

Provincial Groundwater Policy Initiatives

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Provincial Groundwater Policy Initiatives

- Building Capacity
 - Working within GOA and with other stakeholders to raise the knowledge and expertise of groundwater
- Improving Groundwater Knowledge
 - Provincial Groundwater Inventory Program
 - Researching future policy issues
- Groundwater Management Policies and Tools
 - Oil and Gas
 - *Water (Ministerial) Regulations*
 - Policy support to regional plans (Land-use Framework)
- Improving Stewardship
 - Working Well program
 - Groundwater Monitoring, Evaluation and Reporting

Building Capacity

Building Capacity

- Policy section working within GOA and with key stakeholders to increase groundwater knowledge + expertise
- Examples include: community of practice (hydrogeologists), Alberta Water Well Drillers Association, watershed and regional planners
- Strengthen other partnerships through knowledge exchange
 - Watershed Planning and Advisory Committees and Watershed Stewardship Groups
 - Regional Plans under Land-use Framework

Improving Groundwater Knowledge

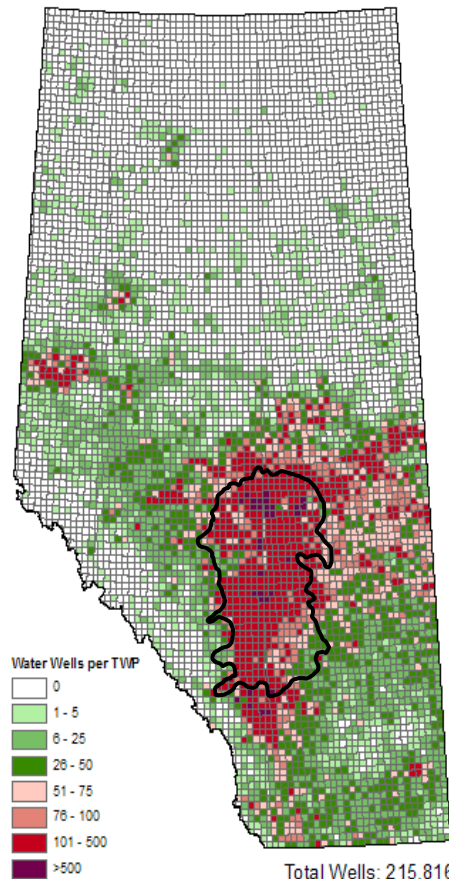
Improving Groundwater Knowledge

- Various events drive need for improved groundwater knowledge:
 - Water for Life (2003) & renewal (2008)
 - Alberta Water Council (2008)
 - CBM development & MAC (2006)
 - Closure SSRB (2006)
 - Rosenberg Report (2007)
 - Provincial Groundwater Risk Assessment (2007)
 - Land-use planning (2008)
 - Groundwater licensing process

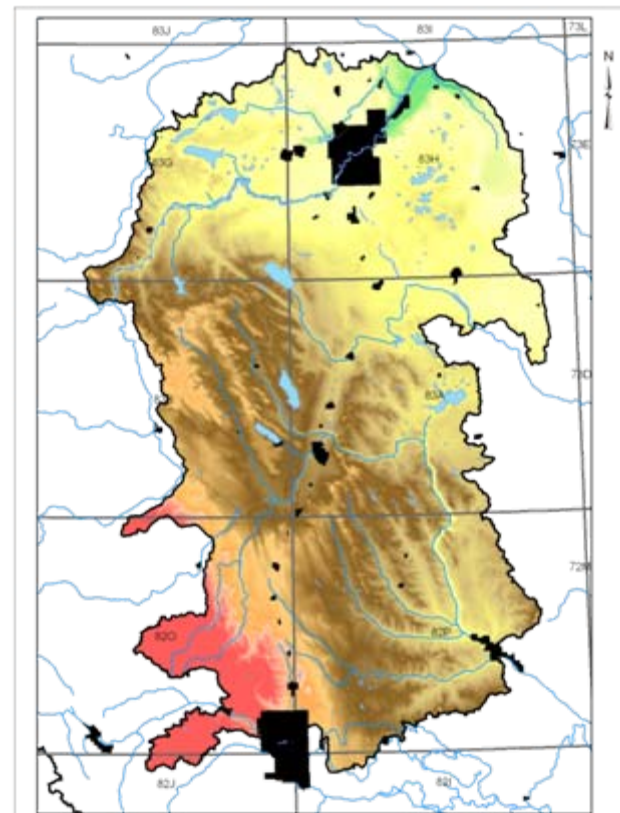
Improving Groundwater Knowledge Provincial Groundwater Inventory Program

