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Recent marine deposits reconstruction of two depositional environments of the French Atlantic coast

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This work provides a 300-yr high-resolution record of past storm and/or tsunami events using a multi-proxy analysis (^{137}Cs and ^{210}Pb dating, chemical composition and grain size) of sedimentary deposits from two coastal depositional environments of the French Atlantic coast. We analyse two wetland areas situated just behind a narrow coastal sand strip: 1) the Mer Blanche and 2) the Turballe. Evidence for strong extratropical storms and/or tsunamis events can be identified in this central part of the Bay of Biscay from the XIXth to the XXth century. Nine short sediment cores were collected in August 2016 using gravity type corer of 10 inner diameter and 100 cm length. Each core was longitudinally sliced, each half section photographed and described. High-resolution elemental analyses of split sediment cores were done using an Avaatech XRF core scanner. Then sediment cores were sampled every 0.5 cm. Grain size analysis was done using a Malvern 2600 laser beam grain sizer; organic carbon was measured by Leco induction furnace. ^{137}Cs , ^{210}Pb and ^{226}Ra activities were measured on about 2 g dried sediment using a low background, well-type γ spectrometer (Canberra). The ^{210}Pb in excess, which is used for dating, was calculated as the difference of measured ^{210}Pb and of its supported activities (^{226}Ra). The history information is performed using historical documents including narrative sources, ancient maps, records of cities repairs, surveys conducted after a disaster, newspaper from different departmental and national archives, and meteorological data. Coastal depositional environments were affected hardest by extreme environmental and climatological events during the last century. In the Mer Blanche core, three extreme episodes can be observed: i) at 36 cm, sediment is characterized by coarser sand and higher Sr/Al ratio, this episode coincides with a high tidal wave in spring 1937; ii) at 55 cm, we observe the presence of many gravels, they dates back to the high tidal wave of 1924 and iii) at 65 cm, the presence of another coarse pebble layer is attributed to a series of severe storms associated with coastal flooding episodes between 1910 and 1913.

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