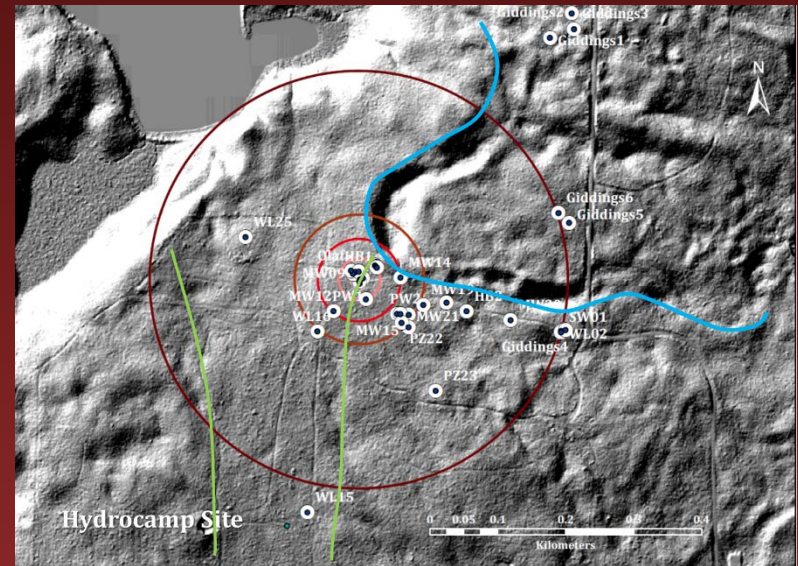
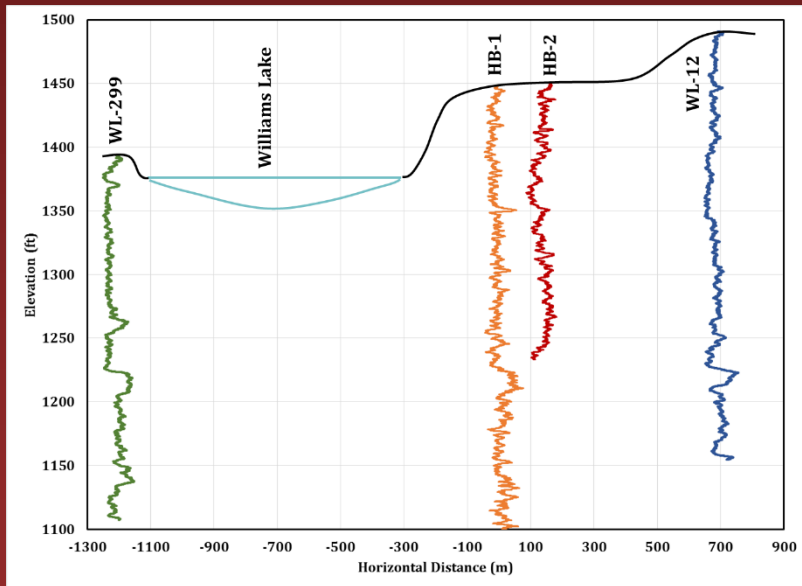


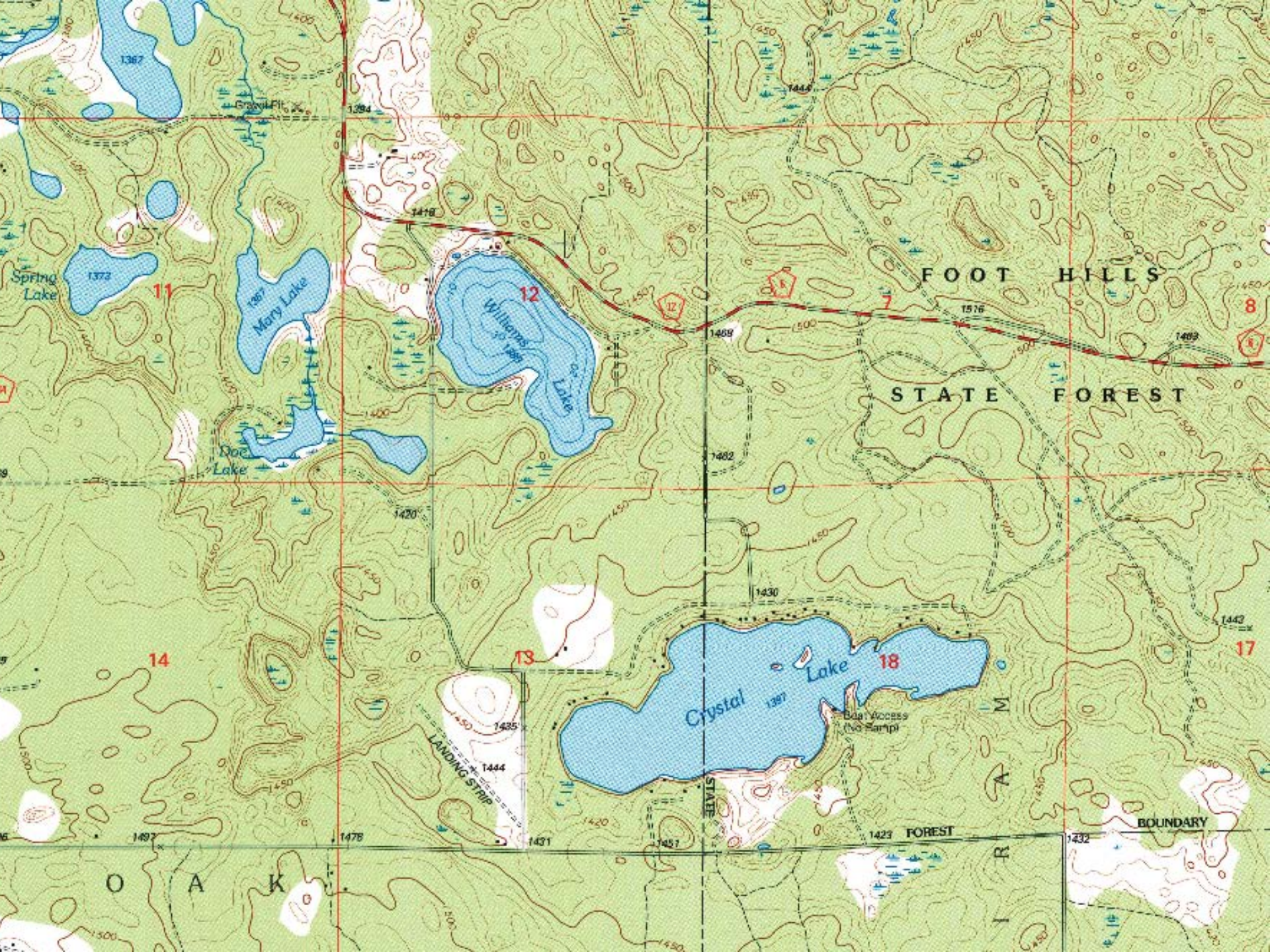
# High Resolution Mapping of Glacial Hydrostratigraphy using LiDAR-based Hillshade images, Rotosonic Core, and Gamma Logs



