The role of the pelagic "biological and physical pump" in carbon cycling is a critical key point involved into the climate change adaptation and mitigation efforts, especially in coastal areas characterized by intense biogeochemical cycling. Fjords are among the few coastal regions that appear to be net annual sinks for atmospheric CO2.

The Comau Fjord

Ecological Frame

- Vertical profiles of temperature and salinity were collected with a CTD at each station.
- pCO2 measurements were carried out with a SAMI-CO2 at each station.
- Water sampling for biogeochemical parameters (C system, nutrients, Phyto-Zooplankton) were taken from the surface and deep layers.
- Temporal variability at single depth was examined by mooring a SAMI-CO2 and a CTD to a floating platform.
- Automatic Mesozooplankton identification (ZooImage).

Background

- Intense vertical structure in the water column could be summarised as 2 layers with a transition-mixing region. Vertical mixing is almost negligible and dissolved CO2 is not effectively mixed upwards enhancing the "Biological pumping" of atmospheric CO2 into the deep ocean.
- The spatial variation of water column structure along the fjord is minimal, however, the depth of the upper layer varies probably depending on the surface-water inputs.
- pCO2 data from mooring line follow the daily thermohaline variations.
- Surface waters have significantly lower pCO2 values compared to the atmosphere and deeper waters. This finding suggests that negative air-water CO2 fluxes predominate within Comau Fjord during Austral spring.
- The concentrations of suspended material (TSS) and chlorophyll a (CHL) were higher deeper in the water column, suggesting material concentration processes across the halocline.
- The mesozooplankton biomass concentration shows an increasing gradient seaward, whereas the abundances are higher in the upper layer (probably depending on the really high abundance of Cladocerans compared with other taxa).

Preliminary Results

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