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## ***Interactive comment on “Long-term monitoring programme of the hydrological variability in the Mediterranean Sea: a first overview of the HYDROCHANGES network” by K. Schroeder et al.***

**Anonymous Referee #2**

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Review of ‘Long-term monitoring programme of the hydrological variability in the Mediterranean Sea: a first overview of the HYDROCHANGES network’ K. Schroeder, C. Millot, L. Bengara, S. Ben Ismail, M. Bensi, M. Borghini, G. Budillon, V. Cardin, L. Coppola, C. Curtil, A. Drago, B. El Moumni, J. Font, J.L. Fuda, J. García-Lafuente, G.P. Gasparini, H. Kontoyiannis, D. Lefevre, P. Puig, P. Raimbault, G. Rougier, J. Salat, C. Sammari, J.C. Sánchez Garrido, A. Sánchez-Roman, S. Sparnocchia, C. Tamburini, I. Taupier-Letage, A. Theocharis, M. Vargas-Yáñez, and A. Vetrano

This manuscript describes the HYDROCHANGES (HC) network for the study of long-term variability of Mediterranean water masses. HC is an initiative proposed during a

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CIESM workshop almost 10 years ago. In the manuscript, the authors present the HC programme, list the contributing institutions and describe the main achievements by reviewing the papers published during the last years and by presenting some figures. The article is well written and the language is fluent and precise. The overall organization is correct although: (1) the objectives of the manuscript are not clear enough and (2) section 1 and section 2 do not follow a logical structure and are excessively long (see details below).

In my opinion this article is suitable for publication in its present form as a Discussion paper in Ocean Science Discussions but not as a research paper in Ocean Science, since there are certain important issues that need to be addressed. First, I think that the manuscript should be resubmitted as a review paper that would synthesize the results obtained by previous authors on changes of deep-water masses in the Mediterranean Sea and discussing the implications and links at a basin scale, which are indeed very relevant for climate change studies. Second, in the present version of the manuscript, too much emphasis to the HC initiative (which is already dating about 10 years) is given. As far as I understand, each of the monitoring sites has been funded by different sources and projects and not only by HC. Further, there is neither a common web portal to distribute the data nor common QC protocols. Thus, I cannot see the interest of writing an article under the umbrella of this initiative, given the fact that a well-defined interaction between the different partners is missing. Third, I suggest reorganizing Section 1 and Section 2 in Introduction and Data and Methods (more details are given below) and also reducing the information related to HC by referring to the website and/or to the documents already published as a CIESM monograph.

SPECIFIC comments:

1) Title and throughout the text: it is not clear if the focus of the article and HC is only deep waters or if covers the entire water column, in which case the inclusion of other data (e.g. satellite data, gliders, . . .) should be explicitly mentioned in the text.

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- 2) Section 1.1, L 19: references on mesoscale variability in the Mediterranean Sea are missing.
- 3) Section 1.3, as stated above, this section should be summarized and merged with the rest of the introduction. The title does not correspond with the contents as many of the other initiatives mentioned such as MFSP, DYFAMED, RADMED,... are not part of CIESM. Further, the list of initiatives should be completed adding Argo, coastal observatories, HYMEX, ENACT-ENSEMBLES, SeaDataNet....
- 4) Section 2.1-2.3: idem as point 3). I suggest explaining only very briefly the initial objectives of HC (L 15-20).
- 5) Section 2.2-2.3: these two sections could be merged to a single section entitled something like 'Data and methods'. Please indicate if common QC protocols and data formats among the HC network have been established.
- 6) Figure 1: please add the name of the different areas described in Section 3.
- 7) Section 3: Northern WMED: the importance of WIW should be mentioned (in case the focus of the paper also includes intermediate waters).
- 8) Concluding remarks: the links with other initiatives (e.g. HYMEX, SeaDataNet, coastal observatories,...) could be mentioned as well as the future plans of HC. Is it envisaged to expand the network by including other institutions?

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