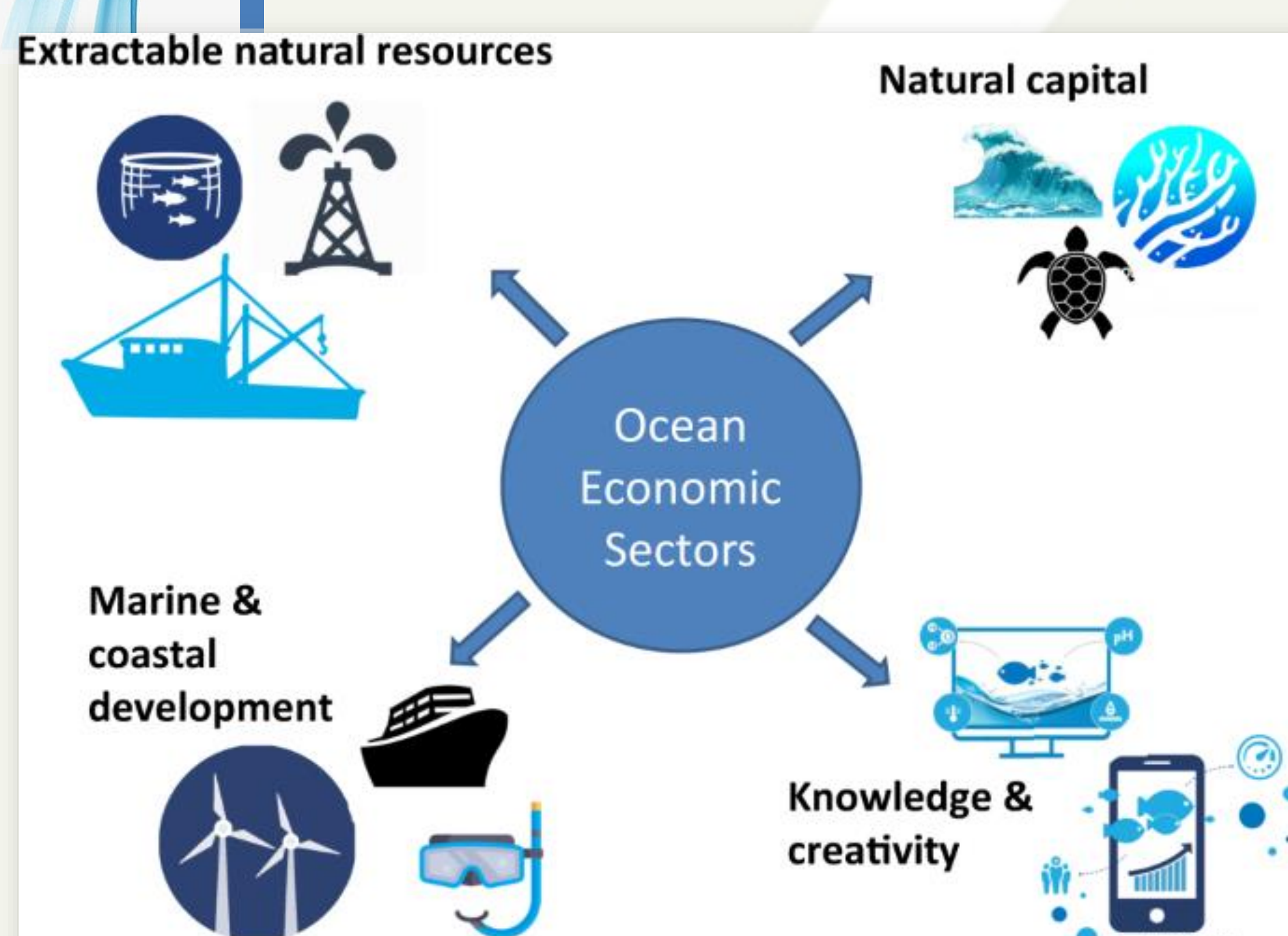# Using seismostratigraphy as a tool for the development of the ocean economy

