

FROM THE FARM TO THE GULF: MANAGING NUTRIENT RUNOFF THROUGH NUMERIC NUTRIENT STANDARDS

Jesse Johnston[†]

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The waters of the United States are impaired.¹ Throughout the past four decades, state governments, public interest groups, farmers, and the EPA have engaged in negotiations with the goal of “restor[ing] and maintain[ing] the chemical, physical, and biological integrity of the Nation’s waters.”² Two of the most

[†] J.D., Drake University Law School, 2015.

1. See *Watershed Assessment, Tracking & Environmental Results: National Summary of Impaired Waters and TMDL Information*, EPA, http://iaspub.epa.gov/waters10/attains_nation_cy.control?p_report_type=T#status_of_data (last updated Sept. 22, 2015) [hereinafter *Watershed Assessment*].

2. 33 U.S.C. § 1251(a) (2012); see, e.g., Michelle Perez & Sara Walker, *Improving Water Quality: A Review of the Mississippi River Basin Healthy Watersheds Initiative (MRBI) to Target U.S. Farm Conservation Funds*, 8-9 (World Res. Inst., Working Paper, 2014), available at <http://www.wri.org/publication/MRBI> (noting efforts and groups involved with the water quality of the Gulf of Mexico and its tributaries). See generally *Partner Organizations*, CHESAPEAKE BAY PROGRAM, <http://www.chesapeakebay.net/about/partners> (last visited Jan. 19, 2015) [hereinafter CHESAPEAKE BAY PROGRAM] (displaying efforts and groups involved with the Chesapeake Bay and its tributaries).

important parties to this discussion are the American farmer and those who represent the farmer's interests.³ The Clean Water Act (CWA) regulates a point source and a nonpoint source differently, with agriculture generally falling into the latter group.⁴ Nonpoint source pollution includes agricultural activity, such as "runoff from fields and crop . . . lands,"⁵ and is managed by state governments.⁶ Currently, Iowa is trying to improve its impaired waters *and* reduce the hypoxic zone in the Gulf of Mexico while balancing the agricultural interests that dominate the state.⁷ Iowa's plan to improve water quality—the Nutrient Reduction Strategy—has been endorsed by farm-advocacy groups and politicians, in part because it provides for the voluntary adoption of conservation practices.⁸ However, environmental groups have criticized Iowa's strategy because it does not go far enough to protect Iowa's waters and the Gulf of Mexico.⁹ Many of these environmental groups and other concerned citizens have called for numeric nutrient criteria (NNC) in Iowa as a way to measure and achieve stated goals for

3. See EPA ET AL., CLEAN WATER: FOUNDATION OF HEALTHY COMMUNITIES AND A HEALTHY ENVIRONMENT 3-4 (2011), available at http://www.whitehouse.gov/sites/default/files/microsites/ceq/clean_water_framework.pdf [hereinafter CLEAN WATER].

4. See 33 U.S.C. §§ 1311(a) & (b), 1314(f)(2)(A) (noting agricultural practices such as tiling and use of synthetic fertilizers are regulated as non-point sources while animal feeding operations are considered by most states to be point-source pollution); 40 C.F.R. § 122.23 (2015) (stating concentrated animal feeding operations (CAFOs) are point sources subject to state National Pollutant Discharge Elimination System (NPDES) programs).

5. 33 U.S.C. § 1314(f)(2)(A).

6. *Id.* § 1329(b).

7. See IOWA DEP'T. OF AGRIC. AND LAND STEWARDSHIP ET AL., IOWA NUTRIENT REDUCTION STRATEGY: A SCIENCE AND TECHNOLOGY-BASED FRAMEWORK TO ASSESS AND REDUCE NUTRIENTS TO IOWA WATERS AND THE GULF OF MEXICO §1, p. 9-10 (2013) [hereinafter IOWA DEP'T OF AGRIC.], available at <http://www.nutrientstrategy.iastate.edu/sites/default/files/documents/NRSfull-130529.pdf> (addressing the challenges of adopting the best management practices to address nonpoint source pollution from agriculture).

8. See, e.g., IOWA RES. COORDINATING COUNSEL, IOWA NUTRIENT REDUCTION STRATEGY app. at 2 (2014), available at <http://www.nutrientstrategy.iastate.edu/sites/default/files/documents/14-appendix.pdf> ("The IFBF has at least 10 major policy statements in support of the Nutrient Reduction Strategy and voluntary soil and water conservation implementation.").

9. See, e.g., *New State Strategy on Iowa's Most Widespread Water Pollution Problem Cries Out for More Accountability, Greater Citizen Input, and Stronger Solutions*, IOWA ENVTL. COUNCIL BLOG (Dec. 6, 2012), <https://iaenvironment.wordpress.com/2012/12/06/new-state-strategy-on-iowas-most-widespread-water-pollution-problem-cries-out-for-more-accountability-greater-citizen-input-and-stronger-solutions/> (noting the Iowa Environmental Council points out that the NRS "fails to list either short-term or long-term goals for water quality improvements").

water quality.¹⁰ Is there an approach to protecting water quality that will allow farmers to continue to adopt conservation practices voluntarily and improve impaired waters with sufficient immediacy? How do numeric criteria affect current water restoration efforts? What would the implementation of NNC look like to stakeholders? By examining water restoration efforts in Texas, Chesapeake Bay, and Florida, as well as legal precedent involving water restoration, this Note will argue that numeric criteria are beneficial and should be adopted by the state before they are *imposed* upon the state.¹¹

Part I of this Note discusses the effects of agriculture on the Gulf and its tributaries and the efforts to address these problems. Part II focuses specifically on NNC: what such criteria would mean for water quality and how NNC works within the current water quality regulation scheme. Part III looks toward judicial decisions that have compelled establishment of quantitative goals associated with water restoration in other jurisdictions. Part IV offers a broad blueprint outlining implementation of state-wide adoption of NNC and corresponding nutrient management practices, in order to ensure continued autonomy in any water restoration efforts, with a focus on efforts in Iowa.

I. NUTRIENT RUN-OFF: FROM THE FARM TO THE GULF

Spanning over 1.2 million square miles, thirty-one states, and hundreds of tributaries, the Mississippi Watershed proves to be a tie that binds.¹² Forty-one percent of the Continental United States' water drains into the Mississippi River and ultimately into the Gulf of Mexico.¹³ Majestic in size and scope, millions of people rely on the waters of Mississippi watershed and the Gulf of Mexico for food, jobs, and recreation.¹⁴

It is a far journey from a stream in rural Iowa to the Gulf of Mexico, but

10. *See id.* (“To motivate Iowans to invest in substantial and sustainable improvements in water quality, Iowa needs [numeric] goals, which are based on benefits to Iowa waters. The nutrient strategy evades this responsibility, promising only to ‘[evaluate] the need for nutrient water quality standards’ in the future.”).

11. *See, e.g.,* Perry Beeman, *Top Ag Official: Voluntarily Cut Runoff Before Feds Take Action*, DES MOINES REG., Dec. 5, 2012 [hereinafter Beeman, *Top Ag Official*] (There is concern that if farmers do not address the issue, they “‘should expect regulation’” to be imposed).

12. *History of the Mississippi-Atchafalaya River Basin (MARB)*, MISS. RIVER GULF OF MEXICO WATERSHED NUTRIENT TASK FORCE, water.epa.gov/type/watersheds/named/msbasin/marb.cfm (last visited Jan. 19, 2015).

13. NAT’L OCEANIC AND ATMOSPHERIC ADMIN., U.S. DEP’T OF COMMERCE, NOAA KNOWS . . . DEAD ZONES, HYPOXIA IN THE GULF OF MEXICO 1 (2009), *available at* www.noaa.gov/factsheets/new%20version/dead_zones.pdf [hereinafter NOAA KNOWS].

14. *See* NAT’L OCEANIC AND ATMOSPHERIC ADMIN., THE GULF OF MEXICO AT A GLANCE: A SECOND GLANCE (2011), *available at* <http://stateofthecoast.noaa.gov/features/gulf-of-mexico-at-a-glance-2.pdf>.

almost sixteen metric tons of nutrients from Iowa farm fields make this trip yearly.¹⁵ Some levels of polluting nutrients are naturally occurring.¹⁶ Some of the nutrients found polluting the waters come from urban areas.¹⁷ However, the bulk of the pollutants causing disequilibrium in the waters and in the Gulf come from farms.¹⁸ The Gulf ingests over 1.6 million metric tons of nutrient run-off yearly, mostly from the Mississippi, Ohio, Missouri, and Atchafalaya rivers and their tributaries.¹⁹ The suspect nutrients come in the form of nitrogen (or nitrates which form when nitrogen is solubilized in water)²⁰ and phosphorus.

The Mississippi River and the Gulf of Mexico together are a sick ecosystem; the Dead Zone is symptomatic of a metastasized disease. The term “Dead Zone” has come to describe the hypoxic zone²¹ found at the confluence of the Gulf of Mexico and the mouth of the Mississippi and Atchafalaya Rivers.²² The name is derived from the effects of nutrient-loading in the water: in July of 2013, there existed a 5,800 square mile area where there was not enough oxygen in the water to support aquatic life.²³ Estimates suggest that about seventy percent of the nutrient loads that cause hypoxia come from agricultural runoff from the farmlands that comprise the abutting landscape of the Gulf’s rivers and their

15. See Bryan Walsh, *This Year’s Gulf of Mexico Dead Zone Could be the Biggest on Record*, TIME, June 19, 2013, <http://science.time.com/2013/06/19/this-years-gulf-of-mexico-dead-zone-could-be-the-biggest-on-record/> (estimating the total nutrient load runoff into the Gulf of Mexico to be 153,000 metric tons).

16. See U.S. EPA, 2000 NATIONAL WATER QUALITY INVENTORY REPORT 15 (2002).

17. See *id.* at 14-15.

18. See MISS. RIVER GULF OF MEXICO WATERSHED NUTRIENT TASK FORCE, REASSESSMENT 2013: ASSESSING PROGRESS MADE SINCE 2008 vi (2013) [hereinafter REASSESSMENT 2013] (discusses agriculture’s role in hypoxic zone in the Gulf of Mexico); *Agriculture*, CHESAPEAKE BAY PROGRAM, <http://www.chesapeakebay.net/issues/issue/agriculture> (last visited Jan. 19, 2015) (noting that twenty-five percent of the Chesapeake’s watershed is devoted to agriculture production and is the single largest source of nutrient and sediment pollution in the bay).

19. REASSESSMENT 2013, *supra* note 18, at iv, vii.

20. TOM ISENHART & MATT HELMERS, IOWA NUTRIENT REDUCTION SCIENCE ASSESSMENT, *available at* <http://water.epa.gov/type/watersheds/named/msbasin/upload/DeanLemke-MattHelmersIowaScienceAssessment.pdf> (last visited Jan. 19, 2015).

