

# Portugal: a biostratigraphic and seismically integrated approach to understanding the North Atlantic conjugate margins

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Exploration success in the North Atlantic Conjugate Margins (NACM) is far from symmetrical with a distinct bias towards Newfoundland's Jeanne d'Arc and Flemish Pass basins. Recent discoveries in the latter have re-ignited interest in the wider region, particularly the conjugate basins offshore Ireland and Portugal. Fundamental to exploration is a unified stratigraphic framework, though this poses a significant challenge due to the paucity of data, inconsistent vintage data sets, and rock availability, especially in such a complex rift-drift evolutionary setting. To address these uncertainties, a comprehensive mega regional dataset was assembled and a multi-disciplinary petroleum geological evaluation was undertaken aside with new Portuguese biostratigraphic study of five wells.

Wells were selected from the Porto (Lula-1 and 5A-1) and Lusitanian (14C-1A, 16A-1 and 20B-1 wells) basins based on their intersection with seismic lines, availability of cuttings samples, existing biostratigraphic data, and depth of penetration. Available samples from these wells were studied for micropalaeontological, nannopalaeontological, and palynological information together with the review and reinterpretation of available biostratigraphic reports. A series of new bioevents were identified within these five Portuguese wells through the integration of all available vintage biodata, new analyses, wireline log data, and other pertinent geological inputs with a detailed biostratigraphic study – the first of its kind to date. These robust bioevents allow identification and a better understanding of the regional unconformities and their correlation across the NACM plus their extent. This contribution summarizes how an integrated approach, honouring a diverse suite of data, provides unique insight into the rifting history of the North Atlantic region with the potential of direct implications for exploration in the NACM.