes, would not necessarily be a clearer picture of PADEP’s performance. Cf. NRC EVALUATION, *supra* note 10, at 83 (concluding that NRC reviewers were “unable to determine the reliability and accuracy of the BMP data reported by Bay jurisdictions” and unable “to quantify the magnitude or the likely direction of the error introduced by BMP reporting issues”). Moreover, even if neither PADEP nor MDE lose confidence in each other, other partners may presume they have, thereby undermining their incentives.

²⁸⁸ Compare NRC EVALUATION, *supra* note 10, at 59–85, 113–23 (concluding that BMPs’ effectiveness and adoption is essentially unknown and that none of the Bay jurisdictions have engaged in truly adaptive management to replace their uncertainties with information), with Bernard W. Sweeney & J. Denis Newbold, *Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review*, 50 J. AMER. WATER RES. ASS’N 560, 566 (2014) (“[W]e found that [sic] nitrogen removal per unit width of buffer varied inversely with subsurface water flux. Where water flux is low, narrow buffers can provide high removal efficiencies, but such sites account for relatively little of the watershed and regional-scale base flows in streams and, therefore, can have relatively little effect on overall water quality.”).

²⁸⁹ Cf. AYRES & BRAITHWAITE, *supra* note 9, at 120–21 (noting tendency of “enforced self-regulation” to obscure needed comparability). Ignorance of the sort, however, can also be useful if it disrupts whatever “common knowledge effects” might otherwise undervalue contributions. See LEWIS, *supra* note 283, at 52–57.

Standard metrics (which have yet to be derived) will have to ignore BMPs' foremost influences: on-site conditions.²⁹⁰ What kind of collaboration could justify heavy reliance on or trust in that sort of strategy?²⁹¹

Decision-makers drawing on technical models are supposedly that much harder to keep accountable.²⁹² But when government-to-government trust hinges on each other's uses of modeled values within a wider framework where the modeling both quantifies obligations and is repeatedly called into doubt, the challenges shift significantly.²⁹³ Without sufficient trust, peer-to-peer assurances can be prematurely discounted—instilling doubts where none are warranted.²⁹⁴ The Chesapeake Bay experience underscores the strategic positioning estimations invite²⁹⁵ and the damage

²⁹⁰ Sweeney and Newbold's findings regarding published results on streamside buffers underscore the point: any given practice can have dramatically different efficiencies depending on site conditions. *See* Sweeney & Newbold, *supra* note 288, at 576. What little long-term monitoring has been done suggests some BMPs are effective and some are not. *See* NRC EVALUATION, *supra* note 10, at 115.

²⁹¹ In October 2014, the CBP released a "verification framework" guidance collecting a dozen "elements," five "principles," a schematic "verification lifecycle," and a system of accounting for BMPs broken out by sector and habitat type. It included 450+ pages of appendixes. *See* Ches. Bay Prog., *Strengthening Verification of Best Management Practices Implemented in the Chesapeake Bay Watershed: A Basinwide Framework* (Oct. 2014) [hereinafter *Basinwide Framework*]. Notably missing from this behemoth was any explanation of its legal or regulatory force or its relationship to or authority under the CWA. Rather subtly the guidance did note the CBP's "Principals' Staff Committee" had voted to approve and adopt the "principles" at a December 2012 meeting. *See id.* at 10 n.14. It also (somewhat disingenuously) stated that Bay jurisdictions had been "required" to "report BMP implementation data on an annual basis" to the CBP by EPA Region III. *Id.* at 6 (citing the Consequences Letter which makes no mention of BMP verification).

²⁹² *See* Fisher et al., *supra* note 45, at 278.

²⁹³ With WIPs and milestones predicated on the TMDL's modeled values, and limited capacities to fully model a jurisdiction's planned actions within the CBP's models, partners face the double uncertainty of not knowing how an updated model will grade their own works-in-progress and/or reshuffle other parties' positions regarding work still to be done. This makes for an especially fluid strategic situation, one where informal norms can significantly reduce incentives to defect. *See* EDNA ULLMANN-MARGALIT, *THE EMERGENCE OF NORMS* 30–37 (1977).

²⁹⁴ *See* Wagner et al., *supra* note 45, at 295.

²⁹⁵ *See* Paolisso et al., *supra* note 165, at S103 ("[T]he fact that all models consist of hypothesized relationships can create a public credibility problem . . . but is viewed as expected, normal and even an opportunity (for refinement) by scientists."). Thus, where the CBP experts see the opportunity for continuous improvements—improvements that could help estuary work globally—the public may see strategic action. *Cf.* PA. DEPT OF ENVTL. PROT., PENNSYLVANIA CHESAPEAKE WATERSHED IMPLEMENTATION PLAN PHASE 2, at 4 (2012) [hereinafter PENN. PHASE II WIP] ("[R]ecalibrations demonstrate the inaccuracies in the model [and therefore] reliance of [sic] this model to implement a

even the threat of opportunism can do.²⁹⁶ It is not necessarily true that “[t]he more assumptions that are fed into [a] model, the more likely the model will produce inaccurate results.”²⁹⁷ It is true that mechanistic models are only as good as our understanding of the mechanisms comprising them.²⁹⁸ The Bay model suggests that nitrogen loads from urban runoff and septic systems grew almost 8% between 1985 and 2009,²⁹⁹ for example, even though observed nitrogen concentrations decreased in some of the most affected segments over that period.³⁰⁰ But is that because concentrations lag behind actual discharges or because they were offset by BMPs?³⁰¹ The available evidence is and will probably remain inconclusive long after the Chesapeake Bay’s fate has been decided.

Consider another example. The Bay model is predicated on the belief that stream channel condition and sediment yield are strongly influenced by upland land use, a belief lately embroiled in renewed debate.³⁰² It may be that legacy effects on streams, especially in this region, confound

regulatory program that imposes enforcement consequences as those described in [the Consequences Letter] is wholly unjustified and arbitrary and capricious.”).

²⁹⁶ As the literature on coordination shows, participants need not *actually* engage in self-serving behavior to deter others from contributing. Furthermore, assuming the Bay jurisdictions’ interests do not coincide (precluding a coordination solution), the sequential nature of their attacks on the CBP model allows them to learn, in essence, what game they are playing. Cf. BAIRD ET AL., *supra* note 237, at 195 (“[I]t is easy to misidentify the game being played. What appears to be a prisoner’s dilemma may be something else entirely.”).

²⁹⁷ ERNST, FIGHT FOR THE BAY, *supra* note 11, at 37. If Ernst was arguing that more assumptions within a computational model introduce more risk of *erroneous* assumptions and, hence, erroneous conclusions, then that may be true (although it is not necessarily true). Cf. Wagner et al., *supra* note 45, at 337 (“Examples abound of agencies perpetuating the misunderstanding of models as answer machines, while at the same time secretly cramming contested, value-laden assumptions into their highly technical models behind the scenes.”). But if Ernst means to argue that mathematically complex models are more likely to be wrong simply because they are complex, then that is almost certainly false.

²⁹⁸ See Wagner et al., *supra* note 45, at 294–95.

²⁹⁹ See CHESAPEAKE BAY PROGRAM, BAY BAROMETER: A HEALTH AND RESTORATION ASSESSMENT OF THE CHESAPEAKE BAY AND WATERSHED IN 2009 (2010), *available at* http://www.chesapeakebay.net/images/press_release_pdf/2009_Bay_Barometer_FINAL_WEB.pdf [<https://perma.cc/FXR9-FU6F>].

³⁰⁰ Cf. Hirsch et al., *supra* note 161, at 871 (reinterpreting datasets from Patuxent River to show flow-normalized trends).

³⁰¹ Cf. NRC EVALUATION, *supra* note 10, at 115 (noting the importance of flow-weighted concentration monitoring datasets for proper trend analysis).

³⁰² See e.g., Dorothy Merritts et al., *Anthropocene Streams and Base-Level Controls from Historic Dams in the Unglaciated Mid-Atlantic Region, USA*, 369 PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOC’Y A 976 (2011); Robert C. Walter & Dorothy J. Merritts, *Natural Streams and the Legacy of Water-Powered Mills*, 319 SCIENCE 299 (2008).

or even defeat the basic association.³⁰³ If so, the model will have to grow still *more* complex in 2017, reconciling the presence of milldams and other history with more general principles of geomorphology.³⁰⁴ This is less a reflection of adaptive management (or of uncertainties about BMPs), however, than it is of geology and of knowledge's accumulation over time.³⁰⁵

Finally, long neglected in BMP implementation has been any systematic or centralized collection of data on outcomes. This is something CBP has been trying to fix,³⁰⁶ especially where the BMP is not publicly cost-shared.³⁰⁷ Without such data, peer-to-peer trust in BMPs rests less on adaptive management than something like “don't ask, don't tell.”³⁰⁸ With so little to distinguish faithful performance from free-riding, though, EPA's options in judging the deployment of BMPs to meet TMDL obligations

³⁰³ See Walter & Merritts, *supra* note 302, at 300 (conjecturing that the immense number of milldams in Pennsylvania's Susquehanna basin from the 17th to the 19th century permanently altered the geomorphology of its streams and, thus, the sedimentation therein).

³⁰⁴ As Merritts and colleagues argue, “[i]f upland soil erosion were the dominant source of sediment to streams, and if the resultant sediment loads were the predominant control on channel geometry, then stream channels should be more stable after many decades of soil-conservation practices. Yet, many streams in the [watershed] continue to be unstable and degrading . . .” Merritts et al., *supra* note 302, at 984.

³⁰⁵ Merritts and colleagues conclude from their case studies that restoring riparian wetlands buried beneath historic sediment, rather than restoring incised streams channels or planting riparian trees, “could be a more effective and sustainable approach” to reducing downstream sediment and nutrient transport. *Id.* at 1001. Whether the restoration work in the Chesapeake should shift to alluvial wetlands restoration over forested stream buffers, though, turns almost entirely on what *confidence* can be placed in Merritts et al., a study the authors themselves said only “raise[d] questions.” *Id.* at 1004.

³⁰⁶ Since 2003, the partners have been submitting their annual BMP data in a uniform format EPA funds helped create. NRC EVALUATION, *supra* note 10, at 61. Still, though partners may have a relatively “good understanding of wastewater discharges and state cost-shared BMP” adoptions, *id.* at 62, various data privacy restrictions, data management failures, and the inherent complexity and costs of field verification limit the partners' knowledge of BMP adoptions. *Id.* at 68–72. Without multiple, redundant methods for locating BMPs and verifying their existence, varied counting practices result. See Caitlin A. Grady et al., *Locating Existing Best Management Practices Within a Watershed: The Value of Multiple Methods*, 49 J. AM. WATER RES. ASS'N 883 (2013).

³⁰⁷ See NRC EVALUATION, *supra* note 10, at 68–83.

³⁰⁸ What little empirical research has been done does not support the claim that BMPs are more likely to be adopted as a result of “collaboration” with landowners than they are from other approaches. See Joseph T. Campbell et al., *Does Collaboration Promote Grass-Roots Behavior Change? Farmer Adoption of Best Management Practices in Two Watersheds*, 24 SOC'Y & NAT. RES. 1127, 1137 (2011) (“Analysis indicates that farmers in a watershed with grass-roots collaborative partnerships do not have higher rates of BMP adoption than farmers in a watershed without a collaborative partnership. However . . . participants in the partnership exhibited higher levels of BMP adoption than did nonparticipants in the same watershed.”).

are limited. The solution is not necessarily more information about its estimates' limitations;³⁰⁹ nor is it necessarily more "guidance" on BMP assessment or verification.³¹⁰ As a complex mechanistic (not statistical) model, a single point estimate for the certainty/uncertainty with which TMDL's predictions are offered would be extremely difficult (if not impossible) to calculate, let alone communicate effectively.³¹¹ EPA, too, must learn-by-doing, using the partners' own best available information to hold them accountable.³¹² Neither the CBP nor EPA has treated the Chesapeake TMDL models as "answer machine[s]."³¹³ Yet, as Section C shows, model uncertainty has become the default argument against WIP implementation and enforcement.

C. *Collaboration's Assurances: Ruining the Magic?*

Pollution "trading" programs have long been billed as the way to minimize the costs of its control.³¹⁴ For example, with point sources

³⁰⁹ Even were EPA to risk the intergovernmental goodwill accrued by critically scrutinizing a partner's claims of BMP implementation, there is no guarantee that it would improve anyone's incentives. It could just as easily reveal facts undermining assumptions in the Bay model system and/or Scenario Builder and empower those who would delay or derail implementation. For example, were EPA to discover that certain BMPs (e.g., streamside buffers) are less efficient than Scenario Builder assumes, it could face litigation over the use of a model to "bind" regulated parties without the proper basis in fact. *Cf. McLouth Steel Products Corp. v. Thomas*, 838 F.2d 1317, 1321 (D.C. Cir. 1988) ("The agency treated the model as conclusively disposing of certain issues On those issues, EPA was simply unready to hear new argument. The model thus created a norm with 'present-day binding effect' on the rights of . . . petitioners.").

³¹⁰ The *Basinwide Framework*, a CBP document, disclaims any effect on EPA's "accountability role" in the seeking of "reasonable assurance[s]" under the TMDL and/or EPA's modes of verifying cost-shared and/or grant-funded implementation. *See Basinwide Framework*, *supra* note 291, at 39–40.

³¹¹ *See Paolisso et al.*, *supra* note 165, at S102–103. The low value of such information should weigh against its being sought. *Cf. PRESIDENTIAL/CONG. COMM'N ON RISK ASSESSMENT AND MGMT., FRAMEWORK FOR ENVIRONMENTAL HEALTH RISK MANAGEMENT, FINAL REPORT: VOL. 1 (1997)* (finding that estimations of uncertainty are unhelpful where "risk-related decisions are routine, made at the local level, and do not involve large stakes.").

³¹² *Cf. Rubin, The Myth of Accountability*, *supra* note 56, at 2132 (observing that accountability can be achieved in such circumstances because a "superior need not regard itself as the sole source of policy initiatives, but may view itself as participating in a mutual learning process with its subordinates" by using very general standards which are more fully articulated by the subordinates as they progress).

³¹³ Wagner et al., *supra* note 45, at 347–48 (calling this "the core misunderstanding" of models).

³¹⁴ This has been especially true with nutrients and polluted runoff. *See, e.g., PAUL FAETH, FERTILE GROUND: NUTRIENT TRADING'S POTENTIAL TO COST-EFFECTIVELY IMPROVE WATER QUALITY 1–2 (2000)*. Several analysts have examined the Chesapeake experience from

paying farmers to adopt BMPs that achieve the same or better pollution abatements than they themselves could, Pennsylvania's program has aimed to unite point and nonpoint sources in collective reductions at the least cost.³¹⁵ Calculating and verifying *actual* reductions in trades and offsets, though, has arguably become as prescriptive as more traditional tools. With the state's TMDL obligations expressed in terms of gross "loads" to the Susquehanna basin, its citizens' ingenuity for reducing expected discharges at the least cost may be its richest resource.³¹⁶ It must first convince its partners that the reductions are real, though.

To verify reductions with reasonable assurances EPA has sought detailed agreements between traders, an "uncertainty" ratio of 2:1 for pollution abated to that allowed, quantified demonstrations of "baseline" equivalence, representative sampling done at locations claiming to have achieved the reductions, serious and transparent credit calculation reviews and some means of ensuring credits' "permanence," i.e., that management practices are conducted annually and not just at the outset.³¹⁷ EPA has insistently questioned Pennsylvania's commitments to any of this.³¹⁸ A skeletal "appendix" on offsets accompanied the TMDL,³¹⁹ begging the question whether its "assumptions and requirements"³²⁰ would govern permittees too.³²¹ But as early as 2012, EPA began asking Pennsylvania's Department of Environmental Protection ("PADEP") hard questions about the "baselines" of controls it had assumed for its credit program and their consistency with the assumptions in the Bay TMDL model.³²² Without proof of their equivalence, PADEP could easily make any farm's

this perspective. See e.g., Lisa A. Wainger, *Opportunities for Reducing Total Maximum Daily Load (TMDL) Compliance Costs: Lessons from the Chesapeake Bay*, 46 ENVTL. SCI. & TECH. 9256 (2012).

³¹⁵ Wainger, *supra* note 314, at 9260–61.

³¹⁶ Cf. Wainger, *supra* note 314, at 9261–62 (showing that costs of compliance with TMDL LAs and WLAs can, in theory, fall dramatically through the use of trading and offsets).

³¹⁷ See U.S. ENVTL. PROT. AGENCY REGION III, COMPONENTS OF CREDIT CALCULATION: EPA TECHNICAL MEMORANDUM (2014); U.S. ENVTL. PROT. AGENCY REGION III, ACCOUNTING FOR UNCERTAINTY IN TRADING AND OFFSET PROGRAMS (2014).

³¹⁸ See U.S. ENVTL. PROT. AGENCY REGION III, PENNSYLVANIA'S TRADING AND OFFSET PROGRAM REVIEW OBSERVATIONS (2012) (copy on file with author) [hereinafter REVIEW OBSERVAIONS].

³¹⁹ See CHESAPEAKE TMDL, *supra* note 147, at App. S.

³²⁰ 40 C.F.R. § 122.44(d)(1)(vii)(B) (2015).

³²¹ See *supra* notes 68–72 and accompanying text.

