



Metazoan use of chemosynthetic food sources at New Zealand cold seeps

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During RENEWZ 2006, a total of 9 cold-seep sites were discovered along the NE continental margin of New Zealand between the depths of 750-1050m, including one of the largest seep sites known, covering roughly 0.18 square km. Seep habitats were characterized by siboglinid polychaetes, bathymodiolin mussels, vesicomyid bivalves, ampharetid polychaetes, pogonophorans, sponges, and authigenic carbonates. Methane-derived carbon was the basis for a large proportion of the seep food web, which included symbiont-bearing and heterotrophic faunas. A mat-forming hadromerid sponge, and 14 invertebrate species associated with it, had $\delta^{13}\text{C}$ values of between -42 to -55 per mil, suggesting that the sponge or its microbial symbionts act as a conduit for methane into the food web. Infaunal taxa had a broader distribution of C and N stable isotopic values, supporting use of production from a diverse suite of microbial metabolic pathways. Extent of methane utilization by infaunal invertebrates was independent of seep location but not habitat type; both the ampharetid beds, sampled during a NewVents cruise, and pogonophoran bed assemblages demonstrated the greatest incorporation of methane. Methane was a primary C source for most animals in the ampharetid bed community, but in pogonophoran beds, the methane-derived carbon was limited to the pogonophora.