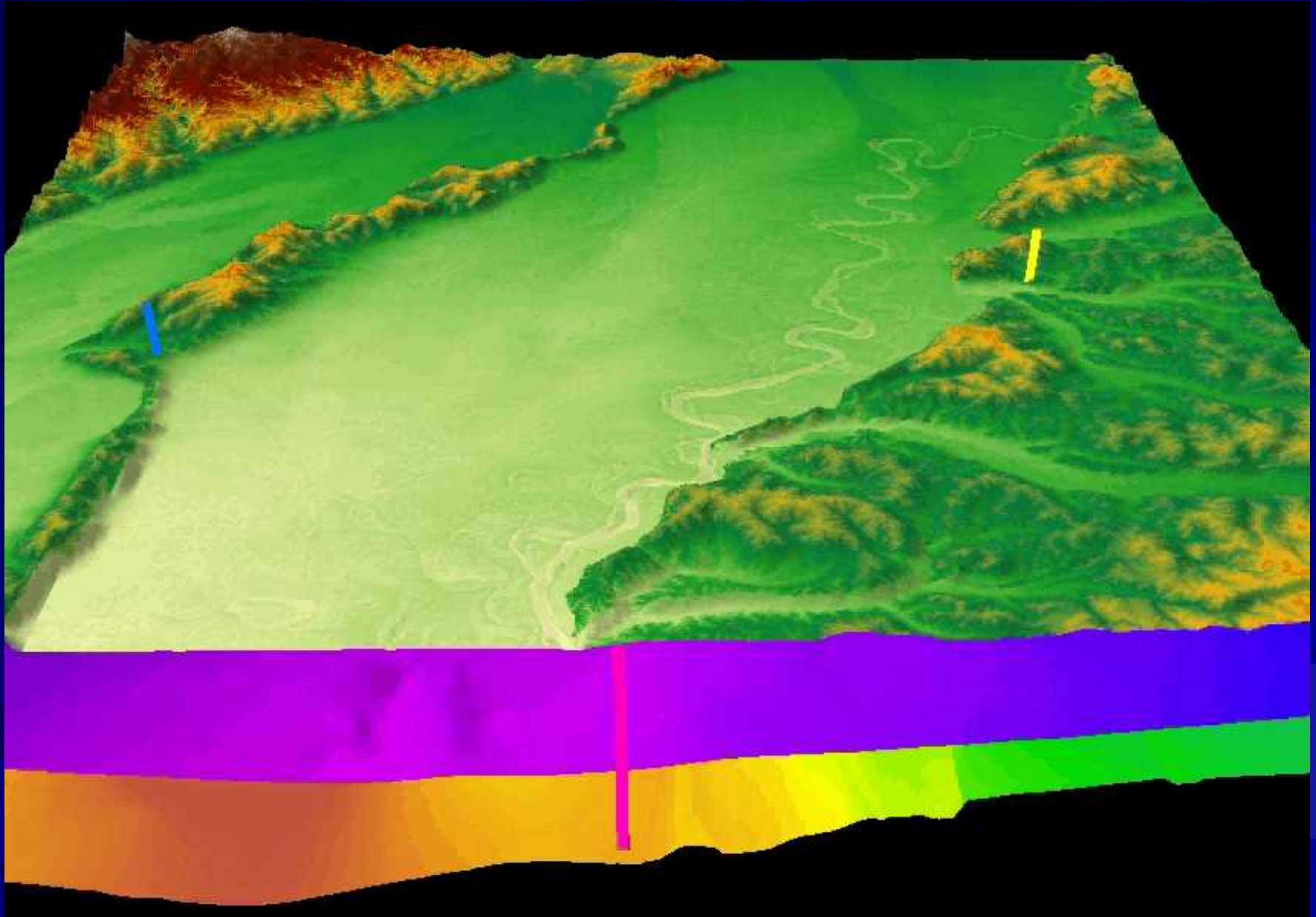
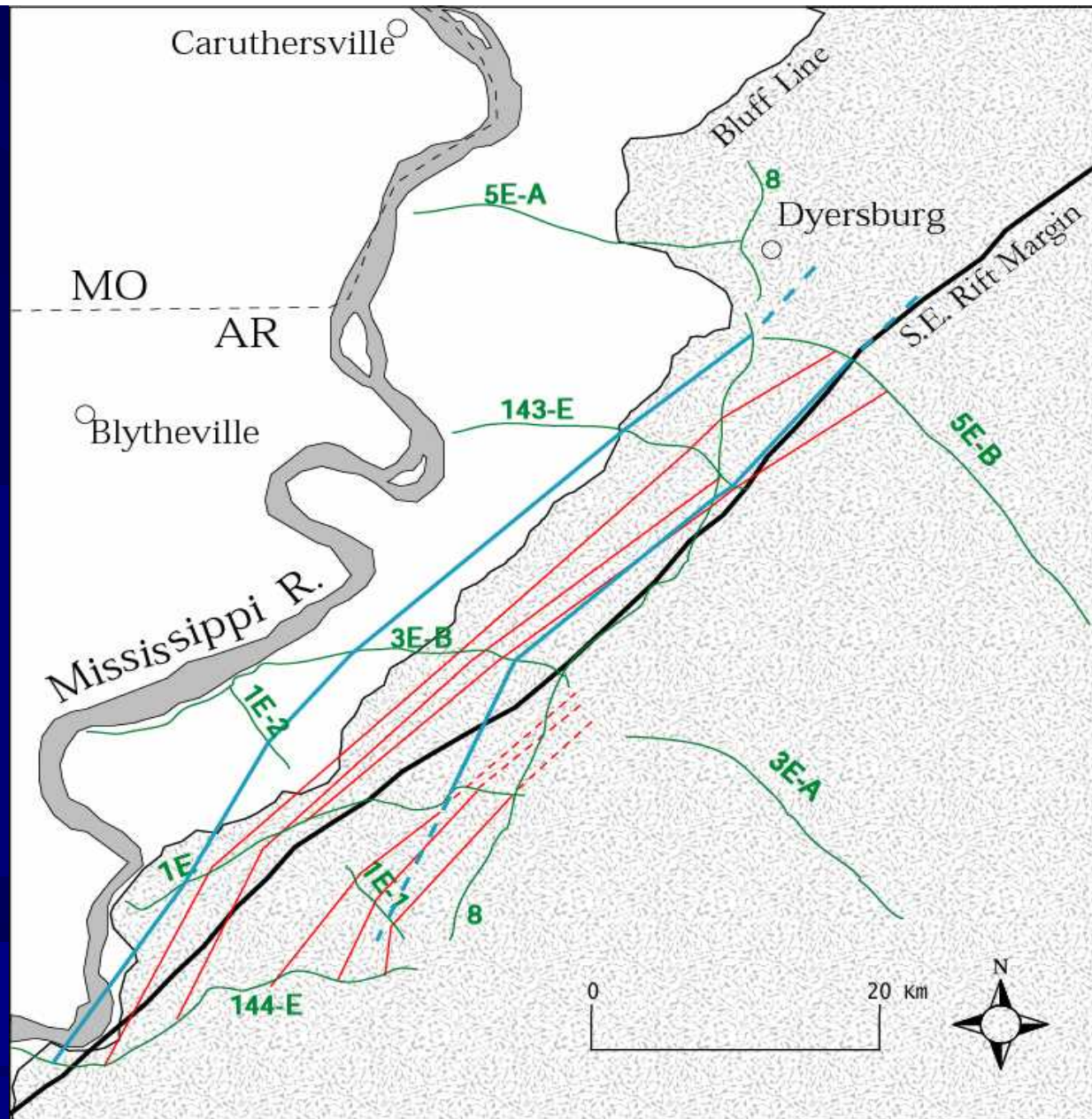


Mississippi embayment, Reelfoot rift, New Madrid seismic zone, and Shelby County, Tennessee

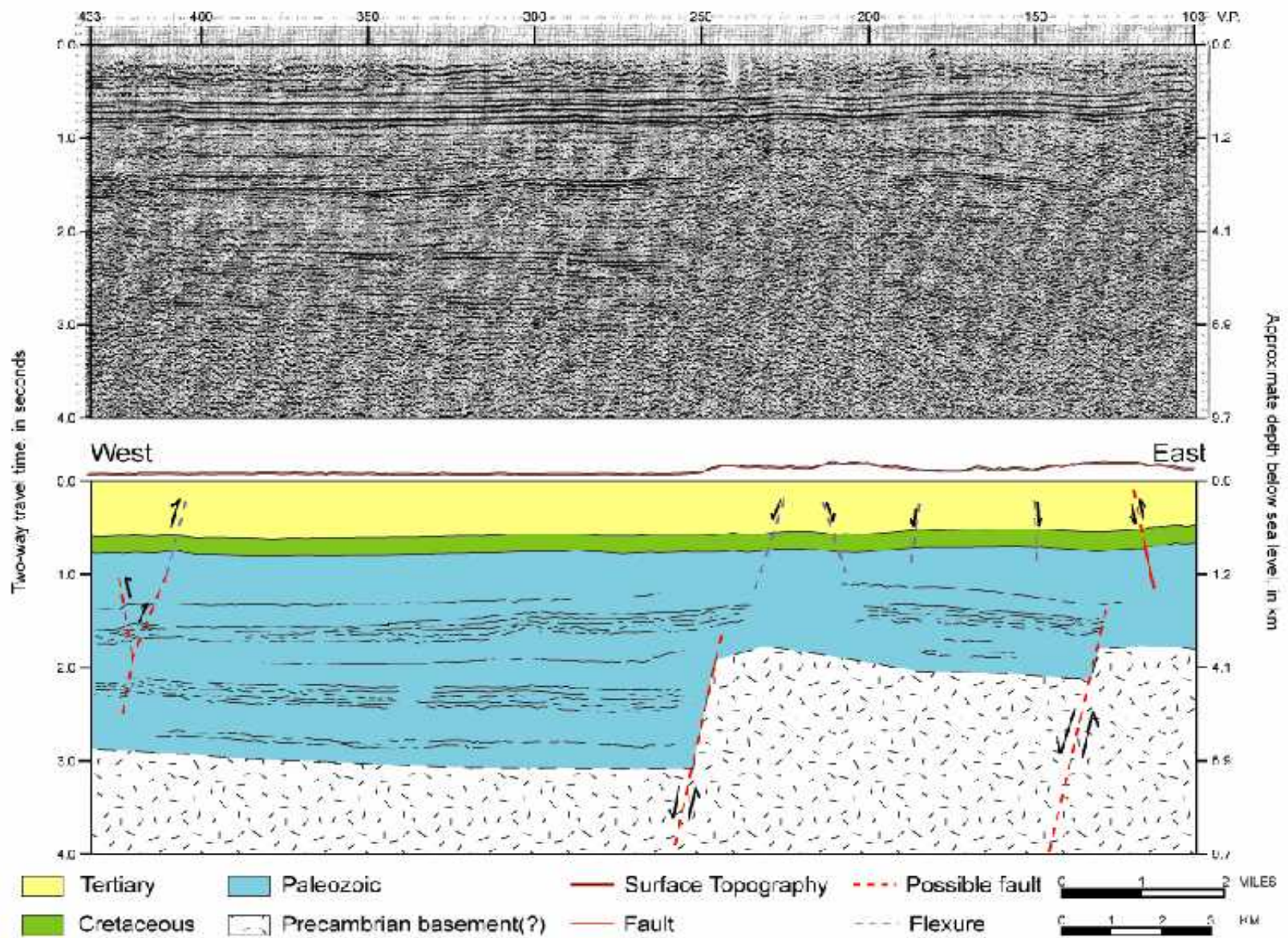


DEM of Mississippi River Valley with underlying top of Paleozoic and Precambrian.  
Red column = Memphis, yellow = Dyersburg = blue Jonesboro (Csontos)



