Granath, J. W., Christ, J. M., Dinkelman, M. G., Emmet, P. A., and Bird, D. E., 2010, **Full crustal 40 km PSDM seismic profiling ("BightSPAN™") of the Cenuna subbasin, Great Australian Bight margin of South Australia** (abstract): Eos, Transactions, American Geophysical Union, Fall Meeting Supplement, v. 91, T33C-2273.

Very long-offset, long-record 2D seismic reflection data have been processed to 40-km pre-stack depth-migrated images of the Ceduna Subbasin as part of BightSPANTM, one of the data sets of ION/GXT's worldwide regional reconnaissance seismic programs (http://www.iongeo.com/Data_Libraries/Spans/). Twelve lines comprise the survey from the breakaway fault system at the edge of undeformed shelf to and beyond the transition to oceanic crust in 4.5 km of water. The data image to depths much greater than previously available seismic datasets, are processed in depth rather than in two-way time, and thus include the deep crust and Moho within the record length. The Ceduna subbasin is free of imaging problems common to passive margin environments, such as salt and mobile mud. Crystalline crust is reduced from 38 km thickness at the shelf margin to as little as 5 to 8 km locally in a series of fault blocks offshore. Three major tectonostratigraphic packages record subsidence and uplift during development of the margin. From bottom-up, the first package (Late J-Aptian) lies immediately above the continental crust and comprises the locus of early extension in the central part of the margin: this package is adequately imaged only landward on the margin where extension was limited, and progressively loses internal character seaward where it thickens dramatically and presumably participated in hyper-extension with the underlying continental crust. The second (Albian-Santonian) and third (Campanian-Maastrictian) packages are progradational with growth faulting inboard linked to toe-thrust systems offshore. The outboard edge of the second is uplifted and erosionally truncated beneath the third, and its basal detachment is folded. The third package lies on the resulting angular unconformity and records the late passive sag phase of margin development. The location of the continent-ocean transition has been conjectural in previous studies of this basin, but these data indicate that it is obscured by late volcanism on the seaward edge of the continental crust, which may have overprinted and obscured its original magnetic signature. Some lines, however, show a simpler transition where 4.5 km of water and crustal thicknesses less than 10 km characterize the transition. The full extensional history includes early, locally-focused pure shear extension with a later stage of simple shear restricted to the outboard edge of the margin. Isostatic rebound on unloading and magmatic inflation of the margin edge accompanied initiation of sea floor spreading.