MEDCOF-8 Climate Bulletin (1st DRAFT)
Large Scale Monitoring Section
prepared by Météo-France

I. DESCRIPTION OF THE CLIMATE SYSTEM (April 2017)

I.1.Oceanic analysis

Over the Pacific Ocean:

- Uniformly warmer than normal except over 2 zones of cold anomalies: the first one between 30°N and 40°N (weak positive PDO index of +0.52) and the second one around 40°S. No significant East-West contrast in the equatorial railway
- "El Niño costero" along Peru and Equator coast ended due to a strong cooling during April on South American coast
- In subsurface, a cold Kelvin wave had strengthened during April entering East part of the basin.

Over the Maritime Continent :

- warmer than normal on the East part, neutral on the West part

Over the Indian Ocean :

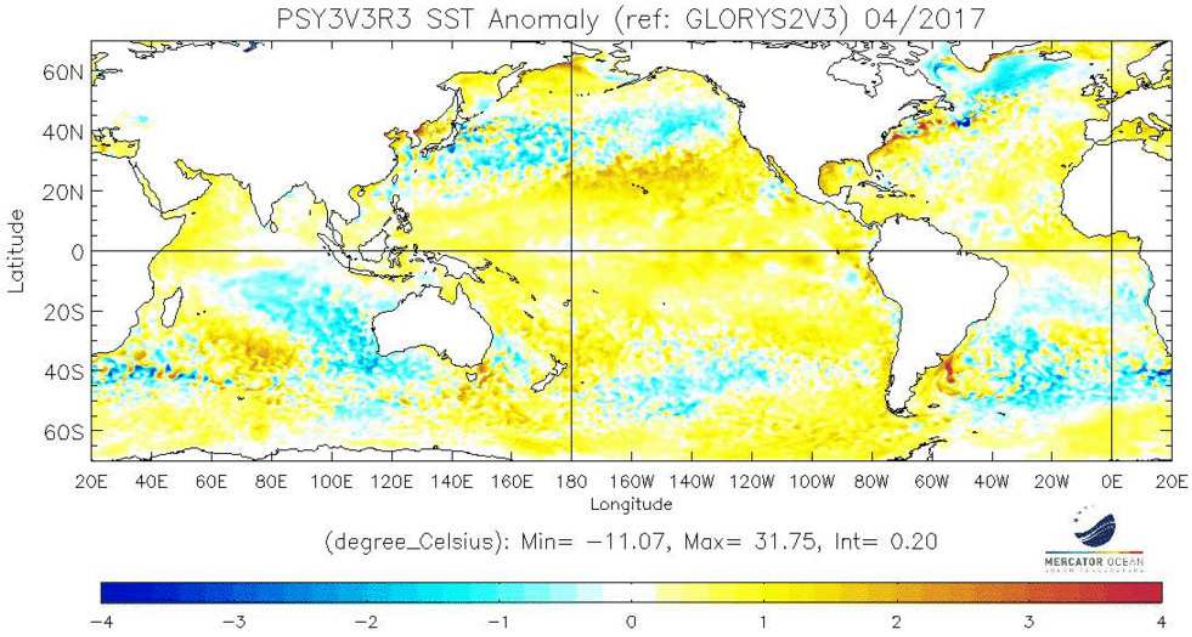
- In the southern hemisphere, still strong contrast between east (cold) and west (warm). More to the north the DMI is still close to 0.

Over the Atlantic:

- Weak warm anomalies around equator and up to 40°N. Dominant cold anomalies in South Atlantic especially around 40°S where they are quite strong. Strong cold anomaly from Labrador to Newfoundland and south of Iceland (Cold-Blob).

Over the Mediterranean:

- SSTs uniformly warmer than normal.



