MEDITERRANEAN CLIMATE OUTLOOK FORUM
MEDCOF-24 Online Forum

MONITORING SUMMARY MEDCOF-24

for April 2025

Final version

Last update: 26 May 2025

Compiled by

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The following MedCOF monitoring summary is based on

- Monitoring information from RA I NA RCC and RA VI RCC Node-CM
- Contribution from Météo France (draft of LRF bulletin)
- Further information from various sources (BOM, NOAA-CPC)
- SEECOF-33 Monitoring document

1. Oceanic Analysis

Over the Pacific Ocean:

- During April 2025, equatorial sea surface temperatures (SSTs) were below average in the central equatorial Pacific Ocean, and above-average SSTs were built up in the easternmost equatorial Pacific Ocean.
- Niño index values (SST anomalies) were above normal for the eastern regions Niño-1+2 and Niño-3 from February to mid-April, and below normal for the westernmost Niño-4 region, but with tendency towards normal. The combined region Niño-3.4 had close-to-normal SST in March and April. Nino3.4 monthly index issued from Mercator Ocean analysis for April 2025: -0,2 °C. **This means in summary a neutral ENSO state of the oceanic component.**
- Subsurface temperature anomalies weakened from March to April in the central and eastern equatorial Pacific.
- **Neutral ENSO conditions will likely continue over summer 2025 according to the Australian Bureau of Meteorology (BOM) and NOAA.**
- In the North Pacific, a PDO- (negative Pacific decadal oscillation) pattern still exists since 2020. **The PDO remains in a relatively strong negative phase.**

For more details see:

- http://seasonal.meteo.fr/slides/BulTech (password protected)
- https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml
- https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/enso.shtml
- https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.shtml
- http://www.bom.gov.au/climate/enso/index.shtml#tabs=Pacific-Ocean
- PDO:
  - https://www.ncdc.noaa.gov/teleconnections/pdo/
  - https://stateoftheocean.osmc.noaa.gov/atm/pdo.php

Over the Maritime Continent and the Indian Ocean:

- The tropical Indian Ocean was mostly slightly warmer than normal in April 2025, but no significant east-west gradient can be seen. Value of DMI close to zero (neutral phase of IOD). DMI monthly index issued from Mercator Ocean analysis: 0,2°C. **IOD is neutral. Forecasts of BOM show neutral to negative IOD for summer 2025.**

Over the North Atlantic:

- In the tropical North Atlantic mostly normal to above normal, but clearly above normal in eastern parts of the North Atlantic, especially close to the coasts of Western Europe and North Africa. NAT monthly index issued from Mercator Ocean analysis: 0°C.

Over the Mediterranean and Black Sea:

- The Mediterranean Sea was warmer than normal in April 2025, 0.5-1 °C in the central and eastern parts and above 1 °C in the western parts.
- SST in the Black Sea was slightly above normal (<1 °C anomaly).

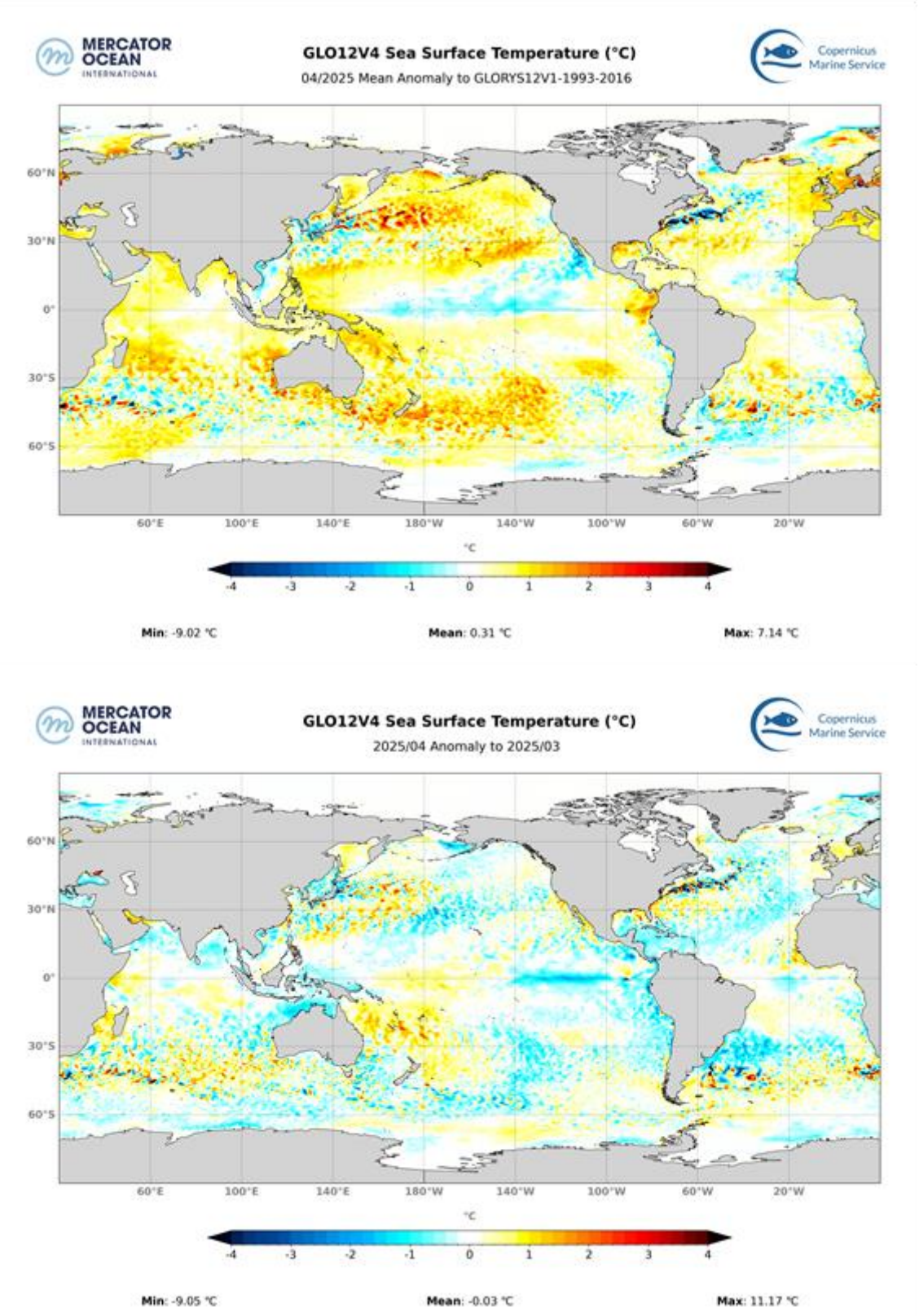


Figure 1.1: Sea surface temperature anomalies for April 2025, 1993-2016 reference (upper map) and anomaly differences April minus March 2025 (anomaly trend). Source: Météo France

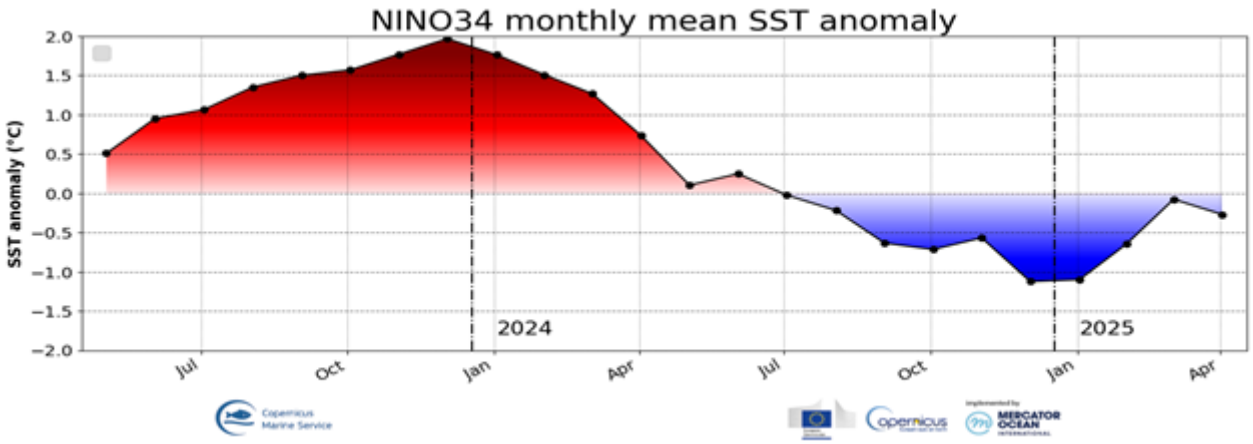


Figure 1.2: Evolution of sea surface temperature anomalies in the Niño3.4 box for May 2024–April 2025, 1993-2016 reference. Data from Mercator Ocean, source: Météo France.

