

PERCEPTION OF THE MIDCONTINENT RIFT BY PEOPLE WHO LIVE ON IT: A VIEW OF PUBLIC EARTH SCIENCE KNOWLEDGE

**North-Central
Section - 49th
Annual Meeting
(19-20 May
2015)**

Paper No. 16-1
Time: 1:35 PM



Geo People 1800-1960



Schoolcraft

**People who discovered and communicated
Geoheritage of the Copper Country: 1800-1960.**

—an incomplete list, but which includes many remarkable people!

This list is part of the history of geology—a science which really started in earnest after 1800.



Whitney



Houghton



Hubbard



Reeder



Seaman

Lane



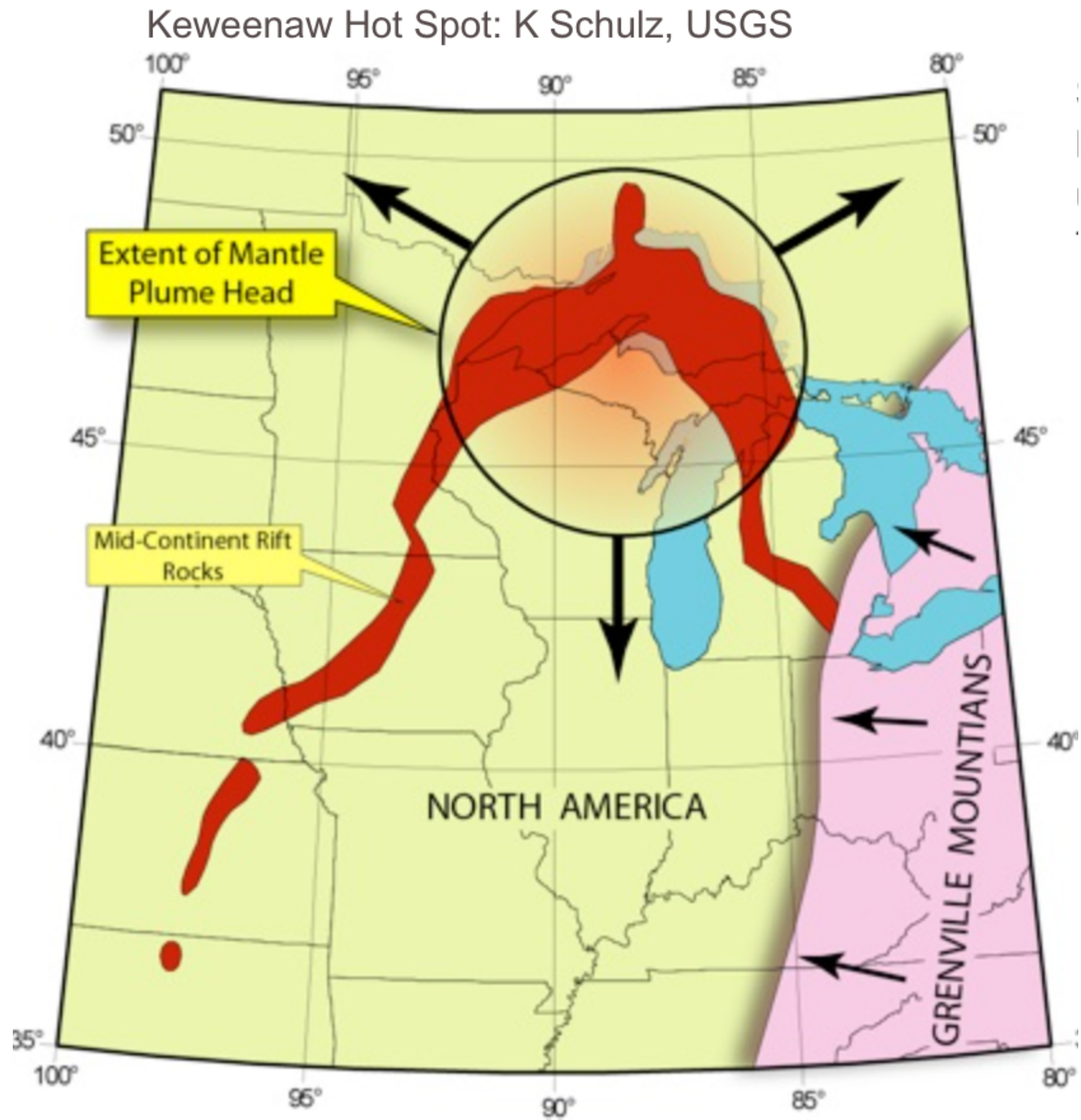
Pumpelly

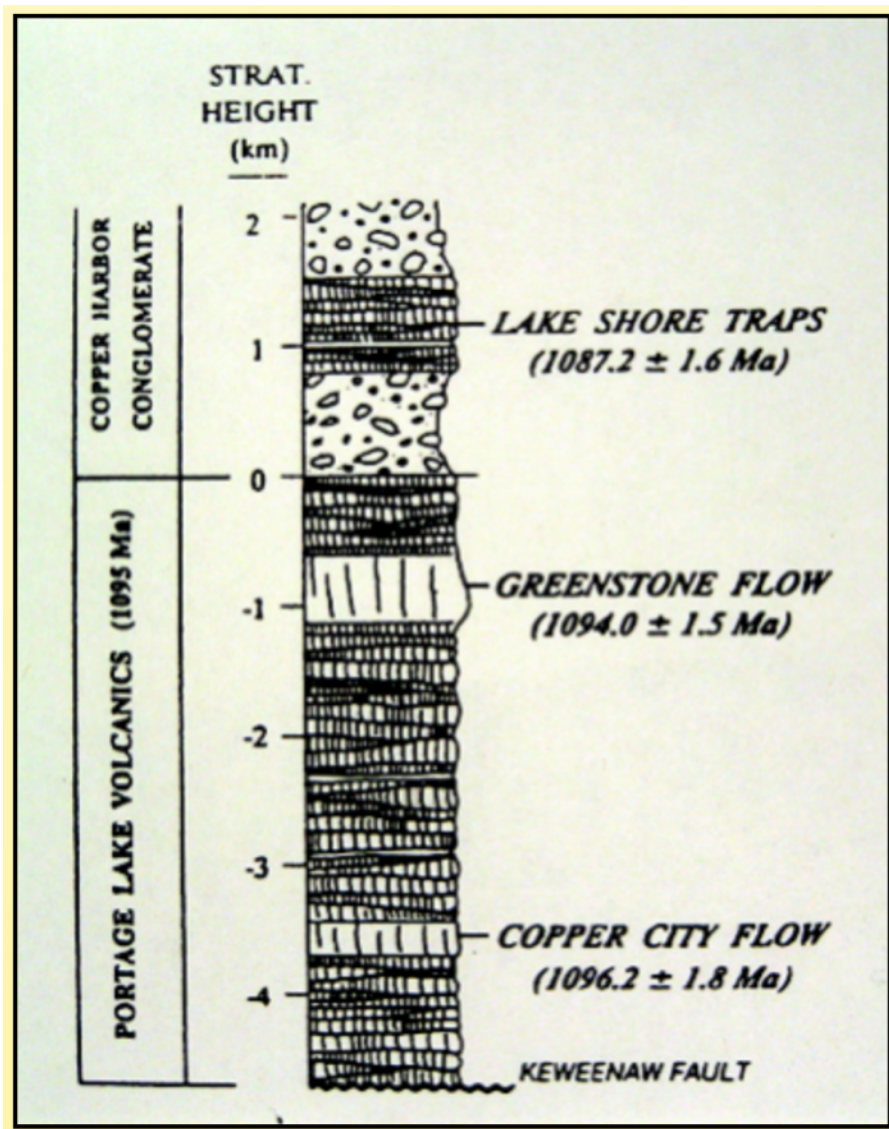
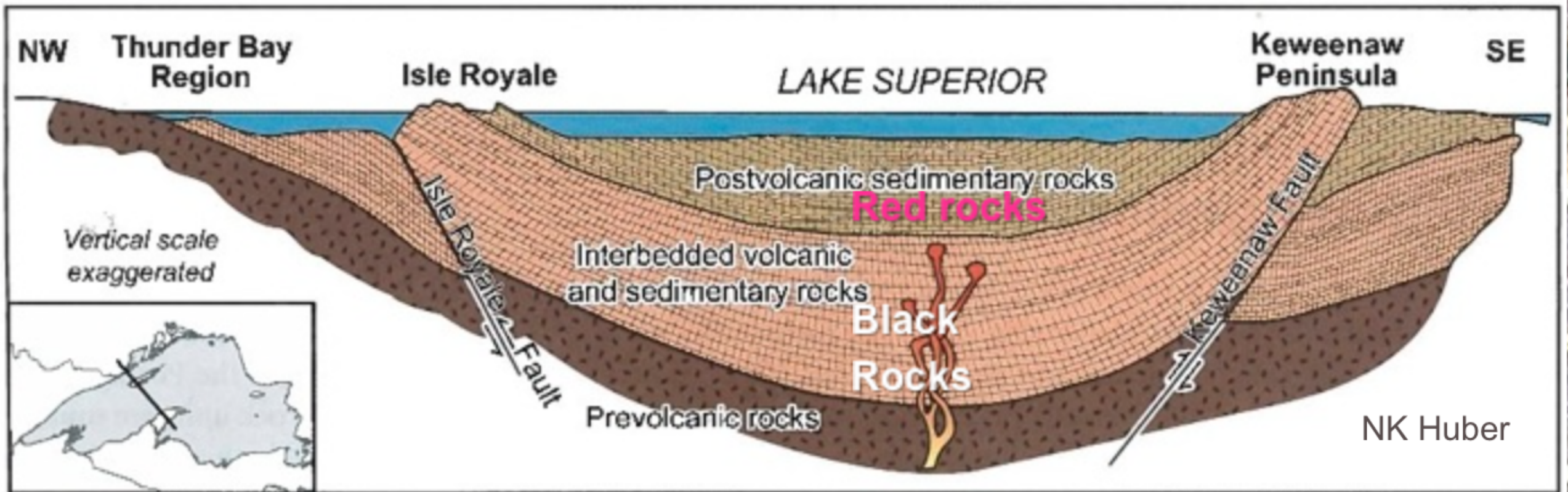


Fossil Hot Spot !

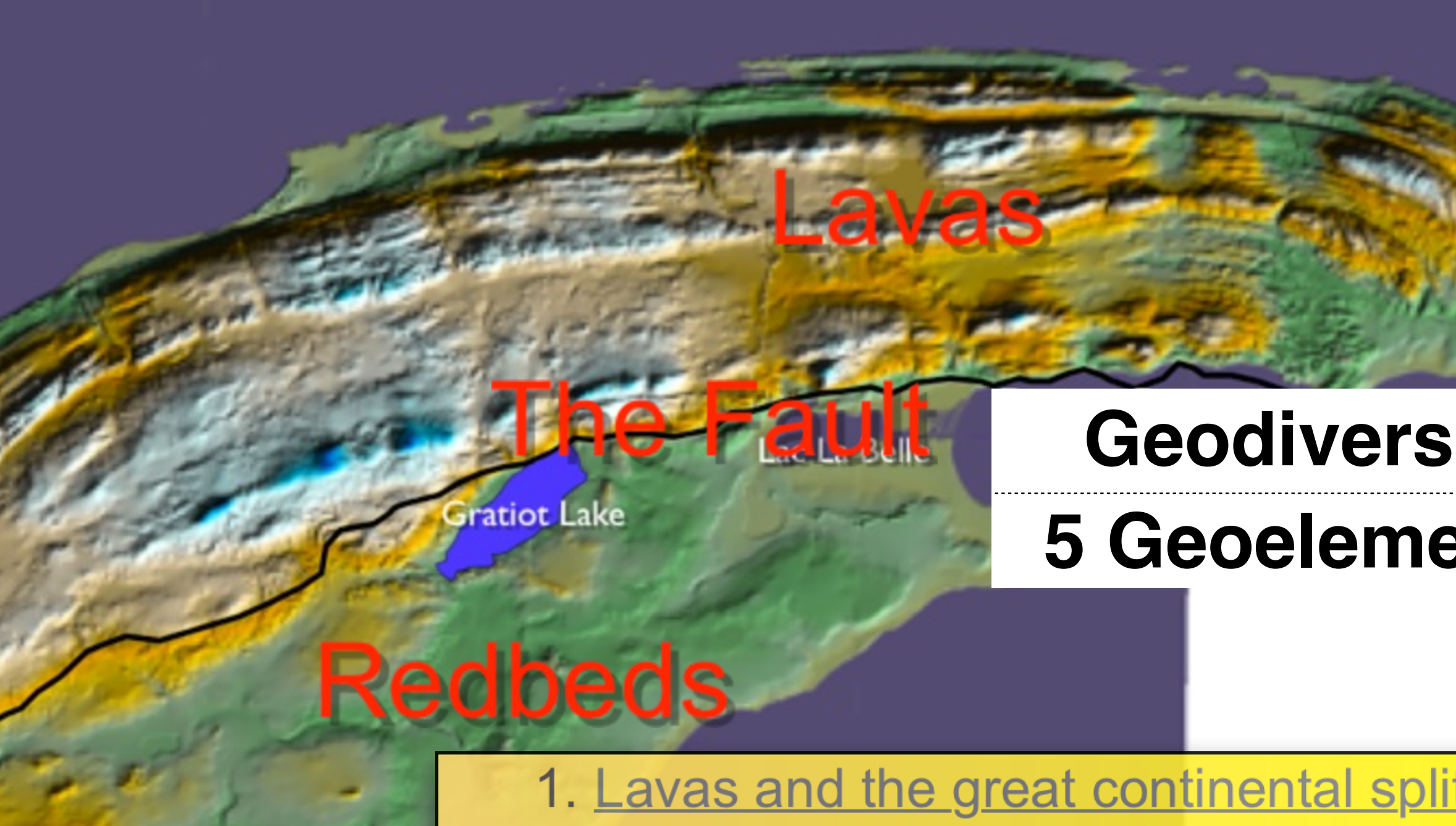
Now has
one of
the
lowest
heat flow
in the
world.

