

U.S. Agri-Environmental Policies: Overview and (Some) Evaluation

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Presented at “Agricultural Policy for the Environment or Environmental Policy for Agriculture?”
172nd EAAE Seminar, Brussels, 28-29 May 2019

The Findings and Conclusions in this Preliminary Presentation Have Not Been Formally Disseminated by the U.S. Department of Agriculture and Should Not Be Construed to Represent Any Agency Determination or Policy. This research was supported by the intramural research program of the U.S. Department of Agriculture, Economic Research Service.



The Panel Charge

- What types of agri-environmental measures are currently applied and at what geographical or administrative scale? What is the specific context of these measures and for how long have they been applied?
- How are farmers responding?
- How is the outcome of the programs/measures assessed and with what indicators? Do the applied measures deliver the expected environmental outcome?



Context: The U.S. “Farm Bill”

- The U.S. Congress sets national food and agriculture policy through periodic omnibus farm bills that address a broad range of farm and food programs and policies.
- **Farm Bills authorize the United States Department of Agriculture (USDA) to implement programs:**
 - Crop commodity programs and crop insurance
 - **Conservation and Forestry**
 - Trade
 - Nutrition
 - Rural Development
 - Research and extension
 - Energy; Horticulture/organic agriculture; Local and regional foods; Beginning, socially disadvantaged and veteran farmers and ranchers.



U.S. Conservation (Agri-environmental) Programs Have Wide-ranging Objectives

- Improving soil health
- Improving water quality
- Increasing pollinator and wildlife habitat
- Improving air quality
- Conserving energy and water
- Preserving farm and ranch lands
- Preserving and restoring wetlands and grasslands



U.S. Conservation Policy: A Portfolio of Programs and Approaches

- **Voluntary payment programs**
 - Land retirement
 - Easements/Land preservation
 - Working lands
- **Compliance Mechanisms**
- **Conservation Technical Assistance**
- **Eco-labeling**
- ***Environmental Regulations***
 - *Not in farm legislation or USDA purview*
 - *Clean Water Act, Clean Air Act, Pesticide regulations, Endangered Species Act, etc.*



U.S. Conservation Portfolio: Land Retirement and Land Preservation

Conservation Reserve Program (CRP)

- Provides annual rental payment to remove environmentally sensitive cropland from agricultural production for 10 -15 years. Includes Grasslands Reserve. First authorized 1985.

Agricultural Conservation Easement Program (ACEP)

- Provides financial and technical assistance to help conserve agricultural lands and wetlands and their related benefits. Permanent or 30 year easements. Predecessor (Federal) programs first authorized 1996.



U.S. Conservation Portfolio: Working Lands

Environmental Quality Incentives Program (EQIP)

- Provides cost-sharing or incentive payments to voluntarily implement conservation practices. First authorized 1996.
- Special initiatives



Conservation Stewardship Program (CSP)

- Targets “good stewards” through stewardship payments. First authorized 2002. Five year contracts.
- Encourages additional conservation through “enhancements.”



