

Hydrology Modelling and Decision-Support Tool for Northeast British Columbia

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On January 11, 2012, the British Columbia Oil and Gas Commission (BCOGC) hosted a workshop and discussion session in Vancouver, BC to present the Hydrology Modelling and Decision-Support Tool they have developed to assist with future water decisions in northeast BC. The session was led by Allan Chapman (BCOGC) and Ben Kerr (Foundry Spatial). Participants included representatives from the Ministry of Environment, Ministry of Forest Lands and Natural Resource Operations, Canadian Association of Petroleum Producers, Ministry of Energy and Mines, as well as from Geoscience BC, Environment Canada, the University of British Columbia, the University of Victoria, and FORREX.

The issue at hand is the large volumes of water required for unconventional natural gas extraction (i.e., hydrologic fracturing) and lack of hydro-meteorological data to guide water licence-issuing decisions. Sources of water for gas extraction are derived from surface flows (freshwater), confined or unconfined shallow aquifers (<600m), and deep aquifers (>600m) disconnected from the surface, which are usually saline.

The hydrological model focuses solely on the surface water source (small and large rivers and lakes) to provide the best representation of the surface hydrology in northeast BC. Information about the water availability (flows) is generated on monthly, seasonal, and annual scales – all of which are required to issue and regulate short-term water licence approvals (<1 year) and long-term water licences. The model will assist in management decisions and determine thresholds where winter flows are not sufficient to support withdrawals and water under the Water Act 1996 for water allocation and will address environmental and instream flow needs.

The hydrologic model is based on a simple water balance continuity equation and is derived from gridded temperature, precipitation, evapotranspiration, and land cover data. The model is calibrated to about 50 Water Survey of Canada gauges located in northeast BC and adjacent areas in Alberta and the Northwest Territories. The final product will consist of a GIS-based “Decision-Support Tool” to inform short-term water licences or approvals and is expected to be available in Fall 2012.

For more information see “Hydrological Modelling and Decision-Support Tool Development for Water Allocation, Northeastern British Columbia (Chapman, Kerr, & Wilford 2012) at http://www.geosciencebc.com/i/pdf/SummaryofActivities2011/SoA2011_Chapman.pdf.

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Reference

Chapman, A., Kerr, B., & Wilford, D. 2012. Hydrological modelling and decision-support tool development for water allocation, northeastern British Columbia; In Geoscience BC Summary of Activities 2011, Geoscience BC, Report 2012-1:81–86. http://www.geosciencebc.com/i/pdf/SummaryofActivities2011/SoA2011_Chapman.pdf (Accessed March 2012).

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