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Groundwater Assessment in the Okanagan Basin Project

and

Water Stewardship Division's Groundwater Program

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Water Stewardship Division
BC Ministry of Environment

Okanagan Water Stewardship Council Meeting
October 18, 2007

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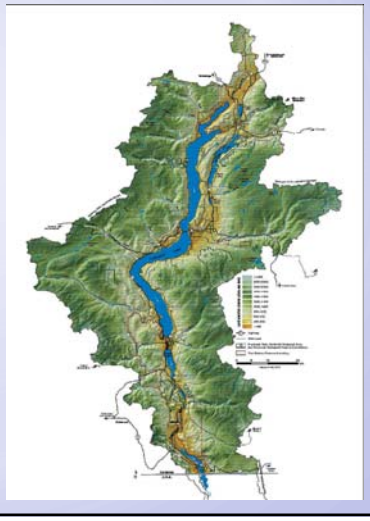
Groundwater Resources in the Okanagan Basin

- 69 mapped aquifers in the Okanagan Basin (~10% of the province's inventory of aquifers)
- 5 of the province's IA aquifers (heavily developed, highly vulnerable) ~25% of the province's IA aquifers
- >6200 wells in provincial database (WELLS)
- 30 active provincial observation wells



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Groundwater Assessment in the Okanagan Basin (GAOB)

- Initiated in 2004
- Purpose – to provide a better understanding of the regional groundwater resources in the Okanagan Basin:
  - •surface/groundwater interactions
  - •groundwater quality
  - •available/sustainable supply of groundwater
  - •climate change impacts
  - •community outreach
  - •science/policy linkages

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GAOB Partners and Stakeholders

Project Partners

- Earth Science Sector of NRCAN (Geological Survey of Canada – groundwater and Pathways)
- Okanagan Basin Water Board
- Ministry of Environment
- Agriculture Canada
- Ministry of Health/Interior Health Authority
- Canadian Centre of Water Excellence (University of Saskatchewan and Manitoba)
- Simon Fraser University
- UBC-O
- BC Groundwater Association

Key stakeholders

- DFO and provincial fisheries
- Regional Districts and local governments
- Local drillers, water suppliers, consultants and water stewardship groups

GAOB Working Group

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GAOB project activities

- ✓ Consultations with local governments
- ✓ Provincial WELLS database work
- ✓ Collection of groundwater reports
- ✓ Analysis of pumping test data
- ✓ Drinking water system inventory
- ✓ Outreach project
- ✓ Mapping products
- ✓ CWN, GSC & WSEP projects
- ✓ Technology transfer

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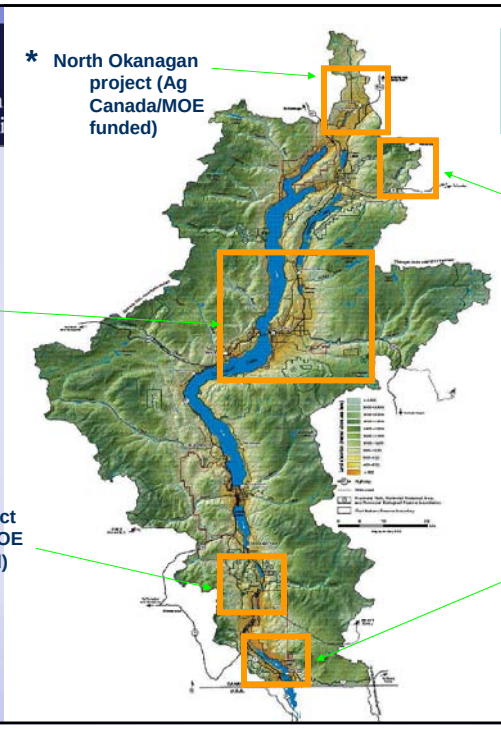

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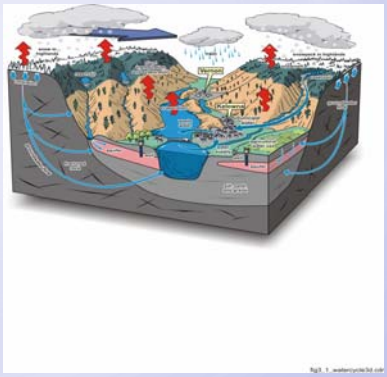
Canadian Water Network Projects "A Basin Approach to Groundwater Recharge in the Okanagan: Bridging the Gap Between Science and Policy"