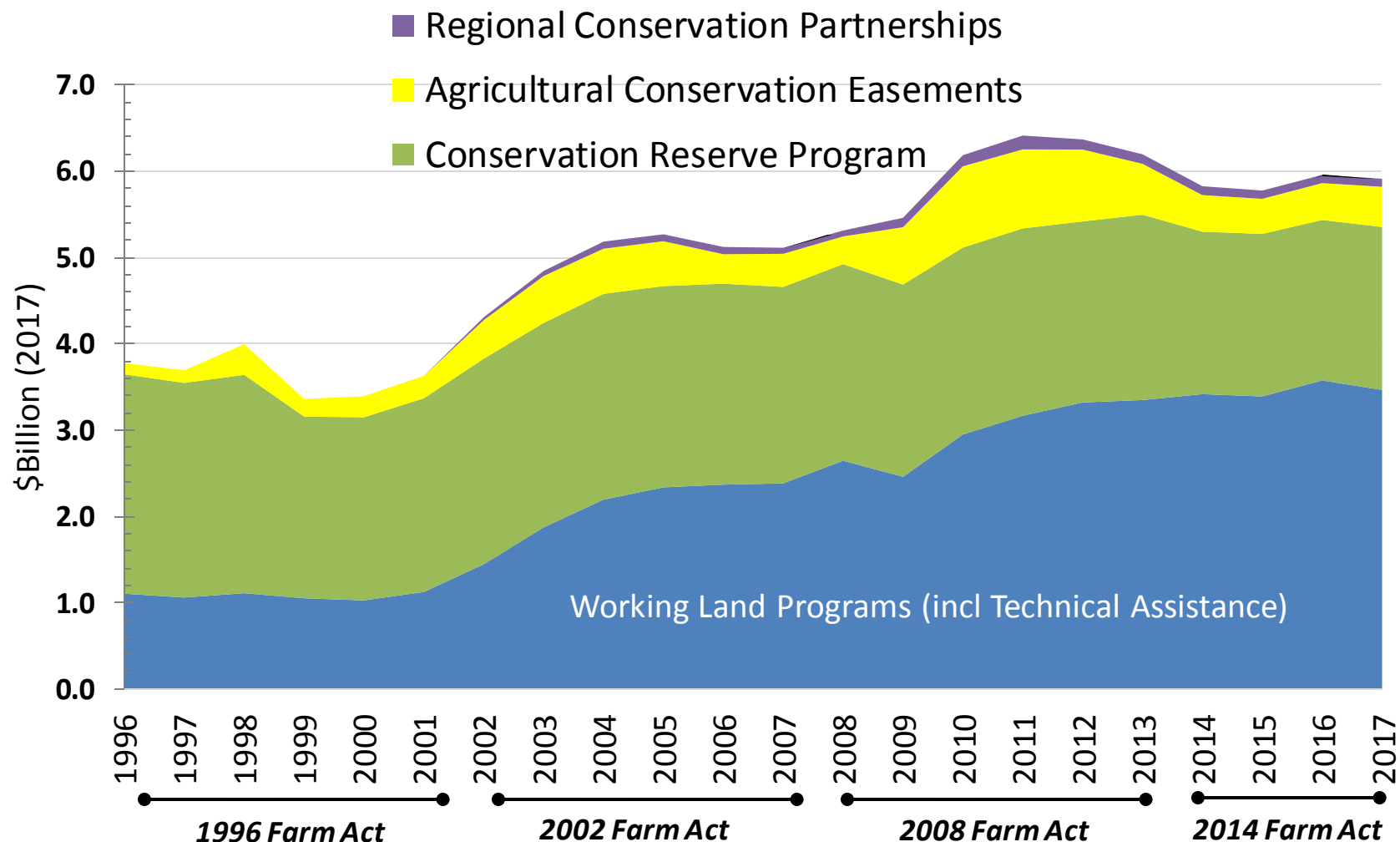
U.S. Conservation Portfolio: Compliance Mechanisms

Basic environmental compliance required to receive farm program payments, including crop insurance premium subsidies:

- **Highly Erodible Land Conservation (HELC):** Apply conservation systems on highly erodible cropland
- **Wetland Conservation (Swampbuster):** Refrain from draining wetland for agricultural purposes
- In effect since December 1985



