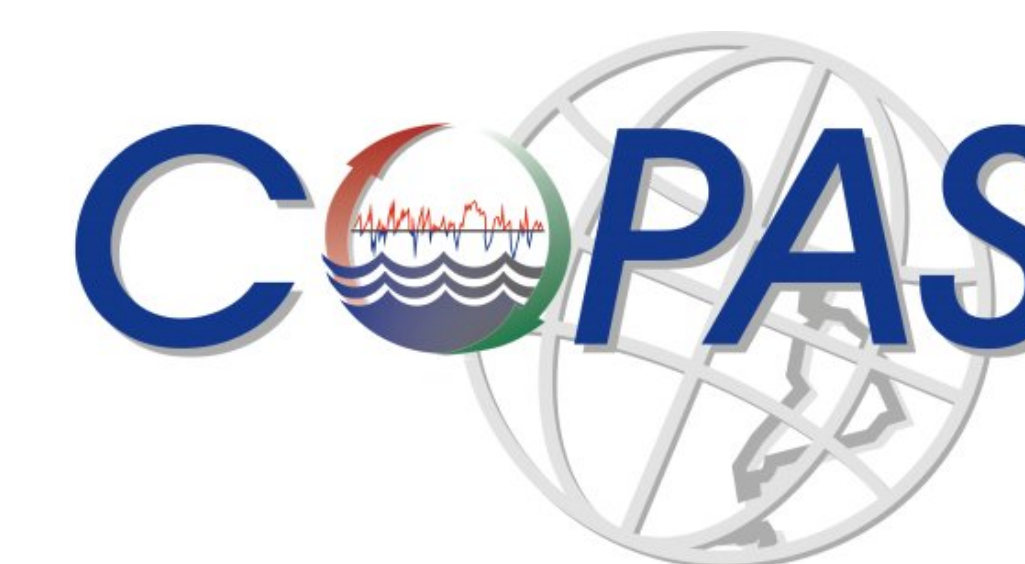


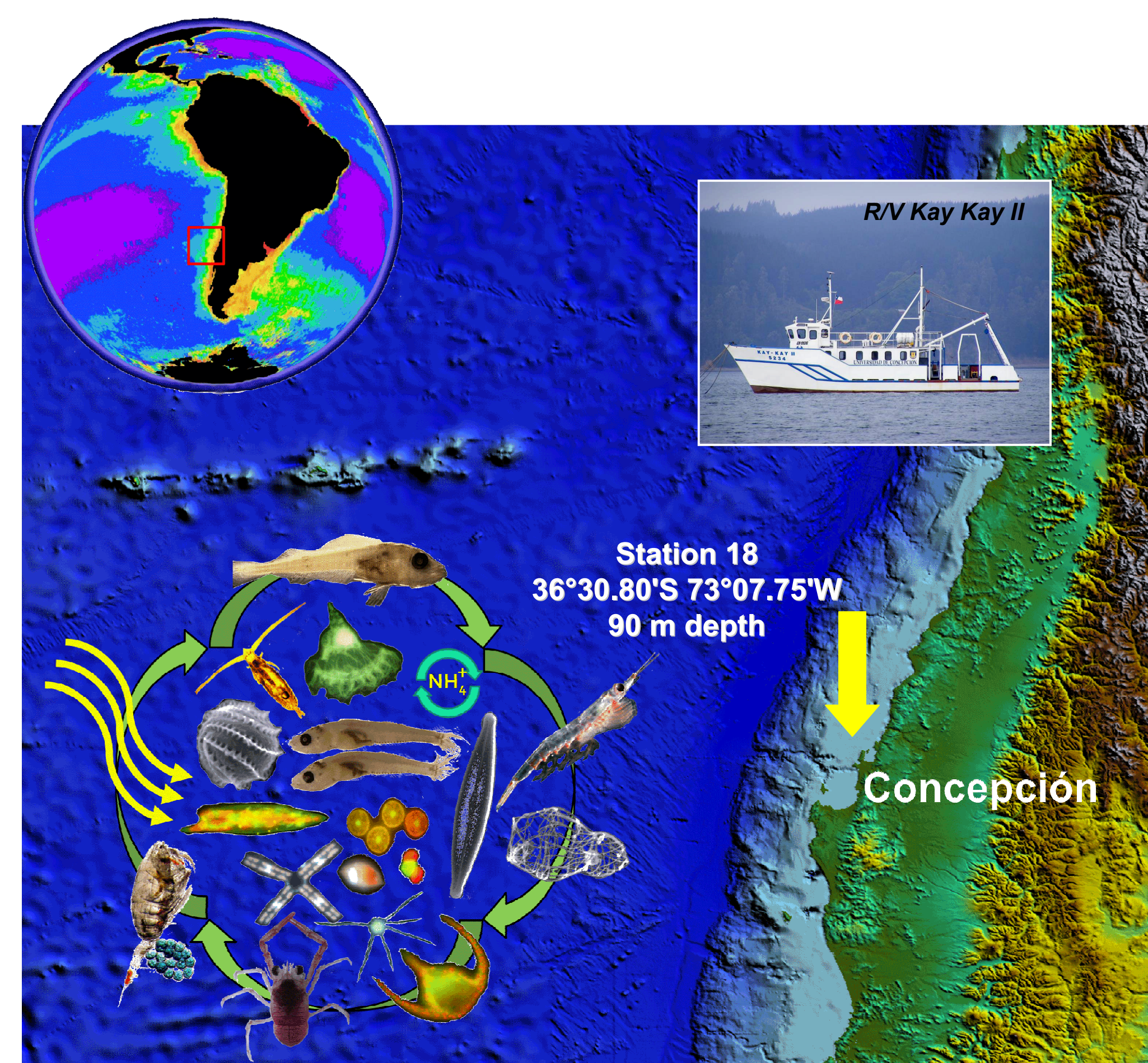


COPAS time series off central Chile

F.J. Tapia, R. Escribano, H. González, O. Pizarro, L. Farías, G. Daneri, C.B. Lange



Center for Oceanographic Research in the eastern South Pacific, University of Concepcion, CHILE



Sampling procedures

Monthly cruises (31 ± 13 days sampling interval) onboard the R/V Kay Kay II
Two-hour transit to/from Station 18 and ca. 12 h at the station

Core measurements

CTD-OF casts (0-90 m)

