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Contrasts in Style of Minibasin Evolution in the Sigsbee Area (U.S. Gulf of Mexico) and the Nile Deep-Sea Fan

Minibasins are polygonal to subcircular depocenters subsiding into thick salt and surrounded by interconnected salt ridges. Actively subsiding, minibasins deform the seafloor, their planform geometry clearly illustrated on multibeam bathymetric data. Young (Plio-Pleistocene) minibasins are present above allochthonous salt in the Sigsbee area (US Gulf of Mexico) and autochthonous Messinian evaporites in the eastern Nile deep-sea fan. In both regions, minibasins form polygonal bathymetric lows having accumulated thick sediments (locally > 6 km Sigsbee area, > 2 km Nile area) bounded by salt ridges affected by extension or strike slip. In both basins minibasin subsidence and salt-ridge growth started soon after deposition of the first overburden strata, minibasin growth being partly controlled by radial spreading and thin-skinned extension above the salt. However, present-day map patterns of the two basins differ. In the Keathley Canyon area (US GOM), minibasins have subcircular planforms, and salt ridges and overlying grabens show little or no preferred orientation. By contrast, minibasins in the Nile deep-sea fan are restricted to a narrow deformation corridor and are bounded by two main families of salt ridges: NE-SW ridges are currently widening and rising, whereas NW-SE ridges are shortened and reactivated as strike-slip faults guiding an overall northwestward escape. This structural fabric results from recent collision of the front of the prograding wedge against a large seamount acting as a distal buttress that is preventing further northeastward spreading, causing reactivation of a minibasin network initially similar to that of the Sigsbee area in contractional, extensional and strike-slip regimes.