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Sequestration and *FutureGen* in Illinois

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Illinois State Geological Survey

Sixth Annual DOE Conference on Carbon Capture & Sequestration
May 8, 2007

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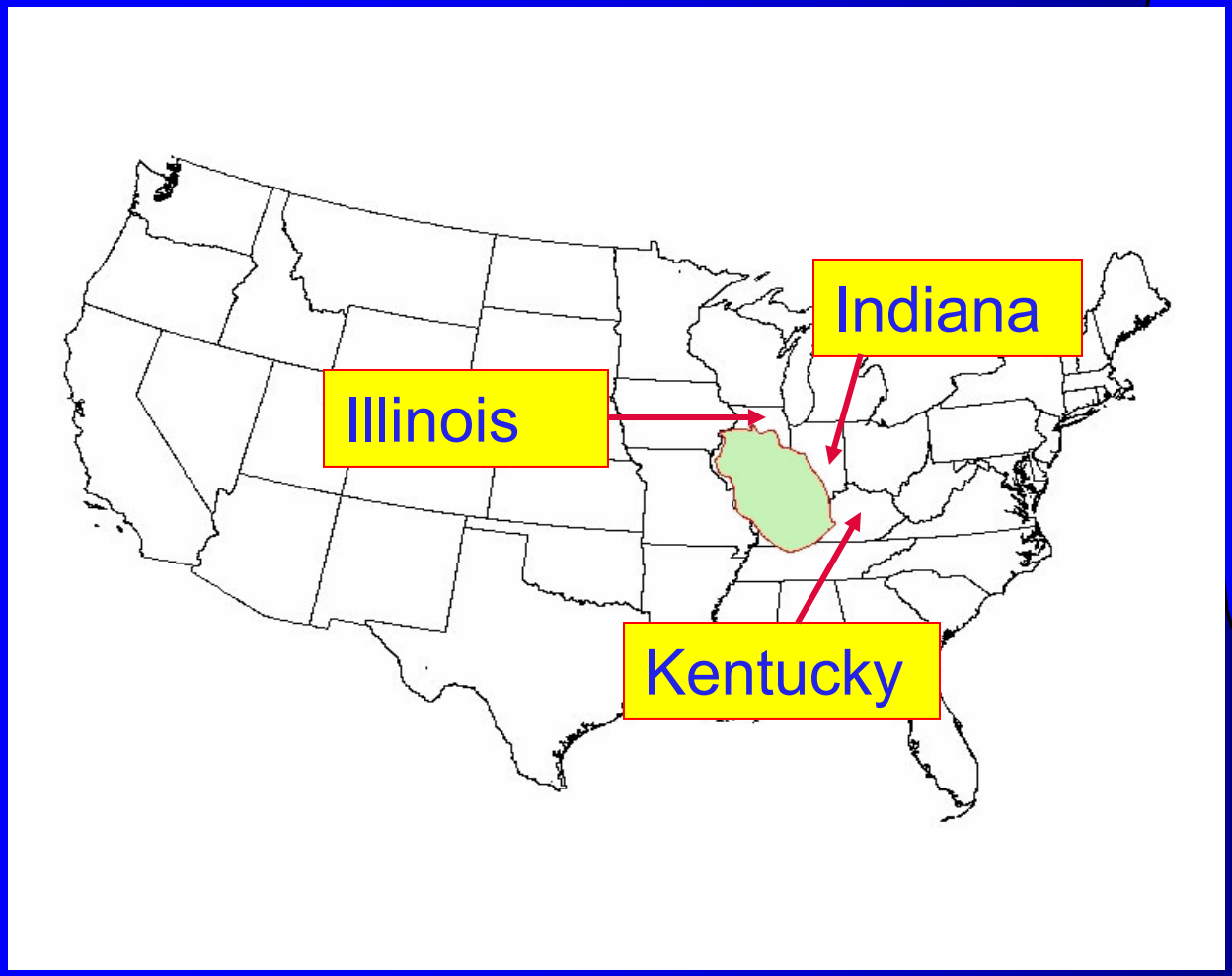
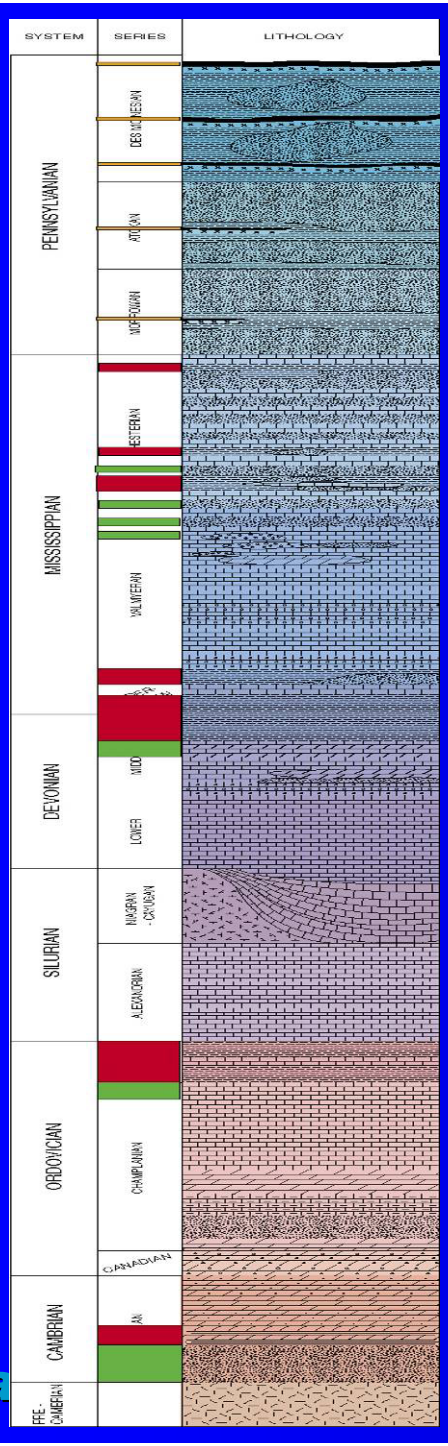
Illinois Basin Geological Focus



- Area of 60,000 sq mi
- Sedimentary column of 3,000 to ~25,000 ft
- Coal at 300-1,500 ft
- Oil at 2-5,000 ft
- Saline formations at 2-13,000 ft