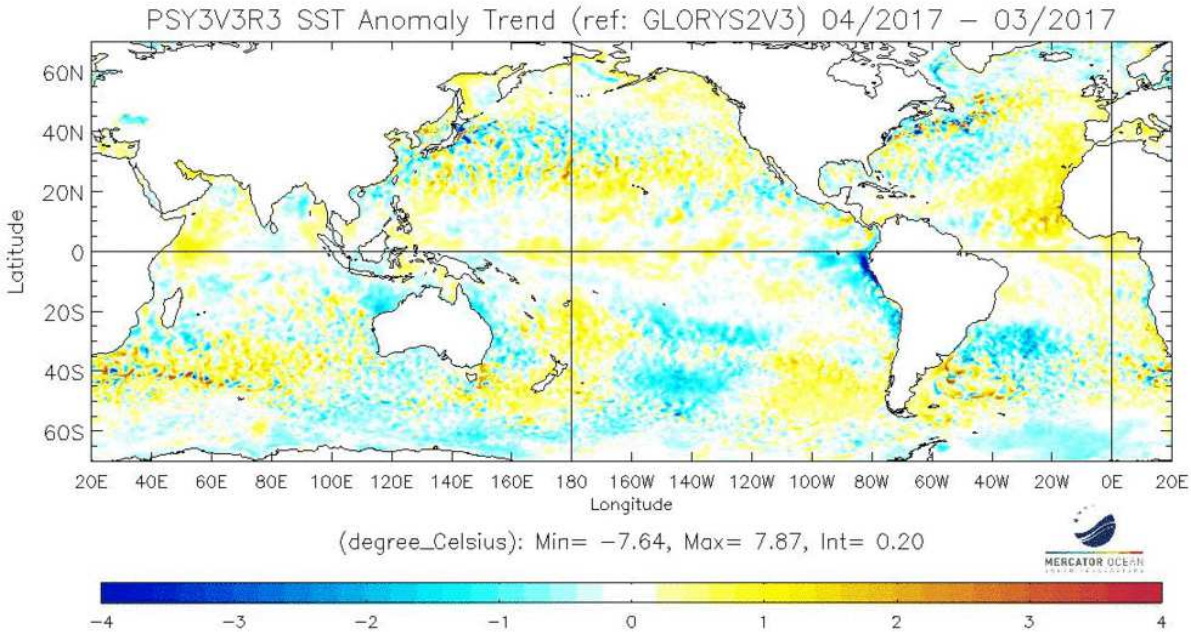


fig.I.1.1: top: SST Anomalies (°C) . Bottom: SST tendency (current – previous month), (reference Glorys 1992-2013).

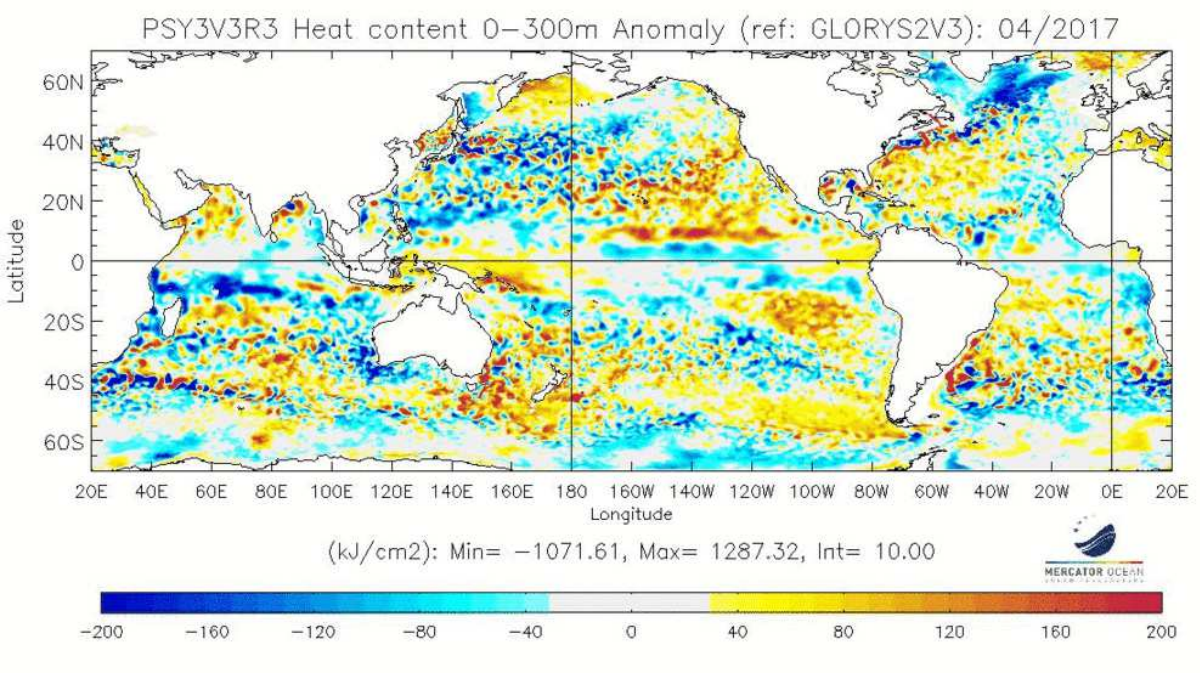


fig.I.1.2: map of Heat Content Anomalies (first 300m, kJ/cm2, reference Glorys 1992-2013)

