United States Department of Agriculture
Natural Resources Conservation Service

USDA NRCS

NRCS Progress in the Great Lakes Basin

(Past, Present and Future)

5th National Conference
for Ecosystem Restoration

July 31, 2013

Mike Moorman
Great Lakes Restoration Initiative Coordinator

Great Lakes Restoration Initiative (Past)

- The Great Lakes Restoration Initiative (GLRI) is the largest investment in the Great Lakes in over two decades.

- Since its inception in 2010, NRCS has received just under $100 million of GLRI funds for assistance to private landowners in priority watersheds.

Great Lakes Restoration Initiative

The objective of this initiative is to address five urgent focus areas:

1. Cleaning up toxics and areas of concern;
2. Combating invasive species;
3. Promoting nearshore health by protecting watersheds from polluted run-off;
4. Restoring wetlands and other habitats; and
5. Working with partners on outreach.

Great Lakes Restoration Initiative

NRCS works with three of the five

1. Cleaning up toxics and areas of concern;
2. Combating invasive species;
3. Promoting nearshore health by protecting watersheds from polluted run-off;
4. Restoring wetlands and other habitats; and
5. Working with partners on outreach.

Great Lakes Restoration Initiative

- We're one of 11 federal agencies, state and local conservation partners and a whole lot of farmers on the ground making this initiative a success.

- Working with the lead agencies, we developed an action plan to concentrate efforts in priority watersheds to improve water quality in the Genesse River, Grand Calumet River and Harbor, Green Bay/Fox River, Maumee River, Saginaw River, St. Louis River.

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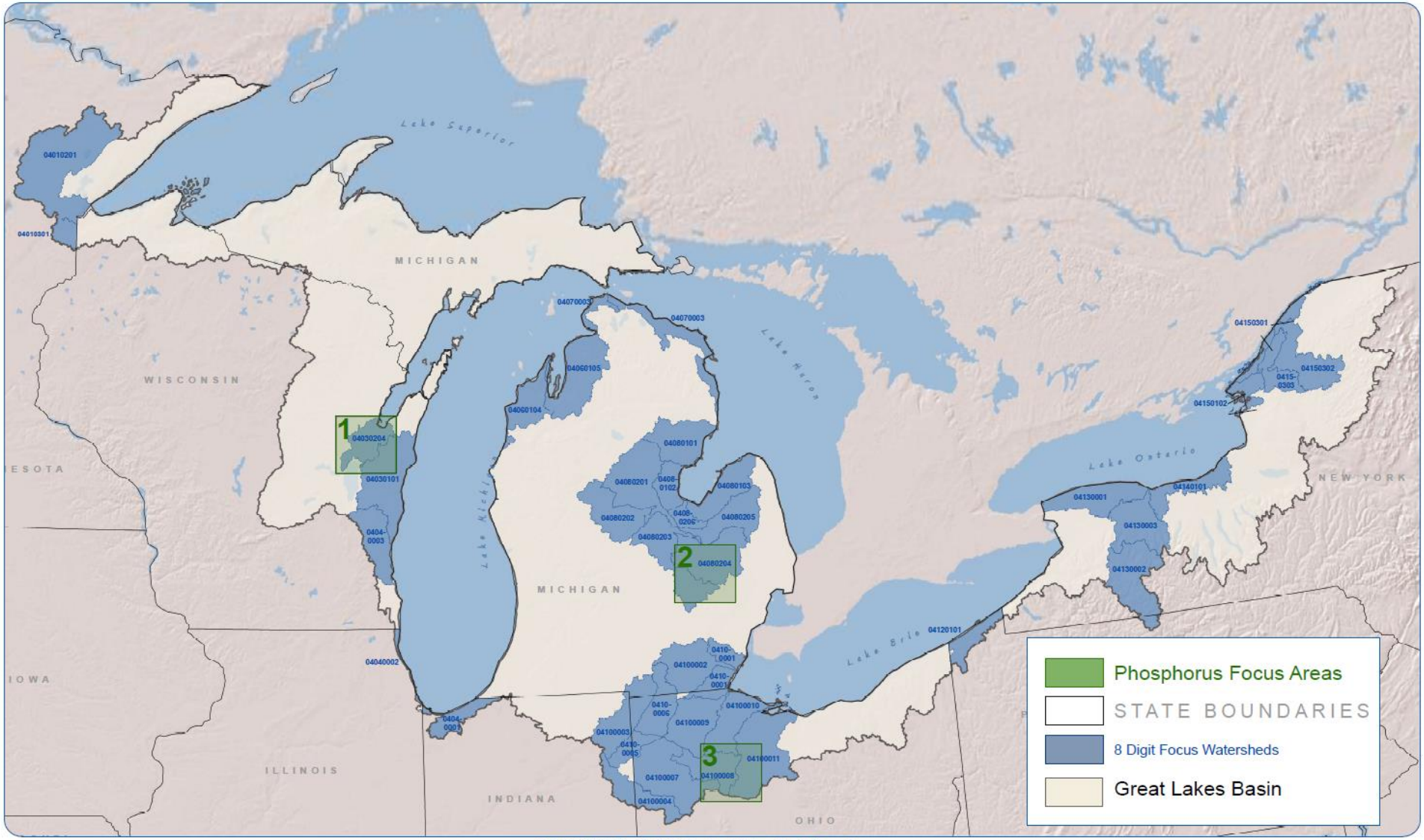
Great Lakes Restoration Initiative (GLRI) Priority Watersheds Fiscal Year 2012



