

Iowa Nutrient Reduction Strategy 2016 Annual Report

19 July 2016

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IOWA STATE UNIVERSITY

Measuring Change

MEASURABLE INDICATORS OF DESIRABLE CHANGE

INPUTS

- People
- Funding
- Agency resources
- Private sector resources



HUMAN

- Partner organizations
- Partner agribusinesses
- Farmer knowledge and attitude
- Point source communities and management knowledge and attitude



LAND

- Land use changes
- Practice adoption
- Point source implementation

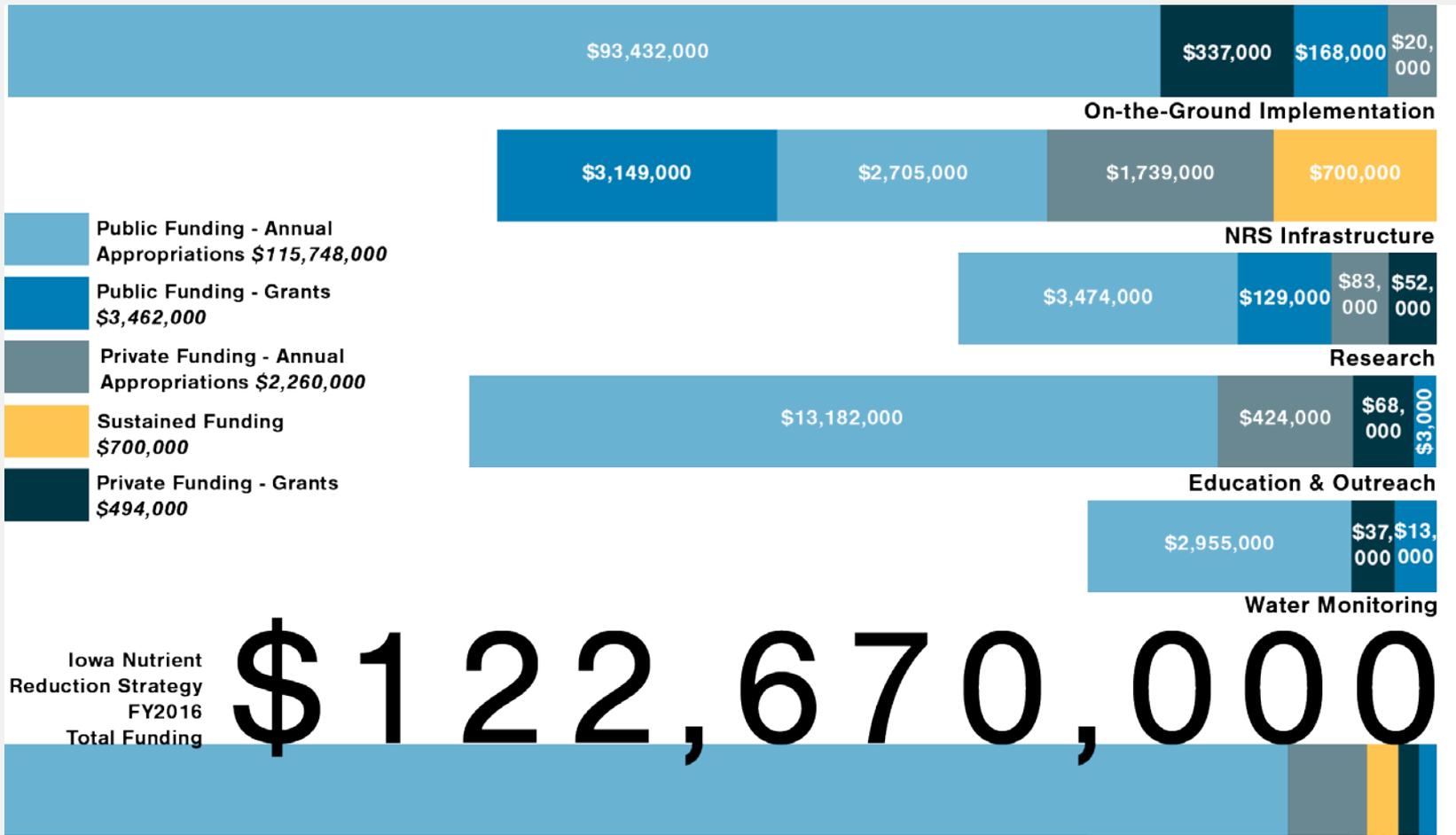


WATER

- Calculated load reduction
- Measured loads in priority watersheds
- Organized watersheds reported load changes
- Measured loads at existing monitoring stations

