

Background and Rationale:

The Lower Triassic of NW Europe is an excellent test bed for a detailed assessment of relationship between provenance and reservoir quality due to the local variations in reservoir quality at both well and basin scale.

Triassic sandstone intervals from well 27/5-1 in the Slyne Basin have been initially targeted for detailed investigation as they are equivalent to the proven reservoir intervals in the Corrib gas field directly to the north, but are hydrocarbon poor, despite displaying porosities and permeabilities greater than those observed in the Corrib.

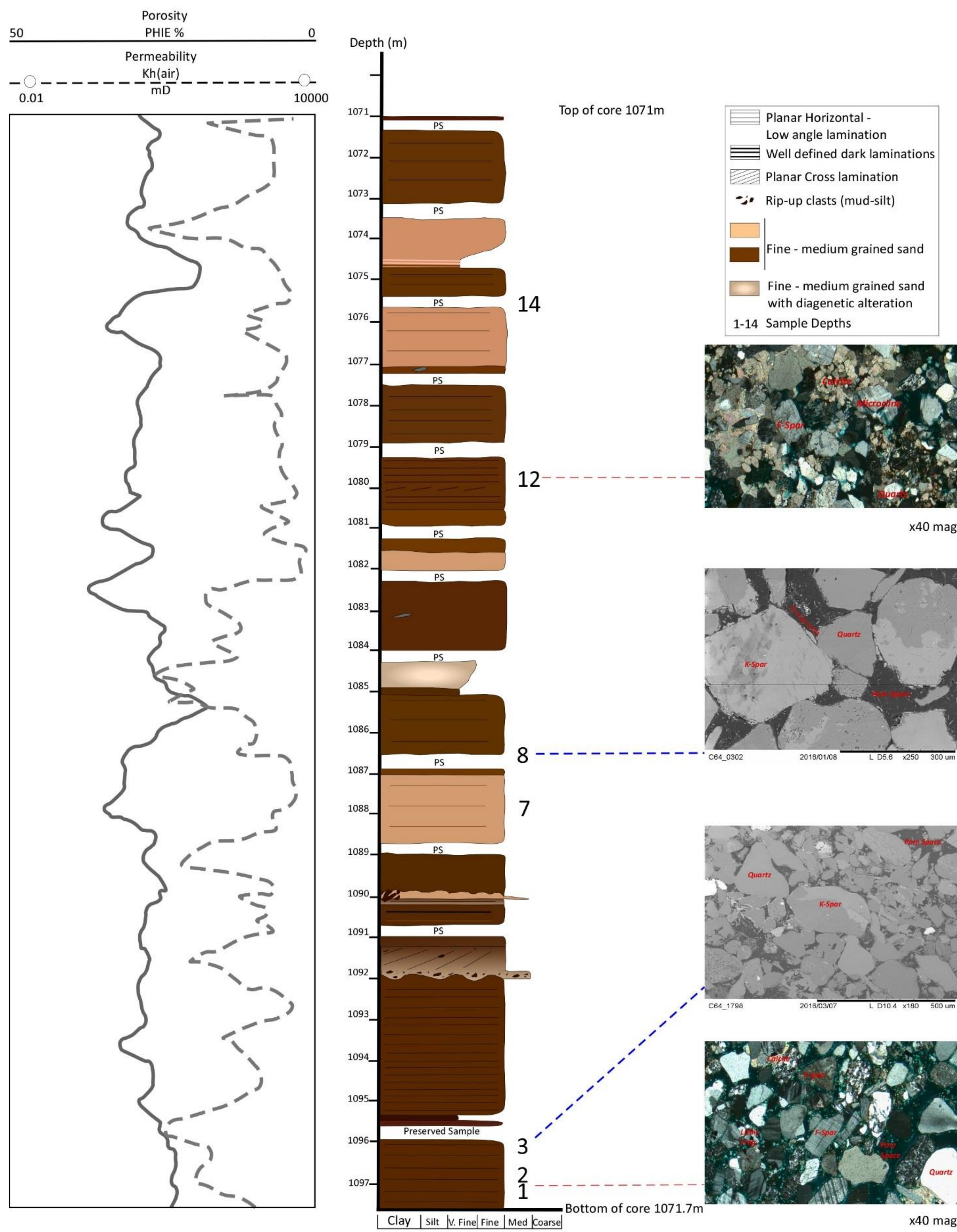
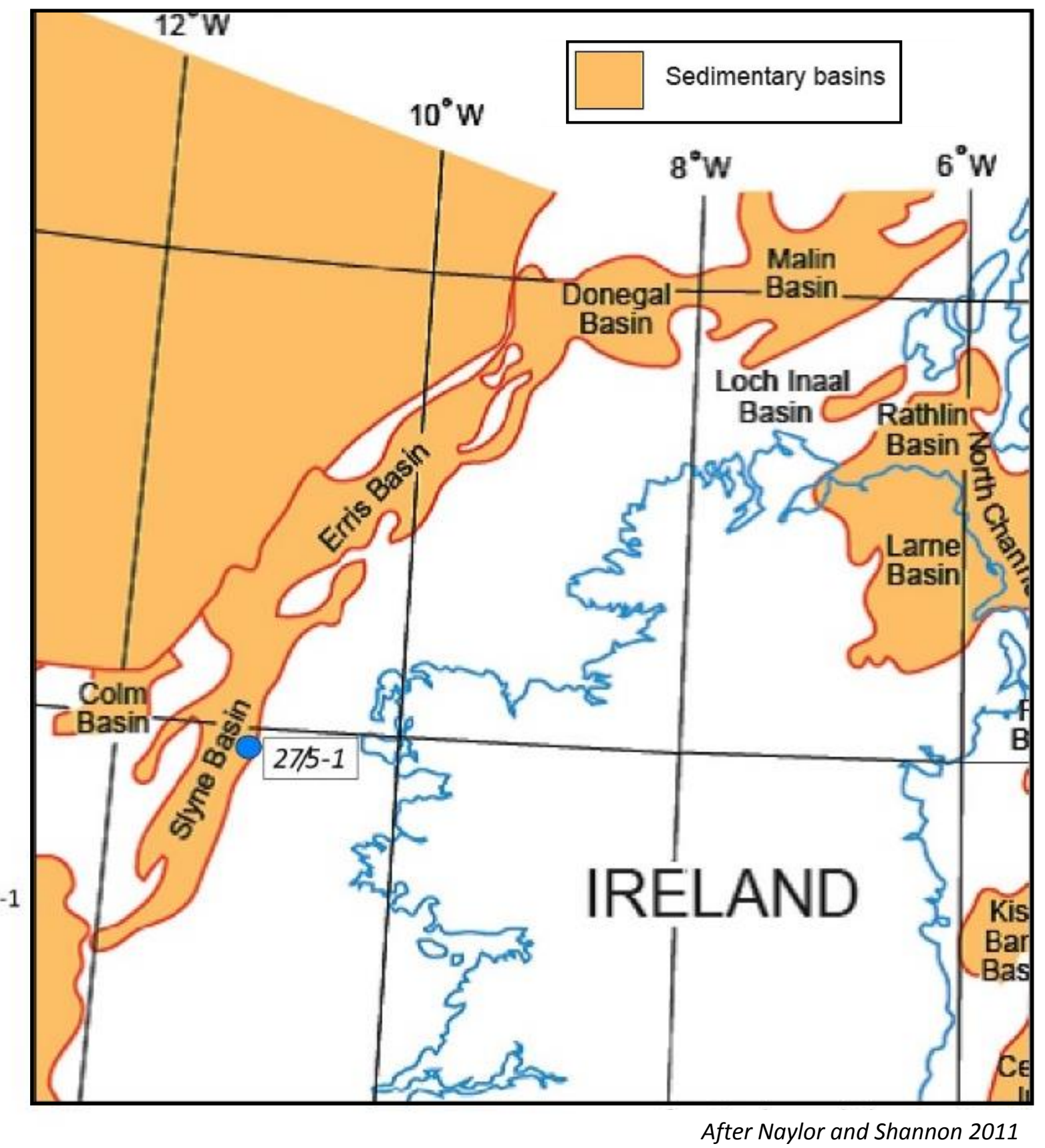
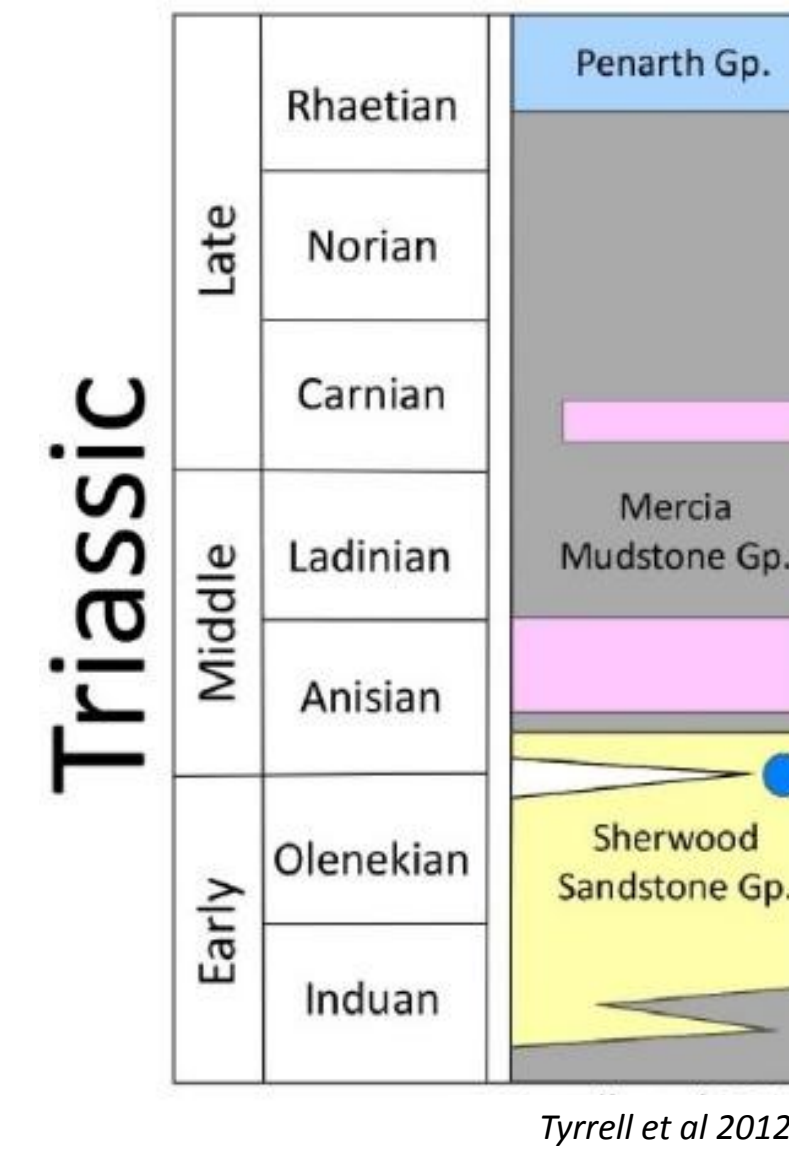
Stratigraphy and Petrography:

The logged Triassic interval from well 27/5-1, core #4, comprises a sandstone dominated unit with minor fine grained silt-muddy beds. Sedimentary structures within the fine-medium sand units include planar to low angle laminations. Some mudstone beds are observed as well as lag layers with angular rip up clasts of grey/green fine grained silt-mud above erosional bases.

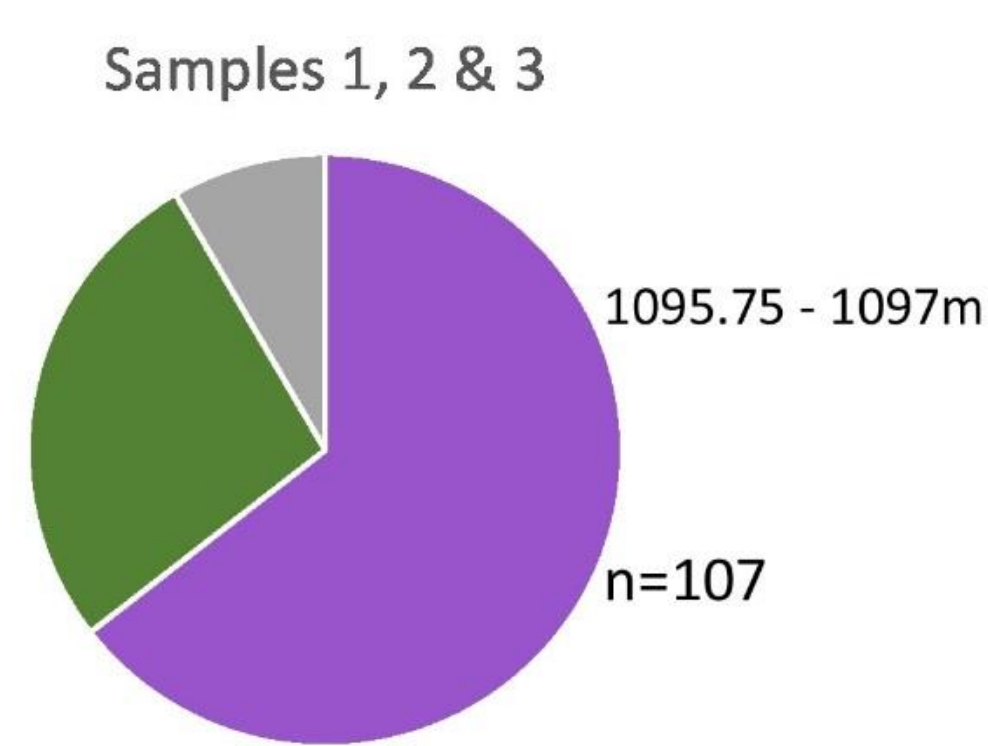
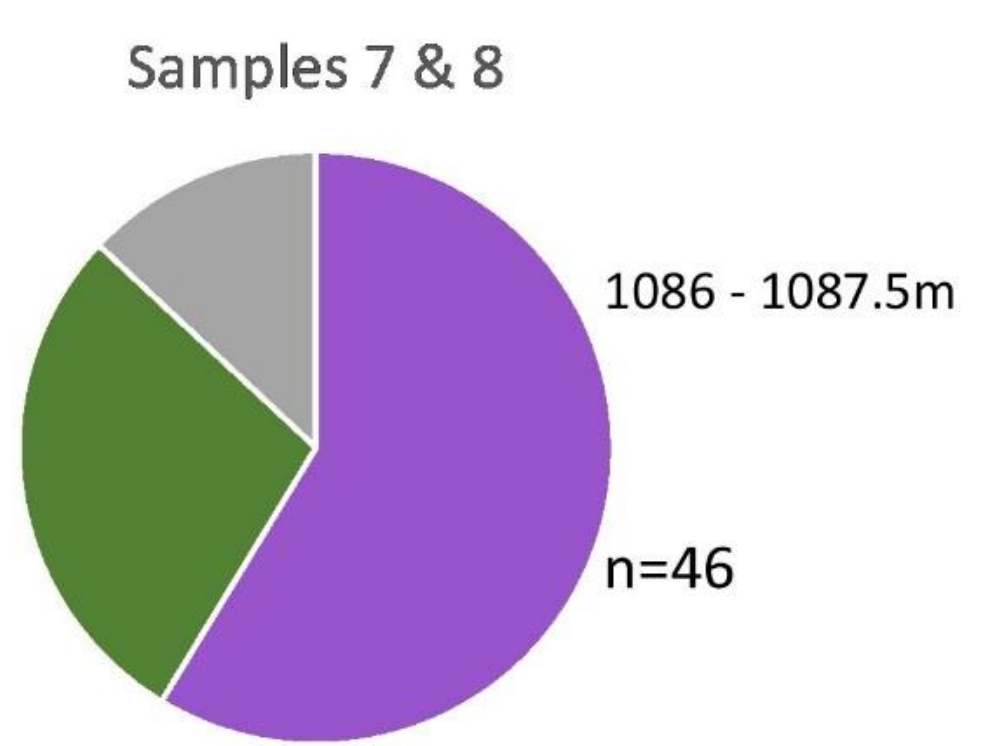
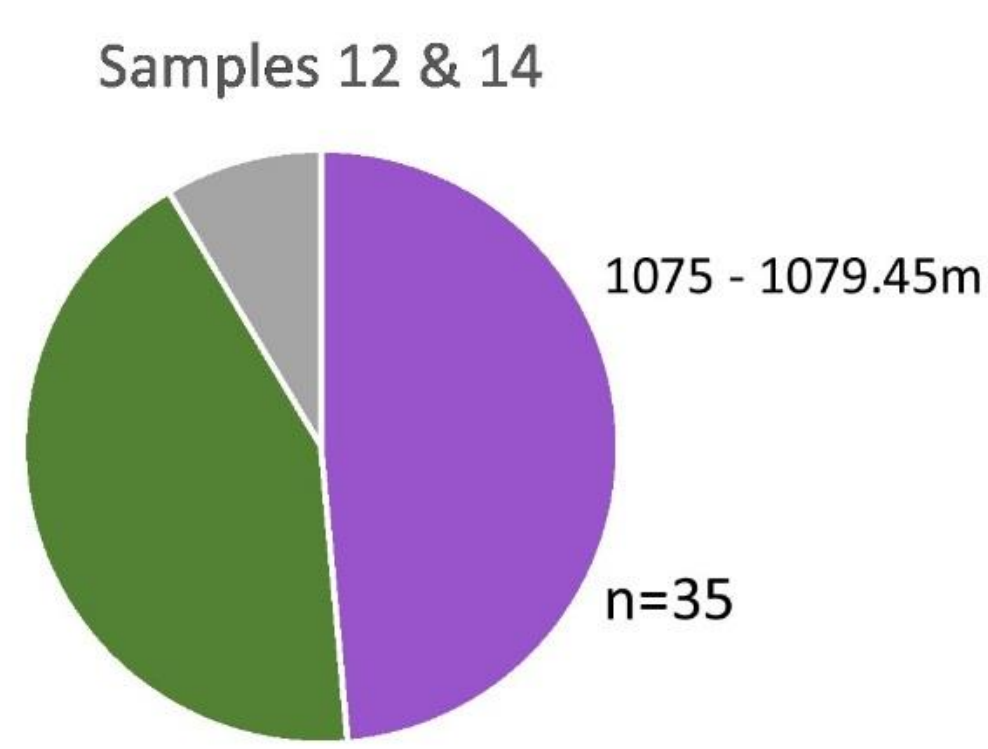
The section is interpreted as part of a bed-load dominated fluvial system with stacked channel sands and some minor abandonment facies.