Prove it!





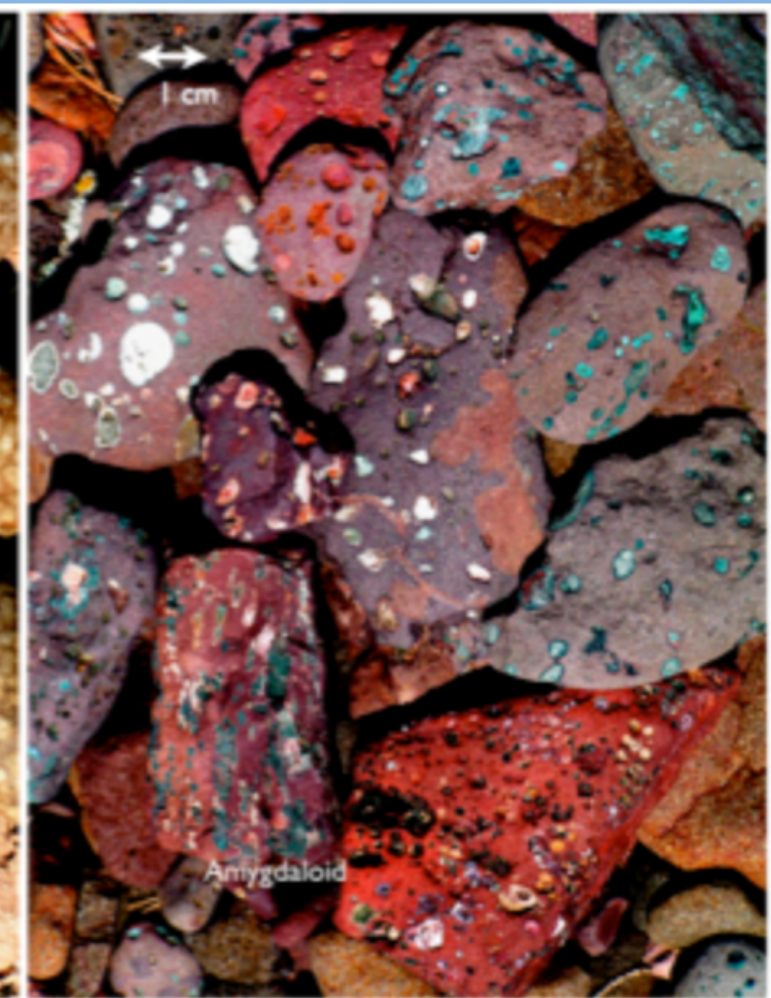
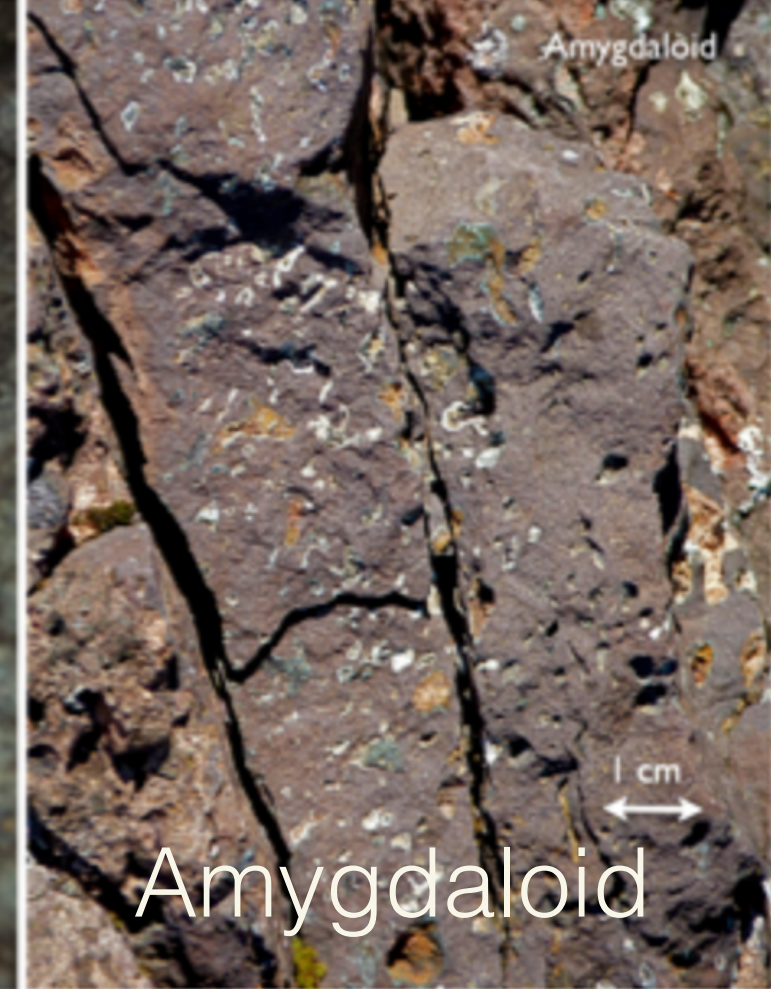
- Short duration of rift magmatism and spreading.
- Very high eruption rate.
- Ponding of erupted materials and extended solidification times.
- Profound geothermal metamorphism.
- Prominent thrust faulting during geothermal activity.



Geodiversity

5 Geoelements

1. Lavas and the great continental split
2. Red Sediments and the filling of the hole
3. The Great Thrust Fault
 - 3.2 Snowball Earth
 - 3.5 Earth's fossil record
4. Massive Glaciation
5. The Feel and Look of the Lake