21. See NOAA KNOWS, *supra* note 13 (describing how hypoxia occurs when excessive amounts of nitrogen and phosphorus are discharged into the water and stimulate the growth of phytoplankton and zooplankton. When these algae die and decompose, oxygen is depleted from the water. When the dissolved oxygen concentration falls below 2mg/L, most marine organisms become physiologically stressed or cannot survive).

22. *Measuring the Hypoxic Zone*, MISS. RIVER GULF OF MEXICO WATERSHED NUTRIENT TASK FORCE, <http://water.epa.gov/type/watersheds/named/msbasin/zone.cfm> (last visited Jan. 19, 2015).

23. *Id.*

tributaries.²⁴ Illinois, Iowa, and Indiana contribute the most to nutrient run-off; Iowa's contribution is just above eleven percent of the total nitrogen loads in the Gulf.²⁵ Nitrogen and phosphorus occur naturally, and atmospheric deposits and natural land account for nearly twenty percent of the nitrogen found in the Gulf of Mexico.²⁶

Iowa's waters are impaired by these nutrients. In Iowa's 2014 survey, the Department of Natural Resources found that 572 bodies of water are polluted and unsuitable for their designated uses.²⁷ These bodies of water require the state of Iowa to develop total maximum daily loads (TMDLs) of pollutants for each of these bodies of water.²⁸ Nitrate levels reached record highs in the Des Moines and the Raccoon Rivers in the fall of 2014—far above the safe levels for drinking water.²⁹ Removing nitrates from the water is costly, and this cost is passed on to the users.³⁰ Addressing the nutrient loading in Iowa's waters will, in turn, positively affect the water restoration efforts occurring in the Gulf. The occurrence of the Dead Zone has created a renewed sense of immediacy for addressing this cross-jurisdictional problem.

The compelling reasons for ensuring clean water in our rivers and coastal regions are numerous.³¹ These range from economic benefits³² gained from

24. NOAA KNOWS, *supra* note 13.

25. Perry Beeman, *Register Special Report: Runoff from Iowa Farms Growing Concern in Gulf*, DES MOINES REG., Oct. 28, 2012, <http://archive.desmoinesregister.com/article/20121028/NEWS/310280045/Runoff-from-Iowa-farms-growing-concern-Gulf>.

26. *Id.*

27. See *The Draft 2014 Iowa List of Clean Water Act Section 303(d) Impaired Waters*, IOWA DEP'T OF NAT. RES. (Apr. 2015), <http://www.iowadnr.gov/Environment/WaterQuality/WaterMonitoring/ImpairedWaters.aspx>.

28. See *id.*

29. Donelle Eller, *Nitrate Levels Reach Record Highs in 2 D.M. Rivers*, DES MOINES REG., Nov. 5, 2014, <http://www.desmoinesregister.com/story/money/agriculture/2014/12/04/high-nitrates-des-moines-19906717/>.

30. See Complaint at 17-18, *Bd. of Water Works Tr. of the City of Des Moines, Iowa vs. Sac Cnty. Bd. of Supervisors*, 5:15-cv-04020 (N.D. Iowa Mar. 16, 2015) (Des Moines Water Works nitrate removal facility cost \$4.1 million to build and costs \$7,000 per day to operate. In the summer of 2013, the Des Moines Water Works facility had to run the nitrate removal facility for 74 days and expended over \$500,000 to treat the drinking water in Des Moines).

31. See EPA, THE ECONOMIC BENEFITS OF PROTECTING HEALTHY WATERSHEDS (2012), *available at* http://water.epa.gov/polwaste/nps/watershed/upload/economic_benefits_factsheet3.pdf (including economic benefits as avoidance of future costs, conservation development in the residential sector, recreation and tourism, and property value premiums).

32. COMM. ON THE MISS. RIVER & THE CLEAN WATER ACT, NAT'L RESEARCH COUNCIL,

healthy watersheds, to the health benefits and an enhanced quality of life that are associated with a sustainable ecosystem.³³ The time and resources contributed by environmental groups and governing bodies to this cause also serve as evidence of the importance of clean water. This author believes that *all* stakeholders desire clean water.

II. OBSTACLES TO WATER RESTORATION EFFORTS

Several efforts have been made to improve the Gulf and its tributaries, but little actual progress has been seen.³⁴ The CWA was passed first passed in 1948, with landmark amendments occurring in 1972.³⁵ These amendments created the CWA regulatory structure that is in operation today. However, for several of the reasons discussed below, the CWA has proven ineffective in restoring the waters of the U.S. single-handedly.

One reason cited for the lack of improvement is the apparatus by which the CWA regulates.³⁶ The CWA regulates effluent limitations from a “point source” by requiring owners and operators to obtain a permit to discharge into a body of water.³⁷ Much of the nutrients causing hypoxia are nonpoint sources of pollutants and thus beyond the delegation of power to the EPA under the CWA.³⁸ Nutrient pollutants in the form of agricultural runoff are enforced through the various efforts of individual states and beyond the reach of federal regulations,³⁹ even though agricultural activities in the Mississippi Watershed contribute 1.7 million tons (seventy percent) of nutrients found in the Gulf.⁴⁰

The fragmented regulations of nonpoint sources of pollution presents an-

MISSISSIPPI RIVER WATER QUALITY AND THE CLEAN WATER ACT: PROGRESS, CHALLENGES AND OPPORTUNITIES 61 (2008) [hereinafter COMM. ON THE MISS. RIVER]. For example, hypoxic conditions affect the growth, interactions, and reproductive capacity of the brown shrimp—the largest economic fishery in the northern Gulf of Mexico. *Id.*

33. See LAURA DLUGOLECKI, ECONOMIC BENEFITS OF PROTECTING HEALTHY WATERSHEDS: A LITERATURE REVIEW 29 (2012), available at http://www.watershedcounts.org/documents/Economic_Benefits_of_Protecting_Healthy_Watersheds.pdf.

34. See NOAA KNOWS, *supra* note 13.

35. *Summary of the Clean Water Act*, EPA, <http://www2.epa.gov/laws-regulations/summary-clean-water-act> (last updated Mar. 13, 2015) [hereinafter *Summary of the Clean Water Act*].

36. See 33 U.S.C. §§ 1251-1387 (2012).

37. See *id.* §§ 1311(3)(a)-(b).

38. See 40 C.F.R. § 122.3 (2015).

39. 33 U.S.C § 1313(d)(1)(A) (requiring states to identify waters within its boundaries for which the effluent limitations are not stringent enough to achieve applicable water quality standards); 40 C.F.R. § 122.3 (agricultural storm water exemption).

40. NOAA KNOWS, *supra* note 13.

other obstacle to obtaining cleaner waters in the Mississippi Watershed because it requires a multi-jurisdictional approach to water cleanup.⁴¹ Coordination across the thirty-one basin states and with the EPA regions is necessary to concertedly reduce nutrient runoff in the Gulf.⁴² However, this degree of cooperation has proven difficult in implementation and administration,⁴³ especially considering the large-scale effects of nitrification seen in the Gulf are “linked with inputs and processes in upstream regions several hundreds of miles away.”⁴⁴

Correcting the nutrient loading can be expensive. Iowa has estimated that it will cost anywhere between \$1.2 billion and \$4 billion to reduce nutrient levels to achieve reduction objectives.⁴⁵ Iowa’s governor, Terry Branstad, has estimated the cost of implementing regulations in Iowa “range from \$900 million to \$2.4 billion annualized . . . with required initial investments of \$1 to \$4.7 billion” to Iowa’s corn and soybean farmers.⁴⁶ Bill Northey, Iowa’s Secretary of Agriculture, has requested \$7.5 million from the state to fund Water Quality Initiative, in the 2016 and 2017 state budgets.⁴⁷ This price tag is a difficult number to derive though, because the cost-benefit analysis that is easily employed in a private setting becomes a more elusive number when dealing with public goods.⁴⁸ It is difficult to assign a value to many of the benefits associated with healthy water, like recreational enjoyment. Further, preventive practices that keep the water clean cost less in the long run than the remedial practices are employed to create the same water quality goal.⁴⁹

Unfortunately, the pervasive narrative is that the costs of environmental

41. See Laura Kerr, Comment, *Compelling a Nutrient Pollution Solution: How Nutrient Pollution Litigation is Redefining Cooperative Federalism Under the Clean Water Act*, 44 ENVTL. L. 1219, 1226 (2014).

42. See generally *id.*

43. See Oliver A. Houck, *Cooperative Federalism, Nutrients, and the Clean Water Act: Three Cases Revisited*, 44 ENVTL. L. REP. NEWS & ANALYSIS 10426, 10432-33 (2014).

44. See COMM. ON THE MISS. RIVER, *supra* note 32, at 190.

45. IOWA DEP’T OF AGRIC., *supra* note 7, at § 1, p. 4.

46. See Letter from Terry Branstad, Governor, State of Iowa, to Lisa Jackson, Adm’r, EPA (July 11, 2012) [hereinafter Letter from Terry Branstad] (on file with author).

47. See Press Release, Nat’l Ass’n of State Dep’ts of Agric., Northey Requests \$7.5 Million for Water Quality (Dec. 1, 2014), <http://www.nasda.org/News/statePR/31017.aspx>.

48. See Bruce A. Babcock & Catherine L. Kling, *Costs and Benefits of Fixing Gulf Hypoxia*, 14 IOWA AGRIC. REV., no. 4, 2008, at 8, 9, http://www.card.iastate.edu/iowa_ag_review/fall_08/IAR.pdf.

49. DANA L. DINNES, ASSESSMENTS OF PRACTICES TO REDUCE NITROGEN AND PHOSPHORUS NONPOINT SOURCE POLLUTION OF IOWA’S SURFACE WATERS 2 (IOWA DNR ed., 2004), available at http://www.iowadnr.gov/portals/idnr/uploads/water/nutrients/files/nps_assessments.pdf.

benefits are in direct conflict with farm benefits.⁵⁰ This sentiment stands as another barrier between agricultural practices and water restoration. The belief that adoption of conservation practices is expensive and difficult will delay any efforts farmers engage in before making an on-farm change to a management practice.⁵¹ Reframing this narrative to reach the late adopters is more critical and urgent with the continuing degradation of the Gulf.⁵²

Farmer's opinions and understanding about water pollution and its causes matter when changes in on-farm behavior are to occur voluntarily—as called for in Iowa's Nutrient Reduction Strategy.⁵³ The Iowa Farm Poll has concluded that farmers do not know enough about key practices that have the best potential for reducing nutrient runoff.⁵⁴ However, farmers seek a majority of their information regarding best management practices from fertilizer dealers or crop consultants: sixty-seven percent of farmers would first consult their fertilizer dealers for nutrient management information and eighty percent-two percent of farmers would first consult their fertilizer dealers for information on the rate of application.⁵⁵ This tendency for farmers to gather information from agribusiness dealers may have created a “normalization” of fertilizer use (and overuse) over time as other methods of fertility management . . . have declined.”⁵⁶ The Farm Poll suggests improvements are needed, and that those who provide products and advice regarding fertilizer products should accept some responsibility to meet voluntary nutrient reduction goals.⁵⁷

Finally, there may be institutional inertia at work.⁵⁸ Scientific research has

50. Jaqueline Comito, *Solutions Have Benefits for All*, THE GAZETTE (Mar. 29, 2014, 3:00AM), <http://thegazette.com/2014/02/02/solutions-have-benefits-for-all/> [hereinafter Comito, *Solutions Have Benefits for All*]; see Letter from Terry Branstad, *supra* note 46.