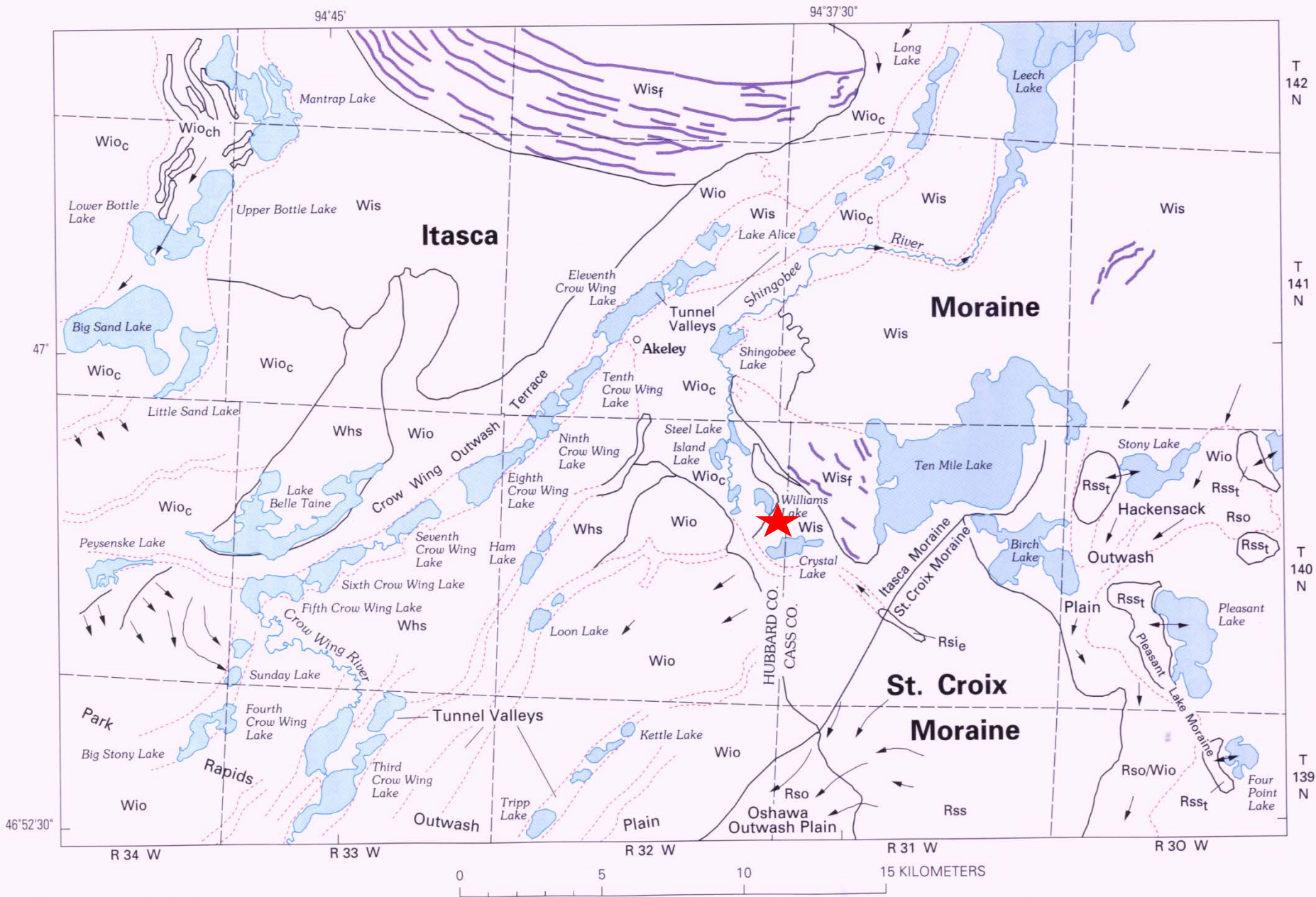
**Scott C. Alexander**  
**Robert G. Tipping**

Department of Earth Sciences  
Minnesota Geological Survey  
University of Minneapolis  
Minneapolis, MN