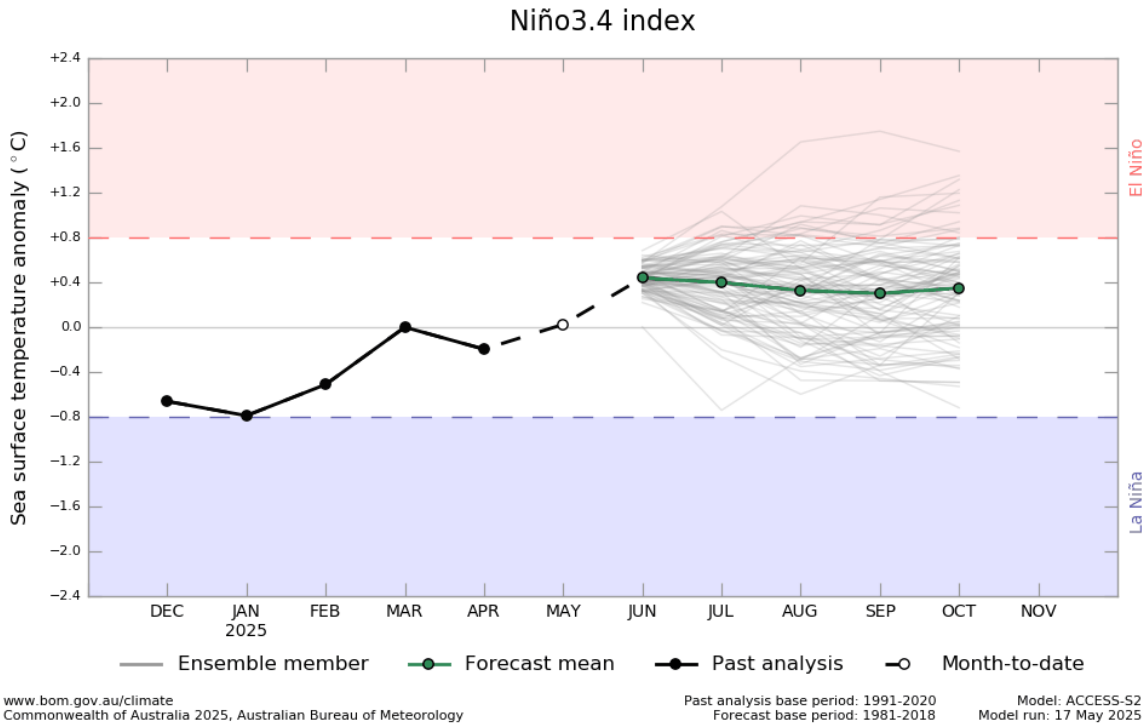


Figure 1.3: Sea surface temperature anomalies in the Niño3.4 region, December 2024-October 2025 (analysis and forecast). Source: BOM, http://www.bom.gov.au/climate/ocean/outlooks/?index=nino34

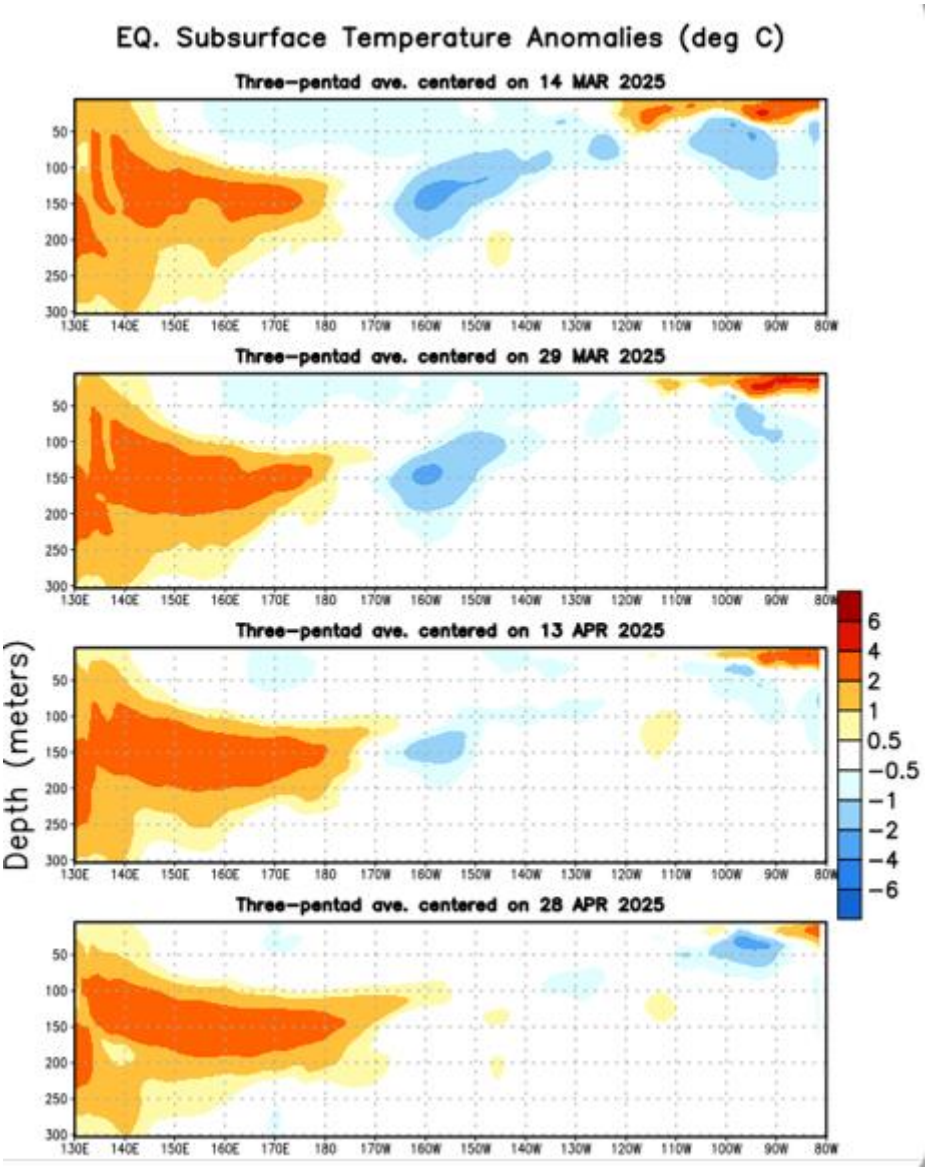


Figure 1.4: 15-day equatorial Pacific Ocean temperature anomalies in the sub-surface March-April 2025. Source: NOAA, https://www.cpc.ncep.noaa.gov/products/precip/CWlink/MJO/enso.shtml

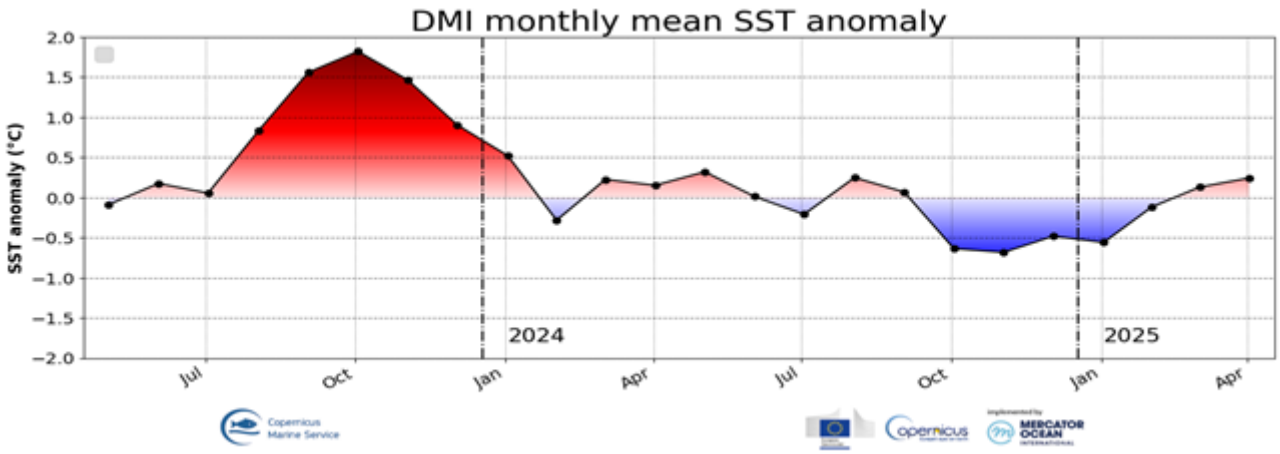


Figure 1.5: Evolution of the DMI monthly index (Indian Ocean Dipole), 1993-2016 reference. Data from Mercator Ocean, source: Météo France.

