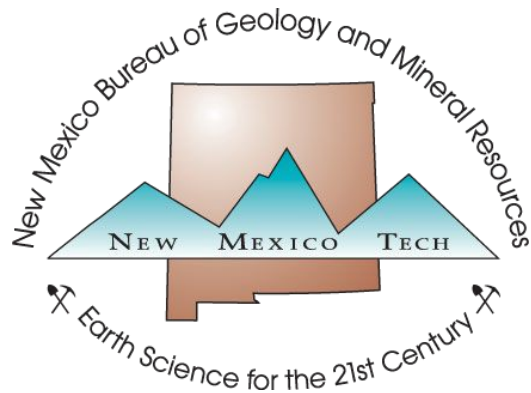


New Mexico's Geothermal Program at NMT

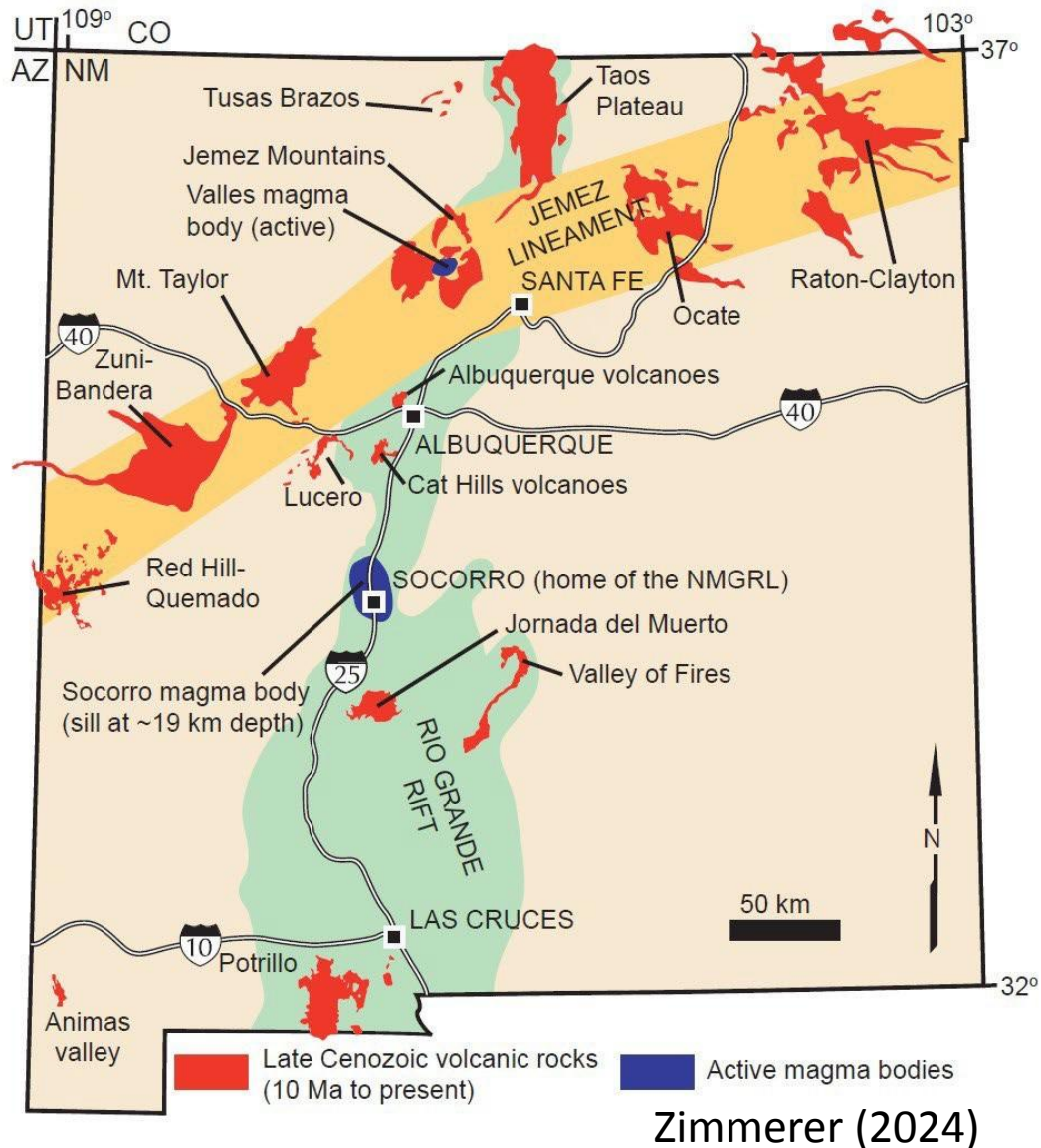
Dr. Shari Kelley

Senior Research Scientist, Geothermal Program

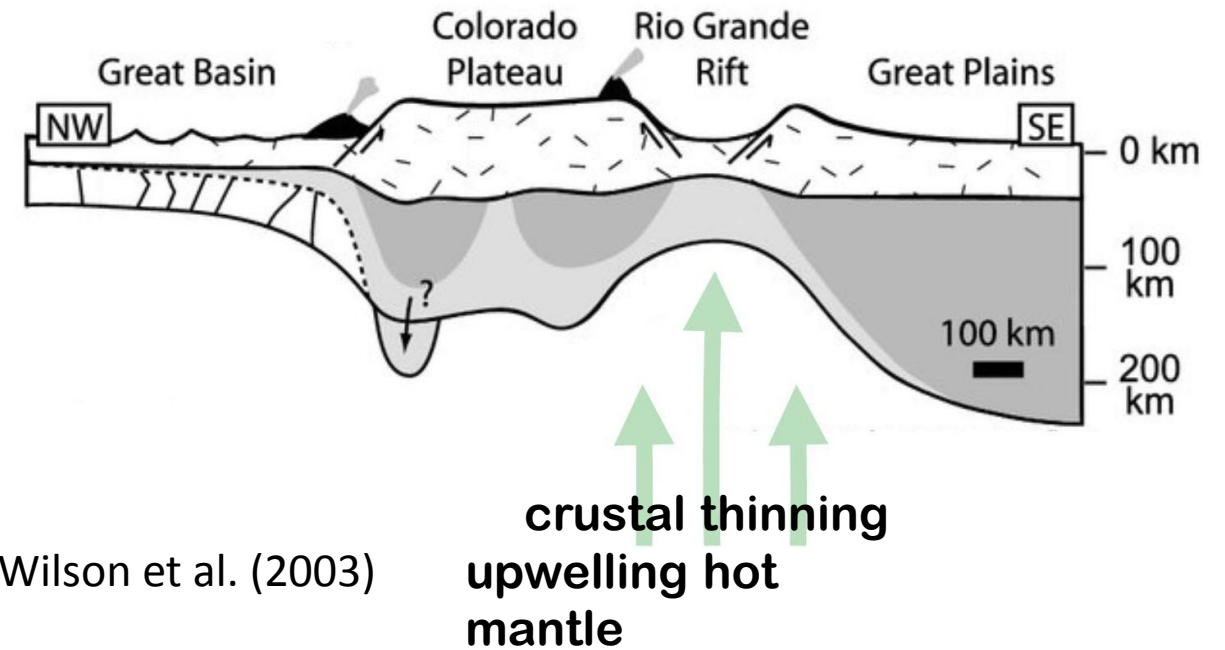
NM Bureau of Geology and Mineral Resources



