

Absolute Time Calibration of Upper Cretaceous Nannofossils Using Graphic Correlation

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The fossil record of calcareous nannoplankton is one of the most abundant and stratigraphically complete of any fossil group. Nannofossils are exceptionally useful for biostratigraphy because of their small size, planktonic habit, rapid evolution and largely cosmopolitan distribution. In the last three decades, nannofossils have lend themselves to high-resolution zonation schemes, which are based on a series of well-established primary markers and a host of secondary markers whose biostratigraphic utility has not been fully explored yet. Determining the maximum range (inception to extinction) of such secondary markers will enhance their utility in biostratigraphy. This study aims to improve the chronostratigraphic resolution of this group of secondary markers. To achieve this, we have applied the Graphic Correlation methodology on analyzed data from a suite of coeval Upper Cretaceous Ocean Drilling Program (ODP) sections (Albian-Maastrichtian) in the western equatorial Atlantic region.

The Graphic Correlation method was developed by Shaw in the 1960's as a means to establish the total ranges of fossil taxa and to correlate among stratigraphic sections by placing them in a standardized framework. Generally, data from a large number of analyzed sections (wells and outcrops) in a given area define a composite standard. When graphing a new section, this composite standard is used to retrieve stratigraphic events, i.e., first and last occurrences of fossil datums calibrated to absolute time. Once interpreted, the new section becomes a part of the composite standard and increases its resolution by establishing more accurate fossil ranges. A Windows-based Graphic Correlation software application, StrataPlot, developed at Energy and Geoscience Istitute, was used for the purpose of this study.