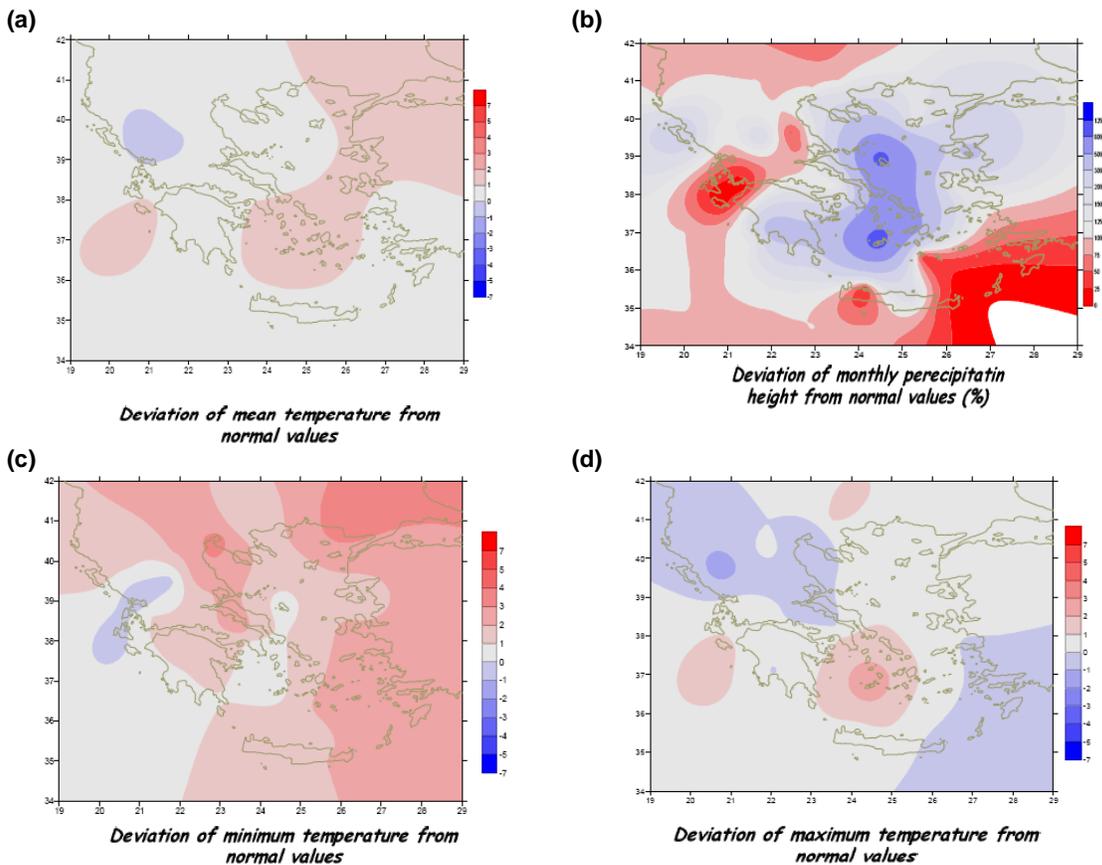


# Qualitative evaluation of Summer 2010 forecast in Greece based on HNMS Monthly Bulletins

## 1. Description of summer 2010 weather conditions over Greece

**June 2010**, although, was “cold” in the beginning, temperature gradually increased and attained its maximum on the 15<sup>th</sup> -16<sup>th</sup> of the month when the first summer heat wave occurred. Overall, the mean temperature showed a slight positive anomaly apart from northwest mainland. Interestingly, the minimum temperature exhibited positive anomalies (~+1 to +3°C) over most parts of Greece apart from the northwest (low negative anomaly), while the maximum temperature was lower than the normal values (~-1 to -2°C) over northwest part and southeast Aegean Sea. The month was characterised by unstable conditions accompanied by strong thunderstorms and hail incidents. Therefore, precipitation amounts were higher than normal values apart from central-west part and southeast Aegean Sea.

