THE HEALTHY WATERSHED FRAMEWORK: A BLUEPRINT FOR RESTORING NUTRIENT-IMPAIRED WATERBODIES THROUGH INTEGRATED CLEAN WATER ACT AND FARM BILL CONSERVATION PLANNING AND IMPLEMENTATION AT THE SUBWATERSHED LEVEL

BY

JAMIE KONOPACKY* & LAURIE RISTINO**

Current approaches to Clean Water Act and farm bill conservation programming are not effectively addressing agricultural runoff in the United States. Waters in the United States are reeling from the effects of nutrient pollution. Clean Water Act and farm bill policies can be revised and integrated to support a small-scale watershed planning and implementation approach that will more effectively restore nutrient-impaired waterbodies. This Article provides an overview of relevant foundational planning principles and complex problem-solving theories and provides concrete Clean Water Act and farm bill policy recommendations, which are rooted in on-the-ground state and local level policy and project experience.

* Jamie Konopacky is an attorney and Fellow in Watershed Policy for Harvard Law School's Environmental Policy Initiative.

** Laurie Ristino is an Associate Professor of Law and the inaugural director of the Center for Agriculture and Food Systems at Vermont Law School.

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"Out beyond ideas of wrongdoing and right-doing there is a field. I'll meet you there."[1]

"[W]e should worry less about whether programs are 'regulatory' or 'voluntary' and more about whether the programs are environmentally sound, fair, and cost-effective."[2]

I. INTRODUCTION

Despite decades of implementation of the Clean Water Act[3] (CWA) and Farm Bill Conservation Title programs,[4] including tremendous investment of

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1 MAULANA JALAL AL-DIN RUMI, THE ESSENTIAL RUMI 36 (Coleman Barks et al. trans., Harper Collins ed. 1995).

2 Douglas R. Williams, *When Voluntary, Incentive-Based Controls Fail: Structuring a Regulatory Response to Agricultural Nonpoint Source Water Pollution*, 9 WASH. U. J.L. & POL'Y 21, 29 (2002).

3 Federal Water Pollution Control Act Amendments of 1972, Pub. L. No. 92-500, 86 Stat. 816 (codified as amended at 33 U.S.C. §§ 1251–1387 (2012)).

4 Agricultural Act of 2014, Pub. L. No. 113-79, 128 Stat. 649 (codified as amended in scattered sections of 7 and 16 U.S.C.).

public resources,[5] we still do not have clean water in the United States. In fact, our waters are reeling from the effects of phosphorus and nitrogen nutrient pollution.[6] Hypoxia in estuaries has significantly increased, and over half of the estuaries in the United States are hypoxic in any given year.[7] Two prime examples are the iconic Chesapeake Bay, with a dead zone that scientists predict will be the size of 3.2 million Olympic-size swimming pools in 2017,[8] and the Gulf of Mexico, with a dead zone measured to be the size of New Jersey—8,776 square miles—this past summer.[9] Moreover, in 2013, the United States Environmental Protection Agency (EPA) estimated that in the nation's total stream length, high concentrations of nitrogen and phosphorus are present in 28% and 40% of streams, respectively.[10] Although there are three main contributors to nutrient water pollution—wastewater treatment plants (POTWs), urban stormwater (MS4s), and agricultural runoff[11]—agricultural runoff has been cited as both the leading source and the greatest challenge.[12]

Our lack of progress in restoring nutrient-impaired waterbodies is not surprising. Relevant CWA planning and farm bill conservation programs have lacked sufficient funding[13] and implementation, and have focused on

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5 The farm bill is our single biggest investment in private, working lands conservation through the Farm Bill Conservation Title (Title II). *Farmers and Fresh Water: Voluntary Conservation to Protect our Land and Waters: Hearing Before S. Comm. on Agric., Nutrition & Forestry*, 113th Cong. (2014) (statement of Chairwoman Debbie Stabenow). Approximately every four years, a new farm bill is authorized and provides billions of dollars of cost-share funding to producers to implement conservation practices or take land out of production. MEGAN STUBBS, CONG. RESEARCH SERV., R43504, CONSERVATION PROVISIONS IN THE 2014 FARM BILL (P.L. 113-79) 1–2 (2014), https://perma.cc/ZM84-3UAJ.

6 *Hypoxia*, NAT'L OCEANIC & ATMOSPHERIC ADMIN. (Oct. 23, 2014), https://perma.cc/TSK6-899D (revised July 6, 2017).

7 *Id.*

8 *NOAA, USGS and Partners Predict Larger Summer 'Dead Zone' for the Chesapeake Bay*, U.S. GEOLOGICAL SURV. (June 14, 2017), https://perma.cc/U3UL-W6KS.

9 Jenna Gallegos, *The Gulf of Mexico Dead Zone is Larger Than Ever. Here's What to Do About It.*, WASH. POST (Aug. 4, 2017), https://perma.cc/D6DK-WH3E; Chelsea Harvey, *Scientists Predict a Gulf of Mexico 'Dead Zone' the Size of New Jersey This Summer*, WASH. POST (June 21, 2017), https://perma.cc/TRG6-XBAJ.

10 *Hypoxia*, *supra* note 6.

11 *Sources and Solutions*, U.S. ENVTL. PROTECTION AGENCY, https://perma.cc/V9QY-7R3Z (last updated Mar. 10, 2017). In some areas, septic systems and industrial food processing are also major contributors. *See, e.g.*, *The Sources and Solutions: Wastewater*, U.S. ENVTL. PROTECTION AGENCY, https://perma.cc/G73J-9GMR (last updated March 10, 2017); *Sources of Eutrophication*, WORLD RESOURCES INST., https://perma.cc/3PLR-CY6K (last visited July 22, 2017).

12 *E.g.*, ECON. RESEARCH SERV., U.S. DEP'T OF AGRIC., AGRICULTURAL RESOURCES AND ENVIRONMENTAL INDICATORS, AGRICULTURAL HANDBOOK NO. AH-722, CHAPTER 2.3: WATER QUALITY IMPACTS OF AGRICULTURE 1 (2003), https://perma.cc/AVV5-R7V5 ("[A]griculture is the leading source of remaining impairments in the Nation's rivers and lakes and a major source of impairments to estuaries."); Williams, *supra* note 2, at 22 ("[A]gricultural nonpoint source pollution is now considered the nation's most persistent and most difficult water quality problem.").

13 Section 319 creates a grant program to assist states in carrying out their nonpoint planning and implementation. 33 U.S.C. § 1329(h) (2012). If a state has made "satisfactory progress" implementing its nonpoint program in the previous fiscal year, the federal

the wrong metrics.[14] Specifically, for many years, EPA gauged the success of the CWA Total Maximum Daily Load (TMDL) planning program based on the number of TMDLs executed,[15] and the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), which implements the bulk of Farm Bill Conservation Title programs, has focused on the number of conservation contracts executed with producers.[16] Consequently, over 50,000 TMDLs have been executed,[17] but we have very

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government may provide up to 60% of the cost for the state's nonpoint program. *Id.* § 1329(h)(1), (3), (8). However, the reality is that section 319 grant funding is limited; for example, in 2016, only $163.4 million was available nationally, a funding level that cannot support the needed level of watershed planning and implementation in agricultural areas and that is far exceeded by the farm bill conservation programs. *319 Grant Program for States and Territories*, U.S. ENVTL. PROTECTION AGENCY, https://perma.cc/6CCM-763T (last updated May 1, 2017).

14 Implementation and enforcement for both the TMDL and conservation programs has historically been lacking. *See* KRIS SIGFORD ET AL., MISS. RIVER COLLABORATIVE, DECADES OF DELAY: EPA LEADERSHIP STILL LACKING IN PROTECTING AMERICA'S GREAT RIVER 1–2 (2016), https://perma.cc/PX5R-P9EG; Laurie Ristino & Gabriella Steier, *Losing Ground: A Clarion Call for Farm Bill Reform to Ensure a Food Secure Future*, 42 COLUM. J. ENVTL. L. 59, 70–71 (2016). With respect to TMDLs, the failure to implement or enforce implementation is no surprise because the CWA's TMDL program does not include explicit implementation provisions. *See* 33 U.S.C. § 1313. With respect to enforcement of best management practices (BMP) implementation and other conservation requirements, a culture of voluntary compliance, lack of tracking technology, lack of funding, and significantly increased workload have been cited as impediments to enforcement. *See* SIGFORD ET AL., *supra*, at 41–42; Ristino & Steier, *supra*, at 70–71.

15 U.S. ENVTL. PROT. AGENCY, A LONG-TERM VISION FOR ASSESSMENT, RESTORATION, AND PROTECTION UNDER THE CLEAN WATER ACT SECTION 303(D) PROGRAM 4 (2013), https://perma.cc/H69T-FRQA ("Previous performance measures for the Program have served to draw attention and effort to areas important during those times, such as tracking the number of TMDLs approved. . . . A workgroup of States and EPA is developing a metric to replace, by [fiscal year] 2015, the simple tally of TMDLs completed with one that measures the extent of State priority waters addressed by TMDLs or alternative approaches in impaired waters.").

16 *See* Ristino & Steier, *supra* note 14, at 109; *NRCS Conservation Programs: Environmental Quality Incentives Program (EQIP)*, U.S. DEP'T AGRIC., https://perma.cc/3DZD-FTFR (last visited July 22, 2017). In this Article, we refer to farmers as "producers," which is consistent with the terminology of USDA. *See, e.g.*, *Financial Resources for Farmers and Ranchers*, U.S. DEP'T AGRIC., https://perma.cc/7W6L-9UYM (last visited July 22, 2017).

17 U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-14-80, CLEAN WATER ACT: CHANGES NEEDED IF KEY EPA PROGRAM IS TO HELP FULFILL THE NATION'S WATER QUALITY GOALS 62 (2013), www.gao.gov/assets/660/659496.pdf [hereinafter GAO, CLEAN WATER ACT: CHANGES NEEDED]. EPA has focused the TMDL program on large-scale watershed TMDLs. *Impaired Waters and TMDLs: TMDL Information and Support Documents*, U.S. ENVTL. PROTECTION AGENCY, https://perma.cc/4AJS-8QF5 (last updated Feb. 21, 2017). Large-scale watershed TMDLs can cover massive land areas—6 million acres in the case of the Wisconsin River TMDL currently being completed—and include several impaired waterbodies or stream segments. *See* Jamie Konopacky, *Battling the (Algae) Bloom: An Analysis of Watershed Policy Approach and Watershed Plans in Wisconsin*, 44 B.C. ENVTL. AFF. L. REV. 253, 280 (2017). Watershed TMDLs are considered efficient because states can complete several TMDLs through a single plan. U.S. ENVTL. PROT. AGENCY, DRAFT HANDBOOK FOR DEVELOPING WATERSHED TMDLS 3 (2008), https://perma.cc/VX49-3U7A [hereinafter EPA'S 2008 HANDBOOK FOR DEVELOPING TMDLS]. However, because execution of very large TMDLs may preclude or delay necessary data gathering/inventorying and landscape scale modeling necessary for implementation, it can result in paper plans that do not facilitate implementation. GAO, CLEAN WATER ACT: CHANGES

little understanding of whether completed TMDLs have led to the implementation of agricultural land use practices and improved water quality.[18] Similarly, the number of conservation contracts has skyrocketed,[19] with little or no focus on whether funded conservation practices help to achieve water quality goals identified in TMDLs or other watershed plans, or how the practices help, if at all, to restore impaired waterbodies.[20] Instead of bean counting TMDLs and conservation contracts, achieving healthy watersheds will require an integrated approach that promotes productivity and measurable water quality improvements.

Rather than amending CWA regulatory permit programs to include agricultural producers or mandating that agricultural producers implement TMDLs, this Article recommends revising and integrating voluntary CWA planning and farm bill conservation programs to carry out a voluntary small-scale watershed planning approach to address nutrient pollution. This revised, voluntary planning approach is practical because in the current political climate, it is highly unlikely that Congress will amend the CWA permit program to include agricultural sources or make TMDL implementation mandatory.[21] Moreover, previous efforts to regulate agricultural runoff have not always been successful,[22] and it is not clear that a regulatory solution would be effective given the diffuse and variable environmental impacts of agricultural production, economic realities of

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NEEDED, *supra*, at 30–31. Moreover, the need to redo calculations for smaller areas within large-scale watershed TMDL areas, which has occurred in the Rock River Basin in Wisconsin, calls into question the efficiency of the large-scale approach. *See* Konopacky, *supra*, at 278–79.

18 *See* GAO, CLEAN WATER ACT: CHANGES NEEDED, *supra* note 17, at 27–28 ("EPA tracks basic information on TMDL development, such as the number, location, and type of long-established TMDLs but, generally, does not have information on the extent to which the TMDLs have been implemented or have improved the quality of impaired water bodies. . . . EPA cannot use its different databases to assess the extent to which most TMDLs have been implemented, and it does not have comprehensive, nationwide information on whether and to what extent TMDLs have led to improved water quality.").

19 Ristino & Steier, *supra* note 14, at 99 ("The administrative imperative is on writing 'contracts' to producers, that is, obligating cost-share payments for the installation of conservation practices under the Farm Bill Title II programs. A 2007 report on technical assistance by the Soil and Water Conservation Society concluded: '[s]erious gaps are opening in the nation's technical assistance network. NRCS staff levels, for example, are 11% below their 1985 level, despite the 500% increase in funding for financial assistance programs.'" (quoting SOIL & WATER CONSERVATION SOC'Y & ENVTL. DEF., AN ASSESSMENT OF TECHNICAL ASSISTANCE FOR FARM BILL CONSERVATION PROGRAMS 1 (2007))).

20 *See id.* at 103–04 (discussing section 1619 and the Conservation Effects Assessment Project's (CEAP) findings). *See also* 16 USC § 3844(i) (2012) (requiring the Secretary of USDA to report to Congress annually on conservation program enrollment numbers rather than on conservation outcomes).

21 *See, e.g.*, Ayesha Rascoe & Timothy Gardner, *Trump Orders Review of Obama Waterway Regulation*, REUTERS, Feb. 28, 2017, https://perma.cc/M5SP-DYYC (describing the Trump administration's hostility to expanded EPA jurisdiction).

22 *See* OLIVER A. HOUCK, CLEAN WATER ACT TMDL PROGRAM: LAW, POLICY, AND IMPLEMENTATION 100–04 (2d ed. 2002) (discussing Congress's failed attempt to require enforceable mechanisms to implement nonpoint management measures in the Coastal Zone Management Act and Coastal Zone Reauthorization Amendments).

farming,[23] and the unique treatment of agriculture in our federal policy and political history.[24] The approach is also necessary because although farm bill conservation programs have helped implement conservation practices on a significant number of acres in the United States,[25] these programs have generally been unable to aggregate conservation implementation within watersheds in a manner that restores water quality impacted by agricultural runoff.[26]

In this Article, we set forth our initial synthesis for a Healthy Watershed Policy Framework (the Framework), which integrates voluntary CWA planning and farm bill conservation programming. The Framework draws from previous and current watershed planning policy and practice, and also builds on our research and previous work, which recommends a hydrologic unit code[27] (HUC) 12 watershed planning approach for addressing nutrient water quality impairments, as well as a reform of conservation programs to improve their environmental efficacy.[28] We have included graphics, actual watershed maps, and planning examples to help elucidate the Framework. The Framework and accompanying visuals are based, in part, upon real-world efforts in Wisconsin, Iowa, and Kansas. We intend for the Framework and visuals included in this Article to create a blueprint that is useful for federal, state, and local agencies, and other stakeholders addressing nonpoint source (NPS) pollution. This blueprint is intended to be iterative—as is any good design process—in order to incorporate lessons learned.

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23 *See* Karen R. Hansen, *Agricultural Nonpoint Source Pollution: The Need for an American Farm Policy Based on an Integrated Systems Approach Recoupled to Ecological Stewardship*, 15 HAMLINE J. PUB. L. & POL'Y 303, 320–21 (1994) ("[T]he mere addition of a harsh environmental regulatory and enforcement stance towards agricultural NPS pollution without subsequent modification of a production-based federal farm policy will do little more than further tighten the economic 'vise grip' which already binds the average farmer."). *See also id.* at 318 ("Normally, the industrial internalization of the cost of agricultural NPS pollution would be the classic theoretical solution to the problem. The difficulty with this solution lies in the fact that the majority of American farmers are merely price takers in the marketplace and do not have the ability to pass added production costs on to consumers. Therefore, this solution would only increase the pressure to produce which is at the root of the agricultural NPS pollution problem. In addition, numerous federal policies have directly and indirectly had the effect of encouraging the practices which contribute to agricultural NPS pollution.").

24 Susan A. Schneider, *A Reconsideration of Agricultural Law: A Call for the Law of Food, Farming, and Sustainability*, 34 WM. & MARY ENVTL. L. & POL'Y REV. 935, 936, 938–39 (2010).

25 *See NRCS Conservation Programs: Environmental Quality Incentives Program (EQIP)*, *supra* note 16.

26 *See, e.g.*, NAT. RES. CONSERVATION SERV., SUMMARY OF FINDINGS: ASSESSMENT OF THE EFFECTS OF CONSERVATION PRACTICES ON CULTIVATED CROPLAND IN THE TEXAS GULF BASIN 3–5 (2015), https://perma.cc/9A36-RVGH (finding some conservation progress but a continued critical need for soil erosion and nutrient loss reduction from cultivated cropland).

27 In the United States, the United States Geological Survey (USGS) has divided the country into hydrologic units. *Hydrologic Unit Maps*, U.S. GEOLOGICAL SURV., https://perma.cc/SAM5-4HM9 (last modified Jan. 27, 2017). Hydrologic units represent drainage areas. *Id.* Each hydrologic unit is identified by a code consisting of 2 to 12 digits. *Id.* In total, the HUC system is comprised of six levels of drainage areas: HUC 2, 4, 6, 8, 10, and 12. *Id.* Smaller HUCs are nested within the larger HUC areas. *Id.* HUC 2s represent the largest and HUC 12s the smallest drainage areas in the HUC system. *Id.*

28 *See* Konopacky, *supra* note 17, at 281.

Although robust academically, we have conceived of this piece with an eye toward practitioners as well as watershed stakeholders and policymakers, with the goal of facilitating their efforts at improving water quality. This Article is organized as follows: in Part II we set forth key principles that undergird the Framework and are exhibited in the real-world examples we reference. In Part III, we describe the Framework process. And, in Part IV, we conclude with recommendations for policy reforms needed to achieve healthy watersheds.

II. PRINCIPLES: SOLVING COMPLEX SOCIAL ISSUES

Water pollution from agricultural NPSs is a complex social problem. Agricultural NPS pollution is highly influenced by topography, soil type, precipitation, hydrology, farm practices, crop type, and agricultural markets.[29] In other words, agricultural NPS pollution is born of a complex system comprised of many interconnected variables. Solving complex problems like agricultural NPS pollution requires a highly coordinated systems approach. In this Part, we provide background on systems thinking and problem-solving as a foundation to further elucidate the Framework presented in Part III. Relatedly, we then set forth principles we have discerned from our clean water and food systems research that are indicative of successful complex problem-solving in this context.

The study of complex systems arose over the last half of the 20th century across many disciplines in an effort to better understand phenomena and solve challenging problems.[30] The systems approach was in counterpoint to reductionist or linear analysis, which had failed to adequately explain the behavior of both natural and human-created phenomena.[31] A key proponent of system thinking was the scientist Donella Meadows.[32] Meadows is known for her influential book *Limits to Growth*, based on her work modeling global trends on population, economics, and environment at the Massachusetts Institute of Technology.[33] She espoused the idea that by thinking in systems, one is better able to see the component parts and their interactions and, therefore, design effective interventions or solutions that minimize unintended negative consequences.[34]

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29 *See* James S. Shortle et al., *Reforming Agricultural Nonpoint Pollution Policy in an Increasingly Budget-Constrained Environment*, 46 ENVTL. SCI. & TECH. 1316, 1316–17 (2012); Mark D. Tomer et al., *Agricultural Conservation Planning Framework: 2. Classification of Riparian Buffer Design Types with Application to Assess and Map Stream Corridors*, 44 J. ENVTL. QUALITY 768, 768–69 (2015); Mahdi Al Kaisi & Matt Helmers, *Heavy Rain, Soil Erosion and Nutrient Losses*, IOWA ST. U. (June 5, 2008), https://perma.cc/9S9G-263U.

30 Alexander Lazlo & Stanley Krippner, *Systems Theories: Their Origins, Foundations, and Development*, *in* SYSTEMS THEORIES AND A PRIORI ASPECTS OF PERCEPTION 47, 48 (J.S. Jordan ed., 1998).

31 *Id.* at 52–53.

