Chena Geothermal Area: A Low Temperature Case Study
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Introduction

Chena Geothermal Area
• Located near Fairbanks, Alaska
• Part of Chena Hot Springs Resort
• Currently the lowest temperature geothermal resource in the world at about 74 degrees C
• The energy for this site has historically been produced using diesel generators
• Now produces all its own electricity using geothermal generators

GeoRePORT
• The Department of Energy’s Geothermal Technology Office has created a new methodology for reporting and analyzing geothermal data
• Goal: make geothermal data easier to understand and compare
• Allows for: evidence based, objective descriptions of current and possible geothermal sites using a grading system

Methods

GeoRePORT
• Geological, Technical, and Socio-economic grade categories
• Categories are broken into 4 main attributes then broken down further into sub-attributes.
• Sub-attributes are assigned character, activity, and execution grades that factor into the total attribute grade.
• Character - the physical aspects of the resource
• Activity - the way that data was collected
• Execution - confidence in the character and activity grades
• Overall grades for attributes determined by sub-attributes' weights and grades

Data Collection
• Information about Chena Geothermal Area was collected using:
  - OpenEI - a wiki based page run by NREL to report data
  - NGDS - National geothermal data collection site to find research papers
  - Geothermal Prospector - a data visualization tool

Results

Character Grade Totals

- The lack of available data may have skewed these charts in certain sub-attributes, so fluid chemistry (geological), power conversion and reservoir management (technical) and transmission (socio-economic) will not be included
- The first chart shows the overall character grades for Chena are low in the technical and geological categories, but high in the socio-economic category
- Most activity and execution grades are high, so the data is reliable

Discussion

Geological
• The low character grades might lead someone to believe this would not be a site for geothermal
• Wouldn’t be good for a direct dry steam power plant because no steam is produced- but other can use binary system

Technical
• The low technical character grades might make lead someone to believe think it wouldn’t be a good choice either
• Got funding and worked around those difficulties with help from the state of Alaska

Socio-Economic
• High character grades all around in this category
• Shows there was a strong need for an alternative energy source
• No economic barriers to producing geothermal energy either

Overall
• Going off of just grades, the site doesn’t seem like it would be fit for a geothermal power plant- this particular project was looking for low temperature geothermal
• Currently have generators installed- produce electricity, heat a greenhouse, cool an ice hotel

Figure 3: Charts showing the overall resource grades for Chena Geothermal Area. Left to right: Total character for the three categories. Total character, activity, execution grades for geological sub-attributes. technical sub-attributes. Socio-economic sub-attributes.

Acknowledgments

This material is based upon work supported by the National Science Foundation through the Robert Noyce Teacher Scholarship Program under Grant #1418852. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. The research was also made possible by the California State University STEM Teacher and Researcher Program, in partnership with Chevron (www.chevron.com), the National Marine Sanctuary Foundation (www.marinesanctuary.org), NREL, and Illinois State University.