



Name: _____

Lab 3 Bedrock Geology of Indiana

The objectives of this lab are to familiarize yourself with the geographic layout of Indiana's bedrock geology and to place your Paleontology Collection samples in that geographic and stratigraphic context. You will locate the sites from which the specimens came as closely as possible, use geological maps and the information recorded with the specimens to determine as accurately as possible the lithostratigraphic units from which they came, and you will locate scientific papers about your site and/or the lithostratigraphic units. You will use IndianaMap, GoogleScholar, and IUCat as tools to accomplish this task.

Using IndianaMap

IndianaMap is an online geographic information system (GIS) provided by the Indiana Geological Survey and its partners. It synthesizes data on geology, topography, land use, environment, and other geographic information for the state of Indiana. IndianaMap can be accessed at <http://www.indianamap.org/>. From the main page, choose View the Map.

You control which layers are visible on the map. You can choose among preset collections of layers in the Map Gallery, or you can choose a combination of your own in the Layer Gallery. For our exercises, the Bedrock Geology gallery map will provide much of the information you need; However, it is useful to add the USGS Topos layer from the Layer Gallery under "Imagery". You can control whether a layer is displayed from the pulldown Layer menu (choose the icon that looks like a bulleted list from the top right corner of the map).



Figure 1: IndianaMap interface

A. *Bedrock Geology from Topo Maps*

Using the information from Lab 1, locate Points A & B from the transect in your Quadrangle in IndianaMap. Activate the Topo Map layer first. Search for a location in your quadrangle (for example, the place for which the quadrangle was named, such as “Crawfordsville”). Relocate the township, range, and section from your transect. Click on the map in the location of endpoints of your transect. A popup menu will appear giving information for all the active layers. If the Bedrock Geology layer is active, you will see the name of the rock unit at that point (e.g., “Borden Group – Bedrock Geology”). Now answer the following questions.

1. What is the name of your quadrangle? (from Lab 1)

2. What is the township, range, section, and quarter section of the two points? (from Lab 1)

A:

B:

3. What geological unit is recorded for that quarter section in IndianaMap?

A:

B:

4. What is the geological period and the absolute age (max and min) for each point?

Period

Max age

Min age

A:

B:

C. Find scientific publications about your samples

Using the information reported above and GoogleScholar, locate three or four papers that have been published about the geology and paleontology associated with your site. If a publication is mentioned on your specimen cards, find it. Otherwise, try searching for the name of the person who collected the specimens, the geological strata, and/or the placename. E.g., you might look for papers by “Horowitz” on “fossils” from “Crawfordsville, Indiana”.

Report the papers you found here in the following format:

Lastname, initials (year), “paper title”. Journal/book, volume: first page-last page.

Horowitz, A. S. (1987). “Valmeyeran (Middle Mississippian) Carbonate Rocks of Southern Indiana”. *A Guidebook for Annual Field Trip of the Great Lakes Section Society of Economic Paleontologists and Mineralogists*, pp. 119-123.

If you cannot find any, ask advice from Dr. Polly. There *are* papers somewhere for almost all the rocks and fossils in Indiana. Information in these papers may help you determine the geological age of your samples, or determining the age may help locate papers. If you can't find papers, go on to part D first.

C. Determine full information about the age and rock units of your samples

Using all the information above, report the following information about your localities:

County; topo quadrangle; township, range, section, and quarter section; latitude and longitude; rock group name; Period; Absolute age range (maximum and minimum).

Ideally you want to provide enough information that you could, with help of a map, travel to the site and collect more fossils. Some of you have samples where there is not enough information available to provide this level of detail. Discuss with Dr Polly if you think you cannot. In all cases, you should be able to figure out a county, geological period, and absolute age range.