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Pennsylvanian coal seams

Mississippian sandstone and carbonate oil reservoirs

CO_2 EOR in mature fields

New Albany Shale

Maquoketa Shale

St. Peter Sandstone

major saline reservoir

Eau Claire Shale

Mt. Simon Sandstone

Potential Seal

Potential Sink

Coal Bed Potential Sink and Seal

from Leetaru, 2004

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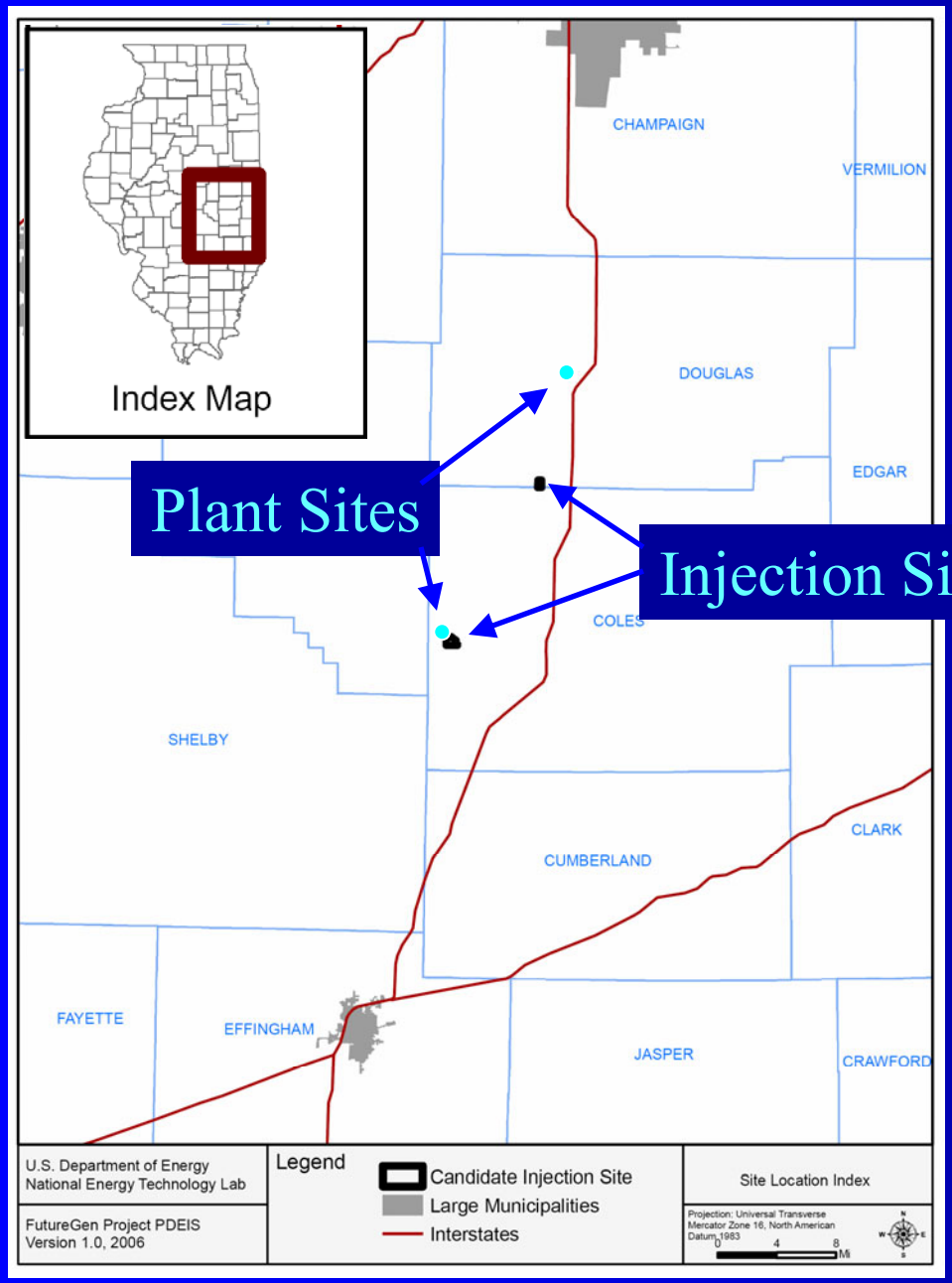
Mattoon and Tuscola FutureGen Sites



- Predominantly farm land
- Easy access, good utilities, available transportation
- Underlain by Mt. Simon Sandstone

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A FutureGen Concept

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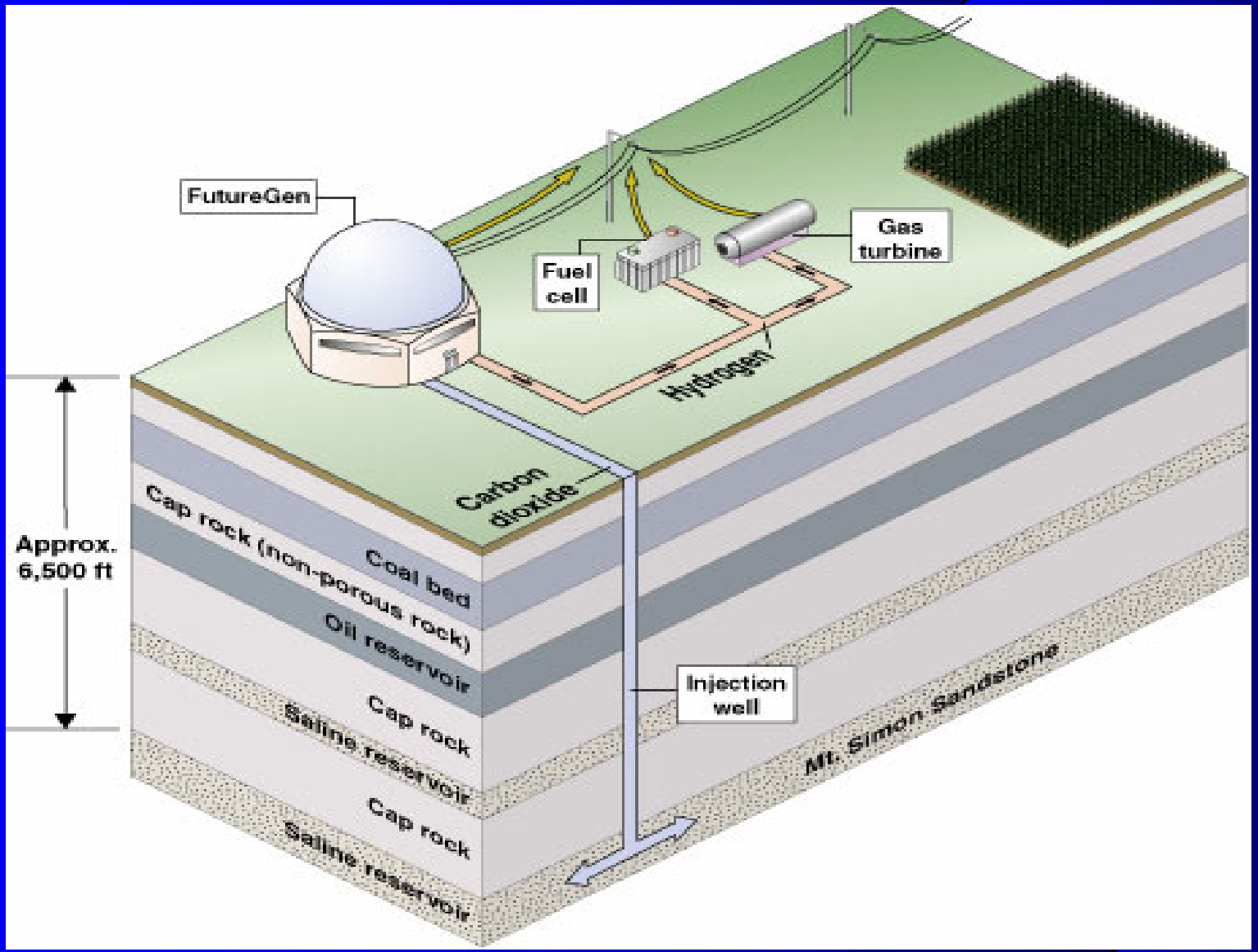

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Mt. Simon Sandstone Reservoir

- Mt. Simon Sandstone is used for natural gas storage in Champaign County, IL at 4,000 to 4,200 ft
- Mt. Simon core has been recovered from a few deep exploration wells

