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86-3: POST-IMPACT EVOLUTION OF CHICXULUB CRATER: SEDIMENTOLOGICAL ANALYSIS OF THE CRETACEOUS-PALEOGENE IMPACT, MEXICO

Sunday, 22 October 2017
09:00 AM - 05:30 PM
Washington State Convention Center - Halls 4EF

The Chicxulub impact crater is the only known terrestrial impact structure to be directly linked to a mass extinction event. This unique distinction, combined with the fact that it is incredibly well preserved, means Chicxulub can readily lend itself to the study of large impact related effects on Earth's surface. This study will document post-impact carbonate sedimentation and the response of the biosphere following the Chicxulub impact. The physical, biological, and geochemical conditions within the Chicxulub crater will be analyzed via a sedimentological analysis of the most recent International Ocean Discovery Program (IODP) core from Expedition 364, which sampled the peak ring and overlying Paleogene sedimentary rocks in the crater. We will document stratigraphic variability, identify and quantify microfossil assemblages and degree of bioturbation (ichnofabric index), and perform elemental analysis using established geochemical proxies such as Cr, Mo, Ni, V and U to determine redox conditions, micronutrients such as Ni, Cu and Zn for productivity, and Al, Si, Ti, and Zr to determine detrital input. Ichnofabric indices, foraminifera, and nannoplankton indicate a relatively rapid return of life to the crater but initial biostratigraphic analyses imply stressed conditions for calcareous nannoplankton for several million years. The extent of early Paleocene anoxia will be evaluated with redox geochemical proxies. We hypothesize that these proxies will reveal increasingly favorable geochemical conditions that are coeval with the return of biota and normal carbonate sedimentation during the Paleocene. This hypothesis will be tested through the use of microfacies analysis, documentation of ichnofabric indexes and microfossils, and use of UAFs X-Ray Fluorescence Spectrometer. This study will clarify post-impact environmental, biological, physical, and geochemical marine conditions.

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