51. See AM. FARMLAND TRUST, THE ADOPTION OF CONSERVATION PRACTICES IN AGRICULTURE 2-3 (2013), available at <https://www.farmland.org/publications> (locate title hyperlink) [hereinafter AM. FARMLAND TRUST] (discussing the logical sequence that a producer engages in when deciding to change an on-farm practice, specifically the second step where manager considers the data collection of the positive perceptions of practice; with these efforts, the narrative is one of high costs).

52. See *id.*

53. See IOWA DEP'T OF AGRIC., *supra* note 7.

54. IOWA STATE UNIV. EXTENSION & OUTREACH, IOWA FARMERS' NITROGEN MANAGEMENT PRACTICES AND PERSPECTIVES, IOWA FARM & RURAL LIFE POLL, (2014), available at <http://www.soc.iastate.edu/extension/ifrlp/PDF/PM3066.pdf> [hereinafter IOWA FARM & RURAL LIFE POLL].

55. *Id.* at 5.

56. *Id.* at 7.

57. *Id.* at 8.

58. *Dead Zone Action Needed: EWG Remarks to Hypoxia Task Force*, ENVTL. WORKING GRP. (Sept. 24, 2009), <http://www.ewg.org/nerws/testimony-official-correspondence/dead-zone-action-needed-ewg-remarks-hypoxia-task-force>.

determined the best management practices and the development and implementation of policy are lagging because regulatory framework requires actual knowledge of current on-farm practices.⁵⁹ This missing information impairs governments and institutions' ability to "strategically direct efforts."⁶⁰ Policy decisions are slow to be enacted and enforced where policy-makers must regulate with a broad stroke.

The goal of the 1972 CWA was to be accomplished by the year 1985; over two decades later this mission is still unfulfilled.⁶¹ Awareness about nutrification is rising in the Mississippi River Basin, and stakeholders are taking action. Some groups have lobbied policy-makers to take the next step and adopt specific criteria for the nutrients causing water degradation. In order to maintain high water quality standards, nonpoint source pollution must be mitigated.

III. NUMERIC NUTRIENT CRITERIA

The EPA⁶² and environmental groups⁶³ contend that numeric nutrient criteria (NNC) would be an important step toward a working solution for nonpoint source pollution. Farmer-advocates contend that voluntary adoption of best management practices, as promoted in the Iowa Nutrient Reduction Strategy, *will* make meaningful progress by providing for better coordination and synchronization of our current state and federal conservation programs.⁶⁴ These groups further contend that NNC would be detrimental to progress because "[t]he numeric water quality standard approach that results in labeling people, farmers and business as 'polluters' has real financial consequences."⁶⁵ What are NNC? How does NNC function within the regulatory scheme of the CWA? And what role do states play in establishing such criteria?

The CWA leaves individual states with the authority and responsibility to

59. *Id.*

60. *Id.*

61. See *Clean Water Act*, EPA REGION 6 OFFICE, <http://www.epa.gov/region6/6en/w/cwa.htm> (last updated Oct. 4, 2011).

62. See EPA, NATIONAL STRATEGY FOR THE DEVELOPMENT OF REGIONAL NUTRIENT CRITERIA 9-10 (1998), *available at* http://www2.epa.gov/sites/production/files/documents/nutrient_strategy_1998.pdf.

63. See Memorandum in Support of the Petition By Iowa Env'tl. Council & Env'tl. Law & Policy Ctr. for the Amendment of the Rules Relation to Water Quality Standards 8 (July 2008), <http://www.iaenvironment.org/documents/2013/Lakes/EnclosureA.pdf>.

64. See Letter from Craig Hill, President, Iowa Farm Bureau Fed'n, to Bill Northey, Sec'y of Agric, State of Iowa (Jan. 7, 2013) *reprinted and available at* www.bleedingheartland.com/diary/5963/two-views-of-iowas-strategy-on-key-water-pollution-problem [hereinafter Letter from Craig Hill].

65. *Id.*

adopt water quality standards for its water bodies.⁶⁶ All states must adopt standards that describe the desired condition of a water body. Standards consist of three principal elements:

- (1) the “designated uses” of the state’s waters (e.g., fishing, aquatic life, drinking water);
- (2) “criteria” specifying the amounts of various pollutants, in either numeric or narrative form, that may be present in those waters without impairing the designated uses; and
- (3) antidegradation policies providing for protection of existing water uses and limitations on degradation of high quality waters.⁶⁷

A state’s water quality standards articulate the “water quality criteria” necessary to protect those designated uses.⁶⁸

Criteria are defined as “elements of State water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use.”⁶⁹ Presently, there are two systems for expressing the second element: numeric and narrative criteria.⁷⁰ Narrative nutrient criteria are expressed *qualitatively*. For example, Iowa’s existing narrative criteria state that all surface waters designated for general use “shall be free from substances, attributable to wastewater discharges or agricultural practices, in quantities which would produce undesirable or nuisance aquatic life.”⁷¹

Numeric criteria specify the “precise, measurable levels of particular chemicals or conditions allowable in a water body.”⁷² Expressed numeric nutrient criteria provide specific levels of nitrogen and phosphorus (causal parameters) as well as criteria for resulting chlorophyll or turbidity (response parameters).⁷³ For

66. 33 U.S.C. § 1313(c)(2)(A) (2012).

67. EPA, STATE ADOPTION OF NUMERIC NUTRIENT STANDARDS (1998-2008) 4 (2008), available at http://www2.epa.gov/sites/production/files/documents/nutrient_report1998-2008.pdf [hereinafter STATE ADOPTION].

68. 33 U.S.C. § 1313(c)(2)(A).

69. 40 C.F.R. § 131.3(b) (2015).

70. Mario Sengco, Standards and Health Protection Division, Webinar entitled Guiding Principles for Developing and Implementing a Numeric Nutrient Criterion that Integrates Causal and Response Parameters (“Bioconfirmation”) (Sept. 19, 2013), available at http://www2.epa.gov/sites/production/files/2013-09/documents/guiding_webinar.pdf.

71. IOWA ADMIN. CODE r. 567-61.3(2)(e) (2015).

72. *Forms of Expression: Numeric and Narrative Criteria*, EPA, <http://water.epa.gov/learn/training/standardsacademy/mod3/page6.cfm> (last updated Mar. 6, 2012).

73. Sengco, *supra* note 70; 40 C.F.R. § 131.11 (a)(1) (requiring that criteria “must be based on sound scientific rationale and must contain sufficient parameters or constituents to protect the designated use.” A causal parameter identifies the nutrients that are the cause; the

example, an expressed nutrient criteria may read TN = 0.56 mg/L; TP = 33 µg/L; where the total nitrogen is not to exceed 0.56 milligrams per liter and the total phosphorus is not to exceed 33 micrograms per liter.⁷⁴

The EPA recognizes that numeric nutrient criteria (expressed quantitatively) are superior to narrative criteria because they:

“Provide measurable, objective baselines against which to measure environmental progress;”

Facilitate the writing of NPDES permits;

“Make development of water quality targets in [Total Maximum Daily Loads] (TMDLs) faster and easier;

Increase the effectiveness in evaluating success of nutrient runoff minimization;” and

Provide broader partnerships to employ best management practices (BMPs), land stewardship, wetlands protection, voluntary collaboration, and urban storm water runoff control strategies.⁷⁵

Nutrient criteria, whether numeric or narrative, is a critical component in managing a state’s nonpoint source pollution. Once a state has identified its impaired waters,⁷⁶ then the state is required by the CWA to establish TMDLs, for each of the impaired bodies of water.⁷⁷ A TMDL defines the maximum amount of a pollutant that a body of water can receive from both point and nonpoint sources.⁷⁸ Through establishment of load allocations in the TMDL, states may restrict nonpoint source pollutants.

Expressed NNC does not, on its own authority, impose regulations on landowners or farmers, nor compel action by nonpoint source polluters.⁷⁹ NNC rep-

response parameter is an assessment of the nutrients. There may be several response parameters that can be identified prior to the assessment endpoint. For example, nitrogen and phosphorus concentration can lead to algal biomass, which dissolves oxygen, and results in floral and faunal community growth).

74. Sengco, *supra* note 70.

75. STATE ADOPTION, *supra* note 67.

76. 33 U.S.C. §1313(d)(1)(A) (2012) (The report of impaired waters submitted by the individual states to the EPA pursuant to 33 U.S.C. § 1313(d)(1)(A) is commonly known as the “303 (d)” list.).

77. *Id.* § 1313(d)(1)(C); 40 C.F.R. § 130.7(c)(1); *see* Pronsolino v. Nastri, 291 F.3d 1123, 1141 (9th Cir. 2002) (holding that states must establish TMDLs for waters affected by nonpoint source pollution).

78. 40 C.F.R. § 130.2 (the maximum amount of pollutants from point sources are referred to as waste load allocations and the maximum amount of pollutants are referred to as load allocations in a TMDL).

79. *See* OFFICE OF ENFORCEMENT AND COMPLIANCE ASSURANCE, EPA, CLEAN WATER

resent the goal for total nutrient content of a body of water, not a limit upon the amount of nutrients that any farmer can apply.⁸⁰ TMDLs represent the limit of any pollutant that a body of water can ingest.⁸¹ TMDLs are the regulatory “hammer.”⁸² In the Chesapeake Bay watershed, for example, the EPA has issued a TMDL for the Bay and for the entire watershed, which includes 92 individual tributary segments.⁸³ The state must provide the EPA with Watershed Implementation Plans, which include intermittent benchmarks and permission for the EPA to use additional regulatory authority where these benchmarks are not met.⁸⁴ TMDLs compel action by states and polluters within a designated watershed, and are heralded as the new approach needed for restoring impaired waters: TMDLs are able to utilize state laws and regulations that vest their authority from law other than the Clean Water Act, which may be a more desirable policy goal throughout the many jurisdictions.⁸⁵ Further, TMDLs are scientifically supported where they set a goal for the largest receiving body of water and then work upstream to meet those goals.⁸⁶

A *goal* could singularly be what farmers need to be able to regulate their individual contributions to nutrient loading in waters. A western Iowa farmer and Environmental Protection Council Appointee, Ralph Lents, stated to a committee of Iowa legislators that “the ag community [is] . . . willing to step up and do something [about water quality], but they just need a direction of what needs to happen.”⁸⁷ Setting goals for watershed projects helps “individuals, programs, and projects establish a clear direction, identify results, and perform at a higher level than would otherwise be achieved.”⁸⁸ The majority of farmers support nutrient runoff controls,⁸⁹ despite the rhetoric from farm-advocacy groups that suggest

ACT ACTION PLAN (2009), available at <http://www2.epa.gov/sites/production/files/documents/actionplan101409.pdf>.

