ALL IT TAKES IS A NUDGE: PUSHING ENVIRONMENTAL FEDERALISM TO TACKLE THE MASSIVE NON-POINT SOURCE POLLUTION PROBLEM

BY

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THESIS

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ABSTRACT

Controlling the massive problem of excess nutrient pollution in America's most prominent waters through the Clean Water Act continues to challenge administrators both on the ground and in the courts. Widespread hypoxia in the Gulf of Mexico, impaired waterways in Florida, and a declining fishing industry in the Chesapeake Bay illustrate continuing failures to remedy existing degradation and prevent future harm. The Act's structure of cooperative federalism places primacy with the states to handle the runoff, yet inaction by the states and the absence of a clear solution has prompted lawsuits by environmental groups seeking stringent intervention and lobbying groups vowing to protect their agricultural industry from increased regulation. Traditional courses of action within the cooperative federalism framework need to expand and accommodate the massive problem instead of remaining legally and scientifically static. Nudging, made popular in recent literature, could be the key policy tool to drive this expansion because it induces improvement through systems that preserve a person's liberty, alleviating constitutional concerns over land use. The water quality standard setting process provides new mediums in which to nudge, but when programs and policies intended to nudge turn into a shove, the judiciary plays an important role in preserving the balance. Contrasting approaches in each watershed provide insight to crafting policies that shift towards balanced and effective nutrient pollution controls before additional legislation is imposed.

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INTRODUCTION

After lunch, you dispose of your cafeteria waste by separating out the aluminum, paper, and plastic products according to the lids on the garbage can. You might not realize it at the time or even consciously decide, but the lids have increased recycling rates by 34% compared to containers without these lids.[1] Described in popular literature as "nudging," the phenomenon draws on the architecture of choices to maintain freedom of decision-making, while influencing behavior in order to improve the lives of citizens.[2] In the context of environmental pollution, this policy tool can be particularly effective by alleviating constitutional concerns over areas of land use regulation traditionally reserved to states and private owners, while preserving the core goals implicit in environmental protection.[3]

Since 1972, the United States has been striving to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" through a system of federal and state checks and balances under the Clean Water Act.[4] The structure, known as cooperative federalism, gives primary authority to the states to handle most forms of pollution within their own boundaries, while reserving

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[1] Noah Castelo, *Policy Memorandum: The Behavioral Dimension of Climate Change Policy*, 2 JOURNAL OF SCIENCE POLICY AND GOVERNANCE 1 (2012) *available at* http://www.sciencepolicyjournal.org/volume-2-issue-1.html; Although nudging as used here is a rather small decision, nudging has also established a record of adoption and success on some large, complex policy challenges, such as smoking restrictions in public places like bars and restaurants or anti-smoking advertising. *See* Alberto Alemanno, *Nudging Smokers: The Behavioural Turn of Tobacco Risk Regulation*, 3 EUROPEAN JOURNAL OF RISK REGULATION 1 (2013)..

[2] A "nudge" is "any aspect of the choice architecture that alters people's behavior in a predictable way without forbidding any options or significantly changing their economic incentives." Although often used in a social and economic context, the theory has applications in many different fields. RICHARD H. THALER AND CASS R. SUNSTEIN NUDGE: IMPROVING DECISIONS ABOUT HEALTH, WEALTH, AND HAPPINESS 5 (2008) [hereinafter NUDGE].

[3] *See* Rachel Croson, Nicolas Treich, *Behavioral Environmental Economics: Promises and Challenges*, 58 ENVIRONMENTAL AND RESOURCE ECONOMICS 335 (2014).

[4] Federal Water Pollution Control Act of 1972 (Clean Water Act), Pub. L. No. 92-500, 86 Stat. 816904 (codified as amended at 33 U.S.C. §§ 1251-1387 (2012)).

power for the federal government to impose their own restrictions if a state fails to meet the purposes of the Act. The innate tension created by the often not-so-cooperative federalism design has been the subject of debate for much of the Act's history.[5]

Widespread nonpoint source pollution, the most significant origin of water pollution in the United States, also happens to be the least regulated.[6] Unlike its counterpart point sources, recognized as those outfalls with "any discernible, confined and discrete conveyance," no stringent permit system exists within the Clean Water Act to the ubiquitous and the diffuse runoff known as nonpoint source discharge.[7] A lack of a statutory definition of nonpoint sources within the Clean Water Act further complicates the water pollution issues. Essentially those sources not meeting the qualifications of point sources fall into the nonpoint source classification, such as urban runoff, fertilizer overflow from agricultural fields, or sediment from construction sites.[8] Rather than implement

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[5] Robert L. Glicksman, *From Cooperative to Inoperative Federalism: The Perverse Mutation of Environmental Law and Policy*, 41 WAKE FOREST L. REV. 719 (2006)

[6] David Zaring, Agriculture, *Nonpoint Source Pollution, and Regulatory Control: The Clean Water Act's Bleak Present and Future,* 20 HARV. ENVTL. L. REV. 515 (1996); *see also* EPA, EPA841-F-96-004A, NONPOINT SOURCE POLLUTION: THE NATION'S LARGEST WATER QUALITY PROBLEM
POINTER NO. 1, *available at http://water.epa.gov/polwaste/nps/outreach/point1.cfm*

[7] 33 U.S.C. § 1362(14) (2000) ("This term does not include agricultural stormwater discharges and return flows from irrigated agriculture"); 40 C.F.R. § 122.3(e)-(f) ("The following discharges do not require NPDES permits…Any introduction of pollutants from nonpoint source agricultural and silvicultural activities, including storm water runoff from orchards, cultivated crops, pastures, range lands, and forest lands, but not discharges from concentrated animal feeding operations…discharges from concentrated aquatic animal production facilities…discharges to aquaculture projects…discharges from silvicultural point sources…Return flows from irrigated agriculture).

[8] "NPS pollution includes pollution caused by rainfall or snowmelt moving over and through the ground and carrying natural and human-made pollutants into lakes, rivers, streams, wetlands, estuaries, other coastal waters and ground water." EPA, EPA NONPOINT SOURCE PROGRAM AND GRANTS GUIDELINES FOR STATES AND TERRITORIES, at 7 (2013) *available at http://www.epa.gov/polluted-runoff-nonpoint-source-pollution/319-grant-current-guidance*; *see also* EPA, EPA-SAB-08-003, HYPOXIA IN THE NORTHERN GULF OF MEXICO: AN UPDATE BY THE EPA SCIENCE ADVISORY BOARD at 10 (2007), *available at*
http://water.epa.gov/type/watersheds/named/msbasin/tfproducts.cfm#sab ("Often, it is human

permitting limitations on nonpoint source runoff, the Act relies on proposed load allocations, state nutrient management plans, and section 319 grant funding for local voluntary management practices to restore and maintain chemical, physical, and biological integrity of the Nation's waters.[9]

Optimism for success of voluntary measures is in short supply.[10] Given the inherent difficulties in managing nonpoint sources, simply providing federal financial and technical support has failed to remedy the eutrophic and hypoxic conditions necessary to support ecologically and economically sustainable use.[11] The disparate regulation of sources causes the greatest improvements to be seen in many rivers and lakes located in urban and industrialized areas, which have traditionally suffered primarily from point source discharges.[12] Current *National Water Quality Inventory* reports largely implicate nonpoint sources, particularly from the agricultural sector, as the greatest contributor of pollution to our nations waters.[13] Of the rivers and streams assessed, 54% were found to be unable to

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activities that contribute significantly to excess nutrient concentrations in water bodies, other examples include golf courses, and lawns; improper application of animal manure")

[9] 33 U.S.C. § 1329 (2015).

[10] *See* Daniel R. Mandelker, *Controlling Nonpoint Source Water Pollution: Can It Be Done?*, 65 CHI.-KENT L. REV. 479 (1989) ("The Clean Water Act has always required nonpoint source controls in state and regional water quality planning programs, but these controls have not remedied the nonpoint pollution problem"); Zaring, *supra*, note 6, at 528 ("Further, a simple economic analysis shows that farmers have little incentive to participate in voluntary pollution reduction programs. Farmers do not bear the total costs of off-farm pollution and erosion").

[11] Mandelker, *supra*, note 10, at 479 ("Nonpoint pollution comes from a variety of sources that require different types of controls. Nonpoint sources resist controls because they are expensive, and the expense is not easily passed on to consumers. Nonpoint source controls are difficult to coordinate because they are usually administered by local rather than state governments. Local governments do not have an incentive to adopt nonpoint source controls because their nonpoint pollution usually is exported elsewhere").

[12] *See* William L. Andreen, *Water Quality Today-Has the Clean Water Act Been A Success?* 55 ALA. L. REV. 537, at 591 (2004).

[13] EPA Office of Water, EPA 841-R-08-001, NATIONAL WATER QUALITY INVENTORY: REPORT TO CONGRESS 2004 REPORTING CYCLE (2009); EPA, *Assessment and Total Maximum Daily Load Tracking and Implementation System (ATTAINS)*, http://www3.epa.gov/waters/ir/ (last visited April 4, 2016); *see also* USDA and NRCS, ASSESSMENT OF THE EFFECTS OF CONSERVATION PRACTICES ON CULTIVATED CROPLAND IN THE UPPER MISSISSIPPI RIVER BASIN (2012) *available at*

support their designated uses, such as fishing and swimming.[14] Lake and reservoir assessments reported a staggering 69% impairment level, and bays and estuaries revealed 78% impairment.[15]

With little political urgency to challenge the status quo written rules applicable to the highly organized agricultural industry, neither Congress nor the states are likely to legislate mandatory nonpoint source pollution controls.[16] Nonetheless, environmental system regulation does not always require new laws and standards from the top to be effective in practice; and it also almost certainly does not guarantee success.[17] Faced with a challenge that at every step grows more complex, other policy forms provide crucial avenues for gradually abating massive problems.[18] People generally need the nudge the most for "decisions that are difficult, complex, and infrequent, and when they have poor feedback and few opportunities for learning,"[19] and massive environmental problems like nutrient pollution are no different.[20]

Massive problems possess certain characteristics that defeat the conventional roles established under cooperative federalism and the Clean Water

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http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/ceap/?cid=nrcs143_014161

[14] *Id.*

[15] *Id.*

[16] Zaring, *supra*, note 6, at 515 "The agricultural interests, rooted in a discrete group that has both strong incentives to organize in order to avoid regulation and a relatively small, easily organized structure, have a particularly large influence on pollution control legislation passed by Congress."

[17] As explained in *Massachusetts v. E.P.A.*, "[a]gencies, like legislatures, do not generally resolve massive problems in one fell regulatory swoop." *Massachusetts v. E.P.A.*, 549 U.S. 497, 524, (2007).

[18] Massive problems are characterized by the complex accumulation of economic, environmental, and social impacts from multiple sources.
J.B. Ruhl & James Salzman, Climate Change, Dead Zones, and Massive Problems in the Administrative State: A Guide for Whittling Away, 98 CAL. L. REV. 59, 65 (2010) [hereinafter MASSIVE PROBLEMS].

[19] NUDGE, *supra* note 2, at 74, 250.

[20] For example, the use of energy efficient labeling to combat energy consumption. *See* Richard G. Newell, and Juha V. Siikamäki. *Nudging energy efficiency behavior: The role of information labels*, No. w19224, National Bureau of Economic Research (2013).

Act, such as aggregation from multiple sources, feedback loops back into the system, adaptive management issues, and no clear solution.[21] Thus, the traditional cooperative federalism framework needs to adapt properly to the massive problem, instead of remaining both scientifically and legally stagnant.[22] I advocate that nudging is the ideal policy catalyst to push environmental federalism and appropriately address nonpoint source nutrient pollution as it seeks to do so by minimizing effects on a person's freedom of choice. Nudging occurs through six principles of choice architecture, all of which have application to the Clean Water Act: sensible incentives[23], well-defined mapping[24], use of defaults[25], feedback[26], expecting error[27], and structuring complex choices.[28]

In part I this paper explores the cooperative federalism framework and how generally the framework nudges roles within the state and federal relationship. Part II identifies novel uses of nudging in the Clean Water Act water quality standard development process. Part III evaluates the role of the courts in arbitrating the balance of interests within a nudge and whether it exceeds. Finally Part IV examines the nudging implicit in voluntary nutrient programs, and when it

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[21] MASSIVE PROBLEMS, *supra* note 18, at 65 (Massive problems generally feature and aggregate of multiple causal sources (number, diversity, distribution, size/effect), consist of causal attributes (Scale, timing, relationship), and result in cumulative effects (spatial distributions, metrics, temporal distribution), and have no clear discrete solution).

[22] Douglas R. Williams, *When Voluntary, Incentive-Based Controls Fail: Structuring A Regulatory Response to Agricultural Nonpoint Source Water Pollution*, 9 WASH. U. J.L. & POL'Y 21 (2002) ("This limited offering of incentives is, quite simply, not enough; if the United States is to make significant further progress toward attaining water quality objectives, efforts to control nonpoint source pollution must be expanded")

[23] NUDGE, *supra* note 2, at 98. Incentives are a classic form of nudge, such as a coupon.

[24] *Id*. at 93. Mapping helps people navigate the choice structure, such as the sticker at the ATM which indicates the proper way to insert your card.

