



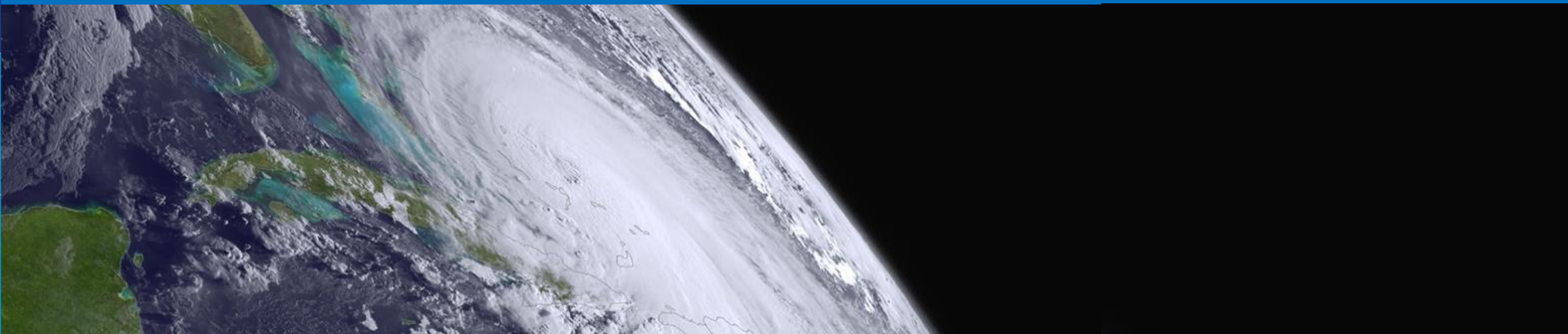
**NOAA**

# Monthly Report of LST Anomaly

## June 2024

**Authors: Peng Yu, Yunyue Yu, and Jingjing Peng**  
*Science Team of Land Surface Temperature (LST) at NESDIS/STAR*

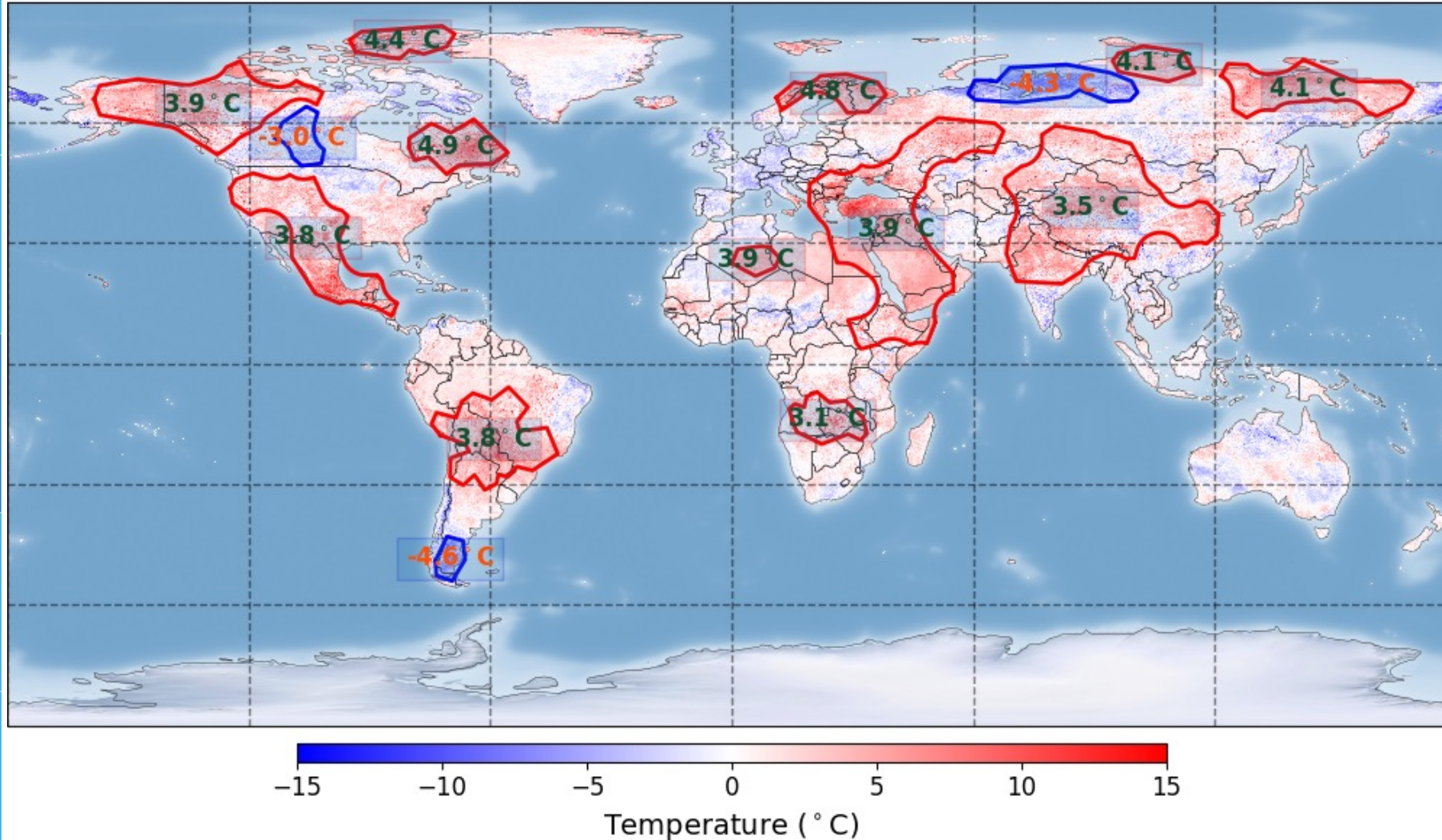
**Data source: JPSS LST Product, GOES-R LST Product**



