camera. From the Nematodes only a subsample of 200 individuals was taken and measured using semi-automated image analysis method. Each individual was classified into $\log_2$ size classes based on its dry weight [μg]. Biomass and production size spectra were constructed by plotting the total biomass/production in each size class against the $\log_2$-transformed size of a class. Spatial variability of size structure and functioning of meiofaunal communities was related to gradients in temperature and other environmental factors (including food quantity and quality descriptors). As water temperatures are foreseen to change in the course of climate warming, the results of this study can be used to discuss the possible climate change effects on meiofaunal communities structure and function in Arctic coastal waters.

O16 Meiofauna at the natural CO_2 vents off Panarea Island, Mediterranean Sea: a proxy for ocean acidification and CO_2 leakage from subseabed storage sites

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The unprecedented rate of CO_2 increase in the atmosphere forms a threat to our oceans. The direct uptake of CO_2 changes oceans carbonate chemistry and pH, a process termed ocean acidification (OA). On the short term, the best option to mitigate atmospheric CO_2 increase is capture and storage (CCS) in deep geological formations in the seabed. Predicting long-term storage security is of course difficult and therefore different CO_2 leakage scenarios require evaluation. Volcanic submarine CO_2 vents form natural analogues that allow studying the effects of long-term exposure to acidified seawater in a holistic approach. Off Panarea Island, we identified a vent area where gas emission ($> 90\%$ CO_2) occurs in a moderate flow controlled by tides. In the water column this seepage results in an average difference in pH minima of 0.385 between the vent and the reference site. The conditions in the water column are therefore a good proxy for future OA and allowed to study the potential adaptive capacities to high CO_2 conditions of *Posidonia oceanica* seagrass and its sessile and motile epibiont communities. In the sedimentary environment we studied the response of meiofauna to acidified pore water conditions (pH minimum: 5.5) as a proxy for CO_2 leakage. Our results indicate that in the light of future OA, changes in *P. oceanica* meadows will mainly occur on the level of the sessile epibiont community composition, while *P. oceanica* seagrass productivity, net epibiont calcification, meiofauna community composition, abundance and function, and biodiversity remain stable. On the other hand, long-term CO_2 leakage, and more specific its effect

on granulometry, reduced meiofaunal density, biomass and biodiversity and changed the meiofauna community structure. Nematode functional diversity shifted towards communities dominated by smaller, faster reproducing species and an altered, simplified food web at the vent sites. The loss of species at the vent area also increased the temporal variability in nematode community characteristics and therefore reduces the resilience to other forms of disturbance.