[25] *Id*. at 85. People tend to stick with the default option they are given, for example sticking with the default settings on a phone.

[26] *Id*. at 92. Providing feedback nudges by indicates proper use, such as a computer icon lighting up when it is running low on battery.

[27] *Id*. at 89. Expecting error can nudge because it corrects improper action, for example a car may beep when seatbelts are not engaged.

[28] *Id*. at 96. Structuring complex choices limits or sets the range of available options, for example a restaurant menu.

does not go far enough. Granted, the solutions identified herein may not always be so unobtrusive as the trashcan example, however this seeks to alleviate a national epidemic that plagues the nation's most pristine waters. Nudging occurs on a spectrum, all nudges, even small ones, have some degree of coercion.

PART I: NUDGING UNDER COOPERATIVE FEDERALISM

From the very earliest stages of the Clean Water Act legislation, the allocation of power within the cooperative federalism structure has been the subject of debate.[29] As the ultimate choice architect, Congress elected a method that ideally would remedy the concerns encountered with allocation of authority solely to either the federal government or the states.[30] Unlike its counterpart "dual federalism," distinguished when power is divided between the federal and state governments in clearly defined terms, the cooperative federalism structure hinges on a collaborative approach between state and federal agencies to reach water quality goals.[31] For example, the Clean Water Act savings clause explicitly provides for federal oversight to "recognize, preserve, and protect the primary responsibilities and rights of States ...to plan the development and use...of land and water resources...."[32] The attempt to nudge cooperation between federal and state agencies troubled the dynamic from the outset because success is strongly correlated to instances when interests are aligned.[33] This is seldom the case, because there is no such concept as a neutral design; even the seemingly arbitrary decisions have subtle impacts on entities under the Act.[34] Take for instance the definition of "Navigable Waters" in section 502(7) of the Clean Water Act and its jurisdictional implications for the cooperative federalism.[35] What at the time was

[29] Andreen, *supra* note 12, at 274.
[30] NUDGE, *supra* note 2, at 3 (discussing the responsibility of choice architect for organizing the context in which people make decisions)
[31] *See* Robert L. Fischman, *Cooperative Federalism and Natural Resources Law*, 14 N.Y.U. Envtl. L.J. 179, 184 (2005) ("Dual federalism is a term that should be reserved for situations where either the federal and state governments act independently, without attempting to align their efforts, or where the federal and state spheres of authority do not overlap").
[32] 33 U.S.C. § 1251(b) (1972).
[33] NUDGE, *supra* note 2, at 186.
[34] *Id*. at 3.
[35] 33 U.S.C. § 1362(7) (2014)

likely a seemingly trivial decision to define it as the "waters of the United States" has evolved into a massive regulatory dispute over jurisdictional boundaries. [36]

a. Cooperative Federalism in Theory

The cooperative federalism configuration, for all its flaws, was chosen for a multitude of reasons.[37] As Oliver Houck notes regarding early years of water pollution abatement backed only by federal financial support, "programs run by the states with federal assistance had failed utterly for 25 years."[38] Prior to the 1972 revisions, few states had bothered to set or enforce water quality goals, hence the need for some recognition of federal oversight.[39] States were not willing to implement real standards with bite, inevitably leading to a "race-to-the-bottom" regulatory approach, perhaps the most common justification for federal involvement.[40] This dilemma creates further incentives to under regulate by

[36] Four Supreme Court Cases in the last two decades have discussed the extent of navigable water jurisdiction, *See* Solid Waste Agency of Northern Cook Cty. v. Army Corps of Engineers, 531 U.S. 159 (2001) (SWANCC) (no jurisdiction over completely isolated waters); United States v. Riverside Bayview Homes, Inc., 474 U.S. 121 (1985) (conferring jurisdiction over waters beyond the traditional definition of navigability); Rapanos v. United States, 547 U.S. 715 (2006) (defining it as water with a "continuous surface connection"); United States v. Appalachian Elec. Power Co., 311 U.S. 377 at 409 (1940) (waters made navigable with "reasonable improvements). As of writing, the proposed rule defining the waters of the United States, U.S. Army Corps of Engineers and U.S. Environmental Protection Agency, "the Clean Water Rule." 80 Fed.Reg. 37,054 (June 29, 2015), was being litigated. *See* In re U.S. Dep't of Def., U.S. E.P.A. Final Rule: Clean Water Rule: Definition of Waters of U.S., No. 15- 3839, 2016 WL 723241 (6th Cir. Feb. 22, 2016).
[37] *See* Michael S. Greve, *Against Cooperative Federalism*, 70 MISS. L.J. 557 (2000).
[38] Oliver A. Houck, *Cooperative Federalism, Nutrients, and the Clean Water Act: Three Cases Revisited*, 44 ENVTL. L. REP. 10426 (2014).
[39] *Id*.
[40] 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) ("Perhaps the most widely accepted justification for environmental regulation at the federal level is that it prevents states from competing for industry by offering pollution control standards that are lower than other states competing for the siting of industrial and manufacturing opportunities").

placing industrial externalities on other states with more stringent standards.[41] As it turns out, states, like people, tend to make poor choices in contexts where they are inexperienced, poorly informed, and feedback is slow to materialize.[42]

Additionally, permitting states to independently design and implement water quality programs in piecemeal fashion is neither cost efficient nor entirely accurate.[43] Rational decision-making contemplates the available data and uses it as a reference to inform choice.[44] Although a sound methodology, the final outcome is anchored to that particular foundational data set.[45] As a result, states would likely promulgate vastly different water quality standards derived from their individual baseline. Cooperative federalism counteracts this phenomenon for point sources by first setting a regulatory floor and permitting a significant degree of flexibility in implementation.[46] Federal involvement thus induces development of state water quality standards by influencing the applicable range.[47] In the point source world, application of this principle through the NPDES permit system is clear, but for those diffuse sources it occurs more discretely.

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[41] *Id.* at 1222 ("The presence of interstate externalities is a powerful reason for intervention at the federal level: because some of the benefits of a state's pollution control policies accrue to downwind states, states have an incentive to underregulate. But this incentive would exist even in the absence of a race to the bottom").

[42] NUDGE, *supra* note 2, at 9.

[43] Glicksman, *supra* note 6, at 733-734 ("Similarly, federal environmental legislation arguably permits environmental policymakers to take advantage of the economies of scale that result from the adoption of national standards…. The federal government was thus better equipped to develop the necessary expertise to formulate effective environmental regulatory standards as well as to implement and enforce those standards in an efficient manner."

[44] NUDGE, *supra* note 2, at 23 ("You start with some anchor, the number you know, and adjust in the direction you think is appropriate").

[45] *Id.* Anchoring refers to the use of setting standards based on the reference points or anchors from another place or system. "Generally, this incorporates bias, and the adjustment is insufficient. However we can nudge the adjustment figure by suggesting a starting point".

[46] The Clean Water Act's "regulatory floor" is found in 33 U.S.C. § 1370 (2014), which states in part that any "State or political subdivision or interstate agency may not adopt or enforce any effluent limitation…or standard of performance which is less stringent than the effluent limitation… or standard of performance" set by EPA.

[47] NUDGE, *supra* note 2, at 24. Take for example campaign fundraising. When candidates request a specific range of prices such as $100, $150, or $200, you are more likely to donate on par with those figures than $5 because the candidate has created a baseline.

Traditionally, the solution is increased federal regulatory control mandating uniform socially and economically optimal standards.[48] In theory, the federal government, while also concerned about economic development, is more willing to implement necessary legislative sanctions despite potential financial burdens.[49] Referencing the federal standards, congressional leaders in the Public Works Committee responsible for drafting the Act, wrote "[t]he committee believes that if the timetables established throughout the Act are to be met, the threat of sanction must be real, and enforcement provisions must be swift and direct."[50] This certainly tends to be the case with point sources, but is not reflected in control of nonpoint sources.

b. Theory Informing Practice: Cooperative Federalism and Nonpoint sources

Given the diffuse nature of nonpoint source water pollution, the typical "command and control" approach is difficult to implement.[51] The lack of flexibility, barriers to meaningful public participation, and stifling of state and local innovation characteristic to command and control legislation would significantly inhibit management of nonpoint sources primarily because of the strong correlation between land use and runoff pollution.[52] The principles

[48] *See* Henry N. Butler & Jonathan R. Macey, *Externalities and the Matching Principle: The Case for Reallocating Environmental Regulatory Authority*, 14 YALE L. & POL'Y REV. 23, 42 (1996); Revesz, *supra* note 40, at 1217; John P. Dwyer, *The Practice of Federalism Under the Clean Air Act*, 54 MD. L. REV. 1183, 1219 (1995) ("The usual justifications for a dominant federal role in environmental regulation are to take advantage of economies of scale with regard to research and data collection, to regulate interstate pollution, and to replace unduly weak state regulation").
[49] *See* William W. Buzbee, *Contextual Environmental Federalism*, 14 N.Y.U. ENVTL. L.J. 108, 121 (2005) (discussing the different interests by state and federal government to impose regulatory burdens or economic sanctions).
[50] Andreen, *supra* note 12, at 271.

[51] *See* Williams, *supra* note 22, at 26-27 (discussing how number of farms, different practices, and locations make a technology-based approach with uniform effluent limitations difficult).
[52] *Id*.

underlying the nudge concept are well aligned with policies available in the nonpoint sources realm, and likely needs to be triggered in order to escape the heavy hand of paternalistic legislation without the preservation of libertarianism choice. Cooperative federalism to some extent reconciles these concerns, preserving state autonomy by heavily relying on federal financial and technical assistance for those sources, but needs to occur at much more meaningful level.[53]

First, preserving state management over hydrological nutrient loads accommodates the natural properties of water pollution and the natural chemical variation of water bodies.[54] The pollutants associated with nonpoint sources are often organic, which poses challenges for the regulating community.[55] Placing sole responsibility for managing the diverse aquatic systems across the nation would incur vast amounts of federal EPA timing and resources (the reason why President Nixon initially vetoed the bill).[56] The Clean Water Act was meant to encourage states to implement controls aligned more appropriately with the natural systems, with federal agency feedback. Feedback is an essential aspect of the system because it tells people when they are performing well and when they are making mistakes.[57] However, feedback is only effective if the person heeds the advice.[58]

Second, structuring choices with anchors can also work at a regional scale, by which reference points are taken at a holistic watershed level and then used to distribute load accountability to states, sectors or other political entities.[59] The

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[53] *See* 33 U.S.C.A. § 1329(f) and (h) Technical assistance for States and Grant program

[54] This natural variability of nutrient levels due to differences in geology, climate and waterbody type indicate that a single pollutant concentration number to support a designated use for nationwide application is not appropriate for nutrients. EPA, EPA 822-R-98-002, NATIONAL STRATEGY FOR THE DEVELOPMENT OF REGIONAL NUTRIENT CRITERIA (1998).

[55] *Id*.

[56] Andreen, *supra* note 12, at 285.

[57] NUDGE, *supra* note 2, at 92.

[58] *Id*.

[59] *See infra* notes 44-45 and accompanying text (explaining anchoring); and *infra* 30 and accompanying text (discussing structuring complex choices).

methodology takes advantage of economies of scales by permitting states to tailor implementation to meet their specific responsibilities based on federal benchmarks and recommendations at an appropriate environmental scale.[60] Thus voluntary programs such as Gulf Hypoxia Task Force and judicial interpretations such the Chesapeake Bay litigation are a powerful means to accurately apportion true pollutant load accountability to the states.[61] When states are given their true pollution liability, they are less prone to underestimate their accountability with frivolous standards and much more likely to implement standards with appropriate values which align the interests of the states in the watershed. With additional federal oversight of a regional collaboration, states view the pollution targets as considerably more achievable because they have a support structure.[62]

Third, framing of the nutrient pollution problem is a powerful nudge in the regulation context for structuring choices.[63] People in general tend to be extremely loss adverse, generally the cost of losing something is much greater than the benefit of gaining that same object.[64] Since the consequences associated with nonpoint source pollution are framed as potential losses instead of possible gains, states are induced to initiate remedial measures for fear of losing authority under the threat of federal intervention. As it stands, states have the benefit of seeing the effects of command and control regulation as well as the cooperative approach. Over the past few years, the looming threat of legislation, citizen lawsuits and federal regulations spurred a rise in nutrient pollution programs.

The states and federal government wield a significant amount of power to nudge one another in the nonpoint realm because both possess the power to

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[60] Robert V. Percival, *Environmental Federalism: Historical Roots and Contemporary Models*, 54 MD. L. REV. 1141, 1174 (1995) (discussing cooperative federalism model and it economies of scale).
[61] *See infra* notes 132-168.
[62] NUDGE, *supra* note 2, at 41; Williams, *supra* note 22, at 27.
[63] *Id*. at 36.
[64] *Id*.

legislate.[65] Thus often the object of the nudge is not always clear, but neither is the cause of the problem. Multiple forms of nudging occur because there are so many different stakeholders that play into the creation of the massive problem.

[65] Even public interest groups exercise influence through citizen suit authority. *See* 33 U.S.C § 1365 (2014).

