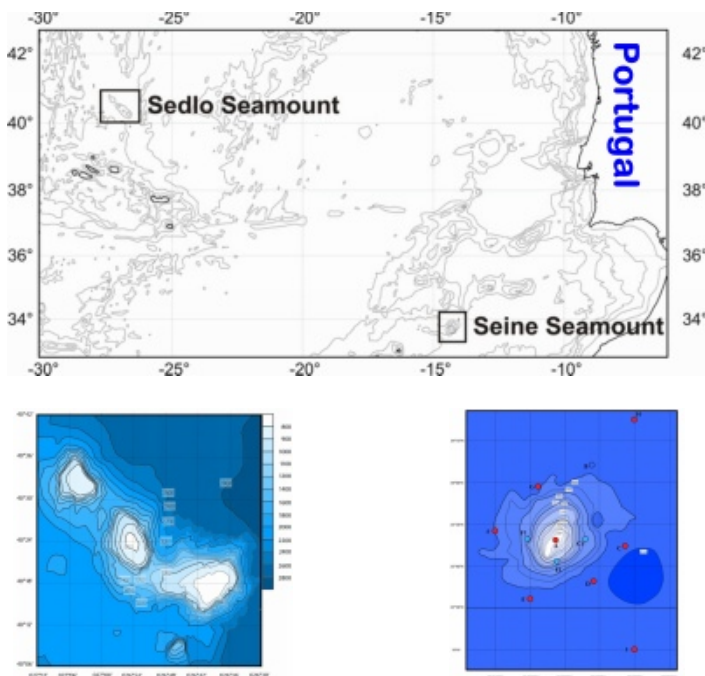


OASIS: Oceanic seamounts: An integrated study



For detailed information about the project see the [official OASIS site](#).



Oceanic seamounts are underwater mountains rising from the ocean floor and having a peaked or flat-topped summit that remains below of the surface of the sea. There are tens of thousands of them scattered throughout the world's oceans and they are considered "hotspots" of marine life (there are often large fish stocks around them) and biodiversity, having many "endemic" species (i.e. unique to seamounts). Scientists refer to this phenomenon as the "seamount effect", however the mechanisms that underlie it are poorly understood. Enclosed physical circulation due to disturbed current flow (Taylor columns), that have the potential to concentrate nutrients on or close to the summit, has been proposed as one likely mechanism.

Our objective (within the framework of the OASIS project) is to assess the impact of oceanic seamounts on the quality and concentrations of particulate organic matter (POM) transported across the topographic features. Suspended particulate material was collected at different depths (50-4000m) from two isolated contrasting NE Atlantic seamounts of different heights and biogeochemical regime, **Seine** and **Sedlo**. The sampling was carried out over a two year period at different times of the year and the nutritional quality of the organic matter (POC, PN, lipids) was determined.

The lipid (i.e. fatty) composition of suspended POM in the mixed layer (samples were taken at 50-90m mostly within the chlorophyll maximum) at both seamounts shows remarkable similarity exhibiting a mixed dinoflagellate/diatom signature. Dinoflagellates seem to dominate over diatoms at all seasons something not surprising for these latitudes and sampling depth (i.e. diatoms prefer colder waters and usually stay closer to the surface). Markers such as poly-unsaturated fatty acids (PUFAs; usually produced by phytoplankton) and phytosterols are very abundant at these depths. No discernable "seamount effect" is observed in the mixed layer with respect to the concentrations and lipid composition of suspended POM.

As particles sink deeper their composition changes due to bacterial decomposition, grazing, and aggregation/disaggregation. In short, phytoplankton markers diminish and/or are altered, whereas zooplankton and bacteria markers tend to increase. Usually labile molecules (e.g. PUFAs) disappear quickly but in some cases they are found almost all the way to bottom (albeit in small amounts) as it is the case at both seamounts in the summer.

The only two departures from this general observation are the summit of the Seine Seamount (~170m depth) and the region between the central and eastern peaks of the Sedlo Seamount (~1100m depth). Both sites have increased concentrations of PUFAs when compared with similar depths elsewhere. The samples were taken a few metres above the bottom in each case.