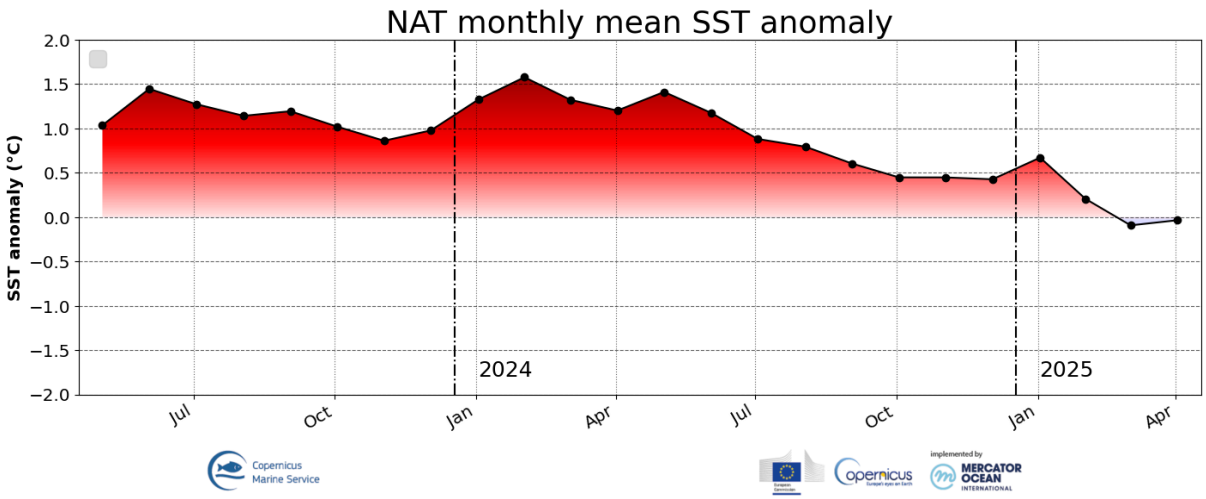
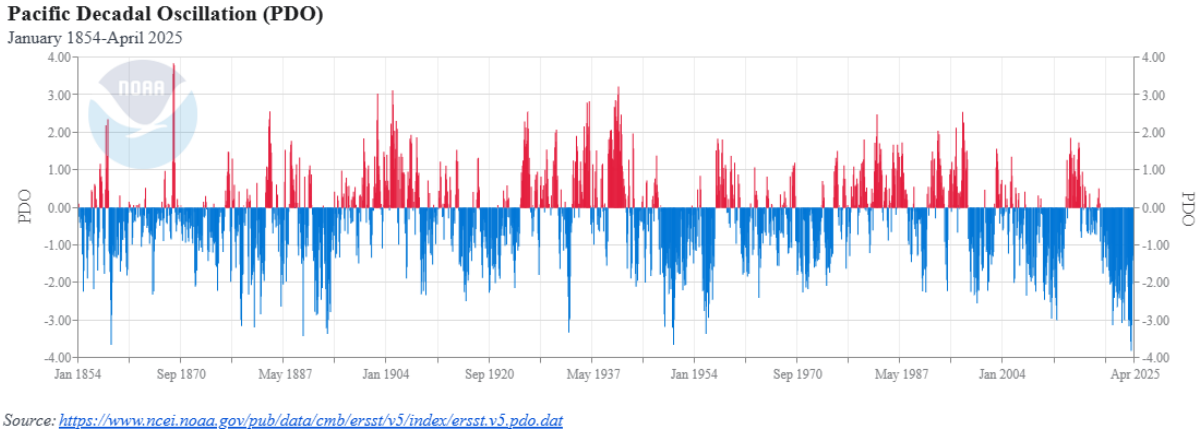


Figure 1.6: Evolution of the NAT monthly index (North Atlantic temperature), 1993-2016 reference. Data from Mercator Ocean, source: Météo France.



Source: https://www.ncei.noaa.gov/pub/data/cmb/ersst/v5/index/ersst.v5.pdo.dat

Figure 1.7: Time series of PDO. Source: NOAA, https://www.ncei.noaa.gov/access/monitoring/pdo/

2. Atmospheric Circulation Analysis

Velocity potential and stream function anomaly field in the high troposphere (insight into Hadley-Walker circulation anomalies), Southern Oscillation Index (SOI) and Madden-Julian Oscillation (MJO)

- Velocity Potential at 200 hPa: Downward anomaly over the centre of the Pacific as well as in the west of the Indian Ocean. Upward anomaly on the Maritime Continent as well as in the north of South America. Quite strong upward motion anomaly over the maritime continent and the western tropical Pacific, but only small anomalies over the central and eastern tropical Pacific. La Niña circulation was still active in February–April, but weakening.
- Streamfunction at 200 hPa: Small dipole around the Equator over the Central Pacific and another over the Maritime Continent. No clear teleconnection is visible, except maybe a weak one from the central/eastern tropical Pacific over the North Atlantic up to North-western Europe. However, since La Niña is decaying, no long persistence is expected.
- SOI was still positive, but weak (monthly value from NOAA CPC for April 2025 was +0.4)
  - https://www.ncdc.noaa.gov/teleconnections/enso/soi
  - http://www.bom.gov.au/climate/enso/index.shtml#tabs=Pacific-Ocean&pacific=SOI

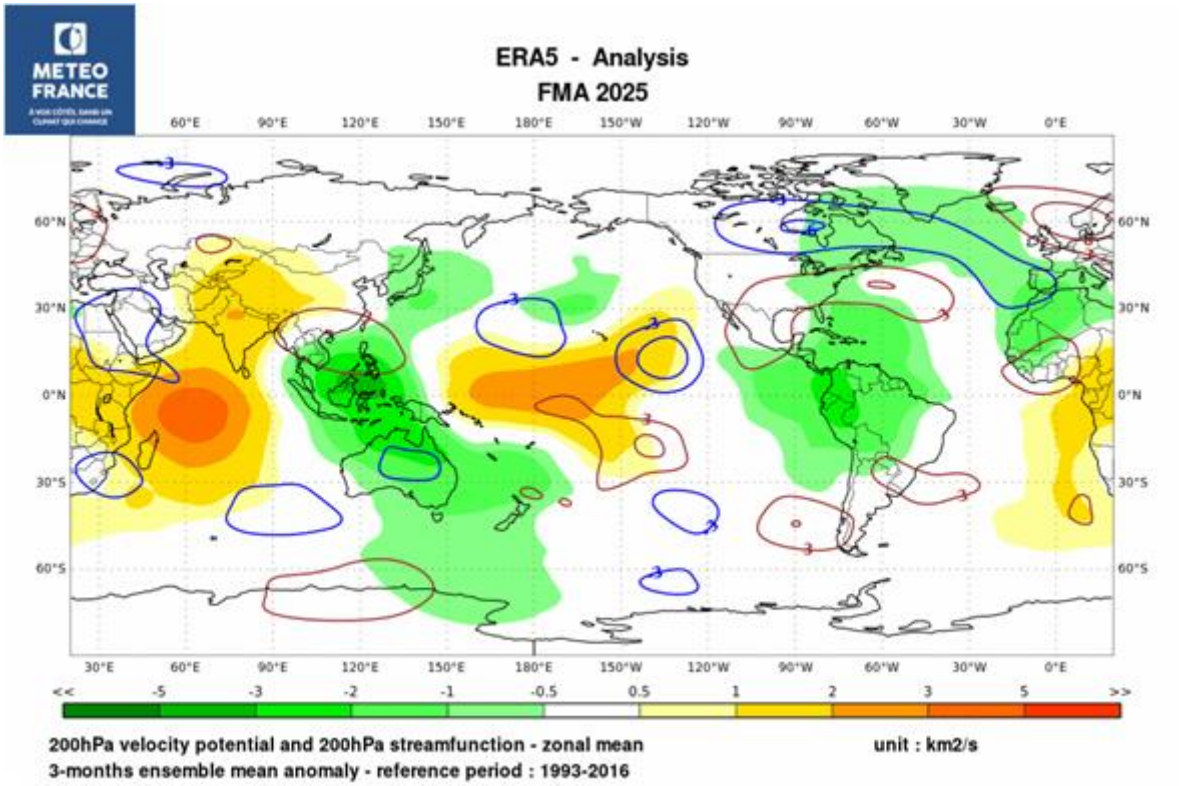
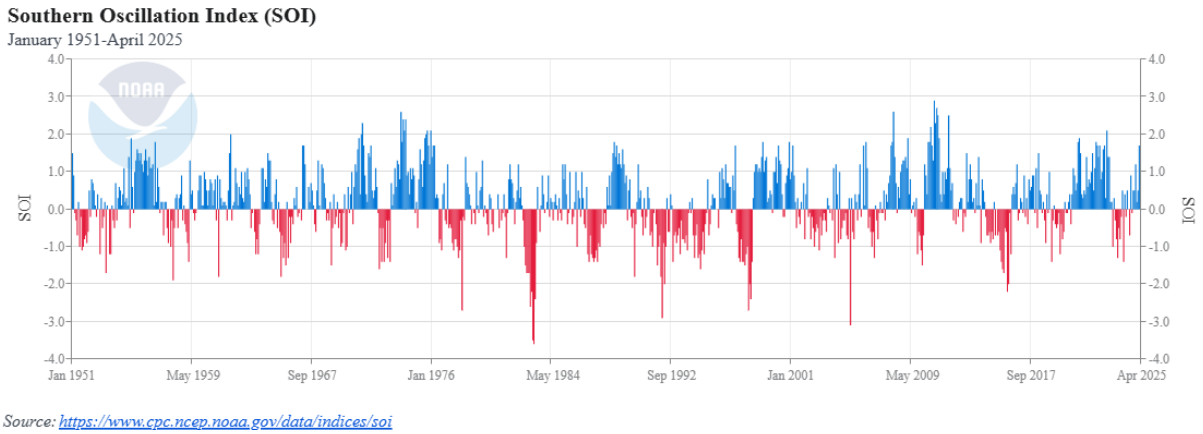


Figure 2.1: Velocity potential and stream function anomalies at 200 hPa for February-April 2024. Green (yellow/brown) indicates a divergence-upward motion anomaly (convergence-downward motion anomaly). Source: Meteo France



Source: https://www.cpc.ncep.noaa.gov/data/indices/soi

Figure 2.2: Southern Oscillation Index. Source: NOAA, https://www.ncei.noaa.gov/access/monitoring/enso/soi

Madden-Julian Oscillation (MJO)

- MJO was inactive or very weak in April and the first half of May 2025.