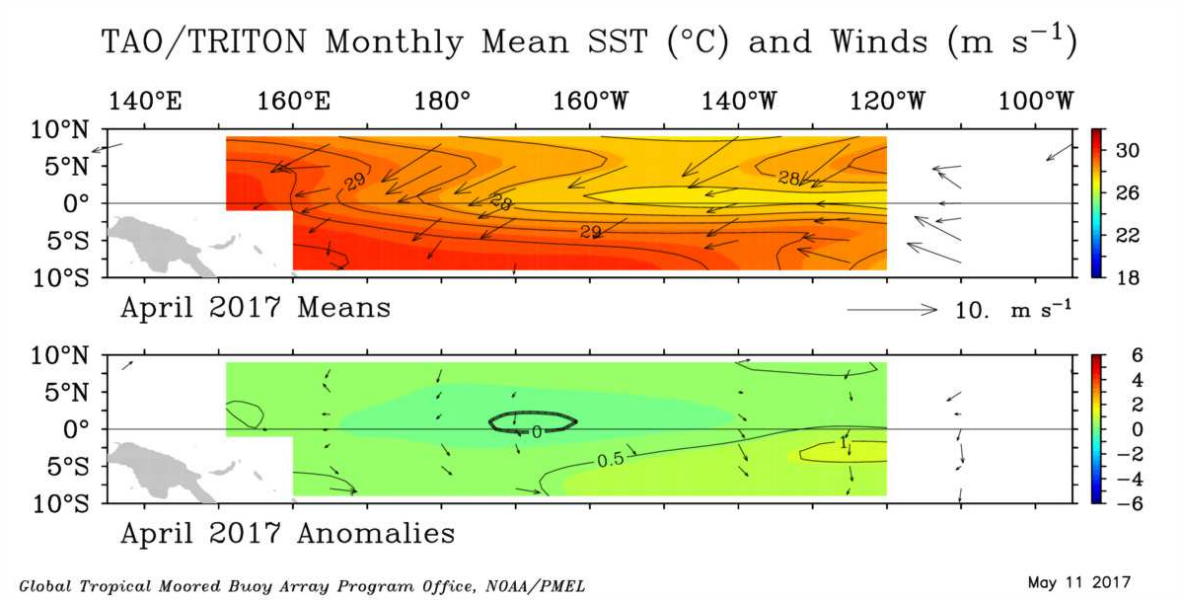


fig.I.1.3: SST Anomalies and Wind anomalies over the Equatorial Pacific from TAO/TRITON.

http://www.pmel.noaa.gov/tao/drupal/assorted_plots/images/sst_wind_mon.png

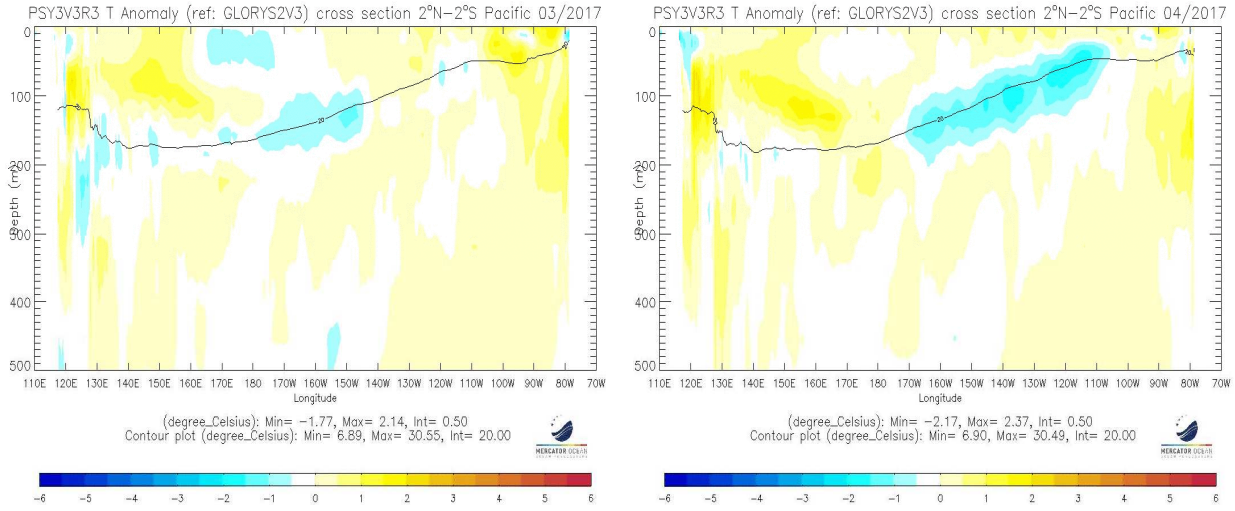


fig.I.1.4: Oceanic temperature anomaly in the first 500 meters in the Equatorial Pacific (previous and current month)

