
A Show Case on Climate Watch Systems Experience of the European Regional Climate Centre

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WMO RA VI Regional Climate Centre (RCC)

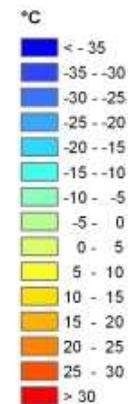
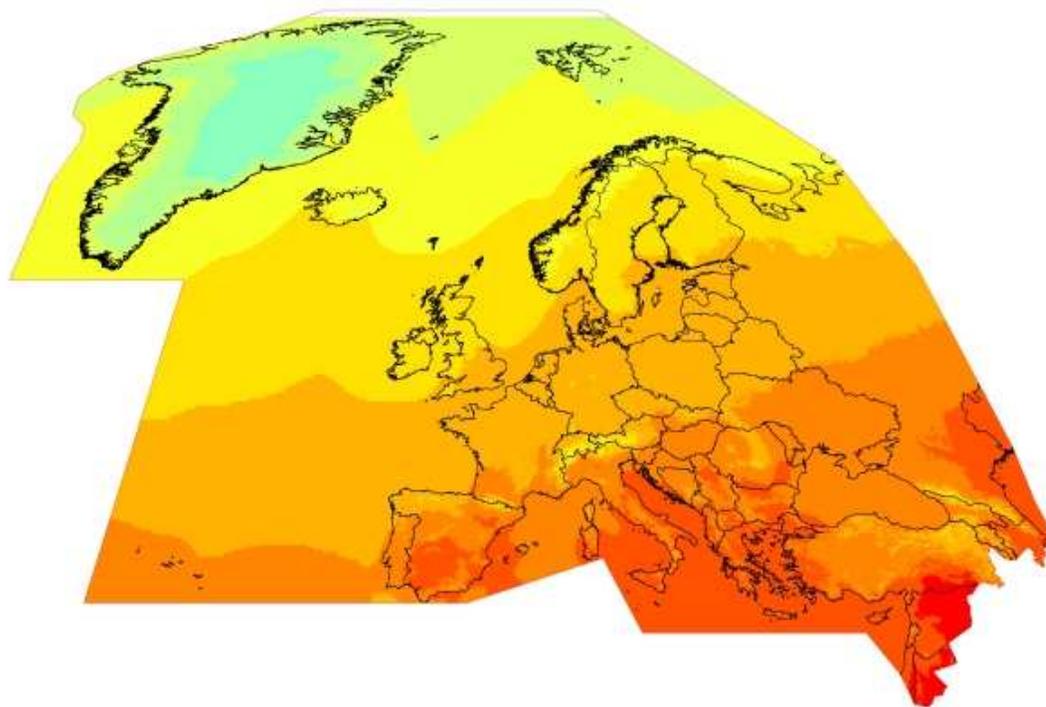
Climate Watch Showcase:

**Long Hot Summer 2012
in southern and southeastern
Europe**



Mean temperatures of summer 2012

Mittlere Temperatur Sommer 2012
Mean Temperature Summer 2012



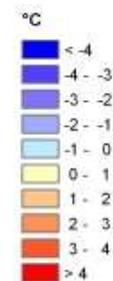
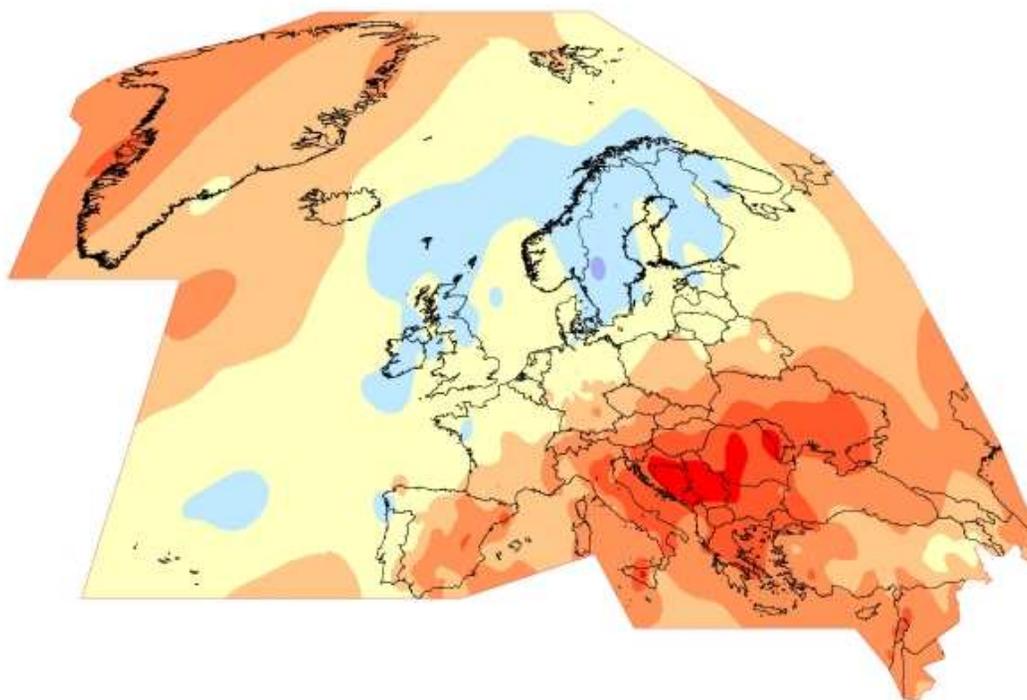
Datenbasis / Data basis:
CLIMAT und Schiffsmeldungen
CLIMAT and ship observations

Stand / last update :
10.09.2012



Mean temperature anomalies of summer 2012

Temperaturabweichung Sommer 2012 vom Normalwert 1961-1990
Temperature deviation Summer 2012 (reference period 1961-1990)

