PROSPECTING GEOTHERMAL RESOURCES IN HAWAII

Application of GIS Mapping and Groundwater Chemistry

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ABSTRACT

The greatest period of water chemistry research pertaining to geothermal exploration in Hawaii was from 1970-1980. During that time period, the chemistry from hundreds of water wells statewide was published, with focus on the Cl/Mg ratio and SiO_2 concentrations as indicators of subsurface heat. This project focused on combining the water chemistry data published in the 1970s-1980s with the most recent and relevant water chemistry data pertaining to geothermal exploration in Hawaii. Drawing on the Cl/Mg ratio and SiO_2 concentrations used in the past, and also utilizing several additional geothermal chemical indicators- the SO_4/Cl ratio and the SO_4-Cl-HCO_3 water classification ternary diagram, we were able to identify water chemistry anomalies that were not previously noted. By incorporating GIS mapping of the anomalous values of the above noted species in wells across the state, we were able to not only visually observe any localized patterns, but also account for climatic and anthropogenic variables which may affect water chemistry. The proceedings provide a comprehensive water chemistry report that may be used as a geothermal exploration tool in Hawaii.