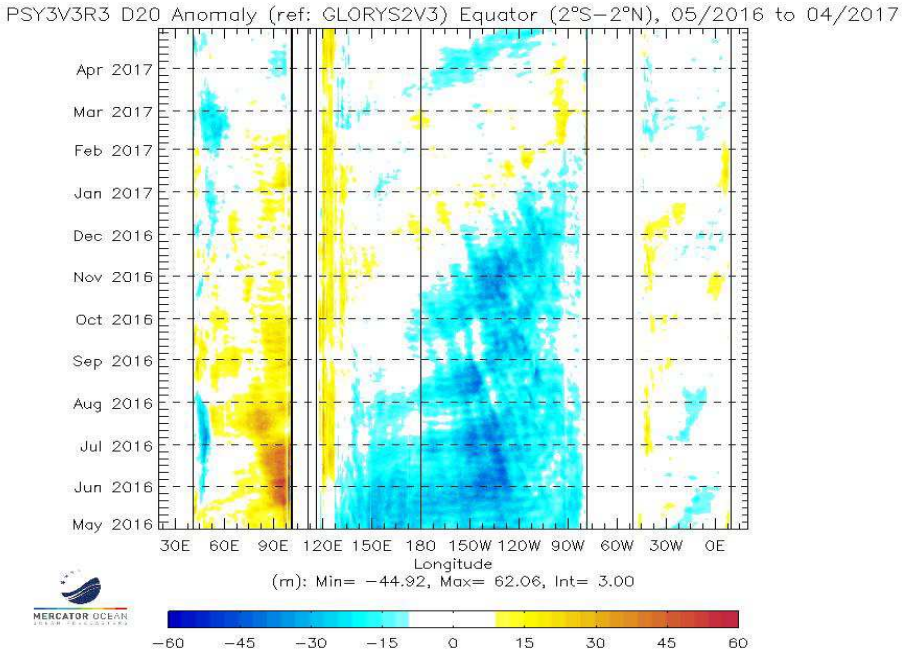


fig.I.1.5: Hovmüller diagram of Thermocline Depth Anomalies (m) (depth of the 20°C isotherm) along the equator for all oceanic basins over a 6 month period

I.2. ATMOSPHERE

I.2.a General Circulation

Velocity Potential Anomaly field in the high troposphere (fig. 1.2.1 – insight into Hadley-Walker circulation anomalies) :

- Vast kernel of strong downward anomaly over Indian Ocean in step with the cold SST anomaly.
- Upward anomaly over East of the Maritime Continent.
- Elsewhere over Pacific Ocean, moderate downward anomaly in the Northern tropical part, moderate upward anomaly in the Southern tropical part to South America.
- In North Atlantic, weak East-West dipole.

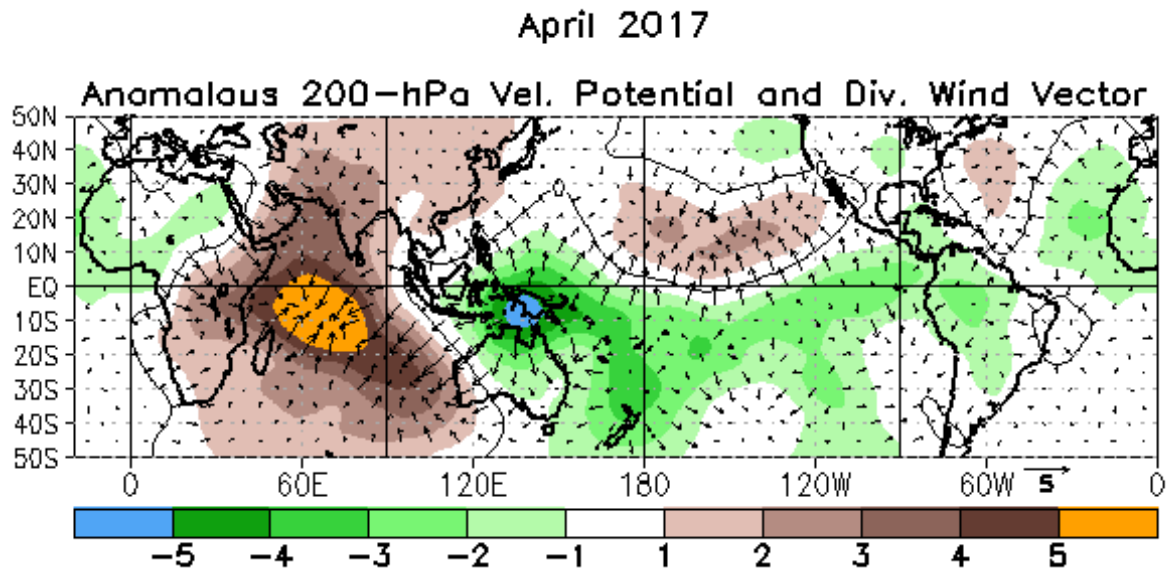


fig.I.2.1.a: Velocity Potential Anomalies at 200 hPa and associated divergent circulation anomaly. Green (brown) indicates a divergence-upward anomaly (convergence-downward anomaly). http://www.cpc.ncep.noaa.gov/products/CDB/Tropics/figt24.shtml

SOI :

- Since ENSO phase is neutral, the SOI index continues to swing around 0 from one month to another. It was negative in April (-6.3) while it has been slightly positive +5.1 in March (see the Bureau Of Meteorology bulletin).

MJO (fig. I.2.1.b)

- Weak MJO activity in April. Temporary weak activity in Western and Central Pacific