Annual Spending In Major USDA Conservation Programs

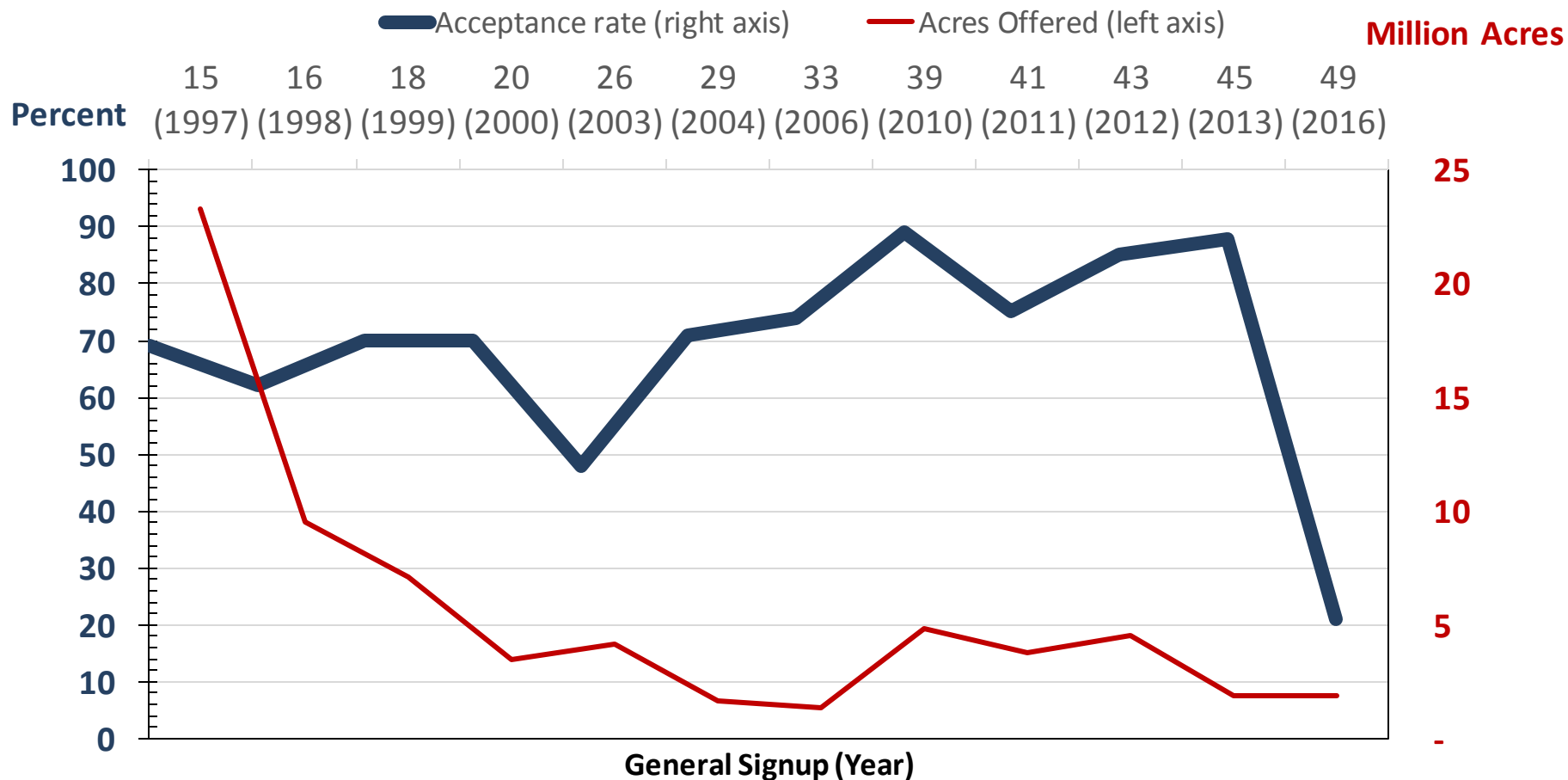


Source: USDA, Economic Research Service analysis of annual budget summaries from USDA, Office of Budget and Policy Analysis



Response: Competition for Enrolling in the Conservation Reserve Program Varies With Program Rules and Economic Conditions

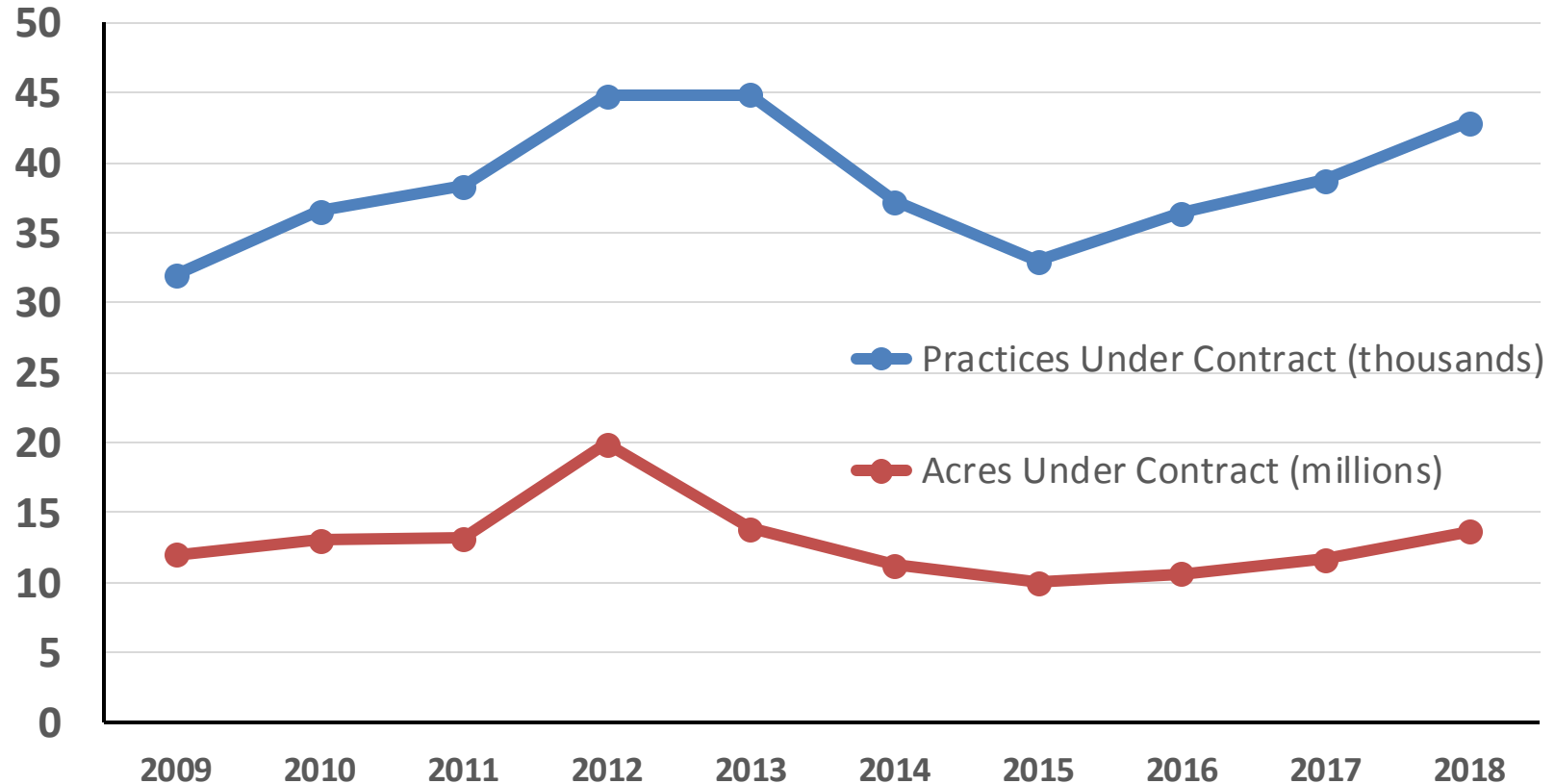
CRP General Signup Acceptance Rates and Acres Enrolled



