



**EERC**

*EERC Technology... Putting Research into Practice*

# *Plains CO<sub>2</sub> Reduction (PCOR) Partnership*

## *Fourth Annual Conference on Carbon Capture & Sequestration*

*Alexandria, Virginia  
May 2–5, 2005*

*By Edward N. Steadman*



# Plains CO<sub>2</sub> Reduction Partnership



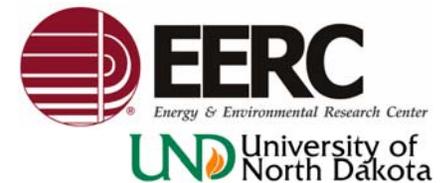


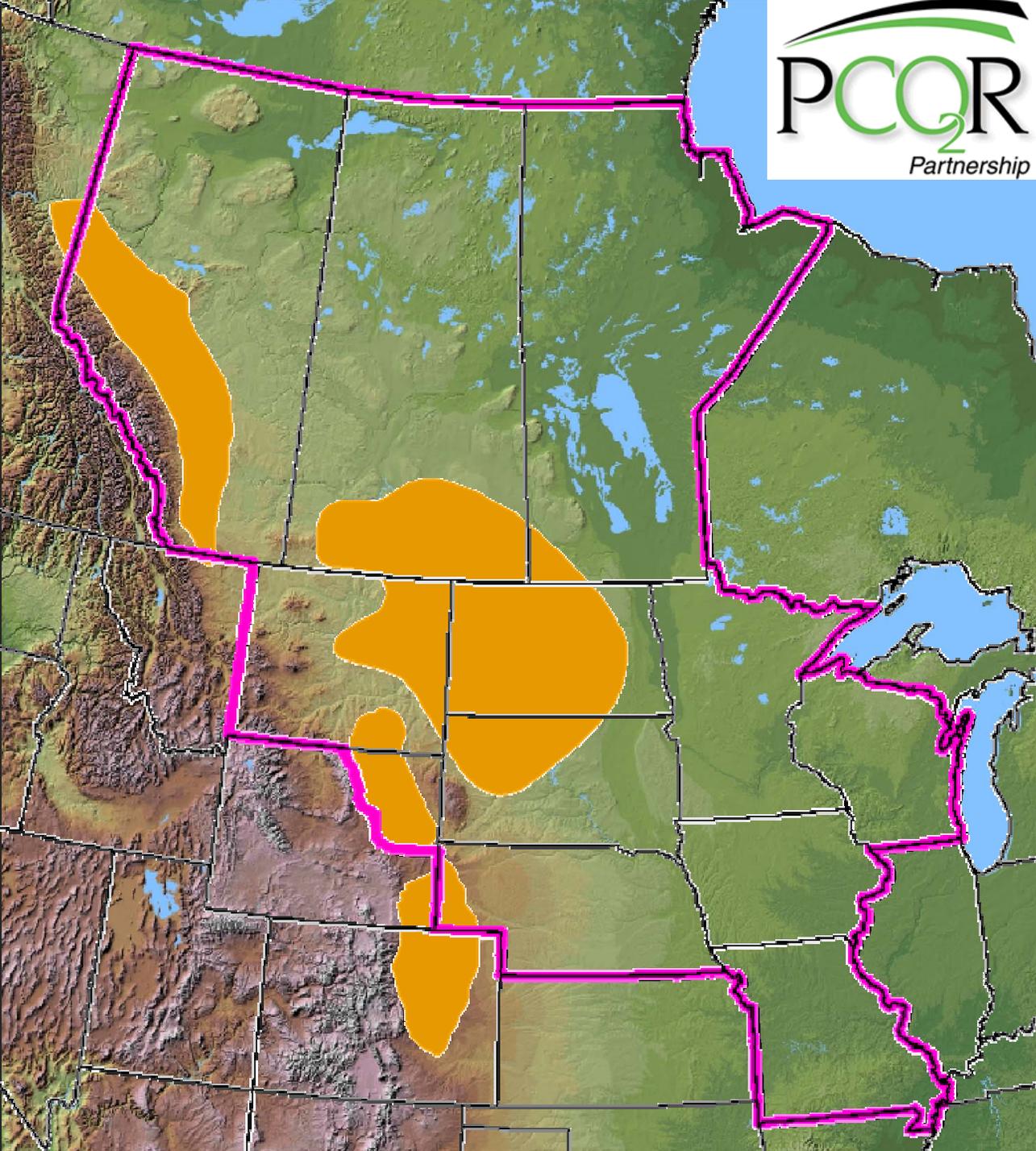


## PCOR Partnership Region

Nine states and three  
provinces

