



The Seventh Session of the East Asia winter Climate  
Outlook Forum 5-7 November 2019, Ulaanbaatar,  
Mongolia



# Review of 2019 summer climate over Mongolia

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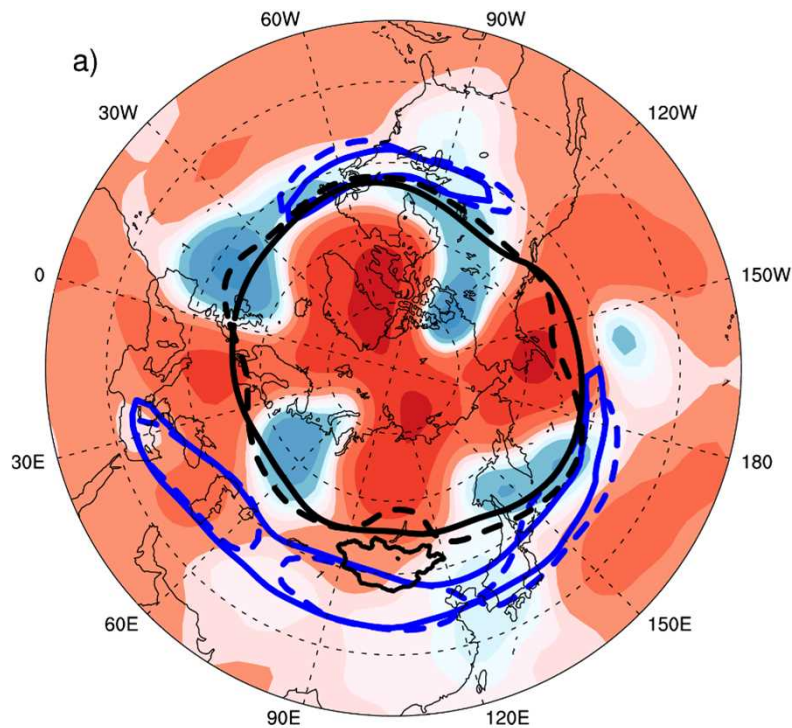
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Information and Research Institute of Meteorology, Hydrology and Environment

# Outline

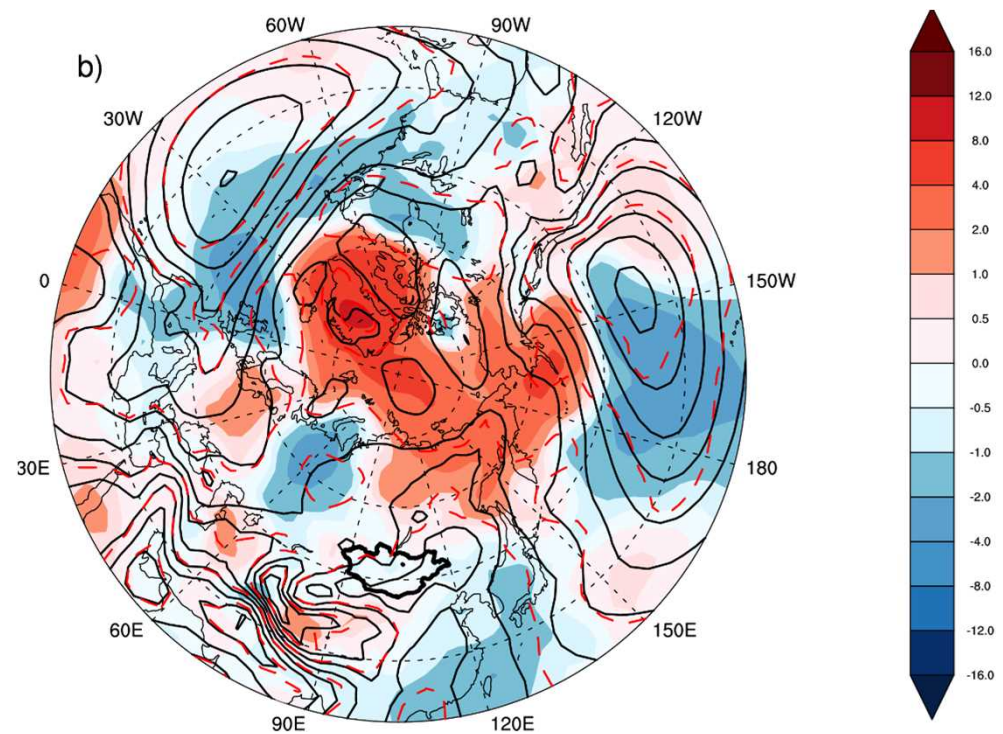
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- **Characteristic of atmospheric circulation**
- **Summer temperature, precipitation**
- **Hot and cold waves in earlier summer (Case-1)**
- **Hot and cold waves in late summer (Case-2)**
- **Record-breaking occurrence**
- **Summary**

