Sand County Foundation

When land does well for its owner,
and the owner does well by his land;
when both end up better by reason of
their partnership, we have conservation.

When one or the other grows poorer, we do not.

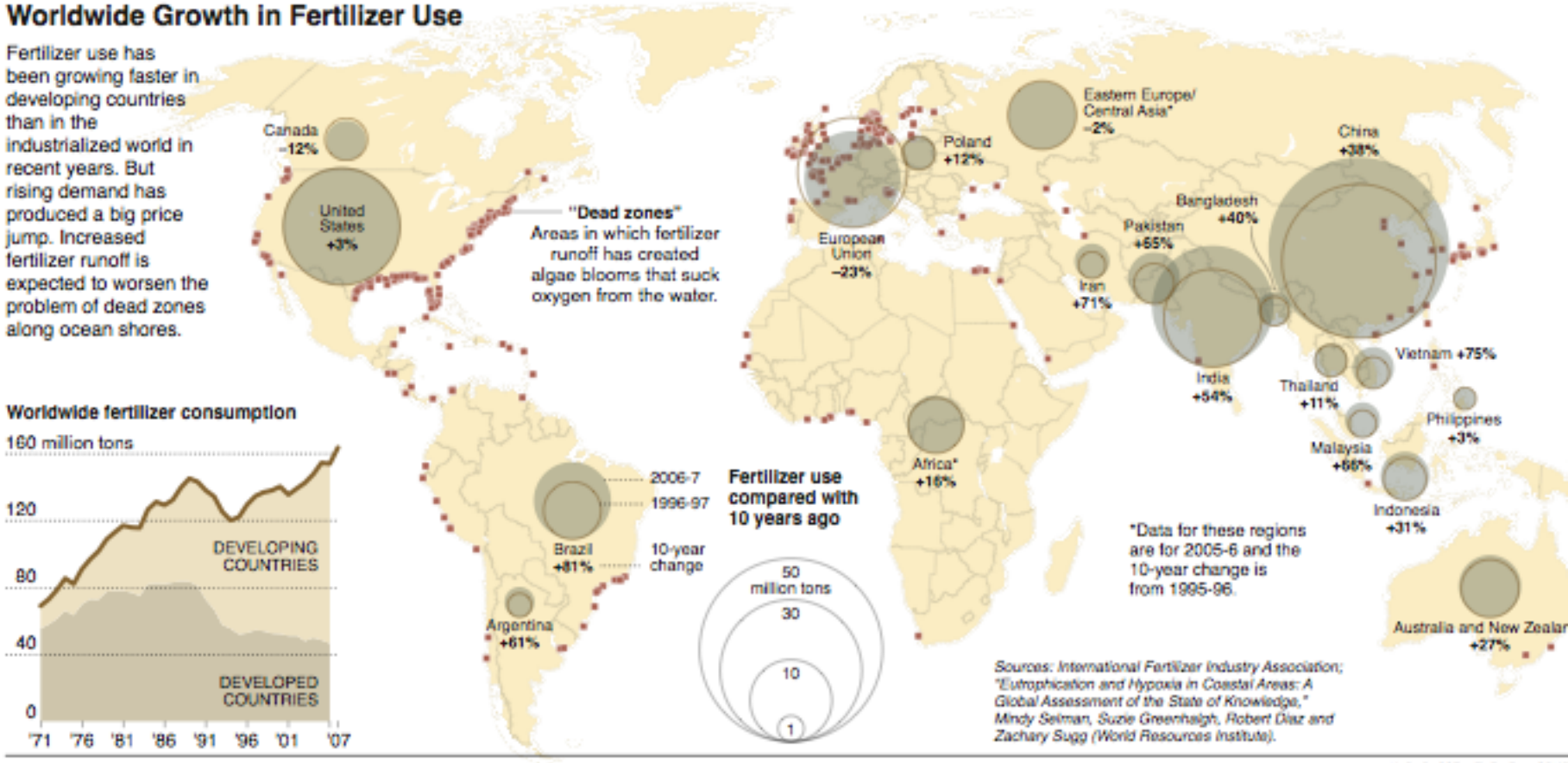
~ Aldo Leopold

Tom Christensen
Regional Conservationist – Central Region
USDA Natural Resources Conservation Service

Alex Echols
Director, Special Programs
Sand County Foundation

Worldwide Growth in Fertilizer Use

Fertilizer use has been growing faster in developing countries than in the industrialized world in recent years. But rising demand has produced a big price jump. Increased fertilizer runoff is expected to worsen the problem of dead zones along ocean shores.



