



WMO RAI



WMO RA VI  
RCC-Network



# **MEDITERRANEAN CLIMATE OUTLOOK FORUM MEDCOF-13 Online Forum**

## **MONITORING SUMMARY MEDCOF-13**

**for October 2019**

**First Draft**

**Last update: 12 November 2019**

**Compiled by**

**WMO RA VI RCC Toulouse Node on Long Range Forecasting**

**Météo France**

**Toulouse, France**

**WMO RA I North Africa RCC Tunisian Node**

**Institut National de la Météorologie (INM)**

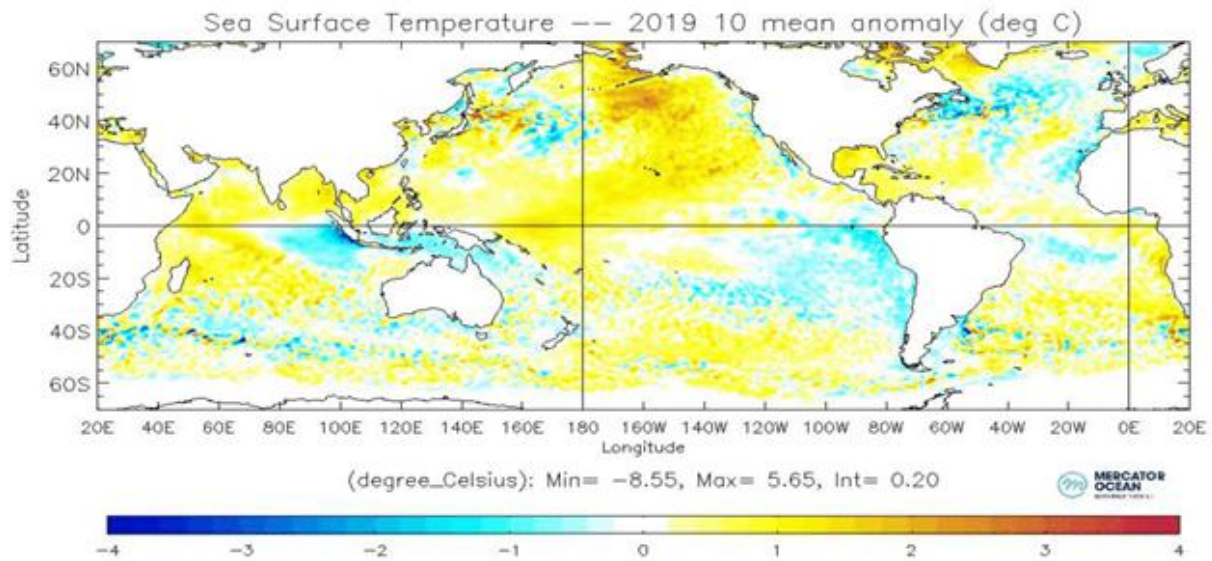
**Tunis, Tunisia**

**WMO RA VI RCC Offenbach Node on Climate Monitoring**

**Deutscher Wetterdienst (DWD)**

**Offenbach, Germany**

# 1. Oceanic Analysis



SST Anomalies for October 2019. Source: Mercator-Ocean

Current situation: Neutral ENSO. Strongly positive IOD.

OCTOBER NINO3.4 INDEX: +0.4 °C (Mercator Ocean PSYV4R2 analysis); see BOM site for weekly values: [http://www.bom.gov.au/climate/enso/monitoring/nino3\\_4.png](http://www.bom.gov.au/climate/enso/monitoring/nino3_4.png)

OCTOBER DMI INDEX: +1.8 °C (Mercator Ocean PSYV4R2 analysis); sharp increase in the first half of October (to + 2.2°C, highest since 1982!); see BOM site for weekly values: <http://www.bom.gov.au/climate/enso/monitoring/iod1.png>

