



Turbulent transport and mixing of discharged groundwater on structured surfaces at the coastal benthic seafloor Helena Klettke, Leonie Kandler, Martin Brede Institute of Fluid Mechanics

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Objectives

How is SGD transported and mixed within the water column?

Does benthic flow affect SGD flux across the seabed interface?





The structured seafloor





bottom topography

flat

ripples

gravelly sand

flow field







Experimental setup







Measurement methods



 \rightarrow concentration and velocity fields measured simultaneously

 \rightarrow correlation gives transport of tracer





Boundary conditions: investigating the influence of gravelly beds

 \rightarrow 4 different beds



 \rightarrow stormy wave scenario







Turbulent transport $\overline{w'c'}$ profiles







What influences the tracer flux?











- Difference in slope from the bottom
- Gravelly beds
 - \rightarrow steeper slope
 - → more turbulent transport and mixing





Conclusions







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take-home messages:

- recirculating SGD and mixing in the water column affect the net flux of discharged groundwater
- separated vortices affect the SGD transport significantly

Thank you!

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