Sea level records Provided by Kenenth G. Miller (kgm@rci.rutgers.edu) March 5, 2013

This file contains published sea level-records for the last 250 million years.

Columns A, B after Miller et al. (2011): Sea-level record for the past 9 Myr generated from benthic foraminiferal 18O using the Liseicki and Raymo (2004) stack to 5.2 Ma and Site 982 from 5.25 to 9 Ma record (Hodell et al., 2001; Andersson and Jansen, 2003). Miller et al. (2011) scaled assuming 67% ice volume and 33% temperature and account for long-term temperature changes by incrementing a 2°C temperature increase between and 2.5 and 3.5 Ma.

Columns C, D after Miller et al. (2005): Sea-level record for the past 9 Myr generated from benthic foraminiferal 18O from 846 (0-6.136 Ma; equatorial Pacific; Shackleton, et al., 1995) and 982 (6.139 to 9 Ma; northern North Atlantic; Hodell, et al., 2001). Records were spliced to create a high-resolution 18O composite record with a sample resolution of 3 kyr for the late Miocene to present. Though they are located in different deep-water masses, the records yield similar values across the splice. The pre-late Pliocene 18O record has average values (2.9‰) that are 0.5‰ lower than modern (3.4‰). Ice volumes during the late Miocene to early Pliocene were similar to the modern (Marchant, et al.,n1993), indicating that this long-term 18O offset reflects deep-water temperatures that were warmer relative to the modern. Thus, we incrementally added 0.5‰ to the values older than 3.5 Ma as a linear function from 2.5 to 3.5 Ma. We converted the adjusted 18O composite record to a sea-level estimate (Fig. 2) by scaling to a calibration of 0.1‰/10 m. Our initial sea-level and 18O estimates showed a change from the last glacial maximum to modern changes of 1.5‰; this change has been calibrated in Barbados as 1.2‰. The difference is due to glacial-interglacial deep-sea temperature changes of ~2°C. We scaled the sea-level curve by 0.8 to account for this difference.

Columns E, F, G, H Backstripped sea level estimates including “guestimated” lowstands (column G) after Kominz et al. (2008) using the Berggren et al. (1995) times scale (BKSA95). Column H provides an update to the 2012 Geological Time Scale (Gradstein et al., 2012).

Columns H, I, J Backstripped sea level estimates after Miller et al. (2005) using the Berggren et al. (1995) times scale (BKSA95). Column J provides an update to the 2012 Geological Time Scale (GTS12; Gradstein et al., 2012).

Columns K, L, M Sea level estimates of Haq et al. (1987). The published curve was digitized and reproduced by Miller et al. (2005). The sea level record is given with the time scales of BKSA95 (column K) and GTS12 (column M).

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