80. See *id.*

81. 40 C.F.R. § 130.2; See Complaint at 2, *Gulf Restoration Network v. Jackson*, No. 12-677 (D. La. Mar. 13, 2012).

82. See Lara B. Fowler, et al., *Addressing Death by a Thousand Cuts: Legal and Policy Innovations to Address Nonpoint Source Runoff*, CHOICES, 3rd Quarter 2013 28(3), at 2, available at http://www.choicemagazine.org/magazine/pdf.cmsarticle_330.pdf.

83. *Id.*

84. *Id.*

85. *Id.*

86. *Id.*

87. O. Kay Henderson, *Governor’s Appointee to EPC gets Quizzed on Water Quality*, RADIO IOWA (Mar. 20, 2015), <http://www.radioiowa.com/?s=ralph+lents>.

88. Perez & Walker, *supra* note 2, at 11.

89. J.G. Arbuckle Jr., *Farmer Support for Extending Conservation Compliance Beyond Soil Erosion: Evidence from Iowa*, 68 J. SOIL & WATER CONSERVATION, 99, 99 (2013).

that farmers are opposed to amending water quality standards.⁹⁰ Research demonstrates that involving stakeholders in the planning of watershed projects results in producer buy-in when compared with a top-down implementation regimen.⁹¹ Setting NNC will not hinder farm practices or inherently alter practices occurring on-farm, but such criteria could assist farmers in the planning and implementation of best management practices, and could provide a review process that is crucial for actual improvement in water quality.

The EPA endorses establishing NNC. In 2011, the EPA published “Recommended Elements of a State Framework for Managing Nitrogen and Phosphorus Pollution.”⁹² One of the eight elements recommends that states develop a “work plan and phased schedule for N and P criteria development for classes of waters (e.g., lakes and reservoirs, or rivers and streams).”⁹³ Currently, about half of the states have articulated NNC for at least one type of water body, or have passed legislation stating their intent to set NNC.⁹⁴ Iowa is a major contributor of nutrients to the Gulf,⁹⁵ and is one of the states that do not have a policy implementation plan in place for managing nutrient pollutions.⁹⁶ The number of states with quantitative criteria could be increasing: environmental organizations and other affected business have begun asking for restrictions on nonpoint source pollution,⁹⁷ albeit most states—including Iowa—have shirked quantification of

90. See, e.g., Letter from Craig Hill, *supra* note 64. Craig Hill states that “[t]he numeric water quality standards approach that results in labeling people, farmers, and businesses as ‘polluters’ has real financial consequences . . . These regulatory approaches have not been effective at reducing nutrient impairments, but have merely redefined the definition of pollution and labeled partners as ‘polluters.’” *Id.*

91. See Perez & Walker, *supra* note 2, at 8.

92. Memorandum from Nancy Stoner, EPA Acting Assistant Adm’r, on Recommended Elements of a State Framework for Managing Nitrogen and Phosphorus Pollution (Mar. 16, 2011), http://water.epa.gov/scitech/swguidance/standards/criteria/nutrients/upload/memo_nitrogen_framework.pdf [hereinafter Memorandum from Nancy Stoner]. These recommendations included: (1) prioritizing watersheds; (2) set watershed load reduction goals; (3) ensure effectiveness of NPDES permits in targeted watersheds; (4) target agricultural areas; (5) address storm water and septic systems; (6) establish accountability and verification measures; (7) bi-annual and annual public reporting and; (8) develop schedule for NNC development. *Id.*

93. *Id.*

94. *State Development of Numeric Criteria for Nitrogen and Phosphorus Pollution*, EPA, <http://cfpub.epa.gov/wqsits/nnc-development/> (last visited Jan. 19 2015) [hereinafter *State Development of Numeric Criteria*].

95. See Press Release, U.S. Geological Survey, Agricultural Practices in 9 States Contribute Majority of Excessive Nutrients to the Northern Gulf of Mexico, (Jan. 29, 2008), http://www.usgs.gov/newsroom/article.asp?ID=1861#.VLBDh4vF_Ys.

96. *State Development of Numeric Criteria*, *supra* note 94.

97. See Complaint, *supra*, note 30.

goals for nutrient reduction.

IV. IOWA'S NUTRIENT REDUCTION STRATEGY: NUMERIC NUTRIENT CRITERIA IS REJECTED

"When faced with two equally tough choices, most people choose the third choice: to not choose." -Jarod Kintz

In May 2013, Iowa published the statewide Nutrient Reduction Strategy. The taskforce relied on a strong relationship with Iowa State University⁹⁸ to compile analysis of policy considerations and scientific assessments of nutrient-pollutants effect on the Gulf of Mexico.⁹⁹ The document addresses the eight strategy elements recommended for consideration by the EPA to "emphasize state implementation of new and existing nutrient reduction practices and technologies for point and nonpoint nutrient sources,"¹⁰⁰ although some of these recommendations were dismissed as impractical for Iowa in the NRS.¹⁰¹ The NRS is comprised of three major sections: Policy Considerations and Strategy, Non-point Source Nutrient Reduction Science Assessment, and Point Source Nutrient Reduction Technology Assessment.

In order to address agriculture's effect on non-point source pollution, Iowa's NRS ultimately suggests "a combination of in-field and edge-of-field practices . . . to reach desired load reductions from nonpoint sources."¹⁰² These suggestions are stressed as *examples* in the NRS document, and are "not specific recommendations."¹⁰³ Two categories of practices are enumerated to support the reduction efforts: nitrogen reduction practices and phosphorus reduction practices.¹⁰⁴ The final two-thirds of the NRS details the scientific methods used to determine which agricultural practices would be most effective while considering the cost of implementing such practices.¹⁰⁵

98. Letter from Karl Brooks, Reg'l Adm'r, EPA Region Seven, to Chuck Gipp, Director, Iowa Dept. of Natural Res., & Bill Northey, Sec'y, Iowa Dept. of Agric. & Land Stewardship (Jan. 9, 2013), http://www.epa.gov/region7/water/pdf/comment_letter_iowa_nutrient_reduction_strategy.pdf.

99. See IOWA DEP'T OF AGRIC., *supra* note 7 at § 1, p. 6-18.

100. *Id.* at § 1, p. 1.

101. *Id.* at § 1, p. 8-9. For example, the report concludes that due to a lack of confidence in the EPA's conclusions and the costs of associated with nonpoint nutrient reduction technologies, NNC are not of enough value. *Id.*

102. *Id.* at § 1, p. 11.

103. *Id.* (emphasis in original).

104. *Id.*

105. *Id.* at §§ 2-3. These "best management practices" included in the report address ni-

The first draft of Iowa's NRS was submitted for comments on November 19, 2012.¹⁰⁶ Thereafter followed a two-month public comment period.¹⁰⁷ The taskforce considered all feedback, and issued the final version of the NRS on May 29, 2013.¹⁰⁸ The EPA also submitted comments to Mr. Gipp, Director of Iowa Department of Natural Resources (DNR) and Secretary Northey, Iowa Department of Agriculture and Land Stewardship (DALs) on January, 9, 2013.¹⁰⁹

The EPA has addressed shortcomings: under the "general comments" section of the letter submitted to Secretary Northey from Mr. Gipp, the EPA states that the section entitled "Numeric Nutrient Criteria Limitations does not reflect the EPA's current thinking about numeric criteria development and implementation."¹¹⁰ The EPA has been clear about the expectation for numeric nutrient standards as an integral part of a state's effort to comply with establishing and implementing water quality standards as required by federal statute.¹¹¹

Iowa's NRS utilizes a voluntary model for nonpoint source pollution supported by monetary subsidies to provide motivation for adoption with high fidelity and few complaints from farmers/landowners/land operators.¹¹² The NRS states that establishing any numeric nutrient criteria would be a "costly regulatory burden" that would not necessarily recognize the progress that could be gained through the voluntary adoption of BMP's outlined in the NRS.¹¹³

While this approach to water conservation may create more willing participants, it has insurmountable disadvantages: "it is very costly to taxpayers and . . . in the decades that this model has been in use it has rarely achieved adoption at the scales sufficient enough to significantly improve water quality."¹¹⁴ This approach also overestimates the ability of point source polluters to reduce nutrient loads. The NRS seeks to achieve 29% load reduction in phosphorus and 41% load reduction in nitrogen runoff from the state of Iowa.¹¹⁵ However, without specifically identifying where these runoff reductions must occur, this goal

trogen management, edge-of-field practices, and changes in land use.

106. *Id.* at Executive Summary, p.1.

107. *Id.*

108. *Id.*

109. Letter from Karl Brooks, *supra* note 98.

110. *Id.*

111. 33 U.S.C. § 1313(a) (2012).

112. DINNES, *supra* note 49, at 353. The voluntary model supported by monetary subsidies is contrasted with a performance-based model that requires the government or some other authoritative entity to require that the water quality standards are met, but allow the farmer/landowner the flexibility to choose and implement among a menu of conservation practices. *Id.*

113. IOWA DEP'T OF AGRIC., *supra* note 7, at § 1, p. 14.

114. DINNES, *supra* note 49, at 353.

115. IOWA DEP'T OF AGRIC., *supra* note 7, at § 1, p. 20.

may remain impossible to meet.¹¹⁶ While there can be voluntary avenues for stakeholders to achieve the stated goals, participation should not be optional.¹¹⁷

There is additional information missing from Iowa's NRS: How will progress be monitored? What is the deadline for reduction goals to be met? What will happen if the goals are not met?¹¹⁸ Progress monitoring requires setting and measuring standards (including NNC), and where those are not met, then TMDLs of pollutants are set for the impaired body of water. These policy pieces are missing from the NRS—it is good science but bad policy.¹¹⁹

V. GULF RESTORATION NETWORK V. JACKSON: LEGAL IMPLICATIONS

Even though Iowa's NRS shies away from adopting numeric nutrient criteria, these measurable standards may be eventual regulatory reality. In July of 2008, Mississippi River Collaborative groups filed a petition with the EPA requesting the agency use its authority under the CWA to establish NNC for the states in the Mississippi River Basin.¹²⁰ In July of 2011, the EPA denied the petition for rulemaking.¹²¹ In September of 2013, Judge Zainey ordered the EPA to make a "necessity determination" as to whether water quality standards should be promulgated to protect the waters of the Gulf.¹²² The district court ordered the

116. See Catherine Kling, *State Level Efforts to Regulate Agricultural Sources of Water Quality Impairment*, CHOICES, 3d Quarter 2013, at 1, available at http://www.choicesmagazine.org/magazine/pdf/cmsarticle_326.pdf

117. See Jacqueline Comito, Op-Ed., "*Voluntary*" Shouldn't Mean *Optional*, (Aug. 18, 2013), available at http://www.extension.iastate.edu/ilf/sites/www.extension.iastate.edu/files/ilf/Op-ed_1_voluntary_shouldn_t_mean_optional.pdf (last visited Jan. 19, 2015) [hereinafter Comito, "*Voluntary*" Shouldn't Mean *Optional*] (maintaining that the NRS will not be successful unless it is approached as voluntary insofar as the flexibility with strategy and not whether to participate in the strategy).