**1,362,089** square miles





## Sedimentary Basins

440,828 square miles

32% of region





## Coal Fields

**292,006** square miles

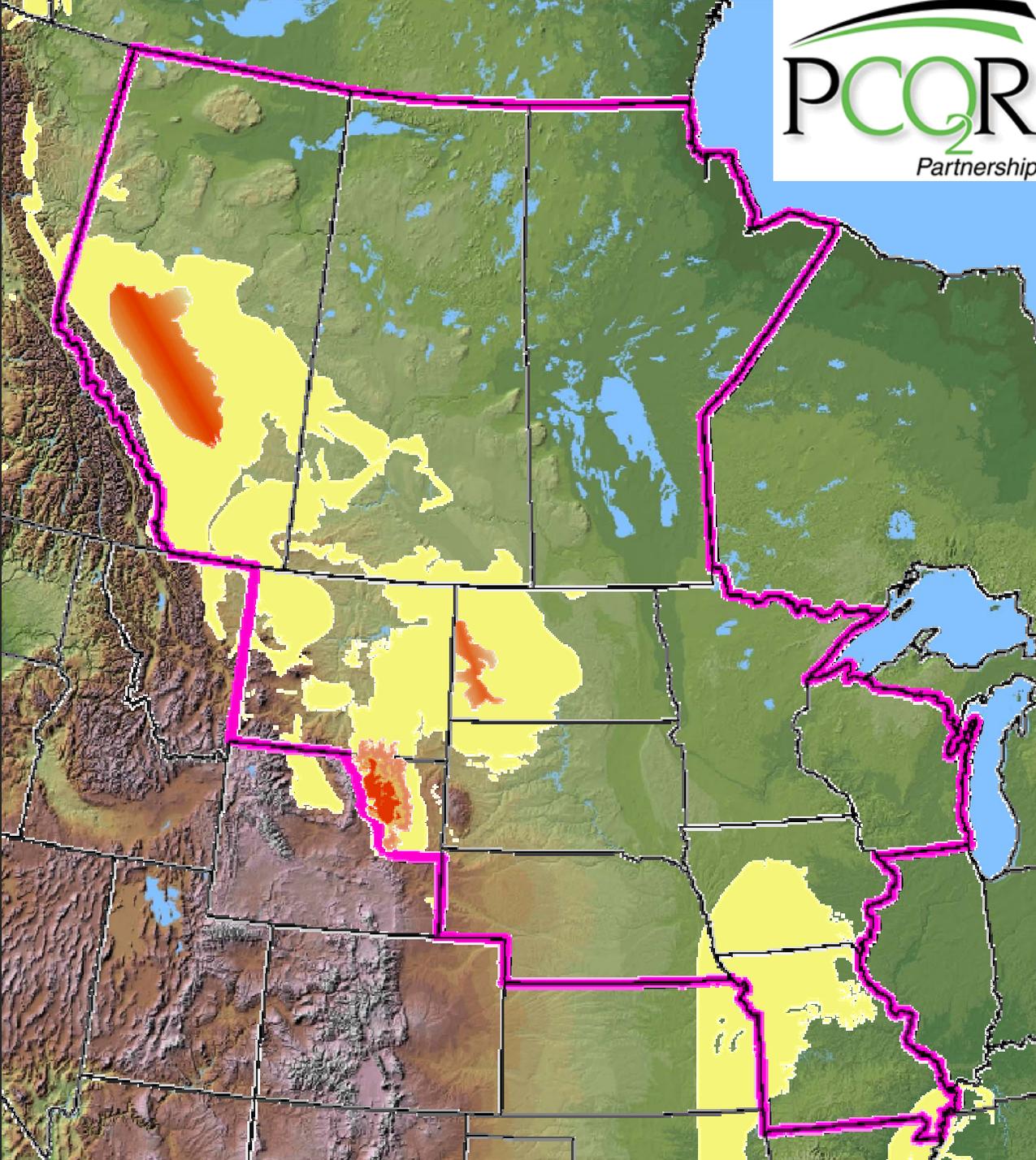
21% of region

Evaluated the Wyodak–Anderson, Ardley, and Fort Union coals

CO<sub>2</sub> sequestration capacity estimated to date: >8 billion tons

## PCOR Partnership Region

Geological CO<sub>2</sub> sequestration capacity estimated thus far: >8 billion tons



