
Basin-scale heterogeneity in evaporitic depositional systems: From gypsum build-ups to major salt collapse

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Résumé

Evaporite depositional systems are often conceptualised as laterally extensive, layer cake alternations of the dominant evaporite facies arrayed cyclically according to an idealised evaporative sequence. Yet, new evidence from the Southern North Sea suggests significant variability at both depositional and diagenetic stages. High-resolution seismic reflection and borehole data reveal widespread thickness anomalies within a Zechstein anhydrite-rich interval, interpreted as primary gypsum buildups that formed under persistent hypersaline conditions and which, after burial, underwent diagenetic transformation to anhydrite, expelling large volumes of mineral-bound water. This latter process, which triggered fluid migration, enhanced dissolution of overlying salt, and ultimately led to the formation of giant collapse structures. Here, a basin-scale analysis is therefore presented, linking early depositional heterogeneity with later diagenetic instability, demonstrating how primary gypsum accumulation and subsequent transformation can drive large-scale salt dissolution and collapse.

Mots-Clés: Evaporites, Zechstein, 3D reflection seismic, Gypsum diagenesis

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