



Utah's Oil Shale Deposits: Stratigraphy and Resource Evaluation

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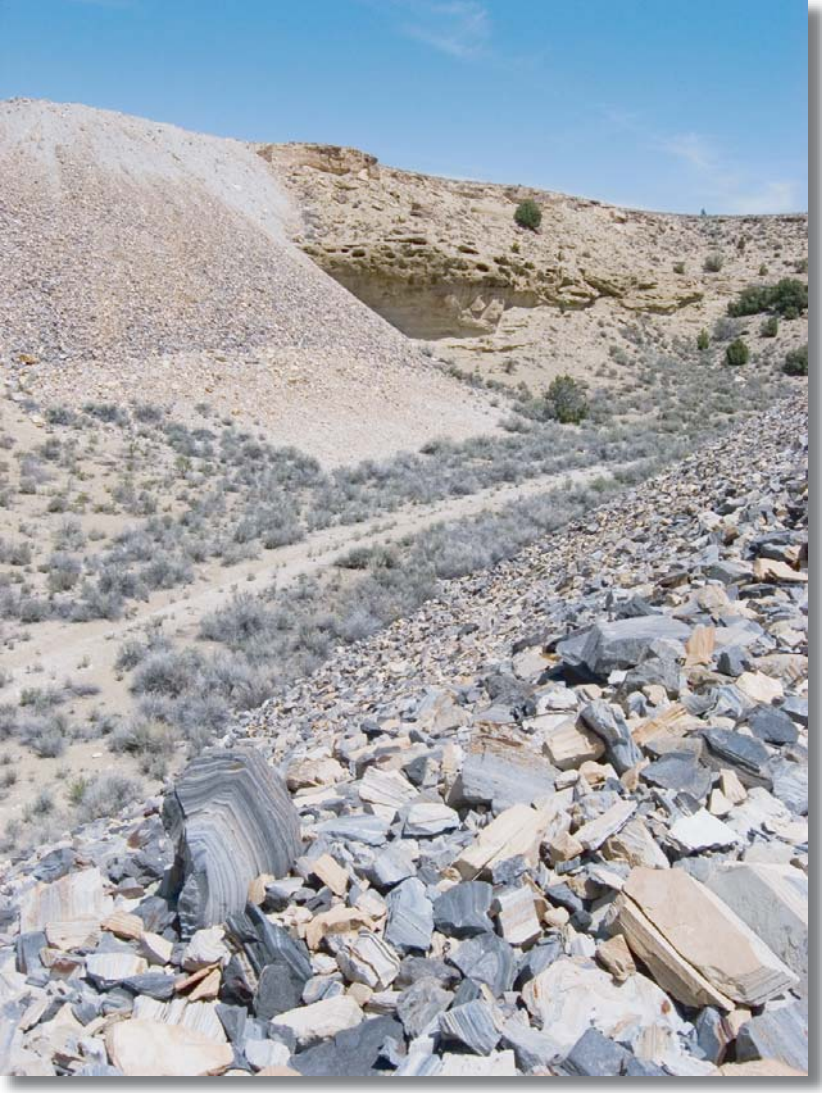
geology.utah.gov

METHODS FOR EVALUATING OIL SHALE RESOURCES

- Step 1:** Digitized density and sonic logs from oil shale wells
- Step 2:** Compared digitized density and sonic logs to Fischer assay analyses (measures shale oil yield in gallons per ton (GPT))
- Step 3:** Derived equations using a reduced major axes fit relating GPT to the sonic or density logs (see graphs below)
- Step 4:** Digitized density and sonic logs from oil and gas wells throughout the Uinta Basin
- Step 5:** Calculated shale oil yield logs for oil and gas wells using derived equations
- Step 6:** Determined maximum thickness of oil shale averaging 25, 35, and 50 GPT



Outcrop of the upper Green River Formation, Parachute Creek Member, Evacuation Creek at Hell's Hole, eastern Uintah County, Utah.



Oil shale stockpile at the White River underground mine. Shale was mined from the Mahogany Zone roughly 1000 feet below the surface.



The White River oil shale mine located south of Bonanza, Uintah County, Utah. This is the location of the BLM R&D oil shale lease which was awarded to Oil Shale Exploration Company (OSEC).



Utah oil shale sample from the White River mine.