Geothermal Energy Basics

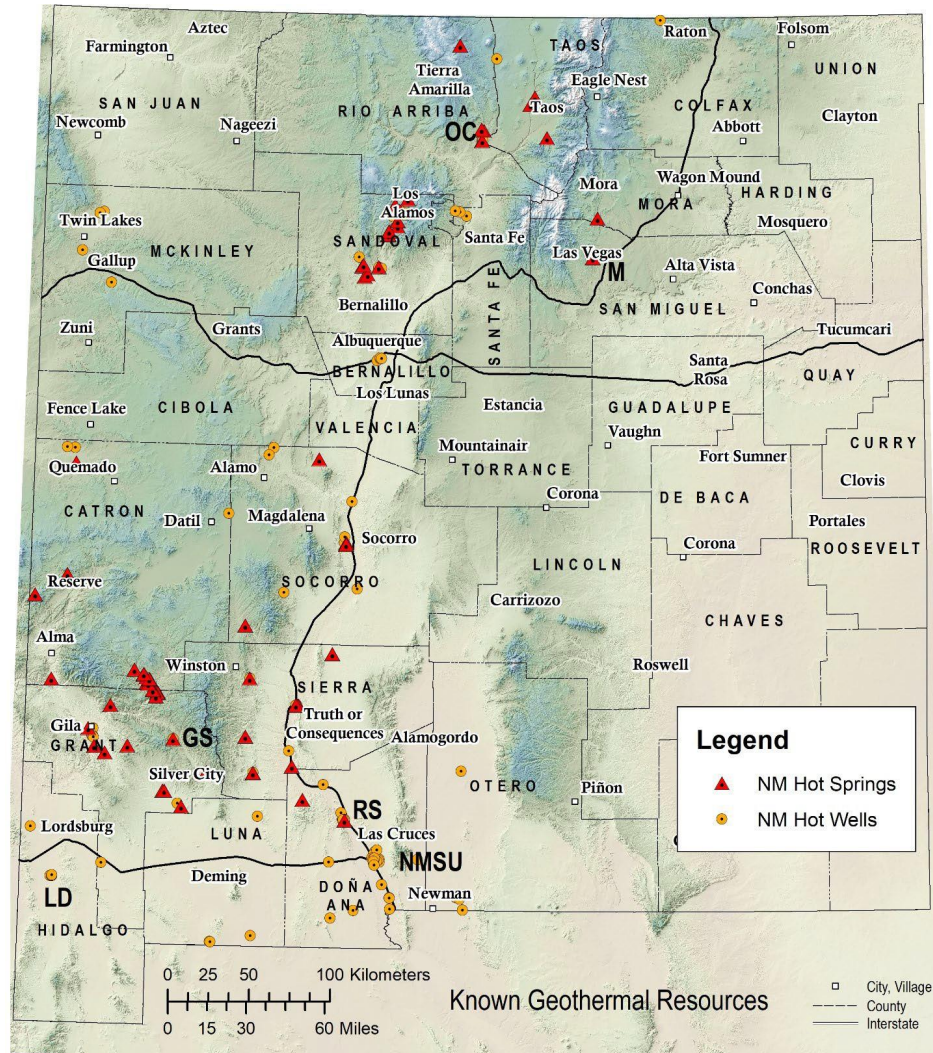


The geothermal potential of New Mexico is driven by two tectonic features: the Rio Grande rift and the Jemez lineament



Wilson et al. (2003)

Direct Use Geothermal Systems

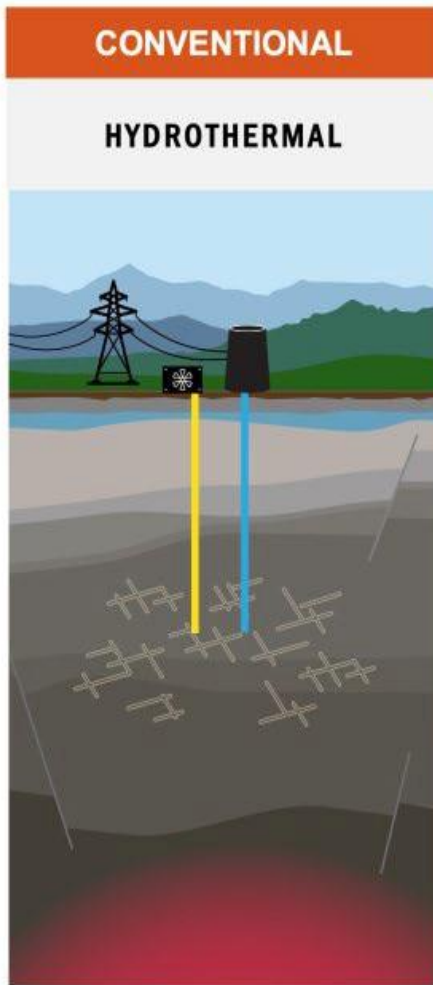


LD=Lightning Dock; RS=Radium Springs; GS=Gila Hot Spring;
NMSU=New Mexico State University; OC=Ojo Caliente; M=Montezuma

