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Evolution of the northern Argentine margin during the Cenozoic controlled by bottom current dynamics and gravitational processes

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A detailed seismic investigation on sediment deposition at the northern Argentine margin (37°S to 42°S) resolves major modifications in oceanographic circulation during the Cenozoic, which resulted from variations in both climatic and tectonic processes. After an extensive erosional period following the onset of glaciation of Antartica at ~34 Ma, which affected all water depth levels, a buried elongated mounded drift within the continental shelf was shaped by bottom current activity during the Miocene. This may represent the earliest deposits of the Malvinas Current (MC) that branches from the Antarctic circumpolar current (ACC) and today is part of a complex shallow water circulation system known as the Brazil-Malvinas confluence (BMC). At the same time a major terrace grew to its present form on the upper slope indicating that a precursor of Antarctic Intermediate Water (AAIW) was also part of the BMC. After another major erosional phase represented by a seismic unconformity at ~6 Ma, sheeted drifts, mounded drifts and sediment waves formed at the continental rise during the Pliocene/Pleistocene. These extensive contourite deposits are diagnostic for a steady north setting bottom flow at the depth level of today's Antarctic Bottomwater (AABW). Evidence for downslope transport mainly stems from the presence of buried turbidites and canyon related depocenters. These features can be related to Andean uplift during the Eocene and to the activation of the canyon system during the Pliocene. Recent mass transport is indicated by scarps and sliding blocks at the seafloor of the slope.