

Monitoring results for summer 2010 and evaluation of SEECOF- III outlook

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SEECOF-III JJA 2010 Climate Outlook

- Warmer than normal in the prevailing part of SEE and Caucasus region
- Precipitation near normal over most parts of the region with some probability of below normal rainfall over Turkey, South of Balkan Peninsula and Caucasus and above normal areas over the Carpathian region, over southern Bulgaria and Serbia

Outlook source - EUROSIP

EUROSIP multi-model seasonal forecast

ECMWF/Met Office/Météo-France

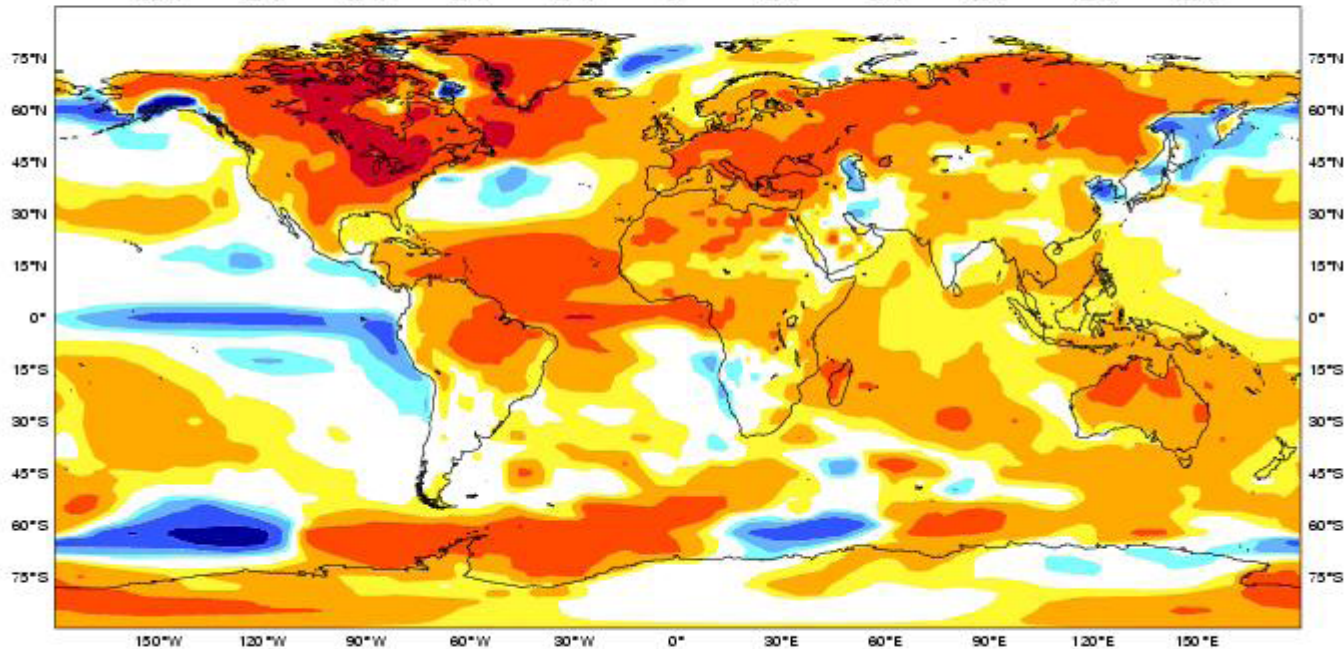
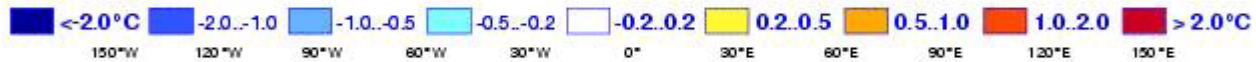
Mean 2m temperature anomaly