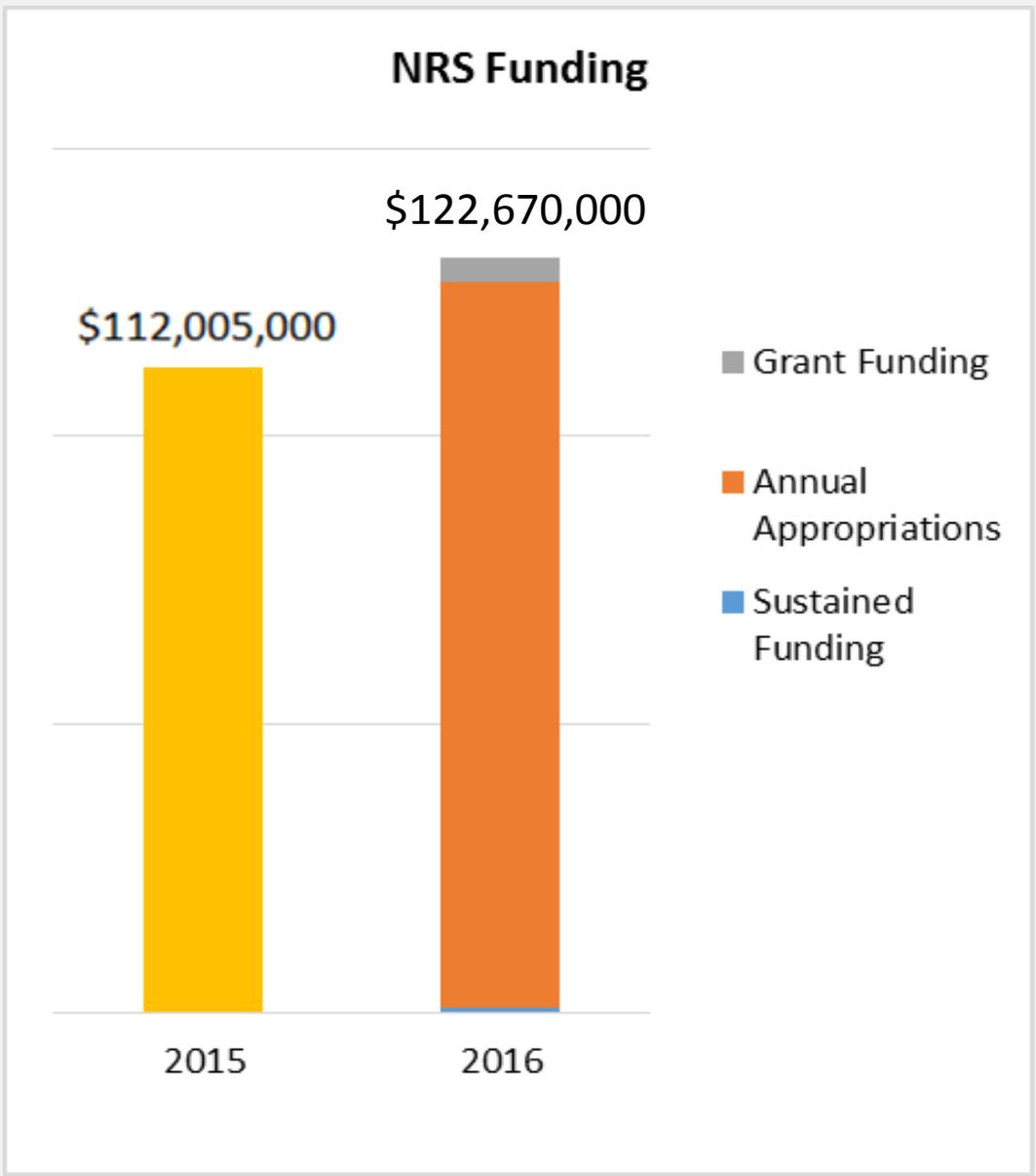
*Nutrient Reduction Strategy Measure of Success Committee,
Water Resource Coordinating Council*

