



Where the Water Flows

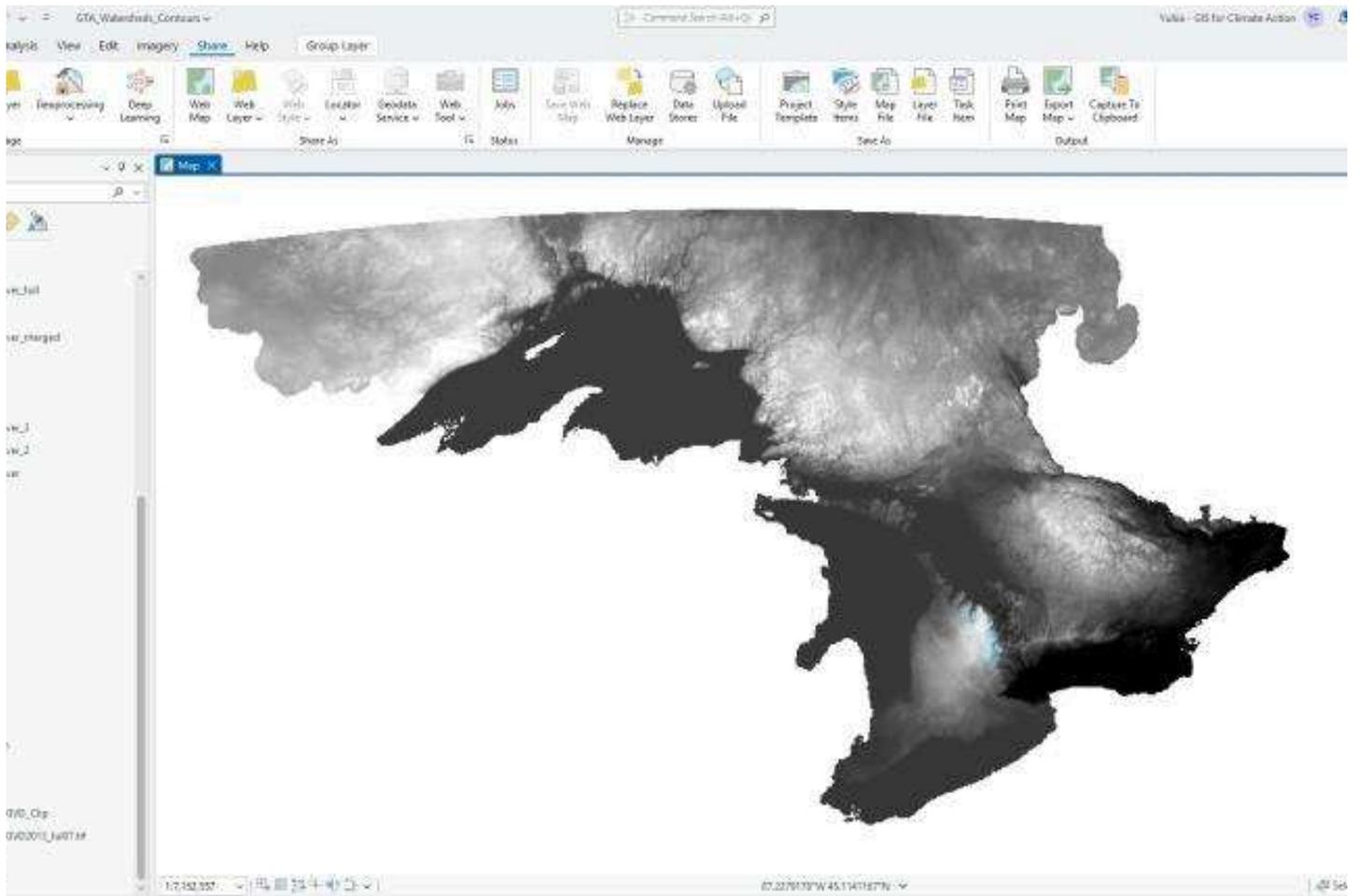
Across the Land Between
Georgian Bay and Lake Ontario

