FROM CATEGORY 4B TO CATEGORY 2: HOW LOCAL STAKEHOLDERS IN THE TAMPA BAY NITROGEN MANAGEMENT CONSORTIUM BATTLED NUTRIENT POLLUTION TO IMPROVE THE BAY

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I. INTRODUCTION

On November 15, 2017, Julie Espy, Program Administrator of the Florida Department of Environmental Protection's (FDEP) Water Quality Assessment Program, wrote a letter to Holly Greening, Executive Director of the Tampa Bay Estuary Program. The contents of that letter were remarkable: Tampa Bay—a central Florida water body which had for decades suffered harmful effects of nutrient pollution (particularly nitrogen)—was no longer impaired for nitrogen, and FDEP had moved it from assessment category 4b ("impaired or threatened") to category 2 ("no use is threatened").[1] This remarkable success is attributable in large part to the efforts of the Tampa Bay Nitrogen Management Consortium (NMC), a unique and innovative decentralized stakeholder

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1. Letter from Julie Espy, Program Adm'r, Water Quality Assessment Program, Florida Department of Environmental Protection, to Holly Greening, Executive Director, Tampa Bay Estuary Program, *Approval of the Nitrogen Management Consortium's Reasonable Assurance Plan* (Nov. 15, 2017), http://www.tbeptech.org/NitrogenMgmtConsort/ReasonableAssurance/2017_Submittal/FDEP_2017_RA_Update_Approval_Letter_11152017.pdf; *see also infra* pt. IV.B.

organization overseen by the Tampa Bay Estuary Program.[2] The NMC operates within the contours created by the convergence of federal and state environmental regulations, starting with the Clean Water Act (CWA) and cascading downward through state and local law.

The NMC consists of a diverse group of stakeholders that combat nitrogen pollution in Tampa Bay. The Consortium functions both as a type of clearinghouse for nitrogen load allocations based on a federal Total Maximum Daily Load (TMDL) and as a facilitator of voluntary nitrogen loading reductions and mitigation projects.[3] The Consortium showcases the tremendous potential that decentralized public-private partnerships have for solving environmental problems at the local community level.

The legal framework that facilitates the project is complex and involves all levels of government. Each governing entity oversees the work of the entity below, delegating certain determinations about environmental policy downward. The CWA's cooperative federalism model, the source that sustains the NMC's efforts, effectively balances federal oversight with state and local action, providing a system of incentives that not only permits but encourages local actors to take the lead on building regulatory systems within parameters established and overseen by the Environmental Protection Agency (EPA).[4]

The CWA is complex, heterogeneous legislation that breaks environmental problems down into categories and treats each category of problems using a discrete method. For example, point sources are regulated through National Pollutant Discharge Elimination System (NPDES) permits, which give regulators the ability to keep a detailed accounting of the volume and type of contaminants entering a water body from a point source.[5] The type of problem presented—requiring industries to limit measurable pollution by implementing technological advancements—is conducive to this sort of regulation.

Other types of environmental problems, by contrast, require more creative and decentralized solutions; particularly, nutrient pollution emanating from point sources and nonpoint sources alike, which has been the new frontier of environmental regulation

2. *See infra* pt. V.
3. *See infra* pt. V.D.
4. *See infra* pt. III–IV.
5. *See infra* pt. III.A.

in the past decade.[6] The EPA lacks the resources to coordinate the type of research and enforcement actions that would be required to monitor the activities of millions of diverse actors—from dog walkers to municipal governments to citrus farmers and gardeners—in all fifty states whose actions contribute in varying degrees to pollution. How could regulators design a system that brought these actors, whose dispersed activities could never be regulated by federal permits alone, within its purview?

The most promising answer is to devolve certain types of regulation to local actors with specialized knowledge and roots in the regulated community. Those actors may then—subject to oversight—deploy (or assist federal and state regulators in deploying) the CWA's regulatory arsenal for maximum effect. The foundation of this approach is built into Section 303 (in concert with other provisions) of the CWA, which delegates to the states responsibility for monitoring water quality and reporting results periodically to the EPA.[7] Federal and state regulators have creatively utilized this and other provisions of the CWA to coax local stakeholders into taking beneficial actions on a quasi-voluntary basis to mitigate nutrient pollution.

This Article investigates this process through the lens of a case study on the NMC. Part II provides an overview of the unique regulatory challenges presented by nutrient pollution. Part III presents an overview of the federal regulatory scheme that underpins state efforts to improve water quality. Part IV studies how Florida law has responded to federal mandates to implement its obligations under Section 303. Part V provides an overview of the NMC's functioning and membership and chronicles its remarkable success in mitigating nutrient pollution in Tampa Bay. Part VI examines the entire scheme from the standpoint of regulatory theory to situate these efforts within the regulatory zeitgeist and recommend the expansion of similar programs elsewhere. Part VII concludes that creative approaches and regulatory innovation should be fostered at the federal, state, and local levels to effectively combat certain types of environmental problems.

6. *See infra* pt. II.A.
7. *See infra* pt. IV.A.

The EPA's Integrated Water Quality Monitoring and Assessment Report Guidance (IRG),[8] as applied by FDEP, provides a vehicle by which local environmental stakeholders may develop local plans to mitigate water pollution.[9] These plans are known as Category 4b plans, or "Reasonable Assurance Plans" (RAPs), because they provide FDEP with reasonable assurance that local efforts will restore impaired waters to conditions that meet federal criteria under the CWA.[10] The EPA's IRG, which governs the way states categorize waters in the reports they are required to provide to the EPA under Section 303(d) of the CWA, reserves a category—

8. The Integrated Reporting Guidance is an EPA guidance document that counsels state regulators on how to assess waters and compile the reports the CWA requires states send to the EPA:

> Clean Water Act (CWA) Section 305(b) reports and Section 303(d) lists are highly visible ways of communicating about the health of the nation's waters. The quality and reliability of the information they contain becomes increasingly important as it is used to set priorities and to implement water quality controls and protection activities.

Robert H. Wayland III, *2002 Integrated Water Quality Monitoring and Assessment Report Guidance*, EPA 1 (Nov. 19, 2001), https://www.epa.gov/sites/production/files/2015-10/documents/2002_02_13_tmdl_2002wqma.pdf.

9. FDEP encourages stakeholders to take advantage of these regulatory provisions:

> The Florida Department of Environmental Protection . . . is working statewide to encourage local stakeholders to develop plans at the earliest practical time to restore waters not meeting state water quality standards. Early implementation of restoration activities is more cost effective, and may allow the Department to forgo certain regulatory steps [most notably, the development of total maximum daily loads ("TMDLs") and Basin Management Action Plans ("BMAPs")], thereby focusing limited local and state resources directly on measures that will improve water quality.

Guidance on Developing Restoration Plans as Alternatives to TMDLs – Assessment Category 4b and 4e Plans, FLA. DEP'T ENVTL. PROTECTION 1 (June 2015), https://floridadep.gov/sites/default/files/4b4ePlansGuidance.pdf [hereinafter *FDEP RAP Guidance*].

10. 4b RAPs must ensure that impaired waters will make progress in relation to federal standards:

> If, after evaluation of the pollution control mechanisms set forth in subsection (1) [technology-based effluent limitations and other pollution control programs under government authority], the water segment is expected to attain water quality standards in the future and is expected to make reasonable progress towards attainment of water quality standards by the time the next 303(d) list for the basin is scheduled to be submitted to EPA, the segment shall not be listed on the Verified List. The Department's decision shall be based on a plan that provides reasonable assurance that any proposed pollution control mechanisms and expected improvements in water quality in the water segment will attain applicable water quality standards.

FLA. ADMIN. CODE ANN. r. 62-303.600(2) (2016).

4b—for waters not attaining water quality standards for which "[o]ther pollution control requirements are reasonably expected to result in the attainment of [water quality standards] in the near future."[11]

The RAP implemented by the NMC has been a key component of region-wide measures designed to ameliorate nutrient pollution in Tampa Bay, and the NMC members have succeeded in significantly reducing nitrogen concentrations and restoring seagrass acreage.[12]

RAPs provide an excellent opportunity for local private-public partnerships to lead on mitigating water pollution, particularly nutrient pollution. Effective RAPs have the potential to rehabilitate water bodies affected by nutrient pollution. RAPs are smart, proven tools that harness local innovation to efficiently solve environmental problems and should be both encouraged and nurtured by legislators and regulators and adopted and implemented by local stakeholders who are concerned about water quality.[13]

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11. Wayland III, *supra* note 8, at 6.
12. The NMC's 2017 Reasonable Assurance Update summarized the progress:

> Recent data and observations from Tampa Bay indicate that continuing efforts to reduce nitrogen loading by the NMC partners are resulting in more than sufficient water quality for the expansion of seagrasses. Time series plots show that, with the exception of the Old Tampa Bay segment in 2015, FDEP-adopted [sic] chlorophyll-a thresholds have been met in all four major bay segments over the 2012-2016 RA period.

Tampa Bay Nutrient Management Strategy 2017 Reasonable Assurance Update Document, TAMPA BAY NITROGEN MGMT. CONSORTIUM 2 (Sep. 29, 2017), https://www.tbeptech.org/NitrogenMgmtConsort/ReasonableAssurance/2017_Submittal/FINAL_2017_RA_Update_NMC_Submittal_10312017.pdf [hereinafter *NMC 2017 RAP Update*] (alteration in original).

13. It is important to note, throughout, that the NMC's RAP is a special case. The NMC's RAP is unique in that Tampa Bay is subject to a federal TMDL, while other watersheds in which RAPs are in place are not. Usually, a RAP is put in place to preclude the need for a TMDL, not to administer an existing TMDL. Email from Julie Espy, Program Adm'r, Water Quality Assessment Program, Fla. Dep't of Envtl. Prot., to Author, *Comments on Article* (Mar. 8, 2018) (copies on file with Author). This makes the RAP model even more promising in that a local stakeholder body has proven capable of effectively administering a federal TMDL.