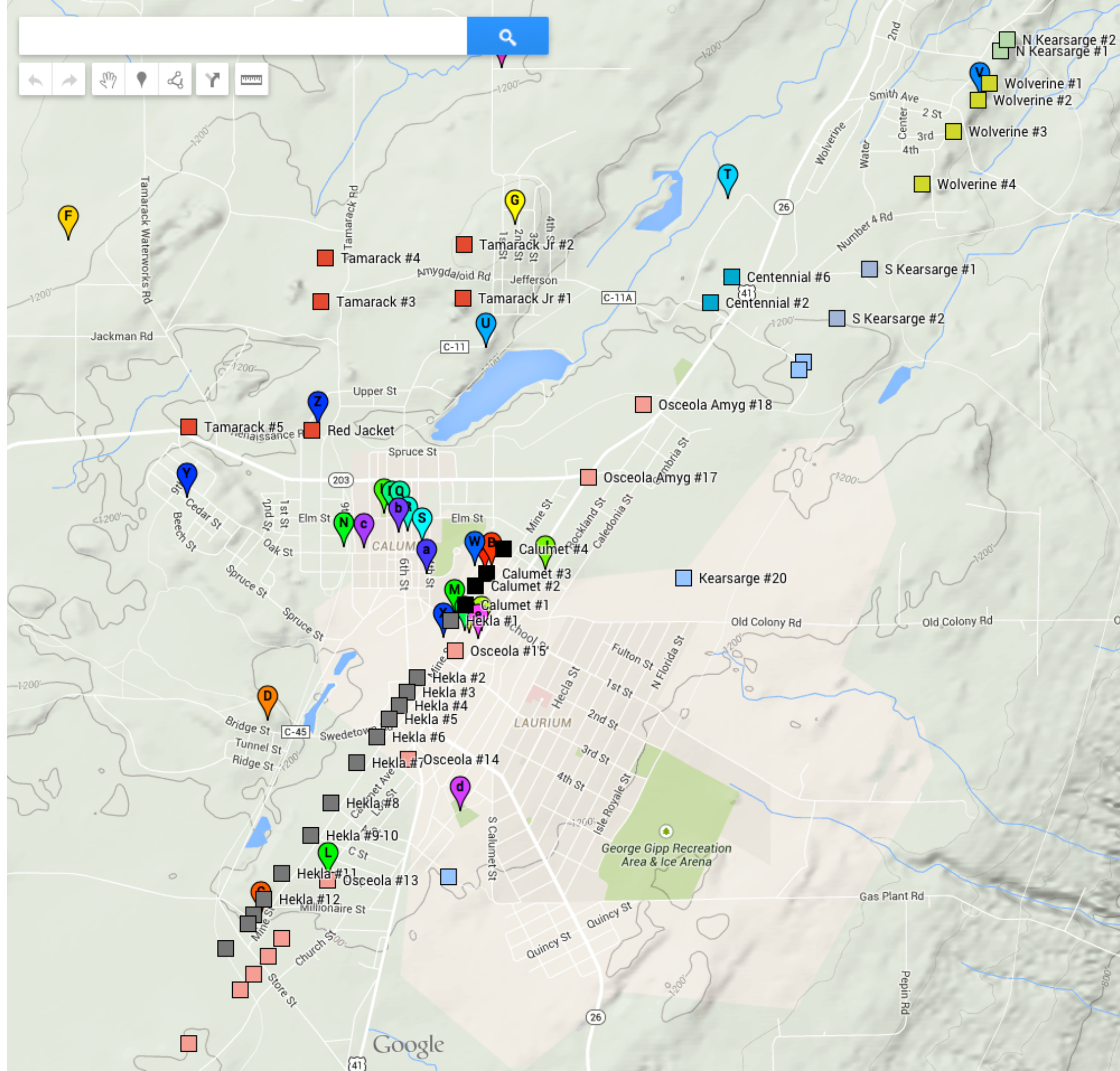
Native Copper Vein in Basalt

Unique,
extensive,
chemically
- unusual
mineral
deposit

A
Cosmic
Oddity



Interpretive
sites and
streets in
Calumet,
the mining
capital,
follow the
geology



Hollowed ground

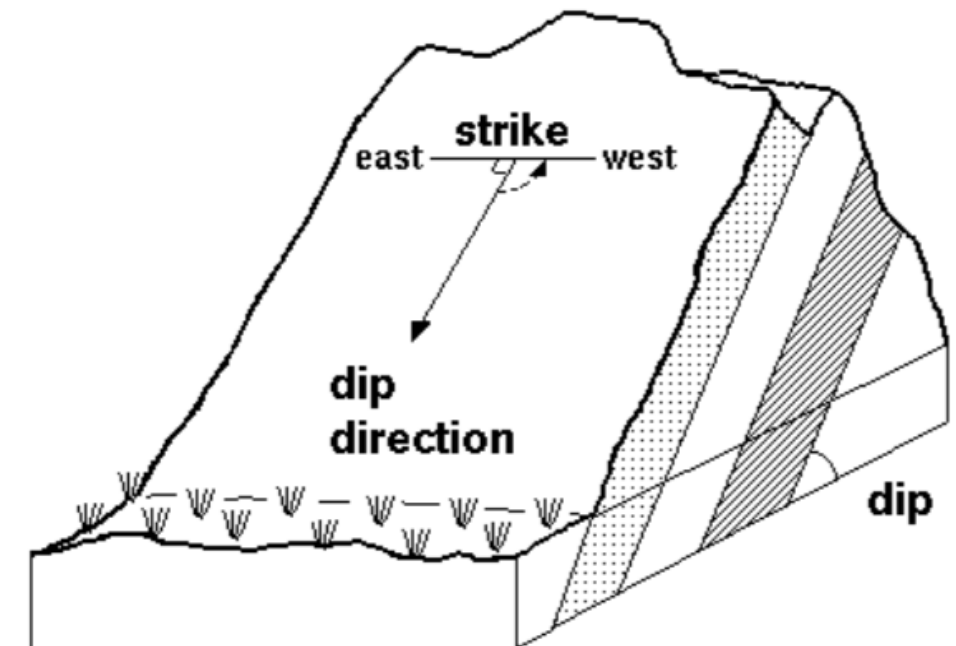
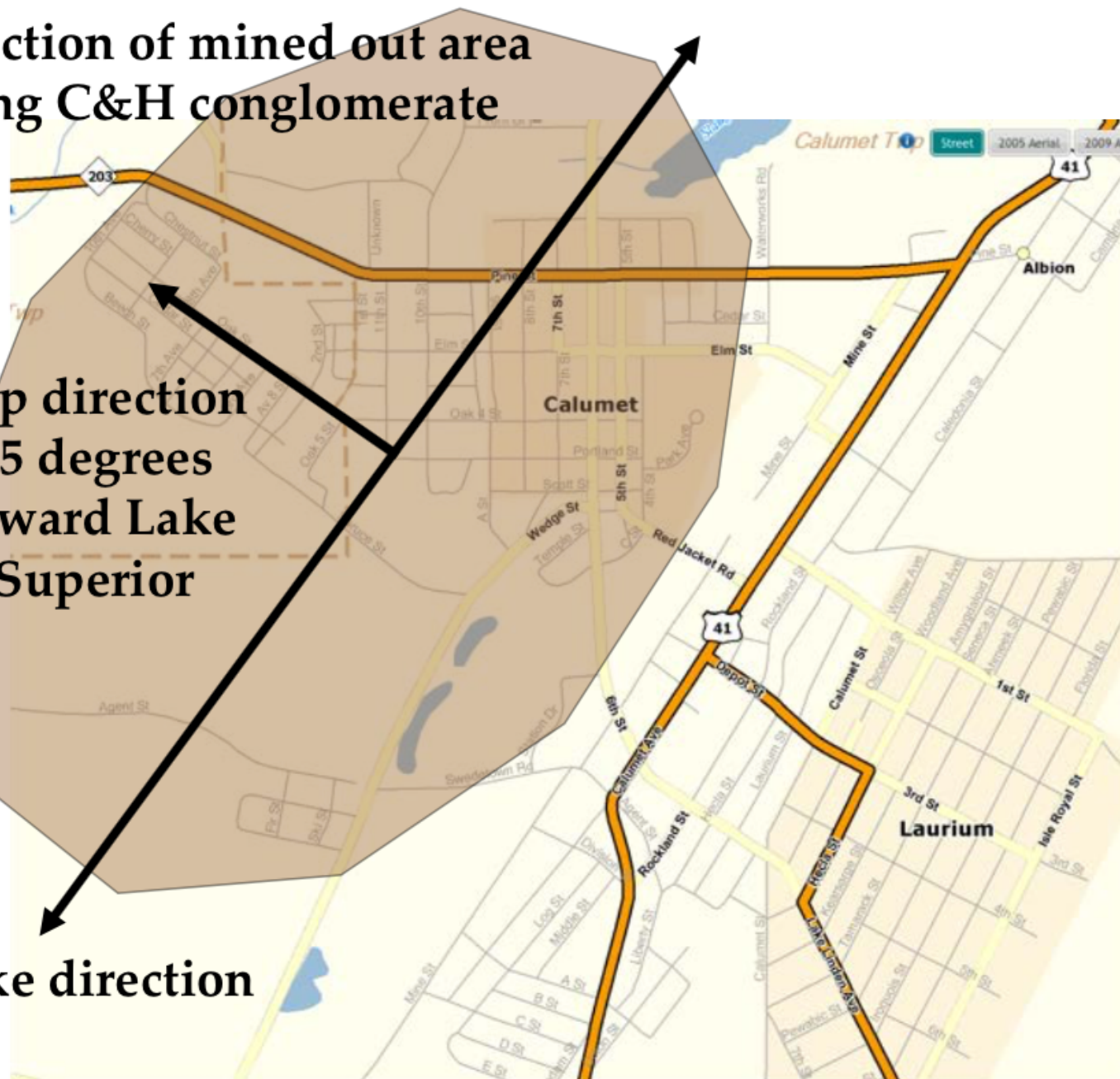
Calumet
Geoheritage