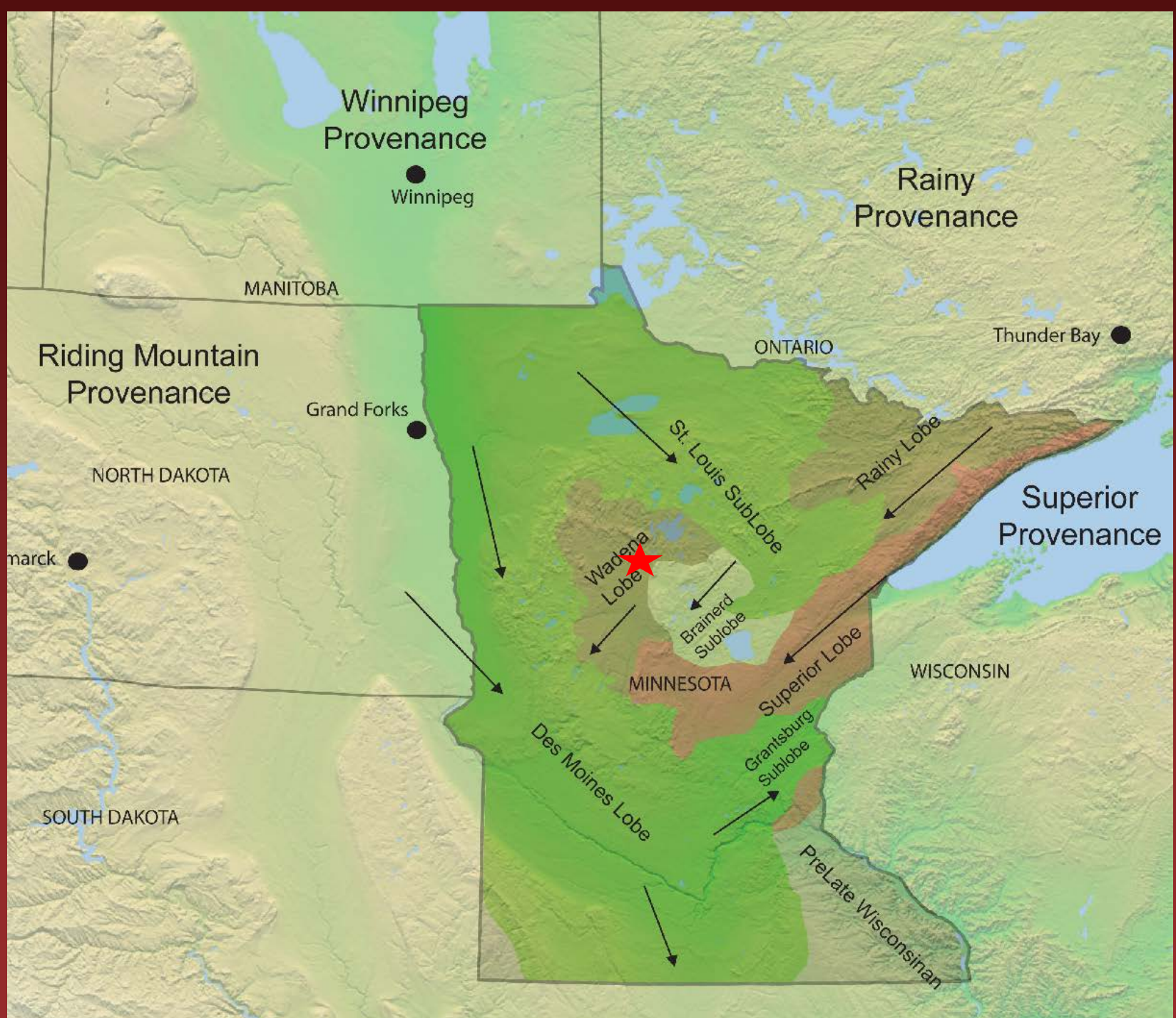




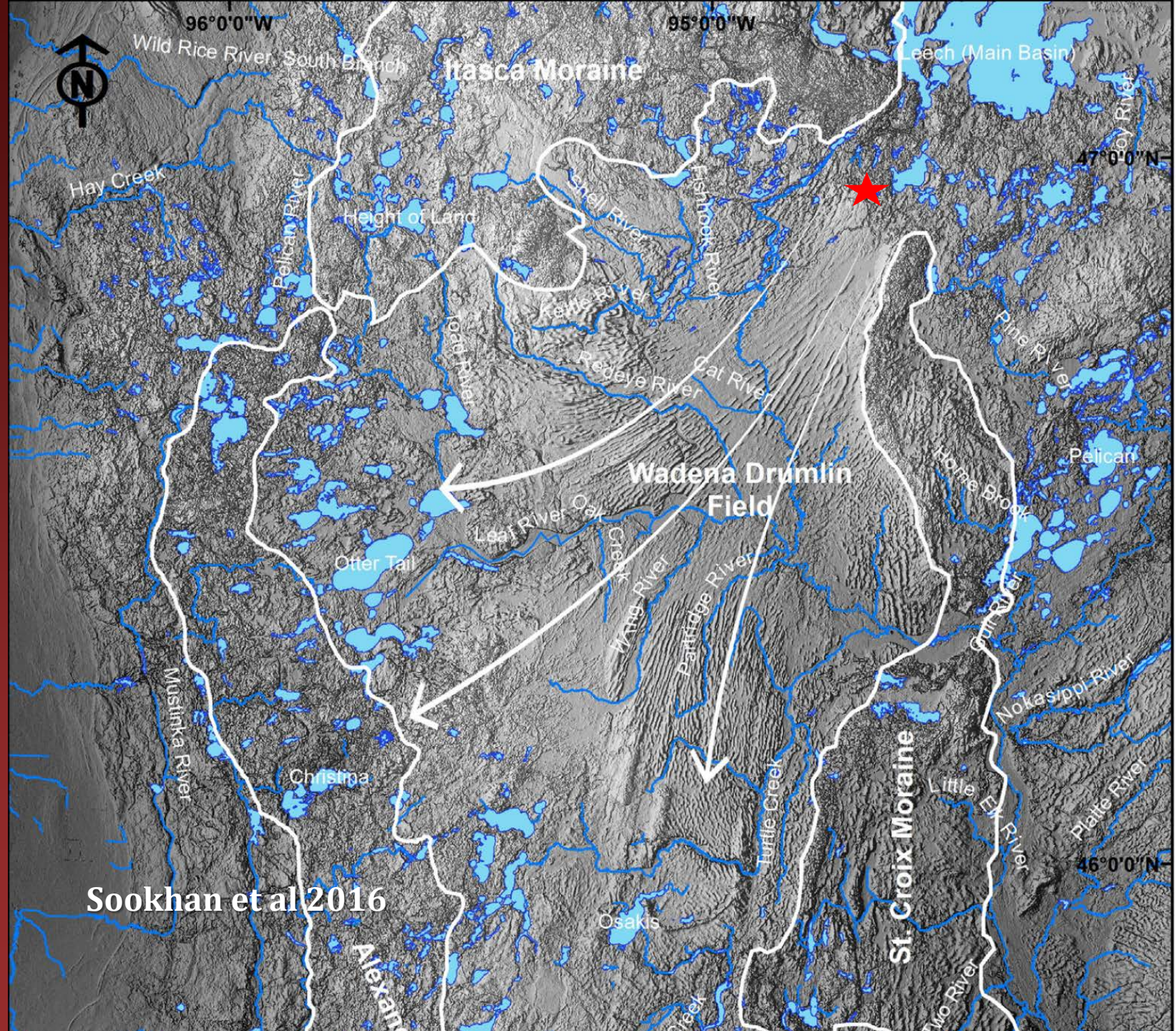


**Figure 2.** Surficial geologic map of the Itasca/St. Croix moraine interlobate area. Map area corresponds to inset on figure 1. (Compiled from Norton (1983), Mooers (1988), Mooers and others (1990), Wright (1993), and Mooers (unpub. data)).

