

**Eleonora Puccinelli**

University of Cape Town, South Africa

***Factors affecting trophic signatures of offshore benthic invertebrates at a Sub Antarctic archipelago***

Eleonora Puccinelli [1], Christopher D. McQuaid [2], Isabelle J. Ansorge [1]

[1] Department of Oceanography, Marine Research Institute, University of Cape Town, Cape Town, South Africa; [2] Department of Zoology and Entomology, Rhodes University, Grahamstown, South Africa

Food availability is a key regulator of the distribution, metabolism and success of benthic populations. In deep sea ecosystems, hydrodynamics and depth play fundamental roles in determining benthic food resources. Recent studies suggest that the Southern Ocean Sub-Antarctic Front is shifting southwards, with implications for primary production and food availability around the Sub-Antarctic Islands embedded in the Antarctic Circumpolar Current. We used fatty acid (FA) and stable isotope (SI) analyses to investigate the dietary signatures of benthic invertebrates and suspended particulate matter (SPM) at three Depths (shallow-100m, middle-300m and deep-600m) in three Hydrographic Regions with different flow and productivity regimes around the Prince Edward Islands. Region and Depth both affected the SI values of SPM, while feeding guild was the key factor influencing consumer trophic signatures. Depth affected the  $\delta^{15}\text{N}$  of all trophic groups and the FA signatures of suspension feeders. Deeper samples were  $\delta^{15}\text{N}$  enriched and showed a greater proportion of mono- and saturated fatty acids, reflecting greater remineralization of SPM and of food reaching the seafloor. Region affected the  $\delta^{13}\text{C}$  and FA signatures of SPM, suspension feeders and deposit feeder/scavengers, with differences between the interisland and open ocean regions. This was probably linked to the retention of nutrients and phytoplankton between the islands. Critically, the effects of Depth and Region were taxon-specific, indicating that long-term responses to environmental change may have complex consequences for the feeding ecology and viability of benthic populations, with implications for the higher trophic levels that these populations support.