Bottle samples from 0, 5, 10, 15, 20, 30, 40, 50, 65, 80, 90 m
Dissolved oxygen
Nutrients (NO₂, NO₃, NH₄, PO₄, SiOH)
Chlorophyll-a (total and size-fractionated)

Other measurements

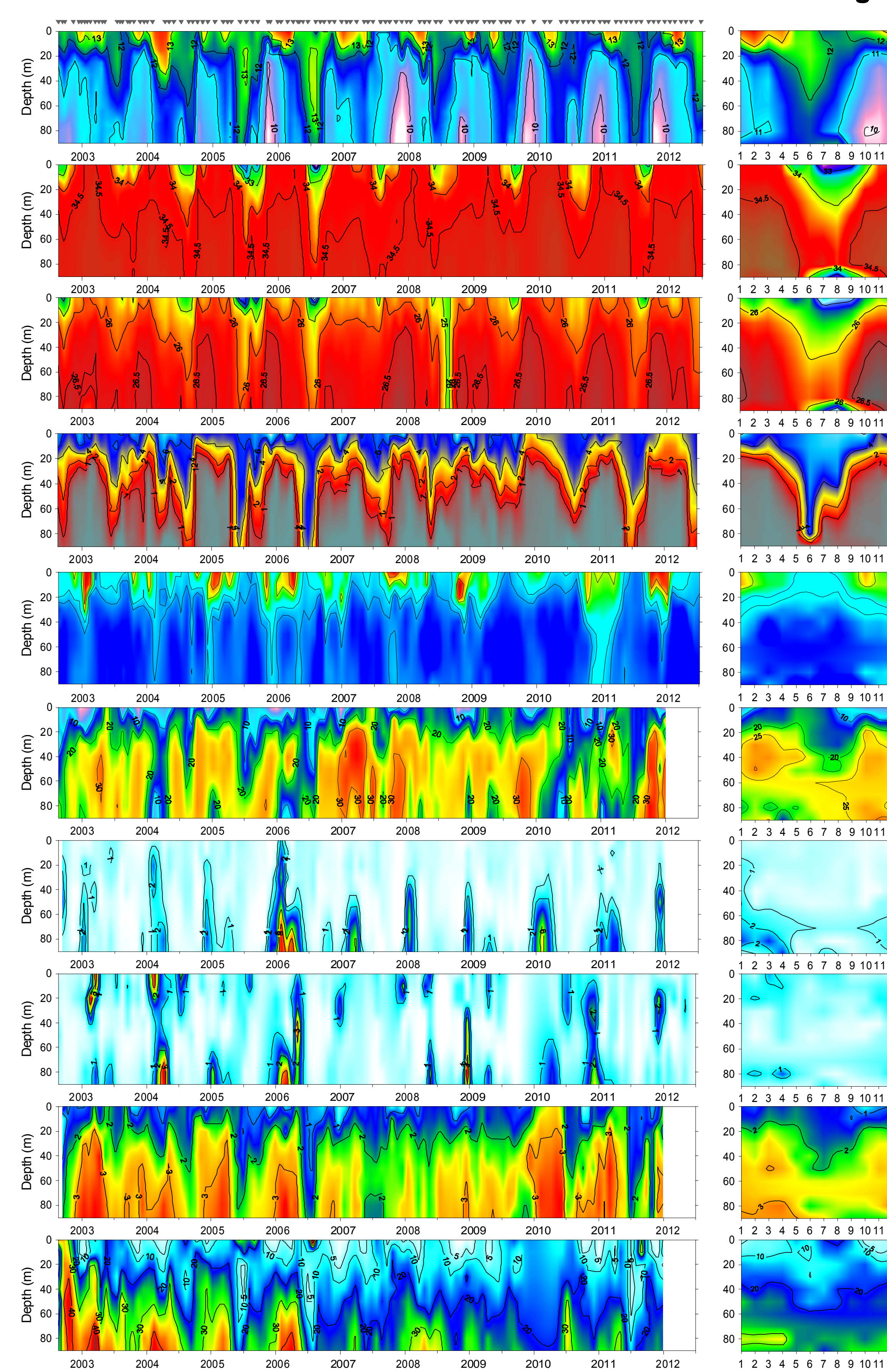
Zooplankton tows for biomass-abundance
In situ incubations for primary production and bacterial secondary production
Sediment traps for POC fluxes
Sediment samples for Siopal, alkenone-SST, diatoms, trace metals
Water samples for dissolved gases, stable isotopes
Flow cytometry
Benthic Boundary Layer metabolism

