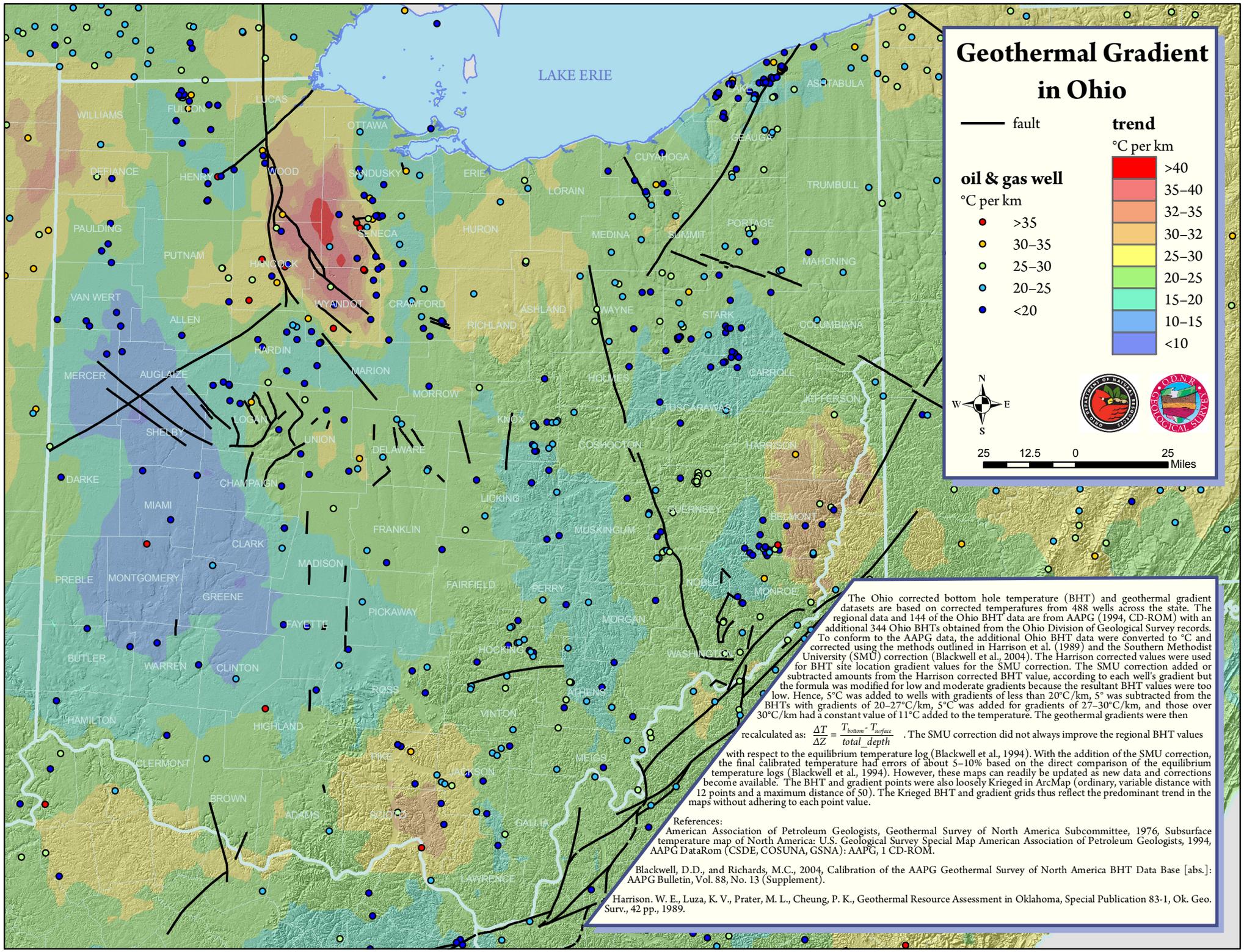
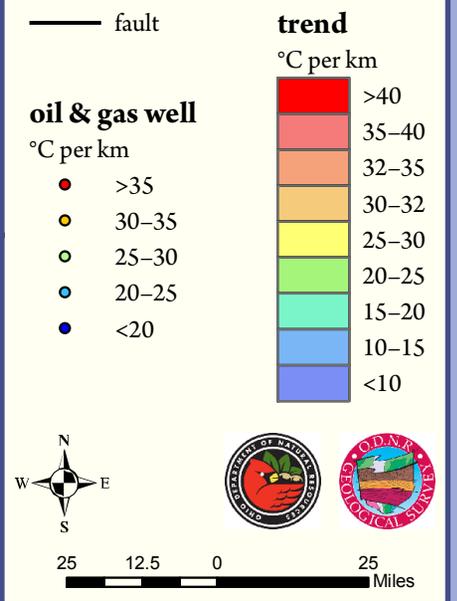


Geothermal Gradient in Ohio



The Ohio corrected bottom hole temperature (BHT) and geothermal gradient datasets are based on corrected temperatures from 488 wells across the state. The regional data and 144 of the Ohio BHT data are from AAPG (1994, CD-ROM) with an additional 344 Ohio BHTs obtained from the Ohio Division of Geological Survey records. To conform to the AAPG data, the additional Ohio BHT data were converted to °C and corrected using the methods outlined in Harrison et al. (1989) and the Southern Methodist University (SMU) correction (Blackwell et al., 2004). The Harrison corrected values were used for BHT site location gradient values for the SMU correction. The SMU correction added or subtracted amounts from the Harrison corrected BHT value, according to each well's gradient but the formula was modified for low and moderate gradients because the resultant BHT values were too low. Hence, 5°C was added to wells with gradients of less than 20°C/km, 5° was subtracted from the BHTs with gradients of 20–27°C/km, 5°C was added for gradients of 27–30°C/km, and those over 30°C/km had a constant value of 11°C added to the temperature. The geothermal gradients were then

recalculated as:
$$\frac{\Delta T}{\Delta Z} = \frac{T_{\text{bottom}} - T_{\text{surface}}}{\text{total depth}}$$

The SMU correction did not always improve the regional BHT values with respect to the equilibrium temperature log (Blackwell et al., 1994). With the addition of the SMU correction, the final calibrated temperature had errors of about 5–10% based on the direct comparison of the equilibrium temperature logs (Blackwell et al., 1994). However, these maps can readily be updated as new data and corrections become available. The BHT and gradient points were also loosely Krieged in ArcMap (ordinary, variable distance with 12 points and a maximum distance of 50). The Krieged BHT and gradient grids thus reflect the predominant trend in the maps without adhering to each point value.

References:
American Association of Petroleum Geologists, Geothermal Survey of North America Subcommittee, 1976, Subsurface temperature map of North America: U.S. Geological Survey Special Map American Association of Petroleum Geologists, 1994, AAPG DataRom (CSDE, COSUNA, GSNA): AAPG, 1 CD-ROM.

Blackwell, D.D., and Richards, M.C., 2004, Calibration of the AAPG Geothermal Survey of North America BHT Data Base [abs.]: AAPG Bulletin, Vol. 88, No. 13 (Supplement).

Harrison, W. E., Luza, K. V., Prater, M. L., Cheung, P. K., Geothermal Resource Assessment in Oklahoma, Special Publication 83-1, Ok. Geo. Surv., 42 pp., 1989.