Comment on essd-2021-134
Anonymous Referee #2

The authors propose a global dataset (331 stations) of high temporal sampling (1-min.) data recorded by tide gauges over the period 2004-2019. Their primary source of data (95%) is the IOC Sea level station monitoring facility (SLSMF) at VLIZ in Belgium, supplemented with data from two national agencies (17 stations), which do not contribute to this data assembly centre of the global sea level observing system (GLOSS) of IOC/UNESCO. The major added-value of the derived dataset is thus the quality control of the SLSMF data, and this is really a major outcome. Indeed, many users have misunderstood what is the goal of SLSMF data assembly centre, whose goal has never been delivering high-frequency data, but informing about the station real-time operational status (Is the station operational, or not). This status reporting goal has been achieved via the collection of the stations real-time data. It should be made a little clearer in the manuscript to underline the originality of what the authors propose. They can also quote one of the comments published by the GLOSS programme directors in J. Coastal Research in response to a clear misuse of the IOC SLSMF dataset for science or technology assessment (Aarup et al. 2019).

Many discussions have taken place within the GLOSS group of experts regarding its SLSMF dataset, in particular to take actions towards a data quality control, hence addressing the needs of scientific applications investigating high-frequency sea level phenomena. In this regard, the work undertaken by the authors is relevant, and clearly fills a gap. However, it raises several issues that need to be clarified: how this action and dataset articulates with GLOSS? What are the perspectives in terms of update and maintenance? Indeed, if the dataset is not meant for update and maintenance, its scope becomes rather limited (2004-2019 and ca 300 stations). It is further limited by the filtering choice, which is clearly an application dependent restrictive feature. (In this respect the title is misleading.) In my opinion, this aspect should be left out to the scientists (what filter they want to apply, and why). The most invaluable aspect achieved here is the 1-minute sea level quality-controlled data. Filters are application-oriented, and often have pros- and cons (here, these are not discussed). In terms of quality-control, the manuscript does not develop the details of the datum and clock shifts. How are these flaws handled? Why the multiple sensor locations are not exploited to fill gaps, instead of using interpolation? Several other technical issues are commented below.
To wrap up, the manuscript is overall well written, and organized. It can represent an invaluable contribution to the international sea level community and science, provided its current limitations are addressed (filtering, interpolation) and perspectives clarified (update, maintenance).

p.2, L43-44: The PSMSL requests their updated reference to be quoted. This data assembly centre has substantially extended its contents since 2003 with many useful developments.

p.3, L82-83: To my understanding, the goal of the IOC SLSMF has never been delivering high-frequency data, but informing about the station real-time operational status (Is the station operational, or not). This goal is achieved via the successful collection (or not) of the real-time data. This aspect should be made crystal clear (see Aarup et al.) for the full appraisal of the added-value provided by MISELA. See general comment above.

p.4, Fig.1: What are the problems illustrated here? I suggest to state them in the figure caption so that the reader makes a direct association.

p.5, L109: The rationale for the criteria (2-year long) should be developed, if there is any.

L111: what is “too many”? “incorrect records”? Need for objective criteria.

p.5, L117-118: I do not understand what it means: “or 30 cm differing from both neighbouring values (20 and 15 cm, respectively”. Please, clarify.


p.5, L128: “Not all problems” Can you give an example?

L130-131: How many users have expressed their interest within this atmospheric community? Did the authors make a survey, for instance within international programmes like GLOSS?

p.6, L138: what is the interpolation rationale behind the duration of “one week”?

p.8, Table: Is the 0.01-degree precision sufficient? At this spatial resolution gravity waves can be rather different in terms of amplitude and impact. For instance, in terms of exposure along a protected coastline (harbour, estuary...).

p.9, L139: “acceptable”? Needs clarification. I suggest to remove this subjective term.

p.9, Last line: “excellent”: the regions in c) d) and f) have large gaps along long parts of the coastline; in other words, far from “excellent” in my opinion.

p.11, L203: June 2018 at the latest in a SLSMF? Needs explanation in the context of a real-time facility, something sounds weird (objectives, misunderstanding...).