# Global Monthly LST Anomaly Overview: June 2024



Merged VIIRS daytime LST monthly anomaly: Jun, 2024

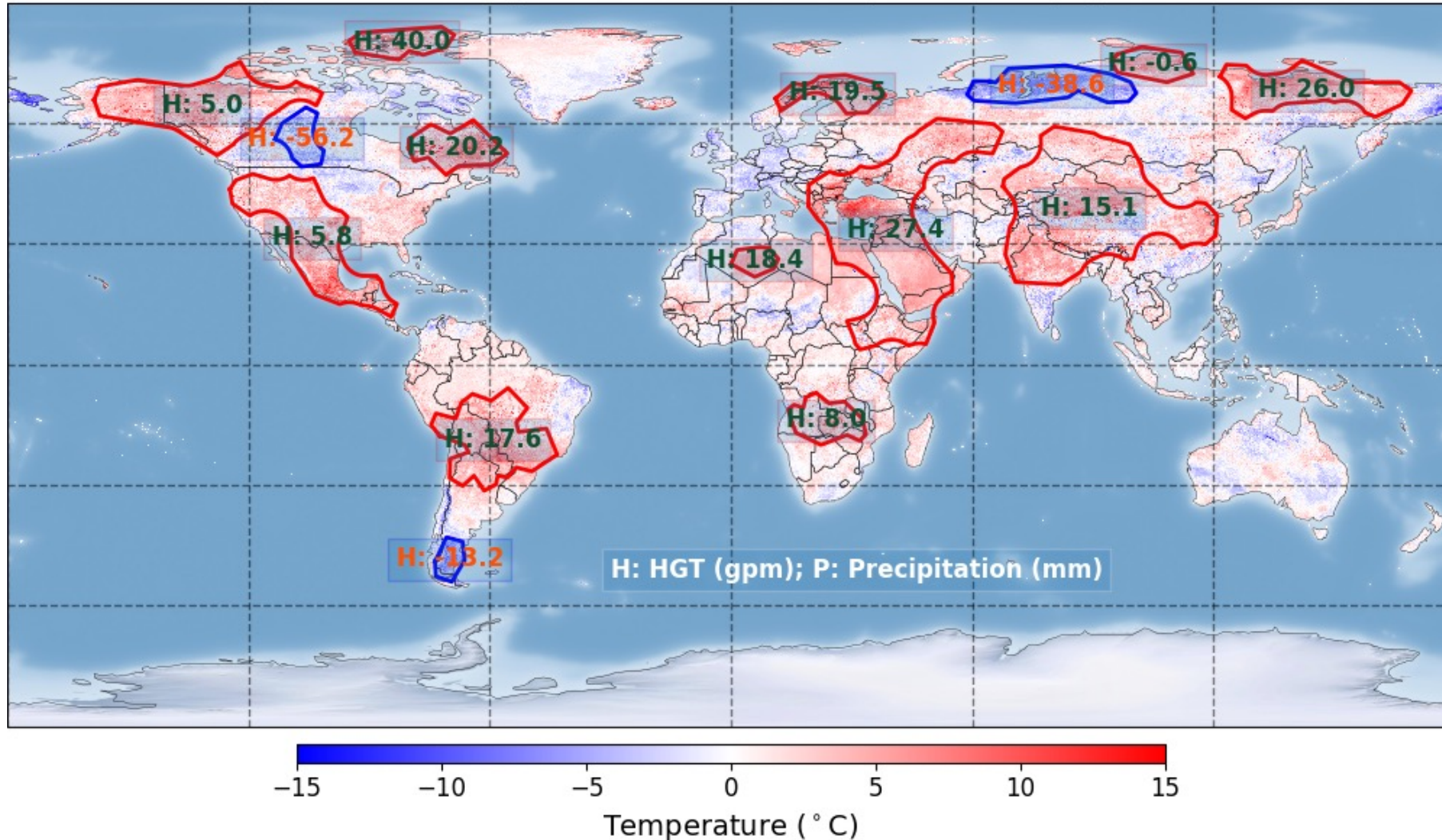


- As in the past year, warm anomalies remain the main theme throughout the globe (1, 2).
- A few cold anomalies are observed Central Canada, the southern tip of South America, and northeastern Russia.
- Compared to the previous month, the large hot anomalies occupying a majority of Asia have separated. Northern India still experiences a significant impact from hot anomalies. The large cold anomaly has retreated northward, significantly reducing its spatial coverage. A few smaller pockets of warmth in Europe and Africa have merged together.
- As for North America, Alaska transitioned quickly from cold to warm. The heat in Canada decreased its coverage, now affecting only eastern Canada.

