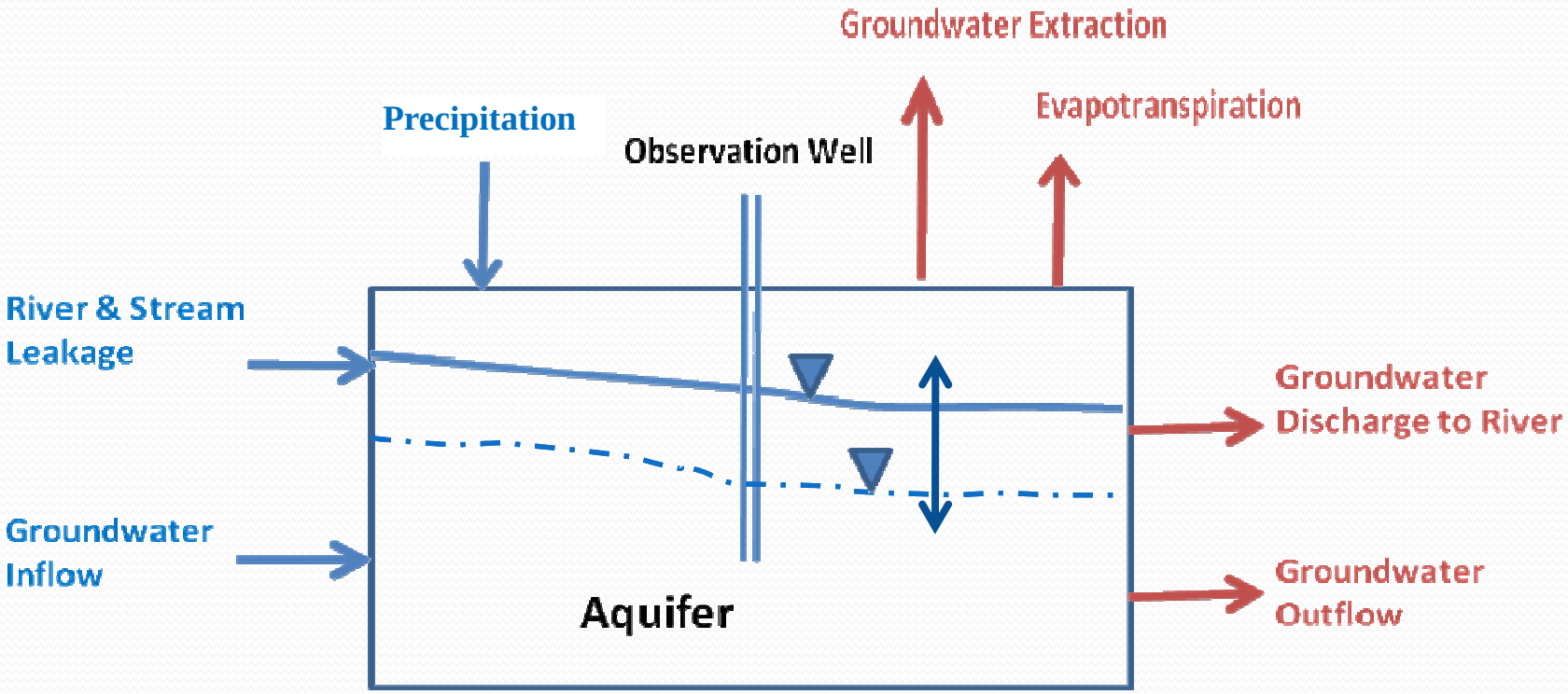
Surface Water – Groundwater Interaction

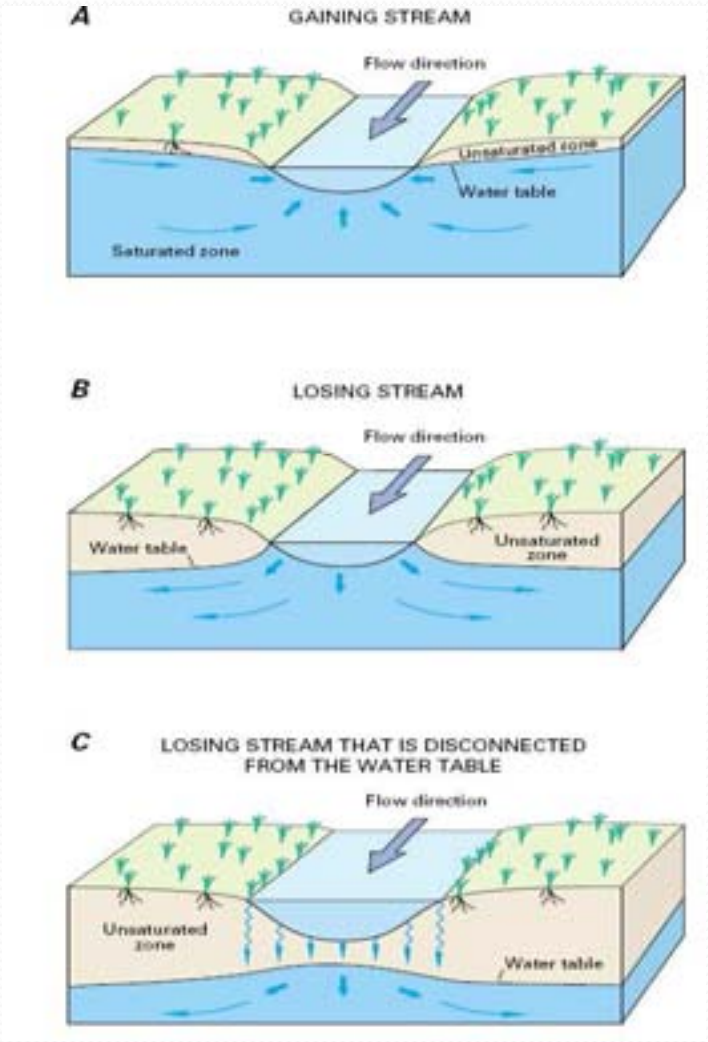
- Conceptual Water Budget
- What is surface water - groundwater interaction?
- What does it mean to Merritt's aquifer?
- What does it mean to Coldwater & Nicola Rivers?

