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Holocene laminated biogenic mud in Wood Bay (western Ross Sea, Antarctica): geochemical data and preliminary paleoclimatic interpretation.

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The study of LGM and Holocene marine sediments is an important goal in Antarctic research and needs high-resolution sequences to reconstruct paleoclimatic events in detail. Literature reports a large number of data coming from inner-shelf bays and fjords, especially around Antarctic peninsula, but also from western Ross Sea.

In this note we discuss compositional data from a gravity core (BAY05-45c; 74° 09.7' S, 165° 57.7' E; water depth: 1058 m; core length: 445.5 cm) collected in 2005 during the Italian PNRA cruise into the inner part of Wood Bay, in front of the Aviator Ice tongue. Wood Bay sea floor morphology is charcterised by a narrow basin, deeper than 1,000 m, oriented WNW-ESE, and transversally connected, by a 800-m deep sill, to the Drygalski basin, streching NE-SW.

Core sediment is composed by laminated biosiliecous mud, with a strong hydrogen sulphide odour and black in colour. Within a few days from core sampling, sediment became oxidized: laminae colour ranges from dark (from dark olive grey to black) to light (from olive grey to olive). Some lighter laminae have cotton-like texture. Data set include X-ray images, magnetic susceptibility, AMS 14C dating, organic carbon, biogenic silica, XRF-scan of major and minor elements. Discussion of the data will point out inferences about sedimentary processes, paleoproductivity and oceanographic conditions during the Holocene.

The most apparent feature is the occurrence, down-core, of at least two intervals of increased productivity, characterised by higher organic carbon and biogenic silica. Within such intervals, a few cm-thick levels show peaks of biogenic silica, as well as of barium, which correspond to relatively lows in organic carbon contents. Organic carbon content is higher in darker laminae, whereas lighter and fluffy laminae display an increased percentage of biogenic silica. Such levels probably mark a rapid and not persistent change in phytoplankton assemblage compositions.