



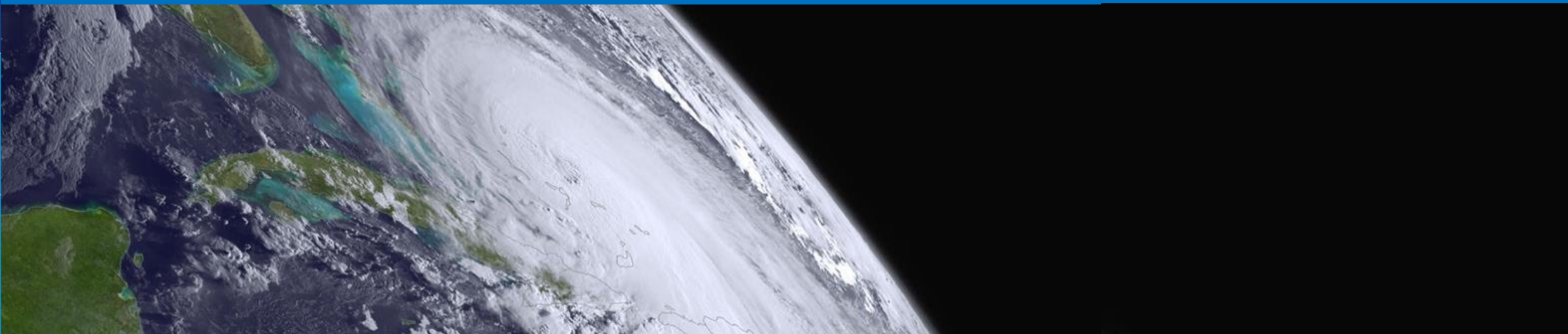
NOAA

Monthly Report of LST Anomaly

March 2024

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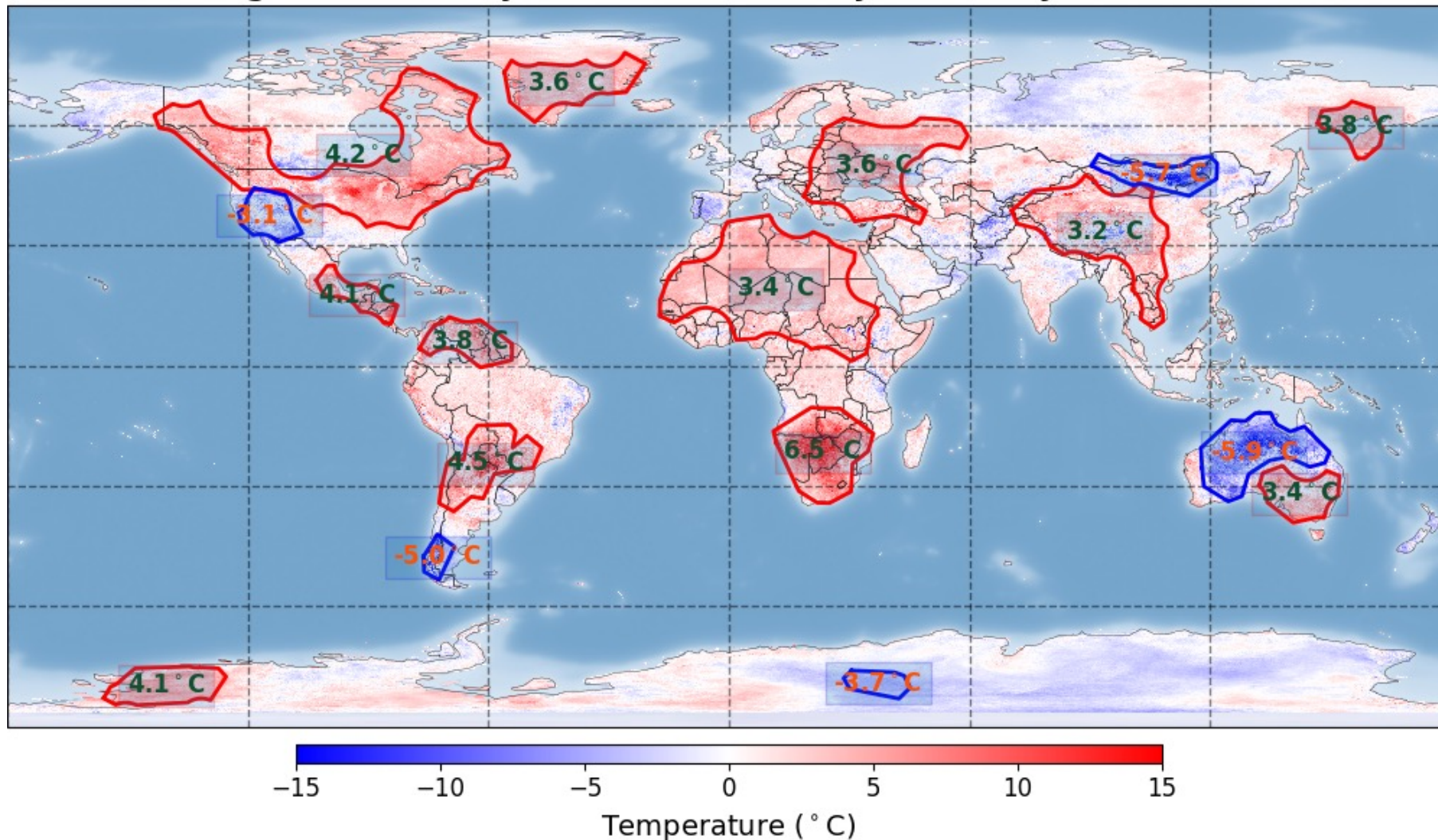
Data source: JPSS LST Product, GOES-R LST Product



