Geophysical Research Abstracts
Vol. 19, EGU2017-14502, 2017
EGU General Assembly 2017
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Review of the late-Holocene storm events along the European Atlantic coasts

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The chronology of the mid- to late-Holocene coastal storms was reconstructed from vibracore samplings, 14C dating and sedimentary analysis from Yeu island (French Atlantic coast). The methodology used is based on the identification of disturbing sedimentary events recognized within three Holocene sedimentary transgressive sequences selected along the northern coast of the island. These sequences correspond to the present-day coastal salt-marshes and swamps. The sediment cores were centimeter-sampled and studied from several sedimentological proxies (Loss of Ignition, sand fraction, mean grain size) with a high temporal resolution. Chronology was built by age-depth model based on eleven 14C measures of organic sediments and shell samples. Ten paleo-storm events were recorded: a 2100-1950 calBP interval as a deeply stormy-disturbed period; five others major impacted times: 600-500 calBP, 2850-2350 calBP, 3500-3270 calBP, 5400-5370 calBP and 6650-6510 calBP; and four final less meaningful storminess hypothesis near 1590 calBP, 6000 calBP, 7000 calBP, and between 7670 and 7470 calBP. This chronology was compared with enhanced storminess periods recognized along the European Atlantic coast. Four stormy periods stand out from the last 4000 years: 600-300 BP, 1100-1700 BP, 2500-2900 BP and 3300-3500 BP, corresponding to late Holocene global cold events. These results suggests that these changes in coastal hydrodynamics were in phase with those identified over the North-eastern Atlantic and seem to correspond to Holocene cooling first shown in the North Atlantic and associated with decreases in sea surface temperature.