GLRI 2012 8 digit Priority Watershed Locations

Focus Area by Funding Year	Funds
EPA GLRI Funding to NRCS (FY2010/2011)	
Invasive Species	1,000,000
Nearshore Health and Non Point Source Pollution	30,642,000
Habitat and Wildlife Protection and Restoration	2,000,000
Accountability, Education, Monitoring, Evaluation, Communication	450,000
Total FY10/11 Funding	***$34,092,000***
EPA GLRI Funding to NRCS (FY2011/2012)	
Invasive Species	554,000
Nearshore Health and Non Point Source Pollution [1]	16,007,000
Accountability, Education, Monitoring, Evaluation, Communication	217,000
Total FY11/12 Funding	***$16,778,000***
EPA GLRI Funding to NRCS (FY2012/2013)	
Invasive Species	465,360
Nearshore Health and Non Point Source Pollution [1, 2]	23,536,968
Accountability, Education, Monitoring, Evaluation, Communication	183,098
Total FY 12/13 Funding	***$24,185,426***
EPA GLRI Funding to NRCS (FY2013/2014)	
Invasive Species	422,928
Nearshore Health and Non Point Source Pollution [1, 2]	22,138,459
Accountability, Education, Monitoring, Evaluation, Communication	168,065
Total FY 13/14 Funding	***$22,729,452***

Great Lakes Restoration Initiative

EPA GLRI Total Funding to NRCS (FY2010/2013)

• Invasive Species	$ 2,442,288
• Habitat and Wildlife Protection and Restoration	$ 2,000,000
• Nearshore Health and Non Point Source Pollution	$ 94,324,427
• Accountability, Education, Monitoring, Evaluation, Communication	$ 1,018,163
• **Total 10/13 Funding**	**$99,784,878**

Great Lakes Restoration Initiative

- NRCS provides technical and financial assistance to landowners through EQIP, WHIP, and CTA
- These programs are vehicles to provide assistance to applicants in priority watersheds for nonpoint source pollution control, wildlife habitat restoration and invasive species control.
- Initially in 2010 GLRI also provided floodplain protection, and purchase of development rights for farm land.

Great Lakes Restoration Initiative

- Over the past three years, GLRI has provided about $35 million in financial assistance above normal Farm Bill funding to help eligible farmers in the Great Lakes Region accomplish critical conservation goals.

- During the time GLRI has been in place, farmers have signed 941 contracts, committing to implementing conservation practices on 189,500 acres .

Great Lakes Restoration Initiative

- Typical practices include: Nutrient management, cover crop establishment, riparian buffers, residue management (no-till / mulch till), pest management, upland wildlife habitat practices, and wetland restoration

Great Lakes Restoration Initiative

- Excessive phosphorous is a significant issue – creating algal blooms in Western Lake Erie and Saginaw and Green Bay.

- Starting in 2012 NRCS has been targeting watersheds with excessive phosphorus inputs -- devoting $20 million, specifically designated to reduce phosphorous loadings in these water bodies.