Bird's nest features near the top of the Green River Formation (top of R-8) along Evacuation Creek, Uintah County, Utah. These cavities were created by the dissolution of nahcolite.



Outcrop of the Green River Formation along the White River, Uintah County, Utah.

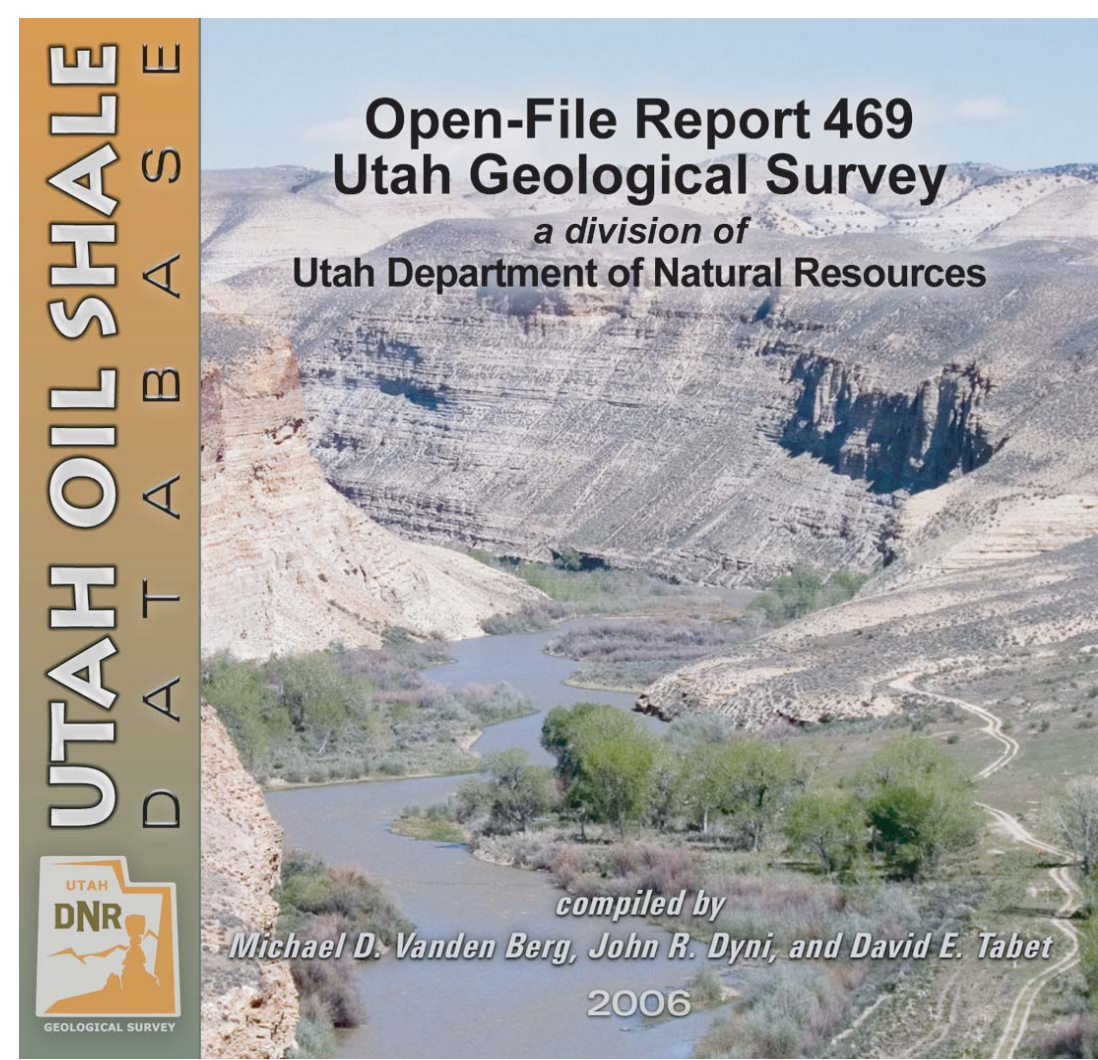
ABSTRACT

With the recent increase in crude oil prices and concerns over diminishing conventional reserves, the Utah Geological Survey has been re-examining the state's oil shale resource. Past assessments concentrated on the Eocene Green River Formation's Mahogany zone in the southeastern part of the Uinta Basin. This lithologic horizon holds the richest oil shale deposits in Utah, but other significant stratigraphic zones, as well as other areas within the basin, warrant further study. We have broadened our investigation to include the entire Green River Formation's Parachute Creek Member, which is found throughout much of the Uinta Basin. Over 100 density and sonic logs from oil and gas wells in the basin have been digitized and tops to key oil shale horizons have been picked. Structure contour and isopach maps were created for each zone, including the R-8, R-7 (Mahogany zone), R-6, R-5, and R-4 rich zones and the A-groove, B-groove, L-5, and L-4 lean zones. Cores from selected rich and lean oil shale horizons will be on display with the poster. In addition, we have correlated available Fischer assay analyses to geophysical logs as a way to produce high-resolution shale oil yield logs. This technique provided data to map oil shale thickness and richness throughout the basin and create structure contour and isopach maps with shale oil yields of 25, 35, and 50 gallons per ton of rock.