Global Monthly LST Anomaly Overview: March 2024



Merged VIIRS daytime LST monthly anomaly: Mar, 2024

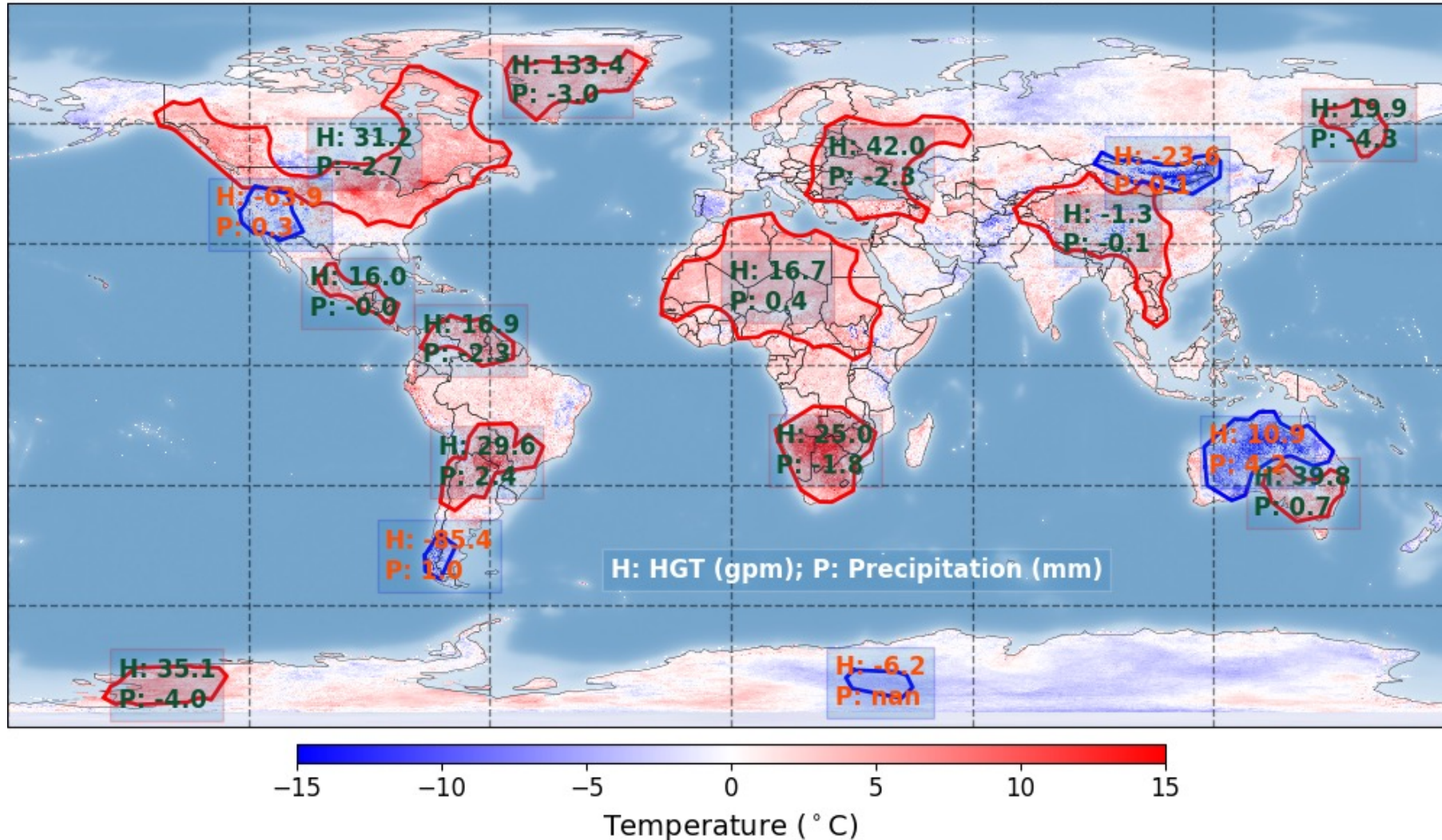


- Warm anomalies dominated most of the world's land surface, especially in Canada, Mexico, Europe, western and central China, northern and southern Africa, southwestern Australia, and the northern and central parts of South America. Notably, **South Africa** experienced the most significant temperature deviation, reaching **+6.5 °C** above average.
- In contrast, a few regions, including northwestern Australia, Mongolia, the southwestern US, and Patagonia, experienced cold anomalies, both the latter two recorded temperatures around **-6 °C** below average.

