

Characteristics of 2013 summer over South Korea

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KMA



Contents



1. Overview

2. Temperature over South Korea

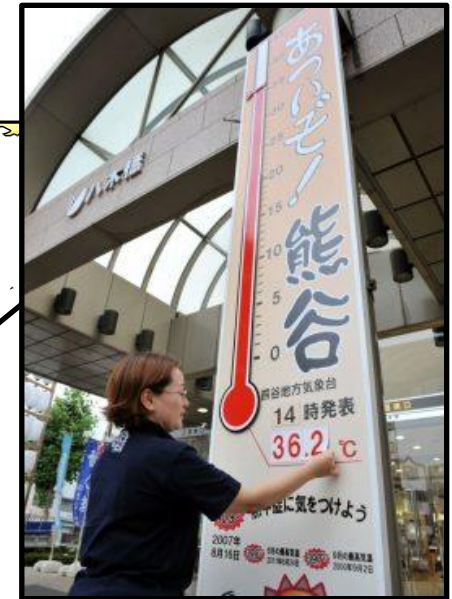
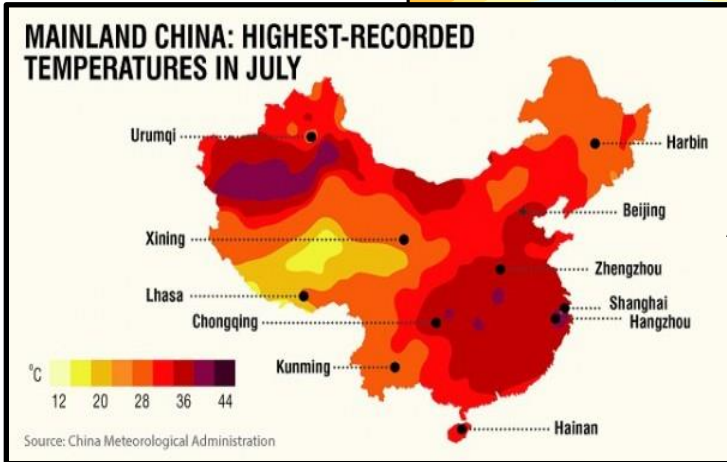
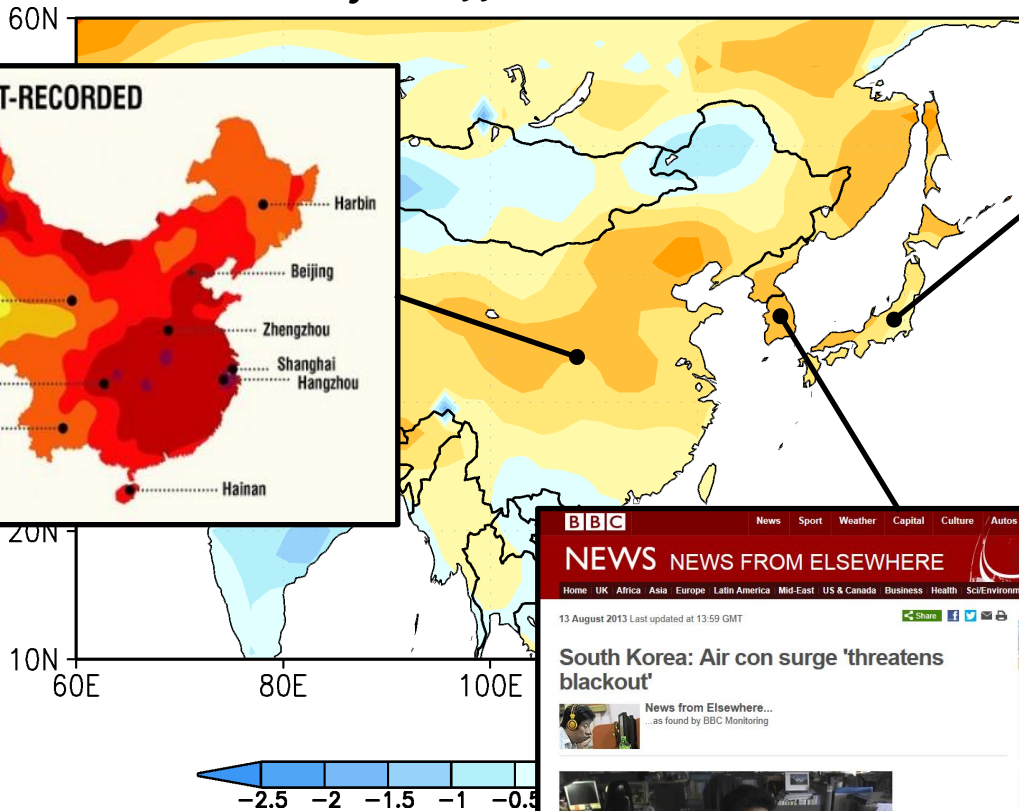
3. Oceanic & Atmospheric Condition