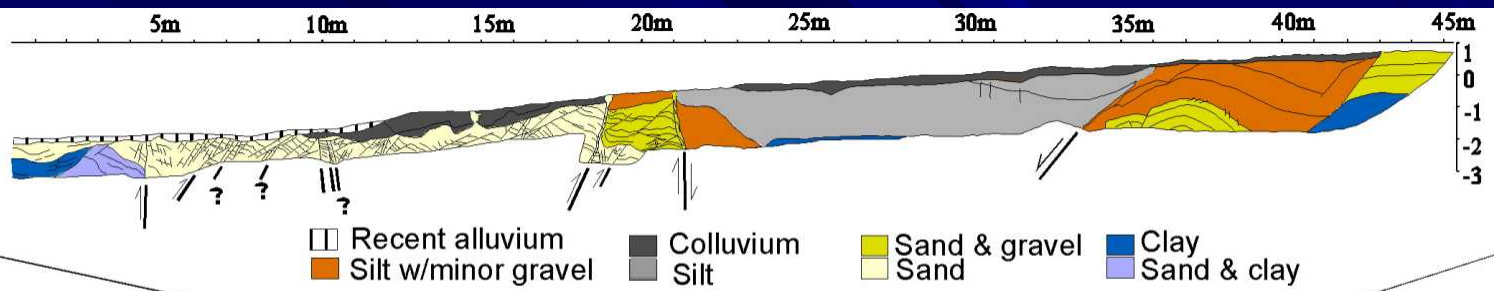


Faulting along eastern margin of the Reelfoot rift. Blue = basement faults and red = shallow faults (Parrish and Van Arsdale, 2004)



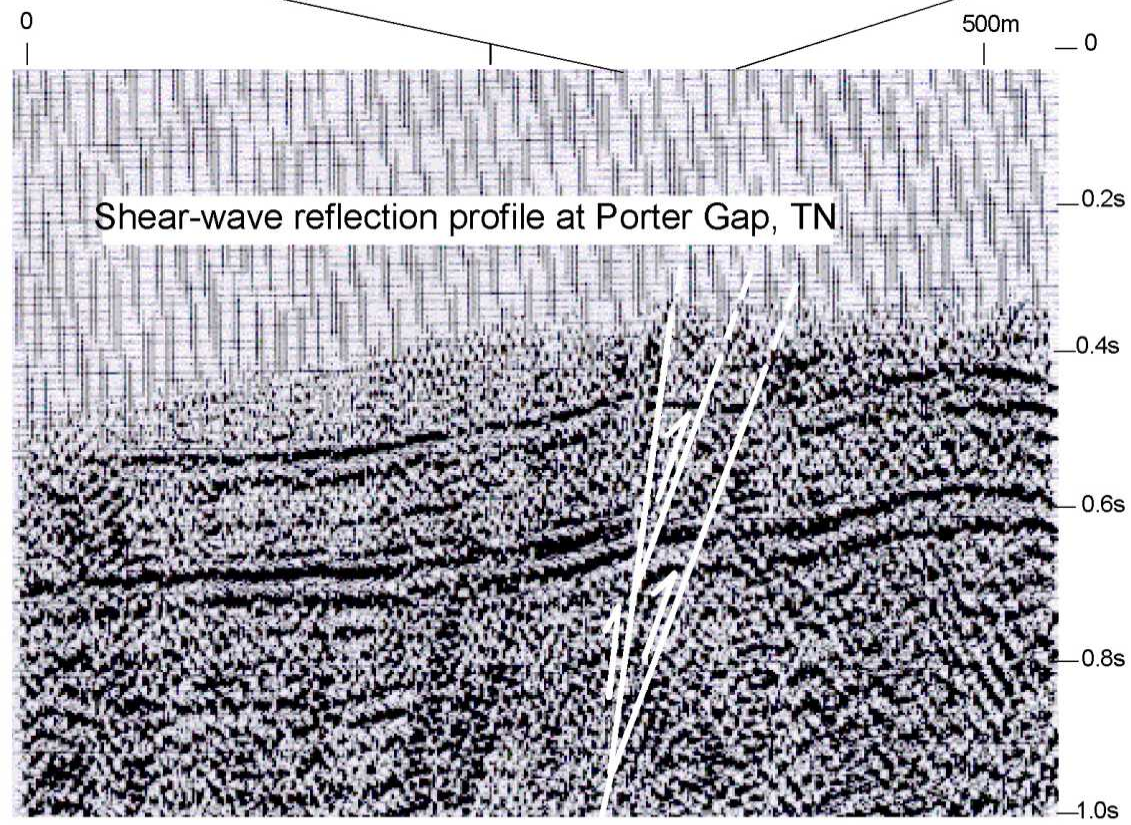
Dow seismic line 143E.





WEST

EAST

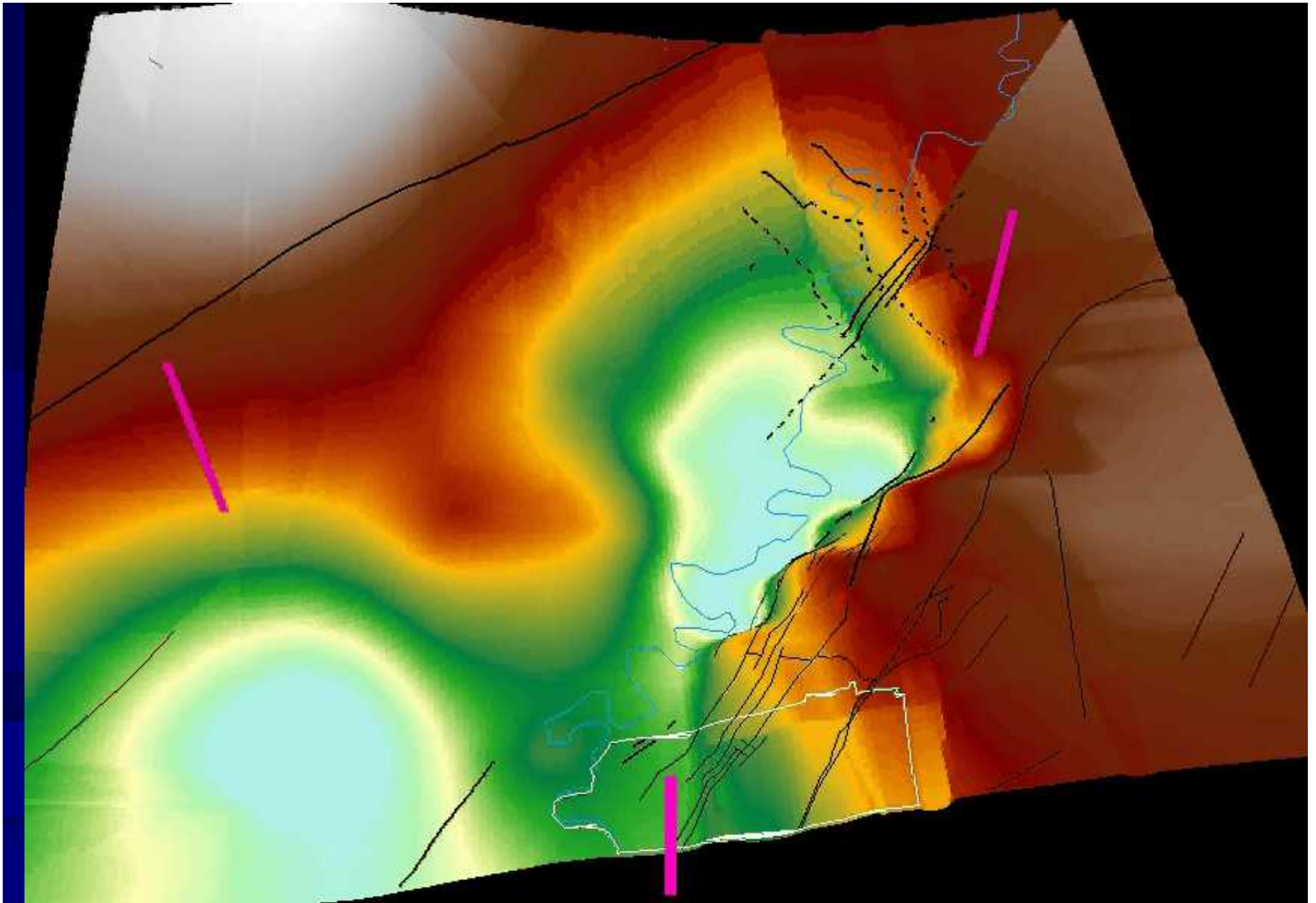


Faulting along the eastern Reelfoot rift margin and bluff line at Porter's Gap, TN (Cox et al., 2001)