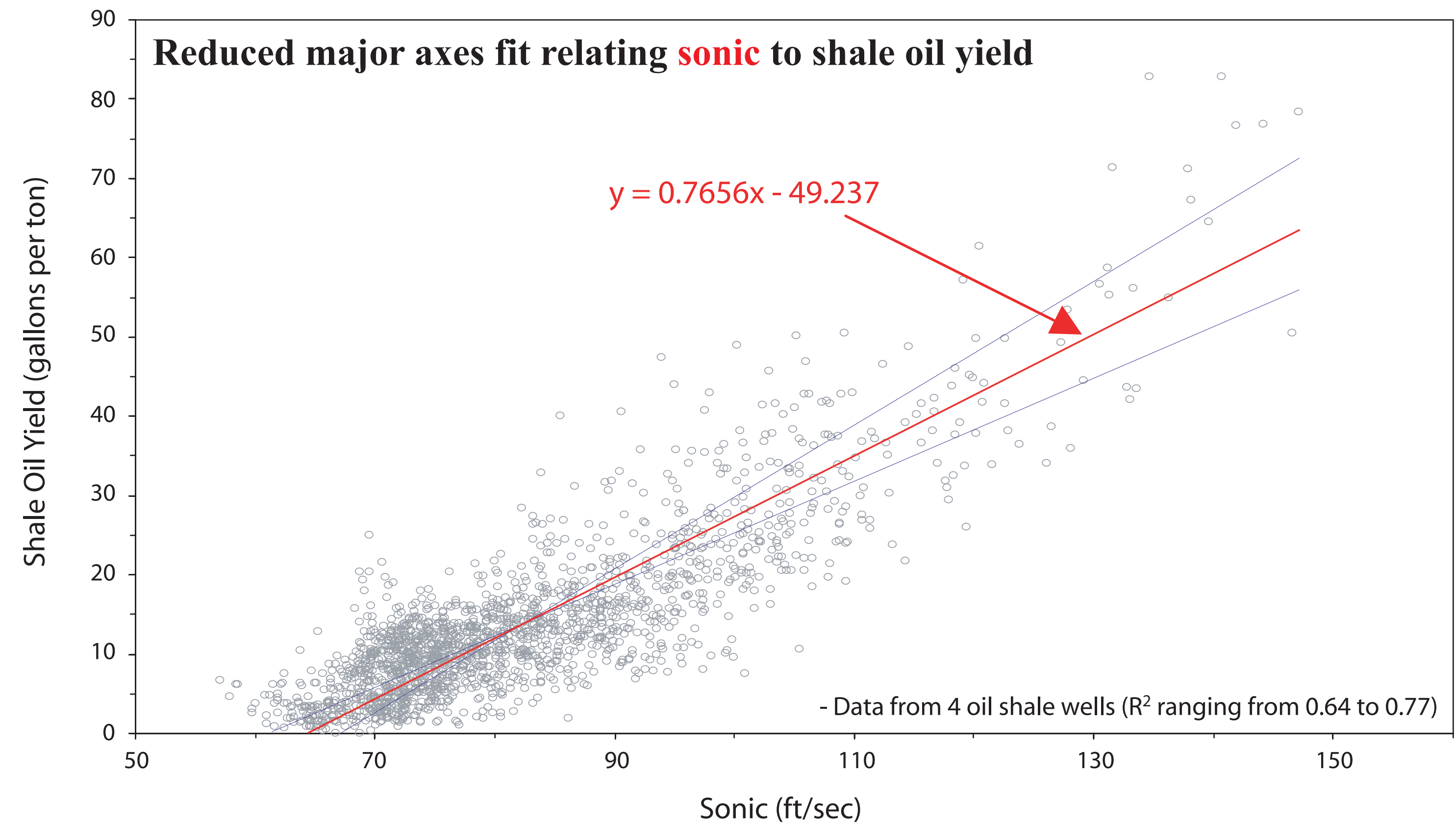
