



Technische
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Leichtweiß-Institut

Disentangling the causes and drivers of 20th and 21st century sea-level changes at local and global scales

Lecture of
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Seminar room Leichtweiß-Institute
Beethovenstr. 51A, Braunschweig
3rd floor

Also online: [Webex link](#)

Coastal communities around the world are increasingly exposed to extreme events that have been exacerbated by rising sea levels. Sustainable adaptation strategies to cope with the associated threats require comprehensive understanding of past and possible future changes at a local level. Yet, many coastlines lack accurate long-term sea level observations. In this presentation, I will introduce our latest probabilistic sea-level reconstruction based on tide gauges covering the period 1900 to 2021.

The reconstruction provides fields of relative sea level and its individual contributors with near-global coverage. I will showcase the performance of the reconstruction against different types of observations and discuss its application for the assessment of sea-level changes in areas where observations are sparse or absent. I will also demonstrate that the reconstruction provides a robust estimate of the climatic contribution to local sea level, and when compared to tide gauge records, offers an independent indicator of nonlinear subsidence back into the early 20th century.

The results indicate good agreement between the different products and therefore allow for the detection and attribution of individual climatic and non-climatic forcing agents since 1900 for both mean and extreme sea levels. I show that at the vast majority of sites return levels of extreme sea levels have decreased significantly over the 20th century as a result of changes in mean sea level and that anthropogenic forcing has been the main driver behind those changes. Our results have important implications for adaptation and mitigation efforts at local and global scales as well as questions of climate justice and associated litigations.

Organised by
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