# Global Monthly LST Anomaly Overview: June 2024



Merged VIIRS daytime LST monthly anomaly: Jun, 2024

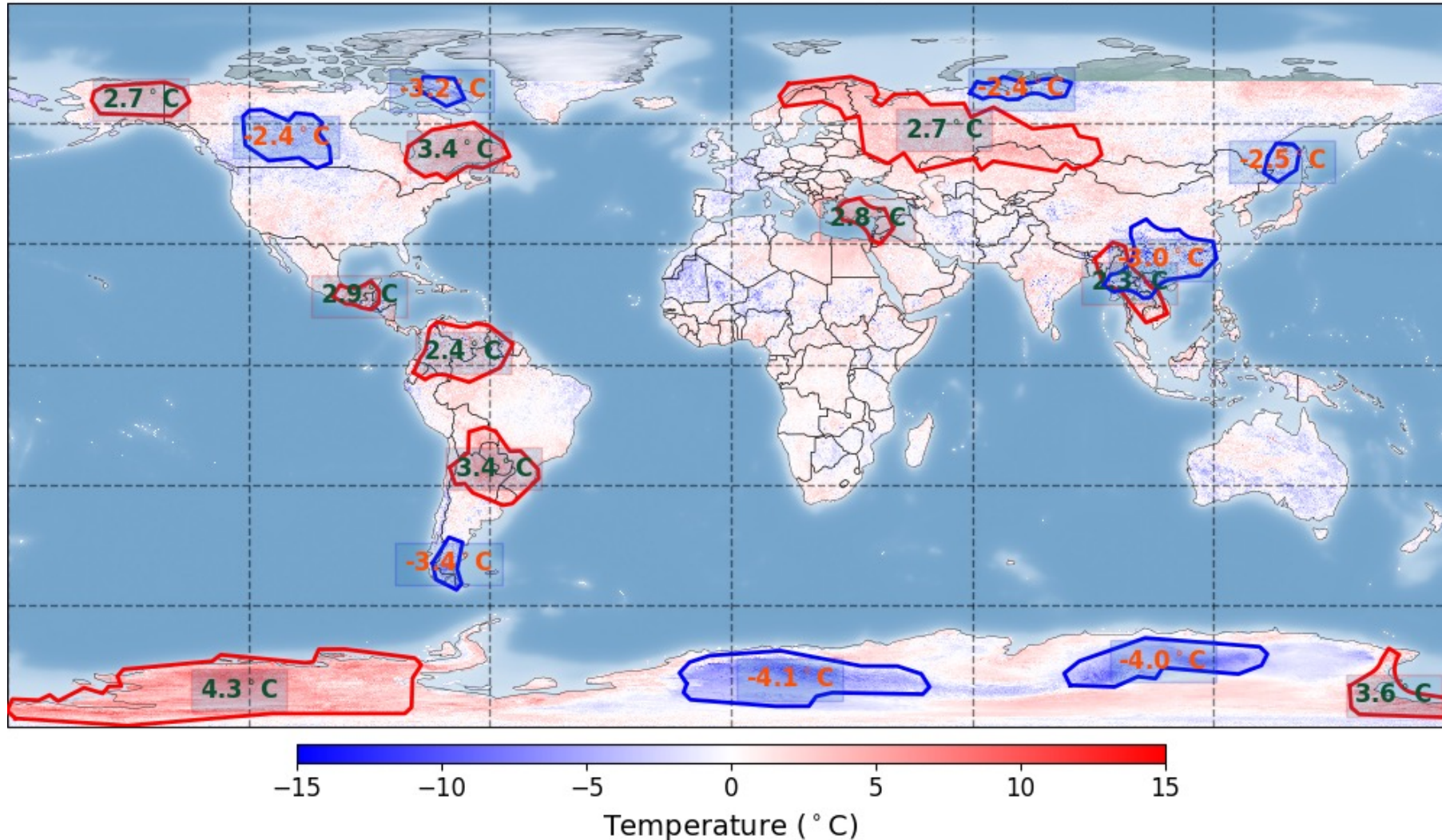


- High- and low-pressure anomalies play a key role in shaping temperature patterns around the world. This month, all significant anomalies but one followed a clear trend.
- Areas with high-pressure anomalies experienced warmer than average temperatures. Europe and Africa saw a significant warm anomaly with a high-pressure anomaly of around 27 gpm.
- Conversely, regions with strong low-pressure anomalies witnessed colder than average temperatures.

# Global Monthly LST Anomaly Overview: June 2024



Merged VIIRS nighttime LST monthly anomaly: Jun, 2024



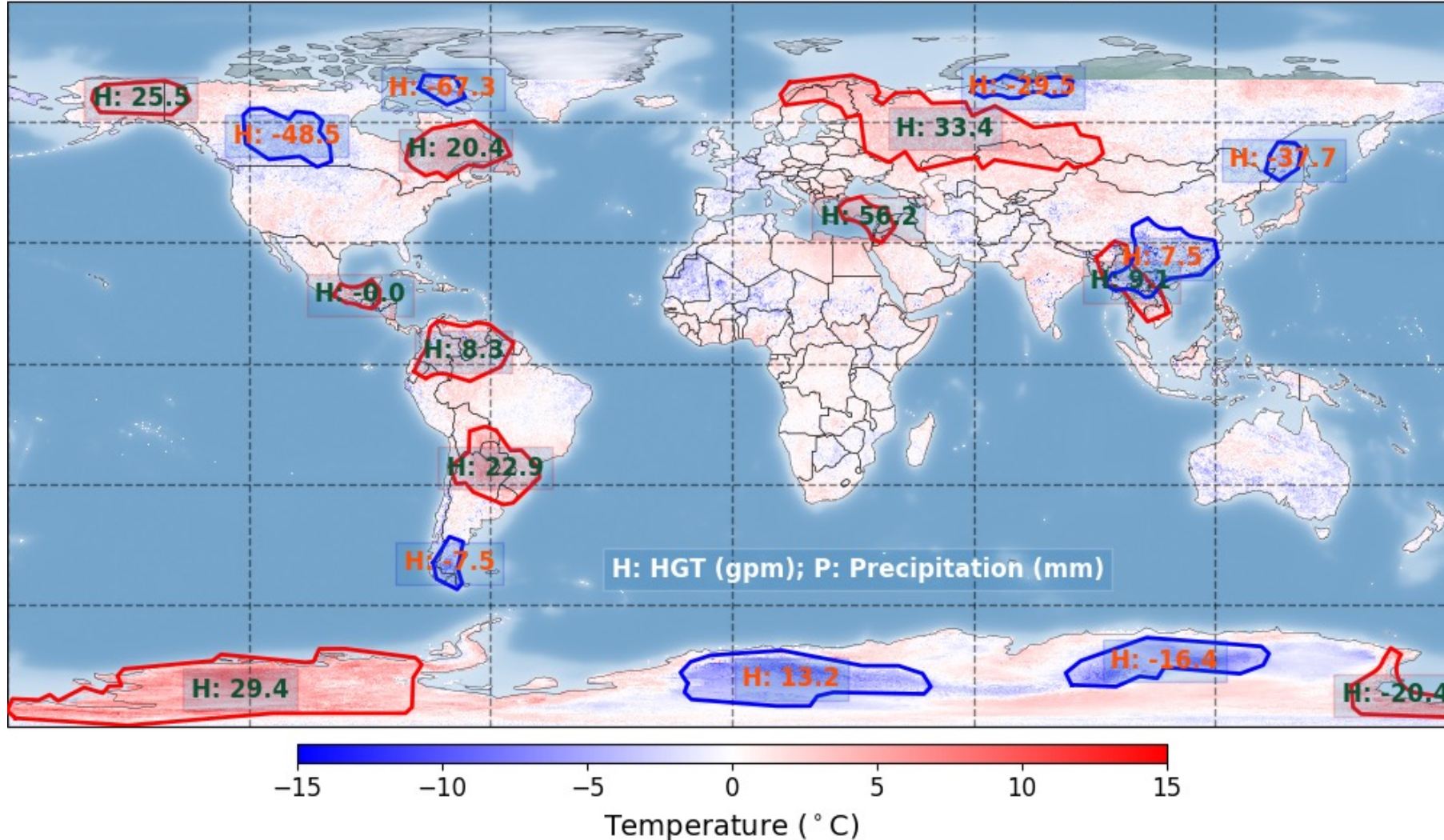
Nighttime temperature anomalies present a clear contrast to their daytime counterparts this month. Compared to daytime highs, nighttime anomalies are generally weaker with a smaller spatial footprint.

