Geothermal is Delicious!

Geology 120 Final Project 2017

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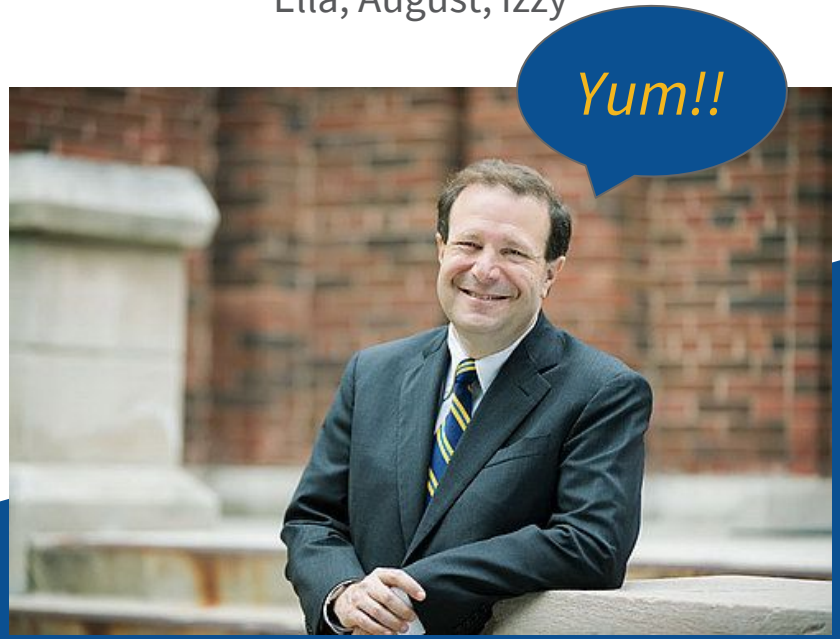


CARBON FREE BY 2050

https://apps.carleton.edu/geothermal/press/?story_id=1611296

What is the Geothermal Project?

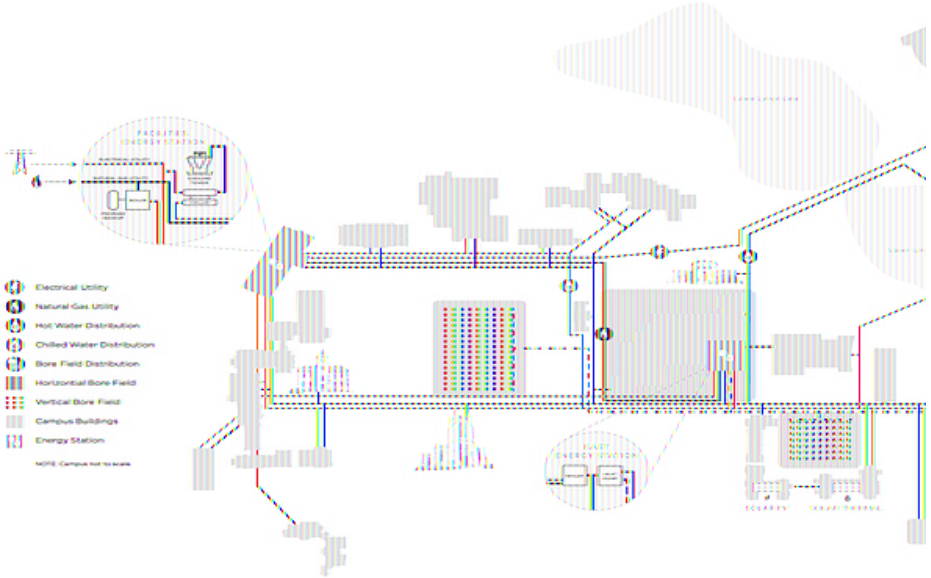
The Geothermal Project has three major objectives:

1. Replace the aging and outdated central plant facilities and provide for future loads as envisioned in the Facility Master Plan
2. Replace the outdated and failing campus steam distribution network and controls
3. Reduce our operating costs and carbon emissions significantly and permanently

The system overview includes:

1. Transition the existing steam distribution system to a **hot water distribution system**
2. Install a heat pump to take advantage of **simultaneous heating and cooling** loads
3. Tie the heat pump to **geothermal bore fields**
4. Add efficient and/or **renewable on site electrical generation** system(s)

From https://apps.carleton.edu/geothermal/plan/



Map diagram of Geothermal well types and placement, from Carleton's Utility Master Plan: https://apps.carleton.edu/geothermal/plan/

Dig in!

