

## Review egosphere-2026-972

### **The complex effect of climate change and urbanization on streamflow in small–medium Mediterranean catchments. Yair Rinat, Moshe Armon, and Efrat Morin**

This article has a very interesting and unusual objective. While studies on hydrological trends and scenarios in medium and large basins are plentiful, the same cannot be said for small basins, and even less so for Mediterranean basins, which frequently experience flash floods as a result of intense rainfall. The results obtained are of considerable interest from both a scientific and an adaptation perspective, particularly in land-use planning. This is a robust study, and the discussion and limitations sections add to its quality. The article is also based on extensive and up-to-date bibliography. I congratulate the authors on the rigor, originality, and contribution of their article.

#### Minor comments

The scenarios for the end of the century incorporate projected urban expansion, which is a very wise decision. Climatically, it uses a multi-model regional output ensemble derived from CMIP5 for the RCP8.5 scenario. The authors have considered an increase in the urbanized area, assuming impermeable soil. However, nowadays this can be accompanied by flood adaptation measures that mitigate its impact, such as the use of semi-permeable soils, the construction of rainwater harvesting systems, or the digitization of the urban drainage system, which could offset the effect of this potential urban expansion. Therefore, it would be beneficial to consider these points in the Discussion section.

Given that the authors analyze only one basin in Israel, and that the regime of intense rainfall is not the same for the entire Mediterranean region, nor is the impact of climate change, I recommend changing the title to: The complex effect of climate change and urbanization on streamflow in small–medium Eastern Mediterranean catchments.

In the rainfall data section, you indicate that the input data comes from the work of Aaramon et al., 2020, after applying the WRF model to the outputs of ERA-Interim for historical events and CMIP5 for future events. This section needs further development. First, when referring to RCP8.5 scenarios, you should specify the time period for which they are obtained. To better understand the subsequent results, it would be helpful to include more information about the estimated changes in rainfall, for example, a graph showing the current estimated rainfall and the predicted rainfall. On the other hand, some parts of the text mention using IMS rain gauges (line 537), when in reality the 32 rainfall points referred to are model outputs. Could you clarify this?

#### Comments on the edition

Line 33. Replace “vulnerability” by “risk” in the sentence “The combined climate change and urbanization pressures increase the region’s vulnerability”.

Line 40. This characterization of the Mediterranean climate is correct in the East. In the western region, the rainy months are concentrated in spring and autumn. It is better to write "The Eastern Mediterranean climate..."

Lines 49-50. Please, specify that these statements about rainy seasons and dry spells refer to the Eastern part of the Mediterranean region. The own references corroborate it.

Line 122. The fact that there are approximately 7 flow events per year in a normally dry river does not mean there are 7 flash flood events. How many floods occurred during the study period?

Line 123. If the maximum flow rate was around  $3 \text{ m}^3/\text{s}$ , how is it possible that it caused so much damage and even fatalities? Please provide an example of a case.

Lines 141-142. You state that "Rainfall data were taken from a selection of rainstorms simulated at high-resolution using the weather research and forecasting...". This sentence is confusing because it suggests rain gauges located on the ground, not the precipitation estimate from the grid points of a weather model. Later, you mention rain gauges. To avoid confusion, please modify this sentence and write something like "Rainfall data were taken from the weather research and forecasting..."

Lines 155-156. You state: "rainstorms with total precipitation greater than 20 mm over the studied catchments in the historical simulations." Are you referring to the average value for the basin? Or are you referring to the minimum value at some point within the basin? Please clarify this in the text.

Line 179. Please remove one parenthesis

Line 257. When discussing urban scenarios, how does it account for the drainage network? And urban vegetation? Or does it simply assume 100% soil runoff? Please clarify this in the article text.