

What is the Age and Origin of the Spherule Bearing Layer in some Ross Sea Cores?

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Abstract

L.P. Khyranina (1985) was the first to suggest that there were two structures present on the Antarctic continental shelf beneath the Ross Sea. One was the ~100 km Bowers impact crater candidate. However, there was no solid evidence that proved an extraterrestrial impact produced the Bowers structure. Debate has ensued for decades on whether the Bowers structure was an impact crater. Now we have come close to finding an answer. We used core samples taken near the crater and sieved into four size fractions (>250,>125,>63,>38 μm). Impact ejecta candidates were then picked from cores ELT 32-08, ELT 32-03, ELT 32-43, ELT 32-06, DSDP 273, DSDP 274, and NPB 95-01 39KC and were analyzed for chemical composition and physical features. All but DSDP site 274 contain pure SiO_2 glasses that resemble tektites. We also found candidates for flow textured impact glass and shocked quartz. This led us to conclude that the origin of the spherule-bearing layer was from an impact. With the use of dated core NBP 95-01 39KC, we have constrained the age to lie between $7,305 \pm 80$ BP and $11,150 \pm 95$ BP (corrected radiocarbon ages) (Cunningham et al., 1999).