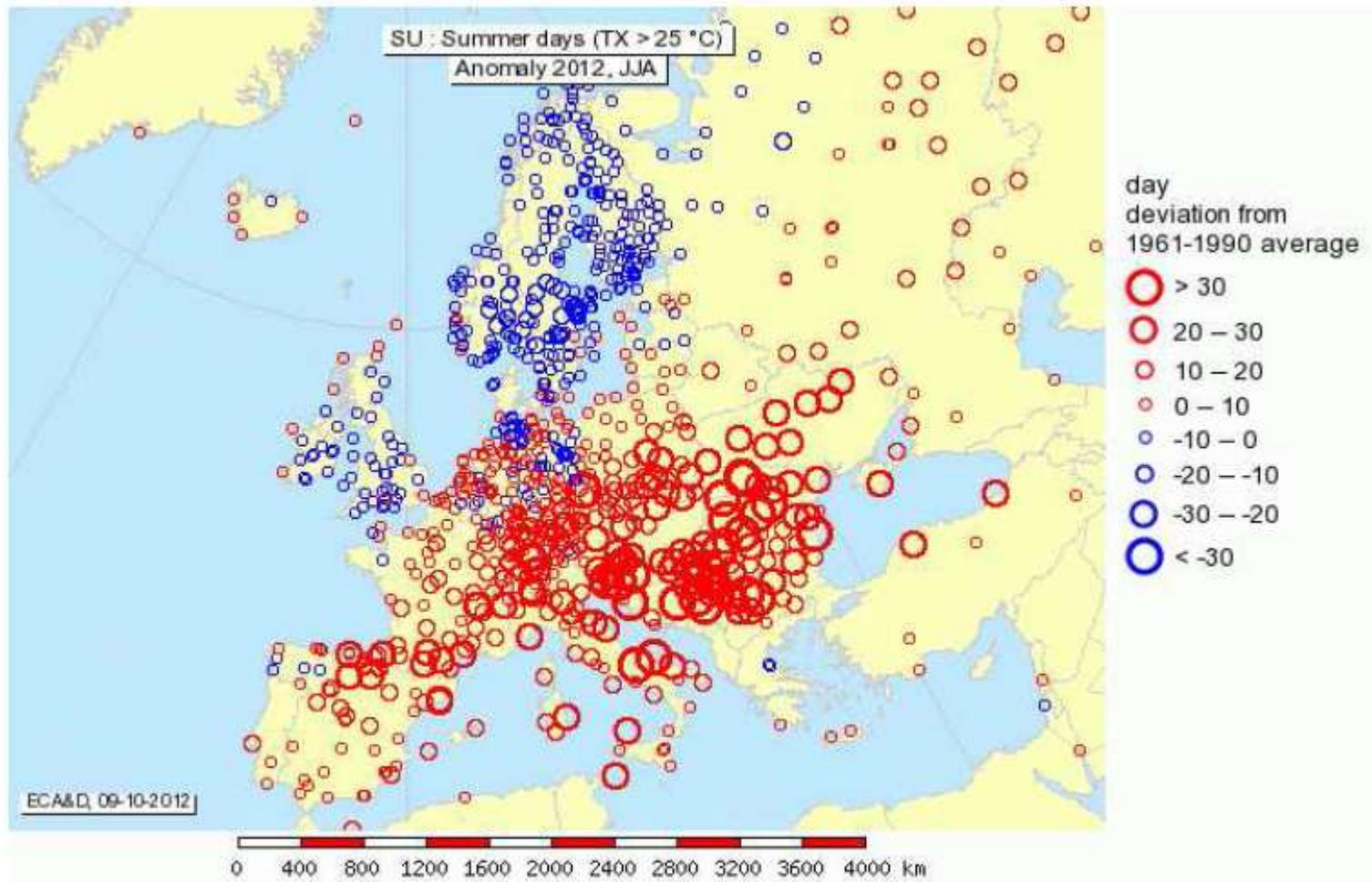


Datenbasis / Data basis:

CLIMAT und Schiffsmeldungen
CLIMAT and ship observations

Stand / last update :

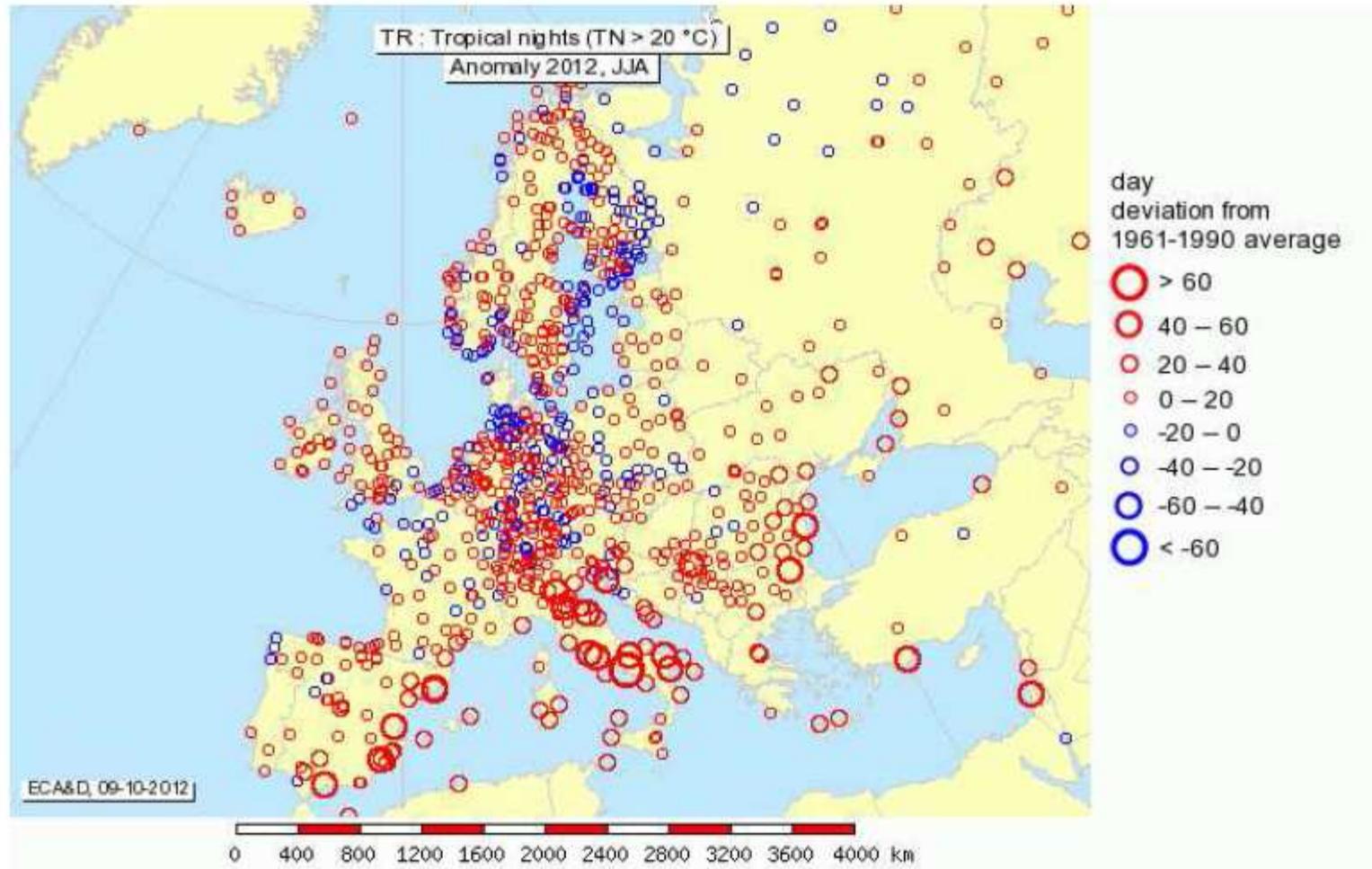
10.09.2012



Anomalies of the number of summer days ($T_{max} \geq 25 \text{ °C}$)



Source: ECA&D (<http://www.ecad.eu/>)