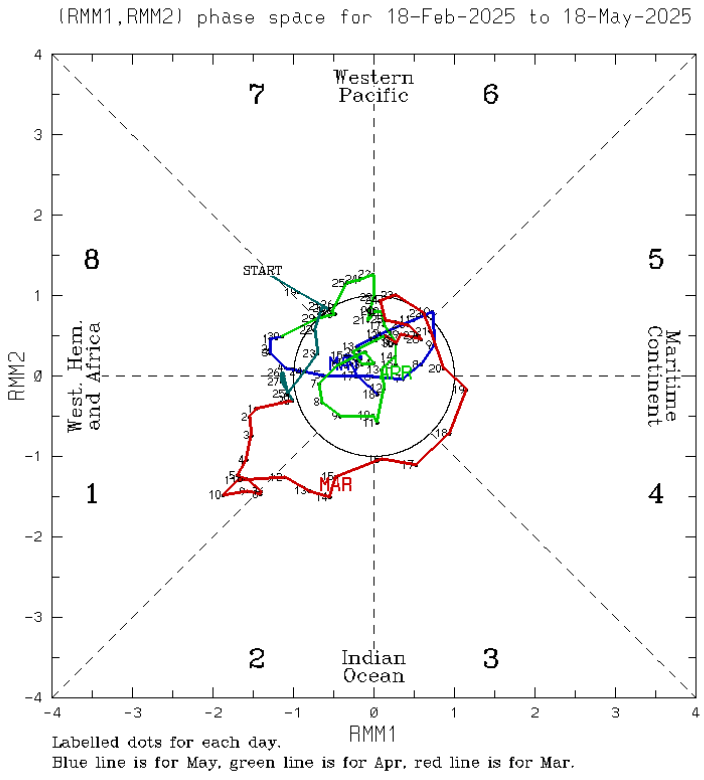


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Figure 2.3: MJO indices. Source: BOM, http://www.bom.gov.au/climate/mjo/

Geopotential height at 500 hPa:

- Teleconnection pattern has developed over the North Atlantic to Northwestern Europe and the Arctic north of Russia.
- Anticyclonic conditions expanded from Northwestern Europe also to other parts of Europe including Eastern and Southeastern Europe, western Mediterranean, parts of the Iberian Peninsula, and western parts of North Africa.
- Anticyclonic conditions also over large parts of southern Asia, associated with significant downward motion in this area.
- Between these two anticyclonic areas a cyclonic area over the eastern Mediterranean, Türkiye, up to the Black Sea, often caused by troughs expanding from northern Russia far to the south.

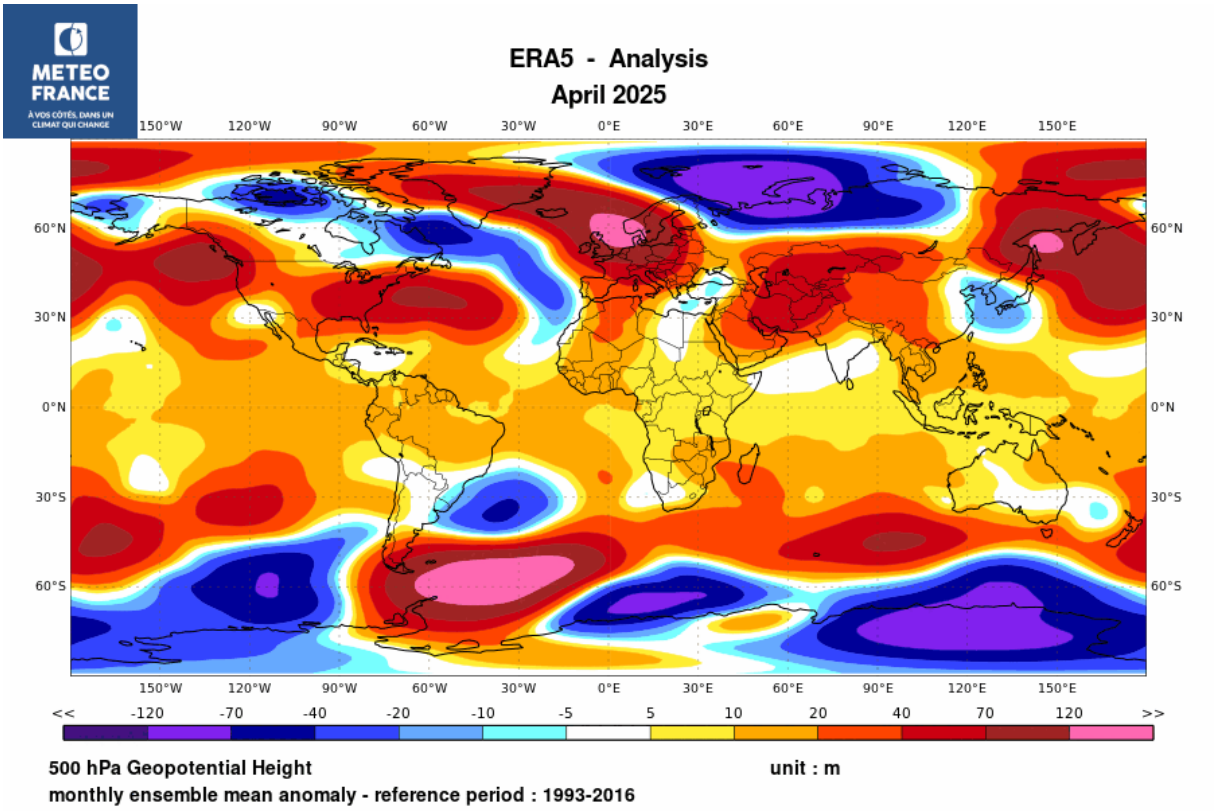

Figure 2.4: Anomalies of Geopotential height at 500hPa (ERA5 data).
Source: Météo-France, http://seasonal.meteo.fr/content/suivi-clim-cartes-ref93-16

Sea level pressure and circulation types relevant for the domain

- Teleconnection pattern North Atlantic – Northwestern Europe – Northern Russia can also be seen in SLP pattern, particularly in terms of anomalies.
- High pressure expanded to large parts of Europe, including large parts of Eastern and Southeastern Europe, western and central Mediterranean.
- Slight low-pressure anomalies over the eastern Mediterranean, the Middle East, southern and eastern Türkiye and South Caucasus, and also from the North Atlantic affecting at least western parts of the Iberian Peninsula.

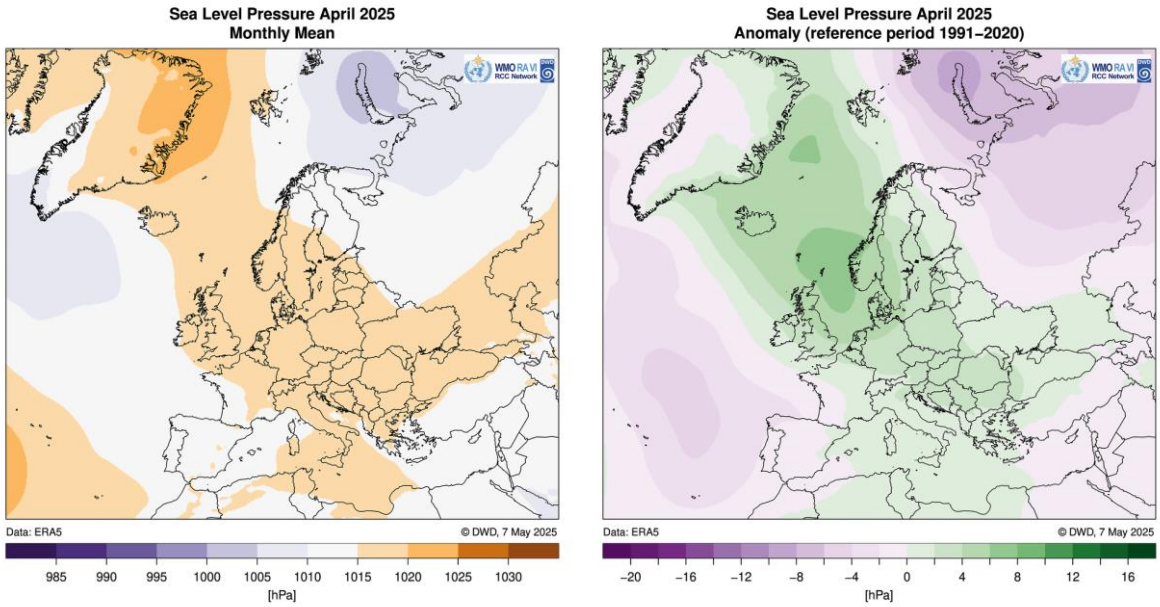

Figure 2.5: Mean sea level pressure over the North Atlantic, Europe and North Africa and 1991-2020 anomalies for April 2025. Source: DWD, https://www.dwd.de/DE/leistungen/rcccm/int/rcccm_int_ppp.html?nn=490674