Source: ERS calculations using data from USDA Farm Service Agency.



Enrollment in USDA's Environmental Quality Incentives Program (EQIP)

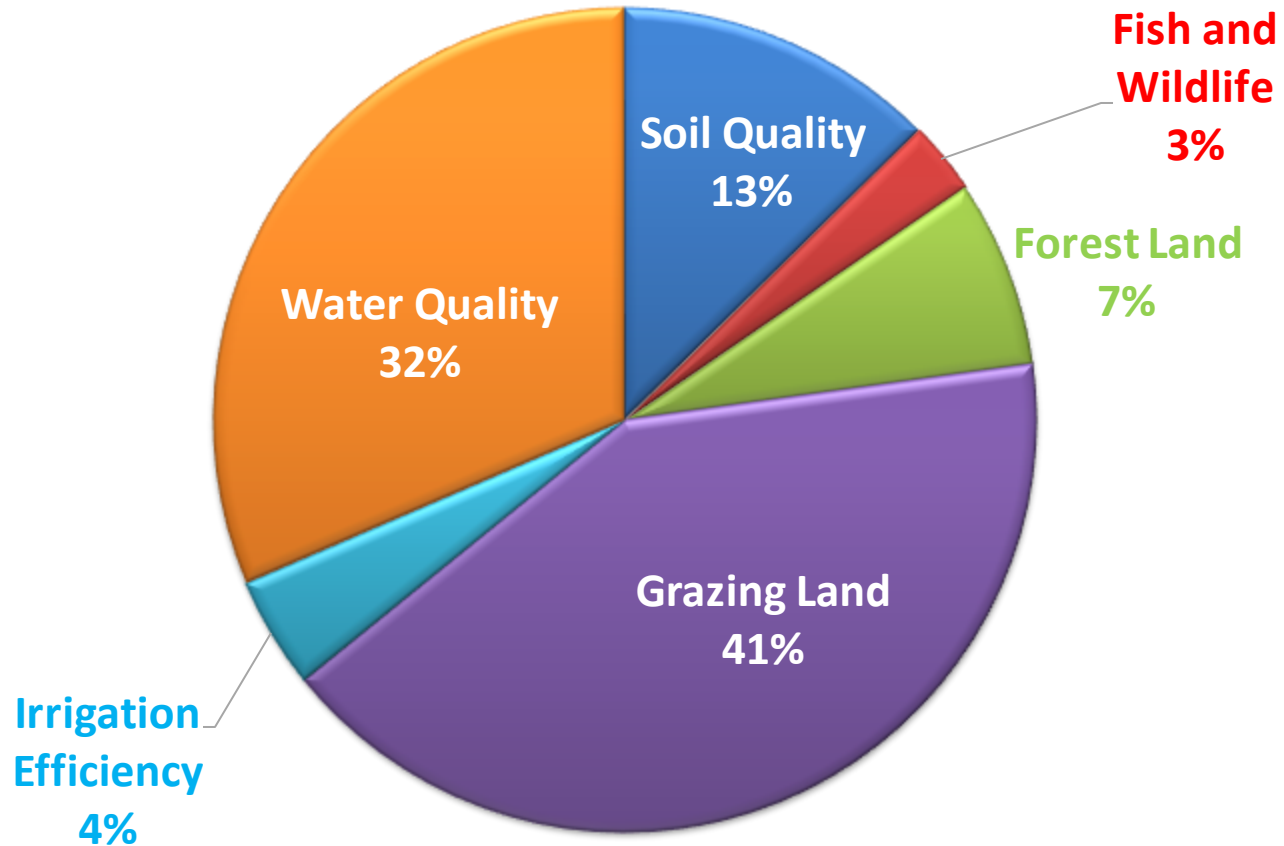


Data Source: USDA-NRCS, ProTracts Program Contracts System, October 2018.

