

Introduction

The Alberta Energy Regulator / Alberta Geological Survey is continuing work to quantify the hydrocarbon resources in shale and siltstone units. This work includes many formations, members, and units. The initial assessments look at all hydrocarbons initially in place but will eventually include cutoffs to quantify technically recoverable resources.

Recent but as-yet-unreleased assessments include

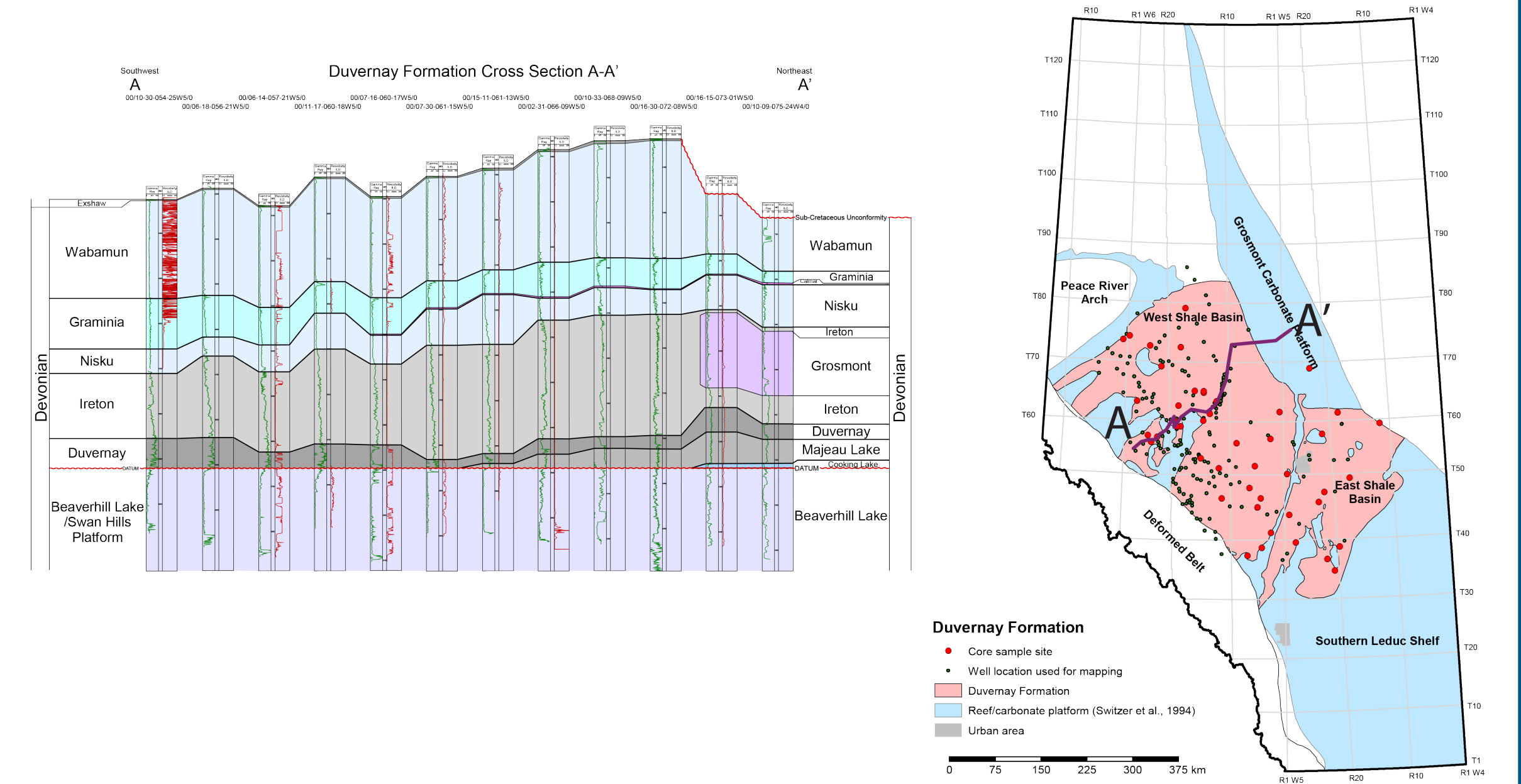
- the middle Colorado shale from the top of the Second White Specks Formation to the base of the Fish Scales Zone and
- the lower Doig siltstone, which is equivalent to the upper Montney Formation in British Columbia.

Assessments of these units take into account uncertainty at every step and produce estimates of gas, oil, and natural gas liquids in place.

Why Consider Uncertainty

To illustrate why uncertainty is important, consider the following:

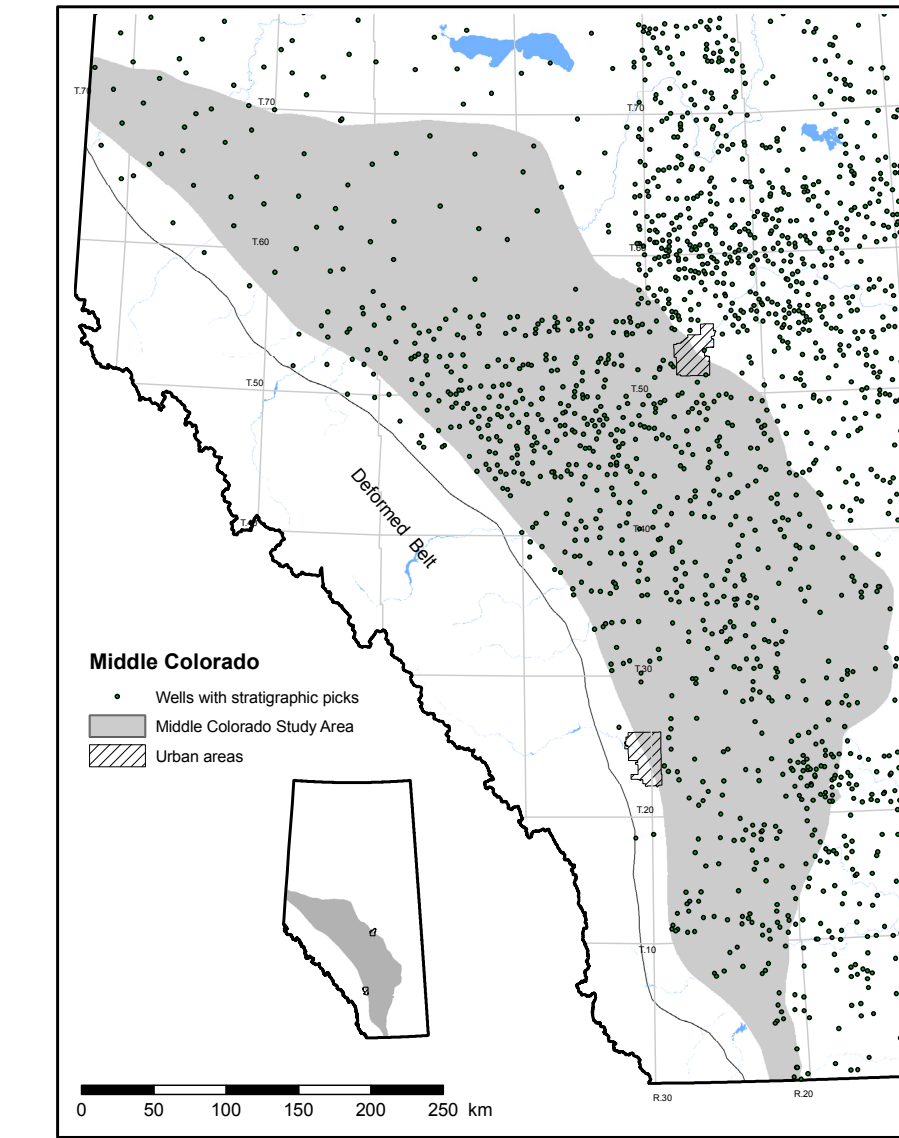
- The prospective area (Ro>0.8%) of the Duvernay Formation is about 60 000 km².
- The average shale thickness (GR> 105 API) in the Duvernay is about 16 m.
- Shale thickness × prospective area of the Duvernay = 960 km³
- The average bulk density of the Duvernay is about 2.55 t/m³.



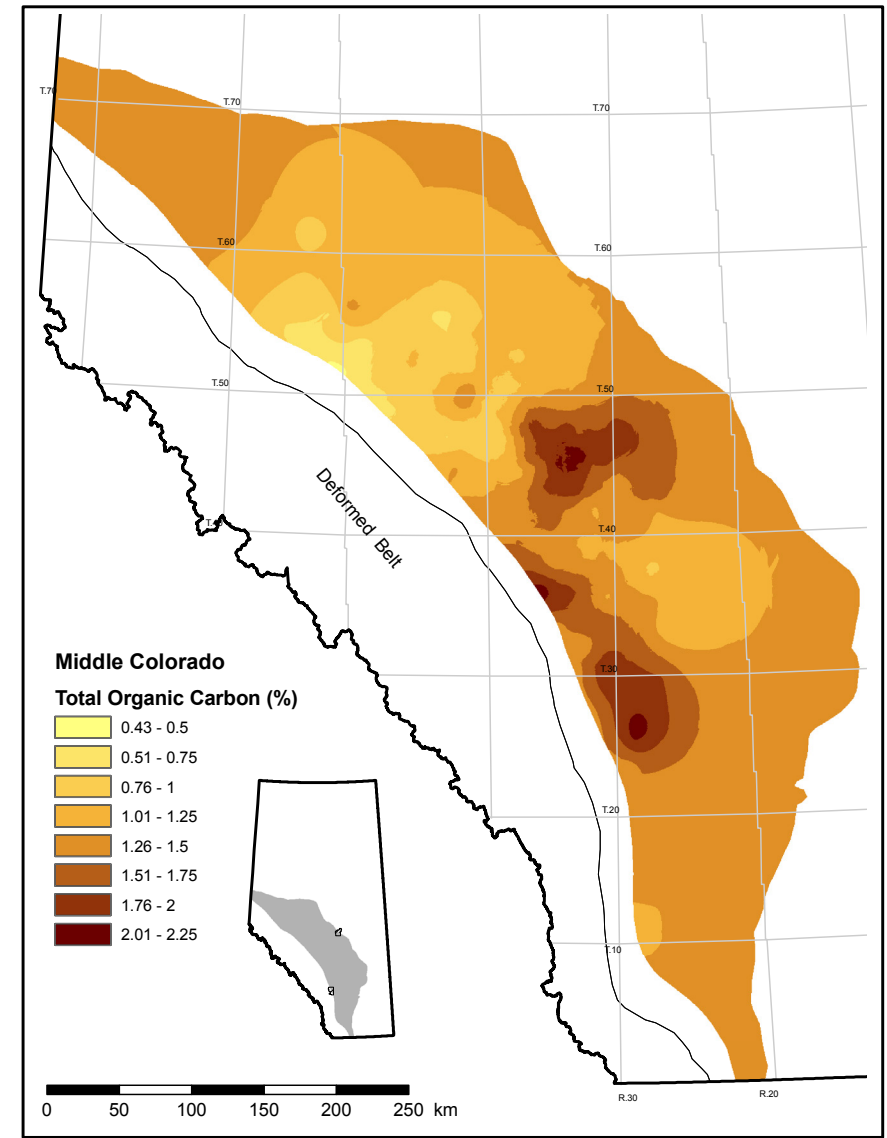
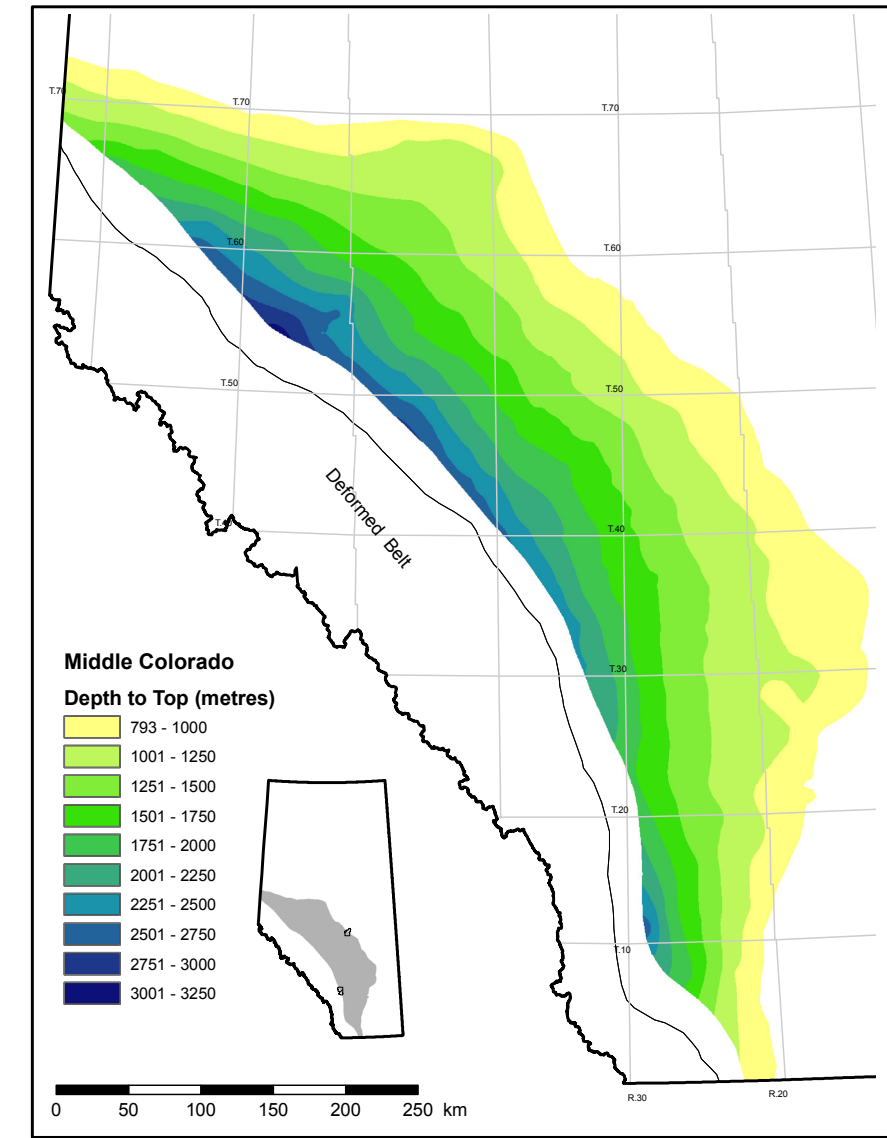
- The mass of shale in the Duvernay is about 2.5×10^9 t. ($960 \text{ km}^3 \times 2.55 \text{ t/m}^3 = 2.5 \text{ Tt}$)
- The AGS shale assessment project team collected about 16 kg of core samples from the Duvernay.
- Therefore, $16 \text{ kg} / 2.5 \text{ Tt} = 0.00000000000064\%$ of the entire Duvernay