³²² See REVIEW OBSERVATIONS, *supra* note 318, at 3. Because Pennsylvania defined its credits in terms of a "unit of compliance" as opposed to a quantity of pollutant, *id.* at 4, the "baseline" in question turns on the extent of controls in place at the subject facility. *Id.* at 7.

status quo look like cuts below the TMDL's allocations.³²³ Being an upstream state, Pennsylvania is perhaps better situated to achieve its reductions by offsets and trading than the tidal states.³²⁴ But PADEP's disagreements with EPA, together with EPA's eventual "backstop" designation of Pennsylvania for its failure to make good on its commitments,³²⁵ have kept the trading genie mostly in the bottle.³²⁶

Pollutant trading, if it is to be done with reasonable assurances, becomes every bit the prisoner of information and uncertainty as other, more traditional tools.³²⁷ EPA's flow of "technical memoranda," released by the CBP publicly to articulate its expectations of trading programs, has arguably reprised the role its WIP guidance played in 2010 and 2011.³²⁸ In private correspondence between EPA Region III and PADEP, these technical memos and EPA's repeated objections to PADEP's failure to meet their particulars came to an impasse in fall 2014.³²⁹ PADEP had complained that the Bay model was wrong,³³⁰ that legacy sediment in the Susquehanna basin's milldam-impacted streams was more serious than

³²³ See REVIEW OBSERVATIONS, *supra* note 318, at 6–10. The TMDL identified and assigned WLAs to 183 "significant" sewage treatment works and 30 significant industrial wastewater facilities in Pennsylvania. See CHESAPEAKE TMDL, *supra* note 147, at 9–20 – 9–28.

³²⁴ Water quality trading may be inherently limited in its capacity to reduce costs of compliance if trades or offsets must occur within a single watershed. Cf. Dave Owen & Colin Apse, *Trading Dams*, 48 U.C. DAVIS L. REV. 1043, 1080–1102 (2015) (analyzing the trade-offs and challenges of crediting one dam's improvement or removal to some other's continued harms).

³²⁵ ENVTL. PROT. AGENCY, EVALUATION OF PENNSYLVANIA'S 2012–2013 AND 2014–2015 MILESTONES 2, 6–7 (2014), available at <http://www.epa.gov/sites/production/files/2015-06/documents/pa.pdf> [<https://perma.cc/S28S-KLLL>].

³²⁶ The "transaction costs" that stem from uncertainty can easily become a bottleneck in pollution trading schemes. See Robert N. Stavins, *Transaction Costs and Tradeable Permits*, 29 J. ENVTL. & ECON. MGMT. 133 (1995). PADEP counted only a handful of trades before EPA's intervention and PADEP's own amendments to the trading program. The latest adjustments will almost certainly make trades and offsets more difficult.

³²⁷ See SARA WALKER & MINDY SELMAN, WORLD RESOURCES INST. ISSUE BRIEF: ADDRESSING RISK AND UNCERTAINTY IN WATER QUALITY TRADING MARKETS (2014). The WRI report confirms what the TMDL's "Appendix S" had conveyed: that new or increased loads anywhere in the watershed, to be fully and effectively offset, must be "quantified using appropriate metrics" and the offsets must be "routinely verified to ensure that they are producing expected reductions." CHESAPEAKE TMDL, *supra* note 147, at S-3.

³²⁸ See EPA TECHNICAL MEMORANDUM ON TRADING AND OFFSETS, available at <http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/EnsuringResults.html> [<https://perma.cc/8KLD-CE4L>].

³²⁹ See Letter from Kelly Jean Heffner, Deputy Sec., Penn. Dep't of Env'tl. Prot. to Jon Capacasa, Director, Water Prot. Div., U.S. EPA Region III (Oct. 8, 2014) [hereinafter Heffner Letter].

³³⁰ *Id.* at 3.

believed,³³¹ and that its experience with trading (nominally dating to 2005) was being ignored.³³² It threatened legal action, at least vaguely.³³³ But as soon as EPA began objecting to NPDES permits utilizing a trade or offset, PADEP's attention to the deficits EPA named was swift and focused. PADEP's complaint that EPA was enforcing mere "guidelines" as "requirements"³³⁴ was in vain; it amended its trading program, at least informally, ostensibly addressing EPA's concerns.³³⁵

The coercion in EPA's approach may have been less motivating than was the fact that the Susquehanna's effects on the Bay are now so long studied that EPA's WQC and 2010 TMDL allocations were more akin to math than to the collection plate at church.³³⁶ Then again, the "model uncertainty" inherent in the Chesapeake Bay model system and its hundreds of mechanisms remains substantial.³³⁷ Whatever the motivation, Pennsylvania could not simply walk away from its WIPs this deep into its promises to "collaborate,"³³⁸ promises that all the partners had aimed directly into the TMDL and its implementation. So it is almost certainly due at least in part to what underlay EPA's position: the common need for "reasonable assurances" and the legal coupling of WQSSs with discharge permitting.³³⁹ Without both, EPA's tactics would have been more questionable.

³³¹ PENN. PHASE II WIP, *supra* note 295, at 4.

³³² Heffner Letter, *supra* note 329, at 3.

³³³ PENN. PHASE II WIP, *supra* note 295, at 4 (calling EPA's model "legally suspect" and "arbitrary and capricious").

³³⁴ Heffner Letter, *supra* note 329, at 3. Pennsylvania might have challenged the use of the technical memos as "rules" pursuant to the APA, although these memos' place within EPA's "enforcement discretion" would have made any such claim a long shot. *Cf. Reno v. American-Arab Anti-Discrimination Comm.*, 525 U.S. 471, 490 ("[T]he Government's enforcement priorities and . . . the Government's overall enforcement plan are not readily susceptible to the kind of analysis the courts are competent to undertake.") (quoting *Wayte v. United States*, 470 U.S. 598, 607–08 (1985)); *see infra* note 344 and accompanying text.

³³⁵ *See* Pennsylvania Dep't of Env'tl. Protect., *Wastewater Supplement to Phase 2 Watershed Implementation Plan*, Revised, Sept. 17, 2015, available at http://files.dep.state.pa.us/Water/Wastewater%20Management/EDMRPortalFiles/Phase_2_WIP_Supplement.pdf [<https://perma.cc/92WC-LVSM>].

³³⁶ *Cf. Sabel & Zeitlin, supra* note 12, at 10–17 (arguing that pressures on peer jurisdictions to publicly justify the positions they take will replace the conventional hierarchical pressures to conform in any properly "experimentalist" ordering).

³³⁷ *See supra* notes 254–60 and accompanying text.

³³⁸ While the EPA/PADEP impasse was brewing, Pennsylvania was negotiating the latest partnership agreement. *See* CHESAPEAKE BAY PROGRAM, CHESAPEAKE WATERSHED AGREEMENT 2014, available at <http://www.chesapeakebay.net/chesapeakebaywatershedagreement/page/P3LT-7253>.

³³⁹ *See supra* notes 134–37 and accompanying text.

Recall that WQSs merge state and federal powers to choose means and ends, amalgamating them in a continuing planning process that renders them the provisional and shared work of both sovereigns. They are the perfect foil for electoral accountability.³⁴⁰ Political competition at each level—and increasingly at local levels—gives *any* aggrieved party a reason to delay—electoral competition is always in progress—which, in turn, sustains high demand for assurances and measurable progress.³⁴¹ Allocating the burdens of uncertainty in this dynamic is a principal key to success. As the critics of collaborative approaches argue, detailed and explicit WQSs can make a big practical difference.³⁴² But calculating the pollution that is compatible with our shared environmental quality goals inevitably sharpens our sense of appropriate contributions.³⁴³ Surviving the inevitable challenge(s) without proof either of the cause/effect relationships behind prescribed ambient conditions *or* the cause/effect relationships linking controls to ambient conditions will remain a litigation risk few experienced administrators want to run, regardless of tool choice. Part IV takes stock of the broader lessons in the Chesapeake.

IV. AN EVOLVED CONCEPT OF LAW IN COERCING COLLABORATION?

Much as the rise of estimative techniques collectivizing the struggle for water quality has featured in the Chesapeake experience, equally important legal maneuvers were made. A deep legal literature traces the

³⁴⁰ Cf. Rubin, *The Myth of Accountability*, *supra* note 56, at 2075–98 (ridiculing the presupposition within most “accountability” arguments that the median voter will be able to attribute responsibility to elected officials of one level or the other, one branch or the other, or for particular choices in a stream of discretionary actions). CWA § 303(e) requires that each state have “a continuing planning process” and EPA’s regulations make it responsible for “periodically reviewing the adequacy of [a] State’s CPP.” 40 C.F.R. § 130.5(a). Because WQSs feature so prominently in a continuing “process,” *id.* § 130.5(b)(1), they are arguably permanently provisional. This has never compromised a WQS’s status as “law,” though, for they unquestionably “preempt” other law. Cf. *Milwaukee v. Illinois*, 451 U.S. 304, 317–18 (1981) (holding that the CWA’s WQSs preempt federal common law actions for tortious pollution of interstate waters).