- Initiated in 2007, launched 2008 starting with Edmonton-Calgary Corridor pilot project
- AENV-AGS Partnership
- Goals
 - improved knowledge
 - tools for management
 - improved methodologies to assess + incorporate different data sets
- Long term vision of 15+ years

Improving Groundwater Knowledge Edmonton – Calgary Corridor



ECC Boundary and Topography



Source: Alberta Geological Survey

Improving Groundwater Knowledge Edmonton – Calgary Corridor

- April 2008 to March 2011
- Why ECC first?
 - Highly populated, significant development
 - High groundwater use, water well density
 - Cumulative pressures from various activities
 - Data rich area, testing of new techniques
- Airborne Geophysics
 - One component of ECC project
 - Correlated against existing data points

Improving Groundwater Knowledge Future Steps with PGIP

- Evaluate ECC project, develop long-term plan for continuing with program
- Develop policy instruments
 - More flexible system, risk based approach
- Improve future use of data
 - Guide research and knowledge to benefit of Albertans (eg. UofC collaboration, AWRI)

Improving Groundwater Knowledge

AGS Presentations at GeoCanada 2010

- [An Overview of Fresh Water Resources in the Edmonton-Calgary Corridor](#) - Joseph Riddell
- [Thematic Mapping of Non-Saline Groundwater Quality in the Major Bedrock Aquifers of the Edmonton-Calgary Corridor](#) - G.F. Huff
- [Insights into the Internal Architecture of the Paskapoo Formation](#) - Steve Lyster, Laurence Andriashek
- [Understanding the Regional Hydrodynamics in the Normal and Sub-Hydrostatic Regimes of the Canadian Rockies Foreland Basin](#) - Abhijit Mukherjee, Steven Lyster, Sheila Stewart, Benjamin Rostron
- [Geostatistical Determination of Sand-Body Geometry in the Paskapoo Formation](#) - Steve Lyster, Laurence Andriashek
- [Bedrock Topography and Sediment Thickness Mapping in the Edmonton – Calgary Corridor, Central Alberta: an Overview of Protocols and Methodologies](#) - S. Slattery
- [Hydraulic Pathways between and within the Scollard and Paskapoo Formations in Alberta: Implications for Pressure Distributions atop the Underpressured Envelope of Central Alberta and](#) - Laurence Andriashek, Kevin Parks
- [Bedrock Topography and Sediment Thickness Mapping in the Edmonton – Calgary Corridor, Central Alberta: an Overview of Protocols and Methodologies](#) - S. Slattery

Improving Groundwater Knowledge Researching Future Policy Issues

- Emerging Issues
 - Shale Gas
 - A “new” natural resource with large development potential
 - Carbon capture and storage (CCS)
 - GOA policy, technical and regulatory teams
- Aquifer Classification System
 - Management tool for making groundwater management use and protection decisions
 - “Sustainability”, “quality” (TDS + other parameters) and “vulnerability” classification

Groundwater Management Policies and Tools

Groundwater Management Policies and Tools

Oil and Gas

- Coal bed methane issues
 - Non-saline water production, Baseline Water Well Testing Standard
- Oilfield Injection Policy
 - Commitment to review policy
 - Achieving good conservation outcomes

Groundwater Management Policies and Tools

Water (Ministerial) Regulations

- Amend WMR with 2012 target
- Water well construction
 - Domestic, licenced, geothermal
- Groundwater Evaluation Guideline
- CBM non-saline water production
- Multiple aquifer completion project outcomes

