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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "Mediterranean depression characteristics related to precipitation occurrence in Crete, Greece" *by* V. Iordanidou et al.

Anonymous Referee #3

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The paper "Mediterranean depression characteristics related to precipitation occurrence in Crete, Greece" by Iordanidou et al. focuses on the analysis of the cyclone tracks which are associated with rainfall over the island of Crete. In my opinion the subject of the article is interesting but the results are still preliminary. I would encourage the authors to resubmit this work but after deepening their analysis.

My major comments go on language an on the scientific content of the article.

1) I am not a native English speaker but it is clear that language needs substantial improvement. The article is full of awkward phrasing and needs to become more at-

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tractive to the readers. As an example, I've noted several suggestions/language issues in the abstract.

Lines 1-4: please be more specific on cyclone tracks characteristics; 'variable intensity' should be deleted. I do not quite understand what do you mean by circulation patterns. In my opinion you do not address such a point in the article. Cyclones cause precipitation not the tracks, nor the circulation patterns.

Line 5: Please note that 0.5x0.5 refers to the grid spacing. Also you could use the degree symbol (0.5°).

Line 6: I guess 'Their' refers to the cyclone tracks, which is mentioned to the first phrase of the paragraph. Please rephrase. Characteristics are 'calculated' not 'extracted' with the aid of the MS scheme.

Line 10-11: You may delete 'severity' and the comma before the 'and'. The word 'filtered' is not appropriate here.

Lines 11-14: 'atmospheric systems' could be replaced by 'Cyclones'. The word 'morphological' is inadequate. It could be replaced by 'physical'. Phrasing in these lines is repetitive and awkward. The whole paragraph should be revised. Please be more precise in the abstract. Instead of 'such as' you could mention the few more tracks metrics that you treat in your analysis. Lines 11-14 could be rephrased to something like: "The seasonal and annual cycle of the physical characteristics of the cyclone tracks are investigated respect to the cyclones' relative location to the island of Crete."

Line 15-18: Remove 'Generally', please be more specific on the study results. The phrase is too long and difficult to understand. You just mean that the cyclones that affect Crete come from the western side of Crete, right?

Lines 18-20: Awkward phrasing. For instance, the phrase could read 'Cyclone induced rainfall is correlated with the intensity of the associated cyclones' or 'Cyclone induced rainfall increases in function to cyclones' depth, radius...'

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Line 20-21: This phrase is difficult to understand. You mean that spring cyclones that affect Crete with rainfall present lower pressures and larger radius (?) than the ones in winter?

Lines 22-25: The phrase is too long. This paper basically associates cyclone track physical characteristics with cyclone induced rainfall. I do not see how you treat hydro-meteorological conditions or what kind of hydrological information is provided. .

Line 25 misses subject. You mean water resources and rainfall extremes?

2) Many papers in the introduction are cited without describing their results or how they are associated with this study. In addition, the current state of the art in Mediterranean cyclones is poorly reviewed. There are several recent studies that treat the association of Mediterranean cyclones with rainfall or convection, e.g.:

Claud,ÂăC., Alhammoud,ÂăB., Funatsu,ÂăB.ÂăM., and Chaboureau,ÂăJ.-P.: Mediterranean hurricanes: large-scale environment and convective and precipitating areas from satellite microwave observations, Nat. Hazards Earth Syst. Sci., 10, 2199-2213, doi:10.5194/nhess-10-2199-2010, 2010.

Miglietta, M. M., Laviola, S., Malvaldi, A., Conte, D., Levizzani, V., and Price, C.: Analysis of tropical-like cyclones over the Mediterranean Sea through a combined modeling and satellite approach, Geophys. Res. Lett., 40, 2400–2405, doi: 10.1002/grl.50432, 2013.

Stephan Pfahl, Erica Madonna, Maxi Boettcher, Hanna Joos, and Heini Wernli, 2014: Warm Conveyor Belts in the ERA-Interim Dataset (1979–2010). Part II: Moisture Origin and Relevance for Precipitation. J. Climate, 27, 27–40. doi: http://dx.doi.org/10.1175/JCLI-D-13-00223.1

Flaounas E, Raveh-Rubin S, Wernli H, Drobinski P, Bastin S (2015) The dynamical structure of intense Mediterranean cyclones. Clim Dyn. doi:10.âĂŃ1007/âĂŃs00382-014-2330-21-17

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3) The description of the MS scheme (pg 6109, lines 11-28) should be moved to section 2.

4) Pg 6113, lines 15-27 and pg 6114 lines 1-10: This part could be clearer. If I got it right some of the cyclones are not associated with several events due to an inconsistency between the cyclone occurrence and the measurement time. How many events are not captured, have the authors tried to perform a sensitivity test on the cyclones radius?

Wouldn't be simpler to associate a cyclone center with a rainfall measurement if the center is X hours before or after the measurement and if the center is Ykm far from the measurement station (where Y is the cyclone radius or something equivalent).

5) Pg. 6114, lines 14-24: this part is more adequate for the introduction.

6) The section 3 should be merged with section 2. Section 2 could be divided in two subsections: one devoted to the methodology and one devoted to the tracking method and the observations.

7) Pg 6115, lines 7-10: Do you refer to analysis or reanalysis? I guess the second. The ERA-Interim reanalyses are available in 0.75° and 1.5° grid spacing from the ECMWF servers. Did you regrid the dataset? Is there a particular reason?

8) Figure 2 presents three rainfall intensity maps in Crete, classified according to three quantiles. However, the rainfall intensity is defined by threshold values. I do not see how the quantiles are relevant to the authors' analysis. In fact Figure 2 seems not to be of any use in the paper.

9) Titles of sections 4 and 4.1 could be changed to something like 'Results' and 'Cyclone induced rainfall', respectively.

10) In 4.2 it is not clear if you treat all cyclones affecting Crete or only the cyclones inducing rainfall.

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11) Sections 4.3 and 4.4 present several statistics on the track features. These sections are very descriptive. I would suggest to the authors to use maps of the cyclones origins or maps of the cyclone track densities instead of using sectors. In my opinion this could provide more valuable information.

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 2, 6107, 2014.