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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Recharge estimation and soil moisture dynamics in a Mediterranean karst aquifer" *by* F. Ries et al.

F. Ries et al.

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We appreciate the valuable suggestions in the anonymous review of referee 2, which will contribute to significantly improve our manuscript. Below we provide our responses to the reviewer's comments.

Comment a1: The Study area section – mainly climate, deserves more data: 1. Page 4, lines 36-37 - Add that this is a "rain-shadow desert"

Reply: We will add this information in the study area section of the revised manuscript.

Comment a2: Page 4, add some data on typical rainfall intensities.

Reply: We will specify typical values of rainfall intensities for recharge events observed at our stations in the revised manuscript.

Comment a3: Page 4 - The area is affected also by the Red Sea Trough (RST) system from the south during autumn and spring with different characteristics.

Reply: We will add this information in the study area section of the revised manuscript.

Comment a4: Page 4 - Data on evaporation?

Reply: We will quote literature values of potential evaporation for our study area in the revised manuscript.

Comment b: Dust and soils 1. Page 4, lines 12-18 - grain-size of the dust? – it is critical to the texture of the soils which is a bit different – clay soil versus loamy-clay - silty-clay.

Reply: We will compare our soils with characteristics of dust.

Comment c: Page 4, lines 21-22 - actually, the mechanism is that the soil develops at the pocket above a fissure which allows a good drainage of the water and to a lesser extent accumulation of eroded particles.

Reply: Thanks for this detail, we will clarify this.

Comment d: Page 9, line 13 – where are these stations?

Reply: We will clarify this.

Comment e: Page 10, line 27 – how dry (% of average)

Reply: We will add typical soil moisture values at our plots before the start of the winter season in the revised manuscript.

Comment f: Page 14, line 2 – Show Auja spring on the map.

Reply: We will include the location of Auja spring in Figure 1 in the revised manuscript.

Comment g: Page 16, lines 16,17 – what are these "high" rainfall intensities? For example, "very high" intensities typical of the RST system (see in the literature and cite) are too high for infiltration – most of which turn into runoff. Therefore the "high" intensities have values/thresholds and rainfall depth maybe as important. When these are exceeded rainfall will turn into runoff typical of the desert.

Reply: In our observation periods we had very few events that could be classified as RST events. During these events we observed high intensities for short time periods but overall low rainfall amounts compared to more common frontal rainfall events from the Mediterranean Sea. Hence, also their contribution to overall groundwater recharge was minor. But we might have missed a real big RST event. We will discuss this in our revised manuscript.

Comment h: Page 3, line 20 – Youval Arbel in his Ph.d. monitored soil moisture in few soil sections in Mt. Carmel, using FDR.

Reply: We are aware of the work of Youval Arbel and will mention this also in the introduction. Up to now we had already mentioned his work in the results section when we compared thresholds for percolation events with those derived from cave drips studies.

Further comments: There are many minor comments of editing and typo in the ms which I attach. Figures are in a good quality.

Reply: Thank you for the attentive reading of the manuscript and the detailed comments. We will revise the manuscript according to your suggestions.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 11, 8803, 2014.