Circulation patterns

- The standard NOAA circulation patterns were not very intense in April 2025.
- NAO was neutral during the whole month of April.
- Arctic Oscillation (AO) also was mostly neutral, with only short fluctuations into the positive range (zonal).
- According to the Meteo France weather type classification, the most dominating type in April was Blocking (more than 50% of all days in the month). Blocking was also frequent in the preceding months (since November 2024 the number of blocking types was well above normal, at least on 12 days in a month), and also in in the first half of May, blocking occurred on 10 out of 14 days. This implies a high persistency of this pattern and is related to the high-pressure area over much of Europe with core over Northwestern Europe. It might be possible that this pattern was triggered by ENSO (La Niña).
- This predominance of blocking can't be explained by the MJO, active in phase 5/6 (which favours the blocking regime) only in February.

MONTH	NAO	EA	WP	EP-NP	PNA	TNH	EATL/WRUS	SCAND	POLEUR
APR 25	0.1	0.4	-0.8	-0.6	-1.1	---	0.5	-0.9	-0.7
MAR 25	-0.1	0.8	0.8	0.7	-0.4	---	0.1	-0.2	0.0
FEB 25	1.4	0.7	0.3	0.6	1.6	1.3	0.3	1.4	-2.9
JAN 25	-1.1	2.7	1.0	-0.4	0.7	2.1	-1.3	-0.7	0.2
DEC 24	1.0	-0.1	-0.3	---	1.4	0.2	0.0	-0.6	-0.6
NOV 24	-0.4	1.1	-0.2	-0.6	0.0	---	1.1	-0.8	-0.4
OCT 24	0.1	1.0	0.9	-1.8	0.2	---	-1.4	1.1	-1.0
SEP 24	-1.2	1.3	1.4	-2.8	1.1	---	-3.4	0.4	0.3
AUG 24	0.7	3.7	1.1	-2.6	-1.0	---	-0.3	-1.2	-1.3
JUL 24	1.5	2.4	-0.8	-0.5	2.0	---	-0.4	-1.6	-0.1
JUN 24	0.2	1.3	-1.3	1.2	1.1	---	-2.3	-1.2	-1.0
MAY 24	-0.4	-0.2	-0.3	-0.9	-2.3	---	0.3	0.9	-0.6
APR 24	-1.0	3.0	0.7	-0.3	-0.9	---	-0.7	-0.7	0.4

Table 1: Evolution of the main atmospheric indices for the Northern Hemisphere for the last months: http://www.cpc.ncep.noaa.gov/products/CDB/Extratropics/table3.shtml

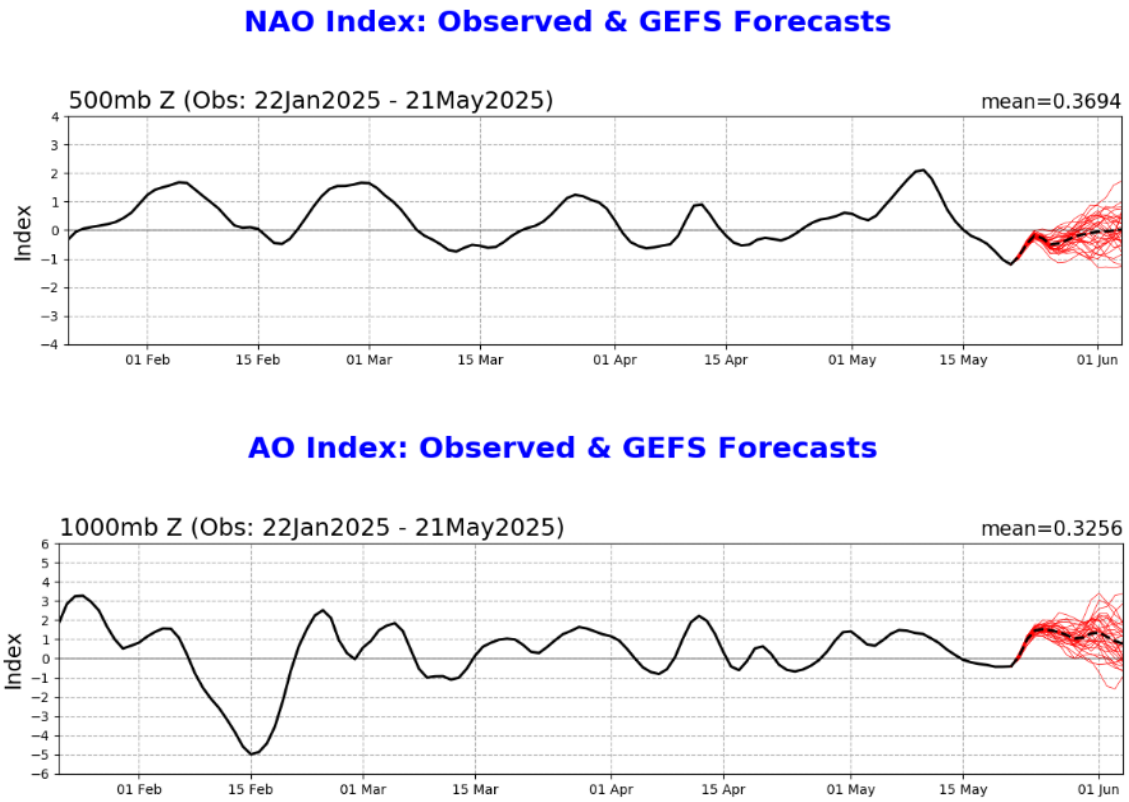

Figure 2.6: North Atlantic Oscillation (NAO) and Arctic Oscillation (AO) indices. Source: NOAA CPC, https://www.cpc.ncep.noaa.gov/products/precip/CWlink/daily_ao_index/teleconnections.shtml

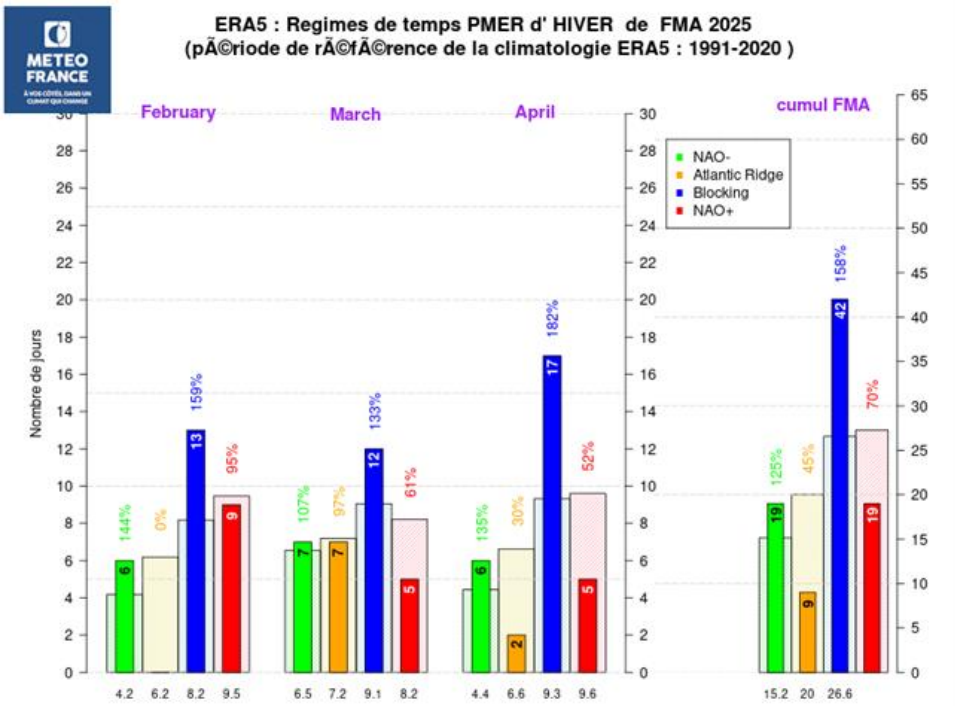

Figure 2.7: Frequency distribution of SLP weather regimes of Météo France classification (winter regime) for February–April 2025 compared to climatology, and aggregation over the entire quarter, for ERA5 reanalysis data. Source: Météo France, http://seasonal.meteo.fr/content/suivi-clim-regimes-trim

3. Precipitation

Europe/RA VI domain

Monthly precipitation in April 2025 shows quite high spatial variability within the MedCOF domain. Particularly dry was the Middle East. Especially eastern Jordan and Syria had places without any rain at all. Also much drier than normal were eastern Ukraine, Moldova, Romania, and eastern Hungary, but also southern Italy, eastern Spain, and northern France which received less than 80% of the normal monthly total, partly less than 20-40%. The Balkans and Greece were partly drier, partly wetter than normal. Most of Türkiye and the South Caucasus, but also western Ukraine were wetter than normal, locally receiving more than 150% of normal. Wet areas in the western parts of the domain were Portugal, most of Spain, southern parts of France, and northern Italy, with partly more than 125%, locally more. Several places in western and eastern parts of the domain received more than 100 mm of precipitation over the month, exceeding partly the 90th percentile.