PART II: NUDGING IN THE CLEAN WATER ACT

Nudging occurs in many ways as noted above simply as a function of the cooperative federalism framework, but there are many tangible applications for the principles of choice architecture within the statutory provisions of the Clean Water Act and the process setting water quality standards.

a. Feedback through the National Pollutant Discharge Elimination System

From the outset, the drafters of the Act recognized that because "[w]ater moves in hydrologic cycles and it is essential that discharge[s] of pollutants be controlled at the source."[66] Section 402 National Pollutant Discharge Elimination System (NPDES) is the keystone of direct federal powers over water pollution control.[67] Although applicable to only point source discharges, the technology-based limitations can be heavily influenced by nonpoint source loads into receiving waters because point source permit writers account for nonpoint source contributions into water bodies.[68] States have also begun issuing NPDES permits with numeric nutrient limits, monitoring requirements, or requiring feasibility studies prior to upgrades.[69]

Discussed below, EPA has placed backstop allocations on point sources in the Chesapeake Bay, to make up the difference in shared waterways when nonpoint sources fail to achieve their targets.[70] Moreover, downstream states may

[66] Andreen, *supra* note 12, at 267.
[67] 33 U.S.C. § 1342(a) The Act generally prohibits the discharge of effluent into a navigable body of water unless the point source obtains a NPDES permit from a state with a EPA-approved permit program or from the EPA itself.
[68] 40 C.F.R. § 122.44.
[69] EPA Hypoxia Task Force, *Report to Congress 2015*, 64, *available at* https://www.epa.gov/ms-htf/htf-2015-report-congress [hereinafter HTF 2015 Report to Congress].
[70] *See infra* notes 121-171 for discussion about backstop allocations.

appeal to the EPA Administrator to disapprove a permit if concluded that the discharge will have an undue impact on interstate waters.[71] By providing feedback for other states, this can provide downstream states such as Louisiana with a remedy to nudge Mississippi River Basin states into holding their own point source polluters accountable for downstream pollution.[72] It further demonstrates the diverse effects of evolving nonpoint source dialogue.

b. Designated Uses as Defaults

Designating uses for each state water body acts as the fundamental driver of the Clean Water Act under section 303(c)(2)(A).[73] Designated uses must at minimum reflect existing uses, but may also establish optimistic uses for a water body.[74] In practice designated uses are much more than simply a means to classify a body of water, it also establishes the water quality goals.[75] States are also required to take into consideration downstream waters in setting designated uses and water quality standards for its waters.[76] Congressional preference for fishable and swimmable waters cannot be ignored.[77] Undeniably," an Idaho court

[71] Arkansas v. Oklahoma, 503 U.S. 91 (1992) (EPA may condition an NPDES permit on one state's compliance with water quality standards of another state) (citing 40 C.F.R. § 122.4).
[72] This may be unlikely, as Louisiana was party to an amicus brief filed on behalf of a coalition of 21 states against the Chesapeake Bay TMDL. However, it is important to note that the Attorney General of each state has discretion to file amicus briefs on behalf of their state, which might be "driven by a sincere interest to have their state's voice heard or, perhaps more cynically, politics." Brandon D. Harper, *The Effectiveness of State-Filed Amicus Briefs at the United States Supreme Court*, 16 U. PA. J. CONST. L. 1503, 1510-11 (2014).
[73] 33 U.S.C. 1313(c)(2)(A) (2014)
[74] *See generally* 40 C.F.R. § 131.10 (2011); 40 C.F.R. § 131.3(f) (2014). Designated (beneficial) uses are "those uses specified in water quality standards for each water body or segment whether or not they are being attained."
[75] 33 U.S.C. § 1313 (2014). The designated use titles take into consideration their "use and value for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, and other purposes, and also taking into consideration their use and value for navigation."
[76] 40 C.F.R. § 131.10.
[77] 33 U.S.C. § 1251(a)(2) (2014).

remarked, "one of the over-arching purposes of the Clean Water Act is to achieve fishable/swimmable uses wherever attainable."[78]

Under the nudge theory, inertia can be a very powerful tool.[79] Setting a default option can greatly influence the outcome, because research indicates people tend to stick with the automatic choices, even with significant decisions.[80] The Clean Water Act implicitly compels states to designate fishable and swimmable characteristics as the default uses for its waters. Where a state fails to designate a water body for that use, the state must conduct a use attainability analysis ("UAA") to prove it could not meet this requirement, reviewing the analysis every three years.[81] Thereafter, changes in the designated uses are allowed only after a period of public comment.[82] The designated use determination is also subject to EPA review and modification.[83] Due to the hurdles imposed by this mechanism, states are more likely to stick with the default option. Review periods can provide interested parties an opportunity to contest a proposed use or removal of designated use, as state and federal entities are not the only parties that can nudge.[84]

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[78] Idaho Mining Ass'n, Inc. v. Browner, 90 F. Supp. 2d 1078 at 1097 (D. Idaho 2000).
[79] NUDGE, *supra* note 2, at 8.
[80] *Id*. at 84.
[81] *See* 40 C.F.R. § 131.20
[82] *See* 40 C.F.R. § 131.10(e); Kelso v. Rybachek, 912 P.2d 536 (Alaska 1996) (a group of miners unsuccessfully challenged the state's denial of their petition to reclassify certain streams to exclude all water uses except industrial use).
[83] *See* 40 C.F.R. §§ 131.5(a), 131.6(c), 131.11(a), (b); Natural Res. Def. Council, Inc. v. U.S. E.P.A., 16 F.3d 1395, 1401 (4th Cir. 1993) (determining whether the states' dioxin criteria is scientifically defensible and protective of designated uses).
[84] 40 C.F.R. § 131.10(g) States may remove a designated use which is not an existing use through a Use Attainability analysis based on 6 factors:
(1) Naturally occurring pollutant concentrations prevent the attainment of the use; or
(2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or
(3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

Designated uses provide a window into nudging meaningful aquatic system services because it sets in motion water quality development for that particular use. The Supreme Court in *PUD No. 1 of Jefferson Cnty. v. Washington Dep't of Ecology* determined a state could hold a federally licensed discharger accountable for not only the applicable water quality criteria, but also the designated use as salmon habitat.[85] The Tenth Circuit upheld a revised designated use on behalf of a Native American tribe for ceremonial purposes.[86] In the tidal waters of the Chesapeake Bay, USEPA developed designated uses for migratory fish spawning and nursery, shallow-water bay grass, open-water fish and shellfish, deep-water seasonal fish and shellfish, and deep-channel seasonal refuge.[87] Under this scheme, many unorthodox designated uses could nudge and improve a water body's quality, such as flood control or filtration.[88] With these uses preserved, the state is obligated to set water quality criteria to protect those uses.

c. Efficient Mapping & Expecting Error Through Water Quality Criteria

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(4) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or
(5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or
(6) Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

[85] PUD No. 1 of Jefferson Cnty. v. Washington Dep't of Ecology, 511 U.S. 700, 714 (1994).

[86] City of Albuquerque v. Browner, 97 F.3d 415, 427 (10th Cir. 1996).

[87] EPA, CHESAPEAKE BAY TOTAL MAXIMUM DAILY LOAD, 3-4 (2010), *available at* https://www.epa.gov/chesapeake-bay-tmdl/chesapeake-bay-tmdl-document [hereinafter BAY TMDL].

[88] For example, Ohio EPA has proposed revisions that will include the addition of a lake habitat subcategory to the aquatic life designation. Kenneth Kilbert, Tiffany Tisler and M. Zack Hohl, *Legal Tools for Reducing Harmful Algal Blooms in Lake Erie*, 44 U. TOL. L. REV. 69, fn. 69 (2012).

Once the state has identified the existing and designated uses for specified water segment, the state must develop water quality criteria representative of those uses.[89] Water quality criteria are manifested in different forms, expressed as numeric, narrative, or both.[90] One opinion provides a useful analogy to describe the difference: a state could adopt a numeric speed limit—70 miles per hour—or a narrative standard—don't drive too fast. Or a state could adopt a combination of both—don't drive over 70, and don't drive too fast for conditions.[91] These criteria are subject to review and preemption by USEPA, which can establish new standards for the state if it finds the state-promulgated standards inconsistent with the requirements of the Act.[92] Well-designed systems expect its users to make errors, and then provide an instrument to correct the error.[93] The federal review statutory mechanism seeks to accommodate this concern by providing evaluation or possibly a proposed standard in the event the Administrator deems it necessary.[94]

Similarly, the best frameworks help people improve their ability to navigate the choice architecture and select the options that improve their life through a nudge known as efficient mapping.[95] This often entails transforming the available data into means that is accessible and most clearly comprehended.[96] In the case of narrative standards, they tend to insert inefficiency into the process since there is no quantifiable target value that identifies the high-risk areas for

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[89] 40 C.F.R. § 131.11(a) (2012).
[90] 40 C.F.R. § 131.11(b) (2012).
[91] *Florida Wildlife Fed'n, Inc. v. Jackson*, 853 F. Supp. 2d 1138 at 1145-46 (N.D. Fla. 2012).
[92] "The Administrator shall promptly prepare and publish proposed regulations setting forth a revised or new water quality standard for the navigable waters involved-- (A) if a revised or new water quality standard submitted by such State under paragraph (3) of this subsection for such waters is determined by the Administrator not to be consistent with the applicable requirements of this chapter, or **(**B) in any case where the Administrator determines that a revised or new standard is necessary to meet the requirements of this chapter." 33 U.S.C.A. § 1313(c)(4)(B).
[93] NUDGE, *supra* note 2, at 89.
[94] 303(c)(4)(B).
[95] NUDGE, *supra* note 2, at 94.
[96] *Id*.

nutrient pollution.[97] Numeric nutrient standards translate much more smoothly into tangible water quality protection by simplifying the process for identification and monitoring of impaired waters.[98] States need to be proactively transforming narrative nutrient pollution into quantifiable values that more readily assist the regulatory agencies with navigating the choice architecture set by the Clean Water Act.[99]

Everyone hates losses, but often people become so risk adverse that it precludes accepting a trade you otherwise would have made.[100] While the process is still voluntary, states should be preemptively adopting numeric standards as it may ease the transition in favor of more lenient standards. At the same time, the potential for increased accountability generates fear among farm interest groups that numeric water quality standards will ultimately lead to regulating traditional nonpoint sources similar to point sources. Point source operators are weary they could bear the brunt of pollution reduction in shared waterways when nonpoint sources fail to adequately meet pollution targets, as seen in the Chesapeake Bay litigation.[101] Lastly, states view numeric standards as a threat to their discretionary authority.[102] Two cases in particular discussed below demonstrate the possible repercussions of failing to do so where environmental groups nudged by petitioning for federal intervention through review.[103] Spurred in part by federal

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[97] Houck, *supra* note 38, at 10431.
[98] Without such standards, states are often unwilling to take restorative action. For example, "Illinois EPA has since determined that at this time TMDLs will only be developed for those parameters with numeric water quality standards. These numeric water quality standards will serve as the target endpoints for TMDL development and provide a greater degree of clarity and certainty about the TMDL and implementation plans." Illinois EPA, TMDL REPORT FOR BIG MUDDY RIVER (2012) *available at* www.epa.state.il.us/water/tmdl/report/big-muddy-one/big-muddy.pdf.
[99] *Id*.
[100] NUDGE, *supra* note 2, at 33.
[101] *See infra* notes 121-172.
[102] Houck, *supra* note 38, at 10431,
[103] *See infra* notes 121-172.

recognition of the need for numeric nutrient standards, citizen suits have and will play a powerful part in nudging the transition.

d. Structuring Complex Choices in Impaired Waters with the Total Maximum Daily Load

When waters within a state fail to meet the applicable criteria, numeric or narrative, the Clean Water Act requires the state to identify and distinguish these as "impaired waters," placing them on the 303(d) list.[104] Listing of a water body as impaired typically leads to development of a total maximum daily load (TMDL), or "pollution diet".[105] The TMDL is a limitation on the receiving pollution for a body of water subject to the review of the USEPA Administrator, who may develop a TMDL for that state in absence of statutory compliance.[106] TMDLs are composed of "load allocations," for nonpoint source pollution, and "wasteload allocations," for point source pollution.[107] Flexibility to structure TMDL composition depending on contributing sources and ancillary regulatory powers have built the TMDL into a truly formidable mechanism for nudging.[108]

In the past, USEPA would collect and compile the impaired waters reports and submit biennial surface water quality reports to Congress.[109] Recently, USEPA has switched to the web accessible ATTAINS technology for

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[104] 33 U.S.C. § 1313(d)(1)(A).
[105] 40 CFR 130.2 (i). "The sum of the individual WLAs for point sources and LAs for nonpoint sources and natural background. If a receiving water has only one point source discharger, the TMDL is the sum of that point source WLA plus the LAs for any nonpoint sources of pollution and natural background sources, tributaries, or adjacent segments. TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. If Best Management Practices (BMPs) or other nonpoint source pollution controls make more stringent load allocations practicable, then wasteload allocations can be made less stringent. Thus, the TMDL process provides for nonpoint source control tradeoffs."
[106] 33 U.S.C. § 1313(d)(1)(c).
[107] 40 C.F.R § 130.2(g)-(i).
[108] *See infra* notes 121-172.
[109] 33 U.S.C 1313(d); 33 U.S.C 1315.

congressional reporting to promote public awareness.[110] This technological transformation is a crucial component of modern nudging, as USEPA interprets its responsibility to congressionally report influences awareness among local stakeholders and streamlines a comprehensive system of reporting for states.[111] The increased accessibility leads to greater public awareness and participation in the water quality protection, particularly through citizen suit enforcement under section 505.[112]

Agency nudging through TMDL configuration took a pivotal turn with the Ninth Circuit holding in *Pronsolino v. Nastri*.[113] The court found TMDL requirements based on a water body containing solely nonpoint sources to be within the discretion of USEPA's authority.[114] Local landowners argued that by establishing TMDLs for waters impaired only by nonpoint source pollution, USEPA had "upset the balance of federal-state control established in the CWA by intruding into the states' traditional control over land use."[115] Owing deference to the Agency interpretation, the court reasoned, "neither the statute nor the regulations specify the load of pollutants that may be received from particular parcels of land or describe what measures the state should take to implement the TMDL."[116] Section 303 expressly preserves TMDL implementation and monitoring for state control, thus this arrangement preserved those traditional state functions.[117]

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[110] *See infra* note 13.
[111] NUDGE, *supra* note 2, at 191; 42 U.S.C. § 11001 *et. seq*. Reporting under the Emergency Planning and Community Right-to-know Act (EPCRA) had the effect of publicly shaming egregious as a means to improve the environment .
[112] 33 U.S.C 1365 (2014).
[113] Pronsolino v. Nastri, 291 F.3d 1123, 1127 (9th Cir. 2002).
[114] *Id.* TMDL development in the Garcia River required loggers at significant cost to mitigate 90% of sediment run-off from logging activities and limit harvesting during certain times of the year.
[115] *Id.* at 1140.
[116] *Id*.
[117] *Id*.

