

Benthic fluxes and early diagenesis processes in Adriatic Sea

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During the last decades various researches in the Adriatic and Ionian Sea allowed the individuation of different area characterized by various early diagenesis environments that generate dissolved fluxes at the sediment-water interface with different intensity.

North of the Po River a thin and discontinuous band of terrigenous fine carbonate sediment and with different reactivity of organic matter produces benthic fluxes extremely variable in functions of the fresh organic matter entered by the main rivers

In front of the Po River a limited area, with high sedimentation rate and high continental and autochthonous organic matter inputs, generates high nutrient benthic fluxes.

In the western Adriatic sediments are characterised by progressive southward decrease of sedimentation rate and reactive organic matter that generate decreasing benthic fluxes. The central Adriatic Sea bottom sediment area is characterized by prevalently carbonate sediments and low fluxes of nutrients due to little organic and inorganic inputs and to precipitation of authigenic mineral.

In the Meso-Adriatic and South Adriatic Depression low sedimentation rates and strongly reworked organic and inorganic matter produce very low benthic nutrient fluxes.

In Ionian Sea slope sediments are characterized by very low particulate inputs and by negative fluxes of DIC acting in this way as CO₂ traps while basin sediments show higher benthic fluxes due to increases of organic matter inputs.

AMERIGO: A new benthic lander for dissolved flux measurements at sediment-water-interface

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Amerigo is a new autonomous and automatic benthic lander for the measurements of dissolved benthic fluxes at the sediment-water interface. The lander is able to measure fluxes of nutrients such as ammonium, nitrites, nitrates, phosphates and silica, gases such as oxygen, carbon dioxide and methane, trace elements such as heavy metals, and also other dissolved pollutants resulting from human activity. AMERIGO is able to operate from transitional environments to continental shelf and abyssal plain. The Lander can include various components, at present it is equipped with 3 benthic chambers for measuring the fluxes at the water-sediment interface and is prepared to host a microprofiler and other benthic instruments (mini-penetrometer, gravimeter, etc.). The 3 benthic chambers are equipped with a water sampler, which also allows injection of tracers, a system for the refilling of the consumed oxygen (Oxystat) and sensors for pH and dissolved gas monitoring (oxygen, methane and in future CO₂). Outside the benthic chambers a CTD probe for measuring the chemical-physical parameters (temperature, conductivity and pressure) and a niskin bottle for the sampling of the water column are present. The lander is equipped with all mechanisms for the dipping (ballast weights), positioning on the bed, raising (a timed release mechanism (burn-wire type) for the release of the ballast and glass spheres for the flotation) and recovery (radio transmitter, GPS position system and flasher) on board. A useful property of AMERIGO is the modularity and flexibility, that is different components, which can be assembled and programmed on the basis of needs and of the environmental conditions in which it will operate.

After the two first testing cruises early results of the AMERIGO functioning will be presented.