- The most significant feature is the extensive warm zone stretching from northern Europe to Central Asia.
- Heat conditions in both northern India and most of Mexico experience significant relaxation during the nighttime hours.
- Neutral conditions dominate the global nighttime temperature picture, with less extreme anomalies compared to daytime.

# Global Monthly LST Anomaly Overview: June 2024



Merged VIIRS nighttime LST monthly anomaly: Jun, 2024



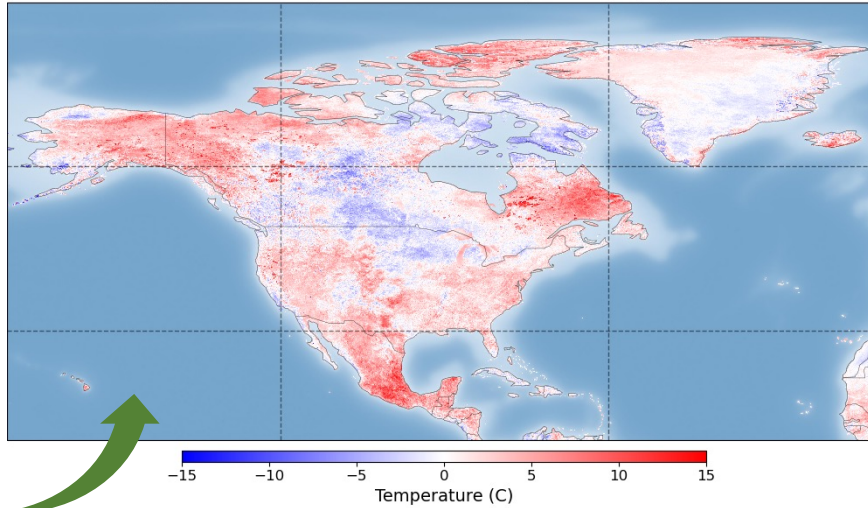
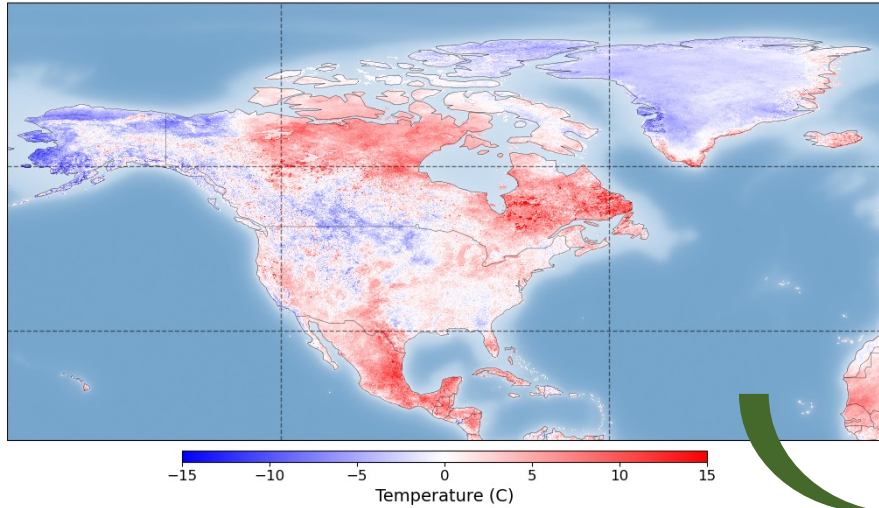
- Data confirms a strong correlation between pressure anomalies and temperature extremes this month. As expected, most major anomalies align: high pressure coincides with warm anomalies, while low pressure is associated with colder temperatures.
- The most significant positive pressure anomaly, reaching **56.2** gpm, was observed over the Balkan peninsula, likely contributing to the regional warmth. Conversely, the strongest negative pressure anomaly, measured at **-67.3** gpm near the North Pole, coincides with the cold temperatures in that area.