https://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/fb08_cp_eqip.html#contracts



EQIP Conservation Practice Implementation (Land units receiving practices)



Data Source: USDA-NRCS, ProTracts Program Contracts System, October 2018.

https://www.nrcs.usda.gov/Internet/NRCS_RCA/reports/fb08_cp_eqip.html#contracts



Steps in measuring the success of conservation programs: Theory

1. Link a change in farmers' stewardship behavior to the program being evaluated
2. Assess how the portion of observed stewardship behavior that can be linked back to conservation program incentives affects environmental quality



Indicators of Program Effectiveness

Option 1: “Before-and-After” comparison

- Compare adoption rate for conservation practices before and after program is implemented (time-series data).

Option 2: “With-and-Without” comparison

- Compare adoption rate for conservation practices for program participants with non-participants (cross-section data)



Indicators of Program Effectiveness, cont.

BUT, correlation does not prove causality

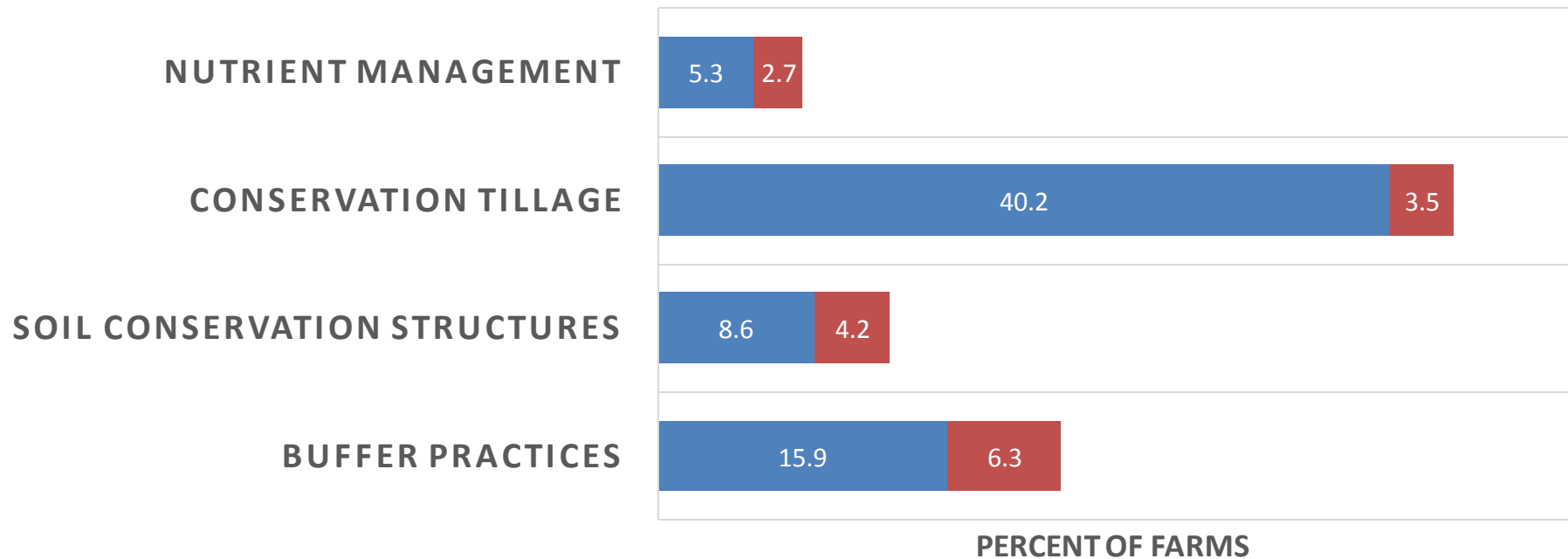
- Could falsely attribute observed conservation practices to the conservation program if all participants were pre-inclined toward voluntary stewardship even without the program



CONSERVATION PRACTICE ADOPTION WITH AND WITHOUT PAYMENTS FOR WIDELY USED CONSERVATION PRACTICES

■ Percent of Farms Adopting w/o payment

■ Percent of Farms Adopting with payments



Source: Claassen, R. J. Horowitz, E. Duquette, K. Ueda, 2014, Additionality in U.S. Agricultural Conservation and Regulatory Offset Programs, Economic Research Report, ERR-170, ERS USDA, July, 75 pp.