Yulia Chepurna

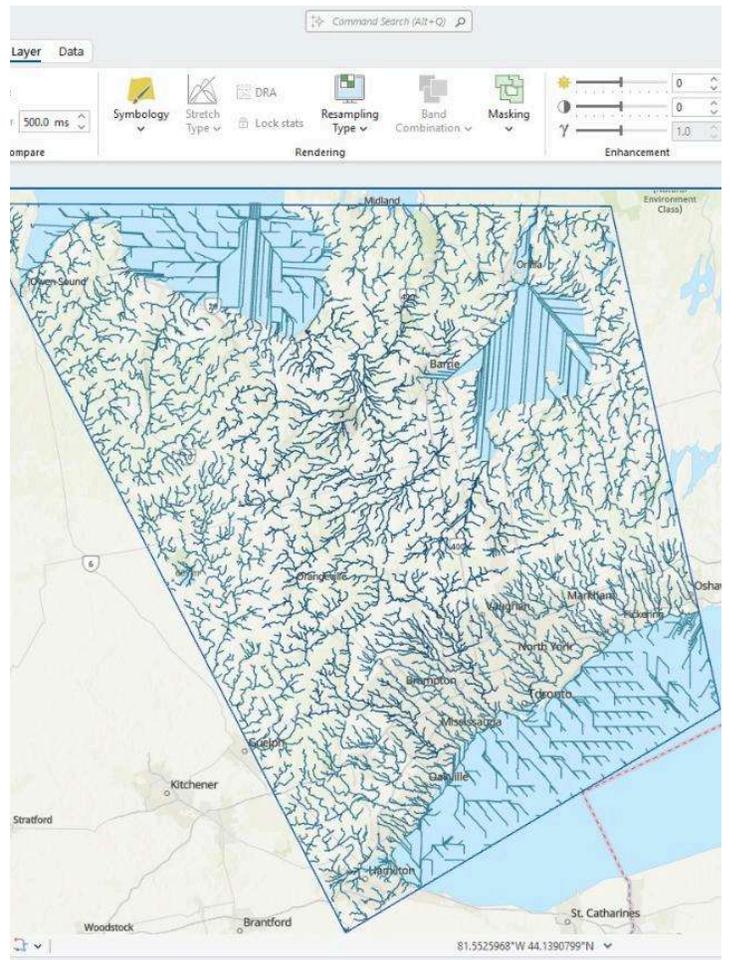
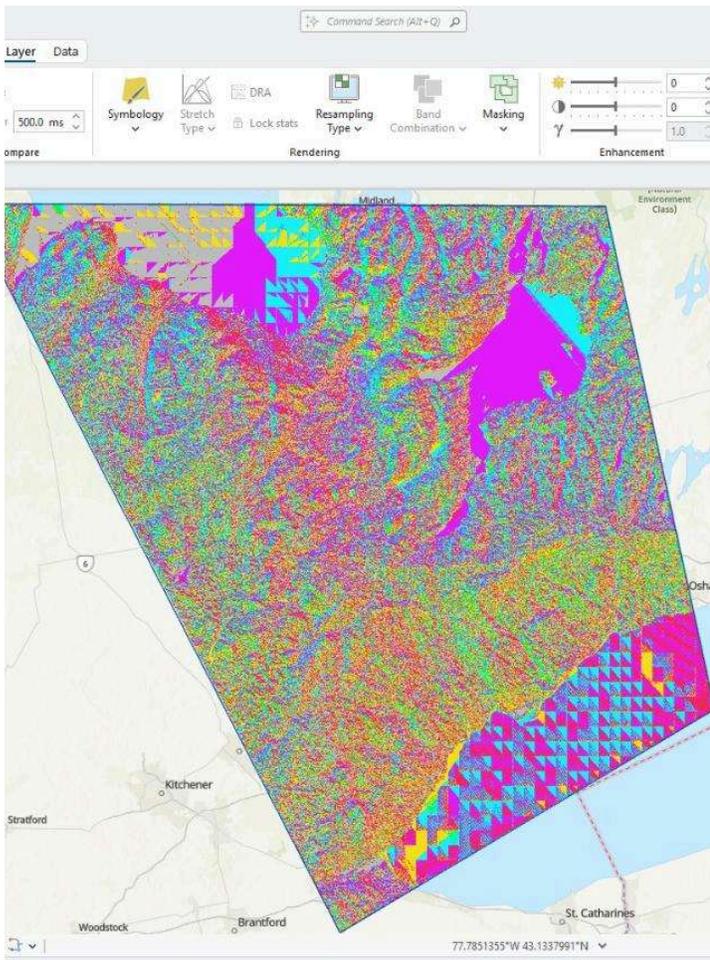
March 11, 2026

On the land between Georgian Bay and Lake Ontario, rivers flow in different directions. This project explores that phenomenon through four rivers — **the Humber, Credit, Holland, and Nottawasaga** — and shows how terrain shapes their paths. Because water always follows the shape of the land, elevation divides this region into distinct watersheds.