- Provide a scientific basis for water budget assessments and water use planning
- Project led by Dr. Diana Allen from SFU
- Goal to enhance knowledge on groundwater recharge in the Okanagan



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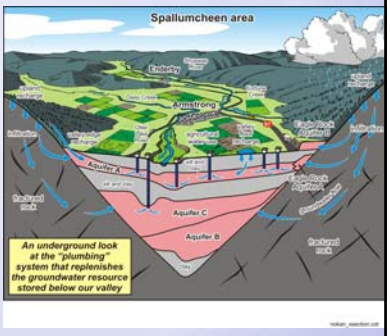
North Okanagan Ground Water Characterization and Assessment Project

- Increase awareness and understanding of groundwater issues and the resource in the North Okanagan
- Types of activities
  - •Water quality monitoring
  - •Water quantity monitoring
  - •Groundwater modelling
  - •Technology transfer (LUAM)



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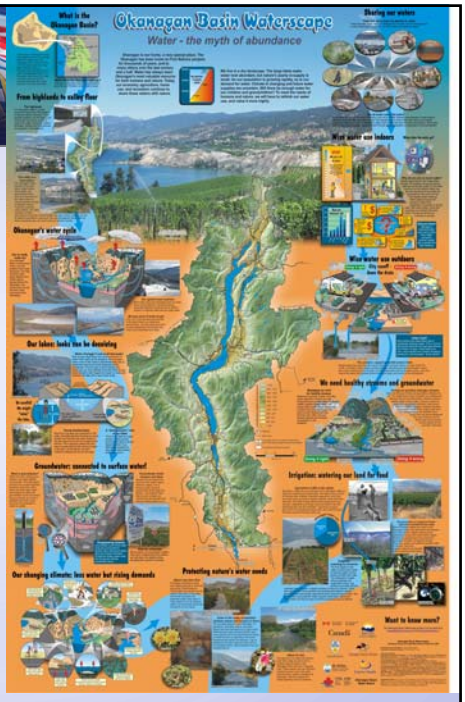
Community Outreach

- Poster content was developed through workshops in 2006
- Poster reflects water issues relevant to the Okanagan
- A teacher's resource kit has been developed



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Mapping Projects

- Digitization of existing surficial geology mapping in north and south Okanagan
- Compilation of bedrock geology maps for the Okanagan Basin at a scale of 1:50,000
- Mapping of fault fracture networks in the Okanagan Basin
- Surficial geology mapping in the Central Okanagan area

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Decision Support Tools

- Assisted SGOG team in Oliver in establishing water resource issues as a priority in the design process
- LUAM modelling tool developed - incorporates science-based studies into operational policy and planning
- RDOS and NORD planners interested in use of LUAM
- Vulnerability maps assist in identifying areas to consider for protection
- Well capture zones to guide source protection planning

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Symposium on Groundwater in the Okanagan

- Held in January 2007 in Penticton to report out on CWN and GAOB projects
- Attended by over 100 folks from various agencies
- Launched the release of the Okanagan Waterscape poster
- Presentations on the Okanagan Basin Water Board's webpage

http://www.obwb.ca/groundwater_symposium/

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MOU between MOE and NRCAN

- In March 2007, a MOU between the Water Stewardship Division of the MOE and the Earth Science Sector of NRCAN was signed
- First federal / provincial agreement of this type to be signed in Canada
- Agreement to work together on regional groundwater characterization and assessments in BC

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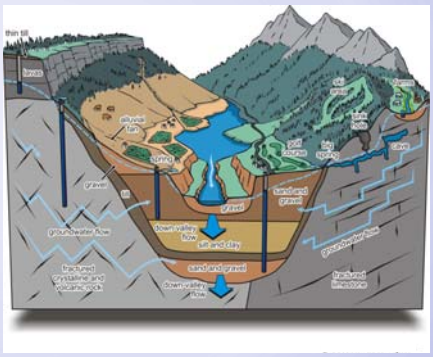
Knowledge gaps and opportunities

- Data gaps
  - Need for more upper catchment observation wells
  - Need for integrated gw and sw monitoring
- Modelling software limitations
  - Need to integrate/model surface and groundwater
- Need to integrate contaminant inventories and capture zones with vulnerability maps in order to couple the impacts of land use activities on the quality of groundwater