## Saline Aquifers

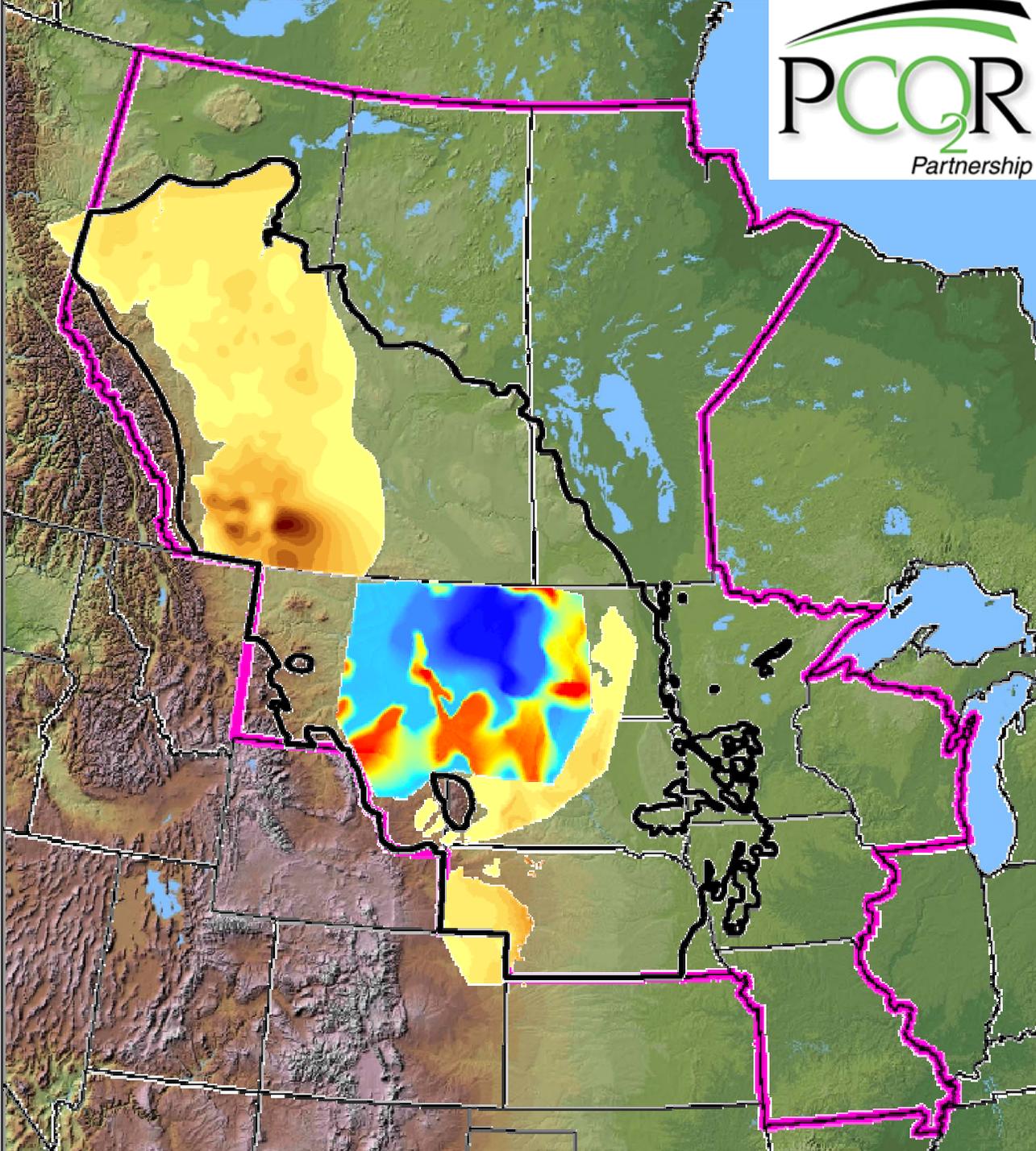
645,677 square miles  
47% of region

