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Mean Tide Level Data in the PSMSL Mean Sea Level Dataset

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The Permanent Service for Mean Sea Level (PSMSL) is the internationally recognised global sea level data bank for long term sea level change information from tide gauges. Established in 1933, the PSMSL continues to be responsible for the collection, publication, analysis and interpretation of sea level data. The PSMSL operates under the auspices of the International Council for Science (ICSU), is a regular member of the ICSU World Data System and is associated with the International Association for the Physical Sciences of the Oceans (IAPSO) and the International Association of Geodesy (IAG). The PSMSL continues to work closely with other members of the sea level community through the Intergovernmental Oceanographic Commission's Global Sea Level Observing System (GLOSS).

Currently, the PSMSL data bank holds over 67,000 station-years of monthly and annual mean sea level data from over 2250 tide gauge stations. Data from each site are quality controlled and, wherever possible, reduced to a common datum, whose stability is monitored through a network of geodetic benchmarks. PSMSL also distributes a data bank of measurements taken from in-situ ocean bottom pressure recorders.

Most of the records in the main PSMSL dataset indicate mean sea level (MSL), derived from high-frequency tide gauge data, with sampling typically once per hour or higher. However, some of the older data is based on mean tide level (MTL), which is obtained from measurements taken at high and low tide only. While usually very close, MSL and MTL can occasionally differ by many centimetres, particularly in shallow water locations. As a result, care must be taken when using long sea level records that contain periods of MTL data.

Previously, periods during which the values indicated MTL rather than MSL were noted in the documentation, and sometimes suggested corrections were supplied. However, these comments were easy to miss, particularly in large scale studies that used multiple stations from across a wide area. Therefore, the PSMSL have decided to begin applying a correction to all mixed MTL/MSL records in its datum-controlled RLR dataset, where a suitable correction is available. These corrections will be clearly flagged, allowing users of PSMSL data to quickly identify these values and ignore these data, or apply a different correction. Here we describe the corrections applied to the PSMSL dataset, how users can find MTL data and the corrections made, and some caveats and warnings that need to be considered.