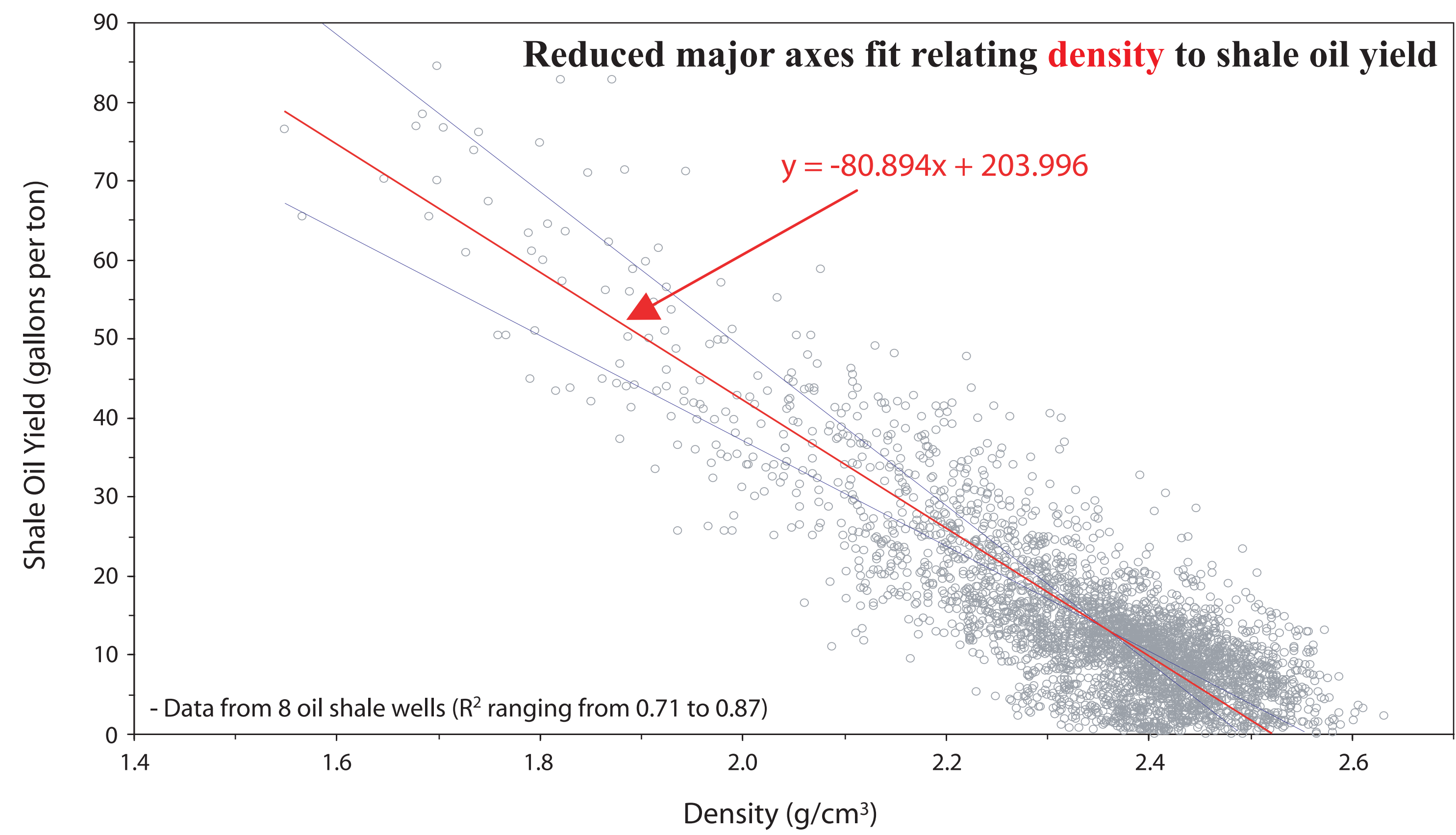
