

Figure F1. Bathymetry and seismic lines, Site U1503.

Figure F2. A, B. Northern SCS margin with seismic coverage of 2-D, time-migrated multichannel seismic reflection data and ocean-bottom seismometer data. Seismic profiles across Site U1503 are shown in Figures F5 and F6. Magnetic chron number after Briais et al. (1993). Thick blue lines and red lines = key seismic lines used to plan drilling transect; orange lines (in A) and pink rectangles (in B) = magnetic lineations within ocean crust; red stars = Expedition 367/368 drill sites, orange square = ODP Leg 184 Site 1148, yellow squares = IODP Expedition 349 Sites U1432 and U1435.

Figure F3. Two-way traveltime to (A) basement (Tg reflector) and (B) T60 unconformity. Proposed drilling transect (thick black line) is approximately at the center of a margin segment bounded to the southwest by a transform fault. Northeastern boundary of margin segment is around Expedition 349 Site U1435. At this location, outer margin high (OMH) and Ridge A seem to coalesce, and Ridges B and C of the COT become indistinct toward the northeast within the next margin segment. Note that the OMH is slightly oblique to the more parallel Ridges A, B, and C.

Figure F4. Deep crustal time-migrated seismic reflection data without and with interpretation. Note the rather thin lower crust (two layers) above a strong Mohorovicic seismic discontinuity (Moho) reflector that can be followed oceanward. Moho reflection is weak to absent seaward from around the interpreted COT. Wide-angle seismic data (Yan et al., 2001) confirm ~6 km thick ocean crust (OC) seaward of the COT. Large detachment fault ~150

km inland of the COT separates more stable crust landward from that of highly extended crust seaward. The OMH is a fairly consistent feature margin along this margin segment. Key seismic unconformities are shown in purple (T70; ~32 Ma breakup unconformity?) and blue (T60; ~23 Ma regional basin event). These ages are inferred from long distance (>100 km) correlation of seismic unconformities with industry holes and ODP Leg 184 Site 1148 (T60); ages need confirmation by coring and are only tentative. Tg unconformity (green) is basement. Arrows = approximate positions of seafloor magnetic anomalies with chron numbers. Seismic is from Line 04ec1555-08ec1555 (courtesy of Chinese National Offshore Oil Corporation [CNOOC]). CDP = common depth point. C11?, C10?, and C9? = possible chrons. MSB = mid-slope basin.

Figure F5. Seismic Line 08ec1555, primary seismic line for Site U1503 and crossing seismic line for proposed Site SCSII-30A. Dashed lines = unconformities, red solid lines = faults.

Figure F6. Crossing seismic line (15ecLW5) for Site U1503. Dashed lines = unconformities.

Figure F7. Reentry system on seafloor after free fall, Hole U1503A. The hole remains as a legacy hole for future occupation. A. Free-fall funnel after landing. B. Inspection of reentry cone after casing installation.

Figure F8. Reentry system and casing, Hole U1503A.