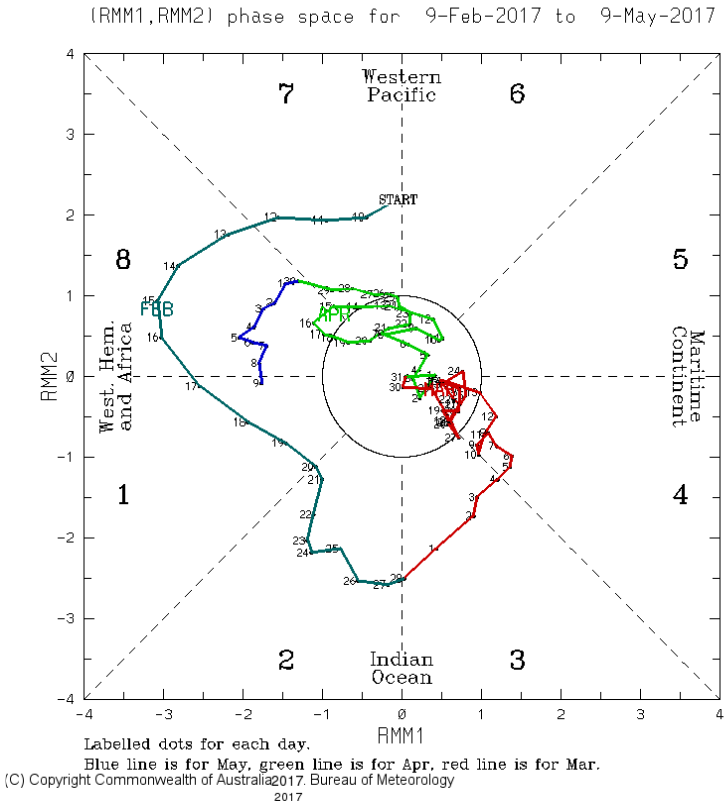


fig.I.2.1.b: indices MJO http://www.bom.gov.au/climate/mjo/

Stream Function anomalies in the high troposphere (fig. 1.2.2 – insight into teleconnection patterns tropically forced): since there is no forcing in the equatorial railway, there is no organised structure near equator in April. The stronger kernels near tropics are due to mid-latitude circulation influence.

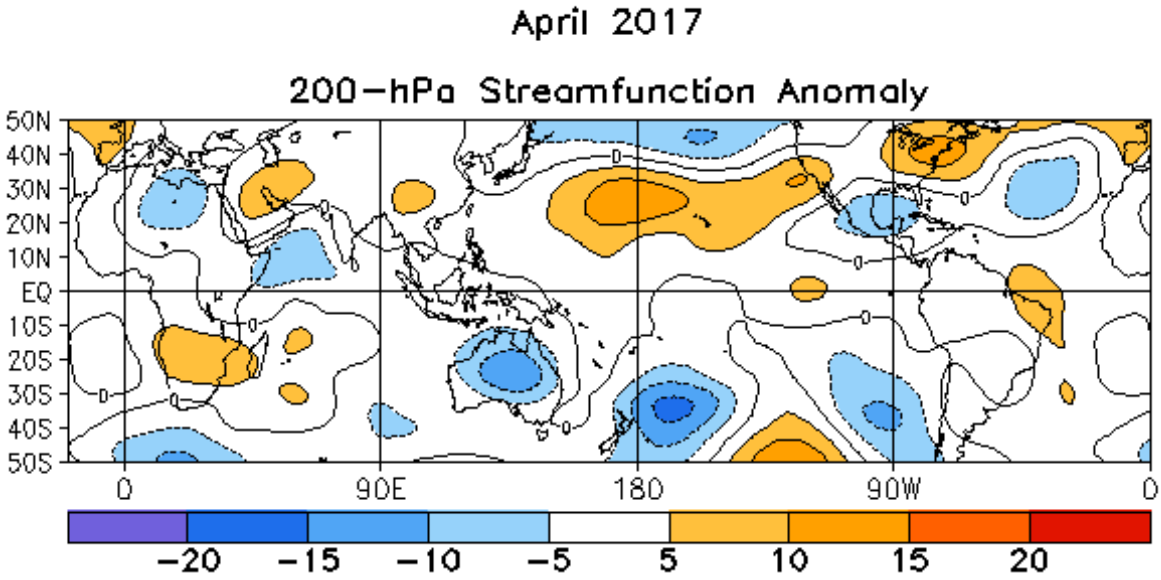


fig.I.2.2: Stream Function Anomalies at 200 hPa.
http://www.cpc.ncep.noaa.gov/products/CDB/Tropics/figt22.shtml

Geopotential height at 500 hPa (fig.1.2.3 – insight into mid-latitude general circulation):

- Unusual conditions over Europe in April. Strong positive anomaly area centre off the coast of Ireland and extended to the Near Atlantic and Western Europe. Conversely, negative anomaly area South-west of the Azores and from Scandinavia to Russia. In this situation, the Atlantic Ridge weather regime was very favoured in April to the detriment of NAO weather regimes (NAO- and NAO+).
- Negative anomaly in Northern Pacific and positive to the North of the Strait of Bering.
- Positive anomalies in North-eastern USA and Southern of Quebec, and negative on the Northern Canada.

