

## Status Report on the Updated In Situ Stress Chapter of the 2027 Geological Atlas of the Western Canada Sedimentary Basin

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With a target release in 2027 the Canadian Energy Geoscientists Association (CEGA), previously the Canadian Society of Petroleum Geologists (CSPG), is planning an updated Geological Atlas of the Western Canada Sedimentary Basin (WCSB). Over 160 contributors will prepare more than 60 chapters, many of which will be new additions to the 1994 version of this atlas.

A sub-committee for the in situ stress chapter, consisting of representatives from industry, government research and regulatory agencies, and academia, has been formed to undertake the planning, data collection, analysis, mapping and reporting on stress magnitude and orientation data in the WCSB. There will be major new datasets compiled for the 2027 version of this chapter since the atlas now will include large regions in the Yukon Territory and the Northwest Territories. Furthermore, new stress data from Manitoba will be included in this update. Due to expanded oil and gas, geothermal and mining activities in the basin over the last three decades, especially in unconventional resources and oil sands, there is a much more extensive dataset compared to what was available in 1994. In addition, new and improved logging tools and analysis methods now provide a level of detail not previously possible.

Several challenges do exist, however, for our project over the next 3 years, when we are scheduled to deliver our preliminary maps and report. These include: vast regions with sparse or no new data; the proprietary nature of much of the stress magnitude data; and fundamental differences between various analysis methods. Collaboration with industry partners in several parts of the basin will be essential to ensure our project presents a complete and representative story. Ultimately our committee also plans to make a major upgrade to the data on stresses in the WCSB that currently exists in the World Stress Map, a collaborative international effort, housed at the German Research Centre for Geosciences (GFZ), to map stresses around the globe.

In situ stress data are used by the petroleum industry for such applications as: designing drilling programs to prevent wellbore collapse and lost circulation; determining a preferred azimuth to drill horizontal wells to maximize production or injection; designing optimal hydraulic and acid

fracturing treatments; selecting safe operating drawdown pressures to preclude sand production; selecting a maximum injection pressure in a thermal recovery, CCUS or waterflood project that will not fracture the reservoir or caprock; designing efficient field drainage patterns; and more.

Our atlas team looks forward, with a little trepidation, to a busy few years putting together the best compilation and synthesis of the available information for the 2027 Atlas. Do not hesitate to get in touch with one of us should you wish to provide data, assist with the project, or have any suggestions.