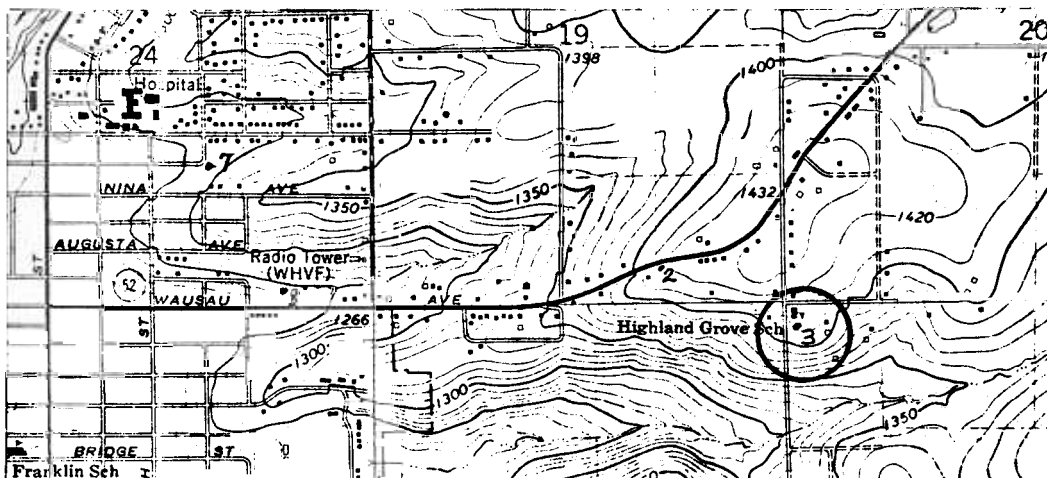


Title: Rhyolites, Highland Grove School

Location: NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 29, T.29N., R.8E. (Wausau East 7 $\frac{1}{2}$  Minute Quad.) Get permission from Robert Zielsdorf, 2105 25th St., Wausau. Phone: 715-842-2592



Author: Gene L. LaBerge

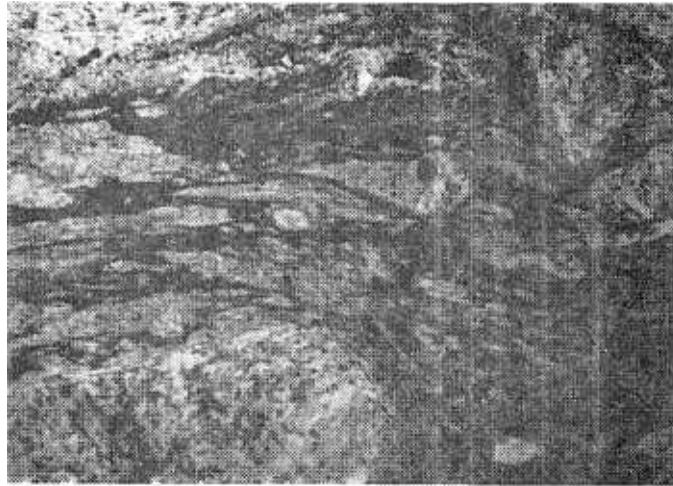
Description: Considerable parts of Marathon County, including that part of Wausau east of the Wisconsin River, are underlain by several types of rhyolitic volcanic rocks. They include lithic and crystal tuffs, welded tuffs, breccias, volcanic mudflows (lahars), flow-banded rhyolites, and volcanic sandstones. At this stop we will see examples of tuffs and welded tuffs, lahars and flow-banded rhyolites.

The outcrops along 25th Street at the brink of the hill are welded crystal tuffs. Flattened shard structures that curve around the phenocrysts can be seen on weathered surfaces.