32 *See, e.g.*, DONELLA H. MEADOWS, THINKING IN SYSTEMS: A PRIMER, at ix–x (2011).

33 *Id.* at xi.

34 *Id.*

Around the same time Meadows's work was gaining popularity, the concept of design thinking as a methodology for creating solutions was evolving.[35] Design thinking is not about how things look but is a process to discover solutions and opportunities.[36] Although the tools and techniques used in design thinking vary, the core of the process is the same and can be summarized by Figure 1.

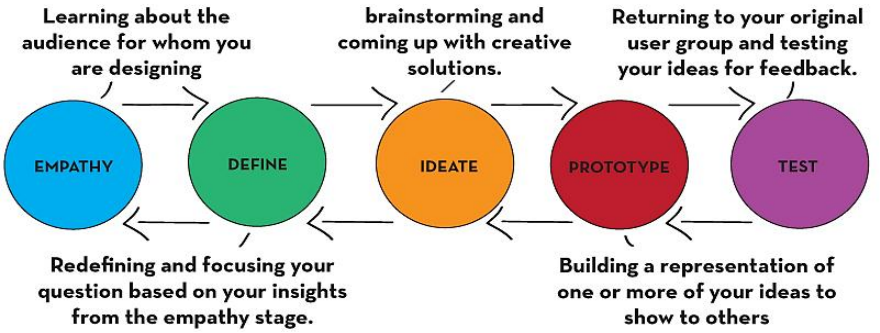

Figure 1: The design process encourages risk taking and continuous learning[37]

The Framework we are presenting in this Article is informed by both systems and design thinking. Through these lenses, we have worked to create a policy framework for addressing agricultural NPS pollution that will catalyze locally led and collaborative small-scale watershed planning that includes all fields and producers in a local watershed. The approach stands in contrast with the current disaggregated field-by-field or producer-by-producer approach that does not take into consideration surrounding land use activities. We have endeavored to work on a policy solution from the end user's perspective, not our own, because a policy created in this way is more likely to be successfully implemented and maintained. The Framework is rooted in the idea that planning and implementation is and should be largely locally driven, taking into account unique on-the-ground realities and needs.[38]

Based upon our study of Wisconsin, Kansas, and Iowa's watershed approaches to improving water quality, we have discerned several principles

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35 DJ Huppatz, *Revisiting Herbert Simon's "Science of Design,"* DESIGN ISSUES, Spring 2015, at 29, 38–40, https://perma.cc/AD2R-BBBF; Reuven Cohen, *Design Thinking: A Unified Framework for Innovation*, FORBES (Mar. 31, 2014), https://perma.cc/M6QF-PPF7.

36 *Design Thinking . . . What is That?*, FAST COMPANY (Mar. 20, 2006), https://perma.cc/33LF-V5VT.

37 *What Is Design Thinking*, CREATEDU (2013), https://perma.cc/6HAX-KX48.

38 A similar approach has recently been reaffirmed by scientists with the Agricultural Research Service. *See* Mark D. Tomer et al., *Agricultural Conservation Planning Framework: 1. Developing Multipractice Watershed Planning Scenarios and Assessing Nutrient Reduction Potential*, 44 J. ENVTL. QUALITY 754, 754–55 (2015); Mark D. Tomer et al., *Combining Precision Conservation Technologies into a Flexible Framework to Facilitate Agricultural Watershed Planning*, 68 J. SOIL & WATER CONSERVATION 113A, 113A (2013).

that undergird and overarch small-scale watershed planning. These principles have significant overlap with the conditions[39] associated with the collective impact model of solving complex social problems,[40] which involves highly structured, cross-sector collaboration in order to create system-wide change.[41] The characteristics of successful watershed planning and implementation efforts that we have identified include:

1) **Transdisciplinary Collaboration** and **Higher-Ordered Coordination**:[42] Addressing agricultural NPS pollution requires both transdisciplinary collaboration and higher-ordered coordination to solve because of its dispersed nature, variability, and data requirements, as well as its economic, environmental, and social dimensions. In particular, successful collaboration in this space requires coordination between different levels of government—local, state, and federal—as well as between different stakeholders in the watershed, including scientists, economists, agronomists, agricultural producers, conservation districts, government officials, and non-governmental organizations (NGOs).

2) **Leadership:**[43] Successful watershed clean-up efforts require individuals or entities to initiate, coordinate, and ensure follow-through. Leadership must be trusted and able to rally key stakeholders around shared goals while avoiding political and cultural fault lines. For example, in watershed planning projects being implemented in Wisconsin, soil and water conservation district representatives and producer groups have served as leaders and helped catalyze producer participation,[44] and in Iowa, representatives at the Iowa Soybean Association

39 Research on successful collective impact efforts have identified "five conditions that together produce true alignment and lead to powerful results: a common agenda, shared measurement systems, mutually reinforcing activities, continuous communication, and backbone support organizations." John Kania & Mark Kramer, *Collective Impact*, STAN. SOC. INNOVATION REV., Winter 2011, at 36, 39 https://perma.cc/S2D5-RL6Q.

40 The collective impact model arose in recognition of the persistent failure of single, organization-style advocacy to transform isolated solutions into broader change. *See* Fay Hanleybrown et al., *Channeling Change: Making Collective Impact Work*, STAN. SOC. INNOVATION REV. (Jan. 26, 2012), https://perma.cc/CD8Z-8RXR. Traditionally, the social sector has invested in discrete programs and approaches to address social problems with the idea that the solutions innovated could then be adopted by other organizations, resulting in scaled change. *See* John Kania & Mark Kramer, *Embracing Emergence: How Collective Impact Addresses Complexity*, STAN. SOC. INNOVATION REV. (Jan. 21, 2013), https://perma.cc/KT7G-22WM. However, "[t]he problem is that such predetermined solutions rarely work under conditions of complexity—conditions that apply to most major social problems—when the unpredictable interactions of multiple players determine the outcomes." *Id.*

41 *See* Hanleybrown, *supra* note 40.

42 *See* discussion *infra* Part III.

43 *See* discussion *infra* Part III.

44 *See* Konopacky, *supra* note 17, at 302–28 (discussing "watershed plans developed by non-permittee stakeholders").

(ISA) have been using the Agricultural Research Service's (ARS) Agricultural Conservation Planning Framework (ACPF) to develop watershed plans and generate producer engagement in watershed planning projects.[45] Additionally, Watershed Management Authorities in Iowa represent another effort to develop and maintain leadership for watershed efforts in that state.[46] These entities serve a critical connective tissue function in the watershed planning and implementation process.

3) **Data**:[47] Data on stream networks, baseline water quality, topography, soil, land management conditions, existing conservation practices, opportunities for additional practices, and any resulting installation and water quality changes are critical to developing, implementing, and adaptively managing watershed plans and making real, measurable progress in addressing NPSs.

4) **Appropriate Scale**:[48] Local watershed level planning and data are important for contextualizing, prioritizing, and implementing conservation activities necessary to improve nutrient-impaired waters. The critical planning scale for guiding on-the-ground action is the HUC 12. This scale promotes effective stakeholder engagement, inventorying, implementation, and adaptive management.

Many of these principles are reflected in NRCS's own conclusions in its Conservation Effects Assessment Program (CEAP), "a multi-agency effort to quantify the environmental effects of conservation practices and programs and develop the science base for managing the agricultural landscape for environmental quality."[49] For example, a 2016 CEAP report entitled *Quantifying the Potential Water Quality Benefits of Agricultural Conservation Practices for Stream Fish Conservation in the Western Lake Erie Basin*, concluded, in pertinent part:

> While the amount and cost of [conservation practice] implementation needed to improve stream health in the [Western Lake Erie Basin] may appear daunting, our modeling indicates that win-win-wins for agricultural productivity, local stream ecosystems, and downstream Lake Erie are possible. Achieving these wins in the most cost-effective manner, however, will require strategic conservation to ensure that the right practices are getting to the right places in the right amount, continued research to explore and maximize the

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45 *Agricultural Conservation Planning Framework (ACPF) Toolbox*, U.S. DEP'T AGRIC., https://perma.cc/A67X-M5ME (last visited July 22, 2017).

46 *See infra* notes 101–106 and accompanying text.

47 *See* discussion *infra* Part III.B.2.f.

48 *See* discussion *infra* Part III.A.2.c.

49 *Conservation Effects Assessment Project (CEAP)*, U.S. DEP'T AGRIC., https://perma.cc/89G3-5JF6 (last visited July 22, 2017).

> potential benefits of [conservation practice]s, and expanded water quality and biological monitoring to track progress and allow for adaptive management. Unprecedented collaboration across government agencies, conservation organizations, research universities, agribusinesses, and individual farmers also will be necessary to develop innovative, cost-effective solutions. And, because a perfect strategy likely does not exist that can meet all conservation, management, and socioeconomic goals in the [Western Lake Erie Basin], we must be aware of tradeoffs, be willing to take action with the best available information, and be willing to adapt.[50]

III. THE FRAMEWORK

In this Part, we discuss our proposal for an integrated Healthy Watershed Policy Framework. Our approach is based on HUC 12 watershed planning building blocks and rooted in integrated and streamlined field-level conservation planning. In Part III.A, we discuss the Framework recommendations for modifications to CWA planning programming, as well as incorporating HUC 12–scale and field-scale planning into state water programming. And, in Part III.B, we discuss recommendations for farm bill conservation programming and additional farm bill policies that affect the efficacy of the farm bill conservation programs.

Through the Framework, we seek to provide a comprehensive voluntary policy approach that moves beyond pilot watershed projects to the programmatic development of locally led HUC 12 watershed plans. The Framework does not incorporate any additional regulatory requirements for producers. Instead, it aims to align, leverage, and target funding to support voluntary HUC 12–scale planning and implementation of conservation practices;[51] promote transparency for planning and scientific research while protecting producer privacy;[52] promote monitoring, continuous learning, and adaptive management; increase stakeholder participation; and improve farm productivity and water quality.[53] By proposing revisions to voluntary CWA planning and farm bill conservation programs and policies, and integrating the revised voluntary programs into a comprehensive approach aimed at

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50 S. CONOR KEITZER ET AL., QUANTIFYING THE POTENTIAL WATER QUALITY BENEFITS OF AGRICULTURAL CONSERVATION PRACTICES FOR STREAM FISH CONSERVATION IN THE WESTERN LAKE ERIE BASIN, at viii (2016), https://perma.cc/3GEZ-JDWU.

51 Specifically, this Framework seeks to align, leverage, and target the following funds: CWA NPS grant funds for states, 33 U.S.C. § 1329(h) (2012); Farm Bill conservation program funds, 16 U.S.C. § 3841(a) (Supp. III 2016); state funds; permitted entity funds; and NGO funds.

52 *See* discussion *infra* Part III.B.2.f.

53 Many of the most effective practices for achieving water quality nutrient reduction targets may also improve soil and farm productivity. *See* Tomer et al., *Agricultural Conservation Planning Framework: 1*, *supra* note 38, at 758 ("[T]he planning framework begins with an emphasis on practices that promote healthy functioning of soils to minimize soil erosion, enhance infiltration and water retention, and minimize loss of plant nutrients ([nitrogen] and [phosphorous]). These practices, such as zero or zonal tillage, cover crops, and nutrient management, carry the potential benefit of increased farm profitability and/or soil productivity . . . and are therefore emphasized in the planning framework without geographic prioritization.").

achieving the above goals, the Framework seeks to catalyze the development and implementation of appropriately scaled watershed plans to achieve water quality goals that have eluded voluntary programs up to this point.

The Framework builds on existing capacities and institutional competencies within relevant agencies and groups and does not require state or federal agencies to cede jurisdiction. For example, the Framework supports NRCS and their state and local partners, including conservation districts, in designing and implementing field-scale conservation practices and leading local watershed planning efforts.[54] It recognizes that NRCS and their state and local partners provide a critical, yet not optimized, delivery mechanism to address on-the-ground environmental conditions. In addition, the Framework ensures a clear role for state environmental agencies, which have extensive experience assessing and monitoring waters and developing plans for water quality improvements. Achieving the necessary level of coordination outlined in the proposed Framework will be challenging. However, to address nutrient and sediment runoff from agricultural areas, it is absolutely critical that NRCS, EPA, state and local agencies, and private stakeholders cooperate to realistically evaluate financial and technical assistance needs for HUC 12 plan development and implementation, and identify how to leverage federal and local resources to meet planning and implementation needs. Although it is not easy, the approach is both politically viable and scientifically sound.

Figure 2 below provides a visual representation of the proposed Framework. On the left, we show relevant voluntary CWA planning programs and HUC 12 and field-scale planning components, and on the right, we show relevant farm bill conservation programs. The box in the center of the graphic represents geographic information system (GIS) data that must be shared to facilitate watershed planning and implementation, and stakeholders are shown in the black circles. The flow lines in the graphic demonstrate how the Framework integrates watershed planning and farm bill conservation programs to better support HUC 12–scale watershed plan development and implementation.

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[54] *See, e.g.*, Douglas Helms, *Getting to the Roots*, U.S. DEP'T AGRIC. (1992), https://perma.cc/6WLG-U8DK (discussing the history and programs of the conservation district delivery mechanism).

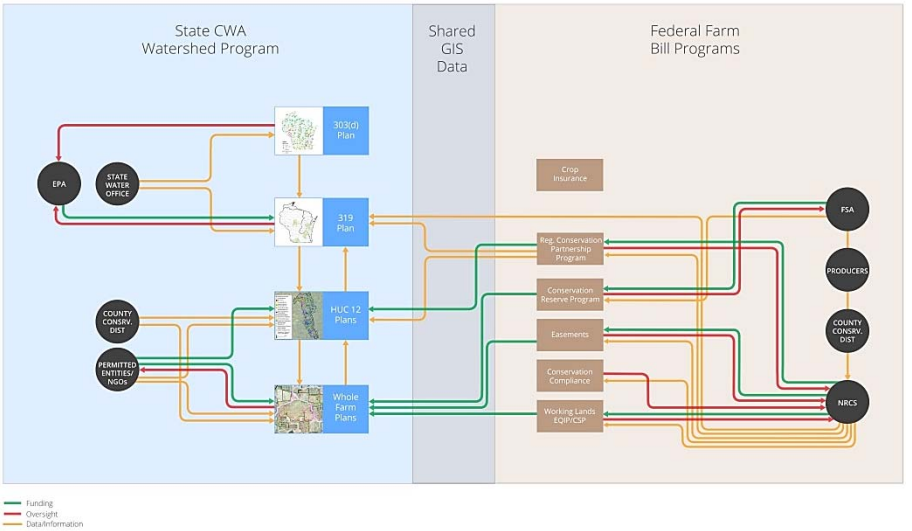

Figure 2: Healthy Watershed Policy Matrix[55]

A. Revised Small-Scale Watershed Planning Approach to State Clean Water Act Programming

We propose that state CWA programming—to effectively address nutrient pollution—be evolved from an approach comprised of incomplete assessment, listing, and TMDL development to a more comprehensive approach focused on prioritizing small-scale watershed planning and implementation. The proposed small-scale watershed programming includes recommended approaches to CWA programs, including impaired water assessment (section 106(e)), listing and watershed planning (section 303(d)), and NPS planning (section 319), as well as a focus on HUC 12–scale and site-level planning. Incorporating HUC 12–scale, implementation-oriented watershed plans and site-level farm conservation plans is fairly novel in the CWA programming context. Although site-level planning is well established in the farm bill conservation planning context, our approach to site-level planning is distinguishable because it occurs in an integrated and streamlined manner in connection with a well developed HUC 12 plan.[56] The

55 Image designed and created by Jamie Konopacky and Yannis Orfanos. Please visit *Environmental Law*'s online database to view the Article with color imagery. The online version also includes an appendix with enlarged images for enhanced clarity. *Articles*, ENVTL. L. (2017), http://elawreview.org/articles/. The idea to incorporate design thinking into this Article was suggested by Professor Ristino based upon her work combining systems and designing thinking in service to progressive social change.

56 Although HUC 12 and site-level plans are included in the water program section of our Framework graphic (Figure 2), we are not suggesting that state water agencies take over site-level or HUC 12 planning. Under the Framework approach, site-level planning would still be led by federal, state, and local conservation officials. Moreover, as discussed below, we propose

core watershed planning elements of the Framework are shown in Figure 3 below. The proposed revised watershed planning approach will identify conservation practice options for HUC 12 watersheds contributing to water quality impairments and will enable practice implementation funding and technical assistance to be more efficiently and effectively deployed to address agricultural nutrient loading from these watersheds.

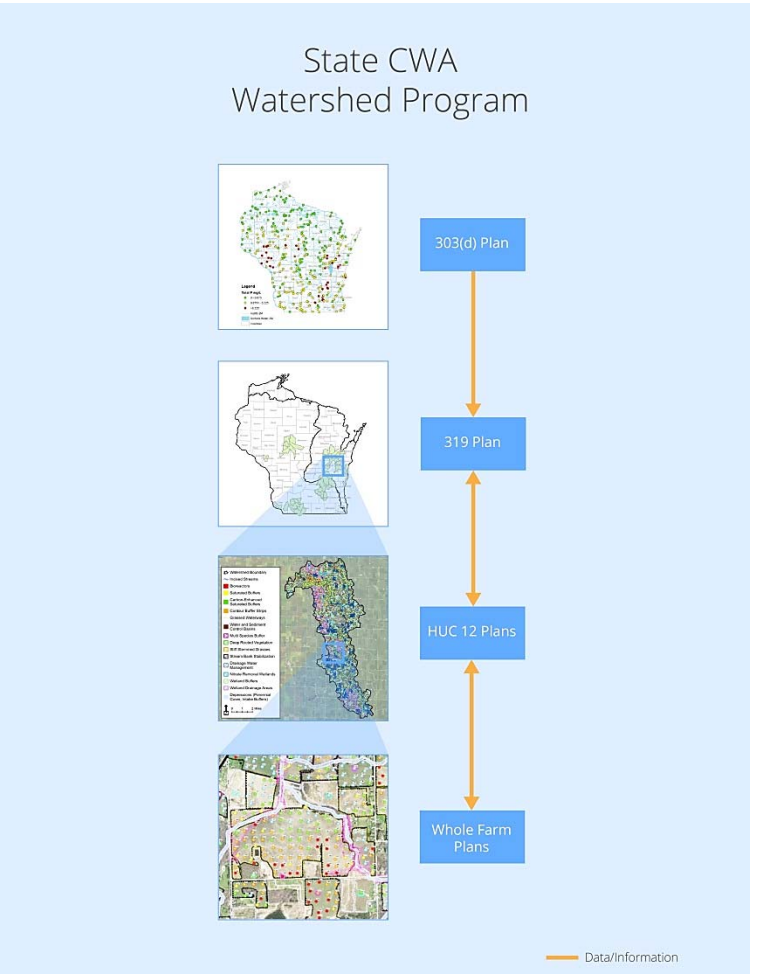

Figure 3: Healthy Watershed Policy Framework—Watershed Planning Component[57]

that conservation districts or similar local agricultural entities be the principal stakeholders in charge of developing local watershed plans. It is expected that these local entities will work closely with state water agencies and other supporting partners to carry out monitoring, modeling, planning and other tasks.

[57] Image designed and created by Jamie Konopacky and Yannis Orfanos. Please visit *Environmental Law*'s online database to view the Article with color imagery. The online version

In this Subpart, we first provide a brief overview of CWA section 303(d) and 319's statutory and regulatory requirements. We then address the substance, procedures, and stakeholders for the proposed revised versions of these programs. We also discuss HUC 12–scale and field-scale planning.

1. Overview of Clean Water Act Total Maximum Daily Load and Nonpoint Programs

The CWA section 303(d) program addresses waterbodies that do not meet water quality standards.[58] It requires states to identify and prioritize waters where technology-based effluent limitations applicable to point sources will not result in the attainment of water quality standards.[59] Program regulations require states to submit impaired water lists to EPA biennially, and specifically identify waters targeted for TMDL development within the next two years.[60] In its guidance, EPA recommends that states establish priority in their section 303(d) lists through the use of a scheduled TMDL completion date or a ranking system.[61] In addition, the regulations require states to submit, according to schedules agreed upon with a Regional Administrator, TMDLs to EPA for approval.[62] A TMDL for a waterbody determines the amount of a pollutant that a waterbody can assimilate without violating water quality standards.[63] TMDLs include an analysis of pollutant loads from point and NPSs, and a margin of safety.[64] TMDL pollutant load allocations for point sources[65] are implemented through the CWA point source permit program—the National Pollutant Discharge Elimination System (NPDES) permit program.[66] Agricultural operations, with the exception of large farms designated as Concentrated Animal Feeding Operations (CAFOs), are considered NPSs[67] and are not permitted entities

also includes an appendix with enlarged images for enhanced clarity. *Articles*, ENVTL. L. (2017), http://elawreview.org/articles/.

