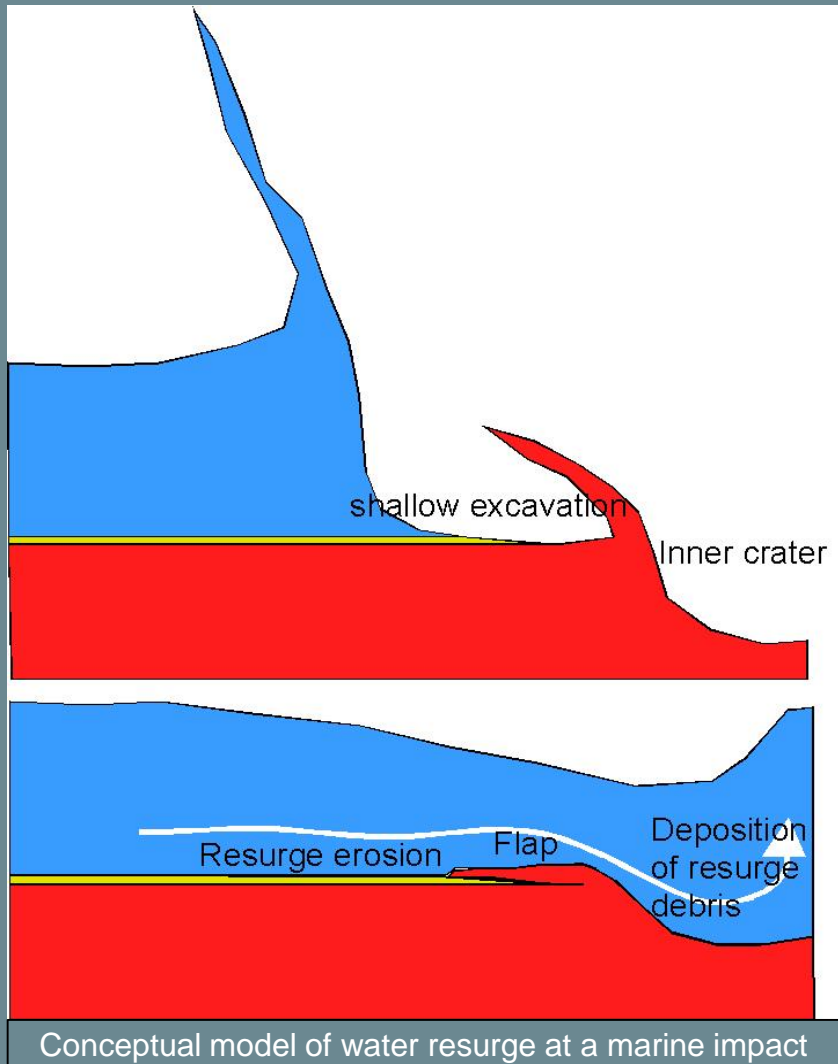


Oceanic resurge at impacts at sea

Chicxulub: the most forceful flood known on Earth



The rim wall of water formed from even a modestly-sized marine impact may be kilometers in height. Although modeling has shown that this wave swiftly breaks and relatively rapidly loses energy during outwards travel from the impact site, the portion of the rim wall that collapses inwards may generate a resurge flow with tremendous transport energy. In this study we compare the deposits generated by this ocean resurge inside one of the largest marine-target craters on Earth, the 200-km wide “dinosaur killer” Chicxulub crater, Yucatán Peninsula, México, with resurge deposits (breccias) in eight drill cores from five other marine-target craters in Sweden and the United States. Examination of the wide range of cored locations within the craters, and target water depths (H) relative to modelled projectile diameters (d) reveal a high correlation between location, average clast frequency ($\langle N \rangle$), and d/H from which any of the four variables can be obtained. The relationship shown here may provide an important tool for diagnosing marine impact cratering processes where there is limited understanding of crater size and/or paleobathymetry.