Groundwater Management Policies and Tools

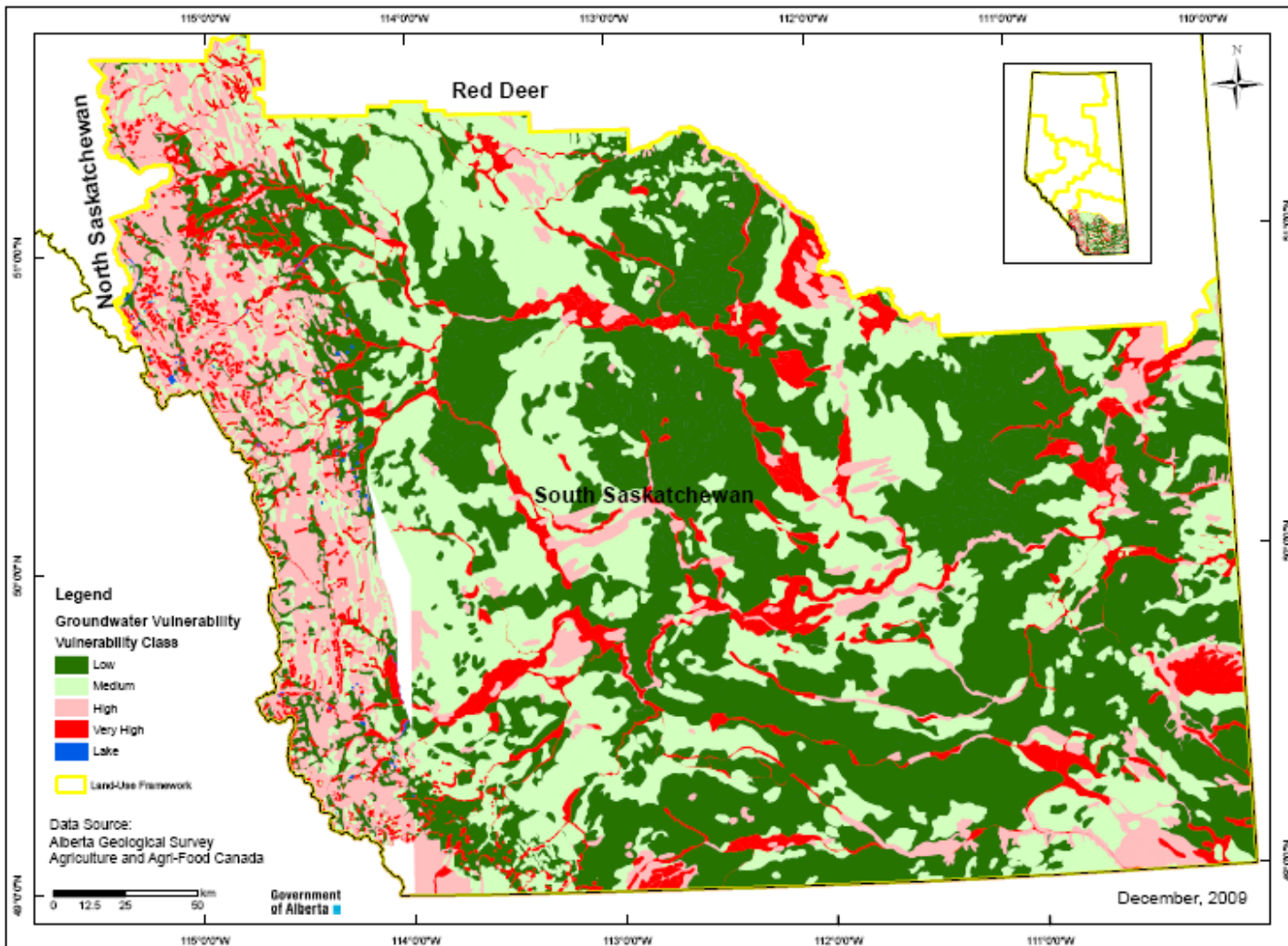
Policy Support to Regional Plans (Land-use Framework)

- Support development of regional cumulative effects management capacity
- Develop “Groundwater Management Units” as a watershed management option.
- Provide screening tool to assess regional risk of contamination to shallow groundwater
 - Groundwater Vulnerability Mapping
 - One of many GIS risk “layers”

Support to Regional Plans (Land-use Framework) Groundwater Vulnerability Mapping

- Provide a regional description of the potential relative risk of shallow groundwater contamination from surface activity
- Regional scale \Rightarrow can only be used as a screening tool to identify areas where more focused study, mapping or investigation may be warranted
- **NOT for making local land use decisions!**