INPUTS



\$1,226,670,000

CRP: Additional \$225 million



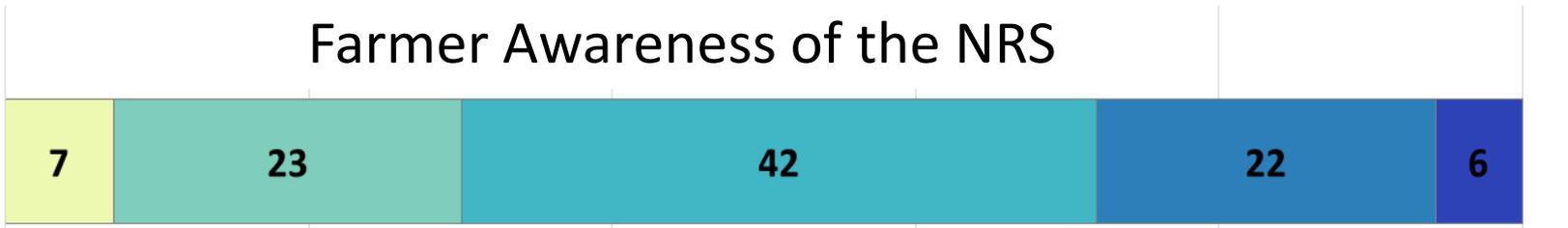


2015 Outreach Efforts

	Number of Events	Average Attendance	Total Reported Attendance
Outreach— Fairs, Tours, and Community Education	98	140	14,375
Field Days	57	41	4,159
Workshops	19	34	1,172
Conferences	4	291	1,281
<i>Total</i>	<i>178</i>		<i>20,987</i>

