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Sedimentary evolution of the Sagara coastal area in Japan and its potential to preserve extreme wave deposits

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The Sagara floodplain is located near Japan's densest populated and industrially active region along the Nankai-Suruga subduction zone. The area has long been the focus of attempts to forecast and even predict future earthquakes. Historical records attest to the occurrence of great earthquakes and subsequent tsunamis that may have originated from the Tōkai segment, however, past rupture zone extents and recurrence intervals remain poorly understood. Reliable sedimentary records that reveal the earthquake and tsunami history are sparse, despite the need to understand the tsunami hazard. To understand the tsunami history from the sedimentary record we are investigating the sedimentary evolution of the Sagara floodplain with an arrayed coring survey with ∼100 m of core along the 450 m-long coast-normal and three ∼150 m-long coast-parallel transects. The percussion cores have practically 100% recovery with 9 cm-diameter cores of mostly 2 to 3 m length with three up to 10 m cores.
Preliminary results of an extensive coring campaign and analyses, including line scans, magnetic susceptibility, CT-scans and more, show a sedimentary evolution from a tidal mudflat to a tide dominated fluvial system to the floodplain that we see at present. As of writing this abstract 10 radiocarbon dating samples are yet to be analysed to inform us on the timeline of this regressive evolution. We expect the regression to have occurred with similar timing as the regression from the Holocene sea level high stand in surrounding sites from 6 to 4 ka onwards.
During this sea level fall tsunamis are expected to have hit the target area repeatedly. A few candidate sediment layers, which fit several of the typical characteristics of extreme wave deposits are identified and further analysed to find out whether they are of marine origin.