Groundwater Vulnerability: South Saskatchewan Region



Improving Stewardship

Improving Stewardship Working Well

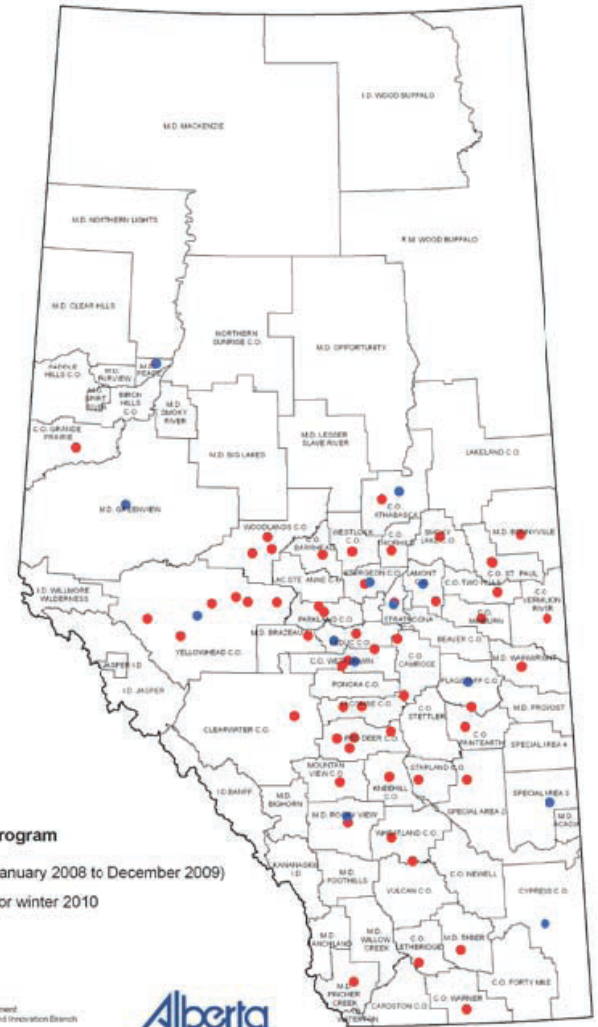
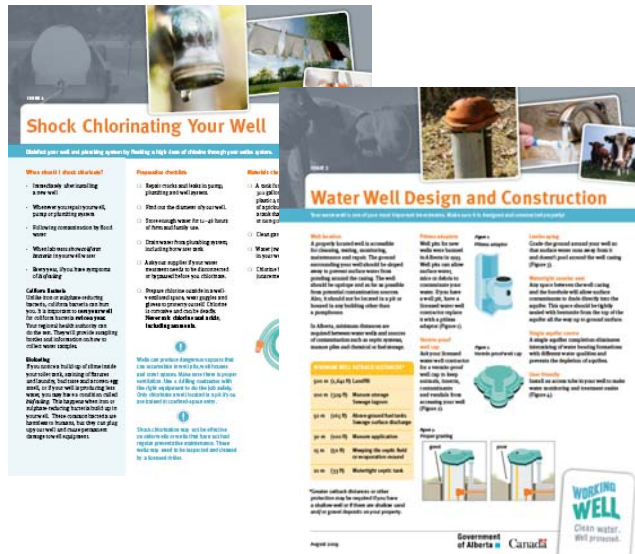
- Community based, hands-on workshops for well owners
- Learn basics of groundwater, well construction, common well problems and best management practices
- Partnership
 - Alberta Environment
 - Alberta Agriculture and Rural Development
 - Agriculture and Agri-Food Canada
 - Alberta Health Services
 - Alberta Water Well Drilling Association
 - Leduc, Brazeau & Yellowhead counties

**WORKING
WELL**

Clean water.
Well protected.

Improving Stewardship Working Well

- 57 workshops since 2008
- 41 municipalities
- Over 1600 participants



Improving Stewardship Working Well

www.environment.alberta.ca/3081.html

www.insideeducation.ca/hidden/water.html

Improving Stewardship Groundwater Observation Well Network

- GOWN
- started in 1956 with wells in Drayton Valley, Leduc and Milk River
- currently over 250 active wells across the province
- measurement of groundwater levels over time
- groundwater quality sampling