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Water Stewardship Division's Groundwater Program

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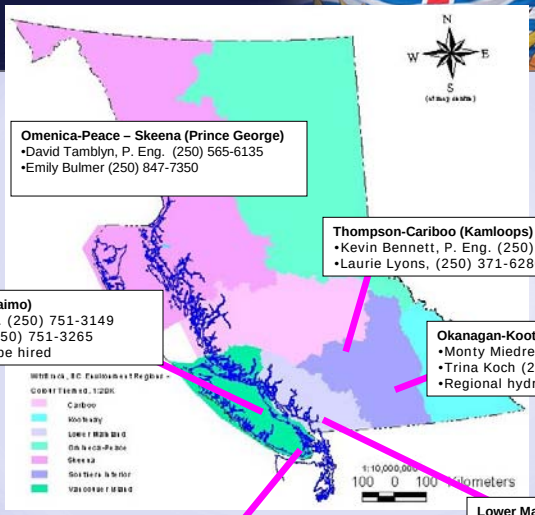
WSD GW Staff



Omenica-Peace – Skeena (Prince George)
•David Tamblyn, P. Eng. (250) 565-6135
•Emily Bulmer (250) 847-7350

Thompson-Cariboo (Kamloops)
•Kevin Bennett, P. Eng. (250) 371-6319
•Laurie Lyons, (250) 371-6280

Vancouver Island (Nanaimo)
•Pat Lapcevic, P. Geo. (250) 751-3149
•Sylvia Kenny, GIT (250) 751-3265
•Water technician to be hired

Okanagan-Kootenay
•Monty Miedreich (250) 354-6376 – Nelson
•Trina Koch (250) 490-2231 – Penticton
•Regional hydrogeologist to be hired

Lower Mainland (Surrey)
•Tim Bennett, P. Eng. (604) 582-5227
•Mike Simpson GIT (604) 582-5205

Victoria
•Mike Wei, P. Eng. (250) 356-5062
•Vicki Carmichael, P. Ag. (250) 387-9465
•Kevin Ronneseth, P. Geo. (250) 356-5180
•Lindsay MacFarlane (250) 953-3408

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WSD's Groundwater Program Activities

- ✓ Regulation development, implementation and compliance
- ✓ Observation well network
- ✓ Ambient water quality network
- ✓ Aquifer mapping and classification
- ✓ Aquifer characterization
- ✓ WELLS database – data entry, well location work and cleanup
- ✓ Outreach
- ✓ Partnerships
- ✓ Water management area planning – Township of Langley
- ✓ Support to Ministry Executive and technical advice to others

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Current WSD Groundwater Projects

- ➢ Drinking water system inventories and well identification plating (VI, Northern BC, FN)
- ➢ Arsenic surveys (Northern BC, Salt Spring Island)
- ➢ Vulnerability mapping (VI and Okanagan)
- ➢ Provincial guidelines for groundwater at risk of pathogens (GUDI)
- ➢ Provincial guidelines for water for EA mining projects
- ➢ WELLS backlog

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Current WSD Groundwater Projects (cont.)

- Township of Langley's Water Management Plan
- Drafting Phase 2 of the GWPR for Cabinet consideration
- Operation, maintenance, sampling of the provincial groundwater monitoring wells
- Aquifer characterization – GAOB
- Outreach – development of brochures
- BC-AB Trade, Investment and Labour Mobility Agreement (TILMA)

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Groundwater Management in BC

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Current Provincial Groundwater Gaps/Needs

- Ability to regulate groundwater extraction not yet implemented anywhere in BC, therefore lack of authority to:
  - use economic instruments to influence groundwater extraction rates.
  - influence groundwater pumping rates is limited and convoluted.
  - require drilling authorizations unless a water management plan has been approved for a designated area.

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Current Provincial Groundwater Gaps/Needs (cont.)

- Limited capability to implement well protection plans, for land surrounding over which the well owner has no jurisdiction.
- Lack of understanding of the groundwater resource (in most locations):
  - regulations that will provide more data about the resource, including sustainable yield, are anticipated but not yet enacted.
- Development of a provincial water governance policy is under development, but not yet complete.