Middle Colorado Shale

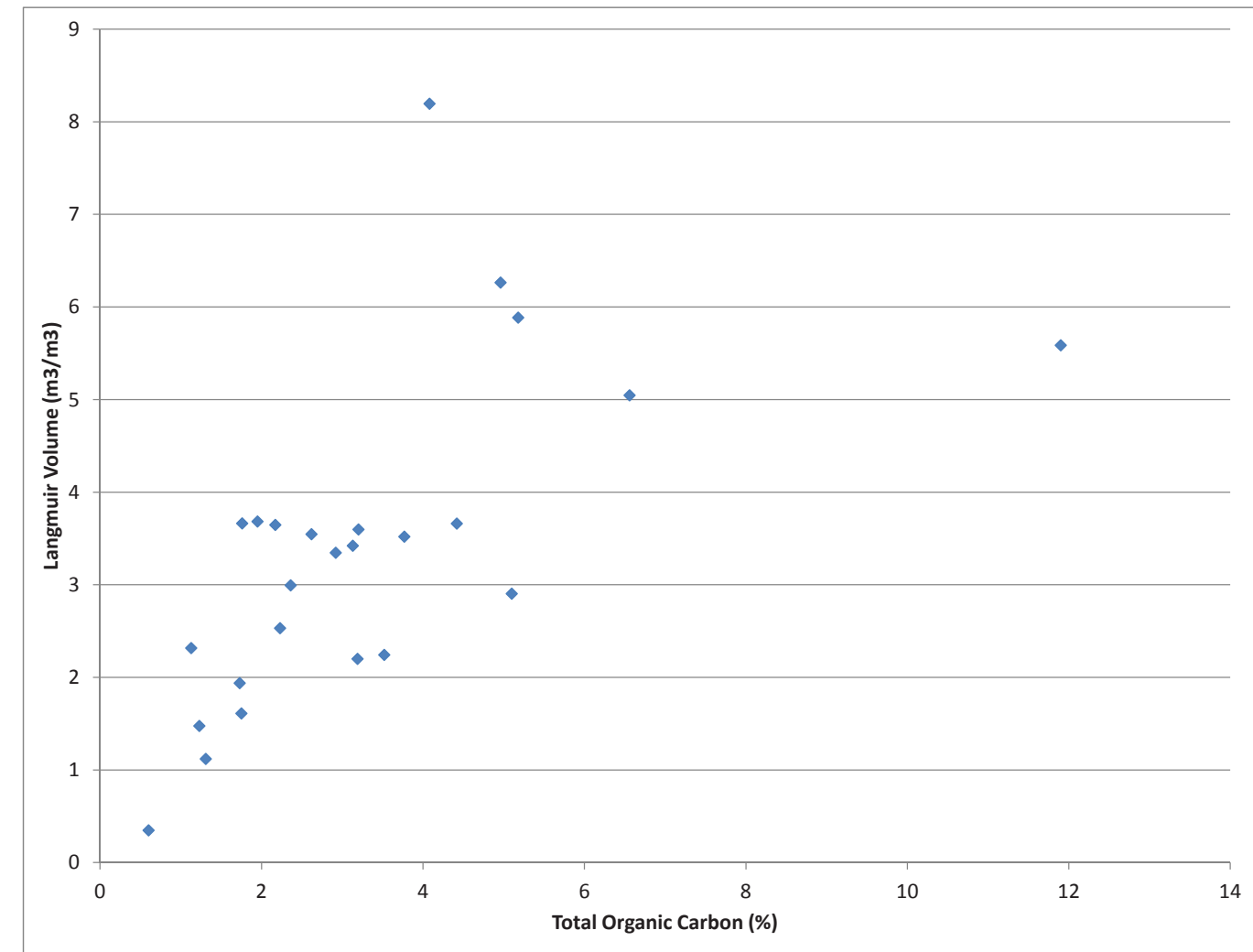
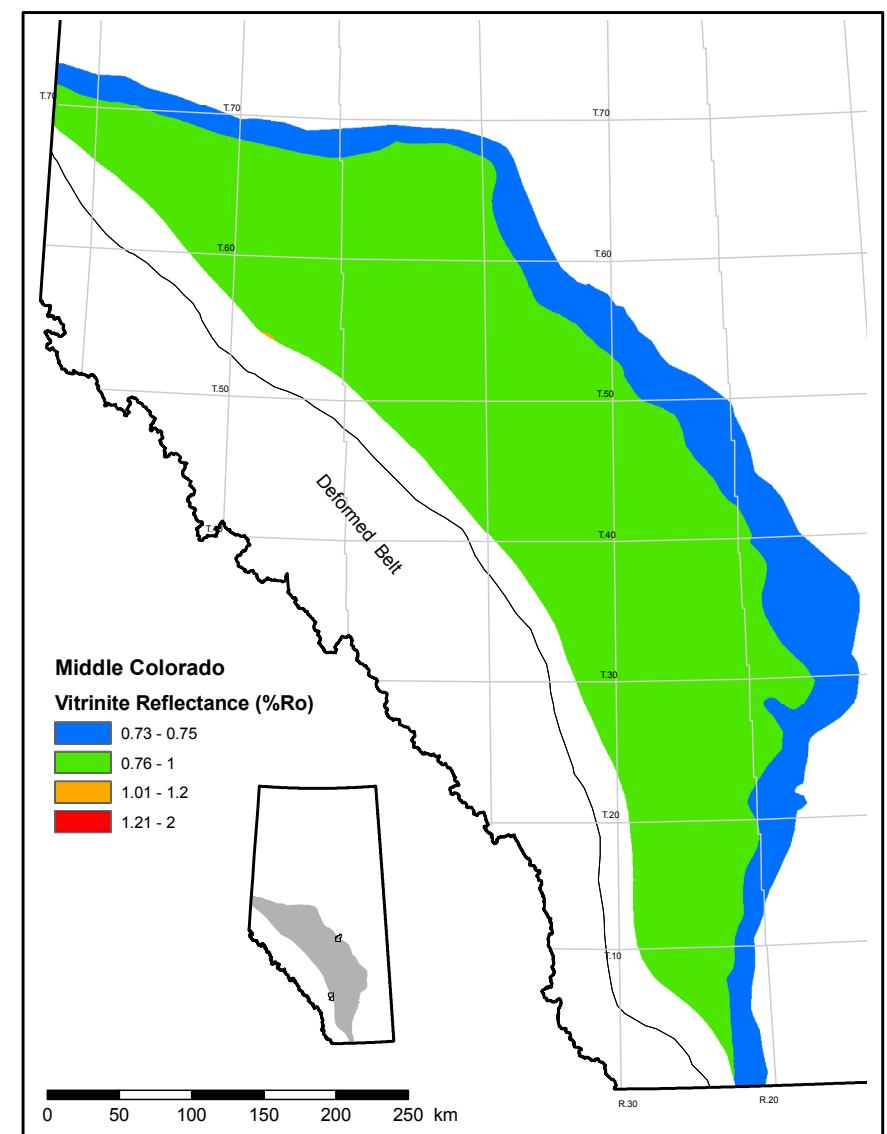
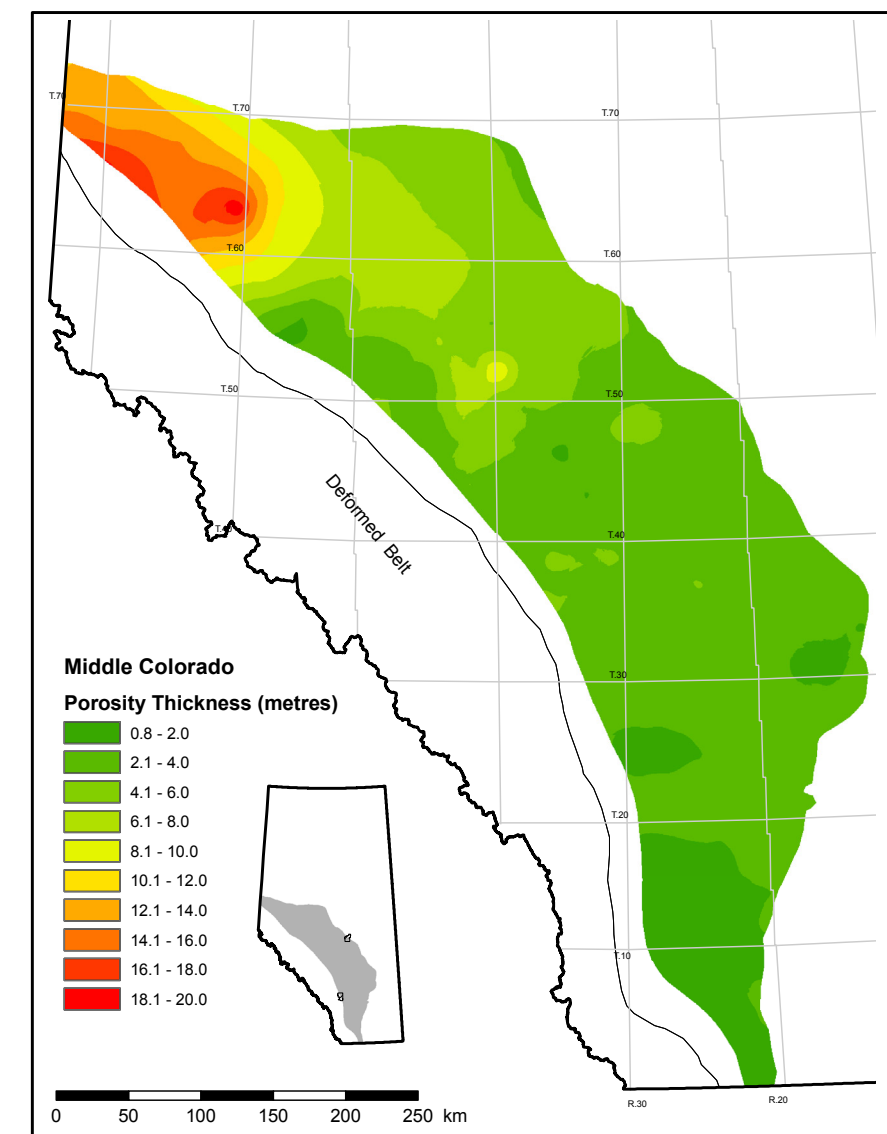
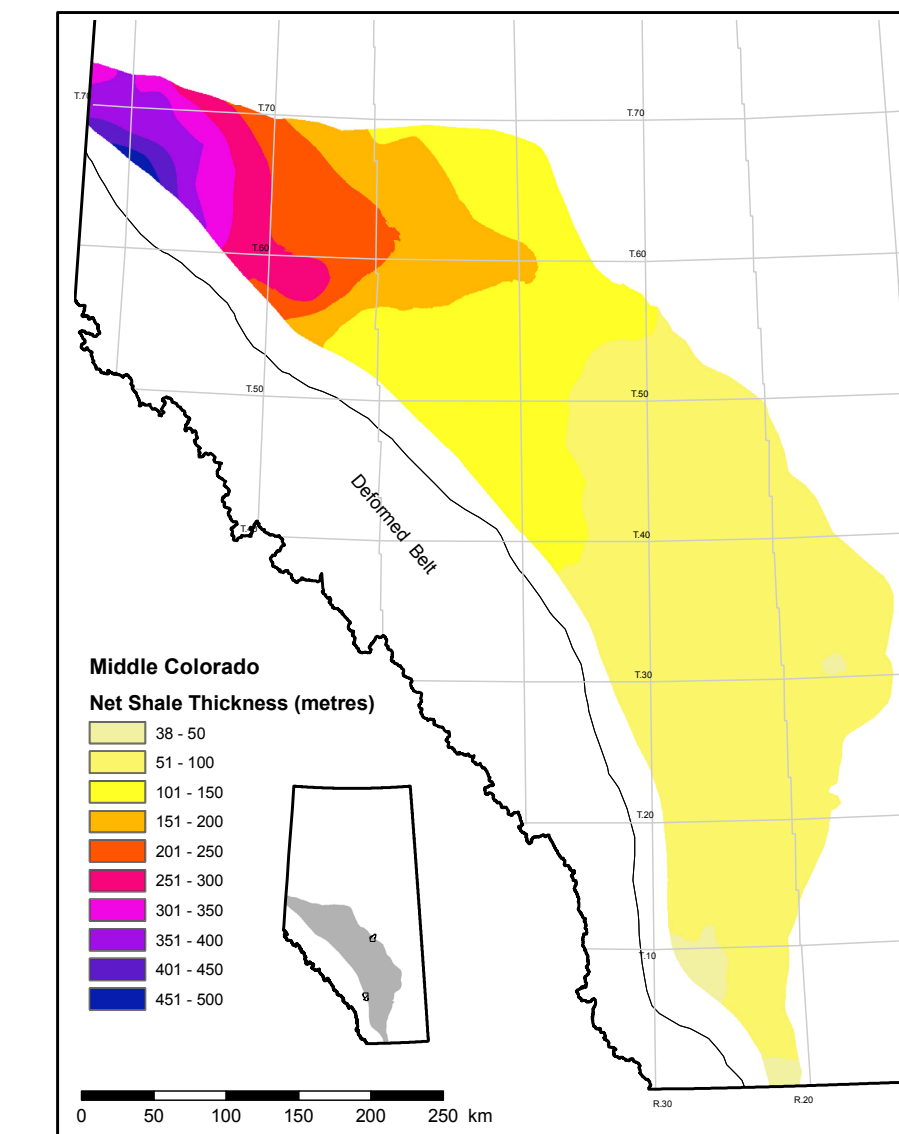
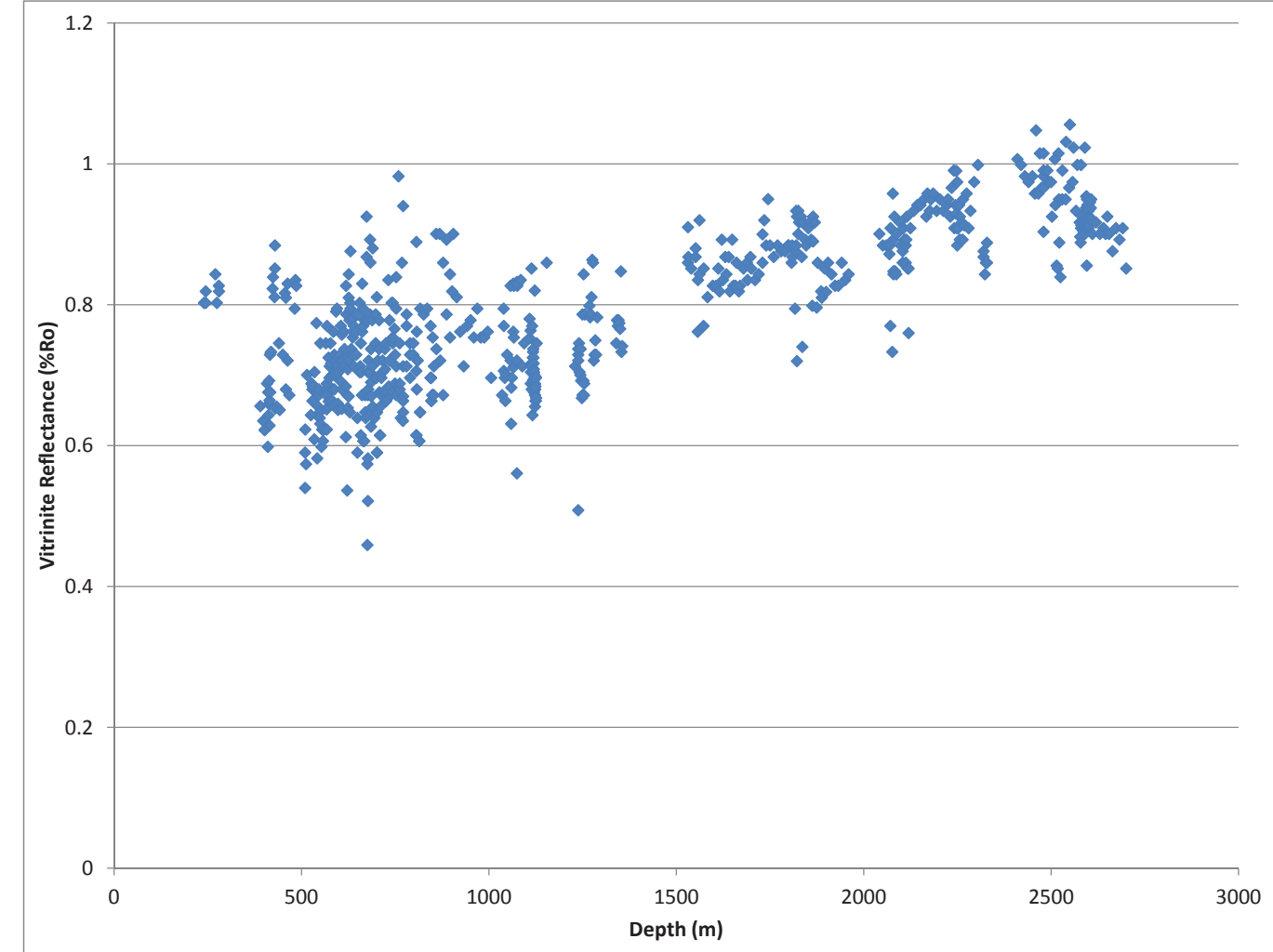
Data Locations