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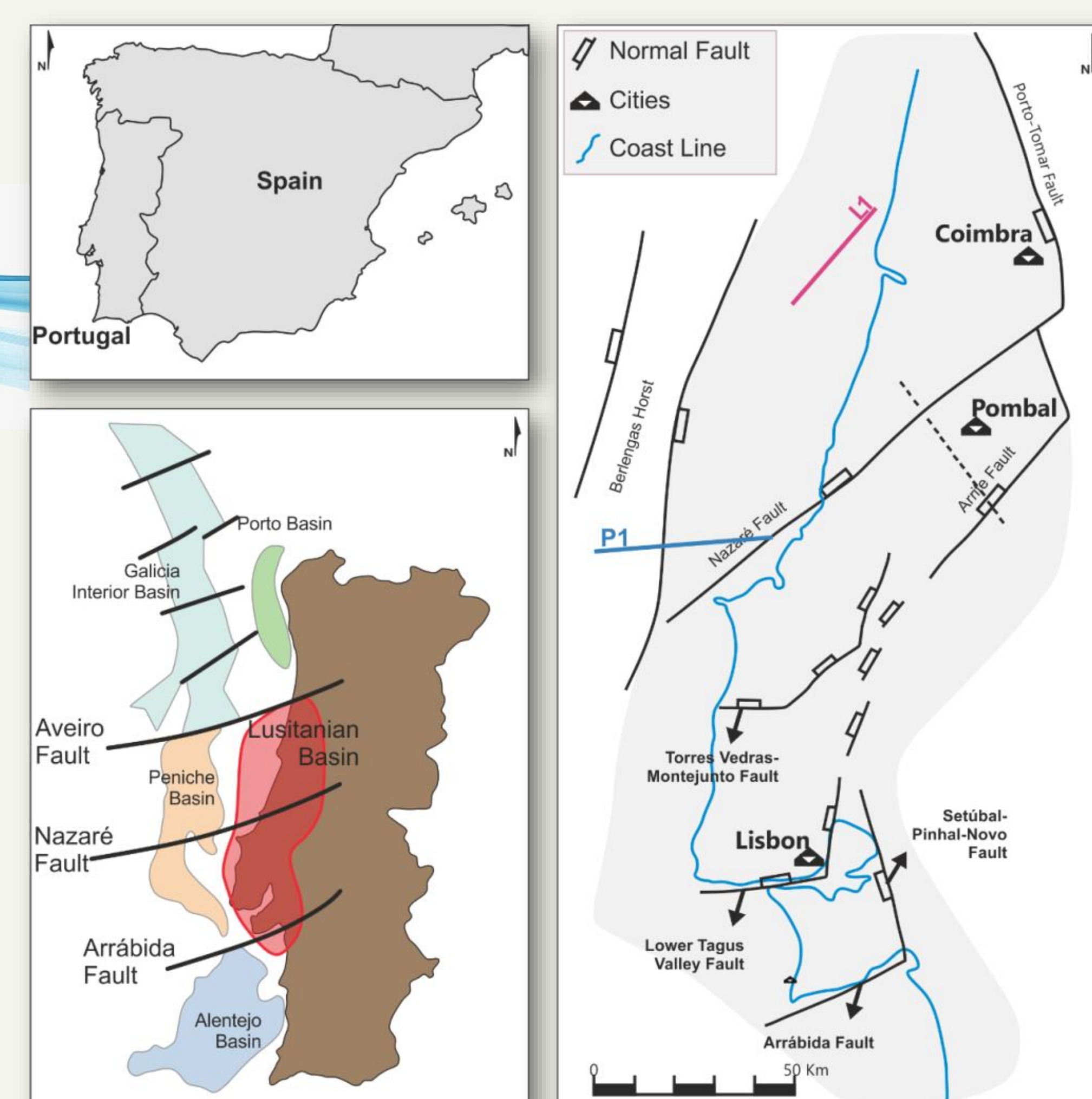Roberto Fainstein [rfain39@gmail.com]

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The oceans are vast and partially unknown territories with millions of years of age and have always represented a fundamental part on our development as a civilization. The Ocean Economy is defined by the OECD as the sum of the economic activities of ocean-based industries, together with the assets, goods and services provided by marine ecosystems - "The Ocean as a Sustainable Source of Economic Grow" – making by 2030 **marine and seabed mining** an emerging industry.

