

# The Use of Unmanned Aerial (UAV) Technologies to Detect Groundwater Inputs in the Credit River

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Unmanned aerial vehicles (UAV) are becoming widely available as the technology has rapidly progresses and costs decrease. As the technology improves and a wider variety of sensors are designed to integrate with the crafts, there is an ever expanding opportunity to use the technology to gather and capture environmental data. For river managers, UAV technologies offer the ability to acquire data which has historically been difficult, labour intensive, dangerous or very expensive to collect. Beyond high quality video, UAVs can capture topographic data through LIDAR and photogrammetry, measurement flows/discharge and collect thermal signatures. Current efforts are being focused on understanding the types and methods of data which can effectively be captured in a riverine environment. Recent work has been conducted to establish the efficacy of using thermal sensors to identify groundwater inputs into the Credit River. This study is being conducted with Trout Unlimited Canada to determine if a drone equipped with a FLIR A65 thermal sensor can be used to detect groundwater inputs in a reach of the Credit River, and if any identified inputs can be correlated to known Brook Trout (*Salvelinus fontinalis*) spawning areas. Having the ability to quickly and accurately identify potential critical habitat such as groundwater inputs is an important component of any riverine project. UAV technologies are providing river managers with one more tool in the tool box, and given the rapid progress seen with this emerging technology, it is likely going to be an important tool in the future.