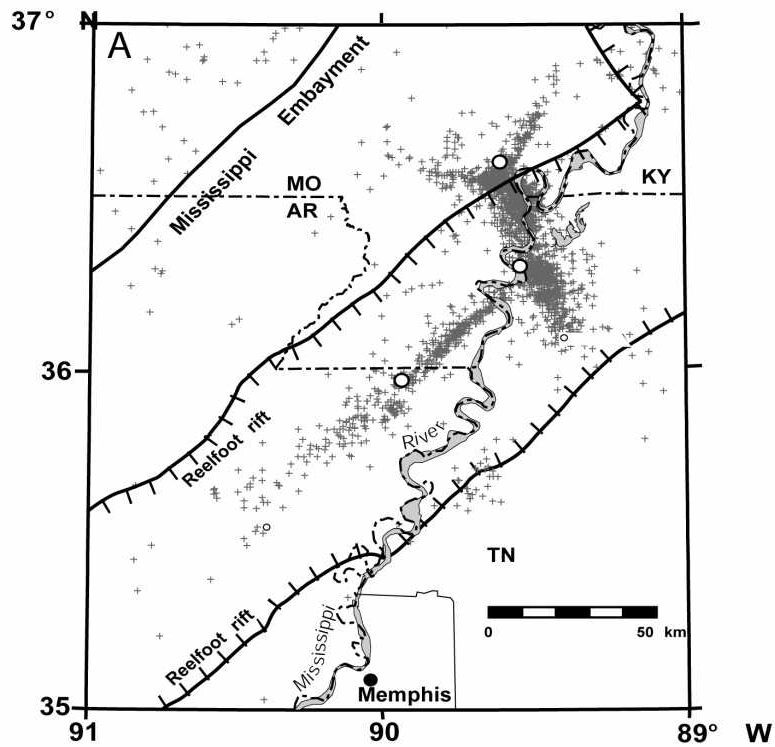


10 m of post 20,000 yr right lateral  
strike slip faulting at Porter's Gap



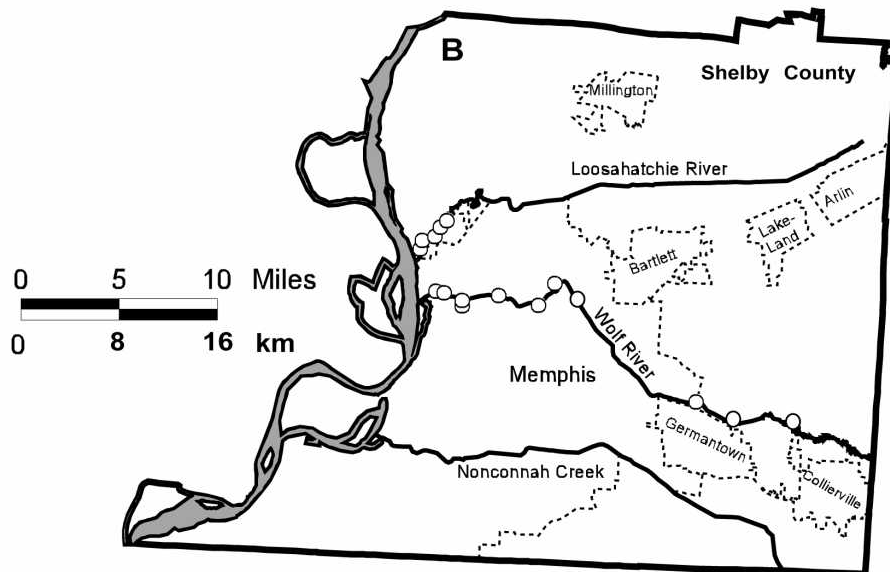


Top of Precambrian illustrating the Reelfoot Rift and eastern rift margin faults (Csontos and Martin)



New Madrid seismic zone, Shelby County, and earthquake liquefaction deposits along the Loosahatchie and Wolf Rivers (Broughton et al., 2001)

Quaternary faulting identified near letter B (Cox et al., 2006)







Looking for Earthquake Liquefaction (Sand Dikes) Along the Wolf River in Collierville





Large sand dike in bank of Wolf River in Memphis formed during earthquake liquefaction

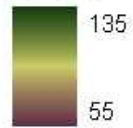




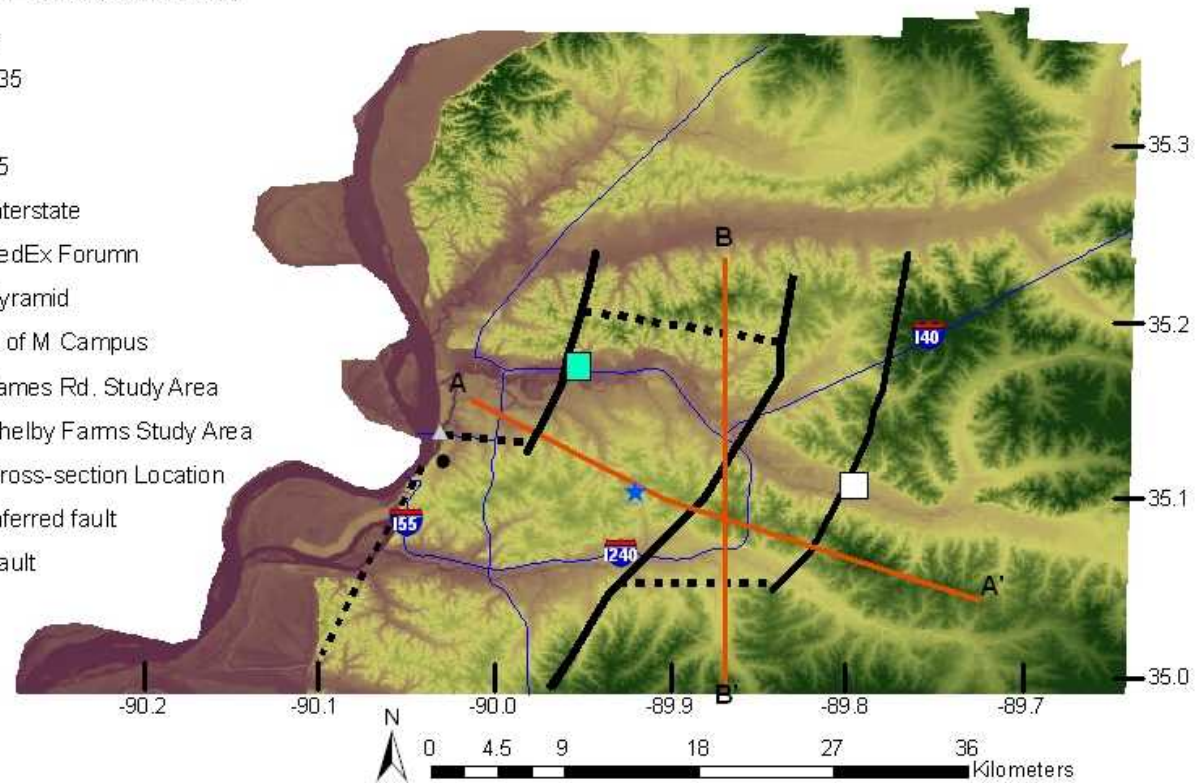
Knife points to where the liquefied sand broke through the dark soil onto the Wolf River flood plain

## Digital Elevation Model

Meters

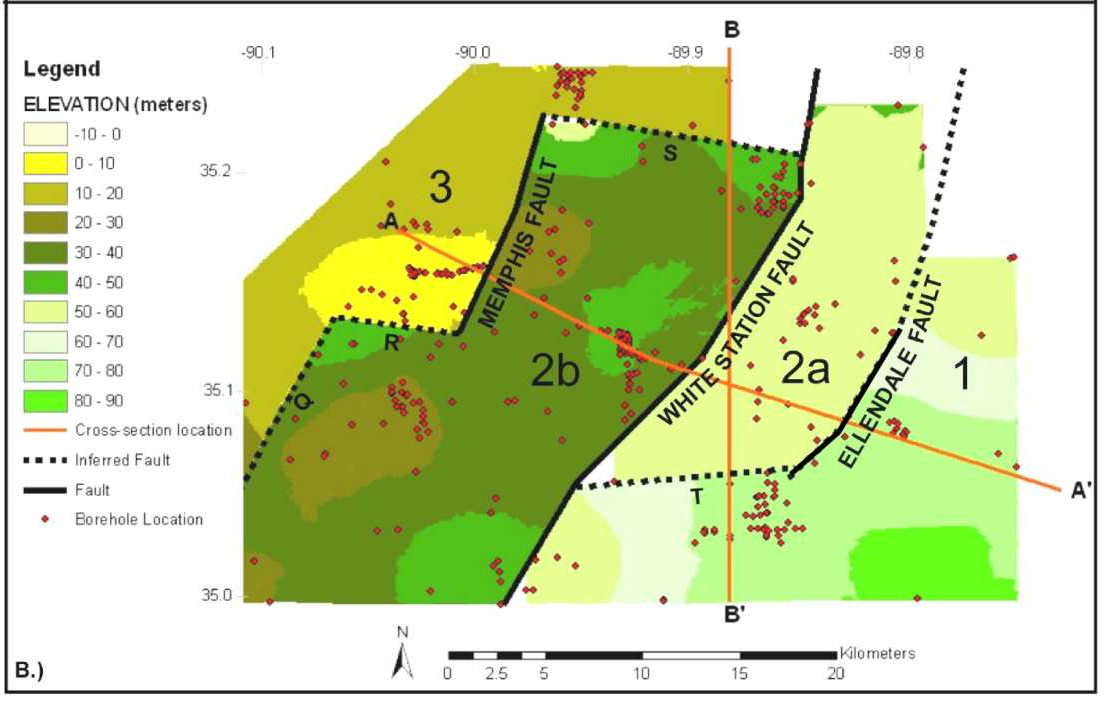
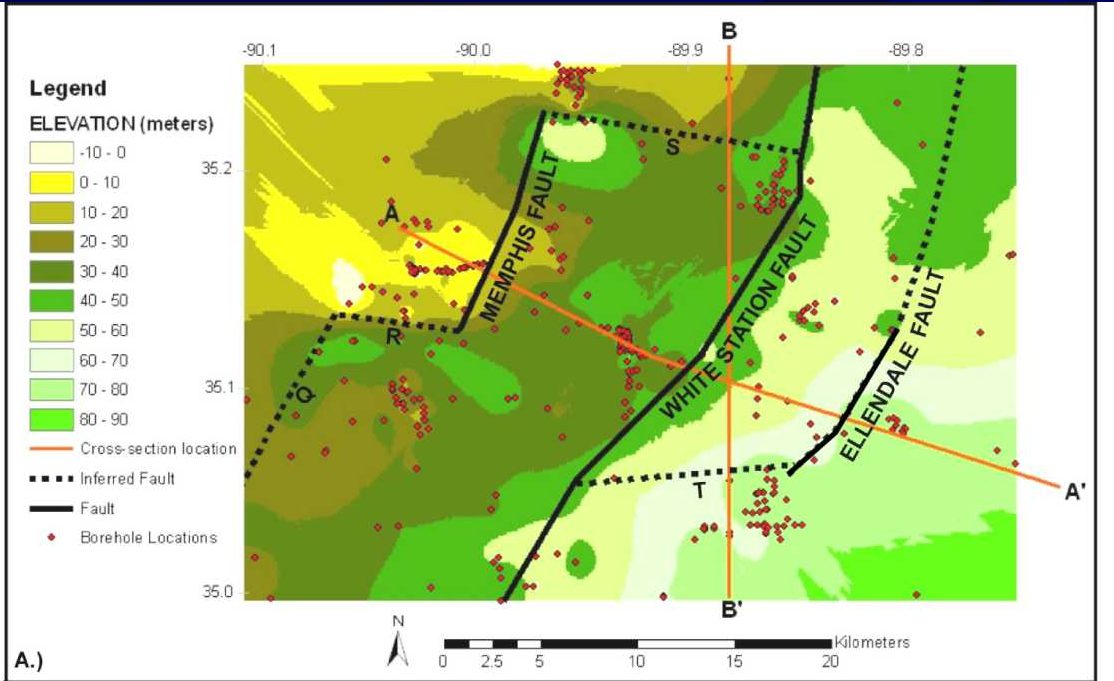


- Interstate
- FedEx Forum
- ▲ Pyramid
- ★ U of M Campus
- James Rd. Study Area
- Shelby Farms Study Area
- Cross-section Location
- Inferred fault
- Fault



Shelby County faults and cross sections A-A' and B-B' (Deen, 2006)