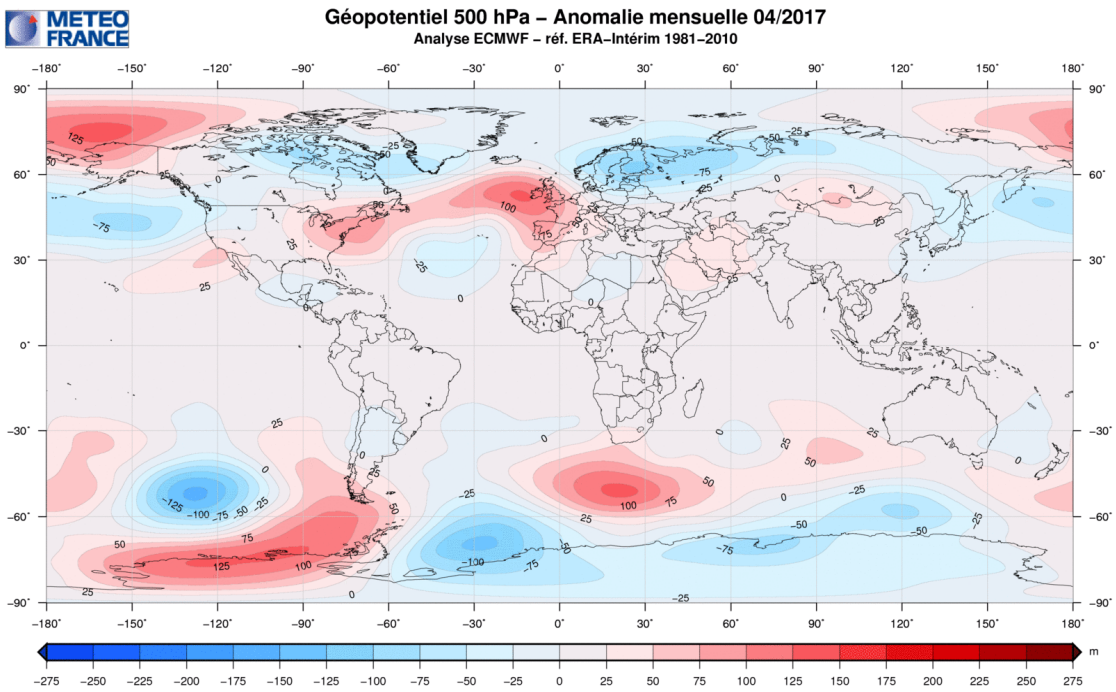


fig.I.2.3: Anomalies of Geopotential height at 500hPa (Meteo-France)

I.2.b Precipitation

- In connection with the velocity potential anomalies mentioned above, deficit of precipitation on Indian Ocean, excess over Maritime Continent. Deficit in the Pacific in the North of equator and excess of precipitation in the South.
- A new dry month in Brazil and Northern South-America, except locally on Equator and Peru coast.
- Wetter than normal in the USA.
- For Europe, dry to the West, wetter than normal on Eastern Europe and Russia.

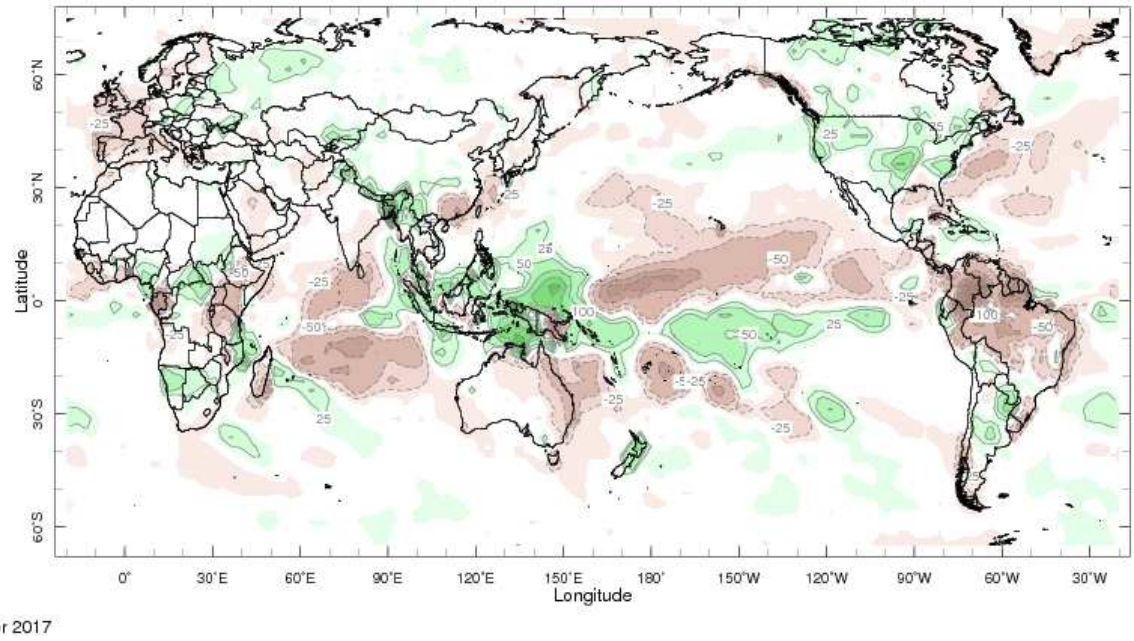


fig.I.2.6: Rainfall Anomalies (mm) (departure to the 1979-2000 normal) – Green corresponds to above normal rainfall while brown indicates below normal rainfall. http://iridl.ldeo.columbia.edu/maproom/.Global/.Precipitation/Anomaly.html

I.2.c Temperature

- Globally April was warmer than 1981-2010 normal of 0.51°C. That is the second highest value behind 2016. (https://climate.copernicus.eu/resources/data-analysis/average-surface-air-temperature-analysis/monthly-maps/april-2017)
- Warm anomalies on the North Pole, on Siberia, Mongolia and a part of China. And from India to Iran and Eastern Africa. Warm anomaly on East of the USA.
- Cold anomalies on Greenland, Canada and Western USA, on Southern South-America and Australia.