Pronsolino highlights an important dynamic of federal power under section 303. While the federal government may have a license to develop total maximum daily loads for impaired navigable waters from nonpoint sources, generally enforcement on the individual sources must come from the states. In the wake of *Pronsolino*, the void of implementation powers could undermine the effectiveness of a TMDL, rendering it little more than an informational document. USEPA's unprecedented approach in the Chesapeake Bay, explained in more detail below, pushes the boundaries on implementation authority and agency deference in TMDL development. In the litigation thus far, the courts have allowed the federal government to ensure the effectiveness of the TMDLs by requiring EPA to play a larger role post-TMDL development and thus depart from *Pronsolino*.

The statutory mechanisms discussed in the previous sections have the potential to nudge the Agency into an expanded role with novel interpretations of existing laws, but their practicality is subject to judicial interpretation. When Agency action or inaction results in the adversarial process, courts play the fundamental role of preserving the balance between the libertarianism and paternalism of a nudge.

PART III: WHEN DOES A NUDGE BECOME A SHOVE: NUTRIENT LITIGATION

Architects attempt to nudge people in ways that will benefit their lives in some way.[118] Inherently this introduces bias into the available choices because architects use subjective judgments to decide the appropriate balance between impinging freedoms and life improvements.[119] Generally courts are insulated from the political pressures felt by elected and agency officials. Thus as interpreters of the statutory language and reviewers of final agency action, the court represents a very powerful entity by reconciling the proper balance of interests within a proposed nudge.[120] This section will examine three regional lawsuits that seek to remedy the declining fishing industry in the Chesapeake Bay, widespread hypoxia in the Gulf of Mexico, and impaired waterways in Florida and further illustrate the predominance of the judiciary in setting a new course for improving water quality.

a. Structuring the Chesapeake Bay Total Maximum Daily Load

The Chesapeake Bay's waning aquatic health spurred response from regulatory and management initiatives throughout the 20th century, including Memorandum of Understanding,[121] specific statutory provisions[122], water quality

[118] NUDGE, *supra* note 2, at 250 ("Our basic conclusion is that the evaluation of nudges depends on their effects-on whether they hurt people or help them").
[119] *Id*. at 249-250.
[120] *Id*. ("The potential for beneficial nudging also depends on the ability of the Nudgers to make good guesses about what is best for the Nudgees. In general Nudgers will be able to make good guesses when they have much more expertise at their disposal, and…when differences in tastes and needs can be easily detected").
[121] CHESAPEAKE BAY PROGRAM, CHESAPEAKE 2000 (2000), *available at* http://chesapeakebay.net/agreement.htm.
[122] 33 U.S.C. § 1267 (2015)

agreements[123], executive orders[124], litigation and consent decrees[125], and specific criteria guidance,[126] however these did little to slow the rapid deterioration.[127] Resolving a number of consent decrees and responding to President Obama's Executive order to restore and protect the Bay, *The Chesapeake Bay Total Maximum Daily Load* identifies the requisite pollution reductions across Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia.[128] More than 40,000 TMDLs have been completed across the United States, but the Chesapeake Bay TMDL is the most compelling and complex.[129] The rigorous plan to restore clean water to the Chesapeake Bay states covers 64,000 square mile watershed, the largest TMDL to date.[130] Reflecting the unique physical, chemical, and biological characteristics of portions of water bodies, the Bay TMDL is actually an aggregate of 92 smaller TMDLs for three pollutants: nitrogen, phosphorus, and sediment.[131]

Yet the size of the Bay TMDL is not the only controversial component of the TMDL. EPA required states to address nonpoint source runoff by providing states with the framework for nudging landowner decisions. Instead of a single number representative of the maximum receiving load for that body of water, the TMDL allocates pollutant limits for source sectors, particularly agriculture, urban

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[123] BAY TMDL, *supra* note 87, at 1-3.
[124] Exec. Order No. 13,508, 3 C.F.R. 23,099 (2009) [hereinafter CHESAPEAKE EXECUTIVE ORDER].
[125] *See* Dioxin/Organochlorine Center v. Clarke, 57 F.3d 1517 (9th Cir. 1995); Scott v. City of Hammond, 741 F.2d 992 (7th Cir. 1984); American Canoe Assn. v EPA, 54 F.Supp.2d 621 (E.D.Va. 1999).
[126] EPA, AMBIENT WATER QUALITY CRITERIA FOR DISSOLVED OXYGEN, WATER CLARITY AND CHLOROPHYLL A FOR CHESAPEAKE BAY AND ITS TIDAL TRIBUTARIES, (2003) *available at*: http://www.epa.gov/region3/chesapeake/baycriteria/Criteria_Final.pdf
[127] BAY TMDL, *supra* note 87, at 1-3.
[128] *See infra* notes 120-126.
[129] BAY TMDL, *supra* note 87, ES-3.
[130] *Id*. at ES-1.
[131] *Id*.

stormwater, and wastewater.[132] As a feature of its accountability framework, the TMDL requires each state to submit "watershed improvement plans" (WIPs) that provide "reasonable assurances" of implementation, including deadlines for states to implement its identified control measures.[133] With representation of reasonable assurances, EPA could reliably allocate loadings to point sources knowing states had both the means and the timeline to achieve nonpoint load reductions.[134] EPA also included contingencies in the TMDL for noncompliance, termed "backstop measures," which threatened tighter restrictions on point sources and frequent objections to NPDES permits.[135] Shortly after the final document was published, national agricultural and residential associations filed suit contesting EPA's authority and their proposed equilibrium of freedoms and benefits.[136]

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[132] BAY TMDL, *supra* note 87, at 4-5 EPA determined the permit allocations of these sectors by considering inputs from the following sectors: agriculture, wastewater, forest, nontidal atmospheric deposition, onsite septic, and urban.

[133] *Id*. at 7-5 Specifically they required the WIPs to:

1. Identify the controls needed to achieve the allocations identified in the Bay TMDL through revised tributary strategies.
2. Identify the current state and local capacity to achieve the needed controls (i.e., an assessment of current funding programs for point source permitting/treatment upgrades and nonpoint source controls, programmatic capacity, regulations, legislative authorities).
3. Identify the gaps in current programs that must be filled to achieve the needed controls (i.e., additional incentives, state or local regulatory programs, market-based tools, technical or financial assistance, new legislative authorities).
4. A commitment from each jurisdiction to work to systematically fill the identified gaps. As part of this commitment, the jurisdictions would agree to meet specific, iterative, and short-term (1-2 year) milestones demonstrating increased levels of implementation or nitrogen, phosphorus, and sediment load reduction.
5. A commitment to continue efforts underway to expand monitoring, tracking, and reporting directed to assessing the effectiveness of implementation actions and to use the data to drive adaptive decision making and redirect management actions.
6. Agreement that if the jurisdictions do not meet the commitments, additional measures might be necessary.

[134] *Id*. at 7-1.

[135] *Id*.; ES-10.

[136] Am. Farm Bureau Fed'n v. U.S. E.P.A., 984 F. Supp. 2d 289, 324 (M.D. Pa. 2013) aff'd, 792 F.3d 281 (3d Cir. 2015) ("Moreover, although Plaintiffs believe that this process was coercive, it is noteworthy that no state has filed suit challenging the TMDL, let alone alleged that their participation in the TMDL drafting process was a result of coercion")

1. Backlash in the Bay: Challenging the TMDL

Disputing the fine line drawn by EPA between coercion and incentivizing, agricultural interest groups (collectively, "Farm Bureau") assembled against the TMDL.[137] The plaintiffs first took issue with the detailed allocations of the TMDL, including the both the sector allocations, and the calculation of a TMDL as the sum of a Waste Load Allocation and a Load Allocation.[138] These allocations, plaintiffs argued, far exceeded the statutory authority of section 303(d), which only permitted USEPA to establish a single figure as the *total* maximum daily load for a water body, but not to allocate that load or describe how it is to be achieved.[139] A limitation on the available source reduction pool, according to Farm Bureau, was not a nudge but rather coercive action as it severely restrained the states' available choices to meet the requisite TMDL levels.

Plaintiffs further contended the final TMDL hindered traditional state's rights to implementation with the required demonstrations of "reasonable assurances" of the nonpoint source load reductions in the WIPs[140] The prescriptive mechanisms for insuring state compliance went beyond EPA's authority, and in fact many of the initial WIPs were deemed insufficient and subjected to backstop authority.[141] Here, the Farm Bureau claimed, "EPA may *issue* a TMDL, EPA has no authority to *implement* a TMDL," and the reasonable assurances were simply a means for EPA to insert itself into an area that Congress, through cooperative federalism, reserved for the states.[142]

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[137] *Id*. at 329.
[138] 40 C.F.R. § 130.2(i)
[139] Am. Farm Bureau Fed'n, 984 F. Supp. 2d at 316.
[140] *Id*.
[141] *Id*. at 304. EPA found that many of the draft Phase I WIPs did not meet their target goal and therefore adjusted the allocations accordingly.
[142] *Id*.

Moreover, the holistic watershed approach taken in the TMDL was challenged on the basis that EPA did not have authority to set allocations for the headwater jurisdictions of Pennsylvania, New York, and West Virginia, which do not actually border the Chesapeake Bay.[143] Because EPA's power is derivative of the state, Farm Bureau averred EPA had no authority reach into other states, in effect allowing states to set TMDLs against other states and going beyond the traditional nonpoint boundaries.[144]

2. District court decision

Symbolic of efficient mapping and structuring choices, the court agreed with the Agency's functionalist approach in apportioning load allocations to sources because it guided states to selecting reductions from specific areas instead of one large pool.[145] Deferring to EPA's technical judgment, the court explained: "To merely set a number, and then let the states, permit writers, and other groups within each state 'duke it out' would not only be impractical, but would also be inconsistent with the CWA's foundational principle, which is that the burdens of eliminating pollution in the Nation's water is one to be shared among federal, state, and local authorities."[146] Moreover, narrowing the range of available pollution sectors still preserved flexibility because it did no more than nudge the states into selecting reductions from specific categories, rather than increase the total reductions required or regulate to individual sources.[147]

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[143] *Id.* at 329.
[144] *Id*.
[145] *Id* at 322 ("To do otherwise, i.e., to simply give a number to an entire municipal sewer system, consisting of multiple sources of point source pollution, and then letting multiple permit writers attempt to attain that allocation, does not make sense because, as the court pointed out, the individual permit writers would lack the coordination required to effectively "divvy up acceptable pollution levels among [the sources]").
[146] *Id*.
[147] *Id*. at 328.

Similarly, requiring reasonable assurances was not an unlawful implementation plan, particularly because the states were not *required* to implement Agency promulgated TMDLs; they could very well fashion and submit their own for EPA review.[148] Assurances were simply a basis against which to measure practicality of a state standard and provide feedback while reserving EPA backstop authority pursuant to section 303(d).[149] Without reasonable assurances of the achievability of nonpoint source reductions, waste load allocations could not be accurately calculated resulting in water quality falling short of its goals.[150] Unrealistic optimism is a common aspect of everyday life, and in the absence of a nudge it tends to preclude people from taking preventive or rational steps.[151] Without some type of mutual timeline and assurances of implementation, it would be naive to expect a favorable ecosystem response in the near future.[152]

The court also found the watershed scale to be consistent with, if not required by the language in §303(d), which mandates water quality standards be implemented at "a level necessary to implement the applicable water quality standards."[153] This approach more accurately accounts for natural hydrogeological processes and relieves part of the pressure on both nonpoint and point sources from achieving the goals in receiving states by nudging an alignment of incentives for all states in the watershed.[154]

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[148] *Id.* at 314. EPA may not, for example, dictate to a state what measures the state must undertake to reduce pollution from a particular source.
[149] *Id*. at 325.
[150] *Id*. at 326.
[151] NUDGE, *supra* note 2, at 32.
[152] Am. Farm Bureau Fed'n v. U.S. E.P.A., 792 F.3d 281, 308 (3d Cir. 2015) cert. denied sub nom. Am. Farm Bureau Fed'n v. E.P.A., No. 15-599, 2016 WL 763272 (U.S. Feb. 29, 2016) (Moreover, even Farm Bureau "agree[d] with EPA that developing source limits, assurances, and deadlines is useful").
[153] *Id.* (citing 33 U.S.C. § 1313(d)(1)(C)); 40 C.F.R. § 131.10.
[154] NUDGE, *supra* note 2, at 186.