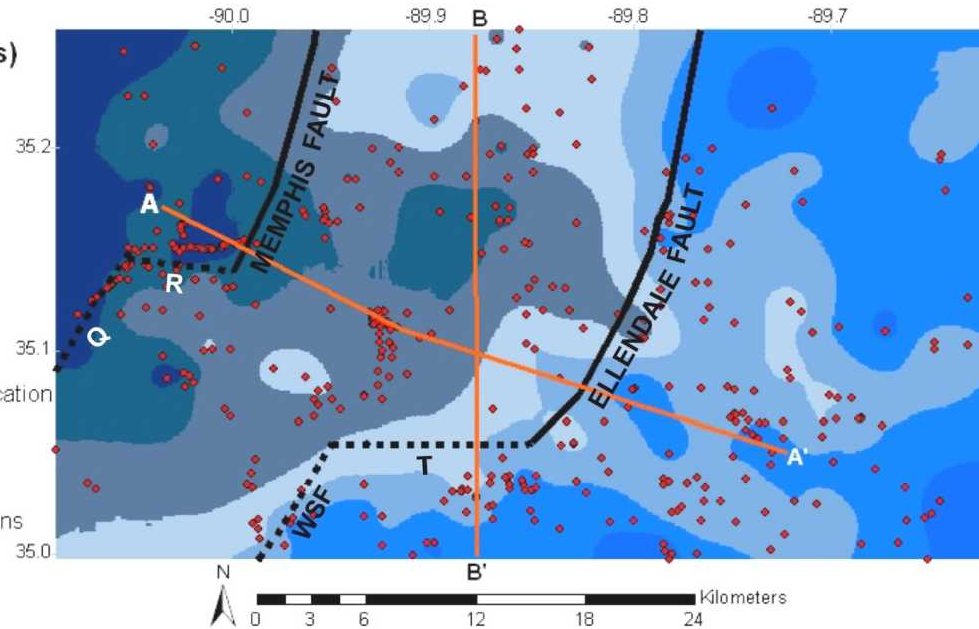
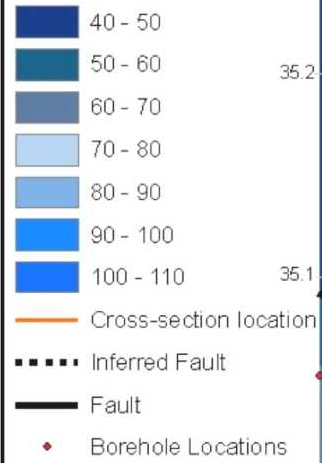




Top of Eocene  
 Lower Claiborne  
 (Deen, 2006)

### Legend

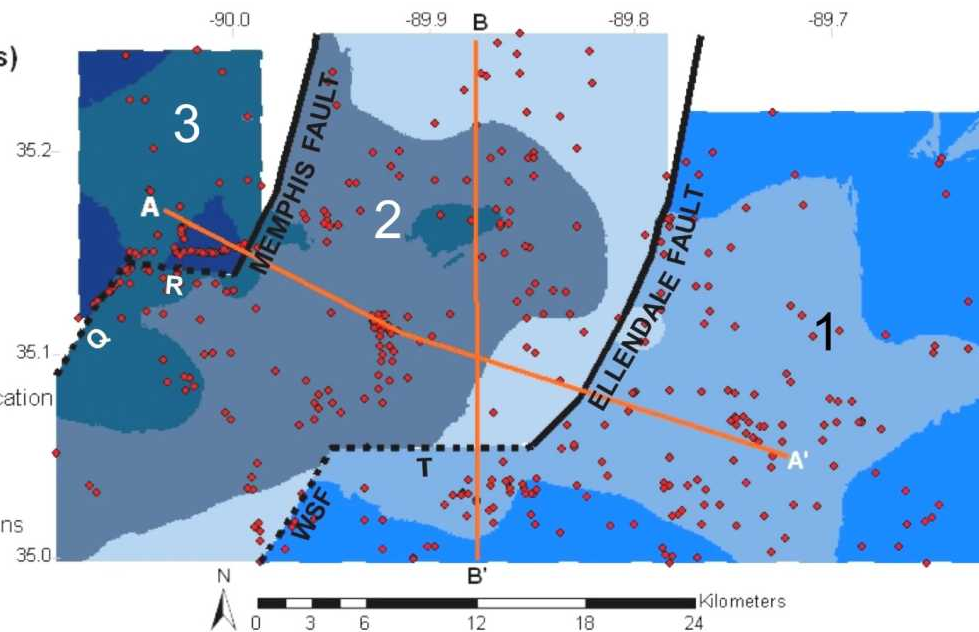
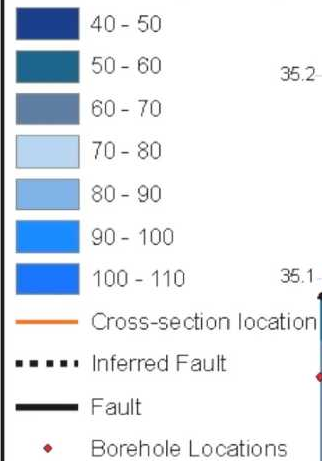
#### ELEVATION (meters)



A.)

### Legend

#### ELEVATION (meters)

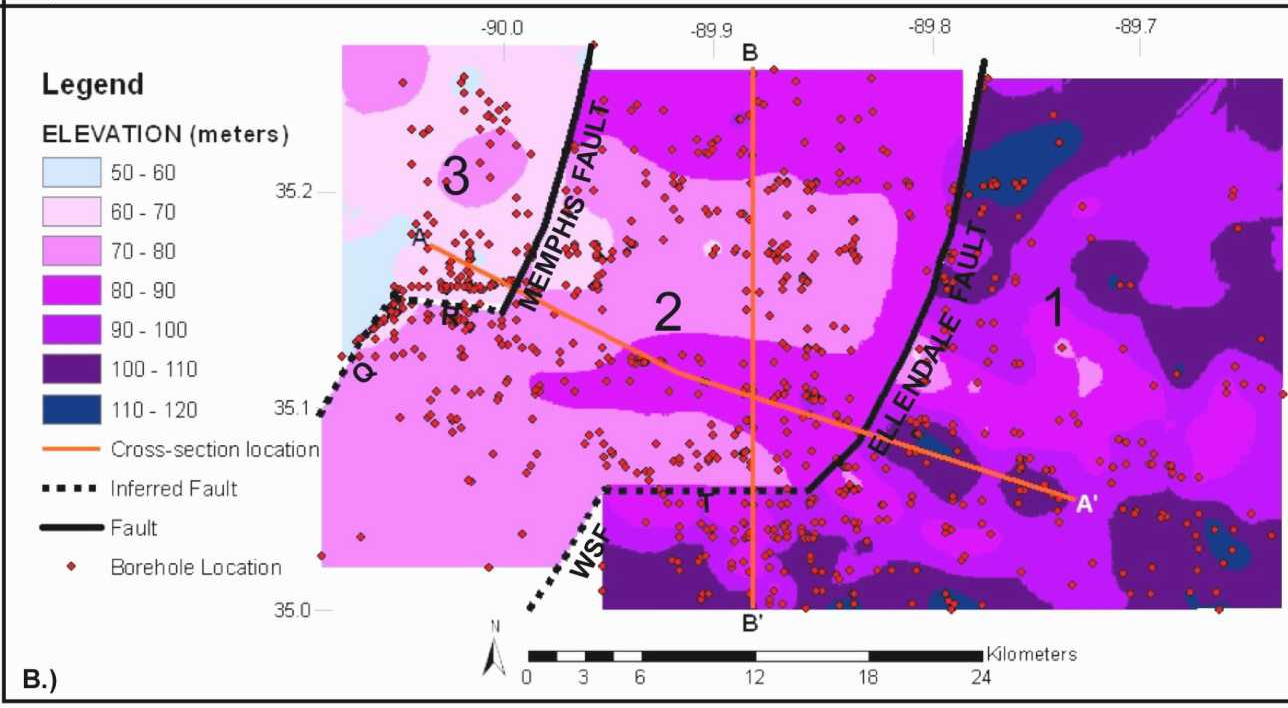
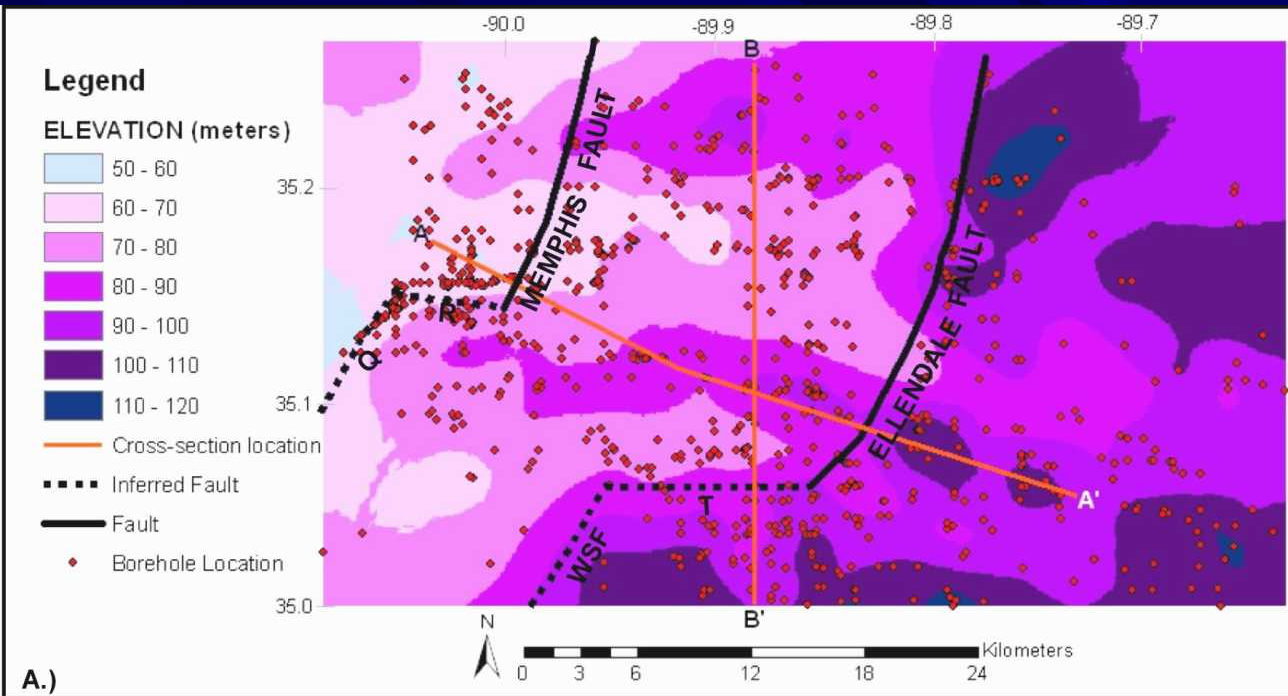


