# Volumetric facies analysis of a Late Holocene mudbelt environment on the Galician shelf (NW Spain).

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This case study uses geographically dense, shallow-seismic data from the Galician continental shelf in order to quantify the sedimentary volume of a confined mudbelt depocenter.

Mud depocenters on shelves are of particular economic and environmental interest because they represent areas where fishing and other ground disturbing activities are most intense and ecosystems hold some of the highest biodiversities. Also, up until now, studies of sedimentary shelf systems have mainly focused on the temporal and special development of sedimentary facies in relation to sea-level changes while little is known about the sedimentary budgets and fluxes that control these systems.

Budget analyses of sedimentary shelf environments are, difficult to accomplish and only very few studies exist to this date that have attempted this due to the required high geographic density of shallow-seismic reflection profiles and sediment cores to calculate sedimentary volumes in an adequate accuracy.

In this study we use 1500 km of new (May, 2011) shallow-seismic (PARASOUND) data in conjunction with multiple sediment cores to calculate a high-resolution isopach map that represents the Late Holocene ($< 5$ cal ka BP) mud accumulation pattern on the shelf.

- This spatially accurate representation permits a more accurate analysis of material pathways in the modern shelf system.

- The mudbelt isopach map also allows for a precise sedimentary budget volume calculation of a mudbelt.

- Sedimentary source and flux calculations show direct input influence of previously disregarded riverine sources along the Galician coast.

- This is especially noteworthy in the wake of urbanization of watershed areas and associated higher erosion rates and consequent higher riverine sedimentary load.

While previous studies show that shelfal mud depocenters represent a major sink for sediments on shelves little is known about their importance for global material flux calculations. This study contributes rare quantitative data from a high-energy shelf environment that helps develop a more in depth understanding of their significance within global material fluxes.

In addition, a high resolution spatial record of this modern mudbelt will enable researchers to analyze future seasonal or annual shifts of material pathways and spatial distribution and volume of this facies. Such an analysis may hold serious implications for a better understanding of ecosystem shifts and thus be of economic interest to fisheries.