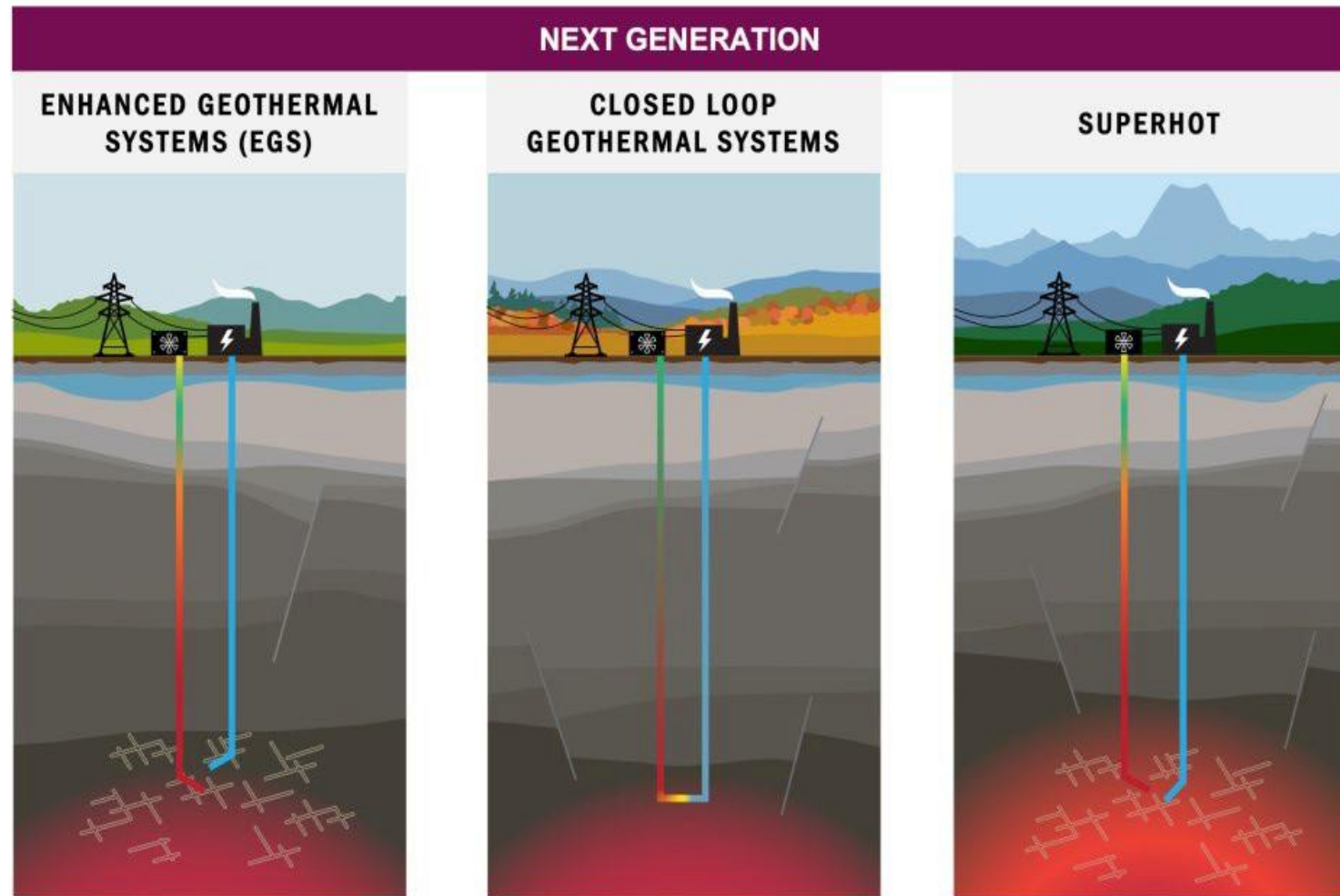


Direct uses of Earth's geothermal heat include recreational soaking, heating greenhouses and fish farms, and heating and cooling buildings.

High Temperature Geothermal (>150°C) for Electricity



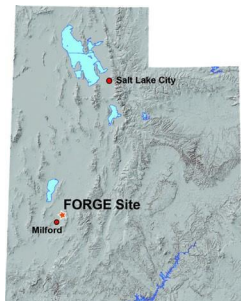
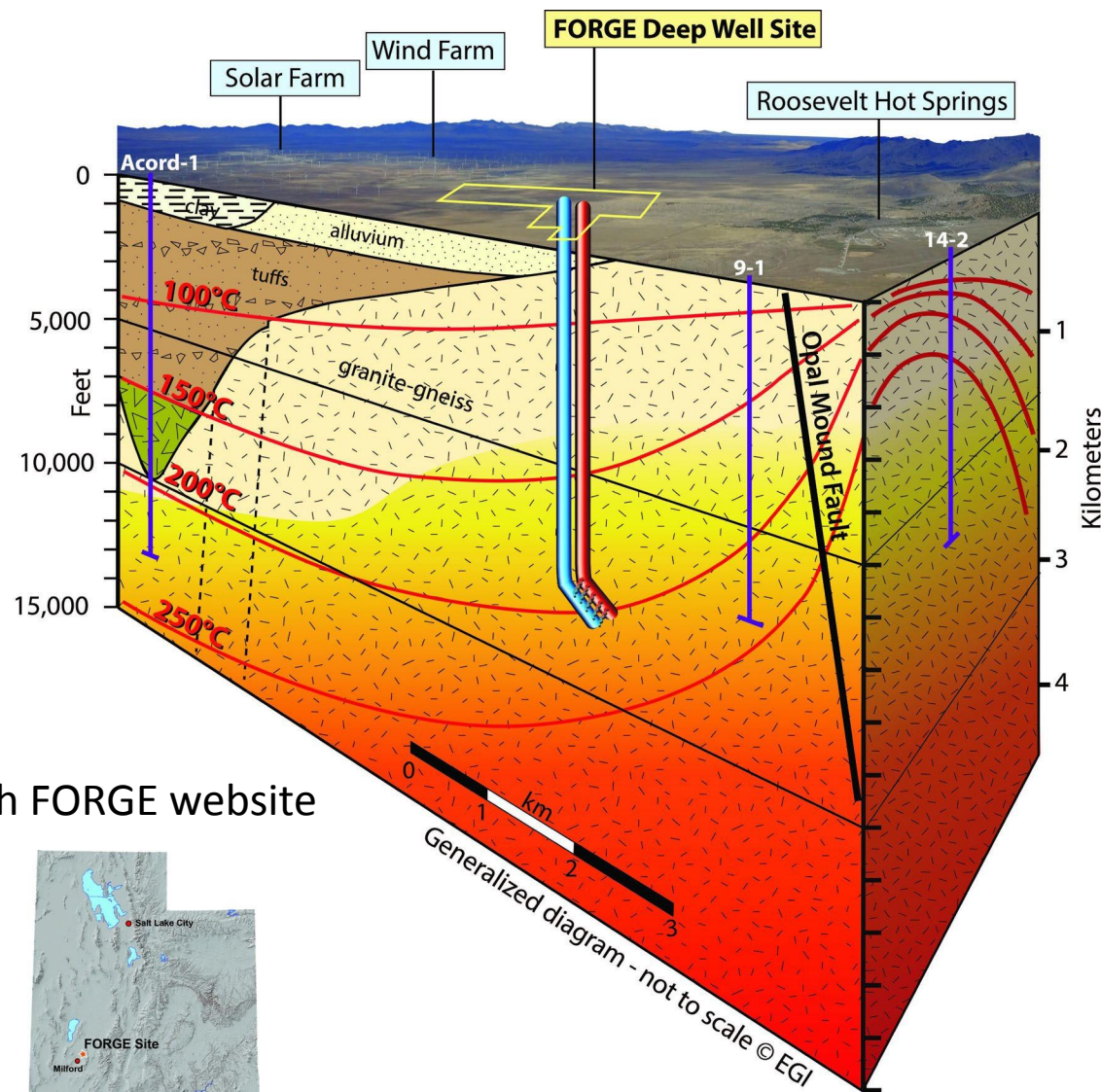
natural fractures



