

# Characterization of the phytoplankton community of Espírito Santo Basin/Brazil (18°20' - 21°00' S – 41° - 37° W) by chemotaxonomy.

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## Introduction

This study is part of the “Environmental Characterization of the Espírito Santo Basin (AMBES) Project”, conducted under the coordination of CENPES-PETROBRAS (Petróleo Brasileiro S. A.). It intends to study the spatial and vertical structure of the phytoplankton community found in the Espírito Santo Basin (ESB) (18°20' - 21°00' S – 41° - 37° W)/Brazil and how they are influenced by environmental conditions and topographical features.

The ESB is characterized by underwater ridges, and banks. Its complex ocean circulation include the formation of eddies and meanders, which influence the input of nutrients (Motoki et al, (2012); Campos, (2006); Maia (2013)) (Figure 1).

HPLC/CHEMTAX were used to identify and quantify the taxonomic groups.

## Methodology

Two campaigns were conducted, one in Winter (July to September 2013) and another in Summer (March to April 2014). The sampling grid was composed of 40 collection points, defined by five transects distributed from North to South, each one sectioned in eight stations located between the 25 and the 3000 m isobaths. The samples were filtered, and filters were stored in liquid nitrogen. 6 L of seawater were filtered through GF/F 47 mm membranes (Whatman, UK). The pigments were extracted using the method described by Wright and Jeffrey (1997). All samples were analyzed in using the method established by Van Heukelem and Thomas; 2001. The samples were divided in 3 groups, defined by Cluster Analysis (Ward’s method) and CHEMTAX analysis was performed.

