EARLY PALEOCENE FLORAS FROM THE SAN JUAN BASIN (NEW MEXICO, USA) RECORD TERRESTRIAL ECOSYSTEM CHANGE FOLLOWING THE CRETACEOUS-PALEOGENE BOUNDARY

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Early Paleocene floral communities were substantially restructured as a result of the Cretaceous-Paleogene (K-Pg) mass extinction at 66.0 Ma. While events immediately adjacent to the K-Pg boundary have been extensively studied, comparatively less research has looked at long-term terrestrial ecosystem recovery during the early Paleocene. The San Juan Basin (SJB), located in northwestern New Mexico, preserves an exceptional, well-constrained, and diverse early Paleocene plant record making it an ideal location to study long-term early Paleocene terrestrial ecosystem recovery. Here we investigate early Paleocene terrestrial ecosystem change using a coupled high-resolution plant macrofossil and $\delta^{13}C$ record from dispersed bulk organic carbon in the SJB.

Plant macrofossils were collected from the lower Paleocene Ojo Alamo Sandstone and lower Nacimiento Formation in the SJB spanning the initial ~1.5 myr of the Paleocene (~66.0 – 64.5 Ma). The SJB macroflora was species rich (187 unique morphotypes), laterally heterogeneous, and dominated by dicot angiosperms with ferns and monocot angiosperms as common accessory taxa. Floral proxies indicate warm (~22 - 27 °C MAT) and relatively wet (~1500 - 2500 mm/yr MAP) climatic conditions similar to modern tropical seasonal forests. Macrofloral extinction, origination, and net diversification rates were simultaneously estimated using the Pradel capture-mark-recapture (CMR) model from 66.0 – 64.5 Ma with 100 Kyr time-steps. Two short intervals of rapidly increasing floral diversity were identified at ~65.3 Ma and ~64.6 Ma respectively. Two intervals of decreasing floral diversity were identified: a short interval at ~65.5 Ma and a prolonged interval from ~65.2 – 64.7 Ma. The onset of both intervals of decreasing floral diversity are coeval with -1.5‰ to -2.5‰ bulk organic $\delta^{13}C$ excursions. We also applied the Pradel CMR model to contemporaneous macrofloras from the Denver Basin (DB), Colorado and the Williston Basin (WB), North Dakota and Montana. The floral diversity patterns estimated from the DB and WB indicated intervals of increasing and decreasing floral diversity that are coeval with the same intervals identified in the SJB. This suggests a potential regional driver for prolonged terrestrial ecosystem instability following the K-Pg mass extinction.