

**1999 Fall Meeting****Search Results:**

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HR: 0830hAN: **OS21B-10**TI: [Highly Variable Methane Distribution at Hydrate Ridge Sediments](#)AU: \* **Heeschen, K**EM: [kheeschen@geomar.de](mailto:kheeschen@geomar.de)AF: *GEOMAR Research Center for Marine Geosciences, Wischhofstr. 1-3, Kiel, 24148 Germany*AU: **Rickert, D**AF: *GEOMAR Research Center for Marine Geosciences, Wischhofstr. 1-3, Kiel, 24148 Germany*AU: **Sahling, H**AF: *GEOMAR Research Center for Marine Geosciences, Wischhofstr. 1-3, Kiel, 24148 Germany*AU: **Goldfinger, C**AF: *COAS-Oregon State University, Ocean Admin Bldg 104, Corvallis, OR 97331-5503 United States*

AB: Hydrate Ridge, the second accretionary wedge of the Cascadia convergent margin, is known not only for fluid venting due to convergent tectonics, but also for its occurrence of gas hydrates in near-surface sediments. In addition there are areas of high back scatter in side scan sonar images which upon inspection by ALVIN and the video-guided Ocean Floor Observation System (OFOS) exhibit no obvious venting activity. As part of the TECFLUX project, methane ( $\text{CH}_4$ ) was determined in sediments and bottom waters from a variety of these different settings. Concentrations were found to vary by as much as 5 orders of magnitudes. The highly variable distribution of methane within vent areas on southern Hydrate Ridge is linked to biological vent communities and to the gas hydrate distribution in the subsurface. At gas hydrate sites, methane increases up to nearly 40,000 nmol  $\text{CH}_4$ /ml total sediment. Values still reach 3000 nmol  $\text{CH}_4$ /ml total sediment at sites without obvious degassing. Due to bioirrigation, sediments from clam sites have much lower values of  $\text{CH}_4$  as well as  $\text{H}_2\text{S}$  in the bioturbated interval compared to sites of bacterial mats. Profiles of  $\text{CH}_4$  and  $\text{H}_2\text{S}$  of bacterial mat habitats show opposing distributions in the uppermost centimeters whereas in sediments underlying clam colonies  $\text{H}_2\text{S}$  and  $\text{CH}_4$  correlate which each other up to a depth of about 10 cm. However, below this depth  $\text{CH}_4$  decreases while  $\text{H}_2\text{S}$  distribution is nearly constant. Chloride values and shows of gas hydrate during sampling strongly suggest gas hydrate dissociation as the source of sediment methane. Intermediate and highly variable methane concentrations were measured in sediment patches identified by high back scatter on side scan sonar images. This is an interesting observation because it could indicate the beginning of vent activity or very young vent systems. Background values ( $< 4$  nmol  $\text{CH}_4$ /ml total sediment) were found in the ponded sediment basins to the east and west of Hydrate Ridge. These values are considered ambient methane contents for typical

continental margin sediments.

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