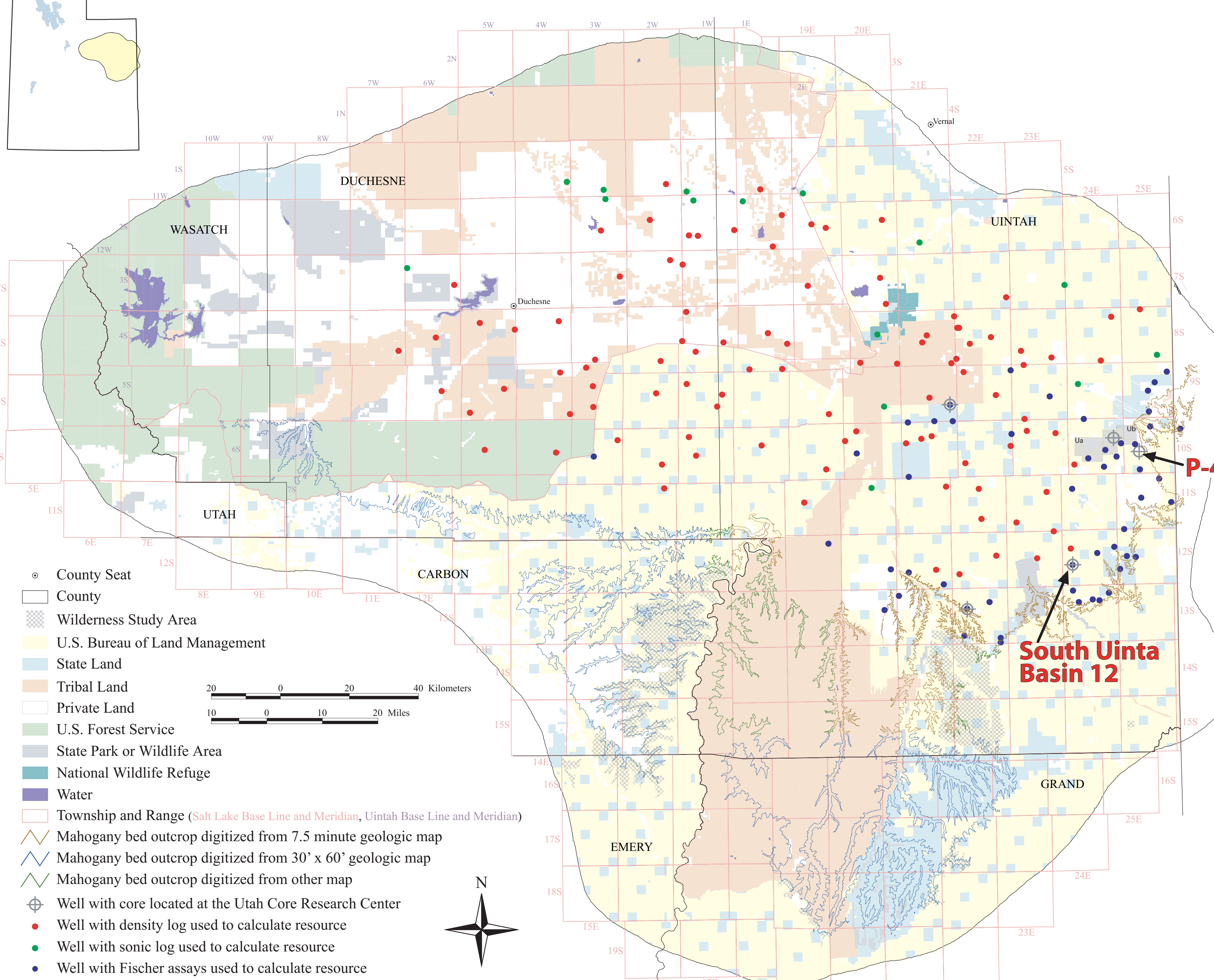
UTAH OIL SHALE DATABASE

