Was the Climate Downturn from 536 to 542 A.D. Produced by a Cosmic Swarm?

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Napier and Clube, prominent British astronomers, believe that the biggest hazard from impact is not from single objects kilometers in diameter but instead from cosmic swarms of moderate sized impactors tens to hundreds of meters in diameter(Clube and Napier, 1990). The climate downturn between 536 A.D. and 542 A.D. may be the result of a cosmic swarm. There may have been multiple impacts and/or incursions of cosmic dust starting in 536 A.D. and continuing until sometime around 542 A.D. Mike Baillie has proposed an impact in 540 A. D. that produced seiches in lakes in Ireland (Baillie, 1999). Rigby et al., (2004) proposed that the dust from an extraterrestrial object 600 meters in diameter produced the dust veil event that started in mid-March of 536 A.D. and lasted for 18 months(Stothers, 1984). The GISP2 ice core has a previously studied interval in the early part of 536 A.D. with the largest nonvolcanic Cl value in the last 2000 years; encompassing the time from Nov 23rd, 535 A.D to March 14th, 536 A. D. The second largest nonvolcanic Cl peak is later in 536 A.D. roughly from March 14th to June 2nd, 536 A.D. We infer that this high Cl value might be due to a distal oceanic impact and have obtained samples from a meter of the GISP2 core that contains this time interval.

We have preliminary data from the GISP2 ice core confirming that the time around March 536 A.D. shows a peak in abundance of impact spherules. The impact spherules are composed of silicate, iron oxide, and carbon. The silicate spherules do not have the same composition as ablation spherules from meteorites and must be from a terrestrial impact event. The impact spherules are accompanied by impact glass, implying that the impactor was large enough to produce an impact crater and had a diameter of at least 141 meters. We also find impact ejecta at the 541 A.D. horizon. Because dust falls out of the atmosphere in four years or less, this data implies that a cosmic swarm caused the climate downturn. We also have a candidate crater and impact ejecta layer in the Gulf of Carpentaria that dates to around 536 A.D. Money from the climate center grant will be used to look for impact ejecta in the sieving residues from the circa 536 A.D. layer in the Carpentaria cores. These particles are comparable in size to most of the GISP2 particulates. We will finish at least 10 out of the 19 slides from our GISP2 samples so that we can make quantitative estimates of the abundance of impact ejecta in each slide. These results should be enough to write a paper to submit for peer review.

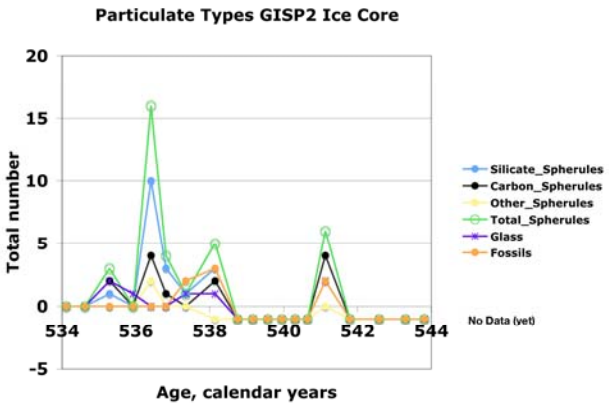

Figure 1. Reconnaissance abundance of impact spherules, glass and marine fossils versus age in GISP2 core (data from Abbott et al., Fall AGU abstract).