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## **Sea-Level Change in the Northern Mediterranean Sea from Long-Period Tide Gauge Time Series**

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### **Abstract**

The oldest tide gauge observations date back to the 18<sup>th</sup> century. Although, globally, they are available in limited number, these centuries-old sea level time series are the only data records providing information on the long-period rates of change of the mean ocean surface. Knowledge of the past sea level behavior can contribute key insights to the understanding of climate change impacts. We highlight the greatest importance of monitoring sea-level changes at all spatial scales, from global to local, using terrestrial and space techniques and outline the physical processes, natural and man-induced, responsible for such changes. In general, tide gauge data are made available through different archiving facilities serving both international and national developments. Tide gauges measure local sea-level relative to a benchmark on land, hence, correctly interpreting these observations is challenging since it demands, among other requirements, a proper knowledge of vertical land motions at the stations. In general, it is not easy to find well documented historical data; moreover, benchmarks were not frequently levelled. For more than two decades, space geodetic techniques, such as GNSS (Global Navigation Satellite System) and InSAR (Interferometric Synthetic Aperture Radar), have provided the opportunity to accurately position points in the

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