II. REGULATING NUTRIENT POLLUTION

A. The Problem of Nutrient Pollution

Regulators, over recent decades, have placed increased scrutiny on nutrient pollution in watersheds throughout the United States. Though nutrients like nitrogen and phosphorous are naturally occurring and necessary to sustain healthy aquatic, estuarine, and marine ecosystems, in overabundance they can interfere with that health by impairing biodiversity, since aquatic and marine ecosystems only have the capacity to assimilate and process a certain volume of nutrients in a given period.[14] Excessive nutrients in the water can lead to Harmful Algal Blooms (HABs) and excessive proliferation of phytoplankton, which reduce light penetration in the water column.[15] Nutrients entering surface water at an accelerated rate lead to eutrophication—the process by which a water body becomes eutrophic, or characterized by excessive concentrations of plant biomass and nutrients.[16] When this proliferation of marine or aquatic flora subsides, these flora die and decay. The ensuing decomposition of organic matter reduces dissolved oxygen (DO) in the water and leads to hypoxia (reduced DO) or anoxia (absence of DO), which in turn harms other aquatic and marine life.[17] The most visible and well-known effect of nutrient pollution in the United States is the "Dead Zone" in the Gulf of Mexico. Nutrients discharged into the Mississippi and Atchafalaya Rivers aggregate in the Gulf, creating a hypoxic zone the size of New Jersey near the rivers' mouths off the coast of

14. *Nutrient Pollution: The Problem*, EPA, https://www.epa.gov/nutrientpollution/problem (last updated Mar. 10, 2017).

15. *Id.*

16. William J. Shapiro, *Protocol to Abate Acidification, Eutrophication and Ground-Level Ozone*, 11 COLO. J. INT'L ENVTL. L. & POL'Y 208, 209 n.12 (2000) (defining eutrophication as "[t]he process by which waters become more eutrophic [i.e. characterized by a high level of plant nutrients, with correspondingly high primary productivity] especially the artificial or natural enrichment of a lake by an influx of nutrients required for the growth of aquatic plants such as algae that are vital for fish and animal life"). *See also* Holly Greening et al., *Ecosystem Responses to Long-Term Nutrient Management in an Urban Estuary: Tampa Bay, Florida, USA*, ESTUARINE, COASTAL & SHELF SCIENCE, Dec. 2014, at A1, A1 ("A primary water quality challenge facing estuaries throughout the world is cultural eutrophication[—]a process in which human activities in the watershed and airshed lead to increased nutrient influxes to the water body, producing levels of over-fertilization that stimulate undesirable blooms of phytoplankton and macro-algae.").

17. National Oceanic and Atmospheric Administration, *What is Nutrient Pollution?*, U.S. DEP'T OF COMMERCE, https://oceanservice.noaa.gov/facts/nutpollution.html (last updated Oct. 10, 2017).

Louisiana and Texas.[18] The effects of this area of poorly oxygenated water ripple into regional economies by damaging populations of commercially and recreationally harvested fish and shrimp.[19]

In March 2011, the EPA Assistant Administrator Nancy K. Stoner published a memo calling on states to implement frameworks for addressing nutrient pollution in our nation's waters.[20] The memo called attention to the increasing incidence of nutrient pollution: 50% of U.S. streams had excessive levels of nitrogen and phosphorous, "78% of assessed coastal waters exhibit[ed] eutrophication," "nitrate drinking water violations ha[d] doubled" during a span of eight years, and "nitrates exceeded background concentrations in 64% of shallow monitoring wells in agriculture and urban areas."[21] Despite these dire figures, Assistant Administrator Stoner expressed confidence that "motivated states, using tools available under federal and state law and relying on good science and local expertise, can mobilize local governments and stakeholders to achieve significant results."[22]

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18. National Oceanic and Atmospheric Administration, *Gulf of Mexico Dead Zone is the Largest Ever Measured*, U.S. DEP'T OF COMMERCE (Aug. 2, 2017), http://www.noaa.gov/media-release/gulf-of-mexico-dead-zone-is-largest-ever-measured [hereinafter *Gulf of Mexico Dead Zone*]. Negative environmental effects of eutrophication include toxins emitted by some species of phytoplankton, which damage aquatic flora and fauna and may even be toxic to humans. *See also* Greening et al., *supra* note 16, at A1 (describing how eutrophication negatively impacts bodies of water).

19. *Gulf of Mexico Dead Zone*, *supra* note 18.

20. The Stoner memo emphasized how dire the situation was:

> Over the last 50 years . . . the amount of nitrogen and phosphorous pollution entering our waters has escalated dramatically. The degradation of drinking and environmental water quality associated with excess levels of nitrogen and phosphorous in our nation's water has been studied and documented extensively, including in a recent joint report by a Task Group of senior state and EPA water quality and drinking water officials and managers. As the Task Group report outlines, with U.S. population growth, nitrogen and phosphorous pollution from urban stormwater runoff, municipal wastewater discharges, air deposition, and agricultural livestock activities and row crop runoff is expected to grow as well. Nitrogen and phosphorous pollution has the potential to become one of the costliest and the most challenging environmental problems we face.

Nancy K. Stoner, *Working in Partnership with States to Address Phosphorous and Nitrogen Pollution Through Use of a Framework for State Nutrient Reductions*, EPA 1 (Mar. 16, 2011), https://www.epa.gov/sites/production/files/documents/memo_nitrogen_framework.pdf (citation omitted).

21. *Id.* at 1–2.

22. *Id.* at 2.

B. The History of Nutrient Pollution Regulation: Difficulties Inherent in Regulating Nutrient Pollution

Controlling the release of nutrients is challenging from a regulatory perspective because nutrient loading often originates from nonpoint sources which cannot be regulated directly through NPDES permits.[23] As a result, regulators have faced challenges in identifying and remediating nonpoint sources of nitrogen and phosphorous, which include stormwater runoff, atmospheric deposition, agriculture, and animal waste.[24] According to a study of watersheds conducted by the U.S. Geological Survey, nonpoint sources of nitrogen were responsible for more than half of in-stream nitrogen in 90% of watersheds studied.[25] Different sources of nitrogen pollution are dominant in different geographic areas, depending on various economic and environmental variables, making centralized regulation of nitrogen pollution difficult, since geographical variation mandates varied approaches to regulating discharges of nitrogen in different locales.[26] For example, in the Western United States, commercial fertilizers and atmospheric

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23. The Ninth Circuit explained:

> In 1972, Congress passed the Clean Water Act, which made important amendments to the water pollution laws. The amendments placed certain limits on what an individual firm could discharge, regardless of whether the stream into which it was dumping was overpolluted [sic] at the time. . . . The Act thus banned only discharges from point sources. The discharge of pollutants from nonpoint sources—for example, the runoff of pesticides from farmlands—was not directly prohibited. The Act focused on point source polluters presumably because they could be identified and regulated more easily that [sic] nonpoint source polluters.

Or. Natural Desert Ass'n v. Dombeck, 172 F.3d 1092, 1096 (9th Cir. 1998) (quoting Natural Resources Defense Council v. EPA, 915 F.2d 1314, 1316 (9th Cir. 1990)).

24. For example:

> Atmospheric deposition of nitrogen can be a major source of nitrogen that is not addressed by water-quality legislation. Because most of the sources of atmospheric deposition are point sources, this form of pollution is currently controlled by reducing nitrogen oxide emissions. Commonly these point sources are located outside of the political boundaries of watersheds that receive this atmospherically deposited nitrogen and, therefore, may not be controlled through State and local government regulations.

Larry J. Puckett, *Nonpoint and Point Sources of Nitrogen in Major Watersheds of the United States*, Water-Resources Investigations Report 94–4001, U.S. DEP'T OF THE INTERIOR 6 (Feb. 9, 1994), https://pubs.usgs.gov/wri/wri944001/pdf/wri94-4001.pdf.

25. *Id.* at 4–5.

26. *Id.* at 5.

deposition are the two most dominant sources of nitrogen pollution, while in the Southeastern United States, animal manure is a more significant contributor.[27] These variations led the study's author to conclude that "[b]ecause no single nonpoint nitrogen source is dominant everywhere, approaches to control nitrogen must vary throughout the Nation."[28]

This variation in the sources of nutrient pollution presents a regulatory challenge for a centralized program like the NPDES permitting system and demonstrates the need for an additional, more localized approach to controlling nutrient pollution. Local stakeholders are likely to have more useful localized knowledge about what types of industry are operating in the area and what types of measures might have the best chance of success locally at controlling nonpoint sources of nutrient pollution.

III. OVERVIEW AND BACKGROUND OF THE CLEAN WATER ACT AND STATES' OBLIGATIONS THEREUNDER

A. The NPDES Permitting System: TBELs and QBELs

1. Technology-Based Effluent Limitations (TBELs) by the EPA

The CWA requires states to cooperate with the EPA to identify impaired surface waters for which national Technology Based Effluent Limitations (TBELs) are insufficient to achieve water quality, and to implement plans to bring them into compliance with Water Quality Standards (WQS).[29] NPDES permits, which limit releases from point sources, and Municipal Separate Storm Sewer System (MS4) permits, which control nonpoint source pollution by regulating stormwater,[30] are first-line defenses against water pollution. NPDES permits achieve reductions in the discharge of pollutants by subjecting dischargers to two types of

27. *Id.* at 4.

28. *Id.* at 1.

29. 33 U.S.C. § 1313(d)(1)(A) (2012) ("Each state shall identify those waters within its boundaries for which the effluent limitations required by section 1311(b)(1)(A) and section 1311(b)(1)(B) of this title are not stringent enough to implement any water quality standard applicable to such waters.").

30. *Stormwater Discharges from Municipal Sources*, EPA, https://www.epa.gov/npdes/stormwater-discharges-municipal-sources (last updated Nov. 4, 2018).

restrictions: TBELs, promulgated by the EPA,[31] and Water Quality-Based Effluent Limitations (WQBELs) promulgated by state governments.[32] Both types of restrictions become components of individual permits.[33] TBELs require dischargers to implement certain minimum technological pollution-reducing measures.[34] TBELs are conducive to a federal standard administered by the EPA, since the pollution control technology available to a particular industry is consistent throughout the nation. Thus, TBELs are dependent on the type of pollutants discharged and require various technological best practices based on the state of the regulated industry.[35]

2. Water Quality Based Effluent Limitations (WQBELs) by State Governments

For many water bodies, significant pollutant loading originates from nonpoint sources. Furthermore, TBELs—with their front-end, individual approach to controlling pollution at identifiable point sources—may not sufficiently limit discharges to assure compliance with Water Quality Standards (WQS). As a result, the EPA will also include the second variety of restrictions—WQBELs—in National Pollutant Discharge Elimination System (NPDES) permits.[36] The CWA requires states to develop WQS, which set limits on pollutants to ensure that waters meet their designated uses.[37] WQS consist of "designated uses of the navigable waters involved and the water quality

31. 33 U.S.C. § 1311 (2012); 40 C.F.R. § 125.3 (2018) ("Technology-based treatment requirements under section 301(b) of the Act represent the minimum level of control that must be imposed in a permit issued under section 402 of the Act.").

32. 33 U.S.C. § 1313(a)(1)–(2).