³⁴¹ See Rubin, *The Myth of Accountability*, *supra* note 56, at 2075–98.

³⁴² See, e.g., Oliver A. Houck, *Cooperative Federalism, Nutrients, and the Clean Water Act: Three Cases Revisited*, 44 ENVTL. L. RPT. 10426, 10431 (2014) (“The difference between numerical and narrative standards is quite simple: one works.”).

³⁴³ Cf. HOUCK, *supra* note 91, at 58 (“The Achilles’ heel of [WQSs]-based regulation has always been the difficulty of ascribing and quantifying environmental effects for particular discharge sources.”); Walker & Selman, *supra* note 327, at 9 (“With climate change we might expect more extreme events than in the past, which will increase the risk of failure of land-based mitigation activities.”).

divide between agency actions with the force of law and those without it.³⁴⁴ A newer literature traces the advent of what is euphemistically known as the “new governance”: the performance-oriented use of informational, collaborative and market tools instead of command-and-control.³⁴⁵ But, as I have argued here and elsewhere, internal agency ordering, particularly the networked, iterative operations so typical of agencies like EPA today, has emptied much of the utility from any simple distinctions between legal and non-legal agency norms, between collaborative and regulatory tools.³⁴⁶ Some courts have embraced a more spectral approach, although not enough of them and not in sharp enough terms. The Chesapeake experience shows how central this aspect of contemporary regulation (and administrative law) has become and why quicker, better progress on this front is needed.

The Chesapeake experience may be unique in the data and program capacity it has amassed. With it, the partners' agents derived precise theories of pollutant fate and transport, of particular species' habitat needs and of the causal relationships between targeted restoration goals and individuated (if also attenuated) threats to a heavily disturbed, dynamic system.³⁴⁷ The problem-solving intermediaries, the CBP and CBC, have remained as pivotal as the regulators, continually updating goals and expectations so as to keep means from becoming ends.³⁴⁸ But they have done more than anyone else to prove that investments in data and program capacity, no matter the scale, are never enough. Even as EPA took massive data sets and crowd-sourced models into defining the parties' pollutant loading obligations and restoration targets, they still needed a complex “accountability framework” grounded in reasonable

³⁴⁴ See, e.g., Robert A. Anthony, *Interpretive Rules, Policy Statements, Guidances, Manuals, and the Like—Should Federal Agencies Use Them to Bind the Public?*, 41 DUKE L.J. 1311 (1992); Robert A. Anthony, *Which Agency Interpretations Should Bind Citizens and the Courts?*, 7 YALE J. REG. 1 (1990); David L. Franklin, *Legislative Rules, Nonlegislative Rules, and the Perils of the Short Cut*, 120 YALE L.J. 276 (2010); William Funk, *When is a “Rule” a Regulation? Marking a Clear Line Between Nonlegislative Rules and Legislative Rules*, 54 ADMIN. L. REV. 659, 661–63 (2002); Kristin E. Hickman, *Unpacking the Force of Law*, 66 VAND. L. REV. 465 (2013); John F. Manning, *Nonlegislative Rules*, 72 GEO. WASH. L. REV. 893 (2004); Thomas W. Merrill & Kathryn Tongue Watts, *Agency Rules with the Force of Law: The Original Convention*, 116 HARV. L. REV. 467, 529–37 (2002); Richard J. Pierce, Jr., *Distinguishing Legislative Rules from Interpretive Rules*, 52 ADMIN. L. REV. 547 (2000); Peter L. Strauss, *The Rulemaking Continuum*, 41 DUKE L.J. 1463, 1466–68 (1992).

³⁴⁵ See *supra* note 12 and accompanying text.

³⁴⁶ See Jamison E. Colburn, *Agency Interpretations*, 82 TEMPLE L. REV. 657 (2009).

³⁴⁷ See *supra* notes 239–48 and accompanying text.

³⁴⁸ *Id.*

assurances to sustain cooperation.³⁴⁹ When the WIPs' promised cuts came due, the very thing missing from EPA's binding regulations—and precisely what had to be disclaimed in the *AFBF* lawsuit challenging the TMDL³⁵⁰—had animated the defunct 2000 TMDL rulemaking: real norms implementing the TMDL.³⁵¹ The Chesapeake TMDL-as-operational-plan, backed by the assurances, spanned the gaps in the law constituting TMDLs.³⁵² It pooled state and local jurisdiction over nonpoint sources, federal jurisdiction over airborne sources, federal grant and subsidy funding and the President's authority over the entirety of the Executive Branch.³⁵³ In short, it fashioned obligations from local, state and federal discretion, which were mutually reinforcing, continuously improving and means/ends effective.

EPA faces challenges constantly where the claim is that it has employed ostensibly “informational” tools to constrain its partners' discretion illegally.³⁵⁴ Federalism hypersensitivities—where any federal policy is immediately denounced as stealing the states' prerogatives—have made that claim all too common.³⁵⁵ The court that hears a majority of these suits, the D.C. Circuit, has a byzantine doctrine meant to separate legitimately informational from regulatory actions.³⁵⁶ The questions mostly boil down to the state of the law before and after the action and whether the action itself changed anyone's legal rights or duties.³⁵⁷ But this has become a permanent muddle. This part borrows a broader theory sorting the proper from the improper uses of informational and regulatory tools, a theory rooted in the parties' relative competencies in multi-jurisdictional environmental work. The principal focus is on mapping that theory to the Chesapeake TMDL and its supporting norms to show how the Chesapeake experience should inform other watershed-wide efforts and

³⁴⁹ *Id.*

³⁵⁰ See *supra* notes 208–16 and accompanying text.

³⁵¹ See *supra* notes 107–18 and accompanying text.

³⁵² See *supra* notes 181–204 and accompanying text.

³⁵³ See *supra* notes 226–48 and accompanying text.

³⁵⁴ See Kalen, *supra* note 53; Richard J. Lazarus, *The Tragedy of Distrust in the Implementation of Federal Environmental Law*, 54 L. & CONTEMP. PROBS. 311 (1991).

³⁵⁵ See, e.g., *Virginia v. EPA*, 108 F.3d 1397 (D.C. Cir. 1996); *Clean Air Implementation Proj. v. EPA*, 150 F.3d 1200 (D.C. Cir. 1998); *Appalachian Power Co. v. EPA*, 208 F.3d 1015 (D.C. Cir. 2000); *Util. Air Regulatory Group v. EPA*, 320 F.3d 272 (D.C. Cir. 2003); *Nat'l Ass'n of Home Builders v. Norton*, 415 F.3d 8, 16 (D.C. Cir. 2005); *Iowa League of Cities v. EPA*, 711 F.3d 844 (8th Cir. 2013); *Nat'l Mining Ass'n v. McCarthy*, 758 F.3d 243 (D.C. Cir. 2014).

³⁵⁶ See Kalen, *supra* note 53, at 677–82 (noting an increasingly hostile D.C. Circuit that manipulates the term “binding” to its own preferred ends); Manning, *supra* note 344, at 914–27.

³⁵⁷ See Manning, *supra* note 344, at 917–23.

even, perhaps, larger scale collective contributory goods. Section A explains the balance of precision and flexibility struck in the Chesapeake while Section B argues why it should matter in court.

A. *Keeping Precision and Flexibility in Check: On Norms in the Chesapeake*

CWA § 303's record nationally shows how reserving too much discretion ("flexibility") is sub-optimal, both as to means and ends.³⁵⁸ The TMDL's federal WQC, sub-basin caps and detailed LA/WLA listed by sector and major source (what we may call its *resolution*) were equaled in credibility by Executive Order 13508, EPA's *Consequences Letter*, its WIP guidance and the CBP's technical memoranda (collectively, the TMDL's *assurances*).³⁵⁹ The TMDL's resolution and assurances combined exerted real *power* over the Bay jurisdictions.³⁶⁰ Although Judge Rambo and the Third Circuit denied a slew of claims rooted in the rhetoric of overreach,³⁶¹ any number of prominent recent precedents could have supported the opposite conclusions.³⁶² So what about the Chesapeake experience *should* protect the TMDL and its auxiliary norms from legal overthrow?

Often in law, the reasons for clarity and finality outweigh those of leaving things undecided—of leaving them to later decision.³⁶³ "Legal institutions convert information, a set of norms, decisional capacity, and enforcement capacity into decisions that they expect to have more value

³⁵⁸ See *supra* notes 100–18 and accompanying text. See David A. Super, *Against Flexibility*, 96 CORNELL L. REV. 1375, 1417–23 (2011) (arguing that the justifications for "flexibility" and leaving things undecided in anticipation of acquiring better information are flawed logically and that, in many cases, flexibility induces demonstrably inferior decisions).

³⁵⁹ See *supra* notes 92–118 and accompanying text.

³⁶⁰ See *supra* notes 322–39 and accompanying text.