# North America LST Anomaly: June 2024



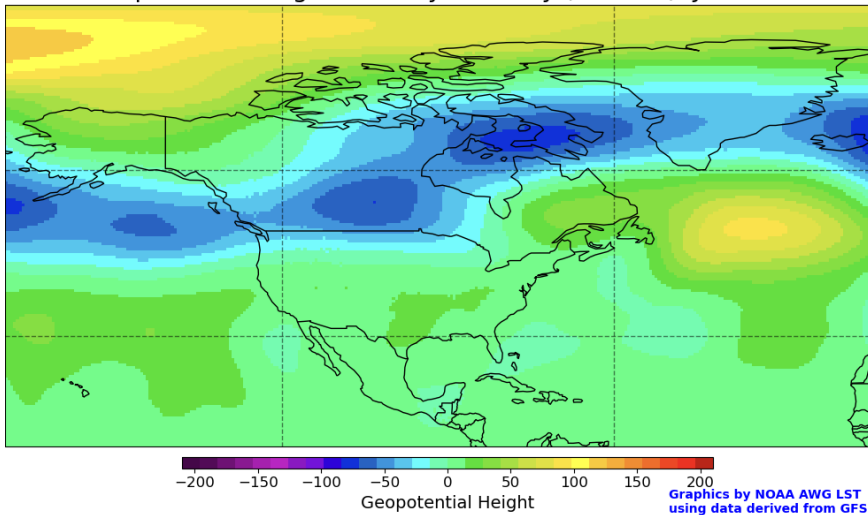
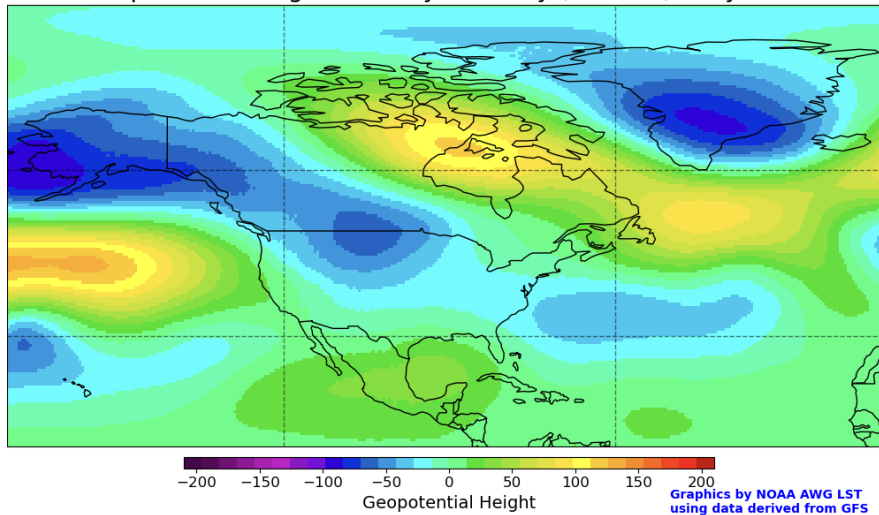
Merged VIIRS daytime LST monthly anomaly: May, 2024

Merged VIIRS daytime LST monthly anomaly: Jun, 2024



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

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

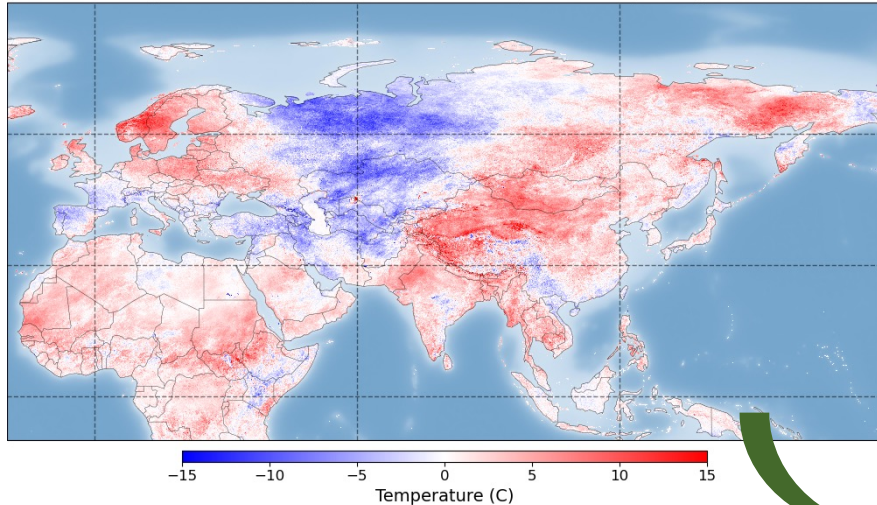


- The evolution of pressure anomalies significantly altered the temperature distribution, particularly between 50° and 70° latitude. A zonal low anomaly belt emerged in this region, impacting temperature patterns.
- Eastern Canada retained its warmth, but the heat shifted westward in its northern regions. This shift resulted in a cooling trend across northern Canada, while [Alaska](#) transitioned from cold to warm.
- The cold anomaly in the Pacific Northwest expanded eastward, reaching further inland.
- Despite these changes, the majority of [Mexico](#) and [the US west coast](#) remained warmer than usual.

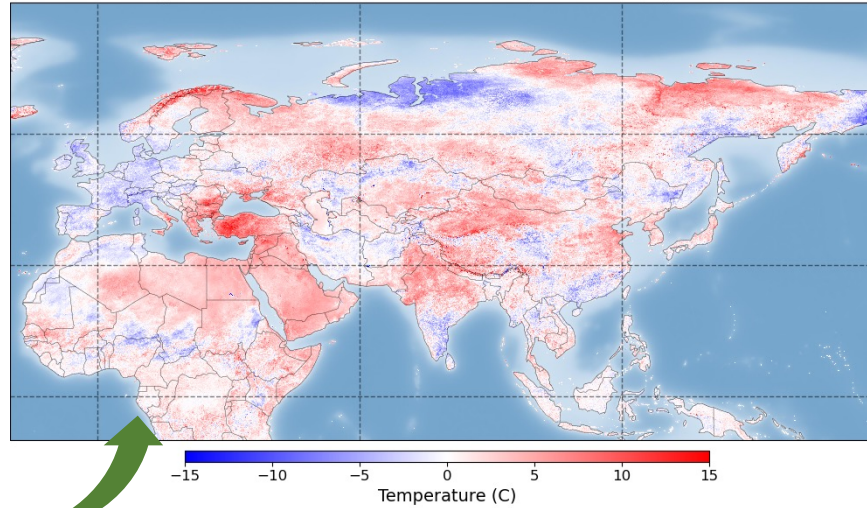
# Europe and Asia LST Anomaly: June 2024