Poke Cake:
Representing the Bald Spot in its current pristine condition, this dynamic dessert– dare we call it performance art? – will demonstrate in real time the drilling process that will temporarily devastate our beloved Bald Spot.

The poke cake is created by "drilling" holes in the cake and filling them with delicious goodness- just like the holes drilled in the bald spot will contain the wonders of vertical geothermal bores. These bores will be part of the total 60 miles of piping being installed under Carleton's campus! Wow!
The bald spot is an ideal location for these wells because it's central to campus and it is unlikely to be built on, due to its beloved nature.

Image from https://apps.carleton.edu/geothermal/funfacts/

Dig in!

Bell Field Brownies
With caramel icing diagramming the horizontal boreholes & piping that were installed in Bell Field, these brownies will be sure to score a goal in your heart.

Vegan Option available!

The unfortunate thing about brownies is they tend to have aquifers below them- meaning drilling vertically results in artesian wells! Yikes! Such a geological phenomenon occurred in our very own Bell Field. The solution? Install the bores horizontally! This can be seen in the horizontal caramel “pipes” just under the surface of these bell field brownies.

Image from https://apps.carleton.edu/geothermal/funfacts/

Cookie Stacking Contest!

You each have 4 different types of gluten free cookies, and each represents a layer of soil composition - Yum! The cookie key is as follows:

Sugar - Jordan Sandstone

Molasses - Prairie du Chien

Chocolate Chip - Loose Deposits

Snickerdoodle - St. Lawrence dolomite

Your job is to guess how the stratigraphy below campus is layered. What fun! Stack your cookies to represent the layers we're drilling into.

The Big Reveal

The correct Cookie Stacking is:

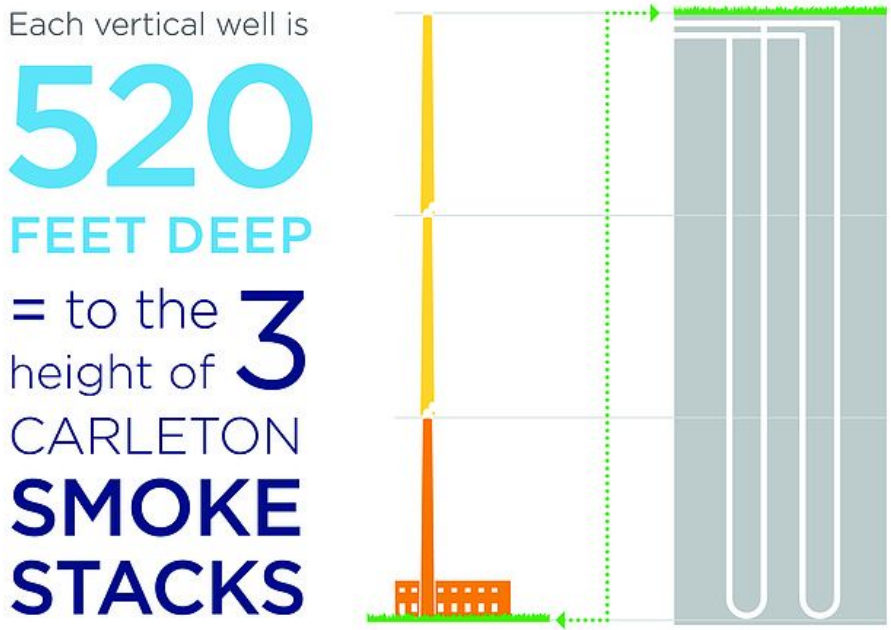
Snickerdoodle - Loose Deposits (50-80 ft) (Top!)

Molasses - Prairie du Chien (126 ft) (Second!)

Sugar - Jordan Sandstone (50 ft) (Third!)

Chocolate Chip - St. Lawrence dolomite (75 ft) (Bottom!)

That puts us at 331 ft, with still 189 ft left to drill down. However, we learned at the #CarlTalks that we need to eat healthy and take care of our bodies. That many cookies may not help us #Flourish. But the point is bedrock is good to drill vertically into. No artesian wells there!



Holy cabooses that's a lot of cookies…

Image from https://apps.carleton.edu/geothermal/funfacts/

You are now a geology master…

Congrats! Have any questions? Go to https://apps.carleton.edu/geothermal/

Happy Eating!