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## Turbidity current signature on consecutive turbidity current: analysis through numerical simulations of multiple consecutive submarine flows

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Turbidity currents are powerful submarine density flows that travel towards the deep-sea carrying huge amounts of suspended sediment. The flow capacity of keeping sediment suspended in turbidity currents controls the flow duration, which can last from minutes to days. Sediment in turbidity currents is entrained when the flows are triggered, or when the flows erode the seafloor and suspend additional sediment in their downslope path. Eventually, suspended sediment settles to form deposits on the seafloor. Therefore, the composition of the seafloor after the passage of turbidity current depends on the initial composition of the seafloor and the erosion, reworking of the bed and deposition of the flow-entrained sediment. Can the comparison of seafloor before and after turbidity currents provide information about the initial flow and seafloor parameters? Can the seafloor composition after a turbidity current passage modify next flow behaviour and to what extent?

We set up numerical models of multiple consecutive turbidity currents in Delft3D4 to study the evolution of both the flows themselves as well as their interaction with the seafloor. Some simulated flows run into clear water while other simulated flows run into the tail of the previous turbidity current. We analyse the influence of the initial flow sediment grain size composition on the flow behaviour and on the bed sediment composition. We investigate the influence on the flow structure of the sediment kept in suspension between consecutive flows. We analyse the evolution of the stratigraphy in the deposit formed by multiple consecutive turbidity currents. The aim of this work is enhancing the knowledge on the evolution of both flows and seafloor. The combination of the findings of these numerical models with field and experimental measurements and interpretations add to the prediction of the characteristics of turbidity currents and the distribution of the flow sediment.