

How stratigraphic architecture, facies, and hydrodynamic processes change as a structurally-confined, submarine-fan basin fills—Proposed research on the Upper Carboniferous Ross Sandstone, western Ireland

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The Upper Carboniferous Ross Sandstone of western Ireland is a well-exposed, exhumed submarine fan deposited in a structurally-confined basin analogous to northern GOM minibasins. The objectives of this research are to relate the temporal and spatial changes in stratigraphic architecture and facies in the Ross Sandstone to changes in sedimentological process related to the constantly evolving landscape of the structurally-confined basin it fills.

Five well-exposed, laterally continuous portions of the Ross Sandstone, which together represent a continuum from early to late confined-basin fill, will be studied in detail. Each of the exposures will be described and documented using the following methodology. First, photopanel will be constructed for each exposure in order to help document and visualize the large-scale architectures of each exposure. Second, detailed, closely-spaced stratigraphic columns (10 to 50m spacing and cm-scale vertical resolution) will be collected. Third, the surfaces between each stratigraphic column will be correlated to each other in order to construct detailed, bed-by-bed correlation panels for each exposure.

These data will be used in the following manner to address the research objectives. First, the correlation panels can be used to document the changes in the size, shape and distribution of architectural elements as the basin fills. Second, the distribution of facies within the correlation panels can be documented in histograms and variograms for each different exposure to document the changes in facies as the confined basin fills as well as changes in hydrodynamic processes active in the fan as the confined basin fills.