58 33 U.S.C. § 1313(d)(1)(A) (2012).

59 *Id.*

60 40 C.F.R. § 130.7(d) (2016).

61 U.S. ENVTL. PROT. AGENCY, GUIDANCE FOR 2006 ASSESSMENT, LISTING AND REPORTING REQUIREMENTS PURSUANT TO SECTIONS 303(D), 305(B) AND 314 OF THE CLEAN WATER ACT 63 (2005), https://perma.cc/GB5J-QCU4 [hereinafter EPA, GUIDANCE FOR 2006 ASSESSMENT].

62 *Id. See also* 40 C.F.R. § 130.7(a).

63 40 C.F.R. § 130.2(f)–(i).

64 *Id.* §§ 130.2(i), 130.7(c).

65 Point sources of pollutants include those sources that discharge through discrete conveyances (e.g., pipes) to waterbodies. 33 U.S.C. § 1362(14) (2012).

66 *Program Overview: Total Maximum Daily Loads (TMDL)*, U.S. ENVTL. PROTECTION AGENCY, https://perma.cc/7D5J-R6Y8 (last updated Mar. 2, 2017).

67 "'[N]onpoint source' is defined to mean any source of water pollution that does not meet the legal definition of 'point source.'" *What Is Nonpoint Source?*, U.S. ENVTL. PROTECTION AGENCY, https://perma.cc/9KSB-F5TY (last updated May 2, 2017).

under the CWA.[68] Accordingly, the CWA NPDES permit mechanism is not used to implement TMDL NPS load allocations.[69]

Like the TMDL program and unlike the CWA point source program, the CWA nonpoint program is a planning program, not a permit program. To carry out the nonpoint program, states with delegated authority develop Nonpoint Management Program plans (section 319 plans), that are to include: 1) best management practices (BMPs) for addressing NPSs; 2) implementation programs; 3) a schedule with milestones that provide for sources to utilize programs and BMPs at the earliest practicable date; 4) a certification that state laws provide or will be amended to provide adequate authority to address NPS pollution; 5) sources of and uses for funding; 6) programs and projects; 7) use of local and private experts to the maximum extent practicable; and 8) a program developed and implemented on a watershed basis, to the maximum extent practicable.[70] EPA requires that states update their section 319 plans every five years.[71]

2. Recommendations for State Clean Water Act Programming

a. Section 303(d) Programming

Currently, many states may not have sufficient or current water quality monitoring data or screening-level assessments for identifying nutrient-impaired waters. Baseline assessment data on nutrients is needed to develop a statewide priority listing of nutrient-impaired watersheds that will be addressed through watershed planning and implementation.[72] We propose states take a geographically comprehensive approach similar to the Clean Air Act[73] (CAA) assessment and planning process to identify nutrient-

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68 33 U.S.C. § 1362(14); 40 C.F.R. § 122.23.

69 *See* HOUCK, *supra* note 22, at 194. The CWA TMDL program "provides no direct authority for EPA to implement [load allocations] for nonpoint sources." *Id.* at 80. However, EPA has, through guidance, created a vague requirement that states provide some type of "implementation plan" for TMDL nonpoint load allocations and reasonable assurances that load allocations will be achieved. *See* Memorandum from Robert Perciasepe, U.S. Envtl. Prot. Agency Assistant Adm'r, to U.S. Envtl. Prot. Agency Reg'l Adm'rs & Reg'l Water Div. Dirs. (1997), https://perma.cc/BM8Y-H8QC (stating "[f]or all section 303(d)-listed waters impaired solely or primarily by nonpoint sources, each State should describe its plan for implementing load allocations for nonpoint sources. The State implementation plan may describe how load allocations will be achieved for individual waters, for several waters within a watershed, or for all affected waters in the State. . . . States may submit implementation plans to EPA as revisions to State water quality management plans, coupled with a proposed TMDL, or as part of an equivalent watershed or geographic planning process," and further explaining that plans should include: reasonable assurances that nonpoint source loads will be achieved, a public participation process, and recognitions of source water protection programs).

70 33 U.S.C. § 1329(b).

71 U.S. ENVTL. PROT. AGENCY, NONPOINT SOURCE PROGRAM AND GRANTS GUIDELINES FOR STATES AND TERRITORIES 2 (2013), https://perma.cc/AF2U-FCRV [hereinafter U.S. ENVTL. PROT. AGENCY, NONPOINT SOURCE PROGRAM GUIDELINES 2013].

72 *See, e.g.*, SIGFORD ET AL., *supra* note 14, at 1–2.

73 42 U.S.C. §§ 7401–7671q (2012).

impaired waterbodies.[74] Although the challenge of defining, through monitoring, the scope of nutrient pollution in a state is arguably greater than the challenge of identifying nonattainment areas under the CAA,[75] the proposed section 303(d) approach focuses initial monitoring at a manageable HUC 10 watershed scale. We recommend that states begin by assessing all waters within their boundaries at the HUC 10 scale. After completing this monitoring, we recommend states utilize screening-level watershed assessment at the HUC 12 scale, to prioritize further assessment, plan development, and implementation for HUC 12 watersheds. This method will ensure that section 303(d) programs, rather than just identifying individual impaired segments or waterbodies and encouraging a patchwork of TMDLs, provide roadmaps that prioritize watershed plan development and implementation at a manageable scale statewide. Moreover, a section 303(d) program focused on systematically assessing and prioritizing smaller scale plans with implementation components is consistent with EPA's most recent recommendations for revising the 303(d) program.[76]

This combined monitoring and screening-level assessment approach is based, in part, on work done in Wisconsin to develop the state's section 303(d) program, Nutrient Reduction Strategy, and Integrated Assessment of Watershed Health.[77] Figures 4–6 below show the results of Wisconsin's

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74 Under the CAA, attainment and maintenance of air standards is accomplished through a comprehensive planning process that provides a nearly complete inventory of all of regions of the country. Robert W. Adler, *Integrated Approaches to Water Pollution: Lessons from the Clean Air Act*, 23 HARV. ENVTL. L. REV. 203, 232 (1999). Each state is divided into air quality control regions, which are designated as "nonattainment," "attainment," or "unclassifiable" for each air pollutant standard. 42 U.S.C. § 7407(d)(1)(A). State plans are then developed to restore or maintain air quality for the designated regions. *See id.* §§ 7410, 7407; *see also* Adler, *supra*, at 232.

75 Adler, *supra* note 74, at 257–58.

> [F]rom a practical perspective, it is easier to assess compliance with NAAQS in contiguous airsheds than to measure attainment in watersheds that comprise a large number of components whose conditions may vary considerably in size, pollution sources, geology, morphology, hydrology, chemistry, biology and other factors. One headwater stream might be badly polluted from any number of sources, while its neighbor is relatively pristine. There are millions of water body components in the country, compared to the 247 airsheds into which the nation has been divided for purposes of CAA compliance. Monitoring each segment would be a monumental task that far exceeds available resources.

Id. at 259.

76 In EPA's 2013 vision statement for the 303(d) program, the agency recommends that instead of executing large-scale watershed TMDLs with the sole aim of completing as many TMDLs as possible, states prioritize watersheds for action and focus on TMDL alternative planning mechanisms when they are more likely to achieve water quality and balance plan development with implementation. U.S. ENVTL. PROT. AGENCY, A LONG-TERM VISION FOR ASSESSMENT, RESTORATION, AND PROTECTION UNDER THE CLEAN WATER ACT SECTION 303(D) PROGRAM 1, 5, 9 (2013), https://perma.cc/D249-T638.

77 *See* TIM ASPLUND ET AL., WIS. DEP'T OF NAT. RES., WISCONSIN WATER QUALITY REPORT TO CONGRESS 2016, at 1, 4 (2016), https://perma.cc/CZ3Q-U5ZT; JIM BAUMANN ET AL., WIS. DEP'T OF NAT. RES., WISCONSIN'S NUTRIENT REDUCTION STRATEGY 7, 10–11 (2013), https://perma.cc/TR97-ERLY (discussing Wisconsin's revised TMDL prioritization framework); CADMUS GRP.,

approach. Figure 4 shows the results of Wisconsin's HUC 10 phosphorus monitoring, which the state used to prioritize areas for nutrient reduction pursuant to its Nutrient Reduction Strategy. Figure 5 shows the first priority group of HUC 10 areas in which the state wants to work to address phosphorus impairments. Figure 6 shows results of the state's Healthy Watershed Assessment, which was conducted using ecosystem health and vulnerability indices.[78] Under the Framework, HUC 10 prioritization (shown in Figure 5) would be repeated for subsequent priority groups until all watersheds in a state are assessed and prioritized. In addition, the assessment efforts that generated the results shown in Figures 4–6 would be combined to identify priority areas for HUC 12–scale watershed planning and implementation within prioritized HUC 10 areas.

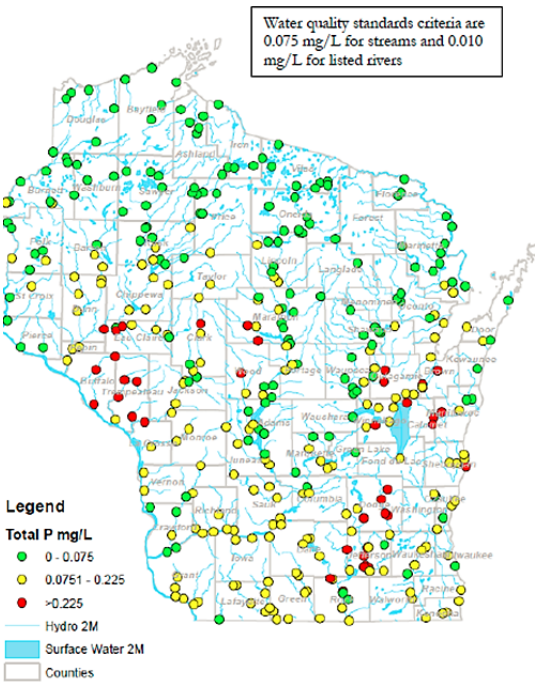

Figure 4: Results of Wisconsin's HUC 10 monitoring used to prioritize watersheds for planning purposes[79]

WISCONSIN INTEGRATED ASSESSMENT OF WATERSHED HEALTH: A REPORT ON THE STATUS AND VULNERABILITY OF WATERSHED HEALTH IN WISCONSIN 4 (2014), https://perma.cc/8NJH-C7XM. Information used to prioritize HUC 12 areas at this level of planning is preliminary. To develop HUC 12 watershed plans—the third planning level in the Framework—watershed inventories and farm conservation plans must be developed, and that data must be incorporated into specific HUC 12 plans.

78 CADMUS GRP., *supra* note 77, at 3–4, 23–26.

79 BAUMANN ET AL., *supra* note 77, at 27 fig.2.1.

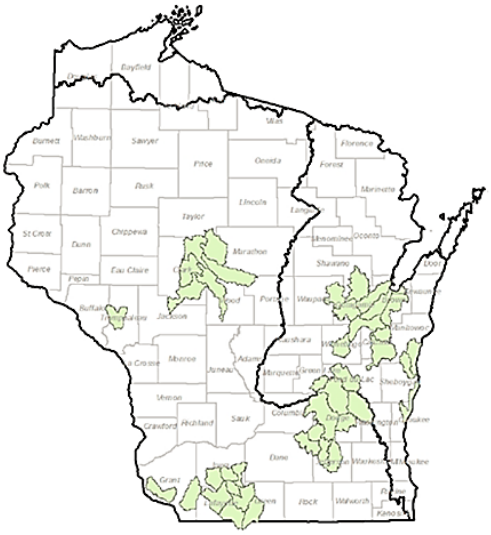

Figure 5: Top HUC 10 watersheds prioritized for nutrient-reduction work based on monitoring results[80]

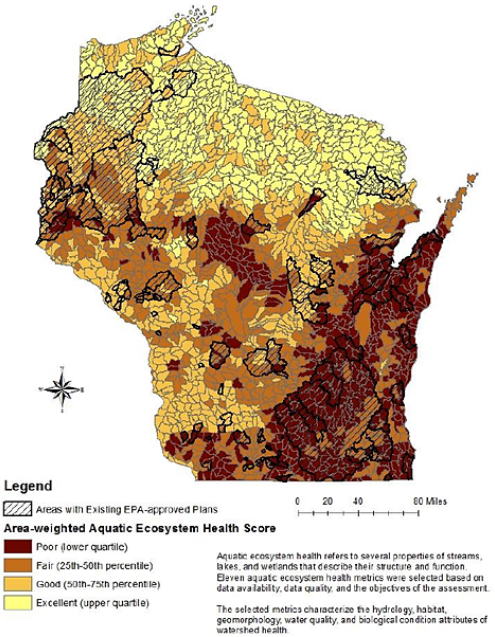

Figure 6: Wisconsin's Healthy Watershed Initiative screening-level assessment results identifying watersheds in need of restoration at the HUC 12 scale[81]

80 *Id.* at Executive Summary–3 fig.ES.2.

81 ASPLUND ET AL., *supra* note 77, app. A, at 9.

The Framework's substantive approach to section 303(d) and 303(e) programming likely differs from states' current assessment, listing, and TMDL development procedures because it focuses on identifying and prioritizing statewide small-scale watersheds for planning and implementation. However, the primary role of state environmental agencies in the development and submission of impaired waters lists, section 305(b) Integrated Reports and TMDLs, or TMDL alternatives under 303(d) would remain unchanged. Under the proposed approach, states could develop statewide roadmaps for carrying out HUC 12–scale watershed planning and implementation and incorporate the same into their Integrated Reports,[82] which would then be submitted to EPA for approval. As discussed in the HUC 12 planning discussion below, states could also continue to work to develop and support stakeholders in the development and implementation of HUC 12–scale TMDLs or TMDL-alternative watershed plans. In addition, states would oversee and track HUC 12–scale plan development and implementation and report on the same to EPA.

b. Nonpoint (Section 319) Programming

Unfortunately, because of a lack of data, funding challenges, and vague EPA guidance regarding the scope of impaired water implementation plans for NPSs, many states' section 319 plans may be informational, rather than implementation-oriented plans.[83] The Framework proposes that state section 319 plans be evolved into implementation-oriented documents that identify and track the development, implementation, and adaptive management of HUC 12 watershed plans for agricultural watersheds identified through states' section 303(d) programs. Section 319 plans should address: 1) all impaired HUC 12 watersheds identified through states' 303(d) programs;[84] 2)

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82 State Integrated Reports are single documents that integrate the reporting requirements of the CWA sections 303(d), 305(b), and 314. EPA, GUIDANCE FOR 2006 ASSESSMENT, *supra* note 61, at 9.

83 *See* HOUCK, *supra* note 22, at 80–81 ("For a state to have the option of offering an implementation plan for 'all affected waters' runs a real risk of describing everything and requiring nothing. For the plan to be offered as part of a 'geographic planning process' or as part of state water quality management plans is also patently amorphous and runs a serious risk of continuing nonpoint source nonmanagement. As anyone who has dealt with state water quality plans knows, they are not 'plans' in a dictionary sense of the word; . . . they are more a process composed of criteria, standards, and abbreviated assessments, some published and some in file drawers, an environment in which site-specific implementation measures can lose their focus, if not simply get lost. . . . [I]t is hard to have confidence in 'reasonable assurances'; from plans that could appear in so many different and diffuse ways." (citations omitted)).

84 The section 319 planning approach proposed herein is somewhat similar to the impaired watershed planning approach proposed in the Nonpoint Source Water Pollution Prevention Act of 1993, H.R. 2543, 103d Cong. (1993). If enacted, House Bill 2543 would have required that "target watersheds in the State [be organized] into 5 priority groups (each consisting of approximately 1/5 of the target watersheds) on the basis of the relative severity of nonpoint source pollution problems in the target watersheds and other relevant considerations." H.R. 2543 § 321(c)(2).

timelines for HUC 12 plan development[85] and implementation;[86] 3) plan adaptive management updates; and 4) modeled and monitored conservation practice implementation and water quality progress.[87]

In addition to shifting the substantive focus in section 319 planning, we recommend clarifying the role of relevant stakeholders in developing and implementing HUC 12 plans for areas identified in states' section 303(d) programs and 319 plans. As discussed below, we propose that state and local-level NRCS officials—together with conservation districts or similar local entities with experience working with producers—be the principal stakeholders responsible for developing and implementing small-scale watershed plans. We further recommend that NRCS state and local offices, with their conservation district or similar partners, provide GIS tracking information appropriately bundled within each HUC 12 watershed for existing, planned, or implemented conservation practices in section 303(d) priority watersheds.[88] Some watershed projects may be carried out by stakeholders other than NRCS or conservation districts. For example, other stakeholders working through the Regional Conservation Partnership Program (RCPP) may lead plan development and implementation.[89] In those cases, NRCS should still report planning and appropriately bundled implementation data for RCPP projects to states or include reporting requirements as provisions in RCPP partner agreements to better enable states to track practices implemented through the RCPP program in their section 319 plans.

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85 House Bill 2543 proposed the following schedule for submitting implementation plans: first priority group plans concurrently with the revision of the state nonpoint management plan; second priority group plans not later than one and one-half years after approval of the state's revised nonpoint plan; third priority group plans not later than two and one-half years after approval of the state's revised nonpoint plan; fourth priority group plans not later than three and one-half years after approval of the state's revised nonpoint plan; and fifth priority group plans not later than four and one-half years after approval of the state's revised nonpoint plan. *Id.* § 321(e)(5).

86 House Bill 2543 proposed that "[i]t shall be the purpose of each implementation program for a target watershed . . . to achieve full restoration . . . of the watershed before the expiration of the 8-year period beginning on the date of approval of the implementation program." *Id.* § 321(e)(2).

87 House Bill 2543 proposed that state nonpoint programs include "random on-site inspections and in situ water quality monitoring" techniques. *Id.* § 321(d)(2)(C).

88 Currently, NRCS and most local conservation districts do not use GIS to track planned and implemented conservation practices within watersheds, and NRCS does not generally share information on planned or implemented practices. *See* 7 U.S.C. 8791 (2012); BAUMANN ET AL., *supra* note 77, at 71; e-mail from Mark Tomer, Research Soil Scientist, U.S. Dep't of Agric., to author (Aug. 7, 2017) (on file with authors); *see also* notes 229–231. However, the ARS's ACPF GIS tool makes such tracking possible. *See* Tomer et al., *Agricultural Conservation Planning Framework: 1*, *supra* note 38, at 754–55. Federal, state, and local officials could and should use this tool to store and manage information on conservation practices for HUC 12 watersheds.

89 *See About RCPP*, U.S. DEP'T AGRIC., https://perma.cc/X4WF-QRTU (last visited July 22, 2017) (describing RCPP, which joins producers, private landowners, water and irrigation districts, nongovernmental organizations, and other partners to "increase the restoration and sustainable use of soil, water, wildlife and related natural resources on regional or watershed scales").

c. HUC 12–Scale Planning

CWA section 303(d) and 319 programs do not include HUC 12 watershed planning requirements. However, as discussed above, the Framework proposes that HUC 12 watershed plans become the building blocks of states' revised approaches to these programs. In contrast to the abstract, mathematical loading targets found in TMDLs and the individual, producer-by-producer contracts utilized in state and federal farm conservation planning, HUC 12 planning encourages producers in local watersheds to collaboratively identify and individually implement critical masses of conservation practices that will more effectively and efficiently address water quality in local waterbodies. HUC 12 areas can be aggregated to form plans covering larger areas.[90] However, all watershed plans for agricultural areas, identified through states' section 303(d) and 319 programs, that aim to address nutrient impairments should be based on HUC 12 building blocks.

Section 303(d) and 319 programs should guide, prioritize, and direct the development and implementation of HUC 12 plans, and producer conservation plans should inform the development of and serve as the implementation mechanism for HUC 12 plans. HUC 12 plans should include GIS maps[91] of existing and proposed practices and EPA's recommended nine key elements.[92] HUC 12 plans could be considered TMDLs or TMDL alternatives.[93] In addition to ensuring that plans are sound roadmaps for conservation practice implementation and water quality improvement, including the nine key elements will ensure that projects are eligible to receive section 319 funding.[94]

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90 *See, e.g.*, MADISON METRO. SEWERAGE DIST., MADISON METROPOLITAN SEWERAGE DISTRICT ADAPTIVE MANAGEMENT PLAN 48 (2017), https://perma.cc/TTX5-3GNH; *see also* e-mail from Dave Taylor, Dir. Of Ecosystem Servs., Madison Metro. Sewerage Dist., to author (Oct. 24, 2016) (on file with authors) (explaining that the Madison Metropolitan Sewerage District Adaptive Management Plan covers nineteen HUC 12 areas).