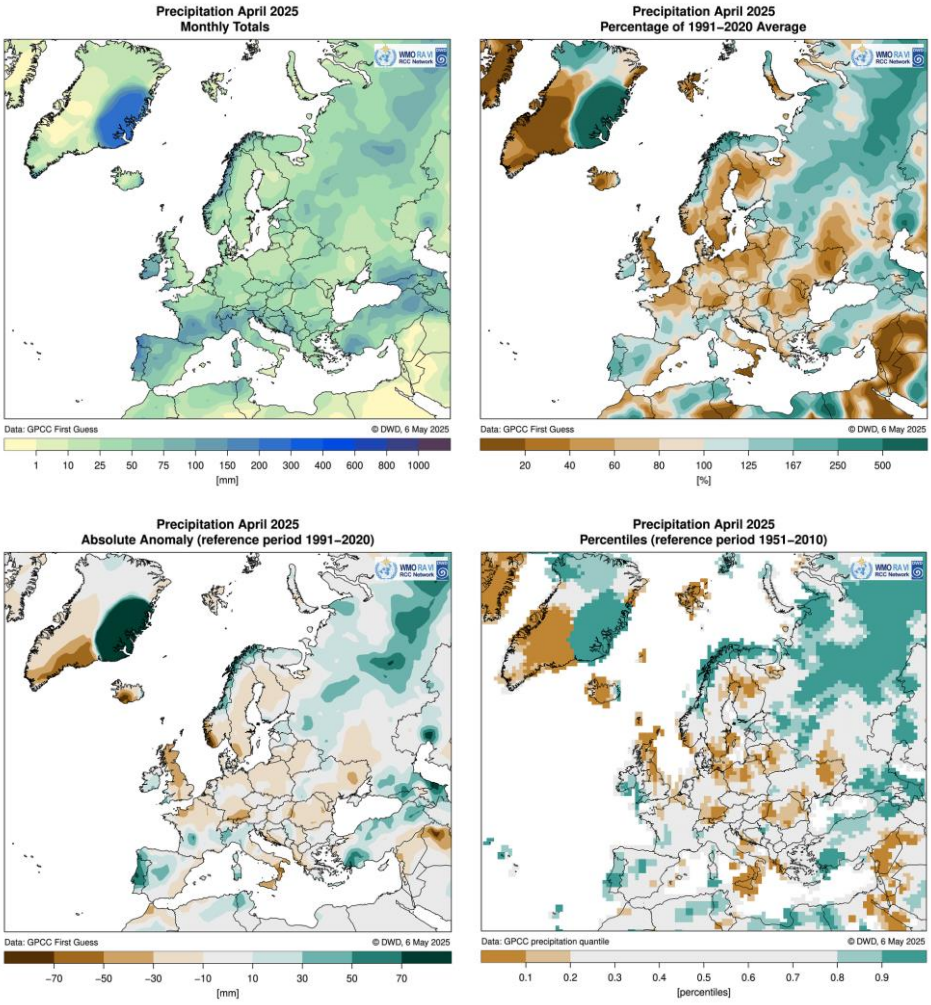

Figure 3.1: Monthly precipitation sum (upper left), percentage of normal (upper right), absolute anomalies (lower left), and percentiles (lower right) for April 2025 (1991-2020 reference for percentages and anomalies, 1951-2010 for percentiles) in Europe/RAVI. Data from GPCC (First Guess version). Source: DWD, https://www.dwd.de/EN/ourservices/rcccm/int/rcccm_month_rrr.html

Precipitation in North Africa

Most of the North African region was affected by markedly dry conditions in April 2025, with precipitation totals generally below 20 mm. Exceptions were observed along the eastern Mediterranean coast, the northwestern part of Algeria, northern Tunisia and northern Morocco, where localized rainfall amounts approached 60 mm.

In April 2025, positive precipitation anomalies were observed over Morocco, the northern and western regions of Algeria, northern Tunisia, and the coastal areas of Libya, with rainfall reaching between 180% and 300% of the 1991–2020 average. In contrast, the remainder of the region recorded near to below normal precipitation.

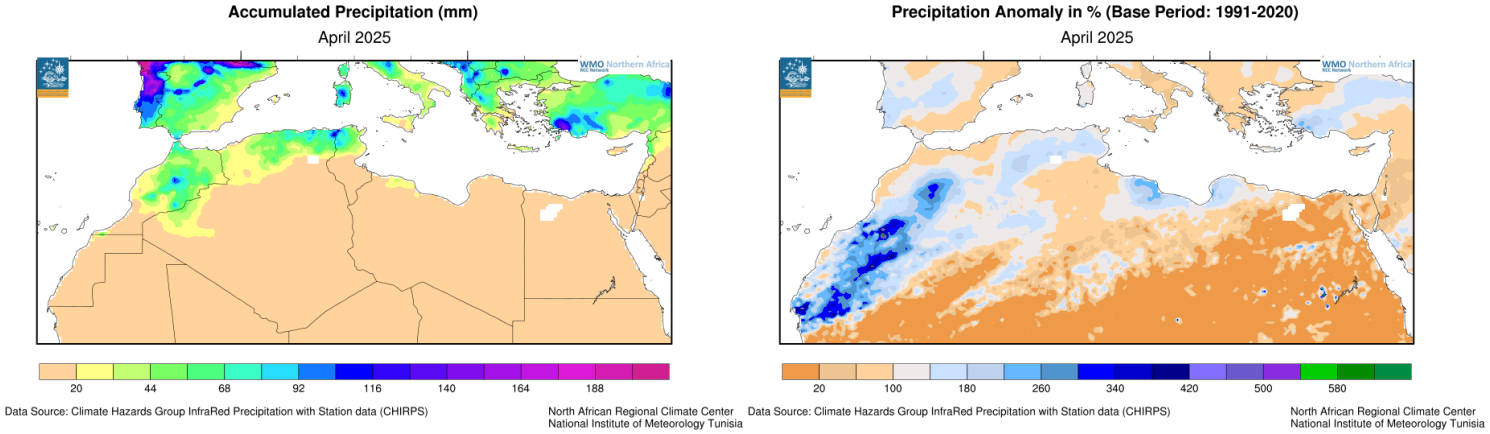

Fig.3.2: Left: Total precipitation; Right: Precipitation anomalies for April 2025 in the RAI-NA Region (North Africa). Data from NCDC (National Climate Data Centre NOAA – reference 1991-2020). Source: INM Tunisia, https://www.meteo.tn/en/climate-monitoring-watch

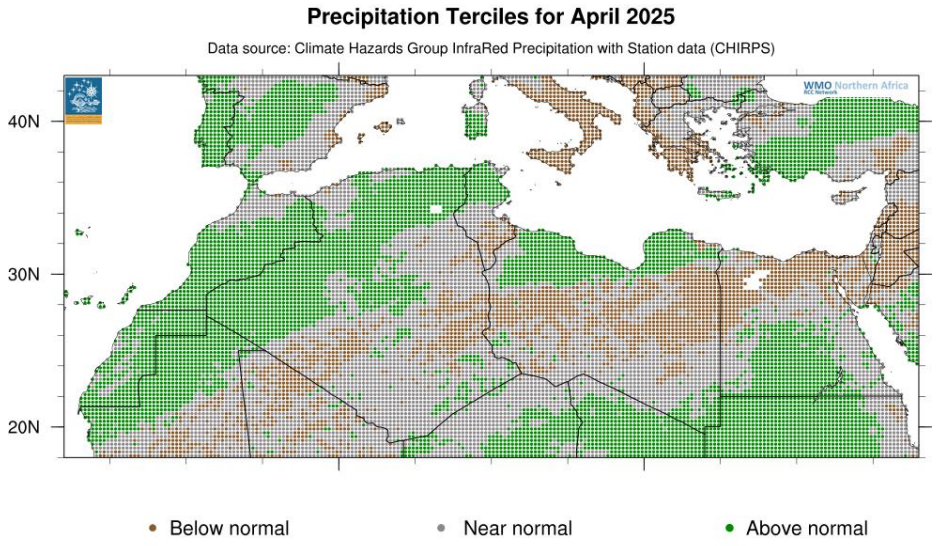

Fig.3.3: Precipitation terciles for April 2025 in the RAI-NA Region (North Africa). Data from NCDC (National Climate Data Centre NOAA – reference 1991-2020), Source: INM Tunisia, https://www.meteo.tn/en/climate-monitoring-watch

4. Temperature

Europe/RA VI domain

Averaged over all RA VI land areas, April 2025 was the eighth warmest April on record since at least 1981 (Fig. 4.1). The anomaly was +1.0 °C (1991-2020 reference). The warming rate of RA VI was +2.5 °C over the period 1981-2025 (45 years); this is equivalent to +0.56 °C per decade.