According to Enterprise Inc. well reports core #4 is characterised by high net: gross sand content and is generally of excellent reservoir quality, as reflected in the porosity and permeability wireline logs.

Sampled sandstones from well 27/5-1 are identified in thin section as being sub-arkosic to arkosic, variably lithic, with significant macro porosity visually estimated to be 10- 20%. Patchy cements are most commonly calcite with some anhydrite, feldspar and quartz overgrowths.

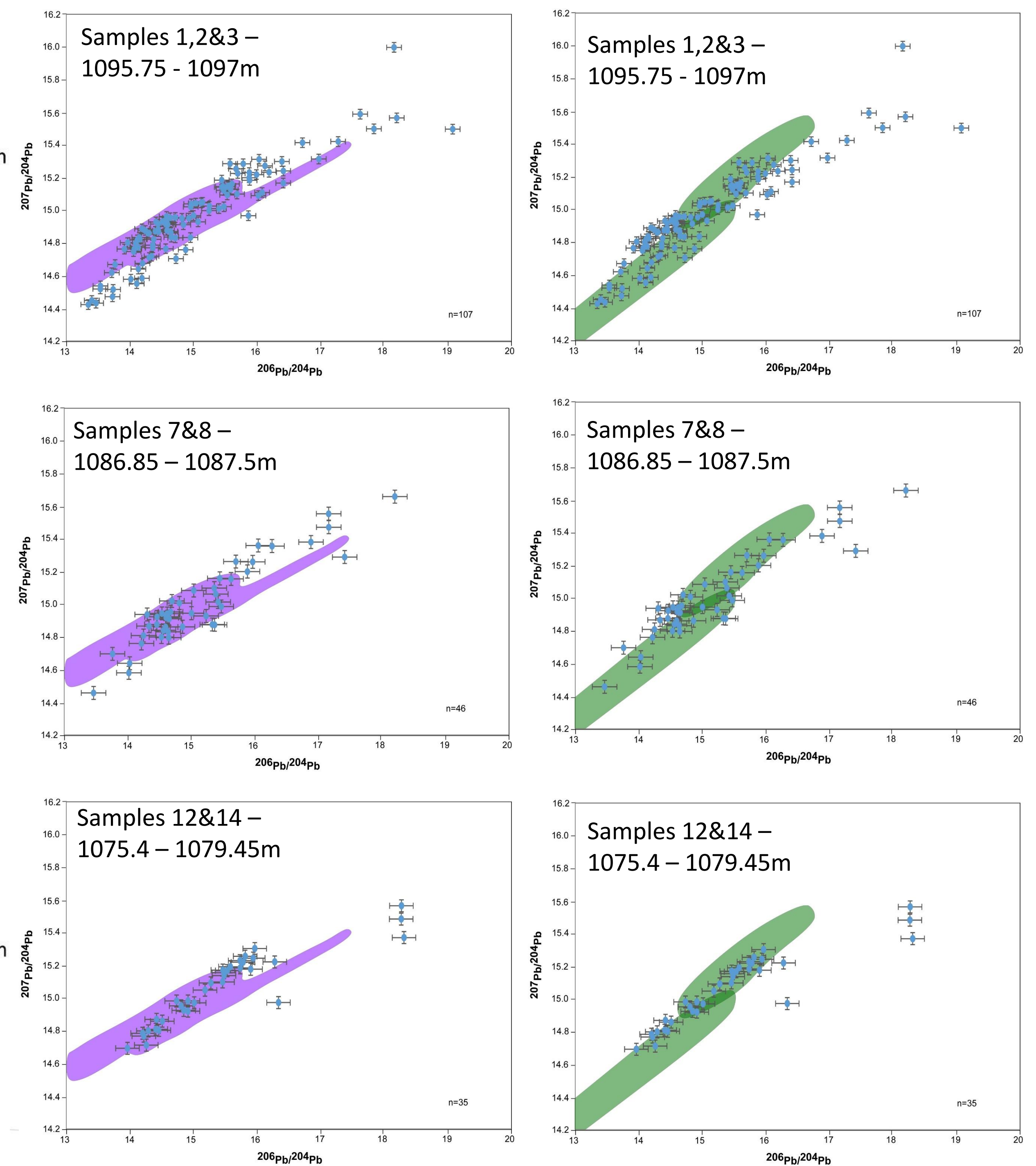


Pie Charts showing proportions of K-feldspar from various source areas, by depth

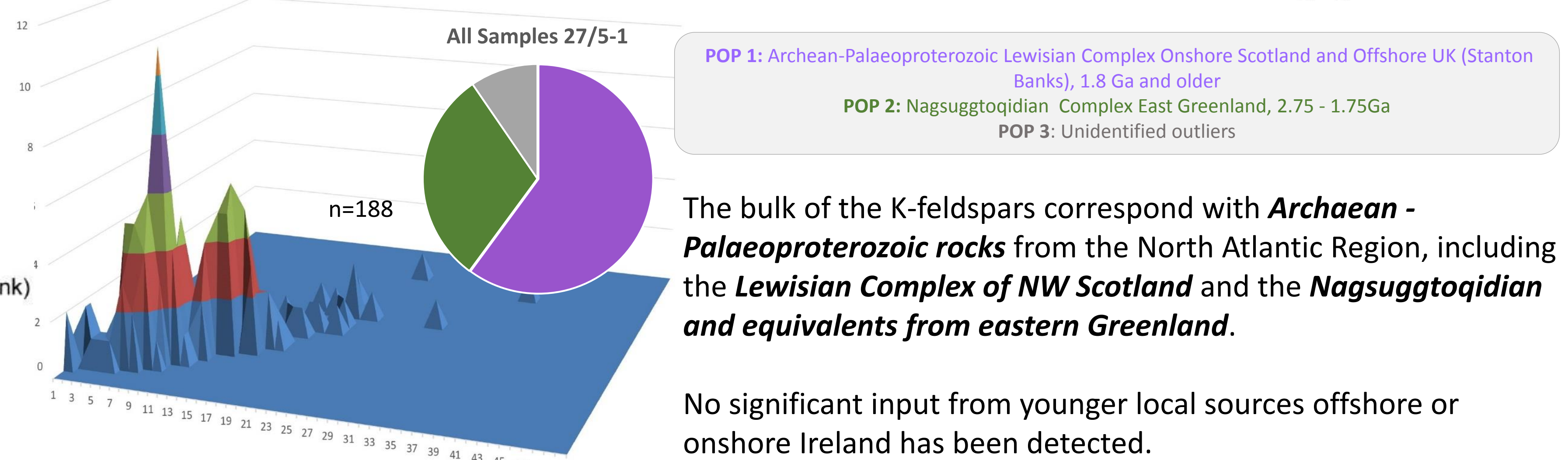
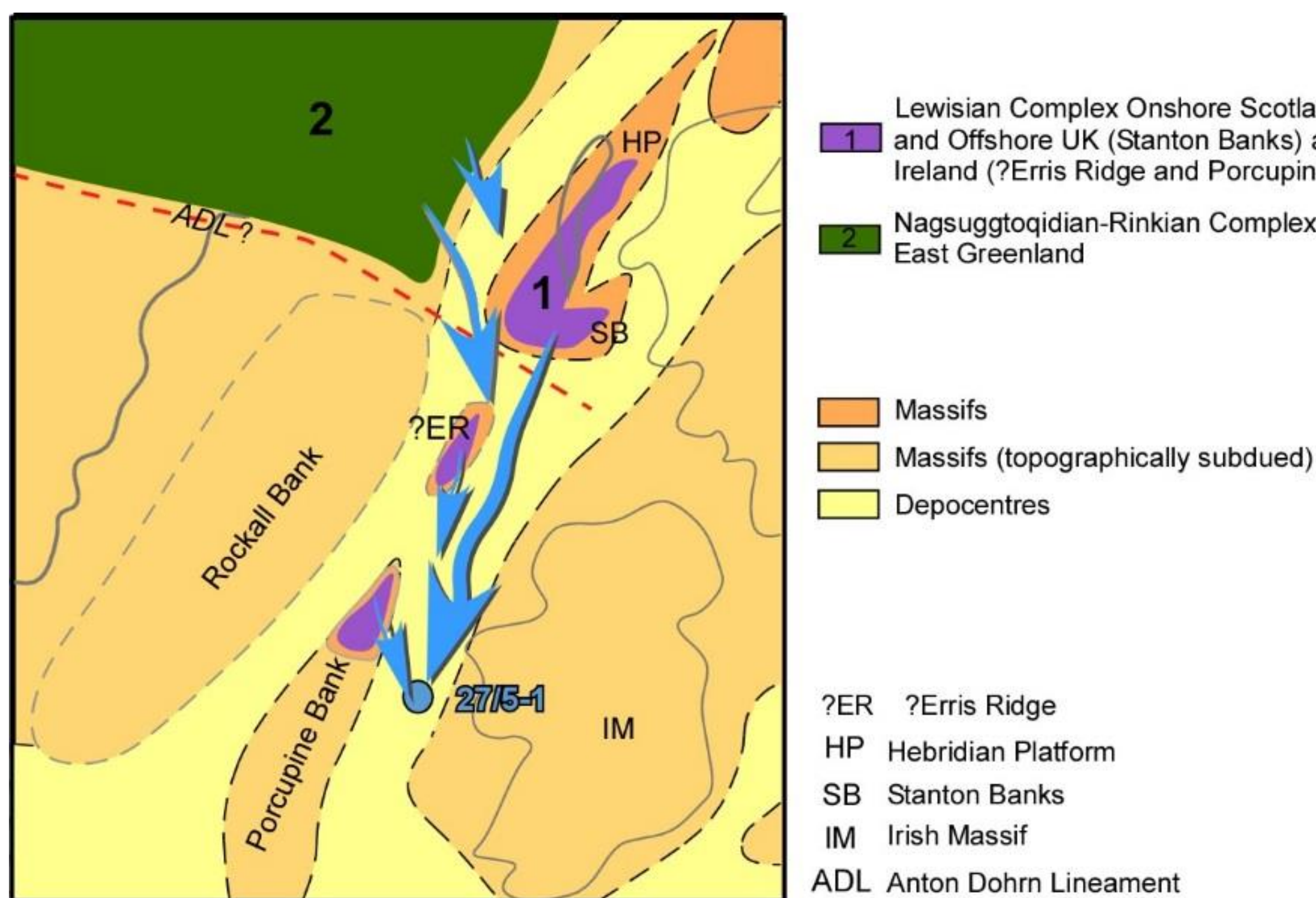


