

Losing Ground: A Clarion Call for Farm Bill Reform to Ensure a Food Secure Future

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*Of all the countries in the world,
we Americans
have been the greatest destroyers of land*
— Hugh Bennett¹

The punishing drought scorched the earth, turning topsoil into friable dirt. When the winds came, massive reddish brown dust clouds choked the air. Crops and cattle were lost and farmers struggled to keep their farms in the wake of devastating losses. The year was 2012.²

I. INTRODUCTION

Soil and water are inextricably related, a fragile and complex system upon which agriculture and, in turn, our species, depend.³

1. TIMOTHY EGAN, *THE WORST HARD TIME: THE UNTOLD STORY OF THOSE WHO SURVIVED THE GREAT AMERICAN DUST BOWL* 125 (2006) (quoting the first chief of the Soil Conservation Service).

2. *See State of the Climate: Drought—June 2012*, NAT'L CTRS. FOR ENVTL. INFO., July 16, 2012, <https://www.ncdc.noaa.gov/sotc/drought/201206> [<https://perma.cc/ZQ9S-Z6NM>]; Kukil Bora, *California Drought of 2012–2014 Is the Worst in 1,200 Years: Study*, INT'L. BUS. TIMES, Dec. 6, 2014, <http://www.ibtimes.com/california-drought-2012-2014-worst-1200-years-study-1737522> [<https://perma.cc/5V7W-VUUN>].

3. This article makes a critical distinction between dirt and soil. Soil is necessary to produce most crops and is the sum of water, minerals, air, animals, wildlife, and decaying matter accumulating in layers over time. Dirt is displaced soil, stripped of its complex structure. *See* DAVID R. MONTGOMERY, *DIRT: THE EROSION OF CIVILIZATIONS* (2007); Janet

Yet we tend to regard this relationship and its criticality in the singular dimension of drought, hindering progress in policy and law to improve agricultural sustainability. Without necessary policy reforms designed to protect the delicate balance between soil health, water conservation, and agricultural yield, we are foreclosing a food secure future for our nation. America's agriculture and farm policy, as embodied in the Farm Bill, has devastated natural resources and, thereby, nature. Single resource advocacy and land management, such as water or soil conservation, fails to address this systems-based challenge, which is inextricably tied to the farm bill safety net. American agriculture, as defined by the U.S. Department of Agriculture ("USDA"), commands the majority of the land mass of the lower forty-eight states. Agriculture is, by far, the biggest consumer of fresh water, all while hemorrhaging top soil and draining wetlands, creating a vicious cycle perpetuating heavy commercial inputs. In order to address the system of resource misuse we reinforce through law and policy, we must first understand the pressures and policies that shape the American food and agriculture system. Then, we must renegotiate society's benefits and priorities afforded to the agricultural sector with policy changes at the nexus of water, soil, and safety net. This rebalancing is absolutely critical if we have any hope of fostering resilient food and agriculture systems in the face of climate change, population growth, and scarce natural resources.

Given its pervasive environmental harm, American agriculture is one of the last horizons of environmental law.⁴ The point of this article is not to vilify agricultural producers, but to leverage society's renewed interest in food to create a clear-eyed dialogue regarding how to address these harms while ensuring food security for the nation and economic security for those who produce our food. One of the pillars of this dialogue must be a hard look at the so-called farm safety net and its relationship to our national policy regarding environmental stewardship and agriculture: the conservation title ("Title II") of the Farm Bill. Unfamiliar to most environmental advocates, the conservation title is a suite of federal

Raloff, *Dirt Is Not Soil*, SCI. NEWS, July 17, 2008, <https://www.sciencenews.org/blog/science-public/dirt-not-soil> [<https://perma.cc/9QCY-PXGP>].

4. J.B. Ruhl, *Farms, Their Environmental Harms, and Environmental Law*, 27 *ECOLOGY L.Q.* 263, 293–315 (2000) (discussing the agricultural exceptionalism that runs through environmental regulation, including the Clean Water Act).

programs implemented by the USDA, providing billions of dollars in federal funds to agricultural producers to improve conservation outcomes on agricultural lands.⁵ In other words, the American taxpayer largely shoulders the burden of environmental measures on private “working” lands. This Article argues that in order to provide for a food secure future, we must renegotiate the Farm Bill’s safety net so that it works in concert with conservation policies by supporting production that is both economically and environmentally sustainable.

In Part II of this Article, we set forth the background on agriculture-related land use in the United States. Next, we provide a brief overview of the science related to soil health and its impact on yield and carbon sequestration capacity, as well as its relation to water use and quality. We then show the connection between agricultural production as supported by federal policy and soil erosion, wetland drainage, and water quality issues to illustrate the relationship of policy to environmental outcomes. In Part III, we provide a brief overview of the evolution of the Farm Bill as a farm “safety net,” and in Part IV, we explore the relatively recent development of the conservation title to address agricultural environmental harms, which coincides with the great transformation of American agriculture over the last thirty years of the twentieth century. Finally, in Part V, we argue for a renegotiation of the farm safety net, including conservation benefits and requirements, in light of the systemic failure of these policies to address environmental damage despite heavy public investment. We conclude with recommendations for Farm Bill reforms toward a rational policy of agricultural resilience and ecosystem health, both necessary for the well-being of our nation.

II. CONTEXT: AGRICULTURE, LAND USE, AND THE SOIL WATER NEXUS

The environmental health of agricultural lands is fundamental to the overall ecological health of the nation. This is because of the sheer land mass devoted to agriculture, as well as because our environmental laws and policies greatly exempt agriculture from

5. MEGAN STUBBS, CONG. RESEARCH SERV., R42093, AGRICULTURE CONSERVATION AND THE NEXT FARM BILL, at 1 (2012).

their requirements.⁶ This Part provides an overview of land use and resource use related to agriculture, showing in particular the environmental devastation wrought by agriculture. We then show how soil health, water, and yield are inextricably related as a complex system, which is disrupted by industrial agricultural production. We follow with a discussion regarding how climate change fundamentally undermines agricultural sustainability and, conversely, how agriculture contributes to climate change with the unmet potential to partially mitigate its harm.

A. Agriculture and Land Use in the United States: The Big Picture

Despite its highly urbanized population and the conversion of farm and rural lands to suburban sprawl in the last century, America's land mass remains largely privately owned, rural, and falling under the USDA's definition of agricultural.⁷ These facts have profound implications for the over-arching environmental health and resiliency of the United States during the Anthropocene Era,⁸ describing the lasting and devastating impacts humankind has on Earth.

The forty-eight contiguous states, Hawaii, Puerto Rico, and the U.S. Virgin Islands consist of 1.94 billion acres of land and water, the majority of which are privately owned.⁹ As Figure 1 below shows, forestland, rangeland, cropland, and other rural land make up nearly two thirds of U.S. land uses, with 363 million acres in cropland, 121 million acres of grassland pasture, 406 million acres in rangeland, and 413 million acres in forestland.¹⁰ Fifty-one percent of the total U.S. land base is used for agricultural purposes,

6. See generally Ruhl, *supra* note 4 (inventorying environmental laws that exempt farms from regulation).

7. *Major Land Uses*, ECON. RESEARCH SERV., <http://www.ers.usda.gov/topics/farm-economy/land-use-land-value-tenure/major-land-uses.aspx> [https://perma.cc/H7FX-3ZP5] (last updated Sept. 27, 2016).

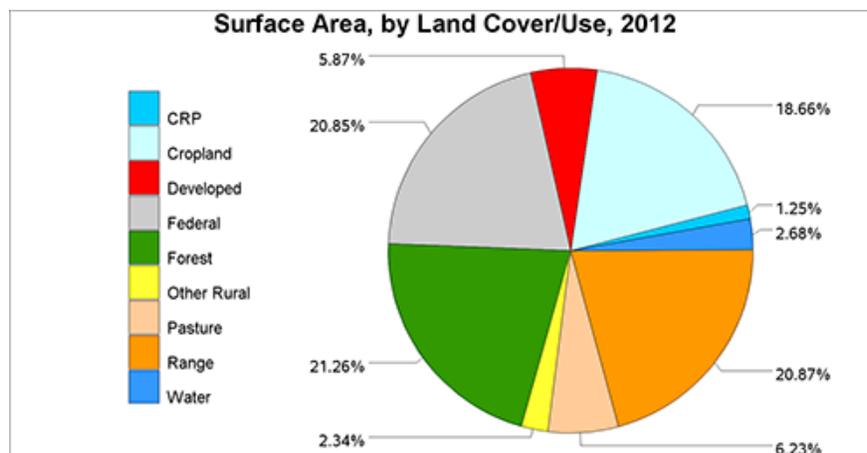
8. Anthropocene (*anthropo* for “man,” *cene* for “new”) refers to the age of human-caused mass extinctions of plant and animal species, oceanic pollution, and atmospheric alterations within the current Holocene (“entirely recent”) epoch, that started after the last ice age. Joseph Stromberg, *What Is the Anthropocene and Are We in It?*, SMITHSONIAN MAG., Jan. 2013, <http://www.smithsonianmag.com/science-nature/what-is-the-anthropocene-and-are-we-in-it-164801414/?no-ist> [https://perma.cc/GP5T-DHAM].

9. NAT. RES. CONSERVATION SERV., 2012 NATIONAL RESOURCES INVENTORY: SUMMARY REPORT, at 2-1 (2015).

10. *Id.*

including cropping, grazing, and farmsteads or farm roads.¹¹ Not surprisingly, agricultural land use is region-specific, with pasture and range uses concentrated in the West, cropland in the Central United States, and private forestland use dominating the Southeast and Northeast.¹²

Figure 1: Surface Area by Land Cover/Use 2012¹³



Importantly, land moves in and out of different uses over time in response to stimuli like commodity price fluctuations and changes in federal policy.¹⁴ Although aggregate acreages for major land uses appear relatively stable, Economic Research Service (“ERS”), an agency under the USDA, reports that this fact can mask significant on-the-ground changes in land use.¹⁵ For example, between 1964 and 2007, cropland acreages decreased by eleven million acres in the Southeast and Northeast.¹⁶ However, cropland acres in the Corn Belt increased by that same amount.¹⁷ Between

11. *Major Land Uses*, *supra* note 7.

12. Cynthia Nickerson & Allison Borchers, *How Is Land in the United States Used? A Focus on Agricultural Land*, ECON. RESEARCH SERV., Mar. 1, 2012, <http://www.ers.usda.gov/amber-waves/2012/march/data-feature-how-is-land-used> [<https://perma.cc/5CUA-QGB3>].

13. NAT. RES. CONSERVATION SERV., *supra* note 9, at 2-1. “CRP” refers to Conservation Reserve Program.

14. Nickerson & Borchers, *supra* note 12.

15. *Id.*

16. *Id.*

17. *Id.*

2000 and 2009, farmers produced more corn to meet the demand for ethanol triggered by federal bioenergy incentives and rising oil prices.¹⁸ In order to increase corn ethanol production to nine billion gallons, farmers expanded corn acreage by reducing cotton acreage, then shifting uncultivated hay to cropland and expanding the use of double cropping (producing successive crops on the same land within the same year).¹⁹ Relatedly, a doubling of commodity prices contributed to grassland conversions in the Western Corn Belt from 2006 to 2011, resulting in a loss of 530,000 hectares of grassland²⁰ and impacting food security in countries like Mexico.²¹ This is a prime example of how federal policies have real-world environmental and social justice impacts.

B. Natural Resource Impacts

Soil has long been confused with land. It is but one part of land. For conservation purposes land must be regarded in terms of all its component parts: soil, slope, climate, susceptibility to depreciation by erosion, over-cropping or other processes of deterioration.

—Hugh Bennett²²

With 17.3 million jobs in food production and agriculture, this sector contributes around \$985 billion annually, or only 5.7 percent of the U.S. gross domestic product (“GDP”).²³ Despite generating such a small percentage of the national GDP, agriculture uses a tremendous share of the nation’s resources.

Although Hugh Bennett, America’s soil conservation pioneer and the first chief of the Soil Conservation Service,²⁴ made a plea

18. See STEVEN WALLANDER ET AL., ECON. RESEARCH SERV., EIB-79, THE ETHANOL DECADE: AN EXPANSION OF U.S. CORN PRODUCTION, 2000–09, at 1 (2011).

19. *Id.* at 14.

20. Christopher Wright & Michael Wimberly, *Recent Land Use Change in the Western Corn Belt Threatens Grasslands and Wetlands*, 110 PROC. NAT’L ACAD. SCI. 4134, 4134 (2013).

21. Timothy A. Wise, *The Cost to Mexico of U.S. Corn Ethanol Expansion*, at 2 (Glob. Dev. & Env’t Inst., Working Paper No. 12-01, 2012) (discussing the connection to increased ethanol production and food prices).

22. *Quotes from Hugh Hammond Bennett*, NAT. RES. CONSERVATION SERV., http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/about/history/?cid=nrcs143_021412 [<https://perma.cc/8UZ3-ZRAZ>] (last visited Aug. 8, 2016).

23. *Ag and Food Sectors and the Economy*, ECON. RESEARCH SERV., <http://www.ers.usda.gov/data-products/ag-and-food-statistics-charting-the-essentials/ag-and-food-sectors-and-the-economy.aspx> [<https://perma.cc/5G5H-SKHR>] (last updated Oct. 14, 2016).

24. The Soil Conservation Service was renamed the Natural Resources Conservation Service during the Clinton administration to reflect its growing role in improving

for soil conservation in the 1930s, agricultural soil is still being seriously degraded. Soil degradation occurs through means such as wind and water erosion, nutrient depletion, salinization, structural decline, pollution, and contamination.²⁵ Reducing soil erosion is critical to both food security and environmental sustainability;²⁶ however, soil erosion remains a problem and “progress in reducing soil erosion has slowed in recent years.”²⁷

The USDA describes soil erosion as involving “the breakdown, detachment, transport, and redistribution of soil particles by forces of water, wind, or gravity.”²⁸ Soil erosion harms soil quality and crop productivity, degrades water and air quality, and disrupts biological activity,²⁹ while economically burdening the agri-business sector.³⁰ According to the National Resource Inventory, fifty-four percent of water-related soil erosion in the United States occurred in just two of the ten farm production regions—the Corn Belt and the Northern Plains—while ninety-three percent of wind-related soil erosion occurred in four of the ten farm production regions—the Northern Plains, Southern Plains, Mountain, and Lake States.³¹ The Natural Resources Conservation Service (“NRCS”) graphic below (Figure 2) shows that soil loss through erosion has declined, but that the problem persists. Further, as the Article explains below, these averages are misleading because they only account for some of the erosion occurring on land designated as highly erodible by NRCS.

environmental outcomes of America’s working lands. See *80 Years Helping People Help the Land: A Brief History of NRCS*, NAT. RES. CONSERVATION SERV., http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/about/history/?&cid=nrcs143_021392 [<https://perma.cc/FA4Q-NKGD>] (last visited Nov. 3, 2016) [hereinafter *A Brief History*].

25. RATTAN LAL, FOOD & AGRIC. ORG. OF THE U.N., TR04B, SOIL CARBON SEQUESTRATION: SOLAW BACKGROUND THEMATIC REPORT 11 (2009).

26. See generally David Pimental, *Soil Erosion: A Food and Environmental Threat*, 8 ENV’T, DEV., & SUSTAINABILITY 119 (2006) (discussing the impact of soil erosion on global food security).

