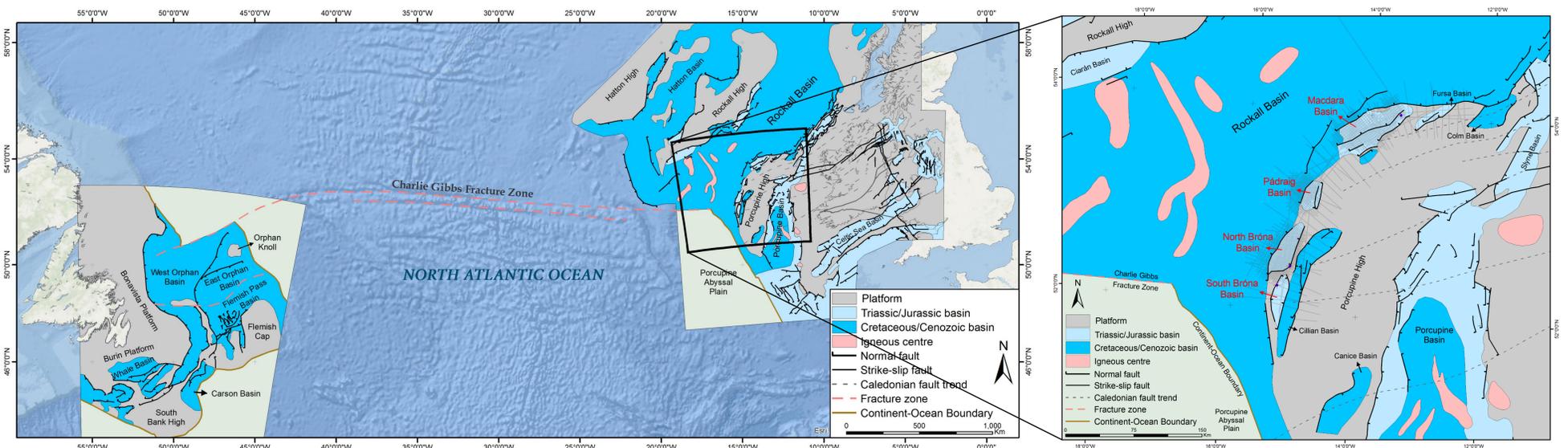


INTRODUCTION

The Irish Rockall Basin remains a frontier area for petroleum exploration with only three wells and four shallow stratigraphic boreholes along the eastern flank of the basin. The currently under-filled trough deepened significantly during several phases of flank rotation and tilting during the Cenozoic, with basin centred deposition, largely from contour current circulation, dominating since the late Eocene. Thin Cretaceous to Recent successions drape steep marginal slopes to the east and these mantle a series of “perched” fault-controlled rift basins of Triassic and/or Mid-Late Jurassic age along the western side of Porcupine High. Investigation of the origin and prospectivity of these poorly-known perched basins is hampered by: (1) a moratorium on new seismic acquisition along the eastern flank of Rockall; (2) uncertain North Atlantic restorations which alternatively place the basins off Labrador or Flemish Pass on the conjugate margin; (3) an unclear NE Atlantic affinity of the basins – are they Hebridean and similar to the Erris–Slyne basins in character or more akin to fault-controlled basins in south Porcupine; (4) issues with distinguishing Triassic from Mid-Late Jurassic basin infill in the absence of well control; (5) an association with a poorly understood phase of hyperextension that led to very thin crust beneath the deep troughs to east and west, and (6) poor constraints on the burial, exhumation and thermal history and the likely source rock development and maturation state.

This project, which commenced in August of this year, focuses on the existing grids of 2D seismic data available for the North and South Bróna basins, the Pádraig Basin and the Macdara Basin on the northern end of Porcupine High. Both the North Bróna and Macdara areas have also been sites of shallow stratigraphic drilling (83/20-sb01, 83/24-sb01 and 16/28-sb01) and 83/20-sb01 established upper Jurassic in the North Bróna basin.

