

### THREE-DECADAL DYNAMICS OF INNER SHELF MULTI-SCALES BEDFORMS, SOUTH AQUITAINE, SOUTHEAST BAY OF BISCAY.

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This study aims at investigating the sea-bed morphodynamics of south Aquitaine inner shelf on the area named "La Salie" (150 km<sup>2</sup>, western Atlantic French coast), with a descriptive and comparative analysis (time lapse of 29 years) of geophysical and sedimentological datasets.

In a water depth extending from 24 to 50 m, four scales sedimentary bodies types are observed: first order scale corresponds to cross-shore large "morphologic ridges". Second order patchy sorted bedforms are constituted by alternating medium to fine sand patches, (thickness ranging from 0.5 to 2 m), cut by smaller elongated coarse sediments depressions. As a major result, the sub-bottom profiler data reveal a northeastern imbrication of this coarse sediment blanket and sand patches. Third order bedforms corresponds to groups of sand dunes which lie on wide coarse sediments areas. At last (fourth order), the entire inner shelf is covered by N15° oriented-wave generated ripples, that are larger (2.2 m wavelength) in the coarse sediments than in the fine sediments (0.3 m wavelength). Over the past 29 years, at a large scale of observation, patchy sorted bedforms remain remarkably persistent, as well as their overall appearance. However, at a smaller scale, weakly but constant movements have been observed: elongation of coarse depression at their extremity (4 m/year with a maximum of 20 m/year), and some coarse/fine sediments boundaries are moving towards the north-east (1-4 m/year with a maximum of 15 m/year) or towards the south-east (3-6 m/year). The general movement is maximum between 25 and 30 m water depth and remains shoreward as well as the third order submarine dunes migration. The persistence of sorted bedforms would be the consequence of the sediment sorting feedback and recurrent storm events. Furthermore, preliminary numerical modeling results appear to be promising for understanding the origin of the longshore (north) component.

### LARGE INTERNAL TIDAL CURRENTS OBSERVED OFF THE LANDES COAST (44°N)

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The ASPEX experiment has deployed 4 ADCP moorings along a transect located off the Landes coast (44°N) for 2 years. The currents in the tidal frequency (from 1h to 30h) have been analysed and have shown a surprisingly high seasonal variability. In summer and Autumn (from July to the beginning of November), the tidal amplitude of the bottom currents by depth of 60m (ASPEX7) and 80m (ASPEX8) reach 40 cm/s during spring tide. The rest of the year, the tidal amplitude barely reaches 10 cm/s. Moreover, the tidal bottom currents exhibit significant low-frequency variability that does not follow the local barotropic spring/neap cycle.

It is shown that the strong tidal currents observed during summer are due to the internal tide propagation. The barotropic current (depth averaged currents) contribution is less the one third of the total tidal current. When the seasonal stratification breaks down, the internal tides vanish and the amplitude of the tidal currents decreases dramatically.