## Results and discussion

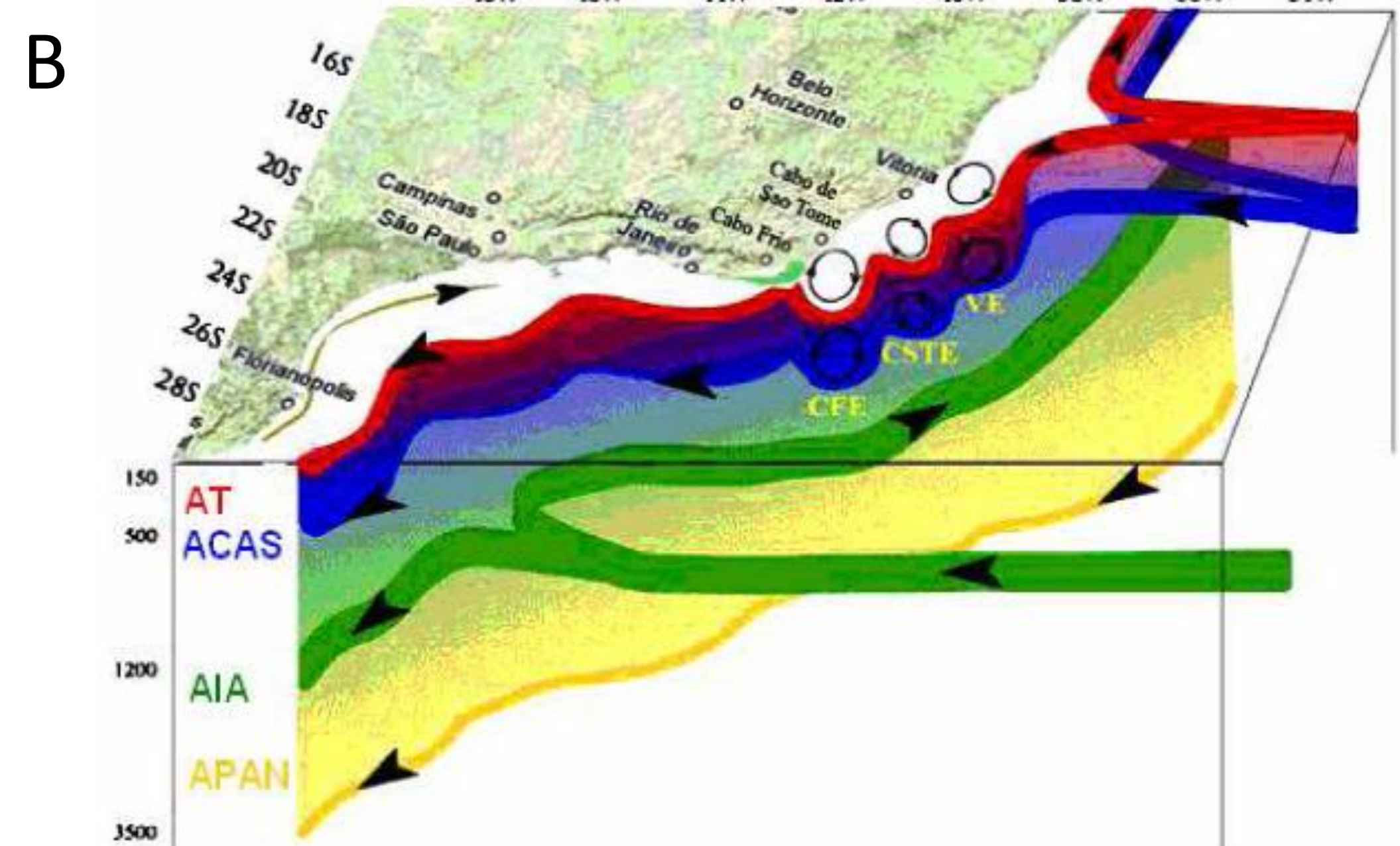
