

## Palaeoproterozoic Earth history: a proposed revision

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A long-standing concept of Palaeoproterozoic Earth history is the presumed time-equivalence of organic-rich rocks (averaging 2–5% total organic carbon) that are found on several cratons, *e.g.* the Shunga Event. Similarly, major positive carbonate-carbon isotope excursions ( $\delta^{13}\text{C} > +5\text{‰}$  and locally much higher) are viewed as marking coeval, worldwide perturbations of the global C cycle, *e.g.* the Lomagundi-Jatuli Event. Here we combine new and published geochronology that shows that the main Palaeoproterozoic carbon burial episodes (PCBEs) preserved in Russia, Gabon and Australia were temporally discrete depositional events between *c.* 2.10 Ga and 1.85 Ga. In northwest Russia we also show that the termination of the Lomagundi-Jatuli Event may have differed by up to 50 Ma between localities.

Intriguingly, PCBEs and Mesozoic Oceanic Anoxic Events (OAEs) share features that hint at a commonality of cause(s) and feedbacks: both are exceptionally organic-rich relative to encasing strata, associated with contemporaneous igneous activity and marked by organic carbon isotope profiles that exhibit a stepped decrease followed by a stabilisation period and recovery. What is different is that PCBE strata are thicker and of greater duration than OAEs (100 s of metres versus a few metres,  $\sim 10^6$  versus  $\sim 10^5$  years durations). This suggests that PCBEs represent processes that can be basin-specific and formed by conditions that are not singularly unique to the Palaeoproterozoic.