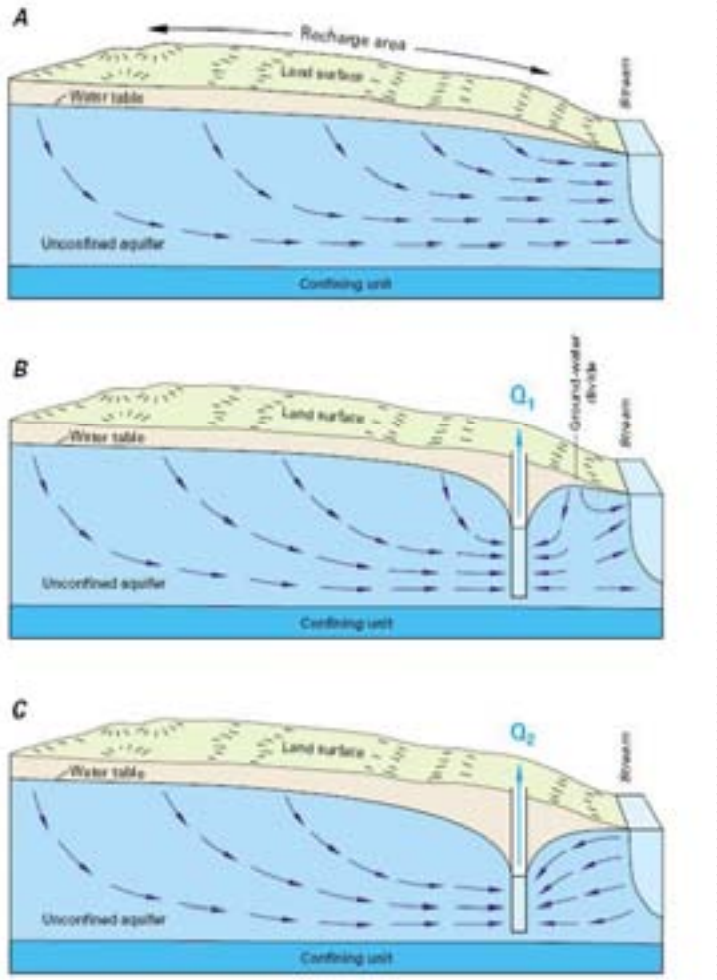
Kevin Bennett P.Eng,
BC Ministry of Forests, Land and Natural Resource Operations, March 30, 2011