**The main oceanic driver at global scale is the Indian Ocean Dipole, in a positive phase.**

**At regional scale, the Mediterranean Sea shows positive anomalies in October.**

## 2. Large scale circulation

### 2.1. Modes of variability

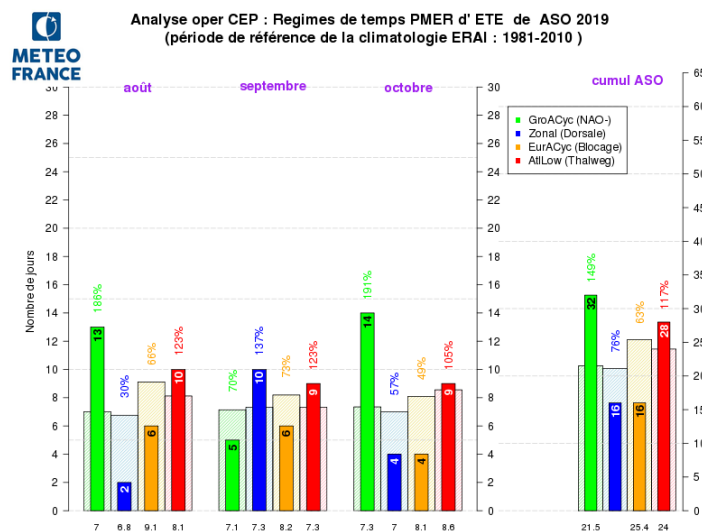
data	year	mm	NAO	EA	PNA	SCA
AnaCEP	2019	06	-0.15	+1.15	-0.49	+0.53
AnaCEP	2019	07	-1.21	+0.78	-1.15	-1.62
AnaCEP	2019	08	-0.14	+2.13	-0.50	+0.12
AnaCEP	2019	09	+0.46	+1.93	-2.28	-1.06
AnaCEP	2019	10	-0.15	+2.25	-1.21	+0.10

data	year	mmm	NAO	EA	PNA	SCA
AnaCEP	2019	MJJ	-1.47	+0.63	+0.05	+0.41
AnaCEP	2019	JJA	-0.57	<b>+2.02</b>	-0.99	-0.35
AnaCEP	2019	JAS	-0.32	<b>+2.37</b>	-1.95	-1.17
AnaCEP	2019	ASO	+0.15	<b>+3.57</b>	-1.91	-0.33

Main modes of variability (source Météo-France)

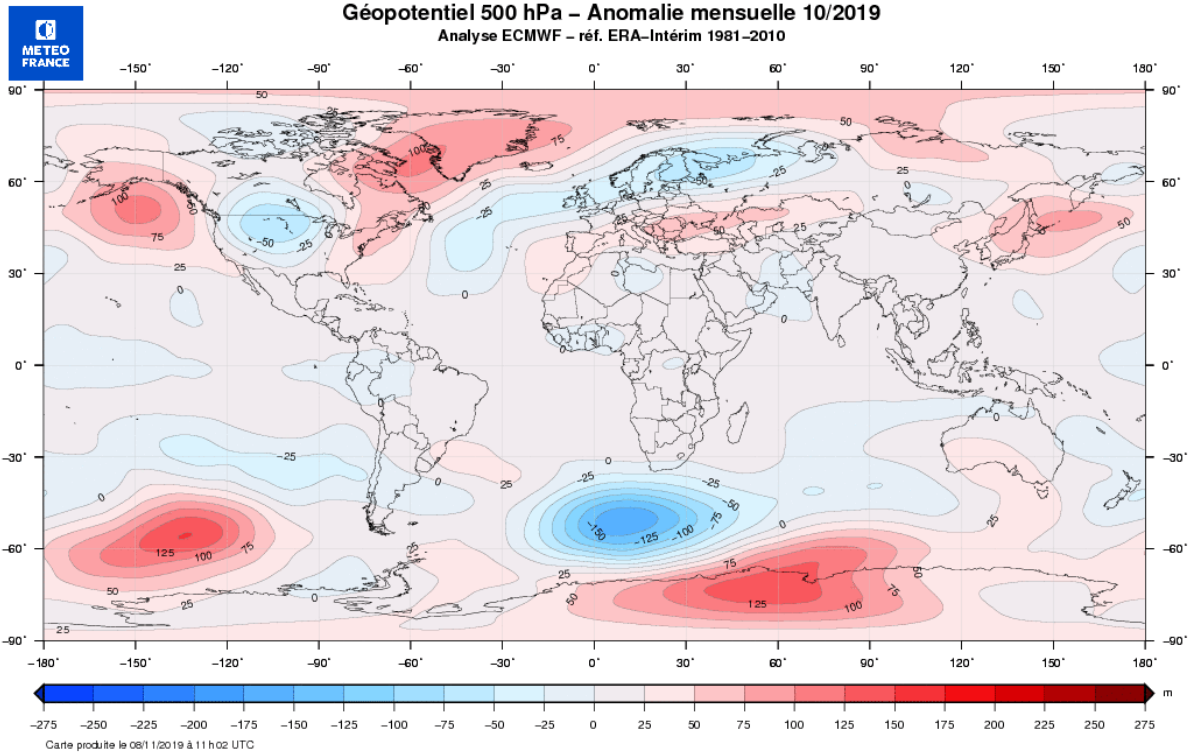
The East-Atlantic mode has been **strongly positive** these last months/seasons.

