Figure F1. Map of the NWS showing major basins and location of modern and "fossil" reefs. Seismic data near Site U1461 is shown in Figure **F8**. Stars = drill sites, green circles = Deep Sea Drilling Project (DSDP)/Ocean Drilling Program (ODP) sites and other core locations referred to in text, yellow circles = industry well locations (Angel = Angel-1; G2/6/7 = Goodwyn-2, Goodwyn-6, Goodwyn-7; A1 = Austin-1; M/MN1 = Maitland/Maitland North-1; TR1 = West Tryal Rocks-1). WA = Western Australia, NT = Northern Territory, SA = South Australia, QLD = Queensland, NSW = New South Wales.

Figure F2. Plate tectonic motion shown for Australia and its margins since 50 Ma in 10 My intervals, including the path line for Site U1459. Gray = present-day exposed continents, light gray = submerged continental fragments and passive margins, black stars = present-day location of Sites U1459–U1464. Generated with GPlates (**http://www.gplates.org**) using rotations in Seton et al. (2012).

Figure F3. Global sea level (eustatic) curves and inundation history of the Australian continent based on paleoshorelines (Isern et al., 1995). Green = filtered global sea level curve (Haq and Al-Qahtani, 2005), black = global sea level curve (Haq et al., 1987), light blue = filtered curve (Haq et al., 1987), dark blue = Miller et al. (2005) sea level curve, red = Kominz et al. (2008) sea level curve. Filtered lines show the long-wavelength component of the eustatic estimate using a cosine arc filter with a 10 My window. All curves are plotted using the Gradstein et al. (2012) timescale. The amount of inundation (red line with circles) is computed relative to the present-day 200 m isobath from the ETOPO2 global 2′ topography (NOAA, National Geophysical Data Center, 2006). Adapted from Heine et al. (2010).

Figure F4. Oceanography and climate of the western Pacific (adapted from Gallagher et al., 2009). Currents (red = warm, blue = cold) are indicated. The direction (green arrows) and geographic extent of the summer monsoon (dashed green lines) are adapted from Kershaw et al. (2003). The average January position of the ITCZ is shown (cf. Huang et al., 2011). Yellow stars = position of the three groups of drilling sites: northern group (Sites U1463 and U1464), second group (Sites U1461 and U1462), and most southerly group (Sites U1458, U1459, and U1460).

Figure F5. Pliocene–Pleistocene record of the NWS and its relationship to various tectonic and climatic events. Horizontal shaded bars = likely periods of Indonesian Seaway restriction. The benthic foraminifer $\delta^{18}O$ curve is from Lisiecki and Raymo (2005). The NWS Indo-Pacific foraminiferal species distribution (from cuttings) is from Gallagher et al. (2009) and unpublished results from the Fisher-1 Well (adjacent to Site U1462). Sea-surface temperature data are from Hole 763A (Karas et al., 2011) (Figure **F1**).

Figure F6. Correlation of gamma logs from eight wells (locations on Figure **F1**) in the NWS. The top Miocene/base Pliocene (orange) is based on age data (green numbers) from Expedition 356 drilling and Gallagher et al. (2009, 2014b) for Goodwyn-7 and Goodwyn-6. Fm = formation. gAPI = American Petroleum Institute gamma radiation units. Depth is in meters below sea surface.

Figure F7. A. Benthic foraminifer $\delta^{18}O$ curve (LR2004) and MIS ages from Lisiecki and Raymo (2005) correlated with wells and cores in the Angel-1 region (Figure **F1**). B. Carbonate in Core BHC4. C. Carbonate in Core BHC1. D. Gamma log for Angel-1 (Figure **F6**). Vertical scale for B–D is in meters below sea surface and Cores BCH4 and BCH1 and the Angel-1 Well are ~50 m apart.

Figure F8. Site U1461 (yellow star; adjacent West Tryal Rocks-2 Well is also shown) on an interpreted seismic profile (A–A′) with "fossil" reefs (light green). See Gallagher et al. (2009, 2014b) for age-depth model (from cuttings) for the five wells: West Tryal Rocks-1 (WTR 1), Tryal Rocks-1 (TR 1), Maitland North-1 (MN 1), Maitland-1 (M 1), and Austin-1 (A 1). The numbers (0.5–4.0) are reflector ages in millions of years. Regional site and well locations are shown on Figure **F1**. Fm = formation.

Figure F9. Site U1459 summary showing core recovery (11 = drilled interval in Hole U1459C), lithostratigraphic units, age, magnetostratigraphy, biostratigraphy, NGR, and total spectral gamma ray (HSGR) wireline log. Gray bar = approximate depth of pipe in Hole U1459C; note the resulting dampened signal of gamma log in the upper 72 m WMSF. Age-depth model was produced from biostratigraphic datums based on calcareous nannofossils (black = Hole U1459B, blue = Hole U1459C) (see **Biostratigraphy and micropaleontology** in the Site U1459 chapter [Gallagher et al., 2017c]). Sedimentation rates are shown for Holes U1459A–U1459C. Basal sedimentation rate for Hole U1459B is extended and calculated based on uppermost datum in Hole U1459C. Benthic foraminiferal assemblages were smoothed to generate this synthesis, resulting in slight differences from data presented in hole summaries. BF = benthic foraminifer, PF = planktonic foraminifer, NN = calcareous nannofossil. IS = inner shelf, MS = middle shelf, OS = outer shelf, UB = upper bathyal. cps = counts per second.