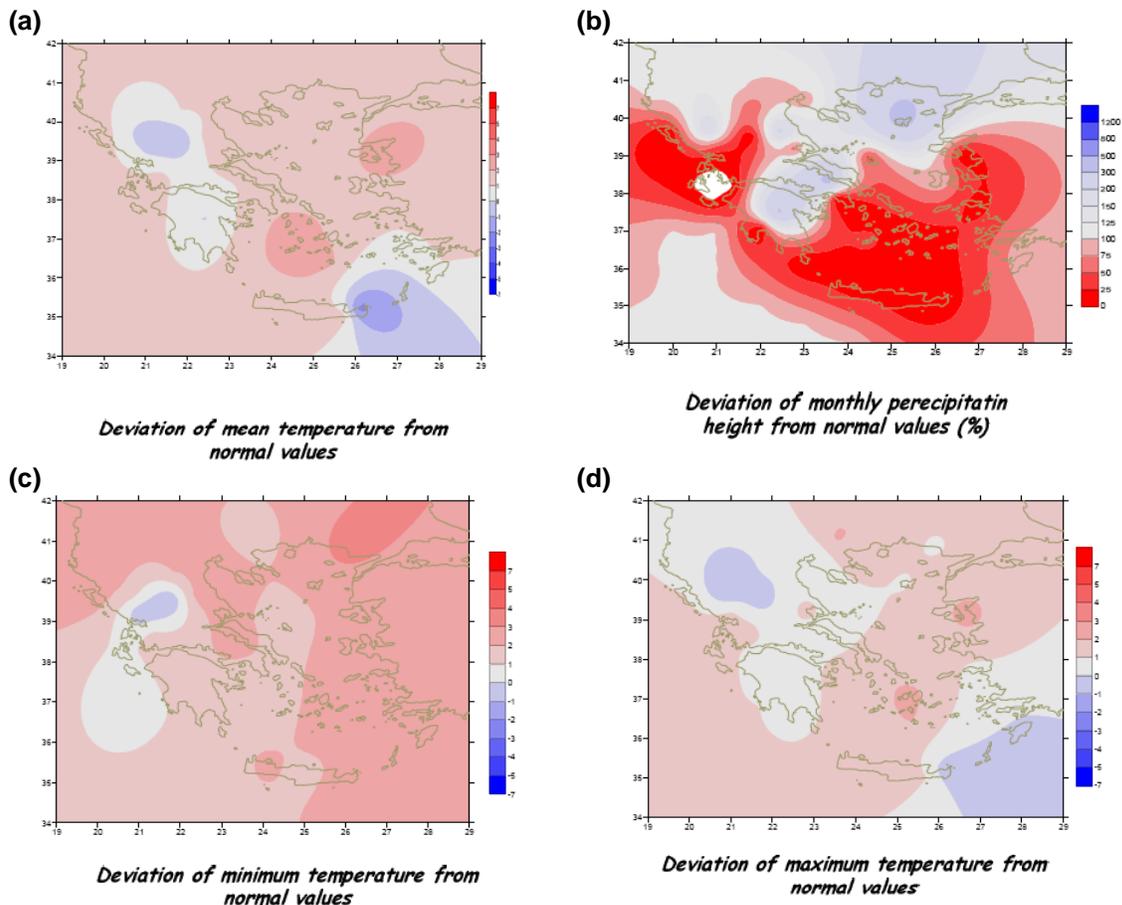
Figure 1 shows the deviation of the mean temperature and monthly precipitation from their normal values and the corresponding minimum and maximum temperature deviations. It is noted that as “normal” mean values are defined the mean values calculated using 30-year records.



**Figure 1.** Deviation of the (a) mean temperature, (b) monthly precipitation height, (c) minimum temperature and (d) maximum temperature from the normal values of the period.

**July 2010** was characterised by short periods of very high temperature during the middle and at the end of the month over most parts of Greece. Hence, mean temperature exhibited positive anomalies apart from the northwest mainland and southeast Aegean Sea. Unstable conditions occurred resulting to strong thunderstorms and hail locally, mainly over mainland. For this reason, precipitation amounts were higher than normal over parts of mainland and north Aegean Sea, whilst they were lower than normal over the rest of Greece.