engineered fractures

saves water

visionary energy source

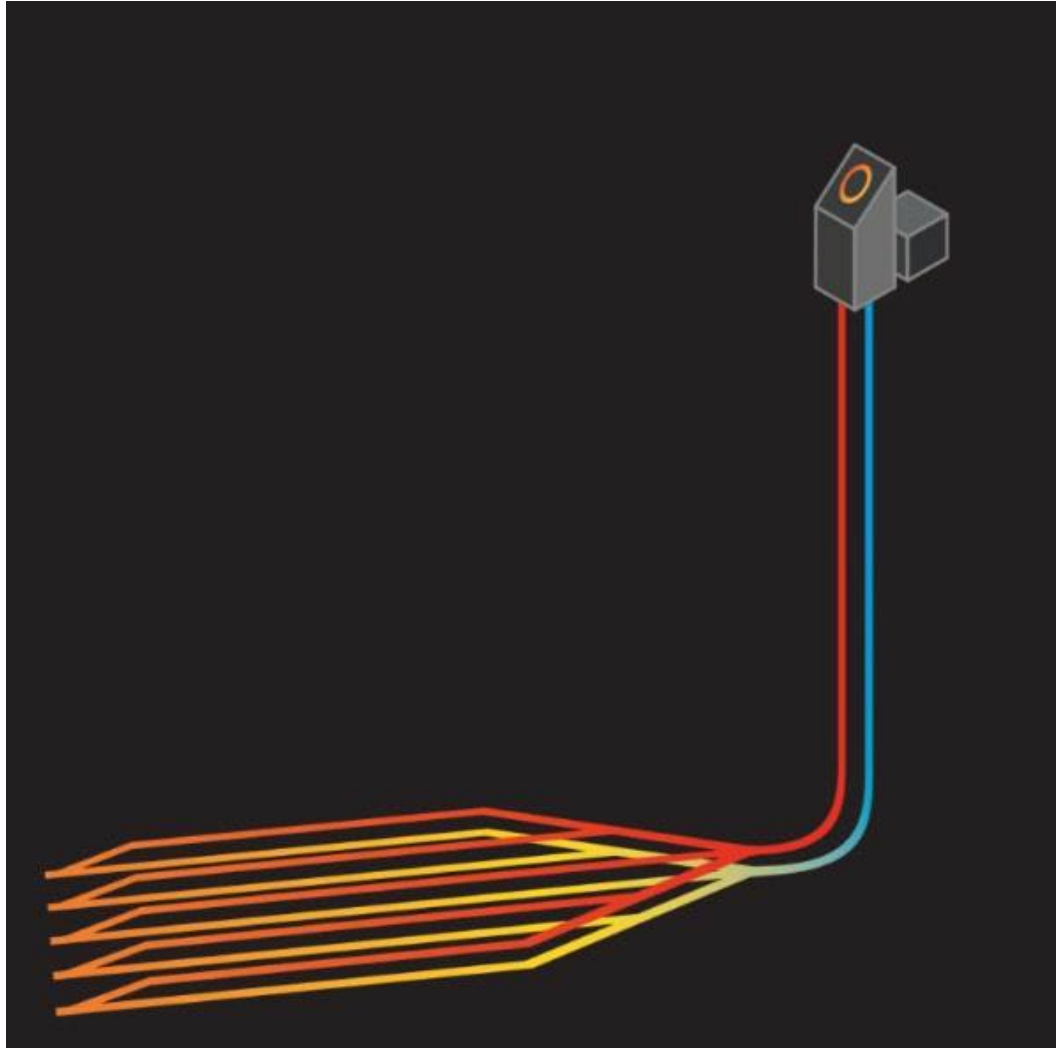


Engineered Geothermal Systems

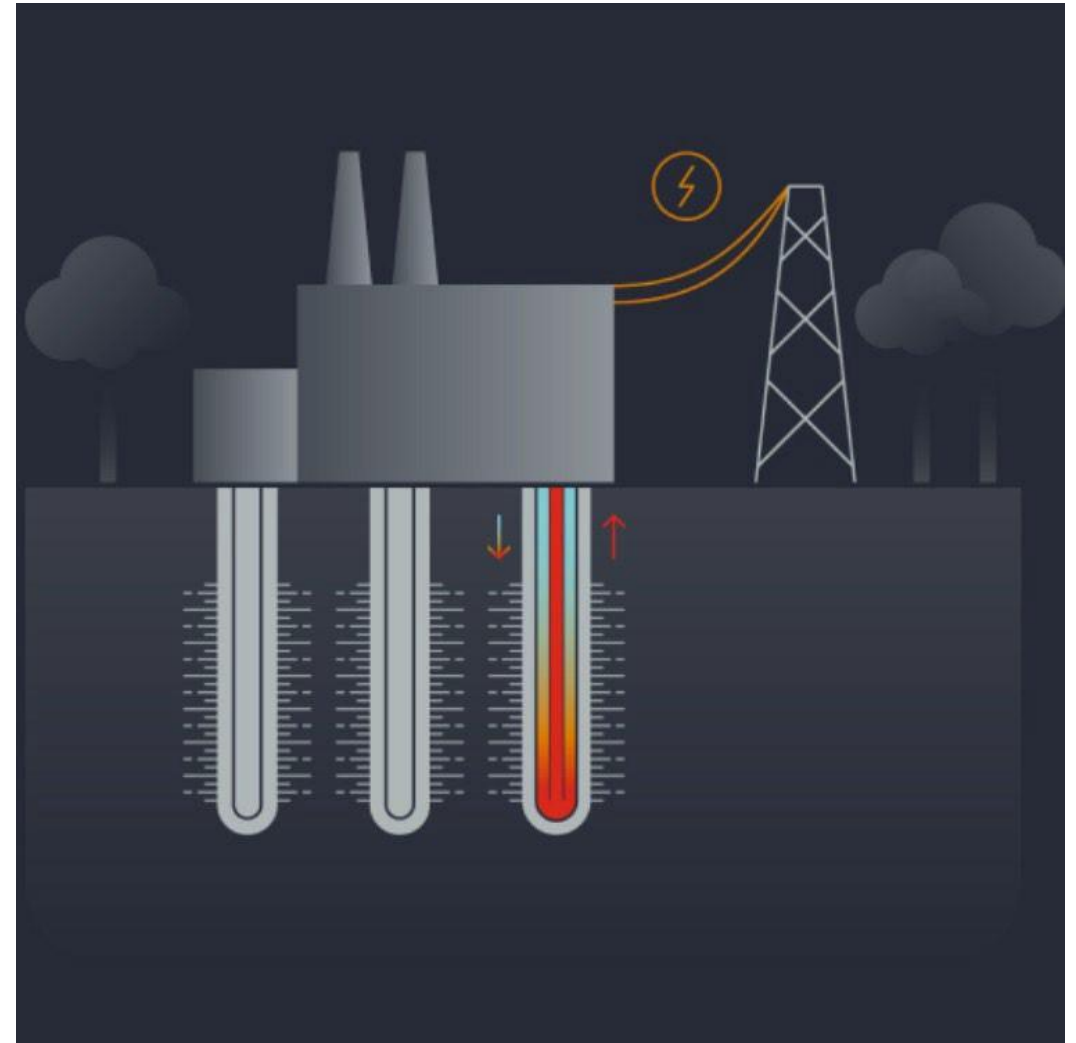
Researchers at the DOE FORGE site in Utah are using technologies developed by the oil and gas industry during the “shale revolution” to reduce drilling costs.

polycrystalline diamond carbide drill bits = faster drilling rates = lower upfront costs