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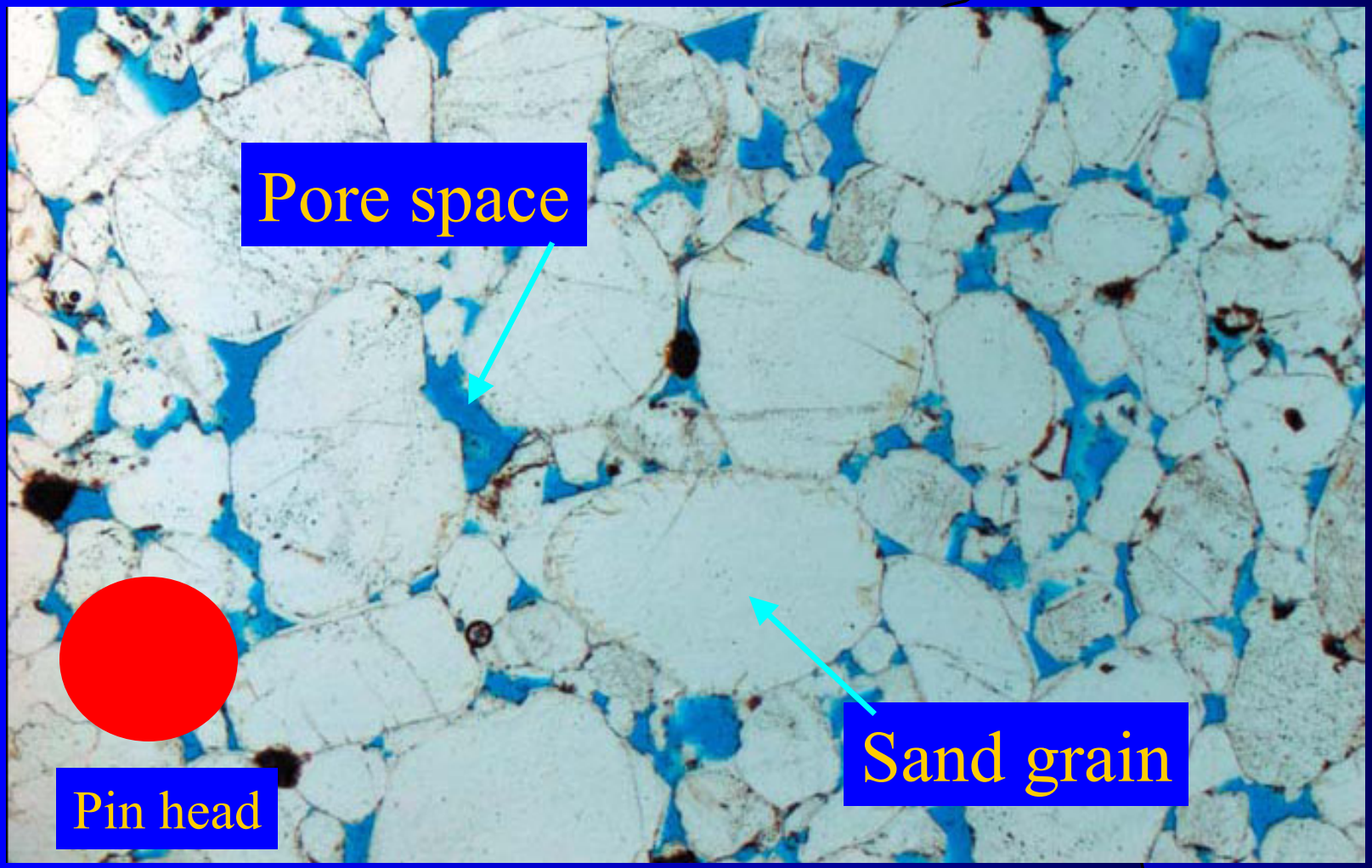
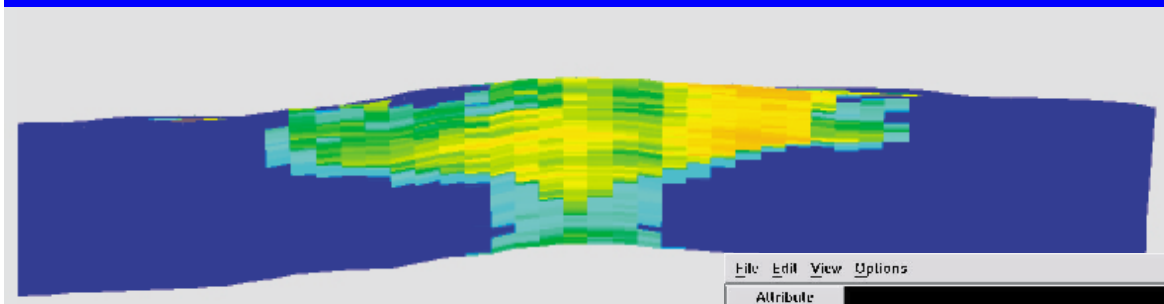
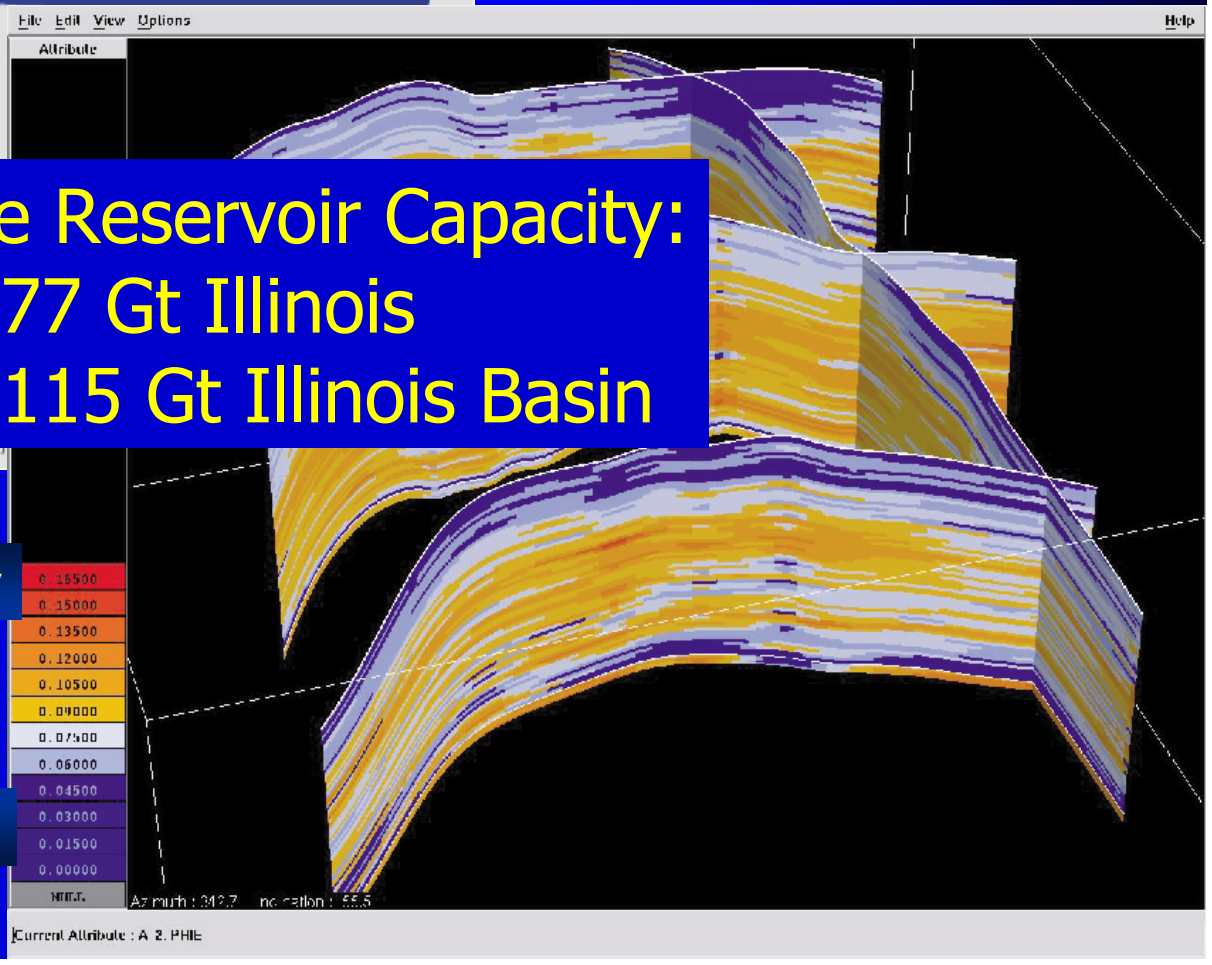
CO_2 Storage in Sandstone Reservoir Pore Space



Mt. Simon Sandstone Assessments



80 years of injection
40 years shut-in



Saline Reservoir Capacity:

- 19-77 Gt Illinois
- 29-115 Gt Illinois Basin

High Porosity

Low Porosity

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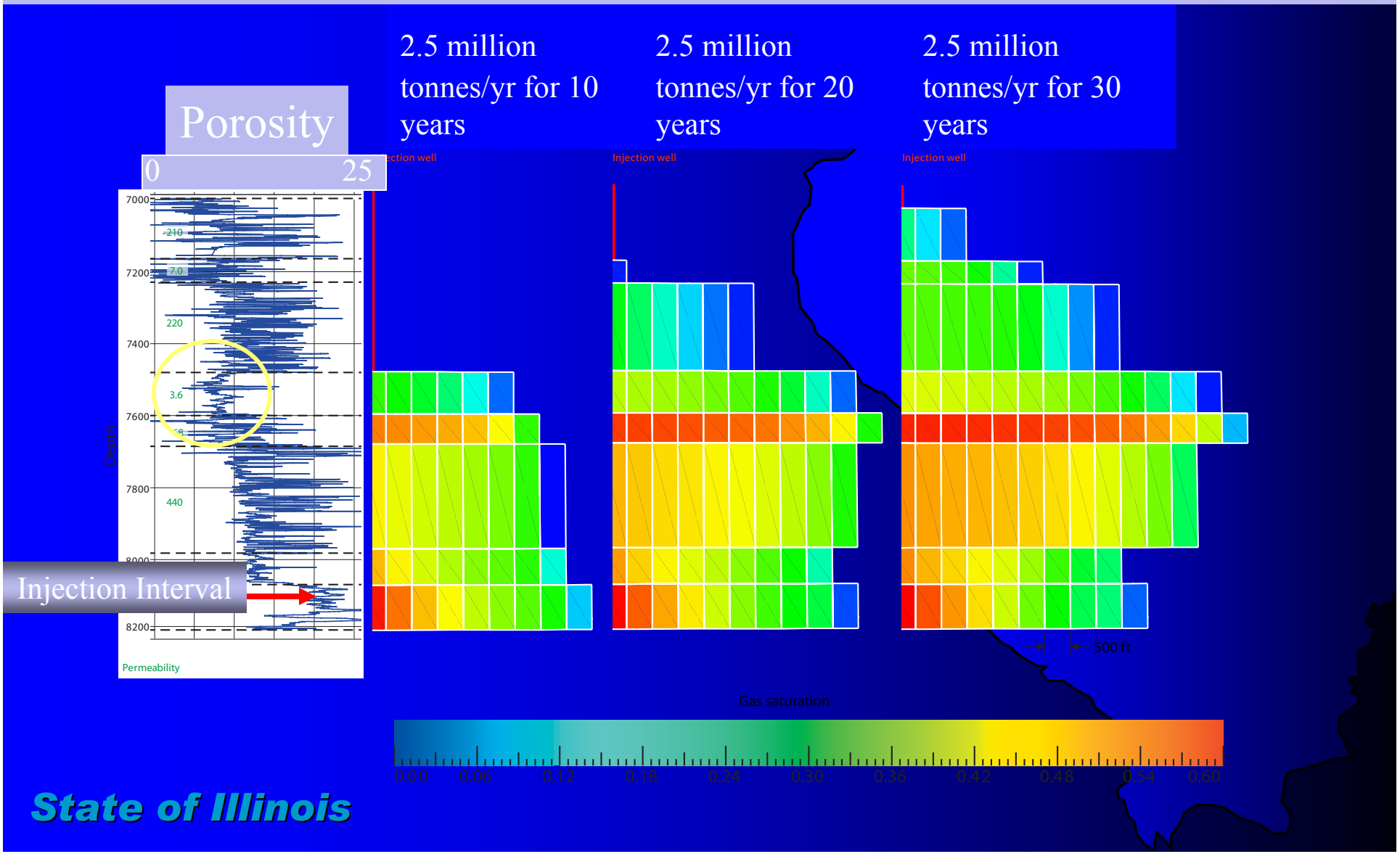
Weaber-Horn #1



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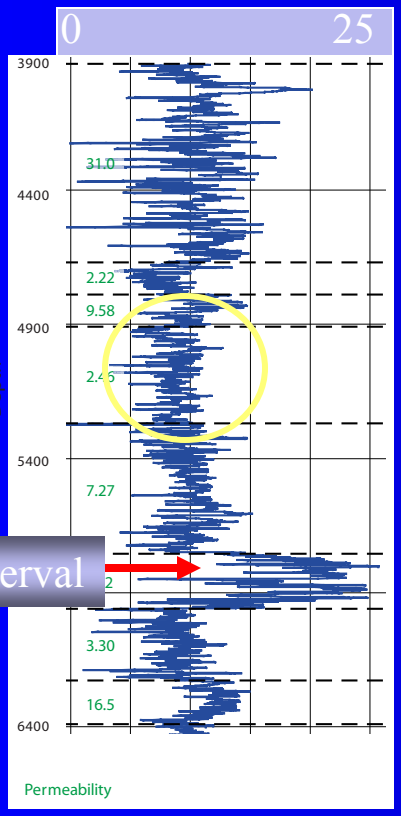
Hinton #7

Porosity

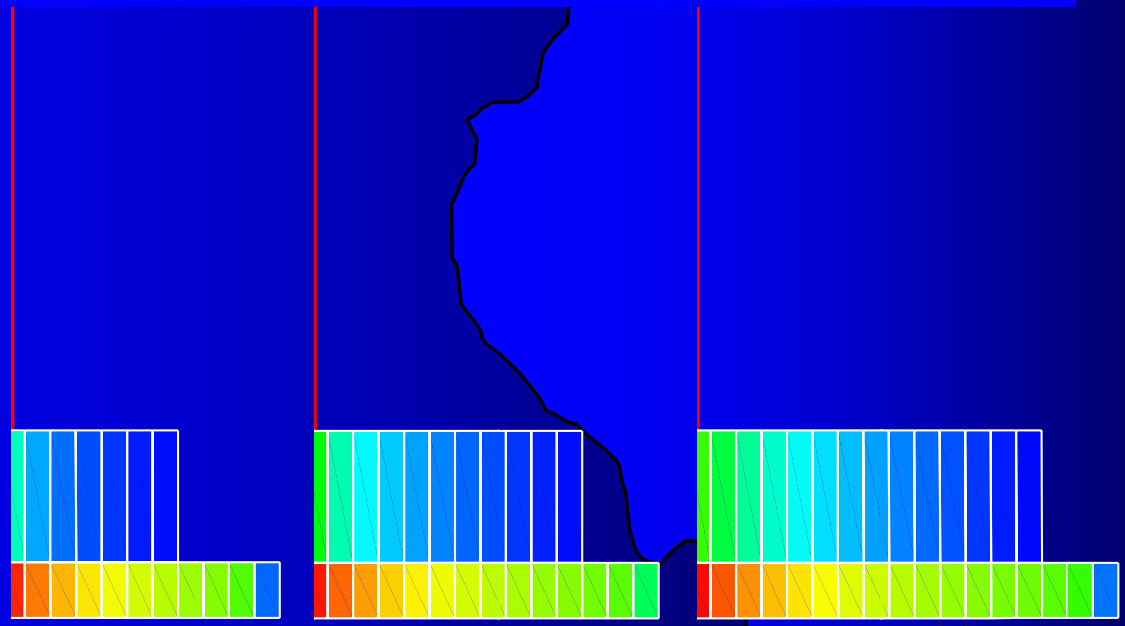


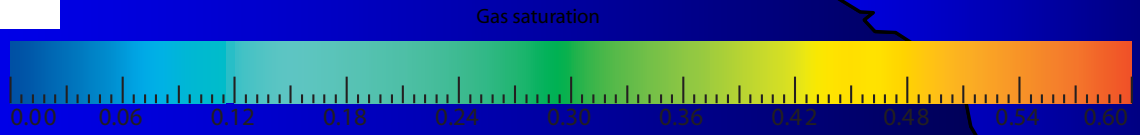
Injection Interval

2.5 million tonnes/yr for 10 years

2.5 million tonnes/yr for 20 years

2.5 million tonnes/yr for 30 years





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VibroSeis Source Trucks Operating on 900 North at the Mattoon Site

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Recording Truck with Mattoon Site in Background

