

Strengthening Agriculture's Commitment to Water Quality: Iowa Nutrient Reduction Strategy

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Progress report

- Iowa Nutrient Research Center
- Ongoing research
- Measures of success
- What's next

Iowa Nutrient Research Center

- Established by 2013 Legislature
- Funded at \$1.5 million for 2013-2014
- Regents Center administered by CALS Dean
- *The purpose of the center shall be to pursue a science based approach to nutrient management research...*
- <http://www.nutrientstrategy.iastate.edu/>

10 Projects year 1: \$1,425,770

- Iowa Institute of Hydraulic Research - **Hydroscience and Engineering** Work Plan
- Distribution, transport, and biogeochemical transformations of agriculturally derived nitrogen and phosphorus in **Cedar River**
- Establishing pragmatically dynamic program for extending water quality **BMP financial information**: Farmer tools for Iowa Nutrient Reduction Strategy
- **Social-economic** research work plan
- Phosphorus transport in Iowa streams: Importance of stream **bed and bank erosion**

10 Projects year 1: \$1,425,770

- Establishment and monitoring of **saturated buffers** within priority watersheds
- Investigating causes of **corn yield decreases** following cereal rye winter cover crop
- Impacts of **cover crops** on phosphorus and nitrogen loss with surface runoff
- Nonpoint source nitrogen and phosphorous **loads at implementation scale**: Direct agricultural nutrient loads to surface waters in relation to land use and mgt.
- **Bioreactor** Research & Assessment of Woodchip Tile Denitrification Bioreactors: Optimal Design/ Performance and Experimental Bioreactor Installation and Study

Manure Research

- Evaluating Instinct with fall applied **liquid swine manure**. Finish likely this summer

Northeast Iowa Research Farm,

- Impact of Liquid Swine Manure Application and Cover Crops on Ground Water Quality
 - <http://www.ag.iastate.edu/farms/11reports/Northeast/ImpactManure.pdf>
- Fertilizer and Swine Manure Management Systems Impacts on phosphorus in Soil and Subsurface Tile Drainage
 - <http://www.ag.iastate.edu/farms/11reports/Northeast/FertilizerSwine.pdf>
- Drainage Water Quality Impacts of Current and Future Agricultural Management Practices

Manure Research

Northwest Iowa Research Farm

- Effects of Tillage and Phosphorus Source on Long-term Phosphorus Runoff Loss and Crop Yield
 - <http://www.ag.iastate.edu/farms/2012%20Farm%20Reports/Northwest/EffectsTillage.pdf>
1. Corn-soybean rotation managed with chisel/disk tillage and fertilizer P.
 2. Corn-soybean rotation managed with no-tillage and fertilizer P.
 3. Corn-soybean managed with chisel/disk tillage and **P-based liquid swine manure**.
 4. Corn-soybean managed with no-tillage and **P-based manure**.
 5. Continuous corn managed with chisel/disk tillage, **N-based manure**, and baled stover.