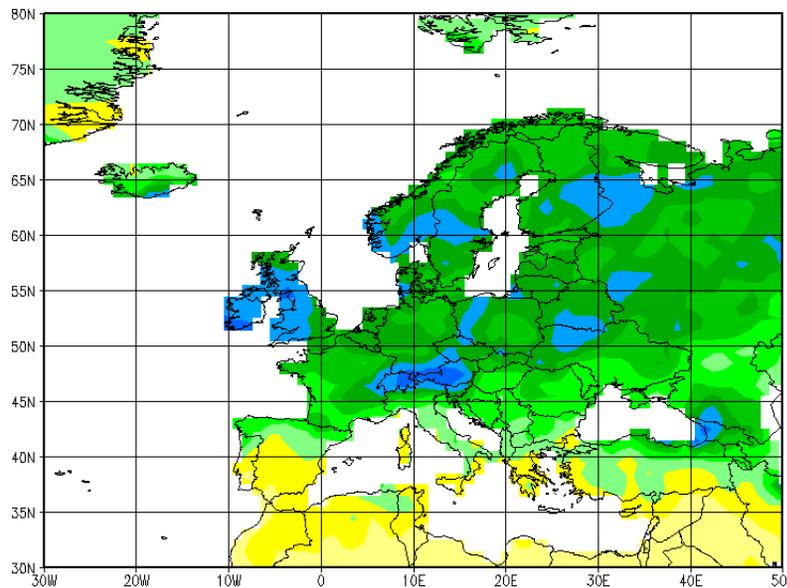


Anomalies of the number of tropical nights ($T_{min} \geq 20 \text{ }^\circ\text{C}$)



Source: ECA&D (<http://www.ecad.eu/>)

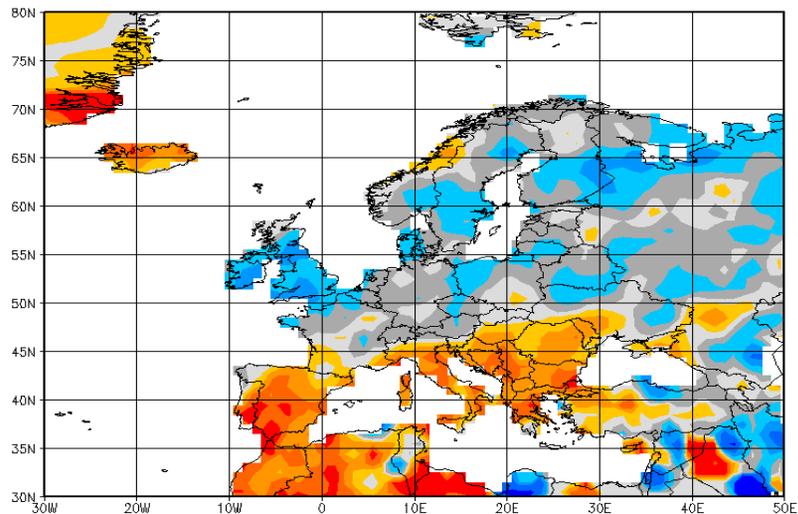
GPCC Monitoring Product Gauge-Based Analysis 1.0 degree precipitation for Season (Jun,Jul,Aug) 2012 in mm/month



(c) GPCC 2013/5/24



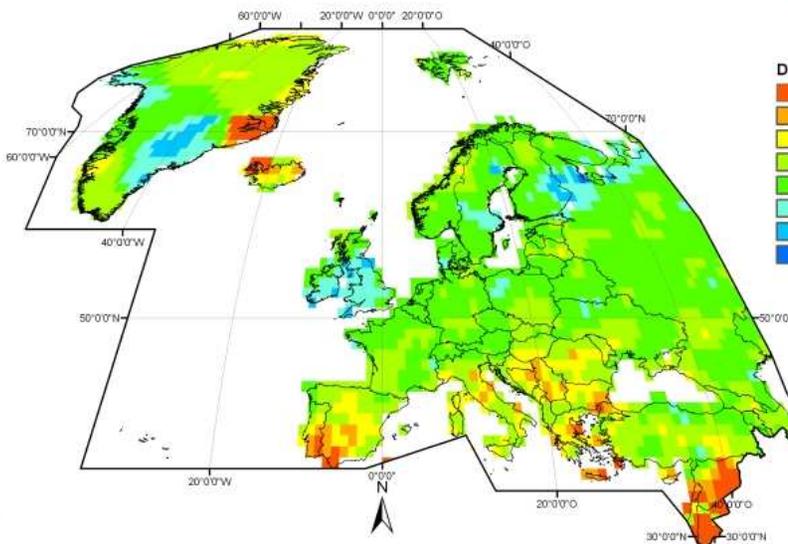
GPCC Monitoring Product Gauge-Based Analysis 1.0 degree precipitation percentage of normals 1951/2000 for Season (Jun,Jul,Aug) 2012 (grid based)



(c) GPCC 2013/5/24



DWD-Standardisierter Niederschlags-Index Sommer 2012
DWD Standardized Precipitation Index Summer 2012



Dürreklassen/Drought classes

<-2	extrem trocken/extremely dry
-2 - -1,5	sehr trocken/severely dry
-1,5 - -1	mäßig trocken/moderately dry
-1 - 0	leicht trocken/slightly dry
0 - 1	leicht feucht/slightly wet
1 - 1,5	mäßig feucht/moderately wet
1,5 - 2	sehr feucht/very wet
>2	extrem feucht/extremely wet

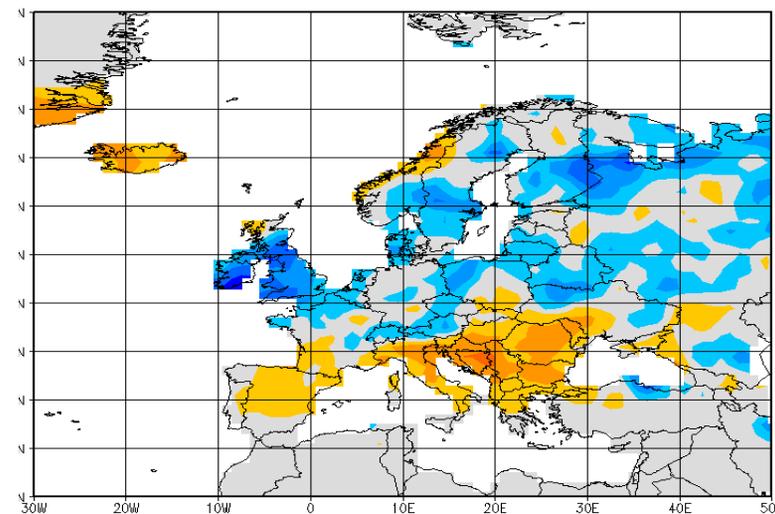
Datenbasis / Data basis:

WZNGPCC
Landsurface First Guess
Product 1.0°

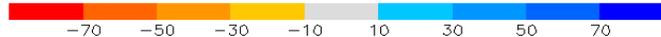
Projektion / Projection:
Mollweide

Stand / last update :
04.09.2012

GPCC Monitoring Product Gauge-Based Analysis 1.0 degree precipitation anomaly for Season (Jun,Jul,Aug) 2012 in mm/month (deviation from normals 1951/2000) (grid based)



(c) GPCC 2013/5/24



Climate Watch System in RA VI

- **RCCs** (e.g. the RA VI RCC network or a subregional RCC) provide **Climate Watch advisories** for the NMHS (describing the general situation)
- **NMHSs** provide **national Climate Watches** for their end-users



