

Abstract Submitted
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Gravity Current - Submarine Structure Interaction: Hazard Analysis via High-Resolution Flow Simulations ESTEBAN GONZALES-JUEZ, UCSB, GEORGE CONSTANTINESCU, U of Iowa, ECKART MEIBURG, UCSB — Two-dimensional large eddy simulations of a compositional lock-release gravity-current interacting with a submerged square cylinder are performed in order to investigate the governing physical mechanisms. The effect of the Reynolds and Schmidt numbers, and of the gap separating the floor and the cylinder, are investigated for both full- and partial-depth release gravity currents. The results are validated with available experimental measurements. The transient forces during the initial impact stage are seen to be several times higher than the forces encountered during the later quasi-steady stage. The density stratification, which is time dependent and can be stable or unstable, has a clear influence on the flow structures that develop. Such flow structures are described in detail and related to the time variation of flow forces and floor shear stresses. The latter are discussed in the context of potential erosional patterns near the structure.

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