JJA 2010

Forecast start reference is 01/05/10

No significance test applied

Variance-standardized mean



Forecast issue date: 15/05/2010

Outlook source - EUROSIP

EUROSIP multi-model seasonal forecast

ECMWF/Met Office/Météo-France

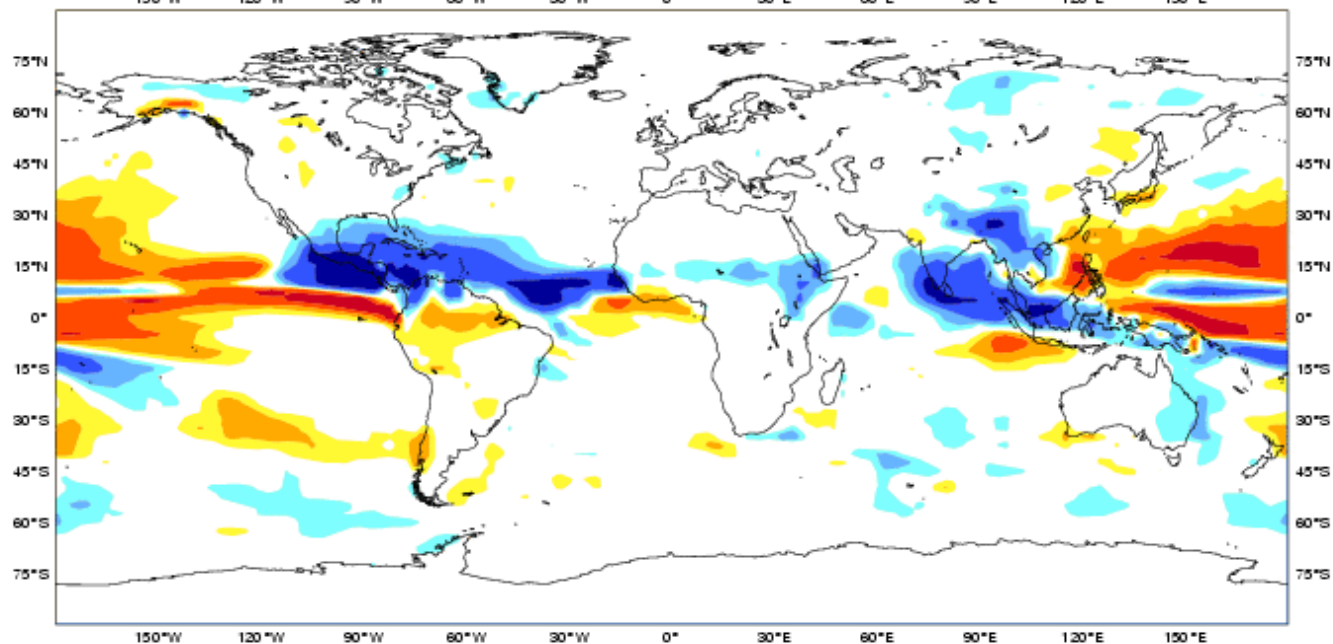
Mean precipitation anomaly

JJA 2010

Forecast start reference is 01/05/10

No significance test applied

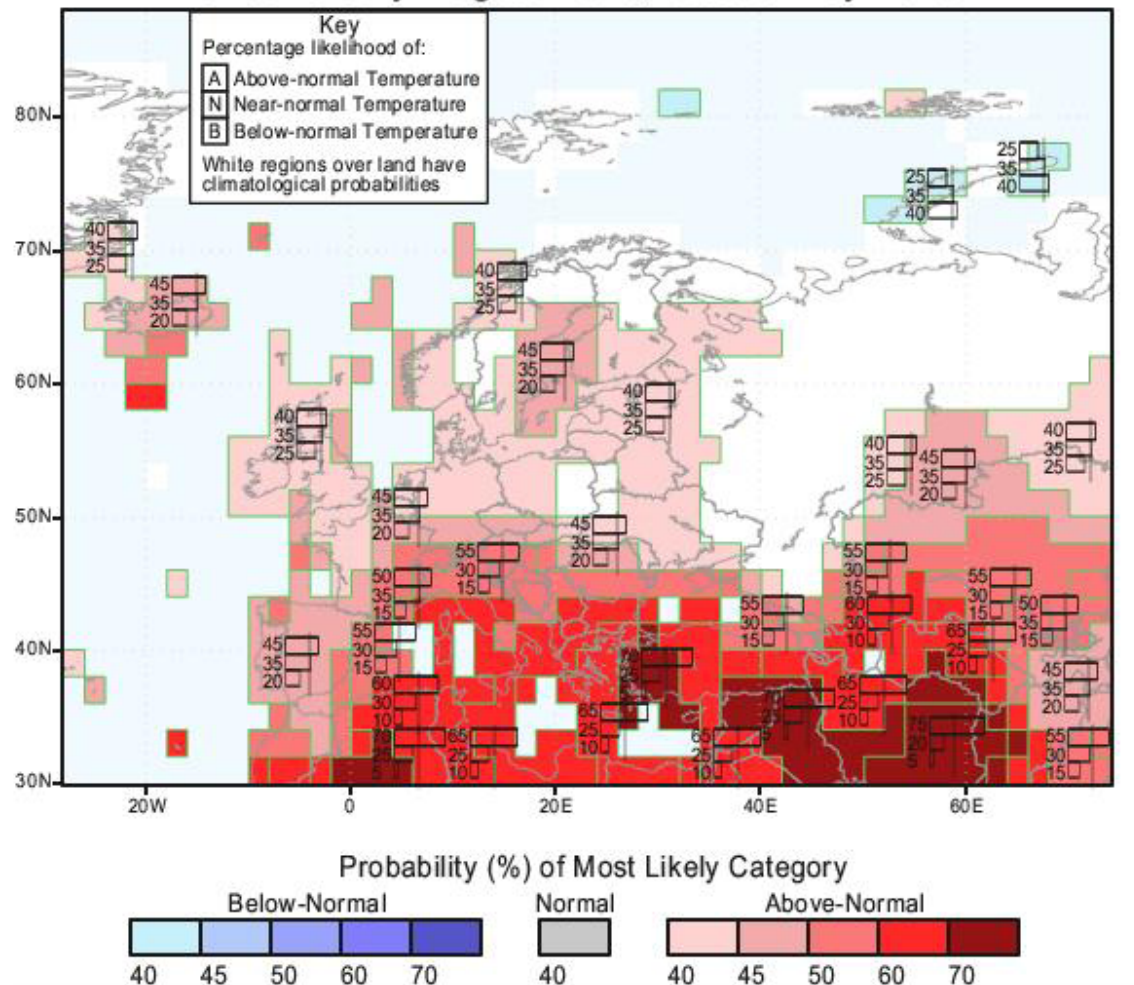
Variance-standardized mean



Forecast issue date: 15/05/2010

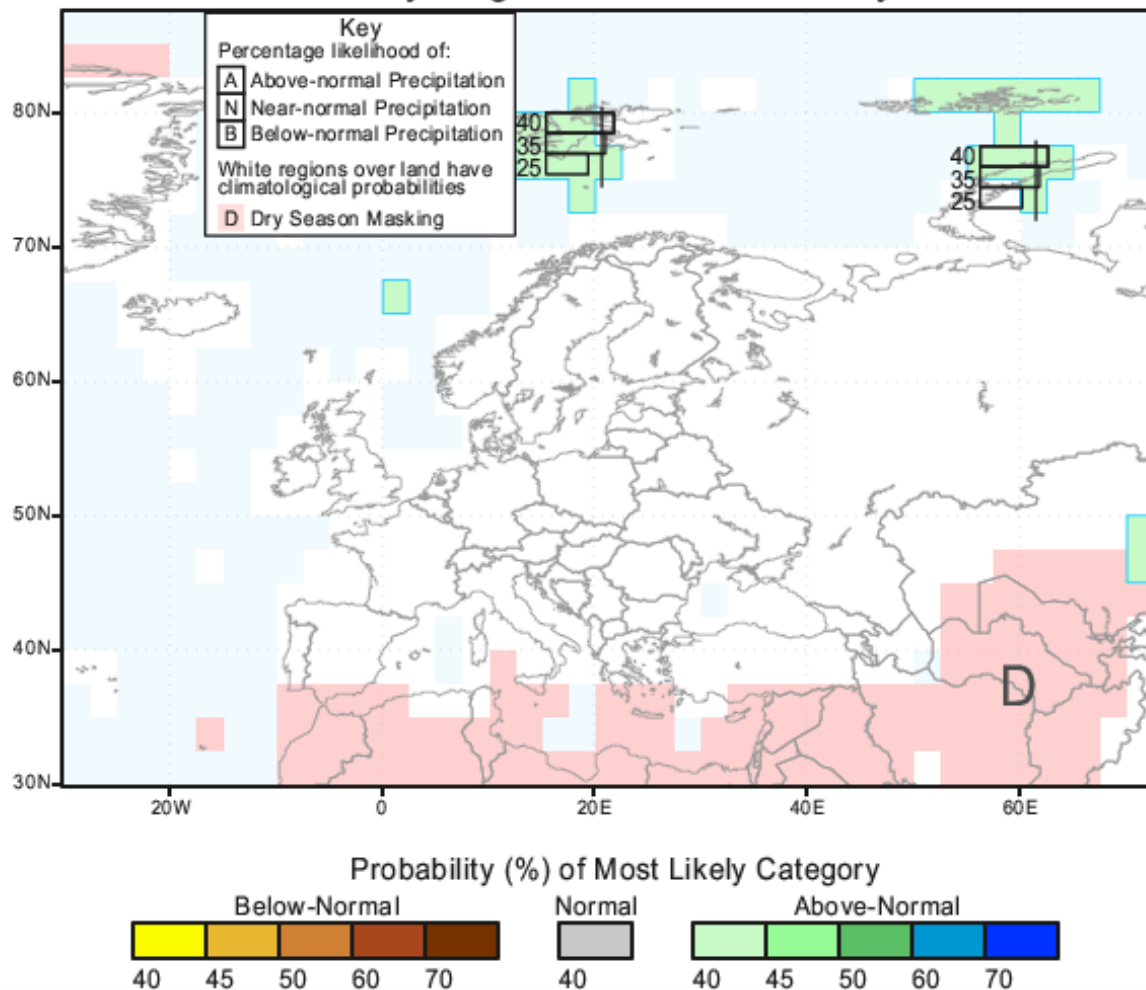
Outlook source - IRI

IRI Multi-Model Probability Forecast for Temperature for June-July-August 2010, Issued May 2010

