

Seismic Reflection Imaging of the Chesapeake Bay Impact Inner Crater Rim

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Since its discovery in 1993, much of the detailed work on the Chesapeake Bay Impact Crater has focused on the effects of the impact on the geologic, structural and hydrogeologic framework of the outer rim of the crater. Less is known about the inner crater, which is the region that was most deeply excavated by the impact and that, like the Chicxulub structure, is likely to have the most complex structure and stratigraphy. The primary goal of this project is to use images, ~3-5 km long, of the transition from the inner crater to the outer crater to study the effects of impact processes on both pre-existing shallow marine stratigraphy, and post-impact stratigraphy of the continental shelf. Data will be recorded to 2 s, and specific targets include 500 m of post-impact sediments, the Exmore breccia, and the contact between the Exmore breccia and the crystalline basement. For this purpose, three roads that lie on both sides of the inner rim as it has been mapped in the existing literature, and that are adjacent to U.S. Route 13 in the Delmarva Peninsula have been chosen. The data will be collected using a 24-channel seismograph, 40 Hz geophones, and a Betsy seisgun, and will be processed using ProMAX. This project will lead to a better understanding of how an impact event can modify the stratigraphic and structural framework of marine sedimentary settings, which are the major targets of petroleum exploration.