Many techniques and methods have been developed to achieve the study of the oceans depths and Seismic Stratigraphy was one of these. This is a method which makes it possible to study rocks and specific features in the deep subsurface and it relies on seismic data - travel time for artificially acoustic waves to radiate from the subsurface and to reach the geophone/hydrophone at the station (two-way time). Later, the geologists can interpret seismic data (computer analysis) applying sequence stratigraphy, which makes it possible to recognize what lays on the subsurface of the ocean.
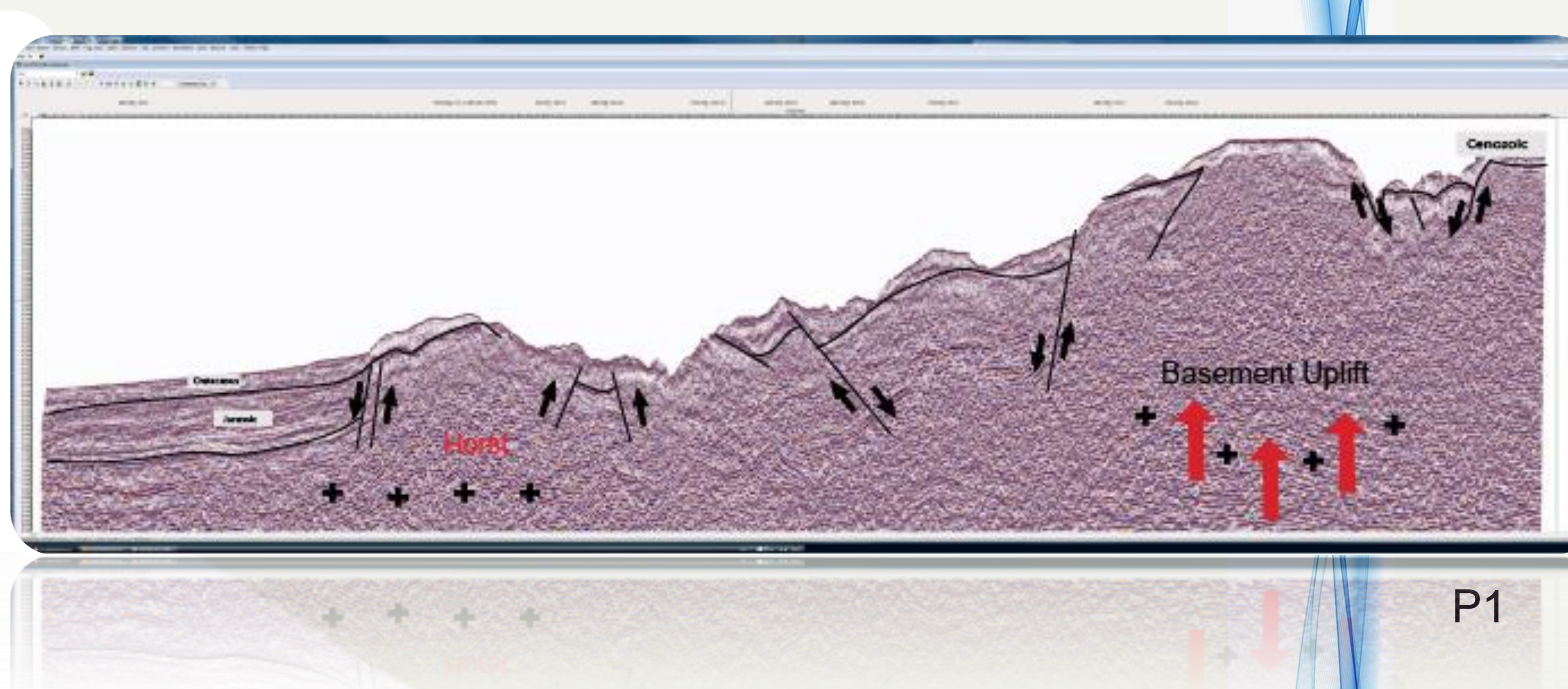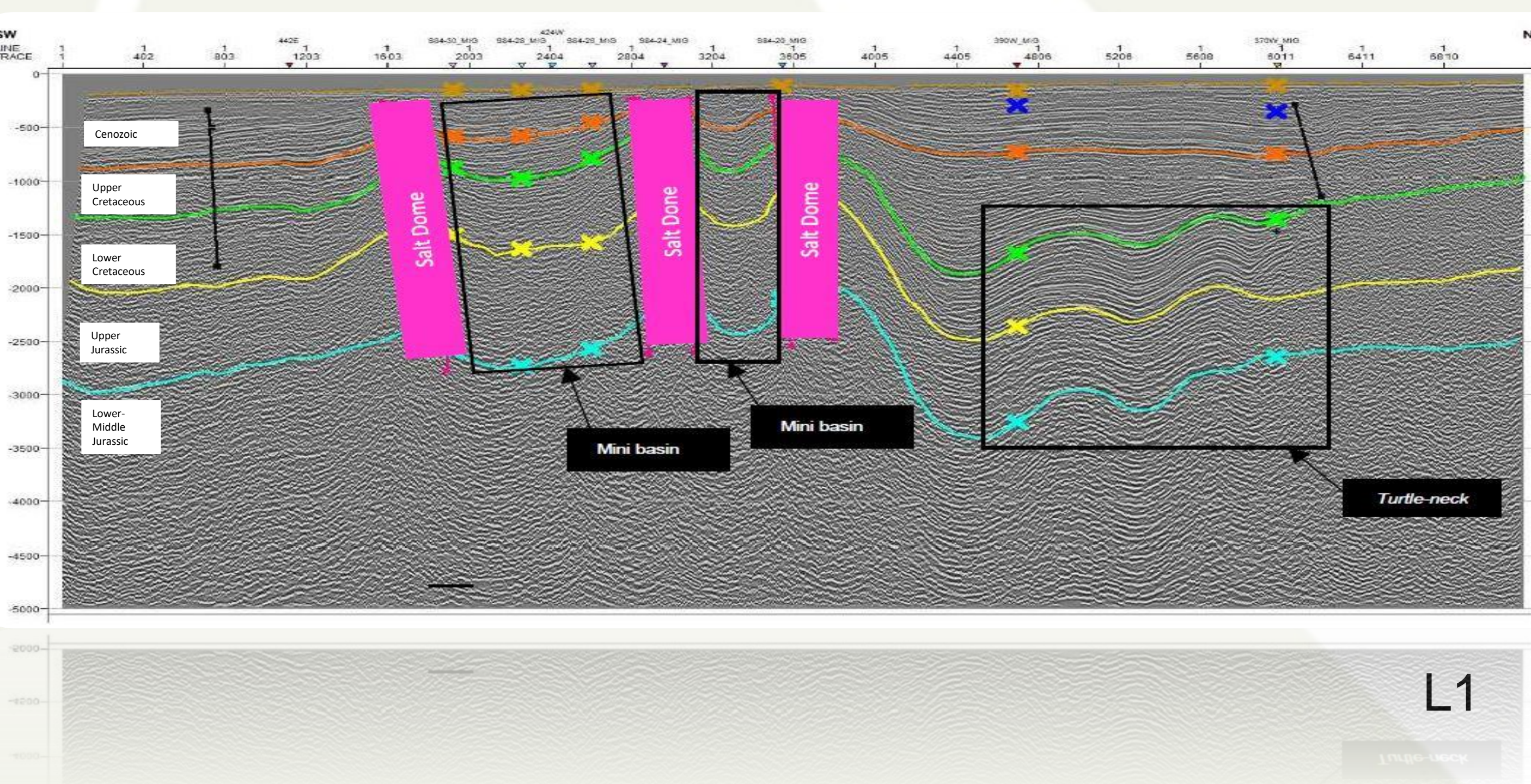

Among several unexplored sedimentary basins in Portugal, there are two adjacent neighbouring basins, namely the Lusitanian (from Aveiro to Setúbal peninsula both onshore and offshore) and Peniche (deep offshore to the west from the Berlengas island) basins, which have been formed and accreted during the same period of geological time (Mesozoic and Cenozoic). However, they show different behaviours and features on seismic profiles.

The Lusitanian Basin, at the northern sector of the coast of Figueira da Foz region, is dominated by diapiric structures. The deep offshore of the Peniche Basin, near the Nazaré Canyon, is controlled by intense tectonism.

This could be explained by the proximity of the Peniche Basin sector to the many submarine canyons that are present along the Portuguese coastline since they can influence the bathymetry due to their intense dynamics (erosion, fault activity, sediment deposition).

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This project, with the help of seismic data interpretation, aimed to contribute for the understanding of the oceans, in this case, the North Atlantic Ocean, and more specifically regarding the Western Iberian Margin. The results are of great help to support current activities regarding the extension of the Portuguese Continental Platform and the assessment of its geological resources (energy, CO_2 sequestration, metals).