Global Monthly LST Anomaly Overview: March 2024



Merged VIIRS daytime LST monthly anomaly: Mar, 2024

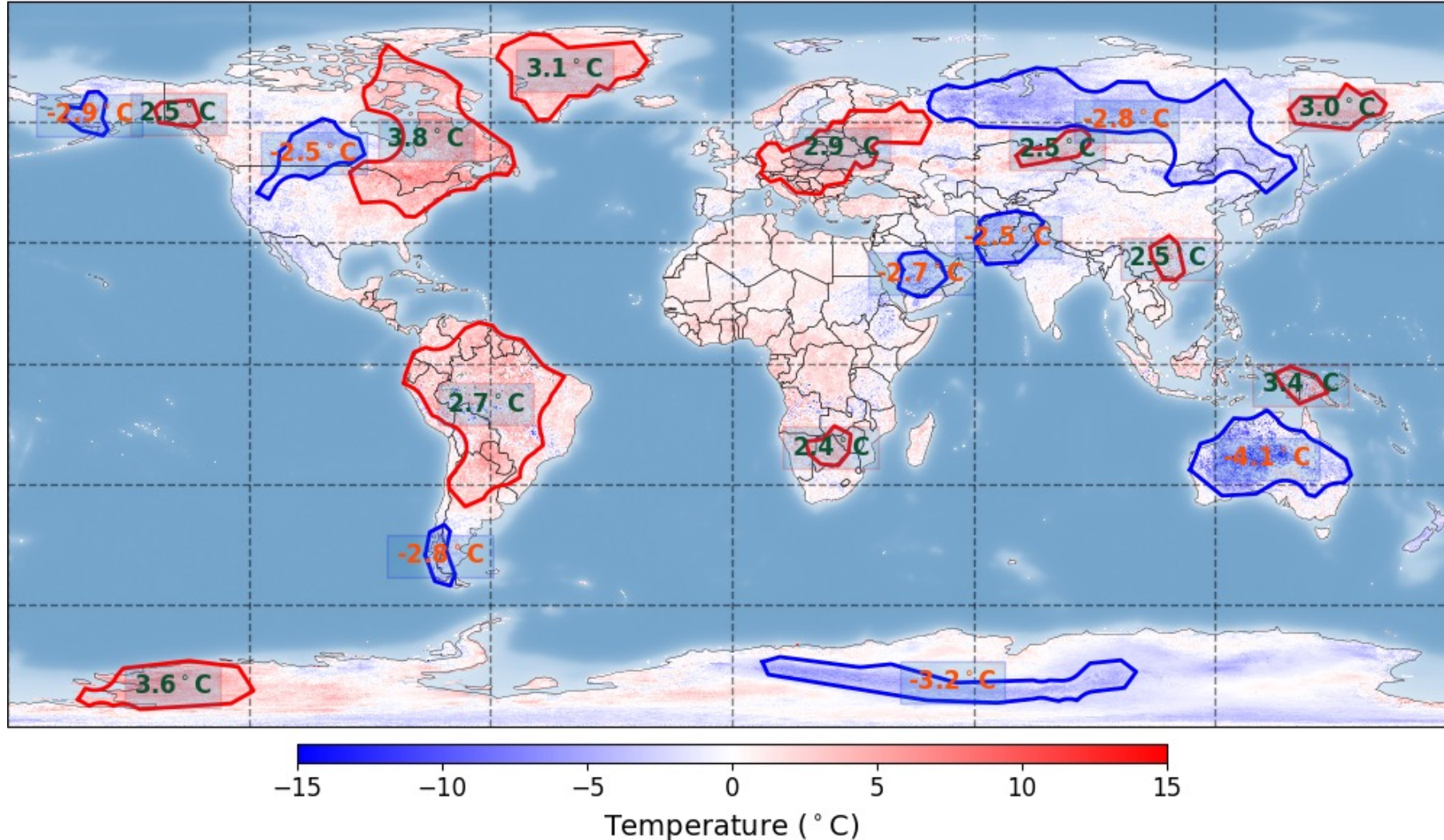


- High-pressure anomalies are a significant driver of most heat events. However, in western and central China, a unique interaction occurs where a high-pressure anomaly collides with a low-pressure anomaly, making the correlation between high-pressure anomaly and positive LST anomaly in this region appear unusual.
- The significant cold events generally correspond well with low-pressure anomalies. However, the one in northwestern Australia cannot be explained by the 500 mb geopotential anomalies. Nonetheless, the higher-than-normal precipitation is likely an important factor.