Continuous measurements (since 2009)

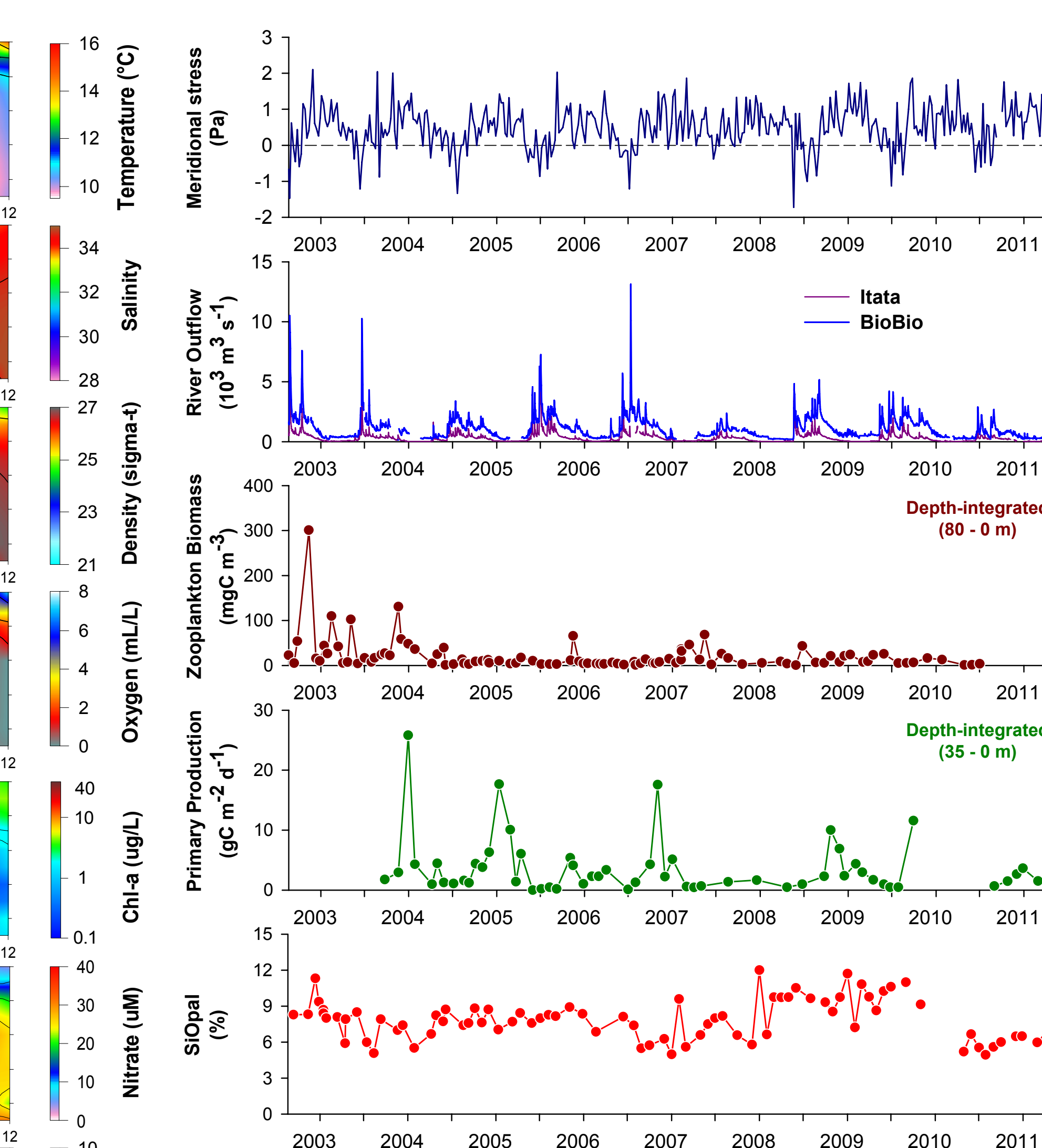
Temperature through the water column
ADCP velocities
Near-bottom dissolved oxygen

