Kolloquium:

Imaging the Previously Invisible: Characterization of the Shallow Subsurface from High-Resolution 3D Seismic Data of the NE Atlantic Margin

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2D seismic reflection profiles and sediment cores have previously been the most common data types to interpret the shallow subsurface in the marine realm. Three-dimensional seismic data have given birth to the discipline of seismic geomorphology, and allow studying ancient, buried geomorphological surfaces. The aim of the kolloquium is to show and discuss the huge variety of landform assemblages mapped out on recently collected data. The talk will focus on the shallow subsurface (uppermost 2 km) of the NE Atlantic Margin, where 3D seismic cubes have a vertical resolution as high as 1 m and a lateral resolution of up to 3 m. Paleo-landscapes and their association with the subsurface can thus be studied on a meter-scale resolution, which is comparable to conventional bathymetric technologies. 3D seismic data have further the advantage to use the seismic amplitudes, and extract more information about the geology imaged. The repetition of 3D seismic surveys enables monitoring geological processes in 4D. The data allow establishing new models for geological processes, including subglacial erosion, glacial lake outburst floods, sand injectites, evacuation craters, megaslides and turbidites, and contourites. The interpretation of the 3D seismic data has implications on fluid migration, glacial/interglacial sedimentation, slope stability, ocean bottom currents, and paleoclimate reconstructions.