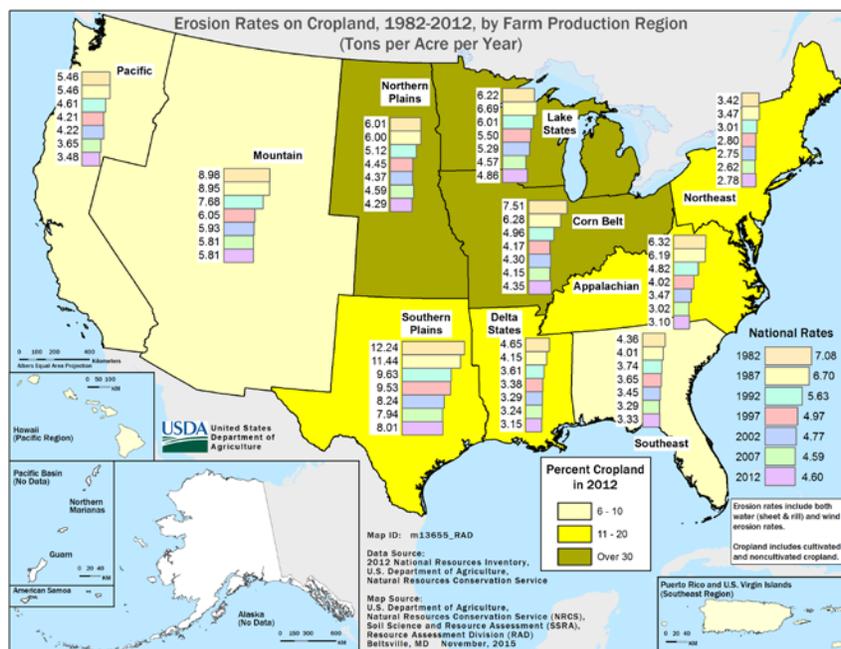
27. See U.S. GEN. ACCOUNTING OFFICE, GAO-03-418, AGRICULTURE CONSERVATION: USDA NEEDS TO BETTER ENSURE PROTECTION OF HIGHLY ERODIBLE CROP LANDS AND WETLANDS 40 (2003).

28. *Erosion*, NAT. RES. CONSERVATION SERV., <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/crops/erosion> [<https://perma.cc/CGY4-49YE>] (last visited Apr. 1, 2016).

29. *Id.*

30. *Id.*

31. NAT. RES. CONSERVATION SERV., 2007 NATIONAL RESOURCES INVENTORY: SOIL EROSION ON CROPLAND, at 3 (2010).

Figure 2: Erosion Rates on Cropland³²

According to NRCS's 2010 data, soil erosion across the Corn Belt averaged "only" 3.9 tons per acre per year.³³ However, as the Environmental Working Group ("EWG") explains in its report *Losing Ground*, "[a]veraging soil erosion over states, regions or the nation obscures the real situation, because erosion and polluted runoff do not occur 'on average.' They occur when it rains."³⁴ Therefore, NRCS estimates understate the actual magnitude of the problem. In fact, an independent EWG and Iowa State University study revealed that:

32. *Erosion Rates on Cropland, 1982-2012, by Farm Production Region*, NAT. RES. CONSERVATION SERV., Nov. 2015, <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/nra/rca/ida/?cid=stelprdb1187041> [<https://perma.cc/VB9F-8SK8>] (available under Thematic Maps subheading). This map illustrates the erosion rates on U.S. cropland from 1982 until 2012 and reflects the most recent data available.

33. CRAIG COX ET AL., ENVTL. WORKING GRP., *LOSING GROUND*, at 4 (2011).

34. *Id.* at 8.

Soil erosion and runoff are actually worse—likely far worse— . . . because the currently available models cannot account for the erosion caused by ephemeral gullies. [Such gullies] are called “ephemeral” because tillage temporarily obliterates them, but they quickly reappear after the next storm.

Surprisingly little research or monitoring has been done to determine the impact of ephemeral gullies on erosion.³⁵

In the 1950s, the USDA established soil-loss tolerance values (“T values”). T values are the maximum rate of soil loss from water and wind erosion that may occur and still sustain productivity.³⁶ Thus, they are a metric against which to evaluate “acceptable” rates of soil erosion.³⁷ The T values have been controversial, with some researchers concluding that “seldom has such an important policy been based on such a dearth of defensible data.”³⁸ Under the soil erosion reduction requirements of the 1985 Farm Bill, i.e., the Food Security Act of 1985, NRCS ultimately set the soil reduction requirement at 2T, meaning federal policy permits soil to be eroded at approximately twice the rate it is replenished.³⁹ In addition, as noted above, NRCS’s method of soil erosion assessment cannot be used to predict erosion from single storms or short term weather fluctuations, both major sources of soil erosion.⁴⁰

35. *Id.* at 14. *Losing Ground* went on to explain:

A 2008 study published in the Journal of Soil and Water Conservation that simulated erosion in ephemeral gullies reported rates ranging from 2.23 tons to 4.91 tons per acre per year. A survey conducted by the Natural Resources Conservation Service found that the erosion in ephemeral gullies ranged from 1.22 tons per acre per year in Michigan to 12.8 tons in Virginia. This report concluded that if ephemeral gully erosion were included in national estimates, reported soil loss could more than double.

Id. (footnotes omitted).

36. MEGAN STUBBS, CONG. RESEARCH SERV., R42459, CONSERVATION COMPLIANCE AND U.S. FARM POLICY 13 (2014).

37. *See, e.g.*, NAT. RES. CONSERVATION SERV., 190-V-NAM, NATIONAL AGRONOMY MANUAL 501.1–502.11 (2011) (discussing how to measure wind and water effects on soil erosion) [hereinafter AGRONOMY MANUAL]; David R. Montgomery, *Soil Erosion and Agricultural Sustainability*, 33 PROC. NAT’L. ACAD. SCI. 13,268, 13268 (2007) (discussing that T-values are “equivalent to ≈ 0.4 –1 mm/yr of erosion (assuming a soil bulk density of 1,200 kg/m³)”); *Wind Erosion (WEPS)*, NAT. RES. CONSERVATION SERV., <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/tools/weps> [<https://perma.cc/3MG3-CN84>] (last visited Aug. 13, 2016).

38. *Id.*

39. Food Security Act of 1985, Pub. L. No. 99-198, § 1213, 99 Stat. 1354 (1985).

40. AGRONOMY MANUAL, *supra* note 37, at 501.3.

Not surprisingly, then, one of the most persistent challenges agricultural policymakers have faced since the 1970s is “[w]ater quality problems resulting from the presence of nutrients, pesticides, salts, and trace elements.”⁴¹ Although scientists recognize that agriculture is the leading source of water quality impairment in the United States,⁴² our laws and policies fail to effectively address the soil-water connection. Years ago, the National Research Council warned that:

Severe degradation from erosion, compaction, or salinization can destroy the productive capacity of the soil and exacerbate water pollution from sediment and agricultural chemicals. Sediments from eroded croplands interfere with the use of waterbodies for transportation; threaten investments made in dams, locks, reservoirs, and other developments; and degrade aquatic ecosystems. Nutrients accelerate the rate of eutrophication of lakes, streams, and estuaries; and nitrogen in the form of nitrates can cause health problems if ingested by humans in drinking water. Pesticides in drinking water can become a human health concern and have been suggested to disrupt aquatic ecosystems. Salts can be toxic at high enough levels and can seriously reduce the uses to which water can be put. In some areas, toxic trace elements in irrigation drainage water have caused serious damage to fish, wildlife, and aquatic ecosystems.⁴³

Despite heavy public investment in agricultural lands conservation under the Farm Bill, when “viewed from a national perspective the magnitude and severity of agricultural water pollution has not improved dramatically for decades.”⁴⁴

The persistence of soil loss and water quality degradation illustrates the circular relationship of these resources to environmental outcomes. As one conservative commentator has noted, “wide-scale soil erosion is a form of pollution that does significant damage to the ecosystems of rivers, lakes and fisheries. Left intact, top-soil serves as a vital part of the water cycle, by

41. NAT’L RESEARCH COUNCIL, *SOIL AND WATER QUALITY: AN AGENDA FOR AGRICULTURE* 21–34 (1993).

42. U.S. ENVTL. PROT. AGENCY, EPA 841-F-05-001, *PROTECTING WATER QUALITY FROM AGRICULTURAL RUNOFF: CLEAN WATER IS EVERYBODY’S BUSINESS* (2005); Robert W. Adler, *Agriculture and Water Quality: A Climate-Integrated Perspective*, 37 VT. L. REV. 847, 857 (2013).

43. NAT’L RESEARCH COUNCIL, *supra* note 41, at 21–22.

44. Adler, *supra* note 42, at 848.

absorbing flood and ordinary rain water.”⁴⁵ Wetlands, which provide for multiple environmental functions and values, serve as another critical component of nature’s filtration system by filtering water runoff as well as mitigating against the effects of storm surge.⁴⁶ Yet for most of U.S. history, federal policy has been to aggressively drain wetlands for agricultural production and to increase yields.⁴⁷

The U.S. General Accounting Office, now the Government Accountability Office (both “GAO” herein), concluded that the USDA needs to better conserve wetlands because, “[o]f an estimated 220 million acres of marshes, bogs, swamps, and other wetlands in the contiguous United States during colonial times, over half have disappeared, and some remaining wetlands have been degraded.”⁴⁸ These losses are

due, primarily, to agricultural activities and development. Pressure to use wetlands for such purposes continues, but in recent times wetlands have become valued for a variety of ecological functions they perform, including abating floods, maintaining water quality, and providing habitat for fish and wildlife.⁴⁹

From 1954 to 1972, wetland conversions averaged 458,000 acres a year, with eighty-one percent converted for agricultural purposes.⁵⁰ This national policy of wetland drainage continued until the rewriting of the Clean Water Act (“CWA”) in 1972. From 1974 to 1982, wetland conversion declined to 290,000 acres per year.⁵¹ However, federal policy protecting wetlands that are non-“waters of the United States” was only adopted with the passage of the 1985 Farm Bill and falls under the jurisdiction of NRCS.⁵² As set forth in

45. NATHAN LEAMER, R STREET INST., OVERSIGHT NEEDED TO GET CONSERVATION COMPLIANCE RIGHT, at 2 (2015).

46. See RALPH E. HEIMLICH ET AL., ECON. RESEARCH SERV., AER-765, WETLANDS AND AGRICULTURE: PRIVATE INTERESTS AND PUBLIC BENEFITS 14 (1998).

47. *Id.* at 25.

48. U.S. GEN. ACCOUNTING OFFICE, GAO-01-325, WETLANDS PROTECTION: ASSESSMENTS NEEDED TO DETERMINE EFFECTIVENESS OF IN-LIEU-FEE MITIGATION, at 1 (2001).

49. *Id.*

50. HEIMLICH, *supra* note 46, at 20.

51. *Id.* at 20–21.

52. “Waters of the United States” is a statutory term under the Clean Water Act. See Clean Water Act, Pub. L. No. 92-500, 86 Stat. 816 (1972) (codified as amended at 33 U.S.C. §§ 1251–1387). Waters of the United States are regulated by the U.S. Environmental Protection Agency (for point source discharges), the U.S. Army Corps of Engineers (for

Part IV, the effectiveness of this policy is seriously compromised by weak enforcement, insufficient implementation resources, and opaque and counter-productive farm safety net policies.

While wet soils are still considered a barrier to maximizing yield in places like the Prairie Pothole Region,⁵³ too little water is the delimiting factor of agricultural production in much of the West. In fact, drought directly impacts soil quality and yield. A study of the effects of the 2012 drought in Iowa found that persistent drought actually changes soil structure, causing fracturing, cracking, and crusting, which can impact soil-water-plant relationships, including yield.⁵⁴ Importantly, those soils “with high moisture-holding capacity and organic matter better tolerated drought conditions.”⁵⁵

The 2012 drought exemplifies the new normal for agriculture in much of the West, which is heavily dependent on irrigation. Agricultural water use in the United States is enormous, making up “80 percent of the Nation’s consumptive water use and over 90 percent in many Western States,” according to the USDA.⁵⁶ Several years of punishing drought in California, which still persist today despite the recent El Nino precipitation,⁵⁷ compelled Governor Brown and the state legislature to finally implement water conservation plans and then, for the first time in the state’s history, to adopt sweeping groundwater regulations to address the

dredge and fill activity), and delegated state regulatory agencies. The distinction between wetlands that are considered waters of the United States, and those that are not, has been hotly debated over the last several years by industry and environmentalists. See, e.g., *It’s Time to Ditch the Rule*, DITCH THE RULE (Sept. 4, 2014), <http://hbaiowa.org/ditchtherule/iowa-water-ways> [<https://perma.cc/43H5-5LUQ>].

53. See, e.g., NAT’L WILDLIFE FED’N & NAT. RES. DEFENSE COUNCIL, WETLANDS AT RISK: IMPERILED TREASURES 10 (2002). The Prairie Pothole Region consists of a large swath of the northern Great Plains, including parts of Iowa, Minnesota, South Dakota, and North Dakota and into Canada.

54. Mahdi M. Al-Kaisi et al., *Drought Impact on Crop Production and the Soil Environment: 2012 Experiences from Iowa*, 68 J. SOIL & WATER CONSERVATION 19A, 19A (2013).

55. *Id.* at 20A.

56. *Irrigation and Water Use: Overview*, ECON. RESEARCH SERV., <http://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use.aspx> [<https://perma.cc/65PG-ZLZG>] (last visited Mar. 28, 2016) (citation omitted).

57. See Matt Stevens, *Sierra Snowpack Shows Improvement, but Not Enough to Declare California’s Drought Over*, L.A. TIMES (Mar. 30, 2016), <http://www.latimes.com/local/lanow/la-me-ln-ca-drought-snowpack-20160330-story.html> [<https://perma.cc/85A4-GPHW>].

catastrophic pumping of groundwater.⁵⁸ Regulating groundwater use is critical because fresh groundwater withdrawals for irrigation account for the majority of all withdrawals in states including California, Texas, Nebraska, and Arkansas.⁵⁹ Agricultural irrigation can compound the devastating impacts of drought by reducing groundwater aquifers relied upon in much of the West for fresh water. For example, aquifers in California and the West's largest aquifer, the Ogallala Aquifer, have experienced tremendous declines in water levels, raising concerns about future agricultural viability in the region.⁶⁰

Irrigation itself may lead to soil degradation through the process of salinization. Too much irrigation or improper drainage can leave salt deposits when the water evaporates.⁶¹ Over time, the "concentrations of those salts can reach levels that make it more difficult for plants to take up water from the soil. Higher concentrations may become toxic, killing the crops."⁶² Recent reports estimate that "[s]alty soils also cause losses of around \$750 million annually in the Colorado River basin, an arid region of the U.S. Southwest."⁶³

Simply put, degraded soils turn into dirt while healthy soils are sources of life for ecosystems. The soil ecosystem is comprised of complex feedback mechanisms, which, when intact, provide for

58. *Sustainable Groundwater Management Act (SGMA)*, CAL. GROUNDWATER, <http://www.water.ca.gov/cagroundwater/legislation.cfm> [https://perma.cc/FJ88-TVL5] (last visited Aug. 14, 2016); see also Dennis Dimick, *If You Think the Water Crisis Can't Get Worse, Wait Until the Aquifers Are Drained*, NAT'L GEOGRAPHIC, Aug. 21, 2014, <http://news.nationalgeographic.com/news/2014/08/140819-groundwater-california-drought-aquifers-hidden-crisis> [https://perma.cc/UB78-UMJX].

59. *Total Water Use in the United States, 2010*, U.S. GEOLOGICAL SURVEY, <http://water.usgs.gov/edu/wateruse-total.html> [https://perma.cc/5RK9-XXA9] (last updated May 2, 2016).

60. See Bridget R. Scanlan et al., *Groundwater Depletion and Sustainability of Irrigation in the U.S. High Plains and Central Valley*, 109 PROC. NAT'L ACAD. SCI. 9320 (2012); Lisa Pfeiffer & C.-Y. Cynthia Lin, *The Effect of Irrigation Technology on Groundwater Use*, CHOICES, 3rd Quarter 2010.