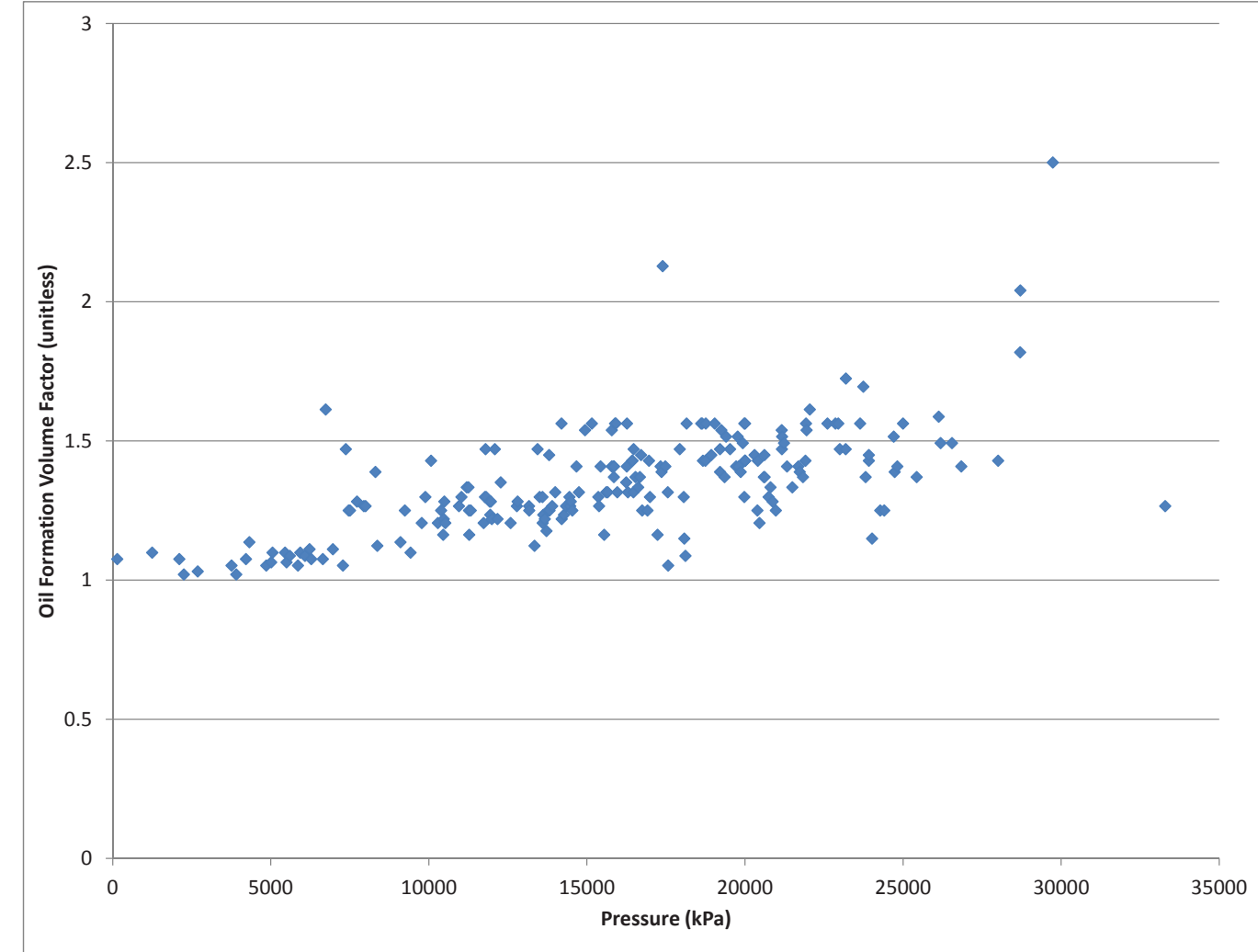
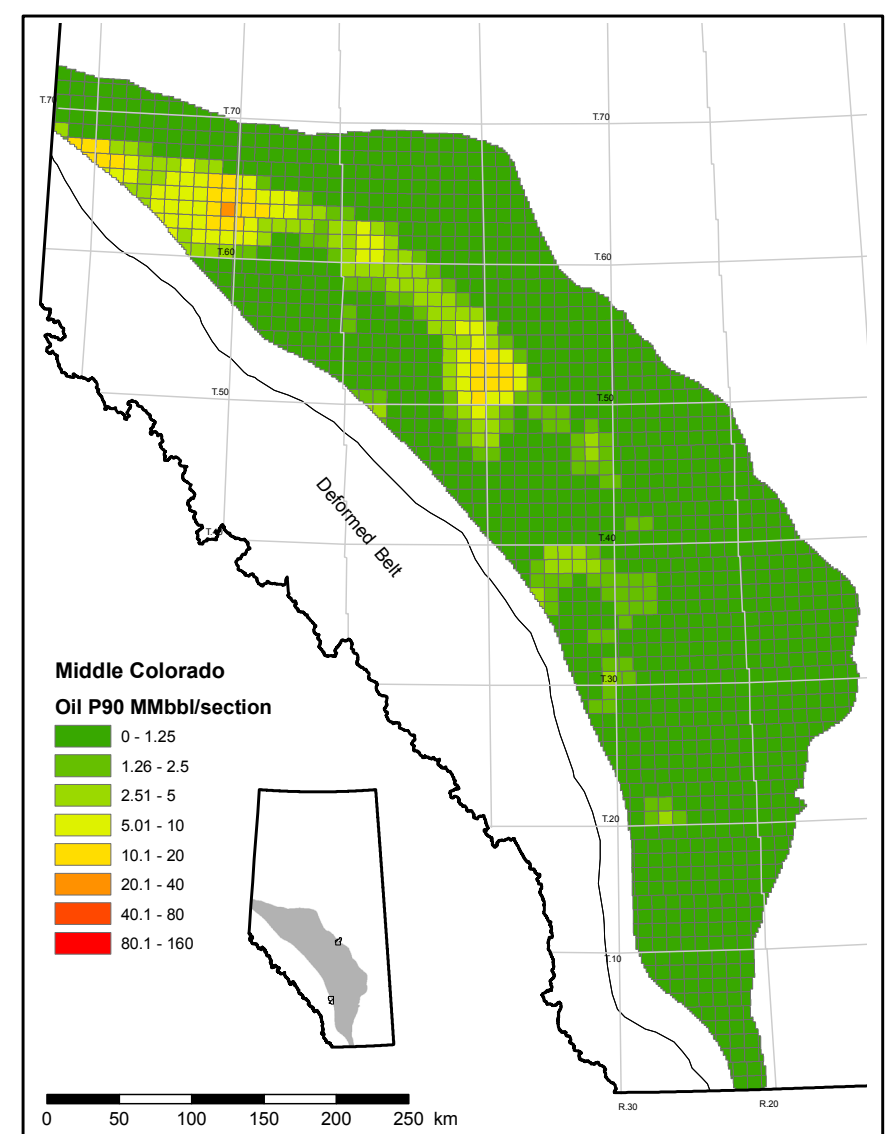
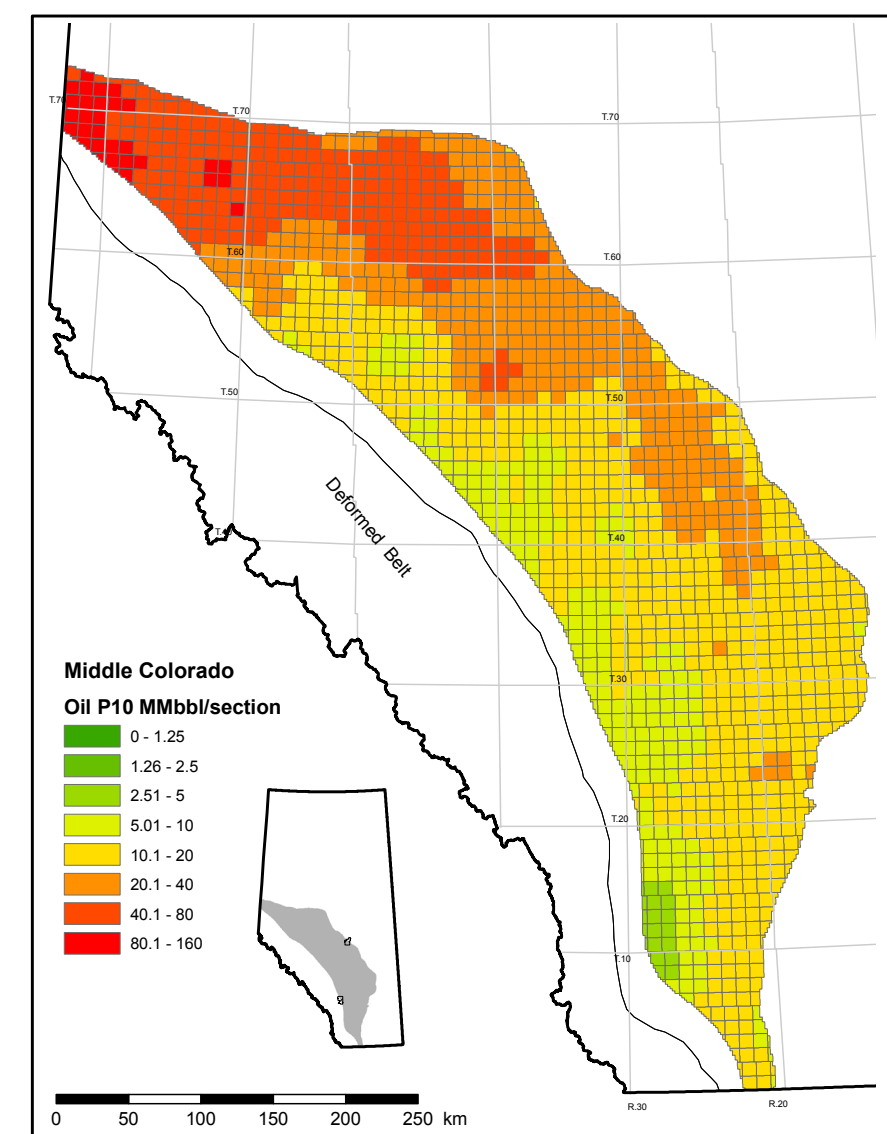
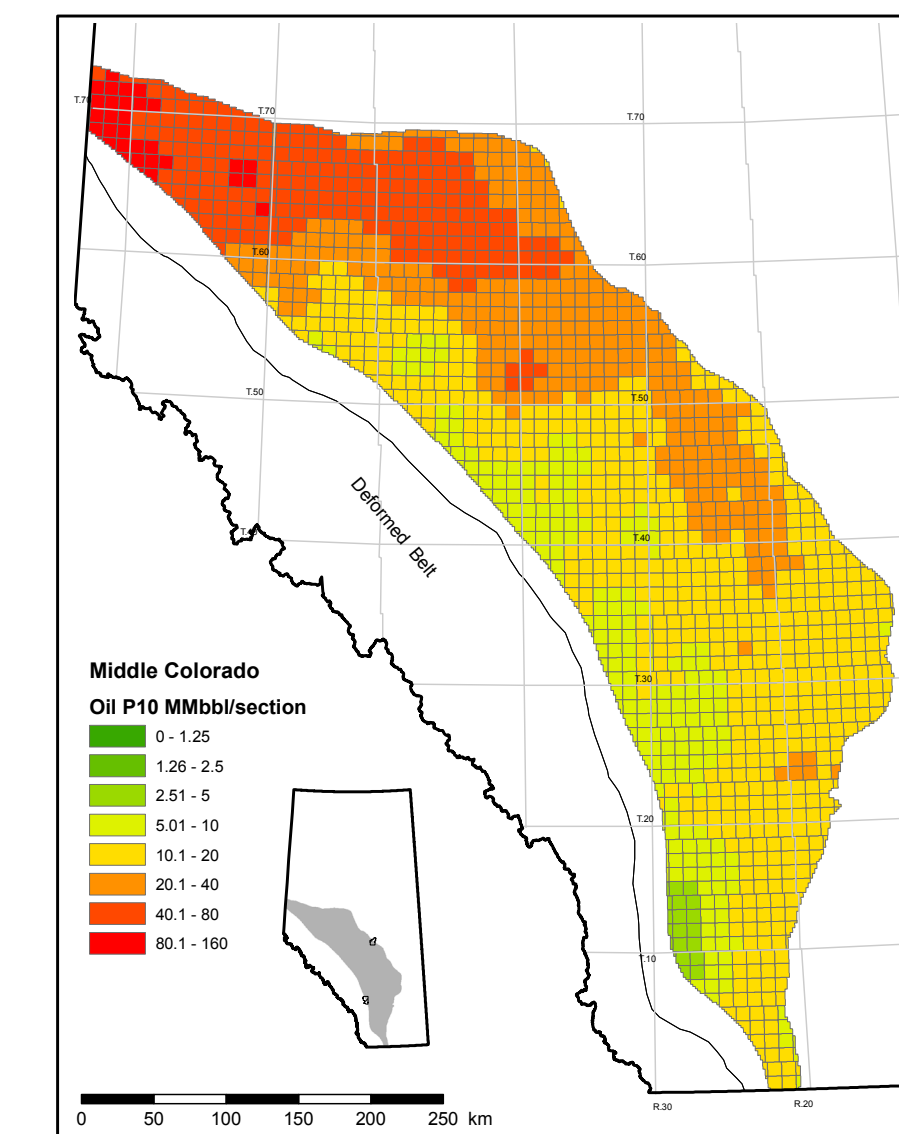