Preliminary Results:

Pb isotope plots showing feldspar analyses from well 27/5-1 (blue dots), by sample, against possible regional sources (Archean-Palaeoproterozoic Lewisian Complex and Nagsugtoqidian Complex East Greenland)



Palaeogeographic Reconstruction:



The bulk of the K-feldspars correspond with **Archean - Palaeoproterozoic rocks** from the North Atlantic Region, including the **Lewisian Complex of NW Scotland** and the **Nagsugtoqidian and equivalents from eastern Greenland**.

No significant input from younger local sources offshore or onshore Ireland has been detected.

Future Work:

This study will be expanded to various other Triassic intervals within the Slyne Basin (from wells 18/20-4, 18/25-3 and 18/20-22). Cores have already been logged and sampled, and the aim of this work is to investigate how the provenance signal varies throughout the basin for a range of depths and paragenetic histories. Middle Triassic horizons (Sherwood Sandstone equivalents) have been targeted as reservoir quality is variable and units can be correlated across the basin, using the base of the Mercia Mudstone Group (Upper Triassic) as a marker. Sherwood Sandstones from wells in the Ulster Basin are also being targeted for logging/sampling. This work links with the ongoing study in the Slyne Basin, while provenance analysis of these sandstones may also help constrain a significant Triassic drainage divide between the Budleighensis River system to the south, and the NE Atlantic Margin basins to the west and north.