Conceptual Water Budget

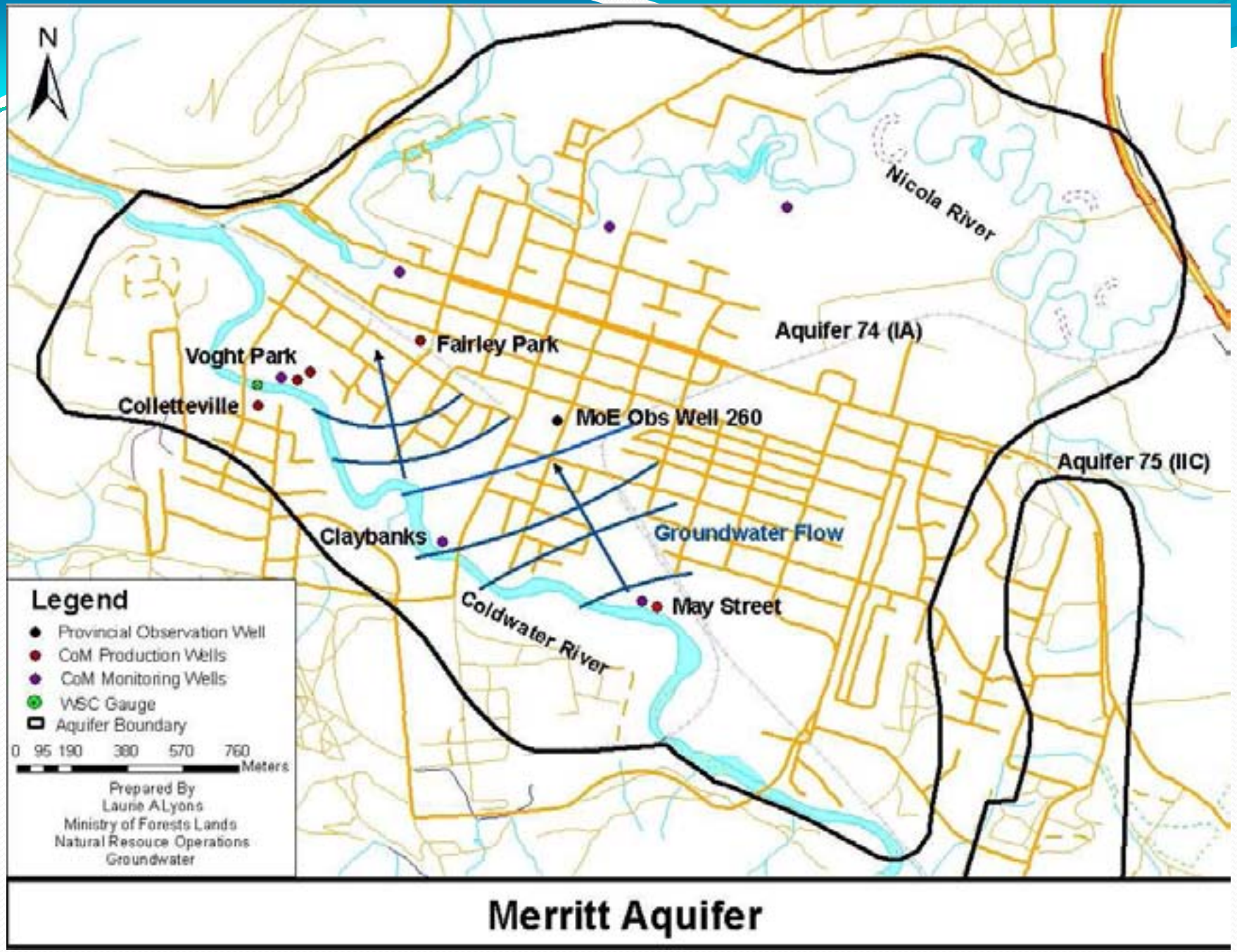


Gaining & Losing Streams

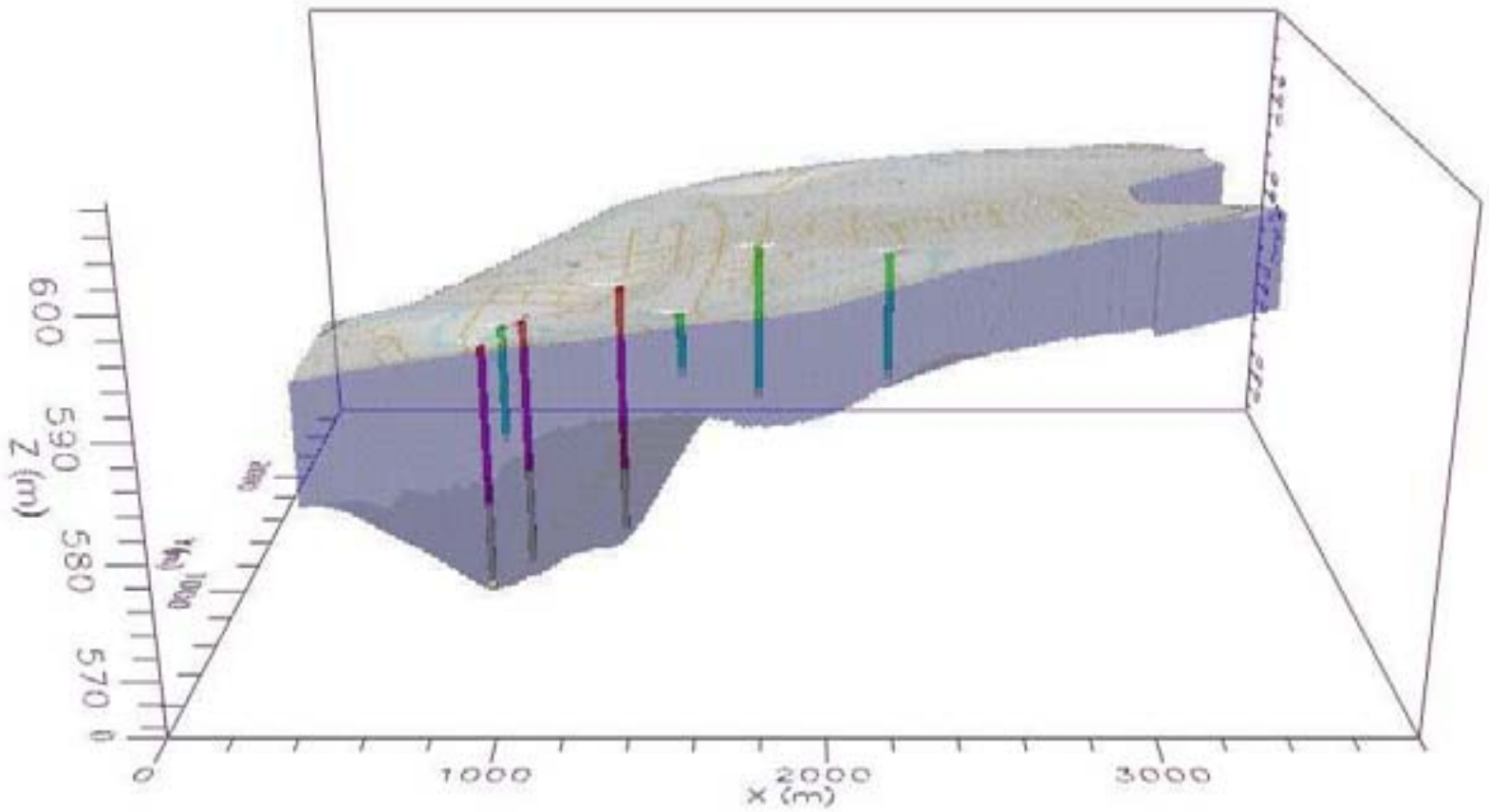




USGS Circular 1186, W. Alley

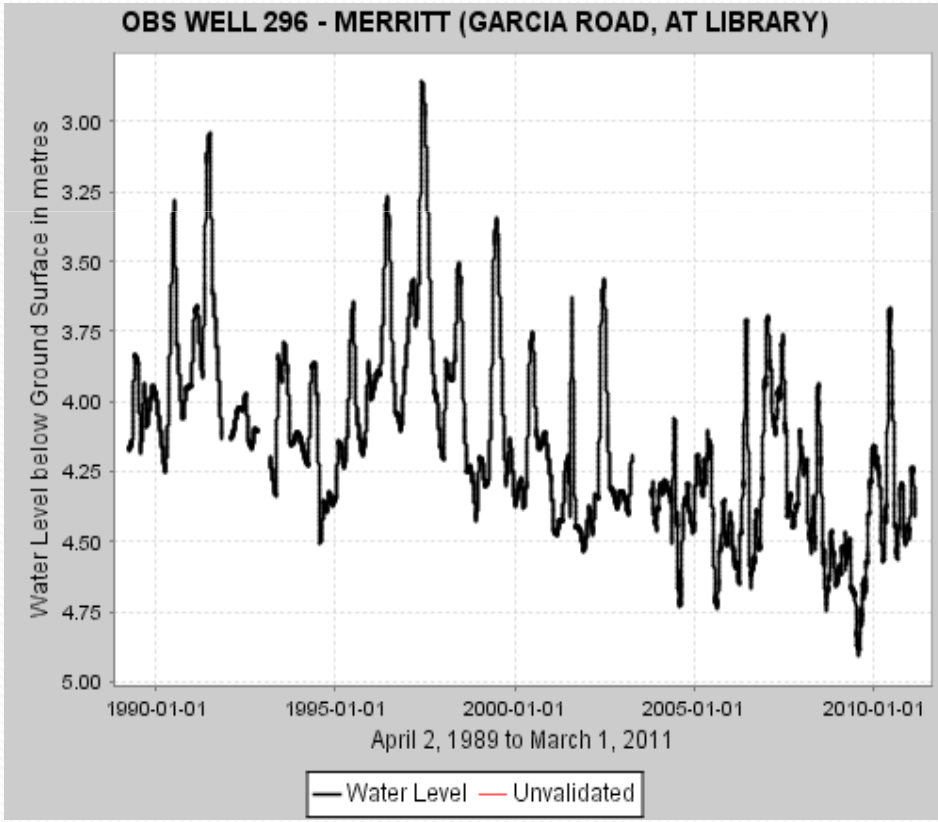

N
Nicola River
Aquifer 74 (IA)
Fairley Park
Voght Park
Colletteville
MoE Obs Well 260
Aquifer 75 (IIC)
Claybanks
Groundwater Flow
Coldwater River
May Street
Legend
Provincial Observation Well
CoM Production Wells
CoM Monitoring Wells
WSC Gauge
Aquifer Boundary
0 95 190 380 570 760
Meters
Prepared By
Laurie A Lyons
Ministry of Forests Lands
Natural Resouce Operations
Groundwater
Merritt Aquifer

