

# How to Make a Ground Moraine Map

## Access the GeoWebFace Application

- ❖ Read the disclaimer, and then select the **"I Have Read And Agree With This Notice"** button.
- ❖ Maximize the windows viewing area (if you have not already done so).

The following is optional but advised (especially for smaller displays) to further increase the viewing area:

- ❖ Select the **Top Gray bar**,
- ❖ Select the **Bottom Gray bar**, and
- ❖ Press the **F11** key (toggle off when done).

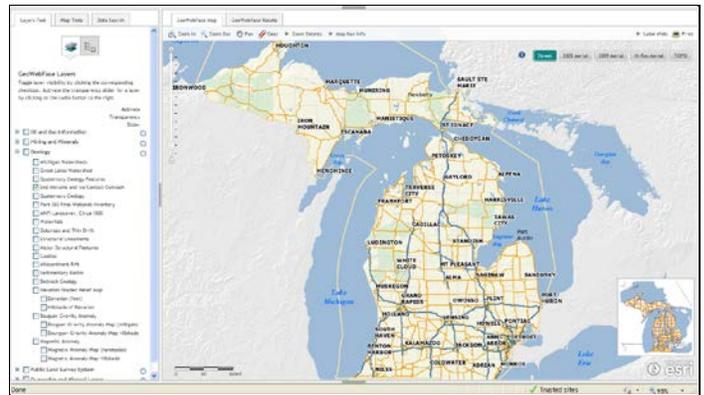
## The Steps

In the **Left Panel** of the display:

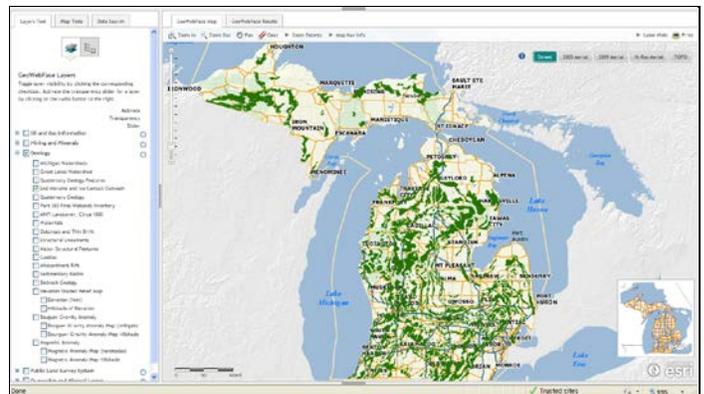
- ❖ **Select the Layers Tools tab**
- ❖ Select the **Geology** layer
- ❖ Select the **End Moraine and Ice Contact Outwash** layer
- ❖ **Pan** and **Zoom** to an area of interest
- ❖ Select additional layers if you are interested

This is a starting point. The illustrated directions have some additional ideas to try.

If you have questions or comments please contact the GeoWebFace Team at [DEQ-GeoWebFace@michigan.gov](mailto:DEQ-GeoWebFace@michigan.gov)



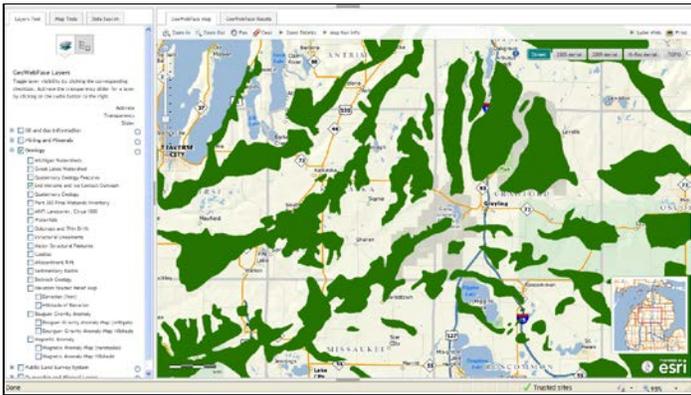
After expanding the **Geology Layer**, the map will look like the map above.



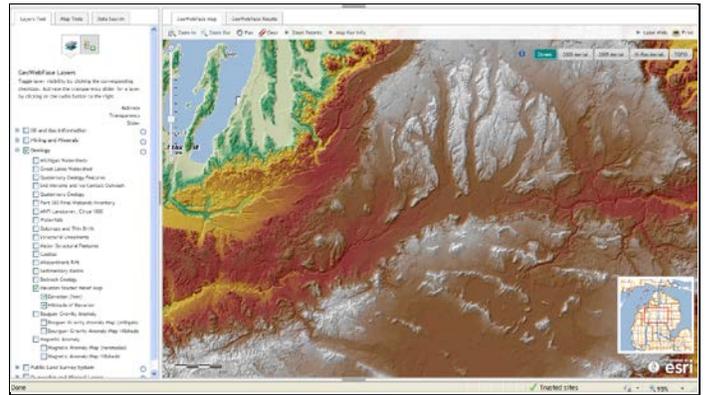
If you check the **Geology layer** and the **End Moraine ..." layer** the map will look like the one above.