Data and products needed for Climate Watch

- **RCC climate monitoring products**
 - Daily and monthly maps, based on gridded data, interpolated from station data (SYNOP, CLIMATs) or from satellites or model reanalyses
 - National data and reports from partners and NMHSs
 - Climate indices (e.g. number of hot days, drought indices)
 - Circulation indices (e.g. for Europe: NAO, extension of Russian High, Blocking indices etc.)
 - Event reports from partners, NMHSs or from the web or media
 - Expert knowledge, data and experience from similar events in the past
- **Forecast products**
 - RCC long-range forecast bulletins (monthly)
 - Forecast maps from ECMWF or other forecast centres

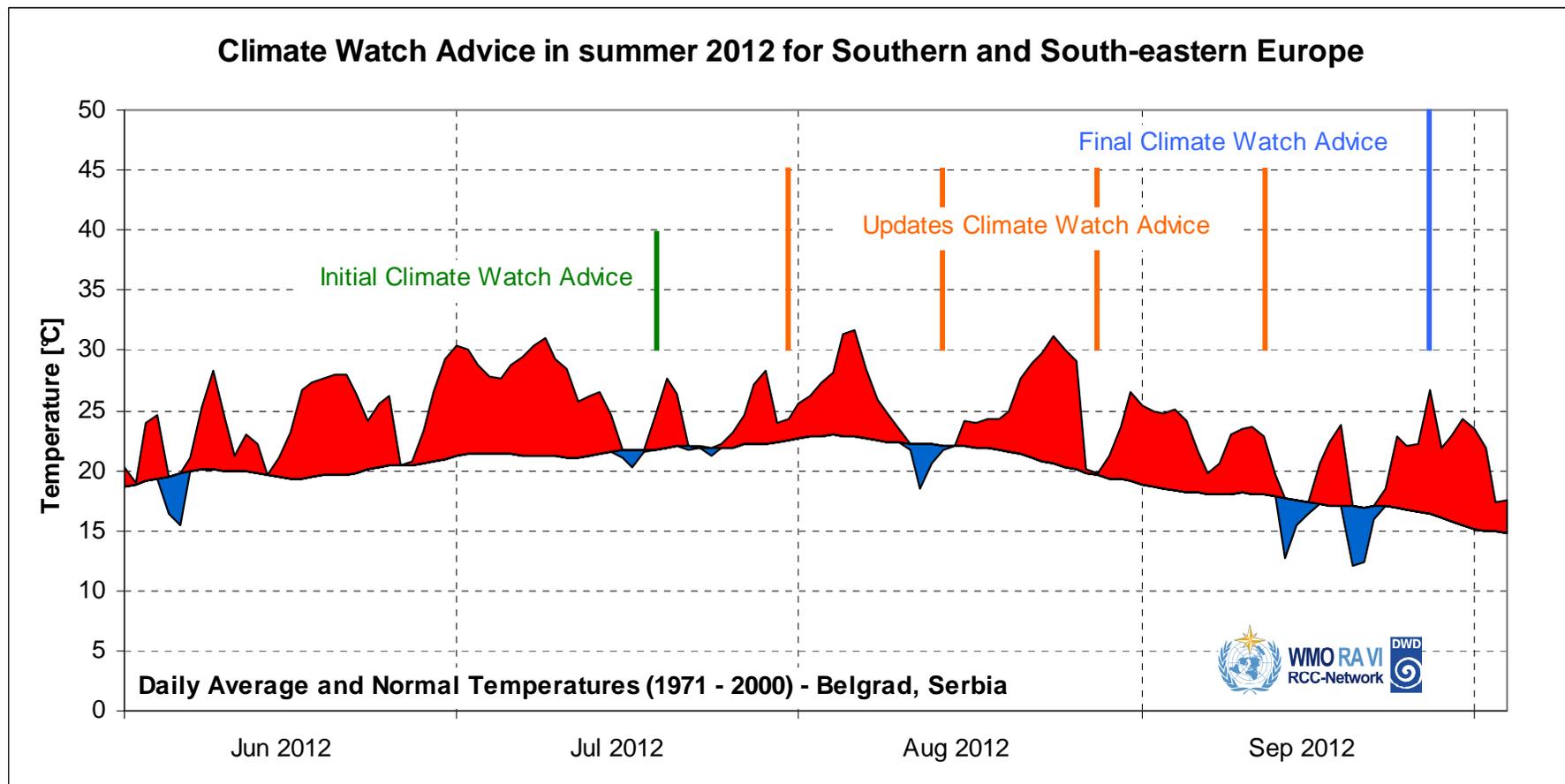


Elements of Climate Watch advisories

- **Decision-making process** within RCC based on climate monitoring and forecast results
- **Initial Climate Watch advisory**, when a significant climate event has started and will likely continue over a longer time period
- **Updates** of Climate Watch advisories, when the event will likely continue further (our experience: every 2 weeks)
- **Termination** of Climate Watch, when the event has ended or is no longer significant.



RCC-CM products: Climate Watch Advice



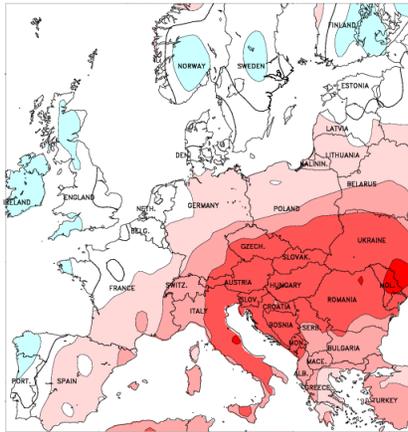
How to provide a Climate Watch

- Looking at seasonal/monthly/weekly/daily **climate monitoring results**
 - Has a significant climate event already started?
- Looking at weekly/monthly/seasonal **long-range forecasts** (anomalies and probabilities)
 - Will this event likely continue?
- **Internal discussion** -> suggestion to send out a Climate Watch advisory
- Formulating a **draft version** of the advisory
- Sending draft **to RCC partners** -> confirm or reject suggestion
- Prepare **final version** of advisory, send it to all concerned NMHSs
- NMHS decide on providing a **national Climate Watch**

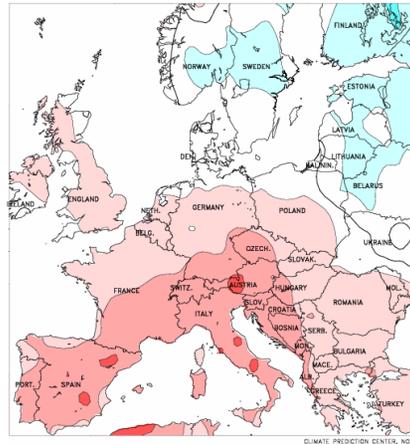


EUROPE Temperature Anomaly [°C]