91 GIS maps should be generated using the ARS's ACPF GIS planning tool. *See supra* note 88 and accompanying text.

92 EPA's Nine Key Elements for watershed planning include the following: 1) causes of impairment, pollutant sources (identified at the subcategory level with contribution estimates), and supplementary watershed goals; 2) management measure load reduction estimates; 3) needed nonpoint source management measures and critical implementation areas; 4) technical and financial assistance and cost estimates "and/or the sources and authorities that will be relied upon"; 5) "[a]n information and education component"; 6) reasonably expeditious nonpoint source management measure implementation schedule; 7) interim milestones for measuring management measures or other control action implementation; 8) criteria for determining loading reduction and water quality standard attainment progress; and 9) "[a] monitoring component to evaluate the effectiveness of the implementation efforts over time." U.S. ENVTL. PROT. AGENCY, NONPOINT SOURCE PROGRAM GUIDELINES 2013, *supra* note 71, at 63–67.

93 Pursuant to EPA's revised vision for the section 303(d) program and associated new metrics for tracking states' progress in addressing impaired waterbodies, in tracking states' 303(d) progress, the agency will recognize TMDLs or alternative plans that are better suited to restoring an impaired waterbody. *Id.* at 35.

94 *Id.* at 63.

The scale of plans is important.[95] Our recommendation that states focus on smaller-scale plans contrasts with the growing size of TMDLs currently being executed in Wisconsin[96] and, to some extent, with the watershed approach as discussed in EPA's guidance.[97] However, we propose this scale because on-the-ground efforts and related research[98] have shown that this is an effective scale for gathering and working with specific land use data, implementing and adaptively managing conservation practices, and facilitating stakeholder involvement.[99]

We recommend an integrated approach to HUC 12 planning that incorporates environmental and economic considerations. To address economic considerations, HUC 12 plans should involve an assessment of impacts on producer productivity,[100] aim to balance any short-term production decline with improved environmental outcomes and longer-term agricultural viability/higher productivity, and utilize the most effective conservation practices.

Stakeholders in Iowa have utilized this type of integrated plan development. The Iowa Soybean Association (ISA), for example, has been developing plans utilizing USDA's Agricultural Conservation Planning Framework (ACPF) GIS Tool.[101] USDA's ARS developed the ACPF GIS tool in connection with a watershed planning conceptual framework, which recommends a dual focus on productivity and environmental benefit.[102] In developing plans, ISA incorporates conservation practices determined to be effective through the Iowa Nutrient Reduction Strategy scientific

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95 The scale determination "impacts stakeholder participation, data capture and analysis, inventories, policy recommendations, remedial actions, monitoring, [and] cost." MICH. DEP'T OF ENVTL. QUALITY, SCALE CONSIDERATIONS IN THE DEVELOPMENT OF A NINE-ELEMENT MANAGEMENT PLAN 1 (2013), https://perma.cc/8RKH-U8JB.

96 *See* Konopacky, *supra* note 17, at 277–83 (critiquing Wisconsin's continuing focus on large-scale TMDLs and proposing smaller-scale alternatives).

97 *See id.* at 274–75 (discussing that EPA has not identified an appropriate scale for watershed planning); *see also* EPA'S 2008 HANDBOOK FOR DEVELOPING TMDLS, *supra* note 17, at 23 ("Watershed TMDLs have addressed areas ranging in size from a few square miles to thousands of square miles.").

98 *See, e.g.*, Tomer et al., *Agricultural Conservation Planning Framework: 1*, *supra* note 38, at 754 ("[W]e propose and demonstrate an interim technology that is suited to [HUC] 12 watershed scale . . . ."); *see also* Tomer et al., *Agricultural Conservation Planning Framework: 2*, *supra* note 29, at 771 ("Our objective is to apply a classification scheme to identify conservation opportunities throughout a riparian network to six Midwestern hydrologic unit code (HUC)12 watersheds and compare the results among watersheds."); Al Kaisi & Helmers, *supra* note 29 (describing methods of minimizing property and soil damage where heavy rains filled soil profiles to capacity with water).

99 *See* Konopacky, *supra* note 17, at 302–03 (discussing counties' nine key element plans and case studies).

100 *See* Tomer et al., *Agricultural Conservation Planning Framework: 1*, *supra* note 38, at 754–55 (describing the need for watershed management plans to consider costs, effectiveness, and producer preference and need).

101 IOWA SOYBEAN ASS'N, IOWA SOYBEAN ASSOCIATION RESEARCH: 2016 ANNUAL REPORT 25 (2016), https://perma.cc/4D3B-JXM2.

102 *See* Tomer et al., *Agricultural Conservation Planning Framework: 1*, *supra* note 38, at 758, 761.

assessment.[103] Below, Figure 7 shows the nutrient removal effectiveness and standard deviation of practices studied pursuant to the Iowa Nutrient Reduction Strategy. Figure 8 depicts a menu of conservation options for one of ISA's studied watersheds. Figure 9 shows conservation practices that producers, ISA, and other stakeholders selected from the menu of options generated by the ACPF GIS assesment after engaging in a local community consultation.

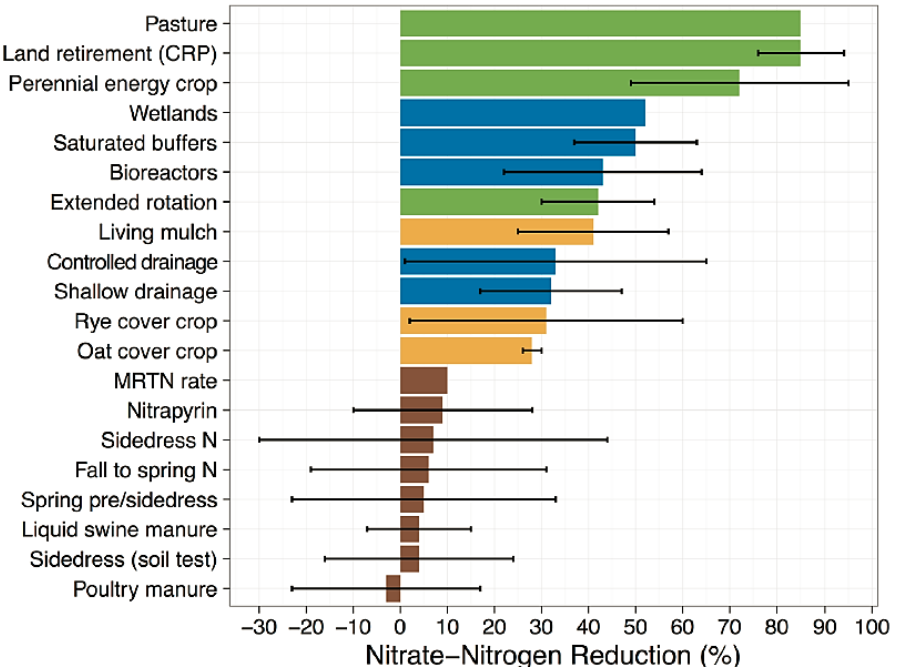

Figure 7: Effectiveness and standard deviation of conservation practices studied as part of Iowa's Nutrient Reduction Strategy implementation efforts[104]

103 IOWA SOYBEAN ASS'N, *supra* note 101, at 24–25.
104 *Id.* at 27.

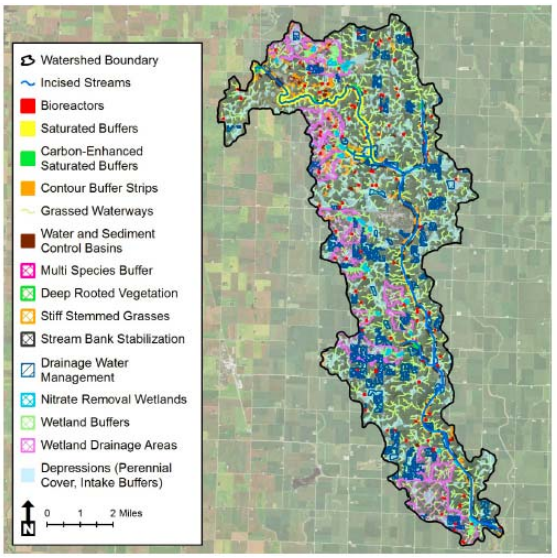

Figure 8: Iowa Soybean Association ACPF planning assessment, showing possible practices for a HUC 12 watershed[105]

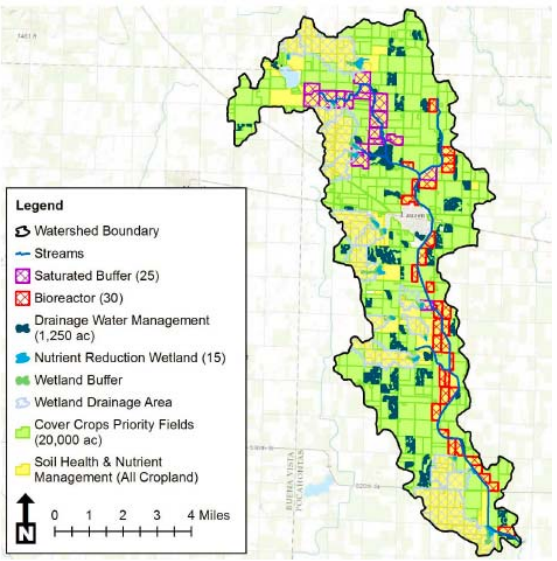

Figure 9: Practices selected for implemenation by stakeholders in a studied HUC 12 watershed[106]

105 ADAM KIEL, INCORPORATING ECONOMIC EFFICIENCY INTO WATERSHED PLANNING 18 (2016), https://perma.cc/5UT4-GG3F; *see also* AM. FARMLANDS TR., PROCEEDINGS: LEADERSHIP IN MIDWEST WATERSHEDS #7: ECONOMIC DRIVERS IN AGRICULTURE AND WATERSHED MANAGEMENT 20 (2016), https://perma.cc/EEA9-Q6YQ.

We do not recommend creating new or overlapping governance infrastructure or planning authorities to carry out HUC 12–scale planning.[107] Although HUC 12 planning could be funded by and carried out through various CWA and farm bill programs, we recommend a consistent approach to plan development and stakeholder involvement. As noted previously, we recommend that conservation districts or similar local entities working with local NRCS offices serve as the principal stakeholders responsible for HUC 12 plan development, implementation, and adaptive management.[108] This ensures that those entities that have historically been responsible for assisting with farm conservation planning have existing producer relationships and have farm planning and conservation practice implementation, tracking, and monitoring expertise are leading watershed planning.[109]

We further recommend that states require a uniform, inclusive, and cooperative watershed planning "conference" process for developing HUC 12–scale watershed plans. At a minimum, locally led watershed planning conferences should include stakeholders comprised of the following groups: NPSs; point sources; significant water users; federal, state, and local agency representatives; environmental community representatives; agriculture

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106 KIEL, *supra* note 105, at 28.

107 *See* John H. Davidson, Commentary: *Using Special Water Districts to Control Nonpoint Sources of Water Pollution*, 65 CHI.-KENT L. REV. 503, 516 (1989) ("By merging nonpoint source control into existing water management institutions, significant and practical governmental efficiency may be achieved. . . . The alternative to the merger of purposes is a continued 'layering' of governmental districts, corporations, and departments, each attempting to achieve specified water management purposes."); *but see* J.B. Ruhl et al., *Proposal for a Model State Watershed Management Act*, 33 ENVTL. L. 929, 938 & n.47 (2003) (discussing transboundary and simultaneous independent approaches to watershed planning, stating "that soil and water conservation districts, which in many states are elected and have political boundaries corresponding to county borders, have generally failed to live up to their promise of comprehensively managing soil and water quality issues," and later clarifying: "We do not mean to discount entirely the possibility that soil and water conservation districts in some states could be 'morphed' into the kind of local watershed-based political structure we describe [in this article]. Our point is that it would be difficult and unwise simply to graft the authorities and responsibilities we envision as necessary to carry out watershed management on to the existing structure of soil and water conservation districts.").

108 *See* JUDITH A. GALE ET AL., N.C. STATE UNIV., EXPERIMENTAL RURAL CLEAN WATER PROGRAM 23 (1993) (analyzing the CWA Rural Clean Water Program finding that the most successful watershed restoration projects were those with strong leadership and follow through at the local county level).

109 *See* Davidson, *supra* note 107, at 511 ("Soil conservation special districts were advocated by [USDA's Soil Conservation Service (SCS)] in order to organize landowners and allow them to develop common solutions to common erosion problems. The 'whole farm conservation plan'—an integrated plan of soil erosion control practices for an entire farming operation—was developed and complemented by soil capability classifications."); *id.* at 514–15 ("[The whole farm soil conservation plan] has the potential to be reformed and refitted for the control of nonpoint source pollution. . . . [T]he soil conservation plan is an established vehicle which is ready for deployment should the political will appear. Because the SCS is already situated in each county, and because the conservation plan is a format which is familiar to nearly every rural landowner, it offers a unique opportunity for action.").

groups, scientific community representatives; tribal councils; and other interested parties.[110]

Where a planning process for a relevant watershed has not been started by a local conservation district or similar entity, point source permittees may take the lead in developing a watershed plan as a means of permit compliance. This has occurred in Wisconsin under the state's adaptive management program, which allows permitted point sources to develop and implement watershed plans to restore water quality in the watersheds within which they are located as an alternative to installing pollution control technology onsite.[111] Where permittees take the lead in developing a watershed plan, we recommend that states require coordination with local conservation district(s) or similar entities and require permittees to follow the same process for plan development.

d. Site-Level Whole Farm Conservation Plans

Similar to the role of HUC 12 plans as building blocks for section 303(d) and 319 programs, site-level farm plans serve as the building blocks for HUC 12 plans. Specifically, the Framework encourages using existing site-level farm plans to help identify previously installed practices and utilizing additional site-level plans as implementation mechanisms for new practices identified in HUC 12 plans. The Framework further recommends that site-level plan development aims to address nutrient related water quality concerns by incorporating productivity, profitability, and water quality considerations.

To restore waterbodies impaired by agricultural runoff, it is critical that local watershed planning stakeholders work on necessary site-level planning for stakeholders in a local watershed simultaneously with HUC 12 plan development, as both planning level processes dynamically inform each other.[112] Although the Framework's proposed process of developing site-level plans in connection with HUC 12 plans is fairly novel, the practice of site-level conservation planning is well established in federal and state agricultural conservation programming.[113] NRCS and conservation districts

110 This approach is similar to that recommended in House Bill 2543, discussed previously. *See, e.g.*, Nonpoint Source Water Pollution Prevention Act of 1993, H.R. 2543, 103d Cong. § 321(e)(3)(B) (1st Sess. 1993) (listing required representative members of watershed management conferences); *see also supra* notes 84–87.

111 *See* Konopacky, *supra* note 17, at 264, 268–70.

112 Others have addressed similar approaches. *See* Hansen, *supra* note 23, at 319 (discussing the need for federal agricultural policy that takes an "integrated systems approach to agricultural NPS pollution . . . [and] balances the multiple national policy objectives with the economic and ecological needs of the individual farmer operating within a local, autonomous watershed"); *id.* at 322 ("[T]he majority of American farmers have become dependent upon their ability to successfully produce within a complex governmental structure based on program subsidies and commodity supports . . . that . . . still encourage farmers to maintain the maximum allowable eligible program yields and acres.").

113 *See, e.g.*, CRAIG COX ET AL., LOSING GROUND 5–6 (2011), https://perma.cc/GK6A-5TBH (describing both federally enforced and voluntary conservation programs in place since 1985).

are the main conduits for site-level conservation planning, technical assistance, and financial assistance.[114] Consequently, under the proposed Framework, we recommend that these stakeholders play principal roles in HUC 12 plan development and continue to take the lead on developing and implementing site-level conservation plans that will be used to implement HUC 12 plans. For site-level conservation practices being developed and implemented pursuant to a well developed HUC 12 plan, we recommend that local NRCS officials be authorized to utilize streamlined contract mechanisms and provide additional practice design and cost-share flexibility, if necessary.

In addition to recommending integrated site-level planning, we propose the use of adaptive management during the development and implementation of both HUC 12 and site-level plans. Using this approach, during HUC 12 plan development, local watershed planning stakeholders would work with producers, local NRCS offices, and other supporting partners to identify existing conservation practices; identify opportunities for installation of additional practices; and discuss implementation feasibility. Use of ARS's ACPF HUC 12 GIS databases and watershed planning tool would greatly facilitate this process. After conducting these analyses, local NRCS and conservation district offices would work with individual producers to finalize site-level plans. As HUC 12 plan implementation is carried out, if water quality monitoring reveals that additional amendment of a HUC 12 watershed plan is necessary or appropriate, planners may revisit with producers and stakeholders to discuss adding or subtracting feasible conservation practices identified in earlier planning discussions.

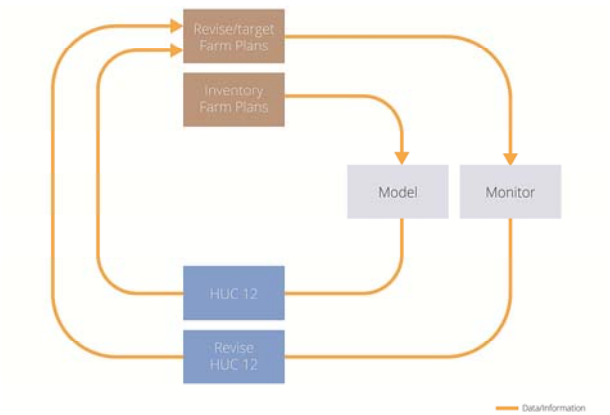

Figure 10: Adaptive management approach to HUC 12 and whole farm plan development[115]

114 *Id.* at 6, 29–30.

115 Image designed and created by Jamie Konopacky and Yannis Orfanos. Please visit *Environmental Law*'s online database to view the Article with color imagery. The online version

B. Revised Farm Bill Programming

1. Relevant Farm Bill Programs: History and Program Overviews

Farm Bill Conservation Title II programs provide technical assistance and funding for the design and implementation of conservation practices and easements, as well as funding for land retirement.[116] Farm bill conservation programs utilize producer "contracts"—a local delivery mechanism that is missing in the CWA programs discussed previously.[117]

Unfortunately, conservation practices implemented through farm bill conservation programs are not effectively addressing water quality concerns. One reason for this is that the majority of farm bill programs focus on implementing conservation practices on a producer-by-producer basis without contextualizing these practices within watersheds.[118] Further, the heavy administrative burden associated with the individual producer signup approach and inflexibility in practice design and cost-share rates also undermine local stakeholders' ability to use federally funded conservation practices to implement HUC 12 watershed plans. Moreover, the overly broad farm bill privacy provision inhibits critical information sharing and can substantially delay stakeholders' efforts to engage producers and efficiently develop plans.[119]

In this Subpart, we provide an overview of the farm bill conservation programs and then discuss proposed changes to these programs and the farm bill privacy provision. Relatedly, we also discuss amendments to the federal crop insurance program that would help to ensure that crop insurance does not undermine environmental gains that could be made through revised farm bill conservation programming. In-depth discussion of Farm Bill Conservation Title reform is beyond the scope of this Article. However, we do provide recommendations for several programmatic improvements, some of which are achievable in the near term. By incorporating the proposed recommendations, farm bill conservation programs can more effectively address agricultural NPS runoff that is contributing to nutrient-impaired waters and prevent the need for any additional regulation.

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also includes an appendix with enlarged images for enhanced clarity. *Articles*, ENVTL. L. (2017), http://elawreview.org/articles/.

116 STUBBS, *supra* note 5, at 1, 3, 7.

117 USDA calls conservation program agreements with producers "contracts," but they are more akin to cooperative agreements in which the producer is receiving a public benefit to provide a pubic good (i.e., improved environmental outcomes) with the on-going assistance of NRCS. *See Prospective Participants/General Public*, U.S. DEP'T AGRIC., https://perma.cc/6VG4-SMB7 (last visited July 22, 2017).

118 *See generally* STUBBS, *supra* note 5.