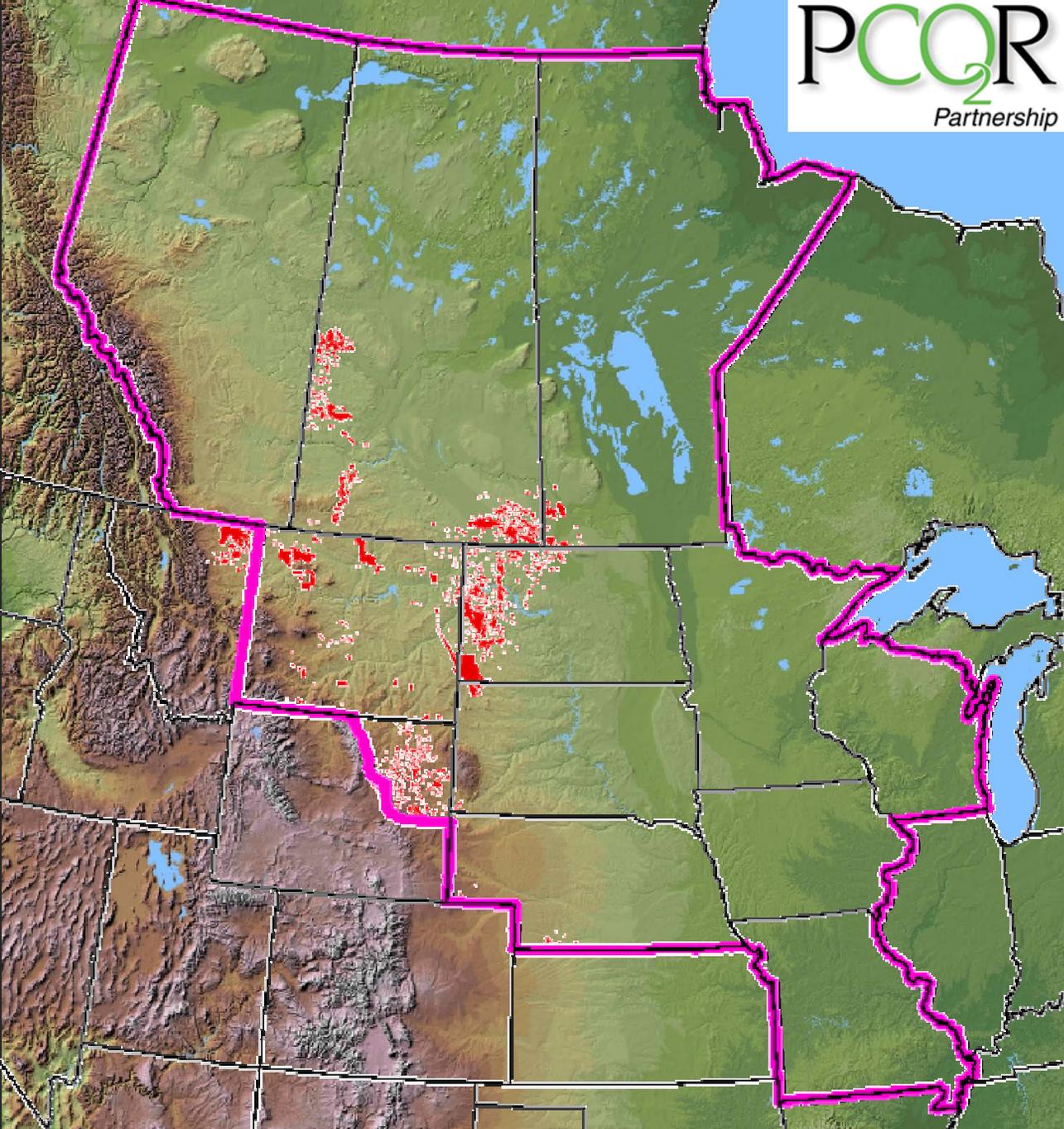
Evaluated the Lower Cretaceous and the Mississippian Madison aquifer systems