Closed Loop Systems

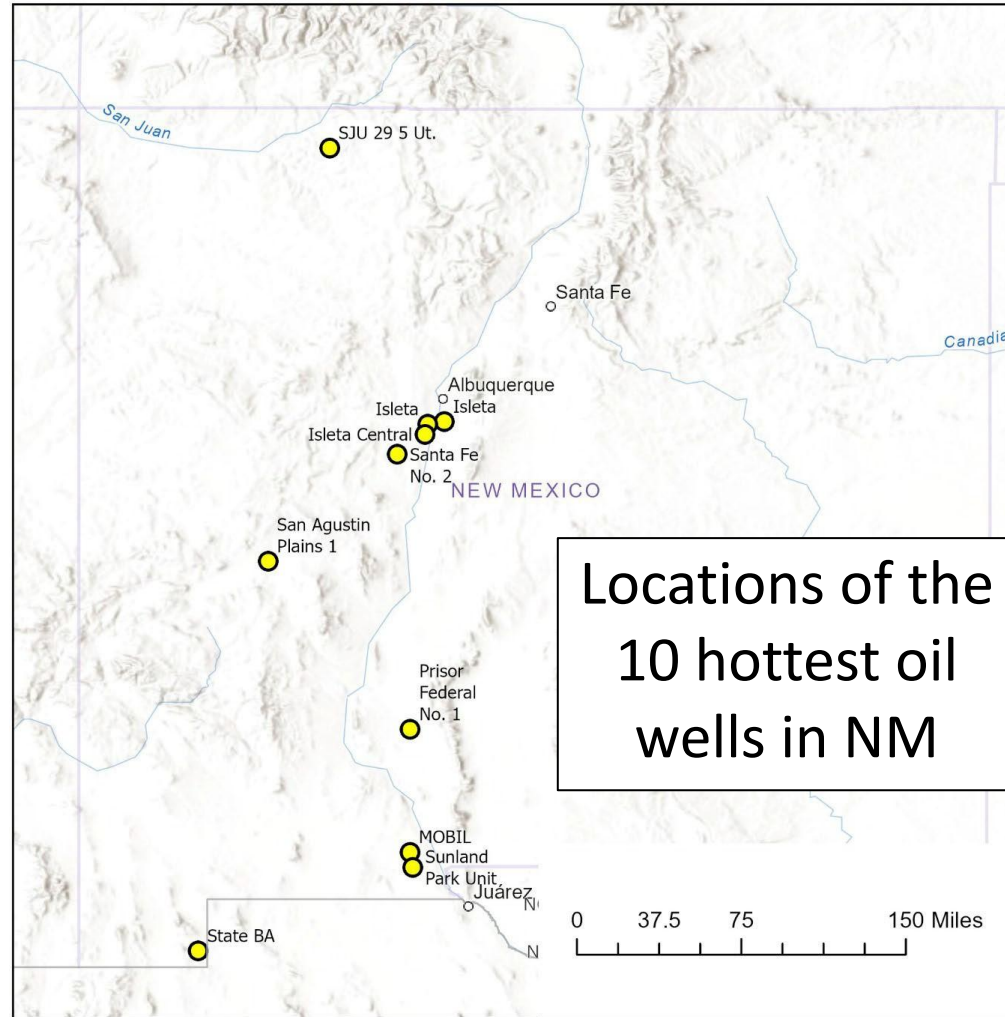


Eavor Loop

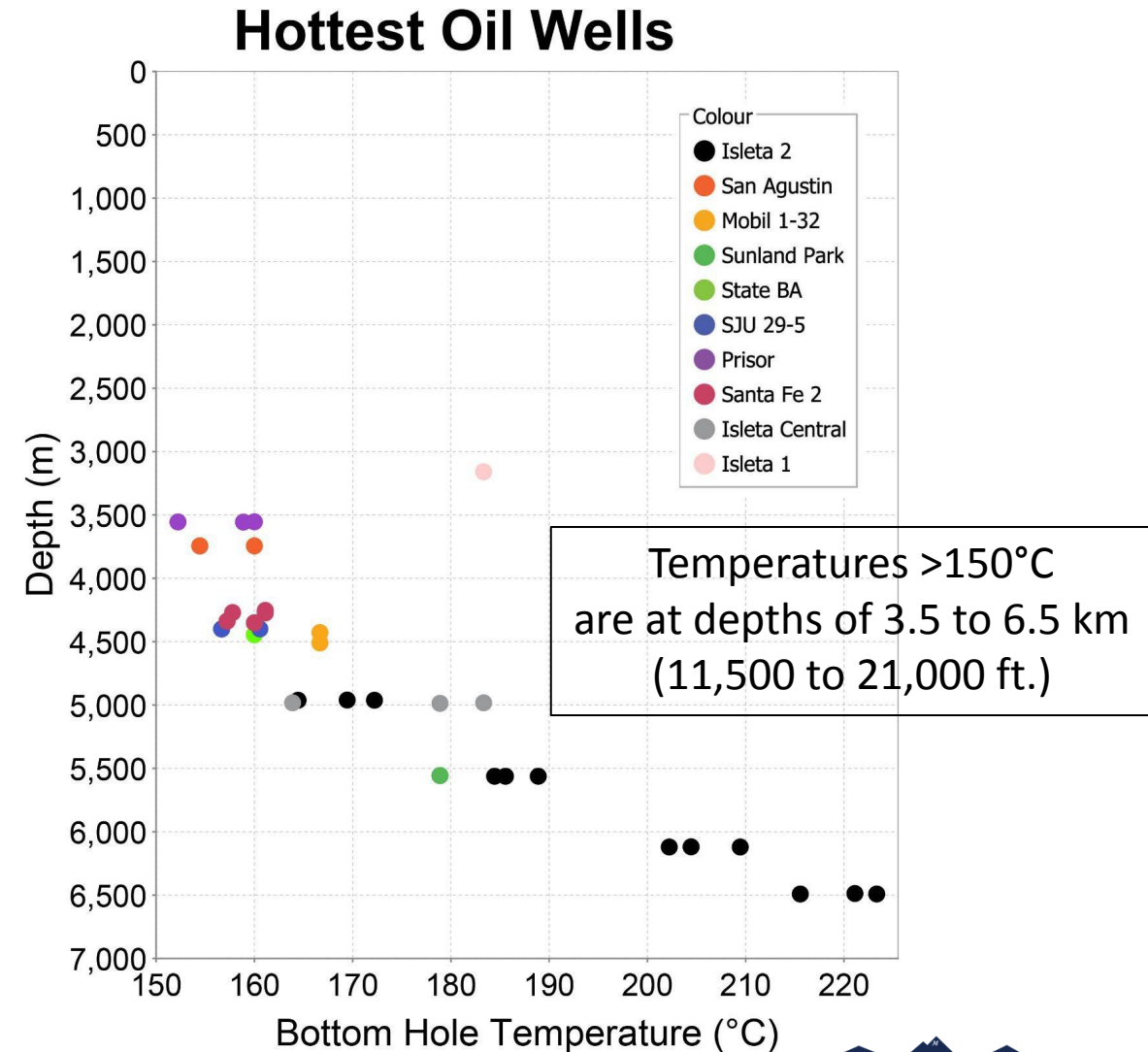


XGS

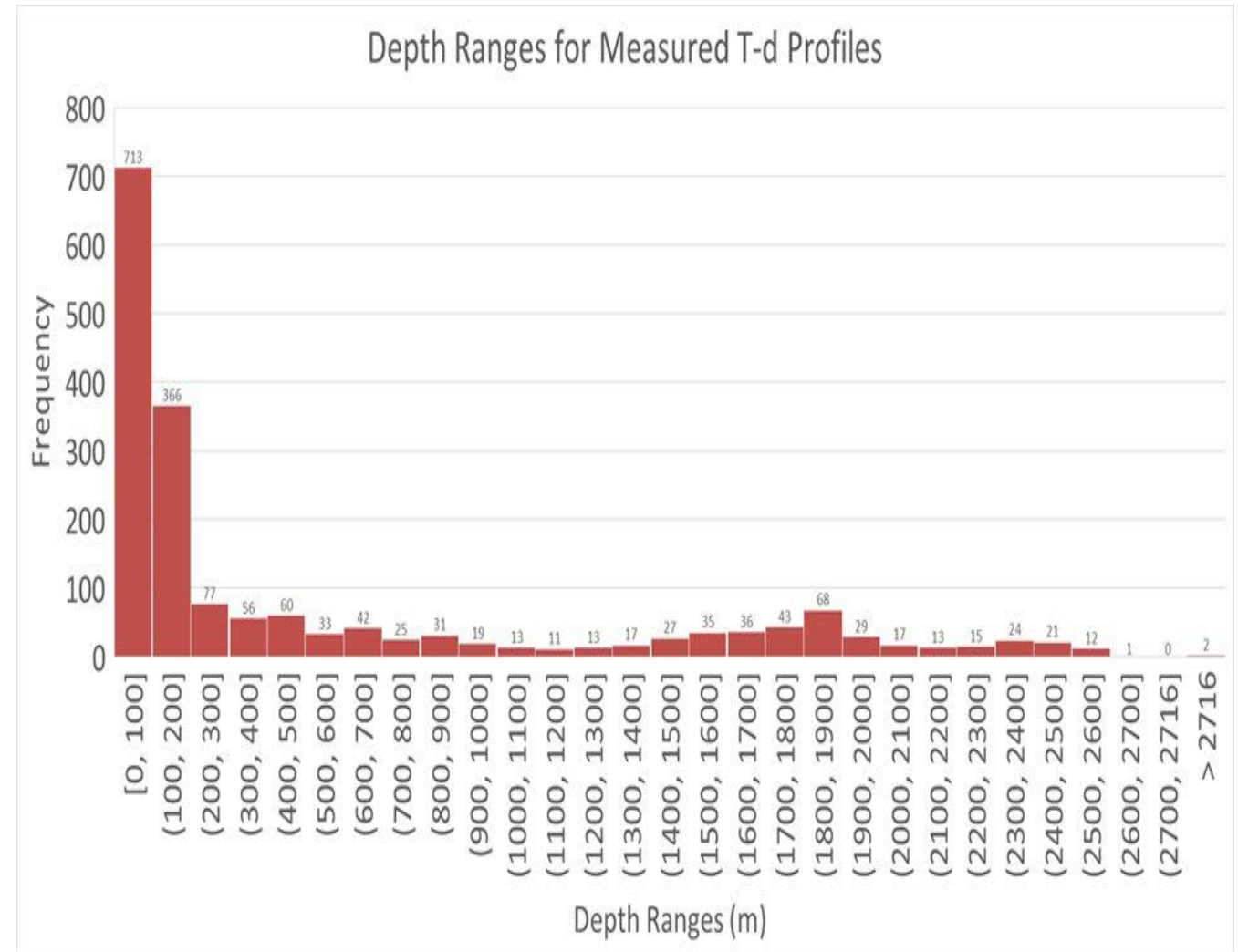
