Michigan Basin Geological Society
January 2024 Membership Meeting

Interactions of the Saginaw and Lake Michigan Glacial Lobes - The Kalamazoo County Mapping Project

WHO: Dr. Robb Gillespie, Senior Research Associate with the Western Michigan University Geological and Environmental Sciences Department
COST (includes dinner): Free for members, brats and side salads
WHEN: January 17th, 2024, Social hour - 5:00 PM , dinner – 6:00 PM, presentation - 7:00PM. Reservations are requested. Please RSVP to Jennifer Trout at jennifer.l.trout@wmich.edu

ABSTRACT
Tunnel valleys have played a significant role in the development of the Kalamazoo County, Michigan glacial landscape. Northeast-southwest trending tunnel valleys associated with the Saginaw Lobe cut across Kalamazoo County, as well as less developed, northwest-southeast trending tunnel valleys associated with the Lake Michigan Lobe. These two tunnel valley systems influenced the direction of subsequent ice movements and dictated development of associated depositional patterns and post-glacial fluvial networks.

Northeast-southwest trending drumlins are observed in the southeast portion of the county. They were formed by Saginaw ice that originally extended farther southwest than currently observed. Computer-generated topographic flooding-surfaces indicate that mass movements associated with the remaining drumlins all occur at approximately the same water level. Thereby, a closely linked origin for all these mass failures is suggested.

Glacial channels, kettle lakes, and pitted/hummocky terrain features are observed in north-east Kalamazoo County. They formed as Saginaw ice retreated to the northeast, creating the large outwash fan that now buries: (1) the north central portion of the county, and (2) two major northeast-southwest trending Saginaw Lobe tunnel valleys. Landforms covering central and western Kalamazoo County are the result of Lake Michigan ice forming the Kalamazoo moraine and its eastward-extending outwash apron.

Andrew Kozlowski, proposed that the early Kalamazoo River cut through the Kalamazoo Moraine by flowing to the east, not to the west, as it currently flows. This temporary eastward flow was interpreted to be the result of catastrophic drainage of a proglacial lake to the west. This was followed by a second high-volume flooding event; this time from the northeast (Barry and Eaton Counties). Much of south-central Kalamazoo County, originally deposited as part of the Saginaw Lobe drumlin field, and the overlying Lake Michigan Lobe-Kalamazoo moraine outwash fan from the west, has been highly reworked, or even removed, as a result of these catastrophic events. These insightful interpretations of Kozlowski, Kehew, and others is supported by this recent, LiDAR-enhanced, mapping project.

BIOGRAPHY

Dr. Robb Gillespie is currently a Senior Research Associate with the Western Michigan University Geological and Environmental Sciences Department. He has retired from teaching with the Department but is now “head wrangler” for the department’s Dino-Park. He is also associated with the Michigan Geological Repository for Research and Education (MGRRE) and the Michigan Geological Survey (MGS). Currently, he is completing the latest edition of the Kalamazoo County Surficial Map. Dr. Gillespie also has over 24 years of experience in the oil and gas industry having worked for ARCO Oil and Gas in their domestic, international, and research groups, and for COHO Resources redeveloping old oil fields. He has operated his own oil and gas consulting business since 1992, and co-founded Tres Rios Resources, Inc. (TRR), a small oil and gas company in 1993. Dr. Gillespie’s geological specialties range from glacial mapping and interpretation to subsurface reservoir delineation, characterization and modeling based on detailed stratigraphic analysis.