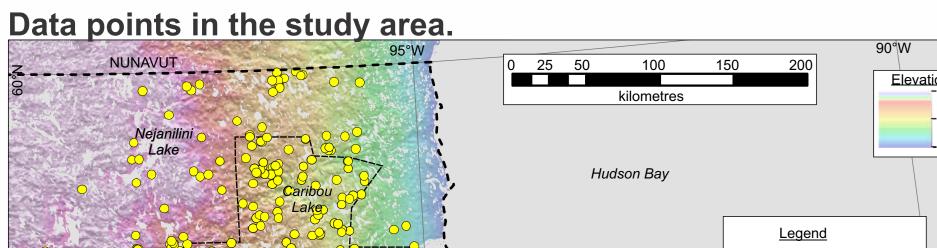
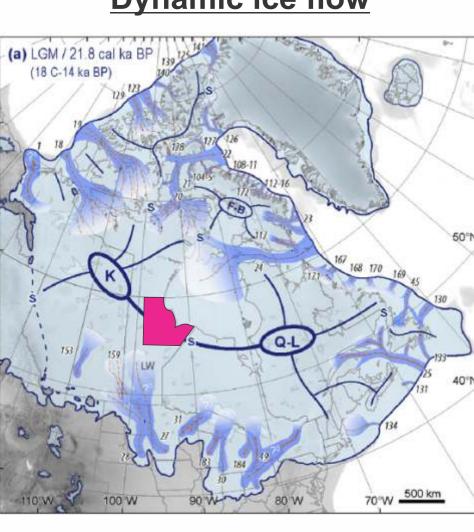


Glacial record of the southwestern Hudson Bay region and its significance for long-term ice sheet behaviour **Gauthier, M.S.**^{1,a}, **Hodder, T.J.**^{1,b}, **Ross, M.**^{2,c}, **Kelley, S.E.**^{2,d} 1. Manitoba Geological Survey, Winnipeg, MB; 2. University of Waterloo, Waterloo, ON a. michelle.trommelen@gmail.com; b. hodder.tj@gmail.com; c. maross@uwaterloo.ca; d. samuel.kelley@uwaterloo.ca

