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California
Department of Conservation
California Geological Survey

Exploration Risks and Geothermal Resource Characterization

California Energy Commission

Integrated Energy Planning Report Workshop

July 9, 2026

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Director and State Geologist

California Geological Survey

CHALLENGES AND OPPORTUNITIES

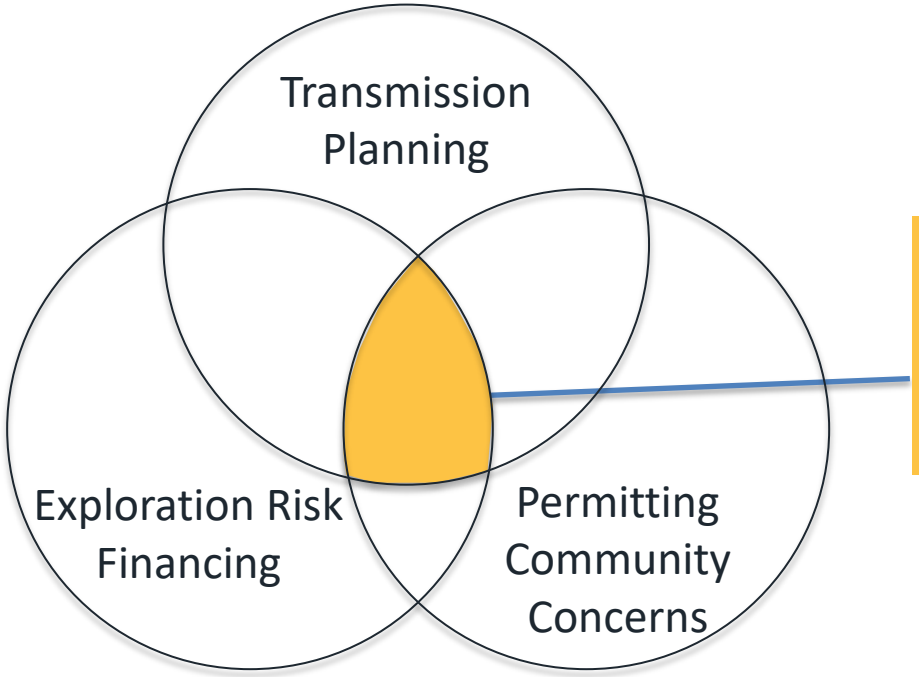
California Department of Conservation
California Geological Survey

Ranked Challenges from June 18 IEPR Poll

1. Permitting
2. Transmission and Interconnection
3. **Exploration Costs and Risks**
4. Financing
5. Community Concerns

Exploration Costs and Risks

- Front-loaded exploration costs
- Amounting to 40% of the project cost
- Risks systematically lower the potential for financing and capital expenditure, and,
- Geothermal development in the state



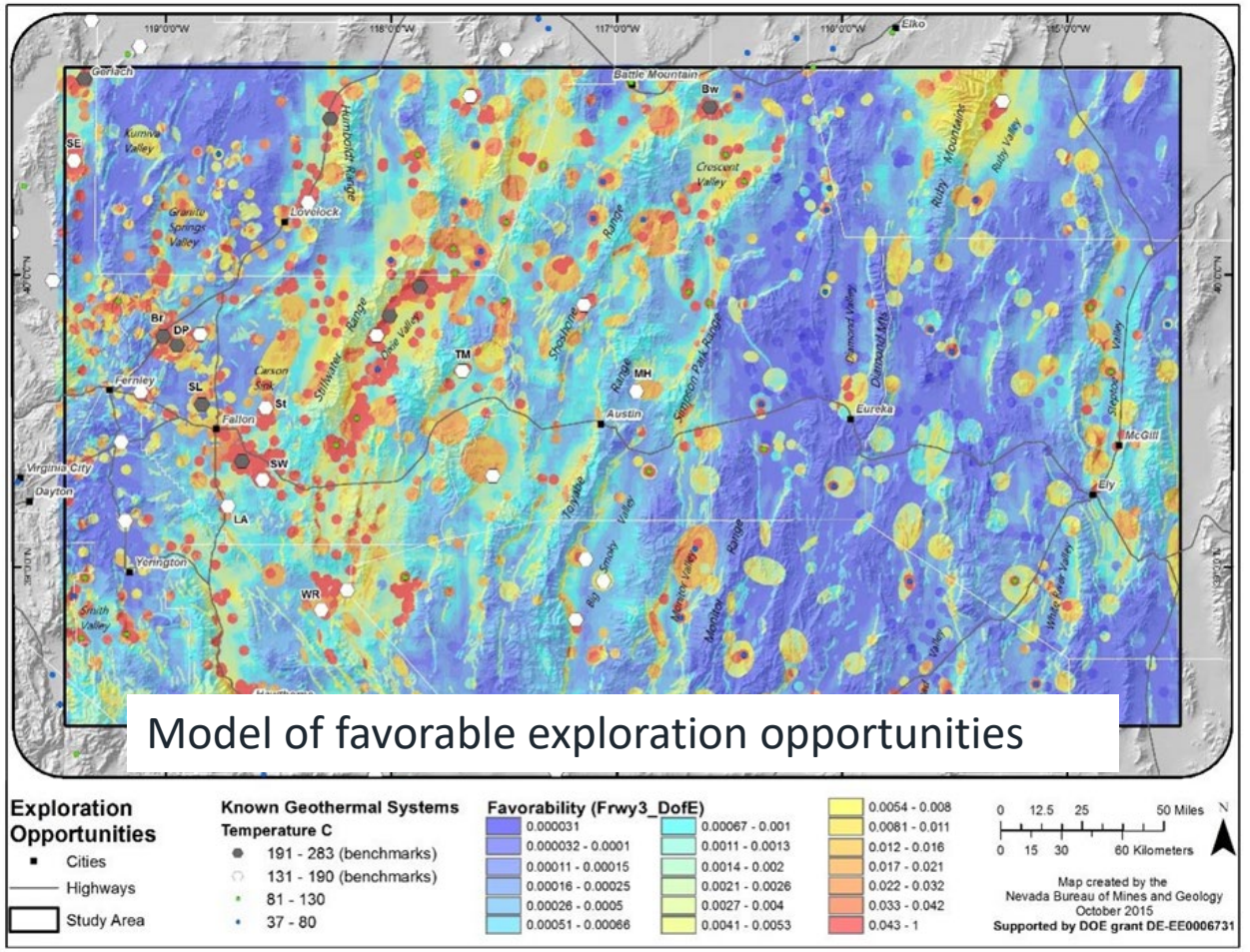
GEOTHERMAL DATA
Priority Areas
Prospectivity
Known and New Resources