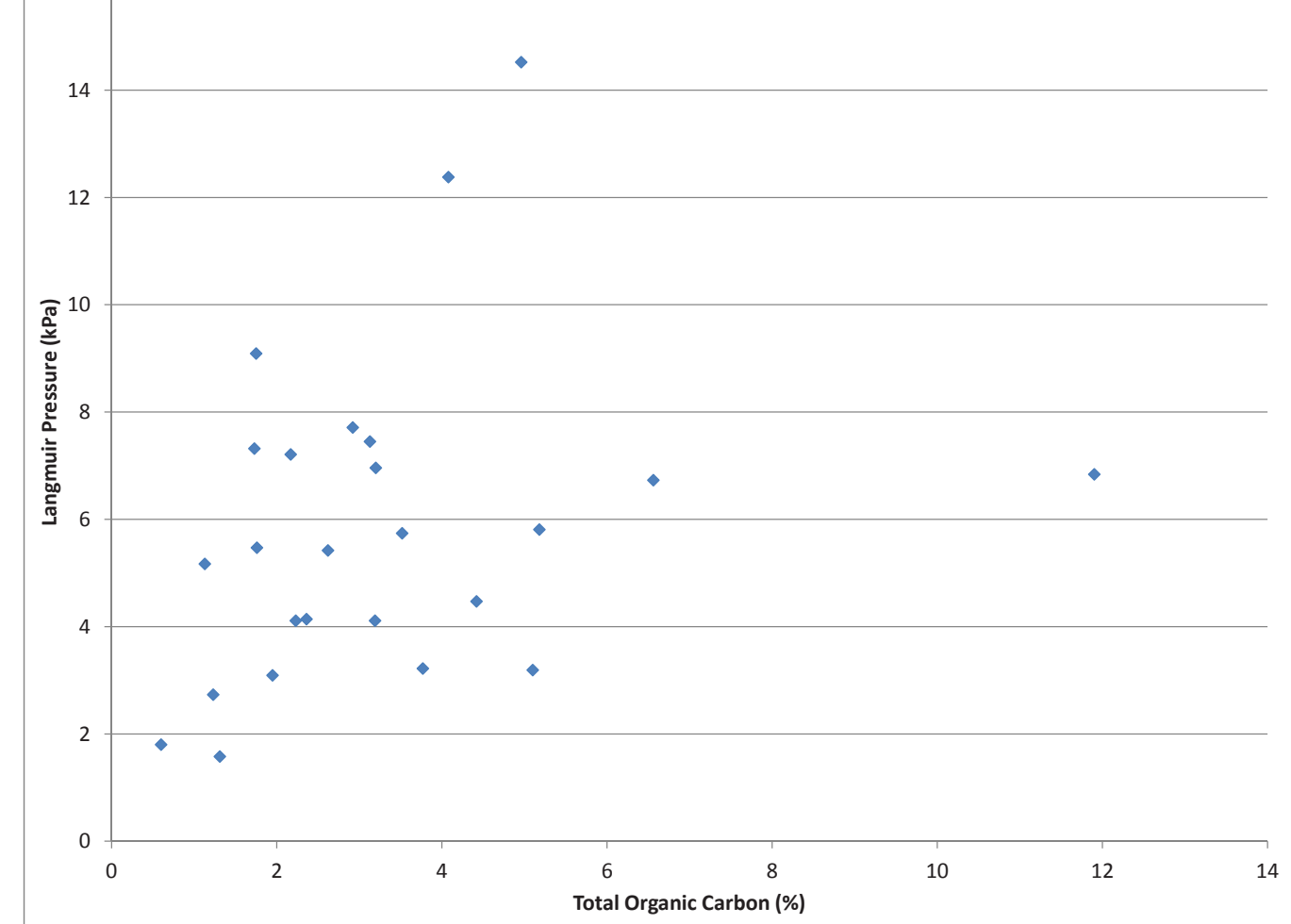
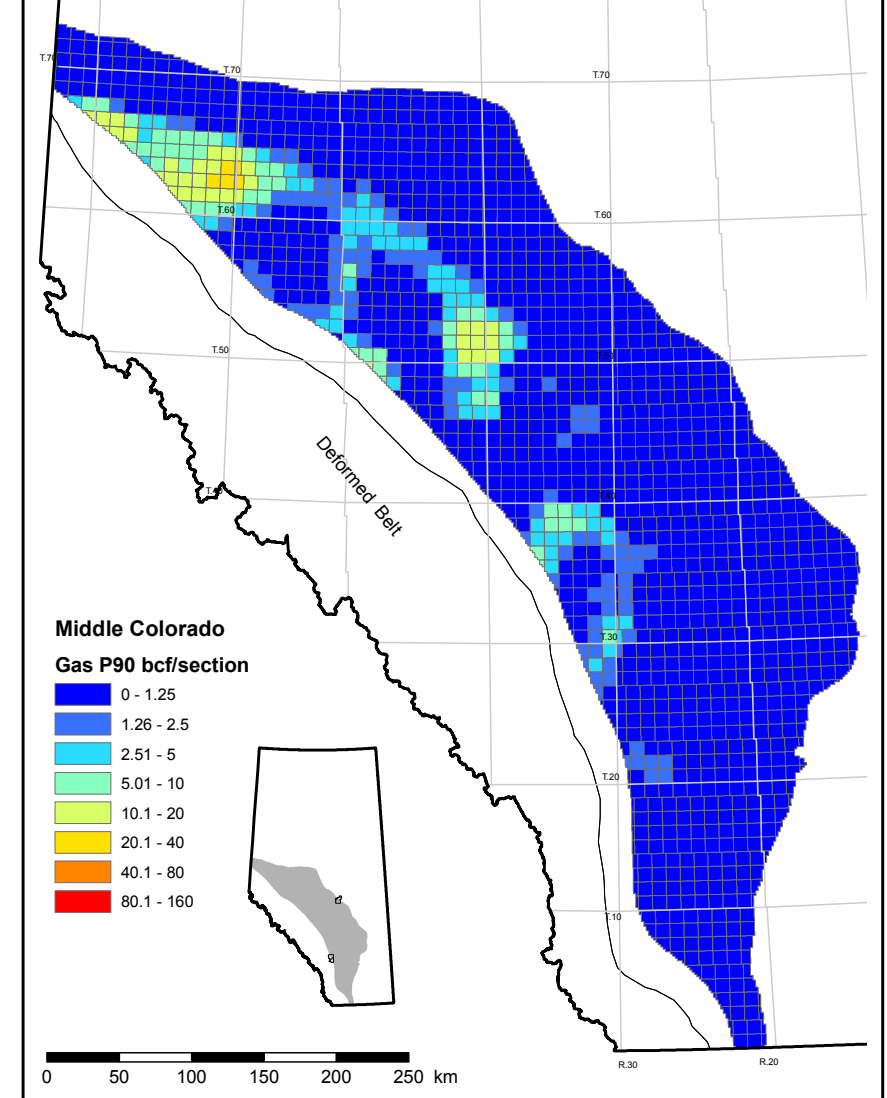
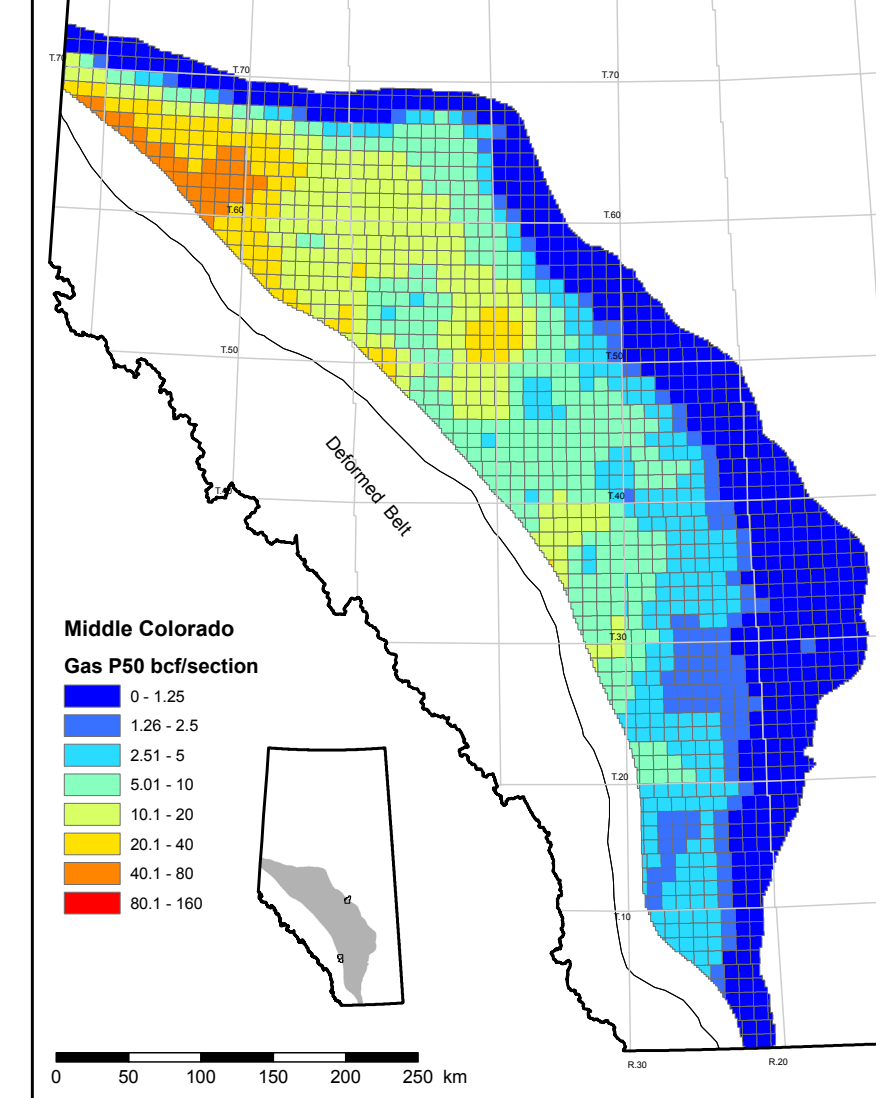
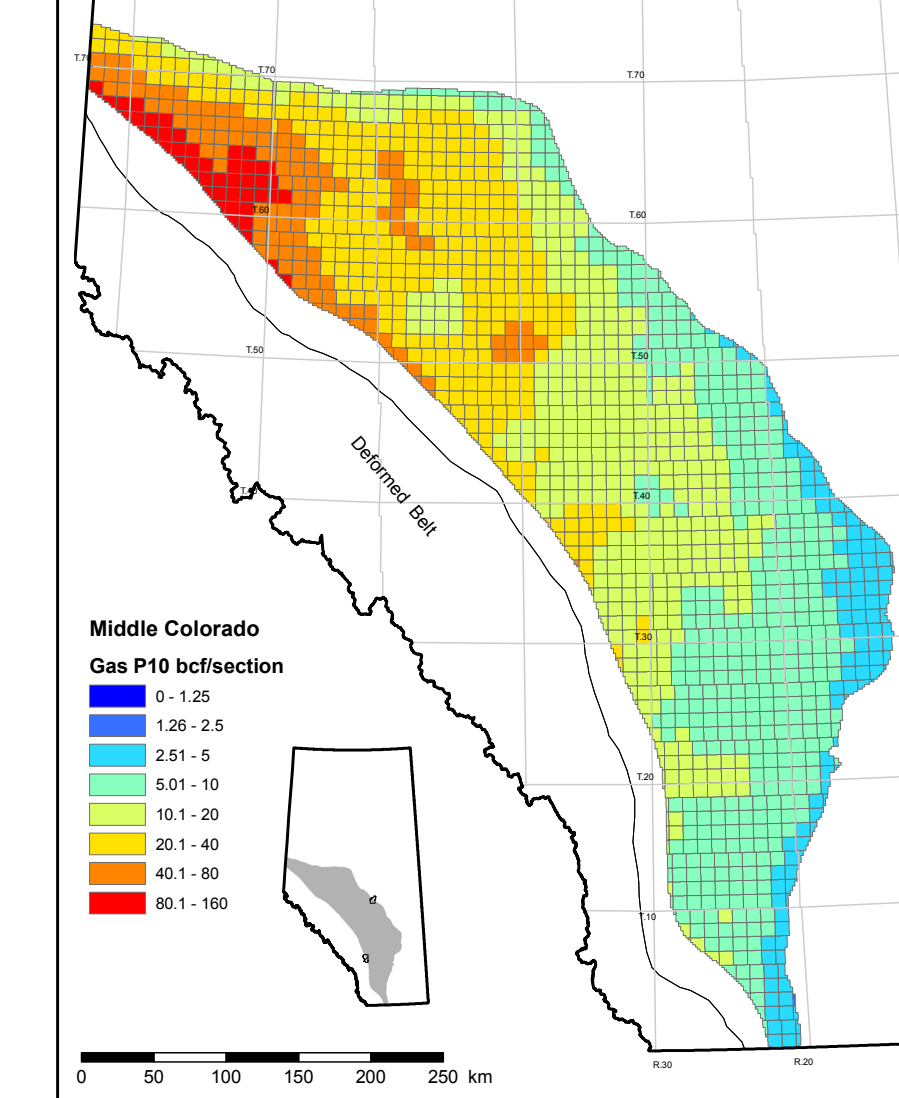
Mapped Variables



