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Sea level in the Global Geodetic Observing System

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The Permanent Service for Mean Sea Level (PSMSL) is the global databank for long-term mean sea level data and is a member of the Global Geodetic Observing System (GGOS) Bureau of Networks and Observations. As well as curating long-term sea level change information from tide gauges, PSMSL is also involved in developing other products and services including the automatic quality control of near real-time sea level data, distributing Global Navigation Satellite System (GNSS) sea level data and advising on sea level metadata development.

At the GGOS Days meeting in November 2019, the GGOS Focus Area 3 on Sea Level Change, Variability and Forecasting was wrapped up, but there is still a requirement in 2020 for GGOS to integrate and support tide gauges and we will discuss how we will interact in the future. A recent paper (Ponte et al., 2019) identified that only "29% of the GLOSS [Global Sea Level Observing System] GNSS-co-located tide gauges have a geodetic tie available at SONEL [Système d'Observation du Niveau des Eaux Littorales]" and we as a community still need to improve the ties between the GNSS sensor and tide gauges. This may progress as new GNSS Interferometric Reflectometry (GNSS-IR) sensors are installed to provide an alternative method to observe sea level. As well as recording the sea level, these sensors will also provide vertical land movement information from one location. PSMSL are currently developing an online portal of uplift/subsidence land data and GNSS-IR sea level observation data. To distribute the data, we are creating/populating controlled vocabularies and generating discovery metadata.

We are working towards FAIR data management principles (data are findable, accessible, interoperable and reusable) which will improve the flow of quality controlled sea level data and in 2020 we will issue the PSMSL dataset with a Digital Object Identifier. We have been working on improving our discovery and descriptive metadata including creating a use case for the Research Data Alliance Persistent (RDA) Identification of Instruments Working Group to help improve the description of a time series where the sensor and platform may change and move many times. Representatives from PSMSL will sit on the GGOS DOIs for Data Working Group and would like to contribute help with controlled vocabularies, identifying metadata standards etc. We will also contribute to the next GGOS implementation plan.

Ponte, Rui M., et al. (2019) "Towards comprehensive observing and modeling systems for monitoring and predicting regional to coastal sea level." *Frontiers in Marine Science* 6(437).