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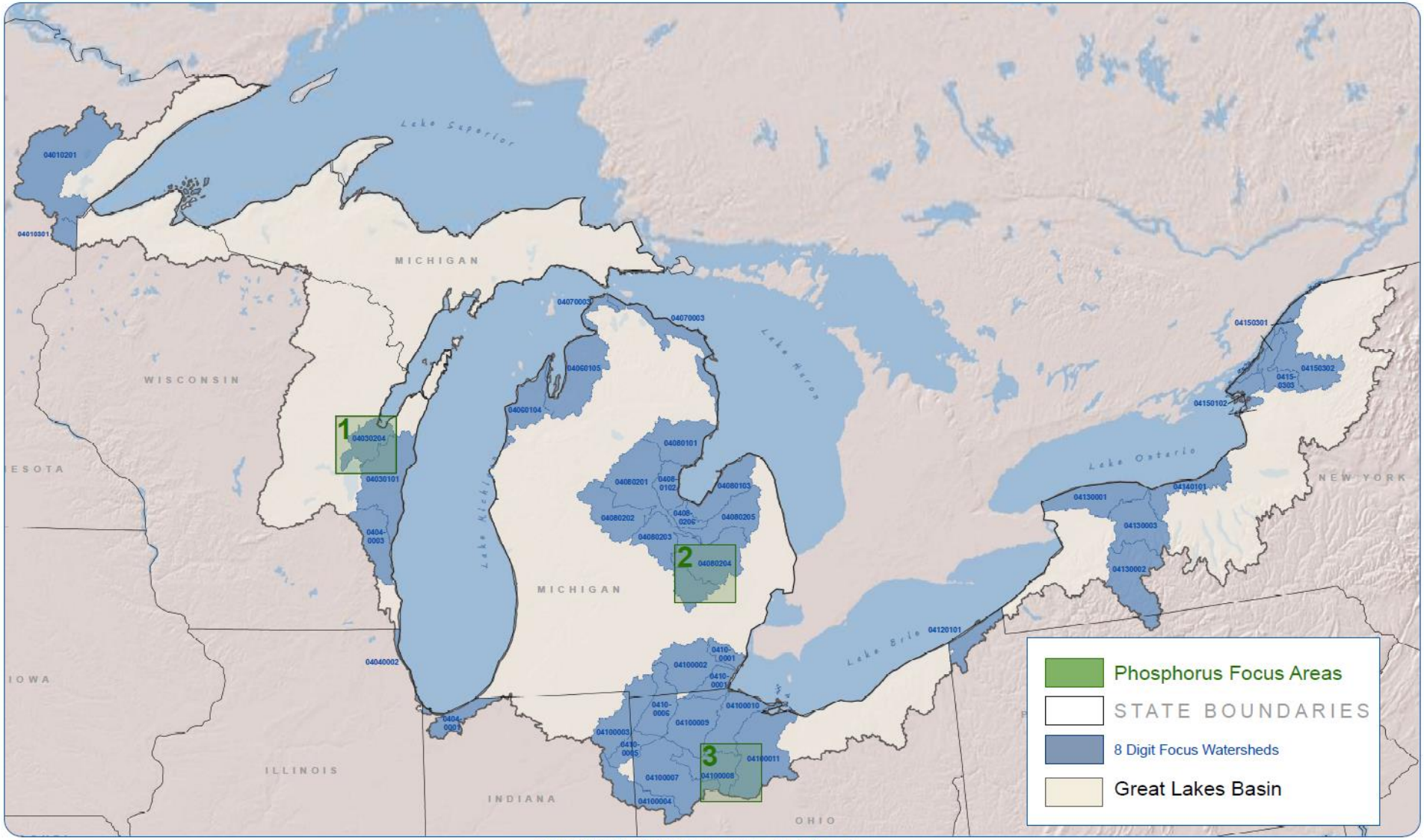
Great Lakes Restoration Initiative (GLRI) Priority Watersheds Fiscal Year 2012



GLRI 2012 8 digit Priority Watershed Locations

Phosphorus Reduction Watersheds

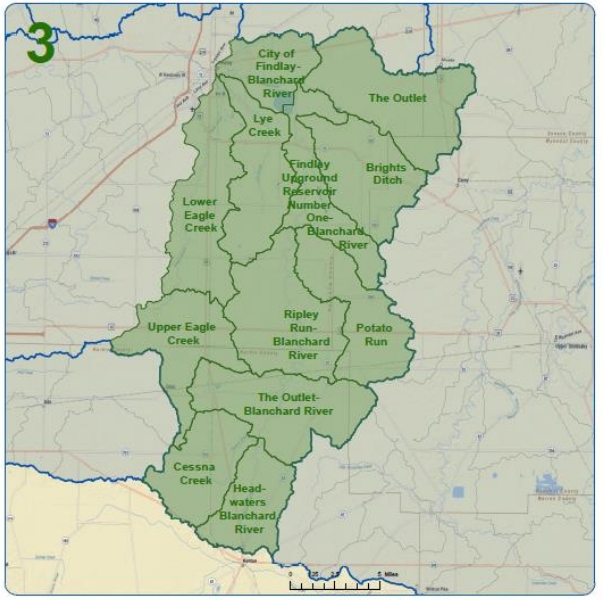
Through collaboration with NRCS, EPA and USGS

Three watersheds were selected based on existing water quality among other factors:

1. Lower Fox River watershed - Wisconsin
2. Saginaw River watershed - Michigan
3. Blanchard River watershed - Ohio

Lower Fox River 12 digit HUC Phosphorus Reduction Focus Areas

Saginaw River 12 digit HUC Phosphorus Reduction Focus Areas



Blanchard River 12 digit HUC Phosphorus Reduction Focus Areas

Great Lakes Restoration Initiative

- NRCS devoted nearly half ($10 Million) of its fiscal year 2012 GLRI assistance to these small priority watersheds to gain maximum benefits in reducing phosphorus.

- Farmers entered into 139 contracts to implement phosphorous-reducing practices on nearly 34,000 acres.