CO<sub>2</sub> sequestration capacity estimated to date:  
>200 billion tons

## PCOR Partnership Region

Geological CO<sub>2</sub> sequestration capacity evaluated thus far:  
>208 billion tons





### **Oil Fields**

2000+ fields evaluated

Volumetric CO<sub>2</sub>  
sequestration capacity  
estimated to date:  
>10 billion tons

### **PCOR Partnership Region**

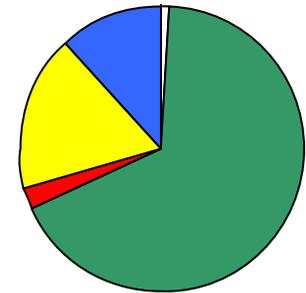
Geological CO<sub>2</sub>  
sequestration capacity  
estimated thus far:  
>218 billion tons

## Sources

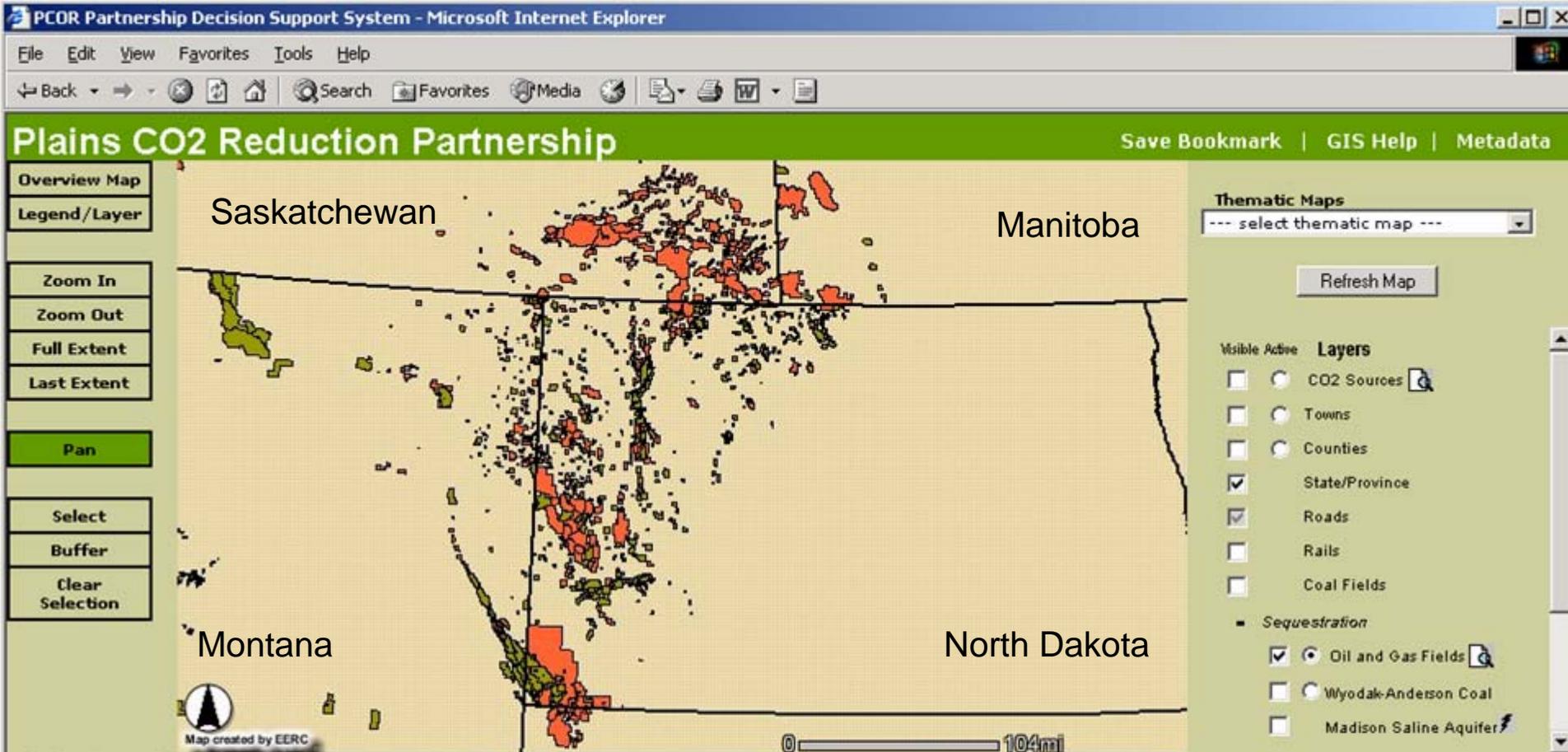
1367 stationary sources

Total CO<sub>2</sub> emissions:  
619 million tons/yr