Shortly after the district court rendered is decision and granted summary judgment on behalf of EPA, the Farm Bureau filed for appeal to the Third Circuit.

3. Chesapeake Taking Center Stage on Appeal

Ambiguity in the regulatory language again spurred debate of whether deference was owed under *Chevron*, but the resulting tension within the cooperative framework posed even greater constitutional questions for the Third Circuit.[155] Under the two-step *Chevron* framework, the court first approached the relevant TMDL precedent and statutory text in the context of the statutory structure and purpose, but found nothing dispositive in the traditional analysis.[156]

Underlying its analysis under step 1 of *Chevron*, the court placed priority on the canons of federalism and constitutional avoidance.[157] Anchoring against the jurisdictional challenges in *Solid Waste Agency of N. Cook Cty. v. U.S. Army Corps of Engineers (SWANCC)*[158] and *Rapanos v. United States*,[159] the court viewed the sector allocations and reasonable assurances as not "so coercive as to pass the point at which pressure turns into compulsion," thus impinging on traditional state land-use authority.[160] Recognizing that Congress may regulate

[155] Am. Farm Bureau Fed'n 792 F.3d at 301.
[156] *See* Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc., 467 U.S. 837 (1984) The seminal Supreme Court decision in *Chevron* developed the widely used two-part test for determining whether to grant deference to an agency interpretation. Part 1 of the test asks if the statute is ambiguous, and if so, step two asks if the agency decision is reasonable based on a permissible construction of the statute.
[157] Am. Farm Bureau Fed'n 792 F.3d at 301.
[158] 531 U.S. 159 (2001) The Supreme Court held that Corps' rule extending definition of "navigable waters" under CWA to include intrastate waters used as habitat by migratory birds exceeded authority granted to Corps under CWA.
[159] 547 U.S. 715 (2006) The Supreme Court held that term "navigable waters," under CWA, includes only relatively permanent, standing or flowing bodies of water, not intermittent or ephemeral flows of water, and only those wetlands with a continuous surface connection to bodies that are waters of the United States in their own right are adjacent to such waters and covered by the CWA.
[160] Am. Farm Bureau Fed'n, 792 F.3d at 304.

channels of interstate commerce and the Bay clearly fell within this realm, the court found no commerce clause dispute so egregious that it usurped state's rights.[161] The Bay TMDL simply did not elicit the same constitutional and federalism concerns as *SWANCC* and *Rapanos*, and as a result, found the term susceptible to multiple meanings.[162] Acknowledging the practicality of source allocations, deadlines, and reasonable assurances in furthering the goals of the Act, the court deferred to EPA's interpretation with the comment, "the EPA's approach makes sense."[163]

Although the court felt "the winners are environmental groups, the states that border the Bay, tourists, fishermen, municipal waste water treatment works, and urban centers" and the "losers are rural counties with farming operations, nonpoint source polluters, the agricultural industry, and those states that would prefer a lighter touch from the EPA," in reality the lines are not so definitive.[164] First, recall nothing necessarily prevents the Bay states from developing their own plan for implementation and in principle preserving choice, however pursuant to a considerably stricter standard for EPA's approval. Second, consider the likelihood of cost sharing by way of agricultural goods or taxes, thus lessening the impact of individual costs while also incentivizing innovation in nutrient control measures.[165] Further, EPA expressly accommodated nutrient credit trading programs in the Bay TMDL, another cost-efficient nudge.[166] Overall, EPA's

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[161] *See* Solid Waste Agency of N. Cook Cty. v. U.S. Army Corps of Engineers, 531 U.S. 159, 174 (2001) Permitting respondents to claim federal jurisdiction over ponds and mudflats falling within the "Migratory Bird Rule" would result in a significant impingement of the States' traditional and primary power over land and water use.
[162] NUDGE, *supra* note 2, at 23.
[163] Am. Farm Bureau Fed'n 792 F.3d at 309.
[164] *Id*. at 309-10
[165] Simpson, R. David, and Robert L. Bradford III. "*Taxing variable cost: Environmental regulation as industrial policy.*" 30 JOURNAL OF ENVIRONMENTAL ECONOMICS AND MANAGEMENT 282 (1996).
[166] BAY TMDL, *supra* note 87, at 10-3; Nutrient credit trading mechanisms are one form of nudging that can be easily replicated in other watersheds, *see* Chesapeake Bay Commission,

nudge was considered in light of a congressional declaration "that the states and the EPA could, working together, best allocate the benefits and burdens of lowering pollution."[167] In the context of choice architecture, the Bay TMDL fosters efficient mapping by fortifying connections between water quality standards and the deployment of physical conservation measures to attain actual reductions.[168]

In light of the denial of the petition for writ of certiorari, the Bay TMDL is now the ideal framework for environmental groups seeking widespread nonpoint source management.[169] Theoretically under an analogous program, states can be nudged to reduce nonpoint source loads from specific sectors of discharges, require realistic obligations of implementation, and align the interests of all states within or draining into a watershed.[170] In fact, E.O. 13508 Chesapeake Bay Protection and Restoration explicitly requests EPA develop pollution control techniques that "can be replicated in efforts to protect other bodies of water"[171] Whether this approach is replicated well remain to be seen, as past EPA Administrator Lisa Jackson indicated, "EPA has decided not to apply its Chesapeake Bay model for reducing pollution to the Upper Mississippi River Basin." Instead, Jackson indicated the EPA might look at ways to quantify how voluntary conservation methods in the Mississippi River Basin are helping reduce hypoxia in the Gulf of Mexico.[172]

Chesapeake Bay: An Economic Study (2012) *available at* https://www.epa.gov/chesapeake-bay-tmdl/comments-epa-evaluations-trading-and-offset-programs-chesapeake-bay-watershed

[167] Am. Farm Bureau Fed'n, 792 F.3d at 310.

[168] *See infra* notes 247-250 on voluntary best management practices.

[169] MASSIVE PROBLEMS, *supra* note 18, at 116.

[170] Jon Cannon, *Choices and Institutions in Watershed Management*, 25 WM. & MARY ENVTL. L. & POL'Y REV. 379, 380 (2000) ("The success of the Chesapeake Bay Program is apparent from an increasingly elaborate and specific set of mutual undertakings among the parties and from reductions in the costs of cooperation among them").

[171] CHESAPEAKE EXECUTIVE ORDER, *supra* note 124.

[172] IOWA NUTRIENT REDUCTION STRATEGY, 13 (2014) *available at* http://www.nutrientstrategy.iastate.edu/documents.

b. Nudging in the Mississippi River Basin: Transparency, Mapping, and Expecting Error

Environmental problems are created when interests are unaligned, but become manifestly amplified when people do not get feedback on the environmental consequences of their actions, revealing the classic *Tragedy of the Commons* dilemma.[173] As the ultimate drainage endpoint for the Mississippi River, the Gulf of Mexico accumulates the heavily contaminated waters of the United States' most agriculturally intensive lands. The Gulf is home to one of the most prominent marine ecosystems in the world, containing an abundance of aquatic wildlife and a once thriving 2.8 billion per year fishing industry.[174] Currently, it is also home to the largest hypoxic dead zone in the United States, spanning 7,700 square miles, about the size of the state of Massachusetts.[175] Much like climate change, there is little scientific debate on the cause of the immense deterioration; large applications of nitrogen-based fertilizers and runoff of nutrients into the Atchafalaya and Mississippi Rivers contribute to nutrient over enrichment and the creation of a seasonal zone of hypoxic (oxygen-deficient) waters, decimating the ecological and economical use of the Gulf. [176] Unlike the Chesapeake Bay, however, EPA has resisted action.

1. Call for Action

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[173] NUDGE, *supra* note 2, at 187 ("even if you know about the connection, it is probably not salient to your behavior"); *see* Allen G. Good, and Perrin H. Beatty. *Fertilizing Nature: A Tragedy of Excess in the Commons*. PLOS BIOL 9.8 (2011).
[174] *Id*.
[175] EPA, EPA-SAB-08-003, HYPOXIA IN THE NORTHERN GULF OF MEXICO: AN UPDATE BY THE EPA SCIENCE ADVISORY BOARD, at 14 (2007), available at http://water.epa.gov/type/watersheds/named/msbasin/tfproducts.cfm#sab.
[176] NATIONAL RESEARCH COUNCIL. NUTRIENT CONTROL ACTIONS FOR IMPROVING WATER QUALITY IN THE MISSISSIPPI RIVER BASIN AND NORTHERN GULF OF MEXICO at 11 (2009).

In 2008 a coalition of environmental groups spearheaded by the Gulf Restoration Network ("Gulf Restoration") petitioned EPA to develop numeric nutrient criteria for nitrogen and phosphorus for every state in which they had not yet been established, or at a minimum, the states in the Mississippi River Basin. Gulf Restoration claimed §303(c)(4)(B) of the Act, EPA's medium for expecting error, required EPA prepare and publish water quality standards "in any case where the administrator determines that a revised or new standard is necessary to meet the requirements of this chapter."[177] For the Gulf, they argued, this was most assuredly necessary, alleging that lack of numeric criteria within Mississippi River Atchafalaya River Basin (MARB) states, past EPA recognition of water quality problems, and available scientific data made it clear the EPA needed to step in.[178] Essentially, Gulf Restoration believed error was evident, and EPA needed to activate its tool to nudge the correct procedure. This approach would utilize federal authority to map narrative criteria into numeric standards for a significant portion of the country.

After three years delay and under threat of suit in 2011, EPA denied the petition, reasoning that using its rulemaking authority in this way would be "unprecedented and complex," and that it preferred to support the "states-first" approach.[179] Pointing to the guidance known as the Stoner Memo, EPA sidestepped the question, explaining it was not determining numeric criteria are not ultimately necessary, but rather believed the most effective way to address excess nutrients is cooperation with the states.[180] Gulf Restoration's request

[177] 33 U.S.C. § 1313(c)(4).
[178] Gulf Restoration Network v. Jackson, No. CIV.A. 12-677, 2013 WL 5328547 (E.D. La. Sept. 20, 2013), *vacated and remanded sub nom.* Gulf Restoration Network v. McCarthy, 783 F.3d 227 (5th Cir. 2015).
[179] *Id*. at 3.
[180] EPA, WORKING IN PARTNERSHIP WITH STATES TO ADDRESS PHOSPHORUS AND NITROGEN POLLUTION THROUGH USE OF A FRAMEWORK FOR STATE NUTRIENT REDUCTIONS (2011), *available at* http://www2.epa.gov/nutrient-policy-data/nitrogen-and-phosphorus-pollution-data-access-tool [hereinafter STONER MEMO] Relying on a 2011 EPA guidance memorandum, known

revealed a high degree of unrealistic optimism.[181]

2. Lawsuit Challenging the Denial

In 2012, Gulf Restoration filed suit in the Eastern District of Louisiana in response to the EPA's denial of their petition for rulemaking.[182] Relying on *Massachusetts v. EPA*,[183] the environmental groups claimed EPA acted arbitrarily when it neglected to even decide whether numeric nutrient criteria were necessary or not, and whether EPA could rely on any other information (i.e., policy or administrative) to achieve this result.[184] *Massachusetts* overturned EPA's denial of a petition for rulemaking seeking to force greenhouse gas regulation, allowing a denial only where EPA could provide a reasonable explanation based on the Clean Air Act.[185]

The District Court was thus faced not only with the question is of whether an agency decision is reviewable, but whether the EPA can refuse to make a decision, and if that decision can be based on non-statutory factors. Agreeing with Gulf Restoration, the court held EPA "lacks the discretion to simply decline to make the threshold determination in response to a rulemaking petition," directing EPA to make a decision but permitting the response on policy factors.[186] Under this precedent, environmental groups could wield tremendous power through

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as the 'Stoner Memo,' which outlines an 8-stage plan to work in partnership with states to address phosphorus and nitrogen pollution for nutrient reductions. Although affirming its commitment to the cooperative relationship with states, the memo asserted USEPA believes numeric nutrient criteria "are ultimately necessary for effective state programs."

[181] NUDGE, *supra* note 2, at 31.

[182] Gulf Restoration Network, No. CIV.A. 12-677, at *1

[183] Massachusetts v. E.P.A., 549 U.S. 497 (2007).

[184] Gulf Restoration Network, No. CIV.A. 12-677, at *1

[185] Massachusetts v. E.P.A., 549 U.S. 497 (2007) ("EPA can avoid taking regulatory action with respect to greenhouse gas emissions from new motor vehicles only if it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do.")

