

### Coastal subglacial events of two competing lobes, north shore Lake Erie

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Structural and lithologic analyses of drift and interstadial sediments near Bradville, Ontario, reveal a complex story of subglacial processes and rheologic superposition in the lower 3 m of a 70 m exposure along the shore of a large depositional basin. Two Catfish Creek till members are separated by subglacial channel deposits in two depressions in underlying deformed interstadial sediments (IS).

NW-dipping faults and elongated sand clasts in IS indicate the Huron lobe overrode and deformed IS at the exposure's west end. It buckled IS while depositing Huron-provenance till with NW fabrics at the east end. Conjugate faults, shears, and boudinage in IS indicate superposed flow from the north, when the Erie and Huron lobes met and together flowed southward. At this time subglacial conduits were carved into IS and modified by meltwater erosion which left a stone lag and gravel near the east end. At the west end, a conduit was filled with squeeze flow till whose boulders show signs of

rotation in a ductile fluid prior to deposition. N-dipping shears and breccias within flow till show brittle shear superposed on ductile as ice overrode flow till with decreased water content, while N-dipping shears and attenuated silt streaks formed in deformation till above the conduit's east bank where ice/bed contact was continuous. SE-dipping shears in till and IS, and till fabrics, indicate the Erie lobe overcame the Huron and superposed a third force on the sediments. More flow till filled the west conduit, followed by a subglacial stream point bar migrating NE, then by deformation till with a boulder pavement whose clasts rotated freely before final emplacement, while deformation and/or lodgement till covered the rest of the section.

Abundant till deformation by viscous flow and ductile shear under high water pressure infers that ice streaming in the Erie basin could have helped drain the central margin of the Laurentide Ice Sheet.