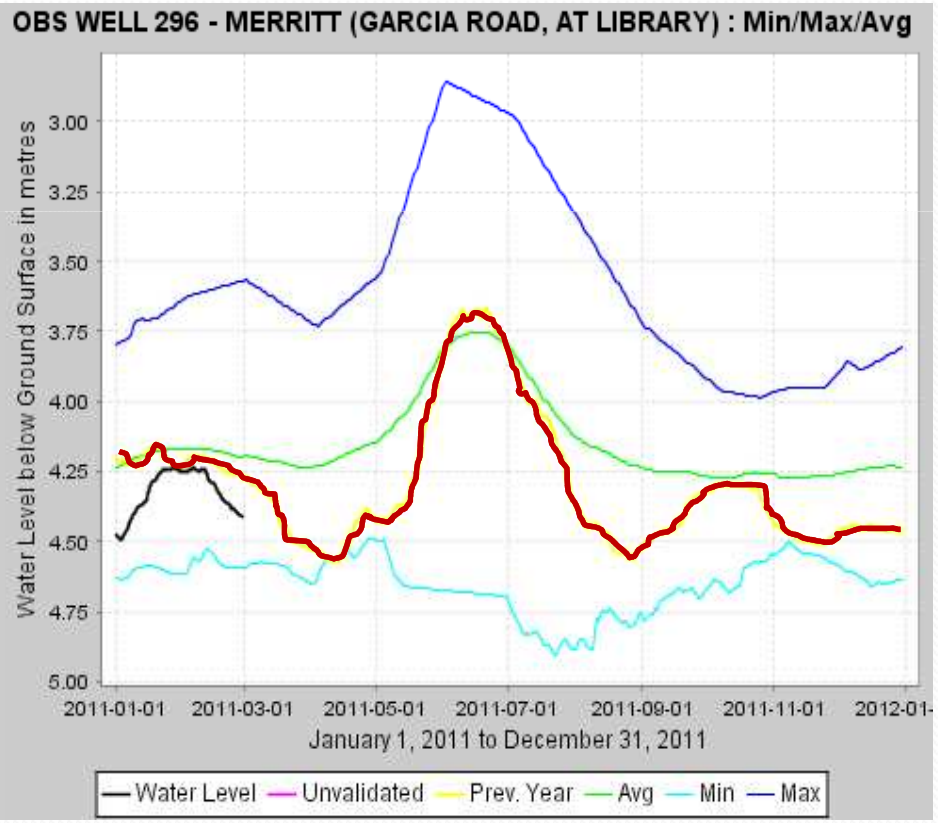
3D Visualization of Merritt Aquifer

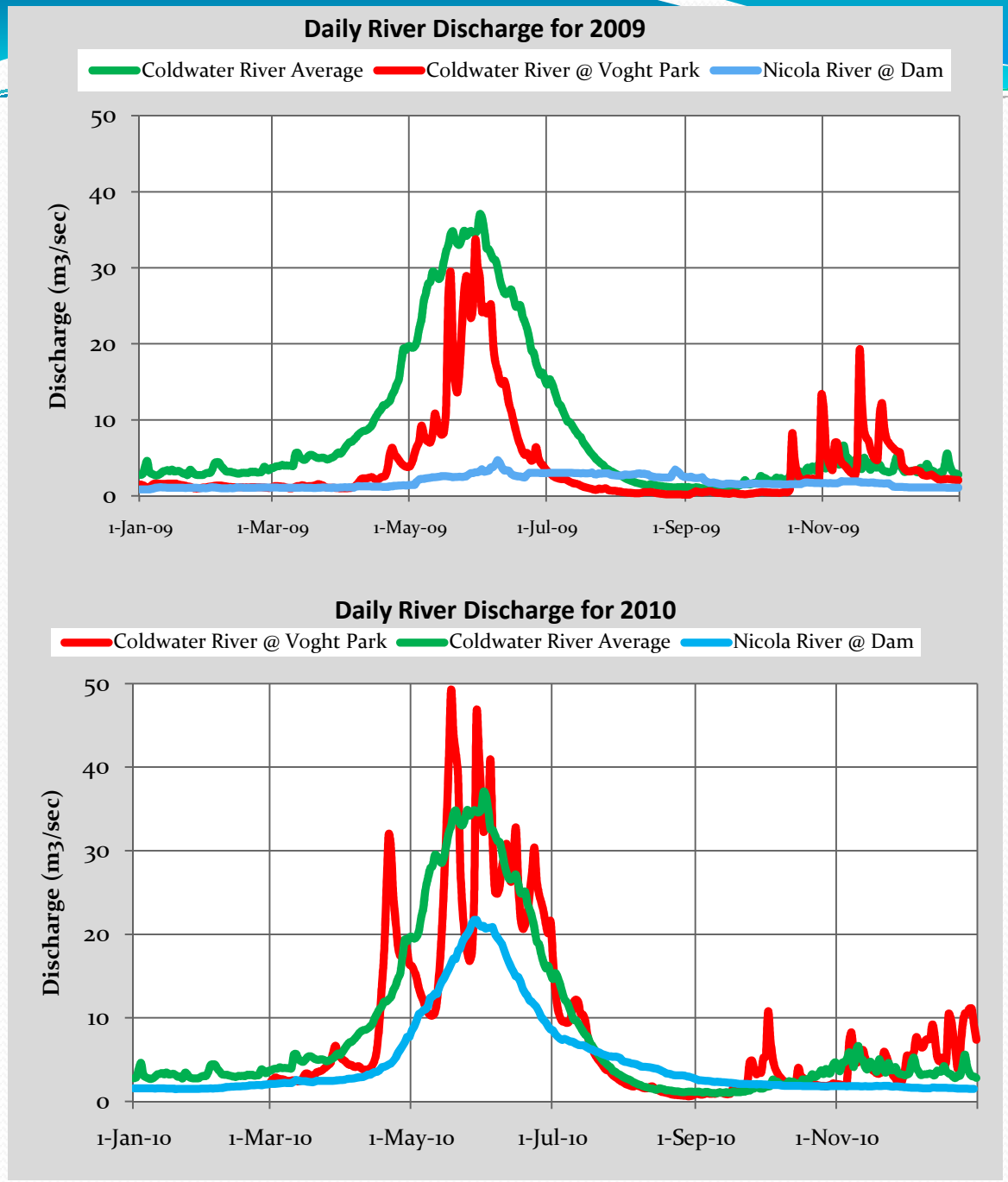


MOE Provincial Observation Well

