

## ANNUAL REPORT ON GEOTRACES ACTIVITIES IN CHILE

May 1st, 2021 to April 30th, 2022

### *New GEOTRACES or GEOTRACES relevant scientific results*

- The concentration of dissolved metals (<0.45 $\mu$ m) in surface estuarine waters of Chilean Patagonia archipelago has been recently analysed (2021). During austral spring, across a salinity front located at 50°S, the dFe concentrations can reach concentrations as low as 5nM despite the proximity of continental iron sources (e.g. Glacier discharges). Measurements of the concentration of metals in waters filtered by 0.02 $\mu$ m suggest that most of the dFe is in the form of colloids (Fig.1).

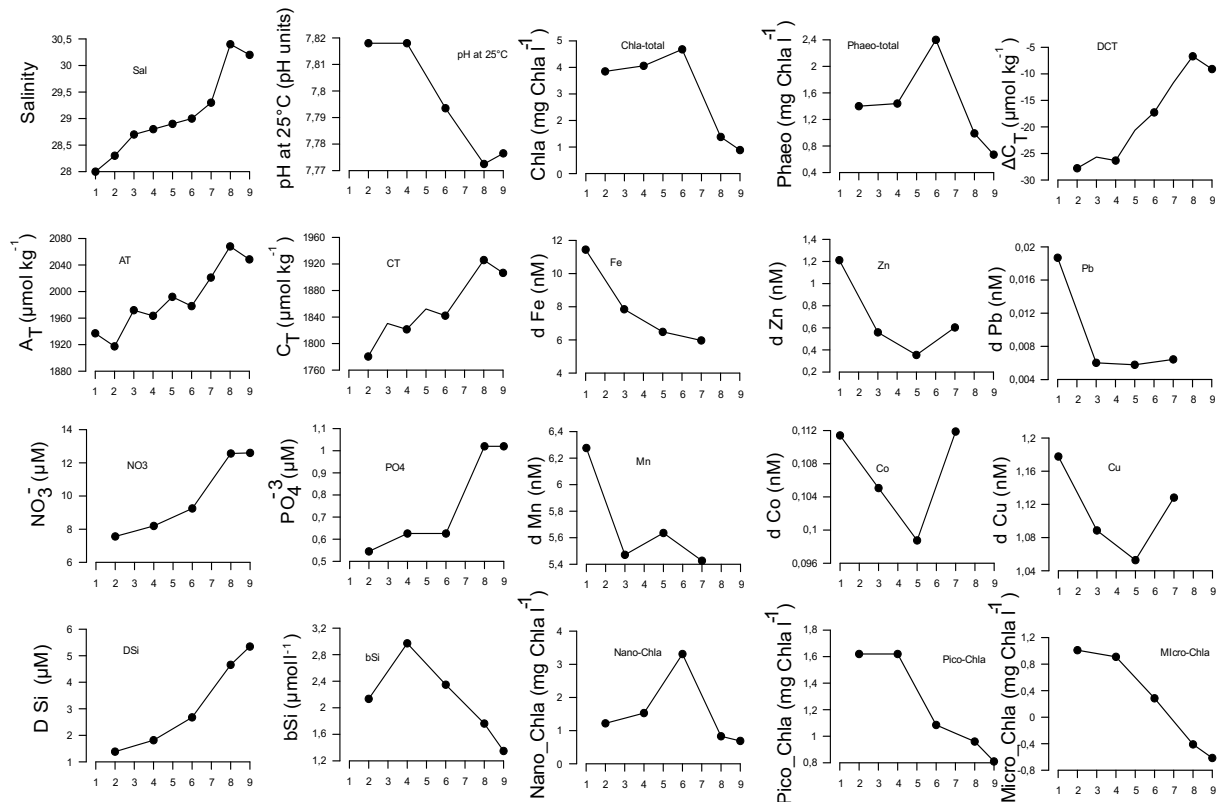


Figure 1. Concentration of dissolved metals (<0.45 $\mu$ m), macronutrients, chlorophyll a, and carbonic acid system parameters across a salinity gradient in fiord waters of Patagonia Archipelago (50°S).

- Iron addition experiments to estuarine waters suggest that the rate of macronutrient uptake in surface waters can be increased by enrichment in 5nM of unchelated iron (Fig.2).

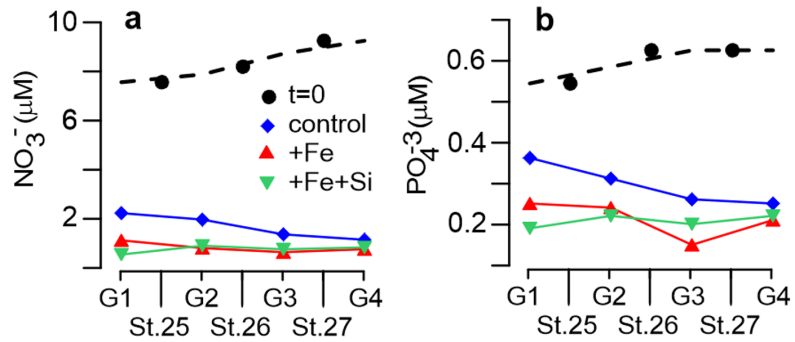


Figure 2. Surface water nitrate and phosphate at the start ( $t = 0$ ) and after three days of “on-deck” incubation ( $t = 3$ ). Dots depict the surface water concentration of macronutrients within a salinity gradient (shown in Fig.1) where experimental carboys (G1-G4) were filled. Coloured symbols depict the concentration of macronutrients (in controls and in + 5nM Fe and +5nM Fe+Si treatments) after 3 days of “on-deck” incubation.

### **GEOTRACES or GEOTRACES relevant cruises**

In January-February 2022, the Fjorflux project (a cooperation project between Germany, Chile and Argentina) carried out on *R/V Meteor* (M179) explored inland waters of South Patagonia and the Drake Passage. In this campaign, phytoplankton composition, carbonate system parameters, methane, phytoplankton size structure, phytoplankton toxine content was studied, along with sampling of surface waters for metals analysis (using a towed fish) and on-deck bottles experiments. Preliminary results suggest that, in this period of the year (austral summer-late austral summer), dFe did not play a role modulating phytoplankton dynamic. However silicic acid seems modulated new productivity and  $\text{pCO}_2$  in surface waters.

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