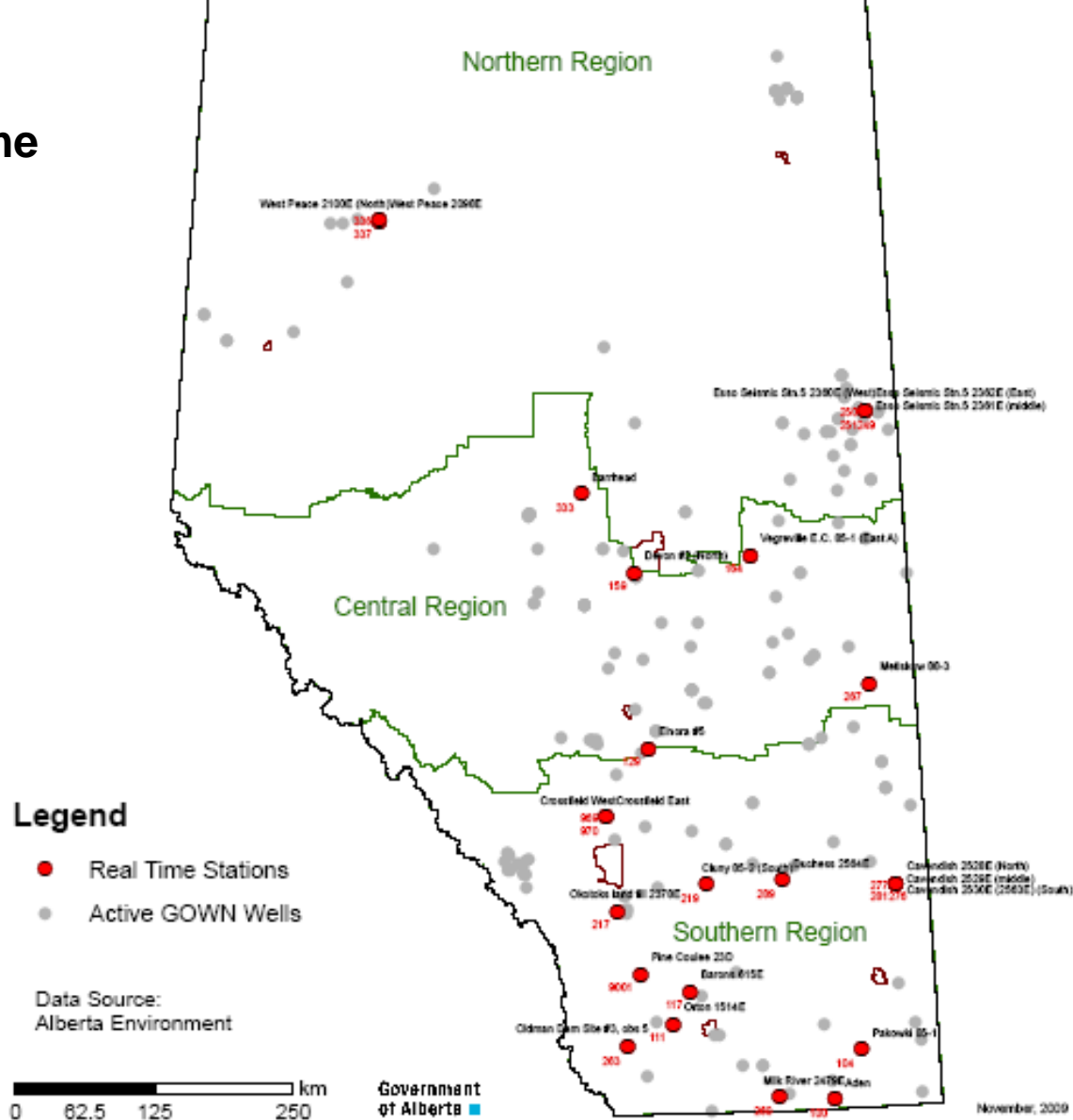
Milk River West GOWN Well



Groundwater Levels

- ~ 200 of the GOWN wells monitoring water levels
- all equipped with special data-logger equipment
- hydrographs available on AENV website
- 19 sites with near real time telemetry

GOWN - Near Real Time



Groundwater Hydrographs

search for “GOWN” on
www.environment.alberta.ca

Groundwater Quality Sampling

- about 165 of the GOWN wells sampled
- 30-40 wells sampled every year, 5 year rotation
- sampled for dissolved constituents and gas
- focus on shallow wells in 2010-11
- results on renewed State of the Environment website

Improving Stewardship State of the Environment Reporting

- current State of the Environment website being updated
- includes air, land, water and biodiversity indicators
- groundwater indicators include:
 - nitrate in groundwater
 - methane gas in groundwater
 - water well density
- groundwater quality indicators based on GOWN data

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State of the Environment

State of the Environment reporting is one way to track environmental quality outcomes and the performance of environmental management strategies.

Various indicators are monitored, evaluated and reported over time, which helps us track and understand environmental trends and make adjustments.

Four types of indicators help us monitor and manage the cumulative effects of development on the environment:

- **Condition indicators** measure environmental quality at any given time; for example, the level of a substance in our air or water.
- **Pressure indicators** measure activities that affect or impact the environment, such as air emissions or wastewater effluent.
- **Response indicators** measures behavioral changes that help reduce pressures on the environment as a result of management actions, such as measuring the percentage of waste diverted from landfills through a recycling program.
- **Performance Indicators** measure the success of management actions the government takes to improve the environment. These actions produce the desired changes in targeted condition, pressure or response indicators.



Questions ?

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