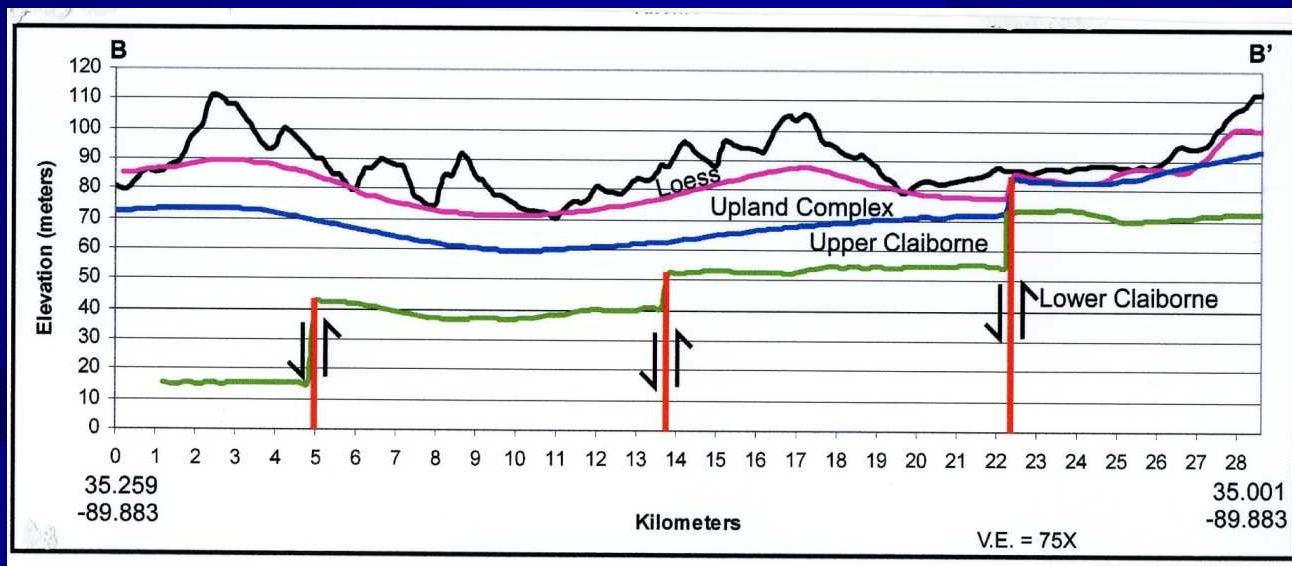
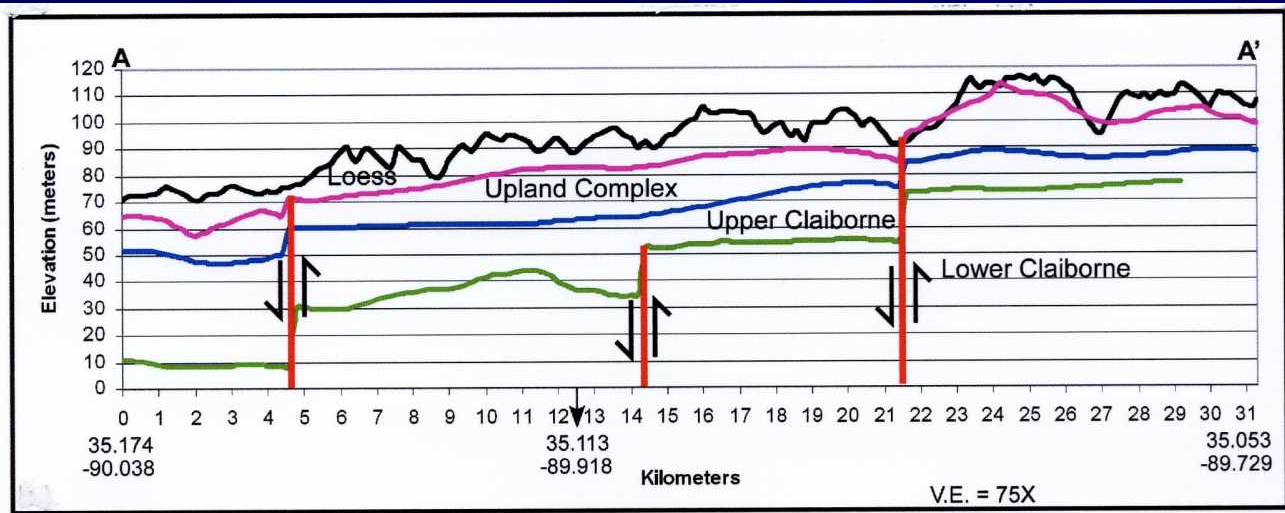
B.)

Top of Eocene  
Upper Claiborne



Top of Pliocene  
Upland Complex



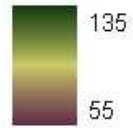


West-east cross section A-A' and north-south cross section B-B' (Deen, 2006)

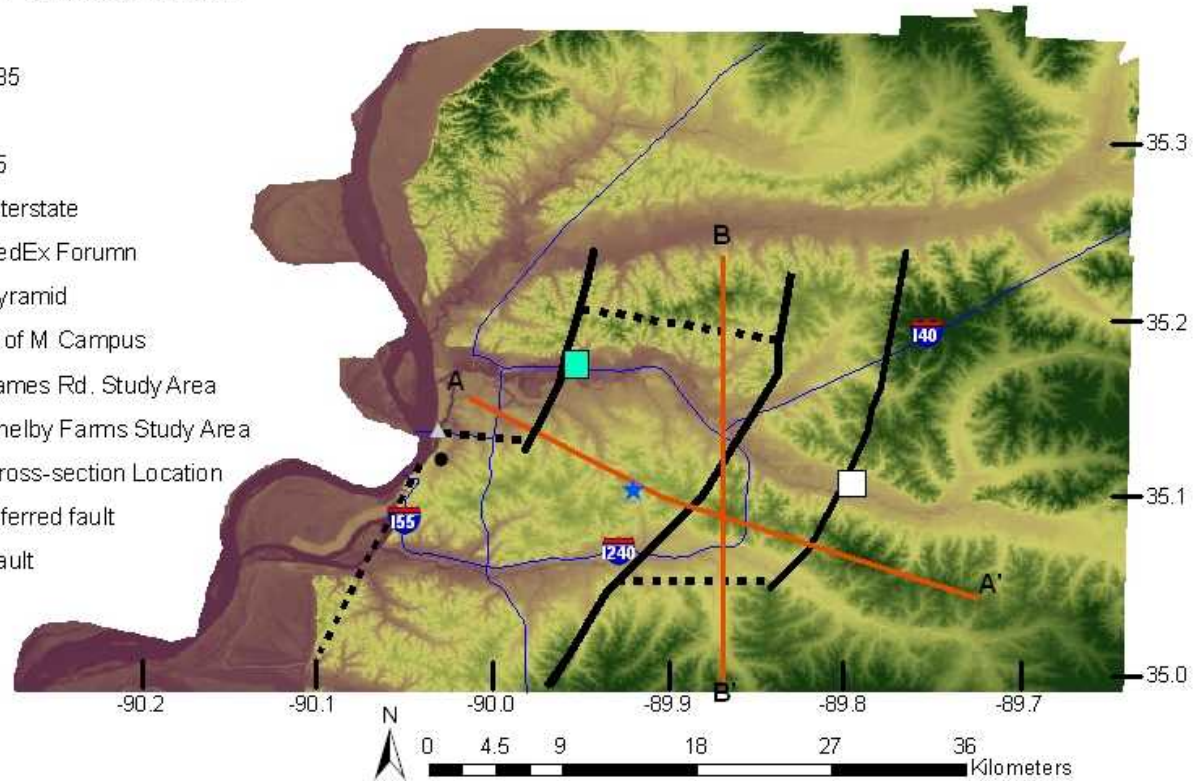


### Digital Elevation Model

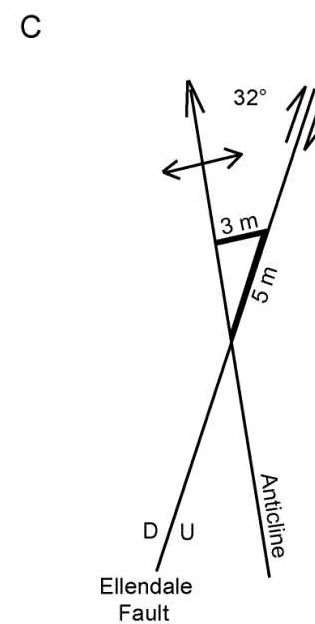
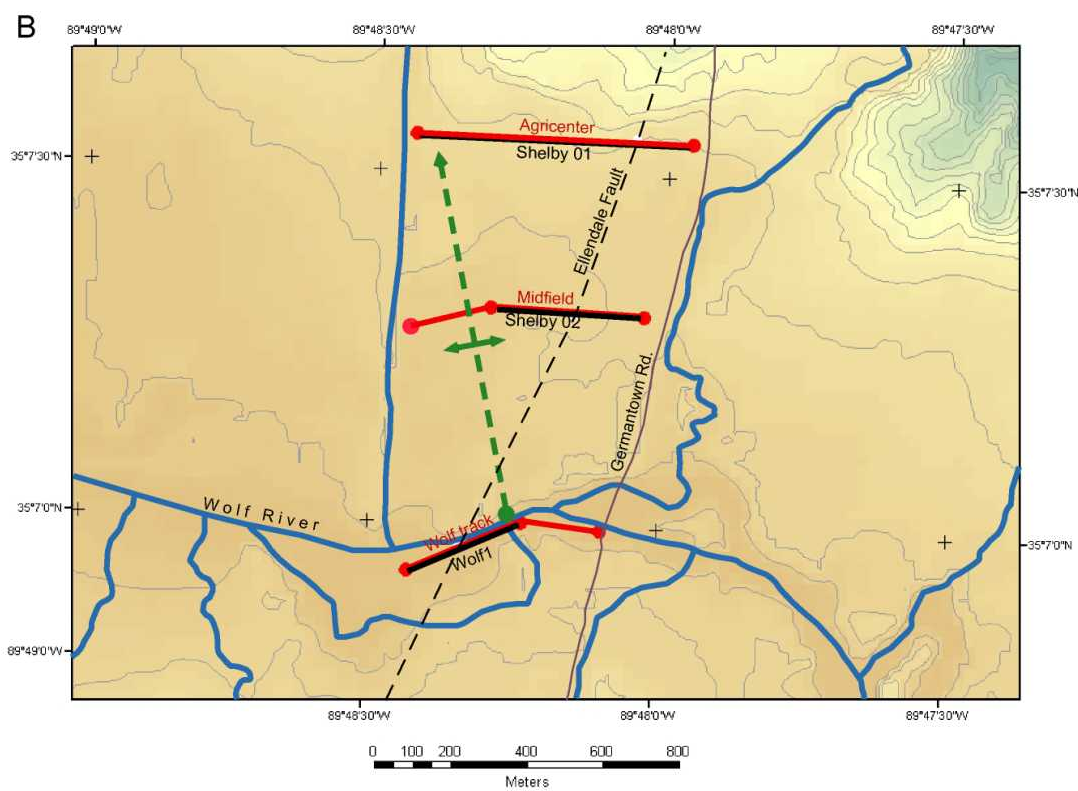
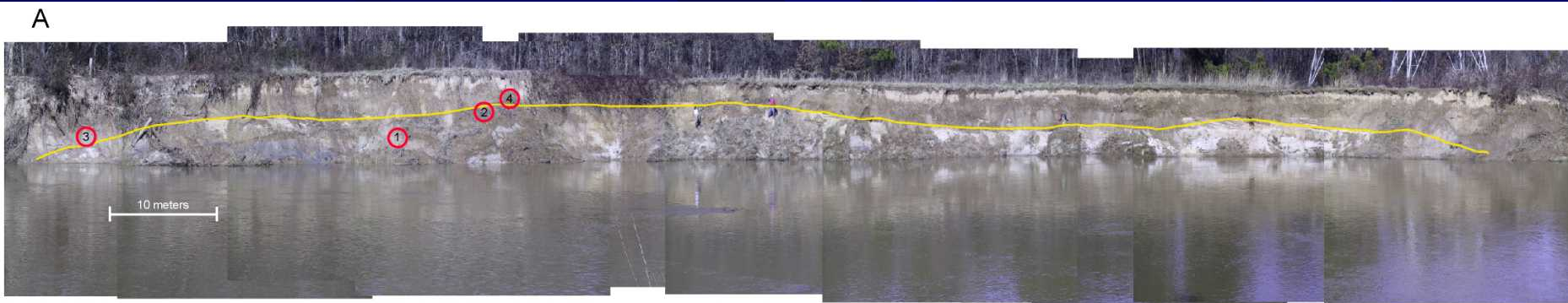
Meters



