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Stratigraphic and Tectonic Controls on the Distribution of Upper Jurassic Sandstones in the North Sea

The application of a revised, biostratigraphically-constrained genetic sequence stratigraphic scheme for the Upper Jurassic of the Outer Moray Firth (U.K. North Sea) enables controls on the deposition of the highly prospective Piper Sandstones of the Humber Group to be investigated. The Piper Sandstones were deposited in wave-dominated deltaic conditions. The temporal and spatial distribution these sandstones within the Ivanhoe, Rob Roy and Hamish (IVRRH) fields was controlled largely by movement on northwest-southeast trending normal faults, set against regionally transgressive marine conditions. The rate, extent and erosive effects of the extensional fault dynamics can now be demonstrated at a chronostratigraphic, i.e. Ammonite Zone resolution. The results are consistent with recent advances in our understanding of the development and evolution of normal faults in both modern and ancient rift systems. The fault growth history of the principal extensional fault arrays can be shown to have occurred through fault segment linkage. This has significant implications for the distribution of these sands, as it demonstrates how the clastic depocentres, formed within the hangingwalls of the normal faults, migrated with time. The revised biostratigraphic scheme also enables a redefinition, yet simplification of the regional lithostratigraphy, which has been excessively and unnecessarily complex in the past. This has significant implications to both the depositional history of the IVRRH fields and the regional correlation and predictability of their Upper Jurassic clastic reservoirs.