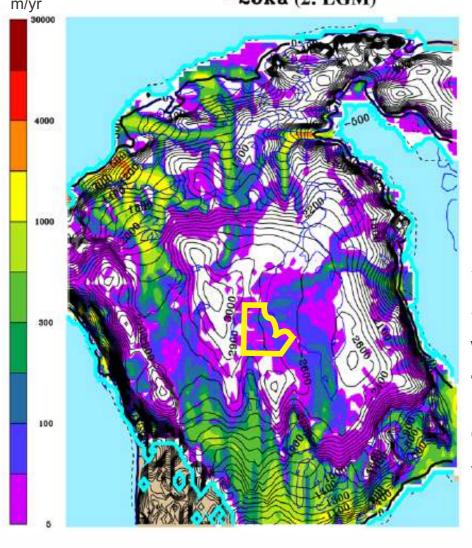


INTRODUCTION



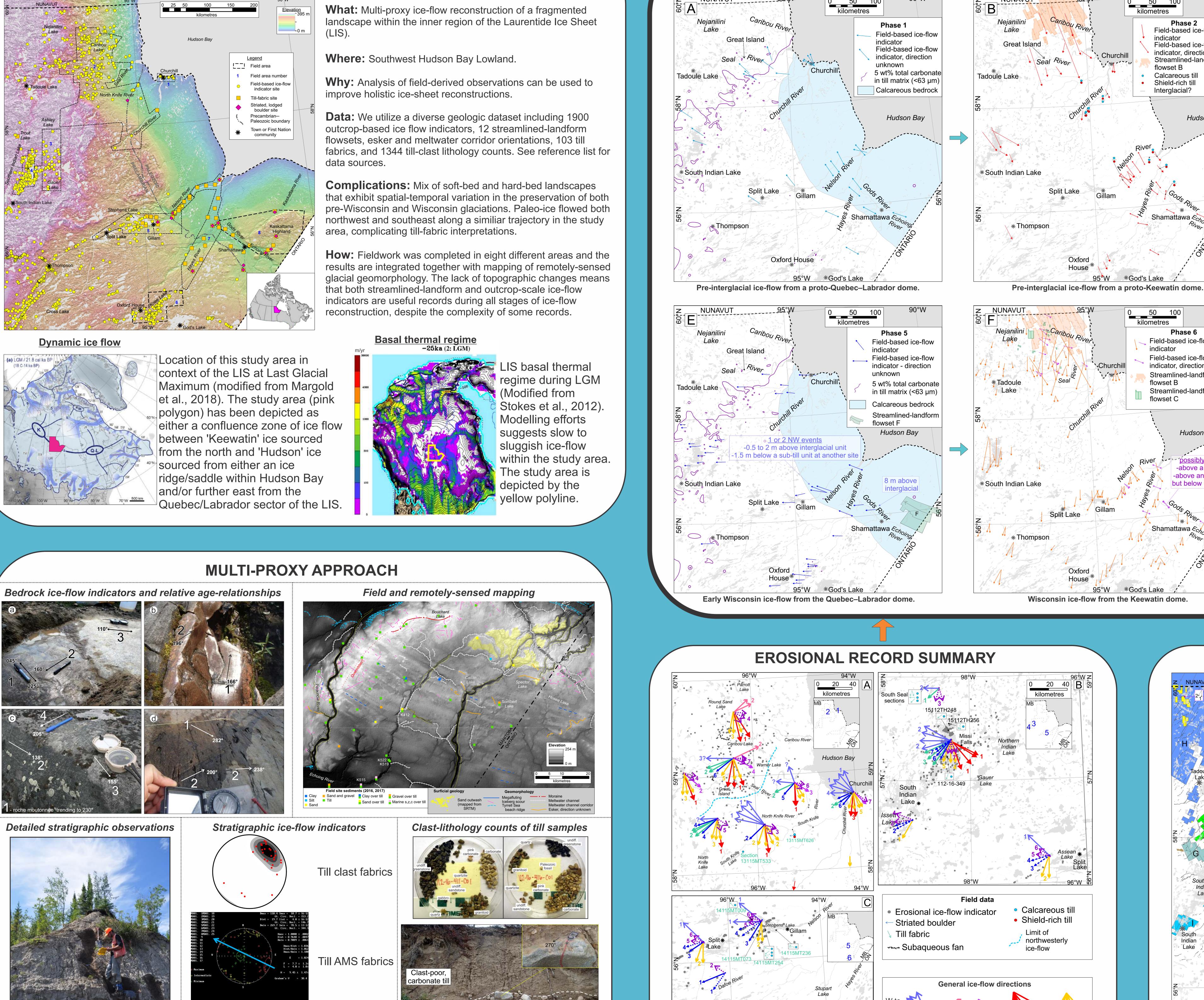
ocation of this study area in context of the LIS at Last Glacial laximum (modified from Margold been depicted as ther a confluence zone of ice flow tween 'Keewatin' ice sourced' idge/saddle within Hudson Bay Quebec/Labrador sector of the LIS

