

How high frequency benthic station helps to understand coastal ocean carbon dynamics

**BRUNO BOMBLED¹, CHRISTOPHE RABOUILLE²,
OUALID AOUJI³, GILLES BUCHHOLTZ³ AND
ALEXANDRE BLIN³**

¹LSCE -CNRS

²LSCE CEA-CNRS-UVSQ

³CNRS

Presenting Author: bruno.bombled@lscce.ipsl.fr

In recent years, the attention has been focused on high intensity events. Floods are for example responsible for massive particulate inputs to the coastal area. Rivers provide the ocean with organic matter and macronutrients which drives the productivity of the coastal ocean and, consequently, the characteristics of benthic ecosystems. Around 75% of carbon inputs enters the coastal ocean during flood times, without understanding the evolution of this material between degradation, export or burial. The impact of these events on the marine environment and ecosystems is still unknown, mainly due to the difficulties associated with measuring time series during these events. In order to remedy this, the use of autonomous high-frequency observation stations of the coastal environment, in the sediments and in the water column, has been proposed.

The OCEANIS group in LSCE developed a benthic station which has been improving regularly since 2008. Today this in situ device allows measurements of the vertical distribution of oxygen, a quantitative tracer of organic carbon mineralization, with a vertical resolution of 200 μm for a deployment of 2 months by daily time step. In order to take measurements in an area of intact sediment, the profiler moves sideways for a distance of 1.5 meters. Recently, Clark type oxygen micro-sensors were replaced by micro-optodes, less fragile and offering higher measurement stability and vertical resolution. The enhanced benthic station was deployed near the Rhône river delta at 20 m depth, for periods of immersion of 2 months. Here, we show preliminary data collected by teletransmission during a pre-flood period in November 2020 and their first biogeochemical discussion.