Worldwide fertilizer consumption

N.Y. Times News Service
Date: 04/29/08
Graphic Slug: FERTILIZER_Gas price

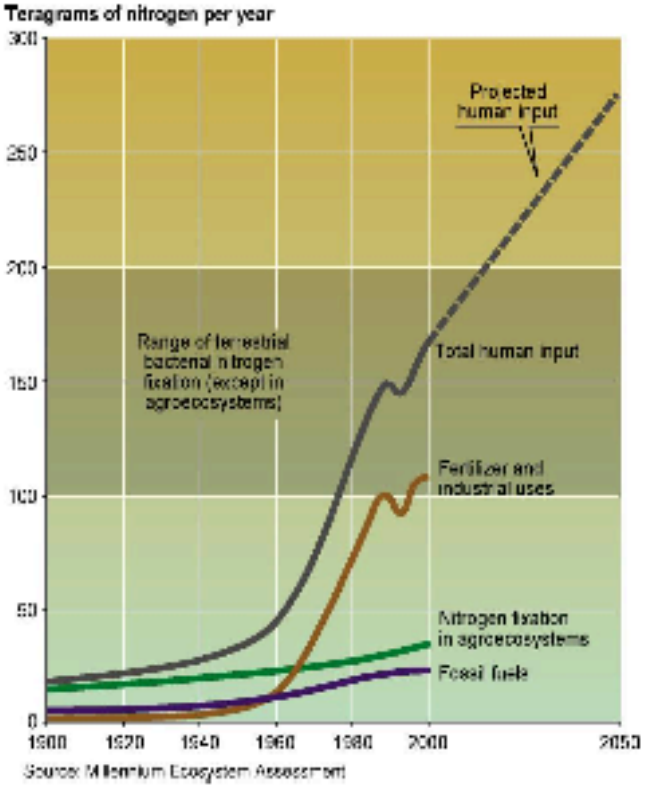
Millennium Ecosystem Assessment

Unprecedented change: Biogeochemical Cycles

Since 1960:

- Flows of biologically available nitrogen in terrestrial ecosystems doubled
- Flows of phosphorus tripled

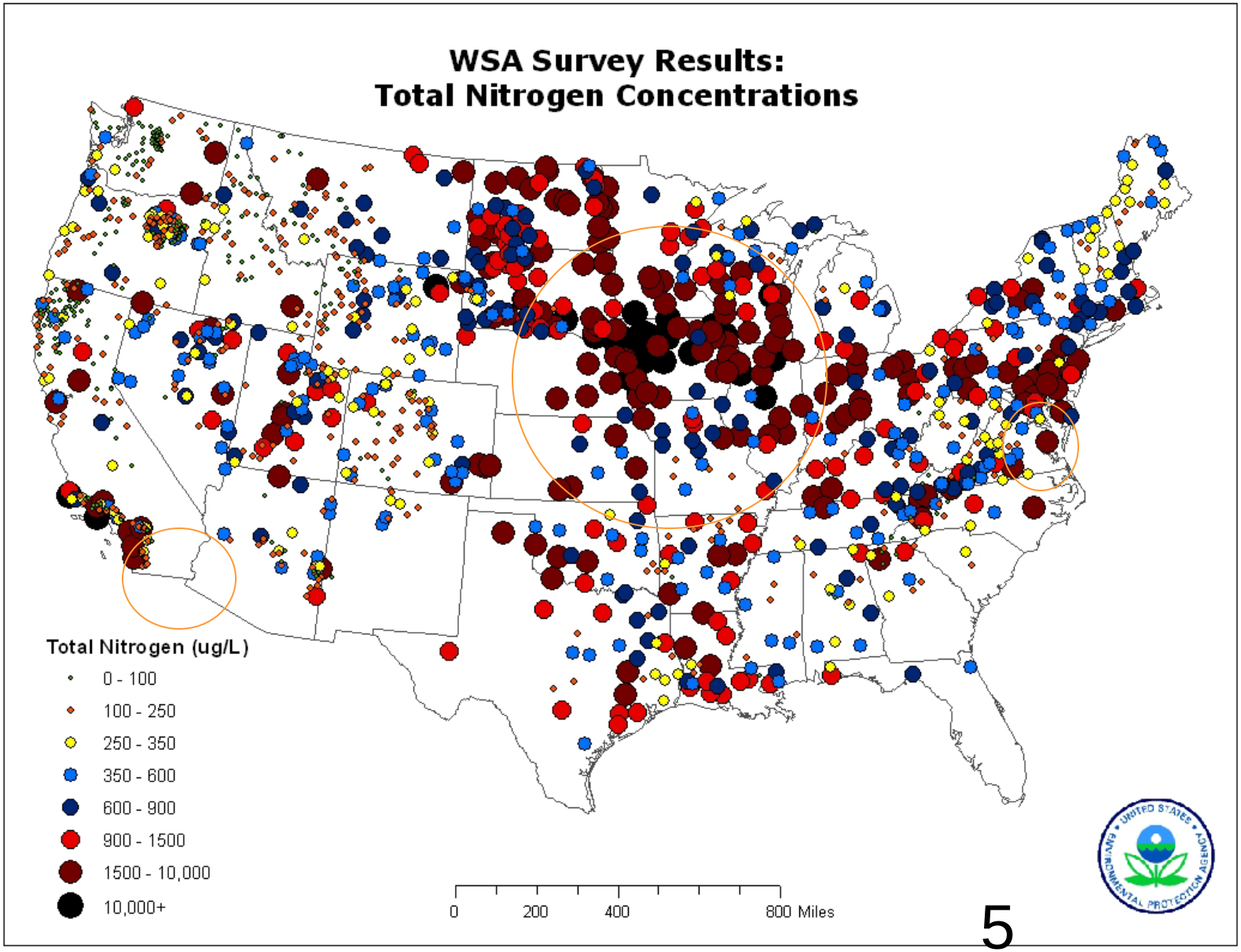
> 50% of all the synthetic nitrogen fertilizer ever used has been used since 1985



Human-produced Reactive Nitrogen

Humans produce as much biologically available N as all natural pathways and this may grow a further 65% by 2050

Concentrations of Nitrogen Nationally



What is CEAP?

