Major local and worldwide impacts events recorded in sediments from Black Rock Forest.

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A core from Tamarack Pond in Black Rock forest has 11 prospective impact ejecta layers that contain Ni rich metal embedded in the surfaces of concoidally fractured grains or marine microfossils. Six out of the eleven layers contain impact glass that has chemistry and morphology that is inconsistent with volcanic glass. Nine out of the eleven layers contain marine microfossils. Some of the marine microfossils are embedded within the surface of impact glasses. Layer 1 contains a marine microfossil with Ni rich metal splashed on its surface. It has an age that matches an impact off the coast of New Zealand at ~1450 A.D. There are contemporaneous megatsunami deposits in eastern Australia with maximum run ups of 110

meters that may be related to this event. Layer 3 contains a siliceous marine microfossil splashed with Ni rich metal. It has a distal origin, on the order of 10,000 km away at a minimum. Its rough age matches that of a proposed impact onto moon in 1178 A.D. This impact should have produced a shower of impact ejecta that hit the Earth, thereby producing secondary terrestrial ejecta. Layer 5 contains magnetite and magnetic siderite with a concoidal fracture. Its age matches that of an impact event in the Gulf of Carpentaria, Australia at 572±86 A.D. The proximal impact ejecta in the Gulf of Carpentaria contain magnetite impact spherules, magnetic siderite, melted marine fossils, and prospective shocked quartz. The age of the impact in the Gulf of Carpentaria roughly matches that of a prominent climate downturn from 535 to 541 A.D. Layer 8 has an age that matches that of a Long Island tsunami layer [1]. Layer 11 contains impact glass with petrified coccoliths on its surface. Its approximate age matches that of a climate downturn at 1158 B.C. We are now sieving these layers for seeds to C-14 date the layers with more precision. We will also use the sieved samples to look for shocked quartz and feldspar, impact spherules, marine microfossils, and impact glass.

[1] Goodbred, S. L. *et al.*, 2006, Eos Trans. AGU, 2006, OS43C-0681