# Characteristic of atmospheric circulation



a. Atmospheric circulation



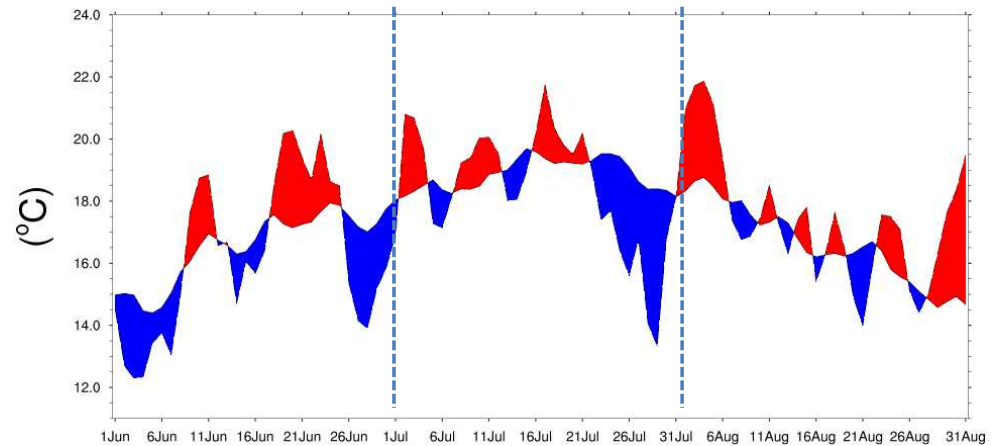
b. Sea level pressure anomaly

————— Climatological polar frontal zone  
- - - - - Polar frontal zone for 2019

————— Mean jet stream at 200 hPa  
- - - - - Jet stream for 2019

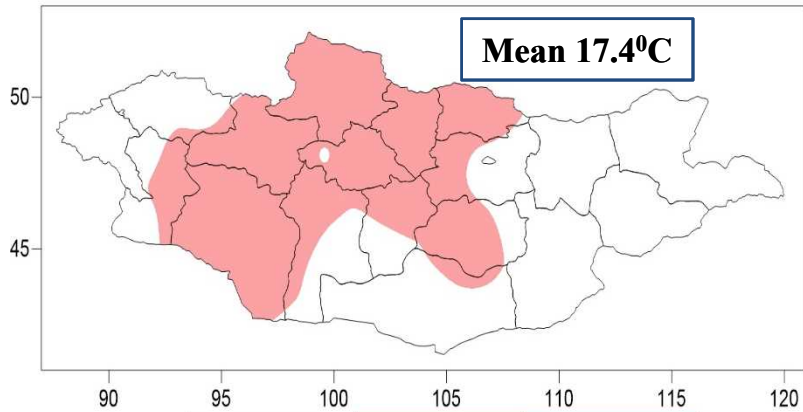
# Summer temperature

Daily mean temperature anomaly in JJA (°C)