Projection of mined out area
along C&H conglomerate

Dip direction
55 degrees
toward Lake
Superior

Strike direction



Strike and dip help geologists orient a geologic feature in space. Strike is the direction of the line that is formed by the intersection of the rock bed with the horizontal surface (what you see poking out of the ground). Perpendicular to this, the dip measures the angle between the rock layer and the horizon.

The Calumet & Hecla Conglomerate dips down at about 55 degrees toward Lake Superior and Isle Royale, underneath Red Jacket. The deepest parts of the mine are thousands of feet below sea level. Notice how US 41 runs at an angle? It's following the **strike** of rock layers.



Michigan Tech



Geothermal bonanza?

Calumet
Geheritage



Photo credit: Michigan Tech Archives

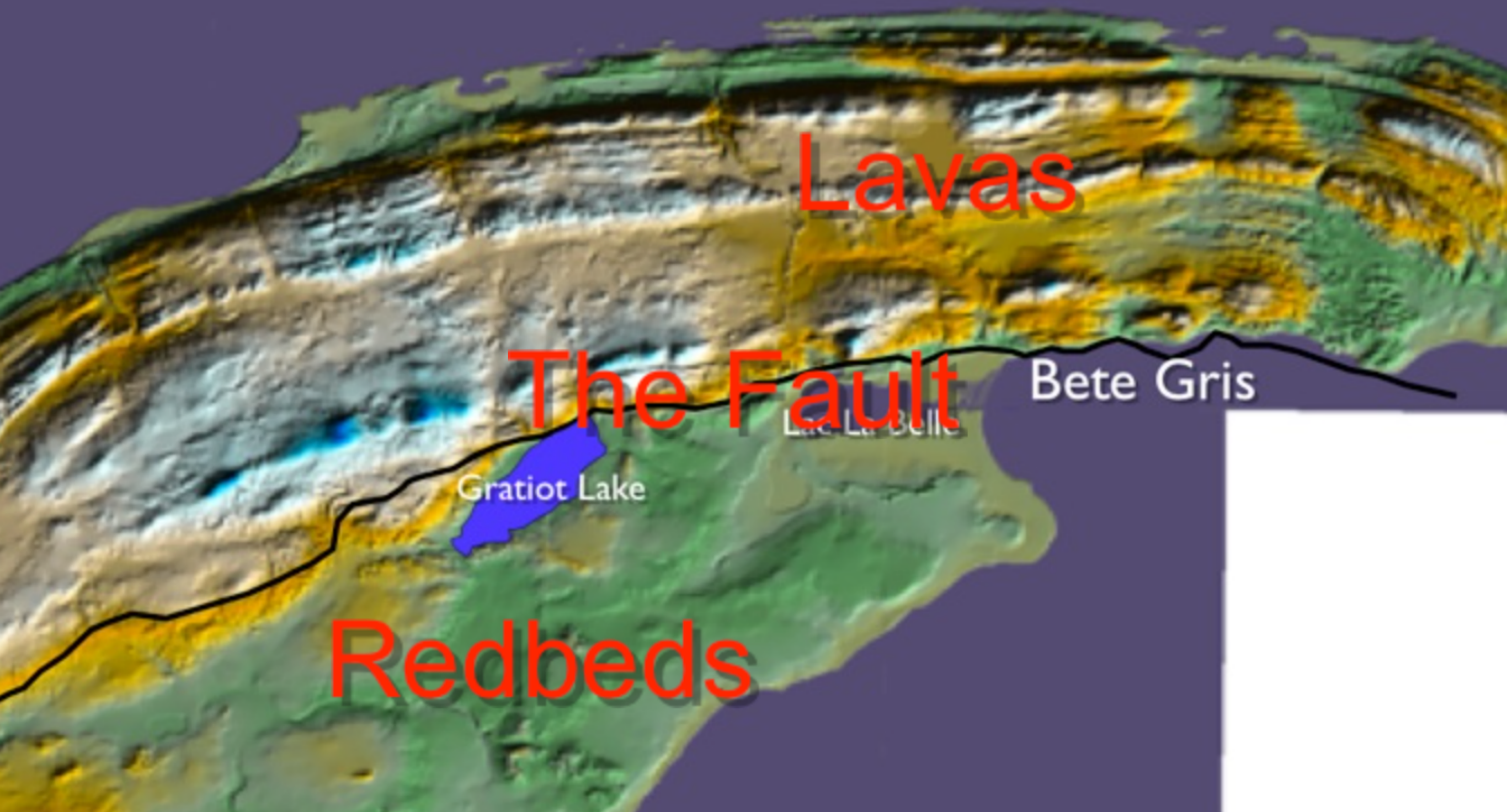
Hot water fills the depths of the Calumet mine openings! 5300 feet below the surface, the water and ground temperatures are about 80 degrees F! This place is the most significant for Calumet's geothermal potential because it is likely the most accessible point to the water - a rare vertical shaft that goes straight down. Investigation of the deep waters last occurred in the 1950s. A Calumet geothermal spa? A welcome addition in our long, cold winters!