Figure F10. Site U1460 summary showing core recovery, lithostratigraphic units, age, magnetostratigraphy, biostratigraphy, and NGR. For Hole U1460B, only limited biostratigraphy (Cores 65F through 68F) and no magnetostratigraphic analyses were performed, so age-depth model for both holes is presented as a composite, resulting in an inconsistency in planktonic foraminiferal datums and associated sedimentation rates from ~300 to 280 m CSF-A. Note the different sedimentation rates for planktonic foraminiferal (blue) and calcareous nannofossil (green) datums. Open circles = depth for *D. altispira* in Holes U1460A (upper point at 279.36 m CSF-A) and U1460B (lower point at 298.92 m CSF-A) (see **Biostratigraphy and micropaleontology** in the Site U1460 chapter [Gallagher et al., 2017d]). Benthic foraminiferal assemblages were smoothed to generate this synthesis, resulting in slight differences from data presented in hole summaries.

Figure F11. Site U1461 summary showing core recovery (11 = drilled interval in Hole U1461D), lithostratigraphic units, age, magnetostratigraphy, biostratigraphy, NGR, and Hole U1461D wireline HSGR. Gray bar = casing depth; note the resulting dampened signal of the gamma log. Biostratigraphic zone boundary ages are shown. Age-depth model was produced from select biostratigraphic datums (see Table **T6** in the Site U1461 chapter [Gallagher et al., 2017e]) color coded by hole (solid circles = calcareous nannofossil, open circles = planktonic foraminifer). Sedimentation rates assume a linear sedimentation rate between datums. Position of the unconformity (wavy line) in the Miocene is determined by lithologic change in Section 356-U1461D-51R-CC. Benthic foraminiferal assemblages were smoothed to generate this synthesis, resulting in slight differences from data presented in hole summaries.

Figure F12. Site U1462 summary showing core recovery (11 = drilled interval in Hole U1462C), lithostratigraphic units, age, magnetostratigraphy, biostratigraphy, NGR, and wireline HSGR. Gray bars = casing depth; note the resulting dampened signal of the gamma log. Biostratigraphic zone boundary ages are shown. Age-depth model was produced from select biostratigraphic datums (see Table **T7** in the Site U1462 chapter [Gallagher et al., 2017f]) (solid circles = calcareous nannofossil, open circles = planktonic foraminifer). Sedimentation rates are calculated separately for planktonic foraminiferal (blue dashed line) and calcareous nannofossil (green line) datums and assume a linear sedimentation rate between datums. Benthic foraminiferal assemblages were smoothed to generate this synthesis, resulting in slight differences from data presented in hole summaries.

Figure F13. Site U1463 summary showing core recovery, lithostratigraphic units, age, magnetostratigraphy, biostratigraphy, MS, and wireline HSGR. Gray bar = casing depth; note the resulting dampened signal of the gamma log. Biostratigraphic zone boundary ages are shown. Age-depth model was produced from select biostratigraphic datums (see Table **T6** in the Site U1463 chapter [Gallagher et al., 2017g]) (solid circles = calcareous nannofossil, open circles = planktonic foraminifer). Sedimentation rates assume a linear sedimentation rate between datums. Benthic foraminiferal assemblages were smoothed to generate this synthesis, resulting in slight differences from data presented in hole summaries.

Figure F14. Site U1464 summary showing core recovery, lithostratigraphic units, age, magnetostratigraphy, biostratigraphy, and NGR. Magnetic polar-

ity is shown in black and white (gray = uncertainty in the data) (see **Paleomagnetism** in the Site U1464 chapter [Gallagher et al., 2017h]). Biostratigraphic zone boundary ages are shown. Age-depth model was produced from biostratigraphic datums only (see **Biostratigraphy and micropaleontology** in the Site U1464 chapter [Gallagher et al., 2017h]) and assumes a linear sedimentation rate between datums (solid circles = calcareous nannofossil, open circles = planktonic foraminifer). Sedimentation rates are calculated separately for calcareous nannofossils and planktonic foraminifers where the datums diverge. Note the break in scale for the age-depth model. Benthic foraminiferal assemblages were smoothed to generate this synthesis, resulting in slight differences from data presented in hole summaries.

Figure F15. Summary of lithology and unit boundaries for each site, Expedition 356. Ages were determined from biostratigraphy.

Figure F16. A. Summary of benthic foraminiferal assemblages for each site, Expedition 356. Ages were determined from biostratigraphy. Benthic foraminiferal assemblages were smoothed to generate this regional synthesis, resulting in slight differences from data presented in both hole and site summaries (see each site chapter for more detail). (Continued on next page).

Figure F16 (continued). B. Taxa and assemblage key.

Figure F17. Expedition 356 NGR, as measured on whole-round cores and during wireline logging. Wireline data have been offset by 20 gAPI for plotting. Ages were determined from biostratigraphy.

Figure F18. Expedition 356 *P*-wave velocity, as measured on discrete core samples using the *P*-wave caliper from each site.

Figure F19. Quartz component percent estimates from smear slide data for each site, Expedition 356. Ages were determined from biostratigraphy.

Figure F20. Carbonate percent from coulometry analyses for each site, Expedition 356. Ages were determined from biostratigraphy.

Figure F21. Scanning electron microscope photomicrographs of typical preservation states of planktonic foraminifers, Site U1463. The depicted species is *Globigerinoides sacculifer* (or closely related to *G. sacculifer*). Depths are in CSF-A.

Figure F22. Sulfate, calcium, and salinity concentrations in interstitial water samples for each site, Expedition 356. Ages were determined from biostratigraphy.