

Ocean Sci. Discuss., referee comment RC2
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Comment on os-2021-125

Anonymous Referee #2

Referee comment on "Coastal sea level monitoring in the Mediterranean and Black seas"
by Begoña Pérez Gómez et al., Ocean Sci. Discuss.,
<https://doi.org/10.5194/os-2021-125-RC2>, 2022

GENERAL COMMENTS

This contribution provides a detailed review of the coastal sea level gauge network in the Mediterranean and Black Seas. On the one hand, it contains a comprehensive collection of the present-day sea-level data available in the two seas, including a detailed list of existing stations and a description of data repositories. On the other hand, a review is made of the applications that exist of such data for operational and forecasting systems of astronomical tides, storm surges, tsunamis and meteotsunamis, as well as for climate-related studies, for calibration of satellite altimetry and for the definition of height references.

The effort to collect data and metadata from all available stations and the description of the existing repositories already makes it a useful review work for researchers and technicians that need to use sea level data, especially given the recent fast increase in the number of gauges and sensors in these seas. Moreover, they also assess the present network capabilities to fulfil important applications of sea level data and point at the most important aspects to be improved.

My minor comments, detailed below, are: their use of acronyms makes reading difficult (comment 1), a subsection on Israeli network is missing in section 2 (comment 2), including more links to data in the Tables of the Appendix would be useful (comment 3), absolute sea level rise is not included in Figure 9 and section 4.2.1 (comment 4), there are missing contents in subsections 4.2 and 4.3 (related to assessment of network capability to fulfil the targeted applications, comment 5). The use of English language is concise and correct and the article is well structured and easy to read, despite the length. Apart from two minor suggestions included in the comment 6 below, the end of this report contains a list of typos that I have encountered while reviewing the article.

All in all, this article can be of interest for many readers of Ocean Dynamics and it can be accepted with minor revisions.

SPECIFIC COMMENTS

Comment 1: Use of acronyms makes reading difficult

The article uses a large amount of acronyms, which are difficult/impossible to remember so that a List of acronyms should be included. Also, some of the acronyms are used before or even without definition. Some examples are included in the list of typos at the end of the report, but it should be thoroughly revised. In this process, the authors could make an effort to decrease the number of acronyms to the minimum (which will already be large) in order to simplify the reading of the article for the readers that are unfamiliar with the topic.

Comment 2: Subsection on Israeli network is missing in section 2

In section 2.1, I would say that a subsection dedicated to sea level measurements in Israel is missing. This must be a mistake because Table A24 contains Israeli stations. Also, later on (e.g., line 627) stations in Israel are again mentioned.

Comment 3: More links to data in the Tables of the Appendix would be useful

Some of the stations in the Tables of the Appendix contain links to data. This is really useful and could be extended to many other Tables, where such links exist. This would be a good place for the authors to recommend the end users what is the best web site to download the different data, especially given the acknowledged cacophony of sea level data repositories with different degree of verification.

Comment 4: Absolute sea level rise is not included in section 4.2.1

If I understand it correctly, the absolute sea level rise would be computed by adding the relative sea level rise and the VLM trend, right? I would find useful that this number is added in Figure 9 and discussed in section 4.2.1. Moreover, a discussion on the error bars

of VLM and the relative and absolute sea level rise values would be useful.

Comment 5: Missing contents in subsections 4.2 and 4.3

Sections 4.2 and 4.3, unlike section 4.1, do not exactly assess the network capability to fulfil targeted applications (the title of section 4). Subsections inside 4.1 indeed contain a technical description of how the available data and repositories of sections 2 and 3 allows performing each application of the different subsections.

