DJF 2022/23 Seasonal Outlook: Israel

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The Seasonal forecast issued by the Israeli Meteorological Service (IMS) is based on ECMWF system 5 seasonal forecast.

1. Prediction of near surface air temperature in the surface (2m above ground level) for DJF 2022/23

Figure 1 presents the probabilities for the 3 near surface air temperature (2m above ground) terciles over Israel for winter 2022/23 in Israel (DJF 2022/23).
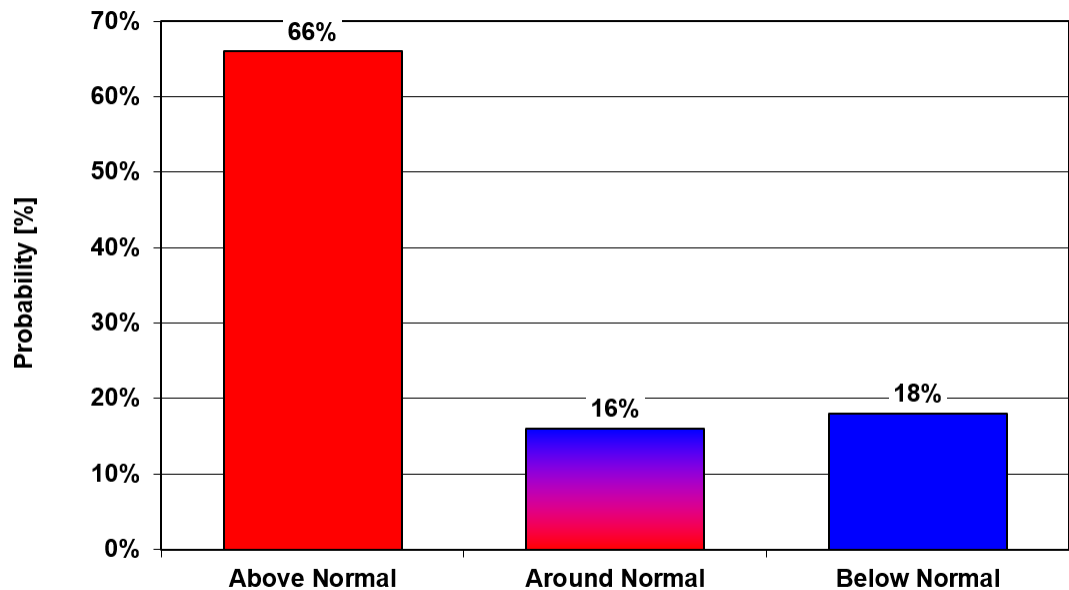

Figure 1: The probability of seasonal temperature falling within each tercile for winter 2022/23 in Israel (DJF 2022/23).

According to figure 1, a "preferred category", defined as a category above or equal to 40%, exists. The highest probability, 66%, is found in the "Above Normal" category. The probability for an "Around Normal" is 16% and the probability for a "Below

Normal" is only 18%. Hence, DJF averaged near surface air temperature in the surface (2m) is expected to be above the normal, in the upper tercile. The mean ensemble mean of 2022/23 relies in the percentile above 97% regarding in reference to the distribution of the 1981/82-2010/11 climatology period.