Basal thermal regim



In-situ striate

bullet-shaped striated clasts



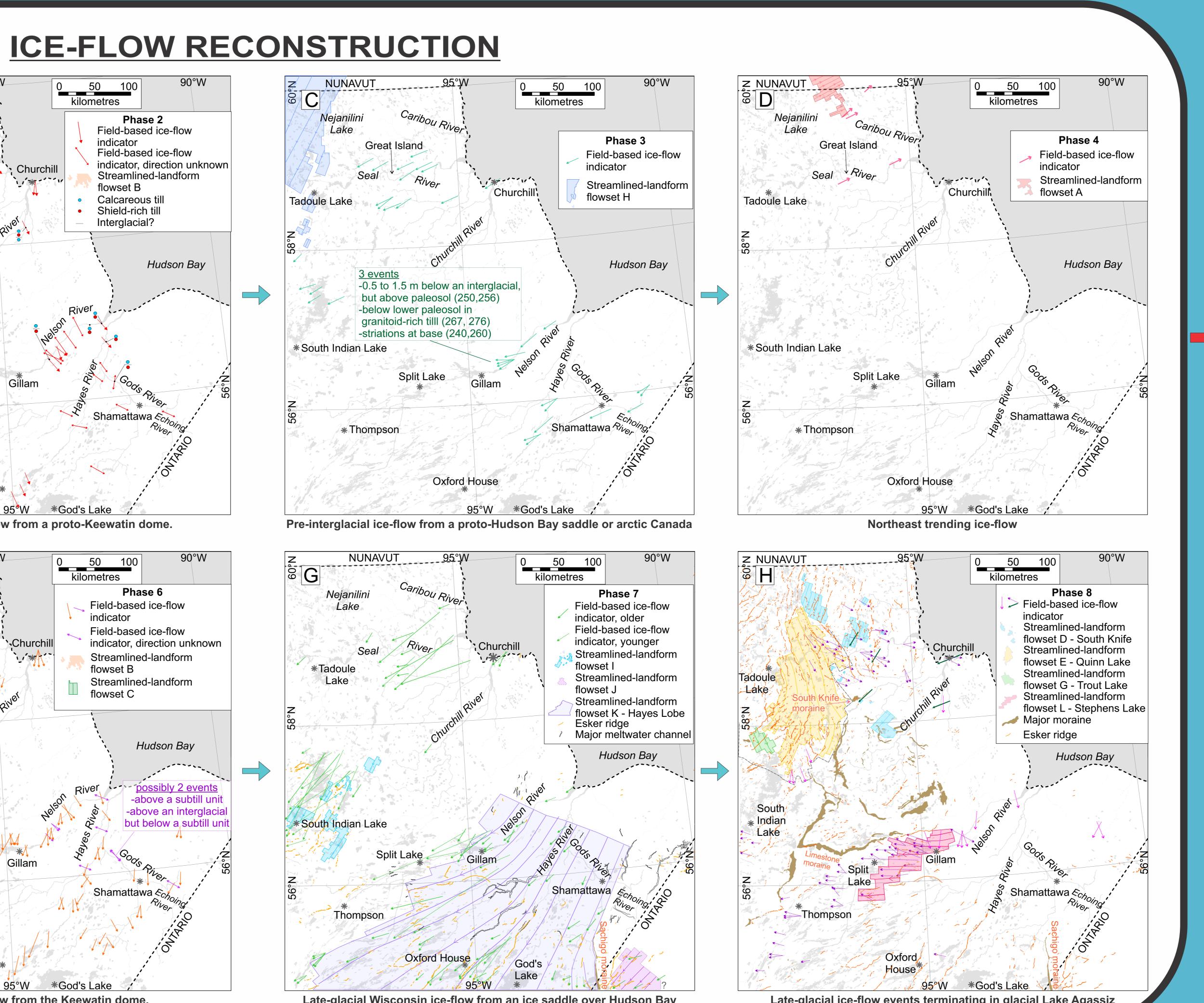
