



Tide gauge records on the Charente-Maritime French Atlantic coast back to the middle of the 19th century

T. Gouriou, G. Wöppelmann, N. Pouvreau

UMR CNRS 6250 LIENSS, University of La Rochelle, France (thomas.gouriou@univ-lr.fr)

A systematic survey of the historical French archives was initiated in 2004 to search for ancient sea level observations. Long term sea-level records are valuable to study trends in sea level components in the context of climate change due to global warming. The survey continues but has already proved to be worthwhile: a large amount of records have been discovered (Pouvreau et al. 2006, Wöppelmann et al. 2006). Long term sea level records in France turn out to be more numerous than the two well-known Brest and Marseille records which are available at the PSMSL databank. The present study focuses on the historical data sets that we have assembled so far for the Charente-Maritime French Atlantic coast, which is located roughly between the Loire estuary and the Gironde estuary. The two longest continuous data sets correspond to: i) Fort Enet, 14 years, from 1859 to 1873, and ii) Fort Boyard, 37 years, from 1873 to 1909. Considering that both sites are just a few kilometers away from each other; that they are subject to the same hydrodynamic conditions; and that the historical information on the benchmarks are well documented, the construction of a composite sea-level time series over 51 years, from 1859 to 1909, is attempted. This is the first goal of our research study. There are more historical records on the Charente-Maritime coast, however shorter: at Aix Island, 7 years distributed from 1824 to 1974; at La Rochelle old harbor, 14 years (1775, 1824, then from 1863 to 1874); and more recently, at the new La Rochelle's harbor (La Pallice), 42 years, from 1951 to the present but comprises some important gaps. The historical records are in paper form (tidal charts, tabulations). They are not included in public data banks. They need to be digitized to provide hourly (or similar) sea level values in numerical form for further data analyses. Two important questions arise in the construction of a composite sea-

level time series. They must be resolved before any climate study can be undertaken on these records. The first question is: Can the different data sets be related to a common datum to form a consistent time series? And the second question is: What is the quality of the recorded data? The poster will address these questions. It will also present the sea-level records currently available on the Charente-Maritime coast, their situation and their environmental conditions. A second goal and current outlook of our study is to expand the historical time series to the present. Since the benchmarks and datum information survived, a modern tide gauge station could be installed and be connected to the historical one through high-precision geodetic techniques. Technical constraints and field reconnaissance show that the Aix Island would be the more appropriate location for the new tide gauge station. Last but not least, we recently discovered historical sea level data recorded at the Cordouan lighthouse, which is located about 50 km south of our study region. The records are sparse, but they cover a long period from 1812 to 1994. Moreover, the first results show that they are related to common datum. A 'data archeology' work has therefore started to rescue these data sets too, and to analyze them. The underlying idea is to compare our results on the Charente-Maritime coast with those obtained at Brest (Pouvreau et al., 2006), i.e. north of our study zone, and with those results that we expect to obtain at the Cordouan lighthouse, located on the south.