### 2.2. Weather regimes

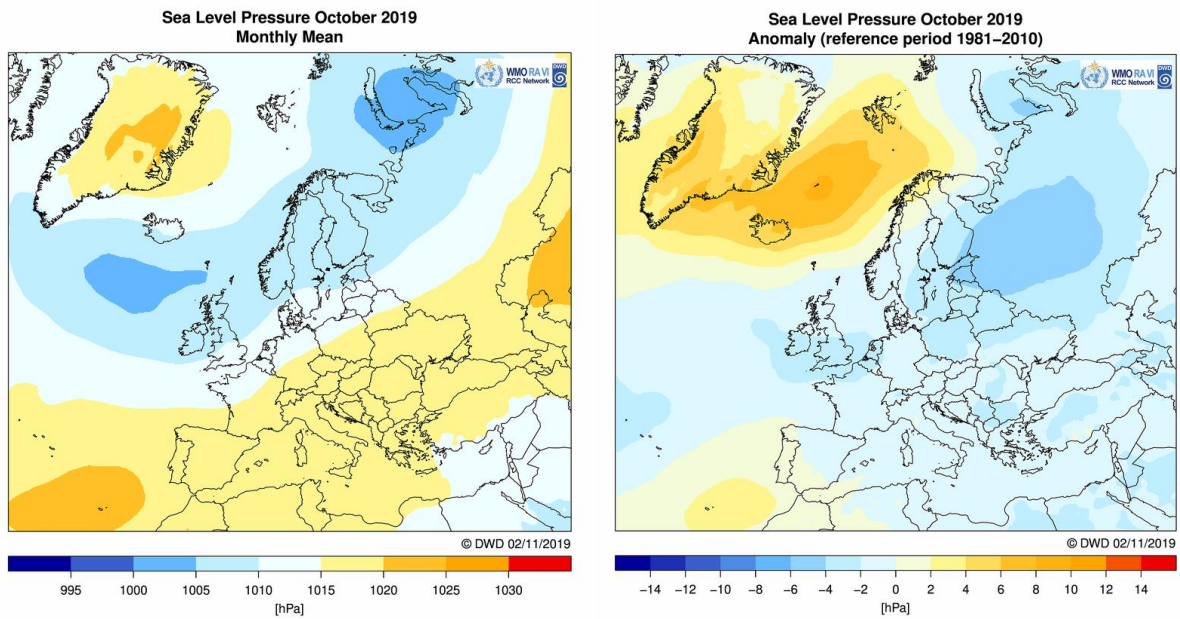


Distribution of weather types of Météo France classification (summer regime) for August-October 2019: NAO-, Atlantic ridge (Dorsale), Blocking (Blocage), Atlantic trough (Thalweg). Source: Météo France, <http://seasonal.meteo.fr/en/content/suivi-clim-regimes-trim>

Météo France weather type classification, too, shows a predominance of Greenland Anticyclone (NAO-) and Atlantic trough. For the southern half of Europe and the Mediterranean region, geopotential anomalies were largely positive, except a slight negative anomaly over Tunisia and Libya.