Merged VIIRS daytime LST monthly anomaly: May, 2024

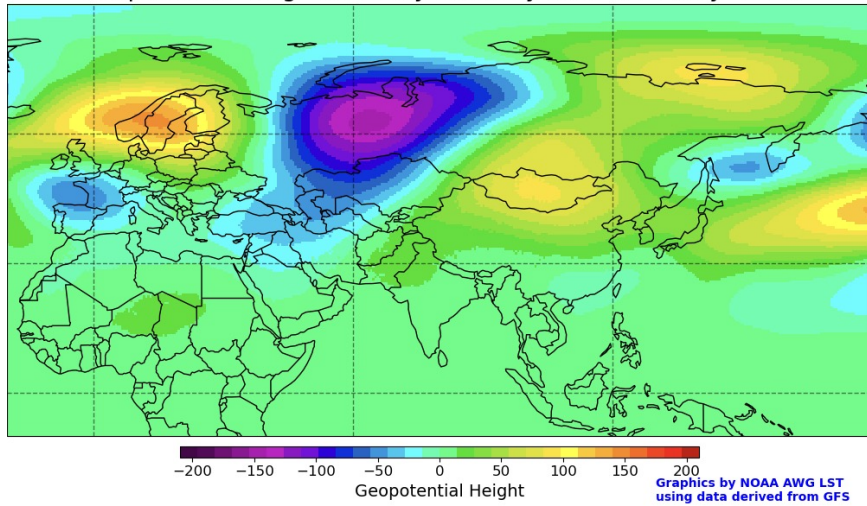


Merged VIIRS daytime LST monthly anomaly: Jun, 2024

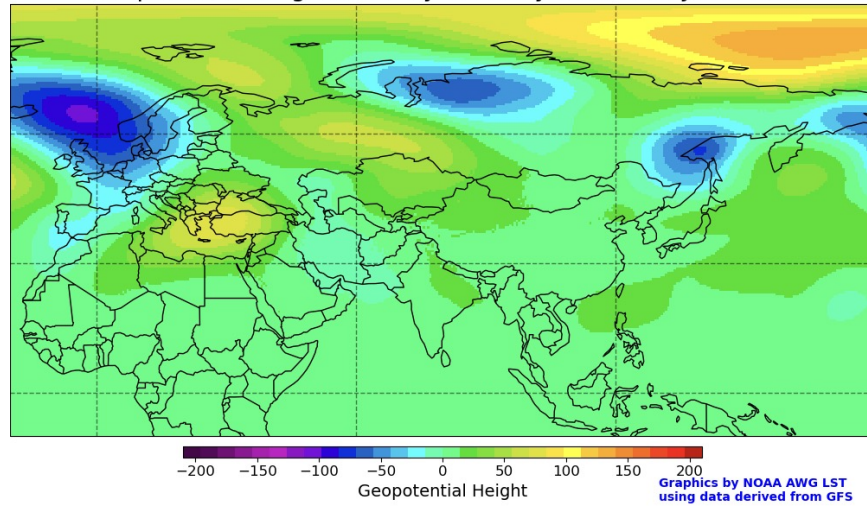


- Pressure anomaly intensities were much weaker in June than May, leading to smaller temperature anomalies underneath.
- Compared to the previous month, the large hot anomalies occupying a majority of Asia separated.
- [Northern India](#) still experiences a significant impact from the high anomalies.
- The [Middle East](#) experienced deadly humid heat wave.
- The large cold anomaly retreated northward and significantly reduced its spatial coverage.
- A few smaller pockets of warmth in Europe and Africa merged together.

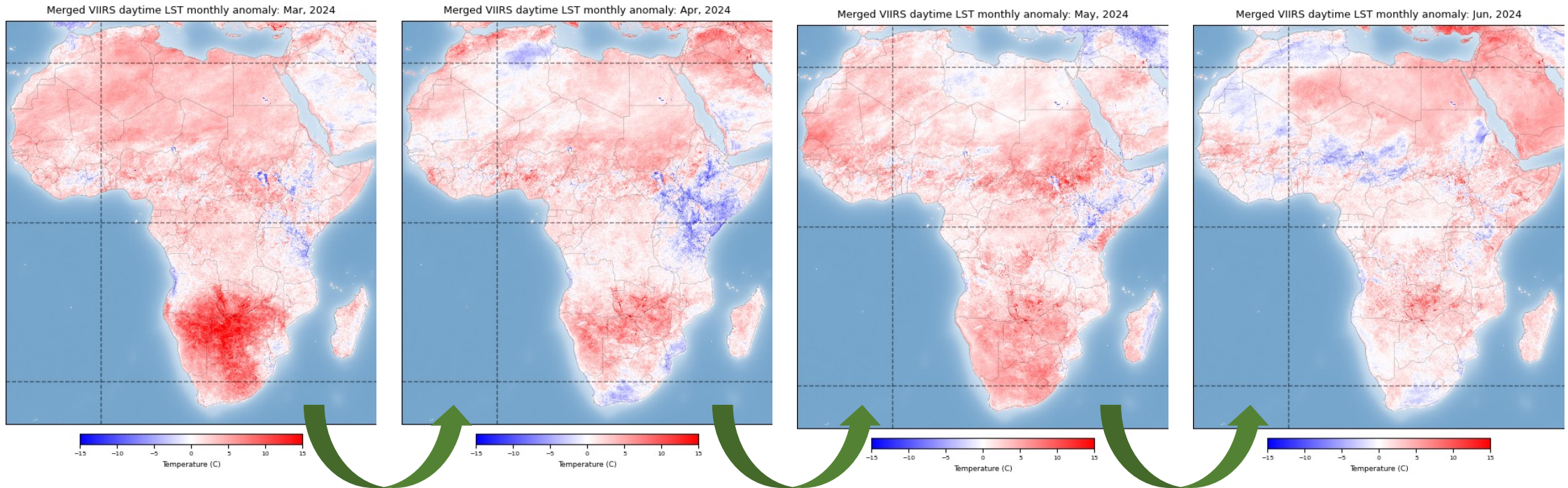
Geopotential Height monthly anomaly (500 mb): May, 2024



