GROUNDWATER TEMPERATURES OF MISSOURI SALEM PLATEAU AND ST. FRANCOIS MOUNTAINS PHYSIOGRAPHIC REGIONS

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MAP DESCRIPTION

The Salem Plateau contains the most extensive groundwater resources in the state. The St. Francois and Ozark aquifers underlie the province and are separated by the St. Francois confining unit. The Ozark aquifer comprises bedrock units from Potosi Dolomite to Kimmswick Limestone in the Salem Plateau. The St. Francois Mountains Province comprises Precambrian granites and rhyolites in part overlain by Cambrian-age sandstone, dolomite and limestone. The igneous rocks have low water yields; however, potential exists for higher temperature water due to concentrations of radioactive isotopes in several granite formations. The St. Francois aquifer is also a producer in this region.

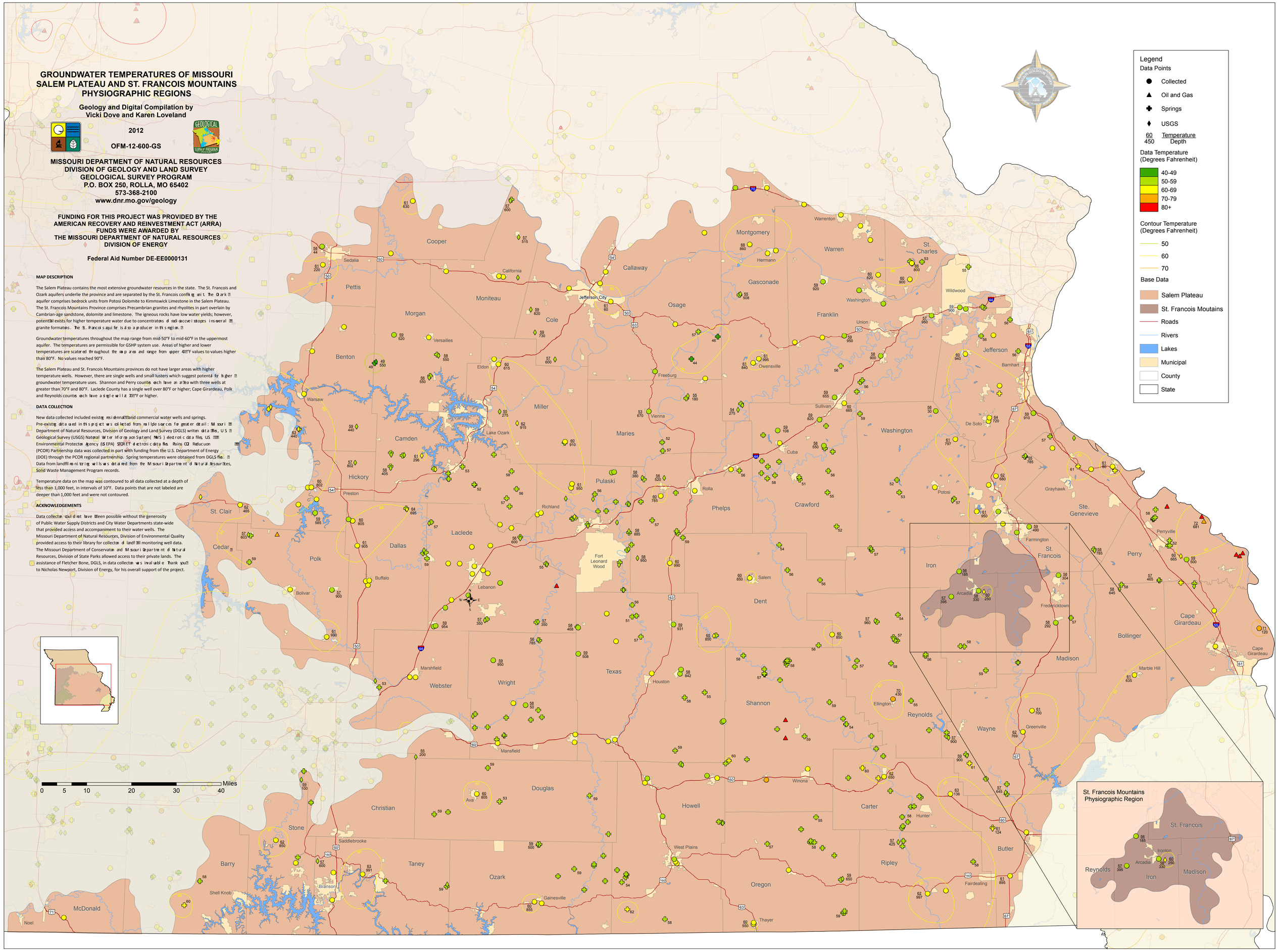
Groundwater temperatures throughout the map range from mid-50°F to mid-60°F in the uppermost aquifer. The temperatures are permissible for GSHP system use. Areas of higher and lower temperatures are scattered throughout the map area and range from upper 40°F values to values higher than 80°F. No values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

The Salem Plateau and St. Francois Mountains provinces do not have larger areas with higher temperature wells. However, there are single wells and small clusters which suggest potential for higher groundwater temperature uses. Shannon and Perry counties each have an area with three wells at greater than 70°F and 80°F. Laclede County has a single well over 80°F or higher; Cape Girardeau, Polk and Reynolds counties each have a single well at 70°F or higher.

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, U.S. Geological Survey (USGS) National Water Information System (NWIS) electronic data files, US Environmental Protection Agency (USEPA) STORET electronic data files. Rains 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. 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.