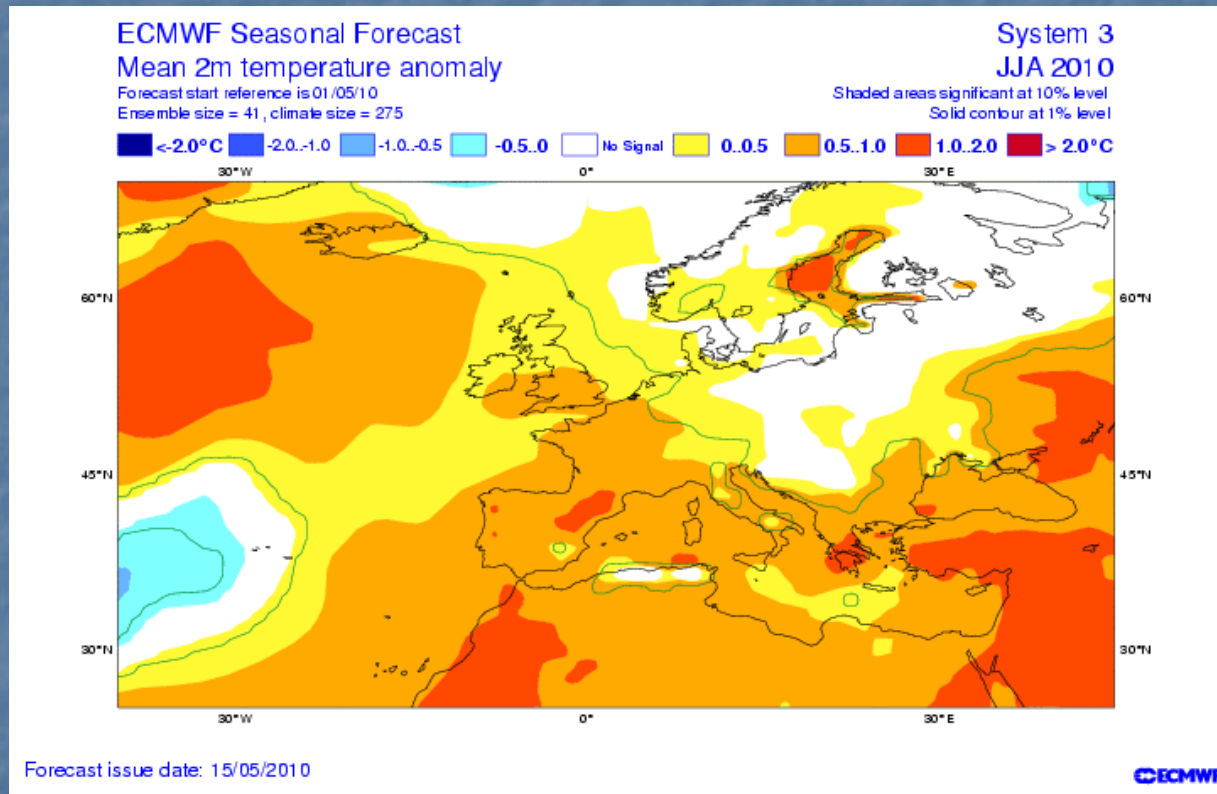


Outlook source - IRI

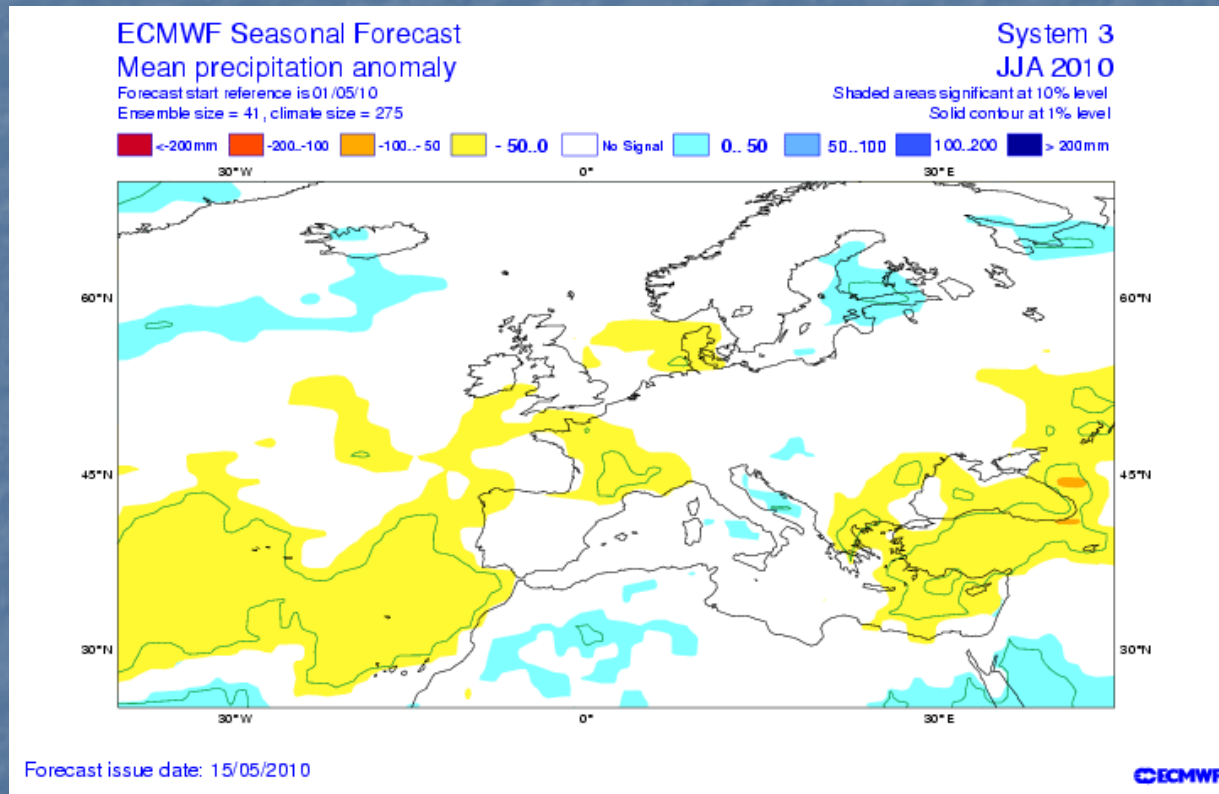
IRI Multi-Model Probability Forecast for Precipitation for June-July-August 2010, Issued May 2010



