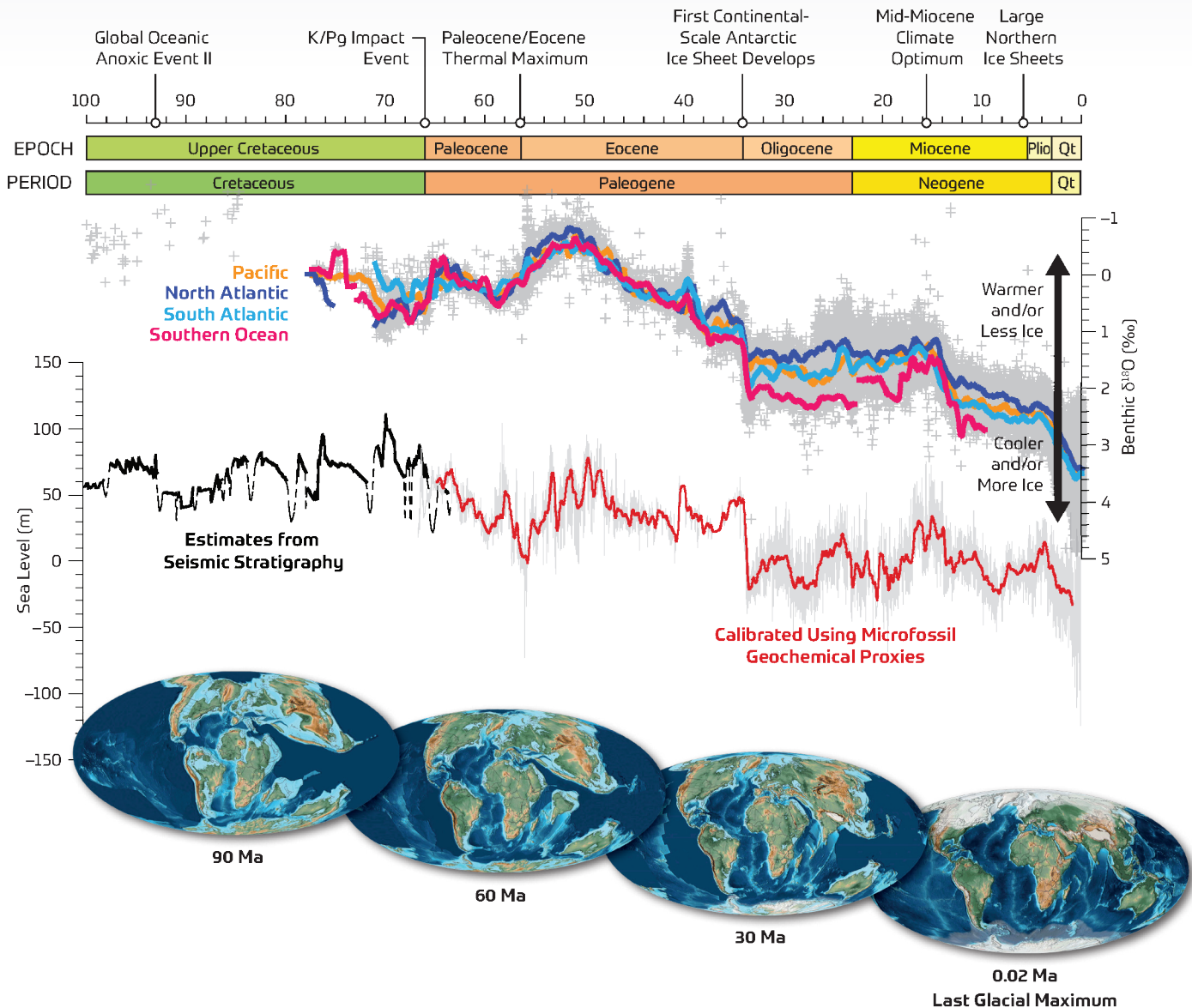


MILLIONS OF YEARS BEFORE PRESENT



One hundred million years of climate change captured in scientific ocean drilling records. Significant paleogeographic reorganization and key events in Earth history accompanied a long-term cooling trend that culminated in the development of permanent ice sheets in the polar regions. The geochemical composition ($\delta^{18}\text{O}$) of benthic microfossils shown here provides a tool for reconstructing bottom-water temperatures in different ocean basins and calibrating records of global ice volume and sea level change. (Qt = Quaternary, Plio = Pliocene). The most recent estimate of sea level change for the Cenozoic is shown and is based on a spliced record derived from multiple scientific ocean drilling cores, while estimates further back in time are largely based on seismic stratigraphy estimates. The global maps show the changing configuration of the continents and ocean through time (boundary conditions of the climate system), as well as the extent of the cryosphere. Sources: Cramer et al. (2009), <https://doi.org/10.1029/2008PA001683>; Miller et al. (2020), <https://doi.org/10.1126/sciadv.aaz1346>; Scotese (2016), PALEOMAP PaleoAtlas for GPlates and the PaleoData Plotter Program; <https://www.earthbyte.org/paleomap-paleoatlas-for-gplates/>