- 2013 sign-up is ongoing with another $10 Million dedicated to the phosphorus priority watershed

Great Lakes Restoration Initiative (Present)

Progress in 2012-13:

- We have completed 2 ranking periods in FY12 with FY13 in progress.
- We have established edge-of-field monitoring sites, will have one complete year of data.
- We are discussing expansion of watershed areas for implementation in 2014.
- We have completed an agreement to implement phosphorus trading in Lower Fox River Watershed, Green Bay, Wisconsin
- Working on Model Farm projects in Michigan, Ohio, and Wisconsin

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Great Lakes Restoration Initiative

Fiscal Year 2012	Environmental Quality Incentive Program (EQIP)			Wildlife Habitat Incentive Program (WHIP)		
STATE	Number of Contracts	FA Contract Obligation	Acres Contracted	Number of Contracts	FA Contract Obligation	Acres Contracted
Illinois	0	$0	0.0	0	$0	
Indiana	11	$455,413	2,715.8	0	$0	
Michigan	121	$4,821,633	29,554.6	36	$158,807	796.4
Minnesota	2	$16,993	5.1	0	$0	
New York	18	$704,353	6,194.4	2	$89,185	39.0
Ohio	75	$2,561,021	12,022.3	0	$0	
Pennsylvania	4	$215,874	478.9	0	$0	
Wisconsin	82	$4,608,871	26,306.0	0	$0	
TOTALS	**313**	**$13,384,158**	**77,277.1**	**38**	**$247,992**	**835.4**

Great Lakes Restoration Initiative

- In fiscal year 2012, producers signed 351 contracts worth nearly $14 Million to implement conservation practices on 78 ,000 acres of their agricultural land.

CEAP—The Conservation Effects Assessment Project

Begun in 2003 to assess effects of conservation practices, build the science base for future conservation

- **Original goals:** Quantify and establish the scientific understanding of the effects of conservation practices at the watershed scale, and estimate conservation effects and benefits at regional and national scales
- **Vision for the future:** Enhanced natural resources and healthier ecosystems through improved conservation effectiveness and better management of Agricultural landscapes

Key Findings of the Great Lakes CEAP Report

Baseline Conservation Practice (2003-2006 percent of cropped acres):

- Mulch till or no-till (82%)
- Structural practices in place on 26% of all cropland acres

Edge-of-Field Reductions Due to Conservation Practice Use (2003-06):

- Sediment (47% reduction)
- Nitrogen (surface) (43% reduction)
- Nitrogen (subsurface) (30-39% reduction)
- Total Phosphorus (39% reduction)
- Pesticide losses from fields (26-27% pesticide risk reduction)

Key Findings of the Great Lakes CEAP Report

Conservation Treatment Needs (percent of cropped areas):

- Cropland needing a high level of treatment (19%)
- Cropland needing moderate level of treatment (5%)

Model Simulations for adoption of additional conservation practices on high/moderate need acres compared to baseline:

Further reduce…Sediment loss by 64%

Nitrogen loss (surface) by 42%

Nitrogen loss (subsurface) by 38%

Total Phosphorus by 36%

CEAP—The Conservation Effects Assessment Project

In 2013 NRCS is starting a new CEAP Project to assess effects of conservation practices, build the science base for future conservation

- **New Goals:** Quantify and establish the scientific understanding of the effects of conservation practices at a much smaller watershed scale, in more detail with more data points.
- **Vision for the future:** more complete data on scale to allow more accurate modeling for more adaptive management that will lead to better management of agricultural landscapes.

Great Lakes Restoration Initiative

- USGS and NRCS worked together to get Edge of Field monitoring installations on-the-ground and collaborated to get producer buy-in for this effort. Folks did a lot of talking, traveling, and hauling equipment to get this work going.
- This project will result in:
  Small watershed data with before and after comparison that can be used for
- public outreach,
- conservation planning,
- practice implementation,
- and follow-up