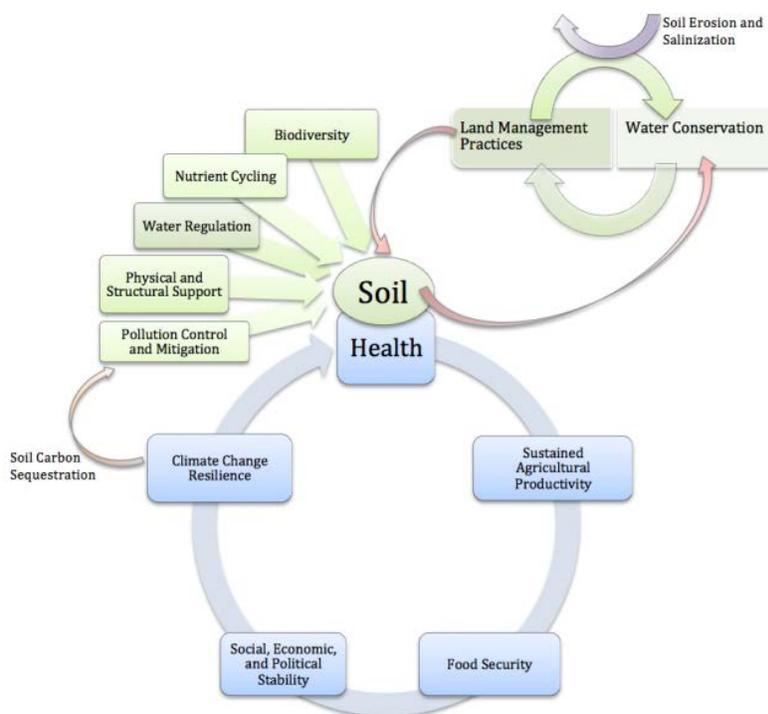
61. *Frequently Asked Questions About Salinity*, AGRIC. RESEARCH SERV., <http://www.ars.usda.gov/Aboutus/docs.htm?docid=10201&page=1> [https://perma.cc/U883-VJ83] (last updated Oct. 18, 2005).

62. Sarah Zielinski, *Earth's Soil Is Getting Too Salty for Crops to Grow*, SMITHSONIAN MAG., Oct. 28, 2014, <http://www.smithsonianmag.com/science-nature/earths-soil-getting-too-salty-crops-grow-180953163> [https://perma.cc/54HN-LKR3].

63. *Id.*

multiple ecosystem services such as improved yield, filtration, and climate change mitigation through carbon sequestration.⁶⁴

Figure 3: Soil Health-Water-Agriculture Connection



As depicted in Figure 3, “[s]oil is a living and life-giving natural resource,”⁶⁵ and soil health depends on many factors, such as biodiversity, nutrient cycling, water regulation, physical and structural support, and pollution control (shown left). When soil

64. Rattan Lal, *Managing Soils and Ecosystems for Mitigating Anthropogenic Carbon Emissions and Advancing Global Food Security*, 60 *BIOSCIENCE* 708, 710–15 (2010) (explaining how soil sequestration works in various ecosystems).

65. *Soil Health*, NAT. RES. CONSERVATION SERV., <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/soils/health> [<https://perma.cc/3K4N-Z48L>] (last visited Aug. 16 2016).

health is addressed through land management and water conservation (shown right), erosion and salinization can be reduced (shown right). The resulting soil health leads to increased agricultural yield, which improves food security, thereby ensuring social, economic, and political stability, and improving climate change resilience. The reverse is also true—poor soil health negatively impacts crop yield, undermining food security and climate change resilience, and compromising soil's role as a carbon sink.

C. Soil, Water, and Yield Connections

Federal soil conservation policy now includes soil health as a key component,⁶⁶ but current implementation does not bear this out. NRCS, the agency charged with carrying out the federal policy of soil conservation, defines soil health as “the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans,” which “speaks to the importance of managing soils so they are sustainable for future generations.”⁶⁷ Soil health has the potential to serve as more than just a definition but an operational concept, like the term “food security,” and thereby guide policy and implementation. However, NRCS tends to use the term “soil health” synonymously with “soil quality.”⁶⁸ In contrast, the Food and Agriculture Organization of the United Nations more consistently distinguishes these terms, “emphasizing the importance of the soil biota to soil functioning” in the term “soil health,” and the temporal aspects that may impact its functioning such as human use and natural events.⁶⁹ This more comprehensive definition accounts for soil health as a complex system:

66. See, e.g., *Healthy Soil for Life*, NAT. RES. CONSERVATION SERV., <http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health> [<https://perma.cc/FH8C-WR45>] (last visited Mar. 27, 2016).

67. *Id.*

68. *Id.*; see also NAT. RES. CONSERVATION SERV., GUIDELINES FOR SOIL QUALITY ASSESSMENT IN CONSERVATION PLANNING, at 3 (2001).

69. *What Is a Healthy Soil?*, FOOD & AGRIC. ORG. U.N., <http://www.fao.org/agriculture/crops/thematic-sitemap/theme/spi/soil-biodiversity/the-nature-of-soil/what-is-a-healthy-soil/en> [<https://perma.cc/V8ZX-WBCY>] (last visited Mar. 27, 2016); see also *Agriculture and Healthy Soil*, FOOD & AGRIC. ORG. U.N., <http://www.fao.org/agriculture/crops/thematic-sitemap/theme/spi/soil-biodiversity/agriculture-and-soil-biodiversity/agriculture-and-soil-health/en> [<https://perma.cc/DXK4-H4CX>] (last visited Aug. 14, 2016).

Healthy soils maintain a diverse community of soil organisms that help to control plant disease, insect and weed pests, form beneficial symbiotic associations with plant roots; recycle essential plant nutrients; improve soil structure with positive repercussions for soil water and nutrient holding capacity, and ultimately improve crop production.⁷⁰

In general, the definition of soil health has fallen into two camps, with significant implications for policy outcomes. The “reductionist” approach considers soil health “based on estimation of soil condition using a set of independent indicators of specific soil properties—physical, chemical and biological”—and has “much in common with conventional quality assessments in other fields, such as materials science.”⁷¹ On the other hand, the “integrated” approach considers that “the health of a soil is more than simply the sum of the contributions from a set of specific components” and “recognizes the possibility that there are emergent properties resulting from the interaction between different processes and properties.”⁷² Until recently, the scientific approach, and, in turn, agriculture policies, related to soil health tended toward reductionism, designed to measure subparts of soil systems but not soil systems as a whole.⁷³ The reductionist approach to soil science went hand-in-hand with the industrialization of agriculture post-World War II, with the heavy commercial inputs of fertilizer and pesticides focused on yield maximization.⁷⁴

Examining soil health and its complex interactions with water use and agricultural productivity from a whole systems perspective illuminates the serious shortcomings of our national farm policy. Crop yield, as previously noted, is closely linked to soil health. Yet, the current Farm Bill safety net—federally subsidized crop

70. *What Is a Healthy Soil?*, *supra* note 69.

71. M.G. Kibblewhite et al., *Soil Health in Agricultural Systems*, 363 *PHIL. TRANSACTIONS ROYAL SOC'Y.* 685, 685 (2007).

72. *Id.*

73. *See, e.g.*, GARY KLEPPEL, *THE EMERGENT AGRICULTURE: FARM, SUSTAINABILITY, AND THE RETURN OF THE LOCAL ECONOMY* 6–7 (2014); *see also* Stuart Shafer, *Where Environmental Policy Is Social Policy: Nature, Food, Society, and Metabolic Processes*, in *ENVIRONMENTAL POLICY IS SOCIAL POLICY—SOCIAL POLICY IS ENVIRONMENTAL POLICY* 11, 11–16 (Isidor Walliman ed., 2013).

74. KLEPPEL, *supra* note 73, at 8.

insurance—is implemented in such a way as to incentivize producers to plant on non-highly productive land. Professor Joshua Woodard of Cornell University has shown that the Federal Crop Insurance Program creates perverse incentives and provides a poor risk management scheme.⁷⁵ The program, in excess of \$100 billion in liabilities annually⁷⁶ and administered under the USDA’s Risk Management Agency, pays an indemnity when either the “yield or revenue is below some elected . . . baseline.”⁷⁷ However, the premium costs are not based upon actual risk because they overlook which fields are actually being planted/insured for any given policy, ignore soil data explicitly, inefficiently estimate expected yield, and are distorted as a result of various capping, capping, and yield exclusion features.⁷⁸ The results are pricing inefficiencies and tremendous margins of error.⁷⁹ In other words, risky planting practices are rewarded with inefficiently low premium costs and higher payouts.

Woodard found that “the government does not utilize soil data in designing products and rates, or setting guarantees.”⁸⁰ Thus:

Instead of using soil data to determine baseline insured yield levels and premium rates, the Government’s methodology relies on a noisy measure of average historical yields which does not account for the number nor specific years of production reported, the weather in those years across different farmers’ policies, nor even which fields being insured. Thus, the Government’s method does not reflect full information regarding soils, or for example when a producer adds or removes new land from an insured unit. This can result in mispricing of the underlying insurance and misalignment of incentives.⁸¹

Soil data that should be factored into the federal crop insurance programs to determine risk and premium include “soil type

75. Joshua D. Woodard, *Integrating High Resolution Soil Data into Federal Crop Insurance Rates: Actuarial, Policy, and Sustainability Implications*, at 1 (AGree, Working Paper, 2016).

76. *Id.*

77. *Id.* at 14.

78. *Id.*

79. *Id.* at 5.

80. Joshua D. Woodard & Leslie J. Verteramo Chiu, *Soil Data Not Considered in Cornerstone U.S. Agricultural Policy*, at 3, (Ag-Analytics.org, Working Draft, 2016).

81. *Id.* at 4.

[which] would be a very important factor as it regards crop yield potential and risk.”⁸² In fact,

the degree to which soils vary within a county (even for counties considered to have relatively high soil homogeneity in the Central Corn Belt) is quite significant, and the implications of ignoring such information in the crop insurance program could be far reaching. Rate differentials in excess of those currently taken into account by the Government’s rating system to the tune of more than 200% appear typical even in very conservative scenarios. New approaches that integrate this information explicitly into yield risk and insurance models is needed to further improve the performance and design of this cornerstone agricultural program.⁸³

In addition, conservation practices that reduce yield risk by improving soil health are not adequately taken into account or incentivized in the crop insurance program. Existing data on the relative risk of different production practices are inadequate, preventing the type of tailored risk assessment of on-the-ground realities that is necessary to reform the farm safety net.⁸⁴

D. Climate Change and Food Security

Agriculture is a key contributor to climate change and is, at the same time, fundamentally impacted by it.⁸⁵ Extreme weather, increased pathogens, and reduced precipitation in much of the world (including the American West) is already disrupting agriculture.⁸⁶ These environmental stressors on agricultural production, combined with global population growth to over nine

82. Woodard, *supra* note 75, at 2.

83. *Id.* at 8.

84. Barry J. Barnett & Ryan Stockwell, *Potential Conservation Implications of Federal Crop Insurance Actual Production History (APH) Procedures*, in AGREE, FOUR PAPERS ON THE U.S. FEDERAL CROP INSURANCE PROGRAM 11, 21 (2016).

85. *Sources of Greenhouse Gas Emissions*, ENVTL. PROT. AGENCY, <https://www3.epa.gov/climatechange/ghgemissions/sources/agriculture.html> [<https://perma.cc/TTR4-7T5T>] (last updated Oct. 6, 2016).

86. *See generally* Jerry Hatfield & Gene Takle, *Agriculture*, in CLIMATE CHANGE IMPACTS IN THE UNITED STATES: THE THIRD NATIONAL CLIMATE ASSESSMENT 150, 151–61 (2014) (articulating that extreme weather patterns have affected and will continue to affect crop and livestock production).

billion by 2050,⁸⁷ require resilient food and agriculture systems. Unfortunately, federal agricultural and farm policies result in perpetuating resource misuse, fundamentally undermining agricultural resilience.

Food system resilience demands that lawmakers develop and implement policies not to simply prevent soil erosion and prevent further wetland conversion, but to achieve healthy soils and wetland functioning. Healthy soils are more resilient because they better retain carbon organic matter and water and act as a more effective filtering system, which in turn improves water quality.⁸⁸ Moreover, agricultural lands can be managed in a way that helps mitigate climate change through enhanced sequestering of carbon. The Intergovernmental Panel on Climate Change predicts that “[m]anaging agricultural soils to store more carbon is likely to have ancillary benefits by reducing soil erosion; the use of cover crops, crop rotations, nutrient management, and organic amendments is likely to increase soil fertility and enhance food security for affected populations.”⁸⁹ With approximately forty percent of the Earth’s land surface used for agriculture,⁹⁰ optimizing agriculture’s potential as a carbon sink has important climate change mitigation potential.⁹¹ In a climate change world, sustainable agriculture is a system that requires society to manage a dynamic set of exquisitely interdependent resources in order to achieve both environmental sustainability and food security for all.

87. *World Population Projected to Reach 9.6 Billion by 2050*, U.N. DEP’T ECON. & SOC. AFF., June 13, 2013, <https://www.un.org/development/desa/en/news/population/un-report-world-population-projected-to-reach-9-6-billion-by-2050.html> [<https://perma.cc/L9FZ-VUV2>].

88. Kibblewhite et al., *supra* note 71, at 686.

89. *Land Use, Land-Use Change and Forestry: Soil Quality and Organic Carbon Storage*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, http://www.ipcc.ch/ipccreports/sres/land_use/index.php?idp=98 [<https://perma.cc/Q3AH-49GF>] (last visited Oct. 26, 2016).

90. James Owen, *Farming Claims Almost Half Earth’s Land, New Maps Show*, NAT’L GEOGRAPHIC, Dec. 9, 2005, http://news.nationalgeographic.com/news/2005/12/1209_051209_crops_map.html [<https://perma.cc/X78W-ALYK>].

91. See, e.g., Rattan Lal, *Soil Carbon Sequestration to Mitigate Climate Change*, 123 *GEODERMA* 1, 12 (2004) (discussing different agriculture techniques that can reduce greenhouse gas emissions).

III. THE FARM SAFETY NET: ITS ANTECEDENTS AND CONSEQUENCES

Agriculture's degradation of natural resources is a function of its startling transformation fueled, in significant part, by federal policies. Unlike with any other sector of the economy, the federal government has an entrenched and mutually reinforcing relationship with agriculture.⁹² Arguably, this relationship originates from the unique nature of agriculture and farming, its dependence on the vagaries of nature, and its necessity to sustain the nation.⁹³ Current agriculture policy is rooted in our agrarian past and Thomas Jefferson's ideal of the yeoman farmer as citizen with the most to gain through social contract with the fledgling federal government.⁹⁴ The contours of this relationship, reflecting the bargain society has struck between agriculture and its externalities, continues, as described above, to have profound and devastating environmental consequences.

The modern story of the federal government's relationship to agriculture starts with the trifecta of falling commodity prices post-World War I, the Great Depression, and the Dust Bowl. The tepid policies of President Hoover gave rise to President Franklin Roosevelt's 1933 administration and his sweeping policies known as the New Deal.⁹⁵ Under Roosevelt, the federal bureaucracy and its social programs exploded in a Keynesian effort to shore up the American economy and social fabric, marking an unprecedented expansion of government.⁹⁶ The resulting redefined role of the federal government reached deeply into the agricultural sector, which was engaged in a tragic cycle of over-production and plummeting prices.⁹⁷

92. See, e.g., R. DOUGLAS HURT, *THE PROBLEMS OF PLENTY: THE AMERICAN FARMER IN THE TWENTIETH CENTURY* 40, 95-96 (2002).

93. See generally Susan 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 (2010) (discussing how agriculture laws reflect the unique nature of agriculture as an industry).

94. SUSAN SCHNEIDER, *FOOD, FARMING, AND SUSTAINABILITY: READINGS IN AGRICULTURAL LAW*, at 3-5 (2010).

95. CONG. RESEARCH SERV., 96-900 ENR, *FARM COMMODITY LEGISLATION: CHRONOLOGY, 1933-2002*, at 1 (Geoffrey S. Becker ed., 2002).

96. *Id.*

97. HURT, *supra* note 92, at 63.

A. The Dust Bowl and the Soil Conservation and Domestic Allotment Act of 1936⁹⁸

If you would like to have your heart broken, just come out here. This is the dust-storm country. It is the saddest land I have ever seen.