Anomaly 0.9°C

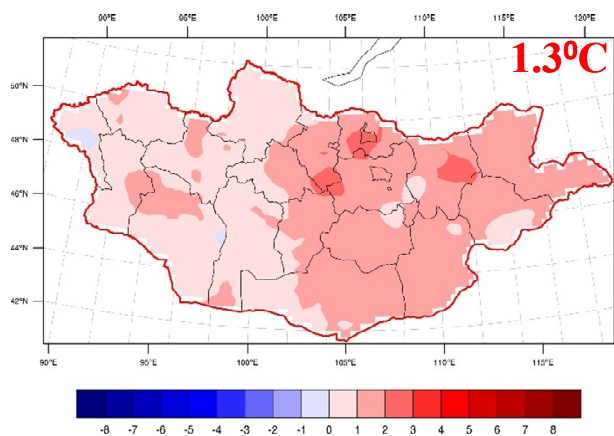
Mean 17.4°C



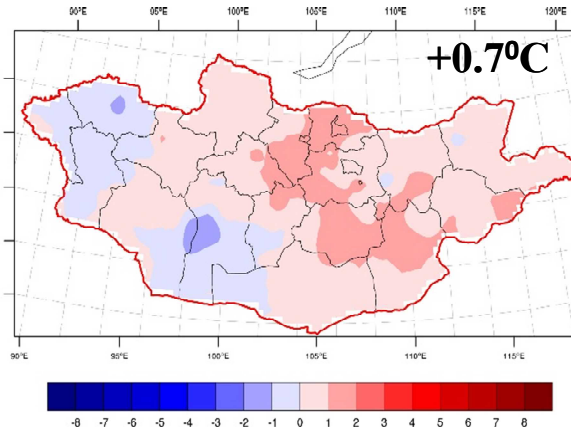
June

July

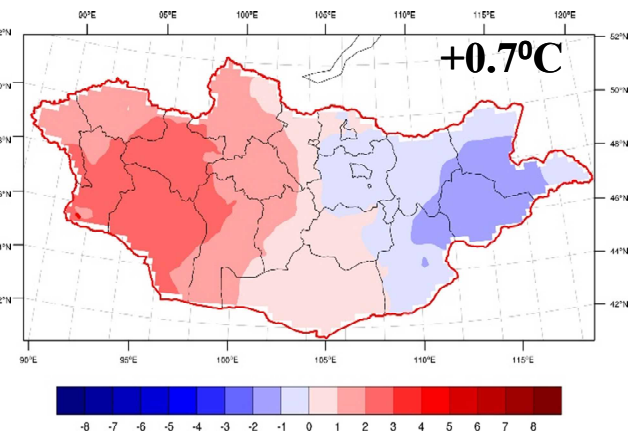
August



1.3°C



+0.7°C

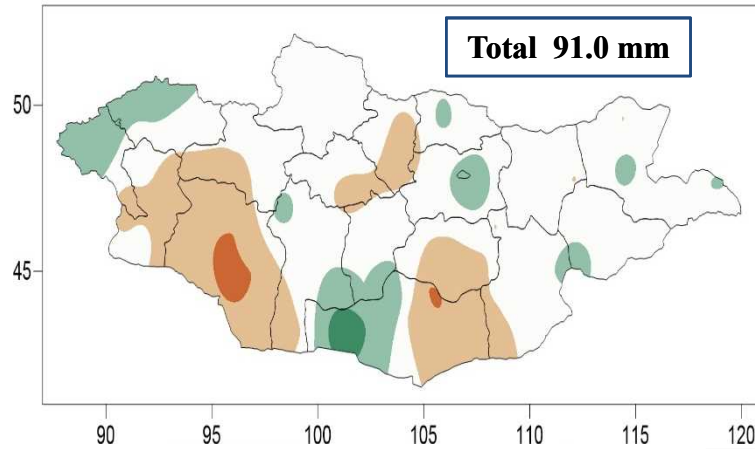


+0.7°C

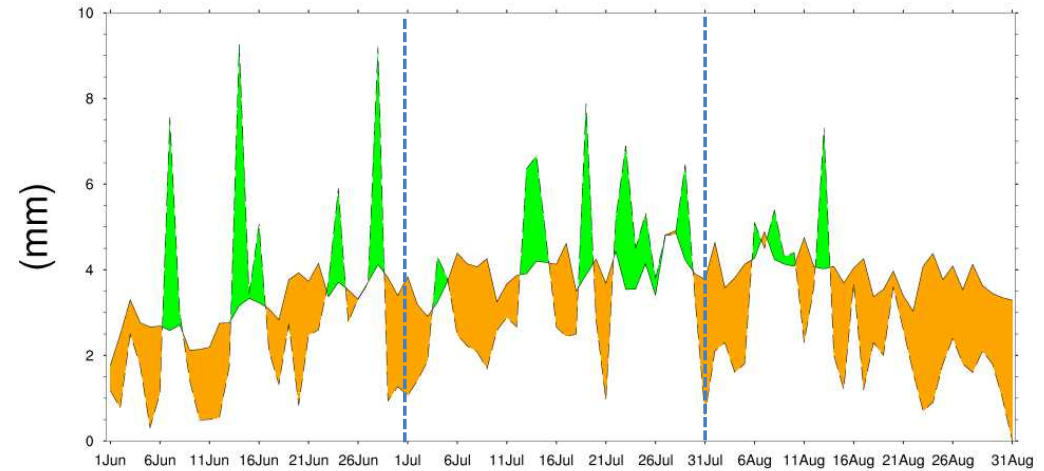
# Summer precipitation

Ratio 114.0%

Total 91.0 mm



Daily mean precipitation anomaly (mm)