119 E-mail from Jason Gomes, Owner, N. Iowa Agronomy Partners, to author (May 17, 2017) (on file with authors).

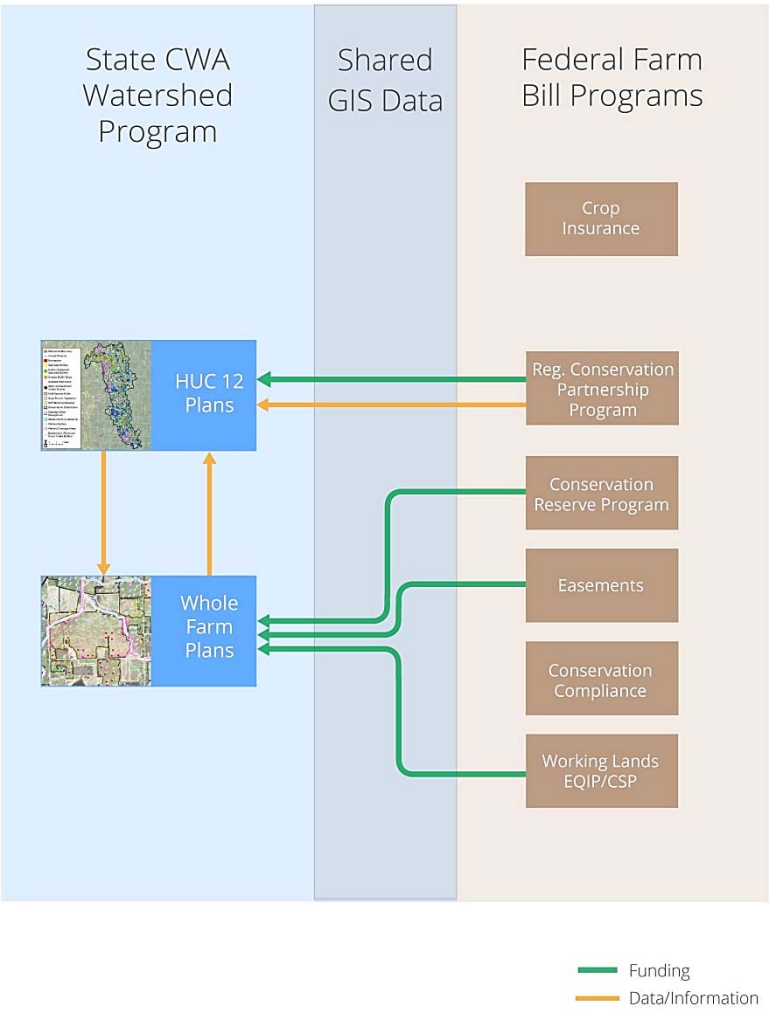

Figure 11: Proposed approach for implementing revised farm bill programs within the HUC 12 watershed context[120]

a. History

The inclusion of conservation as a standalone title in the farm bill is relatively recent,[121] and its evolution over successive farm bills reflects an acknowledgement of the need to address environmental harms caused by

120 Image designed and created by Jamie Konopacky and Yannis Orfanos. Please visit *Environmental Law*'s online database to view the Article with color imagery. The online version also includes an appendix with enlarged images for enhanced clarity. *Articles*, ENVTL. L. (2017), http://elawreview.org/articles/.

121 STUBBS, *supra* note 5, at 1 ("Agricultural conservation has been a stand-alone title in farm bills beginning [in 1981].").

agriculture.[122] The 1985 Farm Bill[123] marked a turning point in farm bill history, with the purpose of conservation shifting from being part of the "farm safety net" to squarely addressing natural resource concerns.[124] The conservation provisions in the 1985 Farm Bill introduced conservation compliance, which requires a basic level of conservation from agricultural producers in exchange for farm bill benefits like subsidies and crop insurance, and introduced the Conservation Reserve Program (CRP), a semi-land retirement program for fragile lands.[125] Up until the 2014 Farm Bill,[126] the number of conservation programs increased, with a noticeable shift in emphasis from land retirement programs to funding conservation practices on working lands.[127] Throughout, the farm bill has taken a voluntary, non-regulatory approach to addressing environmental harms of farming.[128]

Farm bill agricultural conservation programs can be divided into five categories: working lands programs, land retirement programs, easement programs, compliance programs, and other conservation programs.[129] Under the farm bill conservation programs, producers that choose to participate enter into rental, easement, or cost-share contracts, according to the requirements of the specific program.[130] Under cost-share contracts, which are used to subsidize the implementation of conservation practices to address identified resource concerns, producers agree to install conservation practices, with the government typically providing between 50%–75% of the cost of installation.[131] Compensation structures—rental, easement, and cost-share payments—vary by program.[132] Importantly, in addition to funding, NRCS—in conjunction with local conservation

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122 *See generally* Zachary Cain & Stephen Lovejoy, *History and Outlook for Farm Bill Conservation Programs*, CHOICES, 4th Quarter, 2004, at 37, 37–41 (outlining the history of conservation provisions within farm bills).

123 Food Security Act of 1985, Pub. L. No. 99-198, 99 Stat. 1354 (codified as amended in scattered sections of 7 and 16 U.S.C.).

124 *See* Ristino & Steier, *supra* note 14, at 88.

125 16 U.S.C. § 3831 (2012 & Supp. III 2016).

126 Agricultural Act of 2014, Pub. L. No. 113-79, 128 Stat. 649 (codified as amended in scattered sections of 7 and 16 U.S.C.).

127 *See* Erik Lichtenberg, *Conservation, the Farm Bill, and U.S. Agri-Environmental Policy*, CHOICES, 3rd Quarter, 2014, at 1, 1–2.

128 MEGAN STUBBS, CONG. RESEARCH SERV., R40763, AGRICULTURAL CONSERVATION: A GUIDE TO PROGRAMS 2 (2016), https://perma.cc/N4HV-QT5H; ENVTL. & ENERGY STUDY INST., FACT SHEET: CONSERVATION MEASURES AND THE FARM BILL (2017), https://perma.cc/U4C6-YSVL.

129 STUBBS, *supra* note 128, at 2.

130 Ristino & Steier, *supra* note 14, at 93.

131 *See* 16 U.S.C. § 3839aa-2(d)(4)(B)(i) (Supp. III 2016); *id.* § 3839aa-2(d)(2)(A) (2012).

132 *See id.* § 3839aa-2(d); *id.* § 3871c(c) ("[T]he Secretary may make payments to a producer in an amount determined by the Secretary to be necessary to achieve the purposes of the program . . . to producers participating in a project that addresses water quality concerns and in an amount sufficient to encourage adoption of conservation practices and systems that improve nutrient management."); *id.* § 3838g(d)(2) ("The amount of the annual payment shall be . . . based, to the maximum extent practicable, on the following factors: (A) Costs incurred by the producer associated with planning, design, materials, installation, labor, management, maintenance, or training. (B) Income forgone by the producers. (C) Expected conservation benefits. (D) The extent to which priority resource concerns will be addressed through the installation and adoption of conservation activities on the agricultural operation.").

districts—provides technical assistance to producers to plan and install conservation measures to improve environmental outcomes.[133] Ironically, because of the growth of the cost-share programs that include heavy administrative requirements and the decrease in NRCS's workforce, the agency's ability to fulfill its traditional and critical technical assistance role has declined over time.[134] Moreover, a significant portion of technical assistance is now outsourced through private "technical service providers" (TSPs) with varying degrees of efficacy.[135]

b. Programs

i. Conservation Compliance

Enacted in 1985, "[c]onservation compliance is the closest analog to environmental regulation in the Farm Bill."[136] Comprised of the "sodbuster" and "swampbuster" requirements, conservation compliance provisions require that in exchange for farm bill benefits and subsidies such as commodity payments, farm loans, crop insurance, and conservation payments, producers meet conservation requirements for highly erodible lands and wetlands.[137] Under the sodbuster provisions, producers must agree to cultivate land classified as "highly erodible" using an approved conservation plan.[138] Under the swampbuster provisions, producers who convert wetlands after November 28, 1990, making agricultural commodity production possible, are generally ineligible for USDA program benefits.[139] Producers self-certify compliance.[140] Although critically important because of

133 *Id.* § 3841(c)(1); *see also id.* § 3865c(b)(6)(A) ("The Secretary shall pay as compensation for a permanent wetland reserve easement acquired under the program an amount necessary to encourage enrollment in the program . . . Compensation for a 30-year contract or 30-year wetland reserve easement shall be not less than 50 percent, but not more than 75 percent, of the compensation that would be paid for a permanent wetland reserve easement."); *id.* § 3833(a) ("[T]he Secretary shall—(1) share the cost of carrying out the conservation measures and practices set forth in the contract for which the Secretary determines that cost sharing is appropriate and in the public interest; and (2) for a period of years not in excess of the term of the contract, pay an annual rental payment in an amount necessary to compensate for—(A) the conversion of highly erodible cropland or other eligible lands normally devoted to the production of an agricultural commodity on a farm or ranch to a less intensive use; (B) the retirement of any base history that the owner or operator agrees to retire permanently; and (C) the development and management of grasslands for multiple natural resource conservation benefits, including to soil, water, air, and wildlife.").

134 *Making it Right*, ENVTL. WORKING GROUP, https://perma.cc/4RVK-PKXD (last visited July 22, 2017).

135 *Technical Service Providers*, U.S. DEP'T AGRIC., https://perma.cc/PM6X-5SXX (last visited July 22, 2017).

136 Ristino & Steier, *supra* note 14, at 90.

137 STUBBS, *supra* note 5, at 2, 6.

138 16 U.S.C. §§ 3811(a), 3812, 3812a (2012 & Supp. III 2016).

139 16 U.S.C. § 3821(d) (Supp. III 2016); *Wetland Conservation Provisions (Swampbuster)*, U.S. DEP'T AGRIC., https://perma.cc/C7BV-NQ6C (last visited July 22, 2017).

140 16 U.S.C. § 3812a(d)(1) (2012).

the basic level of conservation these requirements provide, the statutory authority provides a significant number of exemptions that arguably weaken the effect of conservation compliance.[141] Further, NRCS, the agency within USDA that implements conservation compliance, has been repeatedly criticized for a failure to enforce its requirements.[142]

ii. Conservation Easements

NRCS is one of the largest funders of conservation easements, with the farm bill allocating millions to purchase easements on working lands.[143] In the 2014 Farm Bill, ostensibly to simplify administration and show a cost savings, Congress combined several conservation easement programs into the Agricultural Conservation Easement Program (ACEP).[144] ACEP includes two types of easements: agricultural land easements and wetland reserve easements.[145] Under the agricultural land portion of ACEP, NRCS provides matching funding for eligible third parties, like land trusts, to purchase and hold easements.[146] Under the wetland reserve easement provisions, NRCS purchases and holds easements on working lands to restore and protect wetlands that have been previously converted for the purposes of crop production.[147] Wetland easements may be thirty-year easements, permanent easements, or easements for the maximum duration allowed under applicable state law.[148]

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141 *See, e.g.*, *id.* § 3812(f)(1) ("No person shall become ineligible under section 3811 of this title for program loans, payments, and benefits as a result of the failure of the person to actively apply a conservation plan, if the Secretary determines that the person has acted in good faith and without an intent to violate this subchapter.").

142 *See, e.g.*, OFFICE OF INSPECTOR GEN., U.S. DEP'T OF AGRIC., AUDIT REPORT 50601-0005-31, USDA MONITORING OF HIGHLY ERODIBLE LANDS AND WETLAND CONSERVATION VIOLATIONS 5, 15, 18 (2016), https://perma.cc/PBN7-T6VJ (finding that NRCS compliance reviews of HEL tracts resulted in inconsistent determinations, did not clearly define roles and responsibilities for compliance reviews, and did not effectively sample eligible tracts for compliance).

143 *See* 16 U.S.C. § 3865(a) (Supp. III 2016) (establishing conservation easement program); *Agricultural Conservation Easement Program*, U.S. DEP'T AGRIC., https://perma.cc/98GW-MPS3 (last visited July 22, 2017) (explaining that NCRS is offering $15 million in 2017 to help eligible local partners establish conservation easements). *See also* UNIF. CONSERVATION EASEMENT ACT § 1(1) (NAT'L CONFERENCE OF COMM'RS ON UNIF. STATE LAWS 2007) (defining "'conservation easement' [as] a nonpossessory interest of a holder in real property imposing limitations or affirmative obligations the purposes of which include retaining or protecting natural, scenic, or open-space values of real property, assuring its availability for agricultural, forest, recreational, or open-space use, protecting natural resources, maintaining or enhancing air or water quality, or preserving the historical, architectural, archaeological, or cultural aspects of real property.")

144 16 U.S.C. § 3865.

145 *Id.* §§ 3865b, 3865c.

146 *Id.* § 3865b(a)–(b)(2).

147 *Id.* § 3865c(a).

148 *Id.* § 3865c(b)(1).

iii. Conservation Reserve Program

The CRP provides compensation to farmers for taking marginal lands out of production and installing practices that improve soil or water quality or wildlife habitat.[149] Unlike the farm bill easement program, producer agreements under CRP only cover ten to fifteen year periods.[150]

iv. Working Lands Programs

Working lands conservation programs allow private land to remain in production while requiring participating producers receiving financial support—also known as cost-share—to implement structural or management practices to improve conservation outcomes.[151] Enacted in 1996 and 2002 respectively,[152] the Environmental Quality Incentives Program[153] (EQIP) and the Conservation Stewardship Program[154] (CSP) are the primary working lands programs.[155] EQIP is the largest working lands program if measured by funding level.[156] In the 2014 Farm Bill, through the EQIP program, Congress authorized NRCS to provide producers with over a billion dollars annually in cost-share assistance to install conservation practices.[157] Working lands program participants receive technical, planning, and financial assistance to install conservation practices.[158] Each state has a manual of conservation practices approved by state NRCS offices.[159] For example, approved conservation practices in Iowa under EQIP may include fencing livestock out of streams, planting cover crops, planting conservation buffers between cropped fields and waterways, or installing cement pads for livestock in order to reduce erosion.[160] EQIP provides producers assistance to implement new practices, and CSP provides producers assistance "to maintain and improve existing conservation systems, and adopt additional conservation activities."[161] EQIP contracts can cover terms of up to ten

149 *Id.* § 3831(a)–(b) (2012 & Supp. III 2016).

150 *Id.* § 3831(e).

151 STUBBS, *supra* note 5, at 7.

152 Ristino & Steier, *supra* note 14, at 93–94.

153 16 U.S.C. § 3839aa.

154 *Id.* §§ 3838d–3838e (Supp. III 2016).

155 STUBBS, *supra* note 5, at 7.

156 *See* 16 U.S.C. § 3841(a).

157 *Id.* § 3841(a)(5).

158 STUBBS, *supra* note 5, at 7. Practices installed under the EQIP program are carried out according to EQIP plans. *Id.* at 8.

159 *See Environmental Quality Incentives Program*, U.S. DEP'T AGRIC., https://perma.cc/M64C-YZ9C (last visited July 22, 2017).

160 NAT. RES. CONSERVATION SERV., IOWA ENVIRONMENTAL QUALITY INCENTIVES PROGRAM (EQIP): LIST OF ELIGIBLE PRACTICES AND PAYMENT SCHEDULE FY2017, at 3–4, 99–100, 235–36, 386–87 (2017), https://perma.cc/XUT7-HHBX (accessible through the "2017 Iowa EQIP Practice Descriptions and Payment Schedules" hyperlink).

161 STUBBS, *supra* note 5, at 8.

years.[162] CSP contracts are for five years, with the option to renew if a producer agrees to achieve additional conservation objectives.[163] If measured by covered acres, CSP is now the largest farm bill conservation program, with seventy million acres of working lands enrolled.[164]

v. Other Programs

Through the creation of the Regional Conservation Partnership Program[165] (RCPP), the 2014 Farm Bill consolidated various programs[166] and increased its focus on partnership opportunities and funding for watershed-scale projects.[167] The RCPP creates partnership opportunities for NGOs, institutions of higher education, state and local governments, tribes, municipal and wastewater entities, and water and/or irrigation districts. Through the RCPP, these entities can leverage federal conservation funding to address priority resource concerns, including water quality, through projects that include multiple producers.[168] RCPP projects must be located in either a Critical Conservation Area (CCA) or a Regional Conservation Partnership (RCP) area.[169] As shown by Figure 12 below, there are eight nationwide CCAs defined by USDA.[170] RCPs are defined through partnership agreements,[171] which may cover five-year periods with a possible one-year extension.[172] Eligible producers that choose to participate in RCPP projects by implementing conservation practices, granting easements, or retiring land may work with a sponsoring RCPP partner or may choose to work directly with USDA.[173] RCPP utilizes the conservation, easement, and rental contracts and agreements provided for in the ACEP, EQIP, CSP, and Healthy Forests Reserve Program.[174]

162 16 U.S.C. § 3839aa-2(b)(2).

163 *Id.* § 3838f(d)(1); *CSP Payments*, U.S. DEP'T AGRIC., https://perma.cc/9FZM-SZ5M (last visited July 22, 2017).

164 *Conservation Stewardship Program*, U.S. DEP'T AGRIC., https://perma.cc/JJ7G-ZUVL (last visited July 22, 2017).

165 16 U.S.C. § 3871(a).

166 The Agricultural Water Enhancement Program, the Chesapeake Bay Watershed Program, the Cooperative Conservation Partnership Initiative, and the Great Lakes Basin Program were all rolled into the RCPP. *Regional Conservation Partnership Program*, U.S. DEP'T AGRIC., https://perma.cc/33UY-6W3S (last visited July 22, 2017).

167 STUBBS, *supra* note 5, at 12.

168 16 U.S.C. § 3871a(2), (4).

169 STUBBS, *supra* note 5, at 12–13.

170 *Id.* at 13.

171 *Id.* at 12–13.

172 16 U.S.C. § 3871b(b).

173 STUBBS, *supra* note 5, at 13.

174 *About RCPP*, *supra* note 89.

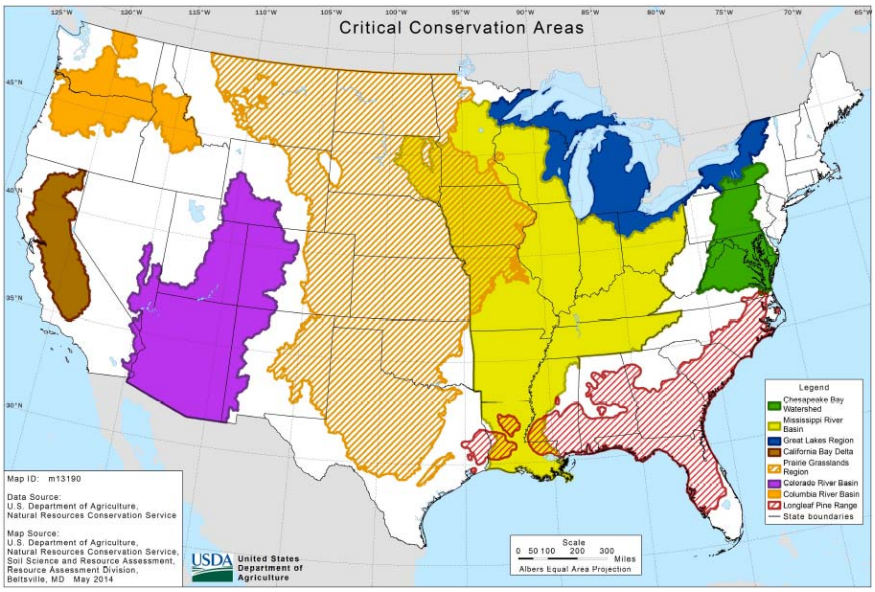

Figure 12: RCPP Critical Conservation Areas, as designated by the Secretary of Agriculture[175]

vi. Crop Insurance

Under the 2014 Farm Bill, the federal crop insurance program is now the primary farm "safety net" through which agriculture is subsidized, with over $100 billion in liabilities annually.[176] The crop insurance program is widely subscribed to by producers, covering about 90% of planted cropland by 2015.[177] Crop insurance is a public–private partnership with USDA's Risk Management Agency (RMA) and its Federal Crop Insurance Corporation Board (FCIC).[178] RMA and FCIC are responsible for determining the set of insurance products, rules, and rates/prices. However, private companies deliver the insurance product.[179] Rather than using information on soil quality—a prime indicator of productivity and actual planting risk—to help determine rates, RMA determines premium rates using the "Actual Production History" method.[180] The Actual Production History method is a "measure of average historical yields across mixed fields."[181] To encourage

175 *RCPP Critical Conservation Areas*, U.S. DEP'T AGRIC., https://perma.cc/E6NU-TREP (last visited July 22, 2017).

176 Joshua Woodard, *Integrating High Resolution Soil Data into Federal Crop Insurance Rates: Actuarial, Policy, and Sustainability Implications*, ENVTL. SCI. & POL'Y 93, 93 (2016).

177 *Why Is the Insurance Premium Discount Provided by the Federal Government So Important?*, CROP INS., https://perma.cc/MJ77-YERG (last visited July 22, 2017).