Anomalies of geopotential height at 500hPa for October 2019. Source: Météo-France, <http://seasonal.meteo.fr/content/suivi-clim-cartes>

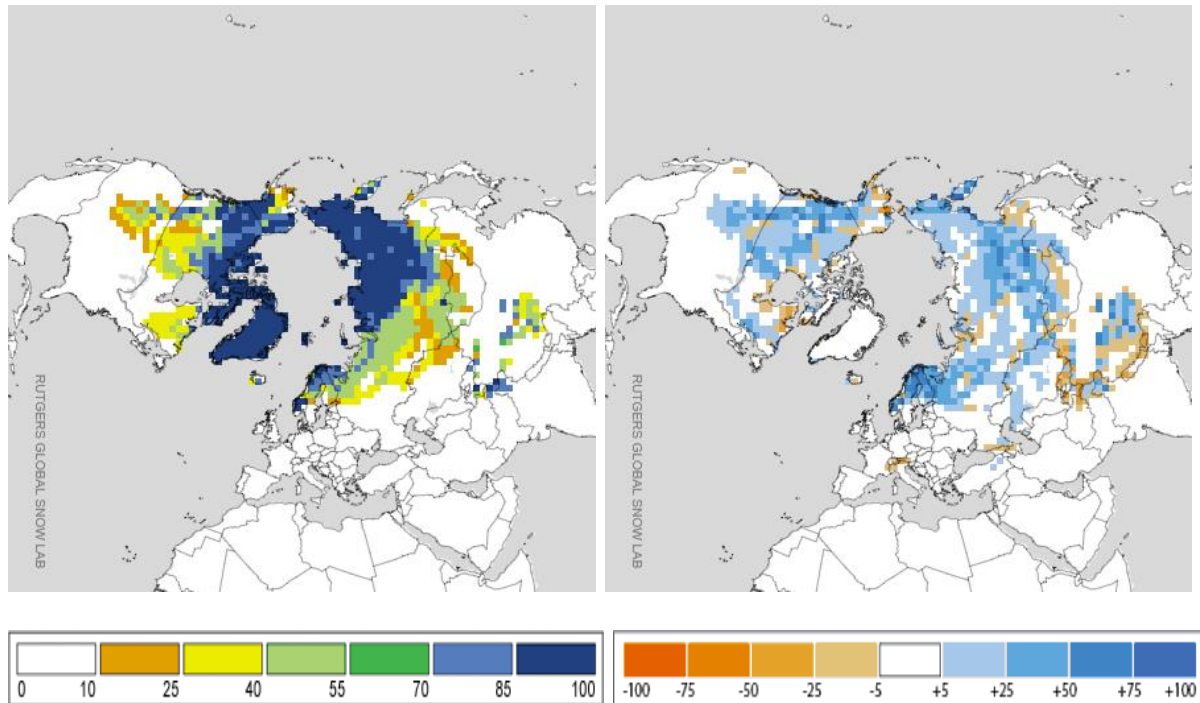


Mean sea level pressure over the North Atlantic, Europe and North Africa and 1981-2010 anomalies for October 2019. Source: DWD, [https://www.dwd.de/EN/ourservices/rccm/int/rccm\\_int\\_ppp.html](https://www.dwd.de/EN/ourservices/rccm/int/rccm_int_ppp.html)

Sea level pressure distribution shows the typical subtropical high-pressure belt extending from the Azores to Russia. The Azores High was more intense than normal in October, but over the Mediterranean region, high pressure was slightly weaker than normal.

### 2.3. Snow cover

Snow cover in Eurasia was above normal in October 2019, particularly over Scandinavia, where snow came quite early in the season.



Left: Monthly snow cover in October 2019 (percent of days snow covered). Right: 1981-2010 anomalies (percent difference from 1981-2010 mean). Source: Rutgers University Global Snow Lab, <https://climate.rutgers.edu/snowcover>