4. Precipitation over South Korea

5. Summary

Overview

Tsfc anomaly for JJA



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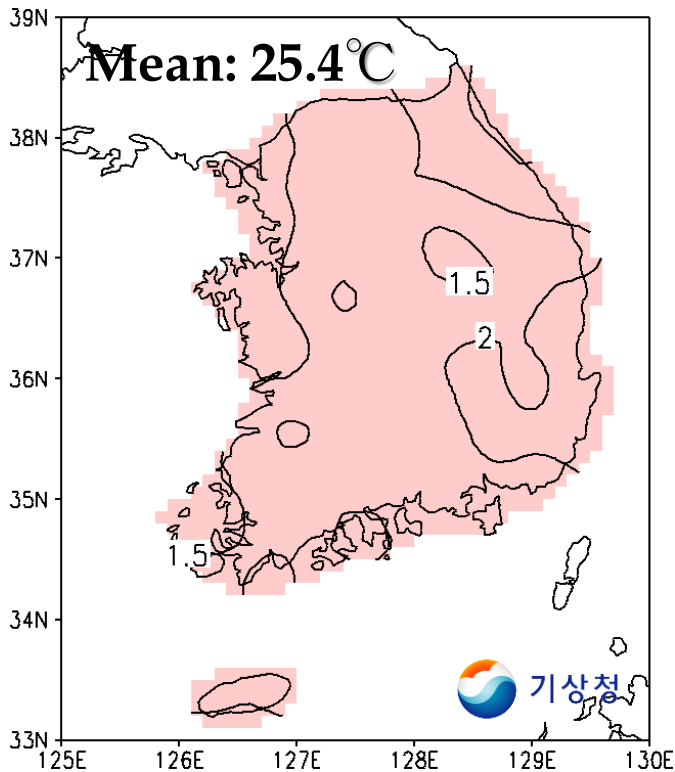
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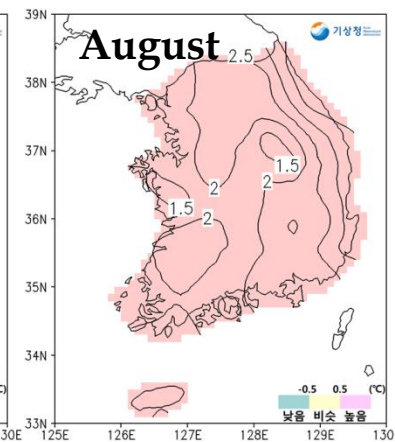
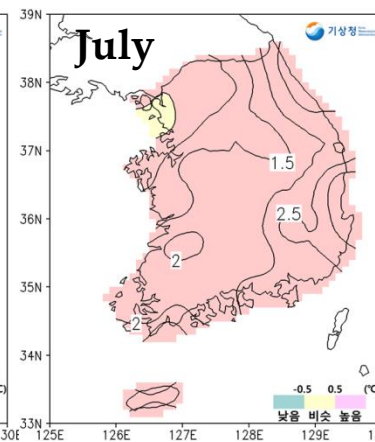
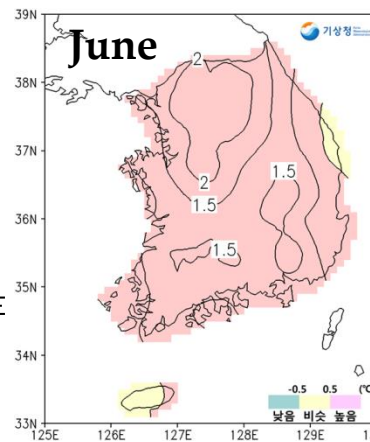
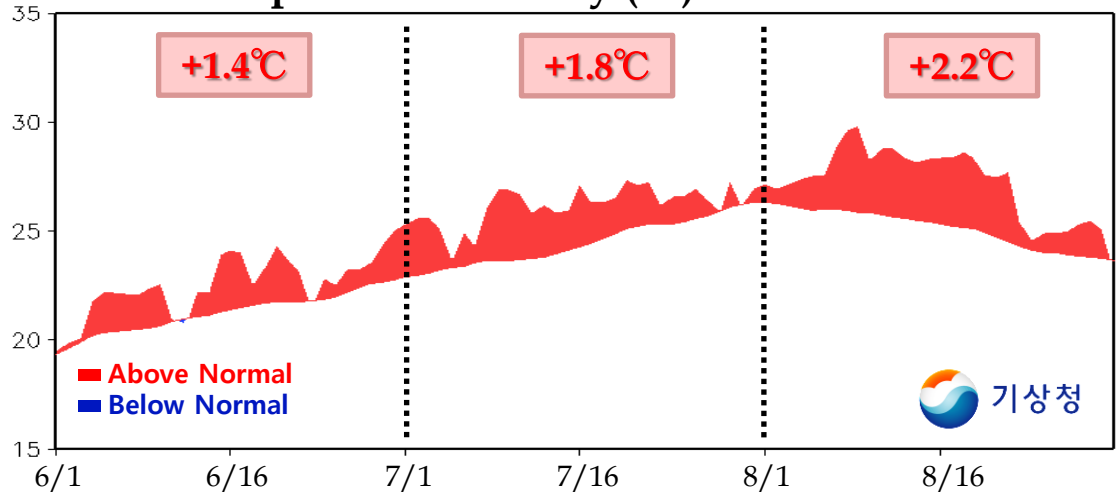
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Temperature

Anomaly: **+1.8°C**

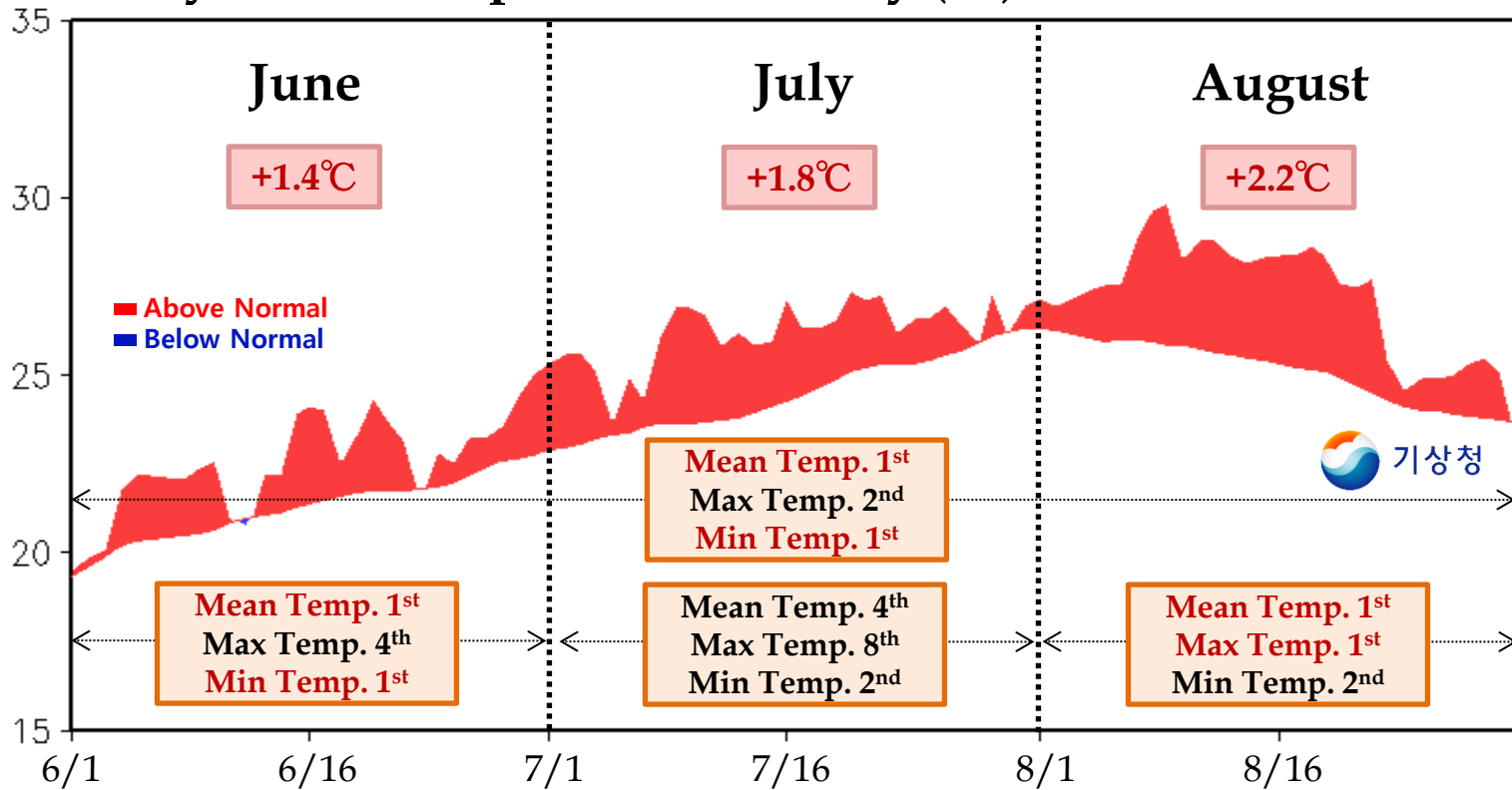


Mean Temperature anomaly (°C)