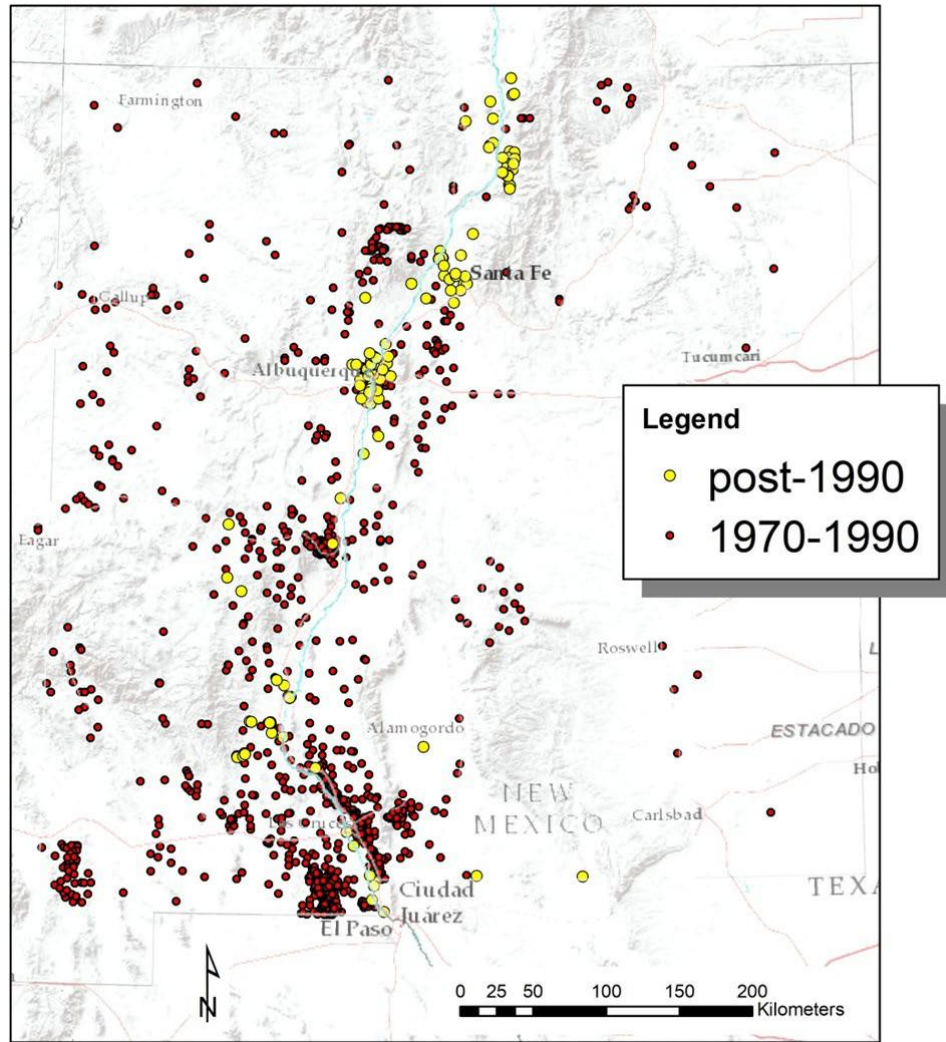
Subsurface Geothermal Data in New Mexico



Deep oil wells provide data indicating temperatures > 150°C at attainable depths (current technology)