33. First, the EPA may impose TBELs directly on dischargers in NPDES permits. 40 C.F.R. § 125.3(c) ("Technology-based treatment requirements may be imposed through . . . [a]pplication of EPA-promulgated effluent limitations developed under section 304 of the Act to dischargers by category or subcategory."). Second, states may add conditions originating in state law, including WQS, to NPDES permits through a certification process. 33 U.S.C. § 1341(d) (2012); 40 C.F.R. § 124.53(a) (2018) ("Under CWA section 401(a)(1), the EPA may not issue a permit until a certification is granted or waived in accordance with that section by the State in which the discharge originates or will originate.").

34. TBELs are promulgated by the EPA and reflect copious research into the technological state of various categories and subcategories of dischargers. 40 C.F.R. §§ 401–471 (2018).

35. 40 C.F.R. § 125.3(a).

36. 33 U.S.C. § 1341(a).

37. 33 U.S.C. § 1313(d)(1)(A).

criteria for such waters based upon such uses."[38] WQS "provide 'a supplementary basis . . . so that numerous point sources, despite individual compliance with effluent limitations, may be further regulated to prevent water quality from falling below acceptable levels.'"[39] WQS function as a type of backstop or second layer of regulation. When NPDES issues a permit (which already contains TBELs), the regulatory agency in the state where it issues ensures that its conditions will not lead to a violation of WQS.[40] States may then either certify the permit or attach conditions that will be incorporated into the final permit as WQBELs.[41]

B. Total Maximum Daily Loads (TMDLs)

To meet WQS, states collaborate with the EPA to establish TMDLs, which are limits on the maximum amount of a pollutant that a waterbody can absorb and still meet WQS.[42] States are required to develop and submit TMDLs to the EPA for approval.[43] If the EPA approves the TMDL, the state incorporates the TMDL into its Continuing Planning Process (CPP), which the CWA requires states to prepare and submit periodically to the EPA.[44] TMDLs are the primary tool in the regulatory arsenal for

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38. 33 U.S.C. § 1313(c)(2)(A).

39. Pud No. 1 v. Wash. Dep't of Ecology, 511 U.S. 700, 704 (1994) (quoting EPA v. Cal. ex rel. State Water Res. Control Bd., 426 U.S. 200, 205 n.12 (1976)).

40. 33 U.S.C. § 1341(a)(1).

> Any applicant for a Federal license or permit to conduct any activity . . . which may result in any discharge into the navigable waters, shall provide the licensing or permitting agency a certification from the State in which the discharge originates or will originate . . . that any such discharge will comply with the applicable provisions of sections 1311, 1312, 1313, 1316, and 1317 of this title.

Id. See also 40 C.F.R. § 124.53(a) (preventing the EPA from issuing a permit until a certification is granted or waived from the State).

41. 40 C.F.R. § 124.53(e)(1)–(2).

42. 33 U.S.C. § 1313(d)(1)(C).

> Each State shall establish for the waters identified in paragraph (1)(A) of this subsection, and in accordance with the priority ranking, the total maximum daily load, for those pollutants which the Administrator identifies under section 1314(a)(2) of this title as suitable for such calculation. Such load shall be established at a level necessary to implement the applicable water quality standards. . . .

Id.

43. 33 U.S.C. § 1313(d)(2).

44. 33 U.S.C. § 1313(e).

combating pollution originating from nonpoint sources and are only required for waters which are considered impaired under the CWA.[45]

Every two years, states are required to assess waters within their jurisdictions to determine which are impaired.[46] State regulators base their assessments of water quality on collected data, which they then measure against state WQS to determine impairment.[47] This is the beginning of the states' roles in the regulatory processes outlined in the CWA. EPA guidance determines what criteria states are permitted to utilize to assess impairment, and waters submitted as part of the 303(d) list are waters for which state regulators and the EPA will collaborate to develop TMDLs for those pollutants causing impairment.[48] Waters on a state's 303(d) list are called "water quality limited segments" and are waters for which TBELs, other more stringent effluent limitations derived from state or local law or other federal law, or other pollution control requirements like Best Management Practices (BMPs) are insufficient to meet state WQS.[49] Along with identification of water quality limited segments, states are required to submit rankings of these waters to prioritize TMDL development.[50] This process continues on a biennial basis, with

45. 33 U.S.C. § 1313(d)(1)(A), (C).

46. State assessments consist of two reports: the 303(d) list of impaired waters and the 305(b) water quality reports:

> In addition to section 303(d) lists of impaired waters states are required to submit section 305(b) water quality reports to EPA. Section 305(b) reports provide information on the water quality status of all waters in the state, whereas section 303(d) lists are a subset of these waters – those that are impaired by a pollutant and in need of a TMDL. Given that both the 305(b) report and the 303(d) lists are due at the same time (April 1 of every even numbered year), EPA recommends that states combine them into a single "Integrated Report."

Overview of Listing Impaired Waters under CWA Section 303(d), EPA, https://www.epa.gov/tmdl/program-overview-303d-listing-impaired-waters (last updated Sept. 13, 2018); *see also* 33 U.S.C. § 1315 (2012) (describing required content of reports).

47. In Florida, state WQS are codified as numeric or narrative criteria. FLA. STAT. § 403.067(3)(b) (2018); FLA. ADMIN. CODE ANN. r. 62-302.200(42) (2016).

48. FLA. STAT. § 403.067(3)(b). EPA regulations outline and specify what types of data states may rely on in assessing water quality. When a state submits documentation of which waters it deems impaired, it must submit along with the document a description of the methodology it has used to assess waters and compile the list. States are required to utilize "all existing and readily available water quality-related data and information." 40 C.F.R. § 130.7(b)(5) (2018).

49. 40 C.F.R. § 130.7(a).

50. *Id.*

states submitting revised and updated lists and plans by April 1 of each even numbered year.[51] Once these impaired waters have been identified, states must begin implementing the TMDL development process.[52] The 303(d) list is the starting point for TMDL development; the copious research that goes into identifying impaired waters reveals to regulators the pollutants whose presence impairs the water body. State regulators then proceed to calculate and allocate a TMDL.[53] The TMDL is issued and adopted at the state level by rule, is submitted to the EPA for approval, and then becomes the guideline regulators and stakeholders use to coordinate remediation activities in an impaired watershed.[54]

The EPA retains authority to approve or disapprove both of a state's decisions regarding which waters it determines are impaired and of state TMDLs.[55] The EPA has thirty days to identify additional waters as water quality limited segments based on the EPA's evaluation of state criteria and WQS.[56] In the event that the EPA disapproves of a TMDL, it has thirty days in which to develop and substitute its own TMDL.[57] Winston Borkowski, in

51. 40 C.F.R. § 130.7(d)(1).

52. Winston K. Borkowski, *Total Maximum Daily Loads in Florida – the New Millennium*, FLA. ENVTL. & LAND USE L. 12.5-1, 12.5-1 (2012).

53. In Florida, several key agencies and entities play important roles in calculating and allocating TMDLs, including the Water Management Districts, the Florida Department of Agriculture and Consumer Services (FDACS), local governments, and local stakeholders. FLA. STAT. § 403.067(6)(a)(1).

54. FLA. STAT. § 403.067(6)(c).

55. EPA regulations outline the approval process:

> The Regional Administrator shall either approve or disapprove such [impairment] listing and [TMDLs] not later than 30 days after the date of submission. The Regional Administrator shall approve a list developed under § 130.7(b) that is submitted after the effective date of this rule only if it meets the requirements of § 130.7(b). If the Regional Administrator approves such listing and loadings, the State shall incorporate them into its current [Water Quality Management (WQM)] plan. If the Regional Administrator disapproves such listing and loadings, he shall, not later than 30 days after the date of such disapproval, identify such waters in such State and establish such loads for such waters as determined necessary to implement applicable WQS. The Regional Administrator shall promptly issue a public notice seeking comment on such listing and loadings. After considering public comment and making any revisions he deems appropriate, the Regional Administrator shall transmit the listing and loads to the State, which shall incorporate them into its current WQM plan.

40 C.F.R. § 130.7(d)(2).

56. *Id.*

57. Borkowski, *supra* note 52, at 12.5-3 to 12.5-4.

a treatise on TMDLs in Florida, describes how the early days of TMDL implementation in Florida led to some confusion over certain nutrient TMDLs created prior to the passage of Florida's 1999 Watershed Restoration Act, which implemented an official procedure for issuing and adopting state TMDLs by secretarial order.[58] FDEP's efforts to implement nutrient TMDLs in 1998, including nutrient TMDLs for Tampa Bay, were not issued pursuant to the Act's provision, even though they were approved by the EPA at the time.[59] The subsequent implementation of the NMC's RAP is viewed by the EPA as implementing a federal TMDL and by FDEP as a substitute for a state TMDL.[60]

C. The Shift from Narrative to Numeric Nutrient Criteria

Prior to 1998, states' WQS contained only narrative criteria for nutrients.[61] This regulatory situation had failed to prevent widespread nutrient pollution in the nation's waters. In response, the EPA's 1998 issuance of a report entitled National Strategy for the Development of Regional Nutrient Criteria began the EPA's effort to compel states to develop numeric criteria to replace the prior narrative standards.[62] The ensuing national effort to implement numeric nutrient criteria has been impaired by a variety of regulatory obstacles, as state regulators have failed to

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58. *Id.* at 12.5-7.

59. *Id.* at 12.5-10.

60. The status of the Tampa Bay TMDL is legally complex:

> Whether or not Tampa Bay is subject to a TMDL or a RAP is in the eye of the beholder. As noted, DEP sought to have EPA approve a reasonable assurance plan for Tampa Bay in lieu of DEP establishing a State TMDL. EPA responded by noting that an existing federal TMDL is in place. Since the federal TMDL was approved in 1998, prior to the Florida Legislature adopting the 1999 Watershed Restoration Act, and DEP has not adopted EPA's TMDL as its own, each agency views the bay differently. EPA views the Tampa Bay reasonable assurance document as implementing the federal TMDL; DEP view[s] the reasonable assurance documents as eliminating the need for a State TMDL. Regardless of the legal subtleties, the cooperative efforts of a diverse group of stakeholders, from municipalities to mining companies, has resulted in remarkable improvements to Tampa Bay.

Id.

61. Adam Weiss, Comment, *Federal Numeric Nutrient Criteria in Florida: When Cooperative Federalism Goes Rogue*, 30 PACE ENVTL. L. REV. 299, 304 (2012). For example, Florida's narrative criteria provided that "in no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." *Id.* at 302.