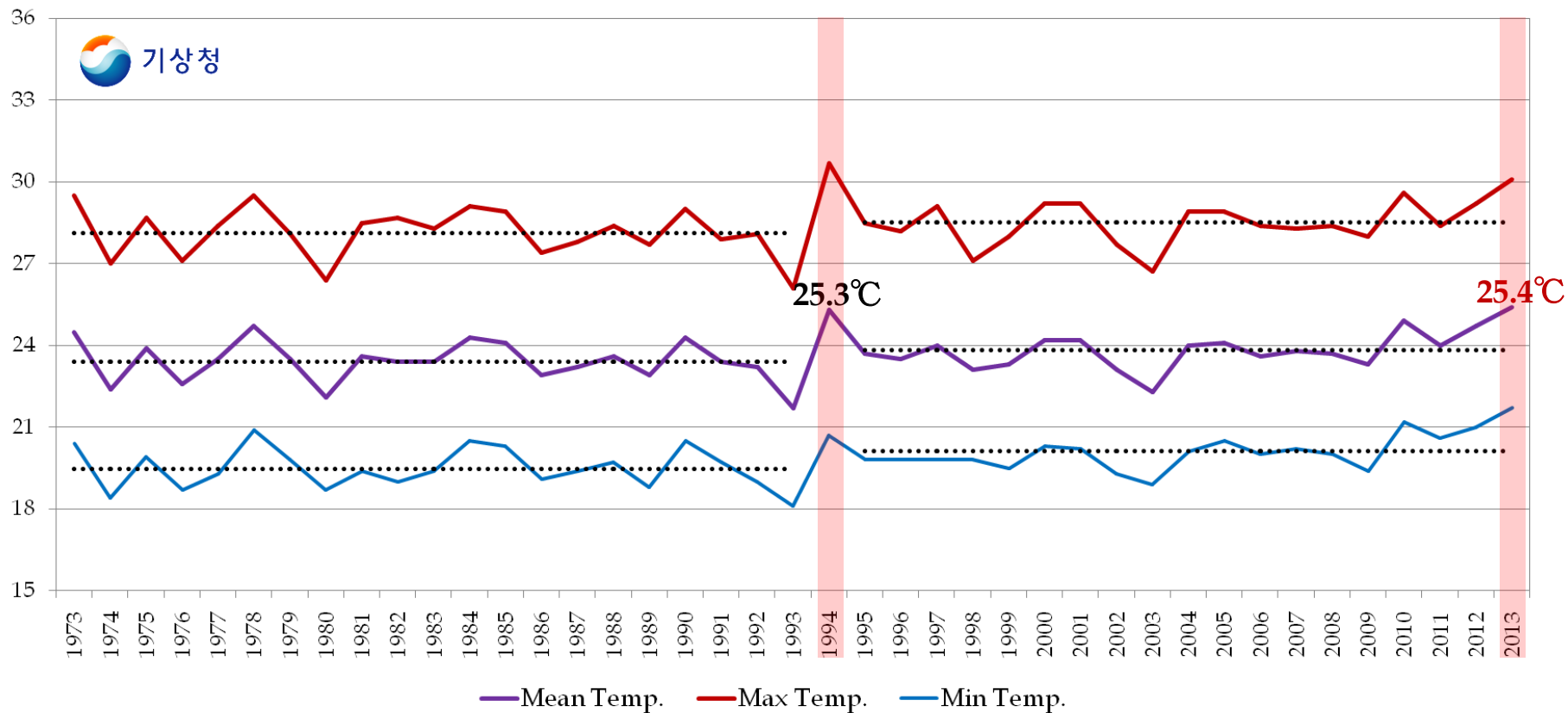


Temperature

Daily Mean Temperature anomaly (°C)