Global Monthly LST Anomaly Overview: March 2024



Merged VIIRS nighttime LST monthly anomaly: Mar, 2024

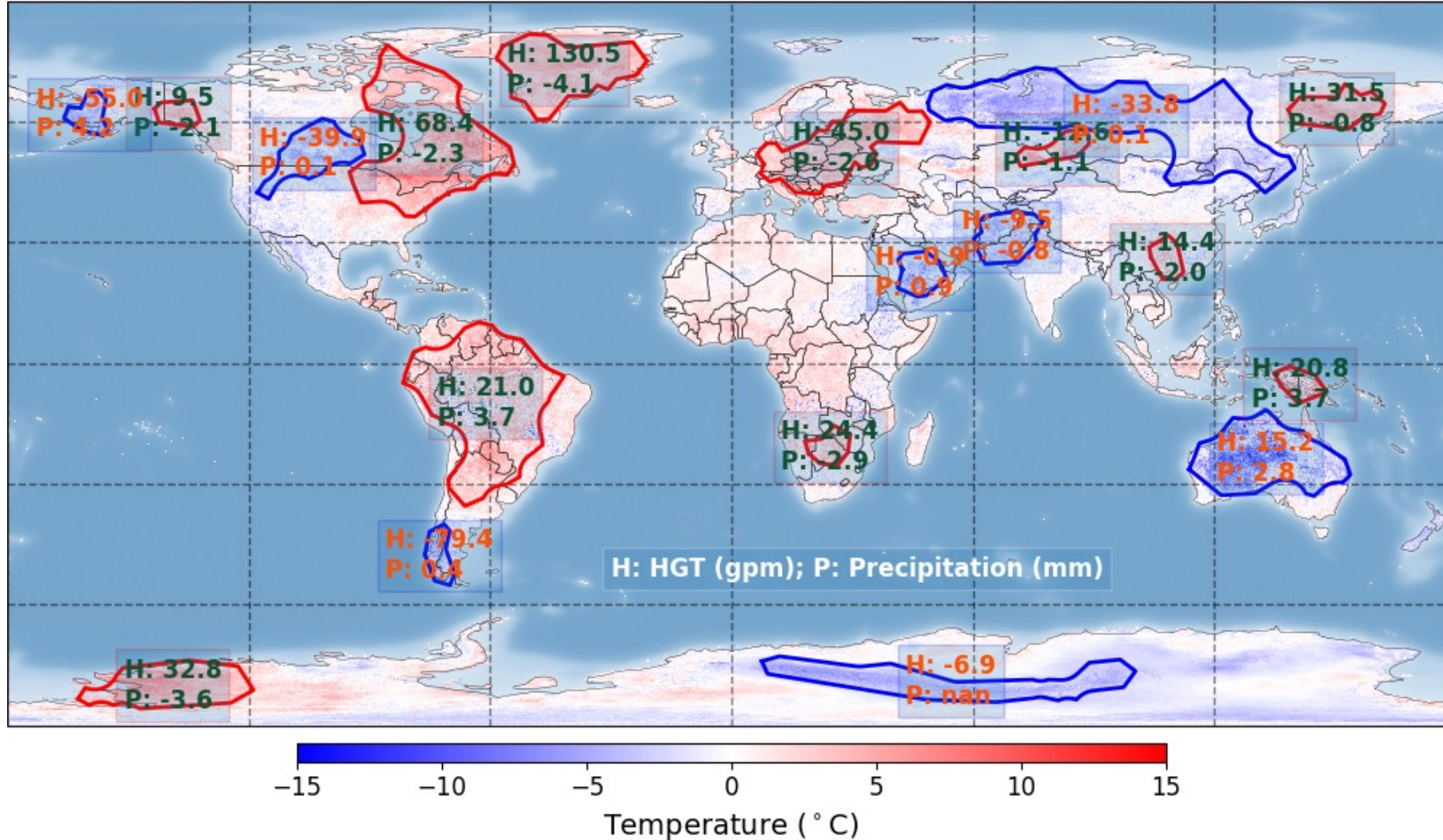


- In the nighttime land LST anomaly image, cold anomalies become more prominent and expand to larger areas, while warm anomalies either shrink or become less apparent.
- Warm anomalies in northern and central South America merge into a larger coverage, encompassing a more significant portion of the continent. Those observed in Mexico, northern Africa, western and central China, and southeastern Australia are not apparent during nighttime hours.
- Compared to daytime observations, the cold anomaly over Mongolia expands northward and covers a larger area during nighttime hours.

Global Monthly LST Anomaly Overview: March 2024



Merged VIIRS nighttime LST monthly anomaly: Mar, 2024



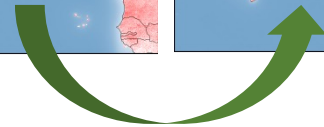
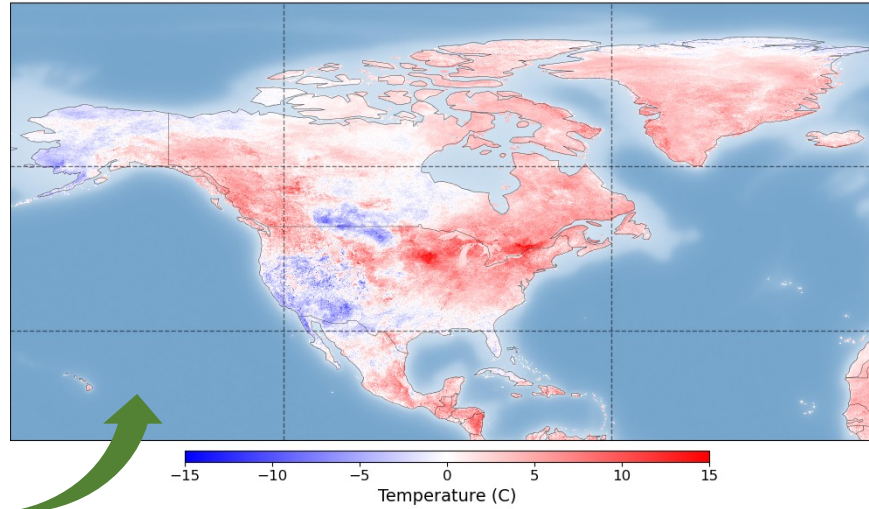
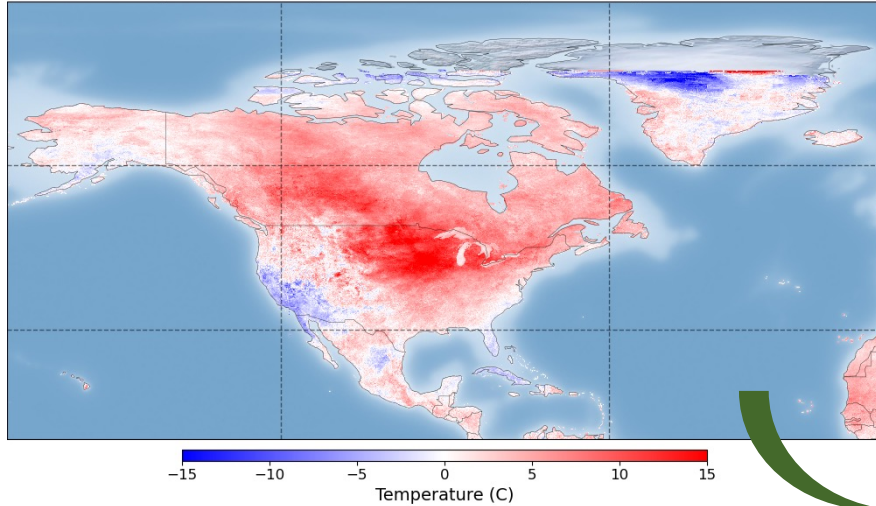
- Good correspondence between temperature and pressure anomalies is commonly observed during nighttime, and this month is no exception. All major events can be explained by the geopotential height anomalies, except for the cold anomaly in Northwestern Australia, which occurs alongside higher precipitation observed this month.