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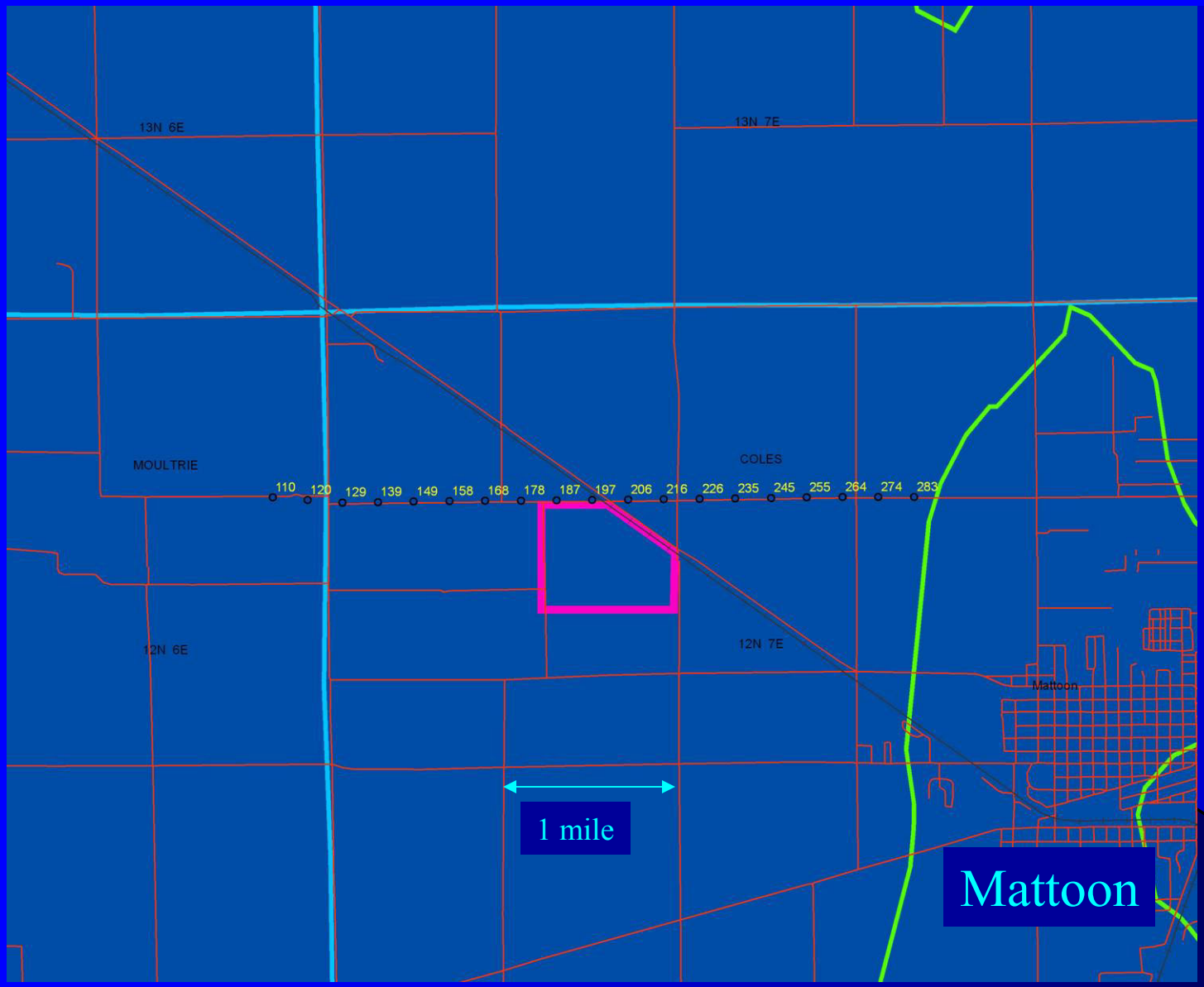
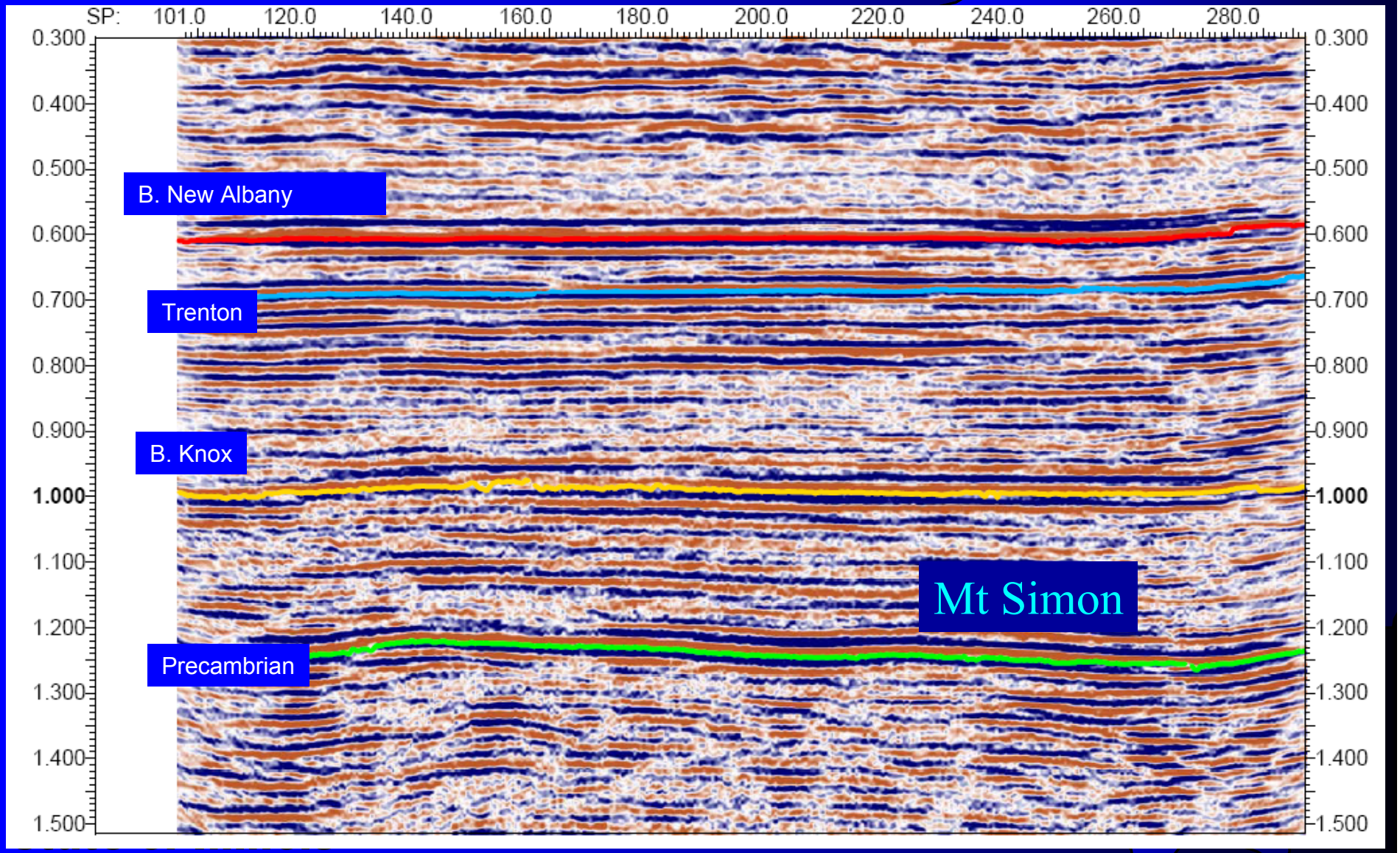
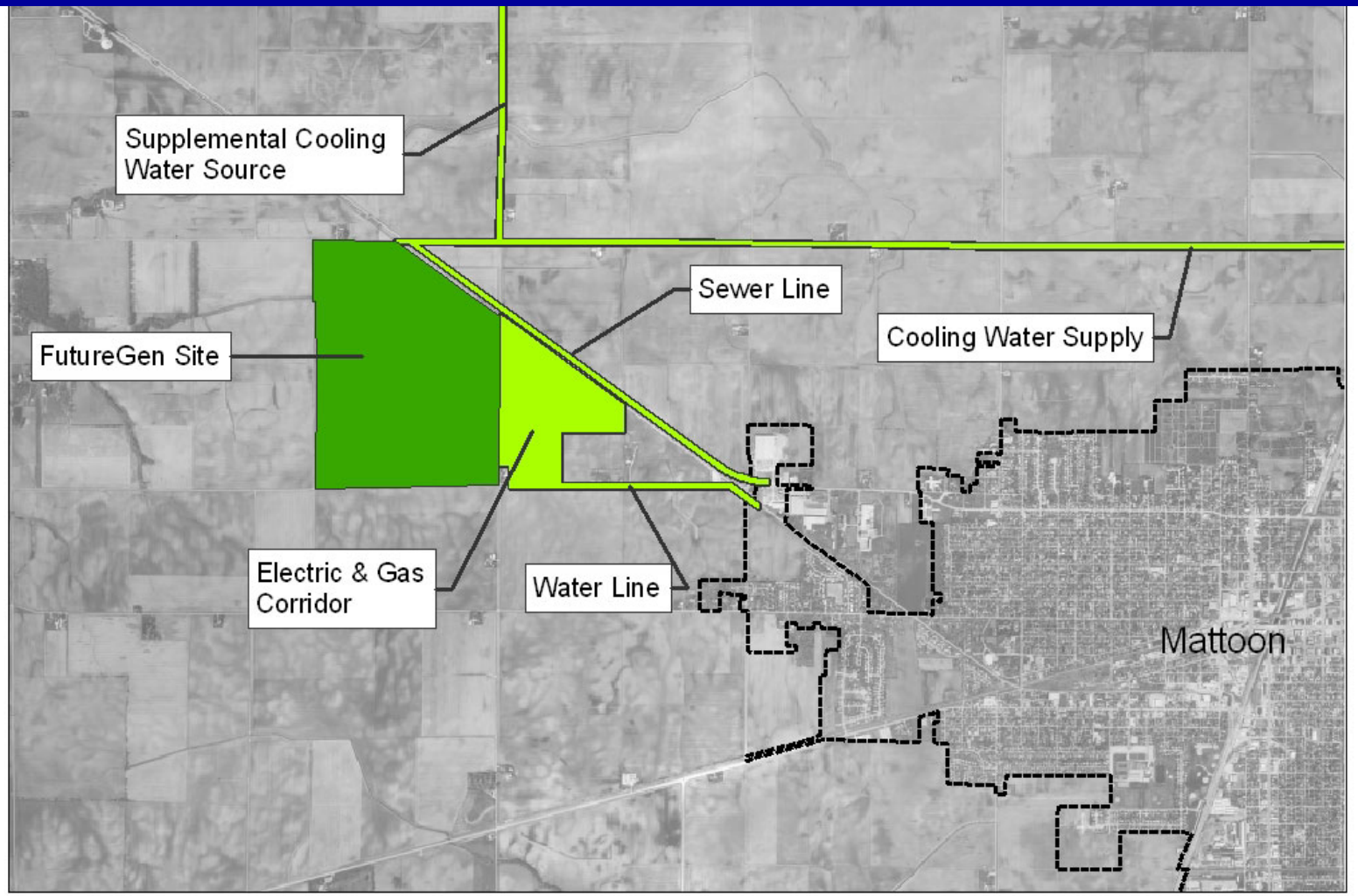
Mattoon FutureGen & Injection Site