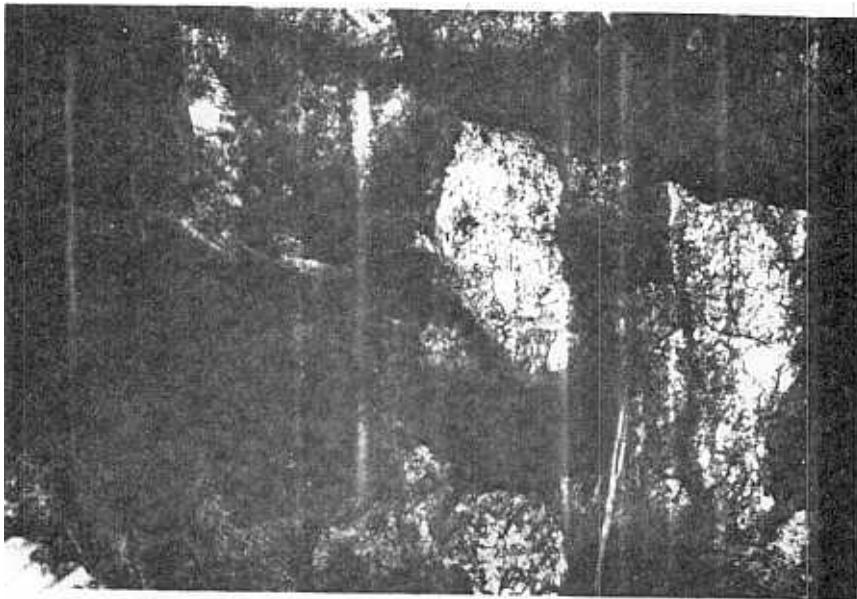
Photograph A shows an example of the texture. A fine, massive, non-porphyrific unit exposed in the woods south of the house appears to be formed of fine ash, and south of the ledge (downslope) is a lapilli tuff. A coarse conglomeratic (laharic) deposit is exposed in the pasture just east of the woods.

Photograph B shows the texture of the lahar.

Microscopic examination shows that the rhyolite is a very fine mixture of quartz and feldspar containing larger quartz and oligoclase phenocrysts. The common occurrence of shard structures (Photo A), relict spherulitic and axiolithic structures and perlitic cracks indicate that the rocks were initially glassy, but have devitrified (crystallized) over the 1900 million years since they were erupted (Van Schmus and others, 1975). The presence of minor foliated sericite and carbonate in the rocks indicates that they are slightly metamorphosed, but the preservation of shard structures shows that the grade of metamorphism is very low. The volcanic rocks here appear to dip nearly vertically, although measuring a dip and strike in rocks of this type is difficult.



- A. Photomicrograph of welded tuff showing flattened shards "draped" around lithic fragments. Approximately x100.

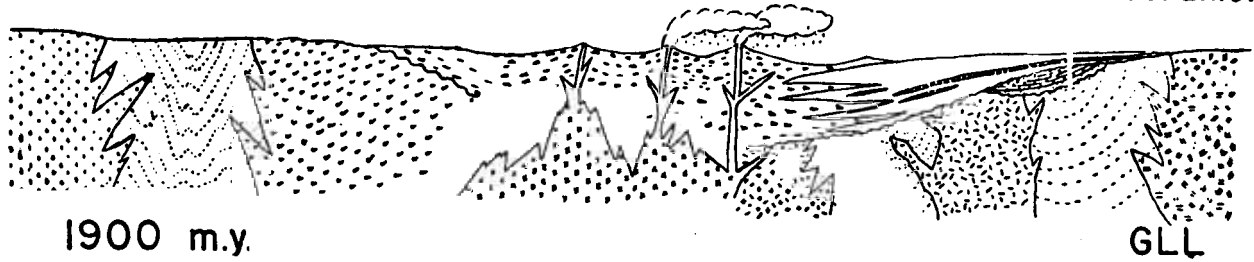


- B. "Conglomeratic" rhyolite, probably formed by a volcanic mudflow (lahar). Pen shows the scale.