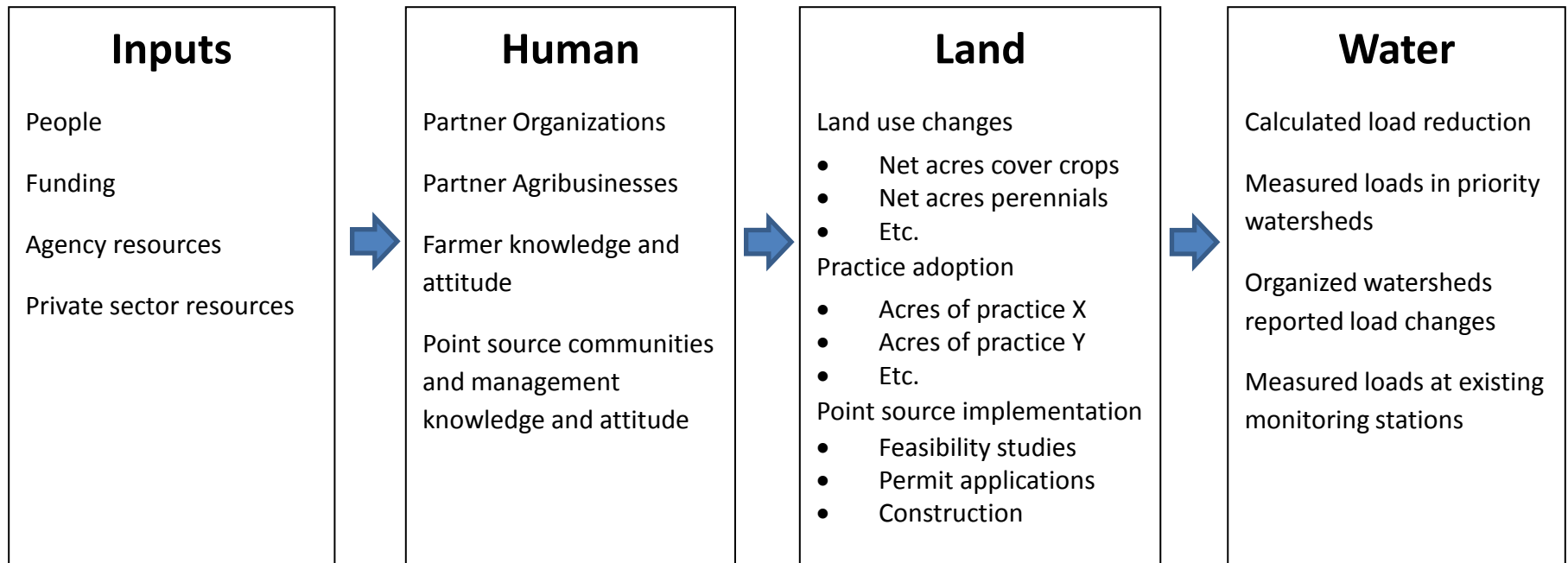
Measures of success committee

- WRCC committee on how to measure if we are making progress toward the goal
- Met 3 times: Sep, Nov, Jan
- Report to WRCC on January 22

Measures of success committee

Measurable indicators of desirable change

Specific indicators in attached text



Example Combination Scenarios that Achieve N and P Goal From NPS

		N	P		Total EAC*	Statewide
Name	Combined Scenario	% Reduction from baseline		Initial Investment (million \$)	Cost (million \$/year)	Average EAC Costs (\$/acre)
NCS1	MRTN Rate, 60% Acreage with Cover Crop, 27% of ag land treated with wetland and 60% of drained land has bioreactor	42	30	3,218	756	36
NCS3	MRTN Rate, 95% of acreage in all MLRAs with Cover Crops, 34% of ag land in MLRA 103 and 104 treated with wetland, and 5% land retirement in all MLRAs	42	50	1,222	1,214	58

Example Combination Scenarios that Achieve N and P Goal From NPS

		N	P		Total EAC*	Statewide
Name		% Reduction from baseline		Initial Investment (million \$)	Cost (million \$/year)	Average EAC Costs (\$/acre)
NCS8	<p>Combined Scenario</p> <p>MRTN Rate, Inhibitor with all Fall Commercial N, Sidedress All Spring N, 70% of all tile drained acres treated with bioreactor, 70% of all applicable land has controlled drainage, 31.5% of ag land treated with a wetland, and 70% of all agricultural streams have a buffer) - Phosphorus reduction practices (phosphorus rate reduction on all ag land, Convert 90% of Conventional Tillage CS & CC acres to Conservation Till and Convert 10% of Non-No-till CS & CC ground to No-Till</p>	42	29	4,041	77	4

Next Steps

- Successful management of cover crops
- Launch priority watershed projects
- Continued education and demonstration
- Establish measurements and baseline
- Make changes, show progress
- Innovate and implement new methods