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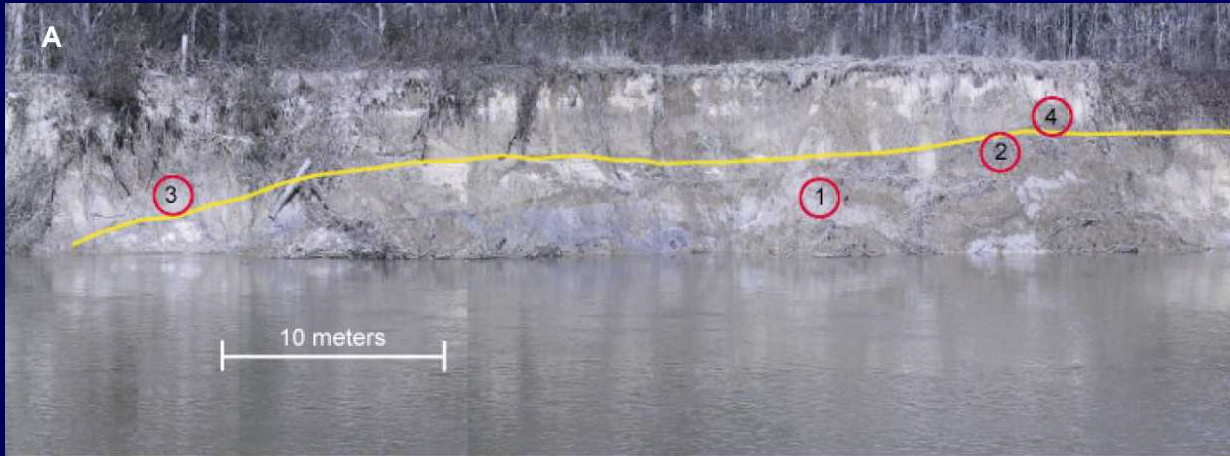


Shelby County faults and cross sections A-A' and B-B'



Anticline in north bank of Wolf River projected into seismic line to north (Velasco et al., 2005)





**B**



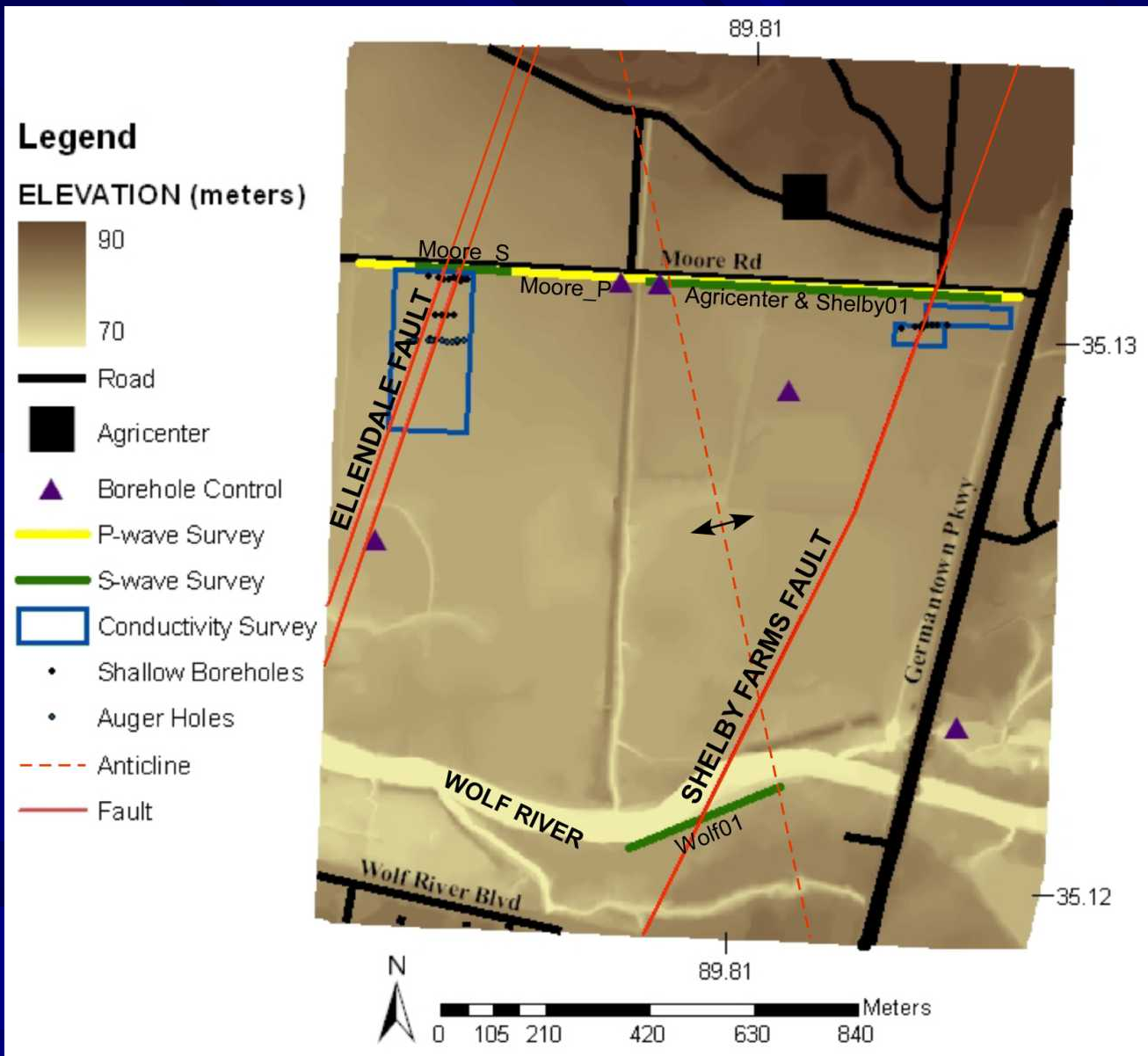
1 =  $4000 \pm 60$  BP

2 =  $2130 \pm 50$  BP

3 =  $1610 \pm 60$  BP

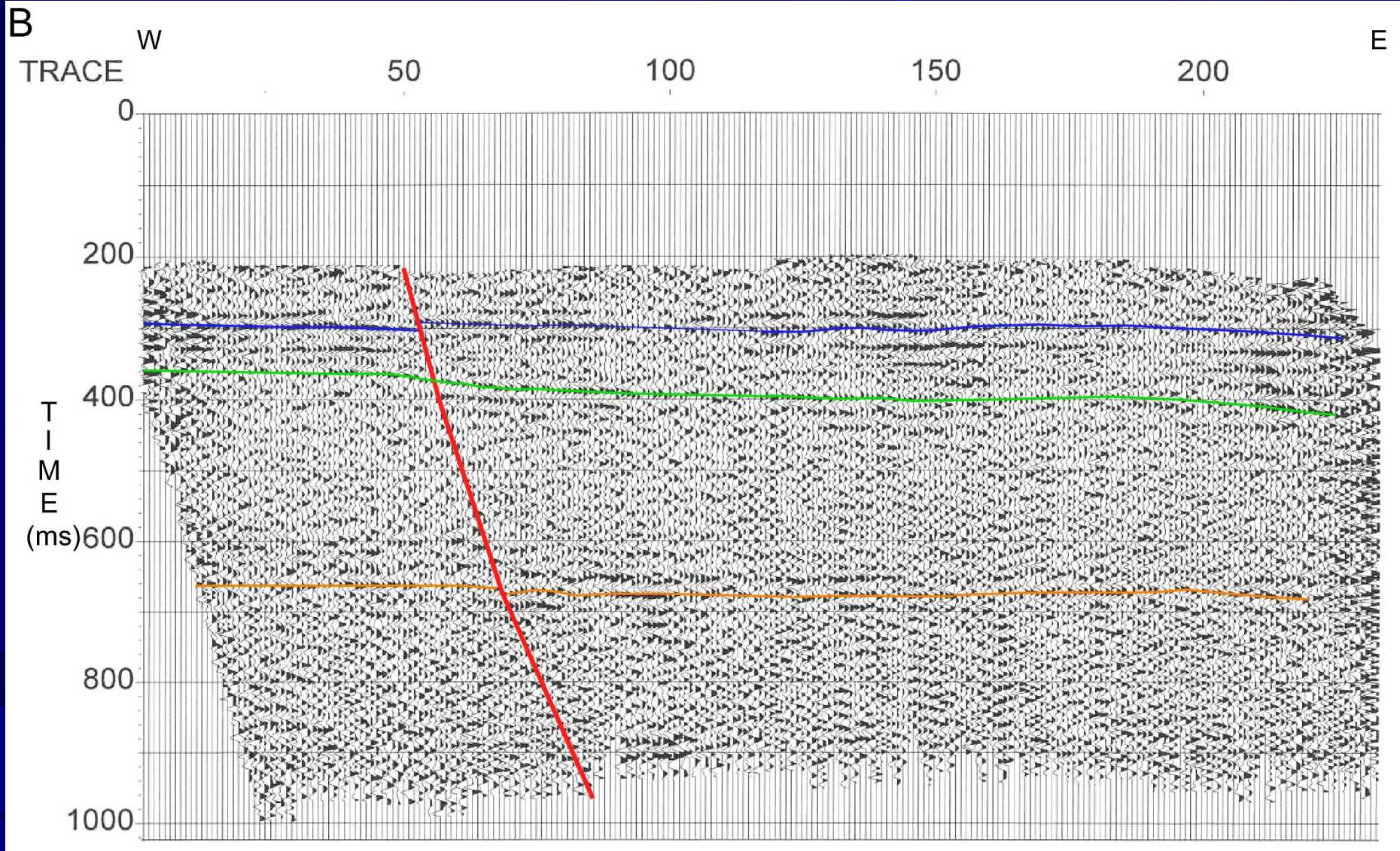
4 =  $1550 \pm 40$  BP

Folding/faulting  
occurred ~400 AD  
(Velasco et al.,  
2005)