Secondary Variables

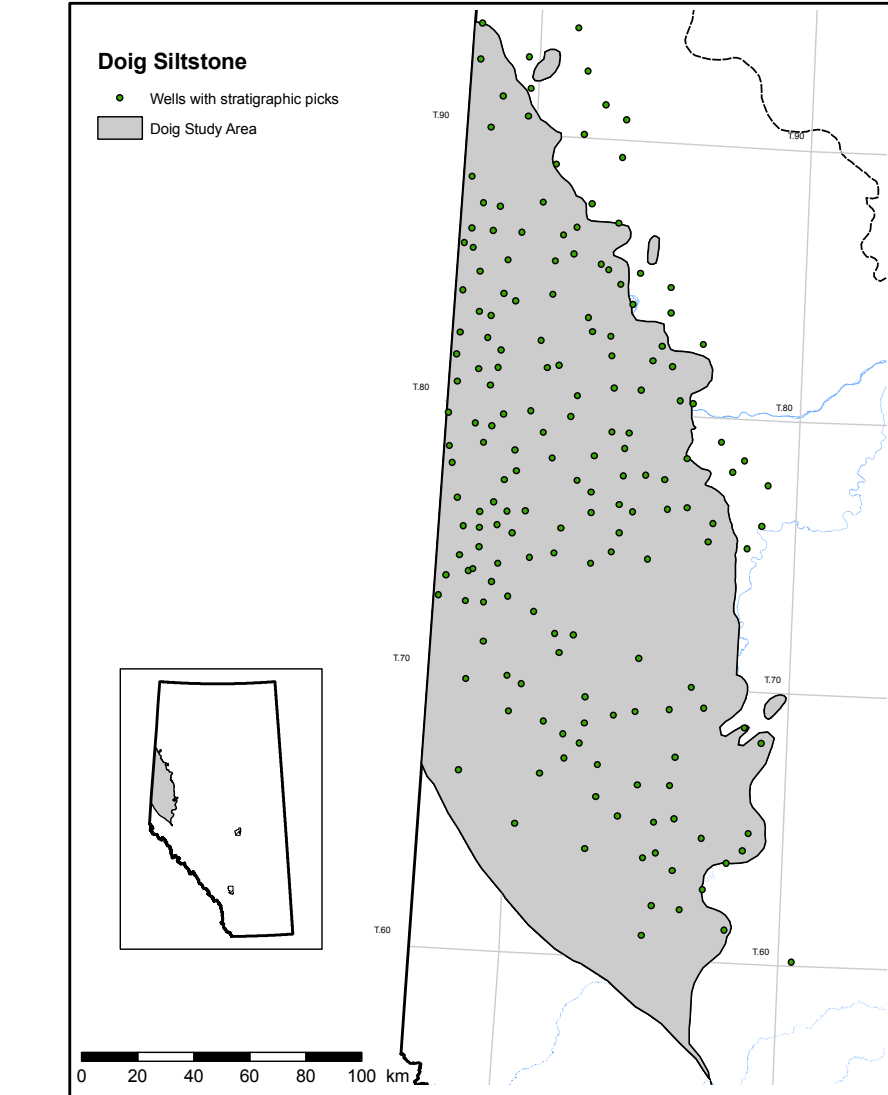


Resource Maps

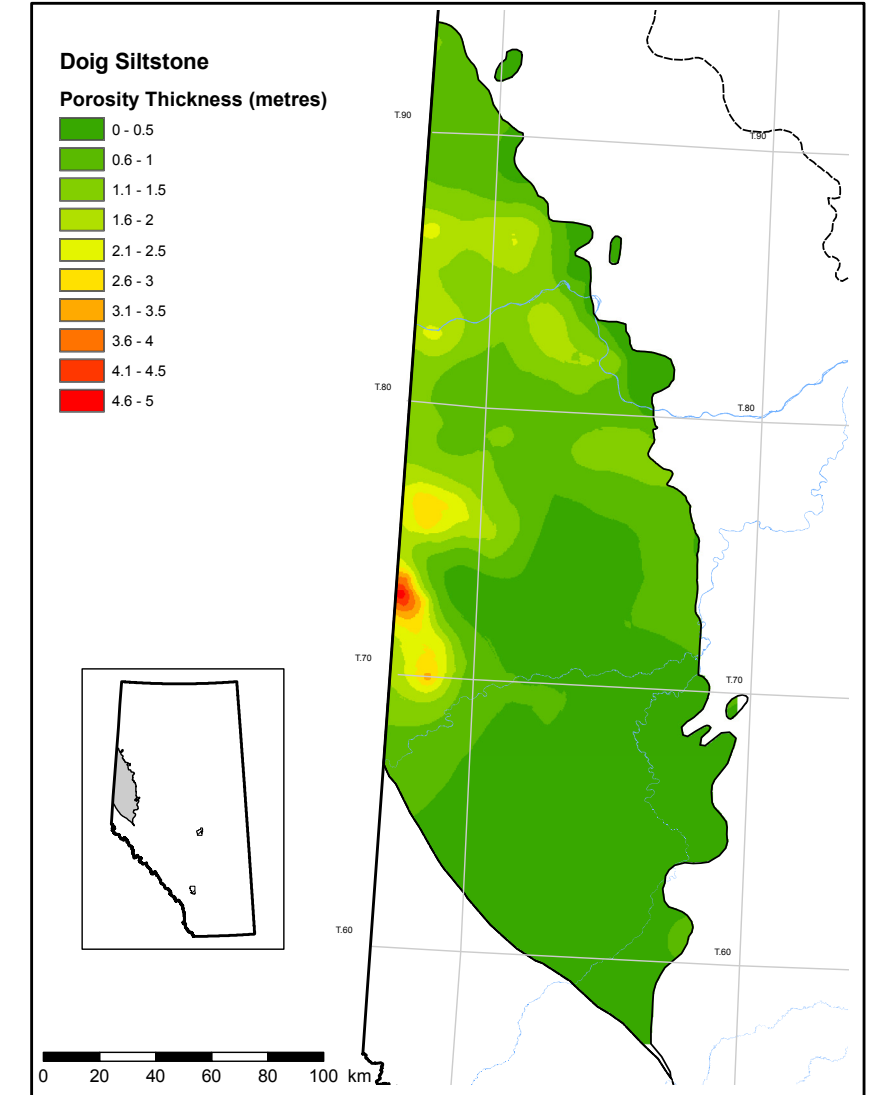
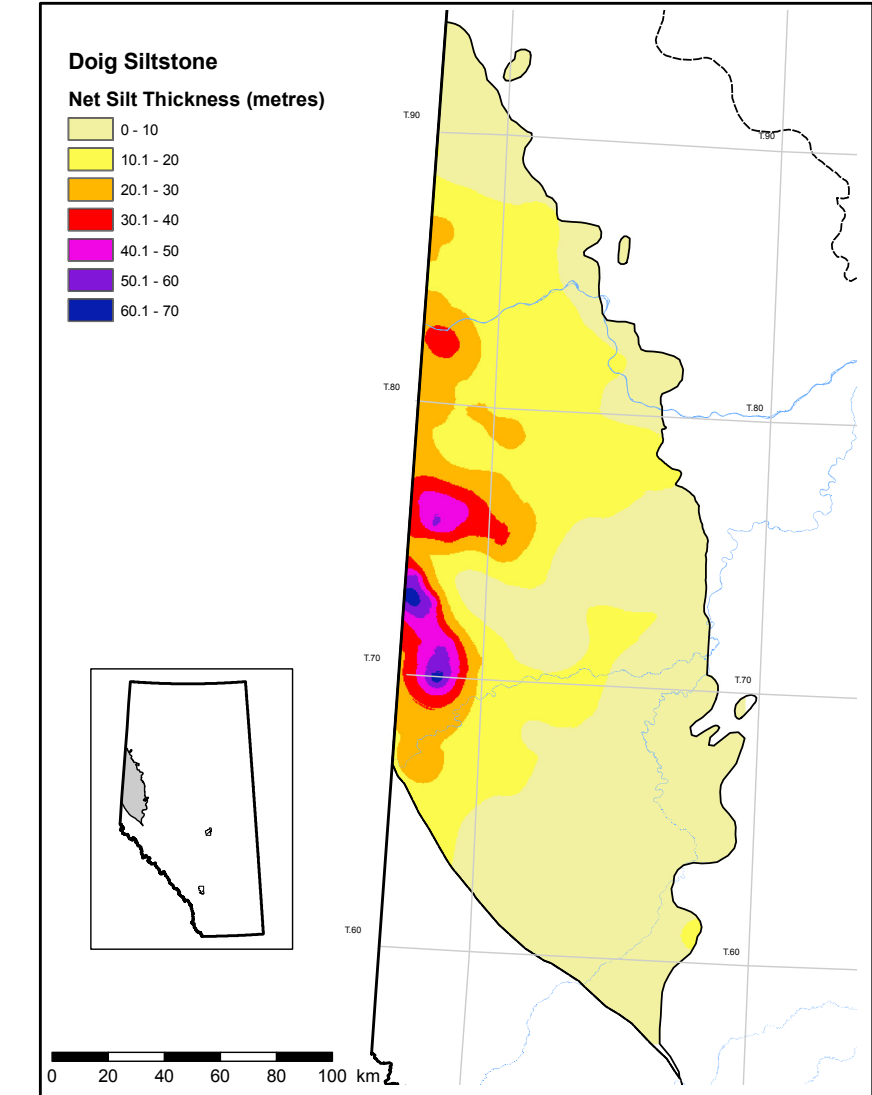
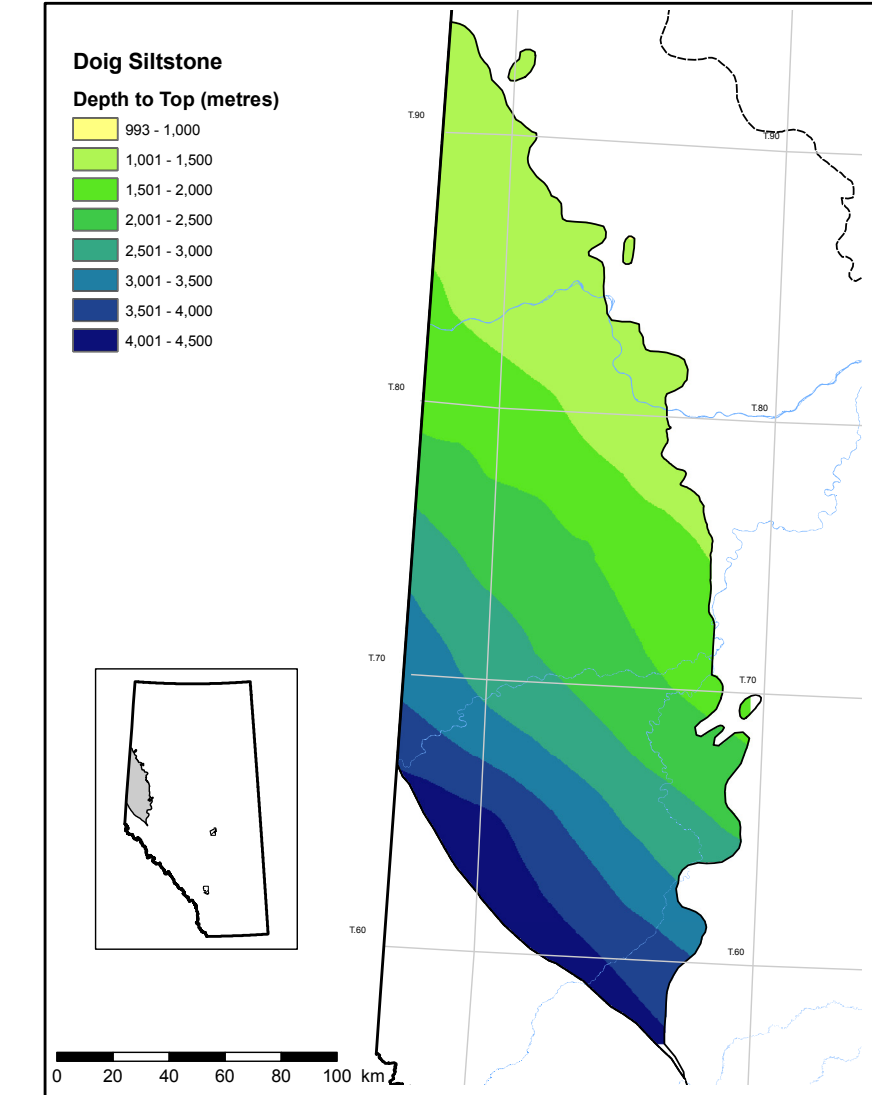