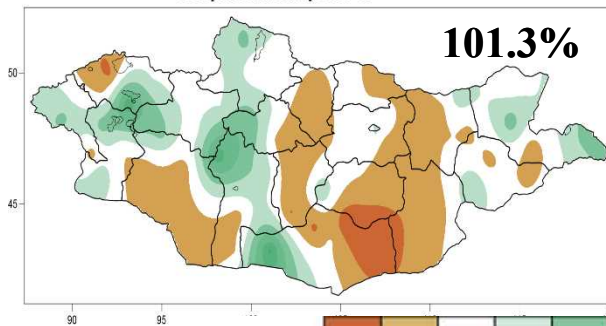
June

July

August

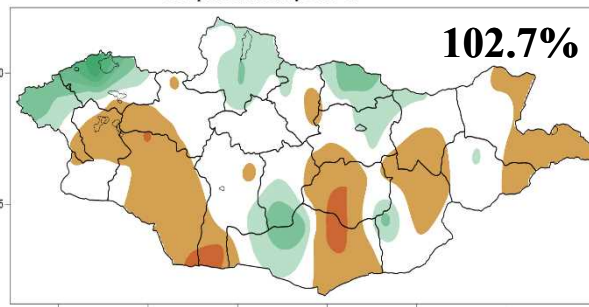
Precipitation anomaly 2019-06

101.3%



Precipitation anomaly 2019-07

102.7%



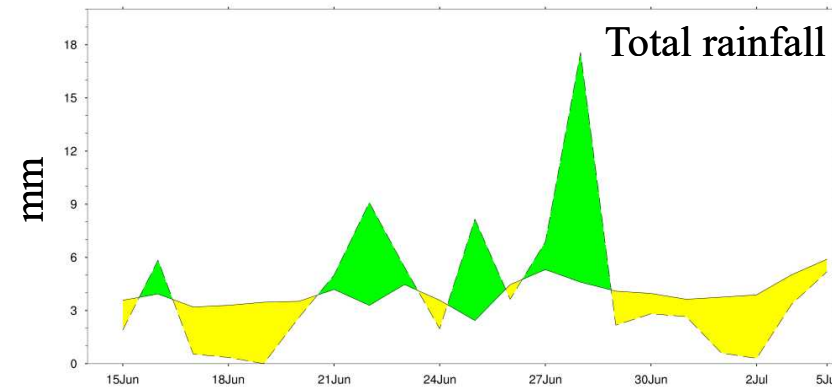
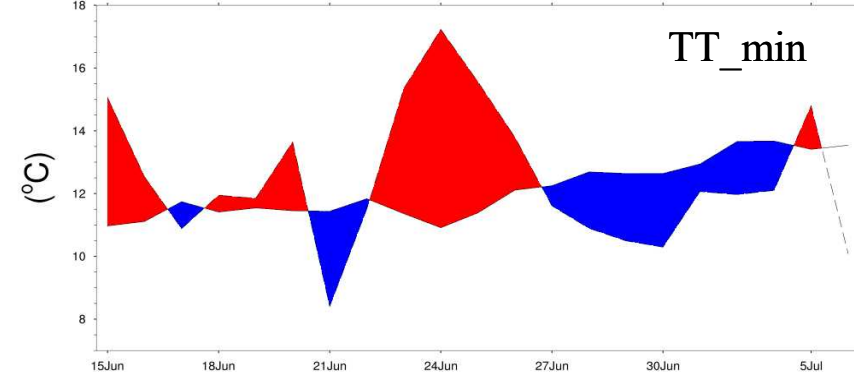
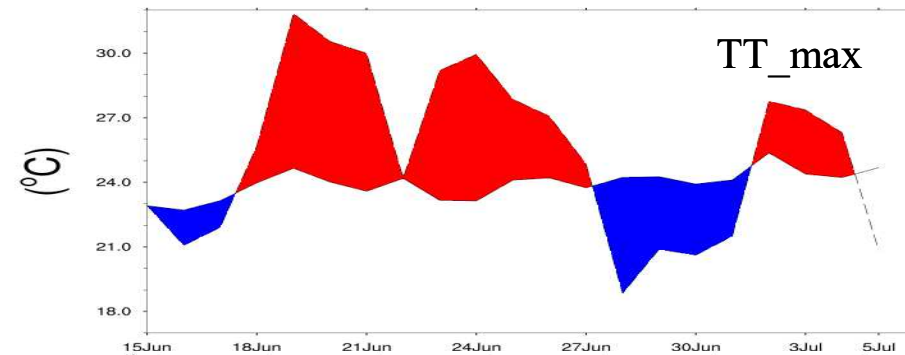
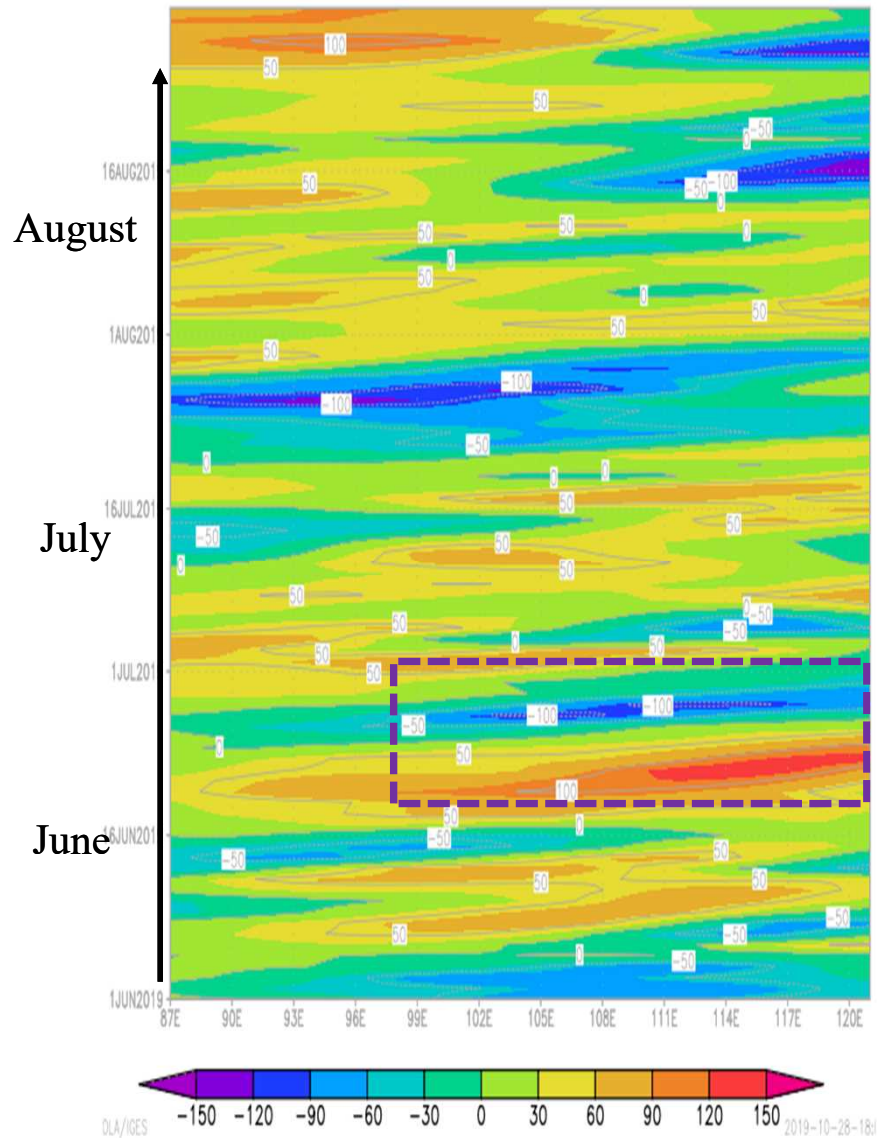
Precipitation anomaly 2019-08