CEAP is a multi-agency effort to quantify the environmental effects of conservation practices and programs and develop the science base for managing the agricultural landscape for environmental quality.

CEAP Significance

Unprecedented capacity for natural resource assessment and analysis has been developed through CEAP—integrating for the first time investments such as the National Resources Inventory (NRI), geospatial databases, conservation practice implementation data, and partner monitoring data—with powerful and improved analytical models and methods.

CEAP Findings Upper Mississippi Basin

Conservation Practices Work!

Compared to no conservation practices:

- Sediment loss reduced by 69%
- Total phosphorous loss reduced by 49%
- Total nitrogen loss reduced by 18%
- Pesticide risks to human health reduced

Comprehensive Planning is Needed

- Surface nitrogen losses reduced by 46% **BUT subsurface losses are reduced by only 9%**
- Without nutrient management practices, erosion control practices can increase subsurface nitrogen losses by re-routing surface water to subsurface flow pathways

Addressing CEAP Finding

- Surface nitrogen losses reduced by 46%

  BUT subsurface losses are reduced by only 9%

Answer:

Increase the adoption of the Management of Ag Drainage Water and associated conservation practices for conservation benefits

Question:

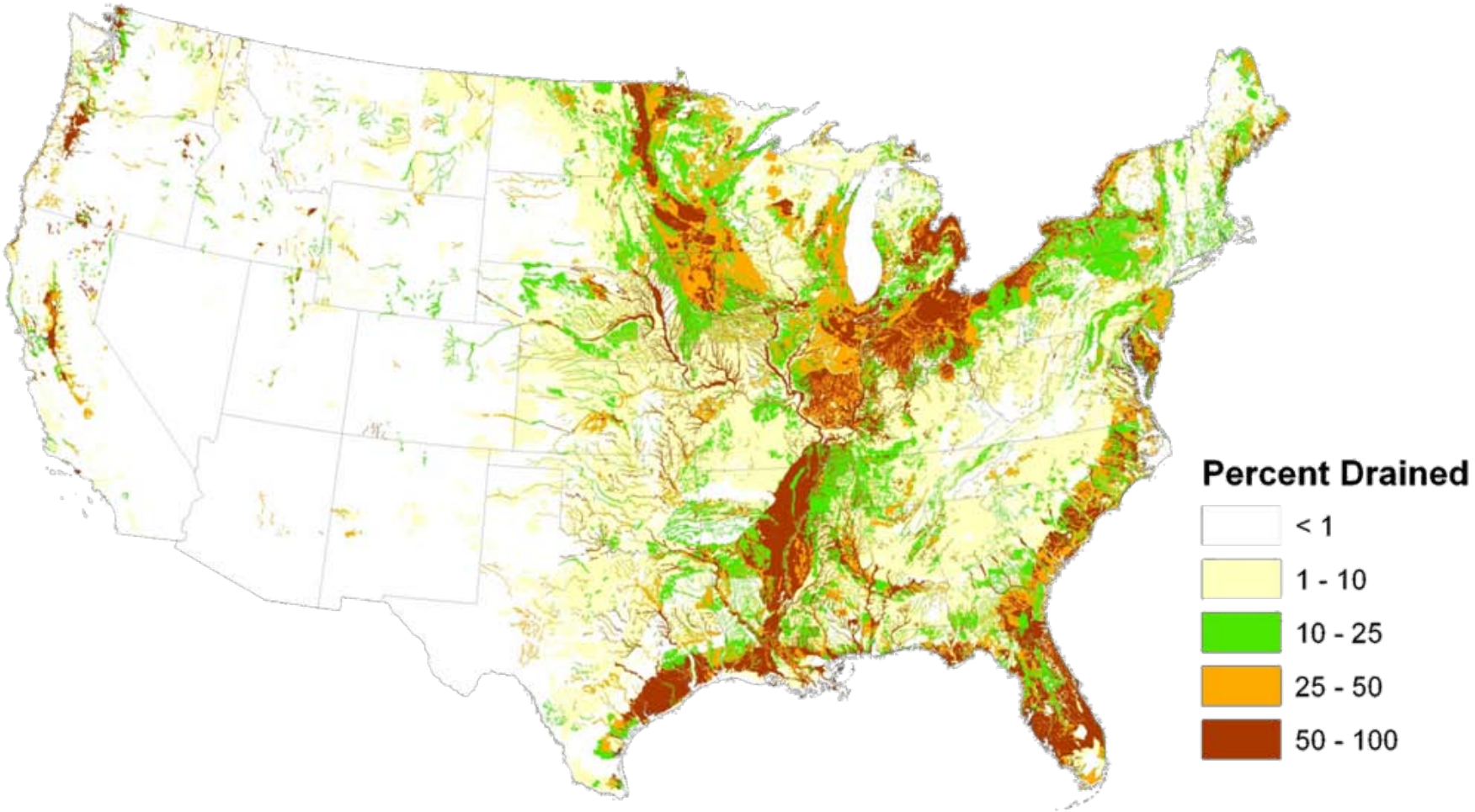
- How do we get that done?????