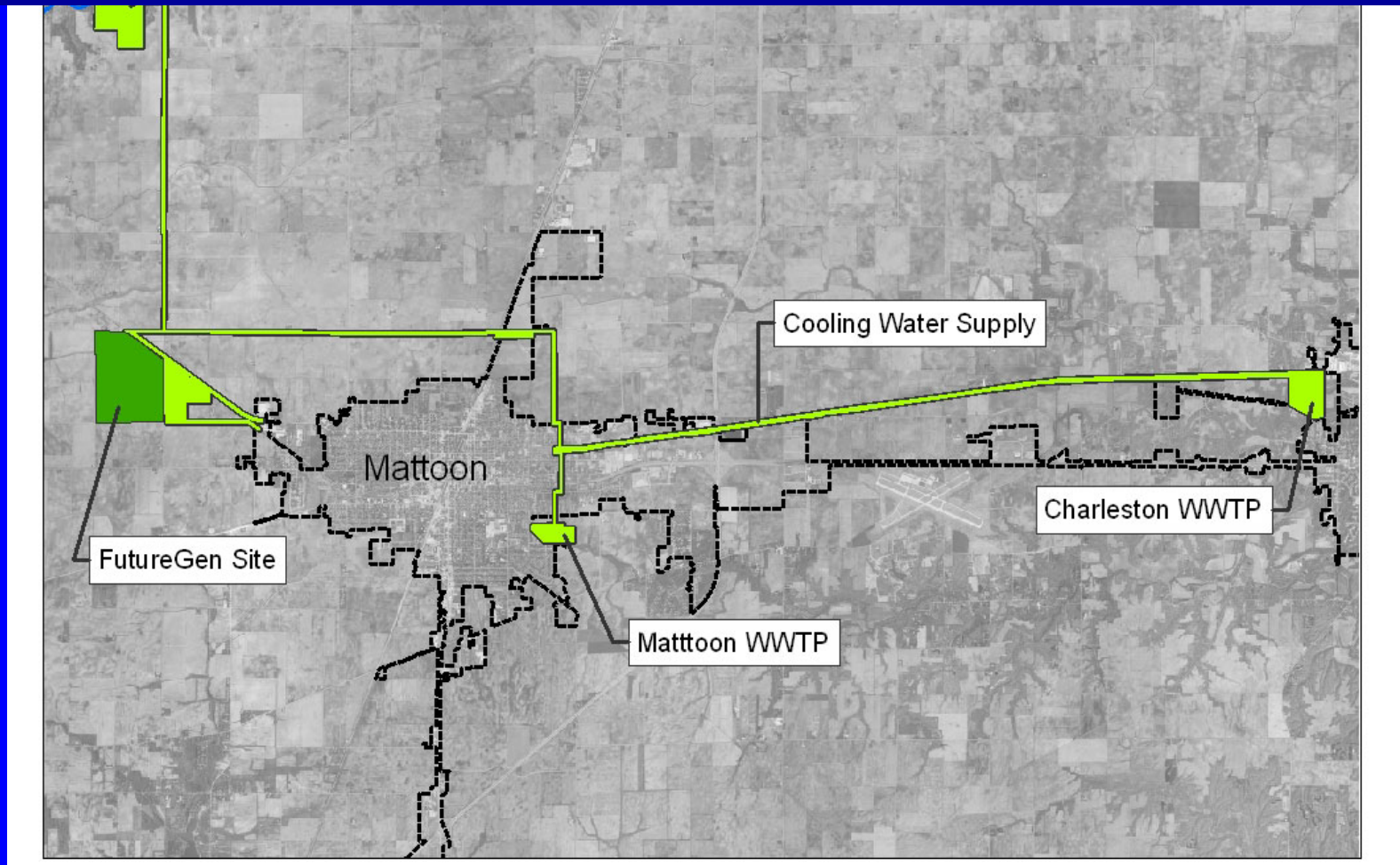
Mattoon FutureGen Site



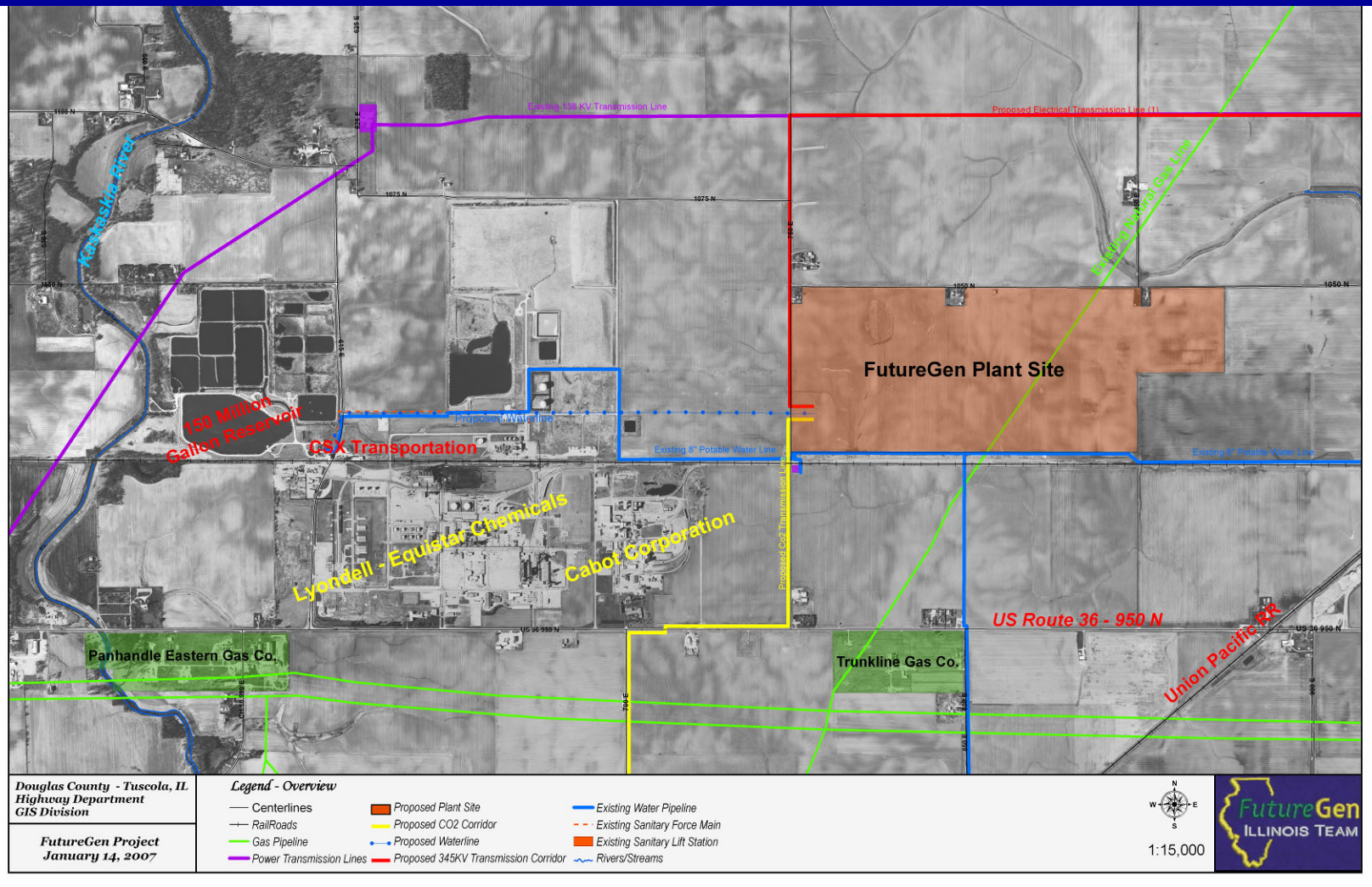
Mattoon FutureGen Site



Mattoon FutureGen Site and Corridors



Tuscola FutureGen Site



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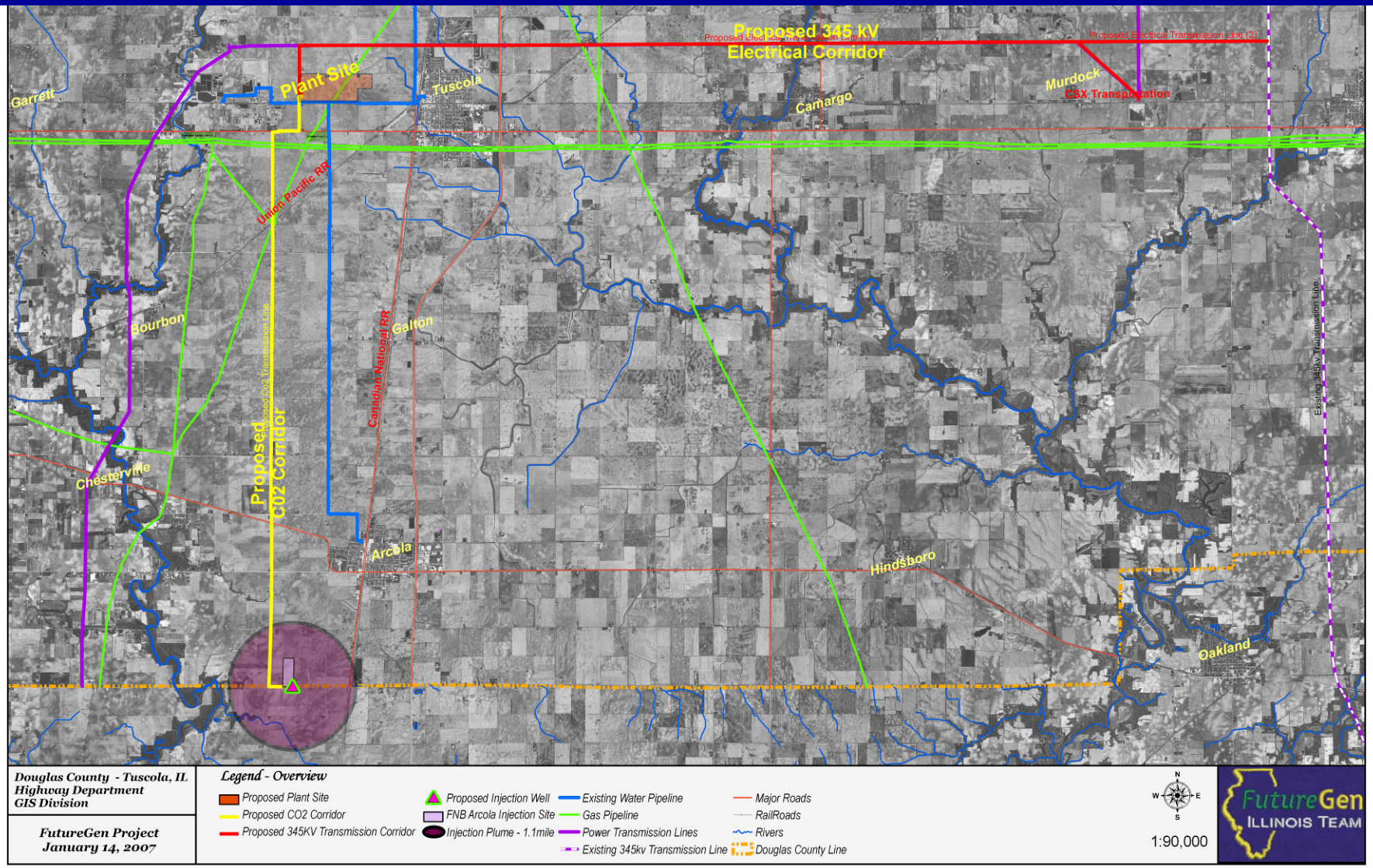
Tuscola FutureGen and Injection Site