CORE MEASUREMENTS AT STATION 18

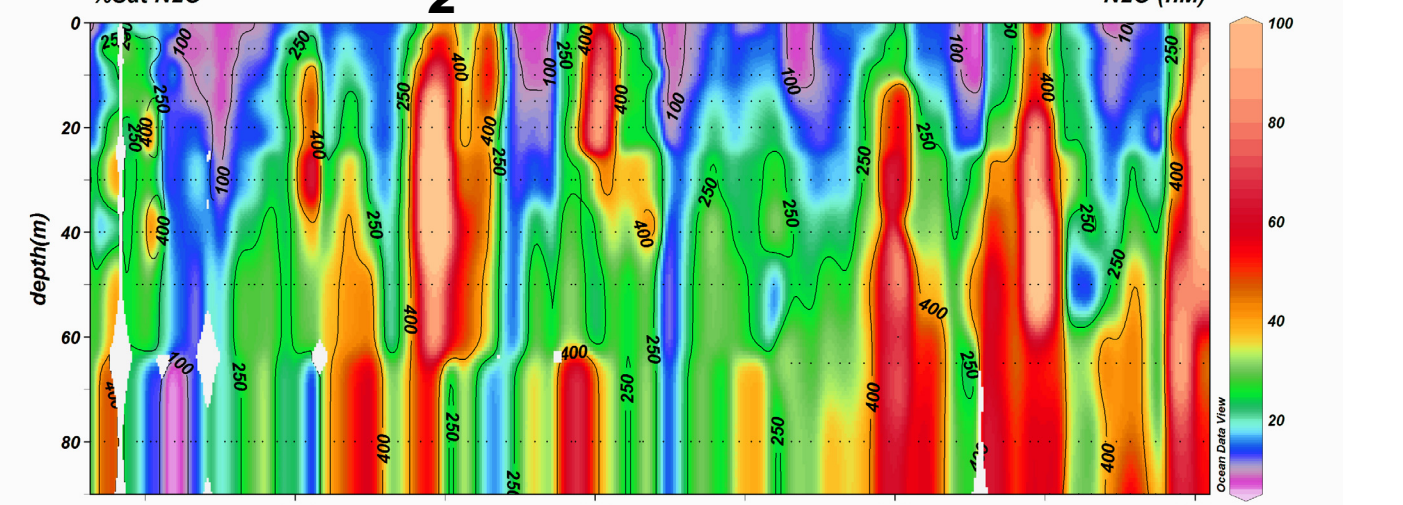
