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TITLE: On the influence of cold?water coral mound size on flow hydrodynamics, and vice versa

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ABSTRACT:

Abstract Using a combination of in situ observations and idealistic 2?D nonhydrostatic numerical simulations, the relation between cold?water coral (CWC) mound size and hydrodynamics is explored for the Rockall Bank area in the North Atlantic Ocean. It is shown that currents generated by topographically trapped tidal waves in this area cause large isopycnal depressions resulting from an internal hydraulic control above CWC mounds. The oxygen concentration distribution is used as a tracer to visualize the flow behavior and the turbulent mixing above the mounds. By comparing two CWC mounds of different sizes and located close to each other, it is shown that the resulting mixing is highly dependent on the size of the mound. The effects of the hydraulic control for mixing, nutrient availability, and ecosystem functioning are also discussed.

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