Outlook source - ECMWF



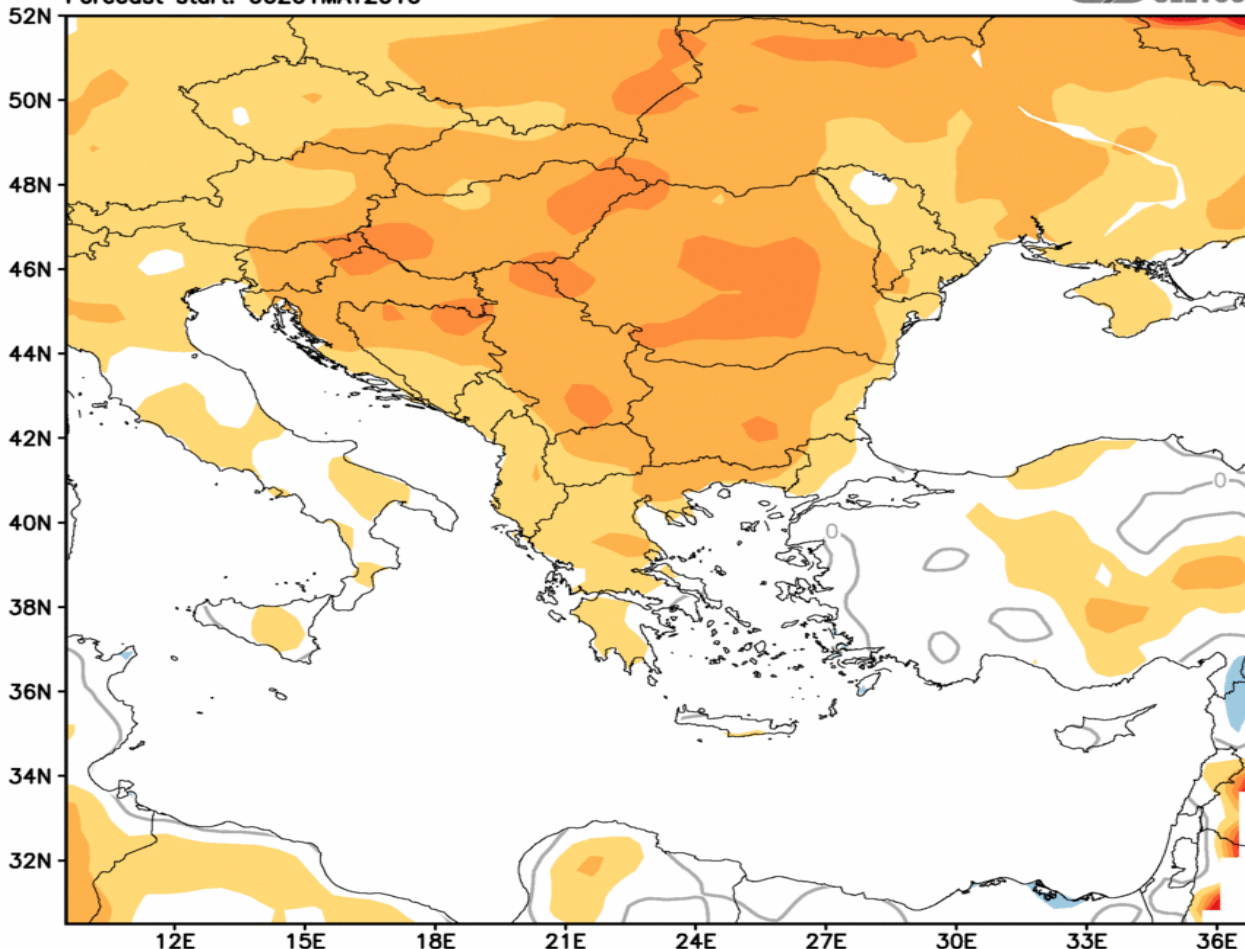
Outlook source - ECMWF



Outlook source - SEEVCCC

RCM-SEEVCCC: Mean 2m temp. anom. (°C) for season JUN-JUL-AUG 2010
Forecast start: 00Z01MAY2010

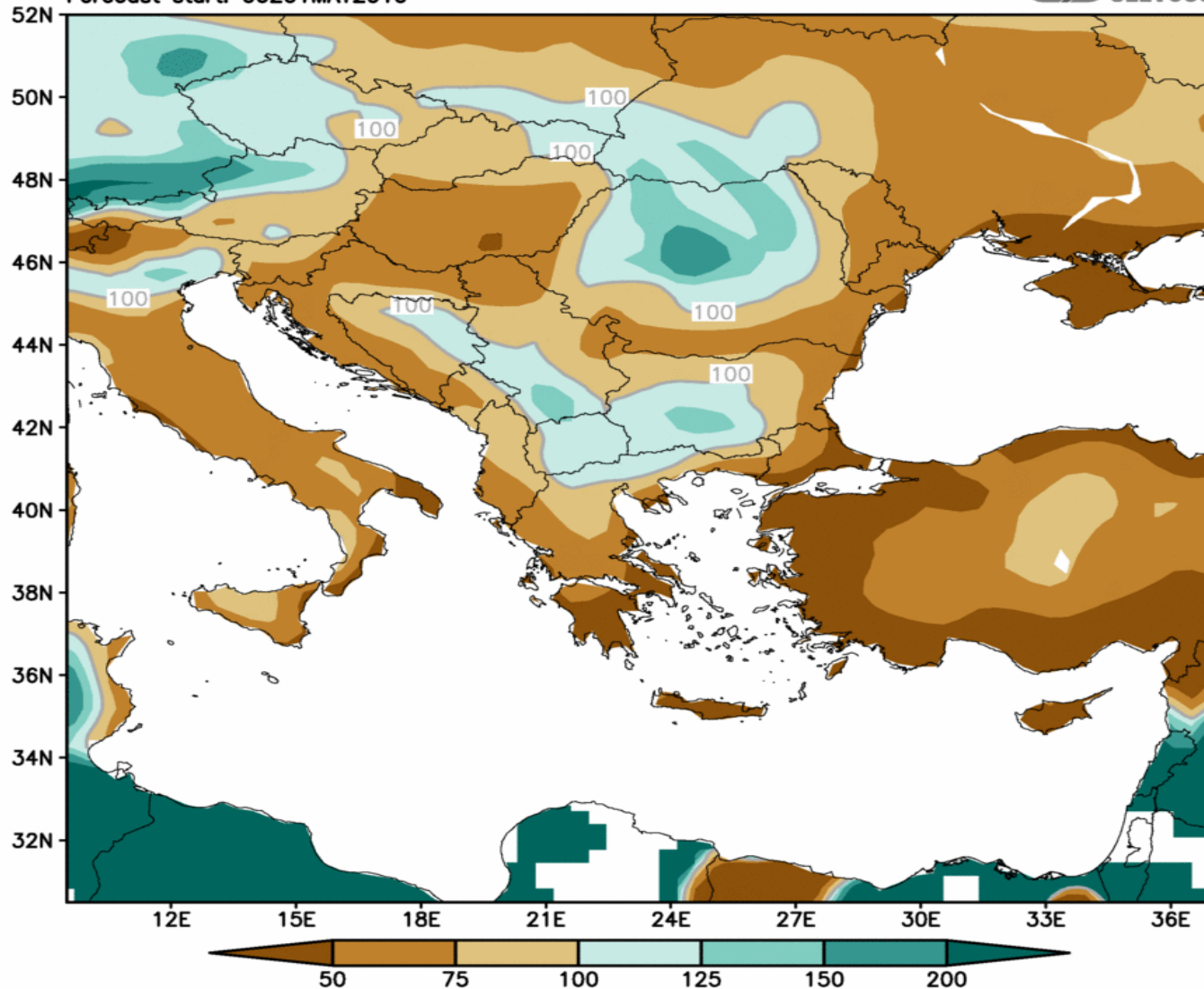
SEEVCCC



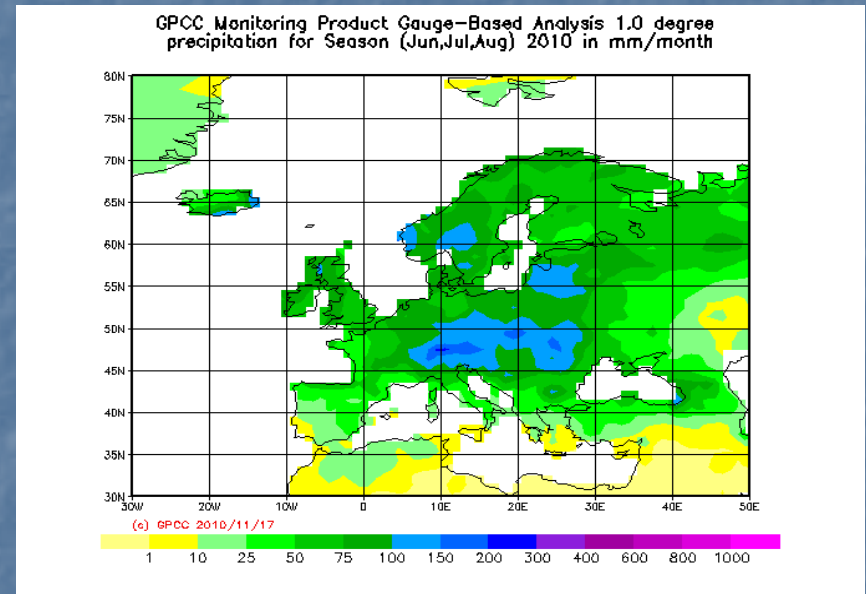
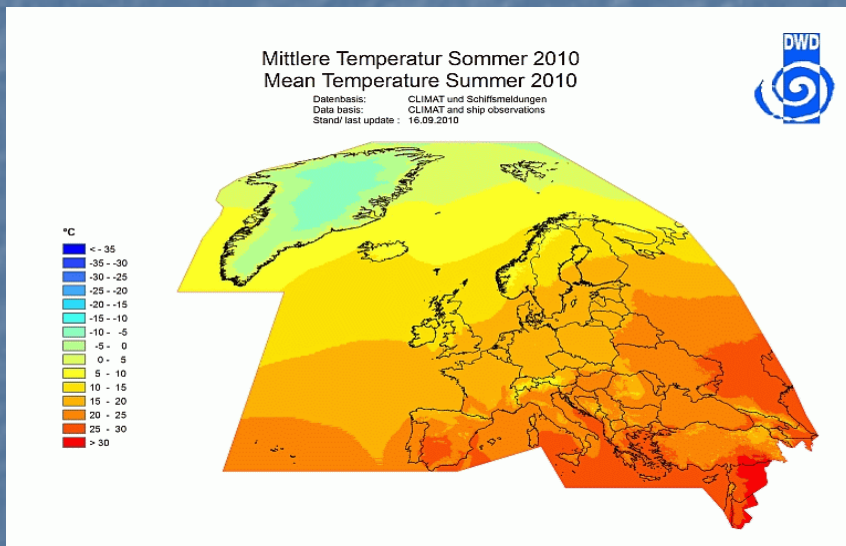
-5 -4 -3 -2 -1 1 2 3 4 5