Time series



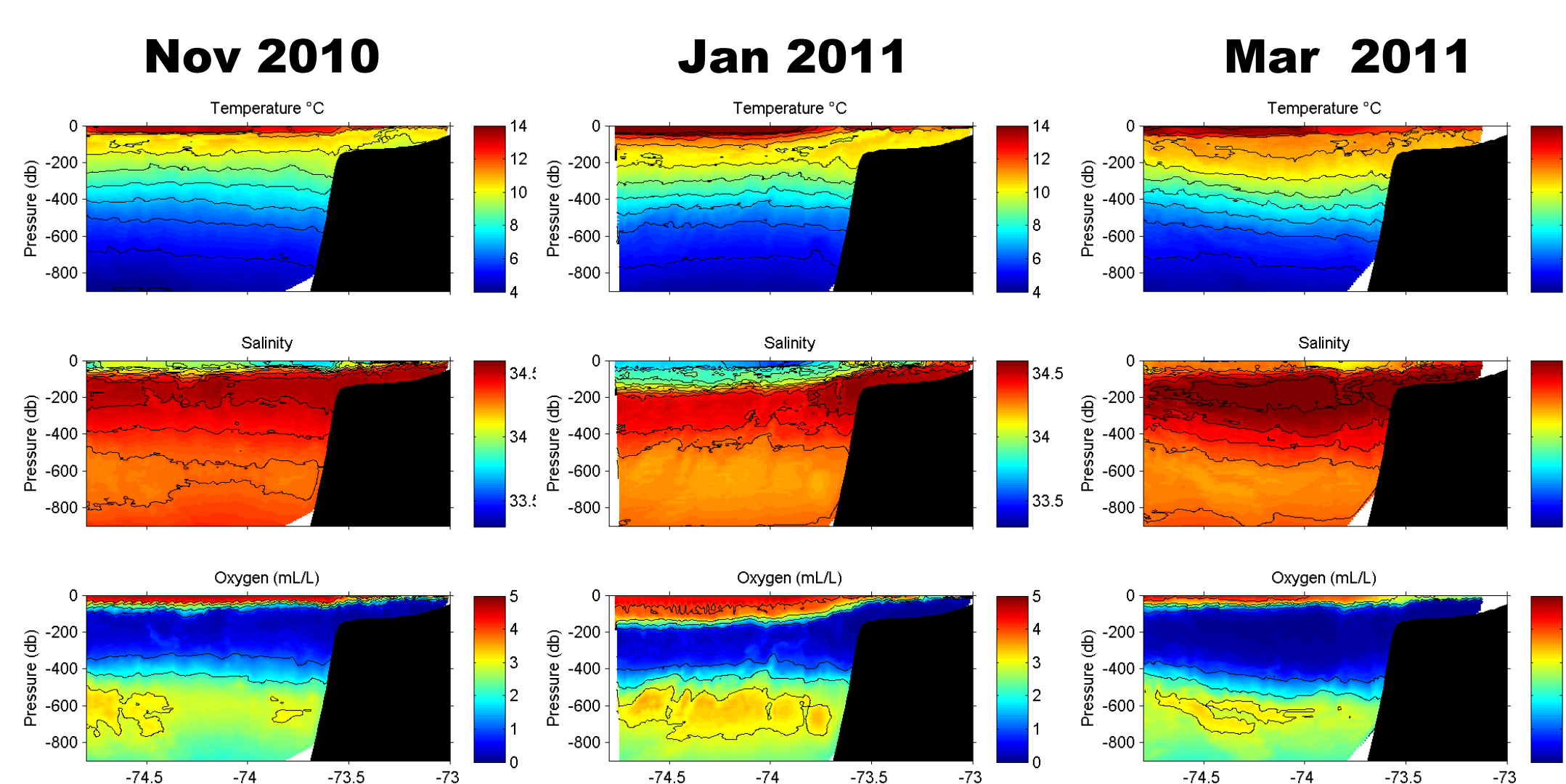
