

## Updating the Tectonic Stress Map of Alberta: The Road Ahead

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### Summary

Knowledge of in situ stress states has practical implications with regards to the stability and safety of underground workings and boreholes, and the capacity to carry out hydraulic stimulations for water or hydrocarbon recovery. With the rapid rise of enhanced recovery from low permeability 'tight' sands and shale by hydraulic fracturing methods, the interest in understanding and detecting stress states has grown rapidly in recent years (e.g., Schmitt et al., 2012). We will present the current understanding of the state of in-situ stress in the Western Canada Sedimentary Basin (WCSB) with focus on the Alberta area and provides further insight into on-going studies (Stress Map 2.0 project) that aim at rebuilding the regional stress map of Alberta. These studies have been underway for the last few years as part of the Helmholtz-Alberta Initiative in collaboration between the World Stress Map, the Alberta Geological Survey, and the University of Alberta. Contributions from representatives of industry, researchers and regulators are currently being used to build up a protocol that will help set up a comprehensive appreciation of stress magnitudes in the WCSB. An on-going study that is attempting to set up a coherent regional picture of stress orientation and magnitudes in the Duvernay Formation will be presented to illustrate some of the key issues to overcome; data that are being used include information from hydraulic fractures, image logging and core samples.

### Reference

Schmitt, D. R., Currie, C. A. and Zhang, L., 2012. Crustal stress determination from boreholes and rock cores: Fundamental principles, *Tectonophysics* 580, 1-26.