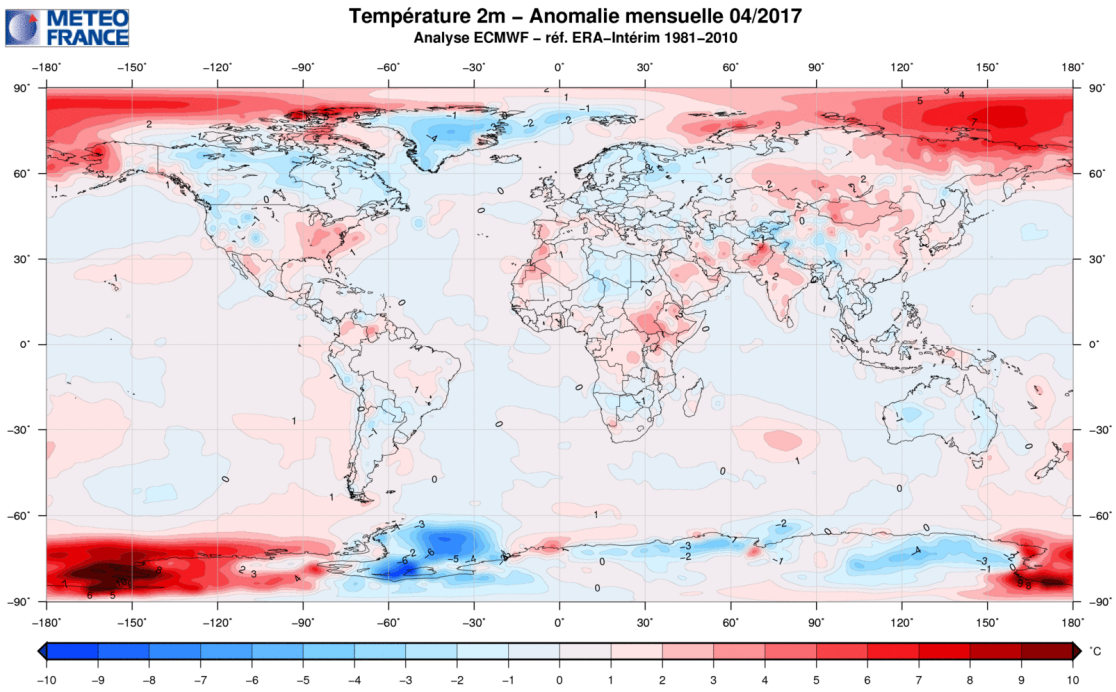


fig.I.2.9: Temperature Anomalies (°C) (Meteo-France)

I.2.d Sea ice

In April, sea ice extent in Arctic, stay at record level of 2016, while in Antarctic, there is a downfall in the extent with a very low level in a context which suddenly changed two years ago (see figure 1.2.13).