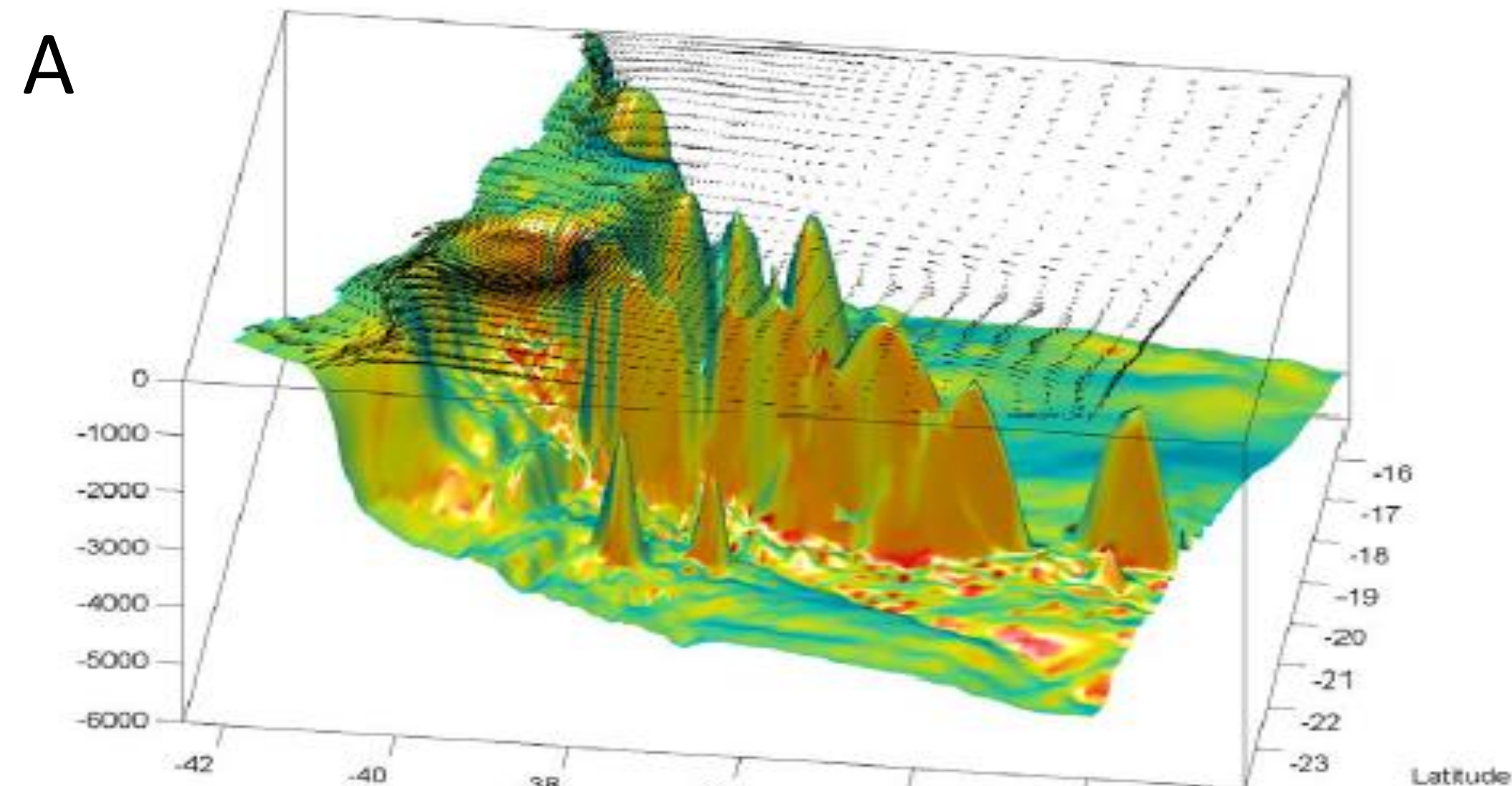