The predication of near surface air temperature for winter in Israel is based on ECMWF seasonal forecast system 5 ensemble, which contains 51 members for the operative prediction. The prediction is relative to the model climatological 1 period 1981/82-2010/11, which is based on ensemble of 750 members. The prediction is based on a 38 grid point's area, which include the whole area of Israel (Figure 2).
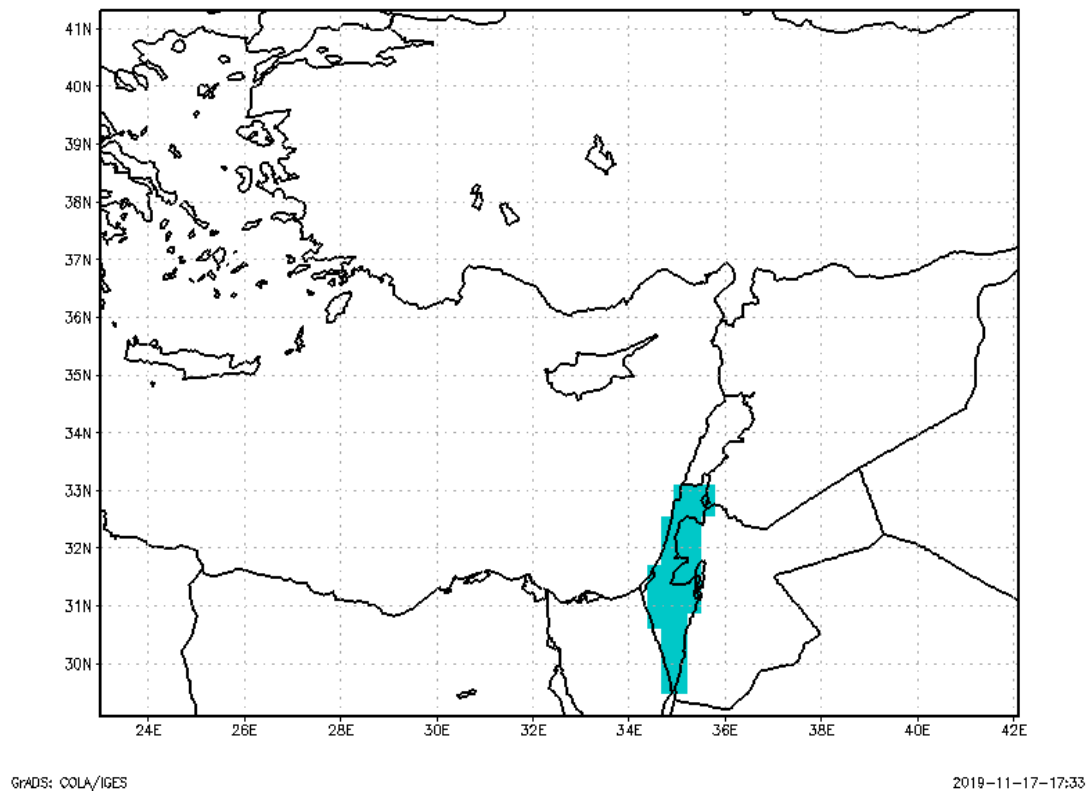

Figure 2: The area (green) with 38 grid points being used for generating the DJF near surface air temperature forecast in Israel.

2. **Prediction of precipitation for DJF 2022/23**

Figure 3 presents the precipitation anomalies over the eastern ~~part of the~~ Mediterranean region. The anomalies are defined as the mean operative ensemble precipitation amount prediction for DJF 2022/23 ~~minus~~ relative to the mean hindcasting ensemble for DJF 1981/82-2010/11.

The precipitation anomalies are based on ECMWF seasonal forecasting system 5 (SEAS5) prediction. The operative model initial time is 1/11/2022 00UTC.

The operative prediction for DJF 2022/23 contains 51 ensemble members.

The hindcasting ensemble that was used to calculate the anomalies is for the period of DJF 1981/82-2010/11, and it contains 750 members. The initial model time in each year is NOV-1st 00UTC.
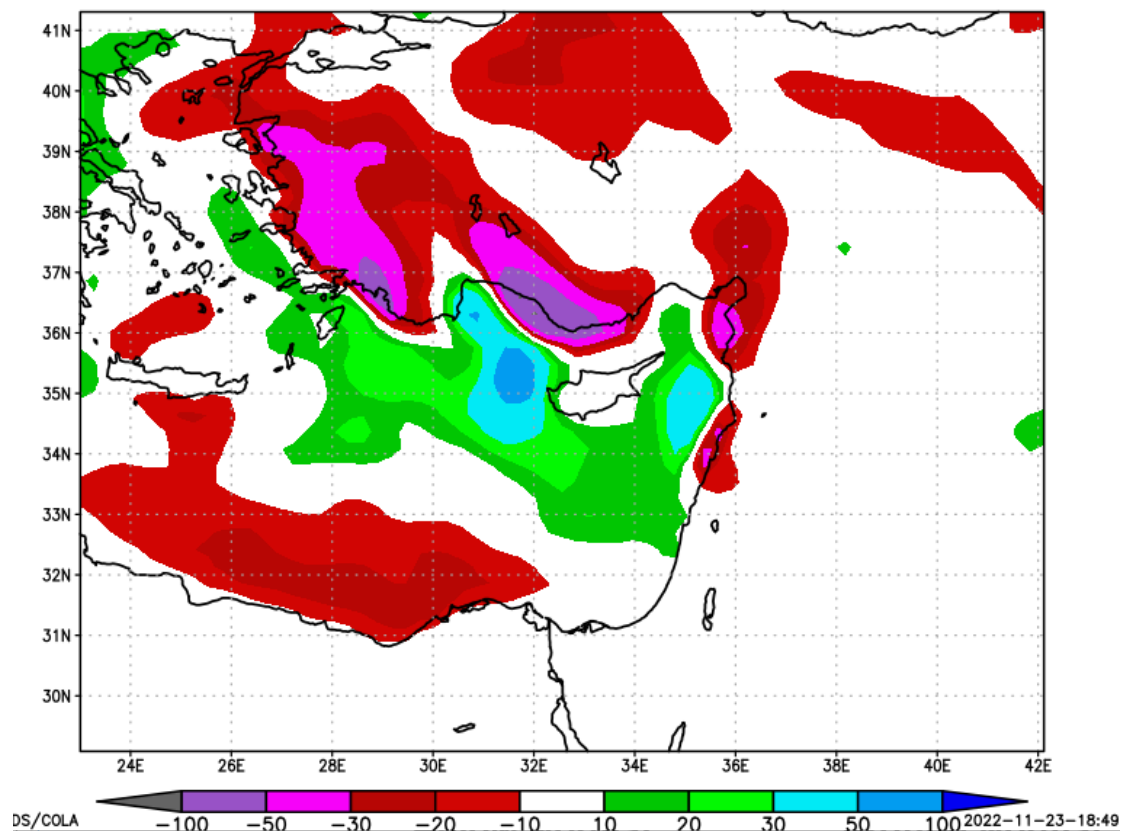