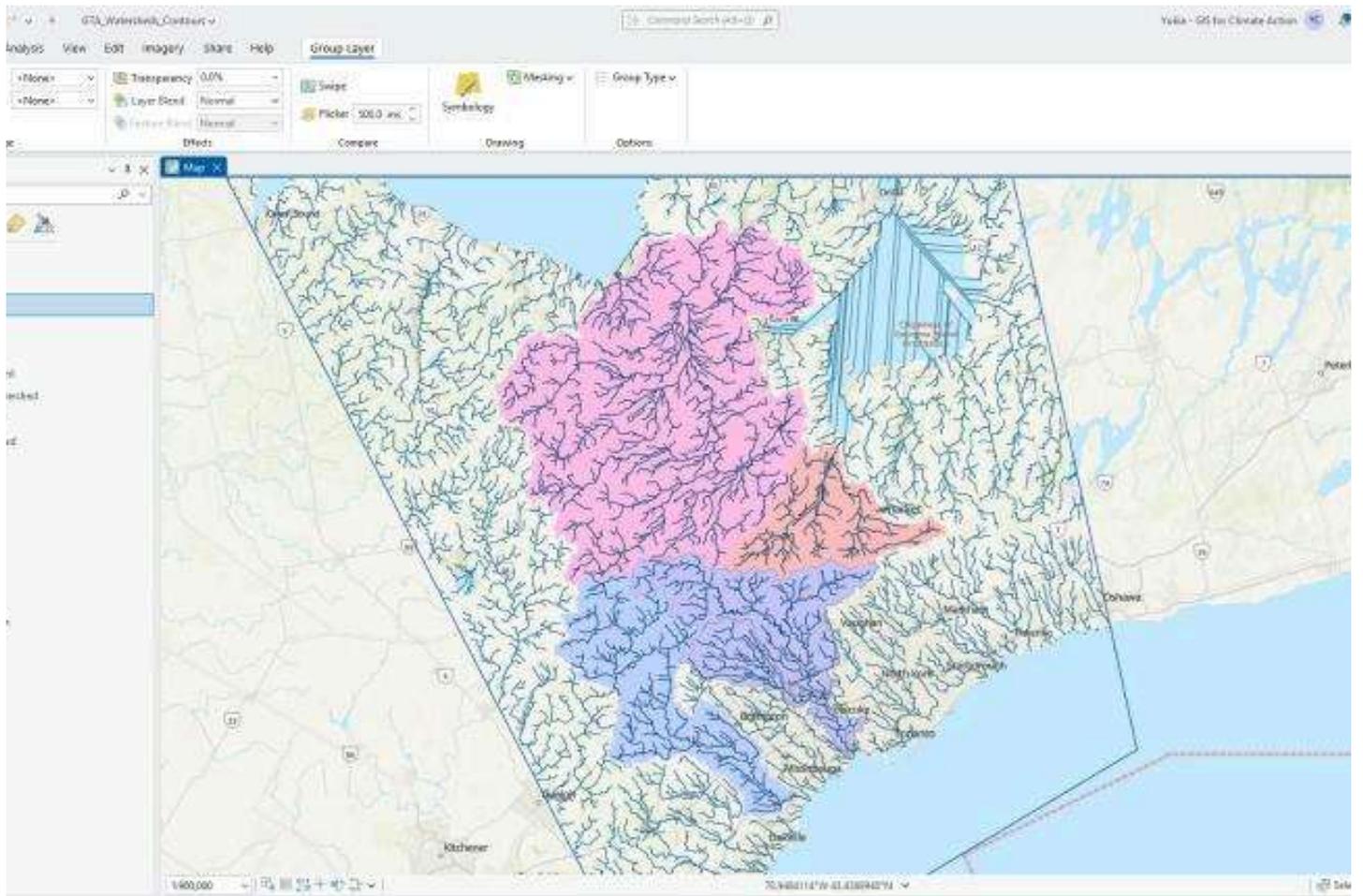
Project steps:



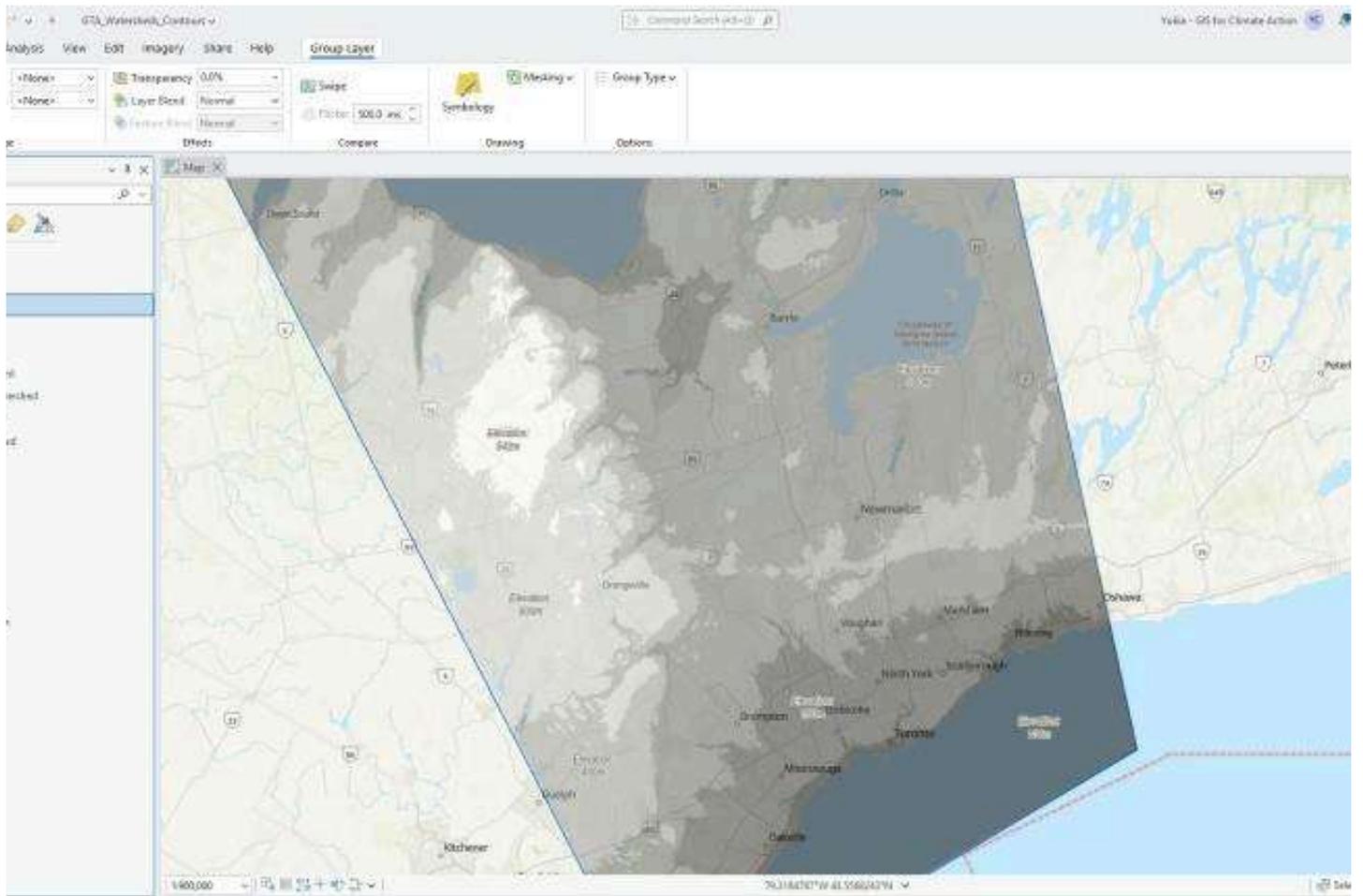
Step one was to obtain a DEM covering the region between Georgian Bay and Lake Ontario. It was found on Ontario GeoHub: [Provincial Digital Elevation Model \(PDEM\) | Ontario GeoHub](#)