Great Lakes Restoration Initiative

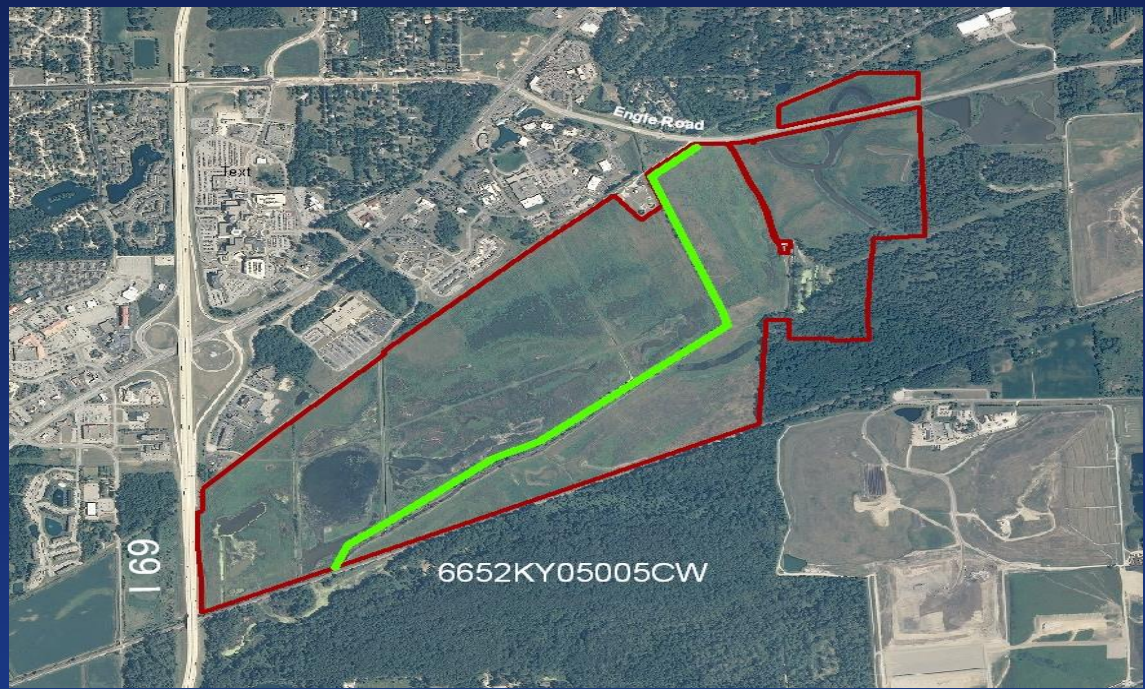
- In 2013 NRCS developed the new Edge of Field Monitoring Practice - 201 and 202.
- 201 is the planning component
- 202 is the installation of the infrastructure
- Partnerships with other Federal, State and Local Agencies, NGOs, and Academia will be needed for data collection and processing.

Great Lakes Restoration Initiative

- In 2013 NRCS initiated Edge Of Field Monitoring Practice
- Through a FRP process states were allowed to submit project proposals for EOF.
- $7 Million was set dedicated split among various water quality initiatives
- Initiatives included National Water Quality Initiative (NWQI), MRBI, GLRI and several other WQIs.
- $1Million was dedicated to GLRI basin
- 30 applications were received and are being evaluated.

Great Lakes Restoration Initiative (Future)

- 18 vulnerable areas identified by ACOE
- One is Eagle Marsh in Indiana – NRCS WRP easement is in place
- Working jointly to correct vulnerability through Wetlands Reserve Program (WRP)
- Approximately $3 Million to repair earthen berm (Phase 1)