North America LST Anomaly: March 2024



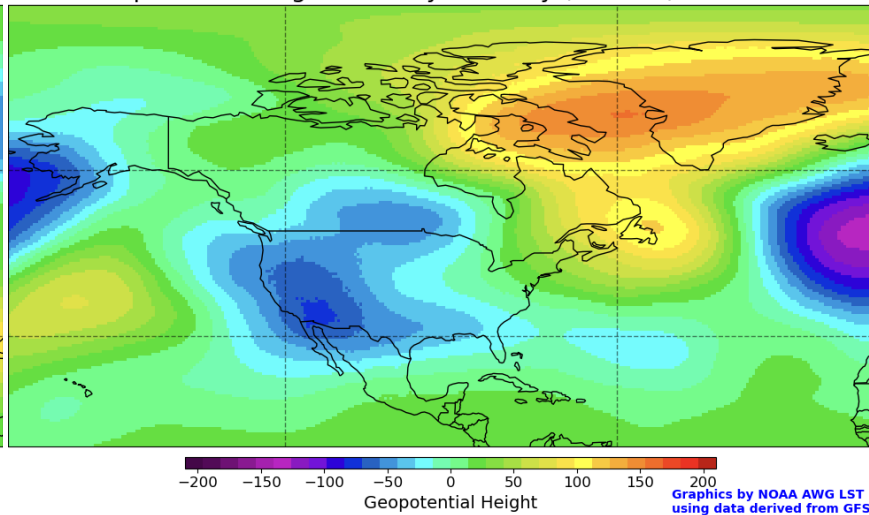
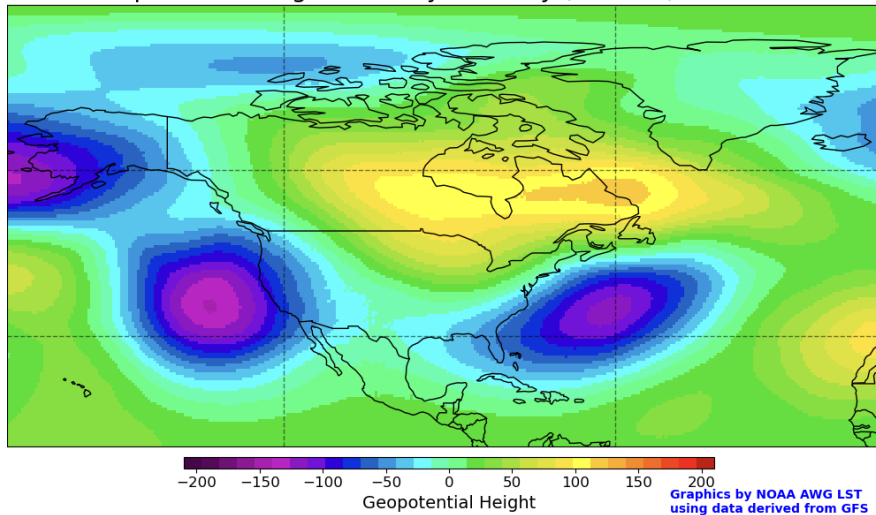
Merged VIIRS daytime LST monthly anomaly: Feb, 2024

Merged VIIRS daytime LST monthly anomaly: Mar, 2024



Geopotential Height monthly anomaly (500 mb): Feb, 2024

Geopotential Height monthly anomaly (500 mb): Mar, 2024

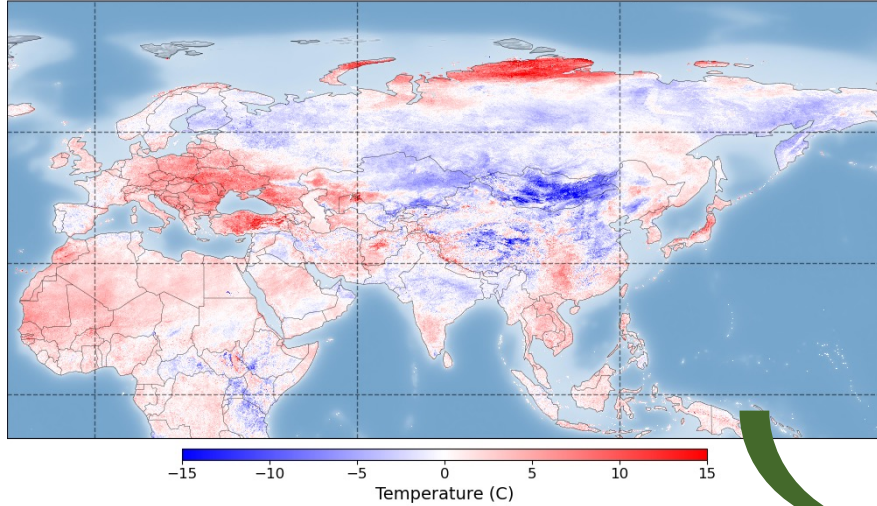


- Compared to February, most of the continent experienced cooling, though the main theme remains warmer than average, coinciding with the northeastward movement of high-pressure anomalies.
- Central America and Greenland warmed up during March.
- A localized cold anomaly developed along the western coast of the US in February. This anomaly primarily impacted the state of California and exhibited a northeasterly expansion in March.