### 3. Drivers

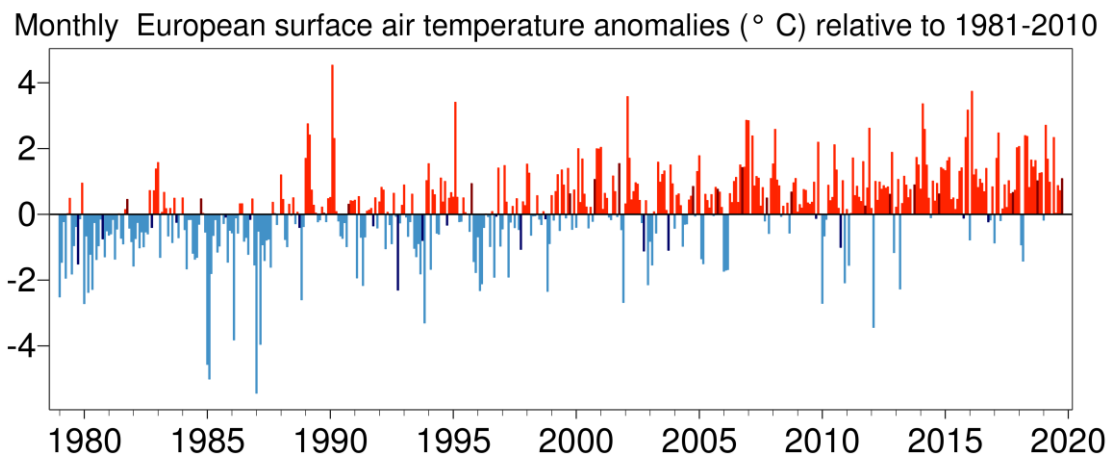
- No significant late-summer SST pattern in northern Atlantic
- Eurasian snow cover above normal in October : NAO- supposedly enhanced (but not observed during recent winters)
- high IOD index has been shown to favour positive geopotential anomaly over Europe.
- Conclusion : **positive geopotential anomaly over Europe** linked to strong positive IOD

## 4. Temperature

### Europe/RA VI

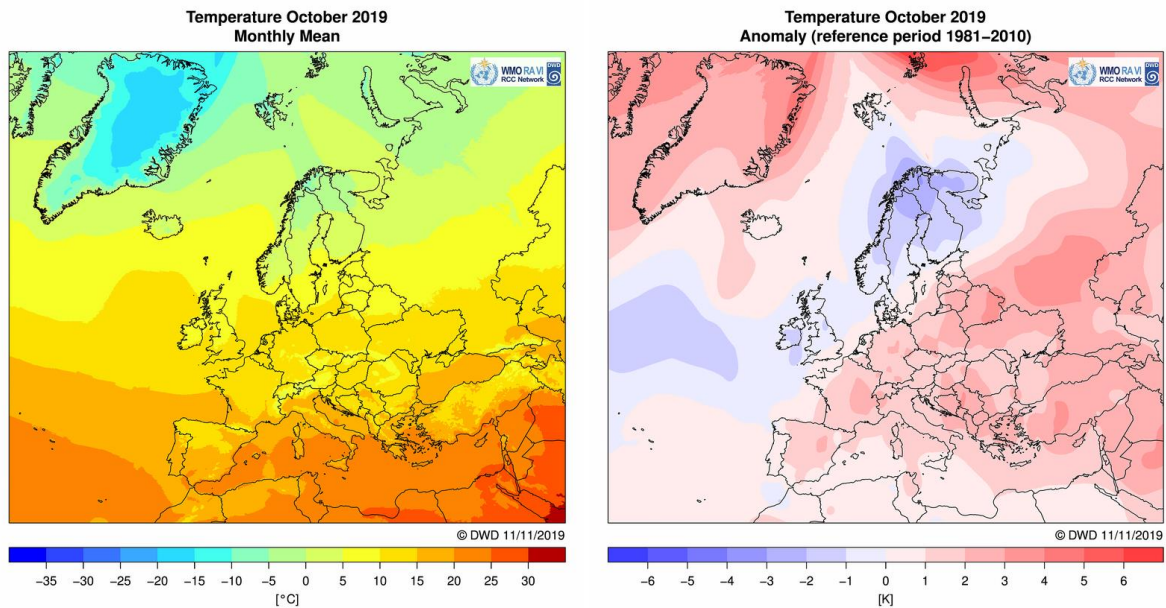
According to Copernicus data, October 2019 was +1.1°C warmer than on 1981-2010 average. It was the third warmest October in the period from 1979 onwards. Only 2001 and 2006 were warmer. Based on NOAA data, the warming trend for October months 1979-2018 (data for 2019 are not available yet) is +0.30°C/decade for Europe.

