CARBON ISOTOPIC COMPOSITION OF ORGANIC MATTER IN CONTINENTAL CRETACEOUS-TERTIARY BOUNDARY SEDIMENTS. T. Maruoka[1,2], C. Koeberl[2], and B. F. Bohor[3], [1]Laboratory for Space Sciences, Washington University, St. Louis, MO, 63130, USA, teruyuki@wuphys.wustl.edu, [2]Institute of Geochemistry, University of Vienna, Vienna, A-1090, Austria, [3]U.S. Geological Survey, Denver, CO, USA

Introduction: Continental Cretaceous-Tertiary sites of the Western Interior of the United States are composed of two layers: a lower kaolinitic layer with spherules believed to represent distal ejecta from the impact, and an overlying smectic layer which contains evidence of shock metamorphism, iridium, and soot. At the time of the terminal Cretaceous event, the area was part of a large area consisting of floodplains and backswamps. In this study, we have used $\delta^{13}C$ values of total organic carbon to examine paleoenvironmental conditions of freshwaters across the K-T boundary (Dogie Creek and Brownie Butte).

Results and Discussion: There is a ~2‰ increase of $\delta^{13}C$ value of total organic matters in the lower boundary clay layer of the Dogie Creek section. Similar excursions of the $\delta^{13}C$ values in the clays were also observed at other continental K-T sites of the North America, such as Starkville South, Colorado and Raton Pass, New Mexico [1]. However, no significant excursions can be recognized in the corresponding layer of the Brownie Butte site and other sites, such as York Canyon, New Mexico [2] and Sugarite, New Mexico [3]. These differences in the $\delta^{13}C$ values indicate that the excursions should have reflected the local environmental factors rather than the $\delta^{13}C$ excursion of the atmosphere at the K-T boundary. As the $\delta^{13}C$ positive excursions were accompanied by the negative $\delta^{15}N$ excursions [1], these can be induced by eutrophication [4]. This could be supported by enhancement of the sulfide accumulation in the lower boundary clay of the Dogie Creek sites [5] because high sulfide accumulation can cause eutrophication in freshwaters [6]. Actually, no enhancement of sulfide accumulation was observed at the lower boundary clay of the Brownie Butte site [5], where the positive $\delta^{13}C$ excursion was not observed as stated above. The acid rain after K-T impact might supply abundant sulfate to freshwaters, which might lead to high sulfide accumulation for some (not all) freshwaters as observed now in polluted lakes.

Acknowledgements: This work was supported by the Austrian Science Foundation, FWF project Y58-GEO (to C.K.).

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