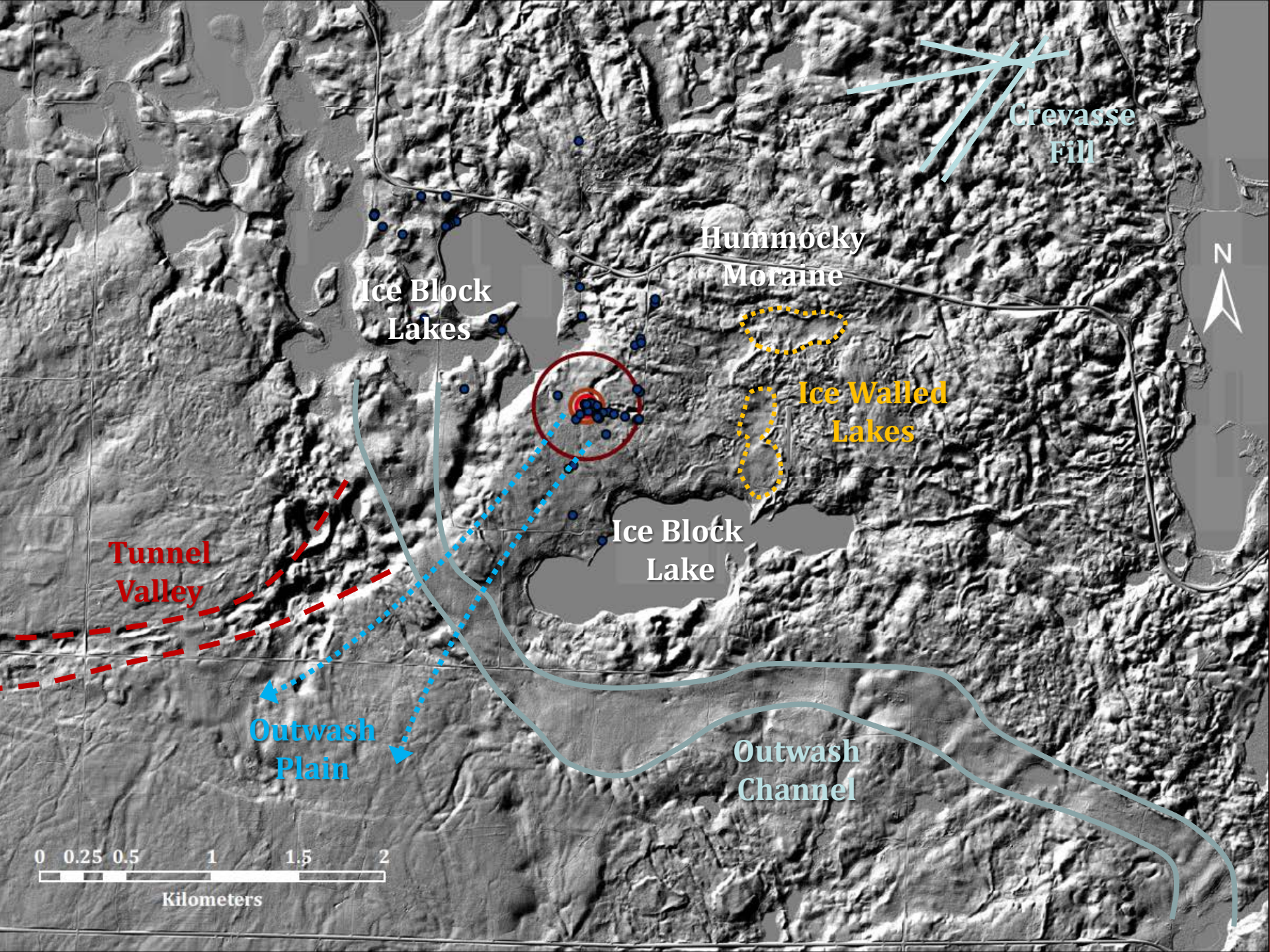








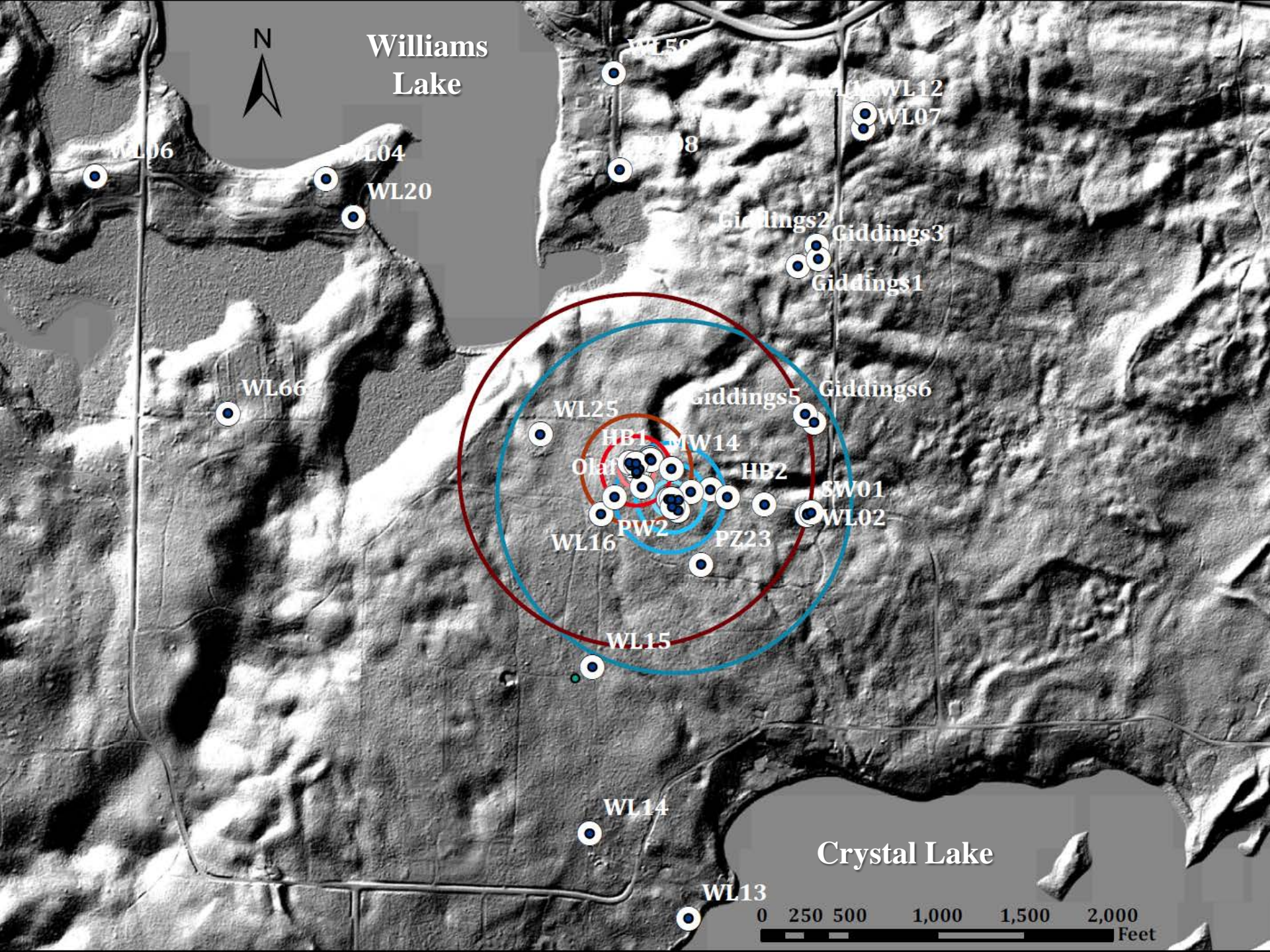