118. See Letter from Karl Brooks, *supra* note 98.

119. Matthew Wilde, *Wolf Outlines ISA's Commitment to Water Quality*, IOWA SOYBEAN ASS'N, <http://www.iasoybeans.com/Waterquality/pdf/WolfoutlinesISA%27scommitment.pdf> (last visited Jan. 19, 2015).

120. Petition to EPA for Rulemaking under the Clean Water Act, Numeric Water Quality Standards for Nitrogen and Phosphorus and TMDLs for the Mississippi River and the Gulf of Mexico (2008) at *4-5, available at [http://switchboard.nrdc.org/blogs/alexander/Ex.%201,%20%20Petition%20\(AR%207-81\).pdf](http://switchboard.nrdc.org/blogs/alexander/Ex.%201,%20%20Petition%20(AR%207-81).pdf) [hereinafter Petition to EPA]; see *EPA Lawsuit*, MISS. RIVER COLLABORATIVE, <http://www.msrivercollab.org/focus-areas/epa-lawsuit/> (last visited Jan. 19, 2015).

121. Letter from Michael H. Shapiro, Deputy Assistant Adm'r, EPA, to Kevin Reuther, Legal Dir., Minn. Ctr. for Env'tl. Advocacy, and Albert Ettinger (July 29, 2011), <http://water.epa.gov/scitech/swguidance/standards/upload/Response-to-Mississippi-River-Petition-07-29-11.pdf> [hereinafter Letter from Michael H. Shapiro].

122. *Gulf Restoration Network v. Jackson*, Civ. Act. No. 12-677, 2013 WL 5328547,

EPA to make a necessity determination for NNC despite the EPA's contention that it was "'not determining that [new standards] are not necessary to meet CWA requirements,' but rather it was 'exercising its discretion to allocate its resources in a manner that supports targeted regional and state activities . . .'"¹²³ On appeal, however, a three-judge panel reversed the district court and held that the "EPA may decline to make a necessity determination if it provides an adequate explanation, grounded in the statute, for why it has elected not to do so."¹²⁴ The case was remanded to the district court to decide whether the EPA's reason for not making a necessity determination was sufficiently grounded in the language of the CWA.¹²⁵ The district court was to apply a highly deferential standard to their review of the EPA's conclusions in this matter.¹²⁶

Prior to the decision in *Gulf Restoration Network v. Jackson*, the EPA has asserted the importance of establishing NNC for the watersheds that flow into the Gulf.¹²⁷ In a report dated August 26, 2009, the Office of the Inspector General stated that the EPA needs to accelerate the adoption of NNC, specifically noting the amount of time that has lapsed since the problem was identified in the Gulf and the lack of improvement toward any goal.¹²⁸ In a memorandum dated March 16, 2011, the agency again noted that "[i]t has long been EPA's position that numeric nutrient criteria targeted at different categories of water bodies and informed by scientific understand of the relationship between nutrient loadings and water quality impairment are ultimately necessary for effective state programs."¹²⁹ The Hypoxia Task Force is one among many water restoration organizations that recognize numeric nutrient criteria to help reduce nutrient pollution, and are fully supported and promoted by the EPA.¹³⁰

Despite the EPA's support for development of NNC, the agency denied the 2008 petition for rulemaking believing:

(E.D. La., Sept. 20, 2013), *vacated*, 783 F.2d 227 (5th Cir. 2015).

123. *Gulf Restoration Network v. McCarthy*, 783 F.3d 227, 231(5th Cir. 2015).

124. *Id.* at 242-43.

125. *Id.* at 243.

126. *Id.* at 243-44.

127. See EPA OFFICE OF INSPECTOR GEN., EVALUATION REPORT: EPA NEEDS TO ACCELERATE ADOPTION OF NUMERIC NUTRIENT WATER QUALITY STANDARDS (2009), *available at* <http://www.epa.gov/oig/reports/2009/20090826-09-P-0223.pdf>.

128. *Id.* at 3.

129. Memorandum from Nancy Stoner, *supra* note 92.

130. MISS. RIVER GULF OF MEXICO WATERSHED NUTRIENT TASK FORCE, LOOKING FORWARD: THE STRATEGY OF THE FEDERAL MEMBERS OF THE HYPOXIA TASK FORCE 10 (2013), *available at* http://water.epa.gov/type/watersheds/named/msbasin/upload/hypoxia_annual_federal_strategy_508.pdf [hereinafter LOOKING FORWARD].

the most effective and sustainable way to address widespread and pervasive nutrient pollution in the [Mississippi- Atchafalaya River Basin] and elsewhere is to build on [existing] efforts and work cooperatively with states and tribes to strengthen nutrient management programs. This . . . is preferable to undertaking an unprecedented and complex set of rulemaking to promulgate federal NNC for a large region. The development of NNC . . . would be highly resource and time intensive.¹³¹

In March of 2012, the Mississippi River Collaborative sued the EPA challenging the agency's denial of the petition on the grounds that the EPA's denial violated the Administrative Procedure Act (APA) for failure to provide a reason for the denial or, in the alternative, because the denial was contrary to the undisputed evidence provided in the Petition about numeric nutrient water quality.¹³² Even though the Court of Appeals has allowed the EPA to deny the petition to make the necessity determination, environmental groups believe this is still a "positive outcome because it has made it clear to the agency that whatever decision it makes has to be consistent with the Clean Water Act."¹³³ The EPA had cited political and administrative constraints as reasons for denying the necessity determination, and the district court may not find these reasons to be supported by the text of the CWA.¹³⁴

The EPA Administrator is required to promulgate any revised or new standard in order to meet the goals of the CWA,¹³⁵ but it is likely that the EPA will avoid using this tool at this time. Determining, promulgating, and enforcing NNC is a difficult undertaking for a national agency because the complexity of the biological and nutrient relationship varies so greatly from water-body to water-body. Even though the EPA has been allowed to avoid a necessity determination regarding NNC in the Gulf tributaries at this time, this lineage of cases does allow for the judiciary to review such agency decisions.¹³⁶ If there is no progress made in reducing nitrification, environmental groups can continue legal assaults on the agency, and the EPA is subject to judicial review.

131. Letter from Michael H. Shapiro, *supra* note 121.

132. Complaint for Declaratory and Injunctive Relief at 2-3, *Gulf Restoration Network v. Jackson*, Case 2:12-cv-00677, (E.D. La. Mar. 13, 2012), 2012 WL 950694.

133. Amana H. Saiyid, *Mixed Results on Need for Water Standard to Curb Mississippi Runoff, Gulf Dead Zones*, 83 U.S.L.WK 1501, No.39, APR. 14, 2015.

134. *Id.*

135. 33 U.S.C. § 1313(c)(4)(B) (2012).

136. *See Saiyid, supra* note 133.

A. *The EPA Has the Authority to Establish Numeric Nutrient Standards:
Florida Wildlife Federation v. Jackson*

Florida has experienced the effects of a lawsuit similar to *Gulf Restoration Network*. In 2008, Florida Wildlife Federation, joined with four other environmental groups,¹³⁷ filed a lawsuit against the EPA to require the agency to promulgate federal numeric nutrient water quality standards for Florida's water.¹³⁸ The lawsuit was filed five years after the EPA's deadline requiring states to adopt NNC, and seven years after the Florida Department of Environmental Protection (FDEP) developed a plan with the EPA to establish numeric nutrient criteria.¹³⁹ The plaintiffs relied on the CWA's statutory language, which allows a citizen suit against the Administrator to compel performance of a duty that the Act makes nondiscretionary.¹⁴⁰ The plaintiff's argued that the EPA's Clean Water Action Plan¹⁴¹ "constituted a 'determination' that Florida's narrative nutrient standard was inadequate, thus imposing on the Administrator the nondiscretionary duty to 'promptly' publish proposed new standards, and the further nondiscretionary duty to adopt new standards within ninety days after the publication."¹⁴²

However, before the issue could be resolved before the court, "the Administrator made an explicit and unequivocal determination that the Florida narrative nutrient standard was inadequate and that a revised or new standard was necessary to meet the Clean Water Act's requirements."¹⁴³ The EPA and the plaintiffs in the suit moved for a consent decree without input from the State of Florida.¹⁴⁴

The consent decree bound the EPA to promulgate numeric standards by January 2010 for Florida's lakes and flowing waters.¹⁴⁵ Built into the decree was the option for Florida to propose its own numeric standards for Administrator ap-

137. Fla. Wildlife Fed'n v. Jackson, No. 4:08cv324-RH-WCS, 2009 LEXIS 123651, at *1 (N.D. Fla. Dec 30, 2009). The plaintiffs were the Florida Wildlife Federation, Inc., Sierra Club, Inc., Conservancy of Southwest Florida, Inc., Environmental Confederation of Southwest Florida, Inc., and St. Johns Riverkeeper, Inc. *Id.*

138. *Id.* at *6-7.

139. *Id.* at *5-6.

140. 33 U.S.C. § 1313(c)(4) (requiring the Administrator to prepare and publish revised proposed regulations or new water quality standards for navigable waters where the State's standards are inconsistent with the applicable requirements of the CWA); 33 U.S.C. § 1365(a)(2) (authorization of a citizen suit against the Administrator where there is alleged a failure of the Administrator to perform any non discretionary duty).

141. See Press Release, EPA, Clean Water Action Plan (Feb. 19, 1998), <http://www2.epa.gov/aboutepa/president-clinton-announces-clean-water-action-plan>.

142. Fla. Wildlife Fed'n, 2009 LEXIS 123651, at *3.

143. *Id.* at *7. The determination was made in a letter dated January 14, 2009, signed by the Administrator's designee. *Id.*

144. See *id.* at *8.

145. See *id.*

proval, in lieu of the federal standards.¹⁴⁶ Litigation was ongoing between the EPA, FDEP, and environmental groups,¹⁴⁷ and in January of 2014, the decree was modified to require numeric criteria for lakes and springs “that mirrored the EPA’s criteria.”¹⁴⁸ Further, the FDEP standards set for downstream were using nonnumeric criteria, but these criteria include numeric components.¹⁴⁹

Although the EPA has publically declared its reluctance to set such standards in the Mississippi Basin, if “substantial water quality degradation from nutrient over-enrichment remains a significant challenge in the State and one that is likely to worsen,”¹⁵⁰ the EPA *must* set nutrient criteria.¹⁵¹ Florida had invested “\$20 million in collecting and analyzing data . . . and . . . has implemented some of the most progressive nutrient management strategies in the Nation;”¹⁵² yet, these facts did not abate the necessity of new standards and involvement of the EPA. The FDEP opposed the Agency’s role in developing numeric standards, but when the dust settled, the state of Florida had *quantifiable* nutrient criteria for the majority of its streams, estuaries, and coastal waters.¹⁵³

*B. The EPA Should Consider the Water Quality Standards Downstream:
Arkansas v. Oklahoma*

The Supreme Court has considered how far the EPA’s reach can extend across state lines in *Arkansas v. Oklahoma*.¹⁵⁴ In this case, a Fayetteville, Arkansas sewage treatment plant had obtained a NPDES permit from the EPA to emit effluent into streams that eventually discharge into the Illinois River, twenty-two miles upstream from the Arkansas-Oklahoma border.¹⁵⁵ The EPA included a pro-

146. *Id.* at *9.