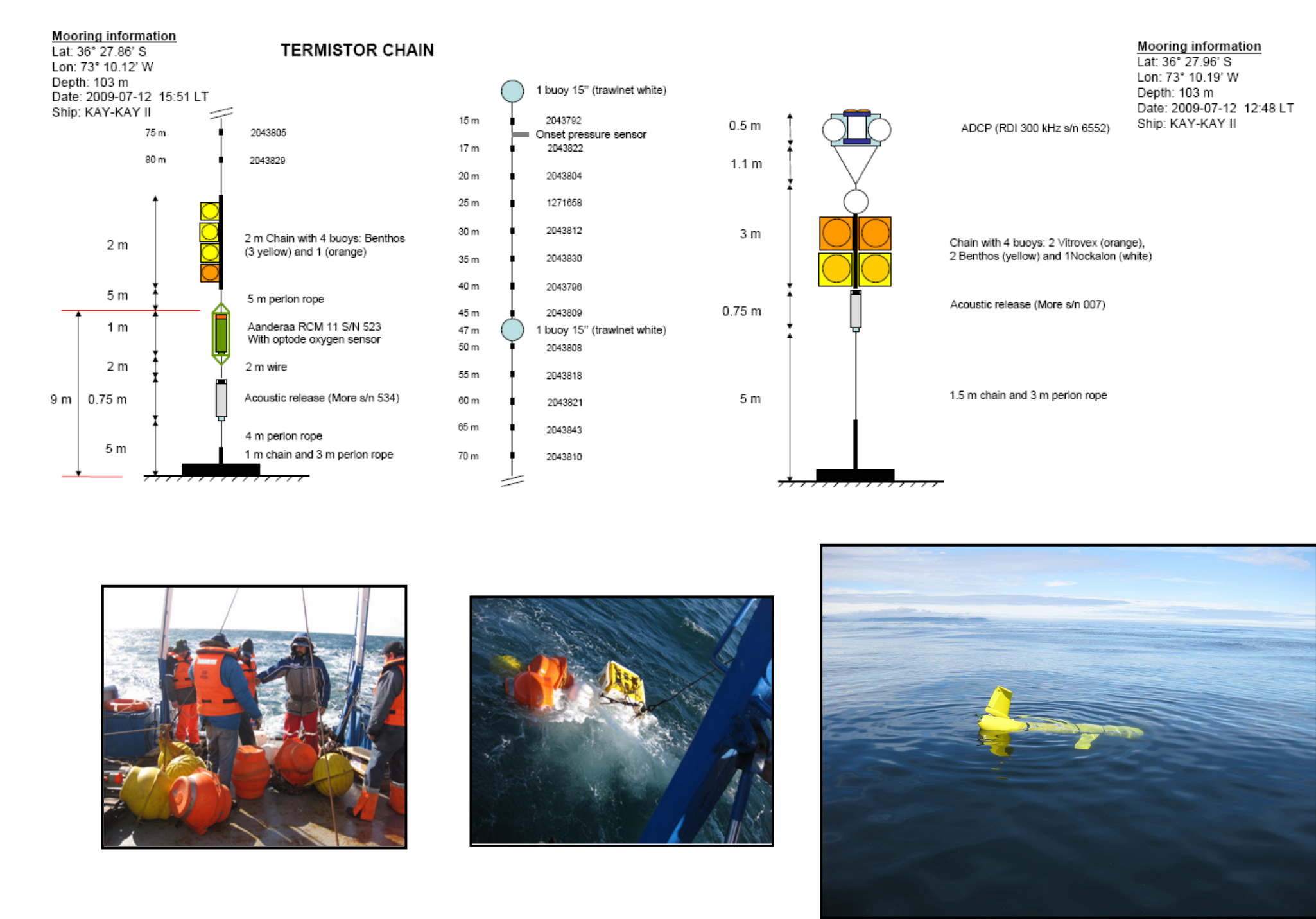
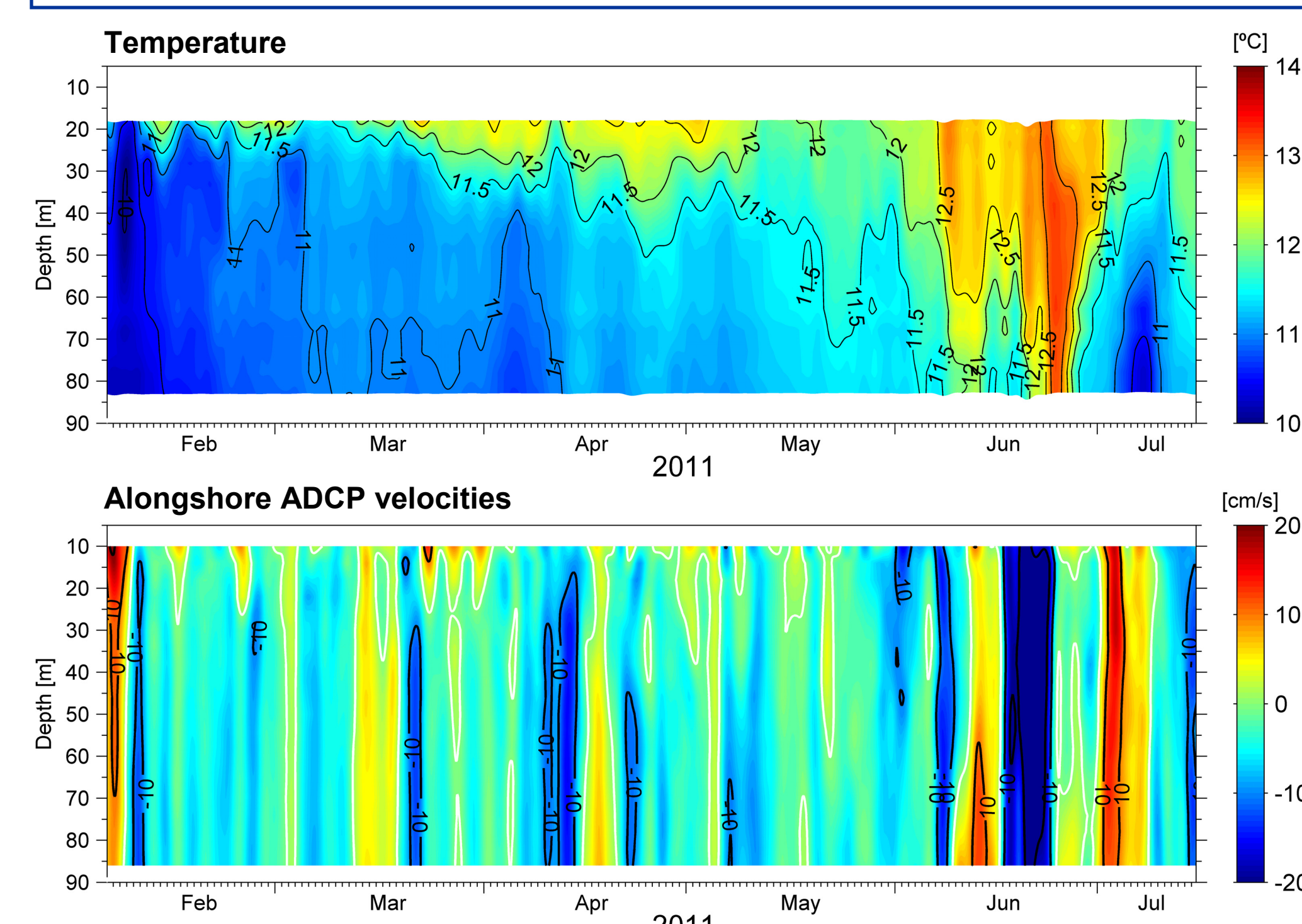