62. *Id.* at 304.

implement numeric criteria in compliance with the timelines established by the EPA.[63] The result in Florida was a lawsuit by environmental groups that attempted to compel the EPA to promulgate numeric nutrient criteria in response to Florida's failure to do so,[64] since the CWA provides that, should the EPA find a state's standards insufficient to fulfill the Act's requirements, the EPA may step in and promulgate standards of its own.[65] Thus, state regulators, who are empowered under the CWA to promulgate rules and standards, have strong incentives to create WQS such as numeric nutrient criteria, to meet the EPA's approval.

IV. FLORIDA'S COMPLIANCE ARCHITECTURE

A. Florida's Impaired Water Rule, Governing Assessment of Water Quality and the Creation of the 303(d) List

Florida's Impaired Surface Waters Rule (IWR) establishes the method by which FDEP complies with the CWA by assessing waters throughout the state to identify those which are impaired and to develop TMDLs for those waters.[66] FDEP promulgates WQS

63. *Id.* at 305.

64. Florida Wildlife Federation, Inc. v. Jackson, 853 F. Supp. 2d 1138, 1143 (N.D. Fla. 2012) ("In 2009 the [EPA] Administrator made an explicit 'determination' under Clean Water Act § 303(c)(4), 33 U.S.C. § 1313(c)(4), that new criteria—numeric criteria—are necessary to meet the Act's requirements. The determination imposed on the Administrator an explicit statutory duty to promptly propose and adopt new criteria unless Florida did so first.").

65. The CWA provides an explicit EPA oversight procedure:

> 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.
>
> The Administrator shall promulgate any revised or new standard under this paragraph not later than ninety days after he publishes such proposed standards, unless prior to such promulgation, such State has adopted a revised or new water quality standard which the Administrator determines to be in accordance with this chapter.

33 U.S.C. § 1313(c)(4) (2012).

66. FLA. STAT. § 403.067(3)(a) (2018).

for waters with certain designated uses,[67] outlines a procedure for determining when waters throughout the state are impaired in relation to these criteria,[68] and develops three lists of water bodies: the Planning List (waters which are threatened with impairment), the Study List, and the Verified List.[69] The Planning List includes water bodies for which FDEP determines a TMDL may be necessary in the future.[70] The Study List includes water bodies which show a clear adverse trend toward impairment, but for which additional information is required to determine whether development of a TMDL is necessary.[71] The Verified List includes the water bodies which FDEP determines are impaired and which comprise the 303(d) list that FDEP submits to the EPA.[72] FDEP

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67. Categories of designated uses are created by rule in Florida:

> All surface waters of the State have been classified according to designated uses as follows: CLASS I [:] Potable Water Supplies[;] CLASS I-Treated [:] Treated Potable Water Supplies[;] CLASS II [:] Shellfish Propagation or Harvesting[;] CLASS III [:] Fish Consumption; Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife[;] CLASS III-Limited[:] Fish Consumption; Recreation or Limited Recreation; and/or Propagation and Maintenance of a Limited Population of Fish and Wildlife[;] CLASS IV[:] Agricultural Water Supplies[;] CLASS V [:] Navigation, Utility and Industrial Use
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> . . .
>
> Water quality classifications are arranged in order of the degree of protection required, with Class I water having generally the most stringent water quality criteria and Class V the least.

FLA. ADMIN. CODE ANN. r. 62-302.400(1), (4) (2018).

68. Section 62-303 of the Florida Administrative Code outlines extensive criteria for how to monitor water impairment relative to the designated uses enumerated above. FLA. ADMIN. CODE ANN. r. 62-303.100(1) (2018).

69. FLA. ADMIN. CODE ANN. r. 62-303.150(1) (2018).

70. FLA. ADMIN. CODE ANN. r. 62-303.200(17) (2018) ("'Planning List' shall mean the list of potentially impaired surface waters or segments identified pursuant to Part II of this chapter where additional information is needed to evaluate whether the water is impaired and a TMDL is needed, as provided in Section 403.067(2), F.S.").

71. FLA. ADMIN. CODE ANN. r. 62-303.390(1) (2018).

> The Study List contains waters where additional information or Department review is needed before the water is placed on the Verified List for TMDL development but available evidence indicates there is a clear adverse trend in nutrients or nutrient response variables with a reasonable expectation that the water will become impaired within 10 years, or evidence indicates nonattainment of water quality standards or stream nutrient thresholds.

Id.

72. 33 U.S.C. § 1313(d)(1)(C) (2012); FLA. ADMIN. CODE ANN. r. 62-303.200(32) ("'Verified List' shall mean the list of impaired waterbodies or segments for which TMDLs

develops TMDLs for these water bodies in cooperation with the EPA pursuant to the CWA.[73] The institution of TMDLs authorizes FDEP to initiate and implement Basin Management Action Plans (BMAPs) to regulate the discharge of pollutants, including nutrients, from both point and nonpoint sources contributing to impairment in a water body—for each impaired water body.[74]

B. Categories of Impaired Waters Available Under the EPA's Integrated Reporting Guidance

The EPA's 2002 IRG established categories and subcategories into which states may classify waters in their assessment reports to the EPA.[75] The EPA guidance creates five assessment categories. The first three categories encompass waters which are not impaired in regard to at least some designated uses, or which are not known to be impaired.[76] States are not required to implement TMDLs for these waters.[77] Category four encompasses waters which are threatened or impaired, but for which TMDLs are not required.[78] Category five waters are known to be impaired

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will be developed, as provided in Section 403.067(4), F.S., and which will be submitted to EPA pursuant to section 303(d)(1) of the CWA.").

73. 33 U.S.C. § 1313(d)(1)(C); FLA. STAT. § 403.067(6)(a)(1)–(2) (2018).

74. FLA. STAT. § 403.067(7)(a)(1).

75. Wayland III, *supra* note 8, at 5–7.

76. The IRG describes these first three categories as:

> 1. Attaining the water quality standard and no use is threatened. [Assessment Units ("AUs")] should be listed in this category if there are data and information that meet the requirements of the state's or territory's assessment and listing methodology and support a determination that the water quality standard is attained and no use is threatened. . . .
>
> 2. Attaining some of the designated uses; no use is threatened; and insufficient or no data and information is available to determine if the remaining uses are attained or threatened. AUs should be listed in this category if there are data and information, which meet the requirements of the state's or territory's assessment and listing methodology, to support a determination that some, but not all, uses are attained and none are threatened. . . .
>
> 3. Insufficient or no data and information to determine if any designated use is attained. AUs should be listed in this category where the data or information to support an attainment determination for any use is not available, consistent with the requirements of the state's or territory's assessment and listing methodology.

Id. at 5–6.

77. *Id.*

78. The IRG describes this category as:

by a known pollutant, do not attain designated uses, and require the implementation of a TMDL.[79] Category four contains three subcategories: category 4a waters are waters for which a TMDL has already been completed; category 4b waters are waters for which pollution control measures other than TMDLs are expected to lead to attainment of WQS in the near future; category 4c waters are waters for which impairment is not caused by a pollutant.[80]

> 4. Impaired or threatened for one or more designated uses but does not require the development of a TMDL.
>
> A. TMDL has been completed. AUs should be listed in this subcategory once all TMDL(s) have been developed and approved by EPA that, when implemented, are expected to result in full attainment of the standard. Where more than one pollutant is associated with the impairment of an AU, the AU will remain in Category 5 until all TMDLs for each pollutant have been completed and approved by EPA. . . .
>
> B. Other pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future. Consistent with the regulation under 130.7(b)(i), (ii), and (iii), AUs should be listed in this subcategory where other pollution control requirements required by local, state, or federal authority are stringent enough to implement any water quality standard (WQS) applicable to such waters. EPA expects that these requirements must be specifically applicable to the particular water quality problem. . . .
>
> C. Impairment is not caused by a pollutant. AUs should be listed in this subcategory if the impairment is not caused by a pollutant. States and territories should consider scheduling these AUs for monitoring to confirm that there continues to be no pollutant-caused impairment and to support water quality management actions necessary to address the cause(s) of the impairment.

Id. at 6–7.

79. The IRG describes this final category as:

> 5. The water quality standard is not attained. The AU is impaired or threatened for one or more designated uses by a pollutant(s), and requires a TMDL. This section constitutes the Section 303(d) list of waters impaired or threatened by a pollutant(s) for which one or more TMDLs are needed. An AU should be listed in this category if it is determined, in accordance with the state's or territory's assessment and listing methodology, that a pollutant has caused, is suspected of causing, or is projected to cause an impairment.

Id. at 7. *See also* Division of Environmental Assessment and Restoration, *Integrated Water Quality Assessment for Florida: 2016 Sections 303(d), 305(b), and 314 Report and Listing Update*, FLA. DEP'T ENVTL. PROTECTION 186 (June 2016), https://floridadep.gov/sites/default/files/2016-Integrated-Report.pdf (providing an overview of how many waterbody segments in Florida fall into each EPA reporting category, what types of pollutants impair the most waters in Florida, and a wealth of other information about water quality in Florida).

80. Wayland III, *supra* note 8, at 6–7.

C. Basin Management Action Plans (BMAPs)

In Florida, when a water body is placed on the verified list, triggering development of a Total Maximum Daily Load (TMDL) for that segment, Florida statute permits the creation of a BMAP by FDEP.[81] A BMAP can be administered by FDEP in cooperation with local water management districts and local stakeholders.[82] BMAP administrators have several regulatory tools at their disposal: the frontline tool is the NPDES permitting system, particularly MS4 permits that govern discharges from municipal stormwater systems that contribute heavily to nutrient pollution.[83] Load allocations originating in TMDLs and implemented in BMAPs become conditions on these permits; in fact, both Phase I and Phase II MS4 permits in Florida contain a "TMDL clause" that automatically incorporates load reduction requirements originating in TMDLs and BMAPs.[84] To address nonpoint sources,

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81. BMAPs are governed by Florida statute:

> In developing and implementing the total maximum daily load for a water body, the department, or the department in conjunction with a water management district, may develop a basin management action plan that addresses some or all of the watersheds and basins tributary to the water body. Such plan must integrate the appropriate management strategies available to the state through existing water quality protection programs to achieve the total maximum daily loads and may provide for phased implementation of these management strategies to promote timely, cost-effective actions.
>
> . . .
>
> The basin management action planning process is intended to involve the broadest possible range of interested parties, with the objective of encouraging the greatest amount of cooperation and consensus possible. In a developing a basin management action plan, the department shall assure that key stakeholders, including, but not limited to, applicable local governments, water management districts, the Department of Agriculture and Consumer Services, other appropriate state agencies, local soil and water conservation districts, environmental groups, regulated interests, and affected pollution sources, are invited to participate in the process.

FLA. STAT. § 403.067(7)(a)(1), (3) (2018). The BMAP for the Alafia River Basin, developed in 2014, will be used as an example throughout this Part.