147. See *Florida NNC Background: EPA and FDEP Agreement to Protect Statewide Waters from Nutrient Pollution*, EPA, <http://www2.epa.gov/aboutepa/florida-nnc-background> (last updated Feb. 23, 2015) (stating the FDEP has adopted and EPA has approved NNC for over 185,000 lakes, all springs, and several major estuaries and coastal waters).

148. See Order Modifying Consent Decree at 11, *Fla. Wildlife Fed’n v. McCarthy*, 4:08cv324-RH/CAS (N.D. Fla. Jan. 7, 2014), 2014 WL 51360, at *4 [hereinafter Order Modifying Consent Decree].

149. See *id.*

150. Letter from Benjamin H. Grumbles, Assistant Adm’r, EPA, to Michael Sole, Sec’y, Fla. Dep’t of Env’tl. Prot. (Jan. 14, 2009), http://water.epa.gov/lawsregs/lawguidance/cwa/upload/2009_01_16_standards_rules_fl-determination20090114.pdf [hereinafter Letter from Benjamin H. Grumbles].

151. 33 U.S.C. § 1313(c)(4)(B) (2012).

152. Letter from Benjamin H. Grumbles, *supra* note 150.

153. See Order Modifying Consent Decree, *supra* note 148.

154. See *Ark. v. Okla.*, 503 U.S. 91 (1992) (Court heard arguments regarding transboundary pollution issues.).

155. *Id.* at 95.

vision in the permit allowed for a change in the permit should field studies indicate that the permit affected water quality standards in Oklahoma.¹⁵⁶

Indeed, this discharge affected the water quality of the Illinois River on the Oklahoma side, where the standards provided that “no degradation [of water quality] shall be allowed” in the upper Illinois River.¹⁵⁷ Oklahoma filed a complaint, challenging the permit.¹⁵⁸ The Administrative Law Judge that first heard the case affirmed the permit, finding that the discharge would not have an “undue impact” on Oklahoma’s waters, and the effect must be more than the *de minimis* impact in this case.¹⁵⁹ Both parties sought judicial review.¹⁶⁰ The Supreme Court ultimately held that because the permit was issued at the federal level, the EPA’s regulation requiring upstream states to abide by downstream standards was reasonable and a permissible exercise of statutory authority.¹⁶¹

The implications from *Arkansas* could put undue pressures on point source polluters: nonpoint polluters do not need to apply for NPDES permits under the law.¹⁶² EPA’s regulations provide that a NPDES permit shall not be issued “when the imposition of conditions cannot ensure compliance with the applicable water quality requirements of all affected States,”¹⁶³ and this provision applies despite whether the permit is issued by the EPA or the state.¹⁶⁴ In states where there are inadequate nutrient criteria, and consequently where the TMDLs do not reflect nonpoint source pollution, polluters petitioning for NPDES permits can be excessively restricted where downstream states have set higher water quality standards.¹⁶⁵ Governor Branstad of Iowa has discussed the high costs of NNC for farmers, but there is also a burden placed on point source polluters where agriculture’s effects on water-quality continue to go unquantified.¹⁶⁶ If the Gulf States set and seek to enforce water quality standards, those entities applying for and maintaining NPDES permits will unfairly bear the burden of nutrient reduc-

156. *Id.*

157. *Id.* at 95, n.2. Oklahoma designated this portion of the Illinois River as “scenic,” which implicates the state’s “anti-degradation” standard. *Id.*

158. *Id.* at 95.

159. *Id.* at 96.

160. *Id.* at 97.

161. *Id.* at 105-06. Certiorari was granted by the Supreme Court to address the Court of Appeals holding that the CWA itself required compliance by Arkansas of Oklahoma’s water quality standards. *Id.* The Supreme Court found it unnecessary to decide whether the CWA did require that discharge from one state comply with water quality standards of another, but held that the statute does not limit the EPA’s authority. *Id.*

162. *See* 33 U.S.C. § 1342(f) (2012).

163. 40 C.F.R. § 122.44(d) (2015).

164. *See id.* § 123.25.

165. *Id.* § 122.44(d).

166. *See* Letter from Terry Branstad, *supra* note 46.

tion.¹⁶⁷ In agriculturally dominated watersheds, “point sources contribute a relatively small percent of the overall nutrient load”—ten percent or less—and yet they are most heavily regulated.¹⁶⁸

C. American Farm Bureau Federation v. EPA: Chesapeake Bay Program Provides a Model for the Midwest

The Dead Zone plaguing the Gulf of Mexico is not an anomaly; the same questions about enforcement, efficacy, and the CWA have been debated in the Chesapeake Watershed for three decades.¹⁶⁹ Chesapeake Bay provides a model for the Gulf and a legal framework for understanding what interest groups, states, and farmers can expect in the near future—“a glimpse of what is to come.”¹⁷⁰ The history of the Chesapeake Bay and efforts to improve the water quality is replete with federally determined water quality standards, cooperative federalism, agreements amongst key groups, and enforcement.¹⁷¹

In *American Farm Bureau Federation v. EPA*, the plaintiffs¹⁷² claimed that the EPA acted unlawfully in setting and promulgating TMDLs because they impeded on the states’ rights to implement a TMDL.¹⁷³ The court held the EPA’s efforts to be lawful: upstream regulations of the watershed, EPA’s overriding of state decision with “backstop” adjustments, and sector and individual source allocations were among the regulations validated.¹⁷⁴

Included in the decision was a detailed outline of the coordinated and cooperative efforts between the EPA and the Chesapeake Bay Program (CBP).¹⁷⁵ The CBP¹⁷⁶ entered into an agreement in 2000 with the EPA and other Chesa-

167. See Kling, *supra* note 116, at 3.

168. *Id.* at 1-2.

169. *Am. Farm Bureau Fed’n v. EPA*, 984 F.Supp.2d 289, 299 (M.D. Pa. 2013).

170. Fowler, *supra* note 82.

171. See *Am. Farm Bureau Fed’n*, 984 F. Supp. 2d at 299-303.

172. *Id.* at 294. American Farm Bureau Federation and the Pennsylvania Farm Bureau brought the original complaint. *Id.* They were joined later by a large delegation of agricultural heavy-hitters, including: the National Pork Producers Council, the National Corn Growers Association, the National Chicken Council, the U.S. Poultry and Egg Association, and the National Turkey Federation. *Id.*

173. *Id.* at 294-95.

174. *Id.* at 314, 322, 330, 344.

175. *Id.* at 299-303. Congress established the CBP when it amended Section 117 of the CWA; the CBP was directed to, among other things, coordinate state and federal efforts to improve water quality. 33 U.S.C. § 1267 (2012).

176. *Frequently Asked Questions about the Bay TMDL*, EPA, <http://www.epa.gov/reg3wapd/tmdl/ChesapeakeBay/FrequentlyAskedQuestions.html> (last visited Jan. 19, 2015). The states involved include Delaware, the District of Columbia, Maryland, New York, Pennsylvania, Virginia, and West Virginia. *Id.*

peake partners.¹⁷⁷ This agreement set one goal: “correct[ing] nutrient and sediment related problems in the Chesapeake Bay and its tidal tributaries sufficiently to remove [those waters] from the list of impaired waters by 2010.”¹⁷⁸ A Memorandum of Understanding was later signed whereby the parties collectively agreed to work together to cooperatively achieve nutrient and sediment targets with the goal of removing the Bay and its tidal tributaries from the 303 (d) list.¹⁷⁹ Thereafter in 2003, the seven Bay jurisdictions established cap loads for nitrogen, phosphorus, and sediment.¹⁸⁰

The Bay jurisdictions reevaluated their nutrient and sediment cap loads in 2007 as part of the agreement.¹⁸¹ The reevaluation revealed that there had been insufficient progress made toward improving water quality to a level that indicated the Bay and its tidal tributaries were no longer impaired by the nutrients.¹⁸² It was at a meeting on October 1, 2007, where the Bay jurisdictions and the EPA agreed that the EPA would establish a Bay TMDL with a target date of 2025 for all necessary pollution control measures to be in place.¹⁸³

After the EPA put forth nutrient target loads for the major river basins within Bay Watershed, states were left to determine their own Water Improvement Plans (WIPS).¹⁸⁴ Phase I directed the states to determine how the control measures will be implemented to achieve target loads.¹⁸⁵ Phase II requested that the states further divide nonpoint source load allocations and any aggregate point source wasteload allocations among smaller geographic areas.¹⁸⁶ Phase III asks for finalized WIPs to ensure achieved water quality standards by 2025.¹⁸⁷

177. *Am. Farm Bureau Fed’n*, 984 F. Supp. 2d at 299.

178. CHESAPEAKE BAY PROGRAM, CHESAPEAKE 2000 6 (2000), available at http://www.chesapeakebay.net/documents/cbp_12081.pdf.

179. *Am. Farm Bureau Fed’n*, 984 F. Supp. 2d at 301.

180. *Id.* The court opinion discussed Pennsylvania’s Chesapeake Bay Tributary Strategy as an example of the planned efforts. *Id.* To specifically address NPS pollution from agriculturally related activities, Pennsylvania’s plan was to enact extensive new farm management regulations through the ACRE initiative (preserving Agriculture, Communities, and Rural Environments), expanded the Conservation Reserve Enhancement Program (CREP), increased forested buffers and wetlands, and secured conservation easements for riparian buffers. *Id.* The total estimated cost for the plan was \$703,318,063. *Id.*

181. *Id.* at 302.

182. *Id.*

183. *Id.*

184. Letter from William C. Early, Acting Reg’l Admin., EPA, to the Honorable L. Preston Bryant, Jr., Va. Sec’y of Natural Res., at 2 (Nov. 4, 2009), http://www.epa.gov/reg3wapd/pdf/pdf_chesbay/tmdl_implementation_letter_110409.pdf.

185. *Id.* at 4.

