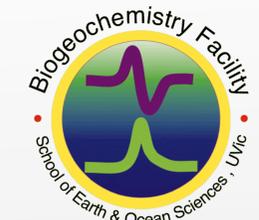


BC Natural Gas Atlas

Geochemical Characterization of our Energy Resources



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<http://bc-nga.com>

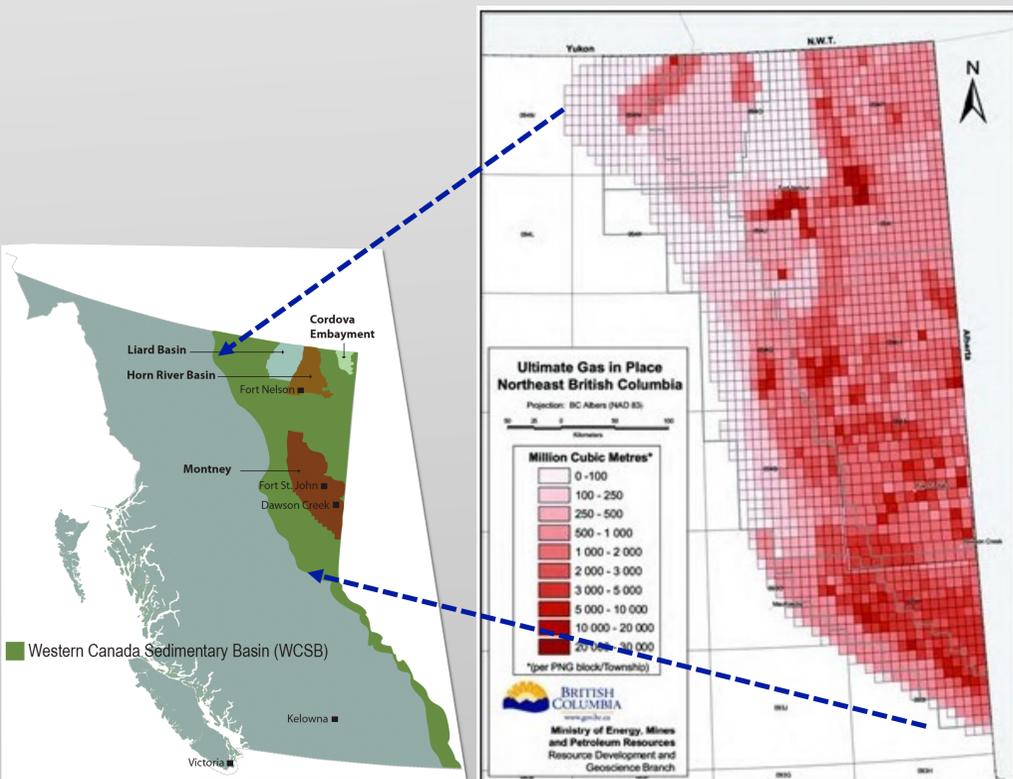
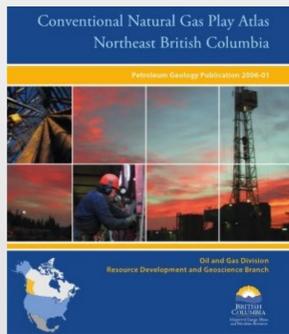
Goals and Products of BC-NGA

- **Acquire existing gas geochemical data** (molecular and isotopic) for NEBC
- **Gas Analyses - molecular and stable isotopes (No Charge !!)** (on gas samples from new and archived exploration and production NEBC wells)
- **Create a geochemical inventory and mapping of natural gases in NEBC** (regionally, on a formation by formation basis in NEBC)
- **Develop and release a web-based geochemical database** (open and accessible by a broad range of users, e.g., industry, government, NGO's, general public, etc.)
- **Integration** into existing petroleum database
- **Incorporation of groundwater and fugitive emissions studies**, e.g., FLNR

BC-NGA captures the **molecular** and **stable isotope signatures** of natural gas to create maps of natural gas "fingerprints" to:

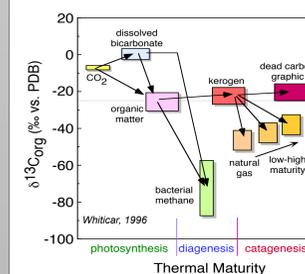
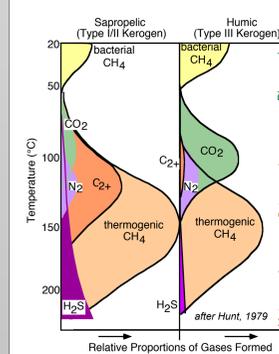
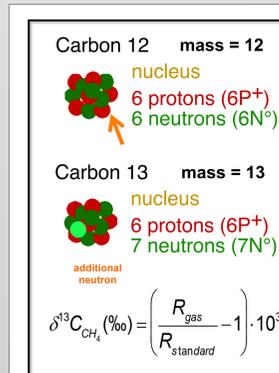
- Characterize and map the geochemical conditions of NEBC's ongoing/future regions of petroleum exploration and production
- Contribute to understanding the geologic framework of natural gas deposits in NEBC at scales of fields to basin levels
- Assist petroleum system models to de-risk plays by understanding and predicting generation occurrences, histories and potential productivity of natural gas in BC
- Provide robust baseline data of gas signatures to identify and track fugitive emissions of natural gas (groundwaters and atmosphere), e.g., distinguish microbial-thermogenic gases
- Offer a "geochemical DNA" catalogue for different gas sources for provenance analysis in production, well completions, processing and transport

Basis for this Atlas



Area of coverage by preliminary maps on accompanying poster

Maps will link to a web-hosted combined geologic and geochemical database for NEBC



Context for stratigraphic chart on accompanying poster

What is Natural Gas "Fingerprinting"?

Combination of natural gas molecular and isotope ratio compositions

Molecular abundances – C₁, C₂₊, CO₂, N₂, H₂S, etc.

Stable isotope ratios – δ¹³C₁, δ²H_{C1}, δ¹³C₂₊, δ¹³CO₂, δ¹⁵N₂, δ³⁴S_{H2S}, etc.

Combination of molecular and isotope ratio compositions can define and differentiate:

- | 1. Gas Types | 2. Process / Pathways |
|--------------------|-----------------------|
| - thermogenic | - migration |
| - microbial | - mixing |
| - geothermal | - maturity |
| - abiotic | - production |
| - artificial, etc. | - alteration, etc. |