Answer:

- NRCS is taking action to focus on this opportunity with our partners

Video

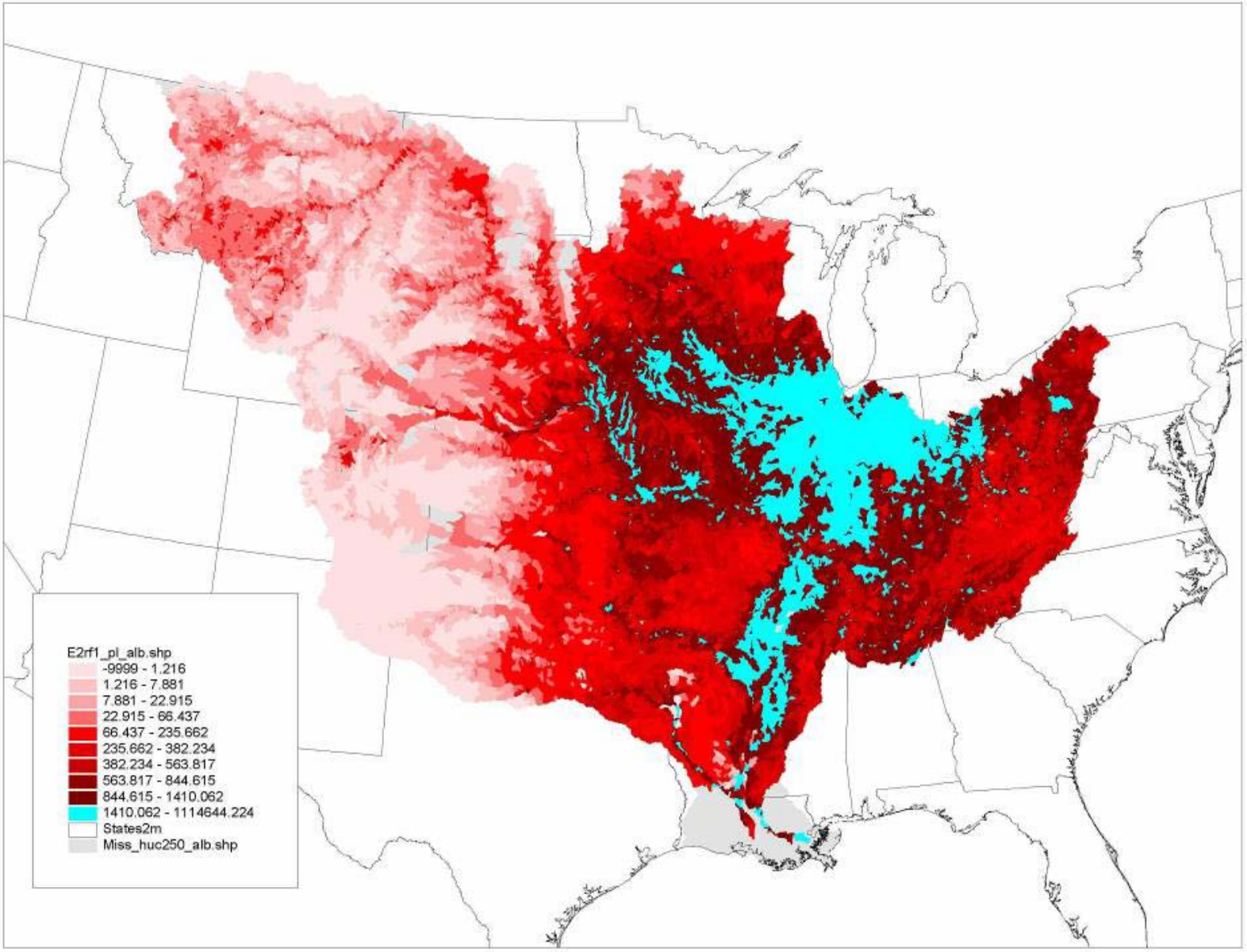
Agricultural Drainage



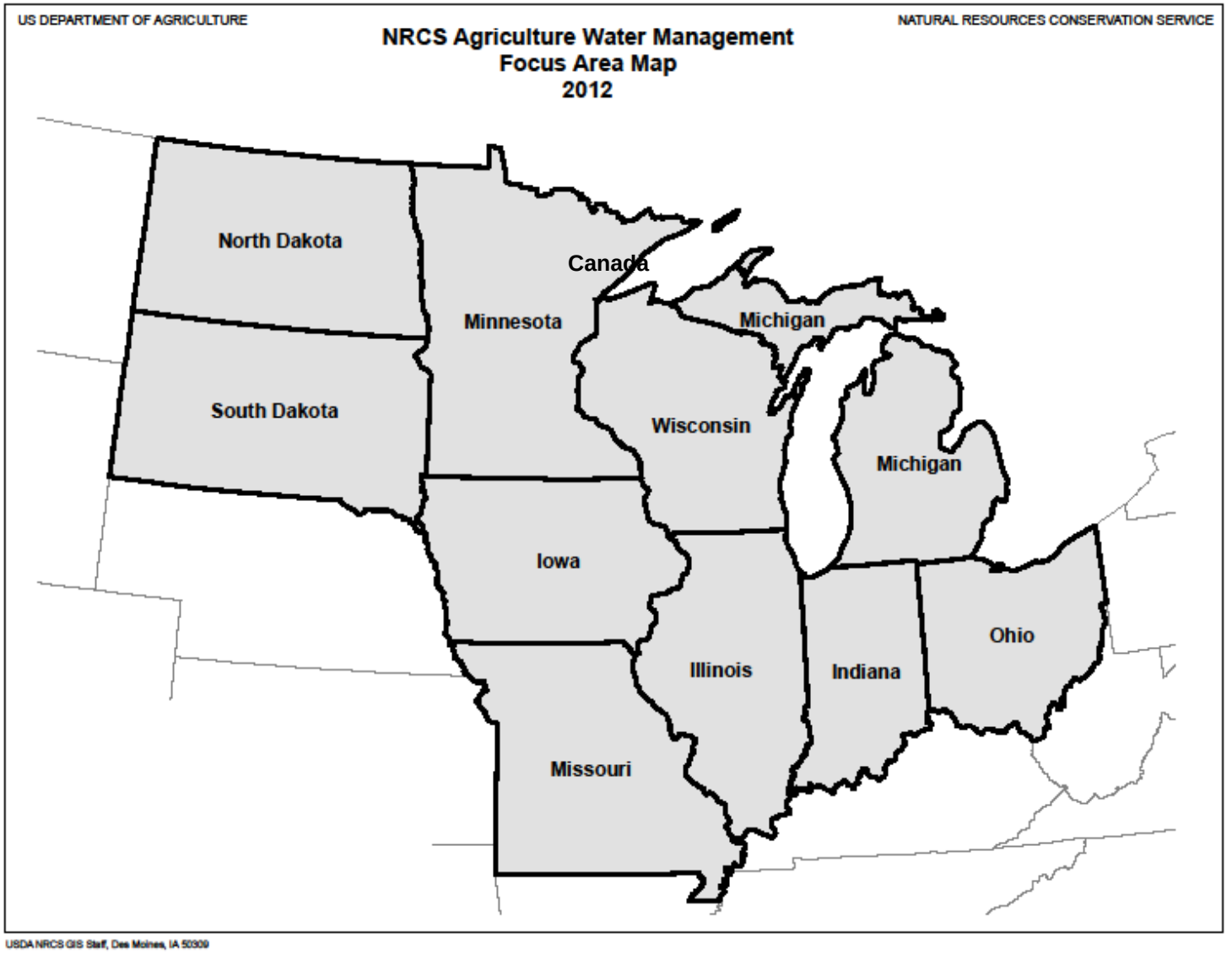
(Jaynes and James 2008)