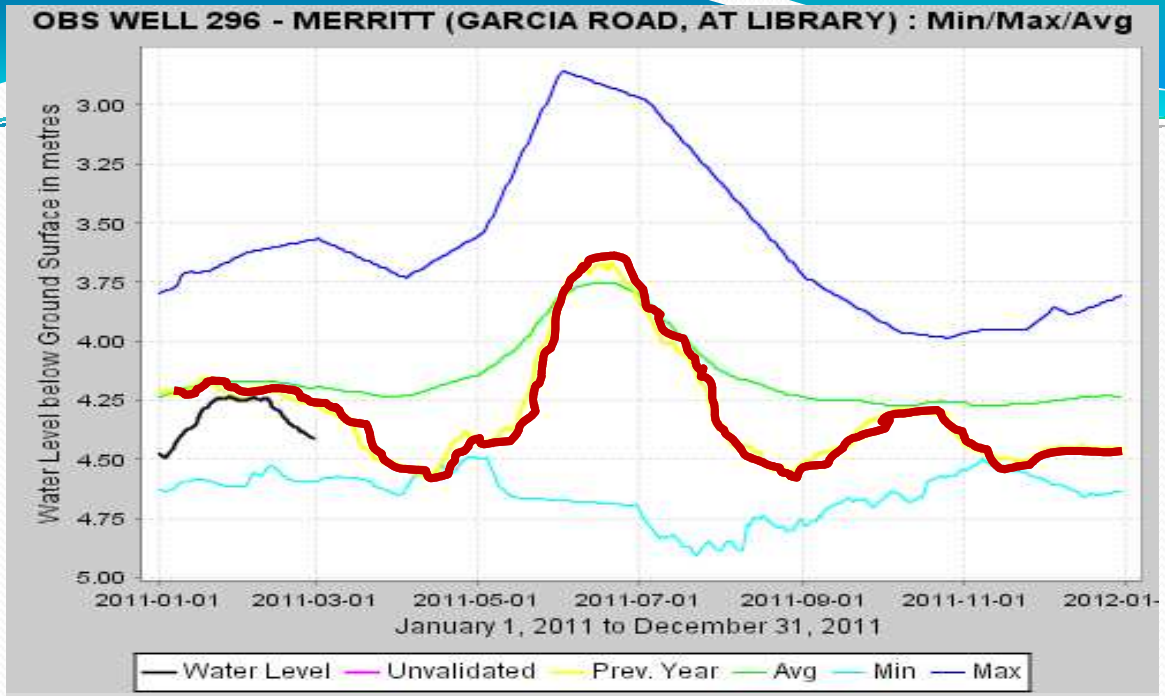
monitoring Merritt aquifer since 1989

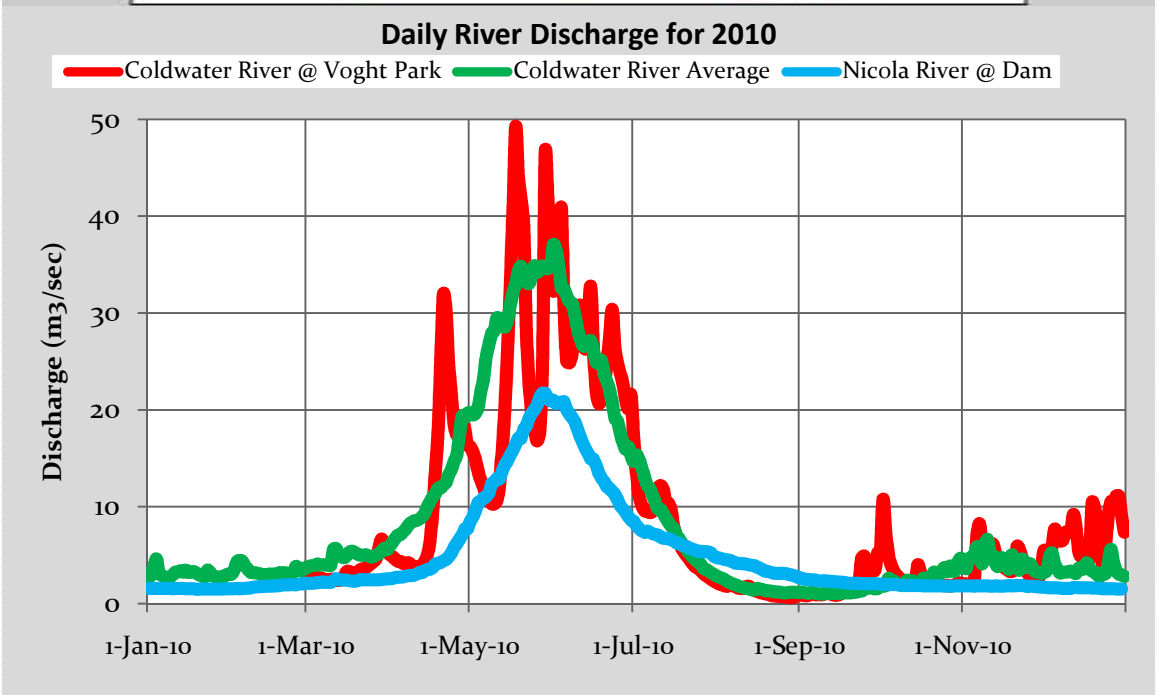