82. FLA. STAT. § 403.067(7)(a)(3).

83. *Stormwater Discharges from Municipal Sources*, EPA, https://www.epa.gov/npdes/stormwater-discharges-municipal-sources (last visited Apr. 23, 2019). MS4 permitting was implemented in two phases. Phase I, implemented in 1990, covers large urban municipal stormwater conveyance systems. Phase II, implemented in 1999, covers smaller municipal systems. *Id.*

84. *Final Basin Management Action Plan for the Implementation of Total Maximum Daily Loads for Nutrients Dissolved Oxygen and Fecal Coliforms by the Florida Department of Environmental Protection in the Alafia River Basin*, ALAFIA RIVER STAKEHOLDERS 39

BMAPs rely on sector-specific BMPs, practices which are known to reduce nutrient loading for different industries.[85] As of December 2018, FDEP oversees about twenty-seven BMAPs in Florida.[86]

D. Category 4b Reasonable Assurance Plans as an Alternative to TMDLs and BMAPs

FDEP will not place threatened or impaired waters on the Verified List of impaired waters—and will therefore not require promulgation of TMDLs and implementation of BMAPs—if stakeholders in the locale can provide FDEP with a plan under local, state, or federal authority that provides the agency reasonable assurance that a water body will attain applicable WQS.[87] FDEP may classify such waters under the EPA's category

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(Apr. 2014), https://floridadep.gov/sites/default/files/alafia-bmap.pdf [hereinafter *Alafia River Basin BMAP*]. This provision in Phase I permits provides that:

> In accordance with Section 403.067, F.S., NPDES permits must be consistent with the requirements of adopted TMDLs. Therefore, when a Basin Management Action Plan (BMAP) and/or implementation plan for a TMDL for a water body into which the permitted MS4 discharges the pollutant of concern is adopted pursuant to Section 403.067(7), F.S., the MS4 operator must comply with the adopted provisions of the BMAP and/or implementation plan that specify activities to be undertaken by the permittee during the permit cycle.

Id. Phase II MS4 generic NPDES permits contain a similar provision:

> If a TMDL is approved for any water body into which the Phase II MS4 discharges, and the TMDL includes requirements for control of stormwater discharges, the operator must review its stormwater management program for consistency with the TMDL allocation. If the Phase II MS4 is not meeting its TMDL allocation, the operator must modify its stormwater management program to comply with the provisions of the TMDL Implementation Plan applicable to the operator in accordance with the schedule in the Implementation Plan.

Id. at 40.

85. *Id.* at 42–44. Agricultural BMPs, a primary variety of BMPs, are provided by the Florida Department of Agriculture and Consumer Services and codified in Chapter 5M-1 of the Florida Administrative Code. FLA. ADMIN. CODE ANN. r. 5M-1–5M-19 (2017).

86. *See Basin Management Action Plans (BMAPs)*, FLA. DEP'T ENVTL. PROTECTION, https://floridadep.gov/dear/water-quality-restoration/content/basin-management-action-plans-bmaps (last modified Dec. 17, 2018) (providing a list of Florida BMAPs and a repository of documentation related to them).

87. *FDEP RAP Guidance*, *supra* note 9, at 2–3.

> [Florida's Impaired Waters Rule] authorizes two types of restoration plans that avoid placement of a water body on the [303(d)] Verified List. . . . Waterbodies with restoration plans meeting the requirements of Rule 62-303.600, F.A.C. ["4b plans" or "Reasonable Assurance Plans ("RAPs")] are not placed on the Verified List or the 303(d) list. Waterbodies with restoration plans only meeting the

4b and avoid the necessity of implementing and approving TMDLs and BMAPs in cases where local stakeholders have established sound, verified methods for monitoring and assessing water quality, controlling and mitigating water pollution, and attaining federal standards under the CWA.[88] Stakeholders accomplish this by submitting to FDEP scientifically rigorous RAPs that adequately demonstrate effective methods to FDEP. RAPs may include Site-Specific Alternative Criteria (SSAC), which are WQS and measurements developed as alternatives to FDEP's generic criteria.[89]

Four RAPs have been approved by FDEP in Florida. First, the Florida Keys RAP—developed by FDEP in cooperation with local governments and state and federal agencies—seeks to reduce annual anthropogenic loading of nutrients contributing to impairments of the narrative nutrient criteria.[90] Second, the Lake Seminole RAP developed by Pinellas County seeks to maintain for Lake Seminole a mean annual chlorophyll-a target of 30 µg/L (micrograms per liter), a total nitrogen (TN) concentration of 1.6 mg/L, and a total phosphorous (TP) concentration of 0.095 mg/L.[91] Third, the Shell Creek and Prairie Creek RAP developed by the Southwest Florida Water Management District (SWFWMD) seeks to remedy impairment due to chloride and Total Dissolved Solids (TDS).[92] The fourth—the subject of this Article—is the RAP created by the Tampa Bay Estuary Program's Nitrogen Management Consortium to address nutrient pollution in Tampa Bay.

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requirements of Rule 62-303.390(2)(d), F.A.C. ("4e plans") are placed on the Study List and the 303(d) list.

Id.

88. *Id.* at 2.

89. FLA. ADMIN. CODE ANN. r. 62-302.800(1) (2018).

90. Watershed Management Bureau, FKRAD Program, *Florida Keys Reasonable Assurance Documentation Update*, FLA. DEP'T OF ENVTL. PROT. 4 (Dec. 2011), http://fl-monroecounty.civicplus.com/DocumentCenter/View/5319.

91. PBS&J, *Lake Seminole Watershed Reasonable Assurance Plan*, PINELLAS CTY. 25 (May 2007), https://www.pinellascounty.org/environment/watershed/LSPublicationsPDFs/Lake_Seminole_RAP-Update_2007.pdf.

92. Shell, Prairie, and Joshua Creeks Watershed Management Plan Stakeholders Group, *Shell Creek and Prairie Creek Watersheds Management Plan Reasonable Assurance Documentation*, SOUTHWEST FLA. WATER MGMT. DIST. 6 (Dec. 2004), https://www.swfwmd.state.fl.us/sites/default/files/medias/documents/SPJCWMPFINAL.pdf.

V. THE TAMPA BAY ESTUARY PROGRAM'S NITROGEN MANAGEMENT CONSORTIUM

A. History of the Consortium and the Deleterious Effects of Nutrient Pollution in Tampa Bay

The NMC was formed in 1998 to address nutrient over-enrichment in Tampa Bay.[93] The Consortium is a public-private partnership consisting of government regulators at the local, state, and federal levels, other local governments and agencies, utilities, and private industries.[94] Prior to 1998, the Tampa Bay Estuary Program and its local government partners implemented a long-term plan to restore seagrass acreage in Tampa Bay to 95% of levels observed in 1950.[95] During the four decades between 1950 and 1990, nutrient pollution led to decimation of as much as 50% of seagrass in the Bay.[96] During the period, the population of the Bay Area surged: Tampa's population increased at a rate of over 8% each year between just 1950 and 1960.[97] St. Petersburg more than doubled in size between 1950 and 1970.[98] Seagrass acreage declined from slightly over 40,000 acres in 1950 to just over 20,000 in 1982.[99] Citizen concern with the conditions in the Bay had already led in prior decades to the passage of the Grizzle-Figg Act in 1980, which required Bay Area wastewater treatment plants to upgrade to Advanced Wastewater Treatment (or shift to 100% reuse), significantly reducing nutrient loads deposited into the Bay as a result of wastewater discharges.[100]

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93. Tampa Bay Nitrogen Management Consortium, *Tampa Bay Watershed Management Summary*, TAMPA BAY ESTUARY PROGRAM 2 (July 29, 2002), https://www.tbeptech.org/NitrogenMgmtConsort/ReasonableAssurance/2002_Submittal/2002_RA_Document.pdf [hereinafter *NMC 2002 RAP*].

94. *Id.* ("The NMC includes local government agencies participating in the [Tampa Bay Estuary Program], and phosphate companies, electric utilities and agricultural interests in the Tampa Bay watershed.").

95. *Id.*

96. *Id.* at 1.

97. *Population of Tampa, FL*, POPULATION.US, http://population.us/fl/tampa/ (last visited Jan. 26, 2019).

98. *Population of St. Petersburg, FL*, POPULATION.US, http://population.us/fl/st-petersburg/ (last visited Jan. 26, 2019).

99. Janicki Environmental, Inc., *Numeric Nutrient Criteria Recommendations for the Tampa Bay Estuary*, TAMPA BAY ESTUARY PROGRAM 3 (Feb. 22, 2011), http://www.tampabay.wateratlas.usf.edu/upload/documents/TBEP_NNC_Final_Exec_Summary_Supp_Docs-web.pdf.

100. FLA. STAT. § 403.086 (2018); Greening et al., *supra* note 16, at A5. Other measures preceded the formation of the Tampa Bay Estuary Program in 1991, including FDEP's

B. NMC Membership, Sources, and Allocations

1. Membership, Contributions, & Voting Rights

The NMC is an ad-hoc entity of the Tampa Bay Estuary Program (TBEP). TBEP began with a Policy Board of nine public entities: the Cities of Tampa, Clearwater, and St. Petersburg; the counties of Manatee, Hillsborough, and Pinellas; and the regulatory entities of FDEP, the EPA, and SWFWMD.[101] Pasco County joined the Policy Board in 2016.[102] In addition to the TBEP Policy Board Member Entities, other public partners participating in the NMC included Manatee County Agricultural Extension Service, the Environmental Protection Commission of Hillsborough County, the Tampa Bay Regional Planning Council, the Florida Fish and Wildlife Commission, the U.S. Army Corps of Engineers, the Tampa Port Authority, the Florida Department of Transportation, and the Florida Department of Agriculture and Consumer Services.[103] Since 2002, the roster has expanded to include MacDill Air Force Base, Tampa Bay Water, and the cities of Bradenton, Gulfport, Lakeland, Largo, Mulberry, Oldsmar, Palmetto, Plant City, and Safety Harbor.[104] Private partners to the NMC included phosphate companies and agriculture industry representatives like Mosaic, Cargill Fertilizer, the Florida Phosphate Council, CSX Transportation, and Florida Strawberry Growers Association.[105] Members since 2002 include SeaWorld

permitting plan for non-agricultural stormwater systems and the City of St. Petersburg's reclaimed wastewater program, which utilized treated wastewater for irrigation. Greening et al, *supra* note 16, at A5; *see also* United Press International, *Bay Cleanup Law Makes a Comeback Governor Signs Bill Requiring $160 Million in Changes at 30 Sewer Plants*, ORLANDO SENTINEL (July 11, 1987), http://articles.orlandosentinel.com/1987-07-11/news/0180200092_1_wastewater-treatment-plants-bill-clearwater-bay (describing a 1981 state law requiring improvements at sewage plants to reduce nutrient loading into Southwest Florida bays).