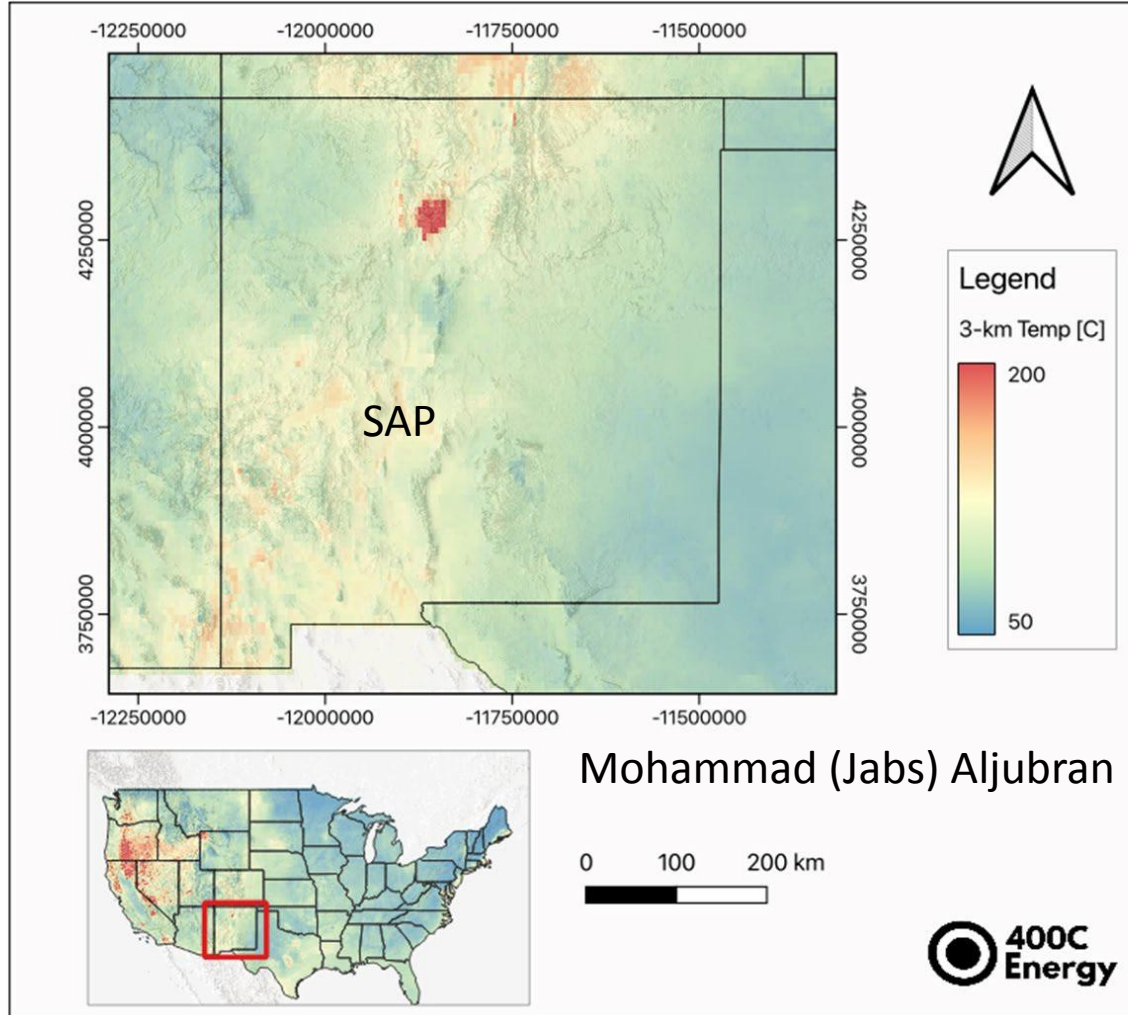
Temperature-Depth Data Measured in Water Wells



Water wells with temperature profiles are predominantly shallow
(an incomplete picture of temperatures at depth)

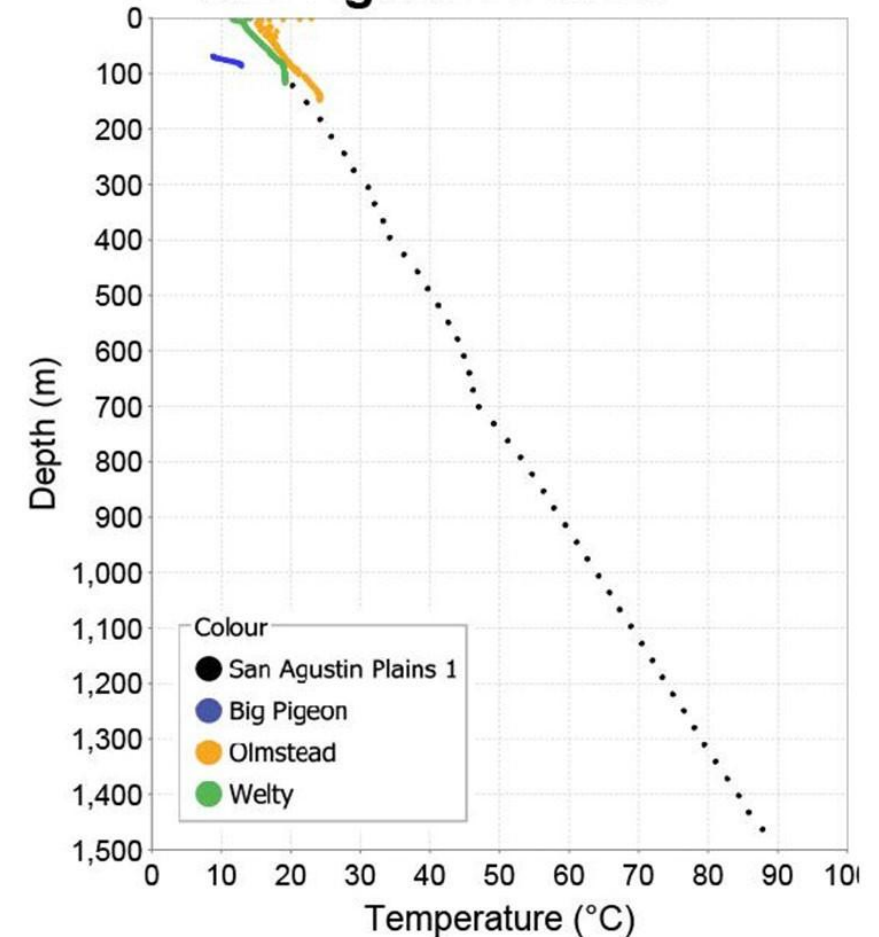
Geothermal Potential in New Mexico

3-km Temperature across New Mexico



Map of modeled temperatures at 3Km (~10,000 ft)

