



ALBERTA INNOVATES

Research and Innovation Project – Knowledge Transfer Summary

Project Title:	Development of the Next Generation of Wet Areas Mapping Model for the Oil Sands Region of Alberta
Project No:	2346
Project Lead:	Paul Arp and Jae Ogilvie, University of New Brunswick
Partners:	Alberta Innovates, University of New Brunswick, Alberta Agriculture and Forestry
Status:	Ongoing

Project Summary:

The project builds on the already established Wet Areas Mapping (WAM) technology. This technology, developed at the Forest Watershed Research Centre (FWRC) of the University of New Brunswick (UNB), consists of a suite of algorithms that predict stream channel locations and cartographic depth-to-water (DTW) table from bare-earth digital elevation models (DEMs). The resulting outputs include maps that can be used to systematically locate ephemeral and perennial channels, and associated DTW-defined wet areas.

With this project, the wet-areas mapping initiative for Alberta enters a new phase by developing the means to digitize flow contributing areas from local towards regional and trans-regional dimensions using massive digital elevation data at 1-m resolution. This is to be done through tile-based processing coupled with seamless cross-tile stream-flow integration, in three stages: (i) testing a cross-tile stream-segment shapefile using the tile-based raster calculations for upslope flow accumulation, (ii) integrating the resulting stream-segment pieces across the tile borders, and (iii) developing from this hydrologically corrected flow accumulation raster for the entire stream network of interest. The project-generated and licensable software will be applied to the oil sands region, and has the potential to expand across Alberta and beyond.

Outcomes:

- Comprehensively connected flow networks across the Oil Sands Region of Alberta at 1 m spatial resolution.
- Segment-by-segment flow network attribution re: upstream contributing area, order, length, slope, etc.
- Associated Cartographic Depth-to-Water (soil drainage) delineations at 1 m spatial resolution.
- Development of Flow Accumulation Across Large Terrains (FAALT) tool, ongoing.

Links:

[Alberta Environment and Parks Resource Data Catalogue – Hydrology](#)
[Forest Watershed Research Centre](#)

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