Title: INnovative Geothermal Exploration through Novel Investigations Of Undiscovered Systems (INGENIOUS) Project Introduction and Activity Update

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Introduction:

- The INGENIOUS project aims to accelerate discoveries of new, commercially viable hidden geothermal systems in the Great Basin region (GBR) of the Basin and Range province in the western USA. In recent years, major achievements have been made in developing improved geothermal exploration methodologies such as play fairway analysis (PFA), 3D and conceptual modeling, resource capacity estimation, machine learning (ML), the application of advanced geostatistics, and value-of-information analysis (VOI).
- Funded by the U.S. DOE-GTO, our ambitious 4.5-year-long, multi-collaborator project aims to fully integrate these techniques to develop a comprehensive, exploration toolkit. Predictive geothermal PF maps and VOI analysis at the regional-and prospect-scale will be used to prioritize new data acquisition, and thermal-gradient drilling will be conducted at up to four prospects to test and validate PF methodologies. This project builds on previous accomplishments of the NV, UT and CA geothermal play fairway projects as well as the NV geothermal ML project (Fig. 1). The project officially started in February 2021.

Objectives:

1. Develop improved regional-and local-scale PF exploration workflows, and using these to produce new map products of geothermal favorability in the GBR;
2. Quantify resource potential, uncertainty, and degree of exploration at several new hidden geothermal prospects in the GBR;
3. Release multiple geoscience data products for public, academic, and industry use;
4. Release new software tools that allow external stakeholders to use and adapt our geostatistical workflows; and
5. Generate a geothermal developer playbook that consolidates current conceptual understanding and best practices for geothermal exploration in the region.