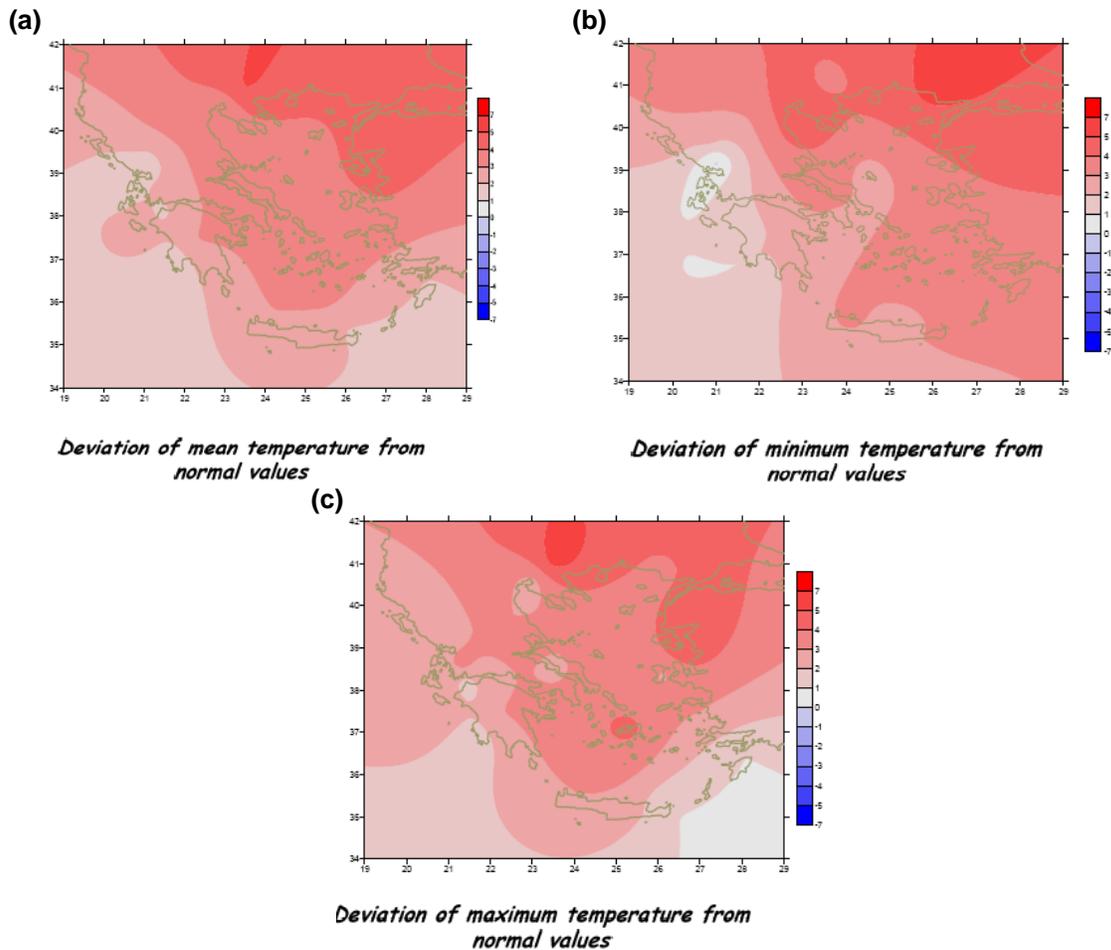
Figure 2 illustrates the deviation of the mean temperature and monthly precipitation from their climatic 30-year mean values for the whole month as well as the corresponding fields for the minimum and maximum temperature values. On average, the maximum temperature anomalies followed the pattern of the mean temperature anomalies, while the minimum temperature was higher than normal values apart from northwest mainland and southeast Aegean attaining small negative anomalies.



**Figure 2.** Deviation of the (a) mean temperature, (b) monthly precipitation height, (c) minimum temperature and (d) maximum temperature from the normal values of the period.