³⁶¹ See *Am. Farm Bureau Fed'n v. EPA*, 984 F. Supp. 2d 289, 313–33 (M.D. Pa. 2013).

³⁶² See, e.g., *Iowa League of Cities*, 711 F.3d at 864 (finding EPA letter to Senator transmitting EPA's interpretation of its rules was "promulgation" of new "effluent limitation" because it led others to believe that "failure to conform will bring adverse consequences"); *Appalachian Power Co. v. EPA*, 208 F.3d 1051, 1021 (D.C. Cir. 2000) (finding a permitting guidance was "binding" because, as a practical matter, parties faced possible sanctions for acting contrary thereto); *Barrick Goldstrike Mines, Inc. v. Browner*, 215 F.3d 45, 47–48 (D.C. Cir. 2000) (finding agency denial of petitioner's claimed exemption was final and binding agency action because petitioner "must change its conduct or risk costly sanctions").

³⁶³ Compare VERMEULE, *supra* note 253, at 179 ("There is a cost to the judicial focus on particulars. Abstraction may represent a virtue and detail a vice. It is not the case that decisions made with more information are always superior to decisions made with less information."), with Super, *supra* note 358, at 1377 ("One of law's most basic functions is to displace decisions across time. A system without temporal displacement is one of will, not of law.").

than that of the inputs required to produce those decisions.”³⁶⁴ CWA § 303 merged state, federal and intermediary institutions’ four factors of production into a networked, continuously evolving hybrid that for years paid insufficient attention to the perils of inaction and non-decision. Nutrient loadings to surface waters and their effects have evaded general decisions nationally.³⁶⁵ Regional goals, composited from local knowledge and precise estimates of nutrient fate and transport have been two keys to action in the Chesapeake.³⁶⁶ Without something like the TMDL’s resolution and the jurisdictions’ mutual assurances of its implementation, any single partner’s inaction, and thus any single source’s freedom, was too easy to justify. But by using its own (incomplete) jurisdiction to prescribe and adjudicate, EPA put effective pressure on virtually all contributors. Of course, without the regulations requiring that discharge permits be conformed to applicable WQSs and TMDLs,³⁶⁷ none of EPA’s leverage would have existed (EPA learned long ago that courts will not abide its objections to individual permits unless it is grounded in some general standard announced *ex ante*).³⁶⁸ In short, EPA’s enforcement discretion—so keenly focused by its own regulations, interstate competition and the record of futile past efforts was used to spur collaborative collective action generating a basin-wide regime.³⁶⁹

It would be a mistake to ignore modeling’s role in this evolution. Ideally, evidentiary and inferential methods are always “transparent” and explicable.³⁷⁰ In reality, such norms too often empower the specially interested minority to engage in litigious “sandbagging”³⁷¹ with the help of generalist judges most concerned to right wrongs in their own case.³⁷²

³⁶⁴ Super, *supra* note 358, at 1399.

³⁶⁵ See URGENT CALL TO ACTION, *supra* note 13. The 1998 announcement of a “Clean Water Action Plan” ostensibly turned national attention toward a “watershed approach” against “runoff from city streets, rural areas, and other sources.” U.S. EPA and Dep’t of Agric., Notice of Availability of Clean Water Action Plan, 63 Fed. Reg. 14109, 14109 (1998). Since then there has been little “action” against nutrients except on a state-by-state, and now regional basis.

³⁶⁶ See *supra* notes 158–61 and accompanying text.

³⁶⁷ See 40 C.F.R. §§ 122.44(d)(1), 122.4(i).

³⁶⁸ See *Wash. v. U.S. EPA*, 573 F.2d 583 (9th Cir. 1978); *Ford Motor Co. v. U.S. EPA*, 567 F.2d 661 (6th Cir. 1977).

³⁶⁹ See AYRES & BRAITHWAITE, *supra* note 9, at 35–51.

³⁷⁰ See Pasky Pascual et al., *Making Method Visible: Improving The Quality of Science-Based Regulation*, 2 MICH. J. ENVTL. & ADMIN. L. 429, 468 (2013).

³⁷¹ See *id.* at 470.

³⁷² An especially instructive reversal of a district judge’s overreaching use of arbitrariness review is *San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581, 599–638 (9th Cir. 2014).

“It is one thing to note that methods are invisible, but it is quite another to imagine how the regulatory discussions would look if methods were more centrally discussed,”³⁷³ or to enforce norms against agencies attempting to solve intractable factual and collective action problems at once.³⁷⁴ As both Hayek and the new governance scholars have insisted, human knowledge is not just “fragmented, diffuse, and contextual.”³⁷⁵ Very often, it is “tacit”: “people . . . come to know many things that they cannot consciously explain to others or even to themselves.”³⁷⁶ Deliberation in such contexts is too often a waste of time; legal requirements in its name are worse. The courts rightly rejected the Farm Bureau’s process criticisms of the Chesapeake TMDL for this reason.³⁷⁷

Still, as poultry manure on Maryland’s Eastern Shore and milldams in Pennsylvania’s past illustrate,³⁷⁸ using central or standard estimates in aggregative planning is as perilous as it is necessary. Some think it better to await true knowledge’s arrival.³⁷⁹ But EPA’s approach to water quality criteria, allowing states’ use of anything not provably wrong,³⁸⁰

³⁷³ Pascual et al., *supra* note 370, at 459.

³⁷⁴ See SIDNEY A. SHAPIRO & ROBERT L. GLICKSMAN, RISK REGULATION AT RISK: RESTORING A PRAGMATIC APPROACH 193–204 (2003).

³⁷⁵ See Amy J. Cohen, *Governance Legalism: Hayek and Sabel on Reason and Rules, Organization and Law*, 2010 WISC. L. REV. 357, 363 (2010).

³⁷⁶ *Id.* at 363. For Hayek’s account, see F.A. Hayek, *The Use of Knowledge in Society*, 35 AMER. ECON. REV. 519, 526–27 (1945) (arguing that the “price system” is an “economy of knowledge” wherein individual participants need to know little “in order to be able to take the right action” and in which “only the most essential information is passed on, and passed on only to those concerned”). For the new governance account, see Dorf & Sabel, *supra* note 12, at 292–314.

³⁷⁷ See *Am. Farm Bureau Fed’n v. EPA*, 984 F. Supp. 2d 289, 333–43 (M.D. Pa. 2013) (rejecting process claims); *Am. Farm Bureau Fed’n v. EPA*, 792 F.3d 281, 306–08 (3d Cir. 2015).

³⁷⁸ See *supra* notes 254–60, 302–05, and accompanying text.

³⁷⁹ See, e.g., Alexandra Dapolito Dunn & Meghan Boian, *Postcards from the Edge: Perspectives to Reinvigorate Clean Water Act Cooperative Federalism*, 5 J. ENERGY & ENVTL. L. 68, 73–79 (2013). Most recent precedents suggest that modeling in itself adds nothing to a case against an agency for arbitrariness. See, e.g., *San Luis & Delta-Mendota Water Auth. v. Jewell*, 747 F.3d 581, 616–34 (9th Cir. 2014); *Upper Blackstone Water Pollution Abatement Dist. v. U.S. EPA*, 690 F.3d 9, 24–29 (1st Cir. 2012); *Alaska v. Lubchenco*, 825 F. Supp. 2d 209, 215–23 (D.D.C. 2011); *Northwest Coalition for Alternatives v. U.S. EPA*, 544 F.3d 1043, 1048–53 (9th Cir. 2008). On the other hand, where the agency’s model rests upon erroneous data or assumptions, see, e.g., *Columbia Falls Aluminum Co. v. EPA*, 139 F.3d 914, 922–24 (D.C. Cir. 1998), or has not been subjected to adequate notice and comment, see, e.g., *Owner-Operator Indep. Drivers Ass’n v. Fed. Motor Carrier Admin.*, 494 F.3d 188, 199–203 (D.C. Cir. 2007), judicial review has been a highly potent check.

³⁸⁰ See 40 C.F.R. § 131.11(b)(1)(iii) (any grounds “scientifically defensible” will suffice).

abetted decades of inaction in the Chesapeake (and elsewhere).³⁸¹ Unprecedented expansion in both animal agriculture and impervious infrastructure underlay a prolonged deferral of quantified, detailed and obligatory pollutant reductions dragged on in the name of “cooperation.”³⁸² Rarely have courts proven capable of sorting out this continuum.³⁸³ Mostly they rule it out of judicial review’s purview.³⁸⁴

What EPA, the CBP and the Obama White House synthesized in the Chesapeake was something between these poles: a means of spurring sub-national jurisdictions into using their own local knowledge—if they have it—backed by sufficient assurances that *everyone* would do their part, or else effective proxy actions would ensue. This synthesis should be replicable elsewhere for other, similar problems. Section B situates this development in the doctrine.

