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Palaeoceanographic change over geological timescales in the northern North Atlantic Ocean: proposed investigations by OGS for IPY

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Thermohaline circulation in the northern North Atlantic ocean system is sensitive to changes over geological timescales, including tectonically-driven adjustments of shallow oceanic gateways controlling the exchange of deep waters with the Arctic Ocean, climatically controlled variations in sea level and sea ice cover during glacial-interglacial cycles and the episodic input of meltwater and icebergs during deglaciation of the adjacent continental margins. These processes are addressed by four projects, recently submitted by OGS as Italian contributions to the International Polar Year (IPY), that propose integrated geophysical and geological investigations of sedimentary archives of palaeoceanographic change in the deep ocean and of glacial records of the adjacent continental margins. These proposals are part of larger, bipolar IPY initiatives that involve international cooperation with partners from European and other countries, including PLATES & GATES, BIPOMAC and NICE-STREAMS.

PATHWAYS contributes directly to the focus of PLATES & GATES on the interaction of global tectonics, global thermohaline circulation and climate change. The project proposes an analysis of the linkages between tectonism and changes in oceanic circulation during two Cenozoic plate reorganizations, in the late Eocene and early Pliocene, through an analysis of palaeoceanographic records preserved in sediment drifts at up to 3 strategic sites.

The target of the EDIPO project is to reconstruct the Plio-Quaternary changes of bottom current activity off the southwest margin of Greenland of the Eirik drift, through an integrated geophysical and sedimentological investigation in order to understand the link between deep-water flow and sedimentary processes at present time, to iden-

tify major facies characterization and paleoceanographic indicators as well as correlate the new data to the existing ODP and IODP sites.

The other two projects contribute in differing ways to both the interests of BIPOMAC (Bipolar Climate Machinery) as well as those of NICE-STREAMS (Neogene Ice Streams) in sedimentary records of Plio-Quaternary change in marine and glacial systems.

GLAMAR (Glacial Meltwater and the Sedimentary Architecture of High-Latitude Continental Margins) proposes a regional analysis of the pathways of meltwater discharge from ice sheets to the ocean, using known latitudinal variation in meltwater discharge along the conjugate margins of NW Europe and Canada as a guide to identifying the morphological and stratigraphic signatures of glaciofluvial sediment transfer across the shelf and slope to the deep ocean.

EGLACOM proposes ato study the sedimentary architecture and seafloor morphology of an ice stream dominated marine depositional system of the Arctic margin (southern Svalbard) in order to reconstruct the margin evolution from the Pliocene to the last deglaciation, to obtain a paleoceanographic record that allows the reconstruction of the margin dynamics since the Pleistocene in relation with the climatic changes at different temporal scale.