



## **INSIGHTS ON THE EVOLUTION OF MID-OCEAN BASINS: THE ATLANTIS BASIN OF SOUTHERN AZORES**

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Single-channel seismic reflection and sidescan (OKEAN) data acquired in an unstudied region of the North Atlantic give important insights on the evolution of mid-ocean basins. Located on the eastern flank of the Mid-Atlantic Ridge, south of the Azores Islands, the study area contains more than 1,000 ms two-way travel-time of sediments with a similar seismic stratigraphy to that of ODP sites 950-952 in the Madeira Abyssal Plain. Processed thickness values correspond to a maximum thickness of about 1450 m and an average thickness of more than 500 m based on velocity data from ODP sites 950-952. The structure of the surveyed area and its location in relation to the Madeira Abyssal Plain and Mid-Atlantic Ridge indicate the existence, south of Azores, of two distinct sedimentary basins separated by major structural lineaments (Azores-Gibraltar and Atlantis Fracture Zones) and by seamount chains (Cruiser-Great Meteor Chain, Plato-Atlantis Chain). The basement of the sedimentary basins is irregular, showing multiple dome-shaped volcanic structures identical to those in the Norwegian-Greenland Sea and Madeira Abyssal Plain. However, half-graben/graben basement blocks predominate east of 30°W underneath a moderately deformed overburden. The complex structure observed most likely reflects changes in the direction and velocity of ocean spreading plus variations in the regional thermal gradients induced by local hot spots. In parallel, some of the sub-surface structures identified next to basin-bounding Fracture Zones may have resulted from transtensional and transpressional tectonism.