Lower Doig Siltstone

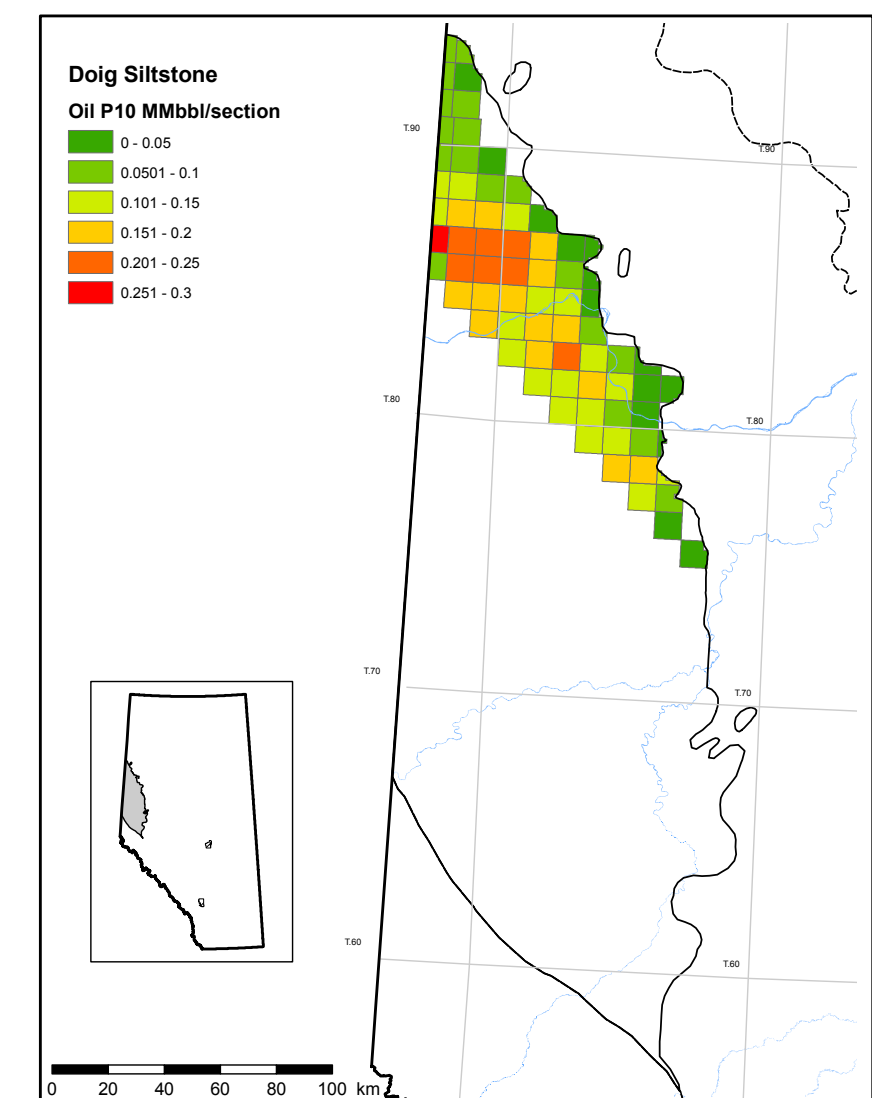
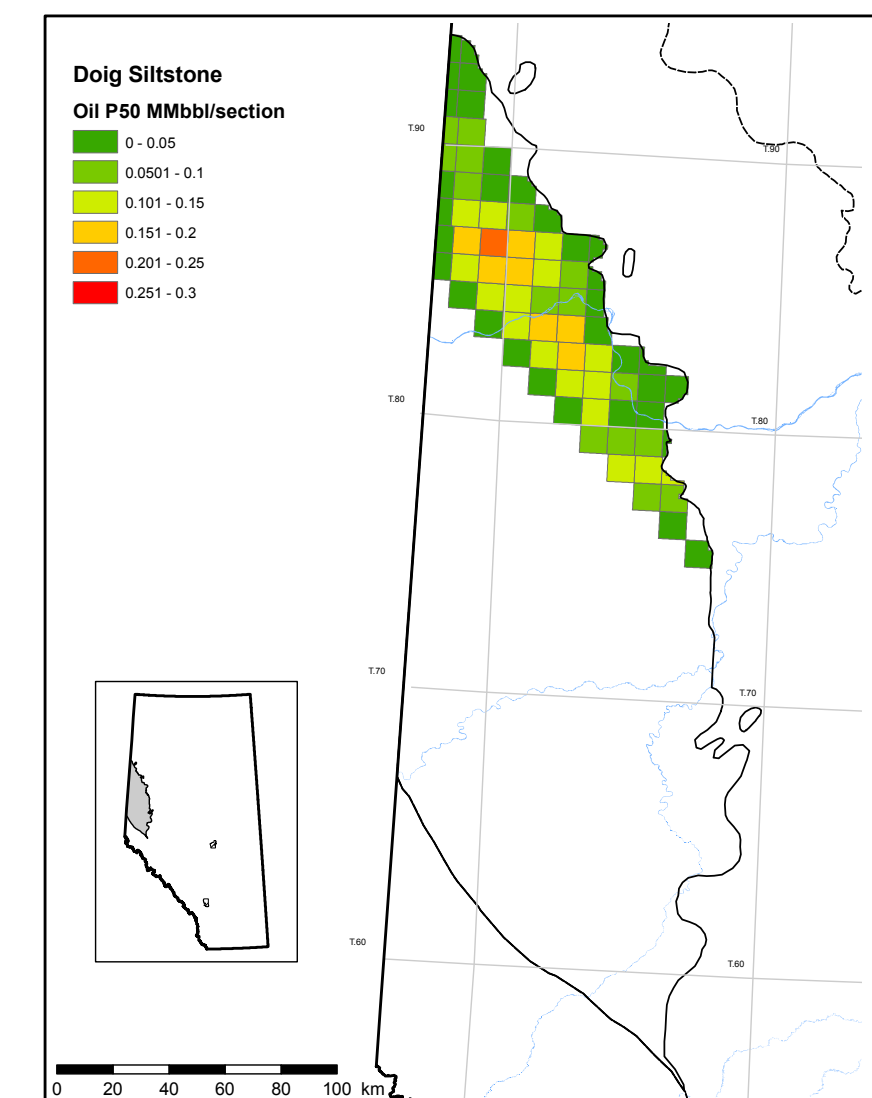
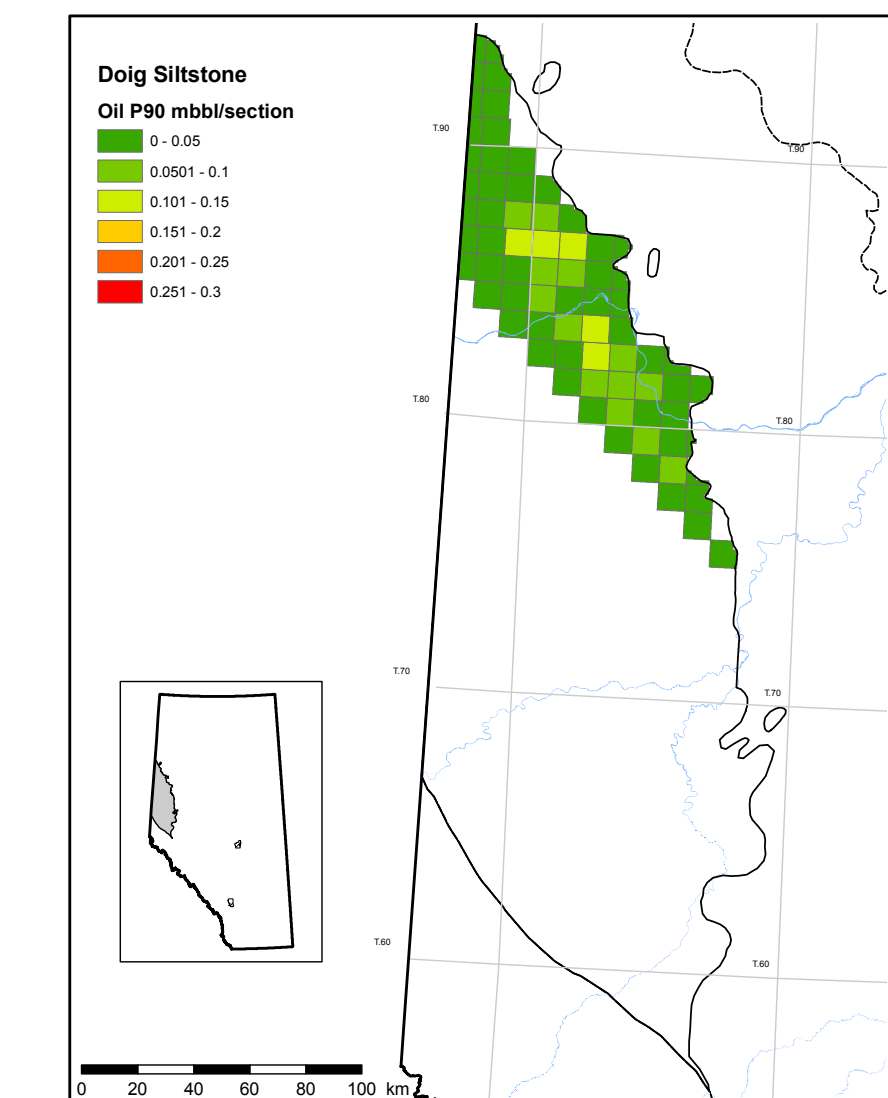
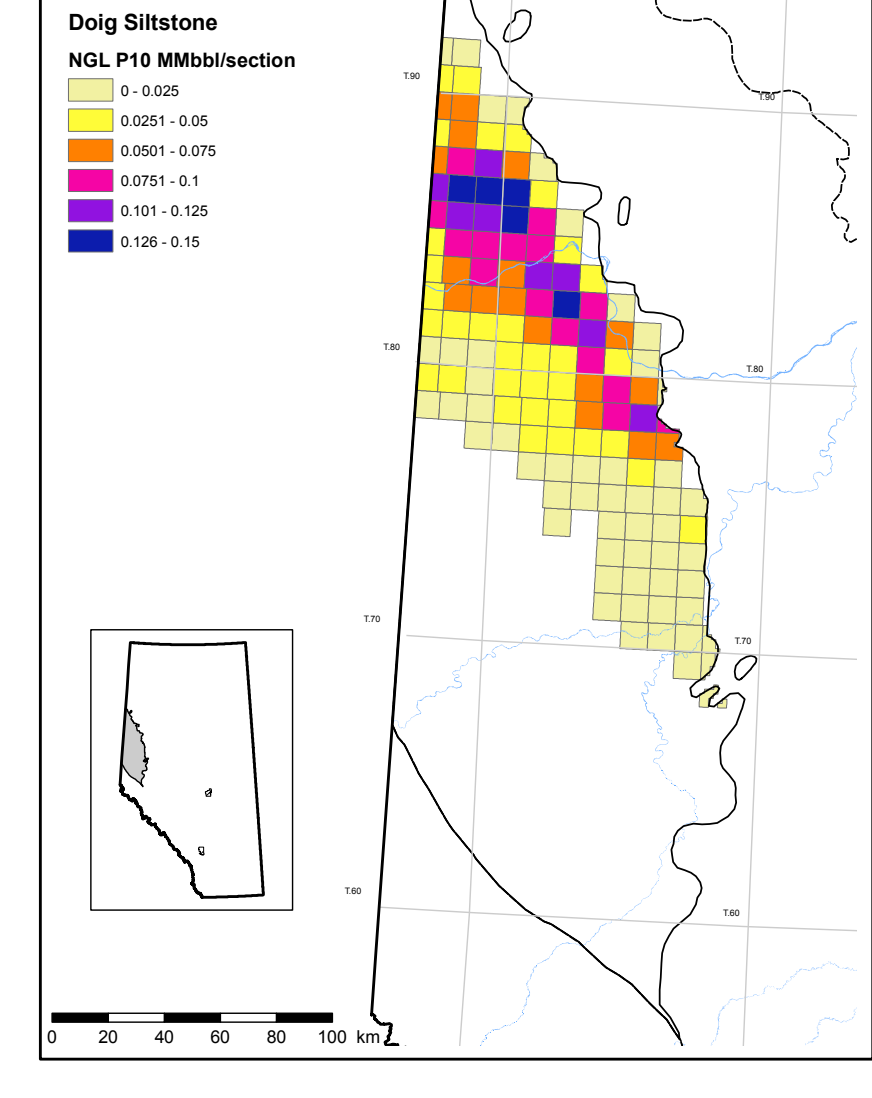
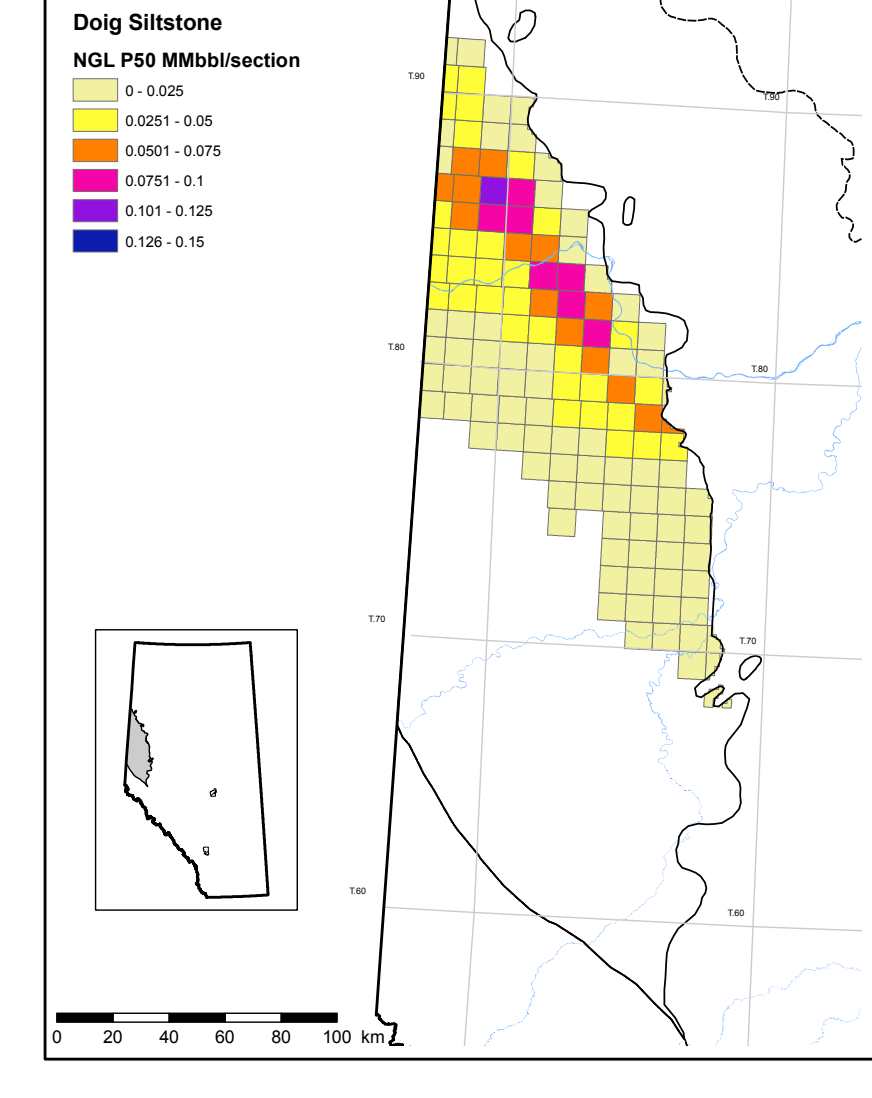
