Linkages between the occurrence of persistent organic pollutants and biogeochemical characteristics of deep-sea trenches

Gisela Hørlitz1*, Zhe Li2, Igor Eulaers2, Stefano Bonaglia3, Ronnie N. Glud4, Anna Sobek1

1 Stockholm University, Department of Environmental Science  2 Aarhus University, Department of Bioscience - Marine Mammal Research  3 Stockholm University, Department of Ecology, Environment and Plant Sciences (DEEP)  4 University of Southern Denmark, Department of Biology

*Gisela.Hoerlitz@aces.su.se

INTRODUCTION

Persistent organic pollutants (POPs) such as Polychlorinated Biphenyls (PCBs) occur ubiquitously in the environment --> associate to organic carbon, leading to close linkages between contaminant fate and carbon cycling

The trophic state of marine systems plays an important role in contaminant fate

--> higher sorption capacity of organic matter in eutrophic regimes (Kuzyk et al., 2010)

--> higher mineralization rates may imply relative enrichment of POPs (Gobas and MacLean, 2003)

Deep sea trenches: formed at tectonic subduction zones ~ 8-10 km depth

--> Generally depleted in organic matter compared to other marine environments

BUT: focusing effect to the trench-centre, due to V-shape topography

HYPOTHESIS

1. Concentrations of POPs are higher at the eutrophic Atacama trench compared to the oligotrophic Kermadec

2. Mineralization of organic carbon leads to higher concentrations of POPs in deep-sea trenches

PRELIMINARY RESULTS (ATACAMA)

1. Very low concentrations

2. Concentrations the highest in the trench 2 site (8000 m depth)