Are buried valley aquifers super highways for groundwater in Northeast British Columbia?

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Introduction

- Northeast British Columbia (NEBC) has seen a large increase in shale gas development during the last 15 years, and the associated hydraulic fracturing requires large volumes of water.
- Currently, most of this water is sourced from surface water, but increased development may increase the demand for groundwater as well. Groundwater resources in NEBC are of critical importance not only to industry, but also to First Nations, local communities, and agriculture.
- Buried valley aquifers found in the Peace River region of NEBC are one viable option for sourcing groundwater.

Study Area

- In the Peace River region, the approximate extent of a large network of buried valleys has been delineated through bedrock mapping, mapped surficial geology, and oil and gas and water well borehole logs.
- A 3D geological model of the buried valley network was constructed using Petrel. The main datasets used were borehole gamma logs and electrical resistivity data from a SkyTEM airborne electromagnetic study conducted over the area.

What are buried valley aquifers?

- Buried valleys are channel-form depressions that have been infilled by sediment and buried following their formation (Cummings et al., 2012).
- Permeable material within can form thick units that have the potential to store and transmit significant amounts of water, thus representing attractive targets for groundwater (Oldenborger et al., 2013).

Future Work

- Based on the developed geological model, a numerical groundwater flow model will be constructed for the study area to assess the impact of buried valley aquifers on regional groundwater flow.
- Results of this study will be used to assess whether or not the buried valley aquifers are a viable water resource for the Peace River region, and provide insight to future investigations of regional groundwater systems containing buried valleys.

References


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