— Ernie Pyle, a roving reporter in Kansas, just north of the Oklahoma border, in June 1936⁹⁹

During the throes of the Depression, Congress responded to record low crop prices with the Agricultural Adjustment Act of 1933 (“1933 Act”),¹⁰⁰ one of President Roosevelt’s first New Deal laws.¹⁰¹ The “[k]ey features of the new law included mandatory USDA price support for specified commodities, direct subsidy payments to farmers, and supply controls.”¹⁰² These commodity price controls, somewhat counterintuitively, featured payments to farmers not to produce on their land. Although the 1933 Act was passed as an emergency measure to address the economic plight of farmers, such acts became a permanent legislative feature of agriculture policy in the government’s effort to support commodity prices through varying policy mechanisms (e.g., land retirement, direct payment, surplus purchase),¹⁰³ with little consistent

98. The Soil Conservation and Domestic Allotment Act of 1936, Pub. L. No. 74-461, 49 Stat. 1148.

99. *The Drought*, PUB. BROAD. SERV., <http://www.pbs.org/wgbh/americanexperience/features/general-article/dustbowl-drought> [<https://perma.cc/3KBG-H5WB>] (last visited Mar. 23, 2016).

100. See HURT, *supra* note 92, at 69; see also William S. Eubanks II, *The Sustainable Farm Bill: A Proposal for Permanent Environmental Change*, 39 ENVTL. L. REP. NEWS & ANALYSIS 10,493 (2009) (considering the Agricultural Adjustment Act of 1933 as the first farm bill).

101. CONG. RESEARCH SERV., *supra* note 95, at CRS-1.

102. *Id.*

103. RENÉE JOHNSON & JIM MONKE, CONG. RESEARCH SERV., RS22131, WHAT IS THE FARM BILL?, at 1 n.1 (2014) (listing seventeen farm bills since the 1930s: 2014, 2008, 2002, 1996, 1990, 1985, 1981, 1977, 1973, 1970, 1965, 1956, 1954, 1949, 1948, 1938, and 1933); see also Agricultural Adjustment Act of 1933, Pub. L. No. 73-10, 48 Stat. 31; Agricultural Adjustment Act of 1938, Pub. L. No. 75-430, 52 Stat. 31; Agricultural Act of 1948, Pub. L. No. 80-897, 62 Stat. 1247; Agricultural Act of 1949, Pub. L. No. 81-439, 63 Stat. 1051; Agricultural Act of 1954, Pub. L. No. 83-690, 68 Stat. 897; Agriculture Act of 1956, Pub. L. No. 84-540, 70 Stat. 188; Food and Agricultural Act, Pub. L. No. 89-321, 79 Stat. 1187; Agricultural Act of 1970, Pub. L. No. 91-524, 84 Stat. 1358; Agricultural and Consumer Protection Act of 1973, Pub. L. No. 93-86, 87 Stat. 221; Food and Agriculture Act, Pub. L. No. 95-113, 91 Stat. 913; Agriculture and Food Act of 1981, Pub. L. No. 97-98, 95 Stat. 1213; Food Security Act of 1985, Pub. L. No. 99-198, 99 Stat. 1354; Food Agricultural Conservation and Trade Act of 1990, Pub. L. No. 101-624, 104 Stat. 3359; Federal Agriculture Improvement and Reform Act of 1996, Pub. L. No. 104-127, 110 Stat. 888; Farm Security and Rural Investment Act of 2002,

success.¹⁰⁴ Thus, the Agricultural Adjustment Act of 1933 was quickly followed by the Soil Conservation and Domestic Allotment Act of 1936,¹⁰⁵ which amended and renamed the Soil Conservation Act of 1935, and then the Agricultural Adjustment Act of 1938.¹⁰⁶ As at least one commentator has noted, “[t]he majority of farm programs enacted by Congress during the twentieth century have their origins in these three pieces of legislation.”¹⁰⁷

In the early 1930s, severe and chronic drought swept westward.¹⁰⁸ In Texas and the plains, a decade-long drought compounded by wind storms eroded massive amounts of fragile topsoil, once anchored by prairie but “broken out” to produce commodities in demand during World War I.¹⁰⁹ The Dust Bowl region spanned close to 100 million acres, including parts of Colorado, Kansas, Texas, Oklahoma, and New Mexico.¹¹⁰ In a historical irony, the very lands settled and cultivated through aggressive federal policies—such as the Homestead Acts—to grow America and its economy,¹¹¹ became symbols of economic, social, and

Pub. L. No. 107-171, 116 Stat. 134; Food, Conservation, and Energy Act, Pub. L. No. 110-234, 122 Stat. 923 (2008); Agricultural Act of 2014, Pub. L. No. 113-79, 128 Stat. 649.

104. See generally HURT, *supra* note 92 (detailing the history of the federal government’s policy interventions in the agricultural sector).

105. After the Supreme Court declared the Agricultural Adjustment Act of 1933 unconstitutional, President Roosevelt signed the Soil Conservation and Domestic Allotment Act of 1936, Pub. L. No. 74-461, 49 Stat. 1148, which amended the Soil Conservation Act of 1935, Pub. L. No. 74-46, 49 Stat. 163, in an effort to reduce soil erosion and preserve national agricultural lands.

106. Agricultural Adjustment Act of 1933, 48 Stat. 31; Soil Conservation and Domestic Allotment Act of 1936, 49 Stat. 1148; Soil Conservation Act of 1935, 49 Stat. 163; Agricultural Adjustment Act of 1938, 52 Stat. 31.

107. Allen H. Olson, *Federal Farm Programs—Past, Present and Future—Will We Learn from Our Mistakes?*, 6 GREAT PLAINS NAT. RES. J. 1, 4 (2001).

108. *When the Dust Settled*, THE NATURE CONSERVANCY, <http://www.nature.org/ourinitiatives/regions/northamerica/when-the-dust-settled.xml> [https://perma.cc/Q44M-DAVE] (last visited Mar. 23, 2016).

109. *Id.*

110. Sandra Zellmer, *Boom and Bust on the Great Plains: Déjà Vu All Over Again*, 41 CREIGHTON L. REV. 385, 390–404 (2008) (reviewing two books about the Great Plains and agricultural disasters).

111. Greg Badsher, *How the West Was Settled: The 150 Year Old Homestead Act Lured Americans Looking for a New Life*, PROLOGUE, Winter 2012, at 27. The Homestead Acts incentivized Western United States settlement by offering abundant, economical tracts of land. The Homestead Acts encompass several statutes: the Homestead Act of 1862, the Southern Homestead Act of 1866, the Timber Culture Act of 1873 (amended in 1904), the Enlarged Homestead Act of 1909, and the Stock-Raising Homestead Act of 1916.

environmental disaster.¹¹² Experts estimated that about 850,000,000 tons of topsoil were blown off the Southern Plains in 1935 alone, and that over one hundred million acres of cropland lost all or most topsoil during the Dust Bowl.¹¹³ Beginning in 1933, the Soil Erosion Service and then its successor, the Soil Conservation Service, administered a soil erosion control program, providing financial incentives for farmers to take lands unsuited for agriculture out of crop production and restore these lands into permanent pastures or forests.¹¹⁴ New conservation practices were also implemented, such as contour plowing and crop rotation, reducing wind eroded soil by sixty-five percent.¹¹⁵

The Soil Conservation and Domestic Allotment Act (“1936 Act”) is significant because it marks the beginning of a national policy of soil conservation.¹¹⁶ The 1936 Act, which remains law today, responded to the hardships wrought by the Great Depression and the detrimental effects of soil erosion during the Dust Bowl. The purpose of the Act, as amended, states:

It is recognized that the wastage of soil and moisture resources on farm, grazing, and forest lands of the Nation, resulting from soil erosion, is a menace to the national welfare and that it is declared to be the policy of Congress to provide permanently for the control and prevention of soil erosion to preserve soil, water, and related resources, promote soil and water quality, control floods, prevent impairment of reservoirs, and maintain the navigability of rivers and harbors, protect public health, public lands and relieve unemployment, and the Secretary of Agriculture, from now on, shall coordinate and direct all activities with relation to soil erosion¹¹⁷

Under the 1936 Act, Congress authorized payments to farmers to reduce and “shift production from soil depleting surplus crops to soil conserving legumes and grasses.”¹¹⁸ The 1936 Act also

112. Eubanks, *supra* note 100, at 10,496.

113. *Timeline: Surviving the Dust Bowl 1931–1939*, PUB. BROAD. SERV., <http://www.pbs.org/wgbh/americanexperience/features/timeline/dustbowl> [<https://perma.cc/PW6A-YBBV>] (last visited Mar. 18, 2016).

114. This program of land retirement continues today under the farm bill in the form of the Conservation Reserve Program, discussed later in this Section.

115. *When the Dust Settled*, *supra* note 108.

116. *See, e.g., A Brief History*, *supra* note 24.

117. 16 U.S.C. § 590a (2012).

118. Olson, *supra* note 107, at 5.

established the Soil Conservation Service in the USDA, transferring the Soil Erosion Service headed by Hugh Bennett from Department of the Interior¹¹⁹ and combining it with similar USDA functions.¹²⁰

Later, in 1937, Congress passed the Bankhead Jones Farm Tenant Act, which authorized the federal government to purchase damaged, sub-marginal agriculture lands.¹²¹ Bankhead Jones reflected the evolution of ongoing federal efforts begun in 1929 to address the serious resource problem of restoring the Dust Bowl lands. Congress first authorized the USDA to study these lands and make recommendations regarding their disposition.¹²² By 1931, the Secretary of Agriculture had convened the National Conference on the Land Utilization Project (“LUP”) to recommend land restoration measures. The conference was followed by a series of executive actions to acquire and administer the LUPs, which gained permanent legislative support with the passage of Bankhead Jones.¹²³ The fledgling Soil Conservation Service purchased and restored Dust Bowl lands, some of which eventually became the National Grasslands, with management transferred to the Forest Service in the 1950s.¹²⁴ These efforts, combined with the Soil Conservation and Domestic Allotment Act, constituted the federal government’s main role in agriculture conservation for the next fifty years until enactment of the 1985 Farm Bill and its “conservation compliance” provisions. Only then did the purpose of conservation programs squarely address natural resources protection.¹²⁵

119. Douglas Helms, *Hugh Hammond Bennett and the Creation of the Soil Service*, NAT. RES. CONSERVATION SERV. HIST. INSIGHTS, Sept. 2008, at 1.

120. *A Brief History*, *supra* note 24.

121. Importantly, this legislation also provided modest program assistance to tenant farmers to purchase their land. The relationship of the USDA to minority and disadvantaged farmers is critical and an ongoing issue, but beyond the scope of this article.

122. George A. Pavelis et al., *Soil and Water Conservation Expenditures by USDA Agencies, 1935–2010*, NAT. RES. CONSERVATION SERV. HIST. INSIGHTS, May 2011, at 14.

123. *Id.*

124. See *Chronological History of National Grasslands*, U.S. FOREST SERV., http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm9_032448.pdf [<https://perma.cc/TG3E-MXHU>] (last visited Mar. 24, 2016).

125. Zachary Cain & Stephen Lovejoy, *History and Outlook for Farm Bill Conservation Programs*, CHOICES, 4th Quarter 2004, at 37, 39–40.

B. The Radical Transformation of Agriculture

As the twentieth century progressed, American agriculture underwent radical transformation. The roots of this change began in the Second Industrial Revolution (or the Technological Revolution) of the late nineteenth century, which drove the growth of industry and cities. Through the expansion of railroads, development of the internal combustion engine, and mechanization of agricultural production, food production required less labor and consumption could occur far from the point of production. By the early 1900s, the once agrarian nation was no longer so, with only forty percent of the American workforce dedicated to farming.¹²⁶ Still, agriculture in 1900 remained labor intensive, comprised of many small, diversified farms, and the majority of the American population remained rural.¹²⁷

However, by 1930, the percentage of the American workforce engaged in agriculture dropped nearly in half to twenty percent. By 1945, only sixteen percent of the workforce was employed in agriculture, reflecting a startling demographic shift.¹²⁸ Although still owned by families, farms became consolidated, larger, and dominated by monocultures, maximizing the efficiencies of economies of scale. The widespread adoption of tractors in the 1930s and 1940s and combines by the 1950s greatly reduced labor inputs, further industrializing agriculture.¹²⁹

From the late 1940s onward, the so-called Green Revolution fueled commodity crop production and yields soared by relying upon new plant hybrids and heavy inputs of industrial fertilizers and pesticides generated, in part, by repurposing the infrastructure of the World War II munitions industry.¹³⁰ The “father” of the Green Revolution, Norman Borlaug, received the Nobel Peace Prize in the 1970s for his contributions to the world food supply. Borlaug developed modern hybrids and cultivation methods, including the use of fertilizers and pesticides, and advocated for

126. CAROLYN DIMITRI ET AL., ECON. RESEARCH SERV., THE 20TH CENTURY TRANSFORMATION OF U.S. AGRICULTURE AND FARM POLICY, at 3 (2005).

127. HURT, *supra* note 92, at 9–11.

128. DIMITRI ET AL., *supra* note 126, at 2.

129. *See* HURT, *supra* note 92, at 115.

130. *Id.*; *see also* Eubanks, *supra* note 100, at 10,495; MICHAEL POLLAN, THE OMNIVORE'S DILEMMA: A NATURAL HISTORY OF FOUR MEALS 41 (2nd ed. 2007).

the adoption of such techniques to increase yield in developing countries to combat hunger.¹³¹ Notably, Borlaug began his career during World War II with the chemical giant DuPont, originally working on industrial fungicides as well as the insecticide DDT to combat malaria.¹³² Two decades later, Rachel Carson's book *Silent Spring* detailed the harmful environmental impacts of DDT, raising widespread public concern, and fueling the environmental movement.¹³³ However, it would take decades for environmentalists to earnestly begin to address the environmental harms associated with agricultural production.¹³⁴

Tremendous gains in agriculture productivity were first generated by increased inputs, such as fertilizers and pesticides, as well as petroleum, through mechanization. However, the engine of growth shifted by late century to new technology (e.g., biotechnology, information technology, and improved chemicals); and for livestock, consolidation, intensification, and integration drove output maximization.¹³⁵ In fact:

Gains in productivity have been a driving force for growth in U.S. agriculture. The effects of these changes over the second half of the 20th century were dramatic: between 1950 and 2000, the average amount of milk produced per cow increased from 5,314 pounds to 18,201 pounds per year, the average yield of corn rose from 39 bushels to 153 bushels per acre, and each farmer in 2000 produced on average 12 times as much farm output per hour worked as a farmer did in 1950. The development of new technology was a primary factor in these improvements.¹³⁶

131. Justin Gillis, *Norman Borlaug, Plant Scientist Who Fought Famine, Dies at 95*, N.Y. TIMES, Sept. 13, 2009, at A1.

132. *Interview: Norman Borlaug*, PUB. BROAD. SERV., <http://www.pbs.org/wgbh/americanexperience/features/interview/earthdays-norman-borlaug/?flavour=mobile> [<https://perma.cc/ZUK6-BGET>] (last visited Mar. 24, 2016).

133. See RACHEL CARSON, *SILENT SPRING* (1962).

134. See William S. Eubanks II, *The Future of Federal Farm Policy: Steps for Achieving A More Sustainable Food System*, 37 VT. L. REV. 957 (2013); Drew L. Kershen, *The Contested Vision for Agriculture's Future: Sustainable Intensive Agriculture and Agroecology*, 46 CREIGHTON L. REV. 591 (2013); Sarah J. Morath, *The Farm Bill: A Wicked Problem Seeking A Systematic Solution*, 25 DUKE ENVTL. L. & POL'Y F. 389 (2015); Laurie Ristino, *Back to the New: Millennials and the Sustainable Food Movement*, 15 VT. J. ENVTL. L. 1 (2013); Stephanie Tai, *Food Systems Law from Farm to Fork and Beyond*, 45 SETON HALL L. REV. 109, 110 (2015).

135. KEITH O. FUGLIE ET AL., ECON. RESEARCH SERV., *PRODUCTIVITY GROWTH IN U.S. AGRICULTURE 4-6* (2007).

136. *Id.* at 1.

Despite enormous yield increases, the percentage of the nation's GDP from farms declined from over seven percent in 1930 to less than one percent in 2002.¹³⁷ Essentially, yield increases had the effect of keeping commodity prices lower than economy-wide price inflation.¹³⁸ This meant that agricultural yield increases and economies of scale resulted in relatively inexpensive food as the rest of the economy grew and diversified.