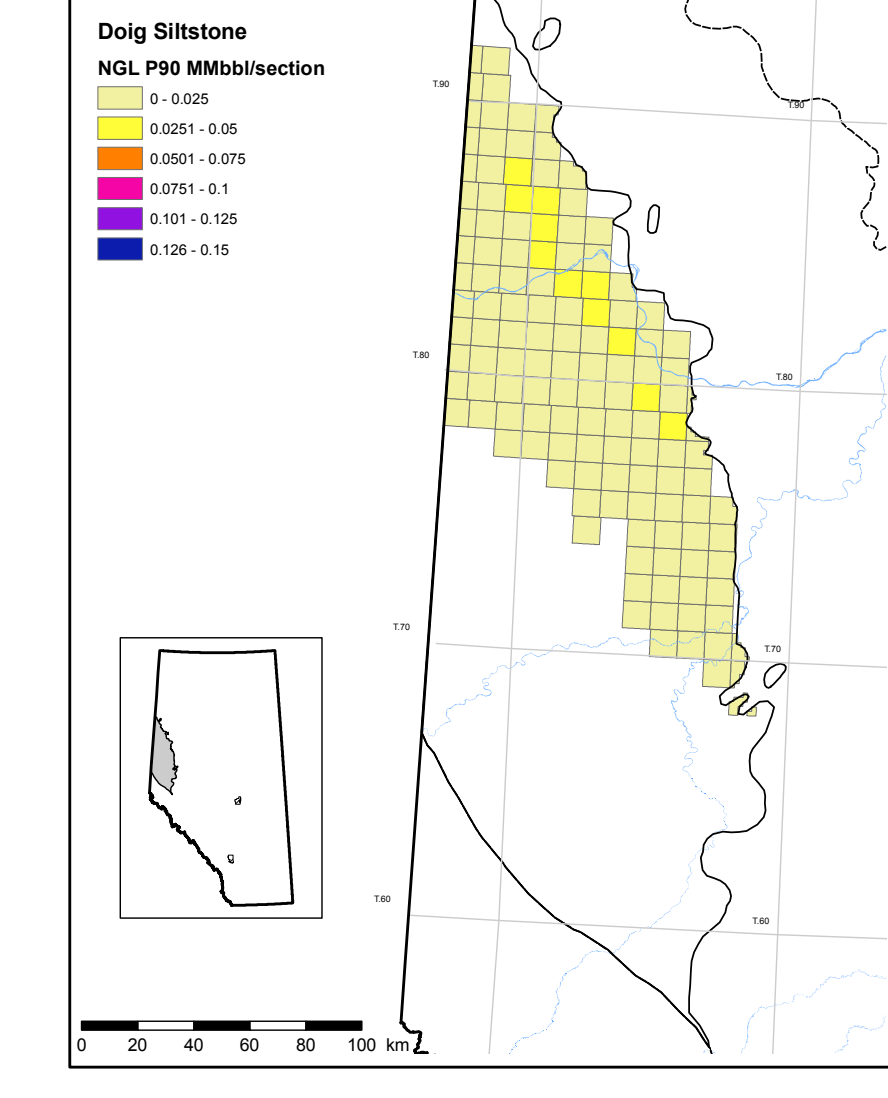
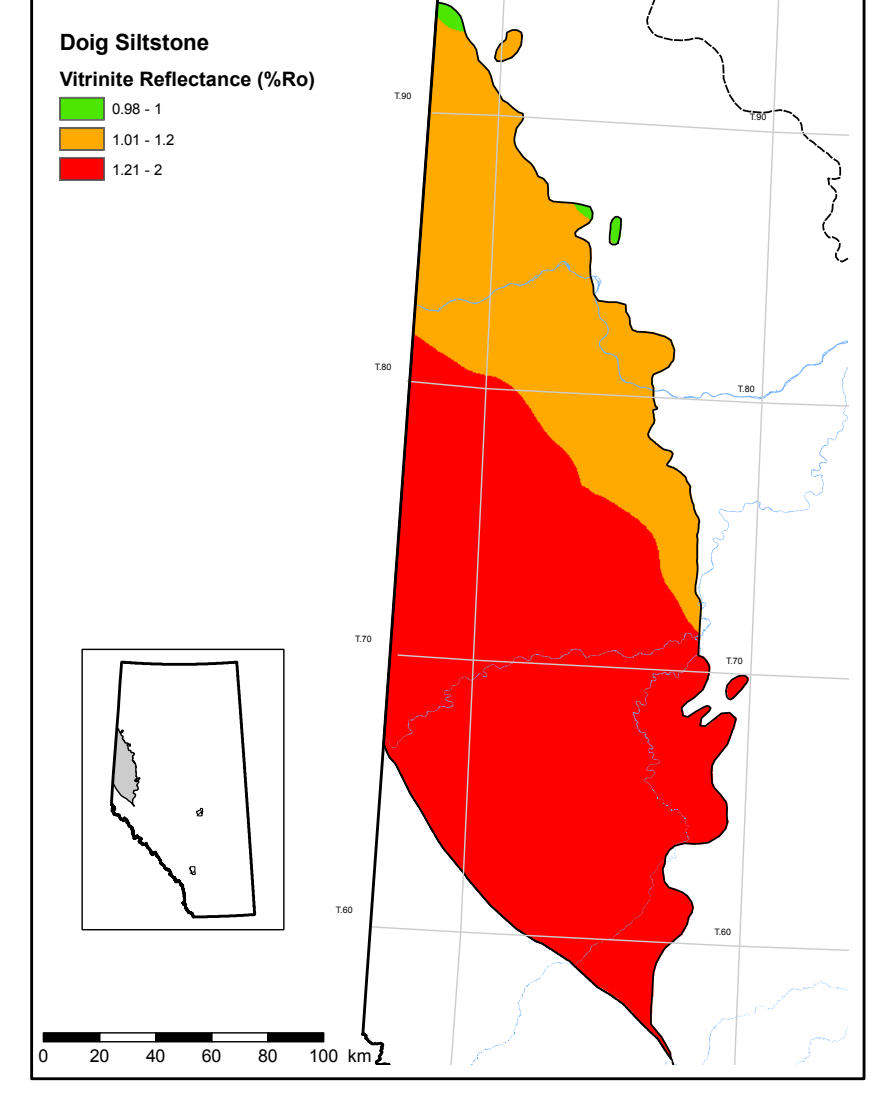
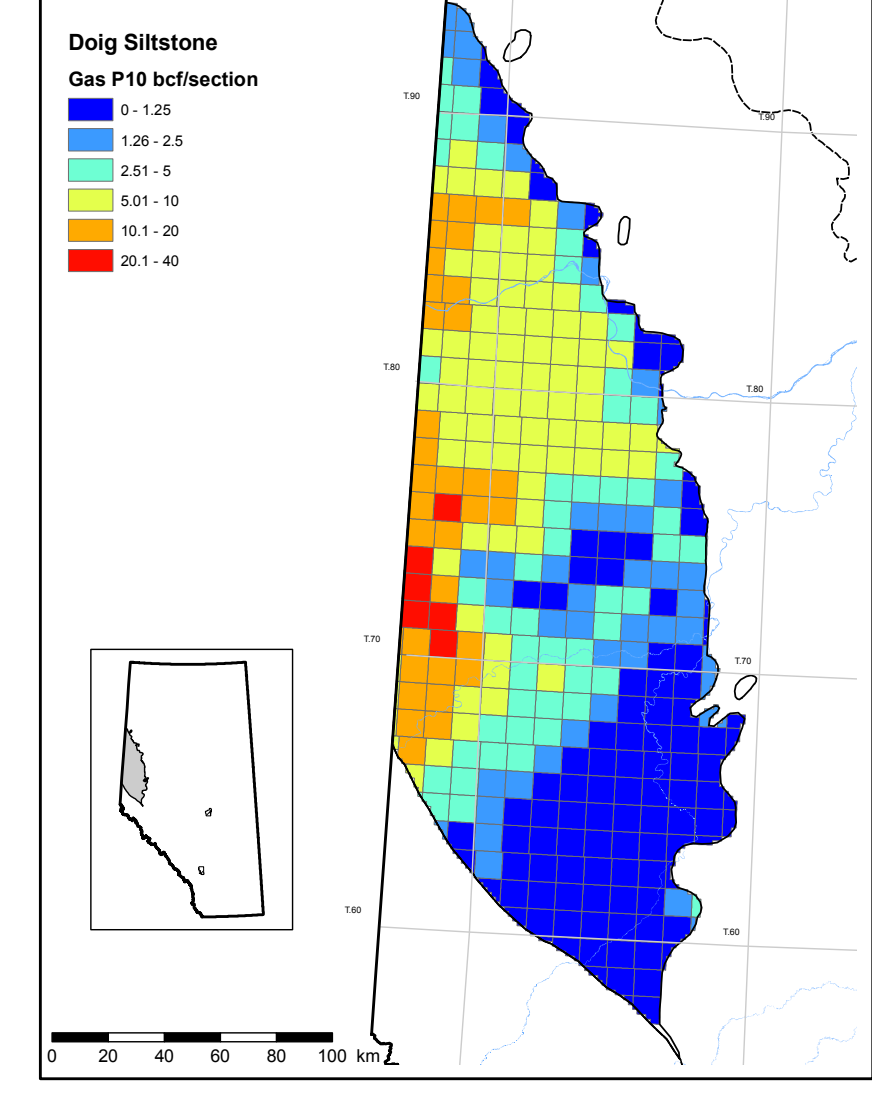
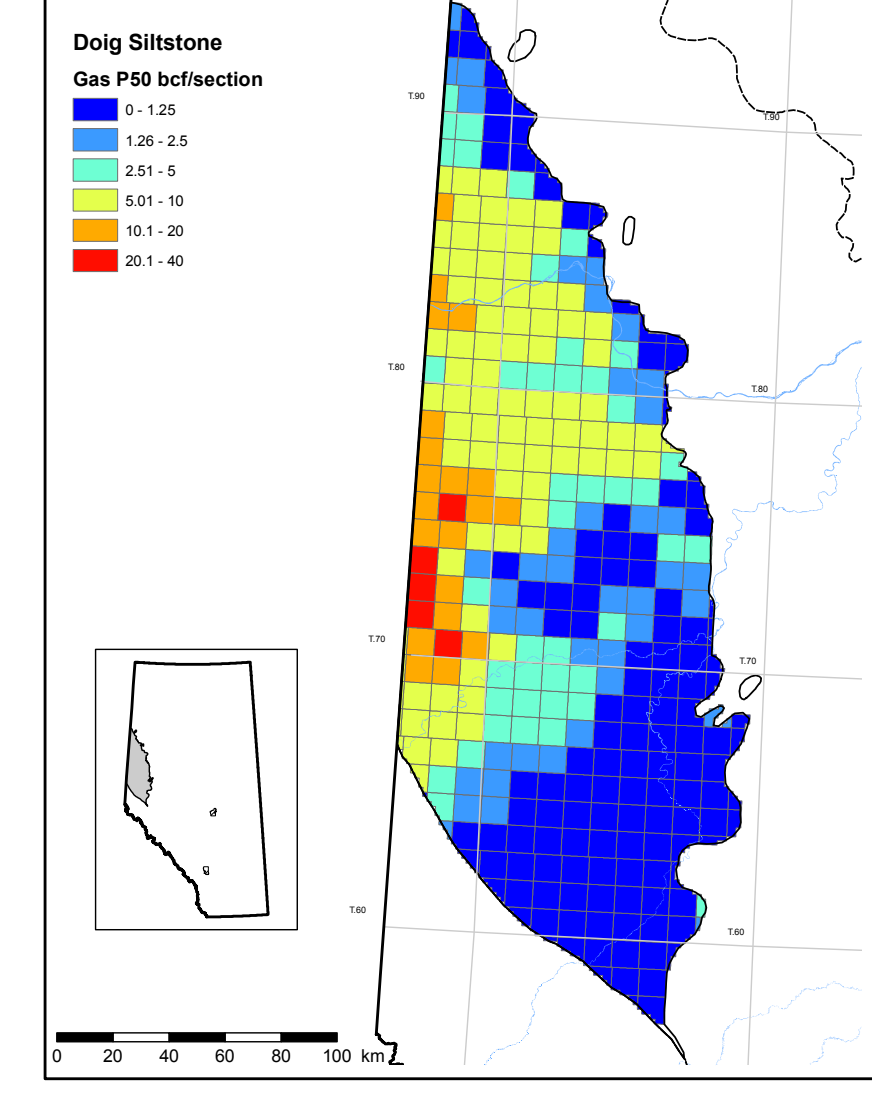
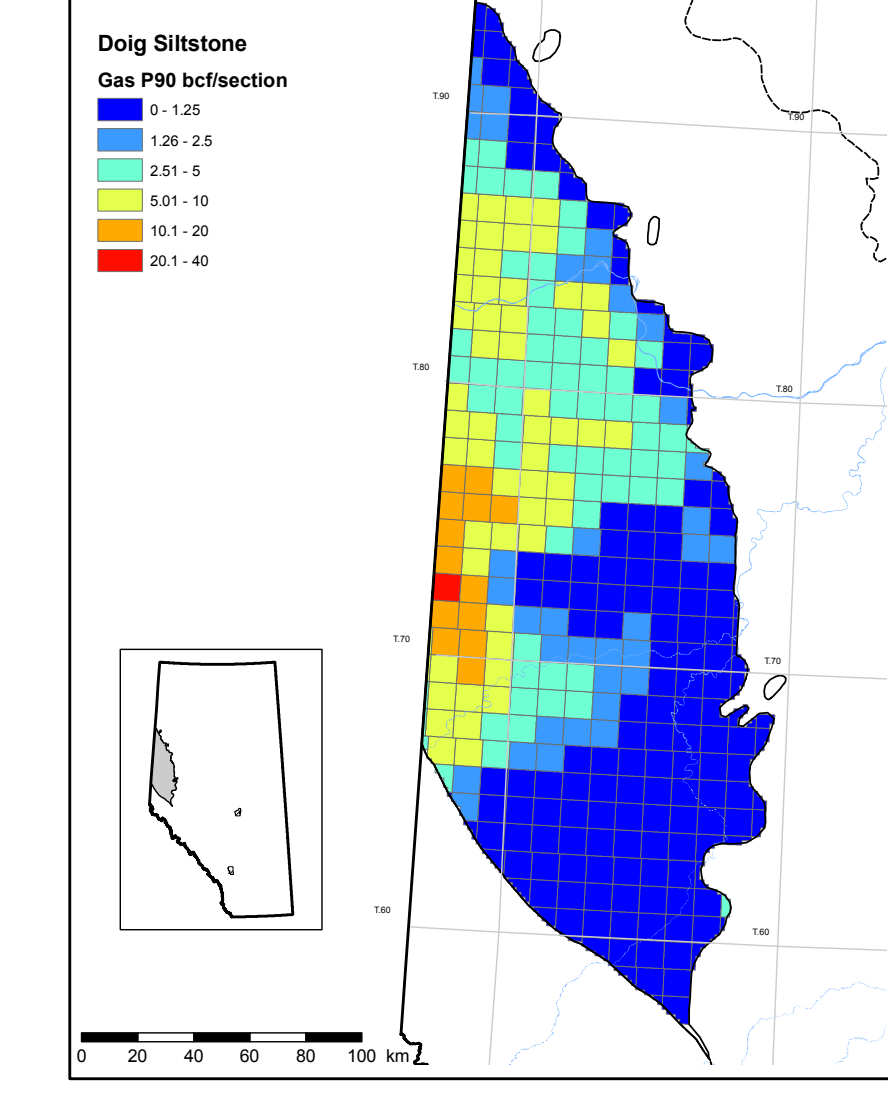
Data Locations