MichiganTech



Funded by a Keweenaw Heritage Grant

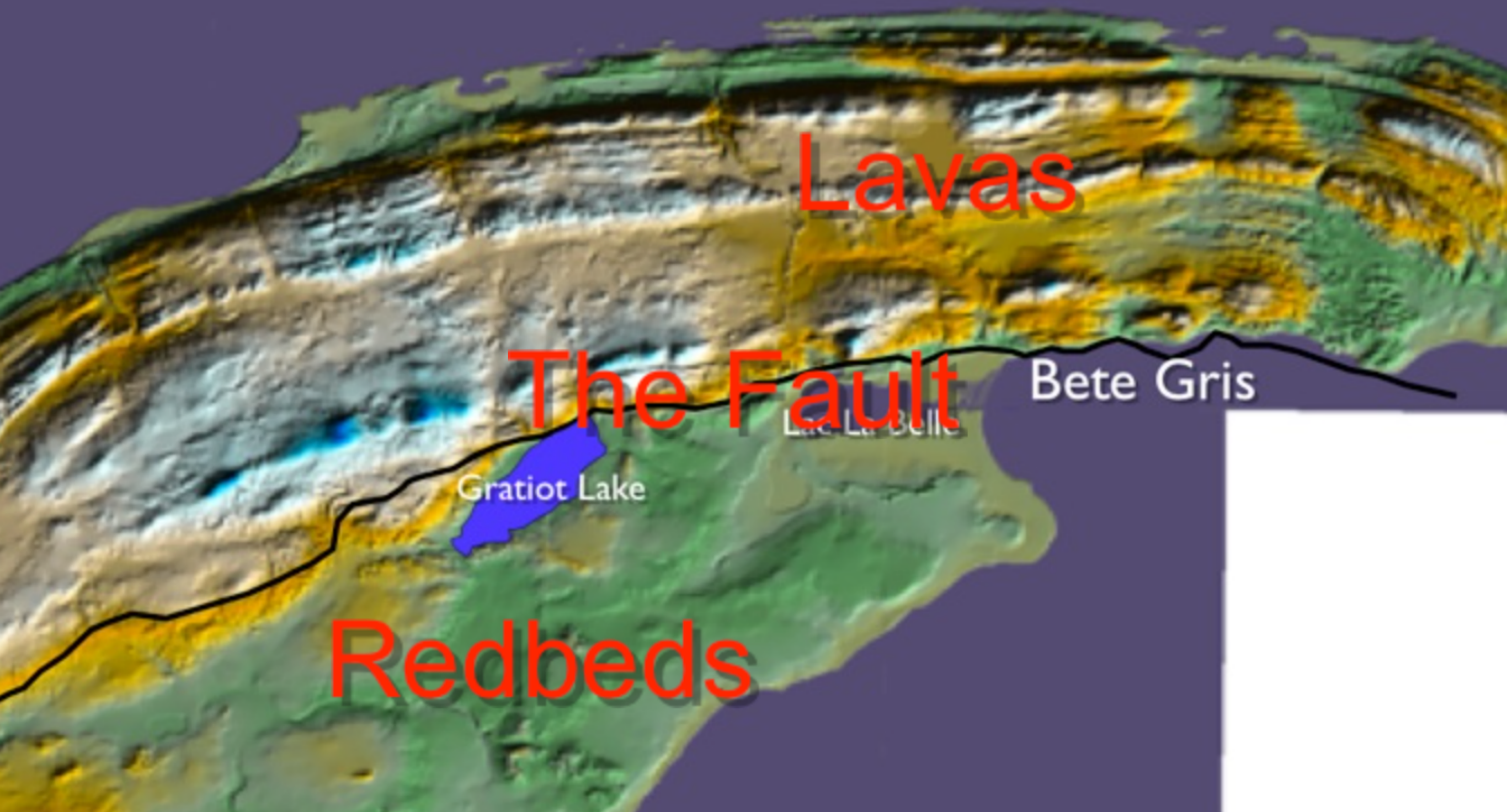


Half of the Keweenaw, the part south of the Fault, is Jacobsville Sandstone, the more mature and younger part of the reduced sequence of fluvial sandiness that were shed off of the continental blocks into the rift valley.



Fluvial Red Bed Sediments fill the rift valley, a relict of an Proterozoic oxidizing atmosphere.





A huge thrust fault cuts the Keweenaw
Most people who live here have heard of it, but have no idea
no idea where it is now or whether it is active. Neither do they
know what a fault is or how to recognize it.



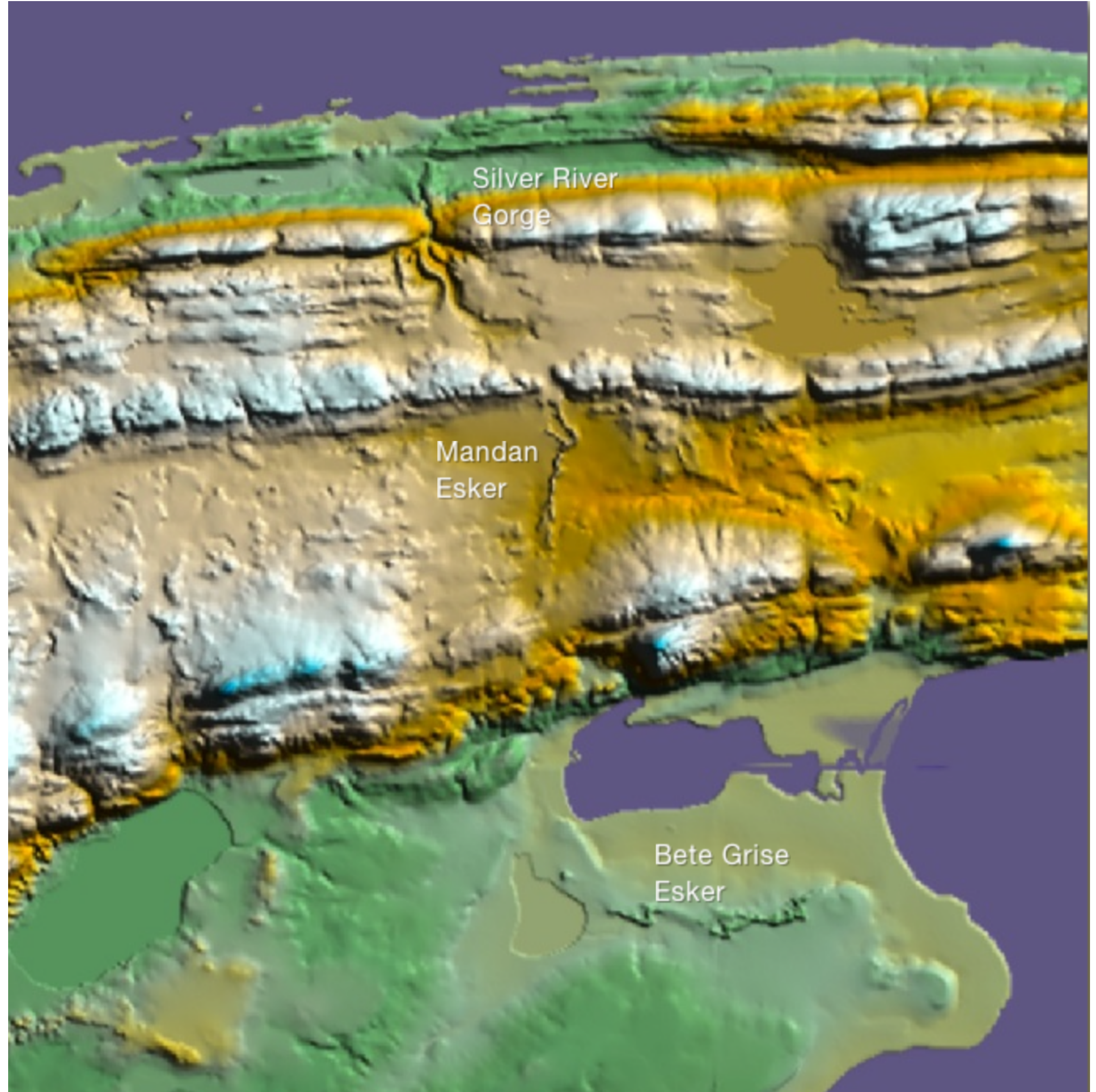
The Fault generates
a line of waterfalls
that fall over the
hard rock slopes

People love waterfalls.
This is a teaching
moment!