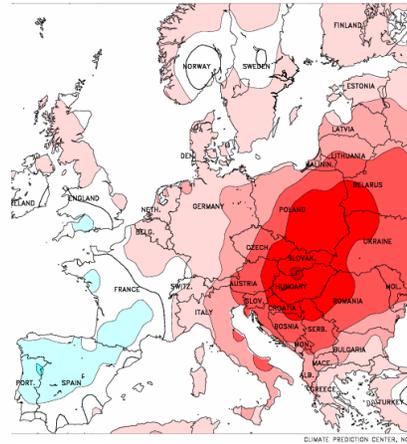
17-06 – 23-06-2012



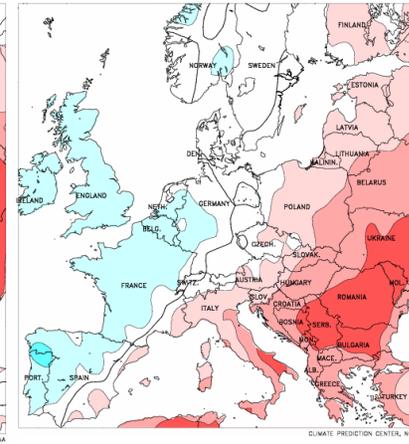
24-06 – 30-06-2012



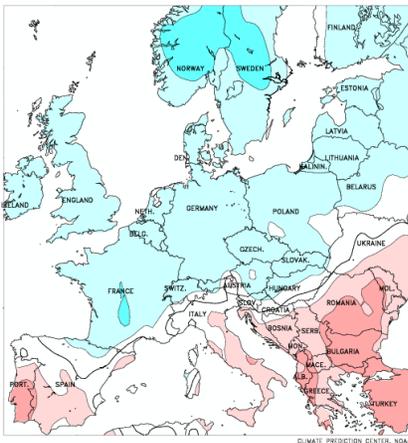
01-07 – 07-07-2012



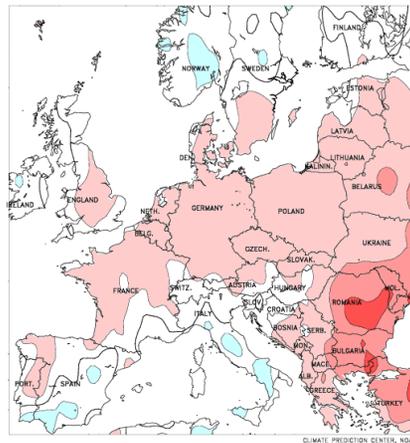
08-07 – 14-07-2012



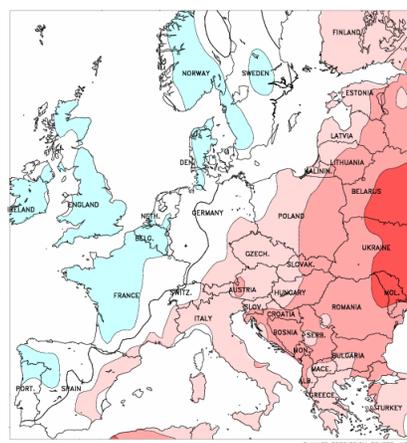
15-07 – 21-07-2012



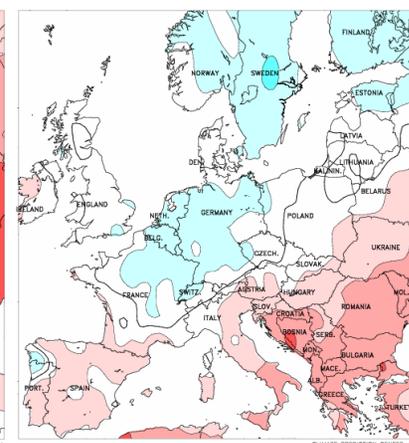
22-07 – 28-07-2012



29-07 – 04-08-2012



05-08 – 11-08-2012



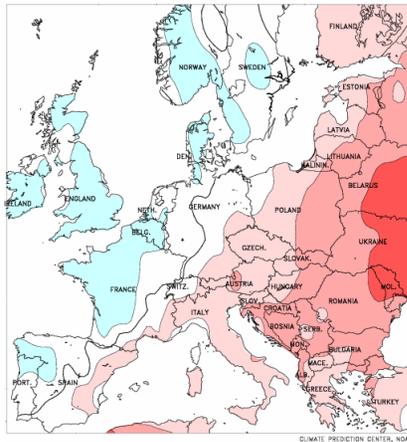
Source: CPC regional monitoring:

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/

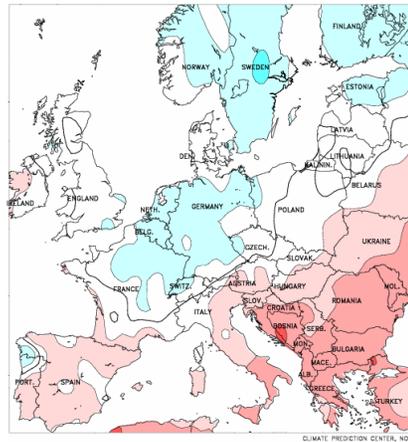


EUROPE Temperature Anomaly [°C]