101. *NMC 2002 RAP*, *supra* note 93, at 6.

102. *NMC 2017 RAP Update*, *supra* note 12, at 14.

103. *NMC 2002 RAP*, *supra* note 93, at 6.

104. The full list of participating public entities consists of the Tampa Bay Estuary Program, EPA, FDEP, Florida Department of Agriculture & Consumer Services, Florida Department of Transportation, Southwest Florida Water Management District, MacDill Air Force Base, Tampa Bay Regional Planning Council, Tampa Bay Water, Tampa Port Authority, Environmental Protection Commission of Hillsborough County, Hillsborough County, Manatee County, Pasco County, Pinellas County, Polk County, Sarasota County, City of Bradenton, City of Clearwater, City of Gulfport, City of Lakeland, City of Largo, City of Mulberry, City of Oldsmar, City of Palmetto, City of Plant City, City of Safety Harbor, City of St. Petersburg, and City of Tampa. *NMC 2017 RAP Update*, *supra* note 12, at 14.

105. *NMC 2002 RAP*, *supra* note 93, at 6–7.

Parks, Busch Gardens, Lowry Park Zoo, Tampa Electric Company, Duke Energy, Tropicana Products, and a handful of private developers.[106] Every five years, entities with a TN allocation of one ton or less per year are requested to contribute a nominal fee of $500 to the Consortium, while entities with allocations over one ton per year contribute $6,000 to support a Technical Support Contractor and to develop the five-year RAP that is submitted to FDEP.[107]

These entities meet regularly at the Tampa Bay Regional Planning Council to discuss and review load allocations and to approve and submit a new reasonable assurance update to FDEP and the EPA every five years.[108] Allocations are distributed amongst NMC members voluntarily through a deliberative process, and the sum of the individual allocations collectively does not exceed the governing TMDL for nitrogen.[109] The individual allocations in turn form the basis of WQBELs for each of the major bay segments.[110] Only entities receiving allocations are permitted to vote on Final Consortium Actions; any entity funding the Consortium may vote on Consortium Recommendations.[111]

2. Sources & Allocations

Stormwater and atmospheric deposition are the primary sources of TN loading into Tampa Bay.[112] These two sources accounted for 82% of TN loading between 1997 and 2001, 77% between 2002 and 2006, 76.5% between 2007 and 2011, and 82.8%

106. The NMC's success at involving representatives of private industry is unparalleled. The full list of private sector participants as of 2017 consists of Busch Entertainment, Lowry Park Zoo, Mosaic Company, Tampa Port Services, LLC, Kinder Morgan Bulk Terminals, Inc., HRK Holdings, Inc., Tampa Electric Company, Duke Energy Corporation, CSX Transportation, Tropicana Products, Inc., Kerry I&F Contracting, Trademark Nitrogen, Yara North America, Alafia Preserve, LLC, Eagle Ridge, LLC, and LDC Donaldson Knoll Investments, LLC. *NMC 2017 RAP Update*, *supra* note 12, at 14.

107. Rob Brown & Jeff Stewart, *NMC Action #25 – Future Funding Options & Voting Protocol*, TAMPA BAY NITROGEN MGMT. CONSORTIUM 1 (Oct. 30, 2009), http://www.mymanatee.org/published/May%2019,%202015%20-%20Regular%20Meeting%20on%20Tuesday,%20May%2019,%202015/F89D71CB-61D2-4C47-AD09-9F77F177F79D.pdf; Email from Holly Greening, former Executive Director, Tampa Bay Estuary Program, to Author, *Comments on Article* (Feb. 17, 2018) (copy on file with Author).

108. *FDEP RAP Guidance, supra* note 9, at 9.

109. Email from Holly Greening, *supra* note 107.

110. *Id.* The NMC currently administers individual allocations for about 190 sources. *Id.*

111. Brown & Stewart, *supra* note 107, at 1–2.

112. *NMC 2017 RAP Update*, *supra* note 12, at 6.

between 2012 and 2016.[113] Domestic wastewater accounted for between 9.2% and 14.7%, industrial wastewater for between 3.9% and 10.9%, industrial fertilizer losses for between 0.2% and 0.7%, and groundwater and springs for between 1% and 3.8% during these periods.[114]

As of 2007, the largest allocations were utilized by agriculture and the larger and more populous municipal governments, with Florida Department of Agriculture and Consumer Services receiving an allocation of 832.9 tons of TN during the 2003–2007 period.[115] The second and third highest allocations went to Hillsborough County and the City of Tampa with 463.4 and 284 tons, respectively.[116] Nineteen entities have allocations greater than ten tons per year, and sixty-two entities have allocations less than ten tons.[117] Forty entities have allocations of one or fewer tons.[118]

C. The 2002 NMC Reasonable Assurance Plan

The NMC's work led to FDEP's approval in 2002 of chlorophyll-a concentration thresholds—a measure representative of the concentration of phytoplankton in the bay measured in micrograms per liter (μg/L)—as the nutrient impairment criteria for Tampa Bay's four segments.[119] The NMC's criteria were developed from the light requirements of turtle grass (*Thalassia testudinum*), a species of seagrass that health ecologists use to measure the health of the Bay's estuarine ecosystem.[120] Excessive chlorophyll-a concentrations indicate excessive phytoplankton in the Bay, which block light from reaching the sea grass,[121] and excessive TN loading into the Bay leads to excessive concentrations

113. *Id.*
114. *Id.*
115. Brown & Stewart, *supra* note 107, at 4.
116. *Id.*
117. *Id.* The top allocations were received by Manatee County (184.7 tons), Mosaic Company (146.1 tons), City of St. Petersburg (84.6 tons), Kinder Morgan Bulk Terminals (80.5 tons), Polk County (69.2 tons), Pinellas County (65.4 tons), Tampa Electric Company (59.4 tons), Pasco County (45.9 tons), City of Clearwater (37.7 tons), City of Lakeland (31.1 tons), City of Bradenton (30 tons), City of Largo (24.5 tons), CF Industries (20.2 tons), City of Plant City (19.7 tons), CSX Transportation (13.6 tons), and Eastern Associated Terminals Company, LLC (13.1 tons). *Id.*
118. *Id.*
119. *NMC 2017 RAP Update*, *supra* note 12, at 3.
120. *NMC 2002 RAP*, *supra* note 93, at 4.
121. *Id.* at 3.

of phytoplankton.[122] The NMC's 2002 RAP was approved by FDEP and the EPA as the basis for gauging nutrient pollution, and the nitrogen allocations adopted by the NMC became the basis for WQS permit conditions governing the discharge of nutrients.[123]

D. Projects Undertaken by NMC Members to Mitigate Nutrient Pollution

Strategies that have proven effective in combatting nutrient over-enrichment have included agricultural and stormwater BMPs, Advanced Wastewater Treatment (AWT), septic tank elimination, drainage improvements, ecosystem restoration, and street sweeping.[124] The NMC maintains an active action plan

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122. *Id.*

123. The FDEP wrote in a letter approving the allocations:

> As indicated in the August 28 Secretarial Order adopting the verified list of impaired waters for the Tampa Bay Basin, the Department has concluded that the nitrogen management plan developed by the Tampa Bay Estuary Program (TBEP) for Tampa Bay provides reasonable assurance (RA) that impairment of designated uses related to nutrients in Tampa Bay will be adequately addressed.
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> . . .
>
> [I]t is important to note that the TBEP chlorophyll *a* targets for each major bay segment are key elements of the RA determination, as they provide the water quality-based targets needed to interpret the narrative nutrient criteria. We carefully reviewed the chlorophyll *a* targets (and the water quality tracking process) and concluded that, pursuant to Rule 62-303.450, Florida Administrative Code (F.A.C.), the targets constitute appropriate site-specific thresholds for nutrient impairment. The chlorophyll *a* targets more accurately reflect conditions beyond which an imbalance in flora or fauna will occur than the nutrient impairment threshold for estuaries in Chapter 62-303, F.A.C. Specifically, the Department will use the following chlorophyll *a* thresholds (expressed as annual averages) as indicators of impairment for future assessments of water segments in Tampa Bay:
>
> Old Tampa Bay 9.3 µg/L
> Hillsborough Bay 15.0 µg/L
> Middle Tampa Bay 8.5 µg/L
> Lower Tampa Bay 5.1 µg/L

Letter from Daryll Joyner, Program Administrator, Bureau of Watershed Management, Fla. Dep't of Envtl. Protection, to Holly Greening, Executive Director, Tampa Bay Estuary Program, *Review of Nitrogen Management Plan* (Nov. 5, 2002), https://www.tbeptech.org/NitrogenMgmtConsort/ReasonableAssurance/2002_Submittal/2002_FDEP_Aceptance_Letter.pdf. It is of note that the chlorophyll-a targets proposed by the NMC and approved and adopted by FDEP are actually more stringent than those found in Florida's Impaired Water Rule. *NMC 2002 RAP*, *supra* note 93, at 3.

124. *NMC 2017 RAP Update*, *supra* note 12, at 17–26 (listing completed and ongoing nutrient loading reduction projects undertaken by NMC partners).

database cataloguing ongoing projects in geographic regions throughout the Tampa Bay watershed area.[125] The NMC's original 2002 RAP outlined several categories of projects implemented during the 1995–2000 plan period.[126] The 105 projects were projected to reduce annual nitrogen loading by 134 tons per year.[127] Ninety-five percent of the projects implemented addressed nonpoint sources (accounting for 71% of expected TN reductions), and the projects were split evenly between public and private entities.[128] Headline projects undertaken by NMC members include stormwater facility improvements and retrofitting; land acquisition and protection through land use regulations to preserve low-intensity land uses; wastewater effluent reuse, including conversion of septic systems to public sewer hookups; atmospheric emission reductions to mitigate atmospheric deposition resulting from emissions by coal-fired power plants; habitat restoration to reduce loading resulting from stormwater runoff; agricultural BMPs, including micro-irrigation; public education campaigns; and industrial upgrades by fertilizer plants and an orange juice manufacturing plant.[129]

E. Measurable Success & Environmental Improvement

According to the NMC's 2017 RAP update, Tampa Bay lost 42% of its seagrass acreage between 1950 and 1988 as a result of nitrogen loading and excess phytoplankton growth.[130] NMC member efforts have facilitated continuous year-over-year reductions in chlorophyll-a.[131]

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125. *TBEP Action Plan Database Portal*, TAMPA BAY ESTUARY PROGRAM, https://apdb.tbeptech.org (last visited Apr. 23, 2019).