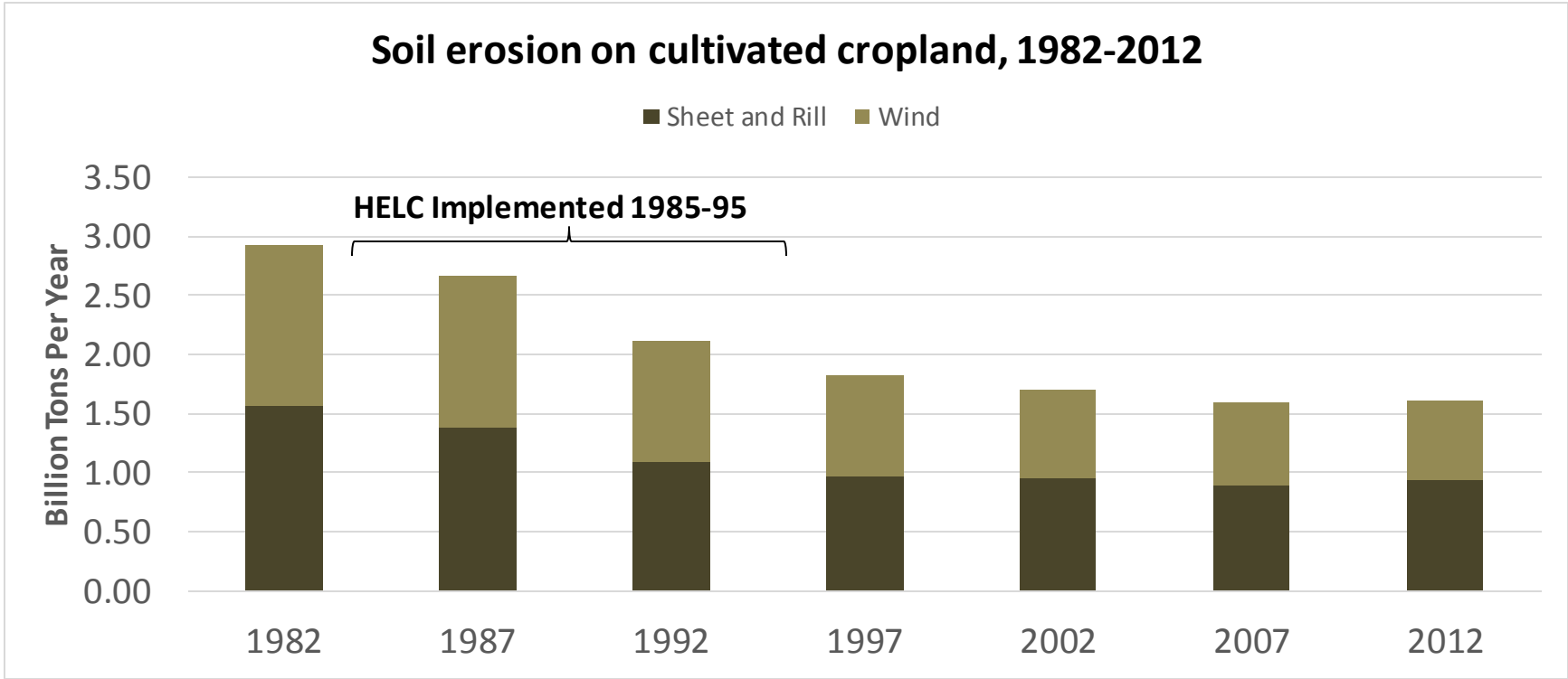


Steps in measuring the success of conservation programs

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Soil erosion declined sharply after conservation compliance (HELIC) was implemented, but... How much of the reduction was *caused* by HELC?



ERS research: *up to* 25 percent of 1982-1997 soil erosion reduction *could have been due* to HELC; ~30% due to CRP. Other reductions on land not subject to HELC.