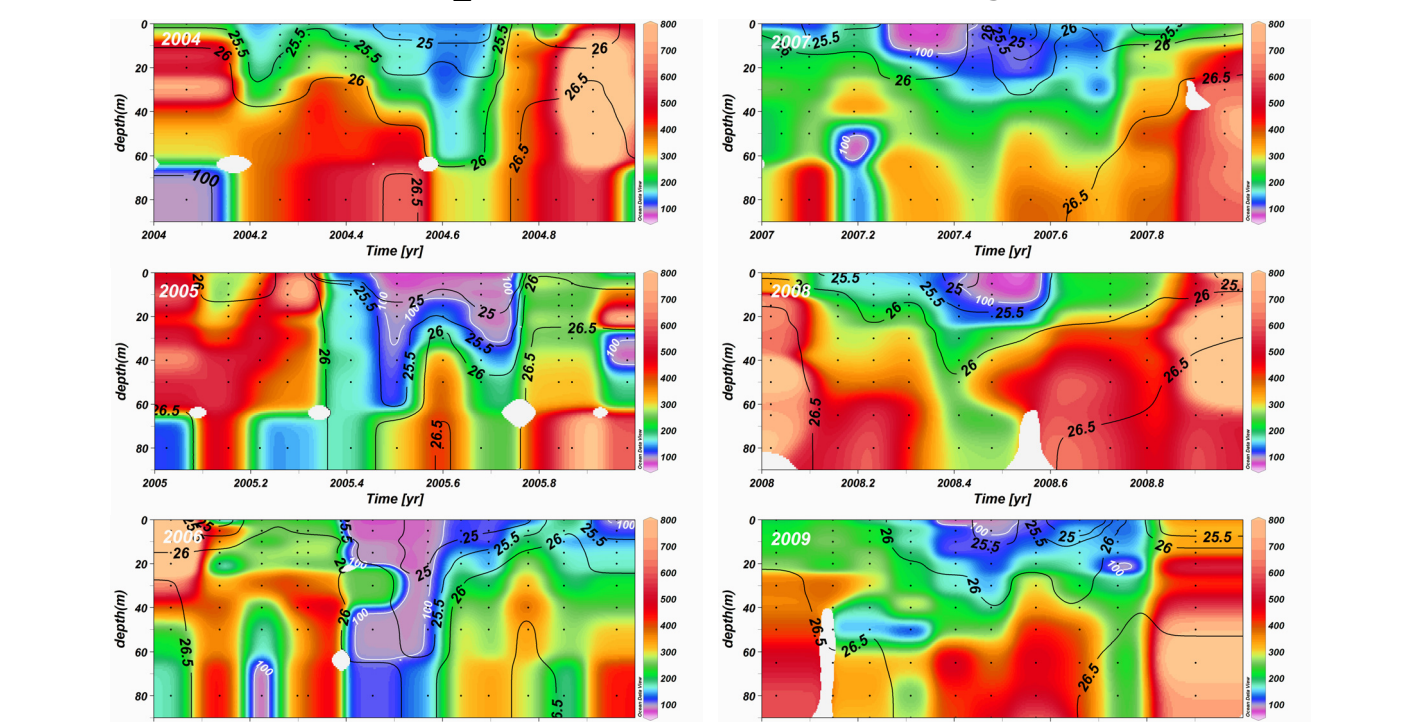
Climatologies



