

Review of major high impact climate events over China this year

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Outline

1

Climate Characteristics



2

Rainy Season Process

3

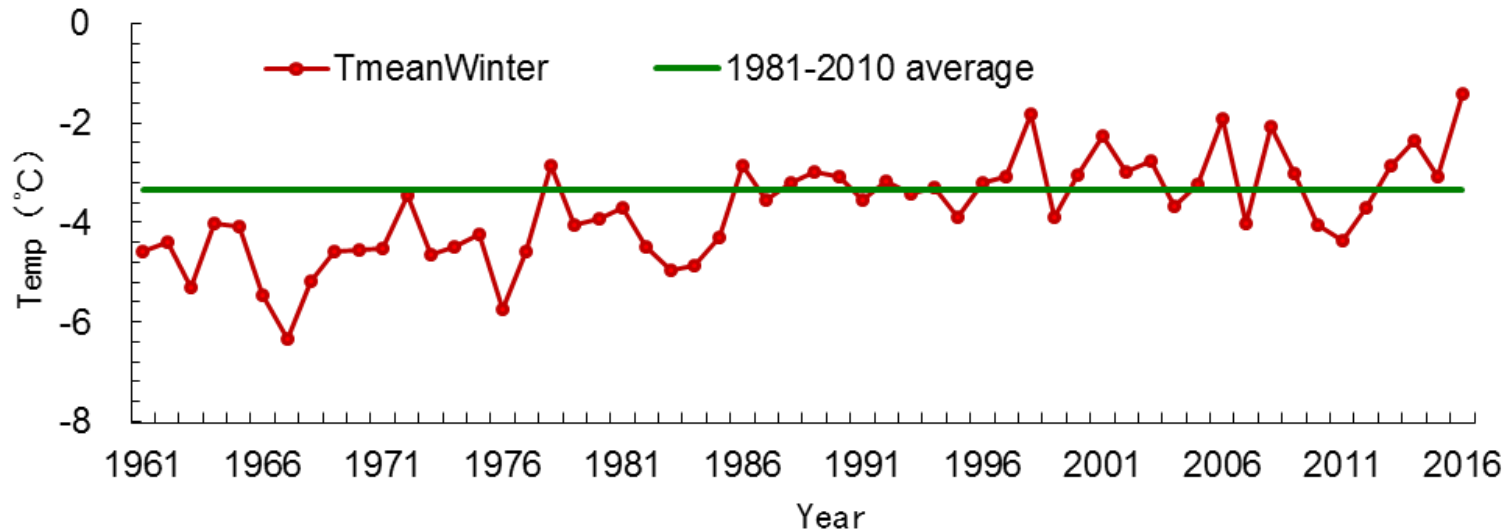
Major high impact events

4

Outlook



2016/2017 Winter: the warmest



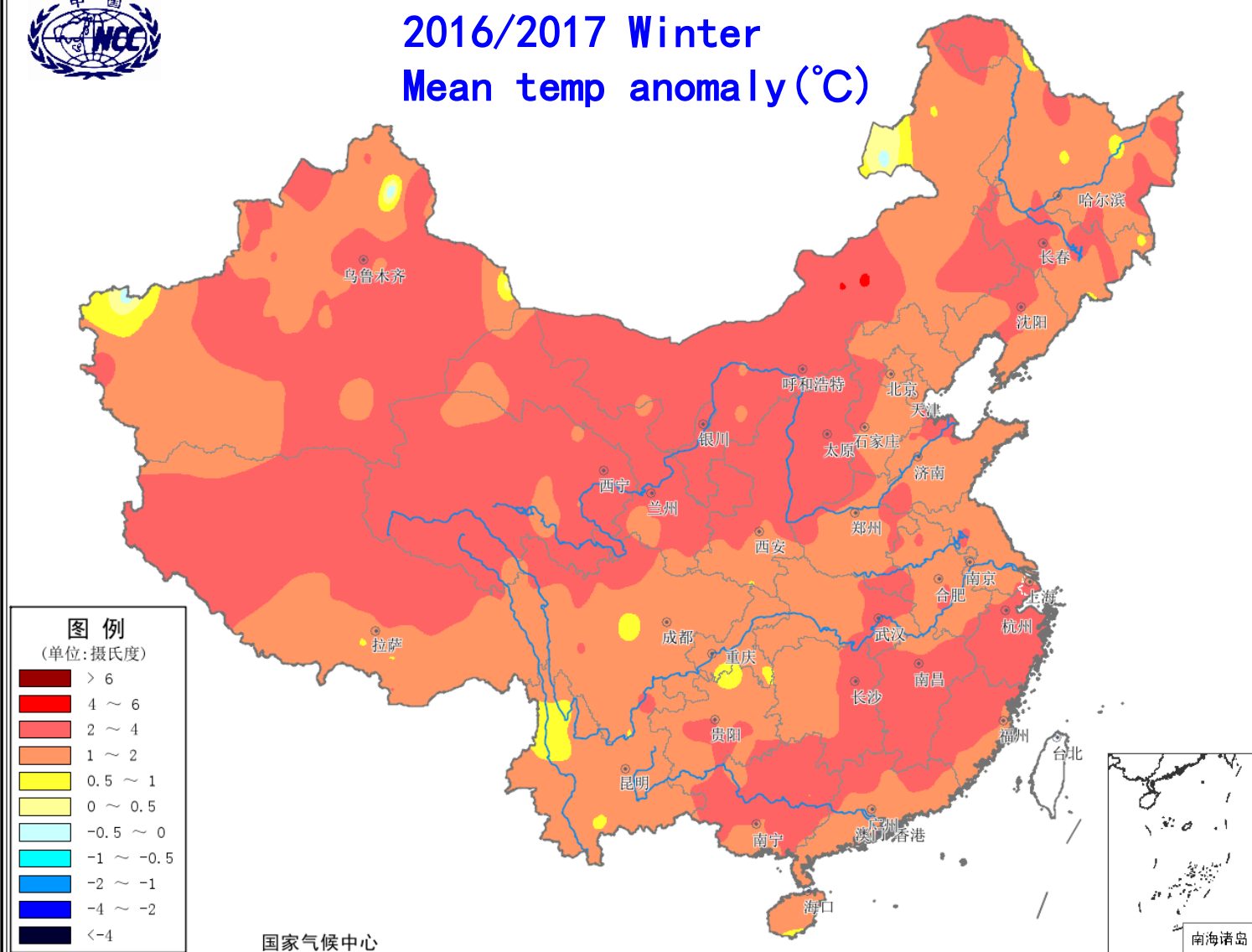
Winter mean temperature over Mainland China 1961 to 2016