186. *Id.*

187. *Id.*

American Farm Bureau Federation (AFBF) has appealed the case, contesting that the CWA limits the EPA's authority to establishment of TMDL—that the EPA has overreached with respect to the Chesapeake Bay restoration efforts.¹⁸⁸ AFBF argues that states have illegally been stripped of their authority to determine *how* to meet the TMDL.¹⁸⁹ The outcome of the district court ruling reinforces the EPA's authority to coordinate efforts of nutrient allocation between point sources and nonpoint sources.¹⁹⁰ As evidenced by the *amici curiae* brief from an alliance of Midwestern states' attorney generals within the Mississippi watershed, jurisdictions in the Gulf watershed realize they too could be required to regulate NPS pollution from agriculture as a party to broader efforts to restore the Gulf of Mexico.¹⁹¹

Efforts to decrease the Hypoxia Zone parallel the Chesapeake Bay Preservation Efforts, but organized Bay efforts began nearly a decade before organized Gulf efforts.¹⁹² This is significant because the progress made by the interested parties may act as a weather vane for efforts of the various groups involved with the water restoration efforts in the Gulf. The similarities between Chesapeake Bay restoration efforts and the Gulf of Mexico task force are too similar to ignore.¹⁹³ The Hypoxia Task Force (HTF) is similar to the CBP, in that they are both multi-jurisdictional and represented by authorized decision-makers in their

188. Brief for the States of Kansas, Indiana, et al. as Amici Curiae in Support of Reversal at 2, *Am. Farm Bureau Fed'n v. EPA*, No. 13-4079, (M.D.Pa Feb. 3. 2014), 2014 WL 505475, at *2 [hereinafter Brief for the States].

189. *Id.* at 7.

190. See *Am. Farm Bureau Fed'n*, 984 F. Supp. 2d at 289.

191. See Brief for the States, *supra* note 188.

192. *Am. Farm Bureau Fed'n*, 984 F. Supp. 2d at 299-303. Chesapeake Bay Program preservation efforts began in 1982 after a five-year study found excess nutrient phosphorus and nitrogen in the Bay. See *Task Force History and Reassessment*, MISS. RIVER GULF OF MEX. WATERSHED NUTRIENT TASK FORCE, <http://water.epa.gov/type/watersheds/named/msbasin/history.cfm>. In 1987, the regional partners entered into a multi-jurisdictional agreement to reduce nutrients in the Bay. *Id.* This agreement was amended again in 1992, 1997, 2000, and 2007. *Id.* The EPA was involved throughout the process. *Id.* Compare with efforts made by the Mississippi River Gulf of Mexico Nutrient Task Force, which commenced in 1997 with the emission of understanding and reducing the Hypoxia Zone. *Id.* The Hypoxia Task Force is multi-jurisdictional, where the states in the watershed have agreed to action plans in 2001, amendment in 2008, and assessed in 2013. *Id.*

193. See, e.g., Brief for the States, *supra* note 188, at 19-20. Amicus brief from an alliance of state attorney generals voicing their concerns that the District Court's approval of the "Chesapeake Bay TMDL also opens the door for EPA to dictate land-use management decisions across the country," with the fear being that the EPA could "control—and potentially debilitate—[agricultural], all under the auspices of setting 'the total maximum daily load' for pollutants entering the Mississippi River." *Id.*

respective states.¹⁹⁴ Further, the HTF has required participating states to create a plan to reduce nutrient levels in the Gulf of Mexico.¹⁹⁵ Both the HTF and the CBP had slow starts: both programs failed to achieve significant gains in their preliminary efforts toward water restoration goals.¹⁹⁶ The CBP agreed to allow the EPA to set the TMDLs (and corresponding load allocations) in order to meet the water quality standards in the Bay, whereas the HTF has not yet requested the federal agency to establish levels on behalf of the Gulf jurisdiction.¹⁹⁷

D. Application of Legal Precedent to the Mississippi/Afalaycha River Basin

Based on the legal actions in the Chesapeake Bay Watershed region and Florida, Iowa and other states in the Mississippi watershed may expect several major shifts in regulation and enforcement of the CWA in the next decade. The states in the Mississippi watershed can expect multi-state agreements to be binding.¹⁹⁸ Also, there will be continued and even increased interaction between these interest groups, states, and the federal government in determining, setting, and monitoring state water quality standards.¹⁹⁹

The decisions in both Florida and the Chesapeake Bay foreshadow the events transpiring in the Mississippi watershed: the increasingly authoritative role of the EPA and society's growing concerns over nitrification in coastal bodies of water. Presently, Iowa and other Midwestern states in the Mississippi watershed, find themselves at a crossroads. Politicians and farmer advocates argue that numeric nutrient standards would be costly to establish and enforce.²⁰⁰ Farmer's opinions are influential: in the Upper Mississippi River basin, farmers

194. See CHESAPEAKE BAY PROGRAM, *supra* note 2; *Hypoxia Task Force Members*, EPA, <http://water.epa.gov/type/watersheds/named/msbasin/members.cfm> (last updated Sept. 25, 2015).

195. HYPOXIA TASK FORCE, MOVING FORWARD ON GULF HYPOXIA ANNUAL REPORT 2011 3 (2011), *available at* http://water.epa.gov/type/watersheds/named/msbasin/upload/Hypoxia_Task_Force_Annual_Report_2011.pdf.

196. See *Am. Farm Bureau Fed'n*, 984 F. Supp. 2d at 300; HYPOXIA TASK FORCE, *supra* note 195, at 6.

197. HYPOXIA TASK FORCE, *supra* note 195, at 10.

198. See *Am. Farm Bureau Fed'n*, 984 F. Supp. 2d at 301 (Judge Rambo went into great detail regarding the multi-jurisdictional approach and agreements made along the way to support the conclusion that the EPA worked cooperatively with the states to develop the TMDLs for the Bay States).

199. See, e.g., HYPOXIA TASK FORCE, *supra* note 195.

200. See Brief for the States, *supra* note 188, at 27 (amicus brief filed by allegiance of state attorneys general arguing that to impose TMDLs in tributaries costs tens of billions of dollars); see also IOWA DEP'T OF AGRIC., *supra* note 8, at 7-9 (noting the complexities associated with establishing and enforcing nutrient criteria where NPS cause the most pollution).

produce “half the nation’s corn, 41 percent of the nation’s soybean exports, and one-third of all the nation’s hog[s] and pig[s].”²⁰¹ Environmental groups maintain that numeric standards are the best possible means for achieving water quality standards, despite the costs of development and implementation.²⁰² There are also costs to the residents and economy of the Gulf if nitrification isn’t managed well enough to minimize and eliminate the Dead Zone.²⁰³ The question becomes how to find middle ground where water quality standards are progressively met while considering and addressing farmer’s economic concerns associated with water restoration. One concern looming over the debate of numeric nutrient standards is if numeric standards are required, *who* will set them? Policy-makers, NPDES permit holders, and farmers in these Midwestern states must realize the ramifications if they jettison the responsibility to establish NNC: that the standards may be set for them.²⁰⁴

VI. IMPLEMENTATION OF NUMERIC NUTRIENT CRITERIA (NNC) AT THE STATE LEVEL

Whether by choice or by mandate, Iowa’s future water restoration efforts may include NNC.²⁰⁵ While the policy debate is still centered on whether NNC

201. Terry J. Satterlee et al., *Nutrients in the Heartland: Regulatory & Legal Issues Surrounding the Mighty Mississippi*, 27 NAT. RESOURCES & ENV’T, no. 4, 2013, at 1, available at http://www.americanbar.org/publications/natural_resources_environment/2012_13/spring_2013/nutrients_in_the_heartland_regulatory_and_legal_issues_surrounding_the_mighty_mississippi.html.

202. See *Gulf Restoration Network v. Jackson*, Civ. Act. No. 12-677, 2013 WL 5328547, (E.D. La., Sept. 20, 2013), *vacated*, 783 F.2d 227 (5th Cir. 2015), at *2.

203. NAT’L OCEANIC & ATMOSPHERIC ADMIN., GULF OF MEXICO REGIONAL SUMMARY 115-17 (2012), available at <http://www.st.nmfs.noaa.gov/Assets/economics/documents/feus/2011/FEUS2011%20-%20Gulf%20of%20Mexico.pdf> [hereinafter GULF OF MEXICO REGIONAL SUMMARY]. Consider that in 2011, commercial fishermen in the Gulf of Mexico Region landed 1.8 billion pounds of finfish and shellfish, earning \$818 million in landings revenue. *Id.* An average of twenty-three million recreational fishing trips are taken annually to the Gulf of Mexico, which creates jobs and accounts for durable equipment expenditures, totaling recreational spending around 9.8 billion in 2011. *Id.* This economy depends on the health of the waters of the Gulf of Mexico, and while the costs may be higher to the farmer in Iowa to assist in reduction of nitrification, the costs of doing nothing will be felt much more in the Gulf. *Id.*; See also ROBERT J. DIAZ & ANDREW SOLOW, NAT’L CTR. FOR COASTAL OCEAN SCIENCE, ECOLOGICAL AND ECONOMIC CONSEQUENCES OF HYPOXIA 3-4 (1999).

204. See Comito, “*Voluntary*” *Shouldn’t Mean Optional*, *supra* note 117 (“If the NRS fails to achieve its stated nutrient load reduction goals, it is likely that regulations will replace the voluntary methods currently available.”).

205. 33 U.S.C. § 1313(e) (2012); see also *Am. Farm Bureau Fed’n v. EPA*, 984 F.Supp.2d 289, 299 (M.D. Pa. 2013)(stating that the EPA does not have authority to dictate

should be instated or not, perhaps the more apropos conversation should be how Iowa, or other Gulf basin states, could implement NNC. Both policy and science are implicated by NNC. The science behind establishing NNC is complicated²⁰⁶ and will require an investment²⁰⁷ by stakeholders and citizens alike. The policy concerns would include funding for farmers and other point or nonpoint source polluters, implementation, and compliance. What effects would such measures have on farm work in the field? How would compliance and fidelity be monitored?

If NNC were adopted, one aspect of implementation may require farmers to develop and follow best-practice management plans that incorporate the scientifically backed farming methods—like those laid out in the Nutrient Reduction Strategy.²⁰⁸ A few states have begun to implement various programs to address water quality. In Minnesota, farmers are required to use a fifty-foot vegetative buffer between their crops and nearby streams.²⁰⁹ In Wisconsin, farmers develop and follow nutrient management plans that incorporate tolerable soil losses on cropped fields, use of the phosphorus index to calculate nutrient application, and restrictions on timing and location of nutrient applications.²¹⁰ In Florida's Everglades Agricultural Area, farmers must first obtain permits that indicate compliance with conservation practices before growing row crops.²¹¹ Florida's approach is noteworthy for two reasons: farmers can tailor their permit by choosing from a variety of conservation practices, and progress is monitored by the Water Management Districts.²¹² Florida's rigorous monitoring system provides timely feedback as to the policy's effectiveness, and this has allowed farmers the gratification of knowing their efforts have worked.²¹³

what measures a state must take to mitigate pollution from any particular nonpoint source).

206. See Sengco, *supra* note 70 (noting that in order to establish a NNC, there must be sufficient data to establish both a causal parameter (like nitrogen and phosphorus) and a response parameter (endpoint assessment) and because bodies of water can respond differently, there is a large amount of data to be gathered and analyzed).

207. Letter from Terry Branstad, *supra* note 46 (Iowa's governor, Terry Branstad, has estimated the cost of implementing regulations in Iowa "range from \$900 million to 2.4 billion annualized . . . with required initial investments of \$1 to \$4.7 billion" to Iowa's corn and soybean farmers.).