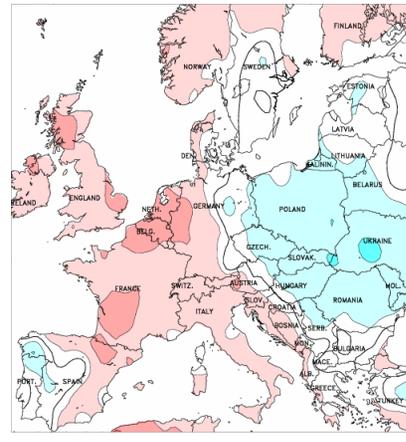
29-07 – 04-08-2012



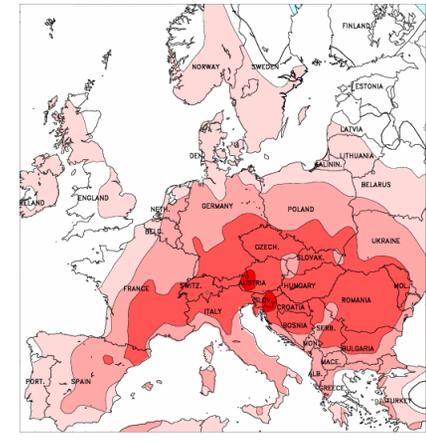
05-08 – 11-08-2012



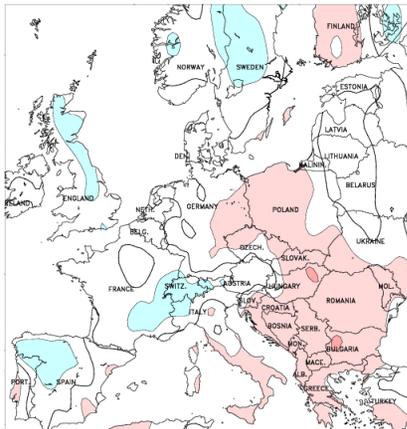
12-08 - 18-08-2012



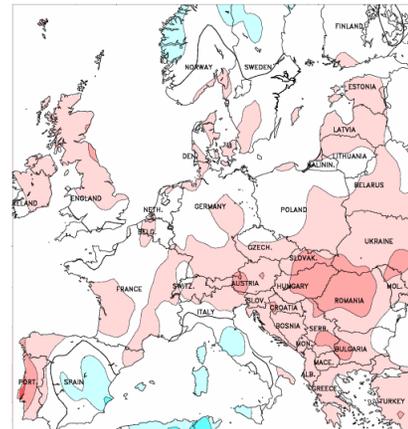
19-08 - 25-08-2012



26-08 - 01-09-2012



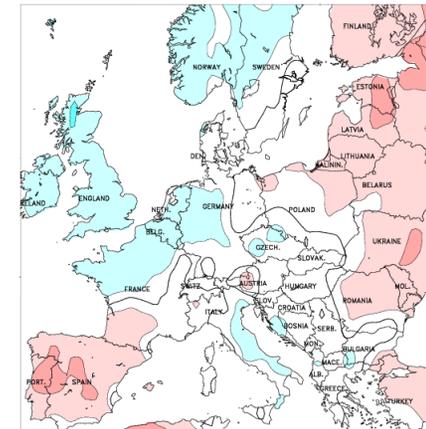
02-09 - 08-09-2012



09-09 - 15-09-2012

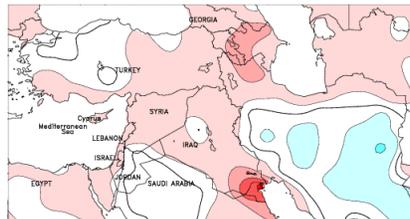


16-09 - 22-09-2012

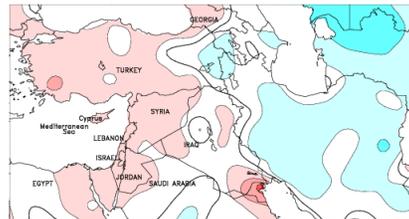


Middle East Temperature Anomaly [°C]

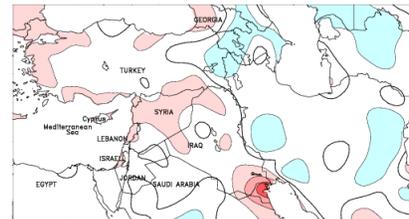
26-08 - 01-09-2012



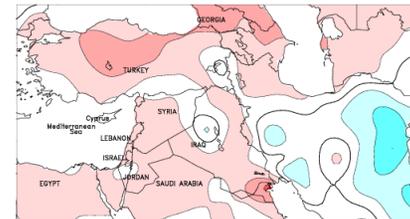
02-09 - 08-09-2012



09-09 - 15-09-2012

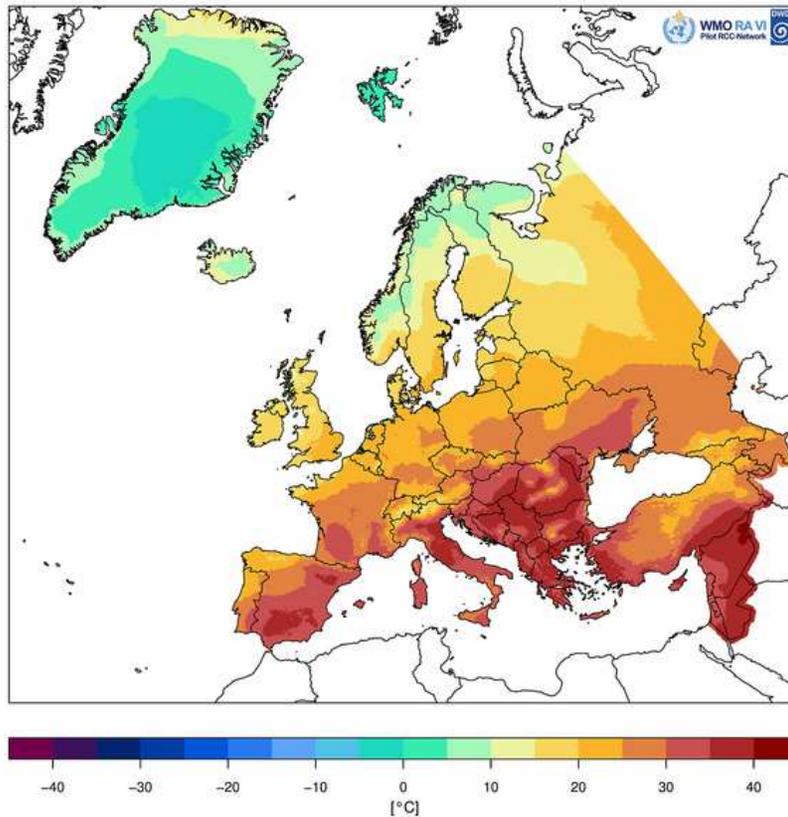


16-09 - 22-09-2012

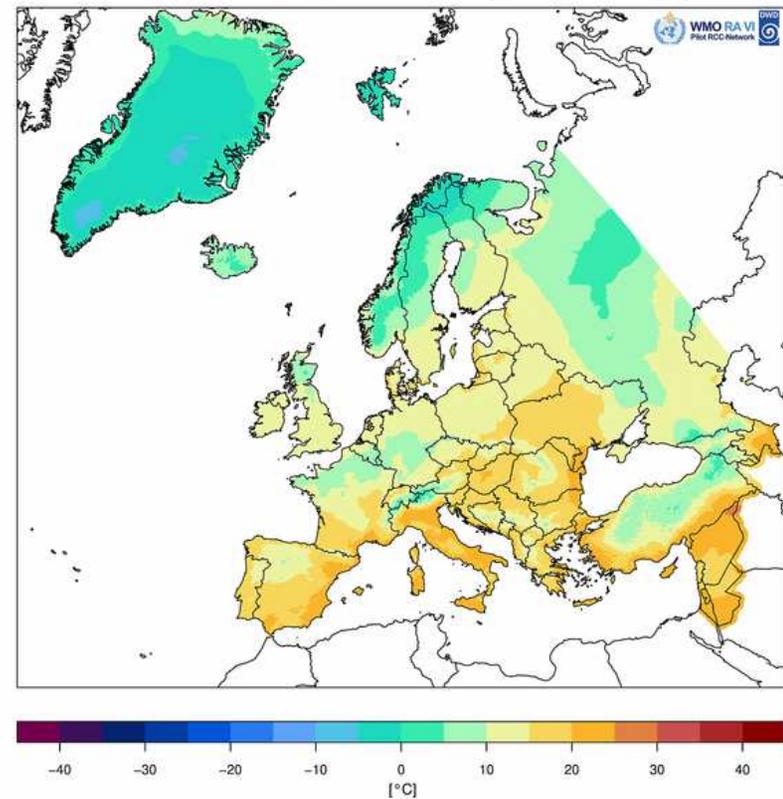


Daily maps Tmax and Tmin (based on SYNOPSIS)

Daily Maximum Temperature: 23 August 2012 (Europe)



Daily Minimum Temperature: 23 August 2012 (Europe)

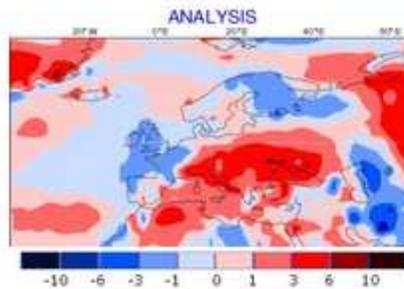


Source: DWD

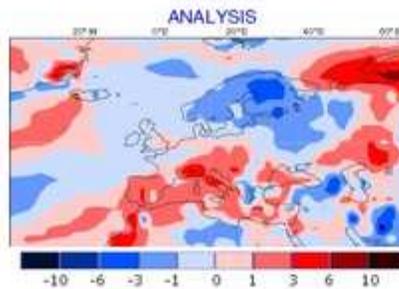


temperature weekly analysis (ECMWF)