Disconnect Riparian Functions

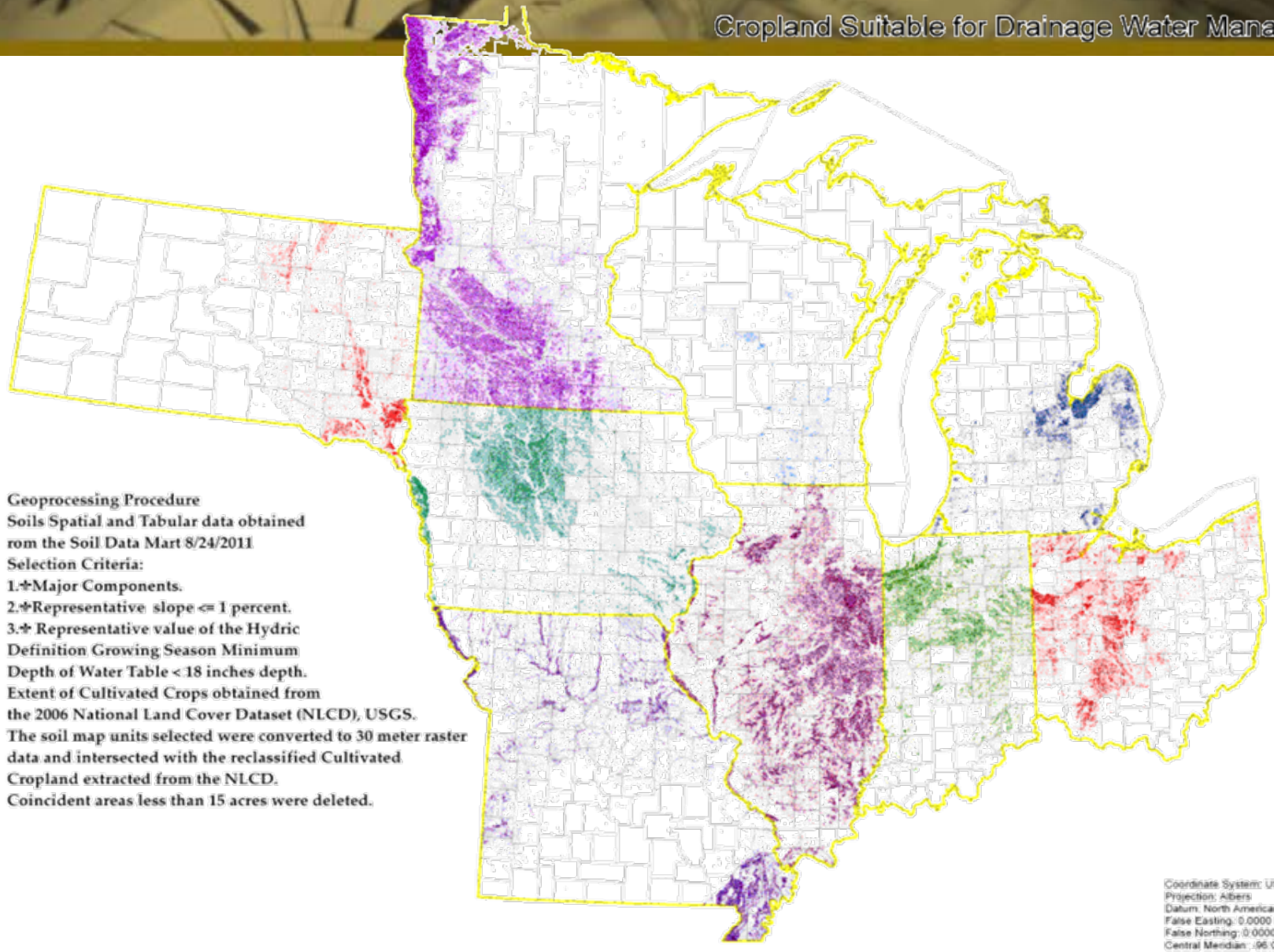
Top 10% Nitrogen Contribution



Priority Areas for Management of Drainage Waters

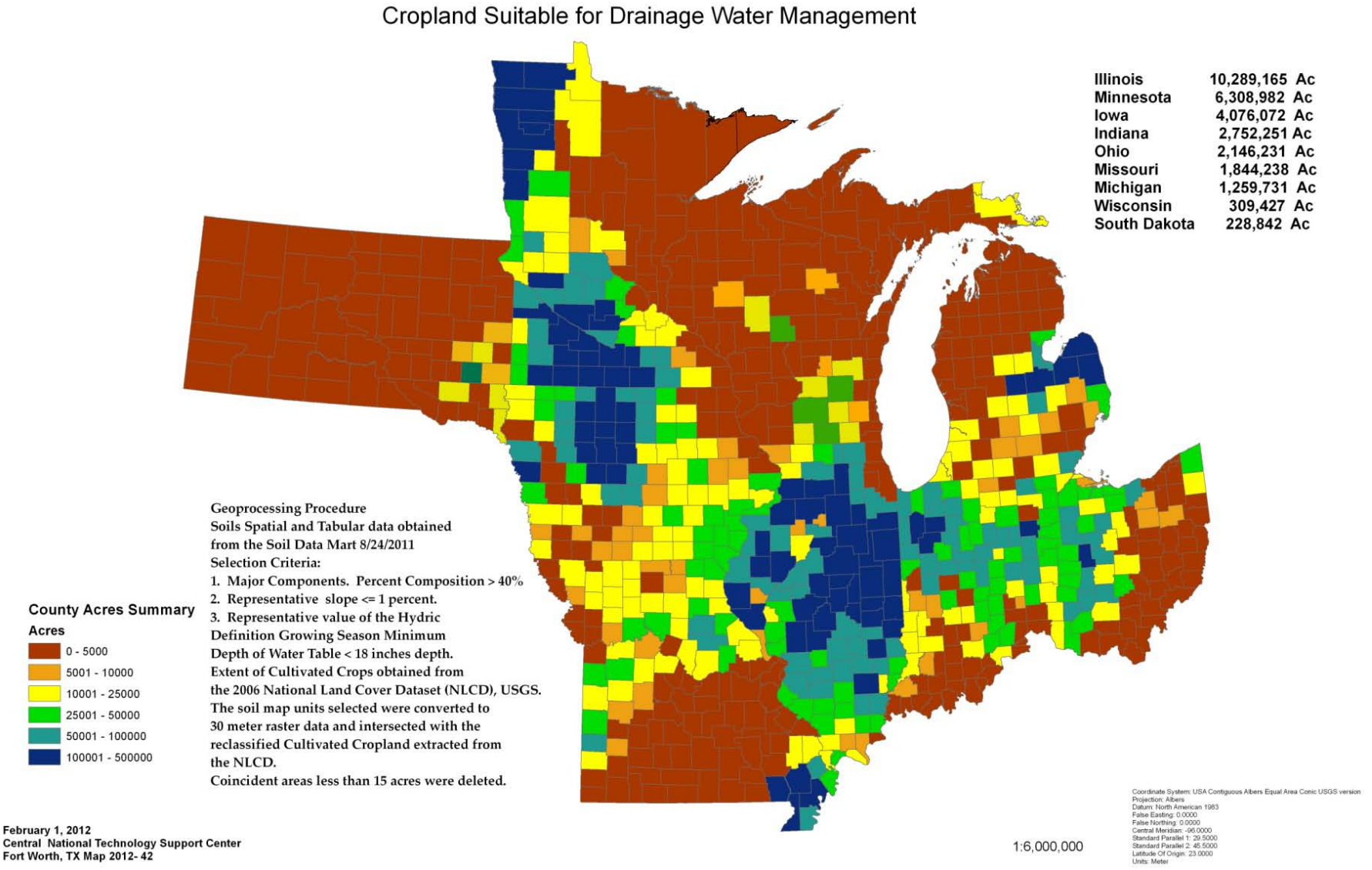