UGS Open-File Report 469 (2006)
Collaboration between the Utah Geological Survey, U.S. Geological Survey, and the U.S. Bureau of Land Management

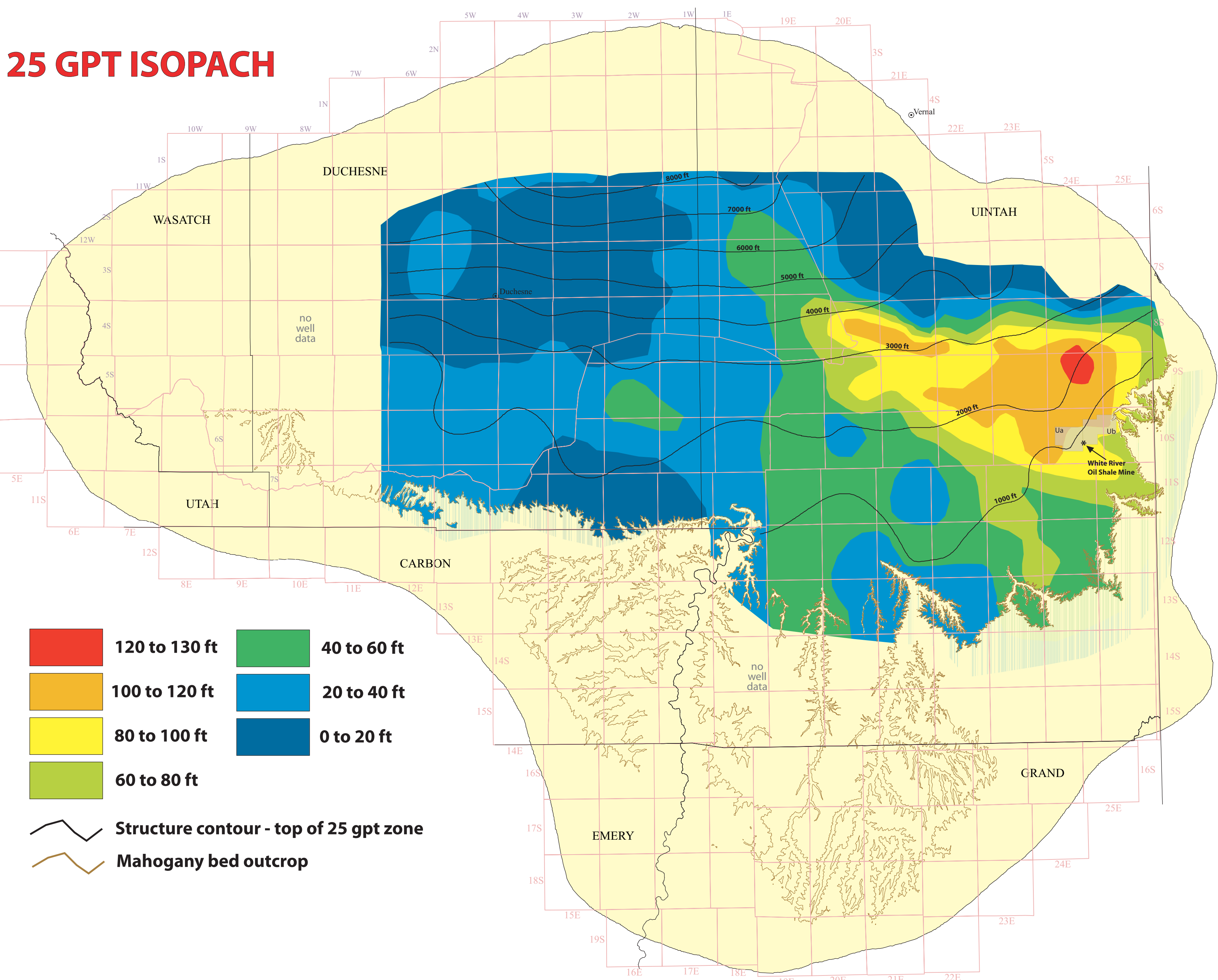
- Contents:
- Fischer assays for 581 wells
 - Excel and Text files
 - Limited pdf files of original reports
 - Lithologic logs for 168 wells
 - Pdf or Tiff files
 - Geophysical logs for 173 wells
 - Tiff files
 - An inventory of paper logs for an additional 290 wells available in the UGS library
 - Formation tops data for over 1000 wells
 - Excel or Text files
 - Extensive Utah oil shale bibliography
 - 981 references
 - Preliminary Utah oil shale resource map
 - New Mahogany bed outcrop coverage
 - Location of wells in database