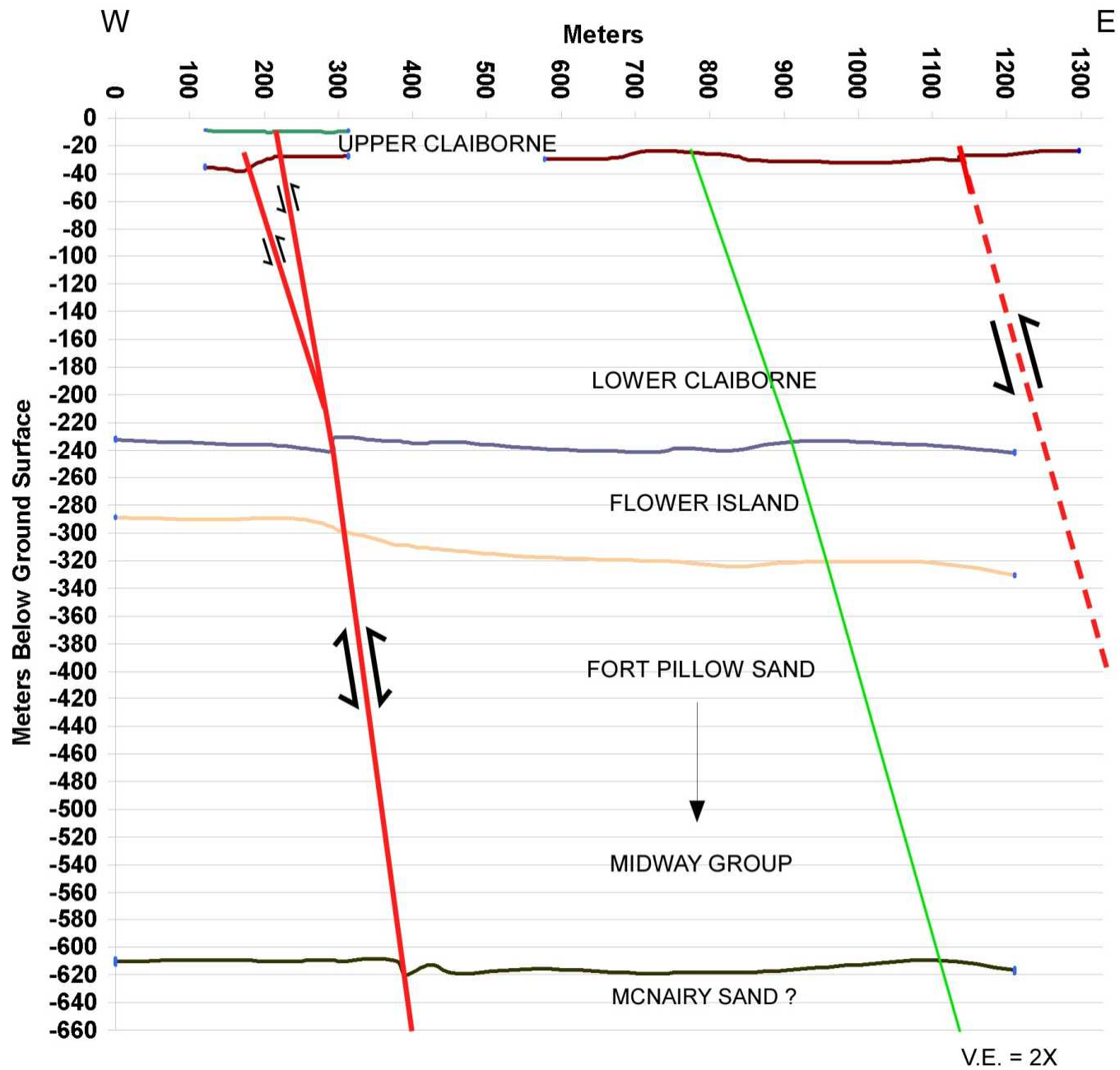


Faults and seismic reflection line locations



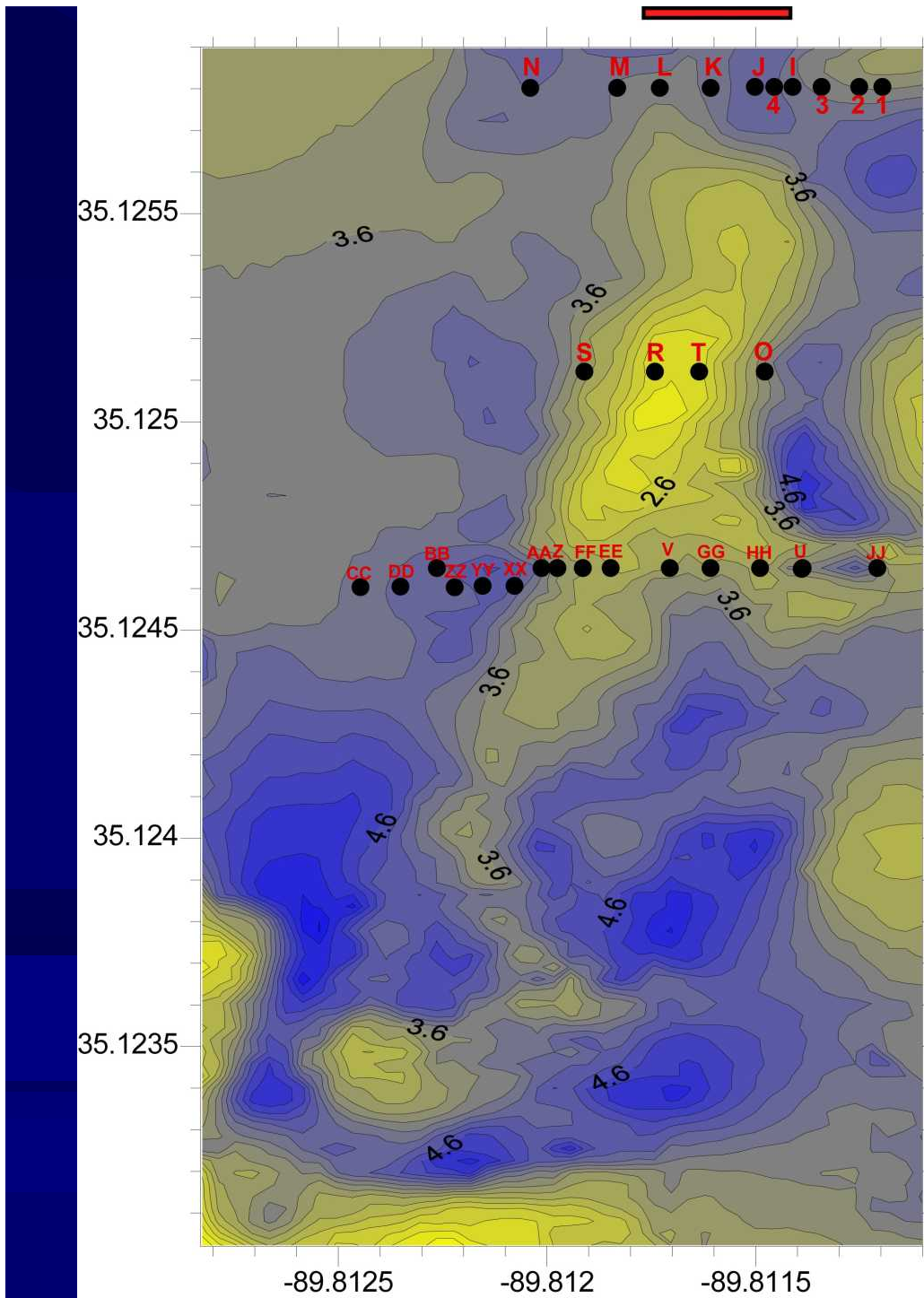


Shallow P-wave reflection line (Woolery)

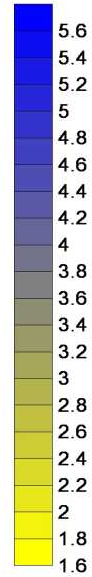


Geologic interpretation of seismic reflection data across the Ellendale and Shelby Farms faults (from Deen, 2006)





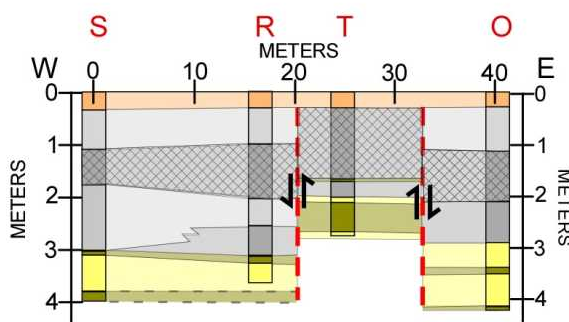
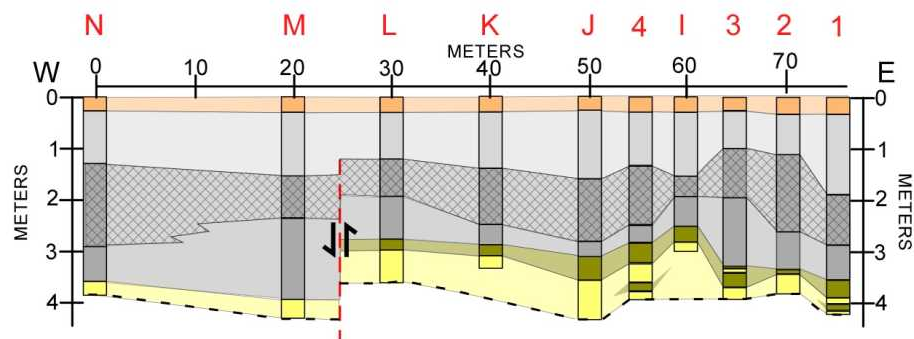
Micromhos



- Fault zone from Moore\_S
- Borehole ID
- Borehole location



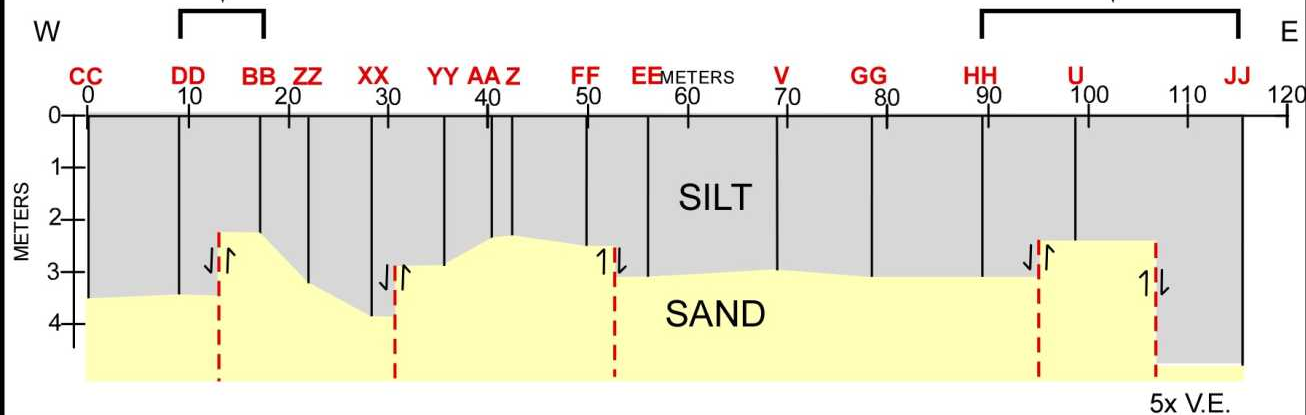
A.)