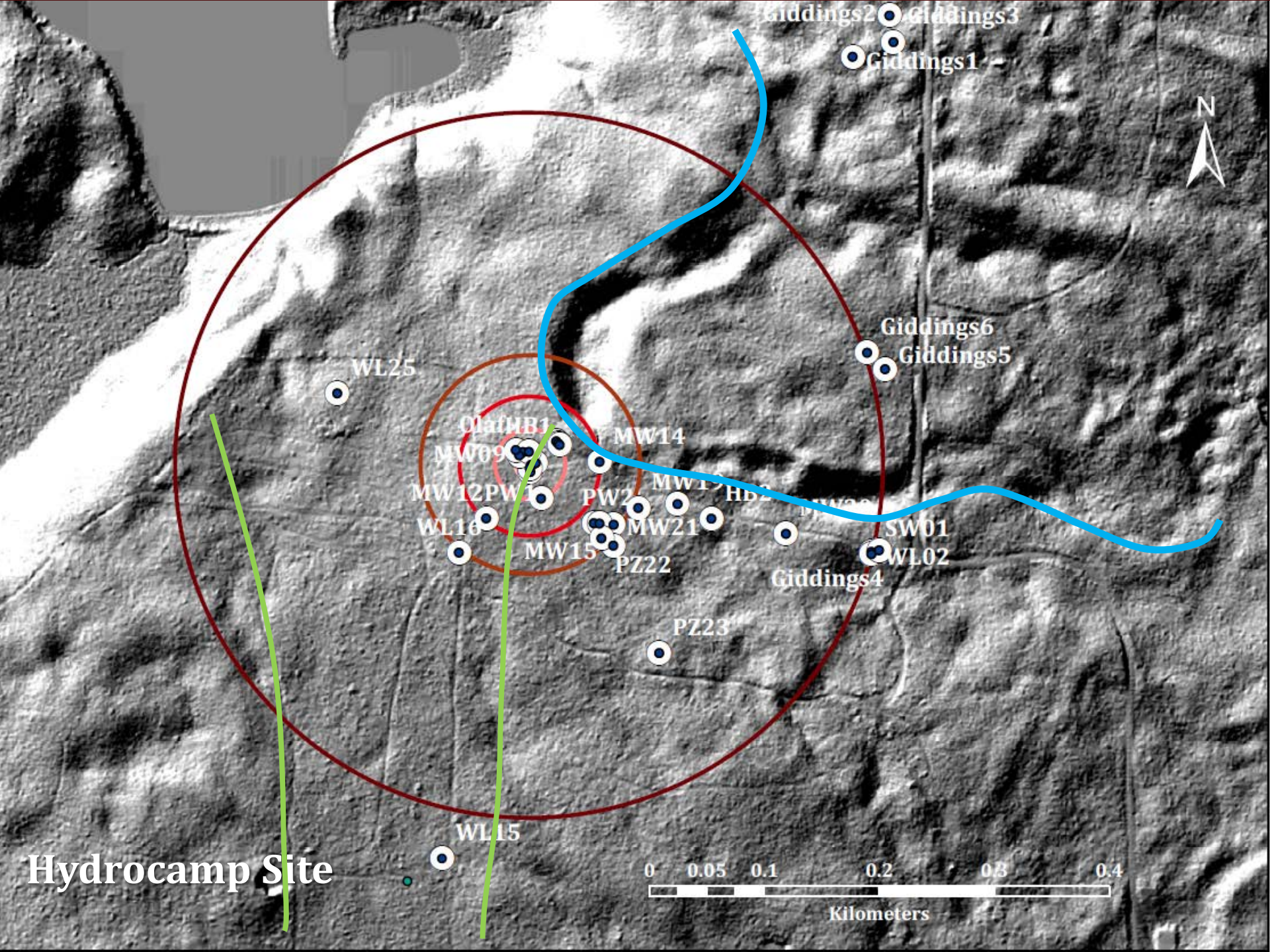