SSE to SSW

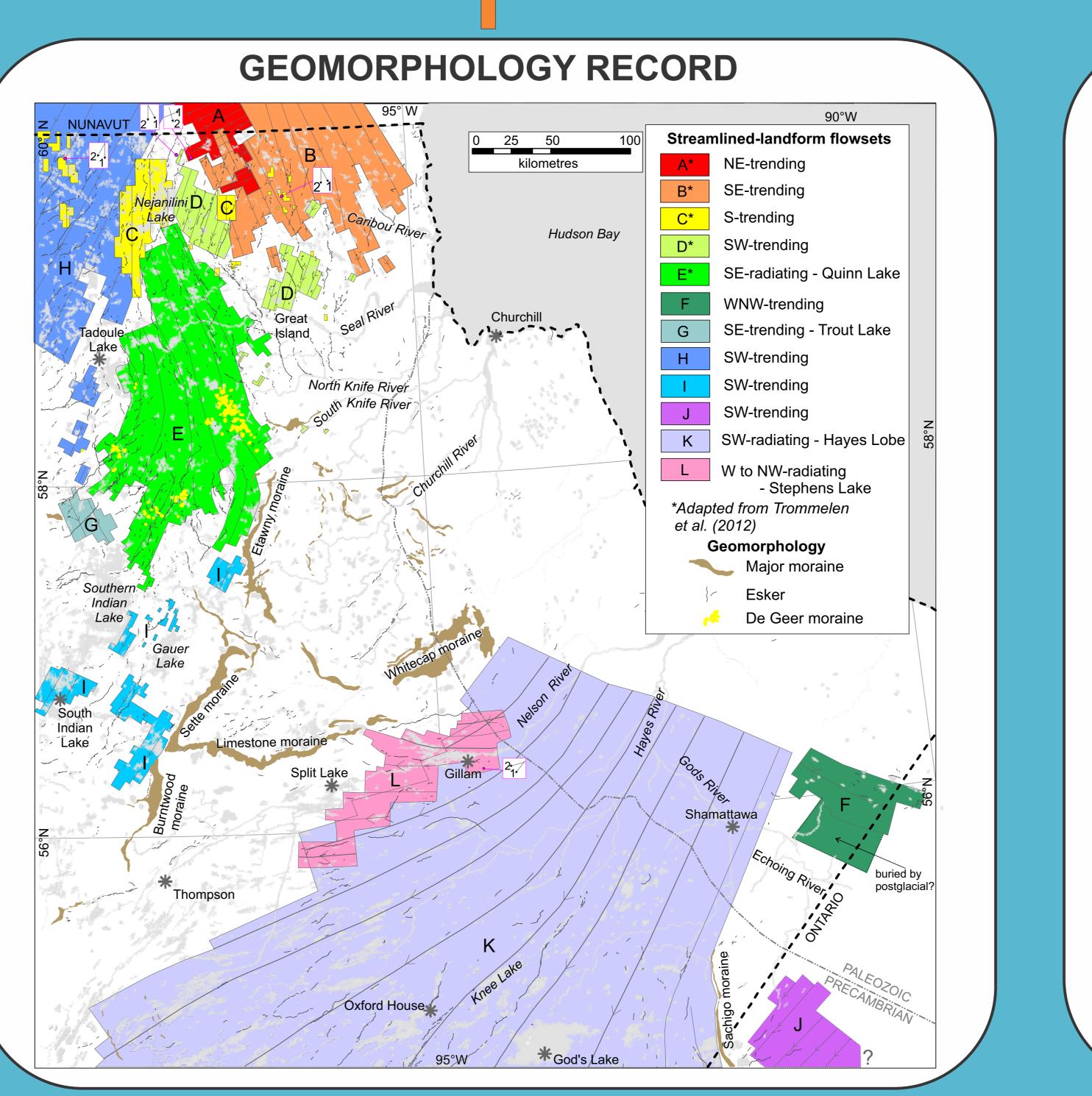
SW to WSW 3 "main"

