

Stratigraphy around the Cretaceous-Paleogene boundary in sediment cores from the Lord Howe Rise, Southwest Pacific

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Cenozoic and latest Cretaceous sediments were recovered at DSDP Site 208 on the Lord Howe Rise, Southwest Pacific. We provide new biostratigraphic, magnetostratigraphic and chemostratigraphic data from Site 208 to constrain the stratigraphy around the Cretaceous Paleogene (K-Pg) boundary and to determine the depth of the K-Pg boundary more precisely. Biostratigraphic data from calcareous nannofossils indicate a near-continuous succession of sediments from the mid-Maastrichtian (Late Cretaceous) to lowermost Thanetian (Paleocene) at depths of 540–590 m below seafloor (mbsf). The biostratigraphic data suggest that the K-Pg boundary corresponds to a siliceous claystone at the base of an interval of silicified sediments (~576–577 mbsf). Osmium concentration and Os isotopic composition ($^{187}\text{Os}/^{188}\text{Os}$) can also be used to identify the K-Pg boundary interval, as it is marked by a peak in Os concentration and a drop in $^{187}\text{Os}/^{188}\text{Os}$ values to ~0.15, both of which are the result of the Chicxulub impact event. Our $^{187}\text{Os}/^{188}\text{Os}$ data show trends similar to those of coeval global seawater with the lowest value of ~0.15 in the siliceous claystone (~577 mbsf). However, the concentration of Os is low in this sample, which suggests that this siliceous claystone was deposited around the K-Pg boundary but may not include the boundary itself. Although the sedimentary record across the K-Pg interval at Site 208 may not be completely continuous, it nevertheless captures a time interval that is close to the Chicxulub impact event. We believe that our results provide important insight into the marine environments near the antipodal point of K-Pg impact events.

Keywords: Cretaceous/Paleogene boundary, Os isotope