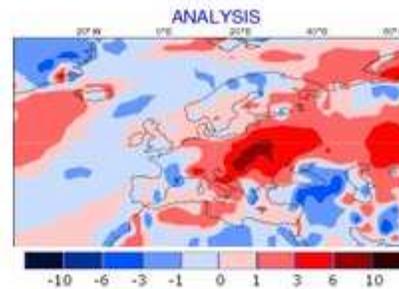
18.06.2012 - 24.06.2012



25.06.2012 - 01.07.2012



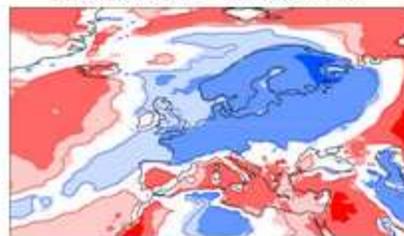
02.07.2012 - 08.07.2012



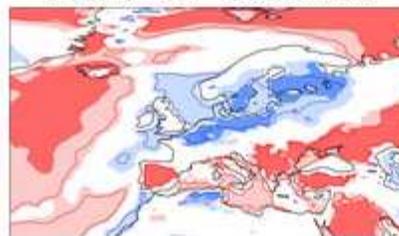
08.07.2012 - 14.07.2012

temperature weekly forecast (ECMWF)

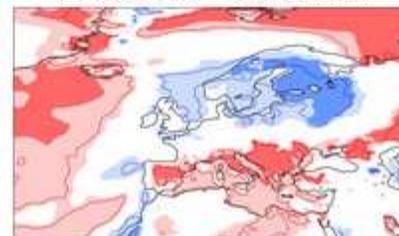
16.07.2012 - 22.07.2012



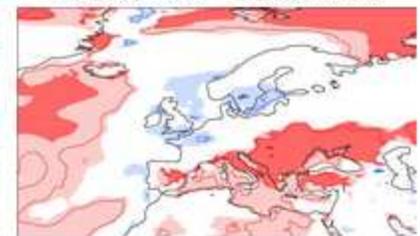
23.07.2012 - 29.07.2012



30.07.2012 - 05.08.2012



06.08.2012 - 12.08.2012



Monitoring
for the last
three weeks

Forecast
for the next
four weeks
from
12-07-2012

Source: ECMWF (available to ECMWF members)



ECMWF EPS-Monthly Forecasting System

2-meter Temperature anomaly

Forecast start reference is 26-07-2012

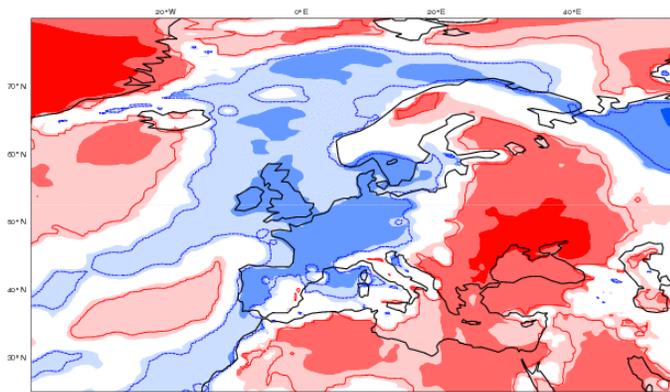
ensemble size = 51 climate size = 90

Shaded areas significant at 10% level

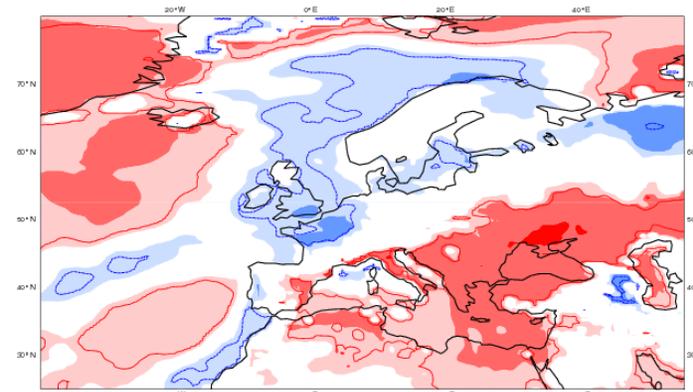
Contours at 1% level



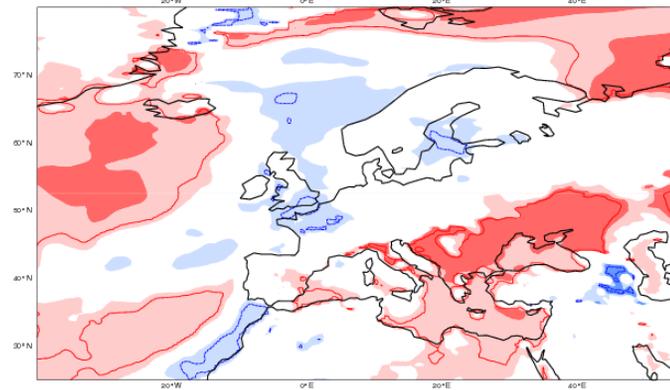
30-07-2012/TO/05-08-2012 **Day 5-11**



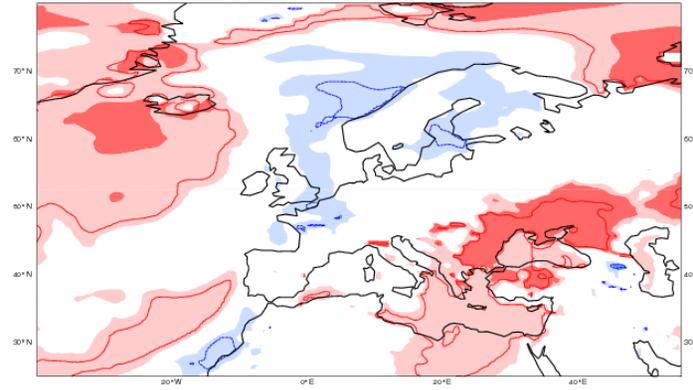
06-08-2012/TO/12-08-2012 **Day 12-18**



13-08-2012/TO/19-08-2012 **Day 19-25**



20-08-2012/TO/26-08-2012 **Day 26-32**



Initial Climate Watch issued on 19 July 2012

Due to the recent weather situation (current heat wave in parts of Southern and South-eastern Europe) and the results from monthly forecast we expect

"A period with (significantly) above normal temperatures at least up to the end of the July with possible extension of such conditions into August is expected for South-eastern Europe. The probability for this anomaly is estimated to be above 70%."



National climate watch from Serbia

Region of concern: Western Balkans

Drought monitoring – June and July 2012

Due to very high temperatures and small precipitation amount in June in the region of Western Balkans very hot and dry weather prevailed, thus increasing a drought risk to a considerable degree.

July temperature anomalies in the region were around +3°C, while in Serbia they amounted to +4.5°C.