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



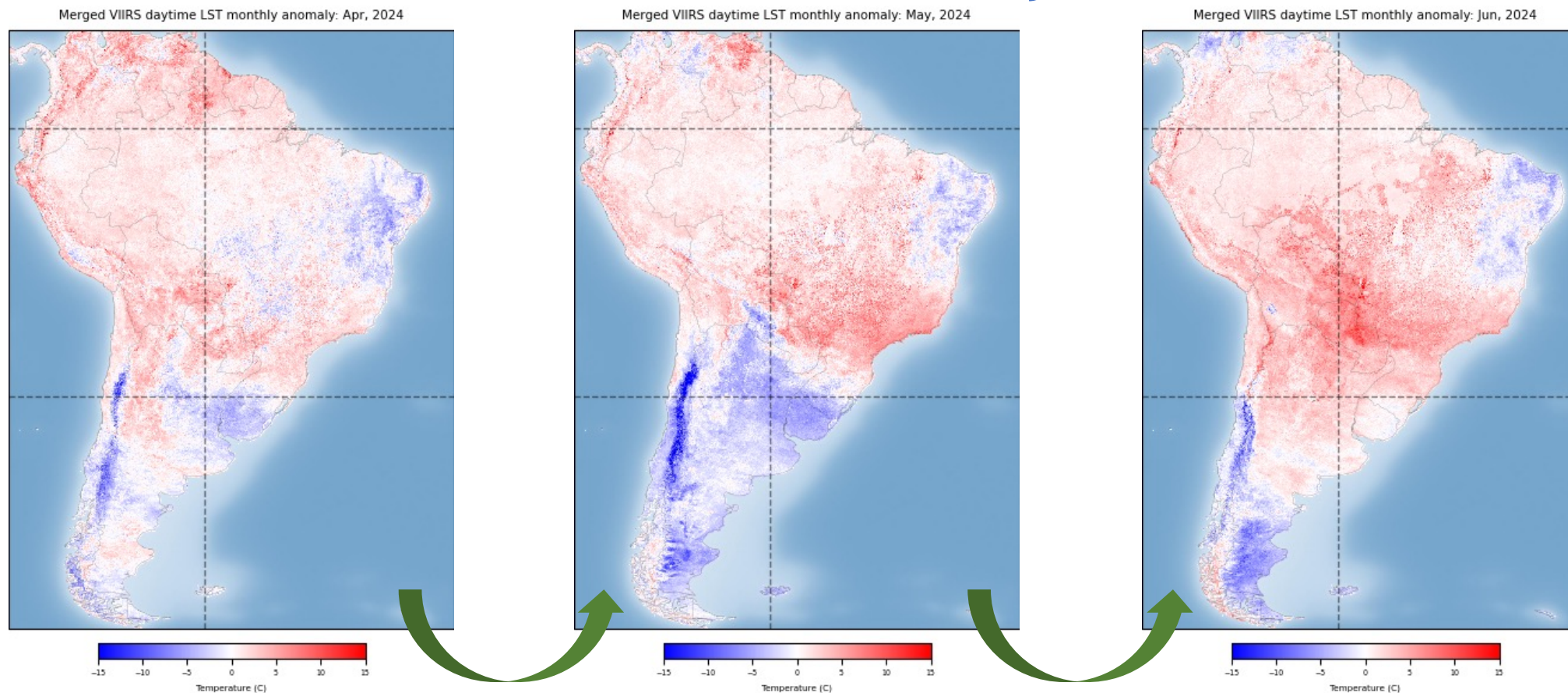
# Africa LST Anomaly: June 2024



- While Africa continues to experience above-average temperatures, the intensity of these anomalies has significantly decreased compared to the previous months.
- The temperature anomalies show a further decrease, with a noticeable retreat of the warm anomalies northward.
- Some areas, especially in the Sahara, now display below-average temperatures.
- However, the regions near the Arabian Peninsula in Africa exhibit stronger above-average heat conditions.



# South America LST Anomaly: June 2024

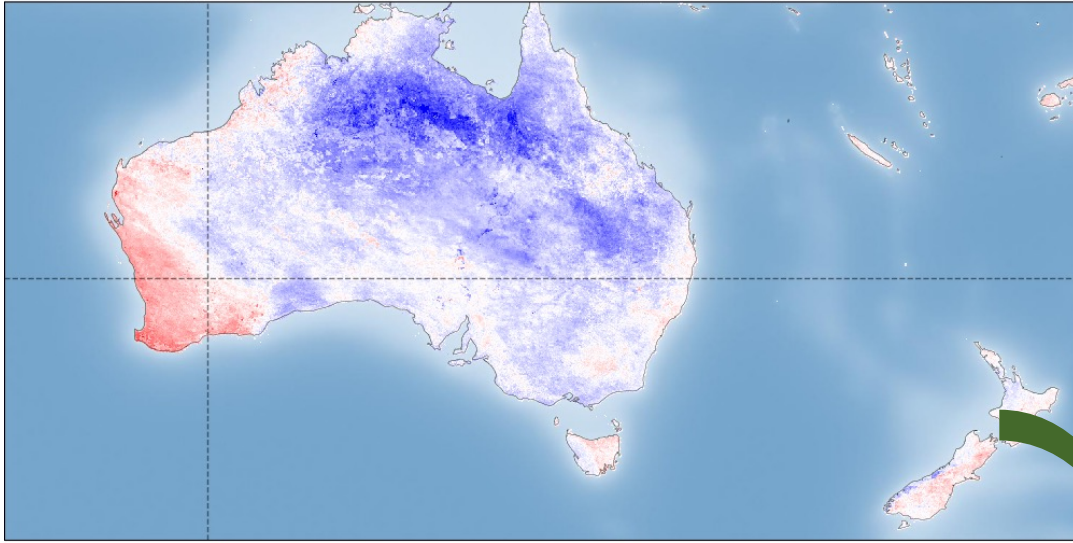


- South America has seen a significant shift in temperature patterns over the past two months, reversing the earlier cooling trend.
- Warm anomalies from May have strengthened and expanded, replacing the cold anomalies that previously dominated the southern half of the continent.