On the contrary, subsection 4.1.1 at the beginning seems to focus on showing results (of sea level rise). Showing these results is highly interesting but, in order to maintain coherence, I suggest to start subsection 4.2.1 with an assessment of the capability of the available data and repositories in order to perform sea level rise analysis, and include the results of Figure 9 at the end as an example. What I mean is that now the subsection is focussed on performing a particular analysis from the very beginning, whilst the description in the first four paragraph (up to line 1070) and Table 1 are useful (and coherent with the rest of the article) even if the results in Figure 9 were not included. In practice, this would only require of a few changes such as rephrasing the two first sentences (lines 1038-1040) to make them more general (so to present the PSMSL RLR as a tool to perform sea level rise analysis in general). Then, in line 1065, for example, a sentence should be added: "As an example of application, the sea level rise trends in the stations with 70-yr long records have been analysed (Figure 9).".

Section 4.2.2 only includes a (very nice) review of the results of previous studies on extreme sea levels in the MS. However, I think that the authors should also discuss if available data and repositories presented in sections 2 and 3 can be used for such analysis. Example of questions that could be answered: What are the limitations of the present M/BS network to perform such analysis? Are there gauges in the places more prone to sea level extremes? Also, no results are given in the BS. This must be simply because such studies have not been done (not because the data cannot be used for such purpose) but this should be mentioned, right?

In the same line, section 4.3 could extend the discussion on the usability of the present M/BS network to calibrate satellite altimetry. For example, if I understand it correctly, the lack of open sea gauges strongly limits such calibration, right? This should be added, shouldn't it? (I think it is mentioned in the conclusions, line 1225, but not here.)

Comment 6: Language corrections

In several moments, there are single sentences (even one-line sentences) making a full paragraph, which is bizarre, right? Could you maybe integrate them into the previous or the following paragraphs? A few examples are included in the list below (lines 339,

827-828, 847, etc.) but a thorough review should be done.

The use of "that" and "which" is sometimes wrong. A few examples are shown in the list below but a thorough review should be also performed.

TECHNICAL CORRECTIONS

Line 55 description -> a description

Line 64: being that more necessary in the era of the human-induced climate changes and the sea level rise. -> a critical need in the era of human-induced climate changes and sea level rise.

Line 71: the latter being combination -> the latter being a combination

Line 117: waves which -> waves that or waves, which

Line 124: gravity waves which, through -> gravity waves that, through

Line 126: situations which -> situations that

Line 154: where in some countries restrictive national data policies -> where restrictive national data policies of some countries

Line 168: Italian,French -> Italian, French

Line 171: Acknowledging all these developments, it emerged that a cohesive mapping -> A cohesive mapping

Line 172: , and even sporadically on national levels (e.g. VilibiÄ et al., 2005), -> (and it has only been done sporadically on national levels, e.g. VilibiÄ et al., 2005)

Line 175: of the sea level -> of sea level data

Line 194: the UNESCO -> UNESCO

Line 195: resulted with -> resulted in

Line 228: Balearic Islands -> Balearic Islands, Spain

Line 246 and 339: IDSL meaning is defined later, in line 349, right? Maybe this sentence should not be here?

Line 314: national and local level -> national and local levels

Line 335: such as: -> such as

Line 339: Is it the best place for this short sentence? I recommend to merge it within another paragraph.

Line 343: JRC and TAD meaning are still unknown at this point

Line 347 the JRC started -> the Joint Research Centre (JRC) of the European Commission started (Or it is even better to introduce it before, in section 1)

Line 384 and 406: I suggest to include "Float type stations:" and "Radar type type stations:" within the paragraphs (i.e., The float type stations consists of ...) or just delete these words, to be coherent with the rest of subsections, which only include text within paragraphs.

Lines 429-430: was the part of Former Yugoslavia -> was part of the former Yugoslavia

Line 435: water resources -> water characteristics (?)

Line 499: preserved, -> preserved.

Line 510: aat -> at

Line 530: while in Table A22 are listed -> while Table A22 contains the

Line 575: gauges -> gauge

Line 592: observatory / observatories are accurate words? I would say this word also refers to an astronomic observatory

Line 594: A subsection about the additional IDSL stations listed in Table A27 might be missing.

Line 602: There are many other countries with coasts on M or BS that are lacking, such as Bosnia Herzegovina, Ukraine, Georgia, Lebanon, Israel and Syria. Either a complete list should be given or the sentence should be deleted. The same applies to the Conclusion in lines 1166-1168.