KENOSHA

WAUSAU

LAKE SUPERIOR

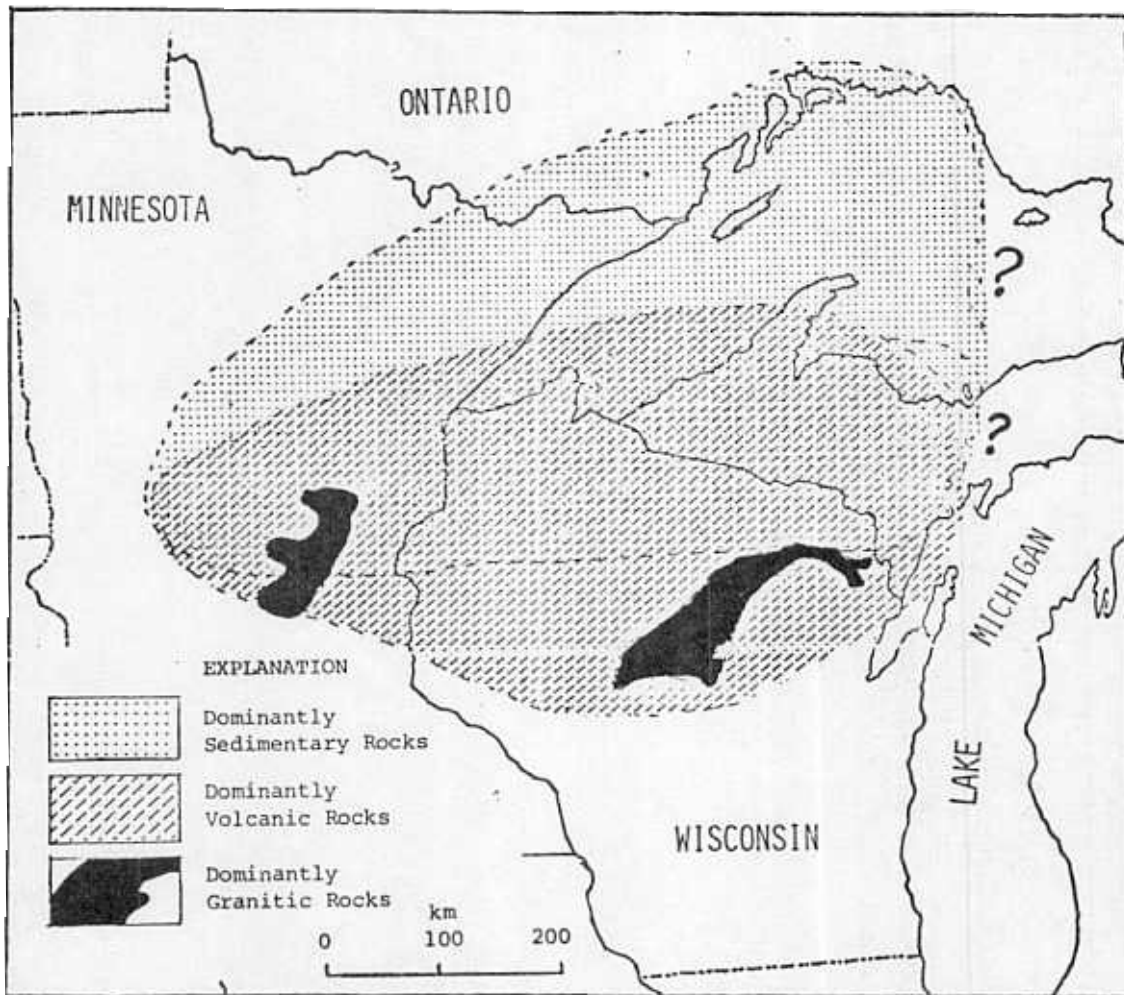


MIDDLE PRECAMBRIAN

-  GRANITIC ROCKS
-  SEDIMENTARY ROCKS
-  VOLCANIC ROCKS
-  DOLOMITE, ETC.

EARLY PRECAMBRIAN

-  GRANITIC ROCKS
-  "GREENSTONE"



Significance: The rhyolites of Central Wisconsin were formed at approximately the same time as the Middle Precambrian iron formation and graywackes of the Gogebic Range. Volcanic rocks and granites are of the dominant Middle Precambrian rocks in the north central part of Wisconsin, and appear to form the "igneous portion" of the Animikie Basin (see diagram) (LaBerge, 1977).

The volcanic rocks are largely pillowed basalts and bedded (water lain) tuffs indicating a subaqueous deposition. However, the rhyolites in the Wausau area are mainly subaerial deposits, and may represent a volcanic island in the Animikie Sea. Settings such as this are the site of zinc-copper ore deposits such as those found recently at Ladysmith, Rhinelander, and Crandon. The ore deposits form where zinc and copper-bearing hot springs came out on the sea floor during the volcanic activity. Significantly there are minor occurrences of these sulfide minerals in the Wausau area.

The intrusion of numerous granitic bodies and faulting has segmented the former east-west volcanic terrane in Marathon County. However, a more continuous belt of Middle Precambrian rocks extends from the Michigan border near Iron Mountain westward beyond Ladysmith, and perhaps as far as central Minnesota.

References:

- LaBerge, G. L., 1977, Major Structural Features in Central Wisconsin and Their Implications on the Animikie Basin; 23rd Annual Institute on Lake Superior Geology, Thunder Bay.
- Van Schmus, W. R., Thurman, M. E., and Peterman, Z. E., 1975, Geology and Rb/Sr Chronology of Middle Precambrian Rocks in Eastern and Central Wisconsin: Geol. Soc. America Bull., Vol. 86, pp. 1255-1265.