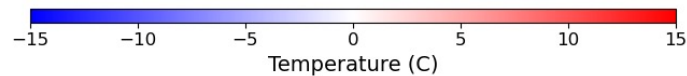
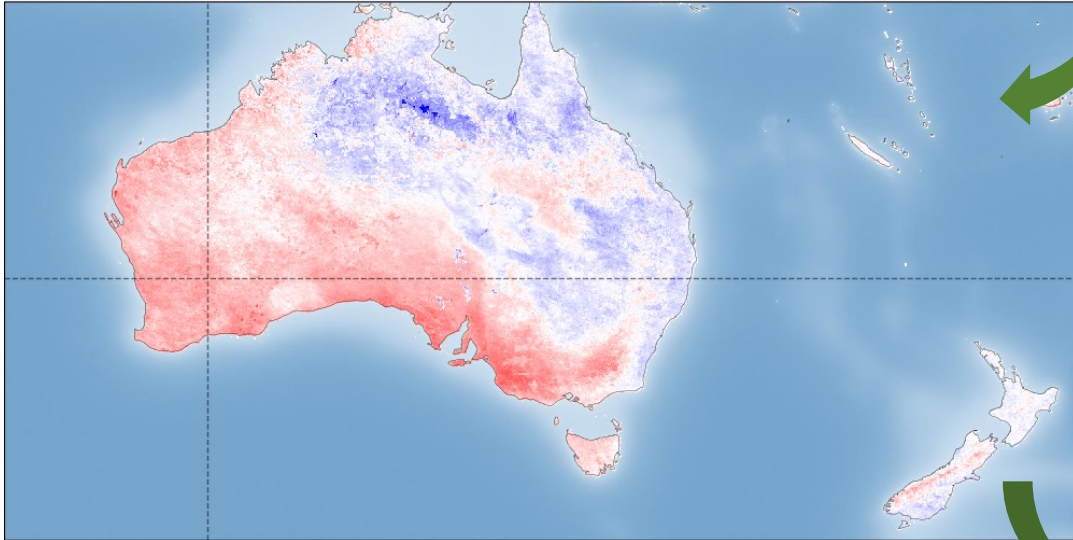
# Australia LST Anomaly: June 2024



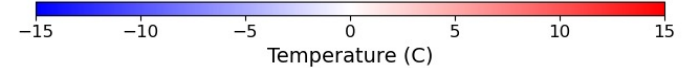
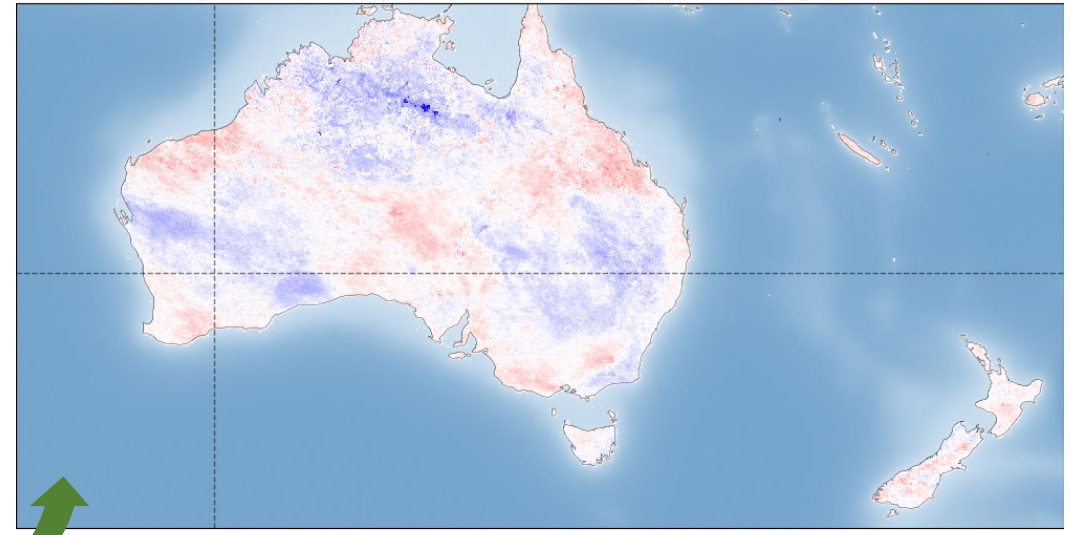
Merged VIIRS daytime LST monthly anomaly: Apr, 2024



Merged VIIRS daytime LST monthly anomaly: May, 2024



Merged VIIRS daytime LST monthly anomaly: Jun, 2024



- Following a cold April and a warm May, Australia's temperatures in June settled into a near-neutral state.
- This shift reflects a moderation from the contrasting temperature patterns observed in the previous two months



# Summary



- A multi-year LST climatology was generated to study impacts by extreme weather events in April 2024:
  - As in the past year, [warm anomalies remain the main theme throughout the globe](#). They spread out across [the whole world](#) with little exception, including Central Canada, the southern tip of South America, and northeastern Russia.
  - Compared to the previous month, the large hot anomalies occupying a majority of Asia separated. Northern India still experiences a significant impact from these anomalies. The large cold anomaly retreated northward and significantly reduced its spatial coverage. A few smaller pockets of warmth in Europe and Africa merged together.
  - The majority of [Mexico](#) and [Northern India](#) still experience significant impact from long-lasting heat wave. The [Middle East](#) experienced deadly humid heat wave.
  - Africa's temperature anomalies have decreased, while regions near the Arabian Peninsula exhibit stronger heat. South America reversed its cooling trend, with warm anomalies replacing cold ones in the south. Australia's temperatures settled into a near-neutral state in June, following contrasting cold and warm patterns in April and May.
  - Your feedback is welcome if you find other areas/features of your interest.
- Please visit LPD team's [anomaly summary site](#) and [monitoring site](#) for more details.