N₂O at Station 18



N₂O saturation vs density



Highlights of the COPAS time series

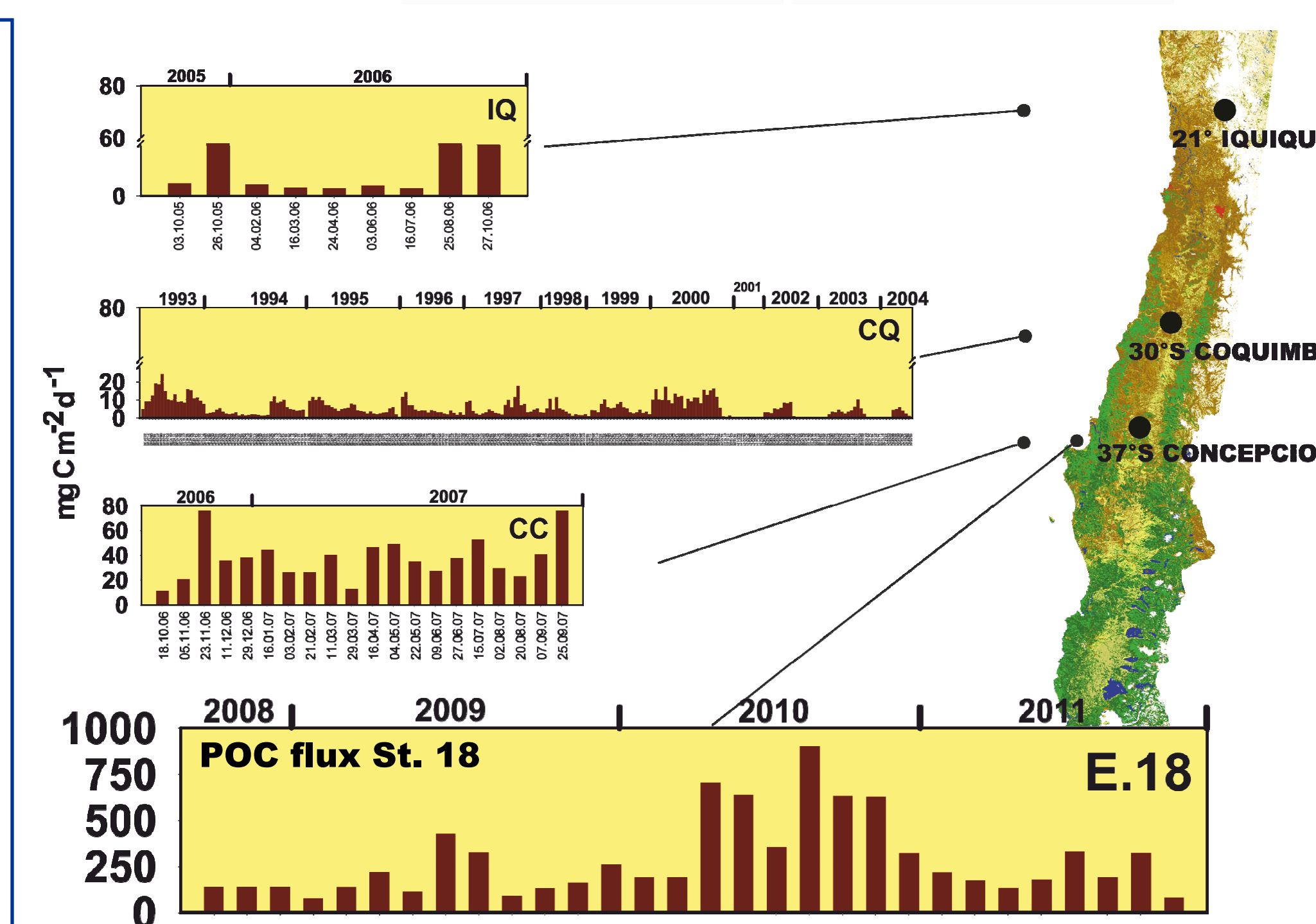
Station 18 is embedded in a region with strong seasonality and high synoptic variability in atmospheric forcing, which combined with changes in freshwater discharges and topographic effects, determines distinct temporal patterns in:

- Hydrographic structure, heat flux and mixing in the water column [1]
- Primary and secondary production [2, 3]
- Biomass and composition of phytoplankton assemblages [4, 5]
- Microbial community composition and abundance in the water column [6]
- Nitrogen cycling and release of greenhouse gases such as N₂O to the atmosphere [7-9]
- Zooplankton biomass, composition, and spatial distribution [10-13]
- Fluxes of Particulate Organic Carbon [14]
- Distribution of biogenic and lithogenic silica in the water column, and of siliceous microorganisms in the sediments, as well as their coupling with changes in freshwater discharges [15, 16]
- Distribution and abundance of fish larvae [17, 18]

This shelf area is strongly influenced by the Oxygen Minimum Zone [19], which is detected as seasonal intrusions of near-bottom hypoxic waters that may reach depths as shallow as 20 m in the summer months. Seasonal changes in bottom water oxygenation shape the distribution of zooplankton in the water column [11] and of macro- and meiofauna in the sediments [20], affecting N₂O cycling in this coastal upwelling region [21]. Occasionally, hypoxic waters may reach the adjacent shoreline and cause events of mass mortality of fish and planktonic invertebrates [22].

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