[186] Gulf Restoration Network, No. CIV.A. 12-677, at 7.

citizen suits, as they could appropriate the federal mechanism for expecting error, the necessity determination, and hijack agency resources to remedy situations where citizen groups perceived error. To prevent this unsolicited transfer of authority, appeal was filed shortly thereafter.

3. Decisions, Decisions

Reinterpreting *Massachusetts*, the Fifth Circuit upheld Agency discretion to refuse making a necessity determination, yet ensured transparency by requiring any ensuing explanation to be based on factors identified in the language of the statute.[187] According to the Fifth Circuit, *Massachusetts* therefore does not stand for the proposition there exists a *per se* requirement of agency response to a petition for rulemaking, as the District Court interpreted, but rather the Agency lacks discretion to base its reasons on factors not grounded in the statute.[188] EPA's rationale for denial must "provide an adequate explanation, grounded in the statute."[189]

Again we see choice architecture in the works, as the Fifth Circuit largely laid out an error proof structure for EPA's arguments on remand by delineating what constitutes sufficiently reasoned justification for denial of a necessity determination. EPA will likely reassert the arguments proffered with the petition denial, so long as it justifies those decisions with clear textual support in the statute.[190] EPA's initial commitment to continue working with states on MARB pollution controls appears to comport with statutory embodiment of congressional policy "to recognize, preserve, and protect the primary responsibilities and rights

[187] Gulf Restoration Network v. McCarthy, 783 F.3d 227, 239 (5th Cir. 2015) ("The agency cannot rely on alternative policy grounds, even if reasonable, if those explanations do not find clear textual support.")
[188] *Id*. at 243.
[189] *Id*.
[190] *Id*. at 239.

of States to prevent, reduce, and eliminate pollution," and thus may statutorily justify the denial.[191] This court-endorsed defense to a section 303(c)(4)(b) citizen suit is a severe detriment to the force of nudging under the necessity doctrine because it limits the scope of the response to an error in the system to agency discretion.[192] EPA thus has discretion on whether to map in response to demonstrated error.

Nudging often toes a fine line between simply influencing people's choices and improper manipulation that detaches the voluntariness of the choice.[193] Improper motives such as personal gain or a desire to control may cloud otherwise favorable choice architecture. As a remedy, good guidance through nudging removes deceit from structure by promoting transparency while implementing nudges.[194] With this in mind, the Fifth Circuit struck a balance between preserving EPA discretion and transparency in the decision-making process by requiring reasoning grounded in the statute.

Some scholars have noted that there has been no discussion of TMDL development in the Gulf, which clearly would qualify as impaired.[195] TMDL building would have to occur at a watershed level, because as one author noted, "Louisiana could close the state down and still have a world-leading dead zone."[196] Given the precedent set in the Third Circuit, there exists speculation that environmental groups will seek to replicate the Bay TMDL in the Mississippi

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[191] 33 U.S.C. § 1251(b)
[192] *See* Laura Kerr, *Compelling A Nutrient Pollution Solution: How Nutrient Pollution Litigation Is Redefining Cooperative Federalism Under the Clean Water Act*, 44 ENVTL. L. 1219, 1221 (2014)
[193] NUDGE, *supra* note 2, at 247.
[194] *Id*. at 247-8.
[195] *See* Megan Galey, *The Role of Water Quality Trading in Total Maximum Daily Load Programs*, ABA AGRIC. MGMT. COMMITTEE NEWSL, at 10, 12 (2014); *see also* Michael M. Wenig, *How "Total" Are "Total Maximum Daily Loads" ?-Legal Issues Regarding the Scope of Watershed-Based Pollution Control Under the Clean Water Act*, 12 TUL. ENVTL. L.J. 87, 187 (1998).
[196] Houck, *supra* note 38 at 10434.

River Basin.[197] With the exception of its own statutory provision in the Act[198], water quality efforts in the MARB have taken a similar trajectory as remediation efforts in the Bay prior to the TMDL.[199] Key differences, however, may hinder this prospect, and raises questions of whether a centralized body is the right method to map numeric development in the Gulf.

Spatially, the MARB covers some 1,245,000 square miles, roughly twenty times the size of the Chesapeake Bay Watershed.[200] Agriculturally productive land in the entire Chesapeake Bay Watershed covers roughly 6,500,000 acres, about 25% of the acres dedicated to agriculture in just Minnesota.[201] If the scope of the Bay TMDL was unprecedented and complex, a Mississippi River Basin TMDL almost seems inconceivable. Geographically, the Chesapeake Bay is a predominant fixture in the northeast community where three of the six states physically border the Bay, and this communal interest may have enticed the states to capitulate to federal TMDL development.[202] While clearly the Gulf of Mexico is economically and ecologically significant, it is far more removed from the contributing pollutant sources upstream the Mississippi River, and thus markedly

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[197] Galey, *supra* note 196, at 12.

[198] In 1998, Congress passed the Harmful Algal Bloom and Hypoxia Research and Control Act (HABHRCA) to address HABs that impacted living marine resources, fish and shellfish harvests and recreational and service industries along the U.S. coastal waters. 33 U.S.C. § 4004, Pub.L. 105-383, Title VI, § 604, Nov. 13, 1998.

[199] Similar to the Chesapeake Bay, the Gulf of Mexico has had a Task Force formed, Executive Order drafted, and been the subject of litigation. *See* Exec. Order No. 13,554, 3 C.F.R. 62,313 (2010)

[200] The Mississippi River originates as a tiny outlet stream from Lake Itasca in northern Minnesota. During a meandering 2,350 mile journey south to the Gulf of Mexico, the Mississippi River is joined by hundreds of tributaries, including the Ohio and Missouri Rivers. Water from parts or all of 31 states drains into the Mississippi River, and creates a drainage basin over 1,245,000 square miles in size. Before reaching the Gulf, the Mississippi meets up with its distributary, the Atchafalaya River. EPA, *Mississippi River/Gulf of Mexico Hypoxia Task Force*, available at http://www.epa.gov/ms-htf/mississippiatchafalaya-river-basin-marb (last accessed March 23, 2016).

[201] Frank J. Coale, *Proceedings of the 2012 Crop Pest Management Shortcourse & Minnesota Crop Production Retailers Association Trade Show* (2012) *available at* www.extension.umn.edu/AgProfessionals.

[202] *See* Daniel C. Esty, *Revitalizing Environmental Federalism*, 95 MICH. L. REV. 570, 641 (1996)

prone to environmental externalities.[203] Possibly the most vital distinguishing factor, however, is the lack of numeric nutrient standards among MARB states, and any coordinated and accountable association to implement them.[204] Without a centralized and dependable organization of states to nudge participation among one another, there can be little assurance that reduction measures will be implemented.[205] Statutory requirements do mandate TMDL development for impaired waters, however the first step in the progression generally begins with numeric standard setting.[206] Thus mapping through numeric standards may have to occur at individual state level for the MARB. Litigation in Florida, described below, illustrates complications over this phase nested within the cooperative federalism operable balance.

c. Florida Wildlife Federation v. Jackson: Expecting Error and Efficient Mapping

The litigation out of the Eleventh Circuit in Florida has long and storied past, spanning to the enactment of the 1972 Act. The battle over Florida's conversion of its everglades to agricultural land has consumed generations.

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[203] Cannon, *supra* note 171, at 383 ("The community in interest consists of the people who bear the significant costs and benefits of addressing a watershed issue").

[204] Although EPA did provide criteria guidance, few adopted even partial criteria. *See* EPA, EPA822-B-00-019 Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria, Rivers and Streams in Nutrient Ecoregion IX, (Dec. 2000); *see also* Jonathan Cannon, *Checking in on the Chesapeake: Some Questions of Design*, 40 U. RICH. L. REV. 1131, 1144-45 (2006); *see also* Jody M. Endres, and Matthew A. Walker, *A tale of three watersheds: U.S. EPA's contrasting approaches to agricultural nutrient pollution*, 2 WIREs WATER 47 (2015).

[205] Cannon, *supra* note 171, at 400. ("Although the Chesapeake Bay Agreement does not provide a means for its enforcement, the norms of mutual dependence and cooperation that have been developed in the course of the program offer some protection against forms of strategic behavior such as free riding"); *see also* 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, 293 (2014).

[206] *See infra* notes 90-103 on numeric standards.

1. The Consent Decree

In 2008, environmental groups filed suit in the Northern District of Florida, asserting that vague policy statements made by the EPA in a 1998 document, *Clean Water Action Plan: Restoring and Protecting America's Waters,*[207] constituted a "necessity determination" for numeric nutrient criteria for Florida's waters, and failure to act was a violation of CWA §303(c)(4)(B).[208] Simultaneously, the Florida Department of Environmental Protection (FDEP) commenced development of its own numeric criteria, yet each plan met a similar fate of endless revisions and implementation extensions.[209] Illustrating the force of the citizen suit nudge, in 2009 EPA exercised their statutory authority and issued an explicit necessity determination.[210] This time, EPA agreed with the observed error, and initiated its correction, which would begin the mapping process.

Later that year, the environmental groups and EPA entered into a consent decree that required EPA to propose and finalize numeric nutrient criteria for the state of Florida, unless FDEP criteria was approved.[211] Hanging over the heads of FDEP like a carrot was the threat of federal intervention, but it still continued to drag its feet. Shortly thereafter EPA delivered the stick, issuing its own numeric criteria for Florida.[212]

Some of EPA's numeric criteria fell short according to the court,

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[207] Florida Wildlife Fed'n, Inc. v. Jackson, 853 F. Supp. 2d 1138, 1146 (N.D. Fla. 2012).
[208] EPA, CLEAN WATER ACTION PLAN: RESTORING AND PROTECTING AMERICA'S WATERS 58–59 (1998), *available at* http://yosemite.epa.gov/water/owrccatalog.nsf/e673c95b11602f2385256ae1007279fe/8cc8c2fd486f236a85256d83004fda6e!OpenDocument. The 1998 document said that the Administrator *expected* all states "to adopt and implement numerical nutrient criteria" by 2003.
[209] Florida Wildlife Fed'n, Inc. 853 F. Supp. 2d at 1147.
[210] *Id.* at 1150.
[211] Florida Wildlife Fed'n, Inc. v. Jackson, 4:08CV324-RHWCS, 2009 WL 5217062 (N.D. Fla. Dec. 30, 2009).
[212] Florida Wildlife Fed'n, Inc., 853 F. Supp. 2d at 1176-77.

particularly the stream criteria and the default downstream-protection criteria for unimpaired lakes were declared arbitrary and capricious because of the reference model EPA used to determine impairment. Any stream would automatically classify as being impaired if it exceeded the 90th percentile for nutrient levels of a geographic sample set.[213] Downstream protection levels, set at the nexus where a stream enters a lake, would potentially classify an entire stream system as impaired if its nutrient levels were higher than the ambient conditions of the lake.[214] The court deemed these benchmarks arbitrary, as they were not an adequate indicator of a *harmful* increase in nutrient levels, but rather simply an increase in nutrient levels, which may be harmful or not.[215]

Nudging FDEP to act, part of the EPA criteria was subsequently replaced with FDEP numeric standards per the terms of the consent agreement, as EPA had explicitly preserved its right to yield to FDEP standards conditional on federal approval.[216] Not all of FDEP's proposed standards followed EPA guidance, and the FDEP's proposal used narrative criteria for "South Florida streams and for marine lakes, tidally influenced streams, and conveyances primarily used for water-management purposes with marginal or poor stream habitat components."[217] With Florida now moving on its commitment, EPA amended its 2009 determination to allow for some narrative criteria, and sought to modify the

[213] *Id*. at 1168 ("Instead, a stream is deemed impaired—in four of the regions—if a nutrient level exceeds that of 90% of the sample set".)
[214] *Id*. at 1170 ("By setting the default DPVs equal to ambient conditions at the pour point, the rule in effect disapproves any change in nutrients, even a change that will have no harmful effect. The result is that upon an increase in a nutrient level at the pour point, an entire stream system is deemed impaired, even if the increase is to a level well below the lake or stream criterion, and even if the change has no harmful effect on the lake's flora or fauna").
[215] *Id*. at 1168 ("The use of unadjusted ambient conditions makes clear that at least for that purpose, the Administrator was shooting at a target intended to identify any change in nutrient levels, not just a harmful change").
[216] Florida Wildlife Fed'n, Inc. v. McCarthy, No. 4:08CV324-RH/CAS, 2014 WL 51360, at *4 (N.D. Fla. Jan. 7, 2014), aff'd sub nom. Florida Wildlife Fed'n Inc v. Adm'r, U.S. Envtl. Prot. Agency, 620 F. App'x 705 (11th Cir. 2015).
[217] *Id*. at 4.

consent decree with environmental groups due to the amendments and approval of the state numeric standards.[218] Given that federal numeric standard promulgation would be rendered moot with the ratified state standards, the court granted the request, holding the EPA's revisions consistent with the Act and implementing the EPA-approved state standards.[219]

2. Uncooperative Federalism: Costs of State Primacy

The convoluted situation in Florida highlights a series of nudges and the underlying priorities. First, people tend to be extremely loss adverse, often to their detriment.[220] Loss aversion pressures us not to make changes even when those changes might be in our best interest for fear of losing our current position. In Florida, EPA was willing to yield to the power to the state to promulgate standards. For a resource constrained agency, EPA has little hesitation to hand the reins over to the states, as is also statutorily required, when the states uphold their responsibility over standard setting for impaired waters. Florida very well could have retained control of numeric development from the outset and avoided the nudge had it preemptively accepted EPA's offer to transform its narrative criteria into numerical values. Whether this would translate into greater flexibility in EPA's decision to approve a state's numeric standards is debatable, however here Florida did revive narrative standards for certain waters where EPA had previously certified numeric values. Fortunately for both EPA and FDEP, EPA was able to modify the consent decree despite protest from environmental groups, and authorize the Florida standards.

