Geophysical Research Abstracts
Vol. 15, EGU2013-3189, 2013
EGU General Assembly 2013

Geochemical assessment of vertical methane fluxes across pockmarks on the Chatham Rise, eastern New Zealand

Richard Coffin (1), Paula Rose (2), Ingo Klaucke (3), Joerg Bialas (4), Lewis Millholland (5), Andrew Gorman (6), and Ingo Pecher (7)

(1) Naval Research Laboratory, Marine Biogeochemistry, Washington, DC, United States (richard.coffin@nrl.navy.mil), (2) NRC, Naval Research Laboratory, Marine Biogeochemistry, Washington, DC, United States (paula.rose.ctr@nrl.navy.mil), (3) Helmholtz Centre for Ocean Research Kiel IFM-Geomar, Germany (iklaucke@geomar.de), (4) Helmholtz Centre for Ocean Research Kiel IFM-Geomar, Germany (jbialas@geomar.de), (5) SAIC, Naval Research Laboratory, Marine Biogeochemistry, Washington, DC, United States (lewis.millholland.ctr@nrl.navy.mil), (6) University of Otago, Dunedin, New Zealand (andrew.gorman@otago.ac.nz), (7) University of Auckland, Auckland, New Zealand (i.pecher@auckland.ac.nz)

Geochemical profiles of shallow sediment will be evaluated to estimate the modern day vertical methane flux across a series of pockmarks on the Chatham Rise, New Zealand. The project encompasses three field events: two seismic surveys conducted across the study region on the University of Otago's RV Polaris in 2012 and a final expedition on IFM-GEOMAR's RV Sonne in February 2013. Seismic and multibeam profiles obtained and interpreted by researchers at the University of Otago, University of Auckaland and IFM-GEOMAR were used to focus sediment coring locations for the February 2013 expedition. Geochemical data acquisition and interpretation for assessment of the current and past vertical methane flux will the primary NRL focus. Current day methane fluxes will be estimated with analysis of sediment pore water sulfate, dissolved inorganic carbon and methane profiles. These data will be compared to paleogeochemical sediment analysis to assess the influence of climate change on methane hydrate stability and vertical gas migration in this region. For paleogeochemical assessment, sediment radiocarbon data and conservative tracers of the sedimentation rate will be used to evaluate the past contribution of deep sediment vertical methane flux to the shallow sediment carbon pools. Conservative tracers in the solid phase sediment will include thorium-230 (230Th), lead-210 (210Pb) and protactinium-231 (231Pa), with half lives of 75,380 y, 22.3 y and 32,760 y, respectively. Interpretation of geophysical and geochemical data focuses on the methane flux during the past interglacial period. This presentation will introduce a spatial variation of shallow sediment methane source(s), concentrations, and potential oxidation levels at the February 2013 coring locations. These data will be assessed with respect to modern day shallow sediment carbon cycling and past vertical methane fluxes related to climate change.