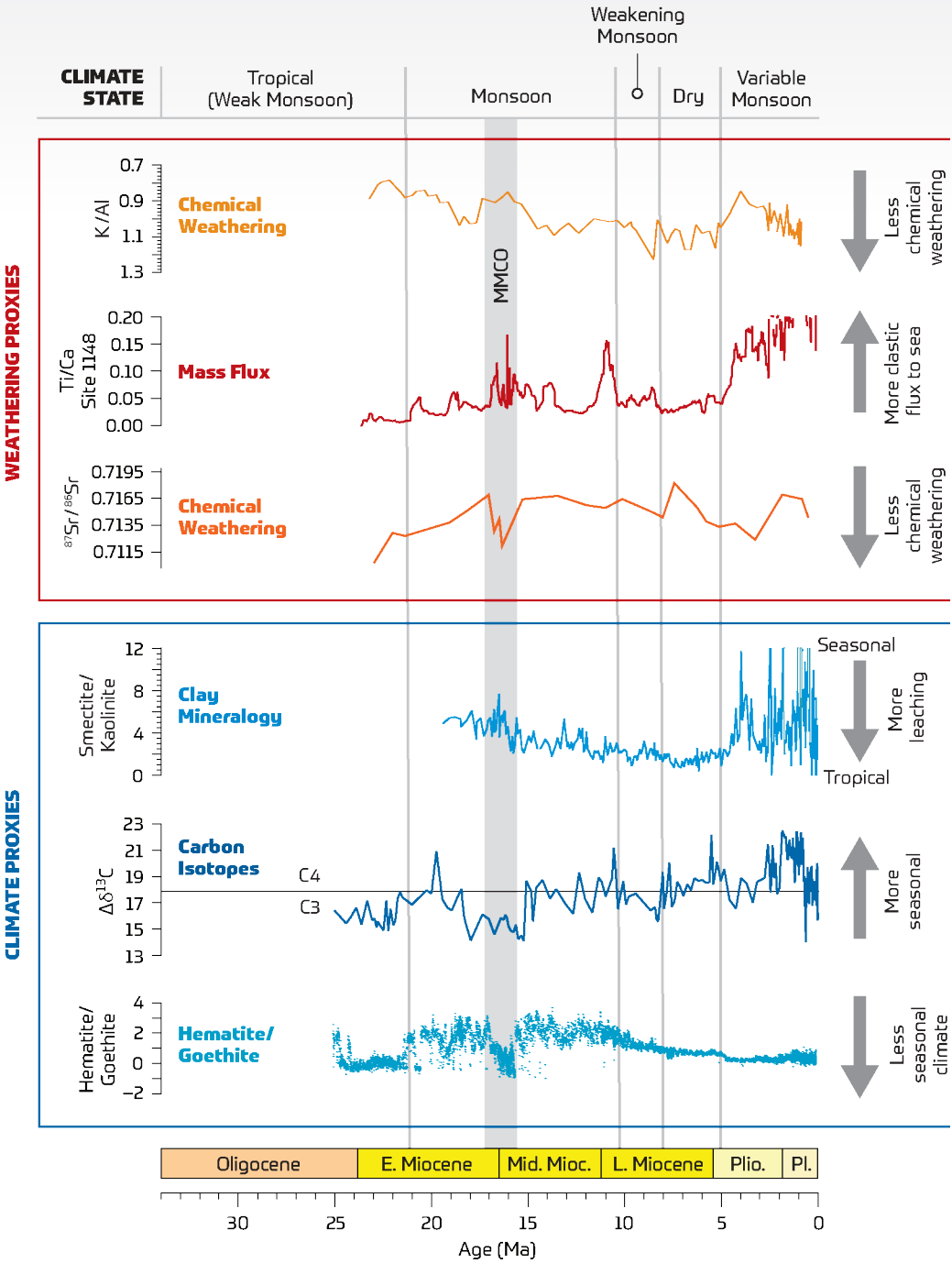

Robust records of both past weathering and climate are necessary to investigate the temporal relationships between weathering and climate and, hence, the feedbacks between tectonic and climate processes. A range of complementary proxies allow us to reconstruct such records from drill cores, as illustrated here with a compilation of some of the more robust erosion and weathering proxies spanning 25 million years at Ocean Drilling Program (ODP) Sites 1146 and 1148 in the South China Sea. The upper three panels are proxies for weathering: (top) chemical weathering (K/Al), (middle) mass flux (Ti/Ca) from ODP Site 1148, and (bottom) chemical weathering (Sr isotopes) from ODP Site 1148. The lower three panels are proxies for changing climate. (top) Clay mineralogy (smectite/kaolinite), (middle) the difference in isotopic composition of atmospheric and terrestrial biomass carbon from ODP Site 1148, which reflects shifts between C4 grassland and C3 woodland flora in the continental flood plain, and (bottom) the chemical weathering index (C_{RAT}) proxy tracking the relative influence of chemical weathering versus physical erosion. MMCO = Middle Miocene Climatic Optimum. *Modified from Figure 8 in Clift et al. (2014), https://doi.org/10.1016/j.earscirev.2014.01.002*