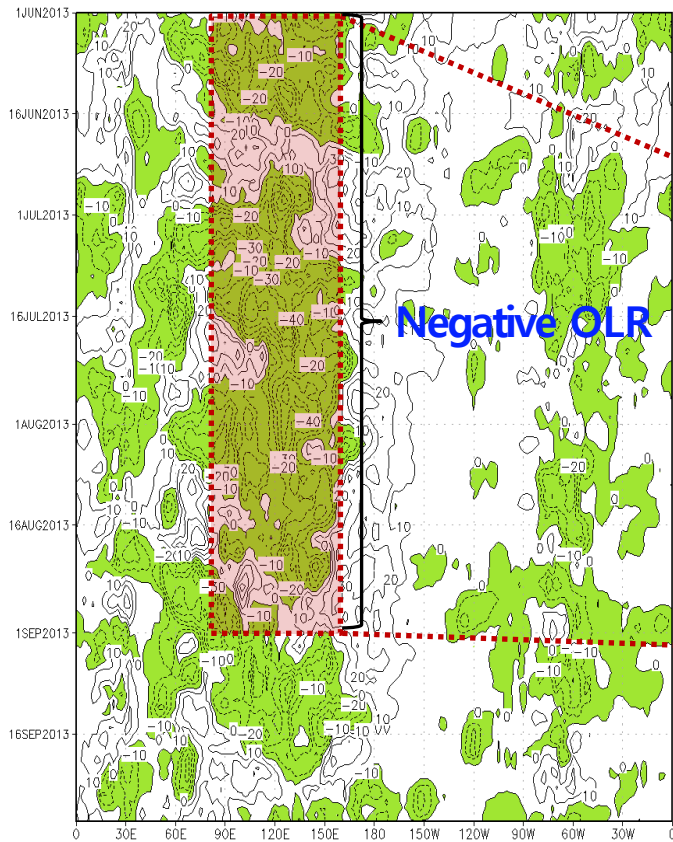


Annual Variation of Temperature for JJA



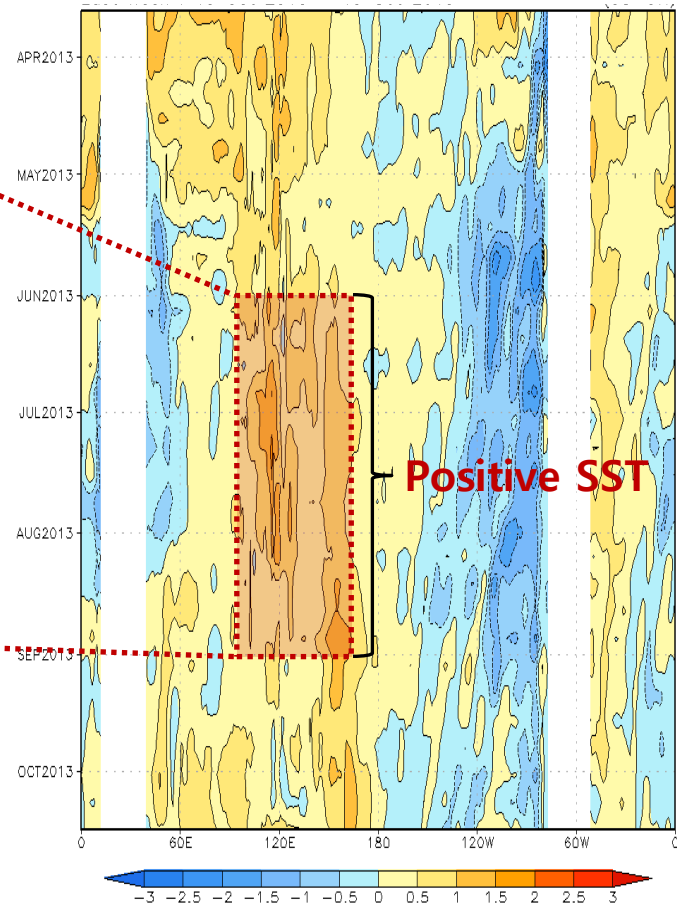
Oceanic & Atmospheric Condition

**OLR anomaly
5-day mean (5°S~5°N)**



DATA: NOAA daily OLR(01Jun2013~29Sep2013) CLIM: 1979-1995 Updated on 18Oct2013

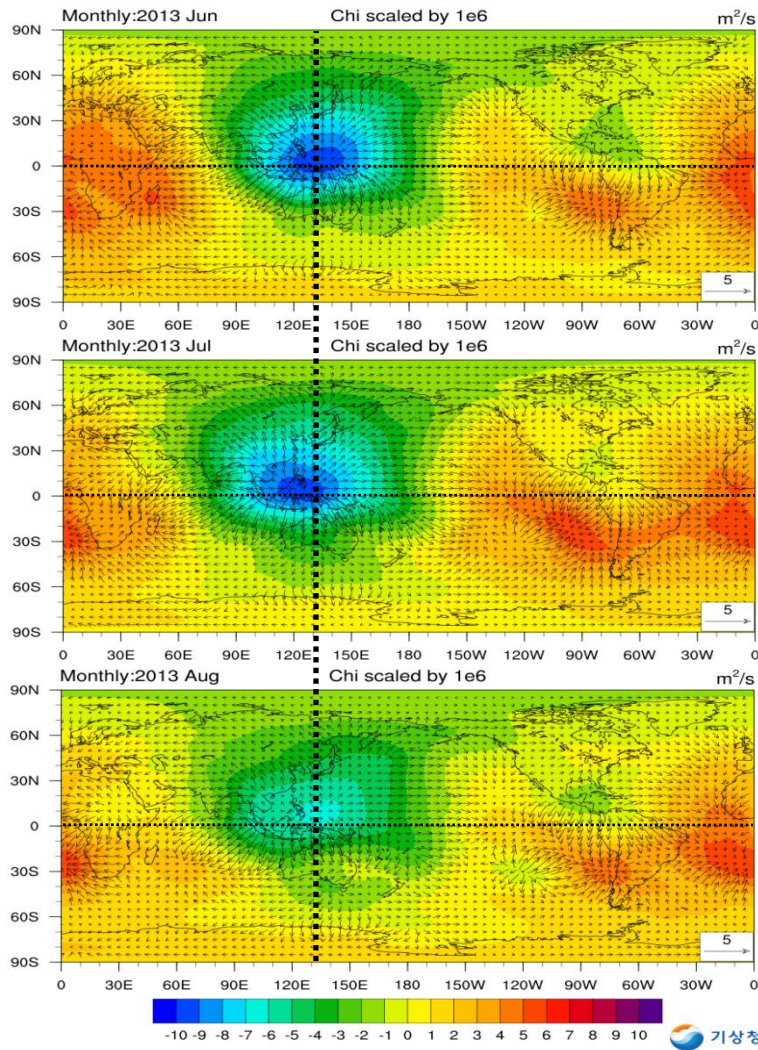
**SST anomaly
7-day mean (5°S~5°N)**



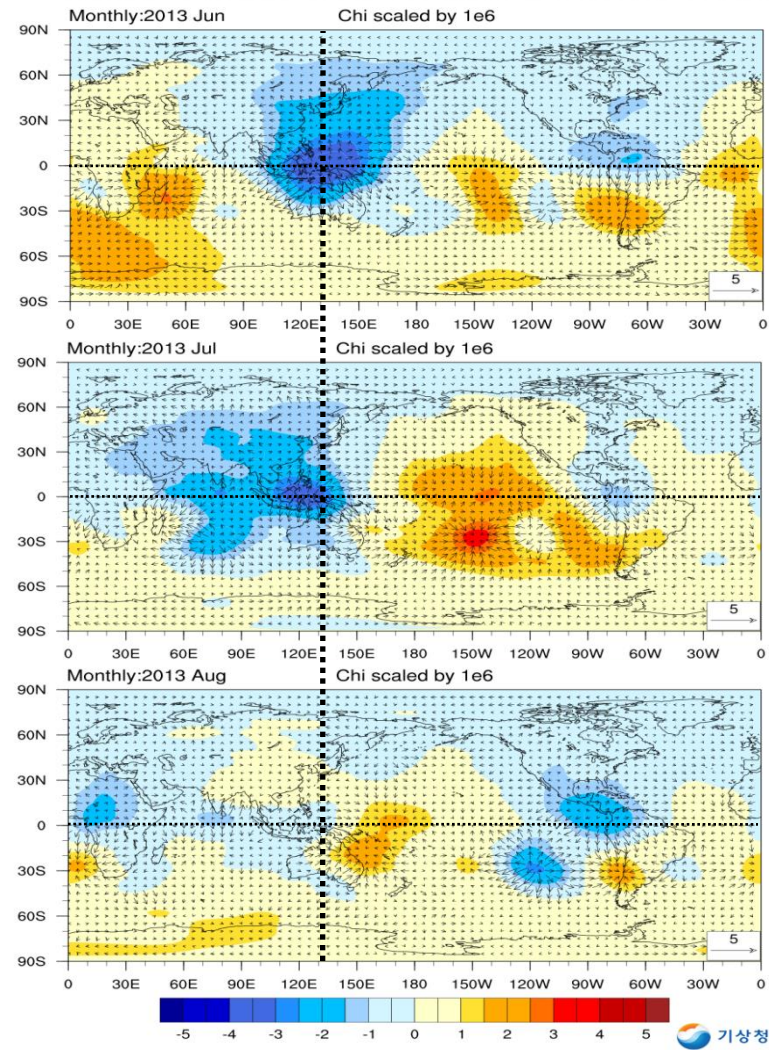
-3 -2.5 -2 -1.5 -1 -0.5 0 0.5 1 1.5 2 2.5 3