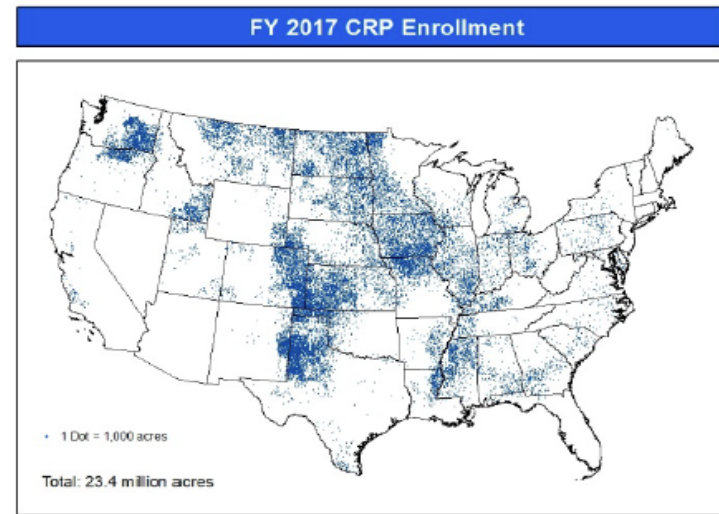
Source: Economic Research Service, Based on National Resources Inventory (NRI) data collected by the Natural Resource Conservation Service (NRCS)



Environmental Benefits of the Conservation Reserve Program

2017

United States



<u>Fiscal Year</u>		2012	2013	2014	2015	2016	2017
Land Enrolled*	million acres	29.5	26.8	25.4	24.2	23.9	23.4
In Wetlands	million acres	2.3	2.1	2.0	1.9	2.1	2.2
Buffers	million acres	2.0	1.9	1.8	1.8	1.7	1.6
<u>Reductions (not leaving field or are intercepted by buffers)**</u>							
Sediment	million tons	230	216	207	202	198	192
Nitrogen	million lbs.	630	586	559	541	535	521
Phosphorus	million lbs.	125	116	111	108	106	103
<u>Greenhouse Gas Reduction (CO2 equivalent/year)**</u>							
CO2 Sequestered	Mil. metric tons	42	38	37	35	34	34
Reduced Fuel and Fertilizer Use	Mil. metric tons	13	12	11	10	10	10
Total	Mil. metric tons	54	49	47	45	45	44

*Cumulative acres. **Annual estimate - See Estimation Methodology at link below.

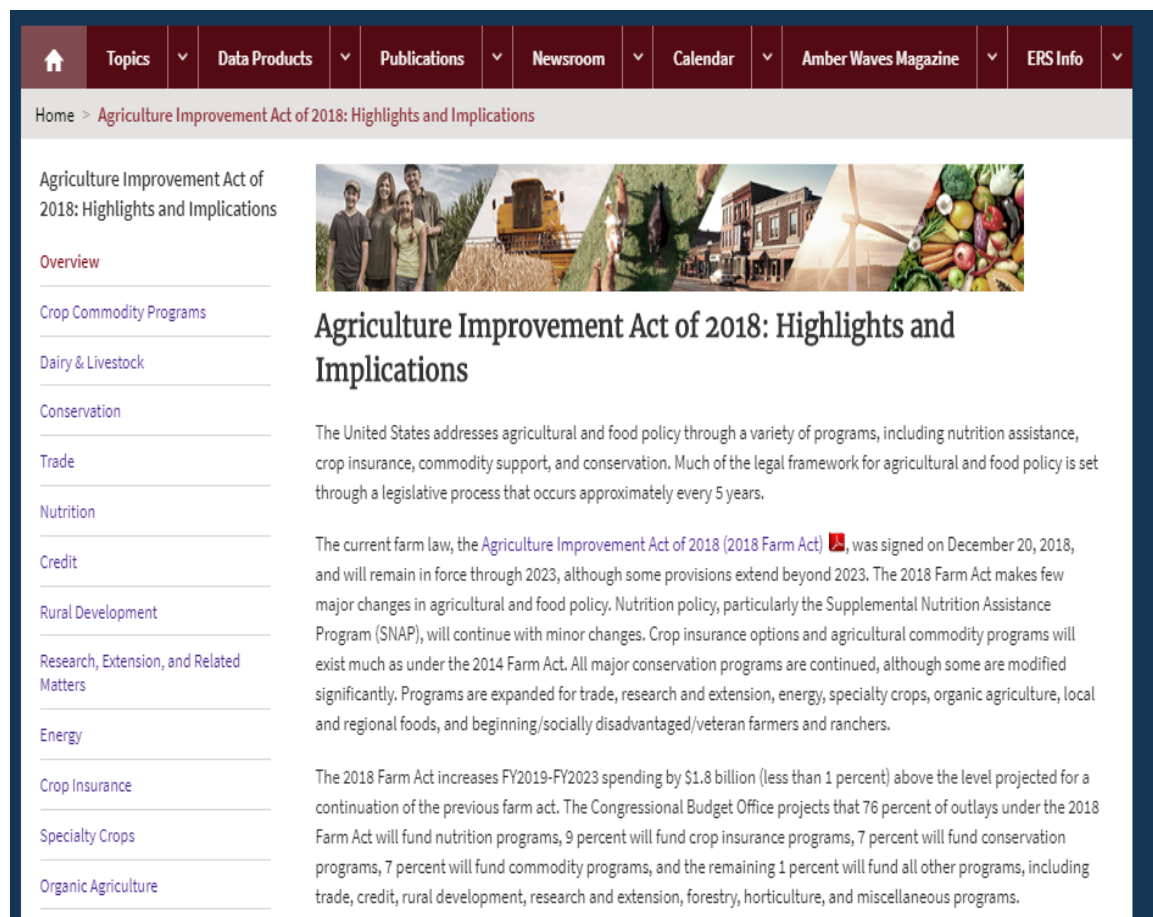
https://www.fsa.usda.gov/Assets/USDA-FSA-Public/usdafiles/EPAS/natural-resources-analysis/nra-landing-index/2017-files/Environmental_Benefits_of_the_US_CRP_2017_draft.pdf

