GEO/BIKE WALK COMMUNICATES GEOHERITAGE IN HOUGHTON, MICHIGAN

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http://www.geo.mtu.edu/~raman/SilverI/HoughtonEC/ http://www.geo.mtu.edu/~raman/SilverI/The_Fault/

GSA Annual Meeting in Denver: 125th Anniversary of GSA (27-30 October 2013) T122. Geoheritage and Sense of Place in the Context of Earth Science Education

March 2013: America's Geologic Heritage

Education Outreach Panel Building 41, Denver Federal Center, Lakewood, CO 1:30-3 pm, Tuesday, 19 March 2013





BUILDING GRASSROOTS FOR A KEWEENAW GEOPARK

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http://www.geo.mtu.edu/~raman/Silverl/HoughtonEC



This site is aimed to walk or bike you through the city of Houghton, a place defined by the local geology, with an eye toward geological features and how they impact the site. You should use your GPS as a guide and Google Earth as a map tool. Any community can be linked to its geologic roots, and this is something that earth science teachers will find helpful. Outcomes of doing this is that people learn how to find their way around, how to visualize landscapes, how to read rocks and then how to understand their natural world and how it works.





2011 GSA Annual Meeting in Minneapolis

Geoscience Education I: Field and Place Based Approaches to Geoscience Education

Minneapolis Convention Center: Room 208AB 11-11:15 am, Sunday, 9 October 2011





KEWEENAW BOULDER GARDEN —A REVITALIZED KAME TERRACE ON CAMPUS, USED AS A TEACHING LABORATORY

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TEACHING WITH BOULDERS

THESE BOULDERS ARE LIKE OUTCROPS, THEY CONTAIN AS MUCH INFORMATION AS MANY OUTCROPS AND BECAUSE THEY WERE SMOOTHED BY GLACIAL ACTION, IT IS EASY TO "READ" THEM (TO SEE THEIR DETAILS). BY CAREFULLY CHOOSING THEM AND THEN MOVING THEM TOGETHER, WE HAVE BEEN ABLE TO ASSEMBLE AN AMAZING TEACHING RESOURCE, WHERE STUDENTS MAY SHARPEN THEIR SKILLS AT READING THE ROCKS.

Some ways to use the boulder garden in geological classes:

Rock identification Mineral identification Which way is up? Understanding Solidification Sedimentary rock structures Assembling a rift





Bill Rose Professor of Petrology 15 November 2010



Waterfront/Canal in Houghton



Portage Lake, the "canal" and the Keweenaw

Question:

Would there be Copper along the big fault that may lie underneath the waterway?



Stats

NAME Houghton Waterfront LOCATION Houghton, MI KMZ Download here SUBJECTS Fault, Glacial channel



2012

13,200 Years ago

Houghton Geo Walk/Bike Sites Bent trees, slope stability testers





Trees growing on an unstable slope will show indications of slope movements because of geotropism--the growth of plants in a direction opposed to gravity. The degree of bending is indicative of the rate or amount of movement. In the example we have found in Houghton, we note that not all trees are bent. Why would this be? Could these observations be made into a slope stability map?

Questions: Why are some trees bent a lot and others not at all? Are they all bent in the same direction?

http://www.geo.mtu.edu/~raman/Silverl/HoughtonEC/Bent_trees.html





http://www.geo.mtu.edu/~raman/Silverl/The_Fault

THE FAULT SO WHAT?

WELCOME FAULT TYPES ACTIVE FAULTS HOW TO FIND STRIKE & DIP AGE & OFFSET HUNGARIAN FALLS





A fault is a break in the rocks that make up the Earth's crust, along which rocks on either side have moved past each other.

The Keweenaw Peninsula is divided into two parts by a huge geological fault. The fault controls the way we live, although many are unaware of it. It is one of many elements of our Geoheritage in the Copper Country and the UP.





Fig. 3.—Junction of the Eastern Sandstone and Keweenaw porphyry-conglomerate, Wall Ravine, Keweenawa Point. a a Keweenawan porphyry-conglomerate; b b, junction débris; c, vertically placed Eastern Sandstone; d conglomerate lay included in c. A fault is a break in the rocks that make up the Earth's crust, along which rocks on either side have moved past each other.

Keweenaw Fault and Geoheritage

Bill Rose 29 July 2013

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Your voice is important. Participate In Our Survey





http://www.geo.mtu.edu/~raman/Silverl/IRKeweenawRift



Ophite

Palisades

ower Ophite

Ophite

This web effort is to give field guidance for several days of geological exploration that can be done within the National Park. Most of the sites described are within a day of Rock Harbor, where many visitors enter the park. Many of the best sites are wave-washed shorelines where the rocks are kept clean by the waves and ice. Isle Royale has lots of shoreline, much more than the Keweenaw Peninsula, which has nearly identical geology. There is background information and day by day field guide information, which you can use in any order. If you spend a week on Isle Royale and hustle, you can visit all of these places. We hope you will try it.



At Blake Point, three parts of the Ophite Greenstone flow can be seen in continuous cross section

Edwards

Island

6/21/2011

Image NOAA Image USDA Farm Service Agenc age U.S. Geological Su

Porter

sland

Merri

Uppe

Ophite

Jopen Onhite

48'08'51.35" N 88'26'59.76" W elev

Blake Pt

Pegmatite

Scoville Pt



pe

Rock

Saturday, October 26, 13

which goes along the shore of Rock Harbor. Along here,







1821: Cass
Expedition,
led by Henry
Schoolcraft





People who helped: Erika Vye, Mark Klawiter, Emily Gochis. Steve Mattox, Heather Petcovic. Carl Englemann, Ashley Miller, Justin Olson, Kathleen McKee ~60 Michigan Earth Science teachers ~40 outside experts (professors, local residents)

Resources:



