

Ministry of **Forests, Lands and
Natural Resource Operations**



GROUNDWATER IN THE COWICHAN BASIN – STUDY UPDATE

**Pat Lapcevic, Rachelle Ormond,
Colleen Gellein and David
Robinson**

**Ministry of Forests, Lands and Natural
Resource Operations**

Presentation to

***Cowichan Valley
Watershed Board***

November 3th, 2011





Background

- Groundwater important source of freshwater in Cowichan Valley
- Cumulative impact of large groundwater withdrawals not well understood – *Is this affecting the aquatic habitats in the river?*
- Focus of work in watershed plan did not include much about groundwater
- Funding provided to watershed board – used by Water Protection Group in Nanaimo to carry out study in 2011



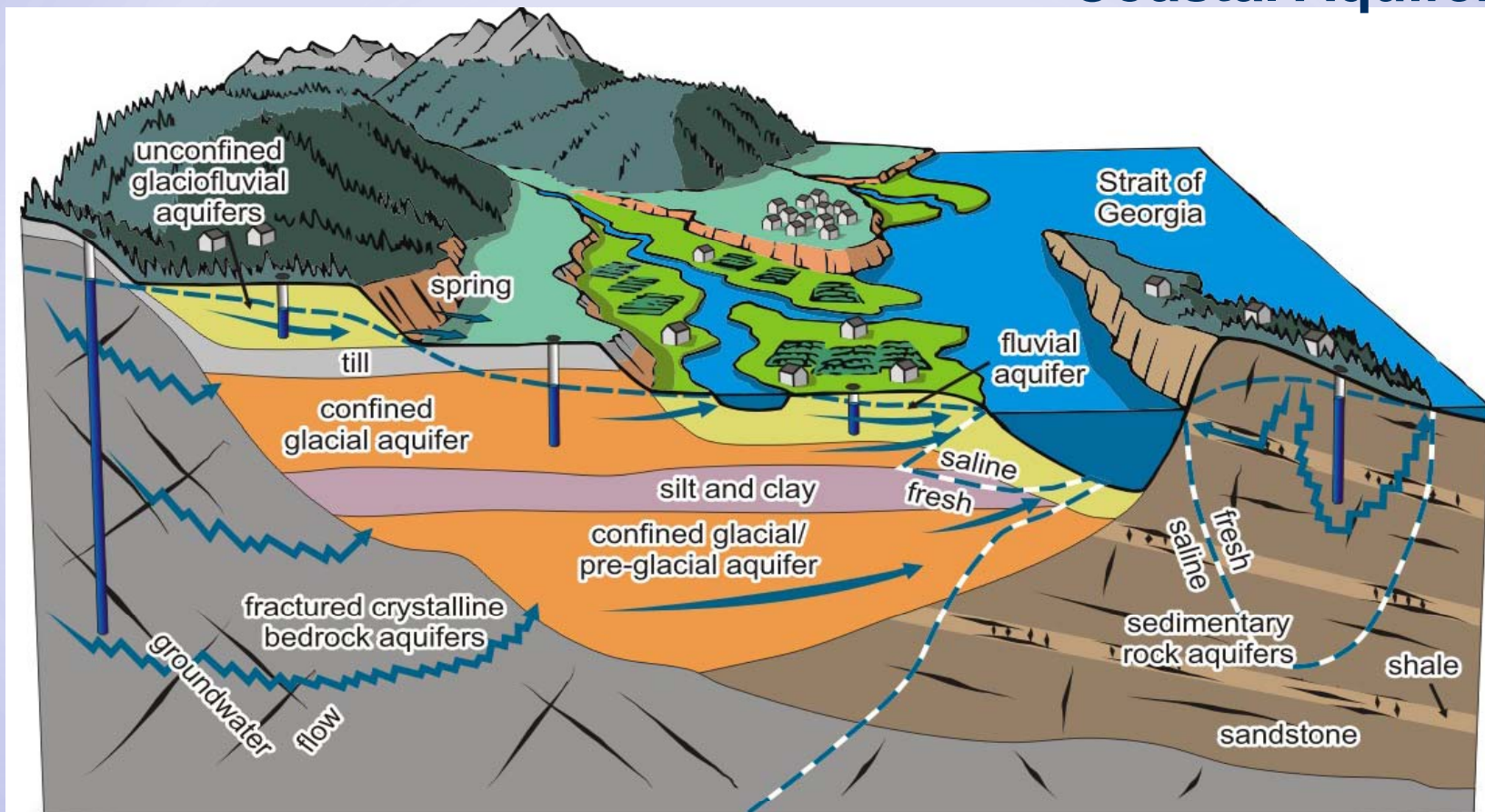
Objectives

- Better understand the role groundwater plays in the Cowichan watershed.
- Quantify the effect groundwater withdrawals may have on low flows in the Lower Cowichan River

This phase of the study:

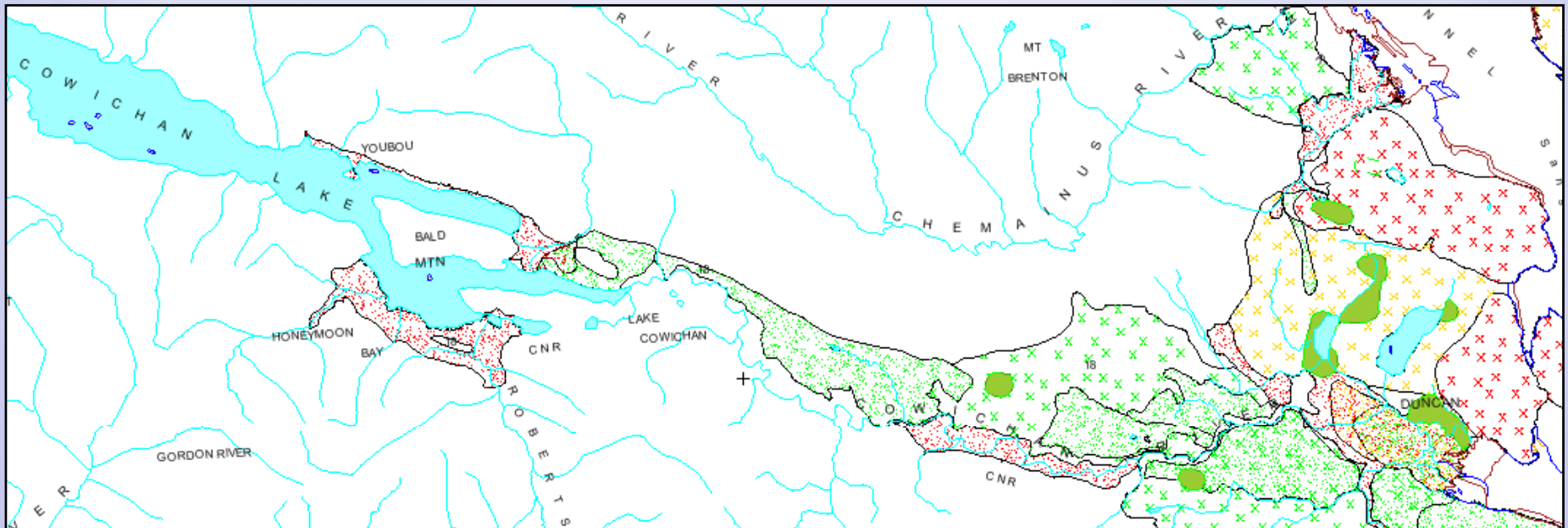
- Compile available groundwater extraction data to better understand groundwater use
- Measure flow in the river downstream of the major groundwater extractions.

Coastal Aquifers





Cowichan Valley Aquifers



- Variable productivity and vulnerability



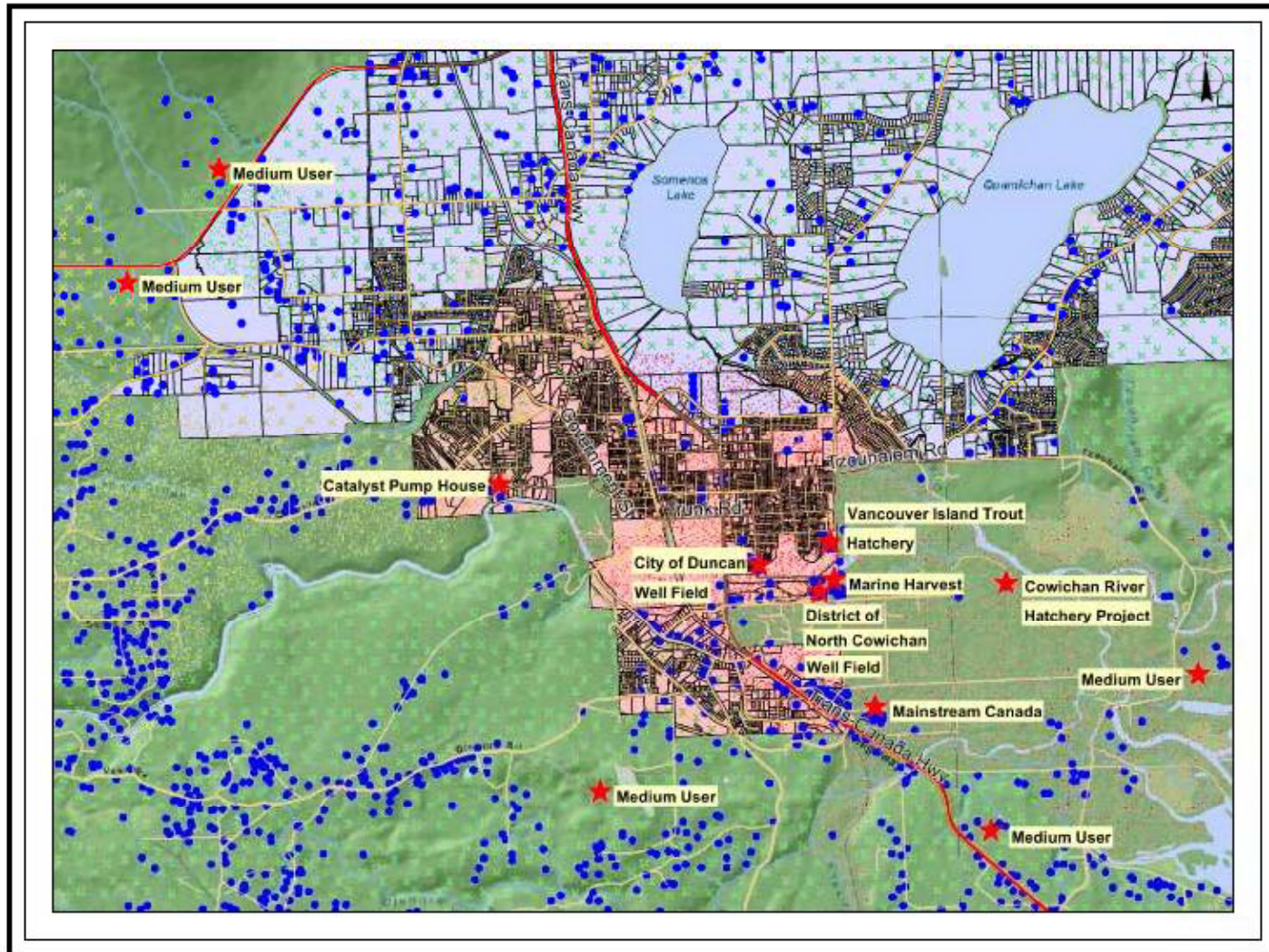
Groundwater Use

- Interested in **how much, when** and **where from?**
- **Large Users-** Municipalities and Hatcheries
- **Medium Users** (> 2500 gal/day, - Commercial & Industrial Users, Utilities/community systems, Agricultural Users
- **Small Users-** Private single-well systems

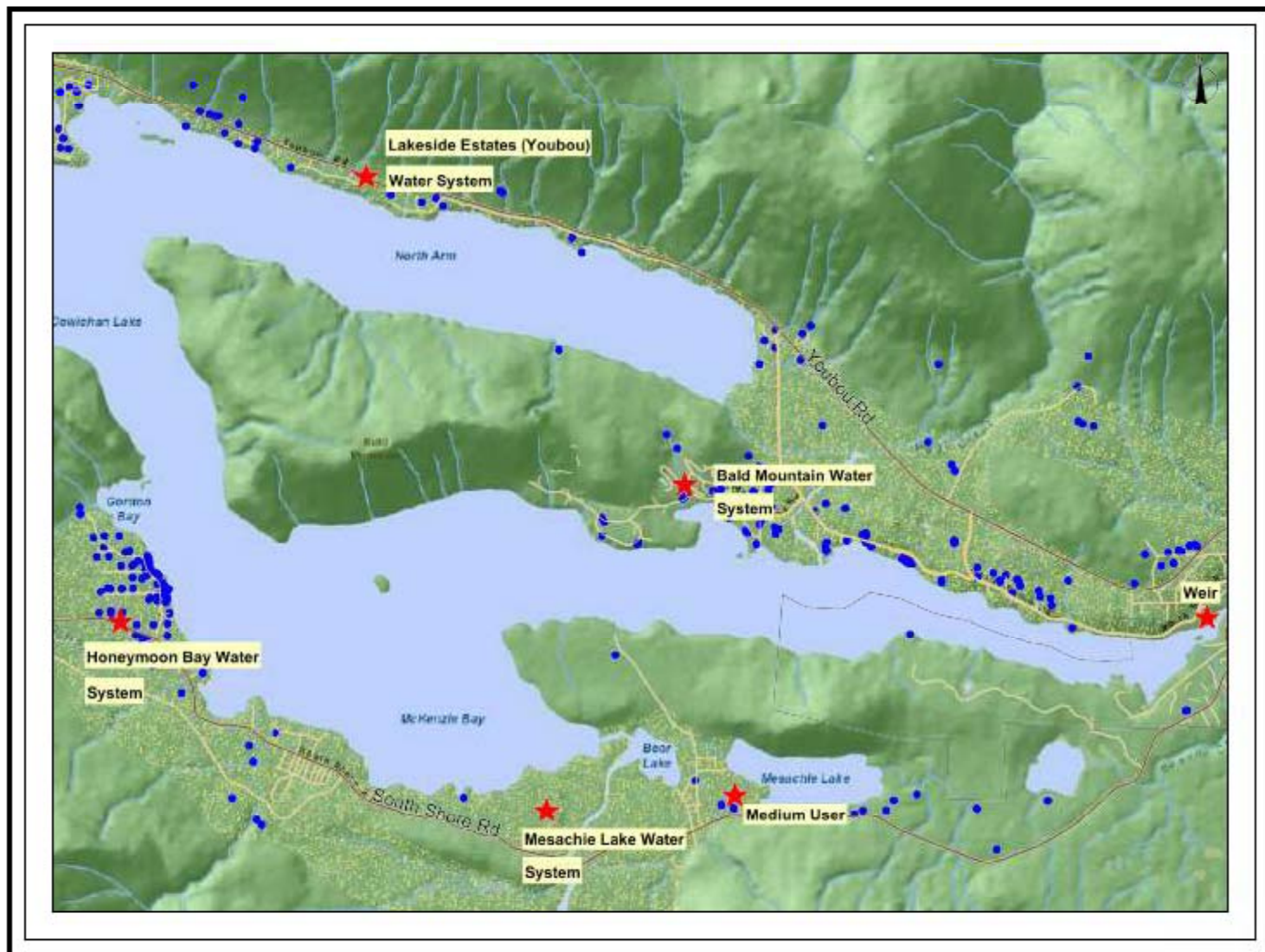


Cowichan Watershed Groundwater Use Survey				
	Agriculture	Commercial & Industrial	Hatcheries	Community / Utilities
Identified	63	62	4	6
Verified	13	39	3	2
In Progress	49	20	1	4
Confirmed Medium Users	0	6	0	4
Confirmed Large Users	0	0	3	2

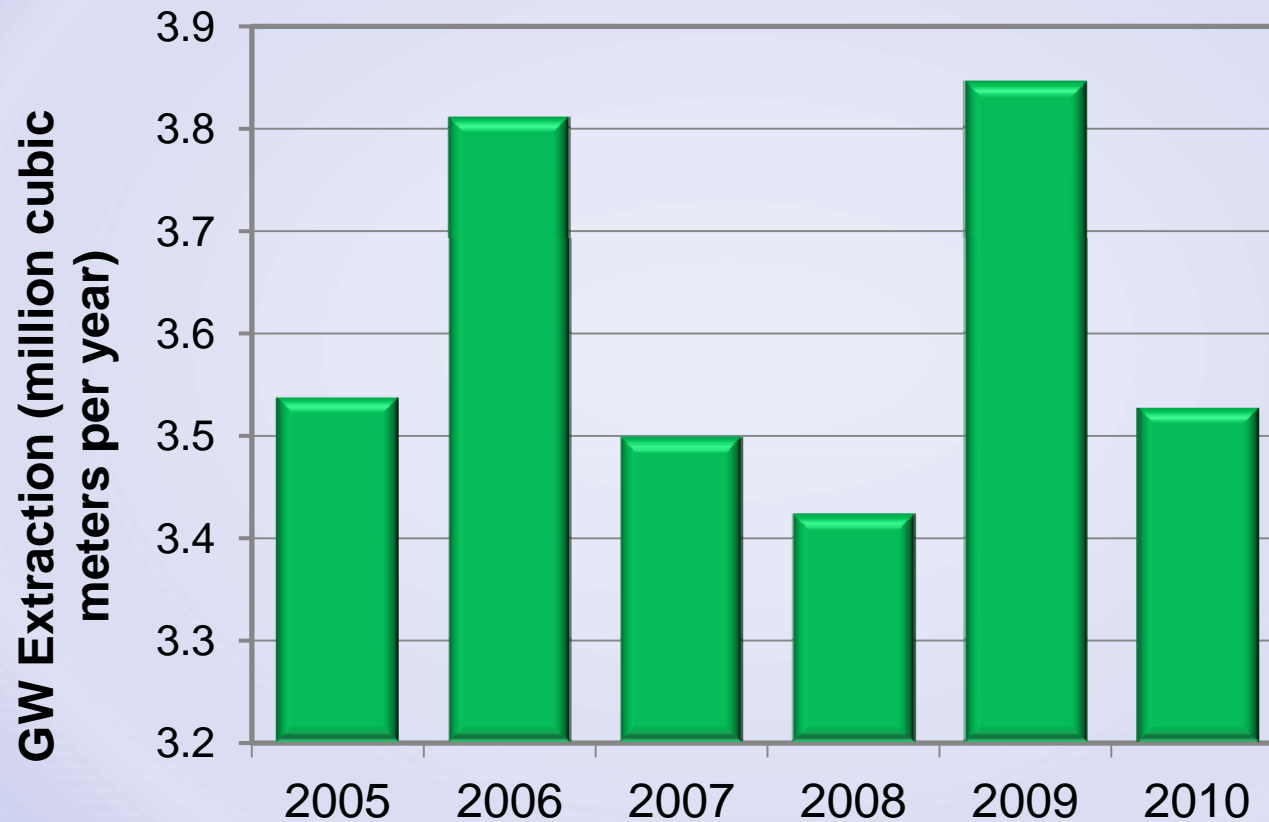
Ministry of Forests, Lands and Natural Resource Operations



Ministry of Forests, Lands and Natural Resource Operations



Ministry of **Forests, Lands and
Natural Resource Operations**



City of Duncan Groundwater Extractions

Ministry of Forests, Lands and Natural Resource Operations



Vancouver Island Trout Hatchery Yearly Extraction Totals





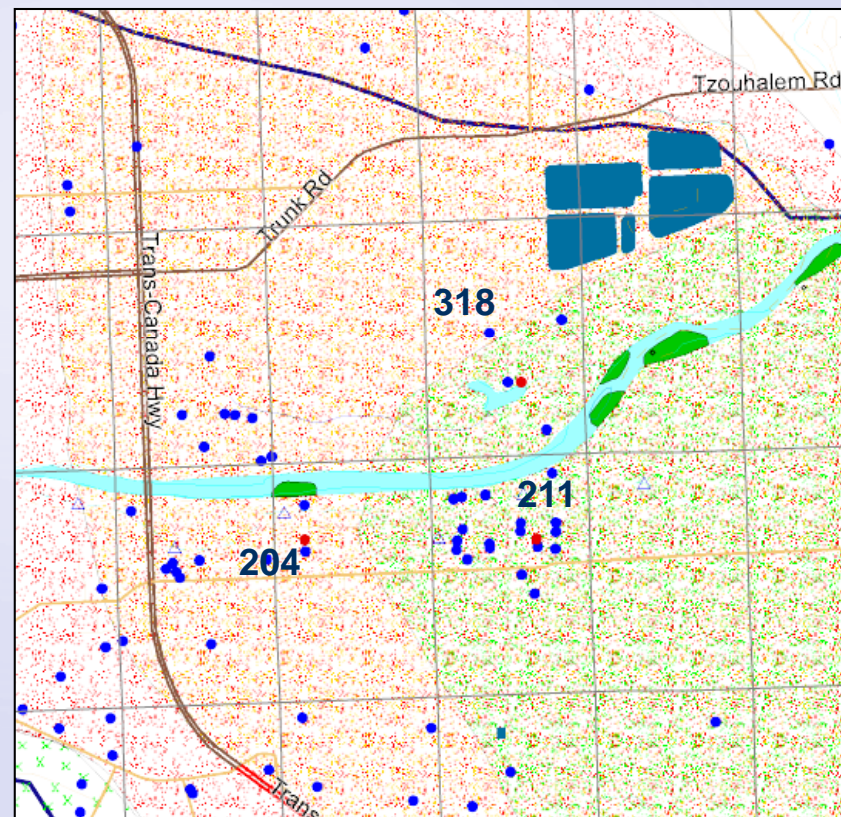
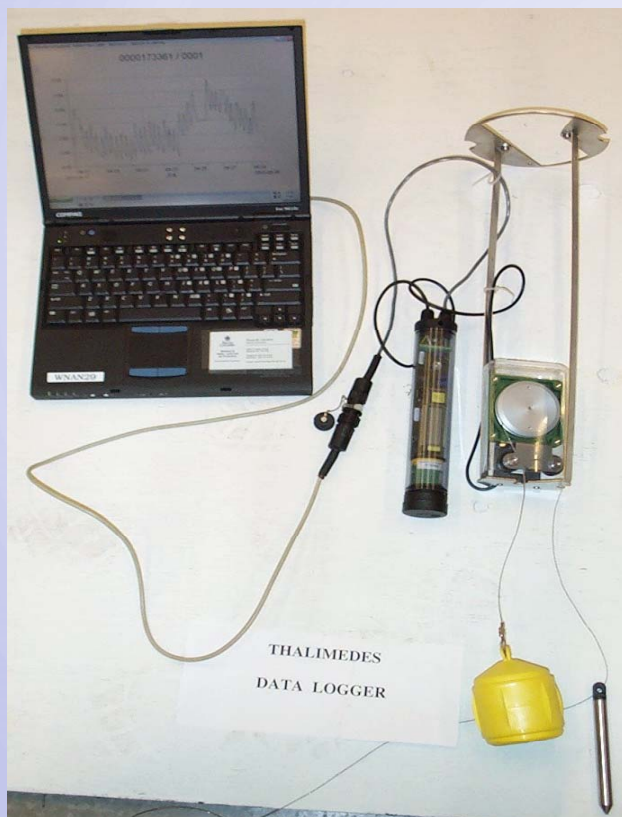
- Literature review, data compilation, consultation with hydrologists
- A temperature logger installed in the Cowichan River July 26;
- Discharge measurements in the Cowichan River (July and August)
- New in-stream measuring station established in September

River Studies

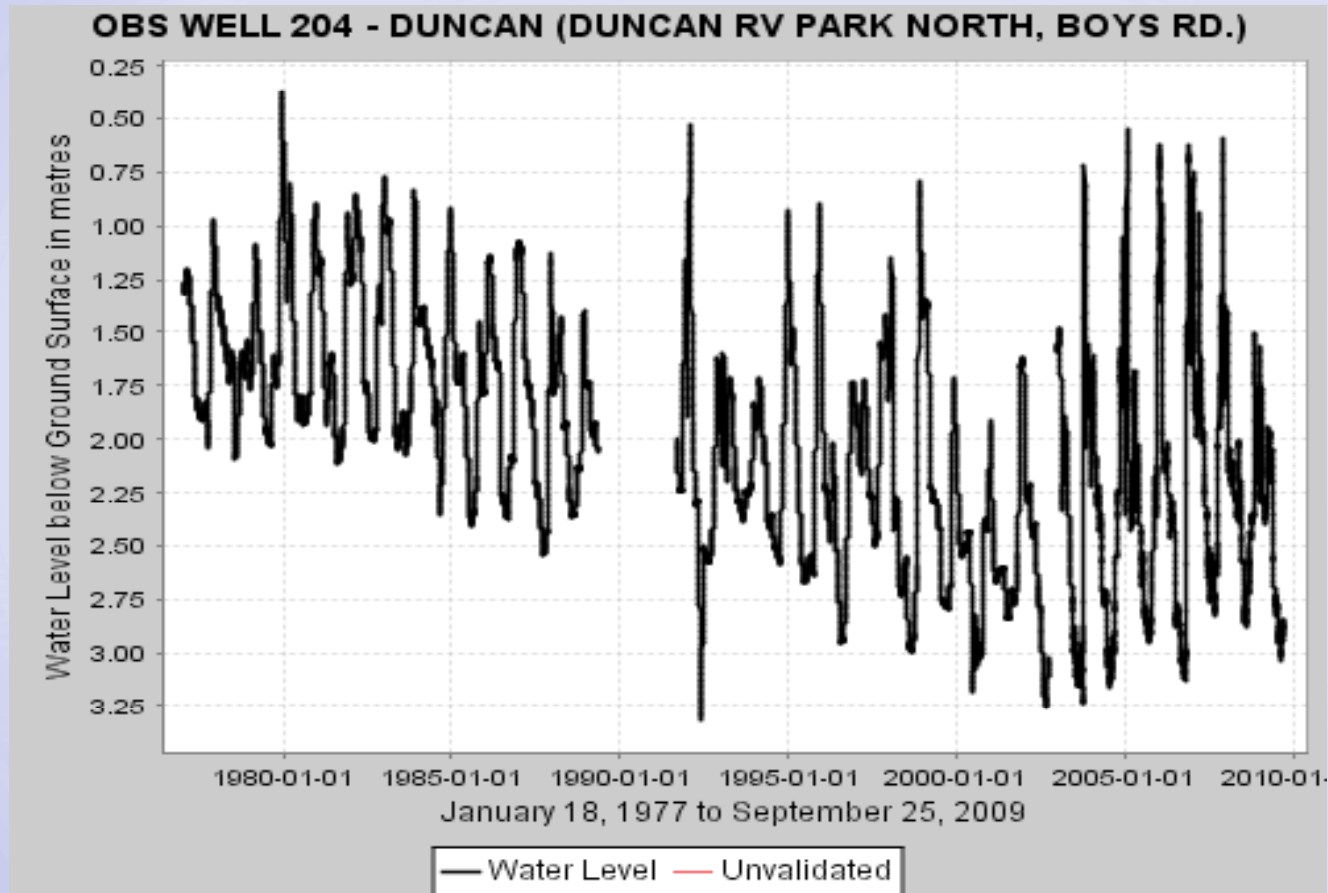




Provincial Observation Well Network



Ministry of Forests, Lands and Natural Resource Operations



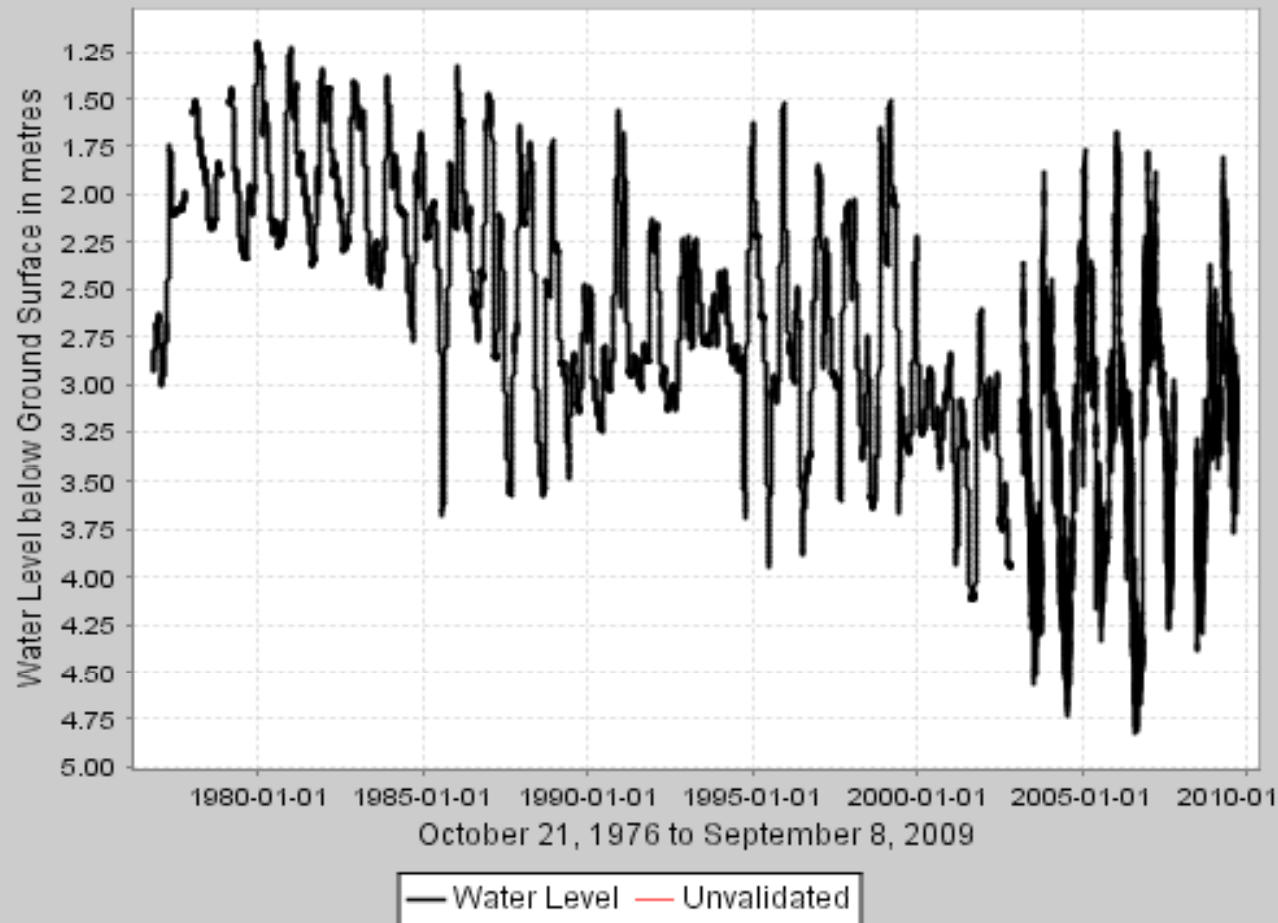
**Unconfined
sand and
gravel,
depth 9m**

Data available at: <http://a100.gov.bc.ca/pub/gwl/disclaimerInit.do>

Ministry of Forests, Lands and Natural Resource Operations



OBS WELL 211 - DUNCAN (MARINE HARVEST CANADA, BOYS RD.)



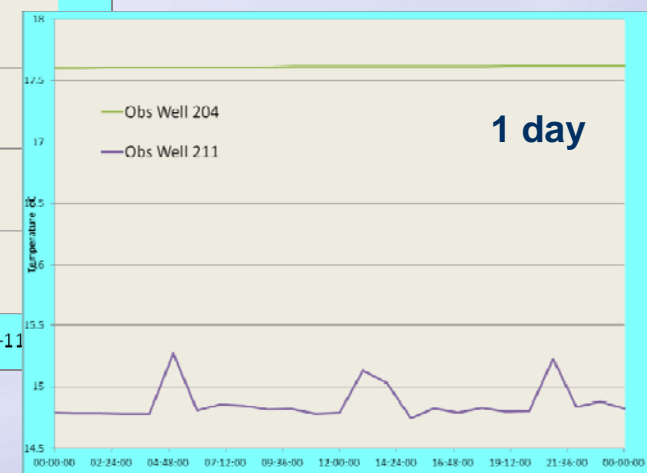
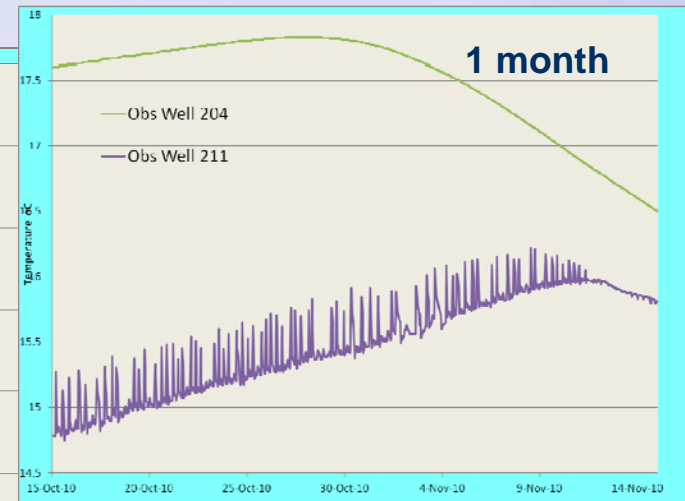
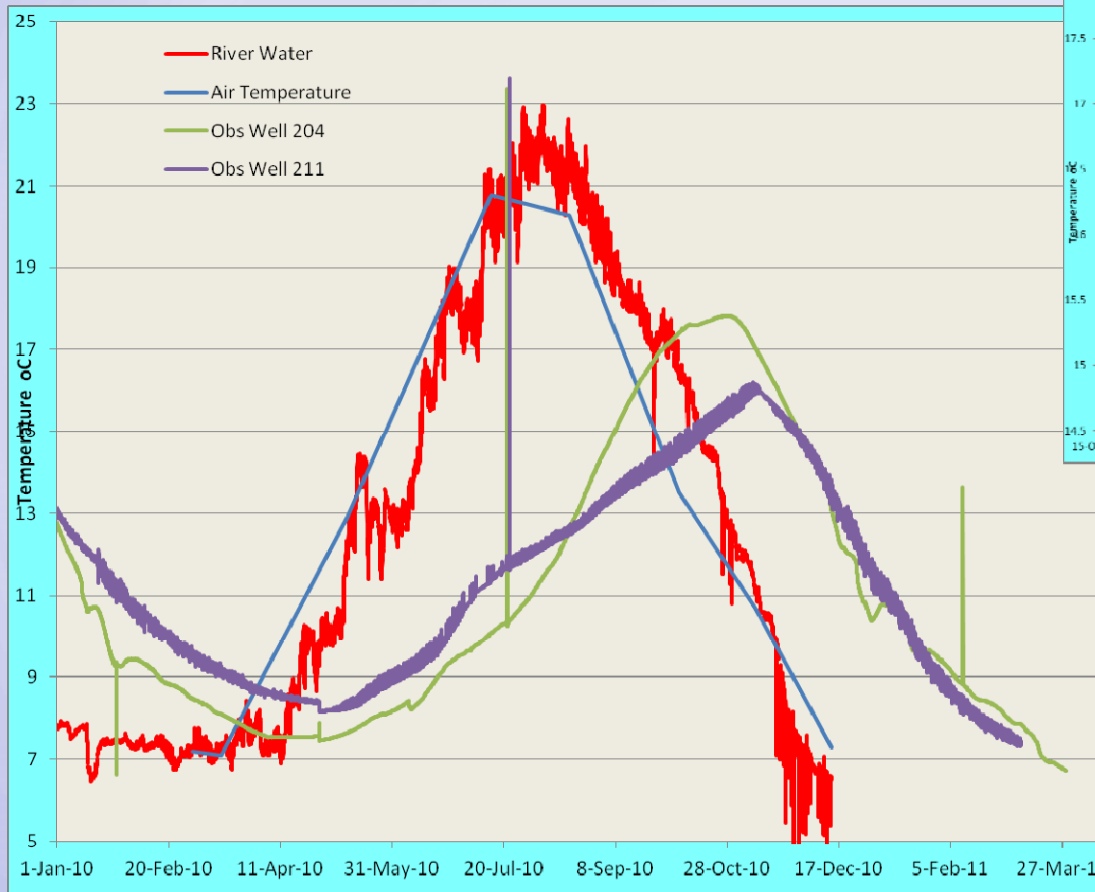
**Confined –
sand and
gravel, 32
m deep**

Data available at: <http://a100.gov.bc.ca/pub/gwl/disclaimerInit.do>

Ministry of Forests, Lands and Natural Resource Operations

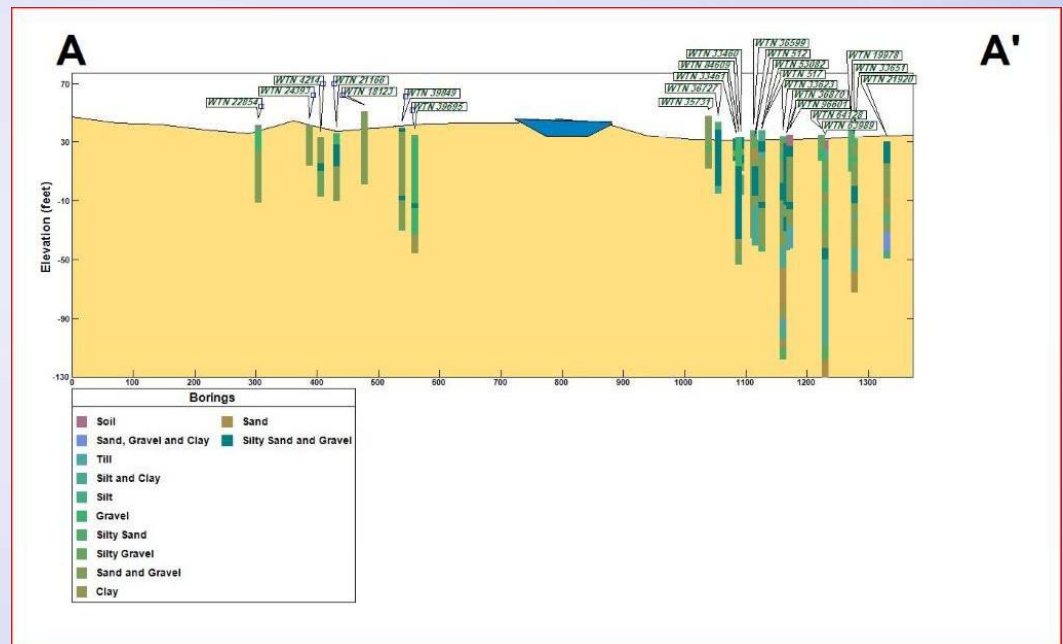


Temperature Analysis



Next Steps

- Complete data collection (large and medium users)
- Generate cross-sections using Envirolnsite[®] software
- Data analysis
- Low flow study design
- Complete a project report
- Collect samples from Cowichan Lake, the Cowichan River, and wells for isotopic analysis.





Acknowledgements

MFLNR & MOE Staff: Graeme Henderson, Brian Epps,
Warren Cooper, Robin Pike, Bill Floyd

Data Contributors: Cowichan Tribes, Vancouver Island
Provincial Hatchery, Marine Harvest Canada,
Mainstream Canada, City of Duncan, District of North
Cowichan, Cowichan Valley Regional District + others.

Cowichan Water Board: Dave Slade, Rodger Hunter



Questions, Comments, Data?

Pat Lapcevic, P. Geo.

Pat.Lapcevic@gov.bc.ca

250 751-3149

Colleen Gellein

Colleen.Gellein@gov.bc.ca

250-751-7118