Summary and Conclusions

- A suite of U.S. Conservation programs generates a suite of benefits.
- Voluntary programs are oversubscribed by farmers, giving USDA the opportunity to improve program efficiency through targeting.
- While research has identified (and generated) behavioral changes and measured additionality associated with programs, most impact measures rely on counts of practices, rather than on environmental outputs.



More information on the 2018 Farm Bill, including highlights and implications of all major provisions, is available on the ERS Webpage: <https://www.ers.usda.gov/agriculture-improvement-act-of-2018-highlights-and-implications/>



The screenshot shows the ERS website's navigation bar with links for Home, Topics, Data Products, Publications, Newsroom, Calendar, Amber Waves Magazine, and ERS Info. The main heading is 'Home > Agriculture Improvement Act of 2018: Highlights and Implications'. On the left is a sidebar menu with links: Overview, Crop Commodity Programs, Dairy & Livestock, Conservation, Trade, Nutrition, Credit, Rural Development, Research, Extension, and Related Matters, Energy, Crop Insurance, Specialty Crops, and Organic Agriculture. The main content area features a collage of agricultural images (farmers, a combine harvester, a horse, a town, a wind turbine, and produce) above the title 'Agriculture Improvement Act of 2018: Highlights and Implications'. Below the title, the text states: 'The United States addresses agricultural and food policy through a variety of programs, including nutrition assistance, crop insurance, commodity support, and conservation. Much of the legal framework for agricultural and food policy is set through a legislative process that occurs approximately every 5 years.' It then discusses the 2018 Farm Act, signed on December 20, 2018, which remains in force through 2023. The act makes major changes in agricultural and food policy, including the continuation of the Supplemental Nutrition Assistance Program (SNAP) with minor changes, and the expansion of programs for trade, research and extension, energy, specialty crops, organic agriculture, local and regional foods, and beginning/socially disadvantaged/veteran farmers and ranchers. Finally, it notes that the 2018 Farm Act increases FY2019-FY2023 spending by \$1.8 billion (less than 1 percent) above the level projected for a continuation of the previous farm act, with funding allocations for nutrition (76 percent), crop insurance (9 percent), conservation (7 percent), and other programs (1 percent).



ERS reports referenced (and more!) are available at:
<https://www.ers.usda.gov/topics/natural-resources-environment/>



United States Department of Agriculture

Economic
Research
Service

Economic
Information
Bulletin
Number 208

May 2019

Agricultural Resources and Environmental Indicators, 2019

Daniel Hellerstein, Dennis Vilorio, and Marc Ribaud (editors)



Natural Resources & Environment



Natural Resources & Environment

Climate Change

The Earth's temperature is rising as a result of increased atmospheric concentrations of greenhouse gases. Agriculture is a source of methane and nitrous oxide emissions, two prominent greenhouse gases. Changes in agricultural practices can reduce emissions of these gases, and reduce atmospheric concentration of carbon dioxide by sequestering carbon in soil.

Conservation Programs

Some farming practices (excess fertilization and manure, for example) can degrade our Nation's natural resources while others (such as preserving land for wildlife) can enhance our natural heritage. USDA conservation programs offer producers a range of options for assistance with conservation efforts.

Environmental Quality

ERS analyzes the use and efficacy of conservation practices and of Federal programs and policies aimed at combating the harmful effects of agriculture as they relate to soil quality, water quality, air quality, wildlife habitat, and wetlands preservation.

Organic Agriculture

Consumer demand for organically produced goods has shown double-digit growth for well over a decade, providing market incentives for U.S. farmers across a broad range of products. Growth in organic agricultural production is occurring in both developed and developing countries worldwide, and the competition for major consumer markets in developed countries, particularly the United States and Europe, is increasing. ERS research on organic agriculture looks at these issues, and the chapter on



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