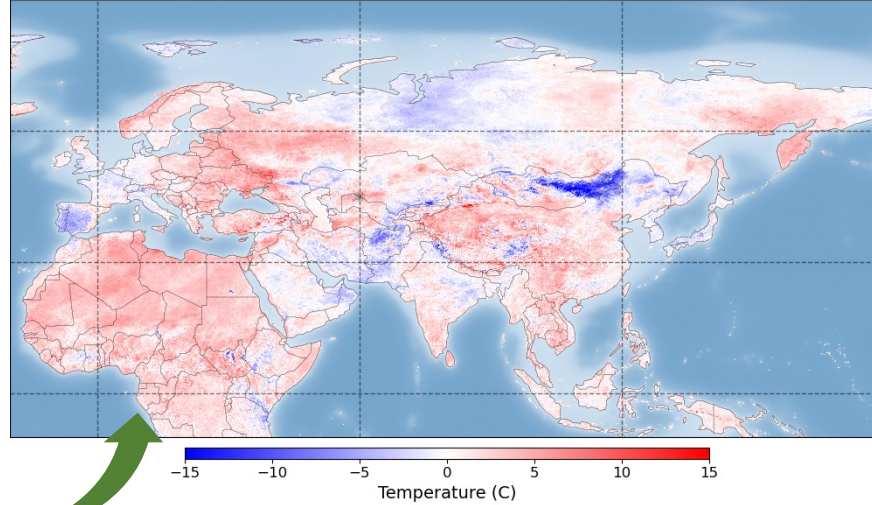
Europe and Asia LST Anomaly: March 2024



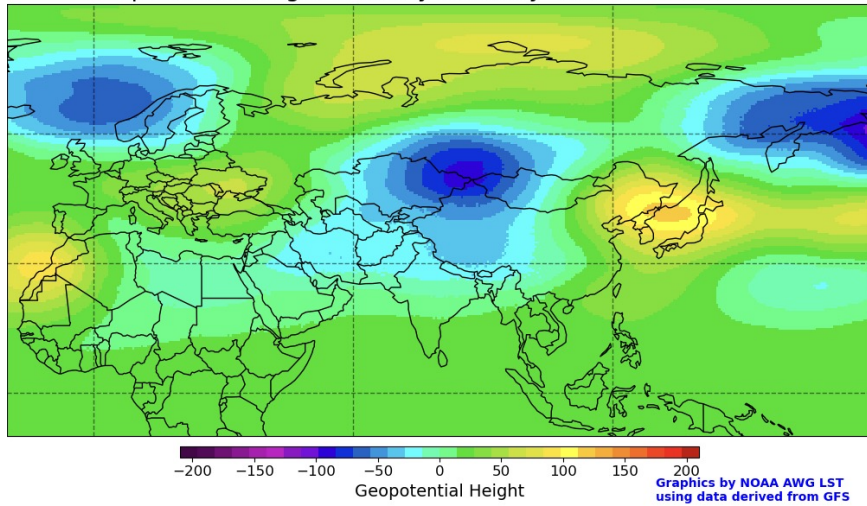
Merged VIIRS daytime LST monthly anomaly: Feb, 2024



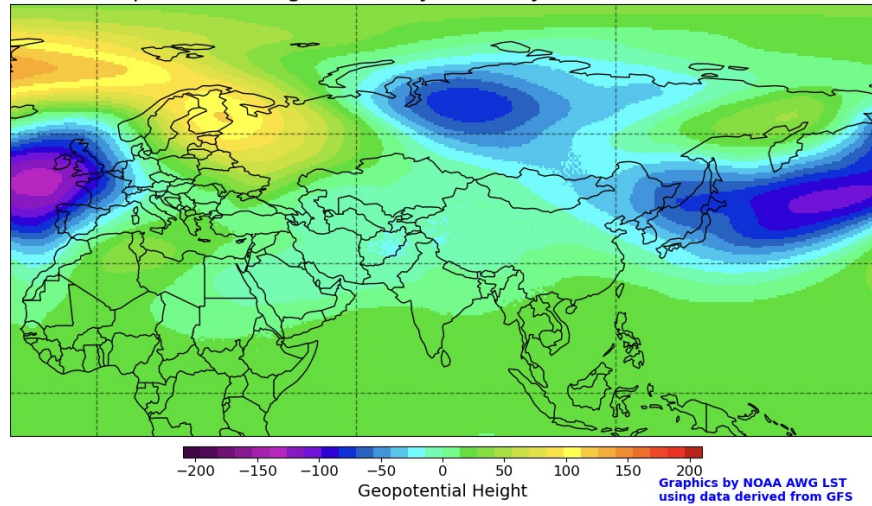
Merged VIIRS daytime LST monthly anomaly: Mar, 2024



