



## **Ground-penetrating radar as a tool to access coastal sedimentary climate- and sea-level archives**

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The understanding of long-term climate variability, especially the variability of local wind fields and regional storm tracks, is most relevant for calibrating climate models and for the prediction of the socio-economic consequences of climate change. Continuous instrumental-based weather observations go back less than two centuries, coastal sediments, however, contain high-resolution climate archives that cover centuries to millennia.

The coastal zone is a highly dynamic depositional environment, shaped by waves and wind and the alternation of erosional and depositional phases. The resulting sedimentary record is often fragmentary and difficult to date. Reading and understanding coastal sedimentary archives therefore requires detailed knowledge of the sedimentary architecture to interpret their genesis, to recognize gaps in the record and to optimize the sampling strategy. In this context, ground-penetrating radar (GPR) turned out to be an invaluable tool as it enables high-resolution imaging of the coastal subsurface, especially in sandy to gravelly sediments where penetration depths of > 30 m and vertical resolutions in the range of 10-30 cm can be achieved.

Examples from Antarctica and the southern North Sea will be presented to illustrate the application and the benefit of combined ground-penetrating radar and sedimentological investigations.