85.3%



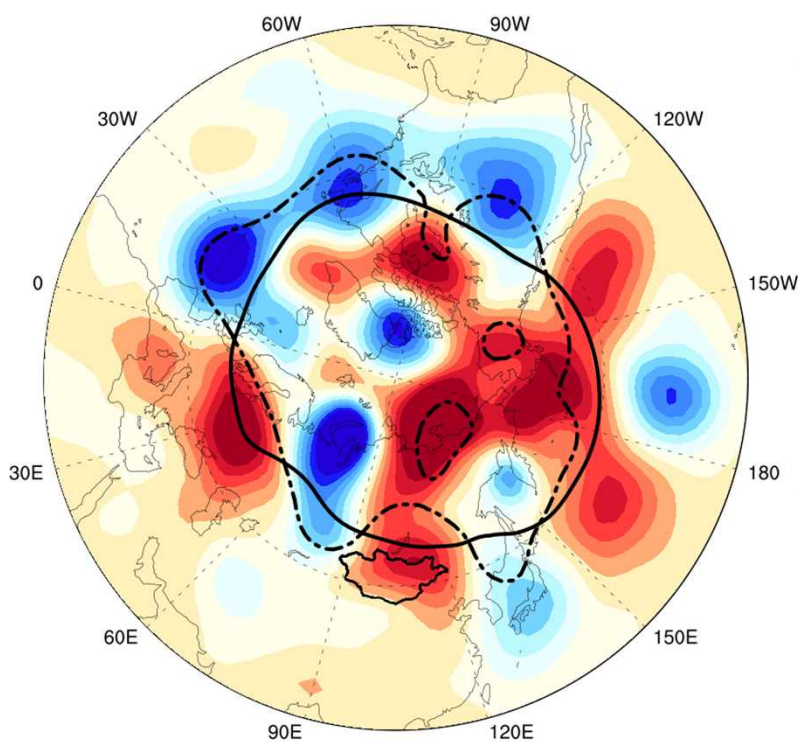
# Hot and cold waves in earlier summer (Case-1)

Time evolution of 500  
geopotential height anomaly



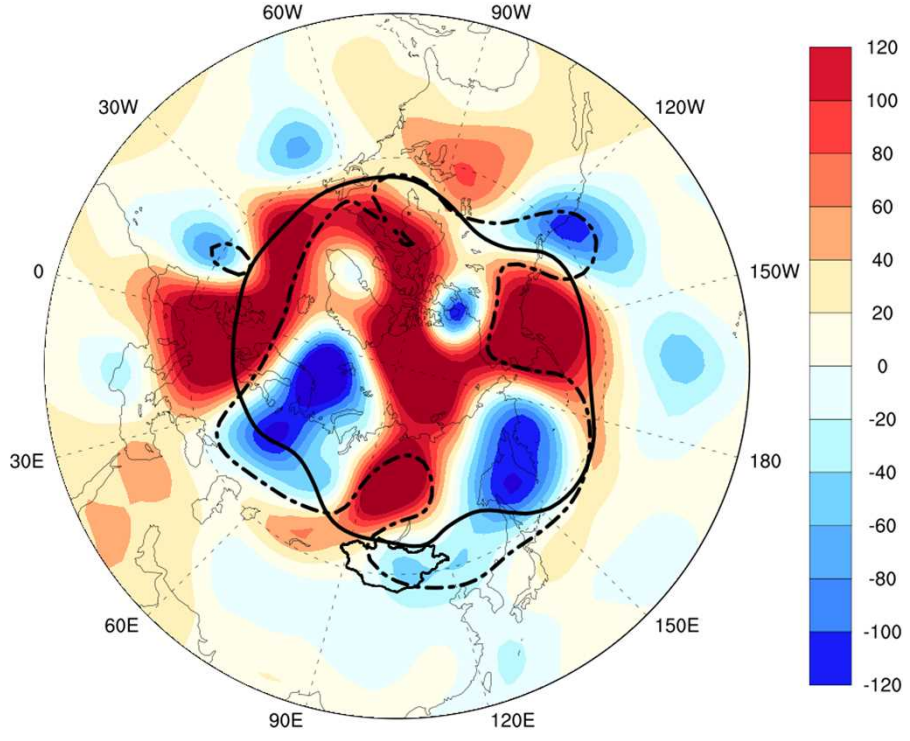
# Characteristics of atmospheric circulation for case-1

