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Novel 3D sequence stratigraphic numerical model for syn-rift basins: Analysing architectural responses to eustasy, sedimentation and tectonics

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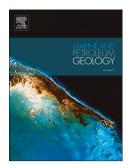
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Title: Novel 3D sequence stratigraphic numerical model for syn-rift basins: analysing architectural responses to eustasy, sedimentation and tectonics

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Abstract

Syn-rift clastic sedimentary systems preserve a complicated stratigraphic architecture that records the interplay of tectonics, eustatic sea level and storage and routing of sediments. Previous conceptual models describe and explain changes in depositional stacking patterns along a fault segment. However, stacking patterns, and the nature of key stratigraphic surfaces, is challenging to predict accurately with conventional sequence stratigraphic models that do not consider the three-dimensional interplay of subsidence, sedimentation, and eustasy. We present a novel, geometric, 3D sequence stratigraphic model ('Syn-Strat'), which applies temporally- and spatially-variable, fault-scale tectonic constraints to stratigraphic forward modelling, as well as allowing flexibility in the other controls in time and space.

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