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[218] *Id.*
[219] *Id.*
[220] NUDGE, *supra* note 2, at 34. ("Loss aversion operates as a cognitive nudge, pressing us not to make changes, even when changes are very much in our interests").

Second, the case casts skepticism on whether the necessity determination is the most suitable vehicle to structure these complex choices and map narrative standards into quantitative numeric standards because of the priority to return to cooperative federalism.[221] Undoubtedly, the environmental group's necessity determination nudged the transformation of narrative to numeric criteria, and that benefit cannot be overlooked. Yet the ultimate consequence from the final consent decree was exemption of flowing waters in the South Florida Region, marine lakes, tidally-influenced flowing waters, and conveyances primarily used for water management purposes with marginal or poor stream habitat components.[222] The court's logic was the EPA failed to properly "translate Florida's existing narrative nutrient criterion into numeric criteria."[223] In fact, intervening industry groups on behalf of the EPA asserted not that numeric standards were unnecessary, but that *appropriate* numeric standards cannot be put in place as quickly as the consent decree would require.[224]

On its face, this may seem like a loss for water quality advocates, but states are considered to be the foremost authority on regulation of their waters. Over the last decade, Courts have been generally tightening federal commerce clause jurisdiction, but also specifically under the Clean Water Act.[225] Beyond the constitutional arguments, there is scientific logic behind the transition as well. Statewide water quality standards such as those initially proposed by EPA may frustrate protection of certain water bodies by listing waters with naturally high

[221] *See also* Kerr, *supra* note 193, at 1222.
[222] Water Quality Standards for the State of Florida's Lakes and Flowing Waters; Withdrawal, 79 Fed. Reg. 18494-01 (2012).
[223] Florida Wildlife Fed'n, Inc. 853 F. Supp. 2d at 1160.
[224] Florida Wildlife Fed'n, Inc. 2009 WL 5217062, at *5.
[225] United States v. Lopez, 514 U.S. 549 (1995) (held that Gun-Free School Zones Act, making it federal offense for any individual knowingly to possess firearm at place that individual knows or has reasonable cause to believe is school zone, exceeded Congress' commerce clause authority, since possession of gun in local school zone was not economic activity that substantially affected interstate commerce). For cases specific to the CWA jurisdiction, *see infra* notes 34 and 160.

nutrient levels as impaired, and ignoring those that are actually impaired despite meeting numeric criteria.[226] Nonetheless, nudging played a significant yet inefficient role by coaxing Florida to draft numeric standards.

[226] Florida Wildlife Fed'n, Inc. 2014 WL 51360, at *8

PART IV: INCENTIVIZING STATE MANAGEMENT PLANS

This part addresses the federal and state nutrient management plans that have been the cornerstone of the voluntary efforts. In particular, I highlight the Midwestern states of Iowa, Illinois, and Minnesota given their status as agricultural powerhouses in the Mississippi River Basin, but also to demonstrate their disparate vigor to compel voluntary reductions. Courts remain a powerful and influential player in nudging nutrient pollution accountability, but they move at a pace fixed to the procedural process. Individual states across the country are taking steps to devise comprehensive and collaborative nutrient management programs, vowing to preempt potential lawsuits.

In theory, the plans embody the quintessential nudge within choice architecture; they preserve the liberty of choosing reduction methods while changing the behavior for the greater good. Association is likely owed to common underlying principles between nudging and the theory of adaptive management, the robust decision-making process prevalent to natural resource management.[227] The similar doctrines of thought rely on a determination of goals and objectives, development of conceptual models, and feedback to make improvements while simultaneously diminishing uncertainty in future decisions.[228] Throughout the paper thus far, we have identified principles implicit to effective choice architecture: understanding mapping, the power of defaults, giving feedback, expecting error, and structuring complex choices.[229] Here, we will explore the final prong of choice architecture, incentives, through the lens of nutrient reduction strategies.

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[227] *See* Robin Kundis Craig & J.B. Ruhl, *Designing Administrative Law for Adaptive Management*, 67 VAND. L. REV. 1, 7-8 (2014).
[228] *Id*.; Carl Walters, *Challenges in Adaptive management of Riparian and Coastal Ecosystems* 1.2 CONSERVATION ECOLOGY 1 (1997).
[229] NUDGE, *supra* note 2, at 102.

In general, the nutrient reduction strategies ultimately acknowledge the path to numeric criteria, but rely on "best management practices" (BMPs) funded under section 319 of the Act, a cost-sharing grant program.[230] The section 319 Nonpoint Source Management Program does not confer authority to states to penalize nonpoint source polluters who fail to apply best management practices or give the federal government authority to intervene with their own plan, but rather it provides financial to encourage the adoption of such practices.[231] All the section requires management plans include are a description of BMPs and implementation strategy, a timeline of proposed annual milestones, and state matching sources of funding.[232]

Financial incentives are a necessary cog of the choice architecture machine and an influential form of nudging, but architects must be cognizant of who uses, who chooses, who pays, and who profits.[233] Outside investment by nonfarmers in agricultural land further complicates implementation of voluntary measures because lease arrangement creates little incentive to invest in land sustainability.[234] Roots run deep in the agricultural communities, and these plans

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[230] 33 U.S.C. § 1329; *see also* USDA, REGIONAL CONSERVATION PARTNERSHIP PROGRAM, *available at* http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/farmbill/rcpp/; Williams, *supra* note 20, at 69 ("Another similar program was the section 208 program, however Congress ceased funding the ineffective grants program in 1981 because of structural shortcomings").

[231] Williams, *supra* note 22, at 75.

[232] 33 USC 1329(b)(2); 40 C.F.R. § 35.268 The only real limitation on funding is the requirement that states demonstrate they have made progress on reducing pollutant loadings.

[233] NUDGE, *supra* note 2, at 99; HTF 2015 REPORT TO CONGRESS, *supra* note 69 at 66. Between 2009-2013, EPA invested $2.3 billion dollars through grant funding to HTF states, with an additional $5 billion coming from NRCS investments in voluntary conservation programs in HTF states.

[234] As federal farm programs continue to encourage investment in farmland by non-farmers because they hold up return of investment even in the face of declining crop prices, nudging in the form of sustainable farm leases may nudge soil conservation. *See* EDWARD COX, THE LANDOWNER'S GUIDE TO SUSTAINABLE FARM LEASING (2010); John H. Davidson, *Factory Fields: Agricultural Practices, Polluted Water and Hypoxic Oceans*, 9 GREAT PLAINS NAT. RESOURCES J. 1, 28-29 (2004); *see also* https://www.iowafarmbureau.com/Article/Farm-and-city-partnerships-can-solve-water-quality-challenges (last accessed March 30, 2016).

strike a workable balance, but success will rely entirely on the commitment to the deadlines and goals.[235]

a. Mississippi River/Gulf of Mexico Watershed Nutrient Task Force

Of the 31 states that drain into the Mississippi River basin, nine Midwest states contribute approximately 75% of the nutrients entering the Gulf.[236] In response to the 1.57 million tons of nitrogen transported to the Gulf of Mexico via the Mississippi River, EPA partnered with five federal agencies and twelve state representatives of agriculture and environmental agencies to form the Gulf Hypoxia Task Force (HTF).[237] Coinciding with the enactment of the Harmful Algal Bloom and Hypoxia Research and Control Act (HABHRCA), the Task Force was chartered in May 1998 with the directive to "provide executive level direction and support for coordinating the actions of participating organizations working on nutrient management within the Mississippi River/Gulf of Mexico Watershed."[238] Clearly this would be a colossal undertaking, and thus Congress appropriated one billion dollars annually, however the proposed funding was

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[235] A. Bryan Endres & Lisa R. Schlessinger, *Legal Solutions to Wicked Problems in Agriculture: Public-Private Cooperative Weed Management Structures as a Sustainable Approach to Herbicide Resistance* (2015) (unpublished manuscript) (on file with authors).

[236] Illinois, Iowa, Indiana, Missouri, Arkansas, Kentucky, Tennessee, Ohio, and Mississippi. R.B Alexander., R.A. Smith, G.E. Schwarz, E.W. Boyer, J.V. Nolan, and J.W. Brakebill. *Differences in Phosphorus and Nitrogen Delivery to the Gulf of Mexico from the Mississippi River Basin*. 42 ENVIRONMENTAL SCIENCE & TECHNOLOGY 822-830 (2008); Pamela A. Porter, Robert B. Mitchell, and Kenneth J. Moore. *Reducing hypoxia in the Gulf of Mexico: Reimagining a more Resilient Agricultural Landscape in the Mississippi River Watershed*. 70.3 JOURNAL OF SOIL AND WATER CONSERVATION 63A-68A (2015).

[237] Mississippi River/Gulf of Mexico Watershed Nutrient Task Force, http://water.epa.gov/type/watersheds/named/msbasin/index.cfm (last visited March 20, 2016).

[238] Agreement to Shrink the Dead Zone. *Charter of the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force* (May 1998). *available at* https://www.epa.gov/ms-htf/charter-mississippi-rivergulf-mexico-watershed-nutrient-task-force; Title VI, Pub. L. No. 105-383, §§ 601-606, 112 Stat. 3447, 3447-50 (Nov. 13, 1998).

eliminated in the wake of economic recession and the War on Terror.[239]

Instead, the HTF acts almost as an intermediary, funneling other sources of funding to HTF states. For example, from 2009 to 2013, the Natural Resource Conservation Service (NRCS) invested nearly $5 billion in voluntary conservation programs in HTF states.[240] Although there was never an explicit threat of withholding funding for failure to join HTF, the program heavily invests in the member states. Additionally, composition of the Task Force is distinct from the Chesapeake Bay Program in that its participants retain much more individual autonomy than members of the Chesapeake Bay Program, there is less of an external accountable structure.[241] The original deadline to reduce nitrogen and phosphorus delivery to the Gulf by 45 percent resulting in a hypoxic zone less than 5,000 km2 was 2015, although given the lack of progress the deadline was recently extended to 2035.[242]

In 2008, the HTF released the Gulf Hypoxia Action Plan that describes a national strategy for abating hypoxia in the Gulf of Mexico and improving water quality in the Mississippi River Basin, reaffirming the original goals by Hypoxia Task Force in 2001.[243] More importantly, it directed states to "complete and implement comprehensive nitrogen and phosphorus reduction strategies."[244] According to HTF, these comprehensive strategies were to be developed in the context of six core guiding principles: encourage actions that are voluntary, incentive-based, practical, and cost-effective; utilize existing programs, including

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[239] Donnelle Eller, *States want 20 more years to meet Gulf dead-zone goals*, DES MOINES REGISTER, February 12, 2015, *available at* http://www.desmoinesregister.com/story/money/agriculture/2015/02/12/states-contributing-gulf-dead-zone-push-deadline/23322609/.
[240] HTF REPORT TO CONGRESS 2015, *supra* note 69, at 64.
[241] MASSIVE PROBLEMS, *supra* note 18, at 109.
[242] *See* EPA, GULF HYPOXIA ACTION PLAN 2008 (2008), *available at* http://water.epa.gov/type/watersheds/named/msbasin/upload/2008_8_28_msbasin_ghap2008_update082608.pdf.
[243] *Id*.
[244] *Id*. at 32.

existing state and federal regulatory mechanisms; follow adaptive management; identify additional funding needs and sources during the annual agency budget processes; identify opportunities for, and potential barriers to, innovative and market-based solutions; and provide measurable outcomes as outlined in the plan.[245] As a result, the Task Force's most redeeming feature is the collaborative network to assist states in developing their own nutrient reduction strategies. [246] Nonetheless, the state Nutrient Reduction Strategies (NRS) would likely have benefited from more explicit guidance on the components of the nutrient plans. Thus nudging could have had the advantage of ensuring the state NRS all meet minimum specifications, which is discussed in greater detail below.

Based on the principles of successful choice architecture, the Gulf Watershed Task Force model is a convincing example of nudging. This approach preserves the state's flexibility of choice in meeting their reduction allocations, while concurrently seeking to fund tangible conservation measures and provide data that would be otherwise unattainable.[247] The risk exists, however, that while the partnership may provide of examples of "success," such as active research, agreements, reports, and voluntary programs, little actual environmental achievement may occur.[248] This counteracts the main theme elicited through this section, incentives, because it simply encourages the status quo, exemplified by the decision to postpone the reduction deadline.

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[245] *Id*. at 8.

[246] Pamela A. Porter, Robert B. Mitchell, and Kenneth J. Moore. *Reducing Hypoxia in the Gulf of Mexico: Reimagining a more Resilient Agricultural Landscape in the Mississippi River Watershed*, 70.3 JOURNAL OF SOIL AND WATER CONSERVATION 63A-68A (2015) ("A weakness of the 2008 action plan is that it contains nothing to suggest that actions discussed in the plan will in fact achieve the goals...The current framework of mainly voluntary coordination of actions and programs, although useful for promoting dialogue and raising awareness of water quality issues, has not realized substantive accomplishments in terms of on-the- ground project implementation or documented improvements in water quality").