## Emissions by Industry Category



- Ag Processing (1%)
- Electric Utility (67%)
- Ethanol (3%)
- Industrial 17%)
- Petroleum and Natural Gas (12%)



1066 fields in the Williston Basin.

Reservoir characteristics compiled on over 80% of the fields.

Minimum of 9 billion tons of CO<sub>2</sub> storage capacity.

Minimum of 400 million barrels of incremental oil can be produced.

# Summary of Phase I Source and Geologic Characterization

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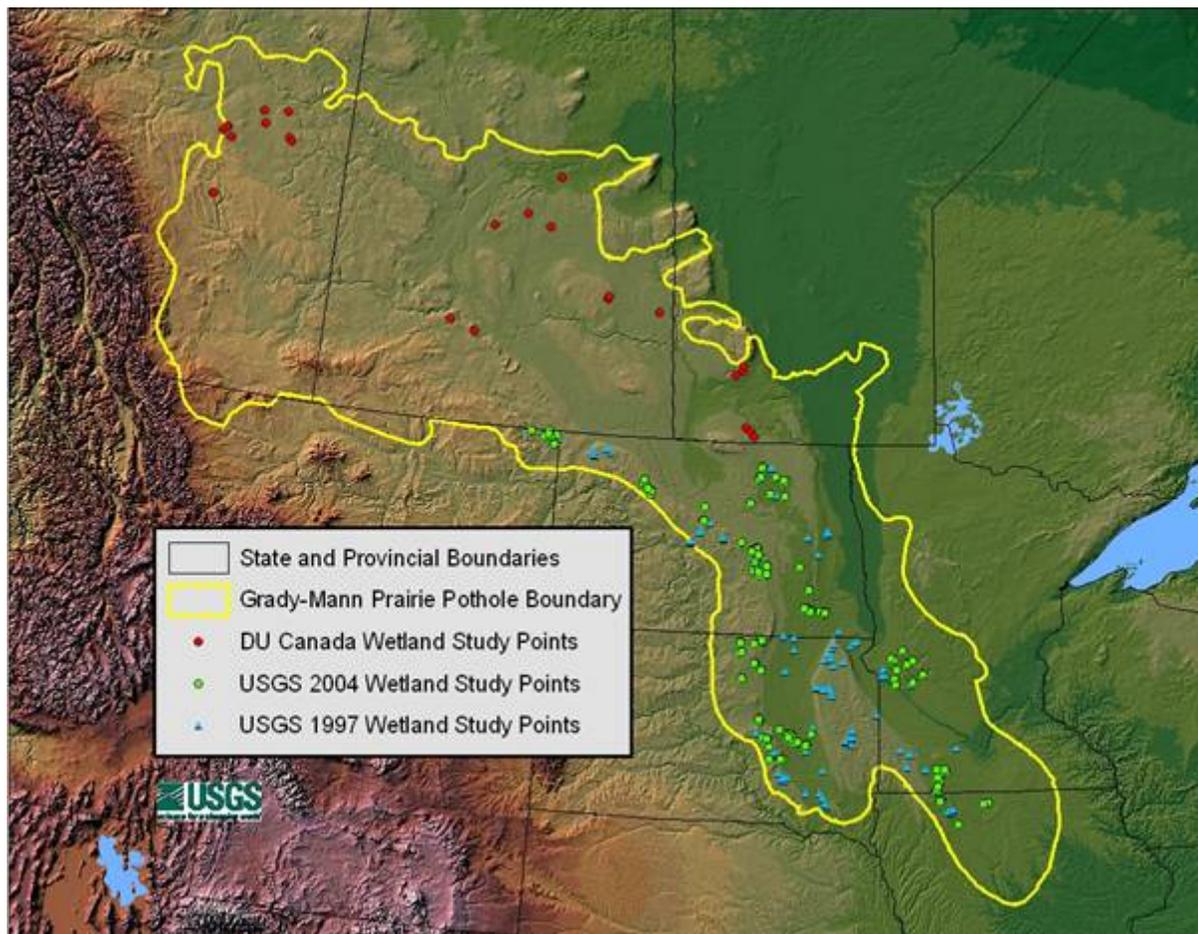
**619 million tons of CO<sub>2</sub> emitted per year from stationary sources**