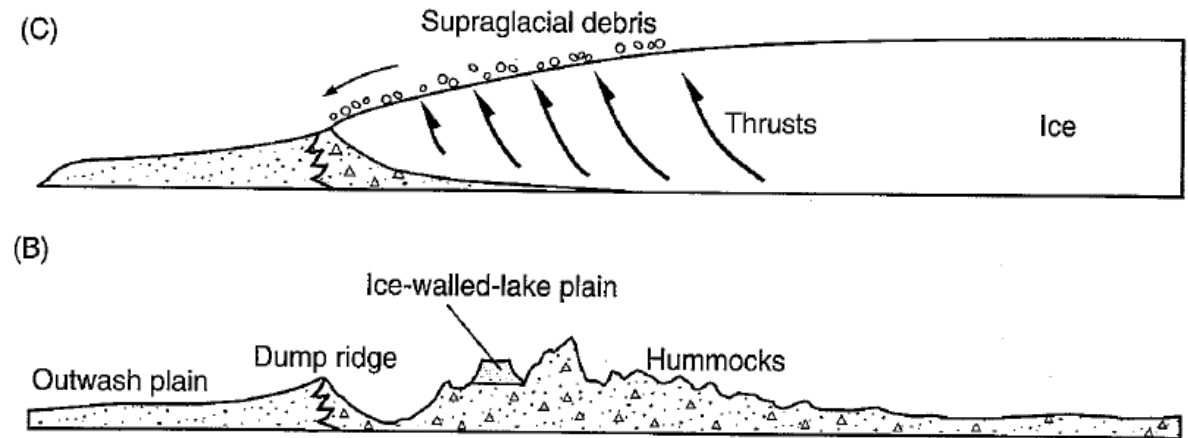
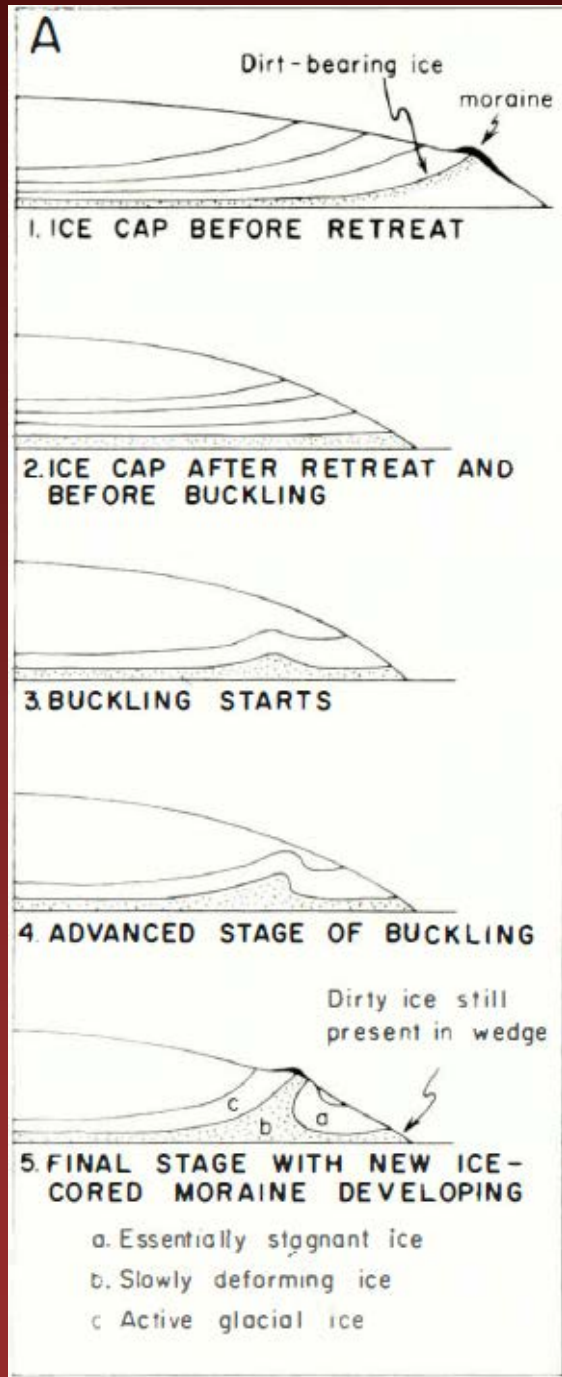