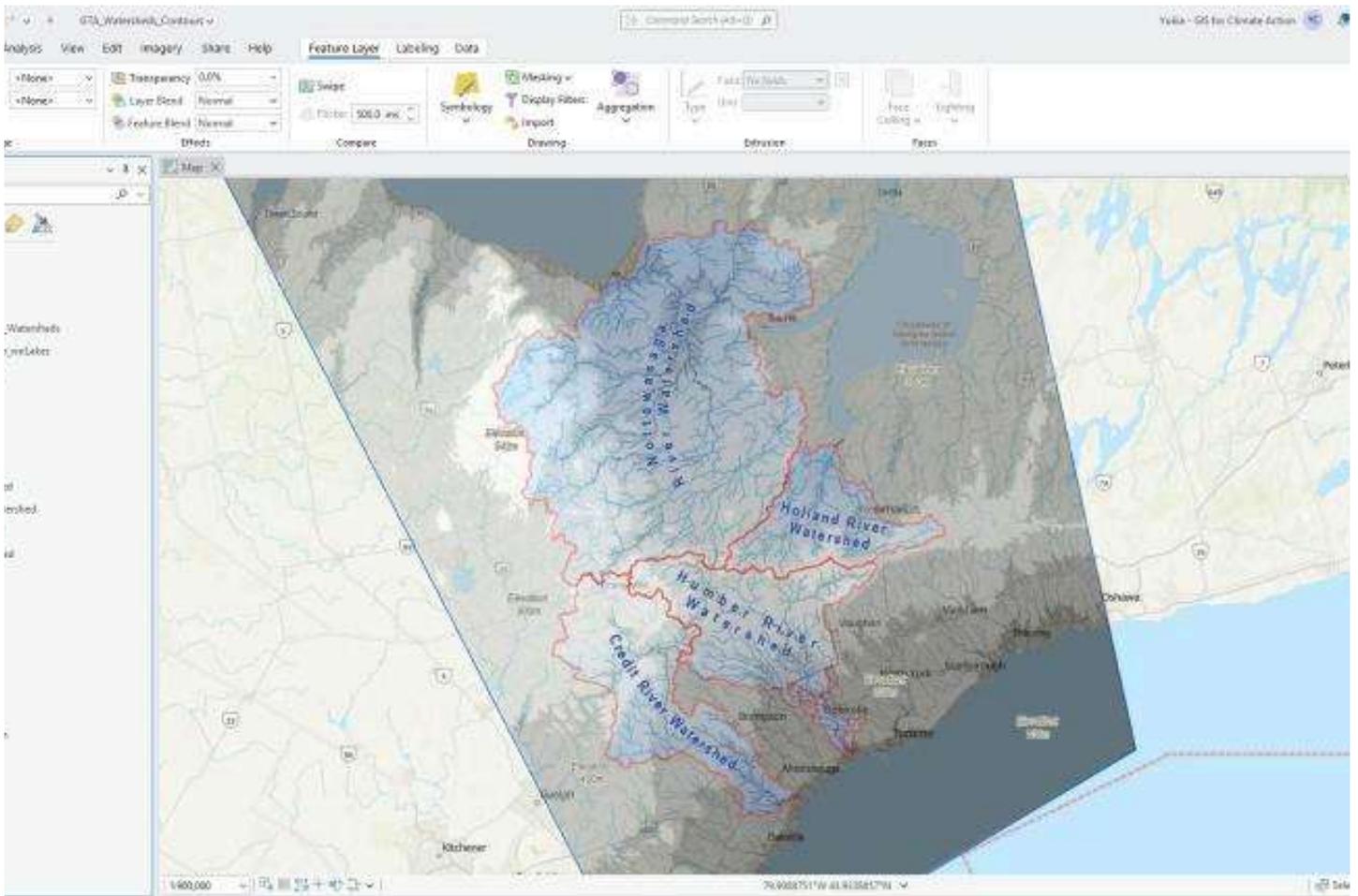
Secondly, the DEM was clipped to the area of interest, and several preparatory steps were performed using hydrological tools. These included the Fill tool, Flow Direction, Flow Accumulation, Raster Calculator (Spatial Analyst), and Raster to Polyline.