In major parts of Serbia, Montenegro, and Bosnia and Herzegovina this was the hottest month of June ever recorded. In most parts of Serbia June was also the warmest month ever recorded.

Two heat waves were recorded in Serbia – the first lasted from 16 to 24 June, and the second one from 29 June to 15 July. Precipitation deficit was recorded in the entire region during June. According to the SPI-2 values for June and July, in most parts of Serbia very dry to extremely dry weather prevailed.

Since 25 June agricultural drought has been identified in Serbia.

Forecast

A warmer and dry weather is forecasted for the period 30 July to 26 August. Temperatures will be above normal in the entire region of Western Balkans (reference period 1981-2010), with forecast probability of 80%. In addition, a precipitation deficit is expected, with forecast probability of above 70%.

In September temperatures will be around and above-normal (reference period 1981-2010), and a below normal precipitation is to be expected.

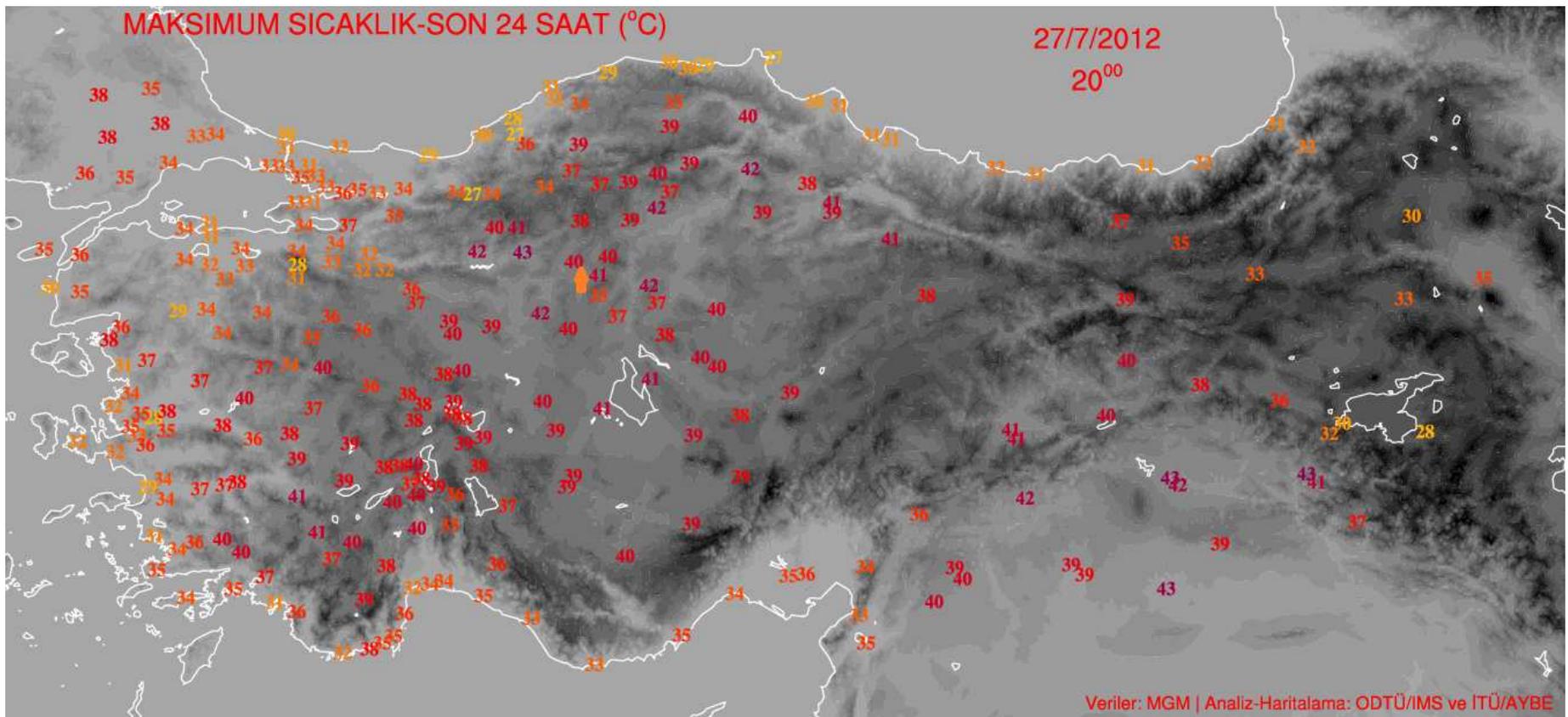
Impacts – conclusion

In view of the analysis for June and forecast for August and September, considerable yield reduction of economically most important crops (corn, soya, sugar cane...) is to be expected in Serbia (amounting to 30-50%); this situation is similar to the 2000 drought.

Updated information will be issued on 07-08-2012.



Temperature maxima in Turkey 27 July 2012



Termination of Climate Watch Advice on 27 September 2012

Due to the recent weather situation and the results from monthly forecast we announce

"Termination of this Climate Watch Advice at the end of September due to weakness of signal and decreasing of absolute temperature at the beginning of October"



Conclusions of Climate Watch Summer 2012 (Pilot CW)

- Advisory was appreciated by the NMHSs and by WMO (positive feedback)
- Advisory was taken for formulation of a more detailed national climate watch
- Conclusions / Problems / Questions to be solved:
 - Which (objective) criteria?
 - Extension to more than one variable (e.g. heat waves can be related to drought, but precipitation forecasts are less reliable than for temperature)
 - Forecasts for week 2-4 often show too low signals (due to higher ensemble spreads), ensemble means can be misleading
 - Generally: Forecasts alone are not enough, comparison with actual monitoring is needed
 - Look at circulation patterns to understand / attribute extreme anomalies
 - Update every two weeks seems reasonable
 - Human resources necessary (discussion forums, watch over the whole year including „out of office“ times -> more than one person necessary)



Side event on the implementation of Climate Watch Systems (CWS) in WMO-RA-VI.
*Organized at the occasion of the European Conference for Applied Climatology,
10-14 September 2012, LODZ Poland*

Recommendations

- **Monitoring** extreme events and providing timely analysis of their extent and intensity is very important for the Early Warning agencies. **Monthly to Seasonal forecasts** should be also used when it is possible to issue them with an acceptable skill (Example of FMI). It was also noted that in the absence of sufficient forecast skill of the seasonal forecast, **medium range to monthly forecasts** can be very helpful in providing good prospects on the evolution and cessation of the extreme events once they are fully established.
- Establish a **coordination mechanism** through, e.g. teleconference or Skype to coordinate with NMHSs climate watch bulletins like the ones produced by RCC-CM during this summer.
- There is a potential for using **social media** to help implementing CWS.
- Establishment of CWS **national focal points** at NMHSs. The focal points network will be useful in liaising between RCC-CM on one hand and the NMHSs and its national users on the other hand for the provision of climate watches and collecting user requirements and feedbacks.
- The RA-VI WG on Climate and Hydrology with the help of RCC-CM should develop a brief **guidance** (two-three pages maximum) to assist NMHS in implementing national CWS. This can be built on the Experience of RCC-CM and the lessons learned from the national demonstration projects.





Thank you for your attention !

Don't worry, be happy ...