**August 2010** was a hot month in the whole Greece; however, the maximum temperature did not overpass the extreme highest values ever recorded. The mean temperature was higher than normal everywhere (between +2 and +4°C) with the largest anomalies occurring over eastern parts and especially over

northeastern mainland (Fig. 3a). Similar patterns are present also in minimum and maximum temperatures anomalies (Fig. 3b,c). Precipitation was lower than normal values over the whole country (not shown).



**Figure 3.** Deviation of the (a) mean temperature, (b) minimum temperature and (c) maximum temperature from the normal values of the period.

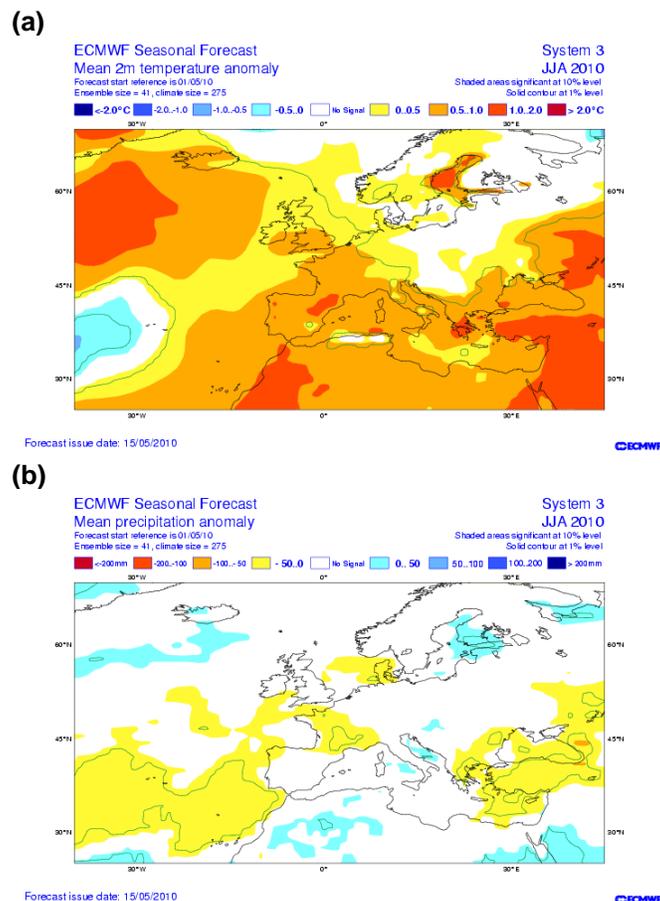
*Detailed description of the meteorological situation in June, July and August 2010 can be found in the HNMS monthly bulletins (<http://www.emy.gr/hnms/english/climatology/climatology.html>).*

## **2. Comparison of summer 2010 weather conditions over Greece with seasonal forecast**

The Hellenic National Meteorological Service receives seasonal forecasts from the European Centre for Medium-Range Weather Forecasts (ECMWF). Although HNMS does not disseminate seasonal forecasts to the public, they are used for research reasons.

The ECMWF forecast for summer 2010 based on the model run of May 2010, for mean temperature, indicated a positive anomaly of the order of 1-2°C for the central-south mainland and a positive anomaly of the order of 0.5-1°C over the rest of Greece (Fig. 4a) with respect to the model climatology. Based on the above description of the actual situation occurred it can be concluded that the seasonal forecast gave, qualitatively, the general trend for the mean temperature, although the highest positive anomalies were observed mostly over the eastern parts. Regarding the mean precipitation, the ECMWF seasonal forecast gave a small negative anomaly everywhere apart from the southwest parts where the signal is not apparent, compared to the model climatology (Fig. 4b). Comparing the actual with the forecasted situation it seems that in reality for the first two months there was some positive anomaly for precipitation mainly for the central-northeast Greece, and only in August precipitation was less than normal.

*These arguments are in accordance with the consensus statement extracted at the end of SEECOF-III meeting as far as temperature is concerned, while precipitation was above normal over part of Greece for June and July and below normal everywhere during August.*



**Figure 4.** ECMWF seasonal forecast for summer 2010 based on the May 2010 run for (a) mean temperature anomaly and (b) mean precipitation anomaly.