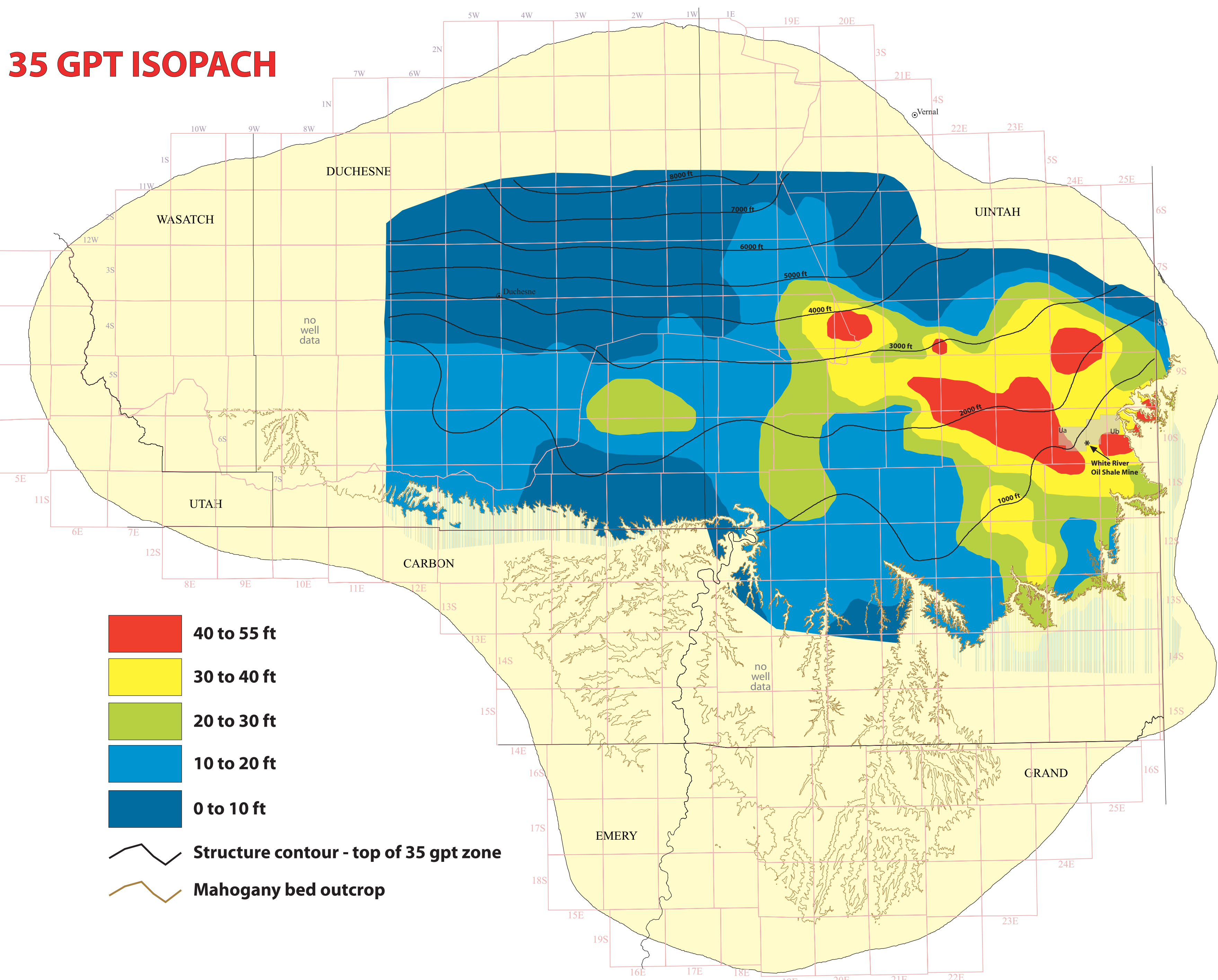
Map showing landownership in the Uinta Basin and the location of wells used in this study



25 GPT ISOPACH



35 GPT ISOPACH



50 GPT ISOPACH