Oceanic & Atmospheric Condition

Velocity Potential & Divergent Wind on 300hPa



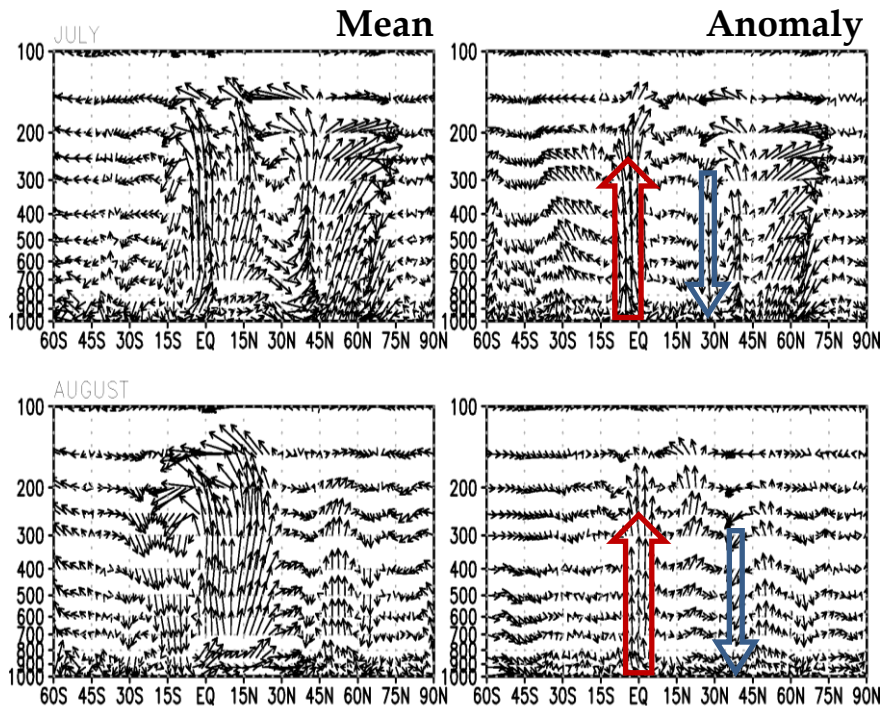
Velocity Potential ANO. & Divergent Wind ANO. on 300hPa



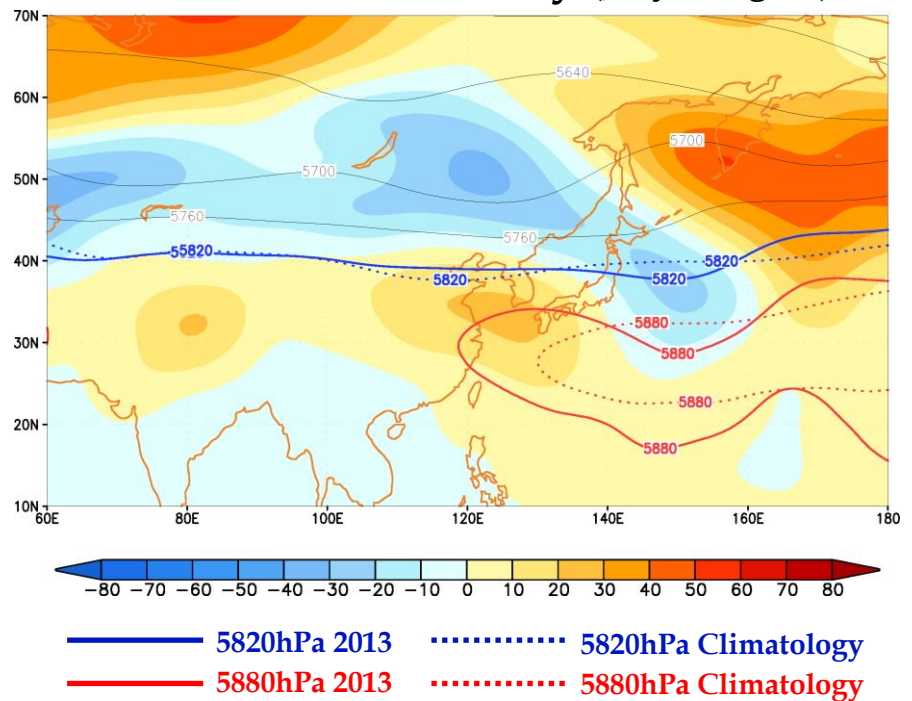
Oceanic & Atmospheric Condition

- Strong convective activity over western pacific
 - Enhanced local Hadley cell
 - Significantly enhanced WNPSH

V & W Wind Vector (120~130°E)

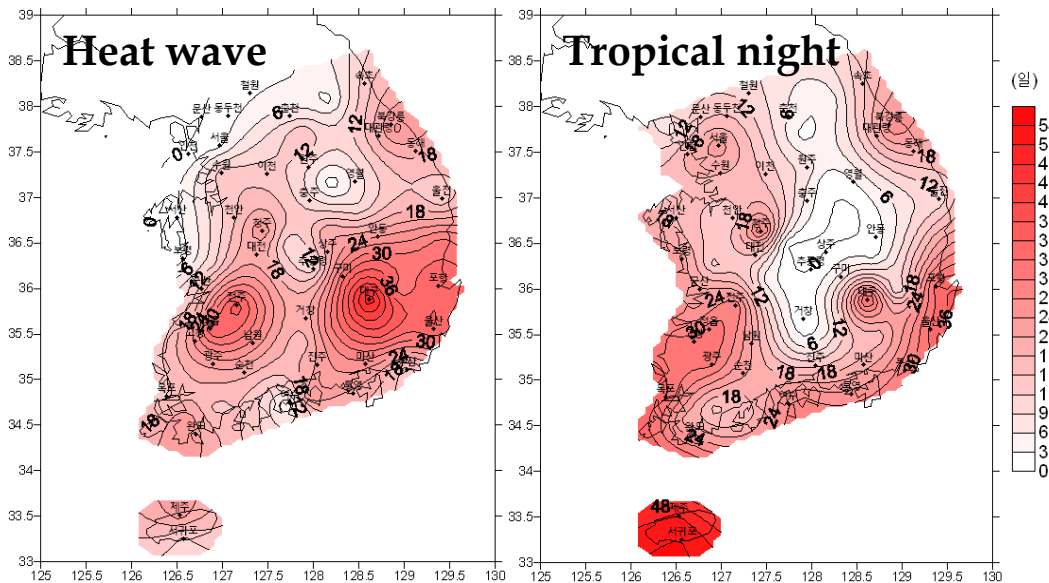


500hPa GPH & anomaly (July~August)



