

Source-to-sink Analysis of a Cretaceous Submarine Fan, U.S. Atlantic Margin, Employing Detrital Zircon Geochronology

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ABSTRACT

The geologic evolution of the U.S. Atlantic continental margin and northwest Atlantic Ocean basin remains, broadly, poorly understood as a result of decades of prohibition of exploration in the region. Current understanding of margin stratigraphy comes from 1970s-1980s era sporadic deep well coverage, drilled by industry and government, and is aided by vintage 2-D seismic-reflection data. These data reveal a coarse stratigraphic framework and facilitate some interpretation, but many questions remain regarding Jurassic through recent evolution of source-to-sink sediment dispersal.

I aim to employ detrital zircon (DZ) U-Pb dating to assess the provenance of a Lower Cretaceous deep-sea turbidite sequence recovered offshore North Carolina and Virginia during Deep Sea Drilling Program (DSDP) Leg 93. The source area(s) for these sandstones are effectively unknown and have yet to be extensively geochronologically or geochemically analyzed. DZ has proved a valuable tool in assessing source-to-sink systems, primarily by constraining potential source terranes. Therefore, DZ analysis will help construct a more robust depositional model for this understudied deep-sea fan

system. Eventual DZ analysis of potential time-equivalent onshore sandstones of the Potomac Group will enhance paleo-catchment and sediment routing models. Although this sequence provides a potentially prominent reservoir, other hydrocarbon system elements have been interpreted to be poor or absent. Nevertheless, DZ analysis can assess potential reservoir distribution and quality and provide insight to broader questions related to scaling of sedimentary system segments.