([https://www.ncdc.noaa.gov/cag/global/time-series/europe/land/1/10/1880-2019?trend=true&trend\\_base=10&begtrendyear=1979&endtrendyear=2019](https://www.ncdc.noaa.gov/cag/global/time-series/europe/land/1/10/1880-2019?trend=true&trend_base=10&begtrendyear=1979&endtrendyear=2019))



Monthly global-mean and European-mean surface air temperature anomalies relative to 1981-2010, from January 1979 to October 2019. The darker coloured bars denote the October values. Data source: ERA5. Credit: Copernicus Climate Change Service/ECMWF, <https://climate.copernicus.eu/surface-air-temperature-october-2019>

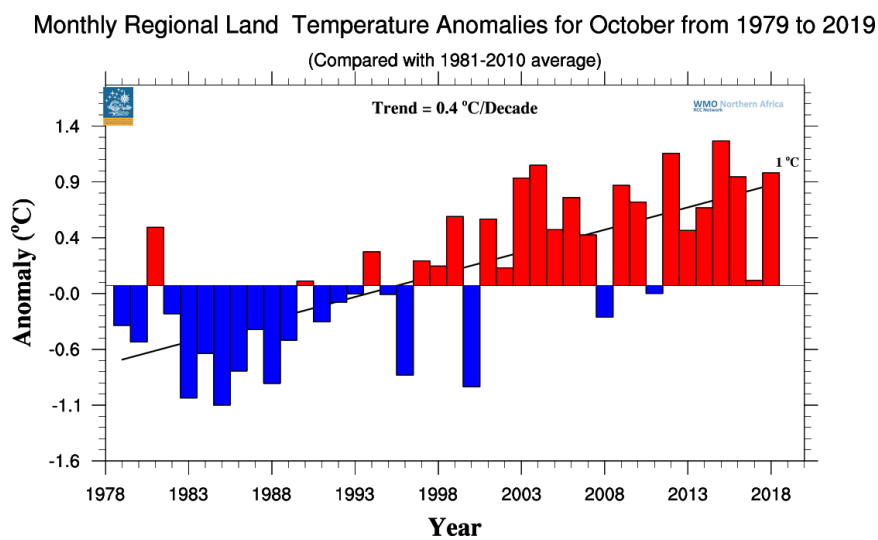
In fact, the RA VI domain of the Mediterranean region was particularly warm in October. Anomalies were mostly between +1 and +3°C, locally even above in Serbia and Turkey. Lowest anomalies in Portugal, Spain and southern Italy were below +1°C, but still positive. Monthly mean temperatures in the lowlands ranged from +10°C in the northern Ukraine to around 25°C in eastern and southern parts of the Middle East. In higher elevations, mean temperatures were mostly between 5 and 10°C.



Mean temperature (left) and anomalies (1981-2000 reference, right) in °C in the RA VI Region (Europe) interpolated from CLIMAT station data, for October 2019. Source: DWD, [http://www.dwd.de/EN/ourservices/rcccm/int/rcccm\\_int\\_ttt.html](http://www.dwd.de/EN/ourservices/rcccm/int/rcccm_int_ttt.html)