Heat wave & tropical night

- WNPSH has extended northwestward → The tropical nights and heat wave appeared to continue from July to August.
- Especially, the heat wave and tropical night appeared to late-August over Southern region and Jeju island in South Korea

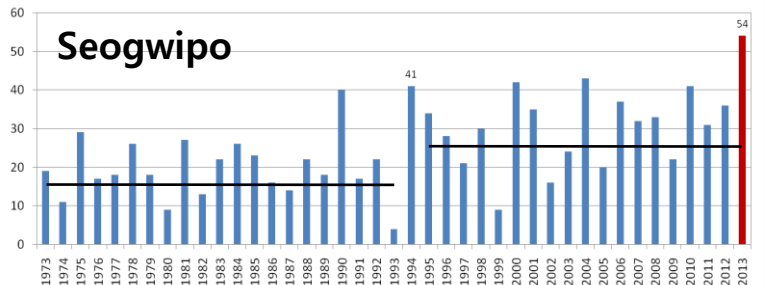
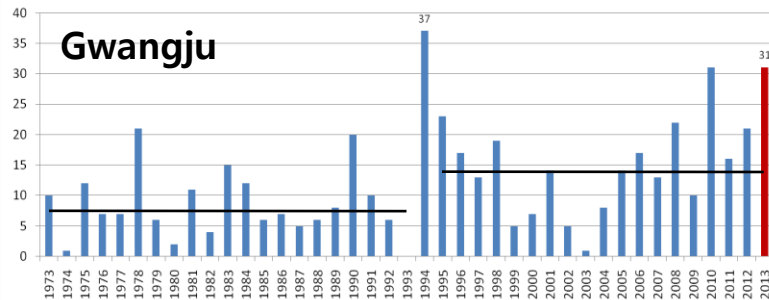
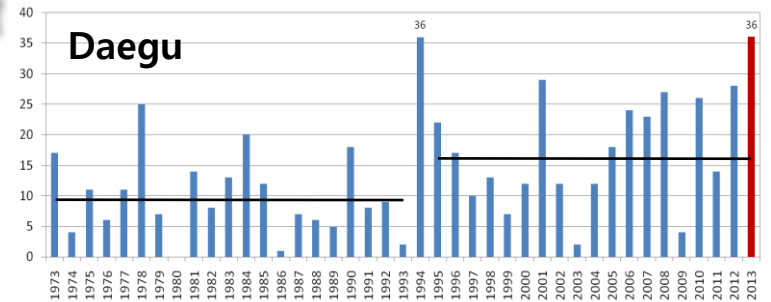
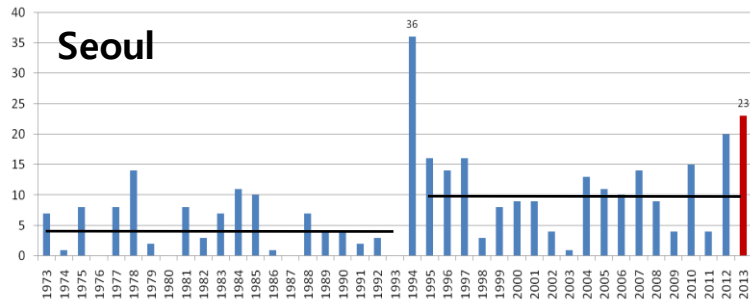


- ※ Heat wave: maximum temperature $\geq 33^{\circ}\text{C}$
- ※ Tropical night: minimum temperature $\geq 25^{\circ}\text{C}$

(Unit: day)

	Heat wave (Ranking)
Central Region	9.7 (14)
Southern Region	24.4 (2)
Jeju Island	17.0 (1)
	Tropical night (Ranking)
Central Region	11.9 (2)
Southern Region	18.7 (1)
Jeju Island	52.5 (1)

Annual variations of Tropical night days

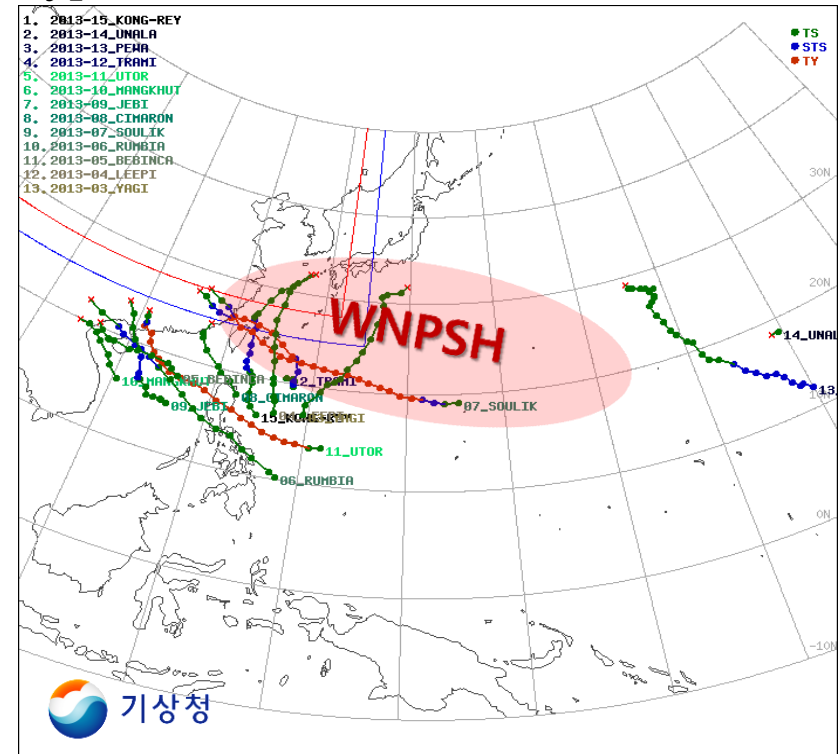


Typhoon

- In summer, 13 typhoons happened and 2 typhoons directly affected to South Korea, which was the normal frequency for 1981~2010.
- Most of the typhoons moved to southern China → It is due to the northwestward extension of WNPSH