Mapped Variables



Resource Maps



Acknowledgements

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Related Publications

Anderson, S.D.A., Beaton, A.P., Berhane, H., Pawlowicz, J.G., and Rokosh, C.D. (2010): Mineralogy, permeametry, mercury porosimetry, pycnometry and scanning electron microscope imaging of Duvernay and Muskwa formations: Shale gas data release; Energy Resources Conservation Board, ERCB/AGS Open File Report 2010-02, 67 p.

Anderson, S.D.A., Rokosh, C.D., Pawlowicz, J.G., Berhane, H., and Beaton, A.P. (2010): Mineralogy, permeametry, mercury porosimetry, pycnometry and scanning electron microscope imaging of the Montney Formation in Alberta: shale gas data release; Energy Resources Conservation Board, ERCB/AGS Open File Report 2010-03, 61 p.

Lyster, S. (2013): Quantification of uncertainty in shale gas resources; Alberta Energy Regulator, AER/AGS Open File Report 2013-13, 35 p.

National Energy Board, British Columbia Oil and Gas Commission, British Columbia Ministry of Natural Gas Development, and Alberta Energy Regulator (2013): Energy briefing note: the ultimate potential for unconventional petroleum from the Montney Formation of British Columbia and Alberta; AER/AGS Information Series 144, 17 p.

Pawlowicz, J.G., Anderson, S.D.A., Rokosh, C.D., and Beaton, A.P. (2009): Mineralogy, permeametry, mercury porosimetry and scanning electron microscope imaging of the Banff and Exshaw formations: shale gas data release; Energy Resources Conservation Board, ERCB/AGS Open File Report 2008-13, 59 p.

Rokosh, C.D., Anderson, S.D.A., Pawlowicz, J.G., Lyster, S., Berhane, H., and Beaton, A.P. (2010): Mineralogy and grain density of Alberta shale; American Association of Petroleum Geologists Hedberg Conference, Dec. 5–10, 2010, Austin, Texas.

Rokosh, C.D., Crocq, C.S., Pawlowicz, J.G., and Brazzoni, T. (2013): Rock Eval™ and total organic carbon of sedimentary rocks in Alberta (tabular data, tab-delimited format); Energy Resources Conservation Board, ERCB/AGS Digital Dataset 2013-0003.

Rokosh, C.D., Crocq, C.S., Pawlowicz, J.G., and Brazzoni, T. (2013): Fluid saturations of Alberta geological units for shale- and siltstone-hosted hydrocarbon evaluation (tabular data, tab-delimited format); Energy Resources Conservation Board, ERCB/AGS Digital Dataset 2013-0015.

Rokosh, C.D., Crocq, C.S., Pawlowicz, J.G., and Brazzoni, T. (2013): Pycnometry of Alberta geological units for shale- and siltstone-hosted hydrocarbon evaluation (tabular data, tab-delimited format); Energy Resources Conservation Board, ERCB/AGS Digital Dataset 2013-0016.

Rokosh, C.D., Lyster, S., Anderson, S.D.A., Beaton, A.P., Berhane, H., Brazzoni, T., Chen, D., Cheng, Y., Mack, T., Pana, C., and Pawlowicz, J.G. (2012): Summary of Alberta's shale- and siltstone-hosted hydrocarbon resource potential; Energy Resources Conservation Board, ERCB/AGS Open File Report 2012-06, 327 p.