Outlook source - SEEVCCC

RCM-SEEVCCC: Precipitation anom. (%) for season JUN-JUL-AUG 2010
 Forecast start: 00Z01MAY2010

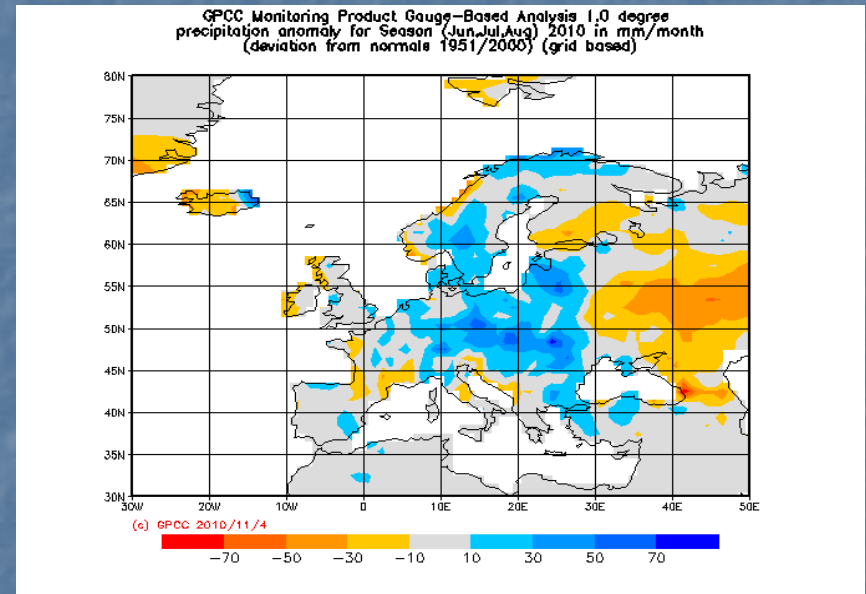
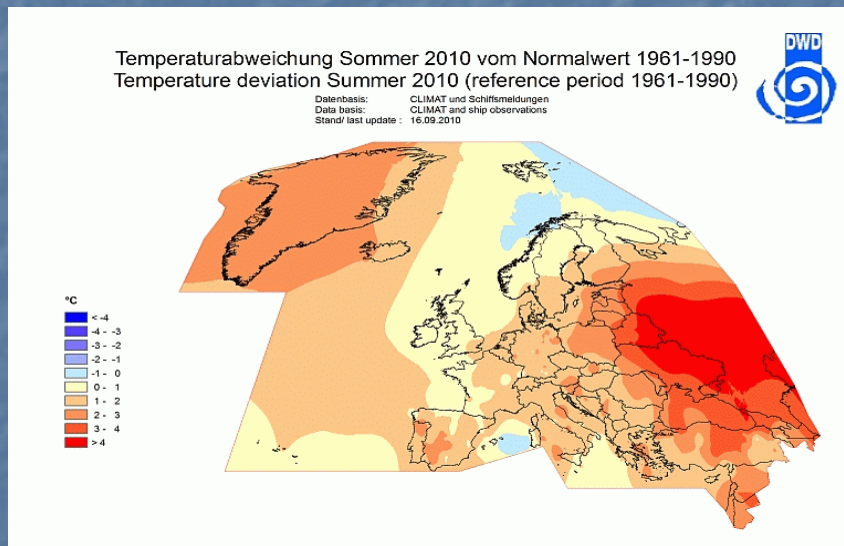


Summer season 2010 observed temperatures (left panel) and summer season observed precipitations in mm per month (right panel). Source: <http://www.dwd.de/ecsm>

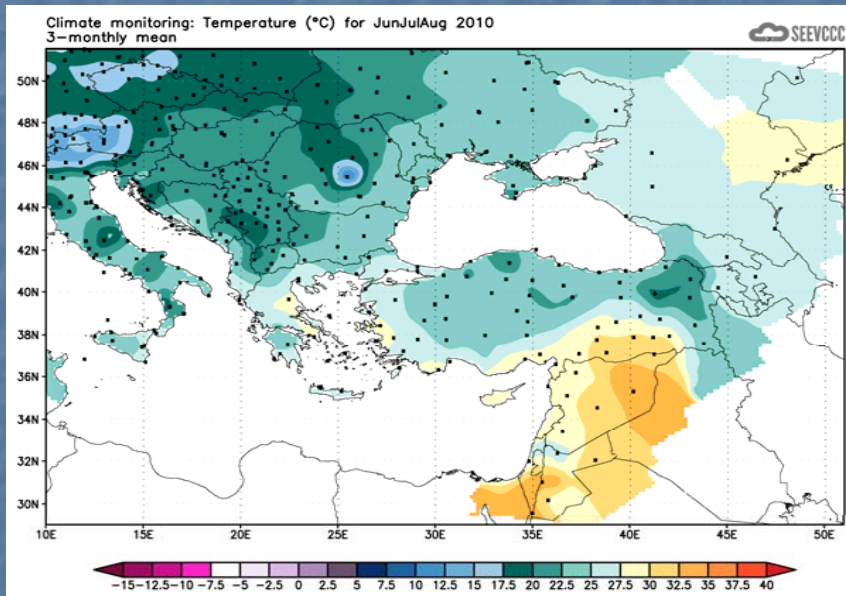


Summer season 2010 observed temperature anomalies (left panel) and summer season observed precipitation anomalies in mm per month (right

panel). Source: <http://www.dwd.de/ecsm>



2010 JJA Temperature Monitoring



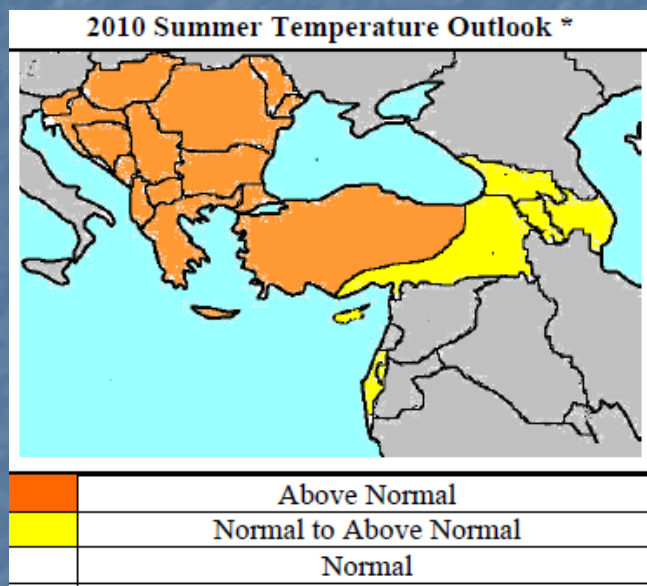
Summer mean temperatures mostly ranged between 20°C and 25°C, in some southern and eastern parts above 25°C, at some higher elevations below 20°C