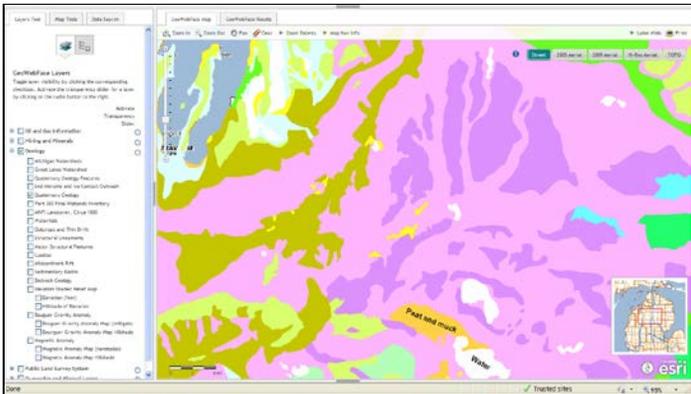
If the uppermost "main layer" is not selected, information in the layers below it will not be mapped.



Use **Pan / zoom** to display the area of interest.



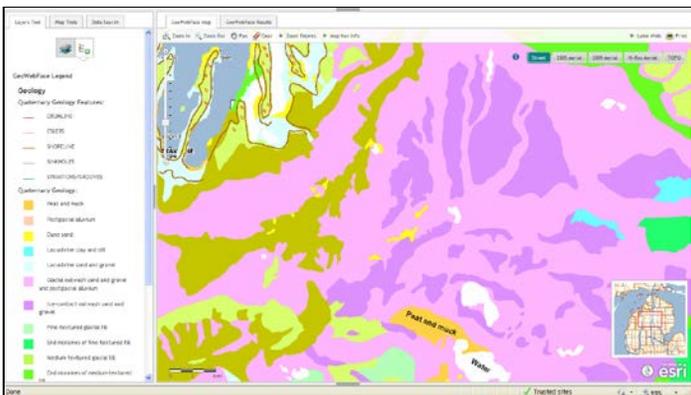
This map shows the **Elevation Shaded Relief layer** with the **Elevation** and **Digital Elevation layers** selected.



If you deselect the **End Moraines layer** and select the **Quaternary Geology layer** the map will look like the one above

The **transparency slider** can help you see the information on the **base map** you have selected.

Under the **Map Tools** tab you can use the **Measure** icon to determine distance and or area.



On this map, in addition to the **Quaternary Geology layer** the **Quaternary Geology Features layer** is added. Also under the **Map Tools tab** the **Legend icon** is selected. The Legend describes the colors and symbols used on the map. You might need to move the slider bar to see the entire legend. For information about all of the ninety plus available layers please go to:

**GeoWebFace Layers and Descriptions**

[http://www.michigan.gov/documents/deq/GeoWebFace\\_Layers\\_and\\_Descriptions\\_376707\\_7.pdf](http://www.michigan.gov/documents/deq/GeoWebFace_Layers_and_Descriptions_376707_7.pdf)

❖ For more information about Michigan Glacial Geology and the landforms that cover most of the state, please go to the online Digital Geology Library Catalog

[http://www.michigan.gov/documents/deq/GIMDL-Catalog-2010-01-20\\_307979\\_7.pdf](http://www.michigan.gov/documents/deq/GIMDL-Catalog-2010-01-20_307979_7.pdf).

Specifically

**Bulletin 04: The Glacial Lakes around Michigan;** W. R. Farrand, 1988

[http://www.michigan.gov/documents/deq/GIMDL-BU04\\_216119\\_7.pdf](http://www.michigan.gov/documents/deq/GIMDL-BU04_216119_7.pdf)

If you zoom out and select the Layers Tab / Geology / Quaternary Geology features you can see the distribution of glacial features over a wider area. You can also see the original **Quaternary Geology of Michigan** map by W. R. Farrand, 1982 online at [http://www.michigan.gov/documents/deq/1982\\_Quaternary\\_Geology\\_Map\\_301467\\_7.pdf](http://www.michigan.gov/documents/deq/1982_Quaternary_Geology_Map_301467_7.pdf)