B.)

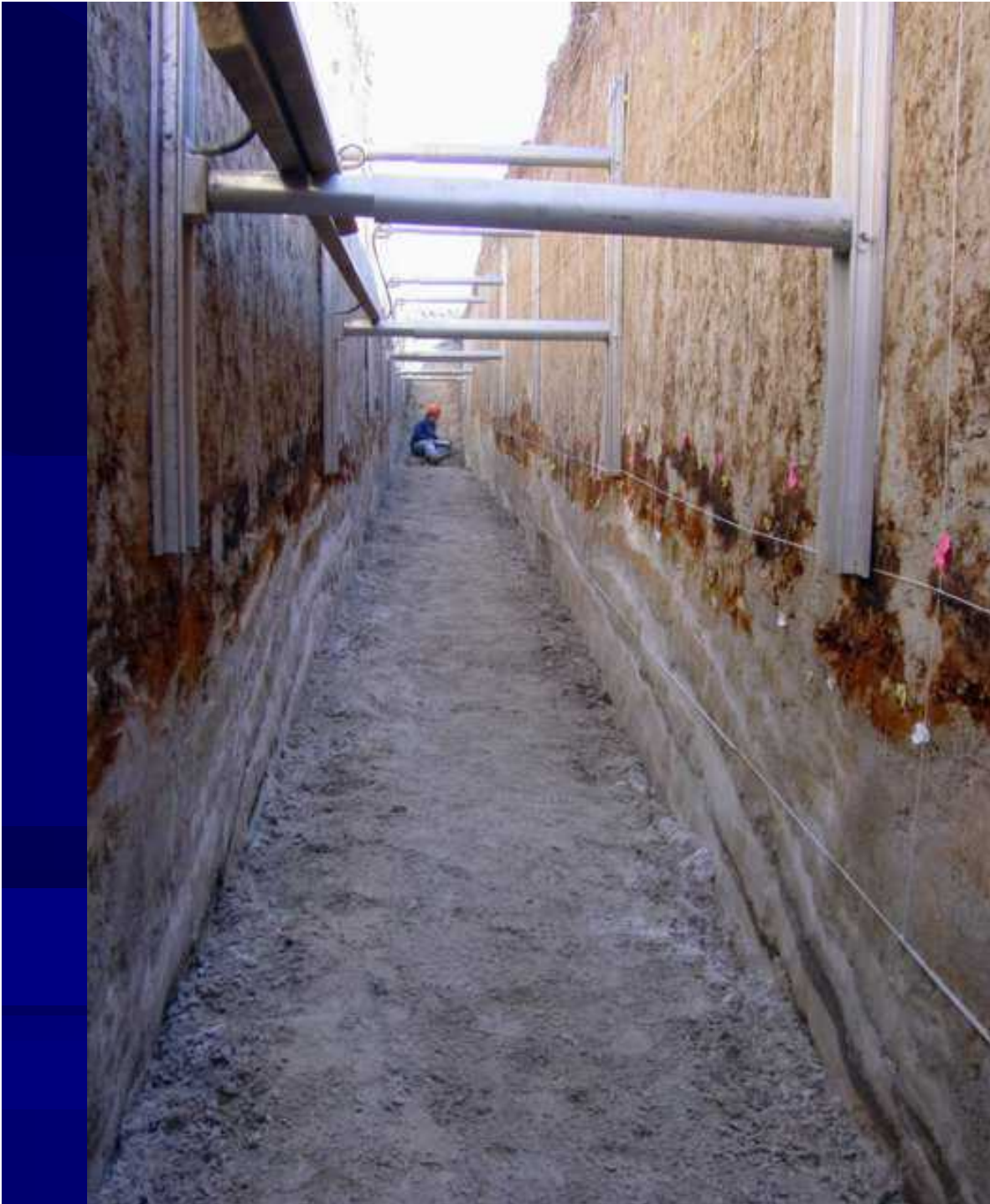
Shelby Farms Trench 2

Shelby Farms Trench 3

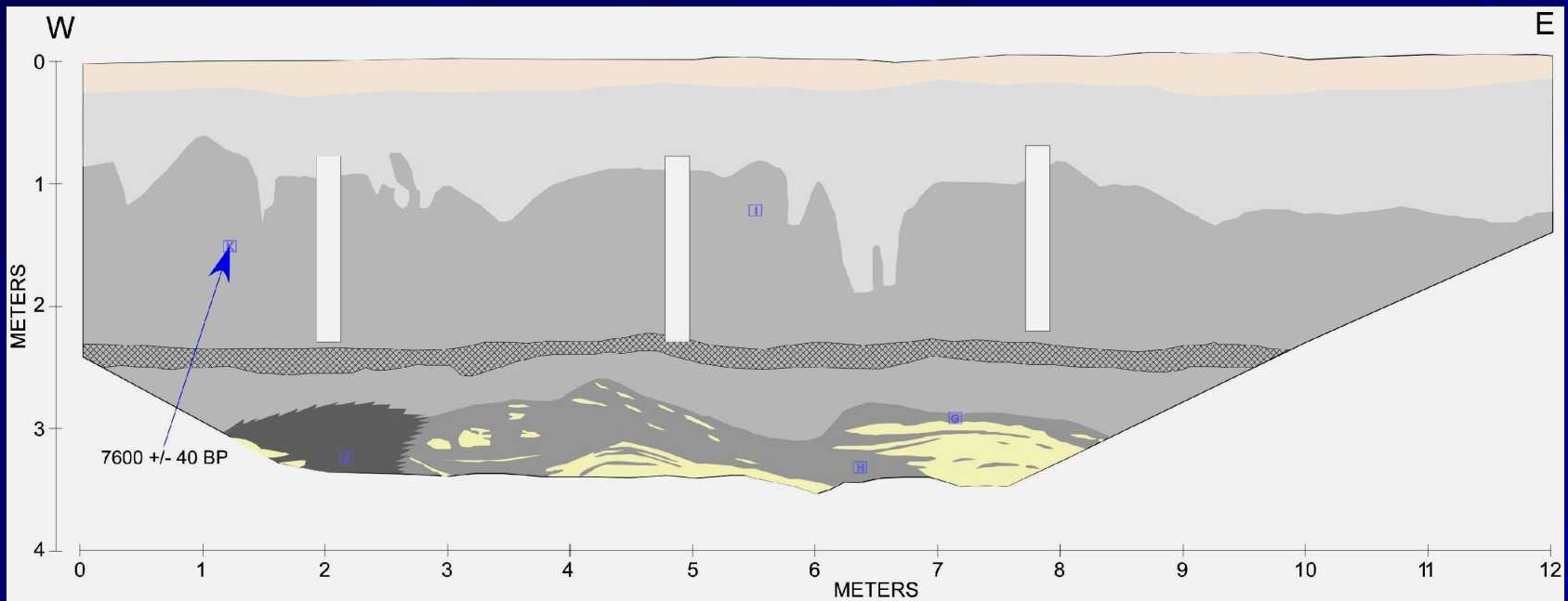


Geologic cross sections from Giddings rig cores





Shelby Farms trench across  
area of Ellendale fault

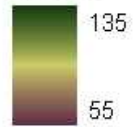


Trench across a portion of the Ellendale fault zone along Giddings rig cores BB-DD line (Deen, 2006)

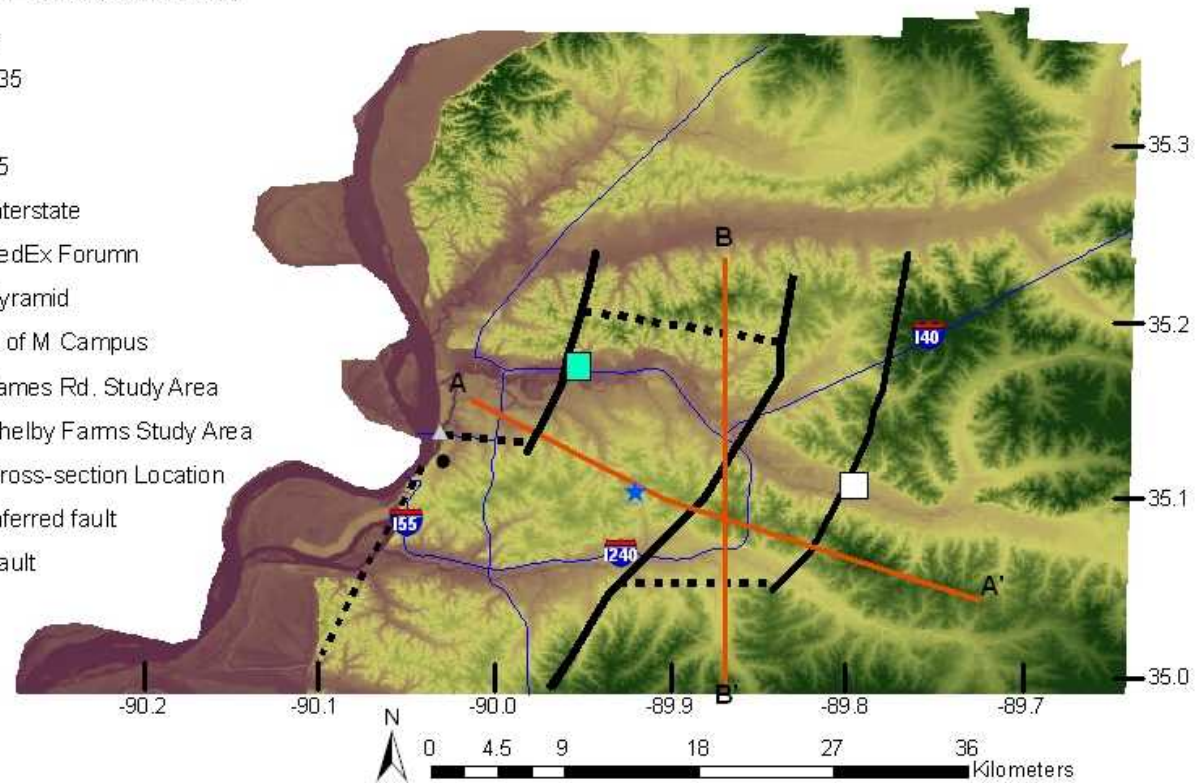


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Meters



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Shelby County faults and remainder of county to be mapped

## References Cited

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Cox, R.T., Van Arsdale, R.B., Harris, J.B., and Larsen, D., 2001, Neotectonics of the southeastern Reelfoot Rift zone margin, central United States, and implications for regional strain accommodation. *Geology*, v. 29, p. 419-422.

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Parrish, S., and Van Arsdale, R., 2004, Faulting along the southeastern margin of the Reelfoot rift in northwestern Tennessee revealed in deep seismic reflection profiles. *Seismological Research Letters*, v. 75, p. 782-791.

Velasco, M., Van Arsdale, R., Waldron, B., Harris, J., and Cox, R., 2005, Quaternary faulting beneath Memphis, Tennessee. *Seismological Research Letters*, v. 76, n. 5, p. 598-614.

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