

The paleoearthquake record of the Cinarcik Segment of the North Anatolian Fault in the Marmara Sea (Turkey) and its implication regarding past historical rupture scenario across the Marmara Sea

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Istanbul and its 12 million inhabitants borders the Marmara Sea, a submarine pull-apart basin related to the North Anatolian Fault (NAF), a major strike slip fault that ruptures in $M > 7$ earthquakes. Constraining the recurrence rate of $M > 7$ earthquakes that threaten the megacity is problematic because the active faults are submarine. For assessing past submarine earthquake ruptures of the Cinarcik Fault Segment located just south of Istanbul, we studied two sedimentary cores and identified seismoturbidites related to historical ruptures. Earthquake related turbidites are identified in both cores, based on their distinctive sedimentological and geochemical signatures. The seismoturbidites recorded in one of the core named Klg04 are inferred to record only mass wasting events related to the rupture on the Cinarcik Segment because of its specific geomorphological location. To constrain the seismoturbidites chronology, we combine short-lived radionuclide, radiocarbon and paleoinclination data. The first four seismoturbidites recorded match the 1894, 1509, 14th century and 989 historical earthquakes. The obtained age model allows us to discuss past historical rupture scenario across the Marmara Sea. The fact that the 1766 earthquakes are not recorded is further discussed based on new macroseismic intensity data and sedimentary records East of the Cinarcik Basin.