

## **Multiphased Rifting and Margin Segmentation across Southwest Iberia and South Newfoundland Conjugate Margin**

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The southwest Iberian margin, in paleogeographic proximity to the Western Tethyan domain, the Central Atlantic and the conjugate margin of South Newfoundland (Canada), is a key domain to clarify unknown aspects of rift extension prior to breakup and the position of the Continent-Ocean Boundary, at the southern segment of the North Atlantic. Interpretation of recent exploration seismic data from the SW Iberian margin, allowed characterizing the evolution and geometry of the late Triassic to late Jurassic-earliest Cretaceous syn-rift sequences and the transition to a passive margin.

The structural segmentation of the proximal to distal sectors of the southwest Iberian margin reveals distinct structural styles, each defining different sectors across West Iberia. The inner proximal margin is characterized by tightly-spaced faults that form small sub-basins showing limited Mesozoic subsidence. The outer proximal margin reveals increasingly deeper basins bounded by master faults, which include thick Middle Jurassic to earliest Cretaceous syn-rift sequences with marked stratal growth. The transition to the distal margin is characterized by multiple superimposed syn-rift sequences bounded by deep-rooted normal faults, defining large sub-basins. A regional breakup unconformity marks the transition to the post-rift sequences from the earliest Cretaceous onwards.

Segmentation of the margin during rifting into discrete sectors, as extension progressively thinned the continental crust to breakup and its transition to drift shows strong dependence to the rheological features of the underlying lithosphere. Comprehensive mapping and seismic stratigraphic interpretation of syn-rift sequences allowed to a more detailed understanding of the initial extensional episodes affecting the continental margin prior to breakup, as the evolution of each of the sectors can be related to the different syn-rift episodes. Thus, the oldest syn-rift sequence can be related to Late Triassic continental extension. From the Middle Jurassic, continued extension associated with the opening of the Central Atlantic and related tectonic subsidence in Southern Newfoundland is mainly recorded at the outer proximal margin. The final Late Jurassic to earliest Cretaceous extensional episodes occurring in the distal domains of Southwest Iberia are interpreted as synchronous to the principal subsidence events recorded on the proximal margin of central West Iberia and on the Jeanne d'Arc conjugate margin.