



Dike diversity in the IODP-ICDP 364 core: A geochemical investigation into the Chicxulub impact structure.

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The Chicxulub impact structure in Yucatán, Mexico is the only known terrestrial impact structure that is linked to an extinction event, has a global ejecta layer and preserves a distinct peak ring. This makes this structure a unique study area for both impact cratering processes and their environmental repercussions. The IODP-ICDP 364 Expedition in 2016 cored the peak ring of the Chicxulub crater, recovering ± 110 m of Paleogene sediments, ± 130 m of suevite and impact melt rocks, and ± 610 m of granitoid basement material [1]. The latter is intruded by both pre-impact magmatic dikes and impact melt rocks. These intrusions show large variations with aplite, pegmatite, dacite, felsite and dolerite, likely representing the pre-impact lithologies, and suevite and melt rocks representing the impact related lithologies [1]. This study presents preliminary results of petrographic thinsection observations and major and trace element analyses using μ XRF, ICP-OES and LA-ICP-MS of these different types of intrusions within the granitoid basement succession. Using this data, we discuss the effects of the impact event on the pre-impact magmatic dikes and the geochemical characteristics and distribution of the suevite and impact melts throughout the granitoid basement. This approach provides further insight into the formational mechanics of the Chicxulub impact structure.

[1] Morgan, J., Gulick, S., et al., 2017. Proceedings of the International Ocean Discovery Program, 364: College Station, TX (International Ocean Discovery Program). <https://doi.org/10.14379/iodp.proc.364.2017>