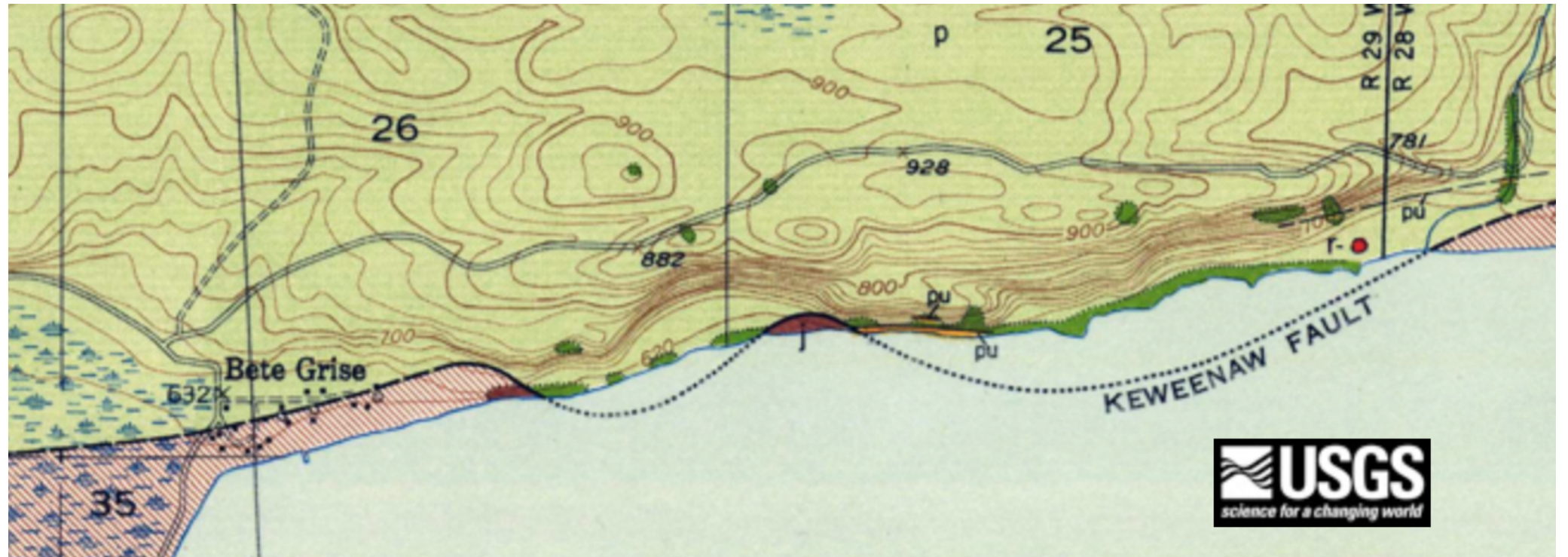


Douglas Houghton Falls

Glacial features are conspicuous and numerous in the Keweenaw. The Mandan esker is among the most striking, with a dramatic gorge associated with two separate eskers.



The Fault can be followed along the Shoreline, and traced through the shallow waters where it crosses the shore. It can also be observed on the wave washed shore rocks in the same spots.



Raised Shorelines are very prominent where sandbars are found stranded above current shorelines. They are like bathtub rings, recording lake history.





Mining waste sites in Lake Superior provide insight into environmental mitigation strategies and the physical oceanography of large lakes.

Keweenaw Geoheritage

NPS US Geoheritage Workshop 2013

Bill Rose



As much as anywhere on Earth, the Keweenaw reflects its Geology....

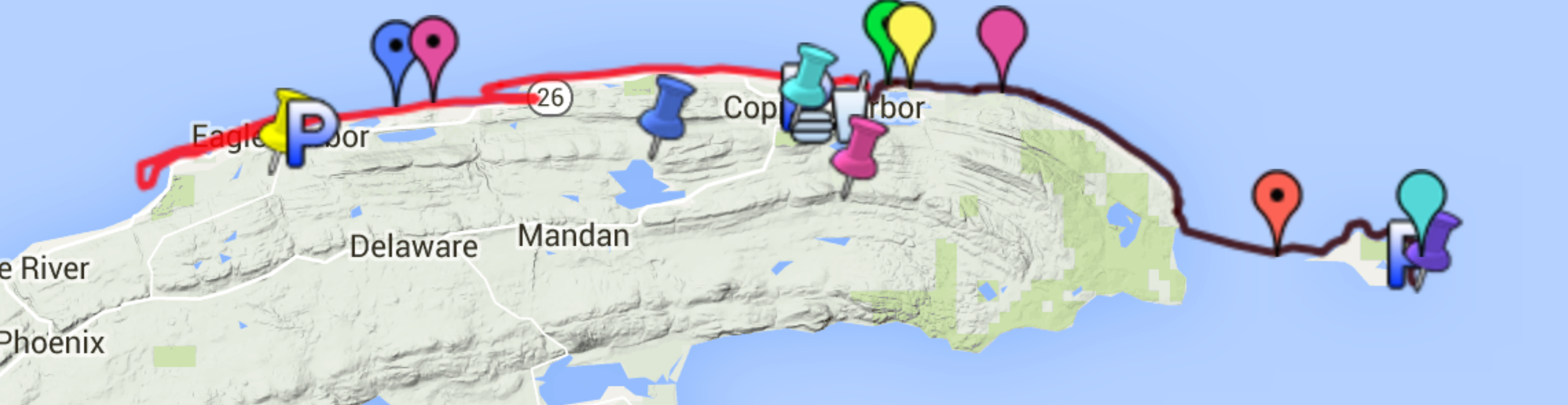
Geotours

Bill Rose



RV Agassiz at Rock Harbor

In July 2015, we plan one day geotours on four of the five Geoelements of Keweenaw Geoheritage. These tours use ground and boat transportation and visit some of the most important places identified by the website. We use the university research boat, the RV Agassiz. The four trips are described below. **Registration and cost** information for these trips is available through the Western Upper Peninsula Center for Science, Math and Environmental Education. **Each trip is limited by the boat capacity to 17 people.**