Cropland Suitable For Drainage Management

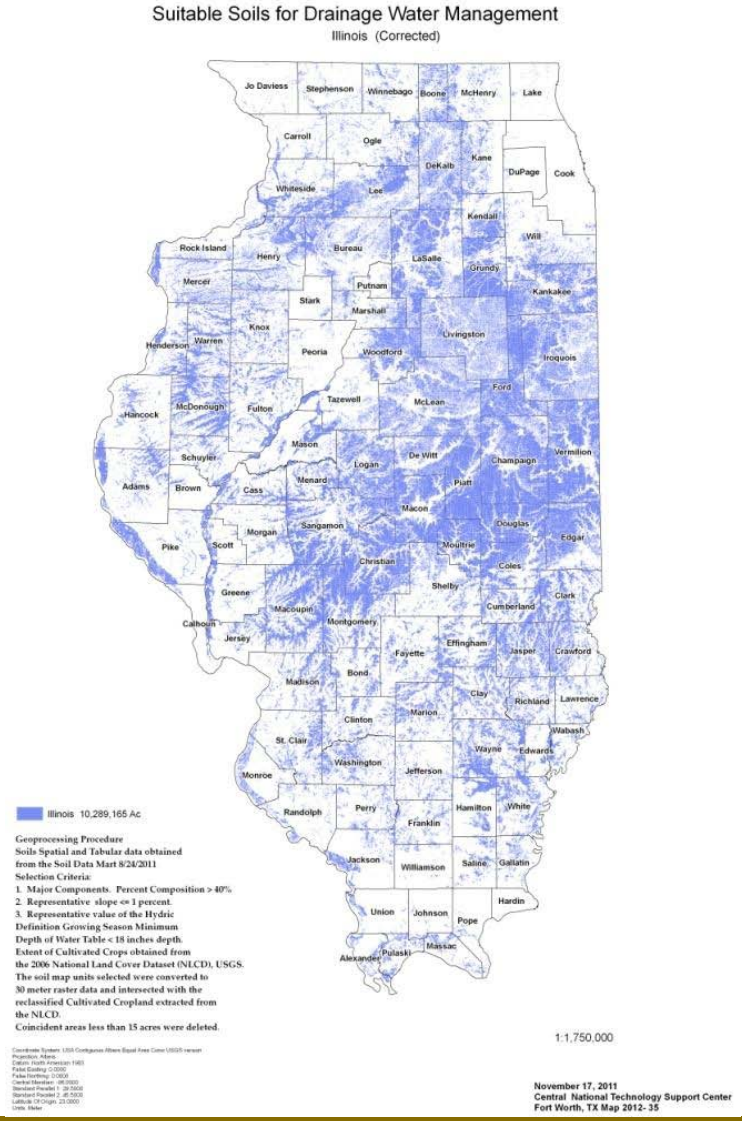


October 3, 2011
Central National Technology Support Center
Fort Worth, TX Map 2012-1

