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***Presents***

# Geophysical Applications to Geothermal Resource Assessment and Their Uncertainty

***By***


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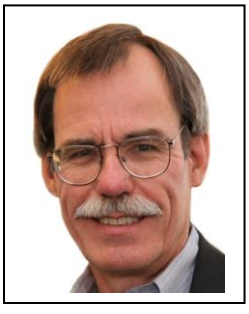
**ABSTRACT:**

Effective applications of geophysics to geothermal resource development do not focus on anomalies but on constraining an integrated resource conceptual model while explicitly considering the implications of uncertainty in data, inversion and conceptual inference. The magnetotelluric (MT) method is emphasized in commercial geothermal exploration because it constrains the 3D geometry of the low resistivity impermeable smectite clay that caps the buoyant thermal water upflow and outflow in geothermal reservoirs. Recent examples illustrate how incomplete consideration of MT uncertainty in the context of geochemistry, geology and thermodynamic constraints can lead to well targeting failures. A Rotokawa Geothermal Field case history illustrates how addressing uncertainty and integrating engineering and geoscience data into a consistent range of conceptual models improves practical applications of MT imaging and earthquake monitoring to reservoir simulation.


**BIO:**



William (Bill) Cumming is an independent consultant who provides technical and management services for geophysical surveys, geothermal resource risk assessment, geophysical research and training in the geothermal industry. His 35 years of geothermal experience include over 20 years with Unocal Corporation (now Chevron) in positions from Geophysicist to Chief Geoscientist. Since 2000, his has provided consulting services to geothermal industry, academic and government clients at over 40 geothermal fields and 100 prospects in the Americas, New Zealand, SE Asia, Europe and Africa. His publications stress the integration of geophysics with results from other disciplines and developing resource conceptual models for well targeting and capacity risk assessment.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