In just the last quarter of the century, agricultural policies and accompanying events converged, radically transforming American agriculture. For example, the farm credit crisis of the 1980s, which resulted in massive farm foreclosures and consolidation; the growth of the biotechnology industry and the resulting ubiquitous use of genetically engineered seeds and related herbicides and pesticides (e.g., glyphosate and neonicotinoids); and the consolidation and integration of the livestock and poultry industries, leveraging scale to externalize environmental costs and create downward pressure on production cost, all unfolded during this period. Because of our remove from agriculture and food production, most Americans remained unengaged and unaware of these changes until recently.¹³⁹

Setting the stage for the farm credit crisis was 1970s agriculture policy, which, in turn, was responding to high commodity prices and the Soviet Union's demand for grain.¹⁴⁰ To meet demand, USDA Secretary Earl Butz was famously quoted as urging farmers to "get big or get out."¹⁴¹ Butz called on farmers to plant "fencerow to fencerow,"¹⁴² breaking out sensitive lands into crop production to fuel foreign demand for commodities. Farmers responded by producing more commodities and taking on more debt to grow

137. DIMITRI ET. AL., *supra* note 126, at 2.

138. FUGLIE ET. AL., *supra* note 135, at 2–3.

139. See Tamar Haspel, *The Surprising Truth about the 'Food Movement'*, WASH. POST, Jan. 26, 2016, https://www.washingtonpost.com/lifestyle/food/the-surprising-truth-about-the-food-movement/2016/01/25/42bed508-bfcf-11e5-9443-7074c3645405_story.html [<https://perma.cc/ZS4H-2Z6H>]; see also Ocean Robbins, *How the Food Movement Is Gaining Strength*, HUFFINGTON POST, Dec. 12, 2012, http://www.huffingtonpost.com/ocean-robbins/sustainable-food-movement_b_2288381.html [<https://perma.cc/74C5-9R6G>].

140. PAUL K. CONKLIN, *A REVOLUTION DOWN ON THE FARM: THE TRANSFORMATION OF AGRICULTURE SINCE 1929*, at 131–32 (2008).

141. Eubanks, *supra* note 100, at 10,495–96.

142. Melanie J. Wender, *Goodbye Family Farms and Hello Agribusiness: The Story of How Agricultural Policy Is Destroying the Family Farm and the Environment*, 22 VILL. ENVTL. L.J. 141, 147 (2011) (citing Eubanks, *supra* note 100, at 10,496).

their operations. When commodity prices fell as a result of domestic and international pressures, such as the Carter administration's embargo of grain to Russia and the OPEC oil embargo,¹⁴³ farmers' fortunes followed suit, leaving significant environmental, societal, and economic devastation.¹⁴⁴ By the end of the 1980s, an estimated 300,000 farmers had defaulted on their bank loans, and thousands lost their farms.¹⁴⁵

At the same time, the 1980s saw the emergence of the fledgling biotechnology industry and the consequent need for federal regulation. The resulting regulatory framework, the so-called Coordinated Framework for Biotechnology,¹⁴⁶ was developed under the Reagan administration with the goal of supporting growth of the biotechnology industry without "undue" regulation.¹⁴⁷ A central Framework tenet is that "U.S. policy would focus on the product of genetic modification ('GM') techniques, not the process itself."¹⁴⁸ The Reagan administration's policy to support the nascent industry was wildly successful. The use of genetically engineered corn and soy seeds in American crops and the companies that own their patents came to dominate commodity production in a mere few decades, a stunning transformation.¹⁴⁹ For example, ERS states that, regarding seeds developed to be resistant to certain herbicides (herbicide tolerant or "HT"):

. . . HT soybeans went from 17 percent of U.S. soybean acreage in 1997 to 68 percent in 2001 and 94 percent in 2014, 2015, and 2016. Plantings of HT cotton expanded from about 10 percent of U.S. acreage in 1997 to 56 percent in 2001, 91 percent in 2014, but declined to 89 percent in 2015. The adoption of HT corn, which had

143. Michael Corbett, *Oil Shock of 1973-74*, FED. RES. HIST., Nov. 22, 2013, <http://www.federalreservehistory.org/Events/DetailView/36> [https://perma.cc/94QN-3Q4K] (discussing how the embargo increased oil prices in the United States and impacted commodity prices).

144. Robert Paarlberg, *Lessons of the Grain Embargo*, FOREIGN AFF., Fall 1980, at 144.

145. See FED. DEPOSIT INS. CORP., AN EXAMINATION OF THE BANKING CRISES OF THE 1980S AND EARLY 1990S, at 259-64 (1997).

146. See Coordinated Framework for Regulation of Biotechnology, 51 Fed. Reg. 23,302 (Jun. 26, 1986).

147. Emily Marden, *Risk and Regulation: U.S. Regulatory Policy on Genetically Modified Food and Agriculture*, 44 B.C. L. REV. 733, 735 (2003).

148. *Id.* at 738 (referring to the Reagan administration's policy that the regulatory framework would focus on the end product).

149. See JORGE FERNANDEZ-CORNEJO ET AL., ECON. RESEARCH SERV., GENETICALLY ENGINEERED CROPS IN THE UNITED STATES 3-7 (2014).

been slower in previous years, has accelerated, reaching 89 percent of U.S. corn acreage in 2014, 2015, and 2016.¹⁵⁰

Similarly, in just twenty years, the livestock industry underwent enormous structural changes, putting production in the hands of fewer companies with power to control the market. For example, the number of hog farms fell seventy percent between 1994 and 2004, but the number of hogs raised remained about the same.¹⁵¹ In 2000, ERS issued a special report on the consolidation of the meat industry, finding:

The U.S. meatpacking industry consolidated rapidly in the last two decades, as today's leading firms built very large plants and many independent packers disappeared. Today, four firms handle nearly 80 percent of all steer and heifer slaughter; just two decades ago, concentration was less than half as high.¹⁵²

C. Watershed: The 1985 Farm Bill

Amidst the farm credit crisis, Congress went to work on the 1985 Farm Bill, futilely attempting the balancing act of reforming expensive and unpopular farm price supports, while aiding financially destitute farmers. The result, the Food Security Act of 1985,¹⁵³ the most expensive Farm Bill up to that time, was reluctantly signed into law by President Reagan.¹⁵⁴ The Food Security Act marked a critical turning point because it was the first time the Farm Bill addressed natural resource concerns by requiring environmental stewardship as a condition of Farm Bill benefits.¹⁵⁵ A contemporaneous law review article posited four key developments as the drivers for this policy shift:

150. *Recent Trends in GE Adoption*, ECON. RESEARCH SERV., <http://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/recent-trends-in-ge-adoption.aspx> [<https://perma.cc/8D6B-3WB8>] (last updated Nov. 03, 2016).

151. NIGEL KEY & WILLIAM MCBRIDE, ECON. RESEARCH SERV., ERR-52, *THE CHANGING ECONOMICS OF U.S. HOG PRODUCTION*, at iii (2007).

152. Econ. Research Serv., *Consolidation in Meatpacking: Causes & Concerns*, ARGIC. OUTLOOK, June–July 2000, at 23, 23.

153. Food Security Act of 1985, Pub. L. No. 99-198, 99 Stat. 1354 (1985).

154. Eleanor Clift, *Reagan Signs History's Most Costly Farm Bill*, L.A. TIMES, Dec. 24, 1985, http://articles.latimes.com/1985-12-24/news/mn-20869_1_farm-bill [<https://perma.cc/EX7V-D4JQ>].

155. STUBBS, *supra* note 5, at 1.

the first opportunity since 1981 for a comprehensive revamping of agricultural policy; the spiraling cost of farm programs calling for reduced farm output and government subsidies; the growing recognition of the environmental destructivity of many agricultural policies; and—perhaps most importantly—the recognition by urban and suburban interests as well as environmental groups of their stake in the farm bill debate.¹⁵⁶

The conservation initiatives authorized by the Food Security Act were the Conservation Reserve Program (“CRP”), and the “Sodbuster” and “Swampbuster” requirements, together referred to as “conservation compliance.”¹⁵⁷ The Secretary of Agriculture designated the Soil Conservation Service (later renamed the Natural Resources Conservation Service) to implement conservation compliance, and the Farm Services Agency (“FSA”) to administer CRP.¹⁵⁸ Conservation compliance and CRP remain in the current (2014) Farm Bill.¹⁵⁹

CRP is one of the most well-known, voluntary Farm Bill conservation programs and, until the 2008 Farm Bill, the largest. CRP is a modern version of USDA’s dust-bowl era cropland retirement policy, with the key difference that the purpose has shifted from controlling commodity production to conservation.¹⁶⁰ Under the program, the USDA pays farmers “rental payments” for a period of ten to fifteen years to take highly erodible lands out of production,¹⁶¹ and provides federal cost-share payments to restore conservation values. The number of acres taken out of production and enrolled in the program depends on Farm Bill acreage caps and commodity prices (higher prices generally incentivize farmers to keep land in production). In 2008, for example, approximately thirty-two million acres of cropland were in CRP.¹⁶² When the rental period expires, farmers may put CRP lands back in

156. Linda A. Malone, *A Historical Essay on the Conservation Provisions of the 1985 Farm Bill: Sodbusting, Swampbusting, and the Conservation Reserve*, 34 KAN. L. REV. 577, 578 (1986).

157. Food Security Act of 1985, Pub. L. No. 99-198, 99 Stat. 1354 (1985) (currently codified in relevant part at 16 U.S.C. § 3831 (2012 & Supp. III 2015) (CRP); *id.* §§ 3811, 3821 (Sodbuster and Swampbuster)).

158. 7 C.F.R. § 1410.1 (2016).

159. Agricultural Act of 2014, Pub. L. No. 113-79, 128 Stat. 649 (2014).

160. Mary Jane Angelo, *Corn, Carbon, and Conservation: Rethinking U.S. Agricultural Policy in A Changing Global Environment*, 17 GEO. MASON L. REV. 593, 629–30 (2010).

161. 7 C.F.R. § 1410.7.

162. DANIEL HELLERSTEIN & SCOTT MALCOLM, ECON. RESEARCH SERV., THE INFLUENCE OF RISING COMMODITY PRICES ON THE CONSERVATION RESERVE PROGRAM, at 3 (2011).

production or sign up for another rental period.¹⁶³ From 1995 to 2014, nearly \$35 billion in taxpayer dollars were spent on CRP payments.¹⁶⁴ One well-placed criticism of CRP is that despite significant public investment, CRP benefits are ephemeral because CRP lands can go back into production.¹⁶⁵

D. Conservation Compliance

The conservation compliance provisions are comprised of the “Sodbuster” and “Swampbuster” programs.¹⁶⁶ These provisions use the “power of the purse” (in this case, losing Farm Bill benefits) to incentivize a degree of environmental compliance by farmers. Conservation compliance is the closest analog to environmental regulation in the Farm Bill. Sodbuster or Highly Erodible Land (“HEL”)¹⁶⁷ compliance applies to land designated by NRCS as highly erodible, and requires producers to follow an approved NRCS conservation plan or system designed to limit soil erosion when producing a commodity crop.¹⁶⁸ HEL compliance recognizes the continued problem of soil erosion on American farmland and the need for conservation planning and related implementation of conservation practices to reduce erosion. Swampbuster or wetland conservation compliance prohibits producers from producing an agricultural commodity on a wetland converted after December 23, 1985, or converting a wetland after November 28, 1990, to make production of an agricultural commodity possible.¹⁶⁹

However, the Sodbuster statutory provisions include an array of exemptions or qualifications muting its efficacy. These

163. 7 C.F.R. §1410.6.

164. EWG’s *Farm Subsidy Database: Conservation Reserve Program*, ENVTL. WORKING GRP., https://farm.ewg.org/progdetail.php?fips=00000&progcode=total_cr [<https://perma.cc/Y7GC-38E9>] (last visited Mar. 26, 2016).

165. MARK V. VANDEVER & ARTHUR W. ALLEN, U.S. GEOLOGICAL SURVEY, *MANAGEMENT OF CONSERVATION RESERVE PROGRAM GRASSLAND TO MEET WILDLIFE HABITAT OBJECTIVES*, at 1 (2015).

166. MEGAN STUBBS, CONG. RESEARCH SERV., R43504, *CONSERVATION PROVISIONS IN THE 2014 FARM BILL* (P.L. 113-79), at 13 (2014).

167. “Sodbuster” technically refers to land not in cultivation prior to passage of the 1985 Farm Bill and the associated conservation requirements, and HEL compliance refers to compliance requirements for those highly erodible lands in production prior to 1985. *See* AM. FARM BUREAU, *SHOULD TYING CONSERVATION COMPLIANCE TO CROP INSURANCE BE ALTERED?*, at 1 (2016).

168. STUBBS, *supra* note 166, at 13–14.

169. 16 U.S.C. § 3821 (2012 & Supp. III 2015).

qualifications include “good faith” compliance violations, graduated penalties instead of complete benefit loss, and allowable compliance variances under the conservation plans if the failure is determined to be technical and minor in nature or beyond the control of the producer.¹⁷⁰ Additionally, exemptions apply to weather, pests, or disease related temporary variances, or when a conservation system causes a producer undue economic hardship.¹⁷¹ Finally, producers have several years to develop and comply with a conservation plan.¹⁷² Similar to the Sodbuster provisions, wetlands compliance includes a litany of exemptions and qualifiers, the totality of which undermines the strength of the wetlands compliance provision.¹⁷³

The 1996 Farm Bill “decoupled” conservation compliance from producer eligibility for the federal crop insurance program, thereby limiting the scope of producers who had to meet its requirements.¹⁷⁴ During the 2014 Farm Bill debate, conservation groups successfully advocated for re-coupling or re-linking conservation compliance to crop insurance¹⁷⁵ in what should have been an important win for the environment, in light of the shifting of the Farm Bill safety net from direct subsidy to crop insurance, as discussed further below. A 2013 report by EWG documented the critical need for re-linking conservation compliance with the farm safety net, showing “a remarkable correlation between counties that are hotspots for conversion of wetlands, wetland buffers and highly erodible cropland and those with highest average payouts from crop insurance.”¹⁷⁶ In addition, EWG found HEL conversion “hot spots” in areas susceptible to drought, finding:

Plowing up highly erodible land is concentrated in the Great Plains from Montana to Texas—areas vulnerable to drought and devastating rates of erosion. The hotspot region at the intersection of Colorado, Kansas, Oklahoma and Texas was ground zero for the Dust Bowl—a

170. *Id.* § 3812.

171. STUBBS, *supra* note 36, at 2–3.

172. *Id.* at 3.

173. 16 U.S.C § 3822(b).

174. STUBBS, *supra* note 36, at 6.

175. See, e.g., 2014 Farm Bill Drill Down: Conservation-Crop Insurance Linkages, NAT'L SUSTAINABLE AGRIC. COAL., Feb. 10, 2014, <http://sustainableagriculture.net/blog/2014-farm-bill-hel-wetlands/0> [<https://perma.cc/BP6M-GK9E>].

176. CRAIG COX & SOREN RUNDQUIST, ENVTL. WORKING GRP., GOING, GOING, GONE: MILLIONS OF ACRES OF WETLANDS AND FRAGILE LAND GO UNDER THE PLOW 8 (2013).

massive ecological disaster that devastated a large swath of the United States during the 1930s as a result of persistent drought combined with poor farming practices on fragile land that had once been covered with grass.¹⁷⁷

Recoupling has had the practical effect of expanding the reach of conservation compliance due to the growth of federally subsidized crop insurance enrollment in recent decades.¹⁷⁸ Available since the 1930s but not widely used by farmers, crop insurance enrollment has grown tremendously since the 1990s when Congress raised federal premium subsidies.¹⁷⁹ GAO found that the federal subsidy to crop insurance premiums had grown to \$8.4 billion annually on average from fiscal years 2008 to 2012, compared to \$3.4 billion a year from 2003 to 2007.¹⁸⁰ Therefore, even before the 2014 Farm Bill, crop insurance was a major safety net for crop farmers.¹⁸¹ The majority of the crop insurance premium subsidy goes to producers of the largest commodities. In 2013, for example, seventy-seven percent of crop insurance premium subsidies went to corn, soy, and wheat production, with corn production, by far, commanding the greatest percentage at thirty-nine percent.¹⁸² This fact, combined with the perverse incentives created by federally subsidized crop insurance, have profound implications regarding environmental impacts.

