

GROUNDWATER IN THE COWICHAN BASIN - PROGRESS REPORT

The overall goal of this study is to develop a better understanding of the role that groundwater plays in the Cowichan Watershed. Specifically, this includes quantifying the effect groundwater withdrawals may be currently having with regards to maintaining an adequate flow in the lower Cowichan River. The first phase of the project was intended to have two components: data compilation and an in-stream flow study. The following progress report is a summary of the work completed between May and September 2011. Funding for the study was provided to the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO) by the Cowichan River Watershed Board.

Data Compilation

- The main groundwater extractors in the area were identified as the District of North Cowichan, the City of Duncan, and four fish hatcheries;
- Metered groundwater extraction volumes and water level measurements were collected from the municipal water providers;
- Each of the four hatcheries was contacted and groundwater extraction data was requested. The Vancouver Island Trout Hatchery has provided all of the requested information, and data has been partially collected from the other three hatcheries;
- Land use maps were analyzed for identification of potential medium volume groundwater extractors in the area;
- Information was extracted from WELLS (the BC Ministry of Environment database containing well construction information) and compiled into a watershed specific database compatible with EnviroInsite software.
- Historical reports were collected and summarized for use as background material in the final project report.

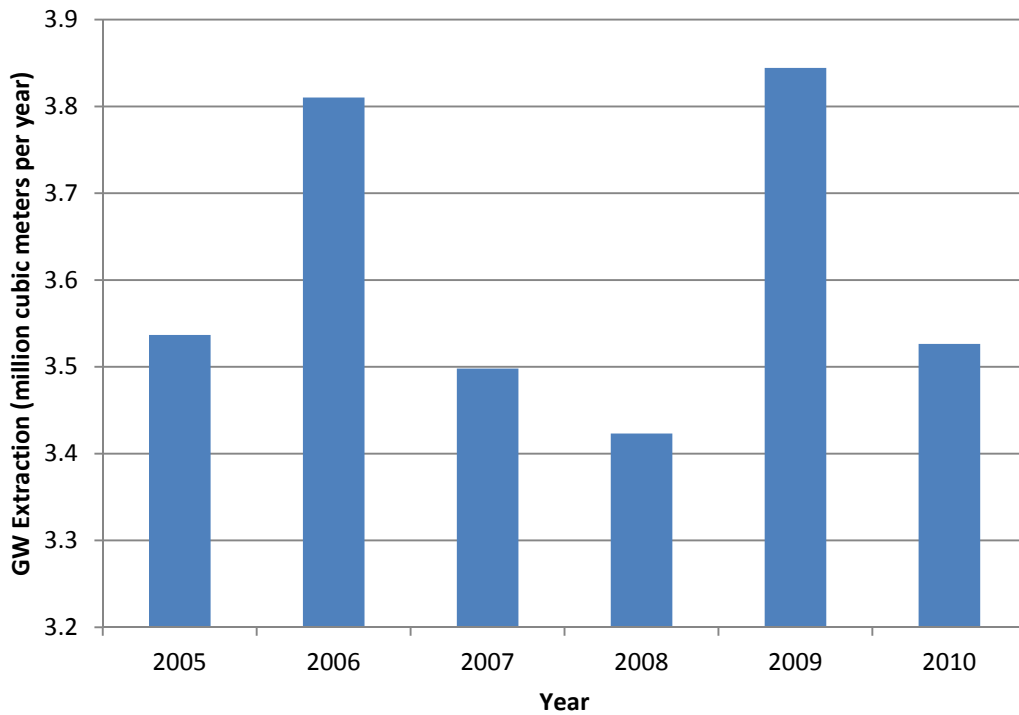


Figure 1 Example of annual groundwater extraction volumes provided by a municipal water supplier.

