Applying statistical techniques to construct a refined Paleocene-Eocene calcareous nannofossil biozonation

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In an effort to refine the resolution of the existing Paleocene-Eocene calcareous nannofossil biostratigraphic zonations, a statistically rigorous methodology was applied to various deepwater sections. Abundance counts on calcareous nannofossils were performed on two ODP sites (Leg 171B, Sites 1051A and 1052A, Blake Nose), and on a deepwater Gulf of Mexico well (Keathley Canyon, Block 774, "Ponza"). In addition, calcareous nannofossil biostratigraphic data were taken from published work, and incorporated into this study to increase the dataset size. After the abundance counts were performed and the data were compiled, a detailed evaluation of the many hundreds of Paleogene-age taxa was carried out, using hardcopies of species distribution charts (BugCAD plots), followed by analysis of results processed through specialized computer software (IPS). This process yielded the placement of the more common types of bioevents (*i.e.*, species range tops and bases), and in addition aided in the recognition of new, useful, subordinate bioevents (*e.g.*, first downhole increases). All bioevents were then analyzed using the ranking and scaling probabilistic sequencing method (RASC). The RASC method resulted in the most probable order, termed the "optimum sequence", for the Paleocene-Eocene calcareous nannofossil bioevents. With the possible discovery of new, non-traditional bioevents, and resulting increased biostratigraphic resolution, the produced optimum sequence has the potential to aid in the success of biostratigraphic correlation within key hydrocarbon fields, as well as between geographically widespread basins.