Farmer Awareness of the NRS

2015 NRS
Farmer
Survey



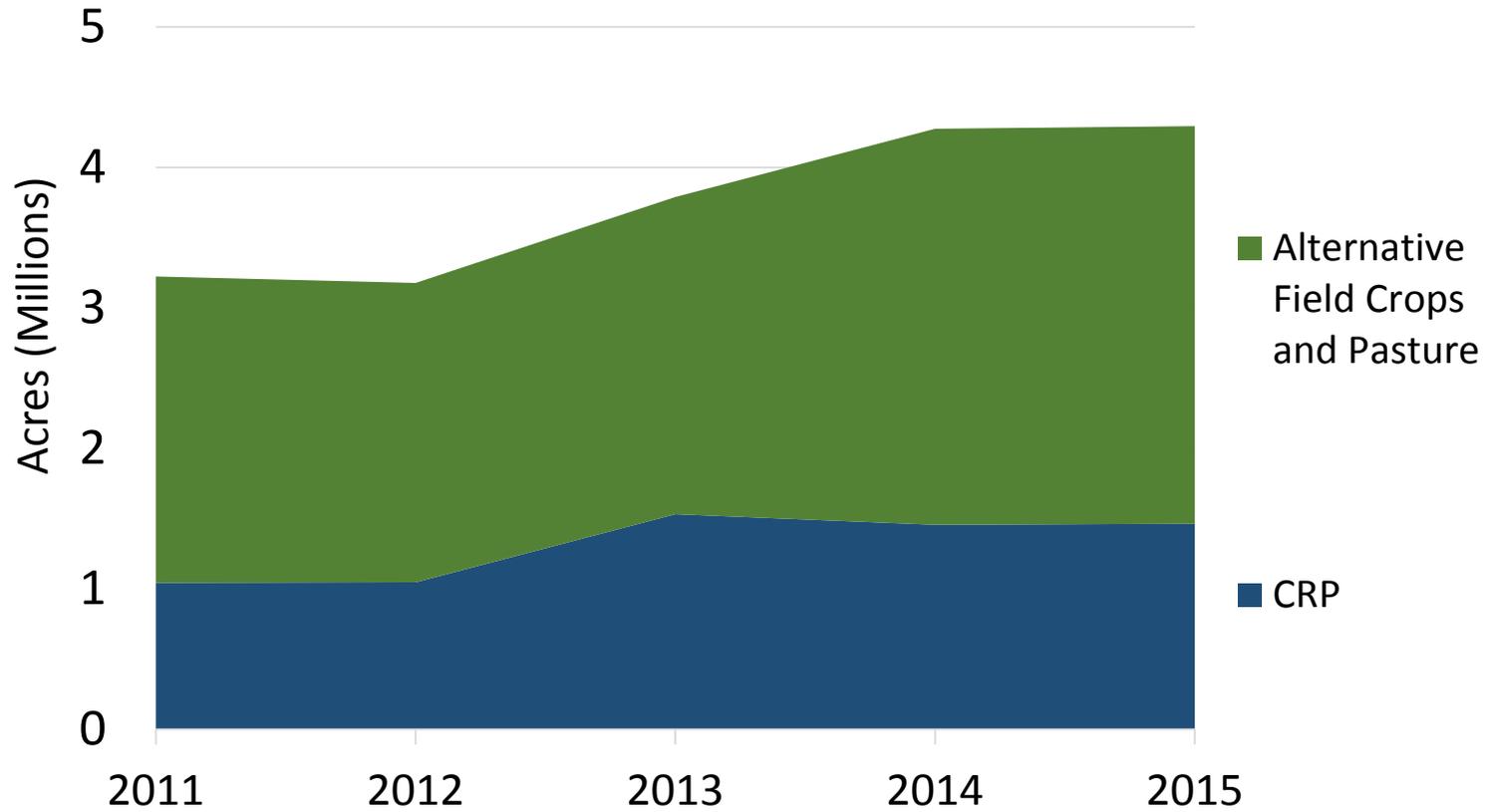
Not at all Slightly Somewhat Knowledgeable Very knowledgeable