Comparing 2009 River Flow (top) to 2010 River Flow (bottom)





Comparing Groundwater Level (top)

to

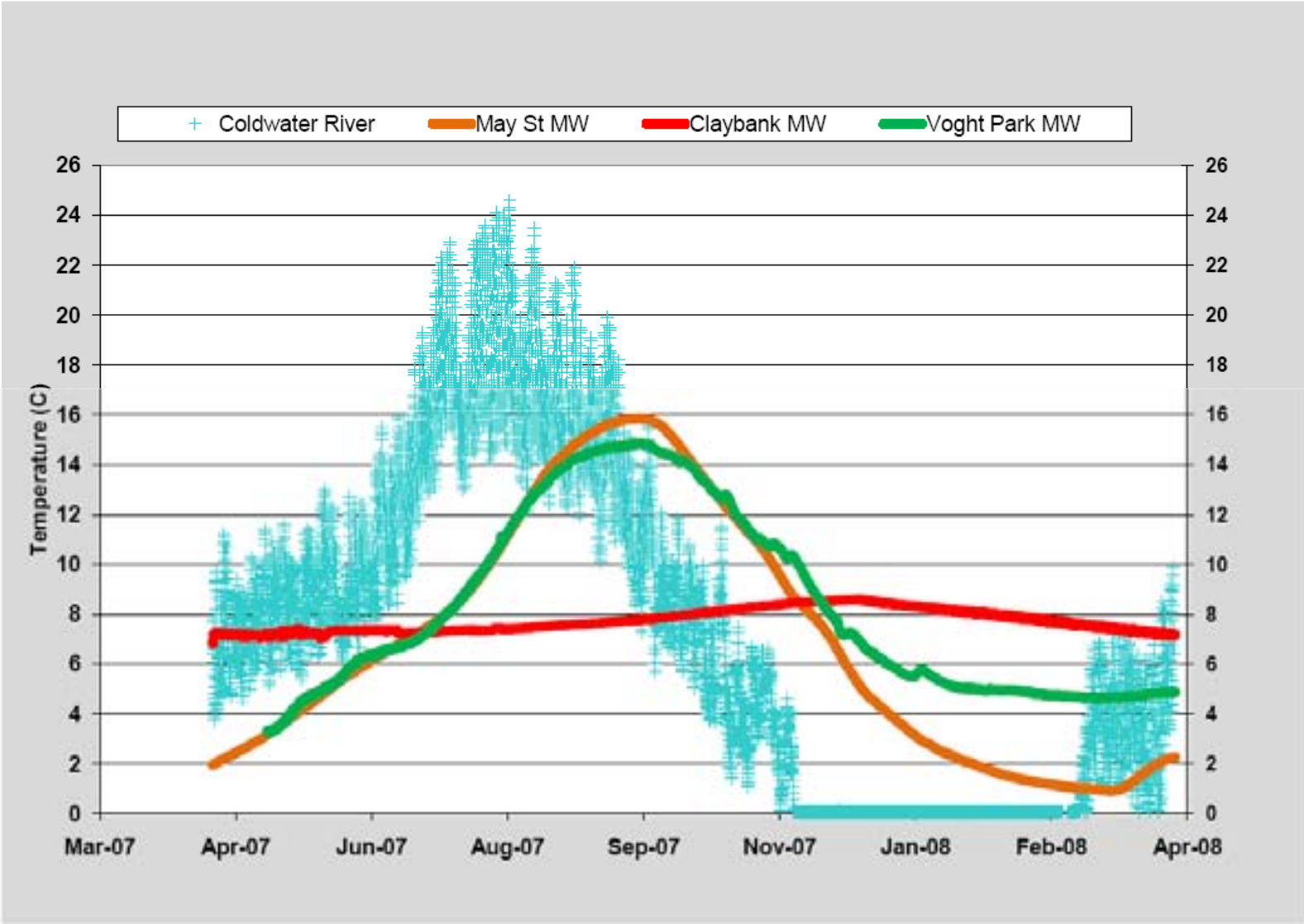
2010 River Flow (bottom)