## Hooke 1970



## Evans 2005



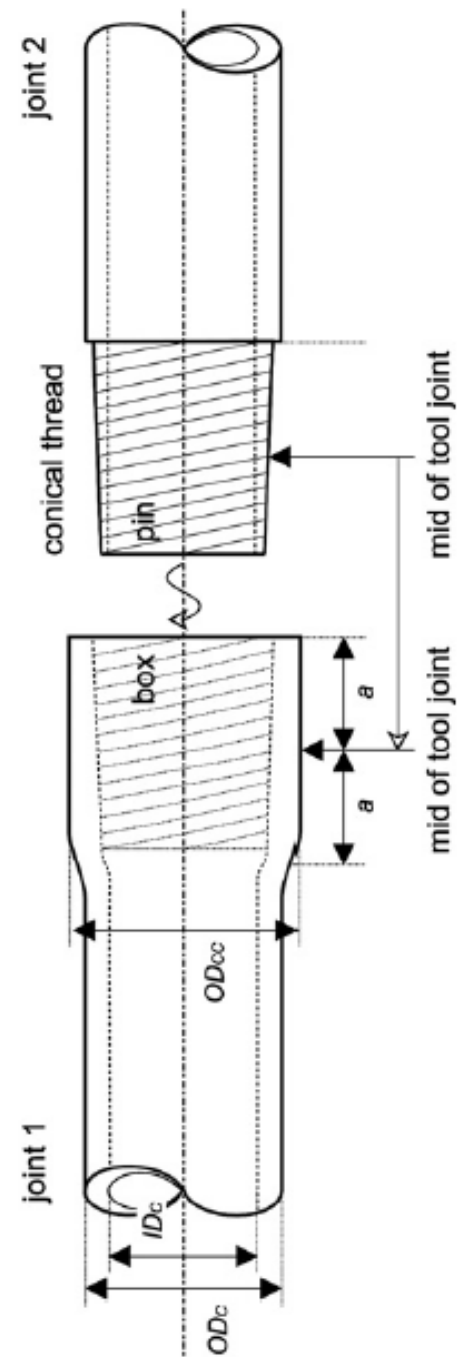
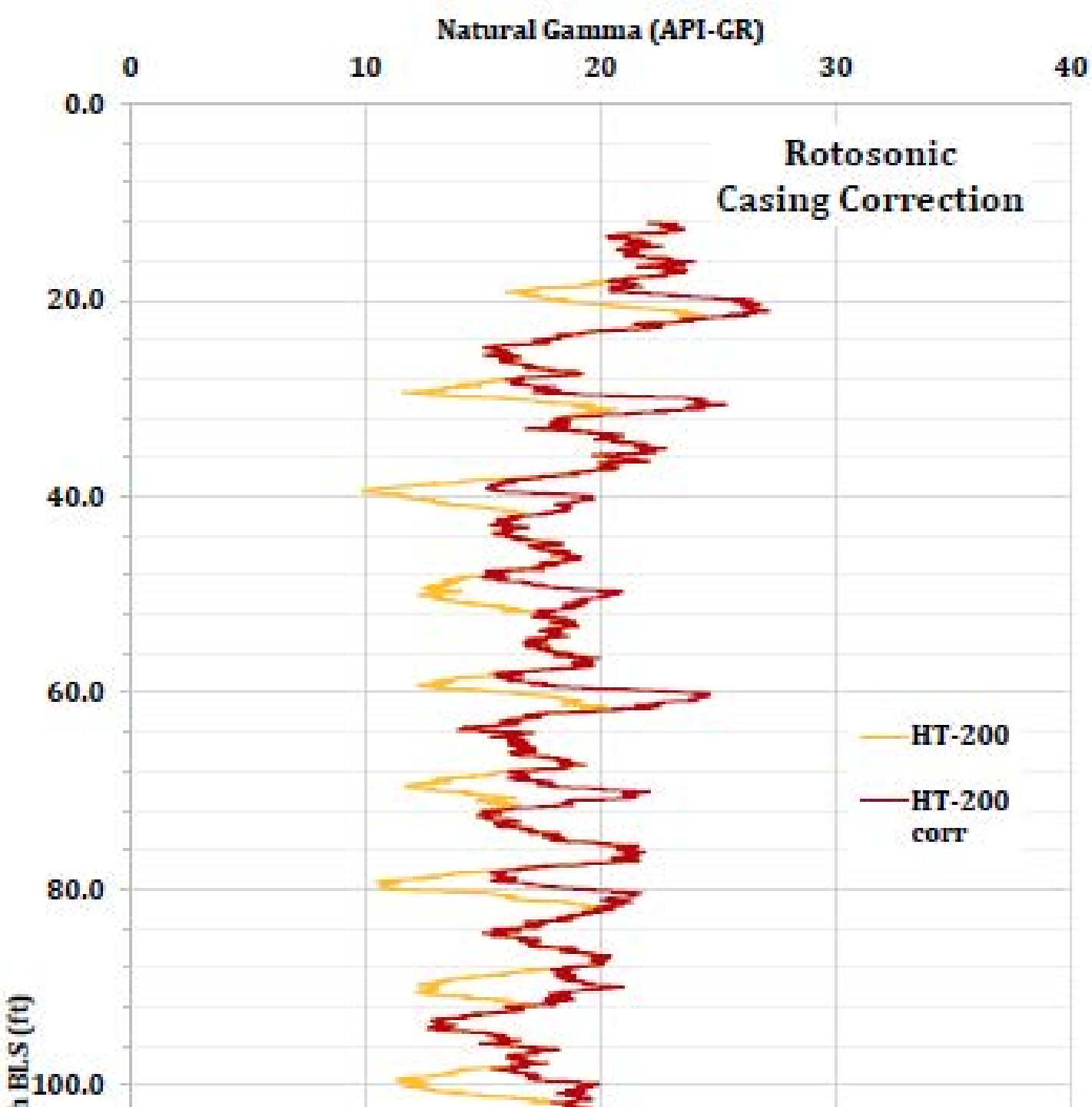