[247] MASSIVE PROBLEMS, *supra* note 18, at 109.

[248] Cannon, *supra* note 205, at 1136 (citing Howard R. Ernst, Chesapeake Bay Blues: Science, Politics, and the Struggle to Save the Bay (2003)).

Incentives exist through funding of programs such as the Environmental Quality Incentives Program (EQIP), which provides technical, financial, and educational assistance to farmers to implement BMP adoption, the Conservation Reserve Program (CRP), which pays farmers to set aside sensitive farmlands for ten to fifteen years; and the Conservation Reserve Enhancement Program (CREP), which funds long-term conservation easements and encourages farmers to adopt conservation practices.[249] Yet incentives need to be in place for reductions or actions that go beyond the conventional practices and motivate states to be the frontrunner in some aspect of water quality.[250] Water quality trading programs are one solution because entities can capitalize on excesses, but the physical structure for that scheme is not in place.[251] With the looming threat of watershed TMDL building, possibly a non-monetary "get-out-of jail-free-card" type incentive might be feasible for states willing to enact numeric standards.[252]

b. Strong Choice Architecture in State Nutrient Reduction Plans

Beyond the mutual goal to reduce nutrient loads by 45%, Nutrient Reduction Strategies in the Midwest tend to share similar characteristics in that they describe a comprehensive suite of best management practices for reducing loads from wastewater treatment plants and urban and agriculture runoff.[253] Based on the core principles of strong choice architecture, the plans should resonate with all stakeholders. A few crucial characteristics of each plan, however, distinguish

[249] *See* Sherry A. Enzler, *EPA-Minnesota Ag Certainty Program-Is It Up to the Task of Cleaning Our Waters*?, 39 WM. MITCHELL L. REV. 959, 976 (2013).
[250] Williams, *supra* note 22, at 109-10.
[251] *Id*.
[252] A similar approach has been incorporated in Minnesota, *see* Enzler, *supra* note 250.
[253] ILLINOIS STATEWIDE NUTRIENT LOSS REDUCTION STRATEGY (2014) *available at* http://www.epa.state.il.us/water/nutrient/ [hereinafter Illinois Nutrient Reduction Strategy].

whether the plans are received with support or litigation.[254]

First, a state's decision to adopt numeric water quality criteria is preeminent feature that coincides with NRS development. The *Iowa Nutrient Reduction Strategy* answers the call of the 2008 Gulf Hypoxia Acton Plan, however embraced the ideology of the Stoner Memo, and the drafters ultimately chose not implement any numeric standards because of a lack of confidence in EPA's criteria recommendations, technological infeasibility, and the substantial financial costs associated with implementing nutrient removal technologies.[255] Conversely, Minnesota does have numeric standards for phosphates in lakes and reservoirs throughout the state, and intends to implement numeric standards for nitrates and rivers in the future.[256] The Illinois nutrient management plan contains numeric standards for phosphates in lakes and nitrate level in streams designated as public water supplies.[257] Notably, however, numeric standards are absent where they are needed the most, in Illinois' expansive stream system.[258] Seeking to avoid the perceived first step to increased regulation, states are then hesitant to accurately develop TMDLs for impaired water bodies within its borders.[259]

Second, states must continue to allocate funds and contribute financial support. As noted above, federal funds are distributed under 319 to maximum of

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[254] *See* Drew L. Kershen, *Sustainable Intensive Agriculture: High Technology and Environmental Benefits*, KAN. J.L. & PUB. POL'Y, 424, 449 (2007).

[255] See IOWA NUTRIENT REDUCTION STRATEGY, *supra* note 173, at 7; Houck, *supra* note 38, at 10434 ("Iowa, ranking number two for nitrogen and four for phosphorus, has no work plan to develop them for *any* class of waters, and has recently determined that numeric criteria are not necessary at this time even for the protection of recreational swimming.")

[256] MINNESOTA NUTRIENT REDUCTION STRATEGY (2014) *available at* https://www.pca.state.mn.us/water/nutrient-reduction-strategy [hereinafter MINNESOTA NUTRIENT REDUCTION STRATEGY]; Enzler, *supra* note 250, at 960.

[257] ILLINOIS NUTRIENT REDUCTION STRATEGY, *supra* note 254, at. Total Phosphorus: 0.05 mg/L. Lakes only to protect Aquatic Life Use and Aesthetic Quality Use. Nitrate: 10 mg/L. Stream segments and Lakes designated as Public Water Supplies. A narrative WQS prohibiting excess algae or plant growth exists for all waters.

[258] Houck, *supra* note 38, at 10434 *Illinois* has not yet developed even a work plan for nutrient criteria for streams, which are of course where nitrogen and phosphorous start their journeys downstream; indeed, the state no longer identifies phosphorus as a cause of impairment at all.

[259] See *infra* notes 90-102 on impediments to numeric standard development.

60 percent of the approved work plan.[260] The Illinois Fertilizer Act ensures that a $0.75/ton assessment on all bulk fertilizer sold in Illinois is allocated to research and educational programs focused on nutrient use and water quality.[261] Additionally, Minnesota amended its constitution in 2009 to incorporate the Minnesota *Clean Water, Land and Legacy Amendment*, which allocates 33 percent of the sales tax revenue from the Legacy amendment to protect, enhance, and restore water quality in lakes, rivers, and streams and to protect groundwater from degradation.[262] When initially completed in 2013, the Iowa Department of Agriculture and Land Stewardship (IDALS) received $22.4 million to implement the conservation measures for nonpoint sources.[263] However, funding to support Iowa's NRS was slashed in 2014.[264] Currently, Iowa's plan for funding is to "make most effective use of funding resources including maximizing benefits per amount expended."[265]

Third, a timeline is critical. Illinois expects its nonpoint source practices will help the state reduce its phosphorus load by 25 percent and its nitrate-nitrogen load by 15 percent by 2025.[266] At the headwaters of the Mississippi River, Minnesota plans to take its fair share of the nutrient pollution burden and achieve a 45% reduction of nitrogen and phosphorus in the Mississippi River by 2045.[267] While the Iowa strategy was one of the few to meet the initial deadline by the Task Force requiring state nutrient plans, it lacks any timeline for implementation. This omission may prove to be a fatal flaw. As mentioned above,

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[260] 40 C.F.R. § 35.265
[261] ILLINOIS NUTRIENT REDUCTION STRATEGY, *supra* note 254, at 6-8; Illinois Fertilizer Act 505 ILCS 80 (2012).
[262] *See* Minnesota's Legacy *available at* http://www.legacy.leg.mn/about-funds.
[263] HTF 2015 REPORT TO CONGRESS, *supra* note 69, at 39.
[264] *See* Neil D. Hamilton, *Sixteen Things to Know About the DMWW Proposed Drainage District Lawsuit*, 2015 Iowa Water Conference (2015).
[265] IOWA NUTRIENT REDUCTION STRATEGY, *supra* note 173, at 4.
[266] ILLINOIS NUTRIENT REDUCTION STRATEGY, *supra* note 254, at.
[267] Compared to average 1980-1996 conditions. MINNESOTA NUTRIENT REDUCTION STRATEGY, *supra* note 257, at 3.

the success of voluntary nutrient management plans relies wholly on the willingness to implement, and there is minimal incentive to implement without a deadline. Here, we return our discussion to litigation as a cautionary tale where the Iowa NRS has failed to nudge with sufficient force. Iowa county leaders will be standing behind the state-sponsored nutrient pollution plan that is less than two years old and still in infancy.[268]

c. Des Moines Water Works Law Suit: Outcome of a Weak Nudge

Competing with an expanding population, the conflict brewing in the one of the Mississippi River Basin's agricultural powerhouse states has put the nonpoint source community on notice.[269] To put the physical and social landscape in perspective, roughly one in five Iowans are employed by agriculture.[270] Plaintiff Des Moines Water Works (DMWW) is a regional water treatment utility located in Iowa that draws direct from the local Raccoon and Des Moines Rivers to provide some half a million citizens clean drinking water.[271] Suffering from increasingly prohibitive costs incurred from nitrate and phosphorus removal,

[268] Brett Walton, *Des Moines Initiates Clean Water Act Lawsuit to Stem Farm Pollution, available at* http://www.circleofblue.org/waternews/2015/world/des-moines-initiates-clean-water-act-lawsuit-to-stem-farm-pollution/; *see also* Annie Snider, *Water Pollution: Iowa utility's lawsuit takes new stab at old nutrient problems*, E&E REPORTER, http://www.eenews.net/stories/1060012531

[269] *See* Jonathan Coppess. *Thinking about the Des Moines Water Works Lawsuit and the History of Drainage*. Policy Matters, POLICY MATTERS (2015) *available at* http://policymatters.illinois.edu/thinking-about-the-des-moines-water-works-lawsuit-and-the-history-of-drainage/.

[270] Iowa Farm Bureau, *Farm Fresh Blog*, https://iowafarmbureau.wordpress.com/2015/05/21/uniteiowa-yeah-lets-get-to-work/ (last accessed March 25, 2016).

[271] Complaint, Board of Water Works, et al. v. Sac County Board of Supervisors, No. 5: 15-cv-04020, 2015 WL 1191173 (N.D.Iowa 2015).

DMWW now seeks to hold three rural Iowa's drainage districts accountable as point sources under the Act and recover costs through common law claims.[272]

Attacking the characterization of tile drainage infrastructure as a point source is not an entirely new concept; conservation groups in California challenged it without success as recently in 2013.[273] DMWW is taking a slightly different approach in their recent complaint, contesting it is the drainage district's failure as a whole to receive a NPDES permit that has resulted in excess nutrients.[274] DMWW contends the runoff does not fall under the exemption for "agricultural stormwater discharge" or "return flows from irrigated agriculture," but rather is classified as "artificially drained groundwater" and therefore should not be exempt from permitting.[275] To meet its consumption regulation, DMWW seeks a 45 percent nitrate reduction, which is in line with federal and state reduction goals.[276]

Until now, nonpoint source lawsuits over absent water quality standards have only indirectly affected agricultural interests. Litigation deep in Iowa's productive farmland directly confronts the agricultural community and exposes a much larger clash of ideological interests. No regulations exist for issuing NPDES permits to drainage districts, and means to achieve the necessary reductions could create cumbersome regulation.[277] As a result of the suit, other drainage districts throughout the Midwest are taking heed and seeking preliminary

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[272] The Des Moines suit is composed of two separate trials. Constitutional issues relating to the power of drainage districts will be decided in the Iowa Supreme Court, while the Clean Water Act cause of action will be heard in federal court.

[273] *Pac. Coast Fed'n of Fishermen's Associations v. Glaser*, No. CIV S-2:11-2980-KJM, 2013 WL 5230266, at *1 (E.D. Cal. Sept. 16, 2013).

[274] IOWA CODE § 468.2(1) and (2). IOWA CODE Chapter 468 and IOWA CONSTITUTION Article I, Section 18, establish drainage districts as they exist under Iowa law.

[275] 33 U.S.C. § 1362(14).

[276] Reply to motion for summary judgment, Board of Water Works, et al. v. Sac County Board of Supervisors, No. 5: 15-cv-040202015, WL 7301504 (N.D.Iowa 2015).

[277] Ikenberry, Charles D., et al., *Nitrate-Nitrogen Export: Magnitude and Patterns from Drainage Districts to Downstream River Basins*. 43.6 JOURNAL OF ENVIRONMENTAL QUALITY 2024-2033 (2014).

counsel.[278] As previously mentioned, states and nonpoint source contributors currently have the benefit of a cooperative approach to water quality. Des Moines is an example of potential alternative arrangements as the result of a weak or absent nudge.

[278] Phyllis Coulter, *Illinois drainage group sets up legal defense fund, eyes Iowa suit*, ILLINOIS FARMER TODAY (February 04, 2016), *available at* http://www.illinoisfarmertoday.com/news/regional/illinois-drainage-group-sets-up-legal-defense-fund-eyes-iowa/article_697be37e-ca98-11e5-84bc-c763d4e7790b.html

CONCLUSION

The cooperative federalism structure as originally designed did not have the capacity to deal with the massive problem of hypoxia we face today. To adequately evolve, the framework needs to expand the traditional roles of all stakeholders under the Act. The best policy instrument to do this is nudging because it alleviates constitutional concerns by potential regulatees while promoting water quality improvement.

Thus a possible answer to the massive nonpoint source problem requires all stakeholders to embrace the ongoing transforming process by utilizing nudges available in choice architecture. By now, it should be evident that despite Congress being the ultimate choice architect of the Clean Water Act, they are not the only sovereign or entity that has the power to design their own architecture and nudge the subject through its structure. Strategic nudging at different levels within the framework of the Act will likely lead to development, adoption and implementation of effective control policies. Many other areas across the country are rife with eutrophic waters, such as the Great Lakes, and would benefit from a nudge. Additional forms of nudging will need to be identified to further this goal, before Congress decides to remove the exemptions for agriculture all together, or find a way to hold agricultural representatives accountable for regulation as point sources as in the Des Moines Water Works lawsuit.