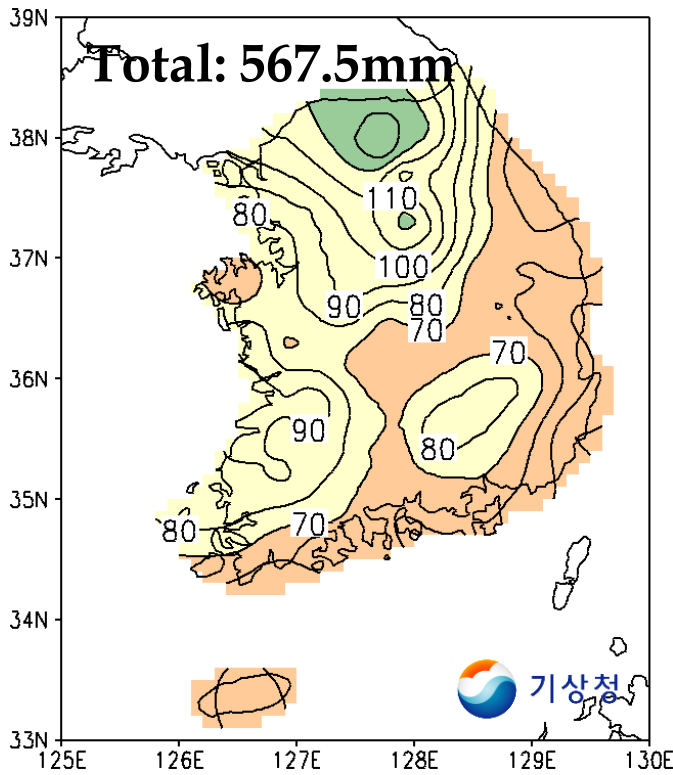
	June	July	August	Total
2013	4 (1)	3 (0)	6 (1)	13 (2)
Climatology (1981~2010)	1.7 (0.3)	3.6 (0.8)	5.9 (1.1)	11.2 (2.2)

Typhoon Track

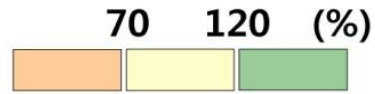


Precipitation

Ratio to normal: 78%

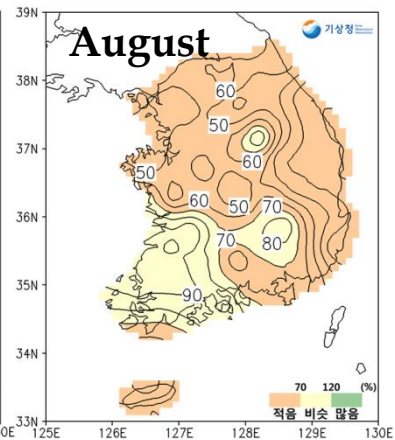
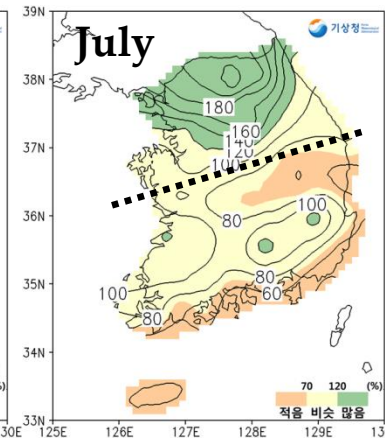
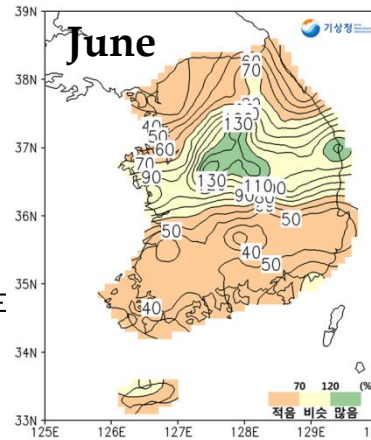
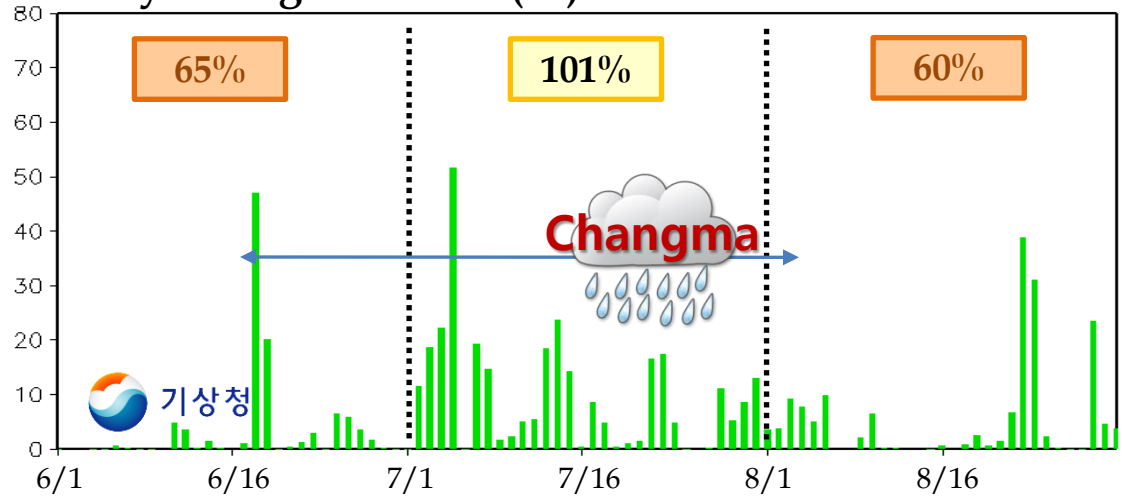