Geopotential Height monthly anomaly (500 mb): Feb, 2024

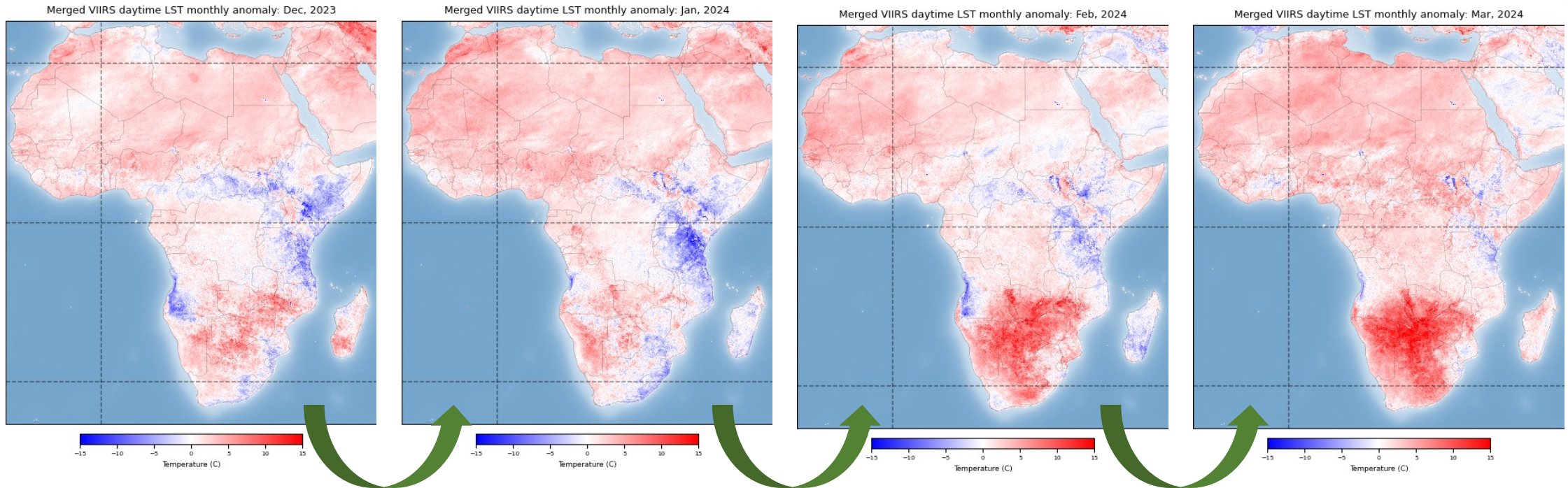


Geopotential Height monthly anomaly (500 mb): Mar, 2024



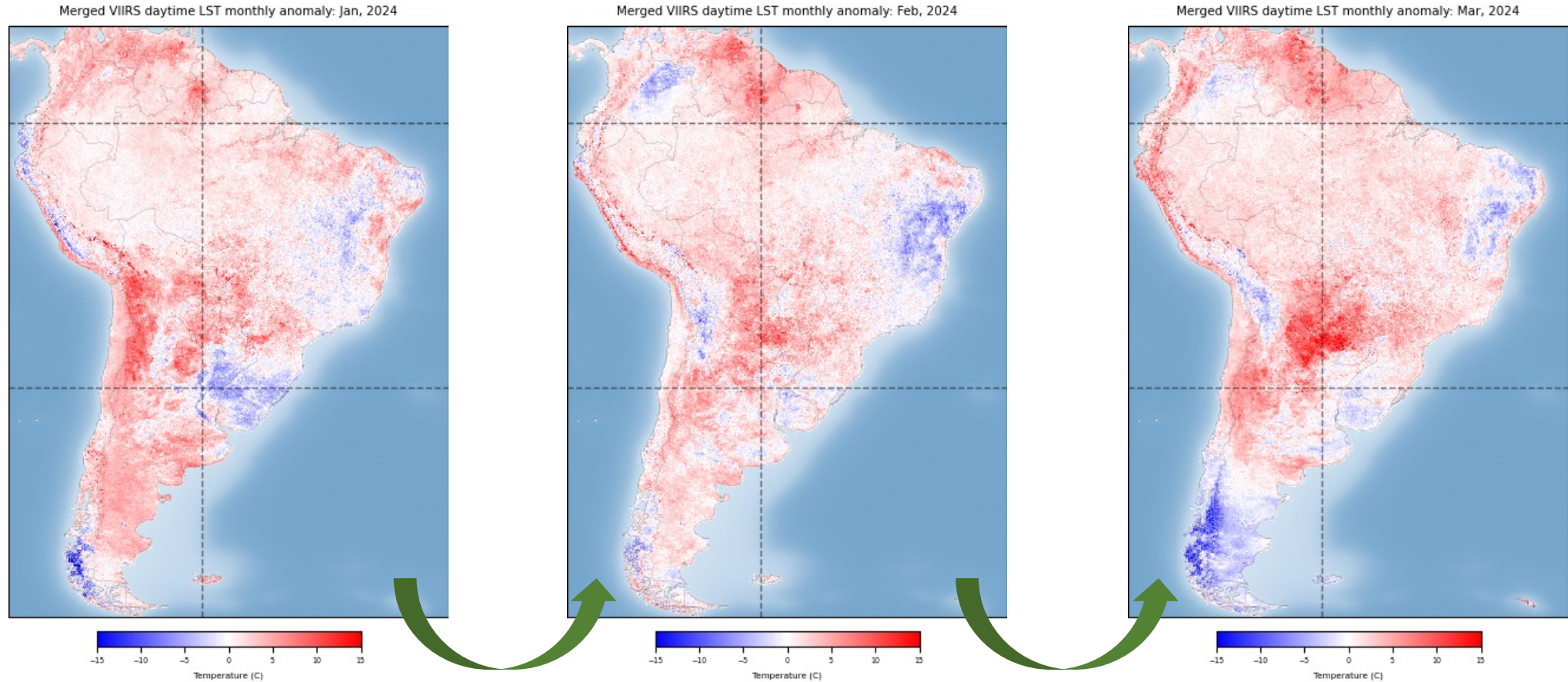
- The low-pressure system continued its eastward and northward movement, leading to a transition to a warm phase in both Europe and Asia to their periphery regions;
- The heatwave affecting the Mediterranean countries expanded to encompass a larger area, though with reduced intensity.
- The warm conditions observed in western and central China spread northwestward.

Africa LST Anomaly: March 2024



- Africa had another month marked by above-average temperatures, continuing a trend that has persisted throughout the entire year. Most of the continent experienced higher-than-normal temperatures, contributing to the overall warmth. Its southern tip was **+6.5 °C** higher than average in March, following a **+5.7 °C** higher in February,
- The Sahel region, while experiencing a lower intensity of warm anomaly, still brought about extreme heat conditions due to its higher reference temperature (climatology). According to [reports](#) from The Watchers, thousands of high-temperature records were broken across Africa.