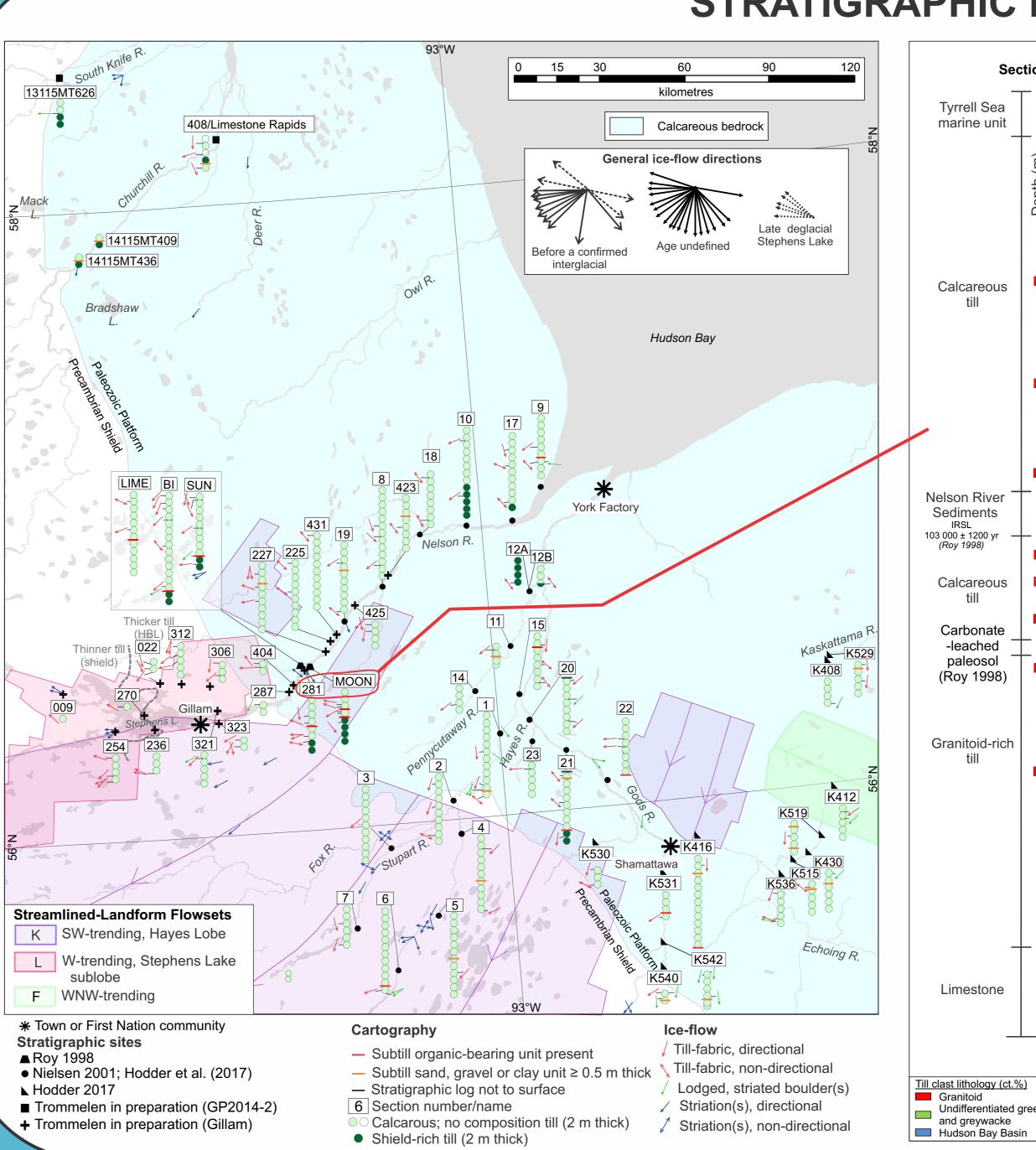
Undifferentiated greenston

kilometres

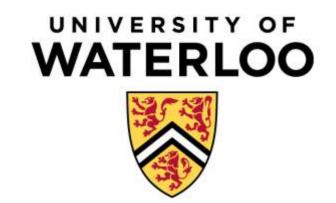
and greywacke Hudson Bay Basin







Late-glacial ice-flow events terminating in glacial Lake Agassiz



MAIN FINDINGS FROM RECONSTRUCTION

The landscape records twelve streamlined landform flowsets, yet only four are related to late stage deglaciation, with two demonstrating evidence of being time-transgressive. This demonstrates that the majority of the landscape in northeastern Manitoba is a palimpsest record of older glacial events. This recognition of similar, multi-age glaciated landscapes, indicative of subglacial bed mosaics of inheritance and overprinting, is becoming more common, hinting at the dynamic nature of the subglacial environment. Understanding these past dynamics has implications for understanding subglacial processes at different scales such as erosion and sediment transport, as well as the long-term behavior of ice sheets and the evolution the subglacial regime. Manuscript in prep, we would welcome comments and feedback (see author email addresses)