Significant Temperature Events JJA

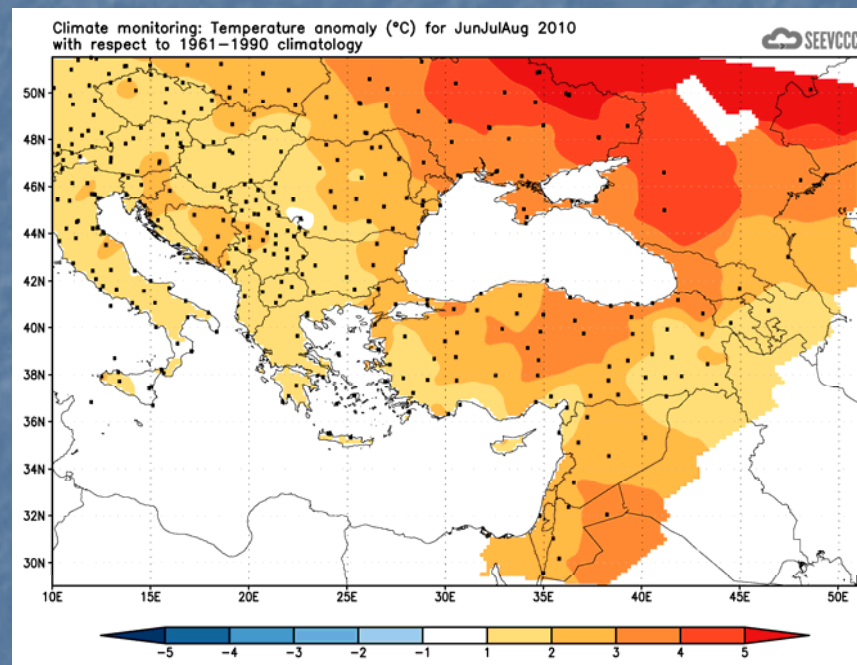
- The nights were warm, the number of tropical nights were higher than normal in many parts of south-eastern Europe
- July/August: extreme heat wave over eastern Europe, extending far to the south (Cyprus 45.6°C, highest value for at least about 100 years) and in June in Serbia
- Absolute maximum temperatures were near to 40°C in many parts of the area, in the south above. Nikosia in Cyprus reached 45.6°C in 1st August, the highest value since the beginning of the 20th century

2010 JJA Temperature Outlook and Observed Temperature Anomalies (°C)

Expected Temperature

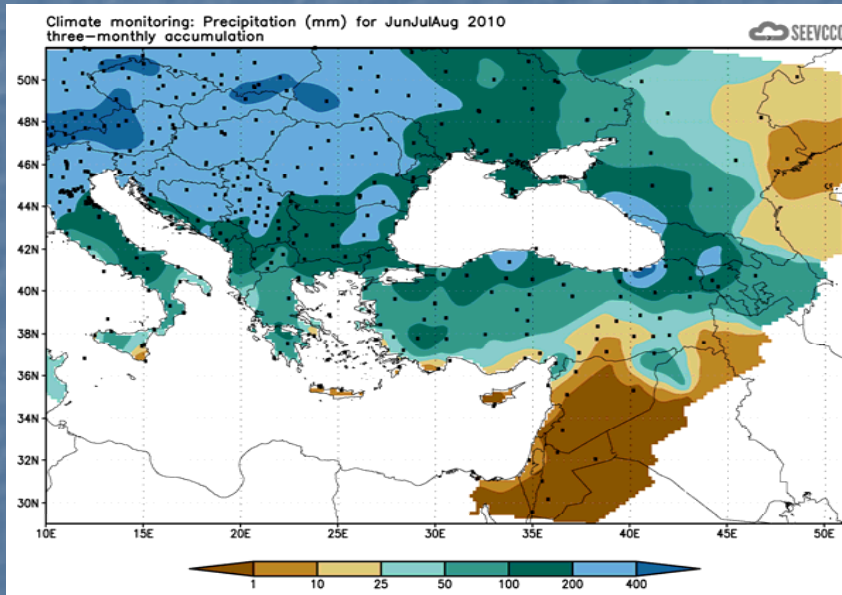


Observed Temperature Anomalies



Summer was warmer than normal over almost whole Europe, and so was over the SEECOF area. Anomalies were above +1°C over almost the whole area, locally above +2°C and even above +3°C in its north-easternmost parts.

2010 JJA Precipitation Monitoring



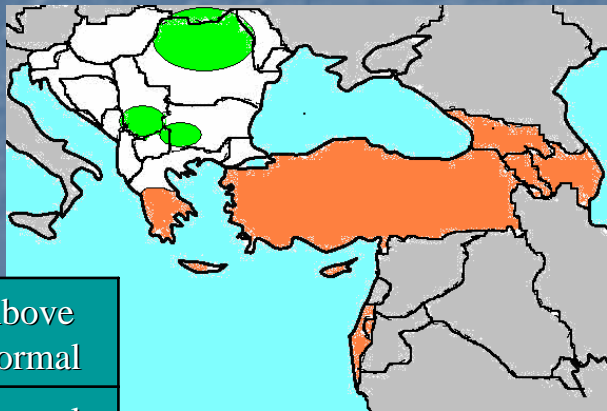
- Precipitation anomalies were very diverse within the SEECOF area.
- Wetter than normal (>125% of the long-term average) particularly in northern and eastern parts of south-eastern Europe and over most of Turkey.
- Mostly dry in the south Caucasus region (especially in Georgia) and near the Adriatic and Mediterranean coasts.

Significant Precipitation Events JJA 2010

- Particularly wet over almost the whole SEECOF area in June with much convective rain
- Heavy rain in the north of the SEECOF area, e.g. in Slovenia, Moldova, Northern Balkan peninsula
- Severe thunderstorms with heavy rain and partly with hail were recorded in the middle of June in Slovenia, Hungary and Bulgaria
- In June heavy rain caused severe flooding in Romania, Moldova, Bosnia and Herzegovina and Serbia

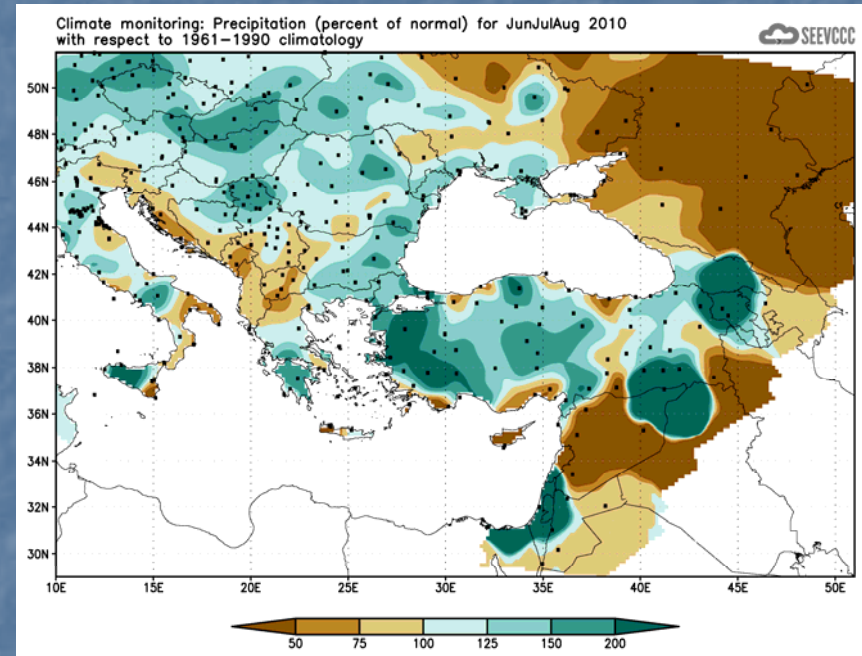
2010 JJA Precipitation Outlook and Observed Precipitation Anomalies

Expected Precipitation



	Above Normal
	Normal
	Below Normal

Observed Precipitation Anomalies(%)



Some features were quite well predicted (surplus of precipitation in the Carpathian region and the south of Bulgaria, deficit of precipitation in the south Caucasus region), but others not, e.g. the high precipitation over Turkey and Greece.