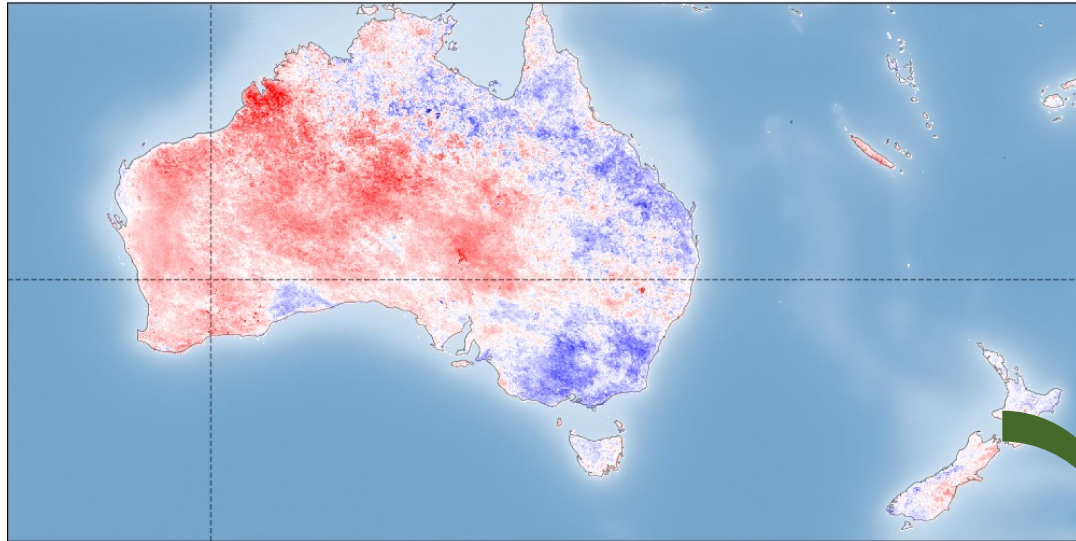
South America LST Anomaly: March 2024



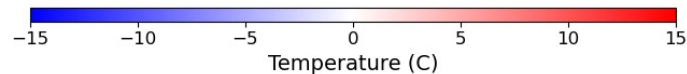
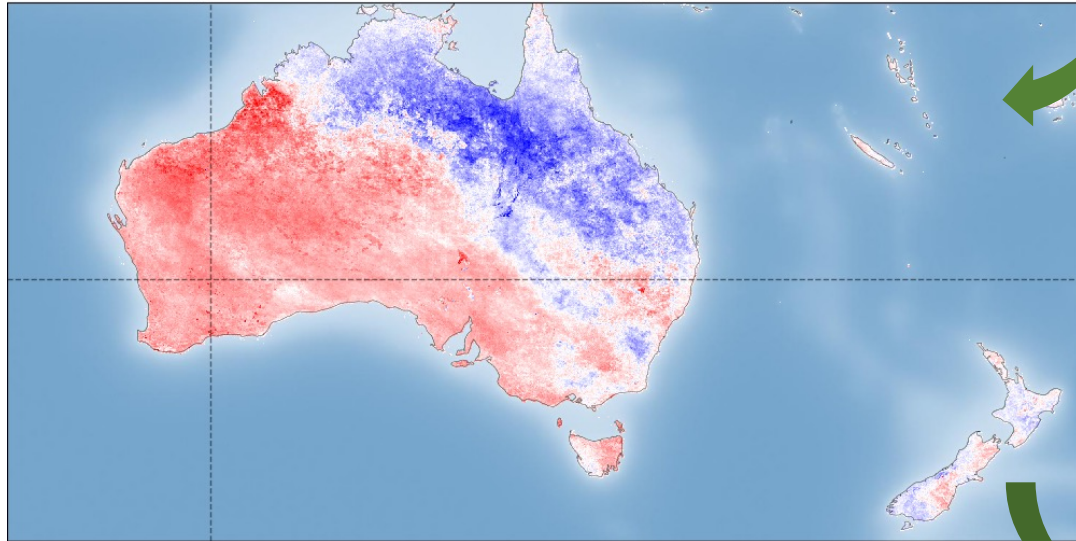
- Across South America, notably in Central South America, a persistent warm anomaly characterized the prevailing temperature patterns.
- The cold anomaly in eastern Brazil stayed;
- The cold anomaly along the east coast at the southern tip of the continent developed and extended further north.



Merged VIIRS daytime LST monthly anomaly: Jan, 2024



Merged VIIRS daytime LST monthly anomaly: Feb, 2024

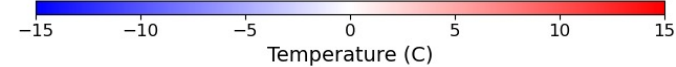
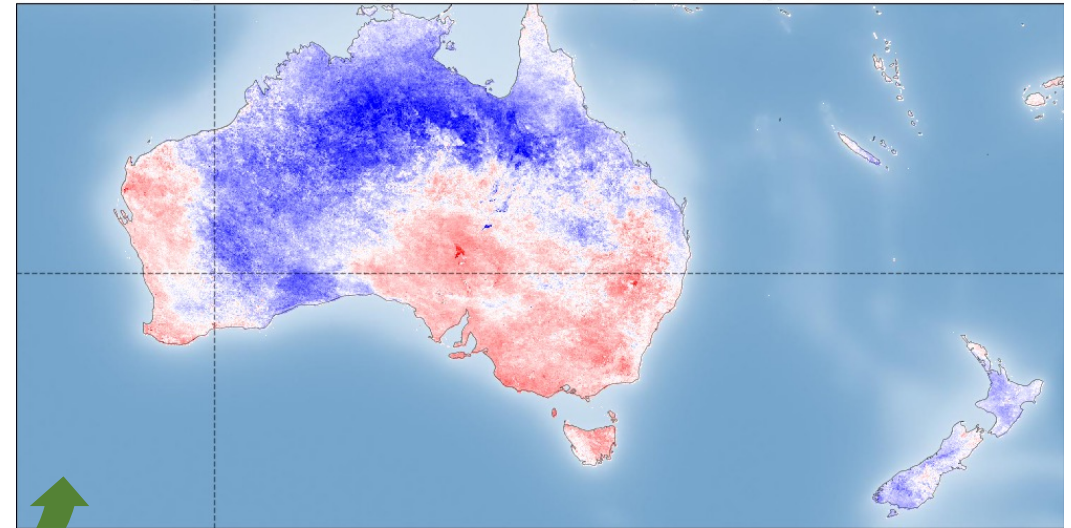


Australia LST Anomaly: March 2024



- The situation in Australia had significant changes compared to the previous two month.
- The cold anomaly in the northeast of the country intensified and expanded during this month. It extended southwestward.
- The southeast of the country remained warmer than normal.

Merged VIIRS daytime LST monthly anomaly: Mar, 2024



Summary



- A multi-year LST climatology was generated to study impacts by extreme weather events in March 2024:
 - The monthly anomalous temperature events and corresponding geopotential height and precipitation anomalies are detected using a machine learning method.
 - Warm anomalies dominated most of the world's land surface, including Canada and Mexico, Europe, western and central China, northern and southern Africa, southwestern Australia, and the northern and central parts of South America. Notably, South Africa witnessed the most significant temperature deviation, recording values **+6.5 °C** higher than the average
 - Africa is experiencing extreme condition. According to [reports](#) from The Watchers, thousands of high-temperature records were broken across Africa.
 - Most of North America observe cooler temperatures in March relative to February, though conditions stayed anomalously warm, especially in Central America and Greenland. This shift reflects the northeastward progression of high-pressure anomalies.
 - Your feedback is welcome if you find other areas/features of your interest.
- Please visit [LPD team site](#) for more details.