Figure 1: Topography (A) from Fragosos & Torres Jr (2009), and shelf and oceanic water circulation) (B), adapted from de Calado *et al.*, (2008)

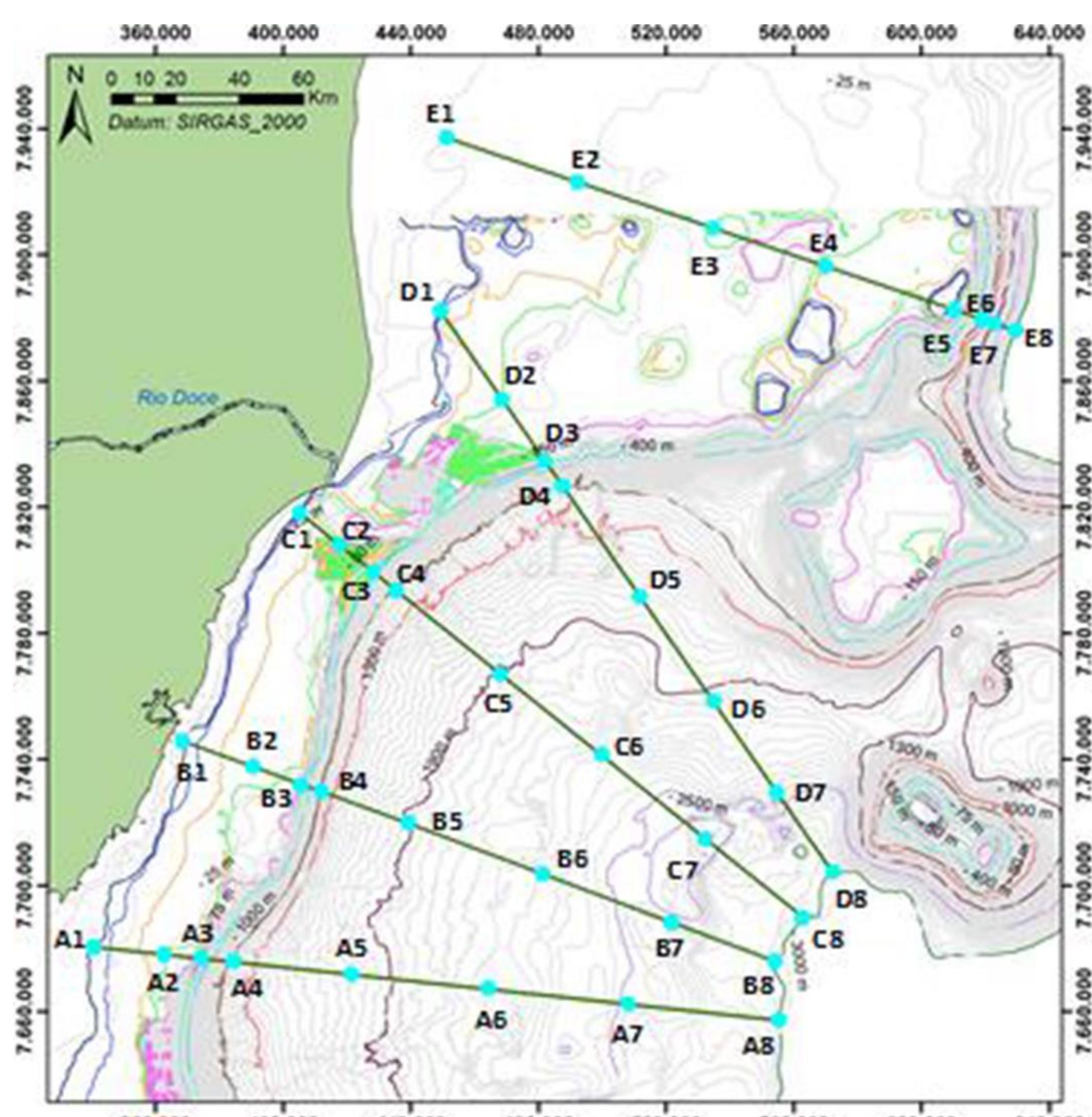


Figure 2: Study area with sampling grid

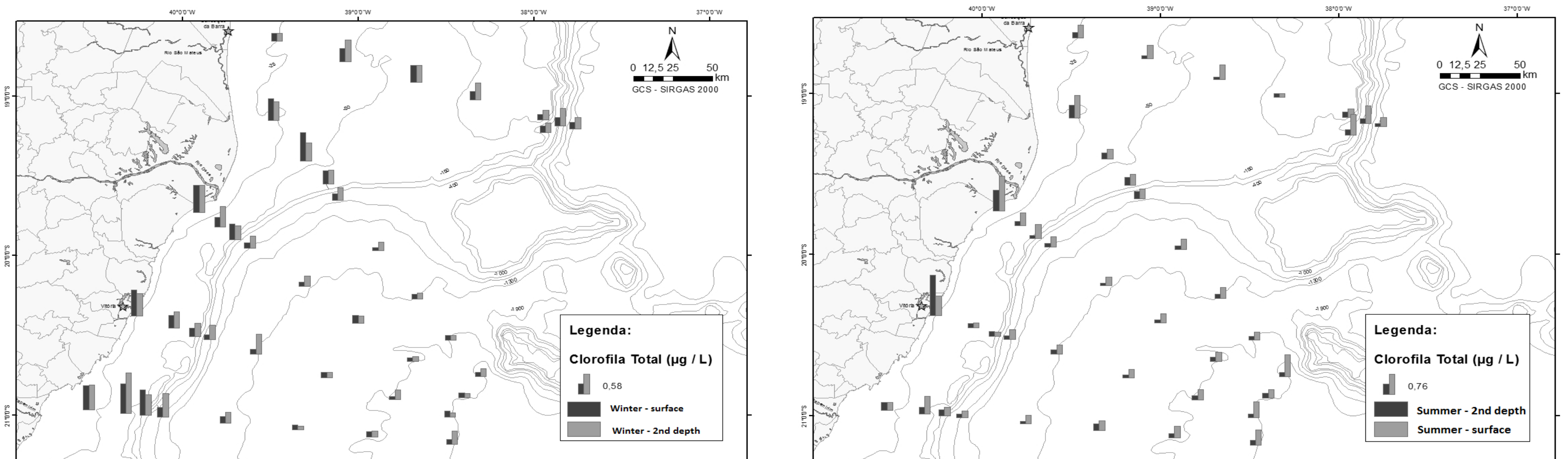


Figure 3: Total chlorophyll biomass, in the Winter (left) and Summer (right) campaigns, at sub-surface (black) and DCM (deep chlorophyll maximum) or at half-depth (grey)

Results show higher biomass on the continental shelf in Winter, and an apparent higher stratification in Summer. Stations E1, E2, E3, E4 and E5 are located on the shelf, on the Bank of Abrolho, geographically separated from the other transects by the Vitoria-Trindade Ridge (Figure 1). For all other transects, only stations 1 to 3 are on the shelf. Input of nutrients from the Doce river (Station C1) influences the coastal area. Also the proximity of Vitoria, a large city (Station B1), influences the biomass. The vortices frequently formed south from the ridge could explain the abnormal variation of biomass along the transects.