E. A Shifting Emphasis: The Conservation Title 1990–2014

The conservation title's voluntary conservation programs continued to expand from the 1990 through 2008 Farm Bills. In the 2014 Farm Bill, the conservation title at \$28 billion represents the third largest title in terms of funding, trailing the crop insurance title at \$41 billion and the nutrition title at \$391

177. *Id.* at 6.

178. See *ERS Publishes New Conservation Compliance Diagram*, NAT'L SUSTAINABLE AGRIC. COAL., Feb. 10, 2012, <http://sustainableagriculture.net/blog/new-compliance-data> [<https://perma.cc/GQD9-AMGT>] (illustrating the relationship between farms and farm acres that receive conservation payments, direct payments, and crop insurance).

179. ERIK J. O'DONOGHUE, ECON. RESEARCH SERV., ERR-169, THE EFFECTS OF PREMIUM SUBSIDIES ON DEMAND FOR CROP INSURANCE, at 3 (2014).

180. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-14-700, CROP INSURANCE: CONSIDERATIONS IN REDUCING FEDERAL PREMIUM SUBSIDIES 8 (2014).

181. O'DONOGHUE, *supra* note 179.

182. TAXPAYERS FOR COMMON SENSE, 2014 FARM BILL CROP INSURANCE SUBSIDIES FOR BIOFUELS CROPS, at 2 (2015).

billion.¹⁸³ Still, at \$28 billion, Farm Bill conservation funding likely represents the United States' single largest investment in working lands conservation. Significantly, Congress has shifted the emphasis of Title II from "land retirement" to cost-share payments for practices to improve conservation outcomes. Farm Bill conservation programs can be divided into the following general categories: conservation compliance, real property conservation programs (rental and easement), and cost-share for conservation practices.¹⁸⁴

The 1990 Farm Bill added a popular and highly successful easement program, the Wetlands Reserve Program ("WRP"), strongly supported by "hook and bullet" groups like Ducks Unlimited.¹⁸⁵ Under WRP, NRCS paid landowners to restore wetlands converted prior to the 1985 Farm Bill in exchange for a permanent or term conservation easement. In essence, WRP returned NRCS to its mid-century role of land restorer and property owner. Subsequent Farm Bills would add other easement programs (the Farm and Ranchlands Protection Program and the Grassland Reserve Program), eventually making NRCS a major federal funder of conservation easements.¹⁸⁶ In the 2014 Farm Bill, these programs would be merged into the Agriculture Conservation Easement Program,¹⁸⁷ ostensibly for cost saving and administrative streamlining.

The 1996 Farm Bill added the Environmental Quality Incentives Program ("EQIP"), a voluntary conservation program where USDA provides cost-share payments to producers who install approved conservation practices.¹⁸⁸ Then, the 2002 Farm Bill added the

183. JOHNSON & MONKE, *supra* note 103, at 2.

184. *See, e.g.*, Agricultural Act of 2014, Pub. L. No. 113-79, 128 Stat. 649.

185. *See generally* Scott Yaich, *Wetlands and the Farm Bill*, DUCKS UNLIMITED, <http://www.ducks.org/conservation/public-policy/wetlands-and-the-farm-bill> [<https://perma.cc/5YST-B6NR>] (last visited Aug. 26, 2016).

186. *See* JOHNSON & MONKE, *supra* note 103, at 8.

187. 16 U.S.C. § 3865 (2014).

188. *See* Federal Agriculture Improvement and Reform Act of 1996, Pub. L. No. 104-127, 110 Stat. 888 (1996). "Conservation practices" are farming methods or structural improvements approved by NRCS to address particular resources concerns. NRCS state offices determine which practices are approved for each state. Examples of approved practices include: wooded stream buffer, stream fencing, cover cropping, grassed waterways and other more controversial "practices" such as high tunnels to extend the growing season. *See, e.g.*, Vermont EQIP Information Overview, NAT. RES. CONSERVATION SERV., <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/eqip/?cid>

Conservation Security Program (“CSP”), later renamed the Conservation Stewardship Program, an administratively complex program designed to reward good stewards for existing conservation practices when enhanced or for new practices when installed.¹⁸⁹ Over successive Farm Bills, the cost-share programs EQIP and CSP, and related partnerships to leverage non-federal funding and landscape-scale conservation, have come to dominate the conservation title.¹⁹⁰ This change reflects a policy shift to improve conservation outcomes (e.g., reducing soil erosion and improving water quality) of targeted resources on agricultural lands.

Since 1935, the federal government has spent \$110 billion dollars in conservation funding for working lands.¹⁹¹ The bulk of these federal expenditures has occurred since the 1985 Farm Bill.¹⁹² These conservation funds are essential in order to address natural resources issues and improve environmental outcomes on agricultural lands, given the gaps in the environmental regulatory framework.¹⁹³ Unfortunately, as the next Part details, the efficacy of the Farm Bill conservation programs is fundamentally undercut by a failure to enforce conservation compliance, inefficient resource targeting and prioritization of conservation programs, and perverse incentives caused by federally subsidized crop insurance.¹⁹⁴

IV. COMPROMISED CONSERVATION: WEAK ENFORCEMENT, PERVERSE INCENTIVES, AND THE SECRECY PROBLEM

Notwithstanding the public’s substantial investment of agricultural conservation through the Farm Bill, serious environmental harm persists. One recent example of the consequences of this harm is an extraordinary Clean Water Act lawsuit filed by the City of Des Moines, Iowa, against upstream

=nrsc142p2_010526 [https://perma.cc/SY6R-QNE5] (last visited Mar. 26, 2016) (listing approved conservation practices under EQIP in Vermont).

189. Farm Security and Rural Investment Act of 2002, Pub. L. No. 107-171, 116 Stat. 134.

190. See, e.g., STUBBS, *supra* note 166, at 22–25 (illustrating the shift of conservation dollars over time to installing conservation practices over land protection and retirement).

191. Pavelis et al., *supra* note 122.

192. STUBBS, *supra* note 5, at 4–5.

193. See generally Ruhl, *supra* note 4.

194. See *infra* Part IV.

agricultural drainage districts.¹⁹⁵ Over the years, the city's public water utility has spent millions to remove nitrates—a potentially serious risk to human health—from drinking water.¹⁹⁶ Nitrates from nitrogen fertilizer applied to cropland run off into agricultural drainage systems, eventually dumping into rivers.¹⁹⁷ In 2015, ERS senior economist, Marc Ribaud, summarized the limits of voluntary conservation programs:

Despite billions of dollars of investment in conservation measures over the past several decades agricultural NPS policies do not appear to be enough to address landscape-scale water quality problems. While some water quality metrics have improved in some agriculturally influenced watersheds, others have deteriorated and more generally, outcomes have remained short of established water quality goals. Over 5,000 water bodies are on the United States Environmental Protection Agency's (EPA) impaired waters list due to nutrients, primarily from nonpoint sources. The voluntary approach has generally not led to an aggregation of conservation effort in impaired watersheds sufficient to produce measurable improvements in water quality. The Natural Resources Conservation Service (NRCS) assessment of conservation practices on cropland finds that while investments in conservation practices have produced an array of environmental services there is still much room for improvement, particularly in regards to nutrients. Agriculture's role is particularly important for some of the nation's most important water resources including the Chesapeake Bay, the Gulf of Mexico, the Florida Everglades, and the Great Lakes, where agricultural nutrients have damaged major fisheries and ecosystems, and threatened water supplies.¹⁹⁸

This Section sets forth and analyzes fundamental issues that undermine the efficacy of U.S. working lands conservation policy as embodied in the Farm Bill, which, in turn, prevents progress in

195. Complaint, *Bd. of Water Works v. Sac Cty. Bd. of Supervisors*, No. 5:15-cv-04020 (N.D. Iowa Mar. 16, 2015).

196. See Mary H. Ward et al., *Workgroup Report: Drinking-Water Nitrate and Health—Recent Findings and Research Needs*, 113 ENVTL. HEALTH PERSP. 1607, 1609–12 (2005); *Nitrate Removal Facility: Fact Sheet*, DES MOINES WATER WORKS, <http://www.dmw.com/upl/documents/water-quality/lab-reports/fact-sheets/nitrate-removal-facility.pdf> [<https://perma.cc/K4QX-F3Q3>] (last updated Dec. 10, 2015).

197. David Bello, *Fertilizer Runoff Overwhelms Streams and Rivers—Creating Vast “Dead Zones”*, SCI. AM., Mar. 14, 2008, <https://www.scientificamerican.com/article/fertilizer-runoff-overwhelms-streams> [<https://perma.cc/F3SC-TANM>].

198. Marc Ribaud, *The Limits of Voluntary Conservation Programs*, CHOICES, 2nd Quarter 2015, at 1, 1 (internal citations omitted).

addressing agricultural environmental harms and threatens future food security.

A. Conservation Compliance Enforcement Challenges

Of course, conservation compliance is only as good as its enforcement. As Part III above details, soil erosion on United States cropland is still significant—in some parts of the country 3.9 tons per acre per year,¹⁹⁹ causing soil degradation, as well as water and air pollution. NRCS has been repeatedly criticized for its poor enforcement of HEL compliance.²⁰⁰ A 2003 GAO report evaluating the effectiveness of NRCS's enforcement concluded:

USDA's Natural Resources Conservation Service has not consistently implemented the 1985 Food Security Act's conservation provisions. Inconsistent implementation increases the possibility that some farmers receive federal farm payments although their soil erodes at higher rates than allowed or they convert wetlands to cropland.

According to GAO's nationwide survey, almost half of the Conservation Service's field offices do not implement the conservation provisions as required because they lack staff, management does not emphasize these provisions, or they are uncomfortable with their enforcement role. For example, field offices do not always find a farmer in violation for failing to implement an important practice, such as crop rotation, and do not always see whether a farmer has corrected the problem; they also do not always check for wetlands violations.

The Conservation Service's weak oversight of its field offices further impairs implementation of the provisions. In the process of selecting samples of cropland tracts to assess farmers' compliance, the Conservation Service disproportionately emphasizes tracts with little potential for noncompliance, such as permanent rangelands. This selection process leads to inflated compliance rates. The Conservation Service also has no automated system to promptly inform its field offices of the tracts selected for compliance reviews or to enable the offices to efficiently report their review results. Therefore, the field offices cannot conduct timely reviews—during critical erosion periods—and provide headquarters with up-to-date information.

Finally, the Farm Service Agency, the USDA agency responsible for withholding benefits for violations identified by the Conservation Service, often waives these noncompliance determinations without

199. COX, *supra* note 33, at 4.

200. U.S. GEN. ACCOUNTING OFFICE, *supra* note 27, at 42.

adequate justification. Without support from the Farm Service Agency, the Conservation Service's field staff have less incentive to issue violations.²⁰¹

Likewise, a 2012 USDA Office of Inspector General ("OIG") audit found that NRCS

has not implemented a comprehensive, integrated compliance strategy designed to verify that its \$3.6 billion in conservation programs are functioning as intended. This has occurred because, according to NRCS' strategic plan, the agency focuses on putting conservation practices "on the ground." We maintain that the NRCS must also design adequate compliance activities to ensure that program benefits are reaching those who are truly eligible and serving their intended purposes.

Over the past decade, a number of OIG audits have demonstrated that NRCS has long-standing problems with verifying the eligibility of participants, their compliance with conservation agreements, and how easements are valued. This review shows that NRCS must strengthen its efforts to improve program compliance by, for instance, reorganizing so that one person or entity at NRCS has the responsibility and authority to ensure that compliance and oversight activities are effective. We also found that NRCS has never performed a risk assessment of its overall program operations, a fact that NRCS officials acknowledge. When NRCS did perform compliance reviews, those reviews did not focus on the specific program vulnerabilities identified by prior OIG reports. Without an improved compliance effort, NRCS cannot ensure the integrity of its \$3.6 billion in program expenditures, nor can it ensure that its resources are used efficiently and effectively to reduce the risk of fraud, waste, and abuse.²⁰²

Moreover, serious conservation compliance implementation issues persist as documented in a March 2, 2016 Interim OIG report. 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 NRCS with comprehensive data regarding producers subject to NRCS

201. *Id.* at "What GAO Found."

202. OFFICE OF INSPECTOR GEN., U.S. DEP'T OF AGRIC., NATURAL RESOURCES CONSERVATION SERVICE'S OVERSIGHT AND COMPLIANCE ACTIVITIES, at "What OIG Found" (2013).

randomized conservation compliance.²⁰³ Consequently, ten states were entirely omitted from NRCS conservation compliance reviews in 2015.²⁰⁴ A follow-up OIG report issued in March 2016 found that NRCS state offices implementing HEL compliance had conflicting and inadequate guidance for compliance review, and that unclear national policy on conservation compliance had resulted in incorrect interpretation of compliance requirements.²⁰⁵ Further, OIG found that state NRCS offices use inconsistent approaches when conducting wetlands compliance.²⁰⁶

Confounding oversight of conservation compliance is the fact that NRCS and FSA, which administers Farm Bill benefits and is supposed to withhold them when a producer violates conservation compliance, do not report conservation compliance data. This lack of transparency frustrates efforts to evaluate whether conservation compliance is being enforced, and undermines any attempt to ensure governmental accountability. The authors were able to obtain conservation compliance data from Chris Clayton, a senior editor at the Progressive Farmer, who requests this data from FSA every year.²⁰⁷ The conservation compliance data, set forth in the Appendix, shows a serious lack of enforcement. Between 2003 and 2013, only a handful of states, such as Iowa, appear to have enforced conservation compliance with any degree of robustness, but even then, most Farm Bill benefits that would have been lost for noncompliance have been reinstated by the USDA. For instance, NRCS reported only 4952 violations over the decade in question, implicating nearly \$124 million in Farm Bill benefits. According to the USDA's data, \$109 million of those benefits were ultimately reinstated. This trend has since continued, with data from 2014 to 2015 showing only 154 violations, with \$504,884 in farmer benefits implicated, of which \$326,523 in benefits have been reinstated.²⁰⁸

203. OFFICE OF INSPECTOR GEN., U.S. DEP'T OF AGRIC., 10601-0001-22, USDA MONITORING OF HIGHLY ERODIBLE LANDS AND WETLAND CONSERVATION VIOLATIONS—INTERIM REPORT, at 3 (2016).

204. *Id.* at 5.

205. *Id.* at 7.

206. *Id.* at 3–4.

207. E-mail from Chris Clayton, Senior Editor, Progressive Farmer, to author (Mar. 21, 2016) (on file with authors).

208. *See* Appendix.

Several factors likely contribute to this systemic lack of enforcement. Because of the expanding array of Farm Bill conservation programs, growing nearly five-fold since 1985,²⁰⁹ NRCS resources have been stretched thin. 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 by the Soil and Water Conservation Society on technical assistance 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. FSA staff levels have decreased by 12% since 2004, and similar trends could be illustrated for other agencies and other components of the technical support and assistance network. Technical service providers (TSPs) are helping fill gaps in the technical support and assistance network but with important limitations. The geographic distribution of TSPs is quite uneven, and TSP skill sets are concentrated in a relatively few areas.²¹⁰

In sum, decreased staffing levels and an increased administrative burden means NRCS has fewer resources to do actual conservation technical assistance work and enforcement.²¹¹

The increased number of producers now subject to conservation compliance due to the recoupling of insurance to conservation compliance in the 2014 Farm Bill has exacerbated NRCS’s administrative limitations. This raises serious questions as to whether NRCS has sufficient enforcement capacity, even if it had the will. To illustrate, a threshold Swampbuster enforcement matter is NRCS’s backlog of wetland determinations, such determinations being a precondition to any violation determination by NRCS. Since the 2014 Farm Bill was passed, NRCS has been deluged by producers’ wetland determination requests, especially in the environmentally sensitive Prairie Pothole Region. In 2014, for example, South Dakota, part of the Prairie Pothole Region, which provides critical migratory bird habitat, had a backlog of nearly three thousand wetland determination

209. SOIL & WATER CONSERVATION SOC’Y & ENVTL. DEFENSE, AN ASSESSMENT OF TECHNICAL ASSISTANCE FOR FARM BILL CONSERVATION PROGRAMS (2007).