B. Threats, Plans and Power: Toward Reviewability in Coerced Collaboration

Had the TMDL been judged sufficiently “binding” or coercive, it would have been invalidated as exceeding EPA’s authority³⁸⁵ or as having been adopted without the requisite process.³⁸⁶ Had EPA’s WIP guidances, consequences letters, or technical memos been challenged, they might have been vacated as improperly adopted “legislative” rules.³⁸⁷ Had EPA’s demand for “reasonable assurances” been better litigated, it might have been enjoined as “plainly inconsistent” with 40 C.F.R. § 130.2(i).³⁸⁸ Finally,

³⁸¹ See, e.g., Steve Szkotak, *Grant withdrawal stalls W.Va.’s No. 1 bay project*, ASSOCIATED PRESS STATE WIRE: VIRGINIA, Sept. 24, 2011.

³⁸² See *supra* notes 151–53 and accompanying text.

³⁸³ But see *Massachusetts v. EPA*, 549 U.S. 497, 528–35 (2007).

³⁸⁴ See, e.g., *Natural Res. Defense Council v. FDA*, 760 F.3d 151, 154–56 (2d Cir. 2014); *WildEarth Guardians v. EPA*, 751 F.3d 649, 650 (D.C. Cir. 2014); *Defenders of Wildlife v. Gutierrez*, 532 F.3d 913 (D.C. Cir. 2008); *New York Pub. Interest Research Group v. Whitman*, 321 F.3d 316 (2d Cir. 2003).

³⁸⁵ See *supra* notes 206–12 and 344 and accompanying text.

³⁸⁶ See, e.g., *Owner-Operator Indep. Drivers Ass’n v. Fed. Motor Carrier Admin.*, 494 F.3d 188, 199–203 (D.C. Cir. 2007).

³⁸⁷ The APA requires notice and comment procedures for “legislative” rules but not for “interpretative” rules or “general statements of policy.” Because the Supreme Court has rarely attempted to do so, the lower federal courts, especially the D.C. Circuit, have had to differentiate these categories (to rather dubious results). See Manning, *supra* note 344, at 914–27. Neither of EPA’s two WIP guidance documents were subject to notice and comment.

³⁸⁸ 40 C.F.R. § 130.2(i) defines the component values of a TMDL’s calculations. Agencies’ interpretations of their regulations are ordinarily controlling unless they are “plainly erroneous or inconsistent” therewith. See *Decker v. Northwest Env’tl. Def. Ctr.*, 133 S. Ct.

had someone challenged the setting of 2025 as the overall goal for 60% of Bay segments' attainment of their WQs, the executive power to "faithfully execute" the law might have invalidated everything.³⁸⁹ Decades of CWA practice show each of these steps was as vital as it was vulnerable. Is a TMDL ever a purely "informational" norm?³⁹⁰ Are federal WQC purely recommendatory if EPA rejects a state's deviation therefrom for lack of conclusive proof of its validity? Could Maryland or Virginia even *possibly* restore and maintain the Bay's "chemical, physical, and biological integrity" without the increasing federalization finally undertaken?³⁹¹

When courts must sort out whether an agency's action is binding, their search may take them beyond the formalities and labels into whether the action *compels* compliance with its terms as would a law.³⁹² Even press releases can compel regulated parties under the right circumstances.³⁹³ But courts evidently are not as good at this analysis as we would expect. For their inquiry into whether an agency's action has *changed* the law's content is carried out without much sense of what law and discretion have become in the administrative state. What does it mean for EPA to *compel* another regulator's choices? Is that compulsion constitutive of law or obligation? An agency like EPA has myriad kinds of *power* over states, the regulated community and other stakeholders.³⁹⁴ But when a court agrees to sort out whose discretion it should be to make or to bracket some decision in a coercive/collaborative context, it has to construe the

1326, 1337 (2013). The same claim by different means would be to challenge EPA's use of its 1991 TMDL guidance as an improperly adopted "legislative" rule. *See, e.g.,* Appalachian Power Co. v. EPA, 208 F.3d 1015, 1023 (D.C. Cir. 2000).

³⁸⁹ *Cf.* OLC Memo on DACA, *supra* note 198, at 5 ("Limits on enforcement discretion are both implicit in, and fundamental to, the Constitution's allocation of governmental powers between the two political branches.") (citing *Youngstown Sheet & Tube Co. v. Sawyer*, 343 U.S. 579 (1952)).

³⁹⁰ *See supra* note 107 and accompanying text.

³⁹¹ 33 U.S.C. § 1251(a) (2012); *cf. id.* § 1251(b) (recognizing as "the policy of the Congress" to preserve the "primary responsibilities and rights of States to prevent, reduce, and eliminate pollution . . .").

³⁹² *See* Kalen, *supra* note 53, at 677–82; Manning, *supra* note 344, at 914–27; Colburn, *supra* note 346, at 690–92.

³⁹³ *See* CropLife America v. EPA, 329 F.3d 876, 881–84 (D.C. Cir. 2003) (finding that agency press release had a compulsive effect on regulated parties); Iowa League of Cities v. EPA, 711 F.3d 844, 864 (8th Cir. 2013) (finding that agency's letter answering Senator's inquiry would have compulsive effect on regulated parties).

³⁹⁴ *See* Appalachian Power Co. v. EPA, 208 F.3d 1015, 1023 (finding from its context that EPA's monitoring guidance for Clean Air Act permits was the agency giving its partner states "their 'marching orders'" expecting them "to fall in line, as all have done, save perhaps Florida and Texas."); Iowa League of Cities, 711 F.3d at 861–76.

real meaning of an agency's rules, the agency's practices implementing them and the source(s) of the agency's residual authority in *a single case*.³⁹⁵ An intransitive statute is only the surface of that context; highly contingent, dynamic, polarized relationships and intergovernmental and partisan frictions comprise much more of it.³⁹⁶ Thus, the reviewing court must identify, weigh and reconcile factors for which it has no expertise and too little coherent judicial doctrine.³⁹⁷

Between the doctrines of ripeness,³⁹⁸ the APA's requirement of "final agency action"³⁹⁹ and the messy differentiation of "legislative" from all other kinds of agency rules,⁴⁰⁰ there are ample filters confining such review.⁴⁰¹ Given their uneven application, though, they do not check abuses of the cause of action purely for leverage. And it is often a lot of leverage given the risks of free-riding, compressed schedules and uncertainty. The judicial impulse to hold agencies "accountable" will remain grounded in a mythic view of the state until it updates its software, so to speak, to grapple with the complex nature of legal discretion and obligation today.⁴⁰² The property of *bindingness* is too crude.⁴⁰³ Government-backed coercion may

³⁹⁵ Cf. *Nat'l Mining Ass'n v. McCarthy*, 758 F.3d 243, 252 (D.C. Cir. 2014) (holding that in reviewability the "most important factor concerns the actual legal effect (or lack thereof) of the agency action in question on regulated entities" and analyzing challenged agency rule in the context of its addressees, its imperative wording, the authorizing statute, existing practices, the possibility of penalties for noncompliance, the state's views, etc.).

³⁹⁶ *Id.* at 249, 252.

³⁹⁷ *Id.* at 252.

³⁹⁸ See, e.g., *Ohio Forestry Ass'n v. Sierra Club*, 523 U.S. 726 (1998).

³⁹⁹ See, e.g., *FTC v. Standard Oil Co. of Cal.*, 449 U.S. 232 (1980); *Bennett v. Spear*, 520 U.S. 154 (1997).

⁴⁰⁰ See, e.g., *Lincoln v. Vigil*, 508 U.S. 182 (1993).

⁴⁰¹ The "puzzling" presumption of reviewability, which often mixes ripeness with finality doctrines, has resulted in a crazy-quilt family of doctrines for interpreting enabling statutes, precedent, and the APA. See Nicholas Bagley, *The Puzzling Presumption of Reviewability*, 127 HARV. L. REV. 1285 (2014). See, e.g., *Reliable Auto. Sprinkler Co. v. CPSC*, 324 F.3d 726, 731–35 (D.C. Cir. 2003); *General Motors Corp. v. EPA*, 363 F.3d 442, 449–53 (D.C. Cir. 2004); *Nat'l Ass'n of Home Builders v. Norton*, 415 F.3d 8, 11–17 (D.C. Cir. 2005); *Cement Kiln Recycling Coalition v. EPA*, 493 F.3d 207, 214–18 (D.C. Cir. 2007).

⁴⁰² Cf. RUBIN, *BEYOND CAMELOT*, *supra* note 48, at 235 ("The concept of legal rights is not merely under-inclusive, in that it applies only to those benefits that are enforced by adjudication, but over-inclusive as well. It confers a misleading dignity on certain governmental actions that fail to provide any real benefits."); Bagley, *supra* note 401, at 1336 (arguing that because it is "unjustified in principle and harmful in practice" the presumption of reviewability of agency rules should be "scrapped" in favor of a more contextual approach to each statute and its signals about how to optimize judicial review in its administration).