San Agustin Plains



Limitations of the extrapolation of shallow data to 3 km

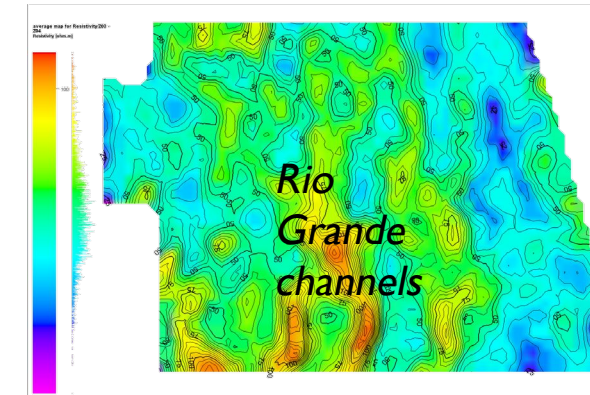
EXAMPLE AEM survey in New Mexico: Santa Teresa study

- **Identify brackish water sources in the Mesilla Basin**
 - Santa Teresa Border Area Brackish Groundwater Availability study (Intera, 2025, funded by NM-ISC)
- **Key hydrogeological characteristics discovered**
 - Buried river channels representing ancient Rio Grande pathways
 - Possible geothermal anomalies detected
- **Next steps involve additional geophysics and drilling exploratory wells to validate findings of a geothermal resource**

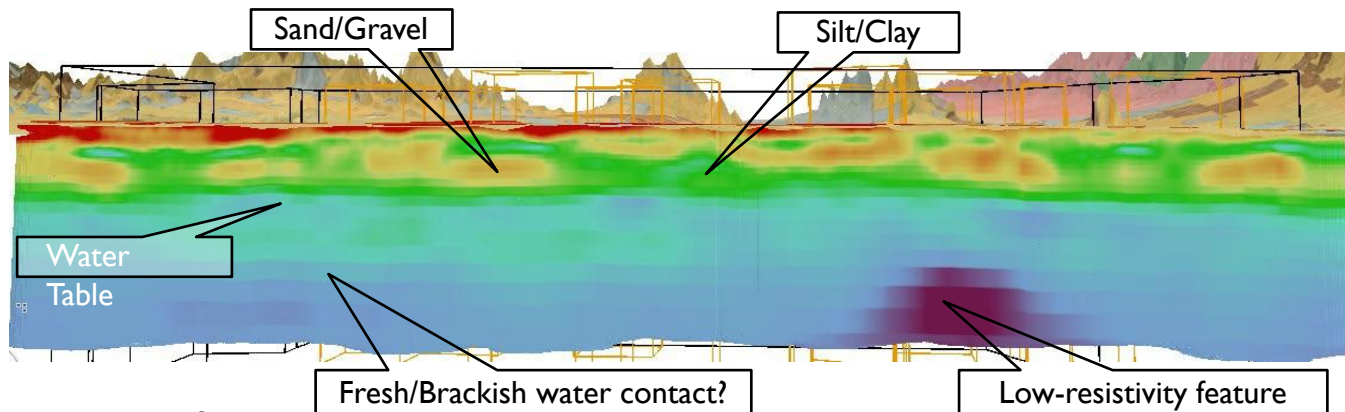
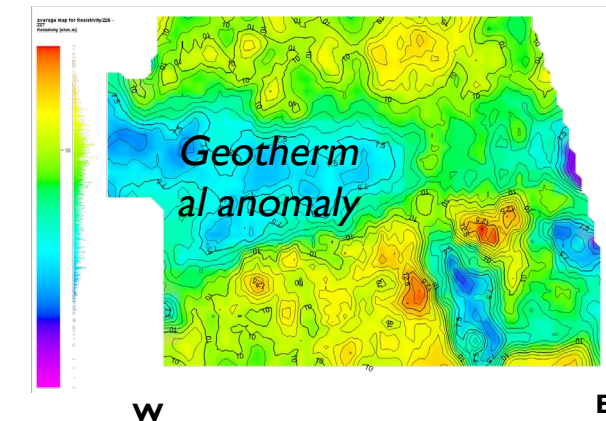


Resistivity Maps

Shallow: 100 ft bgs



Deep: 950 ft bgs



Geothermal Outreach and Education



Geological Society of America Rocky Mountain Section field trip



4th Annual NM Geothermal Workshop (100+ registrations!)



Capitol Hill Day
Washington, D.C.



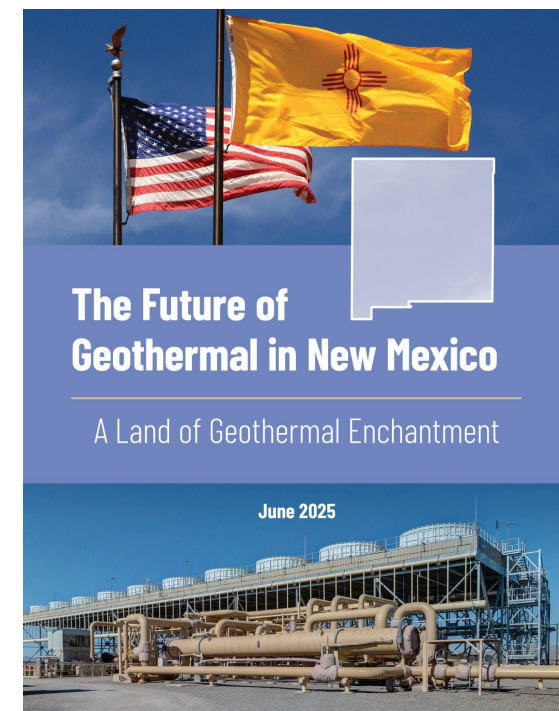
Geothermal Certificate Program students at
Lightning Dock



Beyond Profit program in Santa Fe

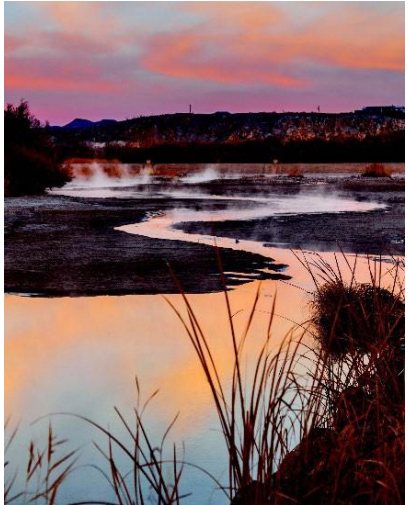


Stanford Geothermal Workshop



<https://geoinfo.nmt.edu/resources/geothermal/futureOfGeothermal/home.html>

What have we accomplished and where are we going?



- Through the geothermal workshops, we have established strong connections among industry, state agencies, universities, National Labs, and geothermal enthusiasts with a goal of increasing geothermal development in New Mexico. *This task will continue.*
- The geothermal certificate program at NMT is training the workforce of tomorrow. *This task will continue and will **grow**.*
- Outreach, by serving on panels at conferences, talking to K-12 teachers, giving seminars at universities, speaking to legislators, and providing information to start-up companies, is increasing the awareness of the positive outcomes of tapping into geothermal resources. *This task will continue and will **grow**.*
- Research has revealed the need to acquire much-needed publicly available subsurface data (geophysics leading to drilling wells) for New Mexico, not only to identify geothermal resources, but to characterize water resources and locate critical mineral deposits.

This is the goal ahead and will require the support of several NMT programs.