The Details:

1. Parts of the study area are characterized by a relatively 'simple' glacial history, either relict and preserved or young and strongly overprinted. Other parts have a more 'complex' glacial record characterized by evidence for numerous crosscutting events (stronger geological inheritance and weaker overprinting by younger events).

Regional ice-flow phases are recorded in ice-flow indicator data that overlies both the 'hard' Precambrian shield with thin till cover, and the 'soft' thick Quaternary sediments that overlie the HBL. The record is incomplete at any one site, thus analysis of this fragmented record was necessary to reduce all observations to eight regional phases.

3. Both older glacial(s) and the Wisconsin glaciation followed similar growth patterns where ice advanced into the study area from ice centered to the west (probably in northern Quebec), followed by a switch in ice-flow direction indicating increased influence from the Keewatin ice centre to the northwest and north. Ice then flowed across the entire study area from the northeast, indicating influence from an ice ridge or saddle centered in Hudson Bay.

4. New evidence for NW and W ice flow augments and extends the regional distribution of evidence for the influence of the Quebec/Labrador ice centre into northern Manitoba during at least two glacial periods. This raises questions about the behaviour and configuration of the ice sheet – especially the ancestral Keewatin ice centre – during growth stages.

5. Multiple phases of regionally-widespread, relict (overprinted or buried) SW-trending ice flows are recorded. The chronology is poorly constrained. These phases could indicate advance(s) of ice from the Canadian Arctic, and/or older ice ridges or saddles over Hudson Bay similar to the last glaciation.

6. Fragmented and regionally-isolated evidence for a NE-trending ice flow may represent a catchment area for the HSIS during a period of large ice volumes (e.g. OIS 4), shifting of the Hudson Bay ice ridge onto land, or ice flow into an open Hudson Bay during a deglaciation.

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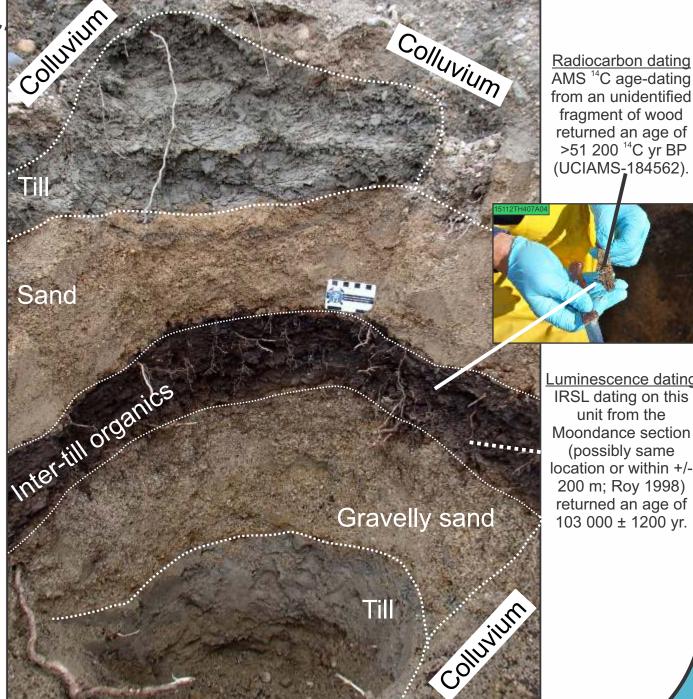
STRATIGRAPHIC RECORD

marine unit

Undifferentiated greenstone

Section 13115MT281/Moondand





Inter-till organic-bearing sediments exposed at Section 13115MT281.