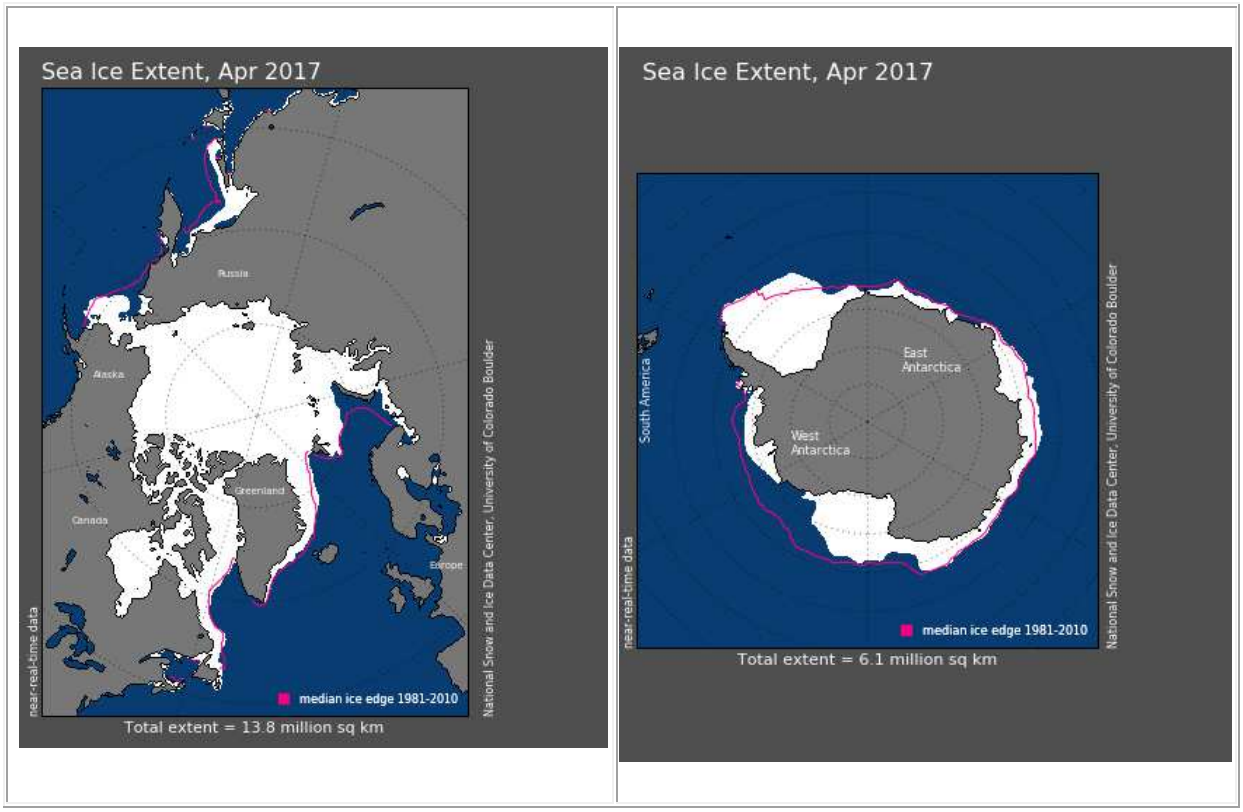


fig.I.2.11: Sea-Ice extension in Arctic (left), and in Antarctic (right). The pink line indicates the averaged extension (for the 1979-2000 period).
http://nsidc.org/data/seaice_index/

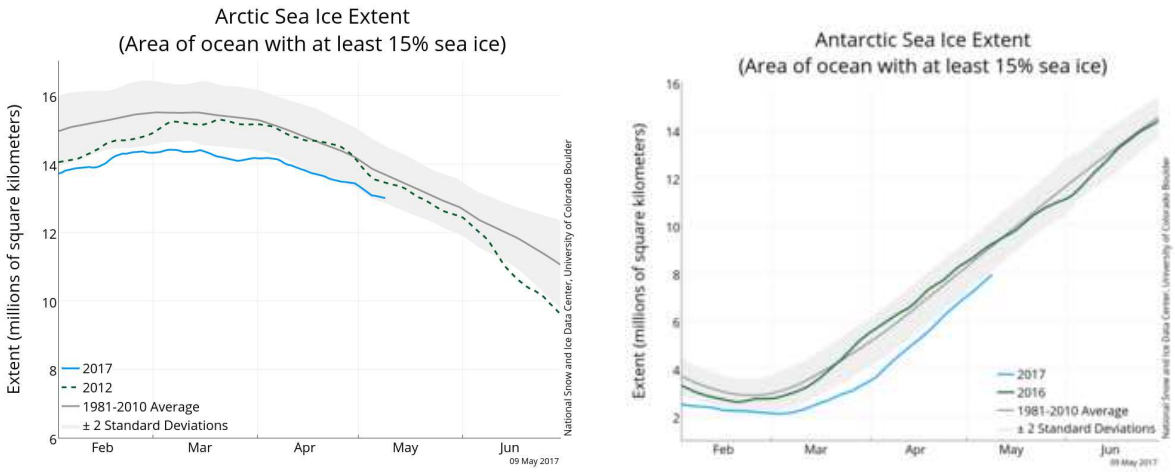


fig. I.2.12 : Sea-Ice extension evolution from NSIDC.
https://nsidc.org/data/seaice_index/images/daily_images/N_stddev_timeseries.png

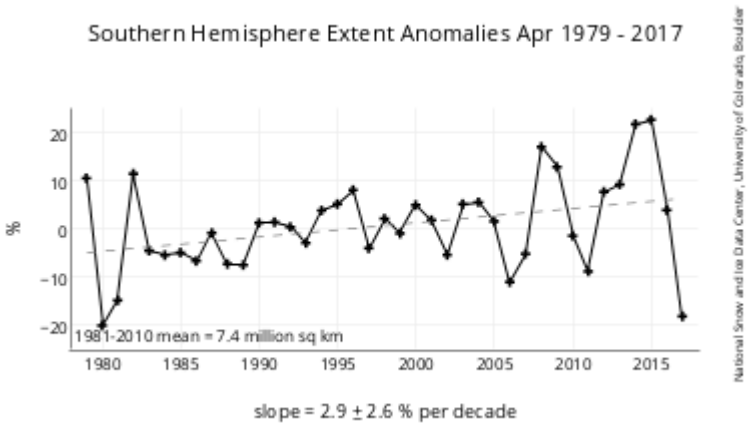


fig 1.2.13 : Monthly Sea Ice Extent Anomaly Graph in Antarctic for the month of analysis (http://nsidc.org/data/seaice_index/)