Flow Study

- A temperature logger was installed in the Cowichan River at a location close to the observation wells on July 26;
- The discharge in the Cowichan River was measured in July and August with the goal of identifying appropriate reaches for an eventual low-flow study;
- A pressure transducer was installed slightly upstream of the Cowichan Tribes hatchery on September 21 to collect time series data on river stage; and
- Challenges were identified with completing a low-flow study including: the size of measurement error compared to volume of groundwater extraction, accounting for pulses in the flow, a wet summer so that low flow conditions were not reached, and a larger flow measurement error during low flow periods.

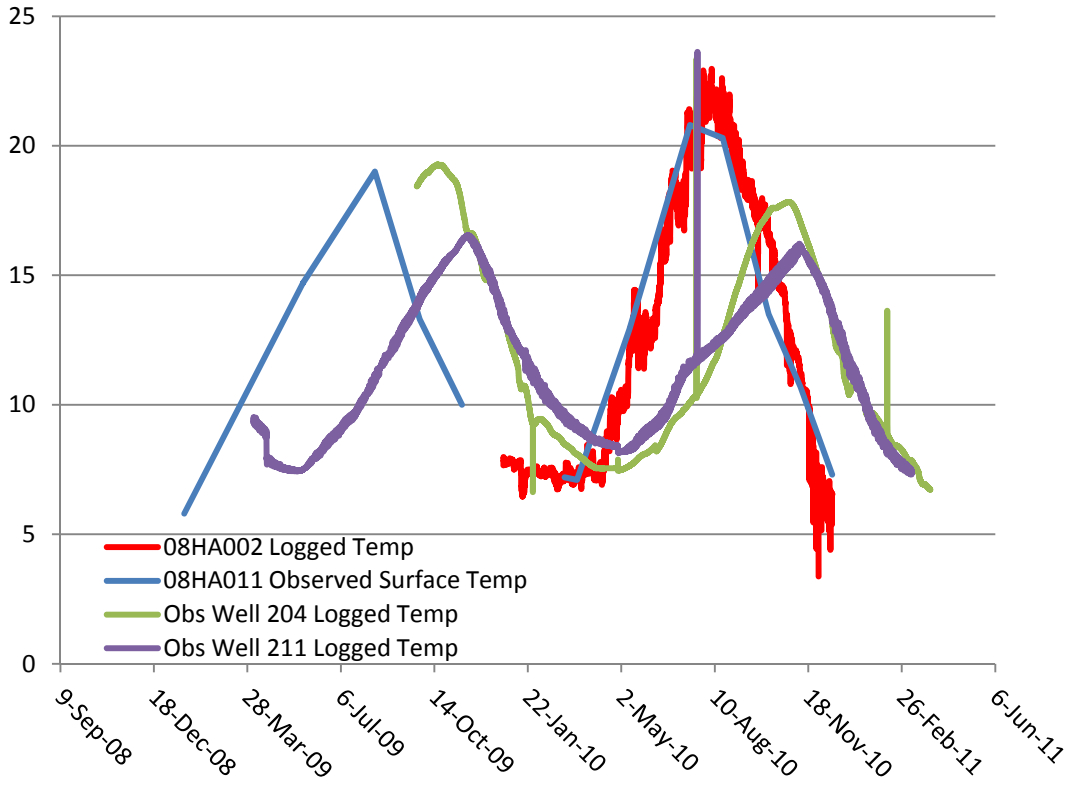


Figure 2 Comparison of observation well groundwater temperature to river water temperature at the Allenby Bridge hydrometric station



Figure 3 Installation of pressure transducer in the Cowichan River

Next Steps

Collen Gellein has been hired to work full time on the project for the next three months. The next steps to be completed include:

- Complete data collection from the fish hatcheries;
- Generate cross-sections using EnviroInsite software;
- Contact potential medium volume groundwater users that were identified in the area and small water system operators to determine groundwater extraction volumes;
- Perform further literature review and consult with staff hydrologists to address challenges identified with the low flow study and develop a potential study plan for 2012;
- Complete a project report including an analysis of the data collected from the groundwater users; and
- Collect samples from Cowichan Lake, the Cowichan River, and the observation wells to be stored until funding is acquired for isotopic analysis.

Prepared by: Rachelle Ormond and Pat Lapcevic (FLNRO)

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