Geothermal Risk Mitigation Strategies

Funding Opportunity Concept

Objective 1: Reduce Risk in Geothermal Development and Standardize Resource Evaluation Criteria

Meeting this objective will involve three tasks:

1. **Defining Geothermal Resource Assessment Criteria**
   - Criteria would consider temperature, geophysical, geologic, groundwater and environmental factors
2. **Creating a national database of existing and historical geothermal data**
   - Utilizing well temperature and geologic data—including data obtained from the oil and gas industry—organize data in categories that reflect the Assessment Criteria
3. **Creating a National Geothermal Resource Classification System**
   - System will define a common ranking mechanism that indicates geothermal development risk

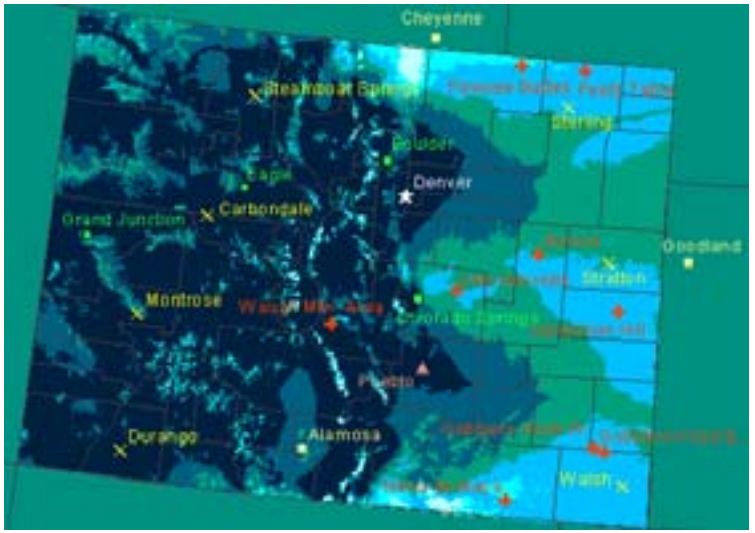
Task 1: Defining Geothermal Resource Assessment Criteria

- **Purpose**: Criteria will serve as a common metric for assessing and comparing geothermal resources and should reflect those factors most relevant to the geothermal industry
- Resource assessment criteria should consider factors such as:
  - Temperature
  - Geophysical
  - Geologic
  - Groundwater
  - Environmental
- Criteria could be presented in ranges (such as low temperature, moderate, or high temperature)
- Criteria should be peer reviewed by Geothermal Energy Association

Deliverable: Methodology report that defines a set of core geothermal resource assessment criteria and justifies the choice of these criteria

Task 2: Creating a National Geothermal Database

- **Purpose**: To centralize all geothermal resource data available in one comprehensive site that can be utilized by industry
- Gather and organize a thorough cross-section of historical and current geothermal resource data that fits in categories defined in Task 1.
- Data should include:
  - All available public information obtained in the last 30 years of geothermal research and exploration
  - Information from oil and gas industry
  - Historic well information held by private companies
- Information must then be organized in a user-friendly way where it can be accessed and easily searched on a website

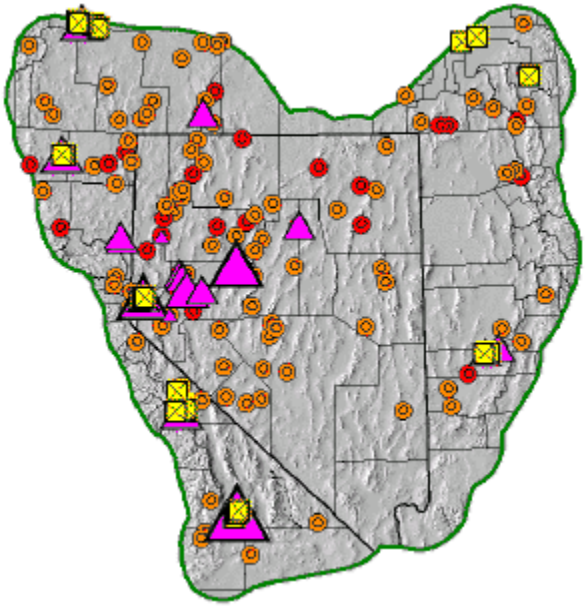


Colorado Renewable Resource Database

Deliverable: Develop a user-friendly website that sorts data geographically and by resource characteristics; Develop system for updating website

Task 3: Creating a National Geothermal Resource Classification System

- **Purpose**: to help the geothermal industry assess development risk in specific areas without having to undertake costly exploratory drilling projects
- Data gathered in Task 2 will inform development of system to organize identified geothermal resources or regions into standard classifications based on favorability rankings
- Rakings will be exhibited with the data contained in the National Geothermal Database
- University of Nevada, Reno has developed classification system that could potentially be used as a model for this work



University of Nevada, Reno Geothermal Favorability Map:
Map created using logistic regression, based on five evidence layers

Deliverable: Geothermal Database website will include site classifications that are based on clearly defined favorability criteria

Objective 2: Develop future Professional Workforce for Growing Geothermal Industry

Meeting this objective will involve three tasks:

1. **Develop Geothermal Curriculum**
   - Fund institutions of higher education, on a competitive basis, to develop geothermal educational curricula
2. **Initiate Educational Scholarship Program**
   - Send two-four students to foreign countries with geothermal development and curriculum for education, research and/or internship
3. **Develop Future Geothermal Workforce**
   - Provide Education and work opportunities for students in geothermal field

Topic Area 3 – Geothermal Professional Education Program

1. U.S. industry needs new geothermal professionals to meet the demands of the growing geothermal development market. GTP is seeking to award grant funding, to institutions of higher education, on a competitive basis, to develop geothermal educational curricula.
2. The institutions will serve as an educational resource to students in geothermal related areas of study, for both research and development and deployment.
3. The education products generated by the institutions will be available to students as well as the general public.
4. Inclusion of some form of foreign exchange program will be required, either as part of the curricula to be developed or as an additional program that is developed.