18-26 Jun



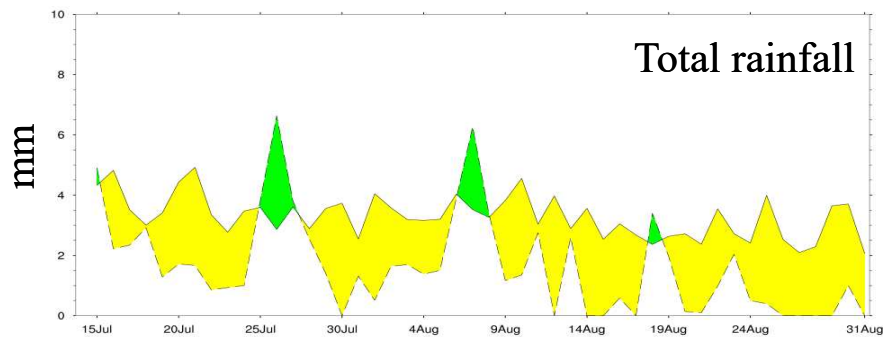
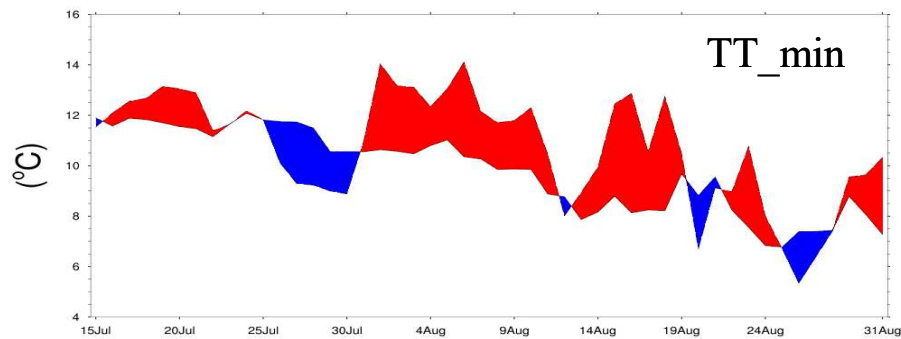
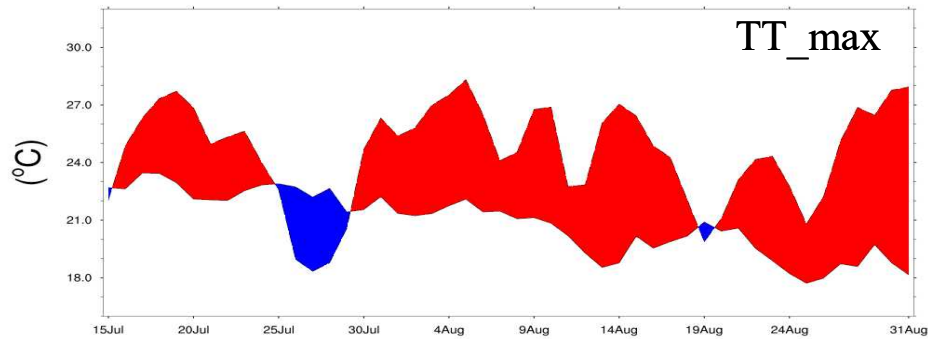
Heat wave

27Jun-01July



Cold wave

# Hot and cold waves in late summer (Case-2)

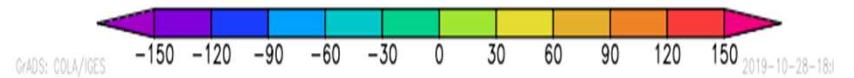
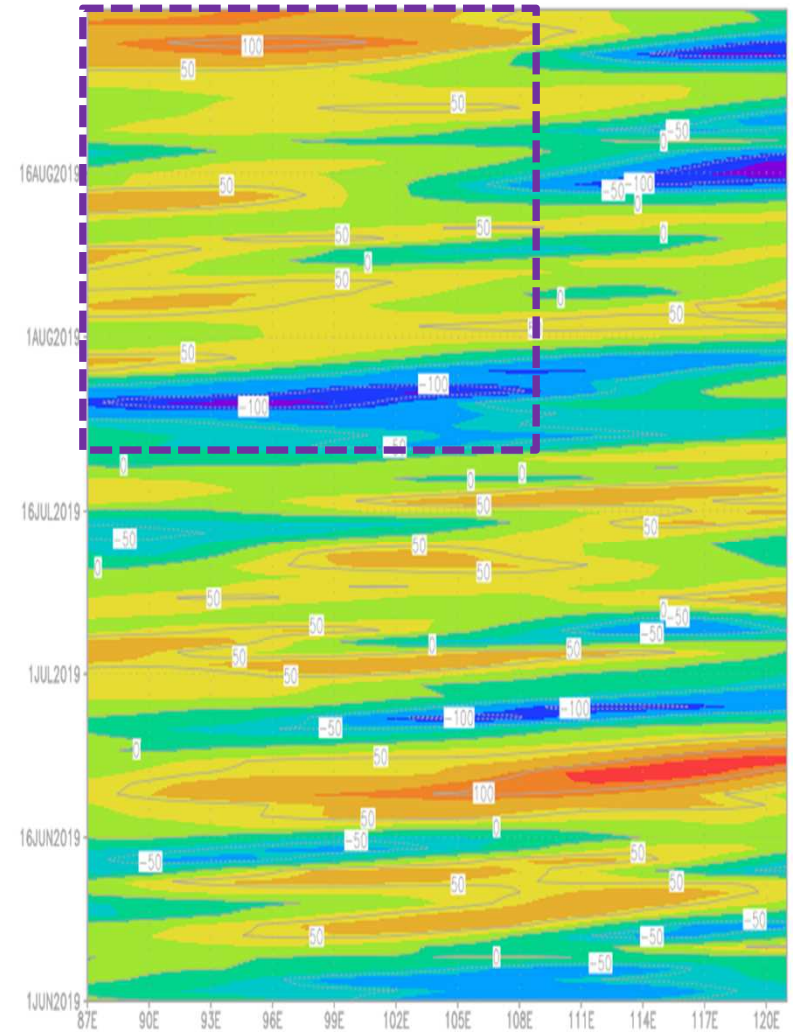