The next step was to create watershed boundaries for the four rivers: the Humber and Credit, which flow south toward Lake Ontario, the Nottawasaga, which flows north toward Georgian Bay, and the Holland, which flows north toward Lake Simcoe. These contrasting flow directions help define the phenomenon explored in this project.



The fourth step was to explore the terrain by generating contour lines from the DEM. The Contour tool was used to visualize elevation changes and better understand how the landscape influences river flow.

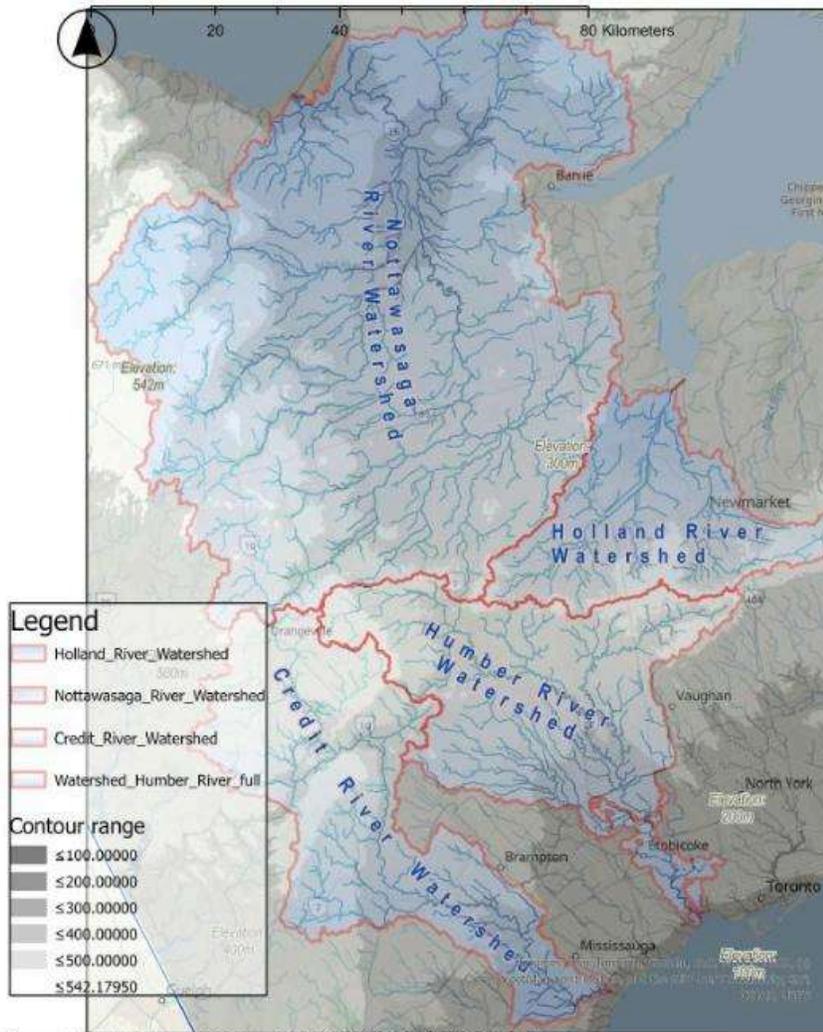


The final step was to style and refine the map layers so the reason for the phenomenon became visually clear. Symbology, colours, and line weights were adjusted to highlight the relationship between elevation and the contrasting flow directions of the four watersheds.

This project shows that the different flow directions of rivers between Georgian Bay and Lake Ontario are caused by the shape of the land. By analyzing the DEM, creating contours, and mapping the watersheds of the Humber, Credit, Nottawasaga, and Holland rivers, it becomes clear that a subtle rise in elevation divides the region. On the final map, lighter colours represent higher elevations, and the blue gradient shows the direction of flow within each watershed, making the divide and flow patterns easy to see.

Watersheds Between Georgian Bay and Lake Ontario

A map of four watersheds shaped by elevation.
Higher terrain appears in lighter tones, and the blue gradient indicates flow direction.



Prepared by Yulia Chepurina for Seneca GIS502V9X.01902.2261, 2026-03-11.
Source data: Provincial Digital Elevation Model (PDEM), Ontario GeoHub.

This layout presents the final map showing four major watersheds shaped by elevation. Lighter tones indicate higher terrain that divides the watersheds, while the blue gradient illustrates the direction of flow within each basin.