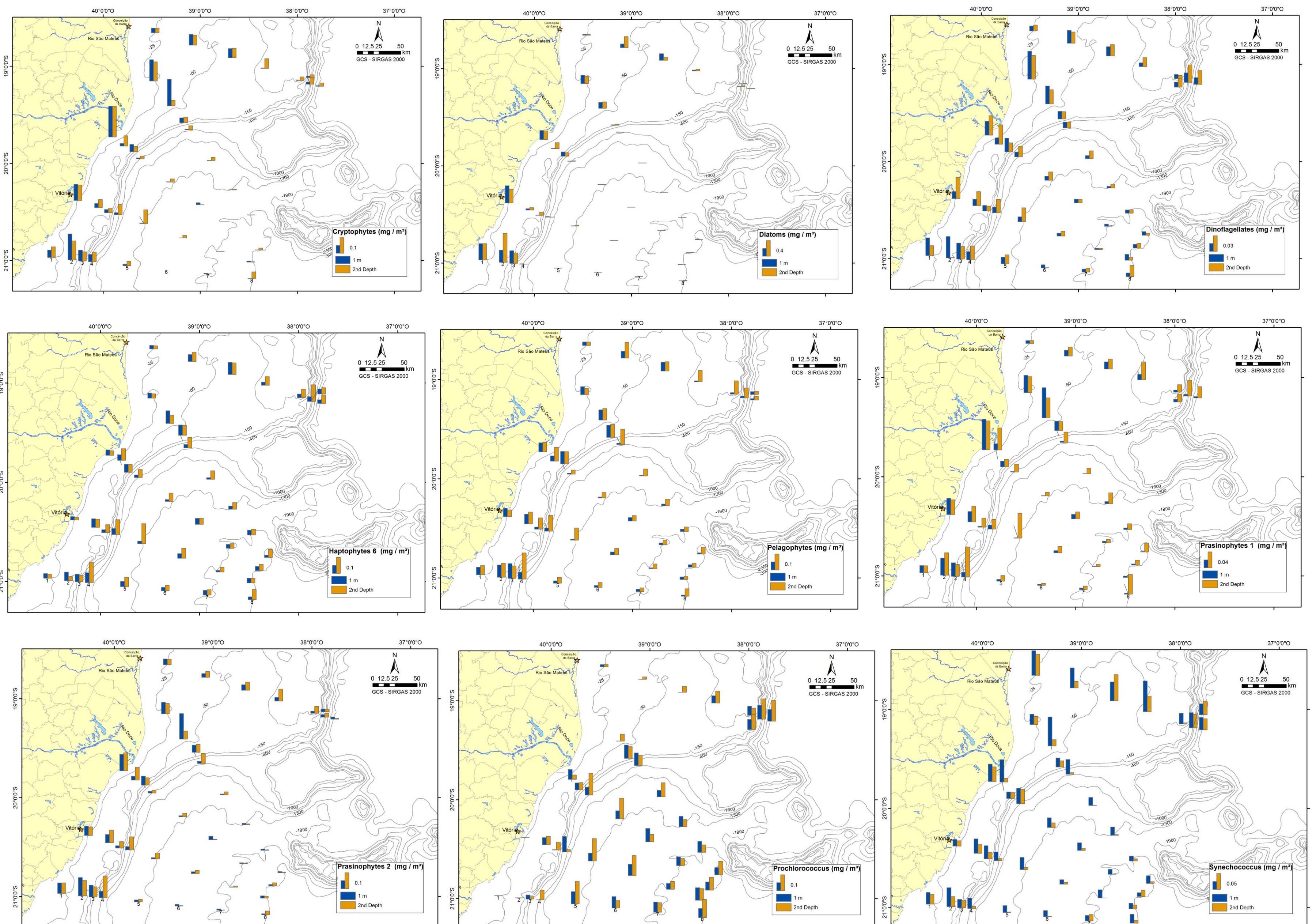


Figure 4: Spatial and vertical distribution of the main taxonomic groups (Winter 2013)

Results from CHEMTAX analysis in the winter campaign are shown at figure 4. Statistical analysis of the data will still be done (ANOSIM and SIMPER), to check similarities and differences on the bathymetric and latitudinal profiles. Redundance analysis will check the influence of environmental conditions (Temperature, Salinity, nutrients, light) on the biomass of the phytoplanktonic groups.