Figure 3: The precipitation anomalies in the East Mediterranean area for DJF 2022/23 [mm] according to ECMWF model with initial time 1/11/2022 00UTC.

Figure 3 presents the precipitation anomalies in the East Mediterranean area for DJF 2022/23 [mm] according to ECMWF model with initial time 1/11/2022 00UTC. According to the figure, there are positive precipitation anomalies in the north side of the eastern Mediterranean Sea. In Turkey the anomalies are positive. In the North Africa Mediterranean sea the anomalies are negative and in the north east coast of the Mediterranean the anomalies are negative (Lebanon and Syria). In Israel the absolute anomaly values are less than 10 mm per season (DJF season).

Figure 4 presents the probabilities for the 3 precipitation terciles over Israel for winter 2022/23 in Israel.
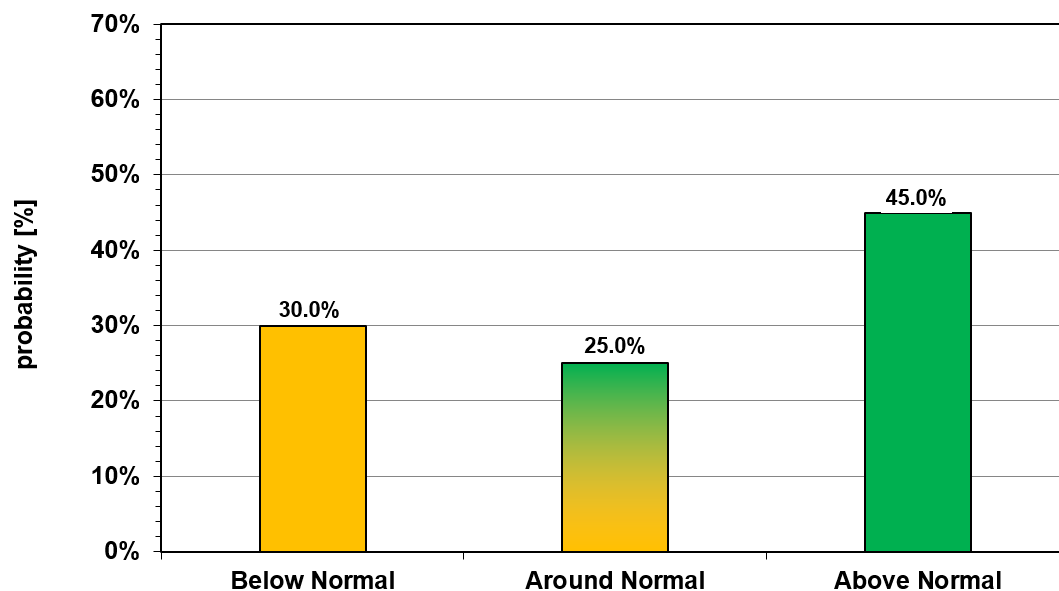

Figure 4: The probability of seasonal precipitation falling within each tercile for winter 2022/23 in Israel (DJF 2022/23).