Identification of Regional Priorities Areas

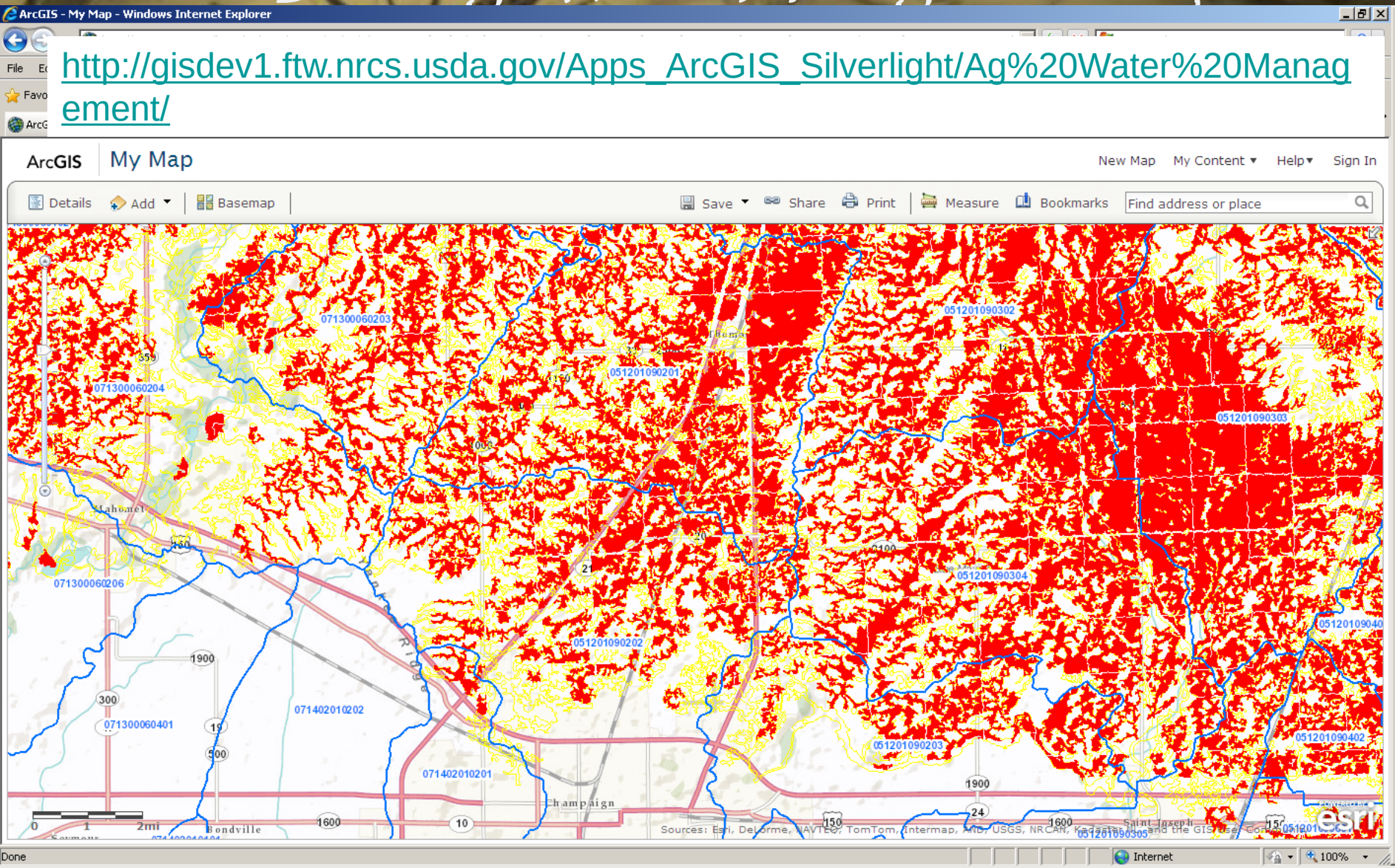


Identification of Priority Areas in States



Web Application for Land with 'Potential for Drainage Water Management' map

http://gisdev1.ftw.nrcs.usda.gov/Apps_ArcGIS_Silverlight/Ag%20Water%20Management/



Producer Assistance

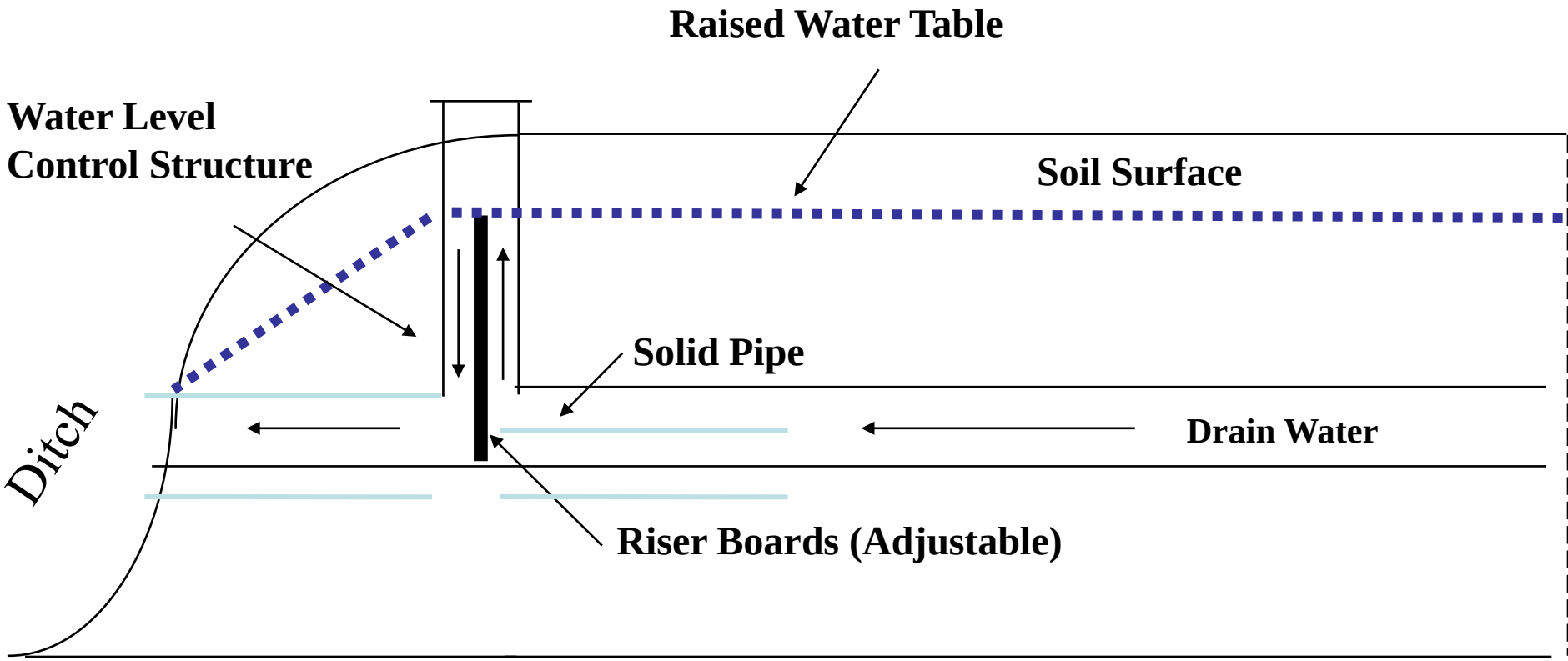
Conservation Technical Assistance

- Site Assessment
- Conservation Planning

Environmental Quality Incentives Program

- Conservation Activity Plan (130)
- Conservation Implementation
  - Drainage Water Management
  - Water Control Structures
  - Bio Reactors

Sink: Drainage Management



The water level control device is installed in the tile drain near the outlet and at various locations within the field depending on topography

Nitrogen Management Potential Discharge Reductions

• Agronomic Practices	20 - 30%
• Cover Crops	10 - 40%
• Drainage Management	20 - 50%
• Bioreactors	20 - 40%
• Bioreactors w/ Drainage Mgt.	50 - 80%
• Wetlands	5 - 60%
• Minimize drainage intensity (for replacement systems)	5 - 35%

- Hugh Hammond Bennett

"We cannot depend on windshield surveys and office planning to carry out a job of the complexity and magnitude of safeguarding our farmland and controlling floods.

Our Hero