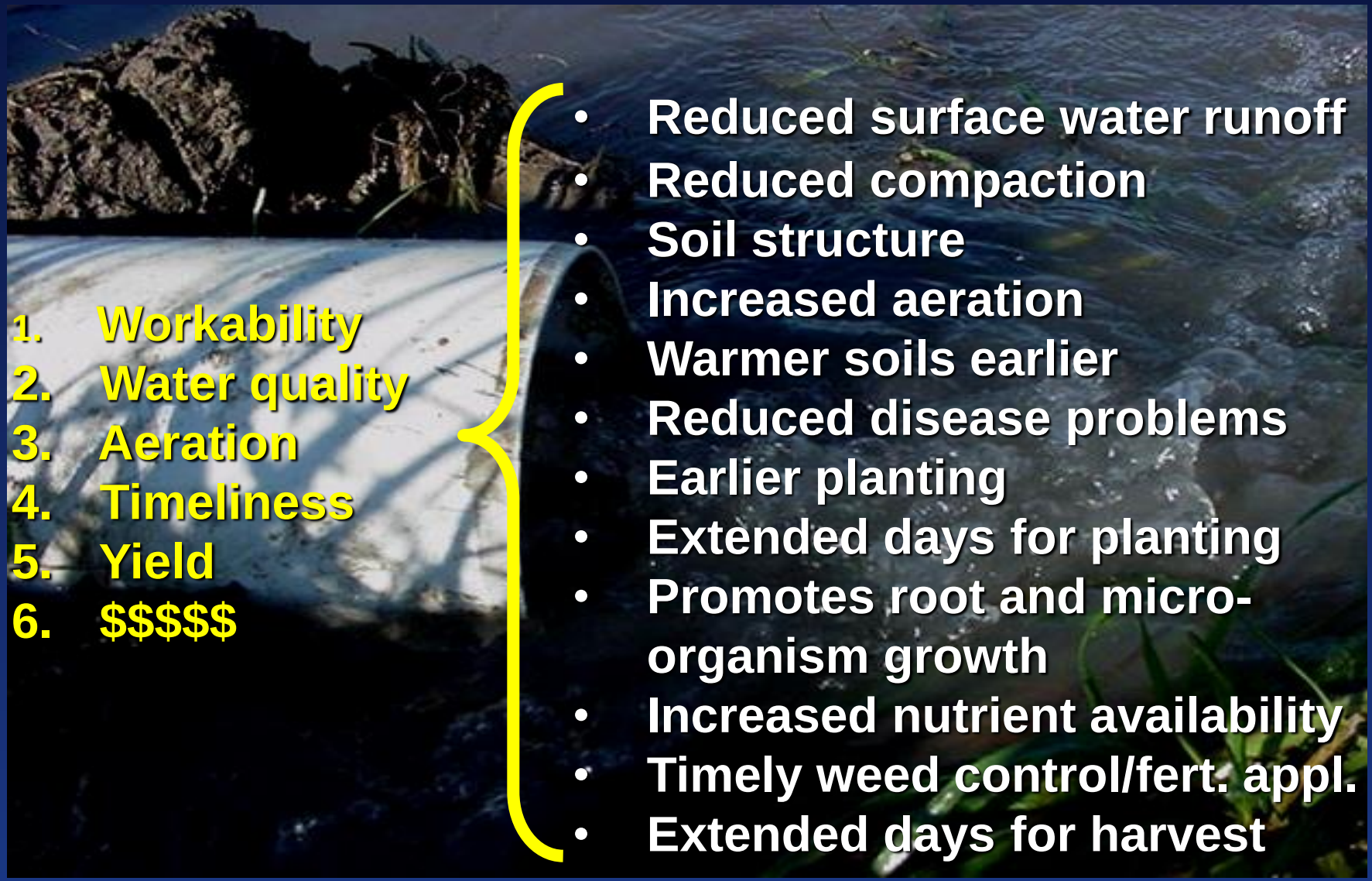


Great Lakes Restoration Initiative

Drainage Water Management (DWM) is returning to NRCS.

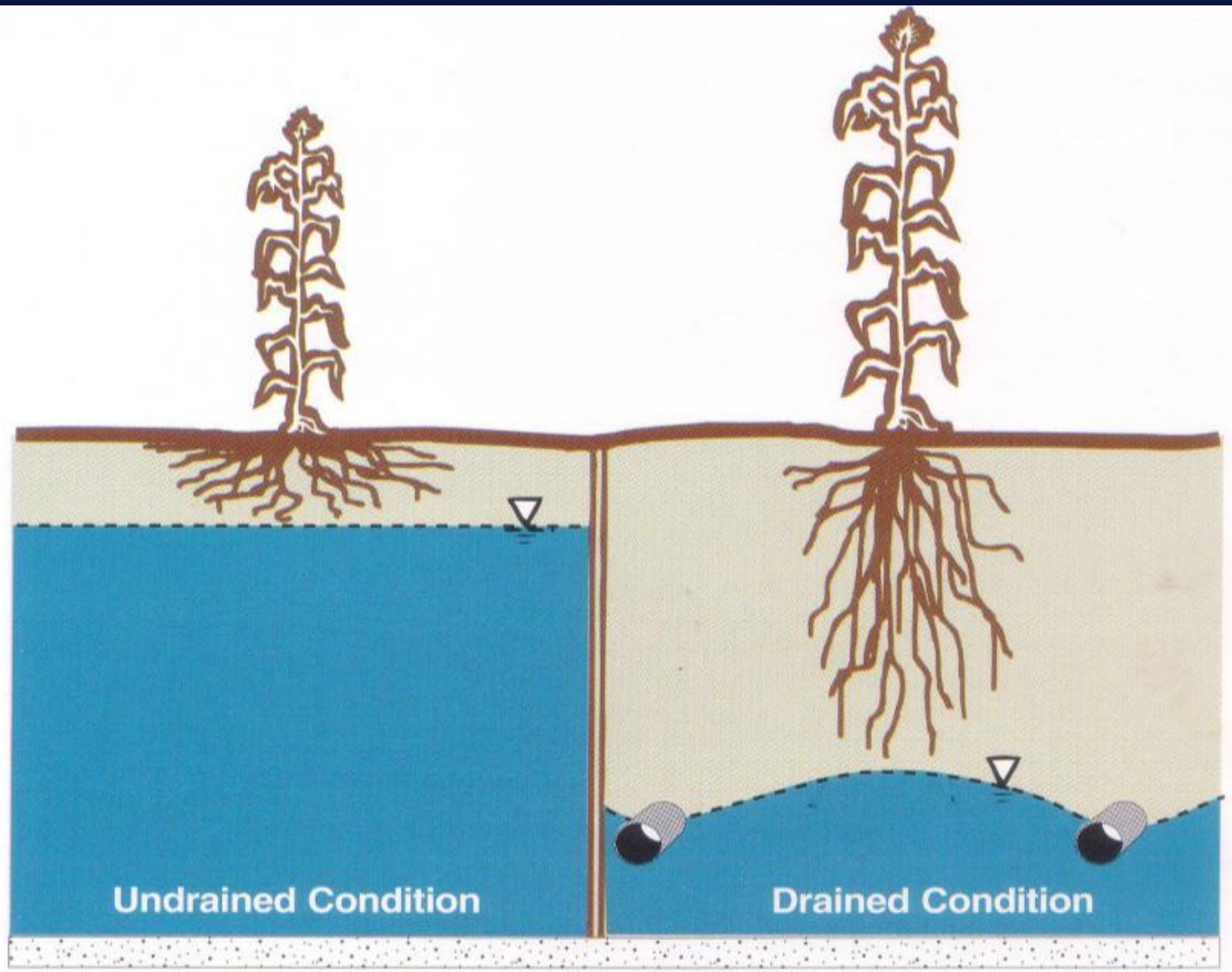
- DWM will be developed as a new practice with a new practice number.
- NRCS Science and Technology division is working with other agencies and universities to develop the standards and specifications for this practice.
- Experimental on field basis outside of NRCS now
- NRCS plans to pilot for FY14

Why is drainage useful?