According to Figure 4, the "Above Normal" (45%) is a preferred category (i.e., a category above or equal 40%). The highest probability is in the category of above normal, 45%. The probability for "Around Normal" is 25%, and the probability for "Below Normal" is 30%. Hence, DJF accumulated precipitation is expected to be above the normal. The mean 2022/23 ensemble mean of 2022/23 relies in the percentile of 51.6% regarding in reference to the distribution of the climatology period 1981/82-2010/11 climatology period. The preferred category is above the mean although the

total anomalies are close to zeros. The reason for this is that there are few extreme members in the lower tercile, which balance the positive members in the upper tercile.

The predication of precipitation for winter in Israel is based on ECMWF seasonal forecast system 5 ensemble, which contains 51 members for the operative prediction. The prediction is relative to the model climatological l period 1981/82-2010/11, which is based on 750 ensemble members. The prediction is based on the area of 20 grid points where the averaged observed precipitation is above the of 200 mm isohyet (for all the rainy season, not only DJF). Therefore, we include only the region which is north of Beer Sheva city (north of latitude 31.3°N). By According to GIS maps most of the area which is north to Beer Sheva have, on average, more than 200 mm of rainfall per rainy season.

In summary: The predication of precipitation in Israel includes only the area which is north of Beer Sheva city (north of latitude 31.3°N).

The next figure (Figure 5) presents the 20 grids point which we are using in order to make prediction for Israel precipitation in DJF season for generating the DJF precipitation forecast in Israel.
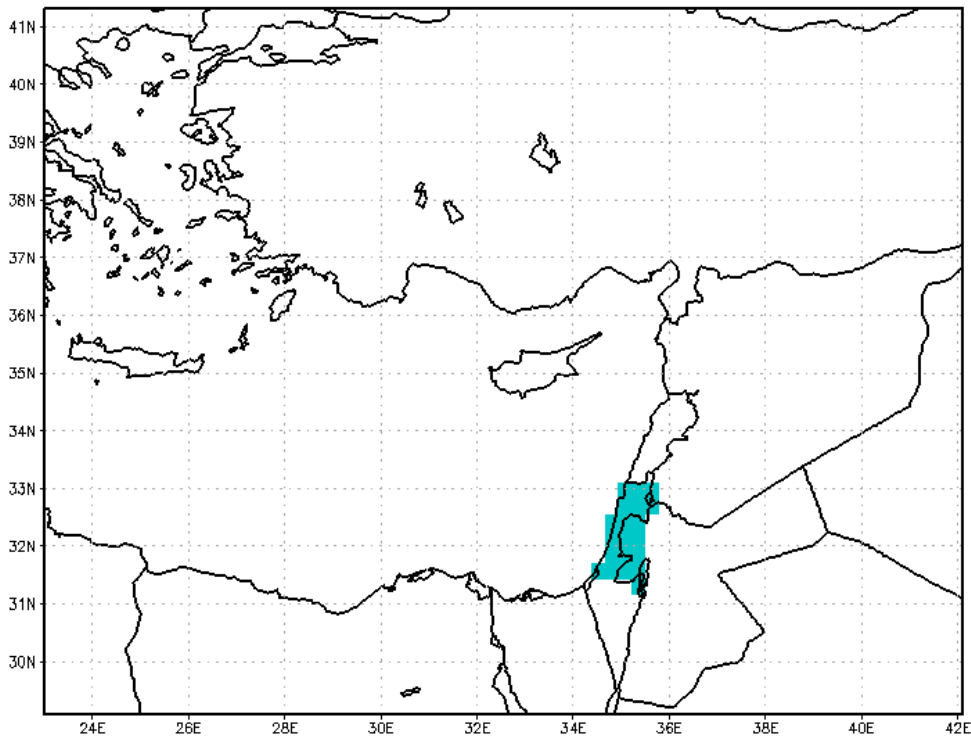
Figure 5: The area (green) with 20 grid points being used for generating the DJF precipitation forecast in Israel.

Please notice that prior to DJF 2017/18, (DJF 2016/17 and earlier) we used ECMWF seasonal forecast system 4. System 4 was approximately half the system 5 resolution. Therefore, only 5 grid points were used to predict the winter seasonal forecast precipitation, instead of the 20 grid points being used today.