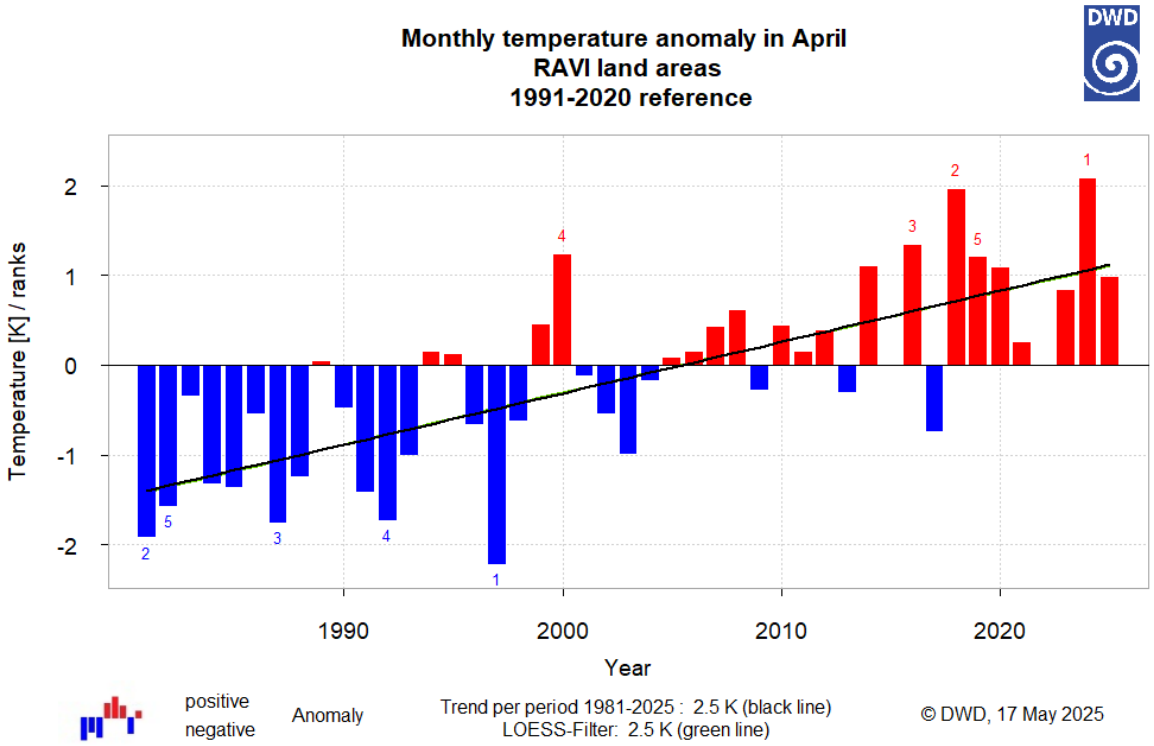

Fig. 4.1: Monthly mean temperature anomaly time series for the years 1981-2025 with trend line, averaged over all RA VI land areas. Source: DWD

Monthly mean temperatures in the MedCOF RA VI domain in April 2025 ranged from close to 0 °C in the Alps to above 20 °C in the Middle East (Fig. 4.2). Most lowland areas had monthly averages of 10–15 °C, only some parts in higher altitudes had lower values. Over the southern Iberian Peninsula, southeastern Türkiye, the Middle East, and over the Mediterranean sea surface, the air was warmer (mainly 15–20 °C).

April 2025 was warmer than the 1991-2020 normal in most parts of the domain, especially in northern and western parts and in the much of the Middle East by more than 1 °C, in north-western France and north-eastern Italy by more than 2 °C. Areas over and around the Black Sea were mostly slightly colder than normal, with largest anomalies over north-western Türkiye (−1 °C to −2 °C).

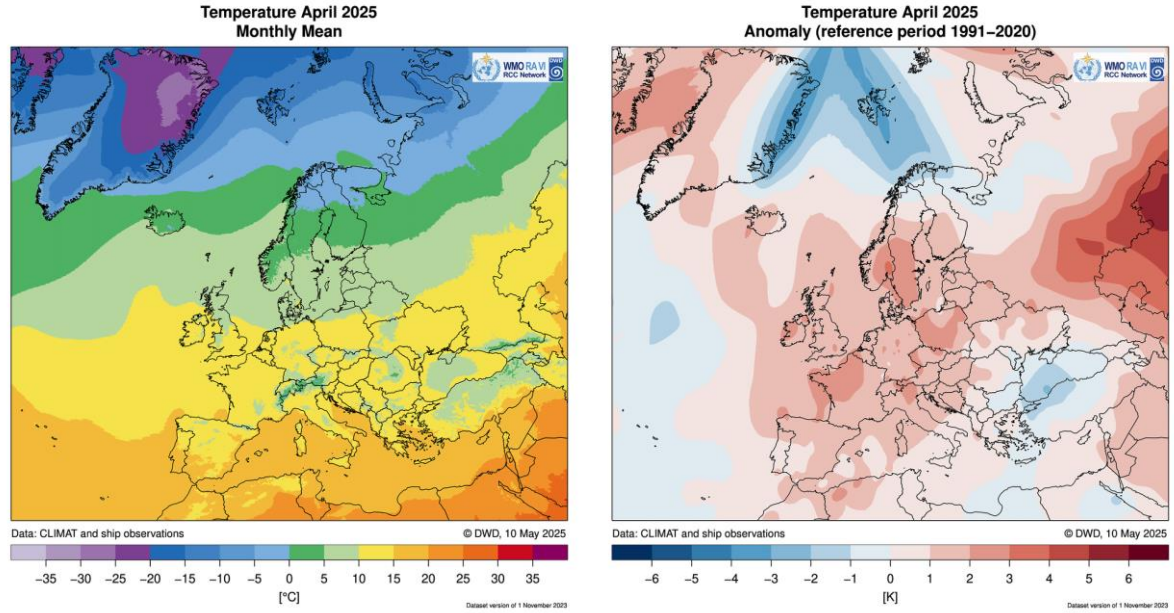

Fig. 4.2: Mean temperature (left) and anomalies (1991-2020 reference, right) in °C in the RA VI Region (Europe) interpolated from CLIMAT station and ship data, for April 2025. Source: DWD, https://www.dwd.de/EN/ourservices/rcccm/int/rcccm_month_ttt.html

Temperature in North Africa

The graph in Fig. 4.3 shows the monthly trend in anomaly air temperature in degrees Celsius of April from 1979 through 2025. 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.

With an excess of +0.5°C above the land mean temperature over the North African domain (Fig. 1), the region has experienced a significant warming trend. This increase corresponds to a substantial warming rate of approximately 0.36°C per decade.

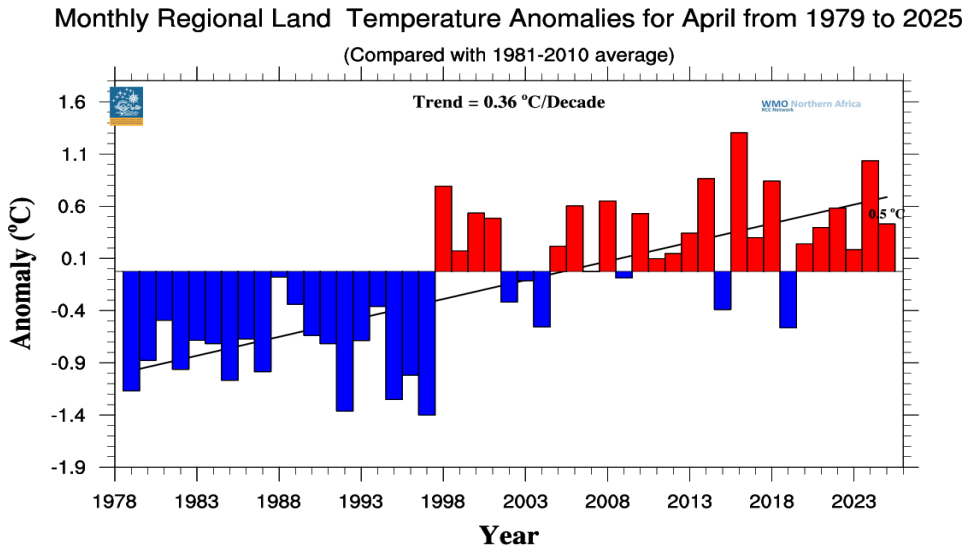

Figure 4.3: Monthly mean temperature anomaly time series 1979-2025 for April with trend line for land areas over the North African domain. Source: INM

In April 2025, average temperatures across Morocco, Algeria, Tunisia, Libya, and Egypt showed significant regional variation. Coastal areas experienced moderate conditions, ranging between 14 °C and 22 °C, with small parts reaching as low as 6 °C in the northern mountainous regions of Morocco and Algeria., while inland regions particularly in the southern parts of Algeria, Libya, and Egypt recorded much higher values, exceeding 30°C in places.