126. *NMC 2002 RAP*, *supra* note 93, at 11.

127. *Id.*

128. *Id.*

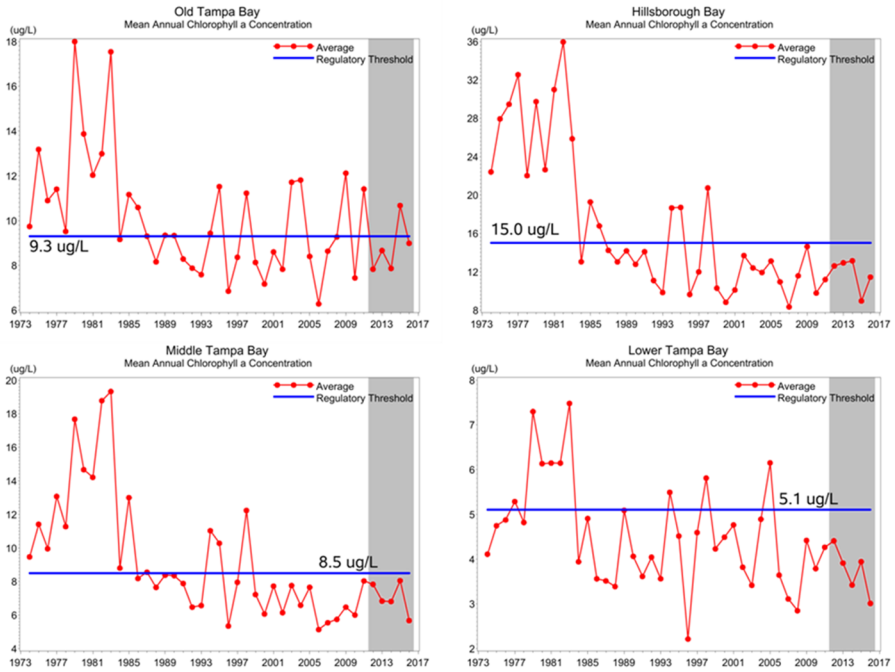
129. *Id.* at 11–12 ("The types of nutrient reduction projects included in the Consortium's Nitrogen Management Action Plan range from traditional nutrient reduction projects such as stormwater treatment upgrades, industrial retrofits and implementation of agricultural best management practices to actions not primarily associated with nutrient reduction, such as land acquisition and habitat restoration projects.").

130. *NMC 2017 RAP Update*, *supra* note 12, at 2.

131. *Id.*

> Recent data and observations from Tampa Bay indicate that continuing efforts to reduce nitrogen loading by the NMC partners are resulting in more than sufficient water quality for the expansion of seagrasses. Time series plots show that, with the exception of the Old Tampa Bay segment in 2015, FDEP-adopted

Annual Average Chlorophyll-a Concentration in Each of the Four Major Bay Segments, 1974-2016[132]



Likewise, current seagrass acreage in Tampa Bay (41,655 acres) exceeds both the recovery goal (38,000 acres) and the 1950 benchmark (40,420 acres) despite significant population increase in the Bay Area during the intervening years.[133]

---

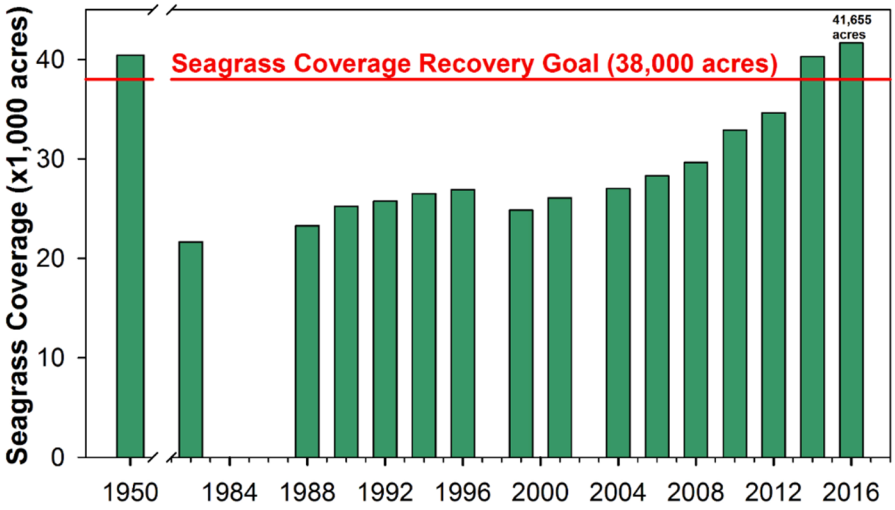
chlorophyll-a thresholds have been met in all four major bay segments over the 2012-2016 RA period. . . .

Id.

132. *Id.* at 3 fig.2 ("The solid lines represent chlorophyll-a thresholds FDEP recognizes as indicators for impairment in each of the major bay segments and are the designated alternative site-specific thresholds adopted by FDEP in 2002. Grey shaded area indicates the 2012-2016 Reasonable Assurance Period.") (Data source: Environmental Protection Commission of Hillsborough County (EPCHC).

133. *Id.* at 3 ("[S]eagrass acreage in Tampa Bay continues to increase. Between 2012 and 2016, seagrass coverage increased by 7,013 acres. As of 2016, Tampa Bay seagrass acreage (41,655 acres) now exceeds both the recovery goal (38,000 acres) and the historic, 1950 benchmark period estimate (40,420 acres)."). Meanwhile, the population of the Tampa Bay area grew very rapidly during the same timeframe; in 2016, the Tampa Bay area had the nation's fourth-highest population growth as 58,000 new residents moved to the area. *Census: Tampa Bay Shows Fourth Highest Population Growth in Nation*, TAMPA BAY TIMES (Mar. 23, 2017), www.tampabay.com/news/growth/census-tampa-bay-shows-fourth-highest-population-growth-in-nation/2317626.

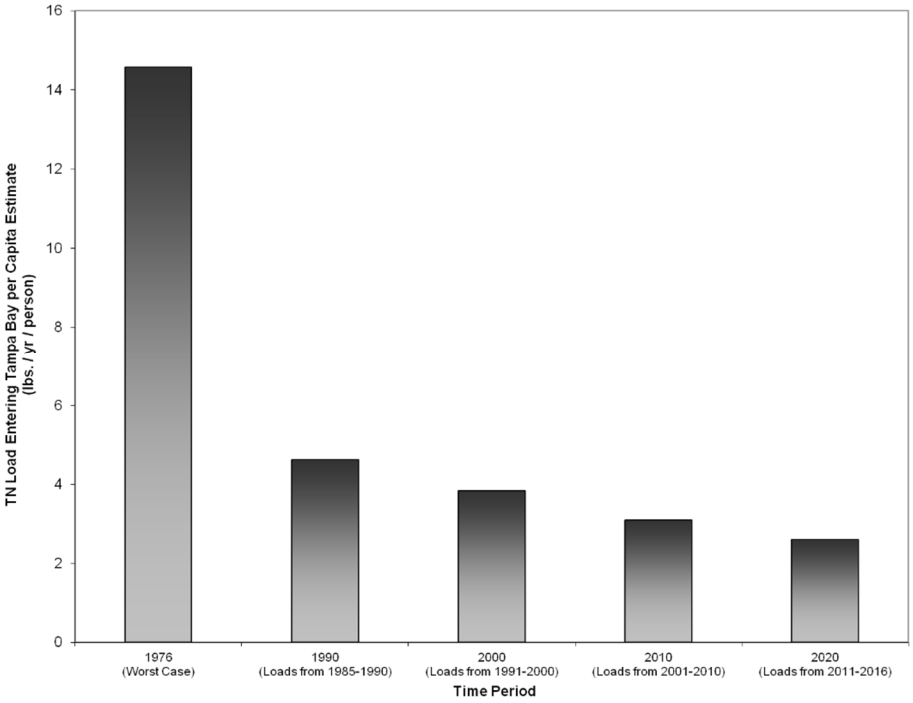
Historic Seagrass Acreage Estimates[134]



NMC member efforts have also led to drastically reduced TN loading into the Bay: in 1976, an estimated 15 lbs/year per capita of nitrogen entered the Bay; as of 2016, that figure is below 4 lbs/year.[135]

134. *NMC 2017 RAP Update*, *supra* note 12, at 3 fig.3 (Data source: TBEP & SWFWMD).
135. *Id.* at 7.

Trend in Historic Per Capita Estimate of Total Nitrogen Load (lbs. per person per year) Entering Tampa Bay[136]



FDEP recently approved the NMC's 2017 RAP Update as adequate to provide reasonable assurance that water quality in Tampa Bay will continue to improve and, in a victory for water quality in Tampa Bay, FDEP no longer considers it impaired for nitrogen.[137]

136. *Id.* at 7 fig.6 (Data Sources: TBEP, US Census Bureau).

137. FDEP's Program Administrator for its Water Quality Assessment Program made the announcement in November 2017:

> On October 31, 2017, the department received the Tampa Bay Nitrogen Management Strategy – 2017 Reasonable Assurance Update Document and following a review of the document concluded the 2017 update demonstrates not only the attainment of the RA seagrass targets, but also the total nitrogen numeric nutrient criteria. Because of this success, all segments covered by the RA will be placed in assessment category 2 for total nitrogen. This assessment category designation identifies the segments as not impaired and attaining their designated uses. I would like to close by emphasizing our appreciation for the outstanding job that you and the stakeholders have done over the years. Taking a valuable water resource, such as Tampa Bay, from impaired to restored is no easy feat. We are especially appreciative of the way stakeholders have continued

VI. ANALYSIS

A. Centralized vs. Decentralized Environmental Regulation

Academic and political debate rages between advocates of centralization and decentralization in environmental regulation. Avowed critic of centralization, Jonathan Adler, makes a six-fold case for decentralization of environmental regulation: (1) regional variation—decentralization allows local regulators to take account of local conditions that vary based on geography; (2) preference satisfaction—decentralization allows local regulators to prioritize environmental issues that are most pressing in the region or locality; (3) knowledge—decentralization helps mitigate the Hayekian "knowledge problem" associated with centralized regulation; (4) innovation—decentralization fosters "laboratories of democracy" at the state and local level as local regulators implement a wider variety of solutions at a more rapid rate than a federal regulator could; (5) accountability—decentralization forces more effective democratic accountability on local authorities than national elections could permit; and (6) "ecologies of scale"—decentralization allows local regulators to utilize a type of comparative advantage in regulating local conditions that makes them better positioned than federal regulators to address local problems.[138]

On the other hand, many commentators have pointed to potential pitfalls associated with decentralized environmental policy, particularly the "race to the bottom" theory, which postulates that state or local control of environmental regulation will create regulatory competition that incentivizes regulatory laxity as states and localities compete with other jurisdictions for mobile capital.[139]

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to embrace this comprehensive restoration plan, and commend them for their efforts to protect and restore Tampa Bay.

