



## **Bottom current deposition in the Antarctic Wilkes Land margin during the Oligocene**

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Sediment cores collected from the Antarctic Wilkes Land continental rise at IODP site 1356 provide evidence for bottom current sedimentation taking place since the early Oligocene (i.e. 33.6 Ma) (Escutia et al., 2011). Correlation between site 1356 sediments and the regional grid of multichannel seismic reflection profiles, complemented with bathymetric data, allow us to differentiate a variety of contourite deposits resulting from the interaction between bottom currents and seafloor paleomorphologies.

Contourite deposits are identified based on the seismic signature, reflector configuration and geometry of the depositional bodies as elongated-mounded drifts, giant mounded drifts, confined drifts, infill drifts, plastered drifts, sediment waves, and moats. Based on the spatial and temporal distribution of these deposits, we differentiate three phases in contourite deposition in this margin: Phase 1) from 33.6-28 Ma sheeted drift morphologies dominate, related to high-energy deposits associated with fast flowing currents during the early Oligocene; Phase 2) At around 28 Ma, mounded drift morphologies and moat channels start forming. Continued intensification of contour currents results in larger contourite morphologies such as giant mounded drifts and moats forming around structural heights present in the Wilkes Land basin (e.g, the Adelie Rift Block). Phase 3) A shift in current configuration is recorded at around 15 Ma above regional unconformity WL-U5, which marks the Oligocene-Miocene Transition. This change is shown by a migration to the North of the drift crests and by a dominance of down-slope sedimentation processes that is indicated by mass transport deposits and channel levee formation.

We interpret the evolution of the contourite deposits during the Oligocene in this margin to be driven by changes in the intensity of bottom current activity over time resulting from ice sheet growth, evolution of bottom morphology and related changes in paleoceanographic configuration in the Southern Ocean.

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