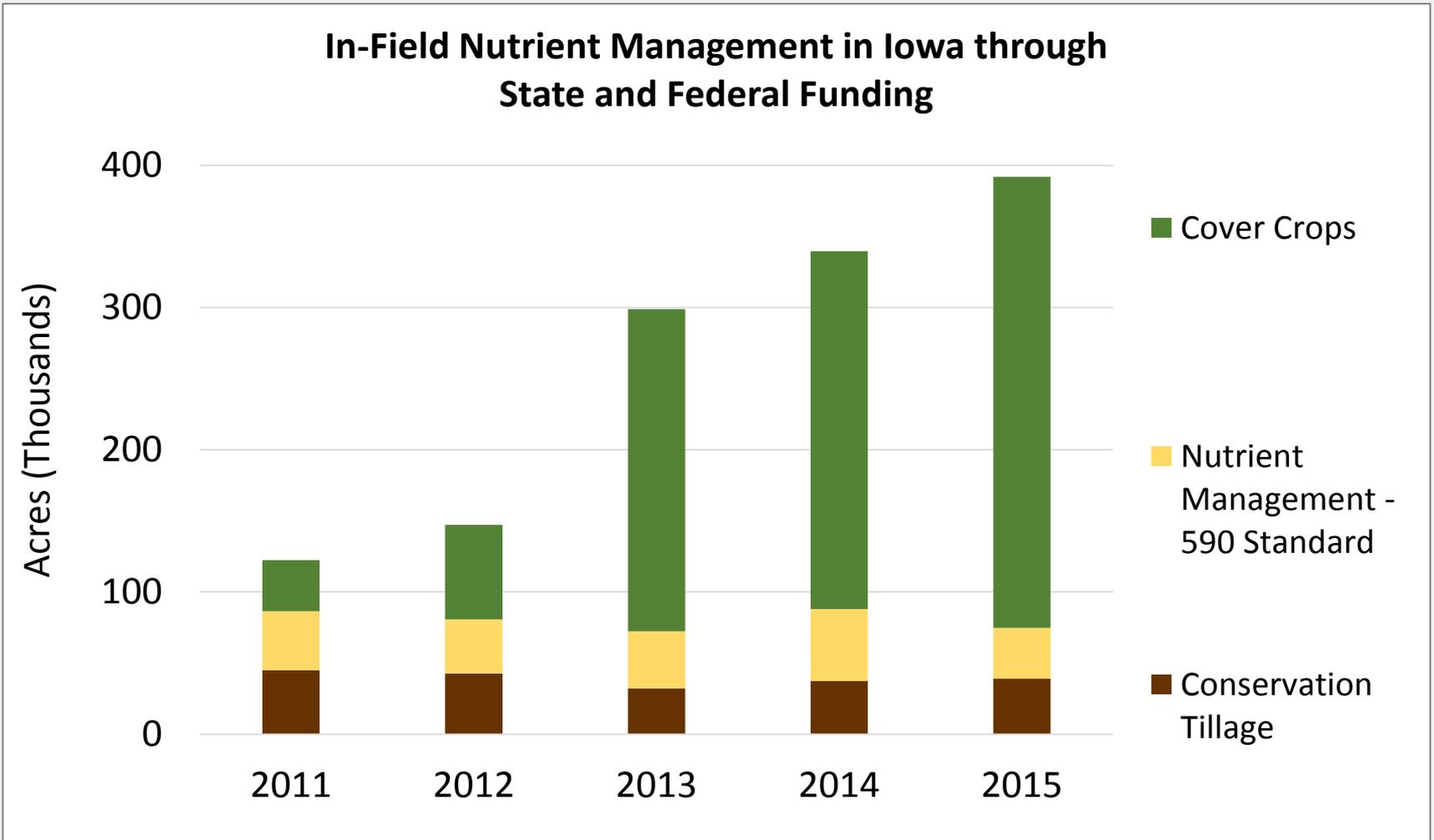
2014 Farm
& Rural
Life Poll



0 20 40 60 80 100

Alternative Land Use in Iowa



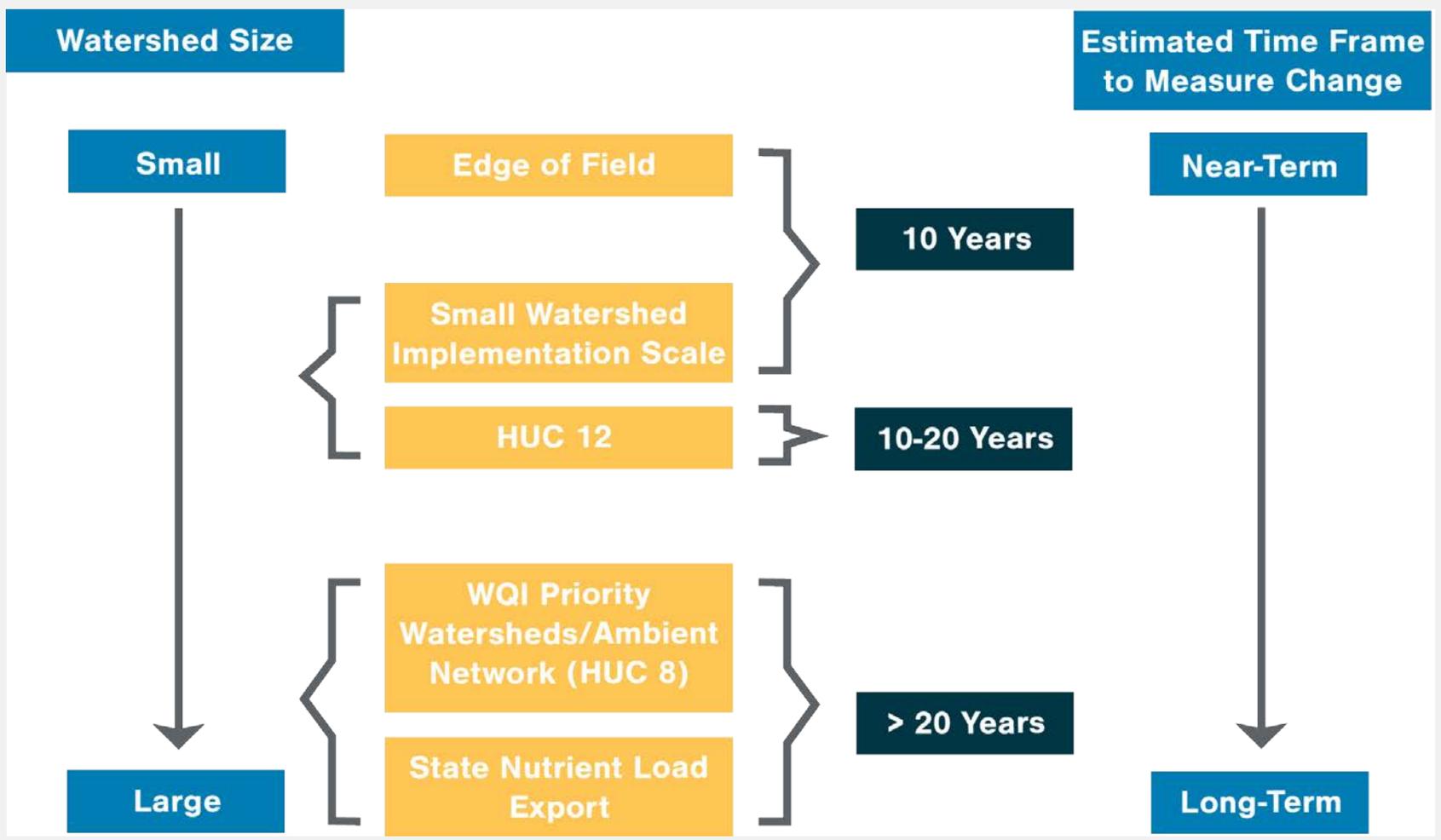


Selected Edge-of-Field Practices in Iowa through state/federal funding, installed since 2011

	2014	2015
Wetlands, Conservation Reserve Enhancement Program (acres treated)		99,309
Bioreactors (acres installed)	676	838
Terraces (feet)	16,076,690	19,821,659
Water and Sediment Control (number).....	18,609	19,321