Assuming a 20% sequestration goal:

- Oil fields alone can get you to the Year 2085.
- Coal fields alone can get you to the Year 2070.
- Saline aquifers alone can get you to the Year 3620.

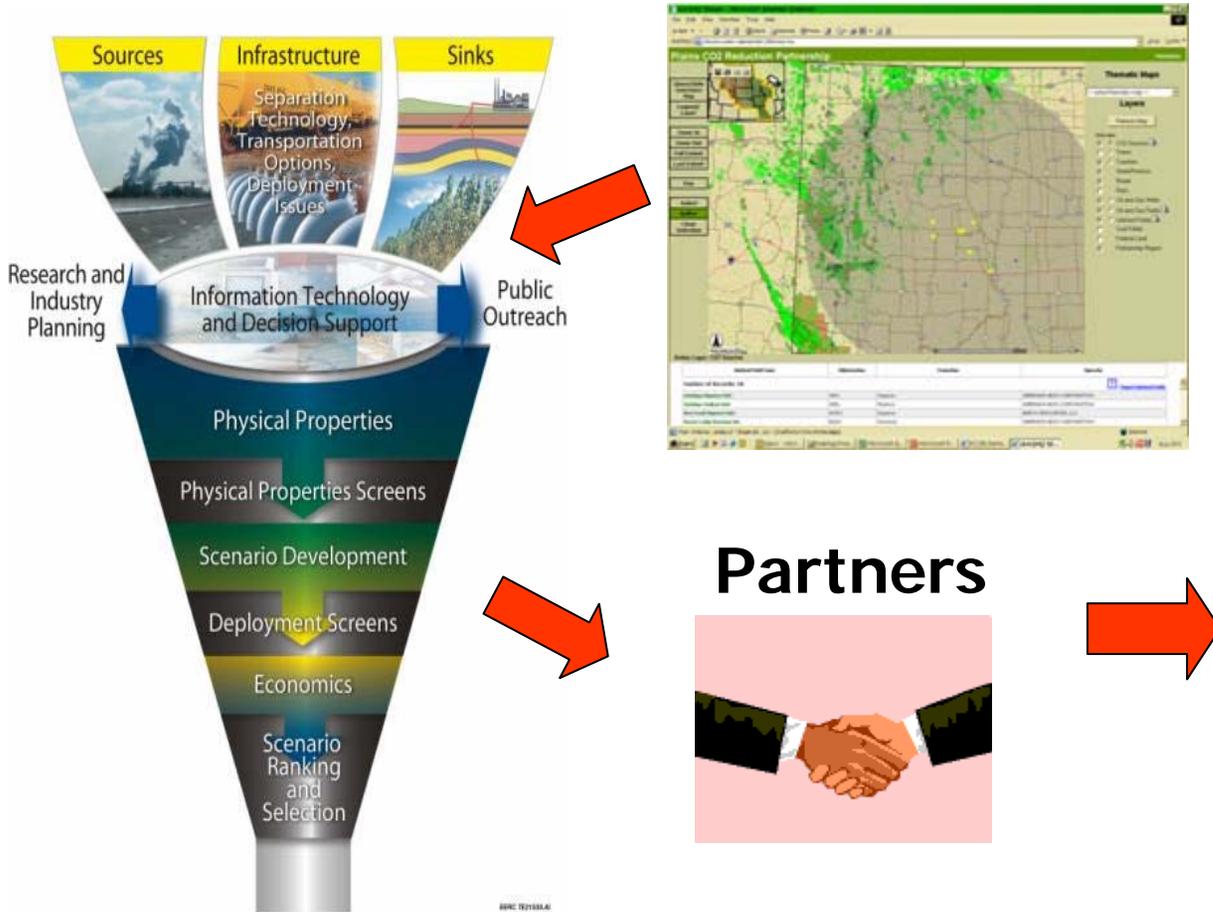


# Study Sites in the Prairie Pothole Region



Estimated CO<sub>2</sub> sequestration potential for Prairie Pothole Region is 65 million tons CO<sub>2</sub>/yr.

# Identifying CO<sub>2</sub> Sequestration Opportunities



- Injection into a deep carbonate system for EOR
- Acid gas injection into a carbonate system for EOR
- Injection into a lignite seam for Enhanced Coalbed Methane (ECBM)
- Wetland/grassland terrestrial sequestration

# Measurement, Monitoring, and Verification (MM&V) Considerations for Phase II and Beyond

PCOR Partnership Meeting – Billings, Montana, October 2004



- Technical
  - Political
  - Economic
- } Health, Safety, and Market-Based Carbon Credits



## Nature in the Balance – CO<sub>2</sub> Sequestration

Produced for a general audience, "Nature in the Balance: CO<sub>2</sub> Sequestration" provides a 30-minute introduction to CO<sub>2</sub> management with a focus on the North American heartland. The video introduces audiences to the U.S. Department of Energy (DOE) National Energy Technology Laboratory's (NETL's) seven Regional Carbon Sequestration Partnerships and describes their role in assessing opportunities for carbon sequestration across North America.

"Nature in the Balance" was produced by Prairie Public Television, Fargo, North Dakota, in collaboration with the Plains CO<sub>2</sub> Reduction (PCOR) Partnership led by the University of North Dakota's Energy & Environmental Research Center (EERC). The PCOR Partnership represents more than 40 public and private sector partners located in nine states and three Canadian provinces in the heartland of North America. Funding is provided by DOE's NETL and program partners. To learn more about CO<sub>2</sub> sequestration, visit the PCOR Partnership Web site at [www.undeerc.org/PCOR](http://www.undeerc.org/PCOR).

**Nature in the Balance (May 2005) 30 minutes.**

Executive Producers – Edward Steadman and Robert Dambach  
Videographer/Editor – Eric Carlson  
Writers – Charlene Crocker and Daniel Daly  
Narration – Hope Deutscher

Cover photograph: Antelope Valley Station Unit 2, Beulah, North Dakota, Basin Electric Power Cooperative

Nature in the Balance – CO<sub>2</sub> Sequestration

# Nature in the Balance – CO<sub>2</sub> Sequestration



Prairie Public  
Television