Line 614: MSL -> mean sea level (MSL)

Line 615: mean sea level (MSL) -> MSL

Line 668: stations that have -> stations have

Line 727: the these two basins -> the two basins

Line 767: once. E.g., -> once. For example,

Line 789: in particular at hourly timescale and the raw data, not easily reachable by users
-> in particular at hourly timescale, of which the raw data is not easily reachable by users
(?)

Line 790: provide the access -> provide access

Line 791: purposes, and other -> purposes -, and other

Lines 827-828: Is it the best place for this short sentence? I recommend to merge it
within another paragraph.

Lines 843-844: over predetermined thresholds occur -> above predetermined thresholds
occur

Line 847: Is it the best place for this short sentence? I recommend to merge it within
another paragraph.

Lines 913-915: Integrate the sentence into the previous paragraph?

988: , that -> , which

Line 990: a low cost GNSS-based buoy that provides sea level data from the open sea ->
based on low coast GNSS buoys that provide sea level data from open sea

Line 994: Meteotsunamis are much less well known to potential readers than tsunamis.
Maybe a short description of the physical phenomena could be added?

Line 1010: but more needs to be done for an efficient warning system to be implemented
-> but it is not sufficient to implement an efficient warning system

Line 1011: an hour -> one hour

Lines 1015 (once) and 1033 (twice): off-shore -> offshore

Line 1020: component -> components

Line 1025: among else -> among others

Line 1030: for several times -> by an order of magnitude (?)

Line 1032: on-shore -> onshore

Line 2069: better with -> better, with

Fig. 9: The relative sea level trend is missing in Alicante I and II.

Line 1108: the prerequisite -> a prerequisite

Lines 1112-1115: This is a dense and unclear sentence, to my opinion, and it lacks from references. First, I suggest to revise it to make it clearer and maybe split it in two sentences. Then, references should be added to sustain it. For example, I do not get what the authors mean by "the increased rate of sea level rise close to the coast". They mean that satellite altimetry gives a too large spurious sea level rise close to shore? Could they add a reference, please? Also, the list of potential errors could be referenced.

Line 1115 to the real physical -> to real physical processes

Line 1126: datum which -> datum, which

Line 1134: the referencing of one with respect to another s essential to allow tidal observations -> the relationship between these three datum must be known to allow the observational data

Line 1136: HAT has not been defined.

Line 1136: (LAT, MSL, HAT...) -> , such as the lowest and highest levels, MSL, etc).

Line 1138: The geodetic datum should be previously defined and related with ellipsoidal datum.

Line 1155: Summary and conclusions -> Discussion and conclusions [It contains some discussion points that are not found in previous sections]

Line 1158: such as storm surges -> such as those produced by storm surges

Lines 1166-1168: Joint this sentence to the previous paragraph.

Line 1175: 2005, that -> 2005, which

Line 1187: In terms of length of the sea level records, numbers -> Focussing on long sea level records, numbers

Line 1190: Apart from the smaller number of tide gauges in the past, this is perhaps the most challenging application, as it requires -> This is perhaps the most challenging application, not only because of the smaller number of tide gauges in the past but also since it requires

Line 1227: This survey -> The present review

Lines 1227 and 1234: Paragraphs start without indentation.

Line 1231: etc) -> etc),

Line 1234: the assessment -> the present assessment

Line 1235: are a prerequisite -> could be improved

Line 1236: a longevity -> the longevity

Line 1238: operations -> operation

Line 1238: the gaps in monitoring systems or their inadequacy -> the spatial gaps in monitoring systems (or their inadequacy)

Line 1241: networks, in particular towards North Africa countries -> networks towards less experienced ones (e.g., in North African countries)

Caption Table A1: Puertos del Estado (REDMAR network) -> Puertos del Estado, Spain (REDMAR network),

Caption Table A2: Balearic Islands -> Balearic Islands, Spain,

A few other captions should be revised to add details in this line (examples are tables A6, A7, A27). The main text contains all the details but I think that the country, at least, should appear also in the Table captions.