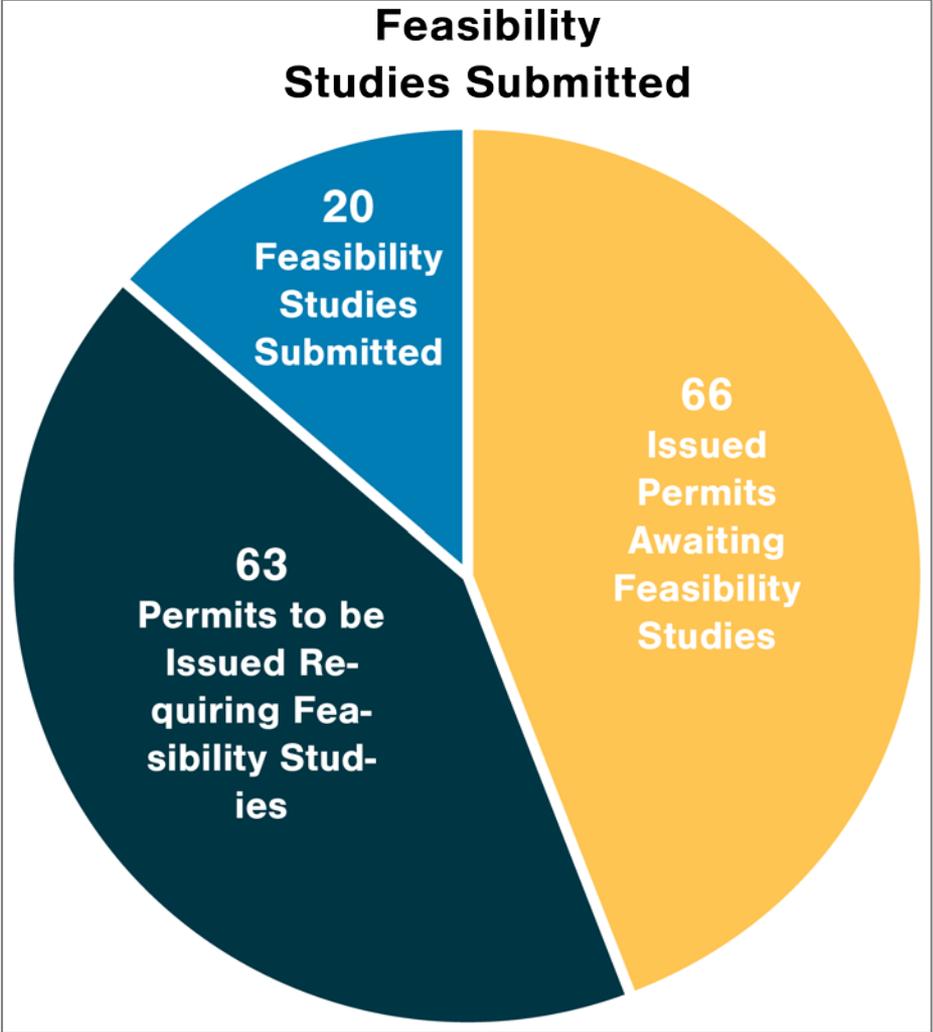


WATER



**Nutrient Load Reduction from Select Conservation Practices
(Pounds)**

	2014	2015
Nitrogen - Total		3,830,000
Cover Crops		2,356,000
CREP wetlands		1,474,000
Bioreactors		6000
Phosphorus - Total	134,947	217,884
Cover Crops	112,518	196,967
No-till	10,622	14,229
Reduced till	345	7
Extended rotation	1463	6,680
Phosphorus—annual CRP fluctuations†	-104,134	+56,311



		Estimate (Target)	POTW	Industry
Total Nitrogen (average)				
number of facilities			41	6
raw waste (mg/L)	25		28.7 (range 0.1 – 285.0)	107.1 (range 3.63 – 748.0)
final effluent (mg/L)	10		15.2 (range 0.2 – 220.8)	22.6 (range 0.0 – 15.5)
% removal	66%		44.7% (range -10.8% - 89.1%)	74.7% (range 60.6% - 87.3%)
Total Phosphorus (average)				
number of facilities			41	9
raw waste (mg/L)	4.0		4.4 (range -3.0 – 419.8)	27.5 (range 0.53 – 200.0)
final effluent (mg/L)	1		2.2 (range 0.0 – 23.9)	17.2 (range 0.05 – 176.0)
% removal	75%		43.0% (range -34.0% - 80.6%)	51.4% (range -40.9% - 89.2%)
Annual Load Reduction (2015-2016)				
Total nitrogen (tons)		-	2,949	115
Total phosphorus (tons)		-	599	99