JJA 2010 Outlook Analysis Sources

- The European Climate System Monitoring – ECSM (the ECSM system is a technical platform of the DWD, Lead of the WMO RA VI Pilot RCC Node on Climate Monitoring, <http://www.dwd.de/ecsm>)
- Climate monitoring review of summer season 2010 and brief assessment of the correctness of the SEECOF 3 climate outlook for summer 2010, (ECSM, DWD, Lead of the WMO RA VI Pilot RCC Node on Climate Monitoring, http://www.seevccc.rs/SEECOF/SEECOF%20IV-STEP1/Pre-PRECOF_RCC-Climate_Monitoring_DWD/);
- Climate monitoring products of the South East European Virtual Climate Change Center - SEEVCCC (Member of the WMO RA VI Pilot RCC Node on Climate Monitoring, http://www.seevccc.rs/imgsrc/clim_mon/201008/), and
- National climate monitoring reports of the following SEECOF-4 participating countries: Armenia, Azerbaijan Republic, Bulgaria, Federation of Bosnia and Herzegovina, Croatia, Cyprus, Georgia, Greece, Hungary, Israel, FYR of Macedonia, Republic of Moldova, Slovenia, Serbia and Turkey (documents available from <http://www.seevccc.rs/SEECOF/SEECOF%20IV-STEP1/>)

VERIFICATION OF TEMPERATURE OUTLOOK FOR 2010 JJA

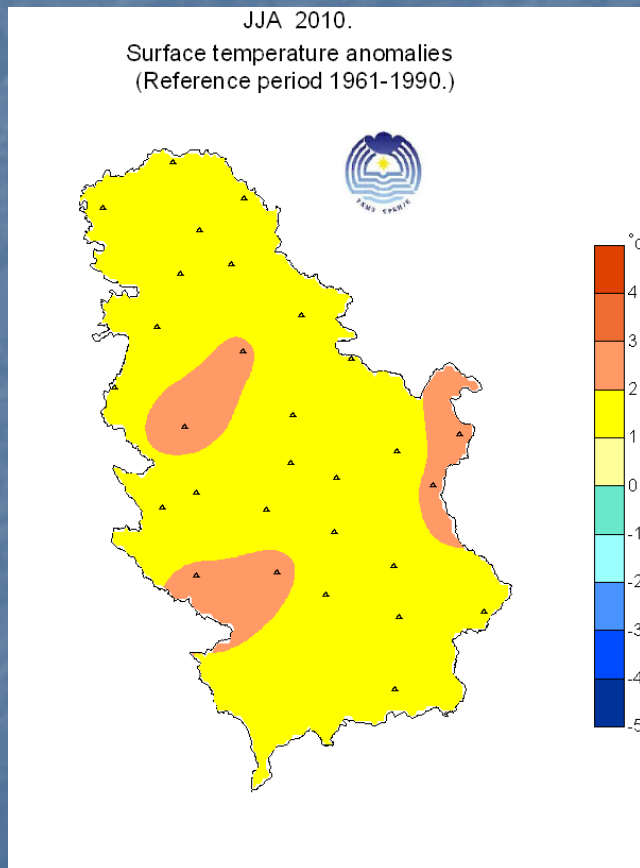
- The SEECOF III climate outlook for summer season 2010 concluded that seasonal temperatures over south-eastern Europe will be very likely above normal and with some possibility (although with no clear signal) also over the eastern Mediterranean, Turkey and the south Caucasus region. On the basis of aforementioned regional, subregional and national climate monitoring products it appears that the monitored anomalies, however, were clearly above normal over the whole SEECOF area, in the eastern parts even more than over south-eastern Europe. **All together, the outlook was correct, but the forecast signal was not so clear as to be expected for these quite strong and extended anomalies**

VERIFICATION OF PRECIPITATION OUTLOOK FOR 2010 JJA

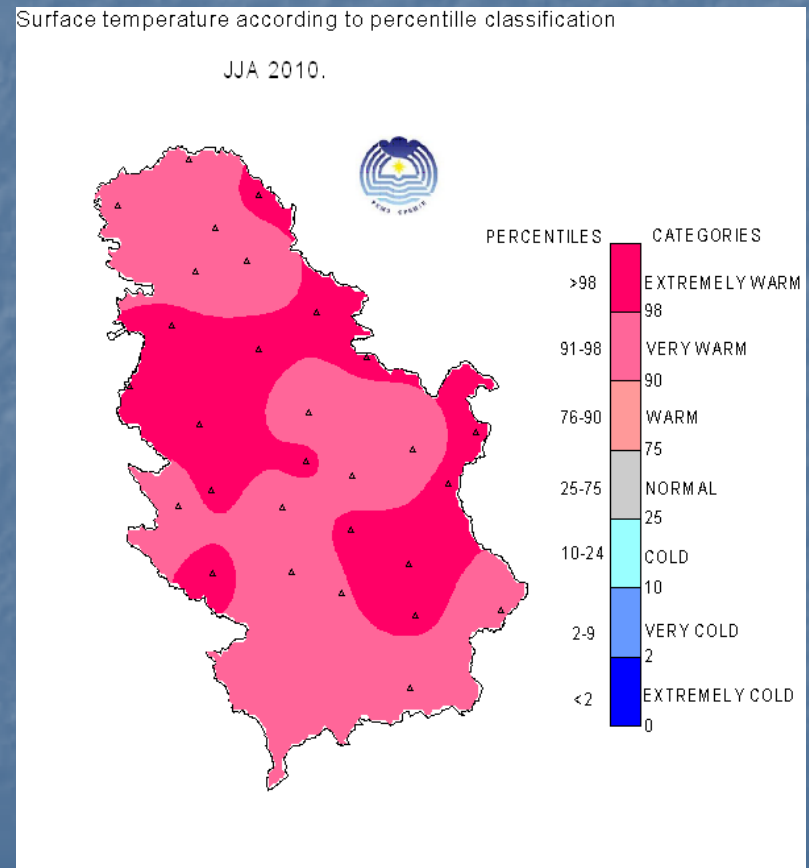
- According to SEECOF III, summer precipitation was expected to be likely near normal with a certain probability for below normal precipitation in southern parts of the SEECOF area and in the south Caucasus region, and for above normal precipitation in some other parts (Carpathian region, the mountain region of Serbia and the south of Bulgaria). The monitored summer precipitation shows that **some of these features were quite well predicted** (surplus of precipitation in the Carpathian region and the south of Bulgaria, deficit of precipitation in the south Caucasus region), **but others not**, e.g. the high precipitation over Turkey and Greece