**“Lake” Randolph**

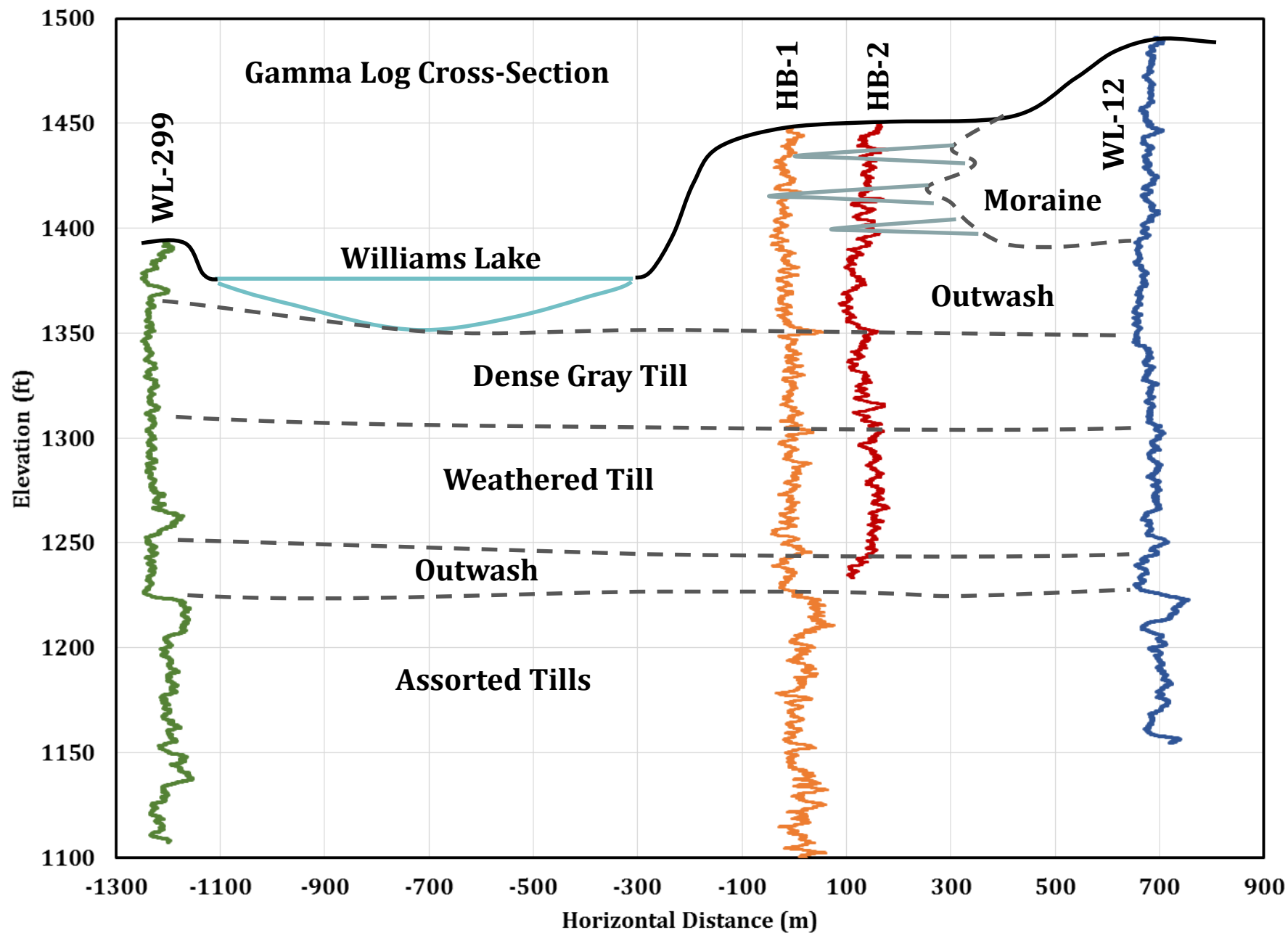
















**HB-1 Muddy Debris Flow 10 to 11 ft**





**HB-1 Transition from brown sand to gray sand 85 to 87.5 ft**





**HB-1 Transition from gray sand to gray till 102-106 ft  
Wadena Lobe Till**





**Hydrocamp Site 1995**





**Hydrocamp Site 2017**