The temperature anomaly map reveals that the month was slightly warmer than the 1991–2020 average over the most parts of the region, with positive anomalies generally between +0.5 °C and +2 °C, especially over northern Algeria, Tunisia, eastern Libya, and northern Egypt. In contrast, negative anomalies, ranging from -1 °C to -2 °C, were observed in parts of southern Morocco, southern Libya, and southern Egypt, indicating cooler-than-normal conditions in these desert areas.

Overall, April 2025 was marked by above-normal temperatures across most of North Africa, tempered by isolated pockets of below normal temperatures in the southern Sahara.

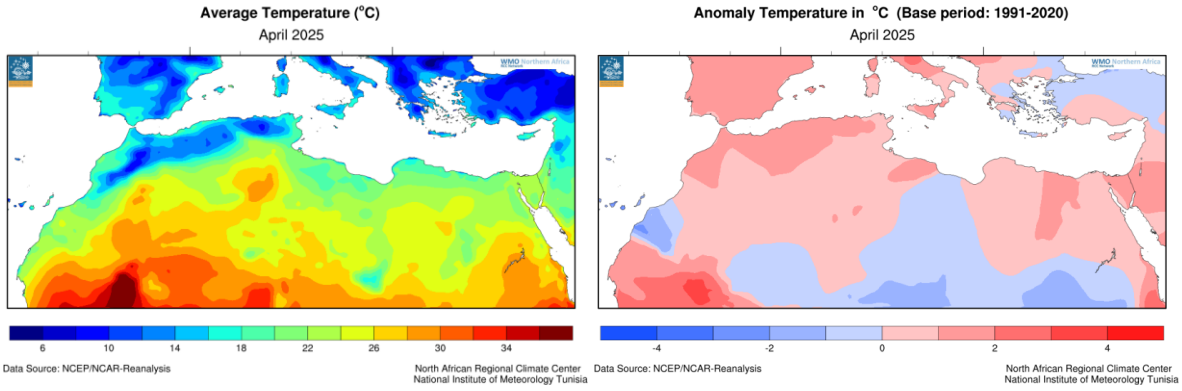

Fig. 4.4: Left: Mean temperature; Right: Absolute anomalies of temperature in the RAI-NA Region (North Africa). Data from NCDC (National Climate Data Centre NOAA – reference 1991-2020), Source: INM, https://www.meteo.tn/en/climate-monitoring-watch

Regarding the tercile map for April 2025, temperature anomalies were below normal in southern Morocco and southern Algeria, while conditions were near normal in northwestern Libya and southern Egypt. Across the remainder of the region, temperatures were predominantly above normal.

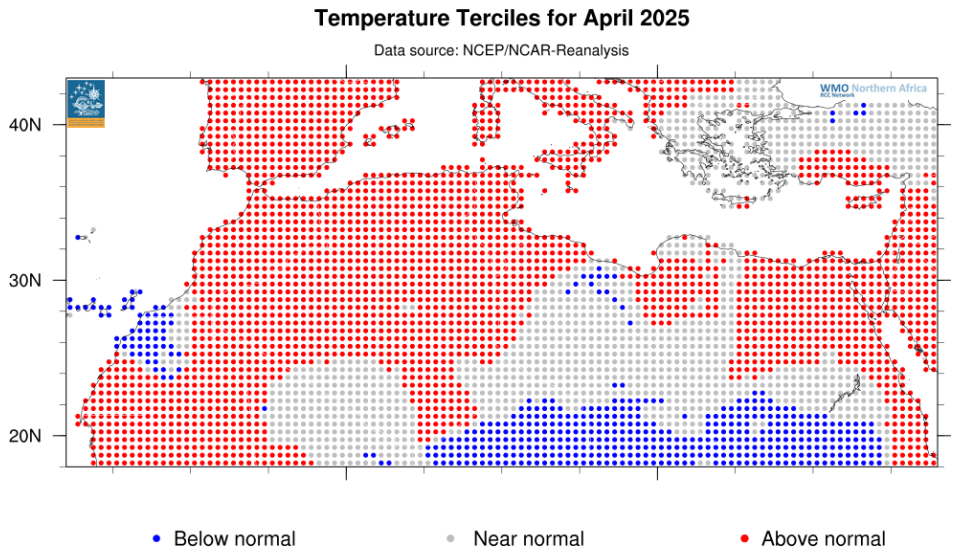

Fig. 4.5: Temperature terciles for April 2025 in the RAI-NA Region (North Africa).
Data from NCDC (National Climate Data Centre NOAA – reference 1991-2020). Source: INM

5. Soil moisture

Soil moisture is not only important for agrometeorology, but also for climate diagnostics. In case of long-lasting anticyclonic periods, a dry soil may amplify positive temperature anomalies (and the risk of heat waves) due to missing cooling by less evaporation. It has also impact on precipitation because less evaporation causes a lower water vapour content in the atmosphere and hence less precipitation (which dries out the soils further).

Europe/RA VI domain

In April 2025, soils (near surface) were wetter than normal in most of the domain, particularly on the Iberian Peninsula and on the western Mediterranean islands. Soils were drier than normal especially in northern France, north of the Black Sea and in the Middle East.

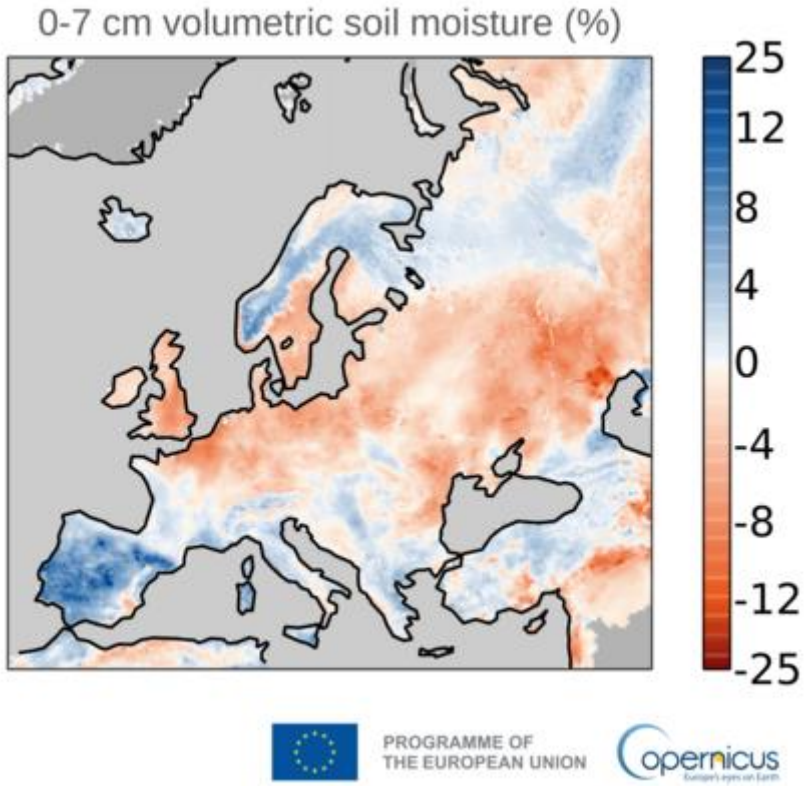

Fig. 5.1: Anomalies of soil moisture in Europe in % of the 1991-2020 normal in a depth layer of 0-7 cm in April 2025. Data from ERA5-Land reanalysis. Source: Copernicus, https://climate.copernicus.eu/precipitation-relative-humidity-and-soil-moisture-april-2025

6. Significant Events in April 2025 in the MedCOF region

Cold wave in Türkiye with severe frost:
https://watchers.news/2025/04/15/turkey-struck-by-severe-agricultural-frost-one-of-the-worst-in-recent-history/

Frost in Croatia:
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7. Likely evolution of large-scale climate patterns in the next months (June–August 2025) – Summary of drivers

- ENSO probably neutral next months.
- IOD neutral, possibly turning to negative.
  - negative PDO
  - Warm Northeast Atlantic

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