178 Woodard, *supra* note 176, at 93.

179 *Id.*

180 *Id.* at 94.

181 *Id.*

producers to participate in the federal crop insurance program, the federal government provides a 60% premium discount.[182]

2. Recommendations for Farm Bill Conservation and Crop Insurance Programs

Because farm bill conservation programs provide implementation mechanisms, technical assistance, and a substantial amount of funding for conservation practices, these programs are critical components of an integrated policy framework focused on the development and implementation of small-scale watershed plans. Moreover, crop insurance is also key to the extent that it can be reformulated to appropriately incentivize environmentally sound farming practices on the front end. Below, we recommend changes to the farm bill conservation programs and the farm bill privacy provision, as well as amendments to the crop insurance program to improve conservation outcomes.[183] We address farm bill program reform generally, rather than on a per program basis, because our recommendations are applicable across all programs. Some of the recommendations presented may be accomplished administratively, while others may require changes in law.

a. Conservation Compliance

The first line of conservation defense for lands in agricultural production is conservation compliance.[184] Unfortunately, NRCS—the agency responsible for its implementation—has been criticized for failing to robustly administer conservation compliance.[185] The reasons for this are multi-factorial. NRCS's technical staffing has declined—even though farm bill conservation programs have expanded—shifting the emphasis of NRCS from technical assistance provider to conduit for federal financial assistance.[186] Administration of conservation compliance also presents a challenge because NRCS relies on its collaborative relationships with producers to achieve on-the-ground conservation implementation through farm bill conservation programs, and the quasi-regulatory nature of conservation compliance is at odds with NRCS's parallel efforts to garner farmer participation through these voluntary conservation programs.[187]

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182 *See Why Is the Insurance Premium Discount Provided by the Federal Government So Important?*, *supra* note 177.

183 These recommendations are reflected in the farm bill programming as depicted in the Framework graphic (fig.2), *supra* note 55.

184 *See* discussion *supra* Part III.B.1.b.i.

185 The USDA Office of the Inspector General and the General Accountability Office have repeatedly criticized NRCS for failing to implement and enforce conservation compliance. *See, e.g.*, USDA MONITORING OF HIGHLY ERODIBLE LANDS AND WETLAND CONSERVATION VIOLATIONS, *supra* note 142, at 5.

186 Ristino & Steier, *supra* note 14, at 109; *Making It Right*, *supra* note 134.

187 Ristino & Steier, *supra* note 14, at 100.

Finally, a lack of USDA transparency and protocols to publicly report enforcement efforts creates an environment where such a lack of enforcement and implementation is perpetuated.[188]

It is also important to note that the NRCS regulatory standard for the highly erodible lands (HEL) compliance ensures that there will always be a net loss of soils.[189] Specifically, the NRCS policy allows soils to erode at approximately twice the rate at which they are created.[190] Moreover, much soil erodes from lands not designated as HEL by NRCS.[191] Despite having a soil conservation policy to address erosion since the 1930s, severe erosion persists.[192] According to USDA's most recent Natural Resources Inventory, soil erosion has actually increased since 2007, reversing decades of progress, including in the corn-belt, the lake states, and the southern plains.[193]

We cannot attain clean water if soil is eroding off farmland. Accordingly, we recommend that conservation compliance be robustly implemented to address soil erosion. We further recommend, as a long-term strategy, adoption of a national healthy soils policy, which aims to eliminate erosion while increasing soil resilience.

b. Crop Insurance

Crop insurance, for which the tax payer underwrites 60% of the premium on average, is now the main farm "safety net," having largely replaced unpopular direct payments in the 2014 Farm Bill.[194] In the 2014 Farm Bill, conservation compliance requirements were "coupled" with farm bill benefits like crop insurance to expand the number of producers subject to conservation compliance requirements.[195] Unfortunately, the actual environmental benefits of this coupling have been muted because of USDA's failure to take into account risky planting practices and reward best management practices in its crop insurance rate setting.[196]

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188 *See id.* at 98, 111–15 (providing data showing farmer conservation violations by state). *See generally* USDA MONITORING OF HIGHLY ERODIBLE LANDS AND WETLAND CONSERVATION VIOLATIONS, *supra* note 142.

189 Ristino & Steier, *supra* note 14, at 101.

190 *See* 7 C.F.R. §§ 12.20–.23 (2016).

191 *See, e.g.*, *Soil Erosion on Cropland 2007*, U.S. DEP'T AGRIC., https://perma.cc/V69M-HSD9 (last visited July 22, 2017) ("The acreage of non-HEL cropland that had [unsustainable] erosion rates . . . [was] 46 [million] acres . . . [in] 2007).

192 *See Erosion Exceeding the Soil Loss Tolerance Rate on Cropland, 2012*, U.S. DEP'T AGRIC., https://perma.cc/8DTF-7M4J (last visited July 22, 2017).

193 *See* NAT. RES. CONSERVATION SERV., 2012 NATURAL RESOURCES INVENTORY SUMMARY REPORT 2-6 to -7 (2015), https://perma.cc/NT2H-ZBZ6.

194 *See generally* DENNIS A. SHIELDS, CONG. RESEARCH SERV., R43758, FARM SAFETY NET PROGRAMS: BACKGROUND AND ISSUES (2015), https://perma.cc/W8VM-JFFQ; *see also* Jonathan Coppess, *Conservation Compliance and Crop Insurance in the New Farm Bill*, FARMDOC DAILY (May 2, 2014), https://perma.cc/38WY-XXYF.

195 Coppess, *supra* note 194; *2014 Farm Bill Drill Down: Conservation—Crop Insurance Linkages*, NAT'L SUSTAINABLE AGRIC. COALITION (Feb. 10, 2014), https://perma.cc/C7F7-KD8H.

196 Woodard, *supra* note 176, at 99.

We recommend that crop insurance premiums be correlated to the risk associated with soil type to avoid a result in which risky planting practices are subsidized and good farming practices are essentially penalized.[197] By doing so, federal crop insurance policy would promote farming on the most productive land and disincentivize farming on marginal land. A revised crop insurance program could also promote more sustainable production decisions by "appropriately incentivizing (or at least not disincentivizing) adoption [of optimal conservation practices such as cover crop use, skip-row, adaptive nitrogen management, or others] via insurance which is appropriately designed and rated."[198]

c. Resource Prioritization Through the Watershed Approach

For some time now, NRCS has recognized the value of using partnerships and either landscape or watershed initiatives to address priority resource concerns, strengthen locally driven initiatives, and leverage non-federal funding for improved environmental outcomes. NRCS landscape initiatives began in earnest under the 2008 Farm Bill (e.g., the Sage Grouse Initiative).[199] More recently, NRCS has continued to work on landscape and watershed scale conservation efforts through the RCPP.[200] The agency's National Water Quality Initiative also works to address agricultural NPS nutrient loading in prioritized watersheds rather than on a producer-by-producer basis.[201]

We recommend that all Farm Bill Conservation Title II programs be amended to more robustly and transparently incorporate a HUC 12–scale watershed planning and implementation approach for addressing water quality resource concerns.[202] Specifically, Congress or NRCS should define "small-scale watershed plans" and incorporate a framework for HUC 12 watershed planning and implementation in farm bill conservation programming.[203] In addition to identifying a HUC 12 watershed planning

197 *Id.*

198 Joshua D. Woodard & Leslie J. Verteramo Chiu, *Soil Data Not Considered in Cornerstone U.S. Agricultural Policy* 13 (Ag-Analytics.org, Working Paper, 2016).

199 Food, Conservation, and Energy Act of 2008, Pub. L. No. 110-234, 112 Stat. 923 (codified as amended in scattered sections of 7 and 16 U.S.C.); *see NRCS Landscape Conservation Initiatives*, U.S. DEP'T AGRIC., https://perma.cc/72WU-5DU3 (last visited July 22, 2017).

200 *2016 RCPP Projects by State*, U.S. DEP'T AGRIC., https://perma.cc/T7JJ-4LPB (last visited July 22, 2017).

201 *National Water Quality Initiative*, U.S. DEP'T AGRIC., https://perma.cc/RC9F-TU4K (last visited July 22, 2017).

202 *See generally* TAXPAYERS FOR COMMON SENSE, IMPROVING PERFORMANCE MEASUREMENT IN AGRICULTURAL CONSERVATION PROGRAMS (2014), https://perma.cc/3THB-VGCC (providing an excellent critique on needed conservation program reforms).

203 Avoiding additional regulation is a goal cited in both the EQIP and RCPP. 16 U.S.C. § 3839aa (2012 & Supp. III 2016) ("[EQIP seeks] to optimize environmental benefits by . . . avoiding, to the maximum extent practicable, the need for resource and regulatory programs by assisting producers in protecting soil, water, air, and related natural resources and meeting environmental quality criteria established by Federal, State, tribal, and local agencies."); *id.* § 3871(b)(3) (Supp. III 2016) ("[The RCPP seeks t]o encourage eligible partners to cooperate

approach in the farm bill conservation title, Congress or NRCS could clarify the "state priorities" language in the conservation programs through statutory amendment or guidance. For example, policymakers could specify that watershed planning and implementation through farm bill programs should take into consideration HUC 12 areas prioritized by states in their section 303(d) programs.[204] Currently, farm bill programs pay lip service to addressing state priorities, but the programs do so superficially, differently, or not at all.[205]

To effectively carry out a HUC 12 watershed planning policy option, the timelines for conservation contracts in farm bill conservation programs may need to be adjusted to reflect HUC 12 watershed planning and implementation timelines. In Wisconsin and Iowa, a fifteen to twenty-year timeline is common for implementing HUC 12 watershed plans, and a similar timeline should be included in a federal watershed planning policy option to ensure enough time for implementation success.[206] Currently, the standard contract terms for most farm bill conservation programs do not cover the full duration of a typical watershed plan.[207] The exception is easements, which may be permanent, for the maximum period allowable under state

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with producers in . . . meeting or avoiding the need for national, state, and local natural resource regulatory requirements related to production on eligible land.").

204 *See supra* Part III.A.2.a.

205 *See* 16 U.S.C. § 3831(f) (2012 & Supp. III 2016) (CRP) ("On application by the appropriate State agency, the Secretary shall designate areas of special environmental sensitivity as conservation priority areas. . . . Eligible areas . . . include areas with actual and significant adverse water quality or habitat impacts related to agricultural production activities. . . . Conservation priority area designation . . . expire[s] after 5 years, subject to redesignation, except that the Secretary may withdraw an area's designation if the Secretary finds that the area no longer contains actual and significant adverse water quality or habitat impacts related to agricultural production activities. . . . In carrying out this subsection, the Secretary shall attempt to maximize water quality and habitat benefits in . . . watersheds . . . by promoting a significant level of enrollment of land within the watersheds . . . by whatever means the Secretary determines are appropriate and consistent with the purposes of this subpart."); *id.* § 3838e(a) (Supp. III 2016) (CSP) ("[T]he Secretary shall carry out a conservation stewardship program to encourage producers to address priority resource concerns and improve and conserve the quality and condition of natural resources in a comprehensive manner."); *id.* § 3838d(5) ("The term 'priority resource concern' means a natural resource concern or problem, as determined by the Secretary that—(A) is identified at the national, State, or local level as a priority for a particular area of a State; (B) represents a significant concern in a State or region; and (C) is likely to be addressed successfully through the implementation of conservation activities under this program."); *id.* § 3871f(c)(2) ("The Secretary shall, to the maximum extent practicable, ensure that eligible activities carried out in critical conservation areas designated under this section complement and are consistent with other Federal and state programs and water quality and quantity strategies."); *see also RCPP State Resource Concerns*, U.S. DEP'T AGRIC., https://perma.cc/4AY6-DMBM (last visited July 22, 2017) ("[RCPP] project applications submitted for consideration through the state funding pool should address at least one of the national priorities or a state-identified priority.").

206 Konopacky, *supra* note 17, at 302–05 (discussing various plans within Wisconsin); *A Guide to Iowa Conservation Programs*, U.S. DEP'T AGRIC., https://perma.cc/QJ3P-34RW (last visited July 22, 2017).

207 *See, e.g.*, Konopacky, *supra* note 17, at 304 ("[T]he 2013 St. Croix nine key element implementation plan establishes a tentative twenty percent reduction goal over a ten to thirty year period.").

law, or for thirty-year terms.[208] CSP contracts range from five to ten years.[209] EQIP contracts can be up to ten years,[210] and CSP and RCPP partner contracts cover five-year terms.[211] To facilitate more effective incorporation of conservation practices into watershed implementation plans, contract terms for farm bill conservation programs (other than the easement programs) may need to be synced with watershed plans. This will require a legislative change to the duration of agreements under EQIP, CSP, and RCPP.

d. Resource Allocation

Funding for farm bill conservation programs should be allocated in a manner that provides sufficient support for the substantial small-scale watershed planning and implementation that is necessary to address nutrient-related impairments caused by agricultural runoff. One option for better allocating funds would be to more explicitly define a watershed planning and implementation option in the RCPP and increase funding for the same. Currently, the EQIP—which takes a producer-by-producer approach to conservation—not the RCPP, is the highest funded program.[212] For 2018, Congress authorized $1.75 billion to be used to implement the EQIP program.[213] In contrast, in the 2014 Farm Bill, Congress authorized $100 million in standalone funds plus 7% of funds and acres from the EQIP, CSP, ACEP, and Healthy Forests Reserve Program to be used for carrying out the RCPP.[214] For 2018, this formula will make approximately $252.6 million available to carry out the RCPP.[215] To best address agricultural NPS nutrient loading, we recommend increasing funding levels for a small-scale watershed option in the RCPP and/or a similar approach in other conservation programs.

In addition to recommending federal farm bill funding adjustments to better support small-scale watershed planning and implementation, we also recommend additional state funding be made available to scale watershed planning and implementation to the level necessary to completely restore nutrient-impaired waterbodies in the United States.[216] Additional state funds,

208 16 U.S.C. § 3865c(b)(1).

209 *Id.* § 3838f(d), (e) (2012).

210 *Id.* § 3839aa-2(b)(2) (Supp. III 2016).

211 *Id.* § 3871b(b).

212 U.S. DEP'T OF AGRIC., NO. USDA-NRCS-NHQ-RCPP, REGIONAL CONSERVATION PARTNERSHIP PROGRAM 9 (2017), https://perma.cc/86QB-PTQV (accessible via "[d]ownload a copy of the new RCPP APF" hyperlink).

213 16 U.S.C. § 3841(a)(5)(E).

214 *Id.* § 3871d(a), (c)(1); REGIONAL CONSERVATION PARTNERSHIP PROGRAM, *supra* note 212, at 9.

215 REGIONAL CONSERVATION PARTNERSHIP PROGRAM, *supra* note 212, at 9.

216 Marc Ribaudo, *Reducing Agriculture's Nitrogen Footprint: Are New Policy Approaches Needed?*, AMBER WAVES, Sept. 2011, at 34, 37 ("About 108 million acres of U.S. cropland need improved nitrogen management. Assuming that farmers would adopt nutrient management practices for an annual payment of $8.88 per acre (the average EQIP payment rate made to

like those provided by the Minnesota Legacy Fund, will be needed and should be contributed as a good policy matter.[217] Moreover, leveraging NGO funding and technical resources is also needed. For example, in many watersheds, land trusts, as well as organizations like Ducks Unlimited and Pheasants Forever, are essential partners and stakeholders in improving and protecting wetlands and associated habitat.[218]

e. Streamlining Administration and Revitalizing Technical Assistance

To aid in the development of site-level plans and guide the implementation of effective conservation practices, producers require sound technical assistance. Since the creation of NRCS's predecessor—the Soil Conservation Service—post-Dust Bowl, NRCS has been a critical provider of on-the-ground technical assistance to farmers across the country.[219] However, NRCS's capacity to provide technical assistance has seriously eroded over the past several decades, as the conservation title programs have expanded.[220] In part, this has occurred because NRCS shoulders the administrative burden of annually executing thousands of conservation contracts with producers to obligate farm bill dollars.[221] This paperwork burden detracts from the agency's ability to provide in-field conservation and implementation assistance to producers.[222] Moreover, NRCS has also seen a decline in technical staff.[223] Instead of addressing NRCS's dwindling technical assistance capacity by investing in workforce development and recommitting to this core aspect of its mission, in the 2002 Farm Bill,[224]

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farmers adopting nutrient management), the cost would be $959 million per year, out of a total EQIP budget of about $1.1 billion.").

217 *See* Konopacky, *supra* note 17, at 301; *Clean Water Fund*, MINN.'S LEGACY, https://perma.cc/4M3L-WJXU (last visited July 22, 2017).

218 *Farm Bill: The Importance of Farm Bill Policy to Ducks Unlimited*, DUCKS UNLIMITED, https://perma.cc/TXX5-DU4M (last visited July 22, 2017).

219 *More Than 80 Years Helping People Help the Land: A Brief History of NRCS*, U.S. DEP'T AGRIC., https://perma.cc/6F7Y-UZXF (last visited July 22, 2017).

220 In its 2007 report, the Soil and Water Conservation Society found that NRCS staffing levels were 11% below pre-1985 Farm Bill levels despite a 500% increase in funding due the expansion of the conservation programs. SOIL & WATER CONSERVATION SOC'Y & ENVTL. DEF., *supra* note 19, at 1. Similarly, in 2014, the United States Government of Accountability Office reported a decline in NRCS staffing due to budget pressure and retirements. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-14-288, U.S. DEPARTMENT OF AGRICULTURE: WORKFORCE DECISIONS COULD BENEFIT FROM BETTER LINKAGE TO MISSIONS AND USE OF LEADING PRACTICES 6–7 (2014), https://perma.cc/WJ2N-GNWU.

221 *E.g.*, *NRCS Conservation Programs: Environmental Quality Incentives Program (EQIP)*, *supra* note 16.

222 For example, in 2015 alone, NRCS obligated over a billion dollars under the CSP, the bulk of which were financial assistance dollars. *NRCS Conservation Programs*, U.S. DEP'T AGRIC., https://perma.cc/3D74-LWWM (last visited July 22, 2017). To perfect these obligations, NRCS entered into over 17,000 contracts for financial assistance. *Id.*

223 *Making it Right*, *supra* note 134.

224 Farm Security and Rural Investment Act of 2002, Pub. L. No. 107-171, 116 Stat. 134 (codified as amended in scattered sections of 7 and 16 U.S.C.).

Congress authorized third party TSPs, to provide technical assistance, essentially outsourcing a chunk of technical assistance.[225]

We recommend streamlining administrative requirements for conservation programs to improve farm bill conservation program efficacy. Overly complicated requirements present an undue administrative burden for NRCS and impede producer participation. In the 2014 Farm Bill, some attempt was made at streamlining. For example, several easement programs—namely, the Farm and Ranchlands Protection Program, Wetland Reserve Program, and Grassland Reserve Program—were lumped together under the new ACEP.[226] Although this effectively reduced the number of programs, the new program is essentially an amalgam of all three but with less funding. Consolidation of this sort is not a substitute for well designed program solutions, but rather is a sleight of hand to reduce needed conservation dollars.

EQIP and CSP are similar programs and require NRCS to execute tens of thousands of lengthy contracts with individual producers in order to obligate funds annually. Through the use of an explicit small-scale watershed planning option in the RCPP and/or other conservation programs, HUC 12 plans covering 200–300 producers could be used to simplify contracting with individual producers. One option would be to provide automatic program enrollment to all producers that seek to implement conservation practices identified in sound HUC 12 watershed plans. Relatedly, NRCS could target technical assistance resources to these same producers. In addition, local NRCS offices could be given greater practice design and cost-share flexibility for the implementation of practices identified as necessary in sound local watershed plans.

We also recommend that the policy of outsourcing much needed, highly skilled technical assistance should be reevaluated for cost, transparency, administrative burden, effectiveness, and market availability. And, we further recommend making targeted, long-range investments in NRCS human capital development, especially in the sciences, engineering, and other areas where the government is best suited to be the provider of technical assistance. As the small-scale watershed planning approach is scaled up, qualified NRCS and local conservation staff will be required to fill technical assistance needs identified in local watershed plans. Investing in NRCS's technical assistance capacity ensures that the public investment in conservation practices is fully realized by optimizing conservation outcomes.

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225 *See generally* NAT. RES. CONSERVATION SERV., TECHNICAL ASSISTANCE PROVIDER ASSISTANCE (2009), https://perma.cc/4B7F-D5XY; *Technical Service Providers*, *supra* note 135.

