Figure F1. Map of eastern Indian Ocean showing locations of Sunda-Sumatra subduction zone, Bengal and Nicobar Fans, and Sites U1480 and U1481.

Figure F2. Simplified composite of seismic reflection profiles showing locations of Sites U1480 and U1481 (from McNeill et al., 2017b). Blue line = interpreted unconformable boundary between Bengal-Nicobar Fan sediments and overlying trench wedge.

Figure F3. Representative X-ray diffractograms for typical sample air-dried, glycol saturated, and heated to 550°. Glycol saturation causes expansion of the smectite mineral structure and separates it from the chlorite (001) peak. Note that intensities of chlorite (002) and (004) peaks are similar before and after heating, indicating little contribution from kaolinite. The increase in illite (001) peak intensity after heating is due to collapse of the smectite (001) structure.

Figure F4. Example X-ray diffractogram for random clay-size powders showing peaks used to identify illite polytypes, Site U1480. Relative proportions of $1M/1M_d$ and $2M_1$ polytypes were determined using Wildfire (Reynolds, 1993) simulations as described by Haines and van der Pluijm (2008, 2010). Q = quartz, P = plagioclase, Cl = clay.

Figure F5. Representative X-ray diffractograms for illite- and smectite-rich random clay-size powders showing position of (060) reflections, Site U1480. d-value of smectite peak is used to identify dioctahedral vs. trioctahedral varieties. d-value of illite peak is used to compute b_o and determine phengite content.

Figure F6. Representative X-ray diffractograms for oriented clay-size aggregates (glycol saturated) showing peaks for smectite (Sm), illite (I), chlorite (Chl; C), kaolinite (K), and quartz (Q), Site U1480. Weight percent normalized mineral abundance values were calculated using regression equations of Underwood et al. (2020). Green curve = background intensity, dashed lines = position of smectite (001) saddle and peak used to compute smectite expandability (Rettke, 1981), I/S = illite (002)/smectite (003) peak used to determine percentage of illite in illite/smectite mixed-layer clay (Moore and Reynolds, 1989a).

Figure F7. Regression equations and plots of integrated peak area vs. known weight percent for clay-size standards (Underwood et al., 2020). See Underwood et al. (2020) for discussion of goodness-of-fit values (r = correlation coefficient) and assessment of errors using linear vs. polynomial regression models. C+K = chlorite + kaolinite.

Figure F8. Ternary diagrams showing normalized weight percent of clay minerals in lithologic units at Sites U1480 and U1481, where smectite + illite + undifferentiated chlorite + kaolinite = 100%. Dashed ovals = fields of data for specified units for comparison with units immediately above in the stratigraphic succession. Subunit IIC and Subunit IIIA/Unit III diagrams include data from both Sites U1480 and U1481.

Figure F9. Lithostratigraphic column (from McNeill et al., 2017b) with normalized abundance of smectite, illite, undifferentiated chlorite + kaolinite, and quartz in clay-size fraction, Site U1480. See Table T2 for tabulated data and identification of sample intervals.

Figure F10. Lithostratigraphic column (from McNeill et al., 2017b) with normalized abundance of smectite, illite, undifferentiated chlorite + kaolinite, and quartz in clay-size fraction, Site U1481. See Table T3 for tabulated data and identification of sample intervals.

Figure F11. Stratigraphic variations in values of illite crystallinity index, expandability of illite/smectite (I/S), and illite abundance in I/S mixed-layer clay in hemipelagic sediments, Sites U1480 and U1481. Illite crystallinity index: dashed lines = boundaries between generic zones of epimetamorphism, anchimetamorphism, and advanced diagenesis (Warr and Ferreiro Mählmann, 2015). I/S expandability: dashed line = subjective best-fit to highlight stratigraphic trend. Dashed ovals segregate results from Unit III with anomalously high contents of smectite.

Figure F12. Variations in illite-mica polytypes, Sites U1480 and U1481. Proportions of $2M_1$ polytype are relative to $1M/1M_d$. See Table T7 for tabulated results and identification of sample intervals.

Figure F13. Histograms showing X-ray diffraction results for illite b_o lattice spacing and apex position of smectite (060) peak. As a generic reference, comparative ranges of b_o values for well-documented metamorphic terranes are from Sassi and Scolari (1974), Padan et al. (1982), and Underwood et al. (1993). Expected peak positions for specific dioctahedral and trioctahedral minerals of the smectite group are from Brindley (1980). See Tables T8 and T9 for tabulated results and identification of sample intervals.