



Towards a trawling-affected sediment budget on the Galician shelf (NW Spain)

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This case study uses vessel monitoring data in conjunction with multiple sedimentological and geochemical proxies on sediment cores to quantify the effect of bottom trawling on a source-to-sink budget analysis of a late Holocene mid-shelf mudbelt.

The long-term effect of bottom trawling on seafloor sediments is largely unknown and the existing studies are contradictory. This is particularly surprising as mud depocenters on shelves are of great economic and environmental interest because they represent areas where fishing and other ground disturbing activities have high impacts, and the associated ecosystems hold one of the highest biodiversity.

The Galician Mudbelt, exemplary for many other mudbelts worldwide, is located on the open and narrow continental shelf of NW Iberia and is widely affected by chronic (continuous and intensive) commercial bottom trawling. In this study we present the results from 2.800 km of seismo-acoustic data used to calculate a high-resolution isopach map that represents the Late Holocene (< 5.3 cal ka BP) mud accumulation pattern on the shelf. In conjunction with sediment core data, we have calculated a sedimentary budget of this mudbelt and for the shelf sediment export for the Late Holocene.

Quantifying trawling induced sediment disturbance to a mudbelt is difficult. We here present vessel monitoring data from one year 2011-2012 to quantify bottom trawling activity. Bottom trawling activity can be identified by filtering the vessel monitoring data by vessel type, vessel speed and geometry of the trawl path. The results from this show geographically detailed bottom trawling activities with varying local trawling intensities depending both on legal restrictions and bedrock geomorphology. In conjunction with this data, heavy metal sediment analysis (e. g. As, Zn, Cr, Pb) and isotope dating (e. g. Cs-137, Pb-210) will be evaluated in a next step for the suitability to calculate the depth of trawling induced sediment disturbance. From this data we plan to calculate a trawling affected sediment budget for the Galician shelf. We present here our first calculations.

While previous studies show that shelfal mud depocenters represent a major sink for sediments on shelves little is known about the effect trawling has on sediment flux calculations. This study aims to contribute rare quantitative data from a high-energy shelf environment that helps develop a more in depth understanding of the significance of bottom trawling towards material fluxes. Such an analysis may hold serious implications for a better understanding of ecosystem shifts and thus be of economic interest to fisheries.