Introducing Glacial Lake Roscommon, Central Lower Michigan, USA

Chase Kasmerchak, Randall J. Schaetzl, and Kenneth Lepper

ABSTRACT

In 2017, an article in the journal Geomorphology described a large, previously undocumented, paleolake that formed atop the interlobate uplands of central lower Michigan. This Pleistocene lake, named Glacial Lake Roscommon, was at times surrounded - partially or wholly - by the ice of the Saginaw, Lake Michigan and Mackinac Lobes. The 2017 study of Glacial Lake Roscommon focused on a kame delta that had formed in the lake 23.1 ka ago, confirming that this part of Michigan was "open water" at about the time of the LGM. The five dates reported from this study were the first to confirm the very early existence of the lake, hundreds of kilometers north of the main ice margin to the south. Since then, an unpublished luminescence date on beach sands from a lower shoreline of the lake established that the lake was still present, but in a restricted part of the basin, at 16.8 ± 0.8 ka ago. A second unpublished date on a higher shoreline (20.1 ± 1.9 ka ago) further confirmed the longevity and persistence of the lake, together, these early dates establish that Glacial Lake Roscommon existed from about the time of the LGM until at least 16 ka ago - a span exceeding 7000 years.

In this poster, we provide maps and graphics depicting the current state of knowledge about Glacial Lake Roscommon. Outflows of water from the lake formed large spillway channels, many of which end in paleodeltas in nearby paleolakes, and/or in subaerial fans. Glacial meltwater flowing into the lake from subaerially grounded ice margins formed kame deltas, kame moraines, and fans - some of which demonstrate textbook-like stratigraphy. Shorelines and beach ridges suggest that Glacial Lake Roscommon had at least four or five different lake level stages. Recent work has confirmed that, subsequent to final lake drainage, a major dune-forming event occurred in the basin between 13 and 10 ka ago.

GENERAL TOPOGRAPHIC FRAMEWORK OF NORTHERN LOWER MICHIGAN, SHOWING THE LOCATIONS OF SOME OF THE MAJOR PHYSIOGRAPHIC FEATURES.

ICE-FLOW DIRECTIONS IN NORTHERN LOWER MICHIGAN.

GLACIAL LAKE ROSCOMMON AT 355 m, WHICH MAY HAVE BEEN THE MOST LONG-LIVED STAGE, DUE TO ITS PROMINENT SHORELINE. THE LIKELY OUTLET OF THIS STAGE WAS AT THE VILLAGE OF WEARDALE, WHICH OPENED DUE TO FURTHER RETREAT OF THE SAGINAW LAKE FROM THE WEST BRANCH MORAINE. AT THE END OF THIS CHANNEL THE VERY LARGE GLOSAVIN DELTA FORMED IN GLACIAL LAKE SAGINAW.

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References


CONCLUSIONS

Glacial Lake Roscommon went undocumented by all previous glacial research. We have confirmed that it existed in the Houghton Lake Basin as large proglacial lake, both while the Mackinac Lobe advanced into it and as it retreated from it. This period spanned from ca. 29 ka (based on OSL ages from the outwash of the Mackinac Lobe in the Grayling Fingers), to at least 23 ka (based on OSL dates from the Cottage Grove Delta). Thus, Glacial Lake Roscommon existed in central Lower Michigan for at least 6,000 years, at around the time of the Last Glacial Maximum. Opportunities exist for continued work on the lake, e.g., dating coastal sediments and establishing linkages between the lake and landforms outside of the Basin.

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