

Pickled Shale Gas Play – How Continental Glaciation Drives Biogenic Gas Formation

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Summary

Continental glaciation had major impacts on hydrodynamics conditions of underlying sedimentary basins. Influx of glacial meltwater displaced brines. These brines inhibited methanogenesis in organic rich, low thermomaturity shales earlier in the basin history (i.e. pickled shales). Influx of fresh water switched conditions to those suitable for methanogenesis during and subsequent to glaciation creating shallow biogenic gas plays in shale units that otherwise were considered thermally immature. Evidence for significant subglacial recharge into the eastern margin of the Western Canada Sedimentary Basins suggests shallow gas deposits occur. To better define how glaciation may have induced conditions suitable for shallow methanogenesis, key constraints on the occurrence of biogenic shale gas have been mapped on a regional scale, including chloride, sulphate, TOC, and Tmax. These are used to define areas of highest potential for shallow biogenic gas occurrence.