Success Stories - Geothermal Data

California Department of Conservation
California Geological Survey

With support from the federal government ($10 million), Nevada has acquired the basic data and technology to advance geothermal exploration.

Nevada Play Fairway – Geothermal favorability

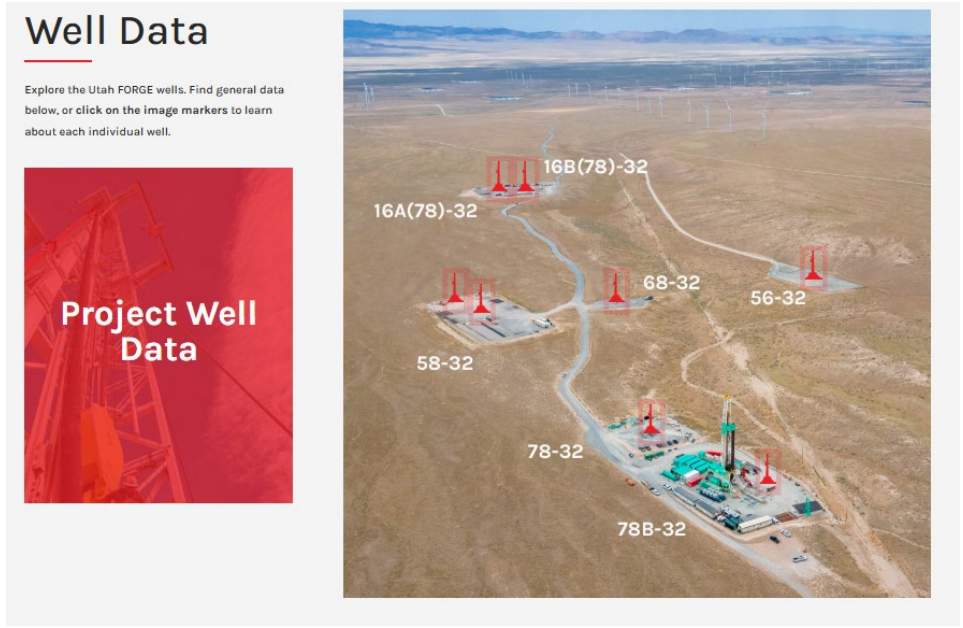


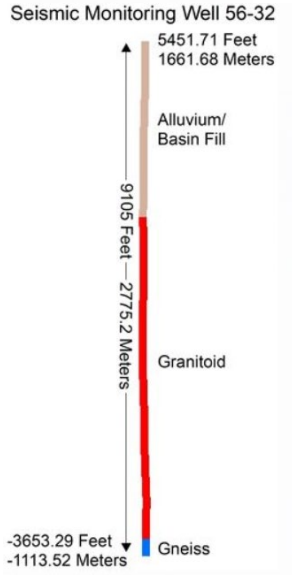
Success Stories - Geothermal Data

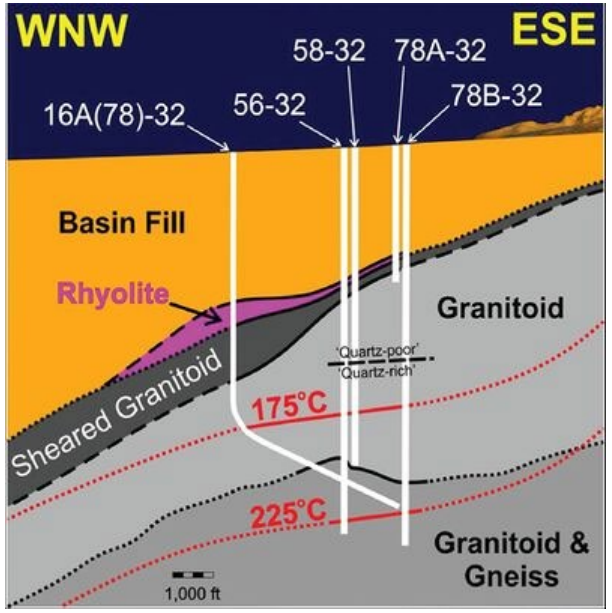
California Department of Conservation
California Geological Survey

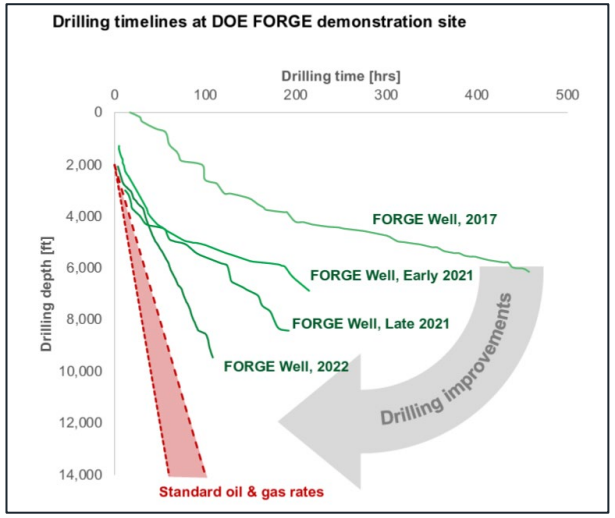
With support from the federal government (~$300 million), Utah has acquired the basic data and technology to advance geothermal exploration.

UTAHFORGE

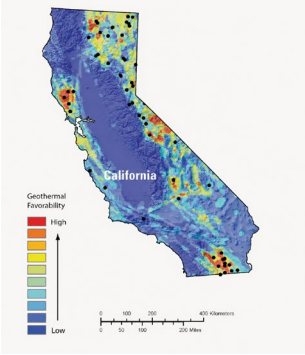




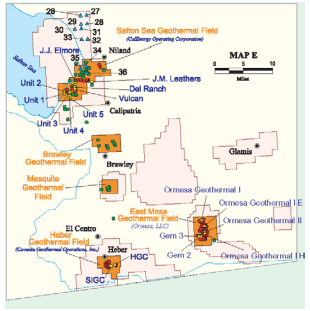




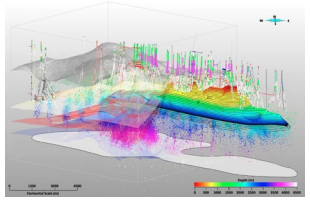
What Has California Done?



Geothermal Favorability (USGS, 2008)



KGRA -Wells and Springs DOC 2002



Monitoring reservoir processes Alumbaugh et al., 2026

National and Regional Favorability Assessments

(2004 - present)