226 *Farm Bill: The Importance of Farm Bill Policy to Ducks Unlimited*, *supra* note 218; *Grassland Reserve Program*, U.S. DEP'T AGRIC., https://perma.cc/3FMZ-QD32 (last visited July 22, 2017).

f. Transparency, Technology Requirements, and Public Research

Achieving watershed planning and restoration goals on a large scale will require greater transparency, as well as the use of GIS to facilitate improved and efficient electronic data collection, storage, processing, management, and sharing. At present, section 1619 of the 2008 Farm Bill poses a barrier to the necessary transparency and seamless communication of relevant conservation information from local NRCS officials to principal planning stakeholders. The provision prohibits USDA or any contractors or cooperators working with the department from disclosing: 1) information that producers provide in order to participate in voluntary conservation programs,[227] and 2) any geospatial information on land or operations maintained by the secretary if the geospatial information pertains to land or operations for which a producer has provided information in order to participate in voluntary conservation programs.[228]

In practice, section 1619 prevents planners from obtaining baseline data directly from USDA on practices installed through farm bill conservation programs.[229] For this information to be releasable, planners must first obtain individual consent from each producer. In a HUC 12 watershed that includes 200–300 producers, this is an onerous task.[230] Watershed planners that have gone through the process of obtaining individual consent from all producers in a watershed have had to wait considerable amounts of time for the agency to pull relevant data from their database only to be provided with a mountain of hard-copy papers in response to their requests.[231]

The farm bill privacy provision has also made it nearly impossible for EPA and states to effectively track and give credit to producers for the implementation of federally funded conservation practices that may be achieving NPS load reductions called for in TMDLs or those practices that are otherwise helping to restore impaired waterbodies.[232]

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227 *See* Letter from Boyd K. Rutherford, Assistant Sec'y for Admin., U.S. Dep't of Agric, to U.S. Dep't of Agric. Freedom of Information Act (FOIA) Officers (July 30, 2008), https://perma.cc/4NRW-7JCC ("Section 1619 does not apply to all information gathered from agricultural producers or landowners. It does not apply to USDA regulatory programs where participation by the agricultural producer or landowner is required by law as a condition of participation in the market place. In addition, section 1619 does not apply to payment information, including name and addresses, to aggregate statistical information, or to information for which the agricultural producer or landowner has consented to disclosure.").

228 7 U.S.C. § 8791(b)(2) (2012).

229 *Id.* § 8791(b)(4).

230 *Id.* § 8791(b)(4)(C).

231 "USDA's data . . . are collected and aggregated for areas that cover, on average, 10,000 square miles, encompassing . . . several rivers and their tributaries," but receiving information about the conservation projects—e.g., location, type, or number—can be delayed, as USDA is legally required to obtain consent from the landowners prior to disclosure of information. GAO, CLEAN WATER ACT: CHANGES NEEDED, *supra* note 17, at 32–33, 65.

232 *See id.* at 27 ("Through its national databases, EPA systematically tracks basic information related to TMDL development . . . includ[ing] the number of TMDLs developed, the name of water bodies to which TMDLs apply, pollutants contributing to impairment, and probable sources of the impairments, as well as information on the extent to which states use

Further, even in cases where data sharing is supposed to be occurring within USDA to ensure the effectiveness of farm bill programs, communication of crucial data is lacking. For example:

> [The Farm Services Agency (FSA)] maintains the database of farm tracts enrolled in Farm Bill programs and provides tract data to NRCS to perform conservation compliance checks. OIG found that neither NRCS nor FSA have developed adequate procedures to ensure that FSA provides to NRCS comprehensive data regarding producers subject to NRCS randomized conservation compliance. Consequently, ten states were entirely omitted from NRCS conservation compliance reviews in 2015.[233]

We recommend a tailored revision of section 1619 that better balances producer confidentiality with watershed planning data requirements, water quality restoration goals, and scientific research needs. Projects in Oconomowoc, Madison, and Green Bay, Wisconsin, as well as the Black Hawk Lake, Lake Rathbun, Price Creek and Tete des Morts Creek watershed projects in Iowa, provide evidence that it is possible to strike a better balance between conservation practice and land management data transparency and producer privacy.[234] Producers in these projects have

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nonpoint source management grant funds to support TMDL development and implementation."). Tracking "TMDL implementation and any associated effect on water quality" requires data regarding the "actions [that] have been taken to reduce pollution in a watershed with a TMDL and how much pollution has been reduced as a result." *Id.* at 29. However, "EPA's ability to track TMDL implementation is hindered by data system limitations and unavailable USDA data. In addition, . . . states have little information on TMDL implementation." *Id.* at 27. Furthermore, "EPA's databases, which contain information uploaded from states' databases, function independently of one another. Because information relevant to TMDL implementation is not consistently tagged with [GIS] data (i.e., latitude-longitude coordinates on waterbody segments, permitted discharge locations, and the spatial extent of projects addressing nonpoint source pollution), . . . the information on TMDL implementation projects and impaired water bodies generally cannot be integrated across separate databases." *Id.* at 30–31. Specifically, "EPA cannot link (1) information on TMDL implementation projects and activities from its Grants Reporting and Tracking System with (2) information on impaired water bodies or the causes of their impairment from the Assessment, TMDL Tracking and Implementation System and can therefore not assess the extent to which TMDLs have been implemented in watershed with impaired waterbodies." *Id.* at 31. Moreover, "the data that states enter into their own systems and upload to EPA's databases do not consistently include this information, in part because EPA does not require the information and in part because state officials developed the majority of TMDLs before the widespread use of GIS." *Id.* In short, "[w]ithout consistently obtaining from states GIS data, . . . EPA cannot integrate information on TMDL implementation projects and impaired water bodies across separate databases and cannot assess whether and to what extent water quality has been affected by TMDL implementation." *Id.* For the purpose of integrating information, "requiring states to report GIS data associated with TMDL implementation is more feasible than asking them to create new data systems or to merge existing ones with EPA's systems." *Id.* "[D]ata on the location, type, and number of [USDA] projects could help identify whether and to what extent TMDLs have been implemented and whether water quality has improved as a result." *Id.* at 32.

233 Ristino & Steier, *supra* note 14, at 97–98 (citation omitted).

234 *See* Konopacky, *supra* note 17, at 306; *Lake Wingra Watershed Plan*, CITY MADISON, https://perma.cc/HX6Q-NRRC (last visited July 22, 2017) (providing hyperlinks to different sections of the final plan); *Lakes*, OCONOMOWOC WATERSHED PROTECTION PROGRAM,

agreed to share information concerning their conservation efforts in order to participate in small-scale plans aimed at improving water quality in their local waterbodies.

We also recommend that any watershed planning option included in revised farm bill conservation programing include a GIS-based mapping component. Specifically, we recommend that a revised policy approach provide for the use of ARS's ACPF watershed planning GIS tool and accompanying soil and land use databases to develop HUC 12 maps for watershed plans. The GIS planning tool and databases developed by ARS facilitate consistent data collection, efficient data management, and consistent and integrated analysis of landscape and conservation practice information that is necessary for HUC 12–scale watershed planning and implementation.[235] The ACPF GIS tool and planning databases also increase the accessibility of watershed planning for local stakeholders and facilitate local-level capacity building.

IV. CONCLUSION

Our current approach to addressing NPS pollution, the Achilles heel of clean water in America, is not working. Our window to address this environmental disaster is narrowing given the continued degradation of our major waterways and estuaries coupled with the added stressors of climate change. The good news is that we do have the tools and delivery mechanisms to address NPS pollution. Further, America continues to make significant investments in working lands conservation through the farm bill and more modest contributions through the section 319 grant program in the CWA.

The Framework we propose requires stakeholder engagement and local problem solving, resource prioritization, and high-ordered collaboration. We understand the associated challenge, but we believe that it is possible and no more administratively burdensome than the less desirable alternative of designing and implementing a new permit program for the 2.1 million farms in the United States. Moreover, we believe the integrated approach proposed

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https://perma.cc/X6NH-XL2U (last visited July 22, 2017) (listing lakes within the Oconomowoc Watershed—each lake provides a hyperlink to the Wisconsin Department of Natural Resources' site); *Upper Green Bay Basin*, WIS. DEP'T NAT. RESOURCES, https://perma.cc/7LR3-NKZY (last visited July 22, 2017) (providing hyperlinks to Green Bay Water Quality Management Plans, which contain, among other things, information about general land use of the concerned watershed area); *see generally Wisconsin Water Planning*, WISC. DEP'T NAT. RESOURCES, https://perma.cc/RR7P-NGRF (last visited July 22, 2017) (providing further information, via hyperlinks, on watershed plans in Wisconsin—of particular relevance, after linking to a specific watershed, you may find the submitted Watershed Plan under the section "Documents & Grants"). For information and links to specific watershed projects in Iowa, see *Approved Watershed Management Plans*, IOWA DEP'T NAT. RESOURCES, https://perma.cc/P6K3-U7CK (last visited June 22, 2017).

235 Presentation by Mark Tomer, Research Soil Scientist, U.S. Dep't of Agric., David James, Geographic Info. Specialist, U.S. Dep't of Agric. & Sarah Porter, Physical Sci. Technician, U.S. Dep't of Agric., Agricultural Conservation Planning Framework (ACPF) 2, 6–7 (on file with authors).

is not only possible but necessary to address, at scale, the complex social problem of agricultural NPS pollutant loading.

Rather than continuing to ask whether a regulatory approach to agricultural NPS loading is possible or feasible, we believe the more important question is whether we will take a hard look at relevant CWA programs and farm bill programs and recommit our investments in a way that is designed to improve soil health and productivity and comprehensively and effectively restore water quality across the United States. With our proposed Healthy Watershed Framework, we have taken the first step in reviewing some of the most relevant water and farm policies and providing insight into how we could evolve and integrate these policies to more effectively achieve our healthy soil and clean water goals.

APPENDIX

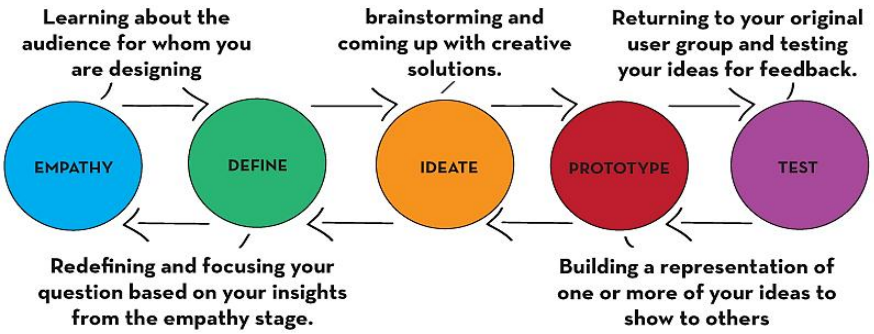

Figure 1: The design process encourages risk taking and continuous learning

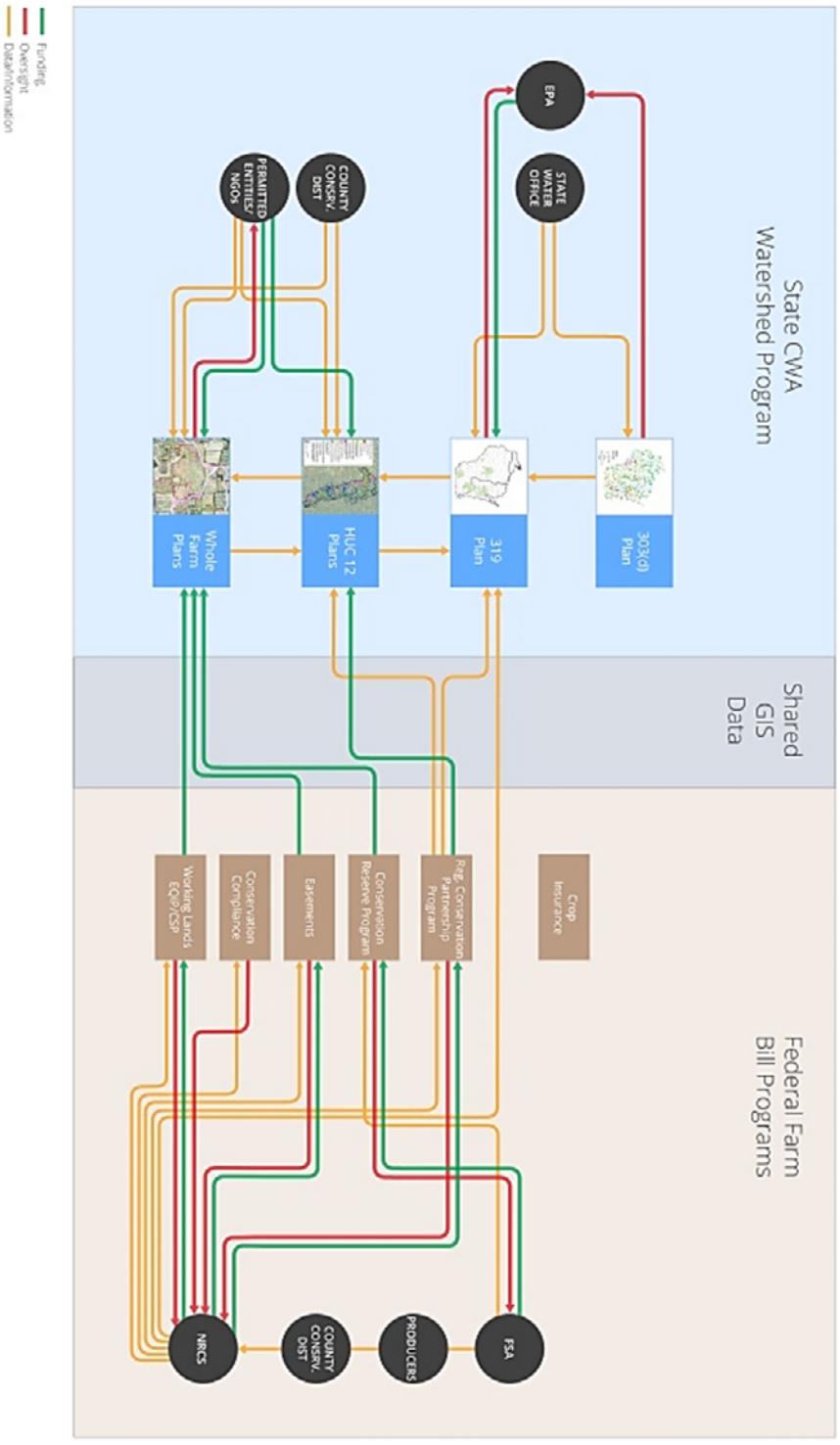

Figure 2: Healthy Watershed Policy Matrix

Figure 3: Healthy Watershed Policy Framework—Watershed Planning Component

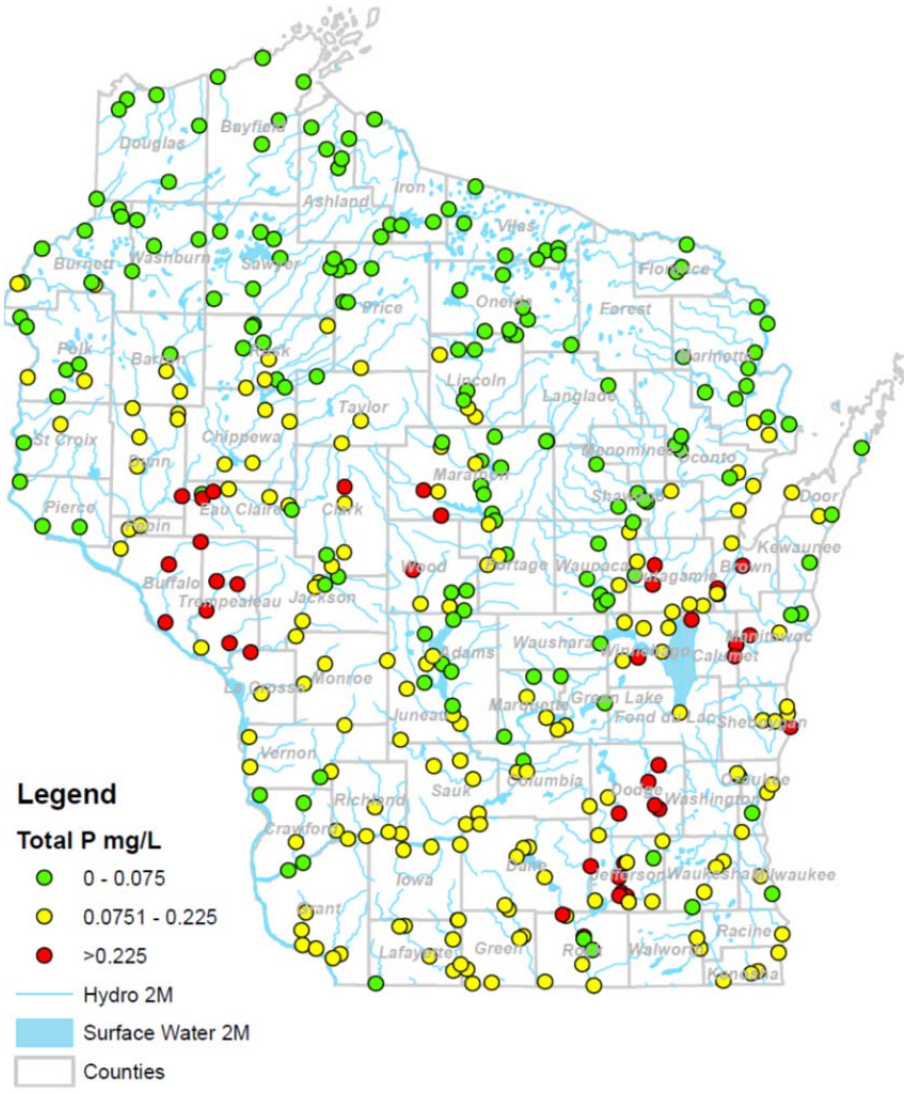

Figure 4: Results of Wisconsin's HUC 10 monitoring used to prioritize watersheds for planning purposes

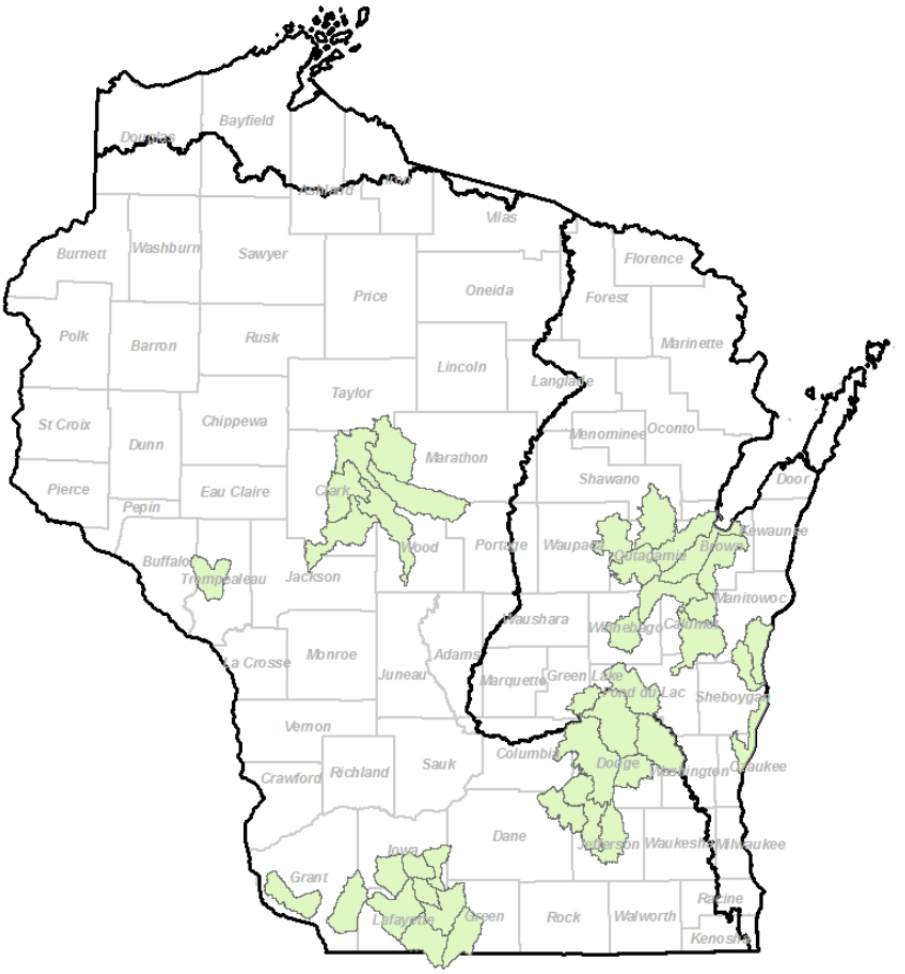

Figure 5: Top HUC 10 watersheds prioritized for nutrient-reduction work based on monitoring results