## North Africa

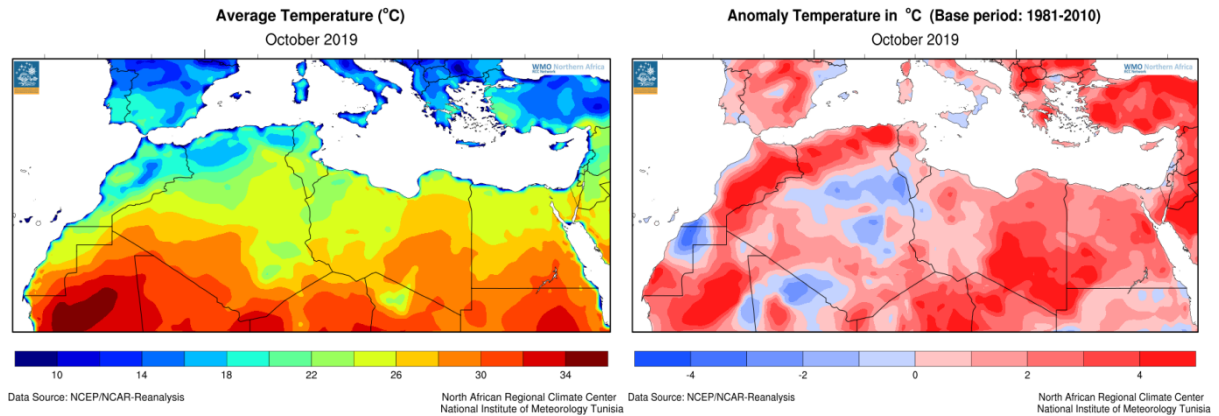
The graph below shows the monthly trend of air temperature anomaly of October in degrees Celsius since 1979 through 2019. For each year, the positive anomaly is indicated by the red vertical bars and the negative anomaly is indicated by the blue vertical bars. The black line tracks the changes in the trend over time. The land mean temperature of North Africa region was above the normal 1981-2010, has reached 1 °C. For October, the warming rate was about +0.4°C per decade.



Monthly mean temperature anomaly (October 2019) time series plots with trend line



October 2019 was hotter than normal over most of North Africa. The registered temperatures were above normal over all of Libya and Egypt and over most parts of Algeria, Tunisia and Morocco. Below-normal anomalies were registered over the middle and the southwest of Algeria, the extreme southwest of Tunisia and a part of the south of Morocco. Monthly mean temperature in October 2019 ranged from less than 14°C in the north of Morocco and Algeria to above 32 °C in the extreme south of Algeria.

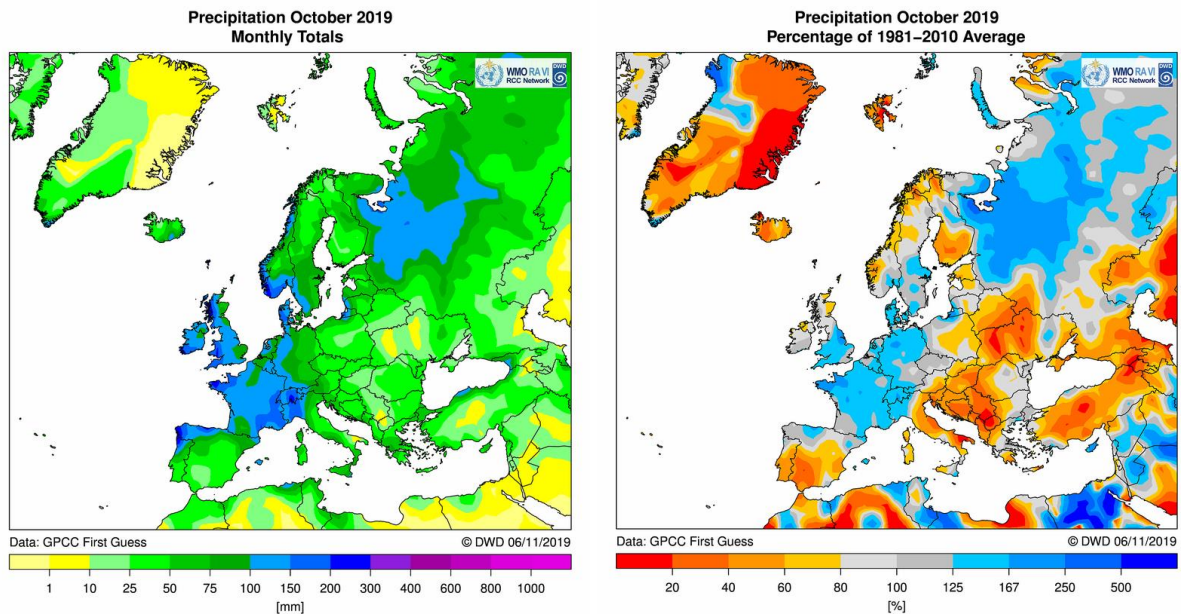


**Left: Mean temperature; Right: Absolute anomalies of temperature in the RAI-NA Region (North Africa)**  
**Data from NCDC (National Climate Data Centre NOAA – reference 1981-2010),**  
<http://www.meteo.tn/htmlen/donnees/climatemonitoring.php>.

