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Twenty Years of Dating 'Snowball Earth' (and other parts of the Neoproterozoic)

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The Snowball Earth hypothesis presented a number of predictions, namely global synchronicity and multi-million year duration, that can be tested with geochronological data. We present an overview of the dating methods that have been employed to constrain the age of the Neoproterozoic stratigraphic record, with a focus on radio-isotopic dating, and discuss objective criteria used for assessing 'quality'. Over the past two decades a concerted effort by the research community has greatly increased the number of radio-isotopic constraints for the Cryogenian and Ediacaran successions distributed globally, providing the data required to test the first order predictions of the Snowball Earth hypothesis. We will present and review the database of radio-isotopic constraints for the Cryogenian from a number of cratons, including a number of unpublished data. Global synchronicity and multi-million year duration are both demonstrated for both the Sturtian and Marinoan glacial intervals, and we will explore future challenges for calibrating the Croygenian/Neoproterozoic.