

EGU21-7020

<https://doi.org/10.5194/egusphere-egu21-7020>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Recent Changes in the Rain Regime in Israel 1975-2020

**Baruch Ziv**<sup>1</sup>, Ron Drori<sup>2</sup>, Hadas Saaroni<sup>3</sup>, Adi Etkin<sup>3</sup>, and Efrat Sheffer<sup>2</sup>

<sup>1</sup>Department of Natural Science, The Open University of Israel, Raanana, Israel (zivbaruchana@gmail.com)

<sup>2</sup>Faculty of Agriculture, Food and Environment, The Hebrew University of Jerusalem, Rehovot, Israel

(ron.drori@mail.huji.ac.il; efrat.sheffer@mail.huji.ac.il)

<sup>3</sup>Porter School of the Environment and Earth Sciences, Tel Aviv University, Tel Aviv, Israel (saaroni@tauex.tau.ac.il; adietkin13@gmail.com)

Previous observation analyses have shown a declining rainfall trend over Israel, mostly statistically insignificant. These findings support the projections of the climatic models for the 21<sup>st</sup> century. The current study, for the period 1975-2020, undermines these findings, and the alarming future projections, and elaborates changes in the distribution of the rain along the rainy season.

The annual rainfall has a negligible trend, of +0.002%/decade, the number of rainy days has declined by -1.9%/decade and the average daily rainfall has increased by +2.1%/decade, all statistically insignificant. In the mid-winter both rainfall and daily rain intensity increased, while these variables have declined in the autumn and spring. The implied contraction of the rainy season is estimated by 2 measures. The 'effective length', which is determined by the time between accumulation of 10% and 90% of the annual rainfall, lasting 112 days on the average. This has been shortened by seven days during the study period. The other is the Seasonality Index (SI), reflecting the temporal concentration of the rainy season around its center. The trend found indicates that the regional climate is shifting from being between 'Markedly seasonal with a long dry season' and 'Most rain in  $\leq 3$  months', further toward the latter.

The trend in Cyprus Low occurrence and in the Mediterranean Oscillation Index were found to explain the rainfall trends only partially. We suggest that the cause for the increase in the mid-winter rain intensity is the increase in sea-surface temperature, found over the east Mediterranean, and for the decline in the transition seasons, to the poleward expansion of the subtropical highs. The contraction of the rainy season on the one hand, and the increased daily rain intensity in the mid-winter on the other, have ecological and hydrological impacts in this vulnerable region.