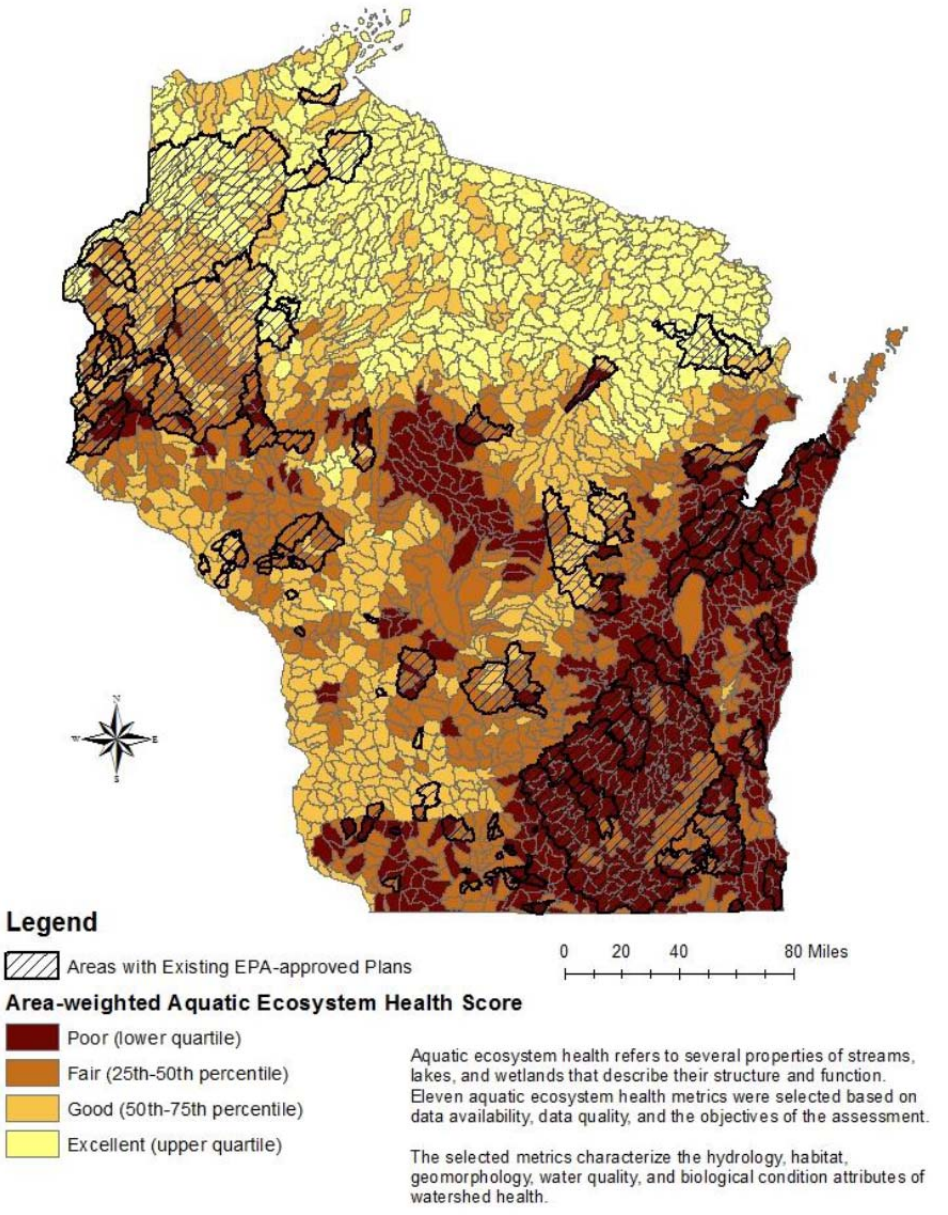

Figure 6: Wisconsin's Healthy Watershed Initiative screening-level assessment results identifying watersheds in need of restoration at the HUC 12 scale

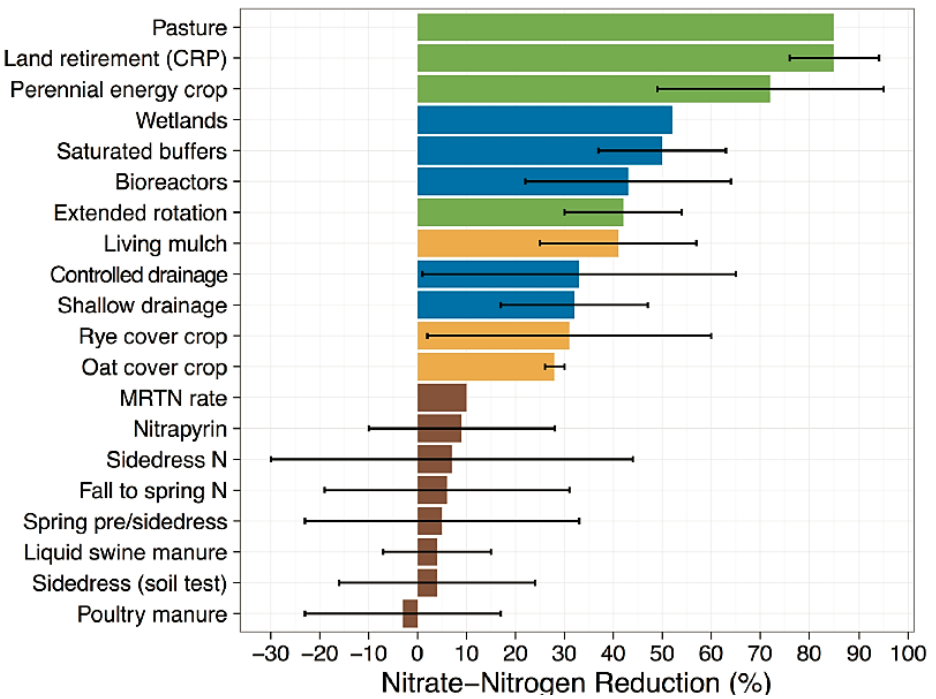

Figure 7: Effectiveness and standard deviation of conservation practices studied as part of Iowa's Nutrient Reduction Strategy implementation efforts

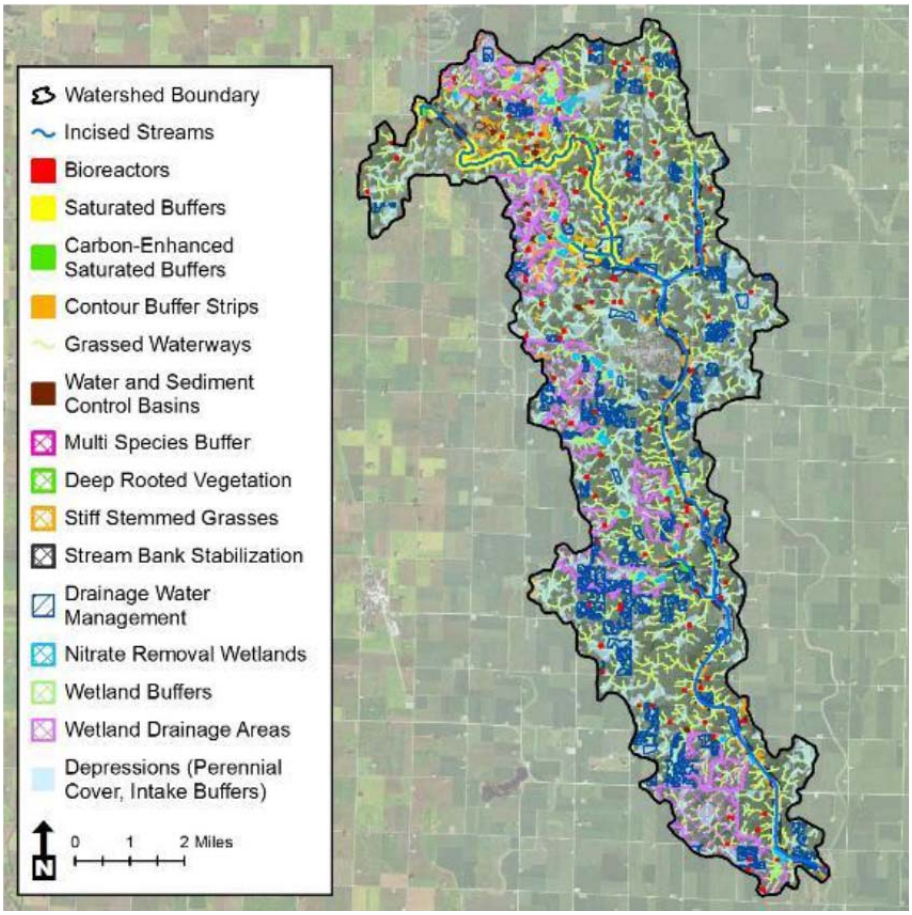

Figure 8: Iowa Soybean Association ACPF planning assessment, showing possible practices for a HUC 12 watershed

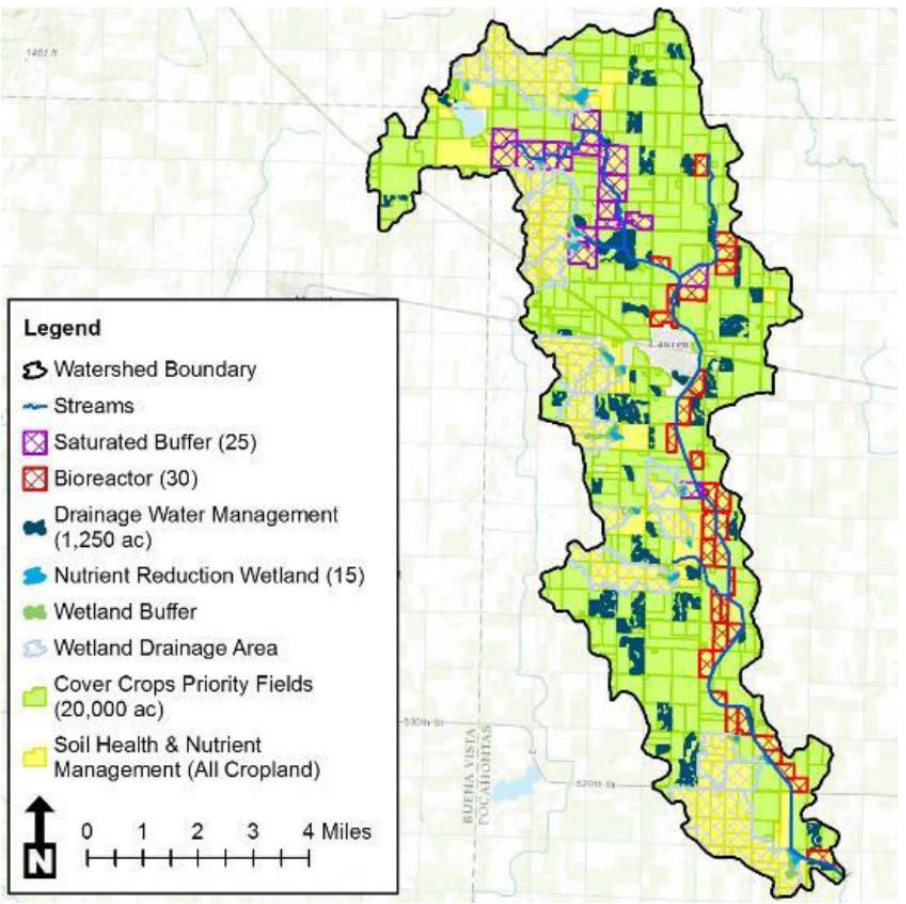

Figure 9: Practices selected for implemenation by stakeholders in a studied HUC 12 watershed

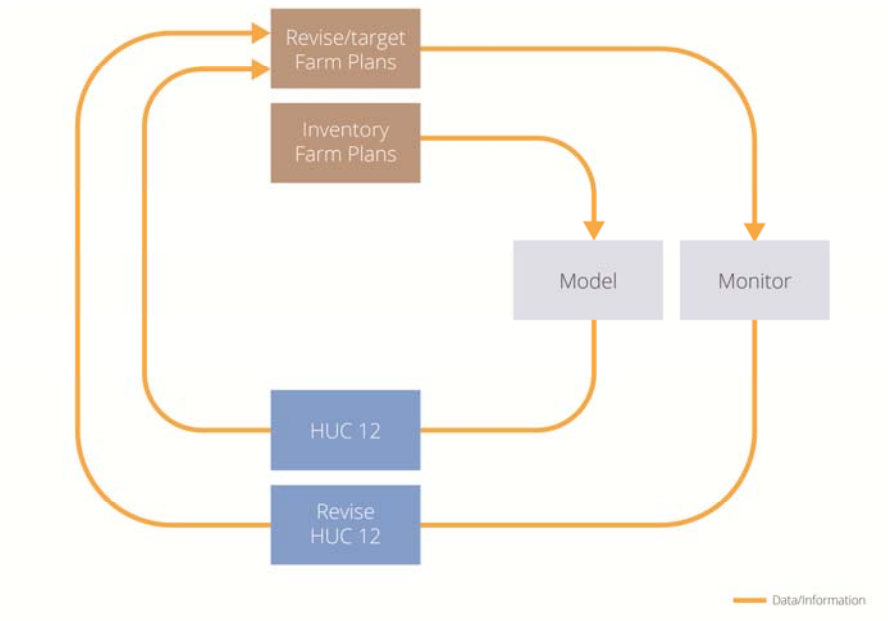

Figure 10: Adaptive management approach to HUC 12 and whole farm plan development

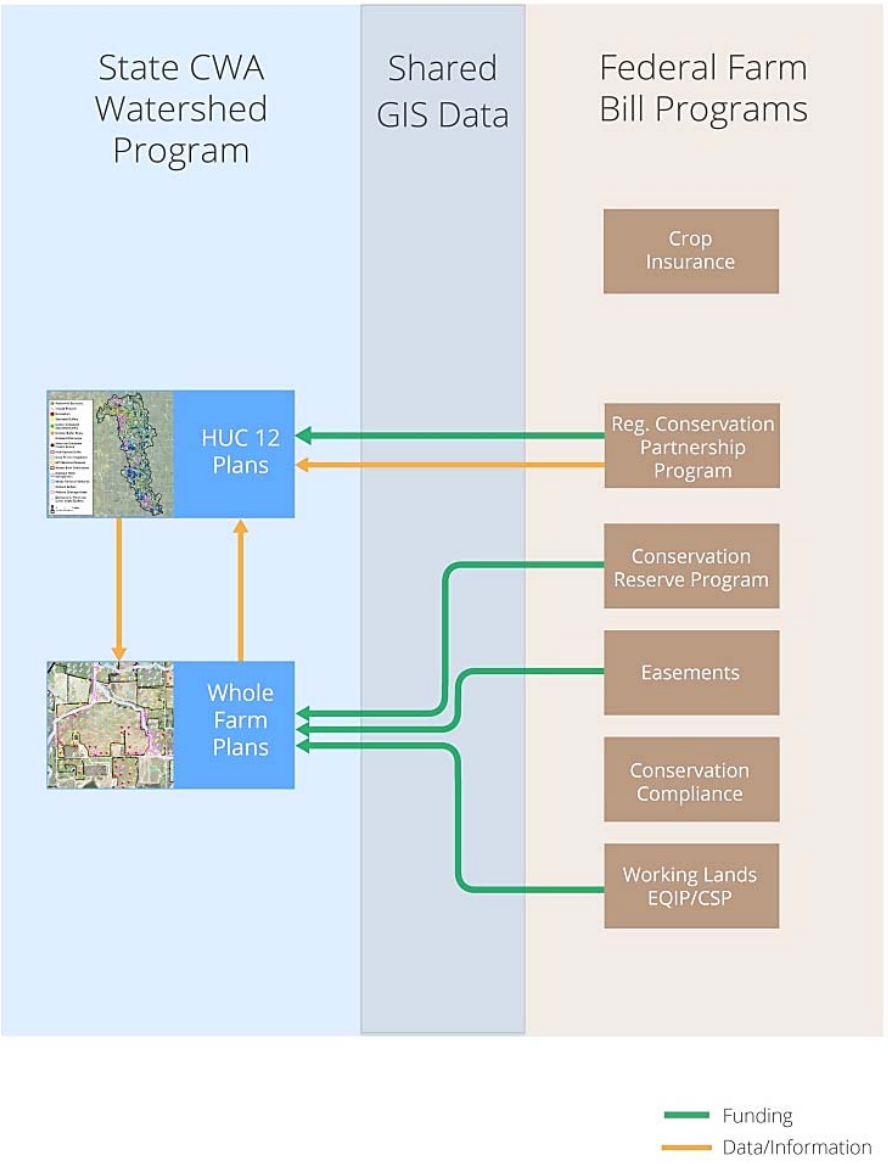

Figure 11: Proposed approach for implementing revised farm bill programs within the HUC 12 watershed context

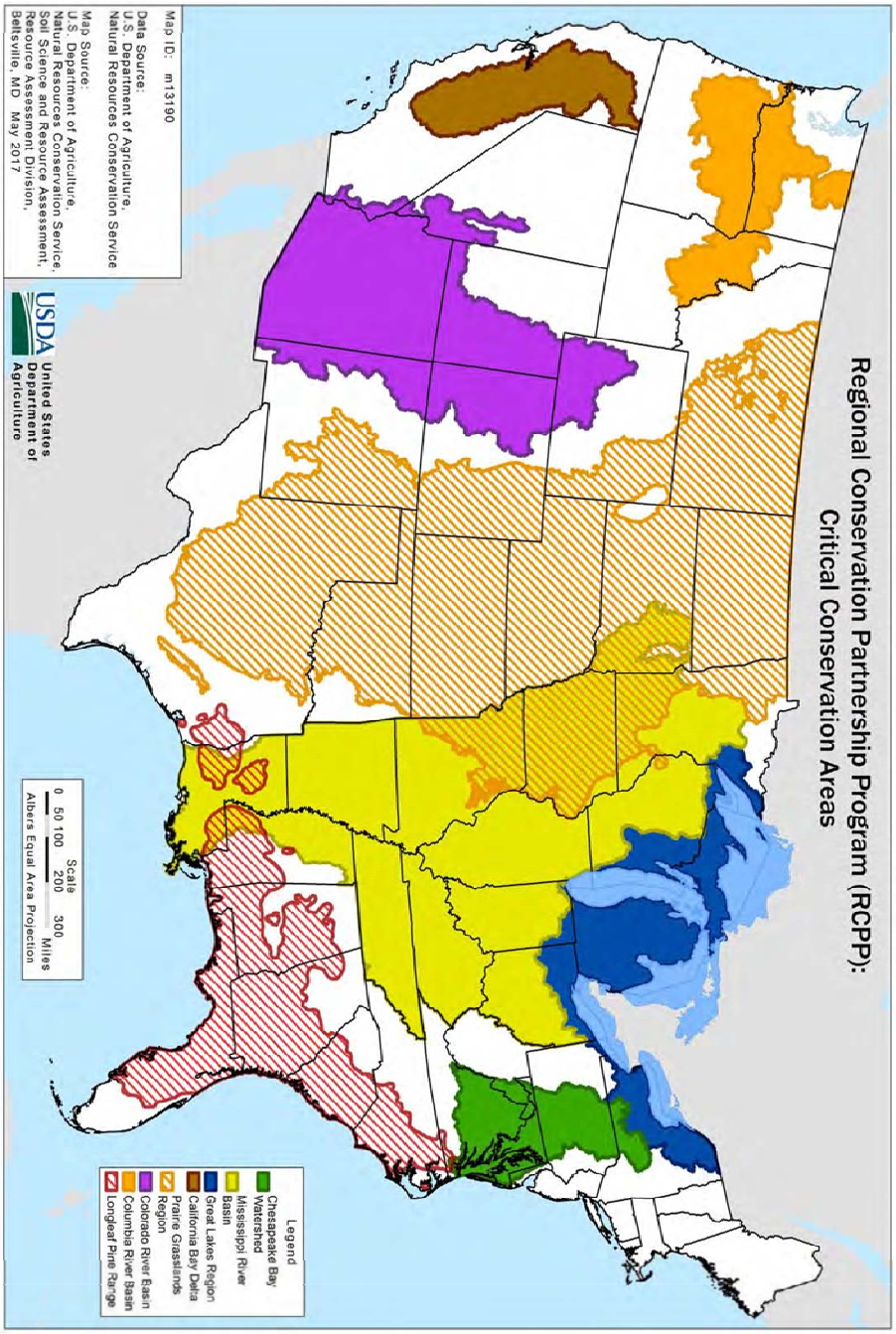

Figure 12: RCPP Critical Conservation Areas, as designated by the Secretary of Agriculture