TECTONOSTRATIGRAPHY OF THE PERCHED MESOZOIC BASINS

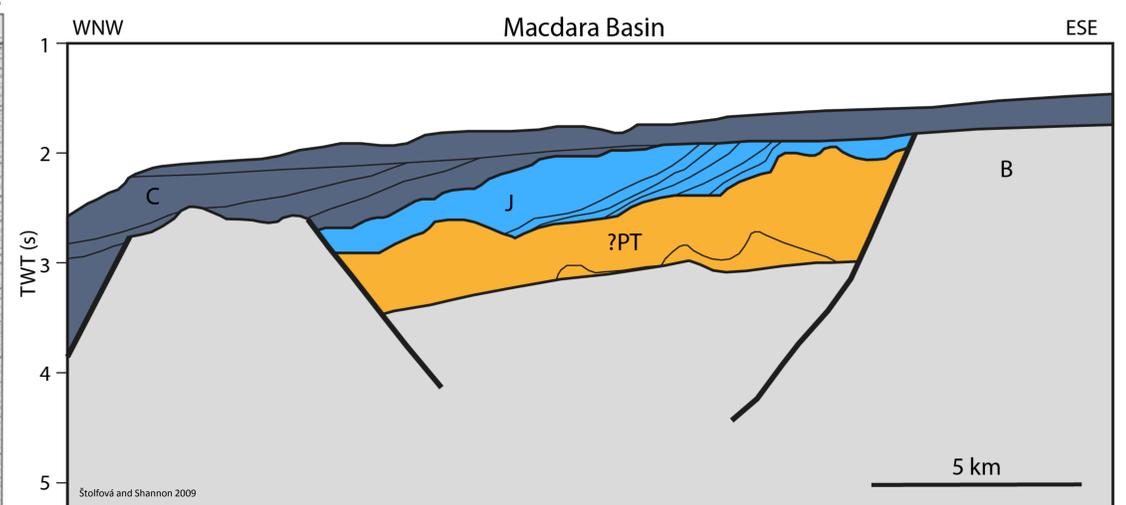
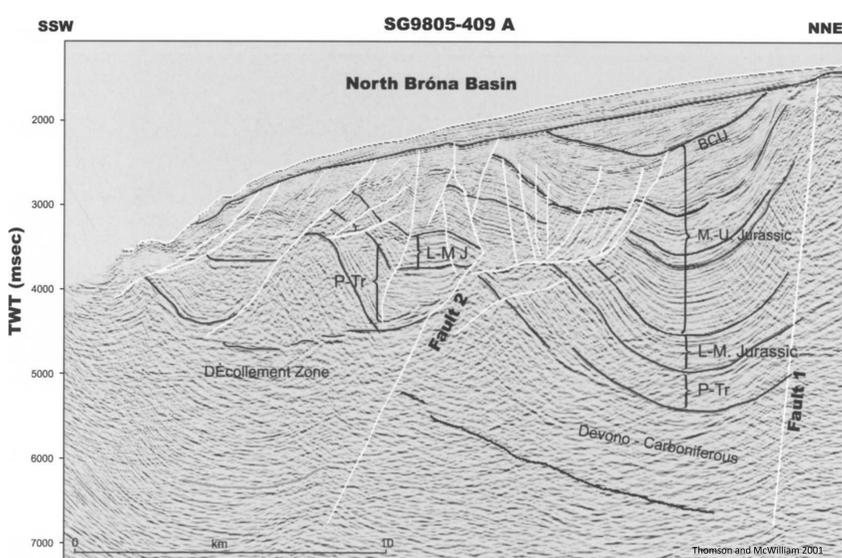


The geometry and interaction between the different fault systems, i.e. those driving subsidence in the small fault-controlled depocentres and those linked to later development of the main Rockall depocentre to the west, are not yet clear. Furthermore, the interaction between rift-boundary faults of different polarity with later westward slope rotations is potentially important.

Several of the perched basins contain folds (both synclines and anticlines) developed prior to the base-Cretaceous unconformity (BCU), and these have been used in the past to infer a phase of late-Jurassic-early Cretaceous compression and inversion. However, on-going work suggests similar geometries in the Slyne Basin could relate to halokinesis and salt-fault interactions. Evaporites and minor halokinesis were previously inferred by Štolfova & Shannon (2009) in the perched basins. Analysis of the geometry and origin of these folds thus forms an element of the study.

Given the basins are undrilled apart from the 83/20 area, the basin infill, depositional evolution, the links between structural development and sediment routing, and the distinction of Triassic from later Jurassic fill components are yet unknown and they will be assessed in the light of ongoing work on analogous basins in the adjacent Porcupine area. Seismic stratigraphic analysis of the Cretaceous-Cenozoic will also examine the evidence for the timing and response to westward slope rotation.

The Macdara Basin to the north includes evidence for late Cretaceous volcanism (Droll igneous centre) and a related igneous centre has been inferred just inboard of the Pádraig Basin (Doon centre) raising questions as to the possible thermal impact of such activity.



PROJECT PLAN

Investigation of the origin and prospectivity of these poorly-known perched basins involves characterising, comparing and contrasting the stratigraphic and structural evolution of all four perched depocentres and comparing these with the adjacent analogous basins, particularly those on the east side of Porcupine High, as well as along the Slyne-Erris trend and beneath the NE Rockall margin. This work entails detailed fault mapping and consideration of fault system evolution, as well as developing a tectonostratigraphy for both the fault-controlled basins and the Cretaceous and Cenozoic cover to address the possible impact of the post-rift events. It is clear that the Mesozoic basins have suffered one or more phases of later westward slope rotation that may have impacted on trap integrity. The basins have also experienced significant but poorly constrained exhumation and this may impact on their thermal history.

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