

BIOGEOGRAPHIC AND EVOLUTIONARY PATTERNS OF CHANGE IN THE
TERRESTRIAL BIOTA ACROSS THE CRETACEOUS\TERTIARY BOUNDARY

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The currently available fossil record suggests, 1) biogeographic differentiation of the Late Cretaceous terrestrial biota and, 2) distinctly different patterns of evolution of terrestrial faunas and floras across the Cretaceous\Tertiary boundary.

Discovery in Alaska of dinosaurs and mammals that lived at Late Cretaceous northern high latitudes provides evidence that many groups of terrestrial vertebrates had extensive geographic ranges and faunas were biogeographically differentiated. The Alaskan dinosaurs, represented by individuals that range in size from hatchlings to adults, might have been migratory forms living at high latitudes only during the summer months. In contrast, the small mammals probably were not migratory.

Although recent discoveries are expanding our knowledge of the evolution of the terrestrial biota, the fossil record of terrestrial vertebrates during the Cretaceous\Tertiary transition is still heavily biased in favor of the northern Western Interior of North America. Here evolutionary change of the terrestrial fauna did not just involve extinction of lineages, some already decreasing in taxonomic diversity, and survival of many others. Shifts in biogeographic range and immigration of new groups played a significant role in remodeling the terrestrial fauna. The paleobotanical record is more extensive but also is biased with the most detailed record coming from the Western Interior where floral change is characterized as "massive" or "catastrophic" in scope.

These conflicting evolutionary patterns are well founded being based on analysis of substantial fossil records. A new program of research directed toward resolution of the apparent paradox tests the hypothesis that at the end of the Cretaceous the terrestrial biota was biogeographically heterogeneous and evolutionary patterns of faunal and floral change in the Western Interior cannot be taken as globally representative.