⁴⁰³ For example, the compliance order at issue in *Sackett v. EPA*, 132 S. Ct. 1367 (2012), was found to be "binding" and "final" because it exerted coercive pressure on the Sacketts—despite the fact that EPA could only enforce its order by suing them in court, whereupon

be much of what distinguishes legal from other obligations,⁴⁰⁴ but for purposes of intergovernmental relations it should be a certain *kind* of coercion. Proper respect for the lack of judicially manageable standards⁴⁰⁵ would not preclude review where abuses of discretion are plain. But an abuse in this context can only be proven from the reasons *why* an administrator has sought to constrain, focus or consolidate legal discretion with some tool, whether informational or regulatory, which others find coercive.⁴⁰⁶

In the Chesapeake starting in 2009 the TMDL's resolution and assurances filled a void left by decades of partial cooperation.⁴⁰⁷ EPA navigated it around the wreckage of the 2000 TMDL rule-making.⁴⁰⁸ Paying close attention to the stakes, stakeholders and available knowledge and tools, EPA's coercion of states and the District was *proportionate to the risks* each jurisdiction's failures represented.⁴⁰⁹ Free-riding was one, but a subtly different risk—the excuse non-contributors create for others—was also afoot.⁴¹⁰ The microeconomic creed that for any pollution problem there are least-cost avoiders to be found, coupled with the political conviction that states are best positioned to find them, drove the bargain.⁴¹¹ Sustaining credible commitments from all partners backed by needed assurances, estimative analysis and the means of continuously improving it all, demanded as much.⁴¹² The fact that EPA did so transparently and

a court would review the order's validity. *Id.* at 1372. What the Supreme Court was either unable or unwilling to explain is why, before any "strictly legal" consequences ensued, *Ohio Forestry*, 523 U.S. at 733, EPA's order was nevertheless "binding" on the Sacketts. A legal right awaiting adjudication—with the burden of proof in its favor—cannot have been violated by *ipse dixit* unless it was no *right* in the first place. *Cf.* Walter Wheeler Cook, *Introduction: Hohfeld's Contribution to the Science of Law*, in WESLEY NEWCOMB HOHFELD, *FUNDAMENTAL LEGAL CONCEPTIONS AS APPLIED IN JUDICIAL REASONING* 7 (Walter Wheeler Cook ed. (1946)) ("*Right* in the narrow sense—as the correlative of *duty* . . . signifies one's affirmative claim against another, as distinguished from 'privilege,' one's freedom from the right or claim of another.").

⁴⁰⁴ *Cf.* SCHAUER, *supra* note 219, at 40 ("Coercion may be to law what flying is to birds: not strictly necessary but so ubiquitous that a full understanding of the phenomenon requires that we consider it.")

⁴⁰⁵ *See* Manning, *supra* note 344, at 929–37.

⁴⁰⁶ *See id.* at 893–94.

⁴⁰⁷ *See* 1983 CHESAPEAKE BAY AGREEMENT, *supra* note 142, at 1; and Jonathan Cannon, *Checking in on the Chesapeake: Some Questions of Design*, 40 U. RICH. L. REV. 1131, 1131 (2006).

⁴⁰⁸ *See supra* notes 107–23 and accompanying text.

⁴⁰⁹ *See supra* notes 363–77 and accompanying text.

⁴¹⁰ *See supra* notes 35–39 and accompanying text.

⁴¹¹ *See supra* notes 239–48 and accompanying text.

⁴¹² *See supra* notes 246–48 and accompanying text.

with the feedback of its public, peers and partners⁴¹³ shows a commitment to proportionality lacking from many intergovernmental schemes.⁴¹⁴ In short, a court would be fully justified to find EPA's WIP guidances, consequences letters, technical memos and even perhaps the TMDL itself, unreviewable or, at the least, due great deference.⁴¹⁵

Just as the law of contracts did not replace the practice of promising (and, indeed, borrows heavily from it),⁴¹⁶ coercing a "partner" jurisdiction to follow guidance does nothing necessarily to undermine electoral or federal principles.⁴¹⁷ It does not necessarily interfere with "accountability,"⁴¹⁸ whether by shifting relative costs⁴¹⁹ or ignoring relative competence.⁴²⁰ Each of those relationships is contingent and contextual. Planning with

⁴¹³ See *supra* notes 163–72 and accompanying text.

⁴¹⁴ Cf. *Util. Air Reg. Group v. EPA*, 134 S. Ct. 2427, 2444 (2014) (claiming EPA's interpretation of CAA would bring about an "enormous and transformative expansion" of its powers necessitating heightened scrutiny).

⁴¹⁵ Compare *Lujan v. Nat'l Wildlife Fed'n*, 497 U.S. 871, 894 (1990) (dismissing challenge to agency program for lack of reviewable final agency action and observing that it is "understandably frustrating" to an interest group that "[e]xcept where Congress explicitly provides for our correction of the administrative process at a higher level of generality we intervene . . . only when, and to the extent that, a specific "final agency action" has an actual or immediately threatened effect."), with Richard J. Pierce, Jr., *The Unintended Effects of Judicial Review of Agency Rules: How Federal Courts Have Contributed to the Electricity Crisis of the 1990s*, 43 ADMIN. L. REV. 7, 27–28 (1991) (arguing that the "widespread phenomenon of unrealistic and inconsistent judicial commands to agencies is attributable to two factors—malleable doctrines and growth in the highly decentralized federal judiciary"—and that the Supreme Court should reduce the opportunities for federal courts to act against agency policy choices with which they disagree).

⁴¹⁶ See, e.g., CHARLES FRIED, *CONTRACT AS PROMISE: A THEORY OF CONTRACTUAL OBLIGATION* (1980).

⁴¹⁷ Cf. SCHAUER, *supra* note 219, at 138–39 (noting the ubiquity of legal sanctions within "cooperative" business arrangements like corporations and contracts); *Nat'l Fed'n Indep. Businesses v. Sebelius*, 132 S. Ct. 2566, 2602–05 (2012) (identifying impermissible coercion of the states by distinguishing financial "inducement" and other "relatively mild encouragement" from a proverbial "gun to the head"). Although the Founding generation clearly anticipated a suite of political risks worth guarding against, a better accounting and checking of *all* possible political risks has necessitated constant innovation from within the system of institutions they created. See generally VERMEULE, *supra* note 253.

⁴¹⁸ See Rubin, *The Myth of Accountability*, *supra* note 56, at 2120–25 (showing that "accountability" must come from within "the complex structure of administrative hierarchies that constitute our basic mechanism for governing ourselves").

⁴¹⁹ See Daryl J. Levinson, *Making Government Pay: Markets, Politics, and the Allocation of Constitutional Costs*, 67 U. CHI. L. REV. 345, 348–61, 387–415 (2000) (showing that the allocation of constitutional "costs" to government agencies will only affect behavioral change as those costs translate into *political* costs).

⁴²⁰ See *supra* note 132 and accompanying text.

provisional goals, duties and methods that are binding until renegotiated is akin to the highly elaborated bargaining of the private sector today.⁴²¹ Where these bargains turn out *not* to be renegotiable over a longer term they may well justify judicial intervention.⁴²² Agency actions like those in the Chesapeake might constitute reviewable “law” to whatever extent they are demonstrably *not* provisional, but neither does being provisional exclude being *imperative*.⁴²³ Using practical power to coerce a state to create and transparently follow a plan can be no more suspect than a state that has for decades shirked its legal “responsibility” to solve a major public problem.⁴²⁴

This leaves only the nature of Article II’s limits on such planning as “execution” of a law like the CWA and its WQs.⁴²⁵ President Obama’s Executive Order 13508 arguably committed the Chesapeake’s WQs to desuetude until 2025 at the earliest—and it capped a decade of delaying a TMDL.⁴²⁶ In another light, of course, the order brought needed focus and urgency where too many other TMDLs are nothing but equations.⁴²⁷ A pragmatic bow to the bounds of public resources, coupled with a reasoned prioritization thereof, may be the best we can hope for when our

⁴²¹ See Ronald J. Gilson et al., *Contracting for Innovation: Vertical Disintegration and Interfirm Collaboration*, 109 COLUM L. REV. 431 (2009).

⁴²² Judge Kavanaugh’s opinion for the D.C. Circuit in *National Mining Association*, an opinion citing Professor Manning’s proposal to the courts that they substitute lesser degrees of deference to “nonlegislative” rules for their failed efforts to force agencies through notice and comment, signaled a fuller turn toward Professor Manning’s skepticism of judicial efforts along this margin. See *Nat’l Mining Ass’n v. McCarthy*, 758 F.3d 243, 251–52 (D.C. Cir. 2014) (citing Manning, *supra* note 344, at 893).