210. *Id.*

211. *Id.*

requests.²¹² NRCS stated its goal was to resolve the backlog within three years.²¹³ These determinations are critical for the ecological health of the Prairie Pothole Region, given the already devastating wetland losses estimated at 74,340 acres from 1997 to 2009.²¹⁴ Yet NRCS's approach leaves the determinations in limbo for nearly the life of the current Farm Bill (four years), during which time the producers retain Farm Bill benefits. Also troubling is that the South Dakota NRCS state office permits producers to hire third-party consultants (who self-certify their qualifications) to make wetland determinations and submit the data to NRCS, although NRCS does retain ultimate wetland certification authority.²¹⁵ The South Dakota Corn Growers helpfully provide a list of consultants that producers may hire, essentially enabling the producers whom the NRCS is charged with regulating to regulate themselves.²¹⁶

Arguably another barrier to robust enforcement is the culture of the USDA itself. In particular, NRCS understandably relies on its relationships with producers to achieve voluntary conservation. However, this cooperative relationship can be antithetical to the enforcement role required by conservation compliance. Moreover, a fundamental cultural barrier is the USDA's over-arching role as a champion of American agriculture, and not as a regulator.²¹⁷ The

212. Joel Ebert, *SD Continues to Grapple with Wetland Determination Backlog*, CAP. J., Aug. 5, 2014, http://www.cajournal.com/news/sd-continues-to-grapple-with-wetland-determination-backlog/article_92851ef6-1ca3-11e4-a025-0019bb2963f4.html [<http://perma.cc/HR3D-2HGH>].

213. Lon Tonneson, *NRCS Looks To Clear S.D.'s Wetland Determination Backlog In Three Years*, FARM PROGRESS, Dec. 15, 2014, <http://farmprogress.com/story-nrcs-looks-clear-sds-wetland-determination-backlog-three-years-9-121567> [<http://perma.cc/6JRZ-KG54>].

214. T.E. DAHL, U.S. FISH & WILDLIFE SERV., STATUS & TRENDS OF PRAIRIE WETLANDS IN THE U.S. 1997 TO 2009, at 1 (2014); see also Kevin E. Doherty et al., *Conservation Planning in an Era of Change: State of the U.S. Prairie Pothole Region*, 37 WILDLIFE SOC'Y BULL. 546, 555-57 (2013) (discussing challenges in attaining future conservation goals).

215. *Landowner Information: What Does a Landowner/Operator Need to Know About Wetland Consultants and the SD NRCS?*, NAT. RES. CONSERVATION SERV., http://www.nrcs.usda.gov/wps/portal/nrcs/detail/sd/technical/?cid=nrcs141p2_036648 [<https://perma.cc/ZNL4-Z48B>] (last visited Aug. 15, 2016).

216. *Wetland Determination Consultants*, S.D. CORN, <http://www.sdcorn.org/for-farmers/wetland-determination-consultants> [<https://perma.cc/Z8HD-KEMF>] (last visited Aug. 15, 2017).

217. See MAX SCHNEPF, ENVTL. WORKING GRP., CONSERVATION COMPLIANCE: A RETROSPECTIVE . . . AND LOOK AHEAD, at 12-13 (2012) (discussing the USDA's lack of compliance enforcement).

latter role mainly falls to the perennial foe of the American Farm Bureau: the Environmental Protection Agency.²¹⁸

Further, the USDA administrative appeals process under the National Appeals Division provides several opportunities for compliance violations to be overturned.²¹⁹ Of course, some appeals process is necessary in order to ensure due process, but the USDA's appeals process further serves to compound NRCS's administrative burden. If NRCS loses a final administrative appeal, the agency may not appeal to federal court.²²⁰ The paucity of federal cases involving HEL or wetlands violations is striking, given the existence of conservation compliance since 1985. Specifically, only four cases were brought before federal courts of appeals, and only twelve were brought before federal district courts.²²¹

Exacerbating the administrative challenges are weak regulatory standards and poor implementation. By NRCS policy, crop producers will be in HEL compliance as long as soil loss does not exceed 2T, which roughly means that continued soil erosion is permitted at twice the rate that soil is created.²²² This standard ensures that there will always be a net loss of soils. As more fully explored above, each year, NRCS only does HEL compliance reviews on a very small percentage of tracts, in many years less than one percent nationally.²²³ In addition, HEL compliance only applies to land designated as HEL, when, in fact, significant soil erosion occurs on land not designated by NRCS as HEL. For example, in 2007, fifty-four million acres of land not designated as HEL were losing soil above tolerance ("T") rates.²²⁴

Conservation compliance and the efficacy of conservation programs are critically needed to address environmental harms on farmland due to the limited reach of traditional environmental laws. However, as shown above, and evidenced by continued soil erosion, wetland conversion, and water pollution, there are

218. See, e.g., Am. Farm Bureau Fed'n, *EPA Regulations Suffocating U.S. Agriculture*, W. FARM PRESS, Nov. 23, 2011, <http://westernfarmpress.com/government/epa-regulations-suffocating-us-agriculture> [<https://perma.cc/UE35-SQQE>].

219. See, e.g., 7 C.F.R. § 11.2 (2016).

220. See *id.* § 11.12 (requiring the agency head to implement the final National Appeals Division decision within thirty days).

221. These findings reflect a WestLaw case search conducted on Aug. 29, 2016.

222. 7 C.F.R. §§ 12.20–23.

223. See generally OFFICE OF INSPECTOR GEN., *supra* note 202.

224. See *Erosion*, *supra* note 28.

fundamental problems with the policy and its implementation. Consequently, policymakers must take a hard look at conservation compliance and payments for conservation practices, and adopt the reforms needed to ensure an equitable return on the public's investment.

B. Crop Insurance

Federal crop insurance is now the primary farm safety net, largely replacing direct payments, which were deeply unpopular with the public. However, the growing cost to the taxpayer of insurance, lack of eligibility limits,²²⁵ and perverse incentives should make the public equally—if not more—concerned with the current safety net. Crop insurance is a significant producer benefit because taxpayers underwrite on average sixty-two percent of premium costs.²²⁶ Producers of the largest commodities have enjoyed the bulk of premium benefits, in part because federal crop insurance is ill-fitting or administratively burdensome for smaller and/or organic producers, who ironically are the least able to absorb risk.²²⁷

As Woodard's research, summarized in Part II, shows, crop insurance incentivizes planting on marginal land because the cost of coverage is not linked to yield risk. In other words, taxpayers are simultaneously incentivizing risky planting practices and subsidizing environmental degradation.²²⁸ The public then pays again through the cost of conservation practices, which are installed to help mitigate against the harms caused by these planting practices. This is atrociously bad policy.

C. The Transparency Problem: Section 1619

An over-arching and fundamental barrier to the efficacy of conservation policy is the lack of transparency regarding Farm Bill payments. Specifically, in the 2008 Farm Bill, a provision little

225. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-15-356, REDUCING SUBSIDIES FOR HIGHEST INCOME PARTICIPANTS COULD SAVE FEDERAL DOLLARS WITH MINIMAL EFFECT ON THE PROGRAM 33–35 (2015).

226. DENNIS A. SHIELDS, CONG. RESEARCH SERV., R43951, PROPOSALS TO REDUCE MINIMUM SUBSIDIES FOR FEDERAL CROP INSURANCE, at 1 (2015).

227. TAXPAYERS FOR COMMON SENSE, HAVES AND HAVE-NOTS IN FEDERAL CROP INSURANCE (2012).

228. Woodard, *supra* note 75, at 10.

known outside Farm Bill circles was successfully added by industry lobbyists, known by its section number 1619.²²⁹ It reads, in pertinent part:

(2) PROHIBITION Except as provided in paragraphs (3) and (4), the Secretary, any officer or employee of the Department of Agriculture, or any contractor or cooperator of the Department, shall not disclose—

(A) information provided by an agricultural producer or owner of agricultural land concerning the agricultural operation, farming or conservation practices, or the land itself, in order to participate in programs of the Department; or

(B) geospatial information otherwise maintained by the Secretary about agricultural land or operations for which information described in subparagraph (A) is provided.²³⁰

This broad-sweeping provision prohibits the USDA from releasing producer-specific Farm Bill payment information except under very limited circumstances. The practical effect of the provision is to create a cloak of secrecy around Farm Bill payments.²³¹ From a public accountability perspective, section 1619 is deeply troubling. This general good government concern is compounded by the specific damage 1619 exerts on scientific research. Scientists are thwarted from, among other things, carrying out research on conservation practices to assess their effectiveness in achieving improved environmental outcomes, essential given real world variability.²³² As Woodard stated in his research on crop insurance, risk, and yield:

[D]ue to data limitations and/or Government data suppression, most studies tend to lack explicit consideration of soil and site specific data on policy and insurance design. While evaluating the effects of soil

229. *Obscure Farm Bill Provision Blacks Out Agricultural Data*, SOC'Y ENVTL JOURNALISTS, Feb. 25, 2009, <http://www.sej.org/publications/watchdog-tipsheet/obscure-farm-bill-provision-blacks-out-agricultural-data> [<https://perma.cc/TSP3-ESZA>].

230. 7 U.S.C. § 8791(b) (2012).

231. In a 2012 Center for Progressive Reform report, Professor Rena Steinzor details how section 1619 creates a bar to information release by providing an exemption to the Freedom of Information Act. RENA STEINZOR & YEE HUANG, CTR. FOR PROGRESSIVE REFORM, GOING DARK DOWN ON THE FARM: HOW LEGALIZED SECRECY GIVES AGRIBUSINESS A FEDERALLY FUNDED FREE RIDE (2012).

232. Woodard & Chiu, *supra* note 80, at 14–15 (discussing the lack of available data to researchers).

on crop growth is, of course, very common in crop sciences on small scales and in trial work, very little has been done on integrating these data and approaches for the purposes of large scale insurance estimation in public policy contexts, with few exceptions.²³³

Similar constraints have been noted by other scientists, such as Professor Adena Rissman, who had difficulty obtaining government data in order to carry out research assessing the efficacy of conservation programs in real world application.²³⁴ This scientific knowledge is critically needed to inform and improve Farm Bill policy. Without site specific data, researchers cannot determine which conservation practices actually work and under what specific conditions. Congress is capable of legislating policy that preserves accountability and facilitates transparency without chilling farmer participation in voluntary conservation programs.

D. Targeting and Prioritization

The continued investment of billions of dollars of taxpayer money in conservation practices begs the question of whether these practices are, in fact, effective. In an effort to answer this question, NRCS began the Conservation Effects Assessment Project (“CEAP”) to study and quantify the environmental effects of conservation practices in the coterminous forty-eight states.²³⁵ The last regional CEAP report, completed in 2015 and focusing on the Texas Gulf Basin, is instructive.²³⁶ The study found that farmers applying voluntary conservation practices in the region had “reduced sediment, nutrient, and pesticide losses”; however, farmers only met good nutrient management practices on twenty-two percent and ten percent of cropland acres for nitrogen and phosphorus, respectively.²³⁷ The study also reported continued sediment or nutrient loss caused by wind erosion during dry periods on 7.6 million acres, nearly forty-one percent of cropland acres in the

233. *Id.* at 3.

234. Adena Rissman et al., *Mapping the Public Interests in Private Land: How Privacy Concerns and Capacity Hamper Spatial Data on Private-Land Conservation* (forthcoming) (on file with authors).

235. NAT. RES. CONSERVATION SERV., ASSESSMENT OF THE EFFECTS OF CONSERVATION PRACTICES ON CULTIVATED CROPLAND IN THE TEXAS GULF BASIN, at 1 (2015).

236. *Id.*

237. *Id.* at 3.

Basin.²³⁸ This statistic is startling so many years after the lessons of the Dust Bowl and after decades of public investment in soil conservation. The report's overarching recommendation was for targeting technical assistance and program funding to acres in greatest need for conservation treatment.²³⁹ Thus, NRCS's own analysis underscores the need for site specific data and interdisciplinary research to assess the efficacy of current conservation practices, which are necessary to target limited resources to improve environmental outcomes.

On the other hand, NRCS has been criticized for prioritizing payments under EQIP to larger producers like concentrated animal feeding operations ("CAFOs") instead of small and mid-sized producers, arguably resulting in subsidization of unsustainable agricultural production. For example, the National Sustainable Agriculture Coalition made the following recent analysis of EQIP payments:

While the National Sustainable Agriculture Coalition (NSAC) is supportive of the \$230 million of EQIP funding that go to support practices like cover crops and prescribed grazing, we continue to advocate that a much larger percentage of these conservation dollars should be available for small and mid-sized family farmers and to sustainable grazing systems. Unfortunately, a significant amount of funding goes toward large payments to concentrated animal feeding operations (CAFOs) through funding for waste lagoons, waste transfer, and waste treatment.

These CAFO practices have dubious environmental benefits and even in some cases [result] in a net loss of conservation benefits. . . .

In FY 2015 alone, NRCS provided more than \$100 million in EQIP funding for CAFO-related practices. This amounts to nearly 12 percent of total EQIP funding that could have otherwise gone to support management based practices. CAFO practices that received significant EQIP cost share support in FY 2015 include waste storage facility (\$48,718,300), waste facility cover (\$23,979,393), animal mortality facility (\$8,106,818), and manure transfer (\$7,924,843).²⁴⁰

238. *Id.*

239. *Id.* at 5.

240. *CAFOs and Cover Crops: A Closer Look at 2015 EQIP Dollars*, NAT'L SUSTAINABLE AGRIC. COAL., Nov. 13, 2015, <http://sustainableagriculture.net/blog/fy15-general-eqip-update> [<https://perma.cc/3CYZ-SMMH>].

V. RENEGOTIATING OUR BARGAIN WITH AGRICULTURE: TOWARD A POLICY OF RESILIENCE AND ECOLOGICAL HEALTH

The 2014 Farm Bill, the omnibus U.S. statement of food and farm policy and appropriator of such, is notable for what it does not say. The term “climate change” is not mentioned in the Farm Bill’s conservation title. The Farm Bill does not employ the word “resilience” or the term “soil health” at all. The word “sustainability” fares somewhat better as it appears four times, although not once in the conservation title.²⁴¹ These absences of nomenclature reflect Congress’s purposeful refusal to address both the impacts of climate change on agriculture and its contribution to global warming. In this way, Congress fails to take this singular policymaking and funding opportunity to lay the groundwork for a food secure future.

The United States does not have a policy of agricultural stewardship, but a policy of mitigated use, cemented in place by opaque Farm Bill policies which undermine its conservation provisions by perpetuating environmental harms. This statement should not be read as an indictment of NRCS, which struggles earnestly on the front lines of conservation, nor of agricultural producers, many of whom operate on thin financial margins.²⁴² Rather, stewardship is the responsibility borne by all Americans as advocates and consumers. Americans spend less of their incomes on food than residents in any other country currently tracked by the USDA,²⁴³ but Americans pay a high social cost with food-related illnesses such as obesity and diabetes, dying estuaries and gulfs, and water that can no longer be made safe to drink.²⁴⁴

This system of benefits and resulting behaviors, to which environmentalists, in large part, have failed to engage in sustained reform efforts, deserves close attention. Below, this Article sets

241. Agricultural Act of 2014, Pub. L. No. 113-79, 128 Stat. 649; *see also id.* at tit. II, 128 Stat. at 713–72 (conservation title).

242. *ARMS Farm Financial and Crop Production Practices: Farm Business Financial Ratios Report*, ECON. RESEARCH. SERV., <http://www.ers.usda.gov/data-products/arms-farm-financial-and-crop-production-practices/tailored-reports-farm-structure-and-finance.aspx> [<https://perma.cc/ME37-DSF5>] (last updated May 2, 2016).

243. Lisa Mahapatra, *The US Spends Less On Food Than Any Other Country in The World*, INT’L BUS. TIMES, Jan. 23, 2014, <http://www.ibtimes.com/us-spends-less-food-any-other-country-world-maps-1546945> [<https://perma.cc/65FR-JUYZ>].

244. *See Nitrate Removal Facility: Fact Sheet*, *supra* note 196.

forth key reforms that would move current policy of working lands conservation toward a policy of stewardship with a fighting chance to legitimately address environmental harms.

