



## **Preliminary modeling of turbidity currents associated with the 2011 Tohoku-oki Earthquake**

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The 2011 Tohoku-oki earthquake generated among the largest volume of sediment transportation associated with coseismic shaking, tsunamis, and submarine landslides. Several recent studies of sediment cores, and instrumental observations revealed that the 2011 earthquake mobilized sediments to transport along the slope and over to the Japan Trench through single or multi-flow turbidity currents. Yet, source location and flow pathways of turbidity currents associated with the 2011 earthquake, and the resulting spatial distribution of deposit thickness remain unknown. Here we model three-dimensional depth-averaged turbidity currents offshore Tohoku area, to investigate possible scenarios of source location, flow size, and pathways of turbidity currents generated by the 2011 earthquake. Within the studied model scheme, the model is theoretically hampered to produce reliable results because of large uncertainties in parameters including seabed conditions and flow properties. In our modelling, sediment cores and subbottom profiles acquired from research cruises after the 2011 earthquake (e.g., *R/V Sonne* SO251A), and previous results are used to constrain most of the parameters. We also test a sensitivity of the parameters in order to examine how the sediment dynamics in Japan Trench changes with different properties of the flow. Our scheme also helps further our understanding of turbidite system produced by old giant earthquakes.