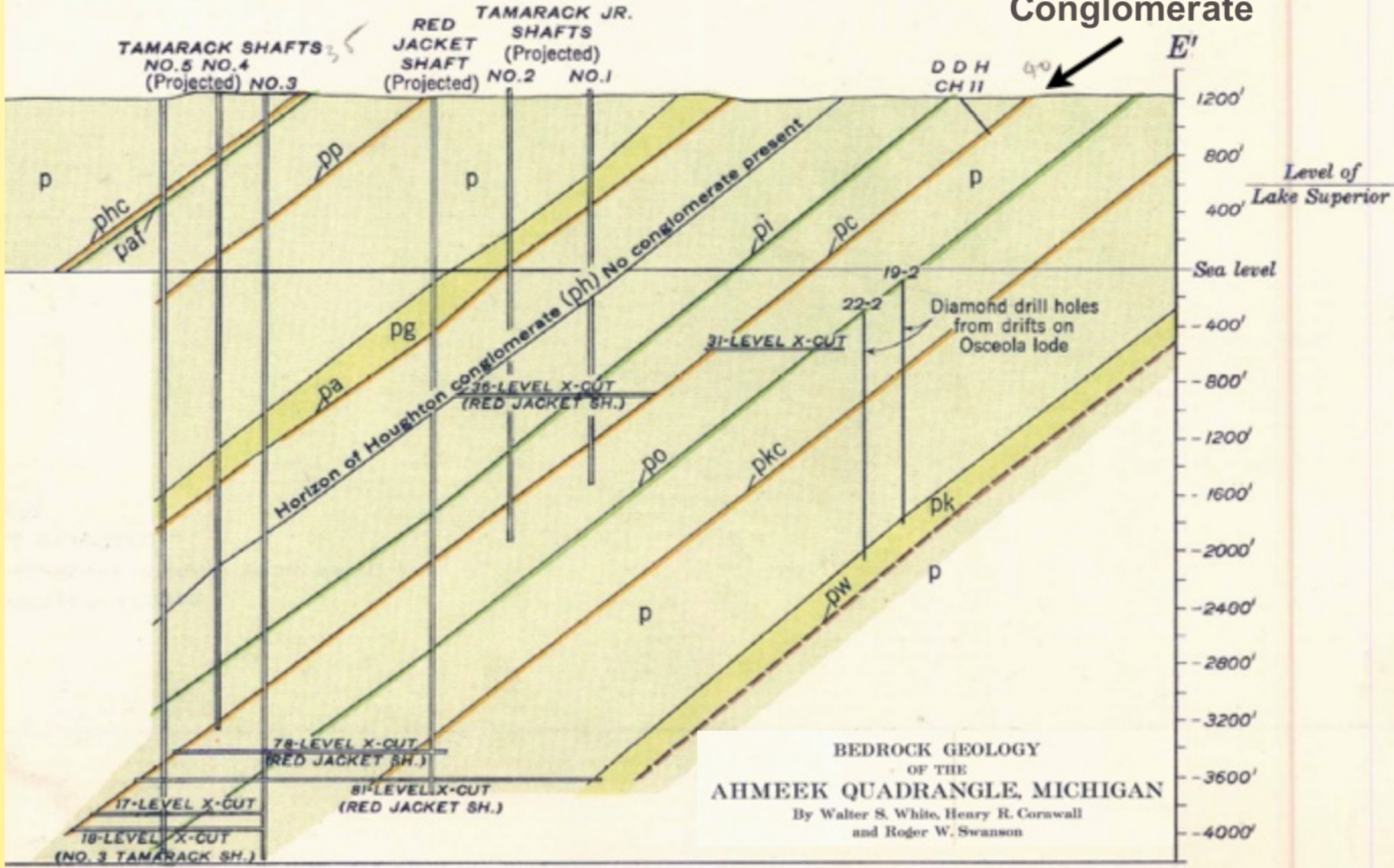


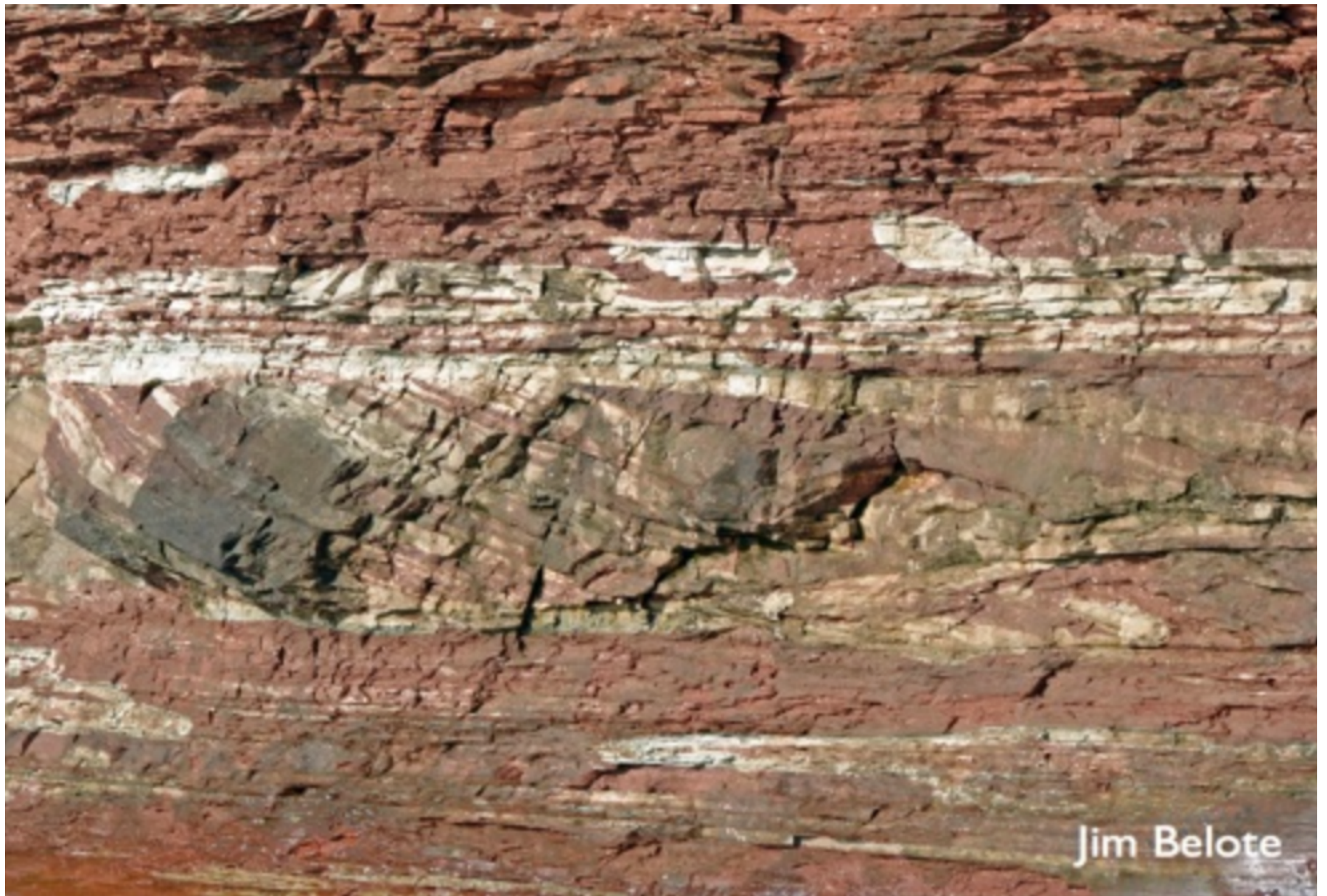
Questions?

Michigan Tech



C & H
Conglomerate





Jim Belote