1. Workability
2. Water quality
3. Aeration
4. Timeliness
5. Yield
6. $$$$$

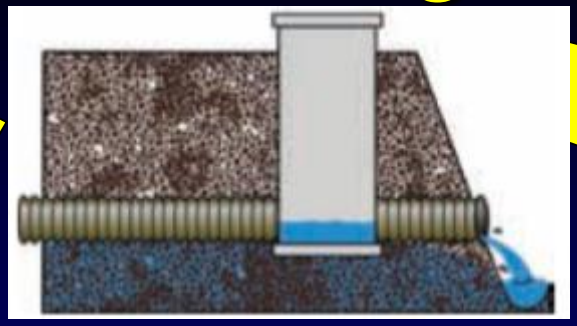
- Reduced surface water runoff
- Reduced compaction
- Soil structure
- Increased aeration
- Warmer soils earlier
- Reduced disease problems
- Earlier planting
- Extended days for planting
- Promotes root and micro-organism growth
- Increased nutrient availability
- Timely weed control/fert. appl.
- Extended days for harvest



Subsurface drainage promotes better root growth and plant health when soils have poor internal drainage.

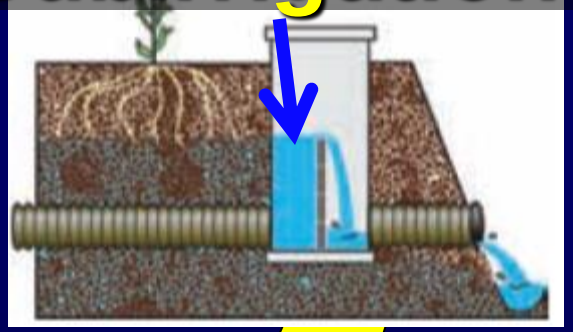
Busman and Sands, 2002. Univ. MN

Controlled or Managed Drainage:

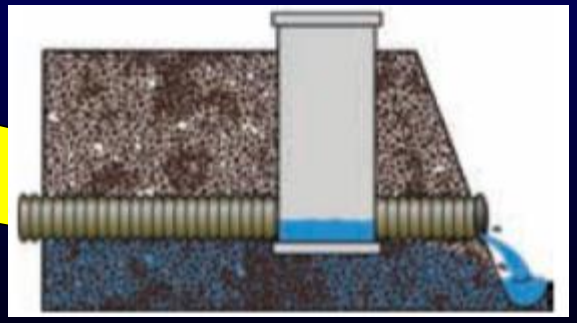


Spring

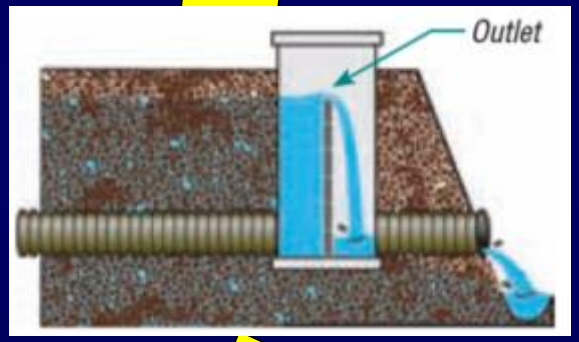
Subirrigation



After planting



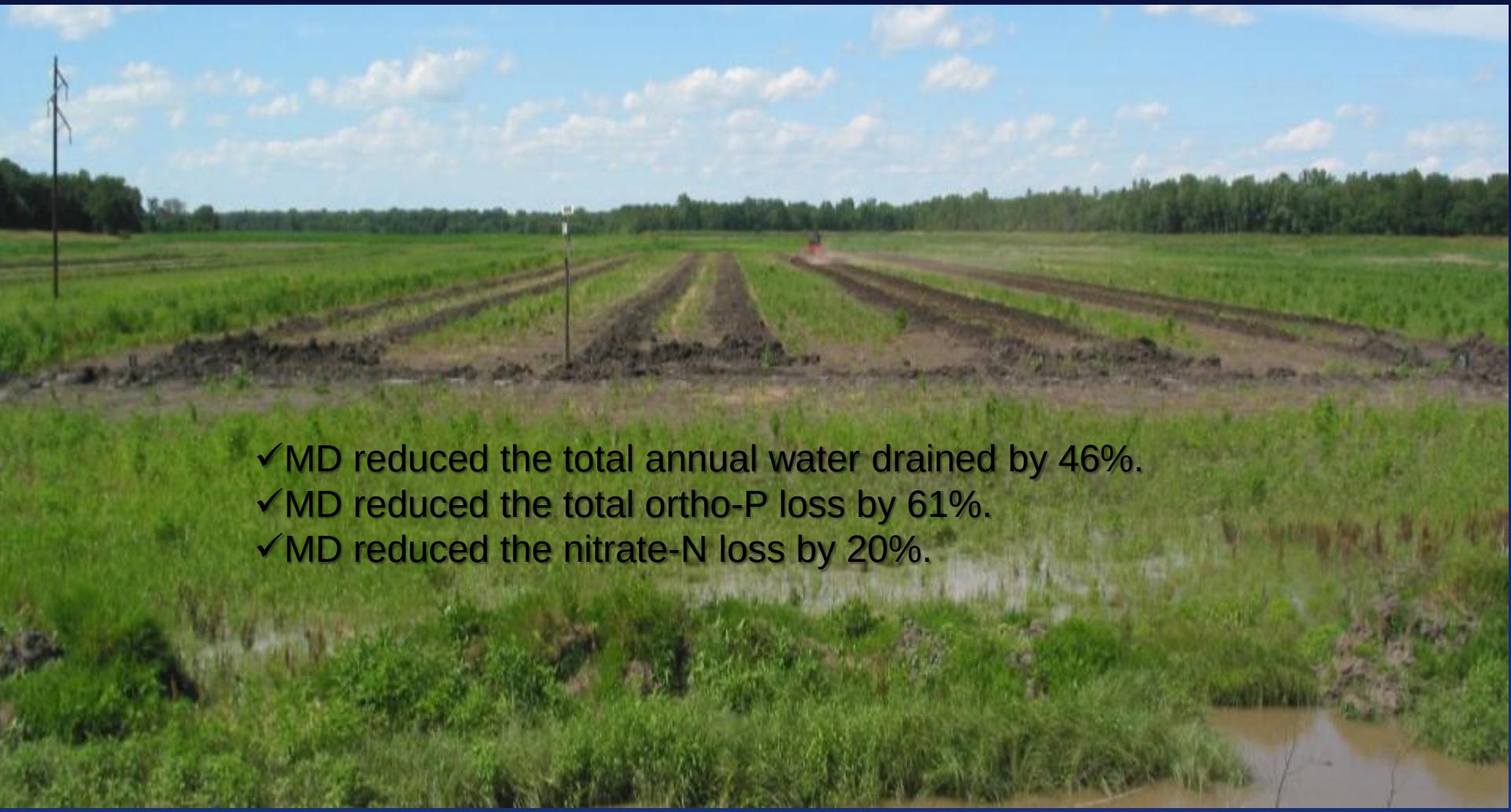
Fall



After harvest

IWMS

- ✓MD reduced the total annual water drained by 42%.
- ✓MD reduced the nitrate-N loss by 54%.
- ✓MD reduced the total ortho-P loss by 77%.


✓MD reduced the total annual water drained by 46%.
✓MD reduced the total ortho-P loss by 61%.
✓MD reduced the nitrate-N loss by 20%.

Great Lakes Restoration Initiative

- There is a lot of excitement in the Scientific Community on Outlet treatments for addressing nutrient loss through surface and subsurface drainage.
- The use of biological and chemical substrates has shown potential in reactors or pseudo-filters for the removal of nutrients such as N and P from subsurface drainage waters.
- NRCS is actively involved and will be moving towards adopting this as a conservation practice as soon as possible.

CEAP—The Conservation Effects Assessment Project

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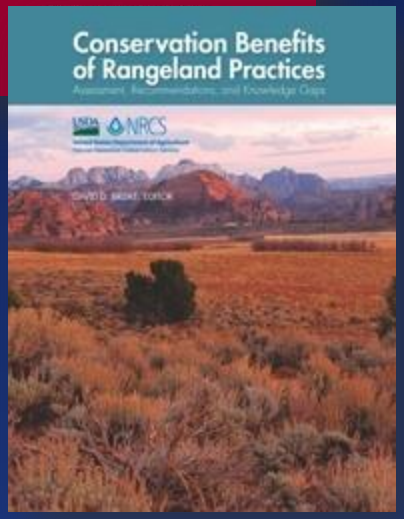
The Three Major Components of CEAP

1. National / Regional Assessments
   - Cropland
   - Grazing Lands (Range and Pastur
   - Wetlands
   - Wildlife
2. Watershed Assessment Studies
   - ARS, NIFA, NRCS
3. Bibliographies and Literature Reviews
   - National Agricultural Library



Conservation Effects Assessment Project (CEAP)

Key Findings:

- The voluntary, incentives-based conservation approach is achieving results.
- Opportunities exist to further reduce sediment and nutrient losses from cropland.
- Comprehensive conservation planning and implementation are essential.
- Targeting enhances effectiveness and efficiency.
- Full treatment of the most vulnerable acres will require a suite of conservation practices.