Earth Syst. Sci. Data Discuss.,
https://doi.org/10.5194/essd-2019-190-RC2, 2020

Earth System Science Data Discussions

Interactive comment on "Development of the HadISDH marine humidity climate monitoring dataset" *by* Kate Willett et al.

Anonymous Referee #2

Received and published: 10 February 2020

"General comments"

This manuscript describes a new dataset of surface humidity over the ocean called "HadISDH.marine". HadISDH.marine is an in-situ based multi-variable surface humidity dataset providing monthly time series from Jan1973 to Dec2018 on 5-degree by 5-degree grids. The manuscript presents in detail the issues of in-situ observation data that should be taken into consideration in dataset construction (section 2), the procedures to construct gridded data with uncertainty estimation (section 3), and the overall assessment of the dataset (section 4). Since thedata set is based on only in-situ observation by ships, its coverage is inevitably limited to the region north of 20S and coastal areas. However, the dataset is unique in that it has spatial and temporal homogeneity (as opposed to reanalysis), provides multi-variables (specific humidity, relative humid-

ity, vapor pressure, dew point temperature, wet bulb temperature, dew point depression, and air temperature) related to humidity (as opposed to National Oceanography Centre version 2.0 (NOCSv2.0) dataset), and complements the companion dataset for land (HadISDH.land). The dataset would be also useful for evaluating climate models in terms of long-term trends of climate variables related to humidity. I had no problem in downloading the dataset from the website indicated in the manuscript. I also found the dataset to be appropriately formatted, consistent with the manuscript, concise in size, and usable. Thus, I am supportive of the publication of this manuscript and dataset largely in the present form. I would like to ask the authors to consider the following points before finalizing them.

"Specific comments"

P1, L13: Please provide definition for "SDH" of "HadISDH".

P2, L43: Please provide citation for GCOS Essential Climate Variables (ECVs).

P2, L54: Please provide definition of "CRUH" of "HadICRUH".

P9, L265: "Processing the hourly data into a gridded product"... Is this title appropriate for this section? (A possible alternative might be "Construction of the gridded dataset and uncertainty estimates", for example.)

P11, L302: It turned out later (section 4.1) that buoy data were eventually excluded from the current version. I would suggest that this treatment (exclusion of buoy data) should be mentioned in the early part of this section. For example, the overall strategy might be summarized first using Figure 6.

P13, L362: "3rd iteration" is referred without prior explanation. I think it would be helpful for the reader if the idea of the entire processing is presented first using Figure 6.

P14, L398 (Fig. S7): Looking at Fig. S7 and its inset legend, "repeated saturation check" (pink, solid line) seems to be making only minor contributions.

P16, L456-458: It would be helpful if formulae are used to describe the procedures explained here.

P22, L650 (Eq.7) and L655 (Eq.8): Where and how was Ugb woven into the uncertainty estimate?

P24, L700: Buoy products are excluded from the current version. I think this should be described earlier, for example, in section 3. Or the overall strategy along with the procedures (visualized in Fig, 6) could be presented earlier.

P27, L776-777, L798-799: How will the decadal trend for relative humidity look like when the pre-1982 period is excluded from the analysis?

P30, L890: It would be worth briefly mentioning again here what comprise the total observation uncertainty.

"Technical corrections"

P10, L289: Remove right parenthesis “)” after “temperature”.

P14, L398: Put periods “.” after “Fig. S7”.

P22, L644: “has” should perhaps read “as”.

P33, L971: Put periods “.” after “averaging”.

P35, L1037: “over estimate” should read “overestimate”.

Interactive comment on Earth Syst. Sci. Data Discuss., https://doi.org/10.5194/essd-2019-190, 2019.