## 5. Precipitation

### Europe/RA VI

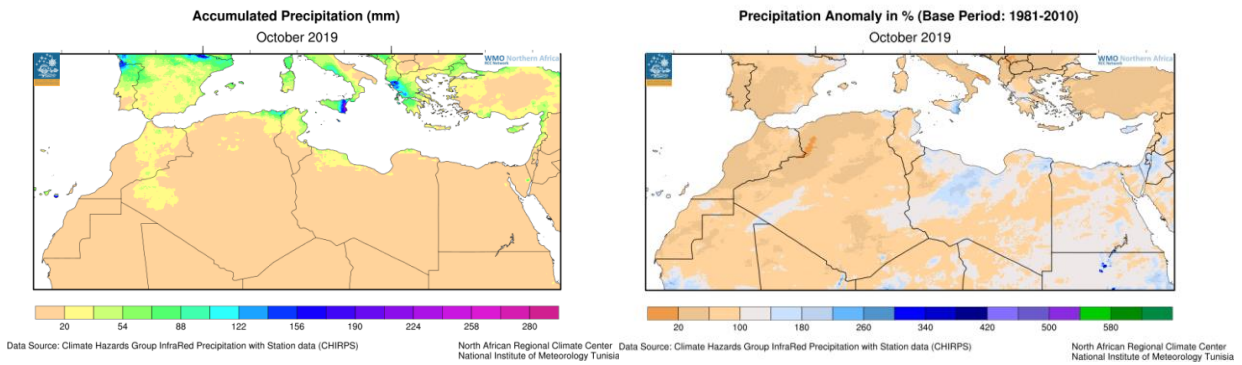
Precipitation in October 2019 showed a high variability within the domain. Wettest areas were northern Spain, north-western and south-eastern France and north-western Italy with totals of above 150 or 200 mm locally. This mostly corresponded to above 125% of the normal. Southern and eastern parts of the domain were much drier, locally below 10 mm the whole month or below 20% of the normal.



Monthly precipitation totals (left) and percentage of 1981-2010 normal (right) for October 2019 in Europe/RAVI. Data from GPCP (First Guess version). Source: DWD, [http://www.dwd.de/EN/ourservices/rccm/int/rccm\\_int\\_rrr.html](http://www.dwd.de/EN/ourservices/rccm/int/rccm_int_rrr.html)

### North Africa

Monthly precipitation totals in October 2019 were below 20 mm over almost the entire RA-I domain. Rainfall amounts exceeding 60 mm were registered in the extreme northeast of Algeria and the eastern coast of Tunisia. Near-normal conditions occurred over most parts of Libya and Egypt. These regions received between 75% and 125% of the normal. Slightly above-normal conditions occurred especially in the middle of Libya. Over Tunisia, Algeria and Morocco the precipitation was below normal during this month of the year with less than 20%.



**Left: Total precipitation; Right: Absolute anomalies of precipitation in the RAI-NA Region (North Africa).  
Data from NCDC (National Climate Data Centre NOAA – reference 1981-2010)  
<http://www.meteo.tn/htmlen/donnees/climatemonitoring.php>.**

**References:**

Météo France monthly and seasonal climate monitoring maps: <http://seasonal.meteo.fr> (password protected)

WMO RA I RCC Node on Climate Monitoring Website with monitoring results:  
<http://www.meteo.tn/htmlen/donnees/climatemonitoring.php>

WMO RA VI RCC Node on Climate Monitoring Website with monitoring results: <http://www.dwd.de/rcc-cm>

GPCC: <http://gpcc.dwd.de>

Copernicus Climate Change Service: <https://climate.copernicus.eu>

NOAA National Climate Data Center: <https://www.ncdc.noaa.gov>

Rutgers University: <https://climate.rutgers.edu>

Deutscher Wetterdienst (DWD), Germany: <https://www.dwd.de>