208. See IOWA DEP'T OF AGRIC., *supra* note 7, at §§ 2, 3.

209. MINN R. 6120.3300(7)(B) (2015).

210. WIS. ADMIN. CODE N.R. §§ 151.01-.09 (2013).

211. See FLA. STAT. § 373.4592 (2014).

212. See *id.*; see, e.g., S. FLA. WATER MGMT. DIST., RESTORATION STRATEGIES SCIENCE PLAN (2013), available at http://www.sfwmd.gov/portal/page/portal/xrepository/sfwmd_repository_pdf/rs_waterquality_plan_042712_final.pdf.

213. See Kling, *supra* note 116, at 3.

Where science establishes the quantified NNC in a water quality standard for a given body of water, farmers within any given watershed in the Gulf basin could then implement from a suite of BMP to assist in meeting these goals.²¹⁴ Farms could develop plans, similar to those in Wisconsin, so that each individual farm has a goal tied to a BMP.²¹⁵ These plans could be developed with the assistance of county extension offices and the vast network of Conservation Districts across the state.²¹⁶

The Soil and Water Conservation Districts could offer a way to regulate and enforce nutrient management plans throughout the state. Soil and Water Conservation Districts (SWCD) are creatures of statute.²¹⁷ There are 100 districts across the state of Iowa, organized conterminously with the counties across the state.²¹⁸ Iowa has a consortium of 500 elected commissioners through the Conservation Districts of Iowa (CDI).²¹⁹ The CDI's mission is to "inform, educate, and lead Iowans through our local soil and water conservation districts to promote conservation of natural resources."²²⁰ The CDI engages in on-the-ground conservation and conservation practice promoting, including working on increasing the amount of crop cover on Iowa farmland.²²¹

The CDI already has a system in place that could support the type of efforts necessary in supporting implementation and enforcement of NPS management. In order to design the most successful and comprehensive conservation management plans for water restoration, implementation plans must, among others:

- 1) Delineate Iowa's varied agroecoregions;
- 2) Identify the critical source areas and associated characteristics that pose high risks for nitrogen and phosphorus loss . . .
- 6) List suites of conservation practices designed to meet water quality standards and maintain the integrity of field-edge remedial practices during peak events;
- 7) Apply policies, education and programs that address social and economic

214. *Id.*

215. See WIS. ADMIN. CODE N.R. §§ 151.01-.09 (2013).

216. See Larry C. Frarey et al., *Conservation Districts as the Foundation for Watershed-Based Programs to Prevent and Abate Polluted Agricultural Runoff*, 18 HAMLIN L.R. 151, 152, 173-74 (1994).

217. See Soil Conservation and Domestic Allotment Act of 1936, Pub. L. No. 74-461, 49 Stat. 1148, 1148 (1936); Iowa Code § 161A.5 (2015).

218. See *About CDI*, CONSERVATION DIST. OF IOWA, <http://cdiowa.org/conservation-districts-of-iowa/aboutcdi> (last visited Jan. 19, 2015) [hereinafter *About CDI*].

219. *Id.*

220. *Id.*

221. See *Programs*, CONSERVATION DIST. OF IOWA, <http://cdiowa.org/conservation-districts-of-iowa/programs> (last visited Jan. 19, 2015).

concerns for the adoption and implementation of conservation practices; . . .
9) Monitor water quality to document the performance of the implemented conservation practices, determine if water quality goals are being met and guide further actions if necessary.²²²

This list of considerations is a part of the general mission of the CDI. The organization is divided into regions, and promoting a series of practices that work for soil and water conservation within each district overcomes the critics of NNS that argue that to set such standards would be implementation of a “one-size-fits-all” policy.²²³

The primary mission of the CDI is to promote and increase knowledge surrounding best management practices in agriculture.²²⁴ SWCD generally have accomplished this goal through the “project powers” granted to the districts through the Standard State Soil Conservation Districts Law.²²⁵ At the inception of the conservation districts during the New Deal, however, it was conceived that the districts would also have enforcement authority.²²⁶ Some states adopted such regulatory authority, but very few districts have acted under the authorization.²²⁷ In fact, recommendations that the SWCDs utilize their enforcement authority in order to promote the goals of the CWA have gone unheeded for decades.²²⁸

The power to enforce is crucial to ensure compliance. For example, in the late 1990’s, fish kills in the Delmarva Peninsula were associated with a toxin from chicken manure, and as a result, Maryland, Delaware, and Virginia enacted mandatory nutrient management plans.²²⁹ The three states implemented different

222. DINNES, *supra* note 49, at 5.

223. See *About CDI*, *supra* note 218; see, e.g., Brittany Borghi, *Farmers Can Better Prevent Nutrient Runoff Based on Land Characteristics*, IOWA NOW (Feb. 17, 2015, 11:44 AM), <http://now.uiowa.edu/2015/02/farmers-can-better-prevent-nutrient-runoff-based-land-characteristics> (expressing concerns by some of a “one-size-fits-all” approach to regulations). See generally IOWA NUTRIENT REDUCTION STRATEGY, IOWA STATE UNIV., PUBLIC COMMENTS—NOV. 2012–JAN. 2013, available at <http://www.nutrientstrategy.iastate.edu/sites/default/files/documents/all.pdf>.

224. See IOWA DEP’T OF AGRIC. & LAND STEWARDSHIP, BECOME A SOIL & WATER CONSERVATION DISTRICT COMMISSIONER (2012), available at <http://www.iowaagriculture.gov/soil/SWCDCommissionerBrochure3.pdf>.

225. See Jess Phelps, Note, *A Vision of the New Deal Unfulfilled? Soil and Water Conservation Districts and Land Use Regulation*, 11 DRAKE J. AGRIC L. 353, 361 (2006).

226. See *id.* at 363.

227. Mary M. Garner, *Regulatory Programs for Nonpoint Pollution Control: The Role of Conservation Districts*, J. SOIL & WATER CONSERVATION 199, 202 (Sept.-Oct. 1977).

228. *Id.*

229. See Michelle Perez, *Regulating Farmers: Lessons Learned from the Delmarva Peninsula*, CHOICES, 3d Quarter 2011, available at <http://www.choicesmagazine.org/choices-magazine/theme-articles/innovating-policy-for-chesapeake-bay-restoration/regulating->

policies: Maryland required farmers to have a state-certified nutrient management plan within three years; Virginia enacted a “go slow” approach that only regulated a small sector of farmers and required little change in their activities; and Delaware took a comprehensive regulatory approach that was overseen by a commission comprised mainly of farmers.²³⁰ Social science researches found at first Delaware farmers complied at a substantial percentage while Maryland farmers were “digging in their heels.”²³¹ However, over the span of the next five years, Maryland’s stricter approach achieved higher levels of compliance.²³² Maryland sent warning letters and levied small fines to farmers who had not developed the nutrient management plan, and was able to obtain near-full compliance.²³³ Researchers ultimately recommend that in order to achieve the goals outlined for the Delmarva Peninsula, the participating states should “consider more frequent and effective farm inspections and significant fines to make non-compliance more costly than compliance.”²³⁴

Compliance with an individual’s nutrient management plans could be overseen by the CDIs: in preparation, planning, and enforcement. This model has worked before: in the late 1980’s, concentrated dairy farms in Texas severely threatened the water quality in particular watersheds.²³⁵ The Texas legislature implemented a “planned intervention” utilizing the Texas Soil and Water Conservation Commissions (TSWCC), the Texas Natural Resource Conservation Commission, and legislation which required the conservation districts to establish a “water quality management plan certification program” and to investigate any complaints related to agricultural nonpoint pollution.²³⁶ If there were a valid concern, then the TSWCC would reactively assist in developing a corrective action plan, and where there was no corrective action taken, the TSWCC would refer the offender to the Resource Conservation Commission, an organization that could, and did, levy fines when necessary.²³⁷

Examples in other states demonstrate that the enforcement authority of

farmers-lessons-learned-from-the-delmarva-peninsula.

230. *Id.* at 2.

231. *Id.* at 3.

232. *Id.*

233. *Id.*

234. *Id.*

235. *See* Frarey et al., *supra* note 216, at 162.

236. *Id.* at 162-64.

237. *See id.* at 163-65. The Texas Natural Resource Conversation Commission levied over \$490,000 in fines before the amended “planned intervention” took place, which “engendered bitterness and charges of inconsistent enforcement from the regulated community.” *Id.* The “planned intervention” legislation sought to add the conservation districts as an intermediary step to help garner higher compliance and better relationships between farmers and the regulating agency. *Id.*

conservation districts can be determinative. In Iowa, the CDIs have played a vital role in the past. There is a duty imported to land owners of real property where they are expected to “conserve the fertility, general usefulness, and value of the soil and soil resources of the state.”²³⁸ Iowa’s legislature has granted the CDIs the power to “conduct surveys, investigations, and research relating to the character of soil erosion and erosion, floodwater, and sediment damages, and the preventive and control measures needed.”²³⁹ The CDI has the authority to investigate practices used at an individual farm, and to be a party to litigation.²⁴⁰ This authority—the ability to enforce aspects of land use regulations—has the CDI poised to be an integral leader in water quality restoration.

The supportive organization structures are in place. Science studies are in and have reported the suite of effective nutrient reduction strategies. The SWCDs have access to farmers. Any policy step taken to fortify goals within these structures would be a step in good faith.

VII. CONCLUSION

Restoring the nation’s biological, physical, and chemical integrity is a tall order requiring coordinated efforts among policy-makers, and a willingness to financially support best management practices. A question has been posed to the people of Iowa: “Do we have the courage and determination to work together as a functional society to confront and correct the causes of NPS pollution within our state?”²⁴¹ Who will ultimately determine the water quality standards for our state? Will Iowa’s leadership take the initiative to establish numeric nutrient standards, or will environmental groups seek to do so through judicial intervention? Will Iowa utilize the vast network of farmer-support unifying the State, or will this network enable individuals to side-step accountability? The information is clear: our inability to keep nutrients on the farm is significantly damaging coastal waters, interior streams, and lakes. Iowa’s NRS offers practices, which will reduce nutrient loads if implemented with wide distribution and with fidelity.²⁴² The research exists to support agricultural communities in adoptions of the best management practices offered by the NRS.²⁴³ However, the missing policy

238. IOWA CODE § 161A.43 (2015).

239. IOWA CODE § 161A.7(1)(a).

240. See *Woodbury County Soil Conservation Dist. v. Ortner*, 279 N.W.2d 276 (Iowa 1979) (holding that the statute governing the rules and regulations under which the soil conservation districts operate is reasonably related to carrying out the announced legislative purpose of soil control, and a proper exercise of police power, even though it may impose an extra financial burden on some parties).

241. DINNES, *supra* note 49, at 7.

242. See IOWA DEP’T OF AGRIC., *supra* note 7, at §§ 2.1-2.3.

243. See AM. FARMLAND TRUST, *supra* note 51 (discussing the six stages that producers

piece must also be put into place to achieve clean waters. Setting goals through NNC and farm-management plans would be a good-faith first step.

commonly go through when adopting a practice).