GROUNDWATER TEMPERATURES OF MISSOURI DISSECTED TILL PLAINS PHYSIOGRAPHIC REGION

Geology and Digital Compilation by
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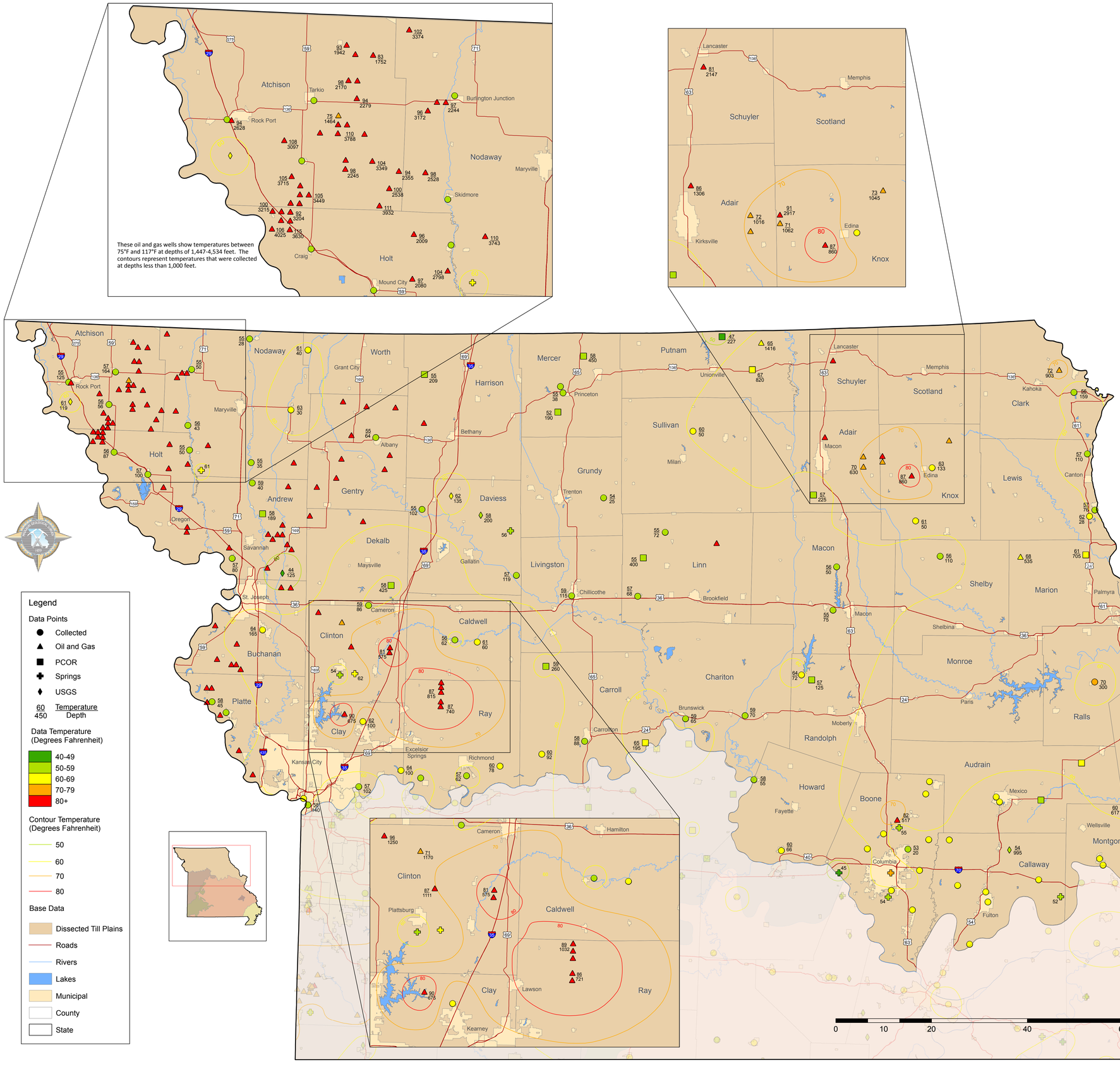

Legend

Data Points

- Collected
- Oil and Gas
- PCOR
- Springs
- USGS

60 / 450 Temperature / Depth

Data Temperature (Degrees Fahrenheit)

- 40-49
- 50-59
- 60-69
- 70-79
- 80+

Contour Temperature (Degrees Fahrenheit)

- 50
- 60
- 70
- 80

Base Data

- Dissected Till Plains
- Roads
- Rivers
- Lakes
- Municipal
- County
- State

MAP DESCRIPTION

The Dissected Till Plains cover northern Missouri and are characterized by Pennsylvanian-age sandstones, shales and limestones that are overlain by glacial drift. Mississippian- to Ordovician-age strata are exposed along the Missouri and Mississippi rivers and produce some water. Pennsylvanian strata have generally low permeability and yield small quantities of mineral-quality water. Usage of water from glacial drift, including pre-glacial stream valleys, increases to the west.

Groundwater temperatures throughout the map range from mid-50°F to mid-60°F in the uppermost aquifer. The temperatures are permissible for GSHP system use. Areas of higher and lower temperatures are scattered throughout the map area and range from upper 40°F values to values higher than 80°F. No values reached 90°F.

Temperatures of 80°F or higher are found within an area in Caldwell, Clay, Clinton and Ray counties at depths of less than 1,000 feet. Similar temperatures are found in individual occurrences in Boone, Knox and St. Louis counties. Individual occurrences at depths greater than 1,000 feet were found in Adair, Pike and St. Charles counties. Wells with temperatures of 70°F to 79°F were measured in Adair, Atchison, Clark, Knox and Putnam counties. In addition, oil and gas wells at depths greater than 1,000 feet in the western portion of these areas have temperatures in the 80°F and higher range.

DATA COLLECTION

New data collected included existing residential and commercial water wells and springs. Pre-existing data used in this project was collected from multiple sources for greater detail: Missouri Department of Natural Resources, Division of Geology and Land Survey (DGLS) written data files, US. Geological Survey (USGS) National Water Information System (NWIS) electronic data files, US Environmental Protection Agency (USEPA) STORET electronic data files, Plains CO2 Reduction (PCOR) Partnership data was collected in part with funding from the U.S. Department of Energy (DOE) through the PCOR regional partnership. Spring temperatures were obtained from DGLS files. Data from landfill monitoring wells was obtained from the Missouri Department of Natural Resources, Solid Waste Management Program records.

Temperature data on the map was contoured to all data collected at a depth of less than 1,000 feet, in intervals of 10°F. With the exception of the insets, data points that are not labeled are deeper than 1,000 feet and were not contoured.

ACKNOWLEDGEMENTS

Data collection could not have been possible without the generosity of Public Water Supply Districts and City Water Departments state-wide that provided access and accompaniment to their water wells. The Missouri Department of Natural Resources, Division of Environmental Quality provided access to their library for collection of landfill monitoring well data. The Missouri Department of Conservation and Missouri Department of Natural Resources, Division of State Parks allowed access to their private lands. The assistance of Fletcher Bone, DGLS, in data collection was invaluable. Thank you to Nicholas Newport, Division of Energy, for his overall support of the project.