



## **Salt Dilution Flow Measurement: Automation and Uncertainty**

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The Tracer method of flow measurement is a relatively convenient and accurate method to measure discharge in turbulent streams and rivers where conventional current metering flow measurement is not suitable or safe. However, it can be difficult to obtain a full range of flow measurements for a hydrometric rating curve, especially at remote locations. Resources are often wasted visiting sites at similar flow conditions, and it can be difficult and dangerous to attempt flow measurements during peak flow events in active water courses. We present results from our Automated Salt Dilution system, AutoSalt, which can develop a large portion of a rating curve over the course of a single storm event, as well as make measurements at a regular interval to track hydraulic control movement. We also present the derivation of the uncertainty associated with the measurements. We have developed a system that can achieve acceptable results (<7% uncertainty) using as little as 100 g per m<sup>3</sup>/s of flow by increasing the Signal to Noise Ratio (SNR) of the sensors. We present results from recent installations in Dunedin, New Zealand, British Columbia, Canada for NIWA and WSC respectively. We've also completed a detailed sensitivity analysis of Temperature Compensated Calibration Factor (CF.T). This work is part of the ongoing effort to establish a Standard Operating Protocol (SOP) for Salt Dilution in British Columbia, Canada, which we will also briefly present.