- Heat Flow, Temperature at Depth, Favorability
- Ongoing efforts by USGS, Universities

Geothermal Data Maps and Compilations

(1970s - 2014)

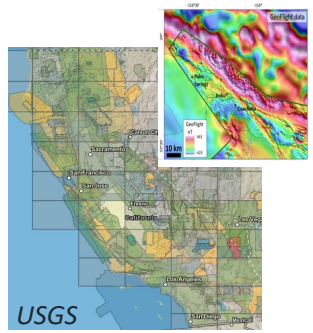
- Statewide spring/geothermal feature maps, and geologic data compilations (e.g. 2004 PIER, 2014 NGDS)
- Historical partnerships between DOE, USGS, CA state govt., National Labs, Universities, Industry

Geothermal Field and Reservoir Characterization

(1950s – present)

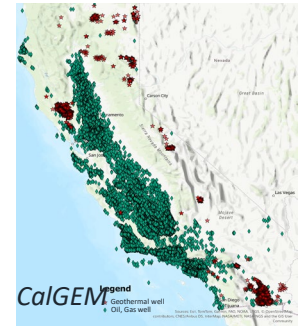
- Hundreds of exploration, drilling, and reservoir modeling studies (esp. Geysers, Salton Sea, Coso, Long Valley)
- Collaborative efforts (DOE, USGS, National Labs, Universities, CEC, Industry)

Unified Compilation?



>200 historical airborne geophysical surveys, new high-resolution surveys

Water quality/water >35,000 wells



>240,000 oil and gas wells, >4,000 geothermal wells

California Geothermal Data Collaborative

California Department of Conservation
California Geological Survey

Integrated Geologic Characterization Data Powering Smarter Geothermal Decisions