1. Transparency

The lack of transparency surrounding the food system is pervasive. Much public and academic attention has been given to state “Ag-Gag” laws,²⁴⁵ but scant attention has been paid to the guarantor of secrecy in the Farm Bill itself, section 1619. Section 1619 prohibits citizens from knowing how and to what effect public dollars are being spent. In other words, section 1619 serves as a bar to transparency, the antithesis of democratic, good government. Additionally, 1619 creates a nearly impenetrable hurdle for scientists and researchers to study the real-world impact of Farm Bill policies on the ground, such as the aforementioned work of Professors Rissman and Woodard. But it is not enough to repeal or amend section 1619. Congress must affirmatively legislate mechanisms that will require governmental data sharing for legitimate public purposes so that human knowledge may grow and improvements to policies and practices may be developed and implemented. Without government preserving a robust commons for data, society will become completely beholden to privatized data, a dangerous outcome for civil society.²⁴⁶

2. Link Crop Insurance Premiums to Yield Risk and Conservation Practices

The federal crop insurance program is not a safety net, but a thinly veiled federal subsidy rewarding destructive behavior.²⁴⁷ Crop insurance must be reformed so that it operates as a safety net for those producers who cannot otherwise afford to mitigate risk. In addition, crop insurance must be reformed to remove perverse

245. See, e.g., Sonci Kingery, Note, *The Agricultural Iron Curtain: Ag Gag Legislation and the Threat to Free Speech, Food Safety, and Animal Welfare*, 17 *DRAKE J. AGRIC. L.* 645 (2012) (providing an example of how Ag-Gag laws have become part of the public and academic agriculture discussion).

246. See Kimberly N. Brown, *Outsourcing, Data Insourcing, and the Irrelevant Constitution*, 49 *GA. L. REV.* 607, 635–50 (2015) (discussing how the executive branch outsources data collection and surveillance).

247. Woodard, *supra* note 75, at 2 (explaining that insurance does not properly account for soil data when calculating risk).

incentives by tying premiums to planting risk and rewarding those producers who implement conservation practices that improve crop resilience and conserve natural resources. Although laudable, re-linking the crop insurance benefit to conservation compliance is insufficient to ensure resource conservation on agricultural lands. The Farm Bill safety net must be designed as a system in order to prevent the current zero-sum game, that is, conservation compliance requiring soil erosion reduction while crop insurance incentivizes such losses.

3. Adopt a Healthy Soil Policy

Current federal policy regarding agricultural soils is not one of conservation but of partial mitigated loss. Although significant reductions in soil erosion on working lands have been made, the length of time it has taken to make these strides is shocking. Moreover, it is concerning that millions of tons of topsoil continue to erode from American agricultural lands, further degrading waterways and necessitating more inputs. USDA policy allows 2T soil erosion on most highly erodible land in order for producers to qualify for Farm Bill benefits even though soils are eroding at twice the rate they are being replenished. In addition, much soil erodes from lands not considered highly erodible. These soils fall outside the requirements of conservation compliance. Policymakers must move beyond the Band-Aid policy of soil conservation, which is based on early twentieth century realities, to a systems-based policy of healthy soil.²⁴⁸ A healthy soils policy creates disincentives for producing crops on fragile soils and focuses on building soil resilience, organic matter, and water retention while aiming for zero loss. Such a paradigm shift is necessary in order to adapt to the realities of this millennium and a climate change world.

4. Add Nutrient Compliance to Conservation Compliance

Non-point source pollution remains the Achilles heel of clean water in America. Even if the Des Moines lawsuit challenging upstream irrigators under the CWA is successful, litigation is a long

248. According to NRCS Chief Bruce Knight, appointed under President George W. Bush, the current NRCS soil health policy is little more than a media campaign. Bruce Knight, *2018 Farm Bill—Soil Health*, AGRI-PULSE, <http://www.agri-pulse.com/2018-Farm-Bill-Soil-Health-06222016.asp> [<https://perma.cc/V4AN-D6JN>] (last visited Oct. 26, 2016) (also outlining the necessary components of a robust soil health policy).

and expensive road to address this pervasive harm and could result in legislative backlash. Even so, the Des Moines lawsuit is extraordinary, arguably representing a turning point in the public's tolerance for farm pollution and a tipping point in the capacity of public infrastructure to deal with it. This moment presents an opening to address agricultural non-point source pollution. A potential policy avenue to address nutrient pollution suggested by a USDA economist is to require "nutrient compliance" as a condition of Farm Bill benefits, similar to the conservation compliance mechanism.²⁴⁹ Such a policy could require best practices to reduce, target, and time application of nutrients based upon on-the-ground conditions. ERS has reported that sixty-five percent of nitrogen treated acreage, with the bulk of those planted in corn, did not meet nitrogen management criteria.²⁵⁰ Improved management would reduce excess nitrogen use on farm fields, decreasing pollution into the air and water.²⁵¹ But, of course, any compliance requirement must be enforced to be effective.

5. Refocus NRCS's Mission on Technical Assistance

In order to achieve necessary environmental outcomes on agricultural lands, NRCS must have the capacity to rigorously target and prioritize conservation practices. Much of NRCS's focus has shifted to program administration necessitated by the accretion of the conservation title and the emphasis on conservation practices through conservation "contracts" with producers. For example, in FY 2009 alone, NRCS entered into 31,960 EQIP contracts totaling over \$731 million in obligations.²⁵² In FY 2010, under CSP, NRCS obligated over twenty thousand contracts, covering over twenty-five million acres.²⁵³ Each year, NRCS state offices enroll producers in these programs and others funded under the Farm Bill by executing thousands of contracts obligating millions of dollars, a

249. Marc Ribaud, *Reducing Agriculture's Nitrogen Footprint: Are New Policy Approaches Needed?*, 9 AMBER WAVES, Sept. 2011, at 34, 37-38.

250. *Id.* at 36.

251. *Id.* at 39.

252. *EQIP 2009 Contracts and Funding Data*, NAT. RES. CONSERVATION SERV., http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/financial/eqip/?cid=nrcs143_008294 [<https://perma.cc/VTB4-BDQJ>] (last visited Mar. 27, 2016).

253. *NRCS Conservation Programs: Contracts*, NAT. RES. CONSERVATION SERV., http://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/fb08_cp_cstp.html#total [<https://perma.cc/B678-2C46>] (last visited Mar. 27, 2016).

tremendous administrative workload. Ironically, the sheer administrative burden of voluntary conservation programs has eroded NRCS's ability to optimize its potential through targeting of benefits and providing producers with technical expertise and support.

6. Enforce Conservation Compliance

Finally, given the vital importance of conservation compliance, lawmakers must critically evaluate whether housing both voluntary conservation programs and conservation compliance enforcement within NRCS undermines the effectiveness of both conservation compliance and NRCS's role as the conduit of voluntary conservation. Both GAO and USDA OIG have found serious deficiencies in conservation compliance enforcement, a failure which FSA's own conservation compliance enforcement data continue to document. The paucity of public enforcement data, the limited sampling for HEL compliance, and the practical challenges of proving wetland drainage are fundamental issues that must be addressed to ensure the efficacy of conservation compliance. The current lack of enforcement and consequences for noncompliance screams for administrative reform and demands a solution that ensures administrative independence, transparency, technical rigor, and consistent application.

VI. CONCLUSION

There is no food without nature. Yet U.S. agriculture policies continue to perpetuate environmental harms. The largely voluntary approach to addressing environmental harms caused by agricultural production is simply not working. Soil and water degradation persist, undermining the nation's overall ecological health and foreclosing a food secure future in a time of rising temperatures, extreme weather events, and global population growth. Policymakers must renegotiate society's bargain with agriculture by adopting a policy of soil and wetlands health, and must design a safety net that supports sustainable farming practices. Ultimately, a precondition of this renegotiation requires sustained and expert involvement of environmental and good food organizations, as well as citizens, in the Farm Bill process. Although many organizations have dabbled in the Farm Bill,

sustained, expert involvement—beyond a handful of stalwarts²⁵⁴—has been woefully lacking. Consider this a call to action.

APPENDIX

Conservation compliance data by state^{*}

Numbers rounded to the nearest whole unit.
Columns abbreviated as follows:

NPV = number of producers in violation

RQ\$ = requested benefits in dollars

RB\$ = reinstated benefits in dollars

NWV = number of wetlands violations

NELV = number of erodible lands violations

Table 1

Cumulative national violations from 2003–13 and 2014–15

	NPV	RQ\$	RB\$	NWV	NELV
2003–13 Cum. Nat'l Violations	4952	\$123,997,099	\$109,751,820	1565	1435
2014–15 Cum. Nat'l Violations	154	\$504,844	\$326,523	58	51

254. A debt of gratitude is owed to organizations like National Sustainable Agriculture Coalition, Environmental Working Group, and National Wildlife Federation, as well as groups like Ducks Unlimited and the Izaak Walton League of America, which continue to advocate for strong conservation funding and conservation compliance enforcement.

^{*} E-mail from Chris Clayton, Senior Editor, Progressive Farmer, to author (Mar. 21, 2016) (on file with authors); *see supra* notes 207–208 and accompanying text.

Table 2
States with no producers in violation from 2003–15

	NPV	RQ\$	RB\$	NWV	NELV
Am. Sam.	0	\$0	\$0	0	0
Ariz.	0	\$0	\$0	0	0
Conn.	0	\$0	\$0	0	0
D.C.	0	\$0	\$0	0	0
Micr.	0	\$0	\$0	0	0
Guam	0	\$0	\$0	0	0
La.	0	\$0	\$0	0	0
Nev.	0	\$0	\$0	0	0
N.H.	0	\$0	\$0	0	0
N.J.	0	\$0	\$0	0	0
N.M.	0	\$0	\$0	0	0
N. Mar. I.	0	\$0	\$0	0	0
P.R.	0	\$0	\$0	0	0
R.I.	0	\$0	\$0	0	0
Utah	0	\$0	\$0	0	0
V.I.	0	\$0	\$0	0	0
W. Va.	0	\$0	\$0	0	0

Table 3
Cumulative violations from 2003–13

	NPV	RQ\$	RB\$	NWV	NELV
Ala.	10	\$23,304	\$16,935	5	8
Alaska	2	\$0	\$0	1	0
Am. Sam.	0	\$0	\$0	0	0
Ariz.	0	\$0	\$0	0	0
Ark.	6	\$54,435	\$54,435	2	1
Cal.	3	\$458,205	\$0	2	0
Colo.	4	\$135,286	\$122,294	0	4
Conn.	0	\$0	\$0	0	0
Del.	1	\$0	\$0	1	0
D.C.	0	\$0	\$0	0	0
Micr.	0	\$0	\$0	0	0
Fla.	4	\$0	\$0	6	0
Ga.	23	\$479,735	\$478,495	12	1
Guam	0	\$0	\$0	0	0
Haw.	3	\$226,000	\$226,000	1	2
Idaho	16	\$160,890	\$153,579	2	3
Ill.	281	\$6,528,974	\$6,186,808	35	142
Ind.	160	\$2,567,216	\$2,504,743	92	15
Iowa	1763	\$38,258,558	\$34,531,380	72	760
Kan.	74	\$1,084,729	\$1,013,115	17	28
Ky.	22	\$674,519	\$672,350	9	6
La.	0	\$0	\$0	0	0
Me.	2	\$0	\$0	2	0
Md.	6	\$36,698	\$36,698	6	0
Mass.	1	\$0	\$0	2	0
Mich.	120	\$7,480,841	\$5,668,155	93	0
Minn.	206	\$6,782,973	\$6,494,149	144	20
Miss.	10	\$27,574	\$808	3	8

	NPV	RQ\$	RB\$	NWV	NELV
Mo.	106	\$2,384,108	\$2,145,142	42	37
Mont.	14	\$629,597	\$618,231	3	16
Neb.	544	\$7,942,618	\$7,118,316	63	209
Nev.	0	\$0	\$0	0	0
N.H.	0	\$0	\$0	0	0
N.J.	0	\$0	\$0	0	0
N.M.	0	\$0	\$0	0	0
N.Y.	114	\$3,105,980	\$1,692,010	64	8
N.C.	24	\$82,100	\$81,420	9	26
N.D.	641	\$25,956,190	\$25,536,609	395	17
N. Mar. I.	0	\$0	\$0	0	0
Ohio	94	\$1,781,308	\$970,070	63	14
Okla.	15	\$400,909	\$7,756	5	6
Or.	98	\$302,014	\$175,145	41	1
Pa.	19	\$157,554	\$152,124	10	16
P.R.	0	\$0	\$0	0	0
R.I.	0	\$0	\$0	0	0
S.C.	3	\$7,400	\$2,274	3	0
S.D.	214	\$11,028,635	\$10,441,158	156	7
Tenn.	34	\$223,156	\$211,122	12	7
Tex.	64	\$831,857	\$146,962	29	10
Utah	0	\$0	\$0	0	0
Vt.	18	\$274,901	\$200,544	17	1
V.I.	0	\$0	\$0	0	0
Va.	5	\$65,717	\$65,717	9	1
Wash.	14	\$264,577	\$263,324	4	1
W. Va.	0	\$0	\$0	0	0
Wis.	211	\$3,559,989	\$1,755,052	133	58
Wyo.	3	\$18,552	\$8,901	0	2
TOTAL	4952	\$123,997,100	\$109,751,821	1565	1435

Table 4
Cumulative violations from 2014–15

	NPV	RQ\$	RB\$	NWV	NELV
Ala.	0	\$0	\$0	0	0
Alaska	0	\$0	\$0	0	0
Am. Sam.	0	\$0	\$0	0	0
Ariz.	0	\$0	\$0	0	0
Ark.	0	\$0	\$0	0	0
Cal.	0	\$0	\$0	0	0
Colo.	0	\$0	\$0	0	0
Conn.	0	\$0	\$0	0	0
Del.	0	\$0	\$0	0	0
D.C.	0	\$0	\$0	0	0
Micr.	0	\$0	\$0	0	0
Fla.	0	\$0	\$0	0	0
Ga.	6	\$919	\$919	2	0
Guam	0	\$0	\$0	0	0
Haw.	0	\$0	\$0	0	0
Idaho	0	\$0	\$0	0	0
Ill.	0	\$0	\$0	0	0
Ind.	19	\$106,736	\$97,980	11	0
Iowa	52	\$183,936	\$58,206	5	32
Kan.	0	\$0	\$0	0	0
Ky.	2	\$0	\$0	1	1
La.	0	\$0	\$0	0	0
Me.	0	\$0	\$0	0	0
Md.	0	\$0	\$0	0	0
Mass.	0	\$0	\$0	1	0
Mich.	1	\$26,343	\$0	1	0
Minn.	5	\$1,811	\$0	2	0
Miss.	1	\$0	\$0	1	0

	NPV	RQ\$	RB\$	NWV	NELV
Mo.	9	\$1,974	\$0	0	5
Mont.	0	\$0	\$0	0	0
Neb.	11	\$756	\$756	4	1
Nev.	0	\$0	\$0	0	0
N.H.	0	\$0	\$0	0	0
N.J.	0	\$0	\$0	0	0
N.M.	0	\$0	\$0	0	0
N.Y.	2	\$23,484	\$11,040	2	0
N.C.	0	\$0	\$0	0	0
N.D.	4	\$1,355	\$1,355	2	1
N. Mar. I.	0	\$0	\$0	0	0
Ohio	5	\$22,004	\$22,004	3	4
Okla.	0	\$0	\$0	0	0
Or.	0	\$0	\$0	0	0
Pa.	2	\$350	\$350	4	0
P.R.	0	\$0	\$0	0	0
R.I.	0	\$0	\$0	0	0
S.C.	0	\$0	\$0	0	0
S.D.	1	\$71,685	\$71,685	2	0
Tenn.	21	\$62,216	\$62,216	8	7
Tex.	0	\$0	\$0	0	0
Utah	0	\$0	\$0	0	0
Vt.	0	\$0	\$0	0	0
V.I.	0	\$0	\$0	0	0
Va.	0	\$0	\$0	0	0
Wash.	0	\$0	\$0	0	0
W. Va.	0	\$0	\$0	0	0
Wis.	13	\$1,275	\$12	9	0
Wyo.	0	\$0	\$0	0	0
TOTAL	154	\$504,844	\$326,523	58	51