TRANSFORMATIVE SENSOR TECHNOLOGIES AND SMART WATERSHEDS (TTSW)

How do we support and advance water research with innovative technologies?

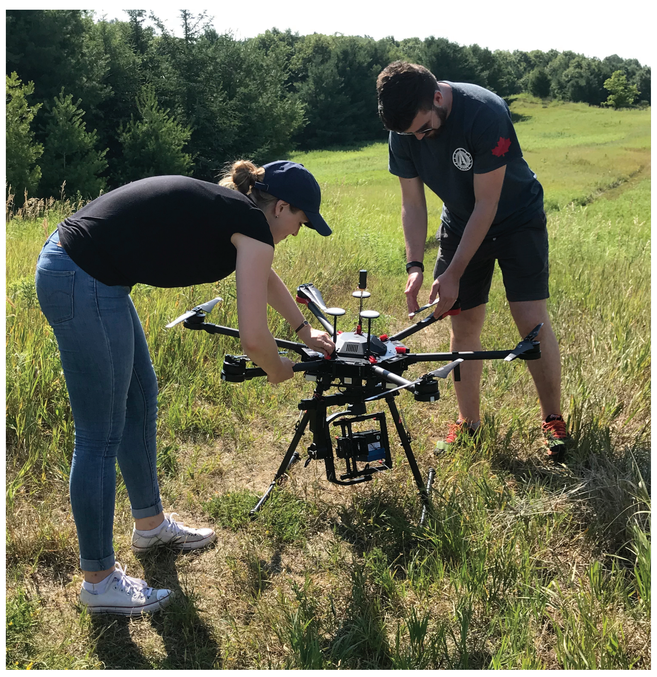
Global Water Futures aims to understand Canada's vast and complex water systems, and develop ways to adapt to the alterations in these systems being caused by climate change. This demands that transformative enhancements are made in the way that environmental data are collected and communicated. TTSW intends to provide some of these enhancements through the development, testing, and pilot implementation of cutting-edge technologies.

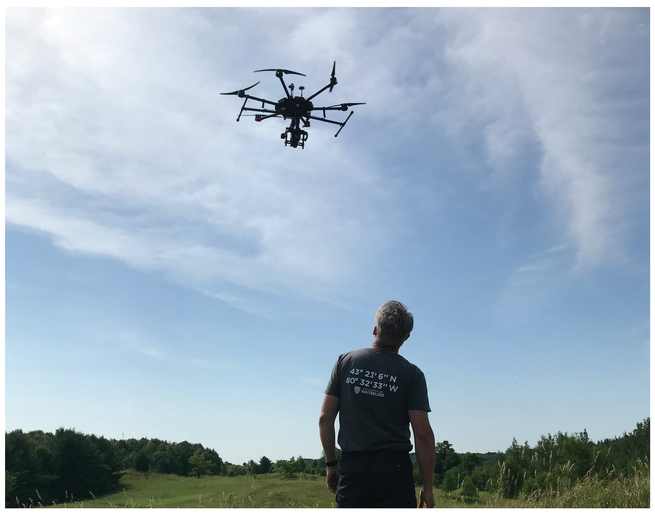
TTSW researchers are working with Canadian industry and government to develop new ways to collect and communicate environmental data.

Improving and Expanding Ground-based Measurements

Furthering the technology to measure environmental parameters in cold regions through the development and testing of new ground-based **sensors.** These sensors will allow researchers to collect improved measurements of snowpack structure, water pollutants, and much more at locations across Canada.

Establishing a pan-Canadian network of field sites to support environmental monitoring. These stations will provide natural settings to test emerging technologies and act as ground truth points for remote sensing systems.





Developing and Testing Airborne Sensors

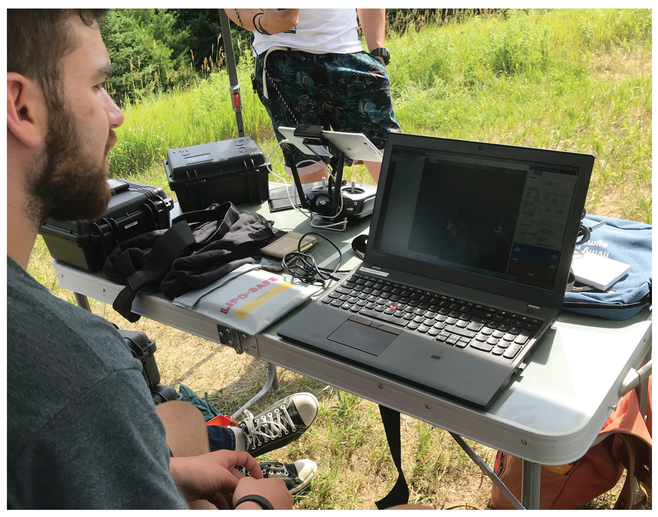
Improving drone platforms and sensors to provide medium-scale measurements needed for environmental monitoring and modelling. Drones provide a way to fill the critical data gap between ground-based field measurements and satellite imagery. TTSW will deploy drones to measure parameters such as snow depth, glacier size, land surface temperature, water level and extent, as well as algal growth in water bodies.

Using airplanes to test new sensors too heavy to carry on a drone. TTSW is developing a unique radar system to help quantify snow water equivalent and soil moisture/freeze-thaw state. The airborne deployment of this system will also allow for these measurements to be taken over large and inaccessible tundra, prairie, and forested expanses.

Increasing Satellite Communication and Observation

Enhancing data collection by outfitting ground sensors with smart transmitters capable of sending data to researchers through satellite networks. This will ultimately allow environmental data to be made available for researchers and end-users, even from the most remote sites.

Working closely with industrial partners toward the launch of a microsatellite mission. This small satellite will carry a hyperspectral sensor and a reflectometer for monitoring a wide variety of environmental parameters. This mission will also be capable of direct communication with smart transmitters at ground sites, and will deliver data to researchers up to two times a day.



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