JJA 2010 Temperatures in Serbia

Temperature anomalies



Percentiles

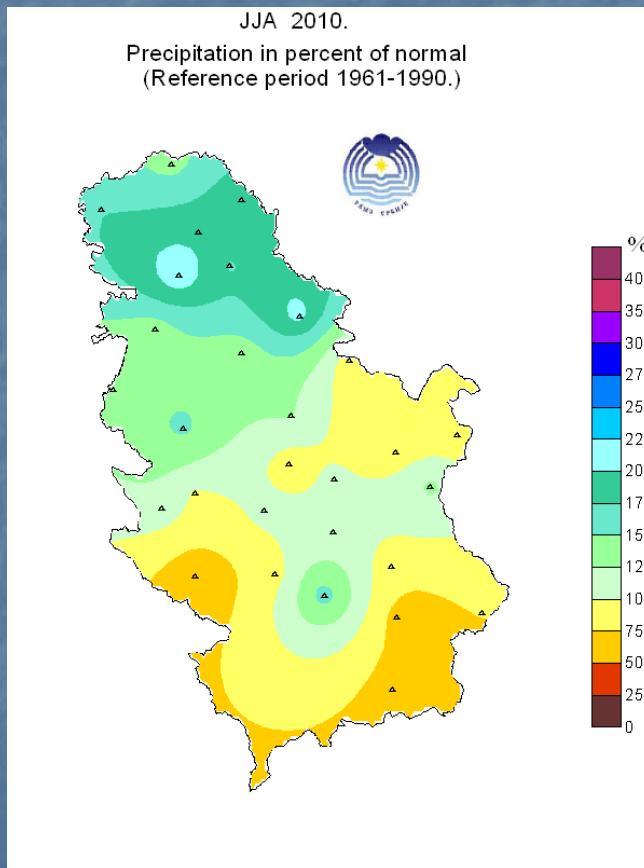


JJA 2010 Temperatures in Serbia

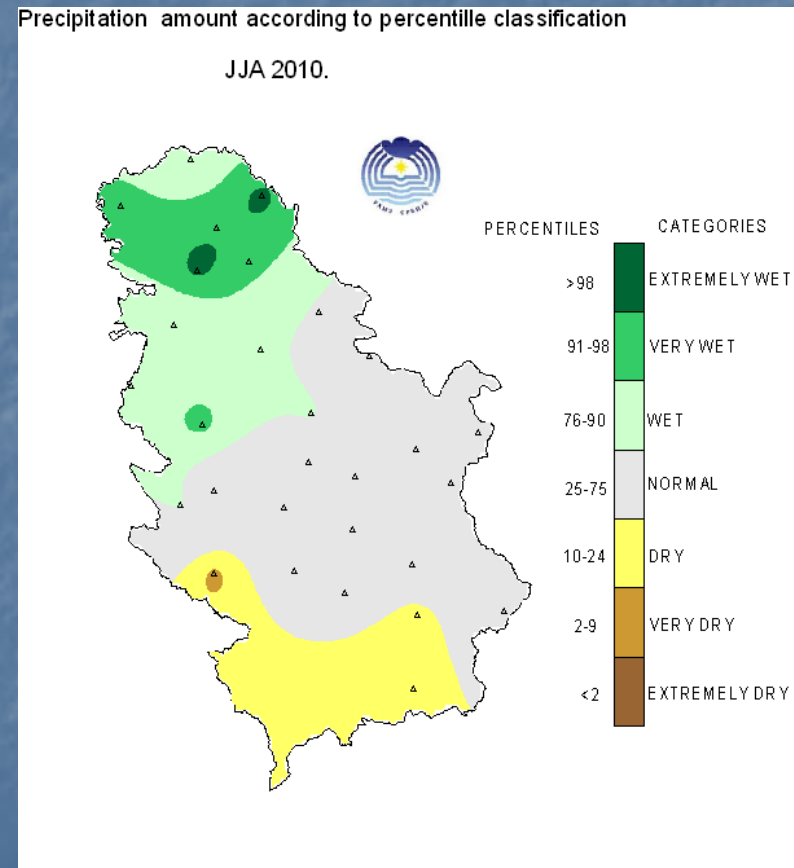
- During the summer season 2010, the air temperature over Serbia was above normal, by 1 to 2°C on average. The highest positive deviations (2 to 3°C) were in eastern and some parts of western Serbia. According to the method of percentiles, all parts of the country were in the category of very hot and extremely hot.
- Number of summer days, tropical days and tropical nights was higher than average in most parts of Serbia. In August, maximum number of tropical days (23) was observed in Negotin and Leskovac, which is more than twice as high as the average for this month.
- The absolute maximum temperatures for June were surpassed on the 12th of June 2010 on Kopaonik and Sjenica, with temperatures 25.4°C and 32.2°C, respectively.
- The average minimum temperatures for August were surpassed in 2010 in Negotin (18.5°C), Kursumlija (14.7°C) and Dimitrovgrad (14.6°C).
- Most parts of Serbia were hit by a heat wave this year, from 7th to 14th of June.

JJA 2010 Precipitation in Serbia

Precipitation anomalies



Percentiles



JJA 2010 Precipitation in Serbia

- This summer, seasonal precipitation was lower than average in eastern, southeastern and southwestern parts, while in other parts of Serbia measured precipitation was higher than average, with maximum over northern Serbia. The assessment of normal criterion by the method of percentiles shows that most of Serbia was within normal. Very wet and extremely wet was in northern, and dry in the southern parts.
- Maximum daily amount of precipitation was surpassed on the 19th of June in Kikinda (90.1mm), on the 22nd of June in Sombor (113.2mm) and Novi Sad (67.6mm) and on the 7th of August in Kursumlija (40.4mm).
- Maximum monthly amount of precipitation was surpassed in 2010 for June in Sombor (240.0mm), Kikinda (202.6mm) and Valjevo (216.8mm) and for August in Novi Sad (168.5mm).

JJA 2010 Precipitation in Serbia

- At the beginning of June, due to abundant rains in the southeastern Europe, major rise of water level was recorded on the Sava, Danube and Tisa. This high water level remained during the first decade of June and the regular flood defense limits were overcome from Jamena to Belgrade on the Sava, from Bezdan to Smederevo on the Danube and on the whole course of the Tisa. From the beginning of the third decade of June, because of new, heavy rains and already high water levels on these rivers, a new, more pronounced high water level was created and lasted until the end of the first decade of July. The emergency flood defense limits were overcome on the Sava at Sabac and Belgrade, on the Danube at Zemun, Pančevo and Smederevo and on the Tisa at Novi Kneževac and Titel. These increased water levels caused some minor material damage.
- A great flood wave on the whole basin of the Kolubara and Jadar was recorded in the period from 23rd June to 5th July. New, historical maximum water levels were measured on the river Kolubara at hydrological stations Beli Brod and Draževac and on the river Ub at hydrological station Ub. Major flooding was recorded on the tributaries of the Kolubara: Tamnava and Ljig, on lower part of Kolubara near Obrenovac, as well as on medium and lower part of the Jadar which caused major material damage.

Contributions to pre Pre-COF of SEECOF-4

- World Meteorological Organization
- Deutscher Wetterdienst, Federal Republic of Germany
- South East European Virtual Climate Change Center hosted by Republic Hydrometeorological Service of Serbia, Republic of Serbia
- Royal Netherlands Meteorological Institute, The Netherlands
- Armenian State Hydrometeorological and Monitoring Service, Republic of Armenia
- National Hydrometeorological Department, Republic of Azerbaijan
- National Institute of Meteorology and Hydrology, Republic of Bulgaria
- Meteorological and Hydrological Service, Republic of Croatia
- Hellenic National Meteorological Service, Greece
- Meteorological Service, Republic of Cyprus
- Department of Hydrometeorology, Georgia
- Meteorological Service of the Republic of Hungary, Republic of Hungary
- Israel Meteorological Service, State of Israel
- Republic Hydrometeorological Institute, Former Yugoslav Republic of Macedonia
- State Hydrometeorological Service, Republic of Moldova
- Federal Hydrometeorological Service of the Federation of Bosnia and Herzegovina, Federation of Bosnia and Herzegovina, Bosnia and Herzegovina
- Republic Hydrometeorological Service of Serbia, Republic of Serbia
- Meteorological Office, Republic of Slovenia
- Turkish State Meteorological Service, Republic of Turkey

Thank you for your attention