Low Flow in Coldwater River
(looking downstream at Claybanks)

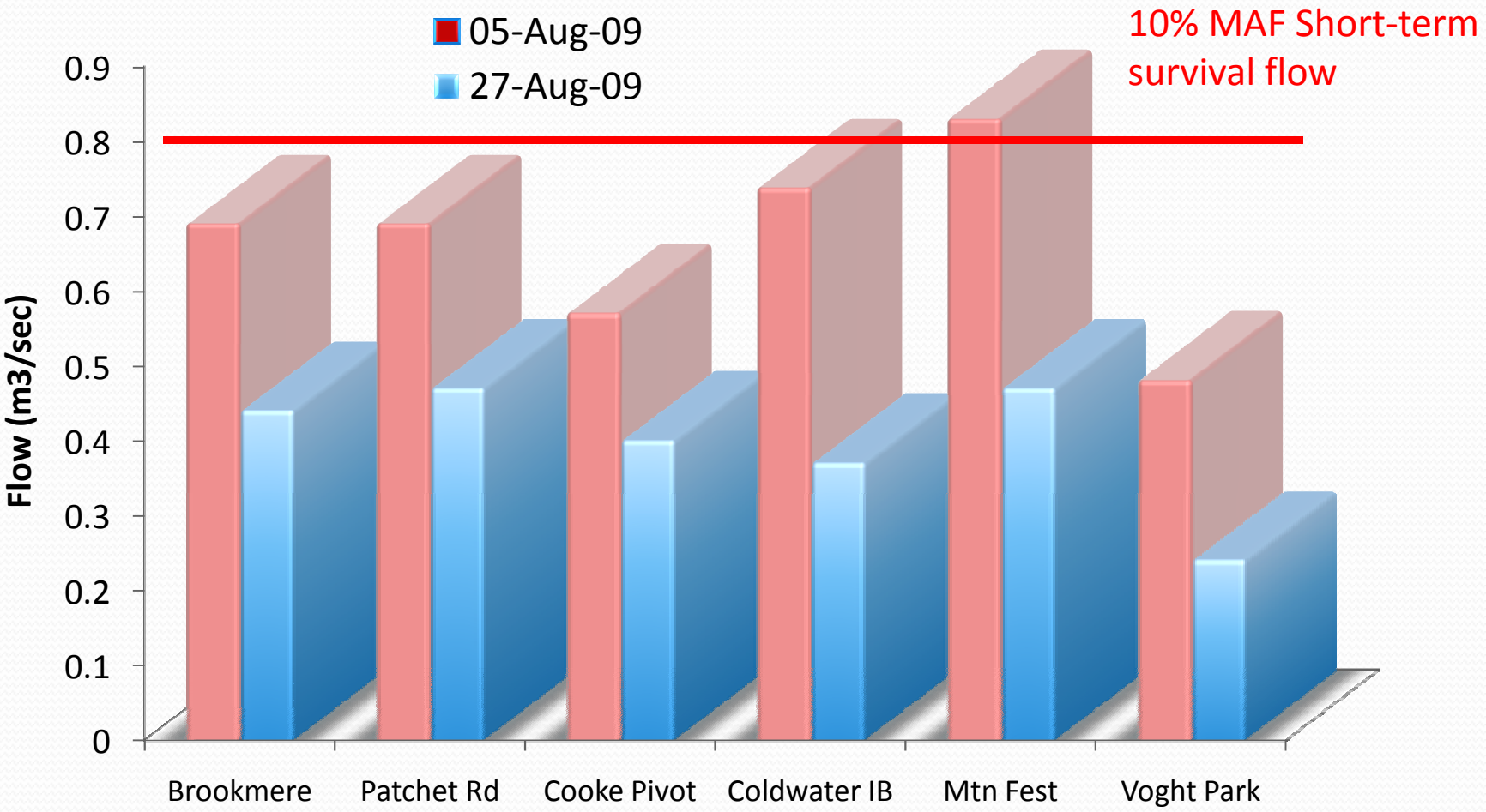
July 21, 2005
Low Flow: 12 to 15% MAD – 1.4 m^3/sec

August 22, 2005
Poor Flow: 2% MAD – 0.2 m^3/sec

Coldwater River vs Groundwater Temperatures



Coldwater River - Brookmere to Merritt



Conclusions

- Recharge to Merritt aquifer dominated by river loss.
- Aquifer health dependent on river flow.
- River health (summer) influenced by aquifer health.
- Climate change? earlier freshet, longer dry season.
- How do we manage aquifer to increase recharge, reduce late summer river losses?
- Water management plans need to understand & consider gw/sw relationships.