



Fig. 2. Glacial epochs on Earth since 3.0 Ga. (A) Black bands indicate durations of the Sturtian and Marinoan cryochrons (Table 1). The graded start to the Marinoan cryochron denotes chronometric uncertainty, not gradual onset. Ellipse F-LIP shows the possible age span of the Franklin large igneous province (LIP) (32, 127). (B) Snowball Earth chrons (black), regional-scale ice ages (medium gray), and nonglacial intervals (light gray) since 3.0 Ga. Ellipse GOE is centered on the Great Oxidation Event, as recorded by the disappearance of mass-independent S isotope fractionations ≥ 0.3 per mil (‰) in sedimentary sulfide and sulfate minerals (484). The dashed gray line indicates questionable glaciation.