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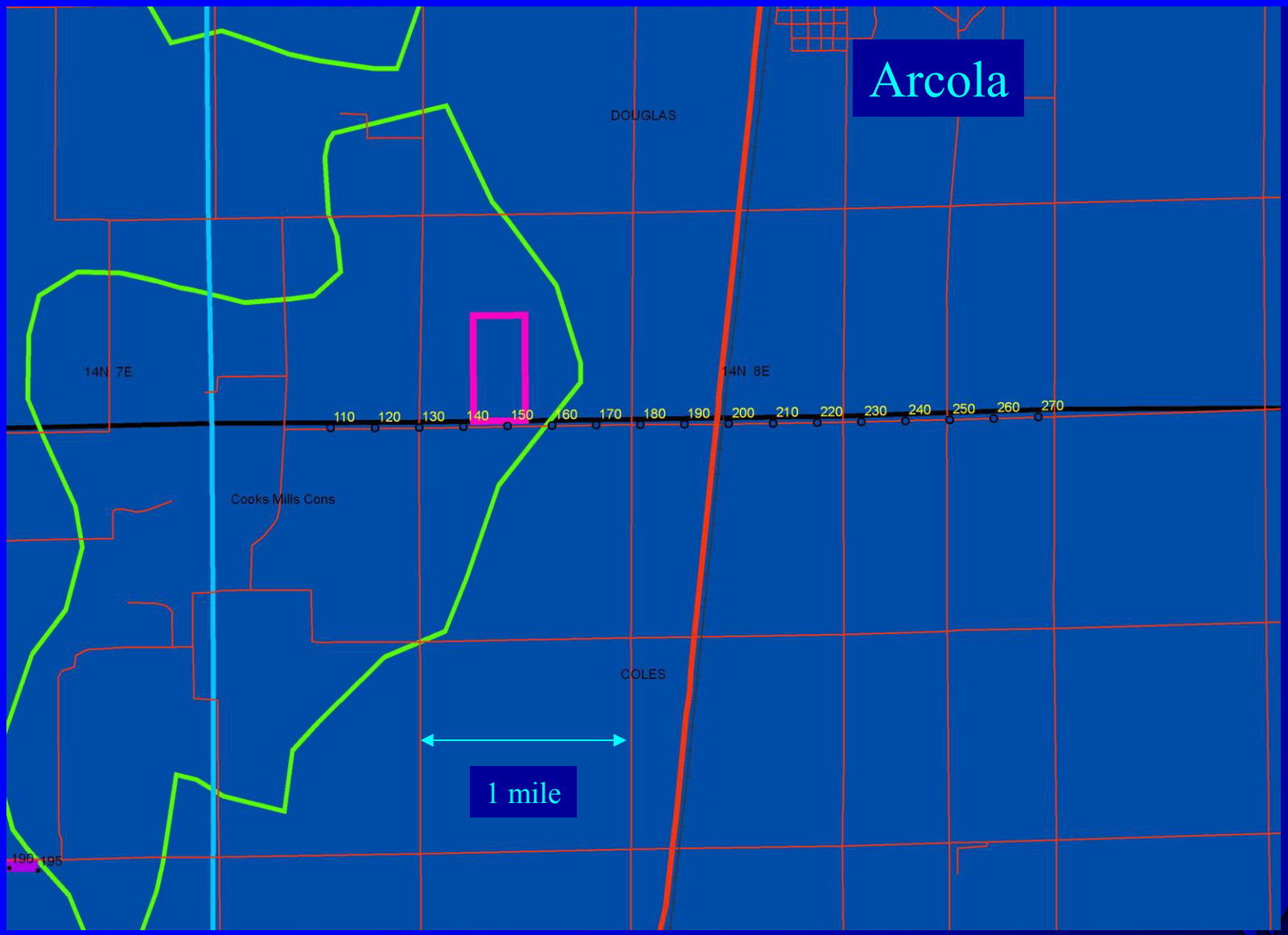
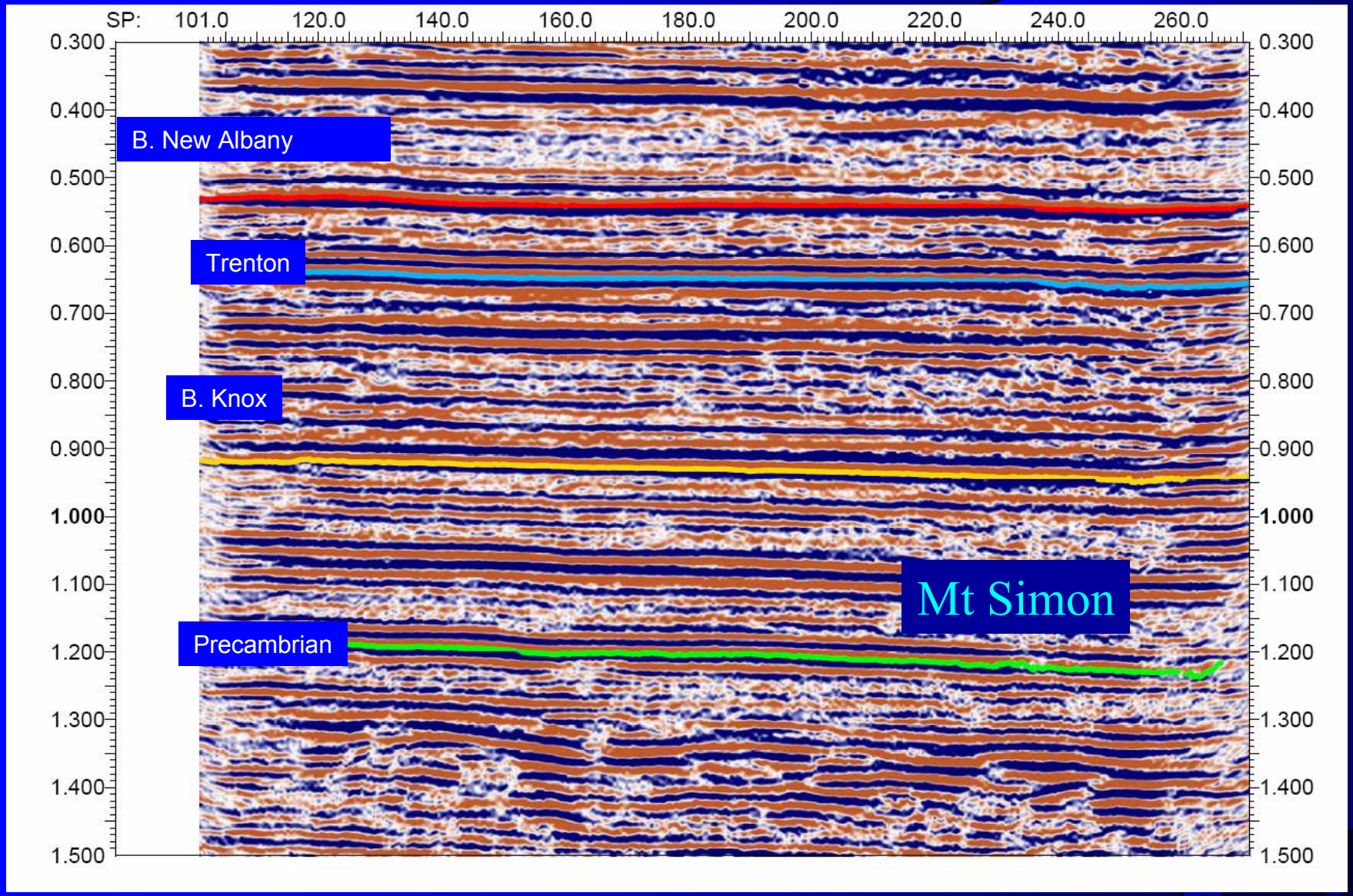
Tuscola FutureGen Injection Site



Tuscola FutureGen Site



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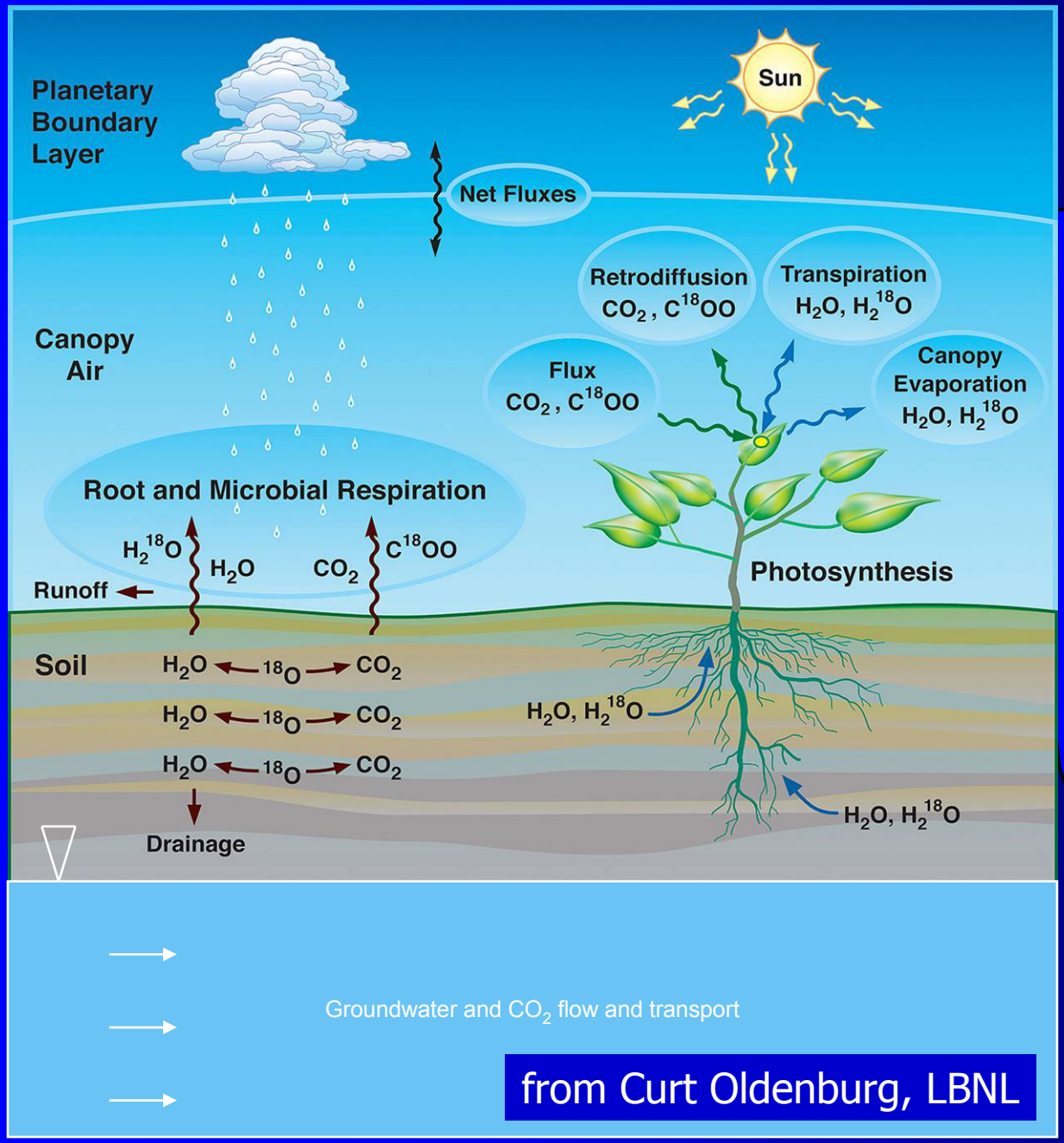

from Curt Oldenburg, LBNL

Environmental monitoring to include atmosphere vadose zone, and groundwater

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FutureGen, Climate Change, and the Illinois Geological Framework Fits Together

" One of FutureGen's fundamental goals is to overcome environmental constraints, especially potential climate change impacts of CO_2 emissions associated with producing electricity and other forms of energy from coal."

U.S. Department of Energy

Office of Fossil Energy

March 4, 2004

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