GAS GEOCHEMICAL DETECTION OF MIGRATION PATHWAYS AND GAS HYDRATE STABILITY ZONE: PRELIMINARY RESULTS FROM ODP LEG 204

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ODP Leg 204 cored nine sites on the Cascadia continental margin to investigate the distribution and concentration of gas hydrates in an accretionary ridge and adjacent slope basin.

Hydrocarbon gases in sediments were analyzed in shipboard laboratories by two different sampling methods, headspace and core gas void sampling. Preliminary results of the gas geochemistry on board are as follows: 1) Conduits of gas migration were identified by analyzing methane/ethane ratios and contents of other heavier hydrocarbons. 2) The base of the gas hydrate stability zone was correlated with a shift to lower methane/ethane ratios. 3) The top of the gas hydrate stability zone was characterized by relative ethane enrichment and propane depletion in core gas voids produced from dissociation of gas hydrate. Gas geochemistry proxies to detect gas hydrate stability zone were consistent with other data such as chlorinity, infrared thermal imaging, and wire line logging. Both headspace and void gas analysis can provide information to detect presence of gas hydrates on board.