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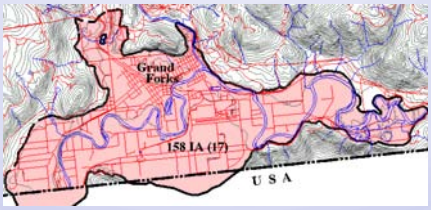
Water Management Plans

- Plan initiated by Minister – possibly at request of local government – in critical areas and signed off by Cabinet (in whole or in part)
- Purposes: to address or prevent conflicts between water users, water users and instream flow requirements, or risks to water quality, fish or fish habitat



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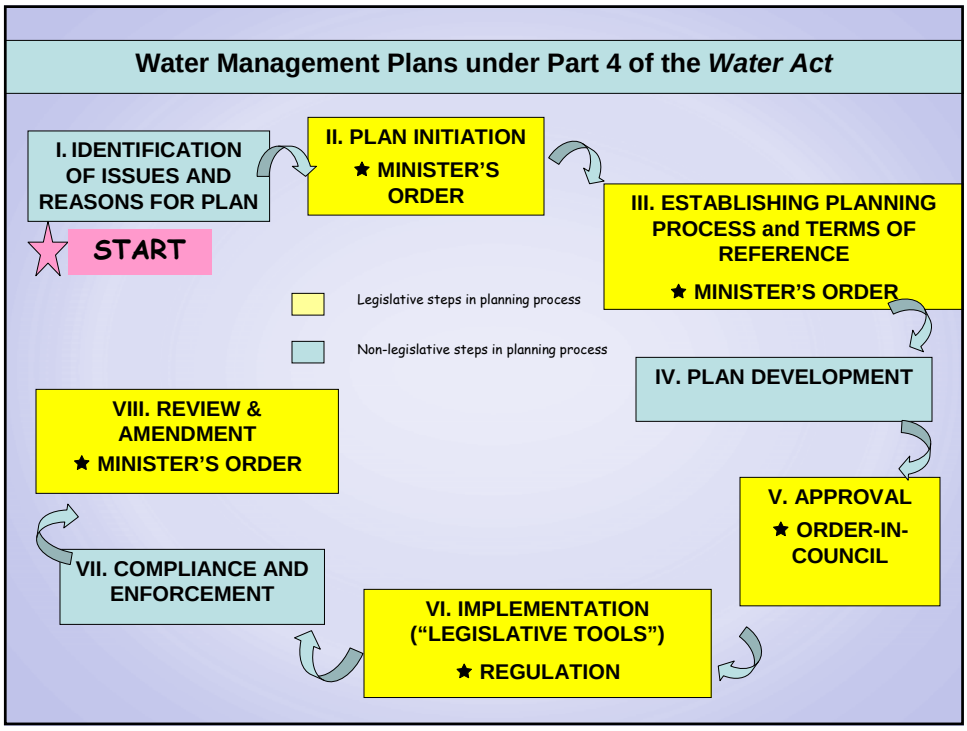
Water Management Plans (cont.)

- Flexible to local conditions and concerns
- Solution oriented – must address specific problems
- Transparent process – mandatory stakeholder and public consultation
- Legally binding – implementation regulation may affect or restrict other statutory decisions (e.g. permits, licences, approvals)
- Revisable, amendable and can be phased



Benefits of a Water Management Plan

- Broad environmental scope
- Adaptable credible process with specified deadlines
- Consistency with RGSs, OCPs, LRMPs, bylaws and other plans
- Unusual powers
- Rights of access
- Government attention
- Legislative teeth
- Fairness
- Potentially powerful impact on groundwater development

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Challenges and Considerations

- Need a long-term commitment to develop and implement the plan
- Strong political support – need for a local Board or Agency to steer the process
- Capacity – dedicated staff and committed funding
- Need to have a good understanding of the resource prior to initiation of the plan
- Willingness of local governments to change or enact by-laws, e.g. subdivision by-laws to reduce consumption, stormwater management, etc.

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Potential Water Management Plan Tools for Groundwater

- Registration of new and existing water supply wells
- Drilling authorizations – terms and conditions for new wells, altered wells, pump installations/changes
- Universal water meters and rate structures
- Conservation and outreadh programs such as sprinkling restrictions, low flush toilets, water wise, etc.
- Nutrient management plans
- Expand Ground Water Protection Regulations, e.g. geothermal wells
- Sewage/septic system management plans
- Licencing groundwater extractions
- Economic instruments to influence groundwater extraction rates


Thank you!
Questions?
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