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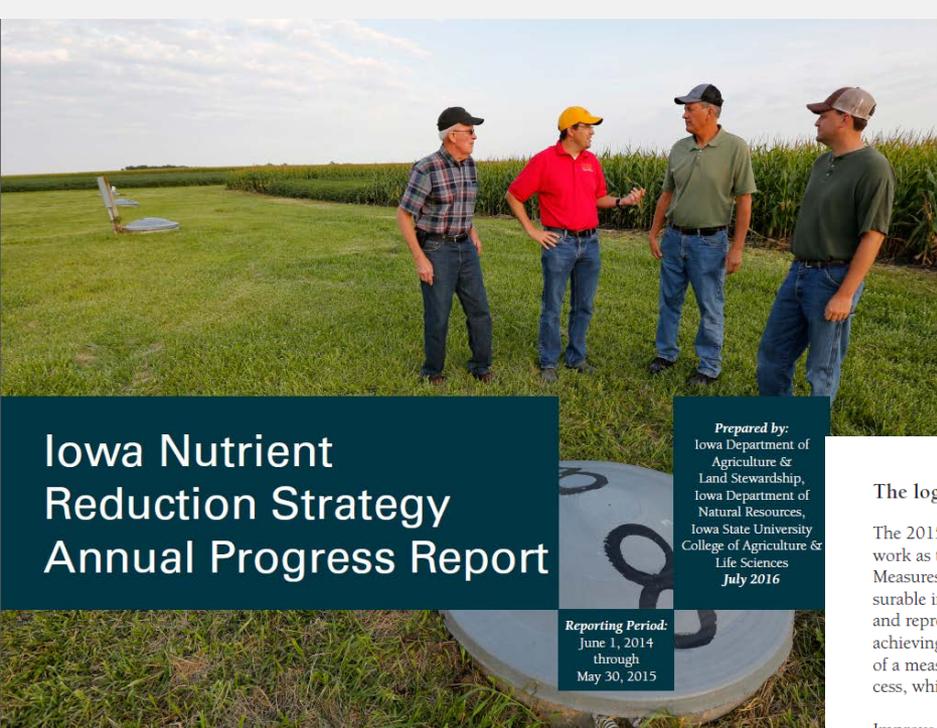
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Iowa Nutrient Reduction Strategy Annual Progress Report

Prepared by:
Iowa Department of Agriculture & Land Stewardship,
Iowa Department of Natural Resources,
Iowa State University
College of Agriculture & Life Sciences
July 2016

Reporting Period:
June 1, 2014
through
May 30, 2015

The logic model approach

The 2015 progress report introduced the “logic model” framework as the basis of considerations set forth by the WRCC Measures Subcommittee. The Logic Model is guided by measurable indicators of desirable change that can be quantified, and represents a progression towards intermediate goals for achieving improved water quality in Iowa. This development of a measurement framework assists the annual reporting process, which was recommended by the 2011 EPA memo.

Improved water quality is the ultimate goal of the NRS, and is represented by the right-most category of Figure 1. In order to affect change in water quality, there is a need for increased inputs, measured as funding, staff, and resources. Inputs affect change in outreach efforts and human behavior. This shift toward more conservation-conscious attitudes in the agricultural and point source communities is a desired change in the human dimension of water quality efforts. With changes in human attitudes and behavior, changes on the land may occur,

measured as conservation practice adoption and point source facility upgrades. Finally, these physical changes on the land may affect change in water quality, which ultimately be measured through both empirical water quality monitoring and through modeled estimates of nutrient loads in Iowa surface water. The measurable indicators that correspond to each category, as outlined in Figure 1, provide quantified parameters in which to track year-to-year changes and continual trends to develop a standardized protocol for evaluating NRS progress.

In measuring progress of the NRS, the logic model serves as a comprehensive reporting tool to inform data collection, indicator development, and assessment of the successes and challenges associated with reducing nutrient loss from point and nonpoint sources. The logic model guides the assessment of a progression of changes, and the concurrent improvements in each of the four primary categories. With continually refine measurement of each category, potential adjustments may be made to the inputs and efforts that partner organizations devote to the NRS in order to impact change over time.

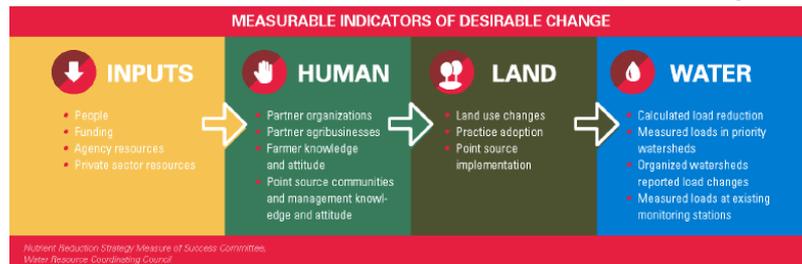


Figure 1: The logic model of the Iowa Nutrient Reduction Strategy, guided by measurable indicators of desirable change.