⁴²³ *Cf. Norton v. South. Utah Wilderness Alliance*, 542 U.S. 55, 66 (2004) (finding statute gave agency a mandatory duty as to “object to be achieved” but left it enough “discretion in deciding how to achieve it” to render agency action unreviewable under the APA). Nothing should turn on the use of sanctions against failures/defection as opposed to rewards for cooperation/contribution. In too many contexts, sanctions are demonstrably better motivation. See, e.g., Roy F. Baumeister et al., *Bad Is Stronger Than Good*, 5 REV. GEN. PSYCH. 323 (2001).

⁴²⁴ Clean Water Act § 101(b)’s recitation of the states’ “responsibilities” of protecting surface waters, bolstered by CWA § 117(g)(1)(B)’s duty to “achieve and maintain . . . the water quality requirements necessary to restore living resources in the Chesapeake Bay ecosystem,” must, in the last analysis, count for something.

⁴²⁵ See U.S. CONST. Art. II, § 3.

⁴²⁶ *Cf. Houck, supra* note 149, at 10222 (concluding that the TMDL is “earth-shifting” because at least it plots a course to attainment, albeit with a long-delayed schedule).

⁴²⁷ *Cf. Houck, supra* note 149, at 10213 (observing that the Chesapeake focus reflected an Administration that was carefully picking its targets, setting an ambitious goal in a huge estuary with critical (but all too common) water quality problems in a region “right under the nose of Congress”).

legislated goals as a society outpace the treasure we will devote to them.⁴²⁸ At least when it takes the form of a publicly reasoned, proportionate directive from the President, such pragmatism can be distinguished—in court, if need be—from rank rewriting of the law to favor one’s friends or bosses. In the legislative process, the latter may be business as usual.⁴²⁹ In enforcement discretion, it is a constitutional breach.⁴³⁰

CONCLUSION

Is the Chesapeake experience so unique? Data from CWA § 319—funded monitoring and planning⁴³¹ is now beginning to emerge in many watersheds, yielding the sort of granular estimates of sediments and nutrients’ origins, transport and fate which first emerged in the Chesapeake a decade ago.⁴³² CWA § 208 has long required states to develop plans

⁴²⁸ See *Defenders of Wildlife v. Gutierrez*, 532 F.3d 913, 921 (D.C. Cir. 2008) (refusing to order emergency attention to problem because agency’s petition denial was “a policy decision to focus its resources on a comprehensive strategy, which in light of the information before the agency at the time, was reasoned and adequately supported by the record”); cf. *OLC Memo on DACA*, *supra* note 198, at 30–31 (linking the potential scope of the “deferred action” program for applying enforcement discretion in deportation proceedings to the scale of the appropriations shortage and concluding that there was “little practical danger” of the order’s preventing an execution of the immigration statutes that would otherwise have ensued); *Nat’l Mining Ass’n v. McCarthy*, 785 F.3d 243, 249 (D.C. Cir. 2014) (“[O]ne of the main goals of any President, and his or her White House staff, is to ensure that such consultation and coordination occurs in the many disparate and far-flung parts of the Executive behemoth.”); CHRISTOPHER K. ANSELL, *PRAGMATIST DEMOCRACY: EVOLUTIONARY LEARNING AS PUBLIC PHILOSOPHY* 9–14 (2011) (arguing that pragmatists accept public problems are not “solved” so much as they are avoided). “Pragmatism departs from a strictly positivist view of experimentation by emphasizing the provisional, probative, creative, and jointly construed character of social experimentation.” *Id.* at 12.

⁴²⁹ See ACKERMAN & HASSLER, *supra* note 62, at 29–35.

⁴³⁰ Settling enforcement matters by rulemaking breaches the outer bounds of Article II, § 3 where the agency “consciously and expressly adopt[s] a general policy that is so extreme as to amount to an abdication of its statutory responsibilities.” *Heckler v. Chaney*, 470 U.S. 833 n.4 (1985); see also *Citizens for a Better Env’t v. Gorsuch*, 718 F.2d 1117 (D.C. Cir. 1983), 1130–36 (D.C. Cir. 1983) (Wilkey, J., dissenting); *Ass’n of Irrigated Residents v. EPA*, 494 F.3d 1027, 1035 (D.C. Cir. 2007). In such cases, the agency action should not be one of unreviewable discretion, especially if it departs from the statute’s express enforcement scheme. Cf. *id.* at 1041–46 (Rogers, dissenting) (arguing that agency’s rule-like “enforcement protocol” absolving regulated parties of liability under three separate statutes prospectively with generic settlement terms executed by the thousands went beyond *Heckler*’s exception to the presumption of reviewability).

⁴³¹ See 33 U.S.C. §§ 1329(b)–(m).

⁴³² See EPA’s collection of § 319 “success stories” at <http://water.epa.gov/polwaste/nps/success319/> [<https://perma.cc/7LBT-LCA9>].

that could easily become WIP-like TMDL implementation plans—especially with so many TMDLs now having been prepared in response to court orders.⁴³³ Finally, and perhaps most importantly, although CWA § 117 might be Chesapeake-specific, § 301(b)(1)(C)⁴³⁴ and EPA's rules implementing the WQs are applicable nationwide.⁴³⁵ So the same leverage EPA found against the Bay-watershed jurisdictions, rooted in the imperative to attain ambient environmental quality goals,⁴³⁶ could be used in other multistate watersheds like the Arkansas, Colorado, Columbia and Snake, Connecticut, Gila, Ohio, Mississippi, Missouri, Platte, Red and Tennessee river systems, the estuaries of the Gulf Coast, Gulf of Maine, Long Island Sound and the Great Lakes.⁴³⁷ Each of those watersheds is now grappling with CWA § 303(d)(1)'s mandate of achieving WQs.⁴³⁸

Indeed, with Congress paralyzed by climate change's interstate, market and political forces,⁴³⁹ the Chesapeake's outlines are all too evident in the Obama Administration's "Clean Power Plan."⁴⁴⁰ As has become clear in the Chesapeake, granular data must be used to estimate needed contributions, to fashion continuously improving estimates of contributors' causal significance and, thus, the proxy actions needed if they falter. As EPA's 2010 GHG reporting rule yields such data for any necessary CAA § 111(d) "federal implementation plan" if states do not cooperate,⁴⁴¹ they face losing the right to choose their own targets and modulate the actions against them. Quite similar to 40 C.F.R. § 122.4(i)—forbidding the permitting of sources that "contribute to" a violation of applicable

⁴³³ See 33 U.S.C. §§ 1288(a)–(j).

⁴³⁴ See 33 U.S.C. § 1311(b)(1)(C).

⁴³⁵ See 40 C.F.R. §§ 122.44(d)(1)(vii)(A)–(B), 122.4(i).

⁴³⁶ See *supra* notes 66–77 and accompanying text.

⁴³⁷ *Cf.* *Am. Farm Bureau Fed'n v. EPA*, 792 F.3d 281, 308 (3d Cir. 2015) (remarking that § 117 "does not add to EPA's regulatory authority" as compared to the Act more generally).

⁴³⁸ See 33 U.S.C. 1313(d).

⁴³⁹ *Cf.* Johnston, *supra* note 28, at 1613–17 (arguing that congressional action on GHGs is not to be expected until a clear majority of states would benefit directly from controlling emissions).

⁴⁴⁰ See Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64662 (Oct. 23, 2014) (to be codified at 40 C.F.R. pt. 60). A key interpretive maneuver in the plan is to treat the CAA § 111's standard of "best system of emissions reduction . . . adequately demonstrated" as that amalgam of measures a state selects to meet or exceed EPA's calculated emissions reduction goals for a covered state's entire electricity-generating sector on the basis of its current circumstances and feasible improvements. See *id.* at 64758. Barring state plan submission and approval, EPA will implement a federal plan for that state. *Id.* at 64861.

⁴⁴¹ 42 U.S.C. § 7411(d) (2015).

WQSs⁴⁴²—EPA’s CAA rules have for decades required that states impose against their own sources any “best system” of emission reduction which EPA determines has been “adequately demonstrated.”⁴⁴³ Either a state tailors the mandate to its sources or EPA will.

Good case studies are more than anecdote, but they are never general proof. Much about the Chesapeake experience is unique. Still, several dilemmas in the Chesapeake are common among public goods problems today: normative disagreement and legal intransitivity; evolving factual uncertainties; interacting levels of relatively autonomous regulators with under- and over-lapping authorities; and the need to guard against free-riding while still allowing for on-course corrections. Solving for these dilemmas without devoting massive resources to failures like EPA’s 2000 TMDL rule-making, or being gutted by lawsuits like the one thrown out in the *AFBF* case, is urgent work. The Chesapeake now stands as the exemplar.

⁴⁴² See 40 C.F.R. § 122.4(i); see also *supra* note 68 and accompanying text.

⁴⁴³ See 40 C.F.R. § 60.22(b)(5) (1989).