Letter from Julie Espy, *supra* note 1.

138. Jonathan H. Adler, *The Fable of Federal Environmental Regulation: Reconsidering the Federal Role in Environmental Protection*, 55 CASE W. RES. L. REV. 93, 107–13 (2004).

139. David M. Konisky, *Regulatory Competition and Environmental Enforcement: Is There a Race to the Bottom?*, 51 AM. J. POL. SCI. 853, 854 (2007); *see generally* Neal D. Woods, *Interstate Competition and Environmental Regulation: A Test of the Race-to-the-Bottom Thesis,* 87 SOC. SCI. Q. 174, 174 (2006) (stating that "state enforcement is systematically affected by the behavior of regional competitors. States adjust their enforcement in response to competitor states when their enforcement stringency exceeds that of their competitors").

The RAP system—and the CWA more broadly—captures the benefits of decentralization while avoiding the costs by creating a special localized role for organizations situated at the intersection of local communities, state governments, and federal mandates. The regulatory framework is complex: at the top are a collection of federal mandates embodied in the CWA (prohibition of water pollution, water quality assessment, and reporting requirements).[140] Paired with these mandates are remedial tools (TMDLs, the 303(d) list, and the NPDES permitting system of Section 402). These tools are then put in the hands of state regulators, who in turn may entrust them to local entities.[141] The federal NPDES permitting system, for example, becomes just one tool available to local regulators under this model of environmental governance. The CWA created an enforcement mechanism in Section 402 (governing NPDES permits), then placed that mechanism (subject to verification that it would be properly utilized by state and local regulators) under the control of approved and vetted parties without abdicating its authority to conduct ongoing monitoring and evaluation of those parties' activities.[142]

The RAP program also fosters something the NPDES system standing alone cannot: active, voluntary remediation activities. Since sources of nutrient pollution vary by geography, local actors have both a vested interest in maintaining water quality in their locale and the tools to fight water pollution using local influence on regional causes. This comports closely with Adler's nod to Hayekian analysis of regulation and its focus on information economics: a local effort by local actors to assess local conditions can utilize particularized knowledge about local conditions that is dispersed across myriad individuals.[143] Perhaps the most prominent instance of this phenomenon is the difficulty of conducting both scientific analysis of impairment and an investigation into the localized causes of nutrient pollution. The EPA lacks the resources to conduct the type of extensive analyses of local conditions that local scientific teams have undertaken. This approach allows environmental regulators to "crowdsource" both scientific research into the conditions of watersheds and knowledge about local sources of pollution.

140. *See supra* pt. III.
141. *See supra* pt. IV.
142. *See supra* pt. III–IV.
143. F.A. Hayek, *The Use of Knowledge in Society*, 1 N.Y.U. J.L. & LIBERTY 5, 7–8 (2005).

There is also a communitarian aspect to the process that helps mitigate what author Neil Gunningham describes as a "culture of regulatory resistance" that may develop when the regulated community adopts an adversarial approach to the regulator.[144] When regional neighbors come together to implement mitigation and remediation efforts, representatives of industry, municipalities, and other stakeholders sit at the table with other people from their communities, their coworkers and former coworkers, and others with whom they have repeated transactions. This type of environment fosters more collaboration and less conflict and assuages the need for expensive and adversarial regulatory interventions. Regulated parties will feel that allocations are more equitably distributed when those allocations are determined collaboratively, locally, and democratically than when they are perceived as decreed by a distant central authority. The race-to-the-bottom problem is prevented by state and federal oversight that mandates thorough assessment and reporting and evaluates progress and efficacy using scientifically measurable improvements in water quality to track progress and compliance.

A more localized approach to controlling nutrient pollution also puts at regulators' disposal municipal tools that are not available to federal regulators. Local and municipal governments are vested with the wide-ranging police power, which permits land use regulations that are often utilized to solve environmental problems.[145] In recent years, states and local governments have even begun to initiate implementation of environmental regulations that are more stringent than federal floors.[146] State and local governments have also taken part in the market-based environmental movement of the past decades.[147] These local tools

144. Neil Gunningham, *Enforcing Environmental Regulation*, 23 J. ENVTL. L. 169, 186–87 (2011).

145. *See* Shannon M. Roesler, *Federalism and Local Environmental Regulation*, 48 U.C. DAVIS L. REV. 1111, 1126 (2015) (stating "if the federal government were to preempt state authority to limit local land use decisions, a state's decision not to regulate is likely a reflection of the status quo, as land use regulation is traditionally the province of local, rather than state, authorities").

146. Roberton C. Williams III, *Growing State-Federal Conflicts in Environmental Policy: The Role of Market-Based Regulation* 1 (Nat'l Bureau Econ. Research, Working Paper No. 16184, 2010), http://www.nber.org/papers/w16184.pdf.

147. *See generally* Robert N. Stavins, *Experience with Market-Based Environmental Policy Instruments* 1 (Res. Future, Working Paper No. 01-58, 2001), https://www.rff.org/documents/1607/RFF-DP-01-58.pdf (considering the "experience around the world with the relatively new breed of economic-incentive or market-based policy instruments").

can open the door to a variety of innovative approaches like Water Quality Credit Trading (WQCT), which functions like a "cap and trade" program by which dischargers who can more efficiently reduce discharges may do so and sell their credits to others for whom similar reductions would be more expensive.[148] Such a program effectively functions as a "pay-not-to-pollute" program which creates a market for pollution reductions. The NMC's allocation framework could function in the future as the basis of a WQCT program.

B. The NMC as an Example of the New Environmental Governance

The NMC is a model of what Neil Gunningham describes as "The New Environmental Governance."[149] This model is essentially localist in nature and represents a shift in environmental regulation from centralized command-and-control to dispersed local action and decision-making. Gunningham identifies several characteristics of this approach to environmental regulation: "participatory dialogue and deliberation, devolved decision-making, flexibility rather than uniformity, inclusiveness, transparency, institutionalized consensus-building practices, and a shift from hierarchy to heterarchy."[150] The NMC exhibits each of these characteristics. The model encourages participatory dialogue and deliberation through its voluntary framework, which gives stakeholders a seat at the table in crafting allocations and contributions and in proposing and implementing mitigation efforts. NMC meetings are attended by representatives of its members who, through parliamentary procedures, craft documents and submittals to regulators collaboratively. Without abandoning centralized oversight (and in fact co-opting and deploying federally-created regulatory and enforcement mechanisms), the legal framework sustaining the NMC devolves decision-making from centralized regulatory bodies like the EPA and FDEP to a collaborative body comprised of local stakeholders,

148. FLA. STAT. § 403.067(7)(a)(7) (2018).

149. *See generally* Neil Gunningham, *The New Collaborative Environmental Governance: The Localization of Regulation*, 36 J.L. & SOC'Y 145, 145 (2009) (examining the "new collaborative environmental governance, an enterprise that involves collaboration between a diversity of private, public, and non-government stakeholders who, acting together towards commonly agreed goals, hope to achieve far more collectively, than individually").

150. *Id.* at 146.

with agencies higher up the chain maintaining effective oversight and approval over the local body's actions. The NMC permits regulatory flexibility, as stakeholders may innovate their own methods of achieving desired discharge reductions and may renegotiate or exchange their allocations amongst themselves. The NMC is built on inclusivity; a diverse group of stakeholders face the same incentives to participate, drawing new members into the organization. The eclectic participation in the Consortium attests to its inclusivity. The NMC's operation is fully transparent; its meetings are public, as are the documents it produces, discusses, and submits. The NMC institutionalizes consensus-building practices with its deliberative democratic approach to environmental governance. The NMC partners harness the incentives of maintaining local regulatory control, improving water quality, and maximizing the optics of action to achieve consensus and compliance. The NMC is a veritable model of the shift from hierarchy to heterarchy; though a significant degree of hierarchy remains in the regulatory framework (the EPA may intervene should water quality improvements fail to materialize), federal micromanagement is nearly eliminated, leaving a heterogeneous group of stakeholders "driving the bus" on at least this narrow regulatory issue.

Another benefit of this model as it pertains to the NMC is the Consortium's meticulous cataloging and dissemination to the public of the information it collects.[151] The NMC brings together a diverse group of environmental scientists acting on behalf of numerous public and private entities to study and monitor the conditions in Tampa Bay's major bay segments. These researchers have the benefit of decades of scientific data collated by the Tampa Bay Estuary Program, which has compiled a treasure trove of data on water quality in the Bay.[152] The NMC performs this ancillary (though highly significant and valuable) service to the public,

151. *See, e.g.*, *NMC 2017 RAP Update*, *supra* note 12. In November 2017, the NMC also won the Coastal Stewardship Award for Stewardship from the Coastal & Estuarine Research Federation for promoting "the wise use of science and management toward the stewardship of estuaries and coasts." *CERF 2017 Scientific Award Recipients*, COASTAL & ESTUARINE RES. FED'N, http://www.erf.org/2017-scientific-award-recipients#Coastal (last visited Apr. 23, 2019).

152. *See* R.R. Lewis et al., *The Rehabilitation of the Tampa Bay Estuary, Florida, USA, as an Example of Successful Integrated Coastal Management*, 37 MARINE POLLUTION BULL. 468, 471 (1999) (illustrating the Fig. 2 Graph that shows the measured areal extent of seagrass meadows in Tampa Bay over time until 1998).

which encourages and fosters the type of transparency and cooperation Gunningham describes as a hallmark of the New Environmental Regulation.[153]

VII. CONCLUSION

The NMC showcases that potential local governance and public-private partnerships have to rectify difficult and complex environmental problems. Regulators at the federal and state level do well to develop regulatory frameworks that both preserve the optimum level of oversight and promote shifting the regulatory burden to local actors, who are better positioned to study local ecosystems in detail and to build coalitions that involve local stakeholders in decision-making and implementation of efforts to mitigate environmental problems. Local stakeholders do well to involve themselves proactively in environmental solutions. Local stakeholders in watersheds threatened by nutrient impairment should consider the NMC's approach as a model and should consider developing RAPs similar to the NMC's. As of 2012, only three other RAPs had been approved by FDEP: the Florida Keys, Lake Seminole, and Shell, Prairie, and Joshua Creeks. The future, hopefully, will see a proliferation of similar RAPs throughout the state and country to continue to improve the nation's waters and mitigate water pollution.

153. Gunningham, *supra* note 149, at 146.