Augu



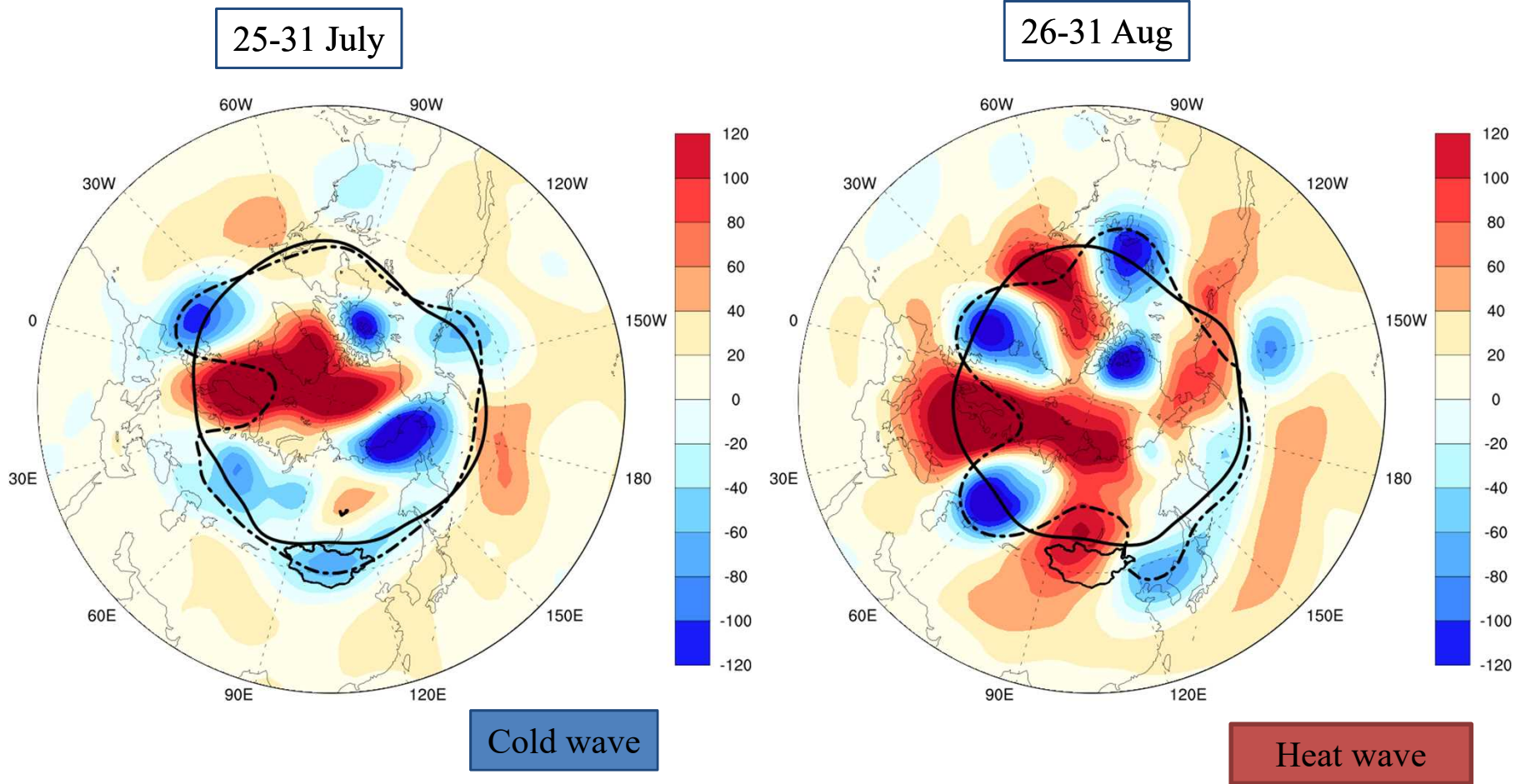
July

June

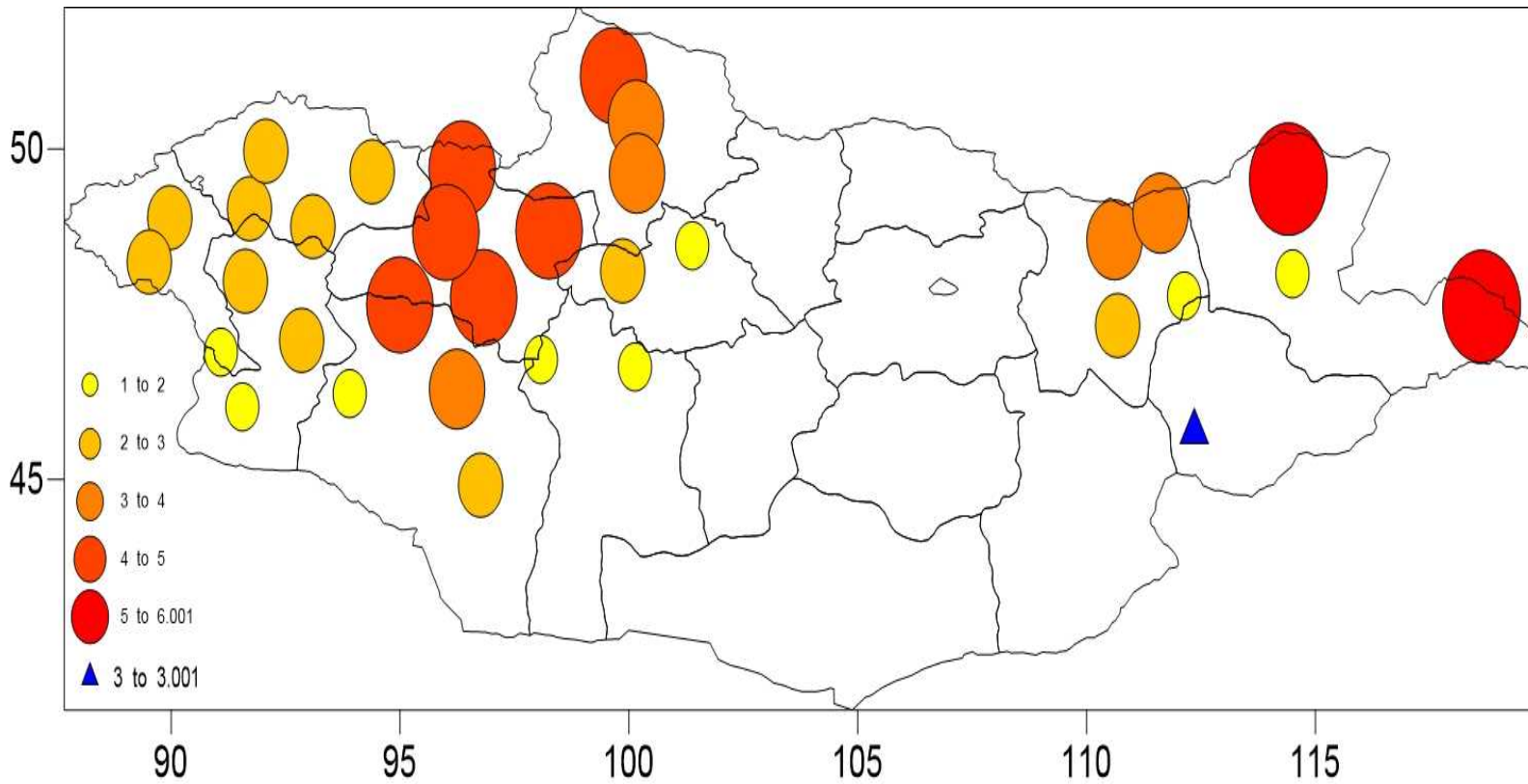




# Characteristics of atmospheric circulation for case-2



# Record-breaking occurrence



# Summary

- Mongolia experienced near normal temperature and precipitation in 2019 summer:
- ❖ Mean temperature over Mongolia was 17.4°C, which is 0.9°C near normal (1981-2010) average. The June, July and August temperature anomalies were 1.3°C, 0.7°C and 0.7°C respectively.
- ❖ The summer total precipitation was 91.0 mm which is near normal and its monthly ratio to normal were 101.3%, 102.7%, and 85.3% for the June, July and August respectively.
- Remarkable heat waves occurred in late June and August were well related with upper level trough which were located over central Asia and Korean Peninsula that compounded stable upper level ridge over entire Mongolia for several days. Especially in later case, maximum temperature exceeded from 1°C to 6°C over western and north eastern part of Mongolia.
- The cold wave occurrence in late June highly depended upon the western Siberian ridge top that is tilted toward central Siberia and which allows the northeasterly colder air mass from the Far east into Mongolia for a couple of days.



Thank you for your attention