Total: 567.5mm



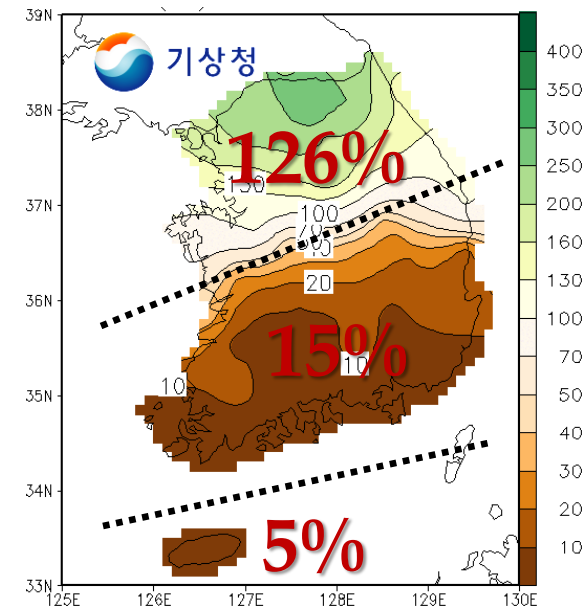
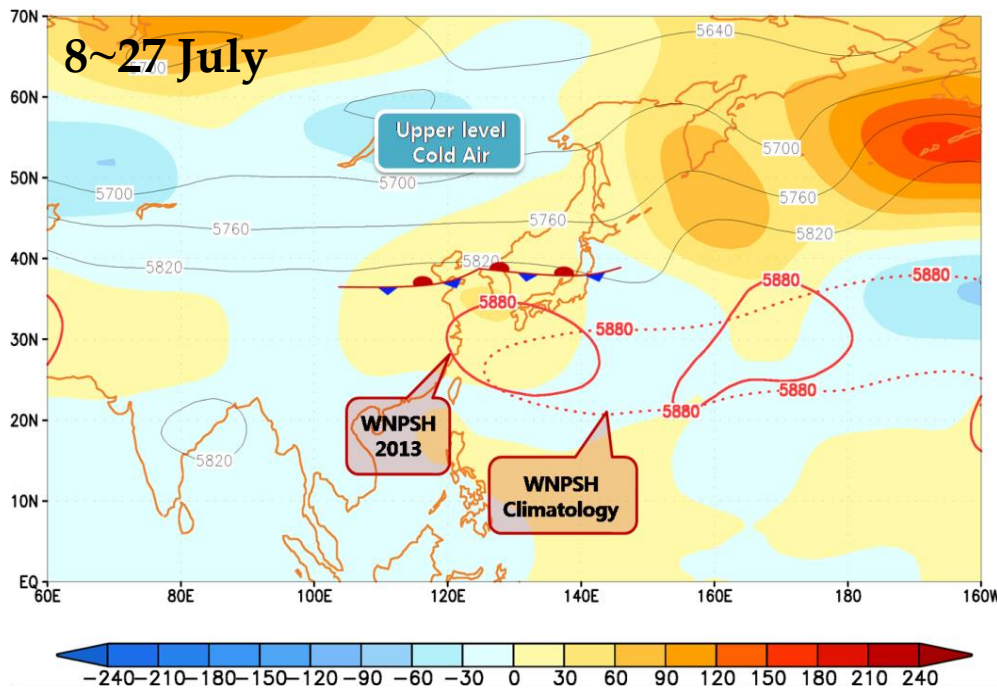
below normal above

Daily averaged amount(mm)



Precipitation

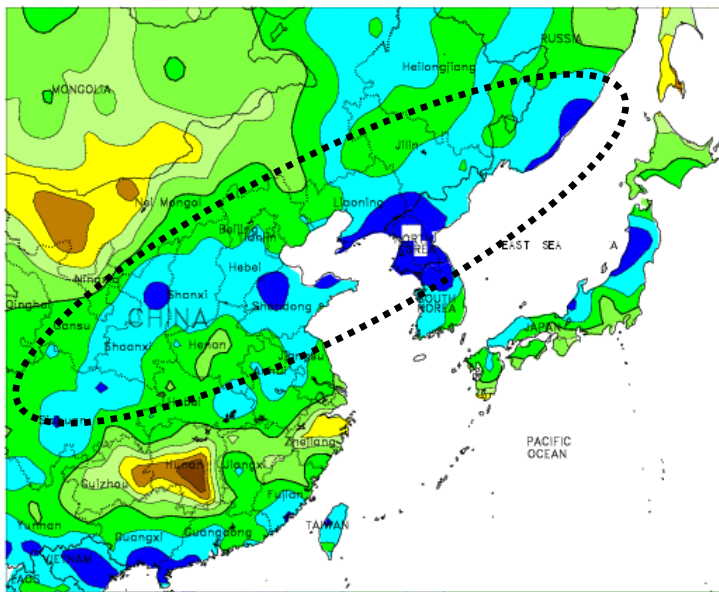
- In July, WNPSH has extended northward → A cold upper level trough passed through over northeast of China → The heavy rainfall occurred over central region of South Korea.
- On the otherhand, Southern region and Jeju island have experienced hot conditions and substantial rainfall deficit.



Precipitation over East Asia

July 2013

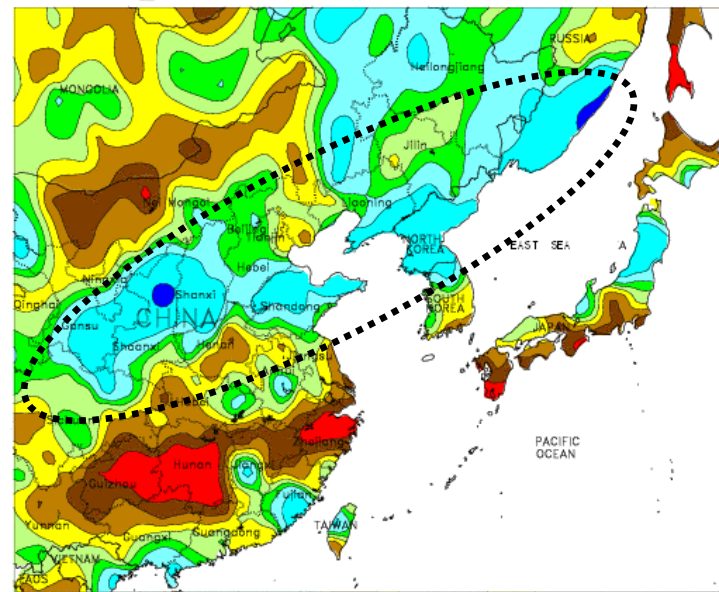
Total precipitation



CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary data



Precipitation ratio



CLIMATE PREDICTION CENTER, NOAA
Computer generated contours
Based on preliminary data



Summary

1. Summer climate over Korea

- Temperature: **above normal (+1.8°C)**
- Precipitation: normal (78%)
- The climate feature over South Korea 2013 summer is a **warm** and normal season.

2. Characteristics of the 2013 summer

- In summer, South Korea has experienced abnormally hot weather
 - The tropical night days has shown an upward trend
- The rainy season started from central region because of early extension of WNPSH to northwestward
 - It induced strong spatial gradients of precipitation
 - Record-breaking heat wave and tropical nights appeared during the summer

Thank you~!

KMA

