Evidence for Extraterrestrial Impacts in Marine Sediment Cores from the North Atlantic

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Extraterrestrial impacts have vastly affected earth's history. However, very little research has focused on oceanic impacts, and many are likely undiscovered. Abbott et al. (2026) described a potential impact of a 7 km bolide onto the Alpha Ridge in the Arctic Ocean, creating a disturbed zone spanning 600 by 200 km. This study examined two marine sediment cores from the North Atlantic, approximately 1800 km from the Alpha Ridge site, for evidence of this impact. ITRAX was used for preliminary elemental analysis on core VM28-025, and cores VM28-025 and VM27-082 underwent calibrated X-Ray Fluorescence (XRF) analysis and magnetic susceptibility profiling. 30 samples of sediment from VM28-025 and 3 samples from VM27-082 were sieved to determine grain size distributions, and impact ejecta candidate grains were selected for imaging using a Scanning Electron Microscope (SEM). Two intervals in VM28-025, from 690-735 cm and about 605-645 cm, contained up to 5,580 ppm Ni, 15,936 ppm Co, and 4,102 ppm Cr, signifying enrichment in extraterrestrial material. Ni remained high when normalized to Fe, Al, Mg, and Si. Magnetic susceptibilities spiked in the same intervals. VM27-082, 330 km from VM28-025, also displayed ET-elemental enrichment, indicating a potential regional event. Impact ejecta candidates from the anomalous layers were found, including up to 15 to 20 spherules per 10 g in some intervals. Over 70 tektites, as well as quartz and garnet displaying shock lamellae in at least three directions, were also found. While elemental and mineralogical anomalies appear to be present in two discrete layers that may represent separate events, they also may represent a single impact-related turbidite created by the Alpha Ridge impact. *Neogloboquadrina pachyderma* fossils were found in three samples from the intervals examined, indicating that the impact(s) were Plio-Pleistocene or younger. K/Ar dating of the layers is ongoing and will determine whether there are one or two events represented in VM28-025 and allow us to connect the impact ejecta to known impact(s). Overall, through geochemical analysis and examination of marine sediment, evidence has been found for at least one and potentially two extraterrestrial impacts in cores from the North Atlantic.