**Summary** Alegret and Thomas, benthic foraminifera ODP Site 690

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**Titel** Benthic foraminifera across the Cretaceous/Paleogene boundary in the Southern Ocean

**Description/Abstract** The impact of an asteroid at the Cretaceous/Paleogene (K/Pg) boundary triggered dramatic biotic, biogeochemical and sedimentological changes in the oceans that have been intensively studied. Paleo-biogeographical differences in the biotic response to the impact and its environmental consequences, however, have been less well documented. We present a high-resolution analysis of benthic foraminiferal assemblages at Southern Ocean ODP Site 690 (Maud Rise, Weddell Sea, Antarctica).

At this high latitude site, late Maastrichtian environmental variability was high, but benthic foraminiferal assemblages were not less diverse than at lower latitudes, in contrast to those of planktic calcifiers. Also in contrast to planktic calcifiers, benthic foraminifera did not suffer significant extinction at the K/Pg boundary, but show transient assemblage changes and decreased diversity. At Site 690, the extinction rate was even lower (~3%) than at other sites. The benthic foraminiferal accumulation rate varied little across the K/Pg boundary, indicating that food supply to the sea floor was affected to a lesser extent than at lower latitude sites. Compared to Maastrichtian assemblages, Danian assemblages have a lower diversity and greater relative abundance of heavily calcified taxa such as Stensioeina beccariiformis and Paralabamina lunata. This change in benthic foraminiferal assemblages could reflect post-extinction proliferation of different photosynthesizers (thus food for the benthos) than those dominant during the Late Cretaceous, therefore changes in the nature rather than in the amount of the organic matter supplied to the seafloor. However, severe extinction of pelagic calcifiers caused carbonate supersaturation in the oceans, thus might have given competitive advantage to species with large, heavily calcified tests. This indirect effect of the K/Pg impact thus may have influenced the deep-sea dwellers, documenting the complexity of the effects of major environmental disturbance.

**Table S2**: Benthic foraminiferal counts from ODP Site 690, and ages for the studied samples. Epifaunal (E) and infaunal (I) species are listed in the table.

**Table S3**: Results of d13C and d18O analyses on benthic foraminifera (Nuttallides truempyi and Stensioeina beccariiformis), and % CaCO3 data from ODP Hole 690C.

**Position**: ODP Hole 690C: Lat -65.160, Long 1.204, Elevation -2925, Drilling, Sampling date 1987-01-21 to 1987-01-23

**Labels** ODP

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