This year, we started with a pretty warm winter which is the warmest winter since 1961.

Winter Mean temperature is -1.41°C which is 1.94°C higher than average (-3.35°C).



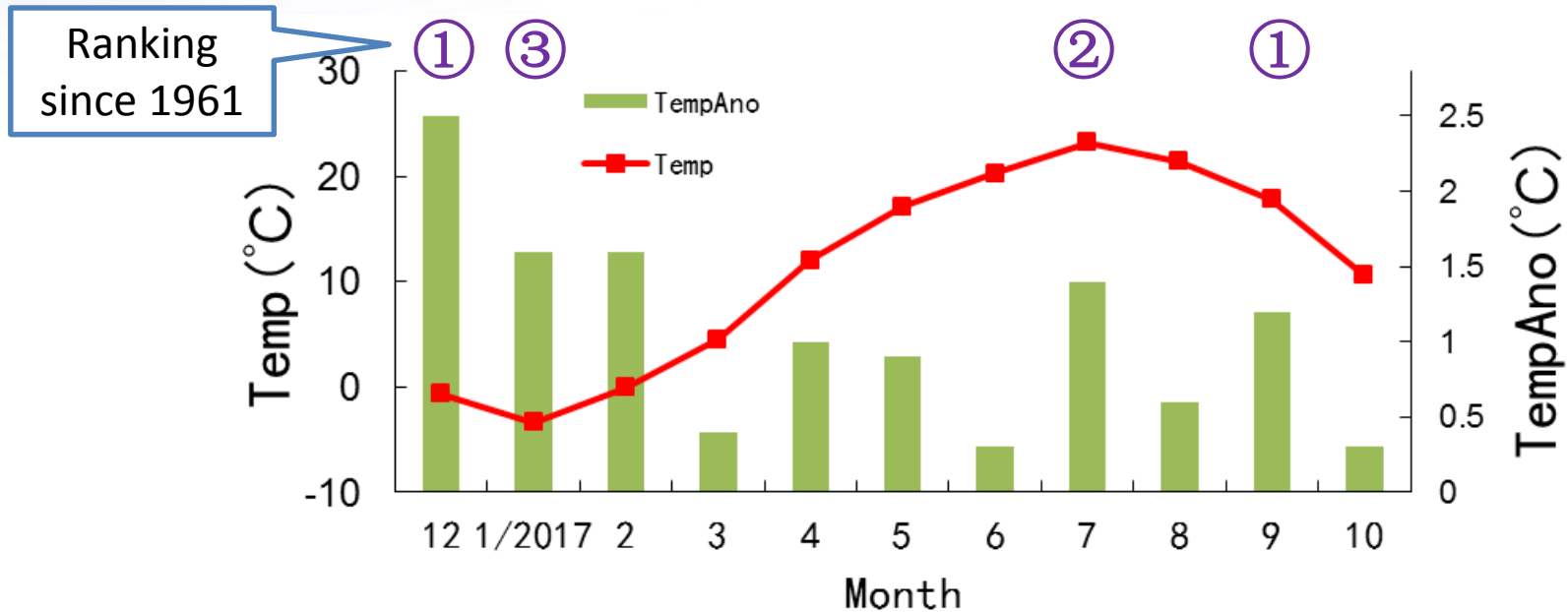
2016/2017 Winter Mean temp anomaly (°C)



Most of Mainland China were positive anomaly (>0.5 °C).

The higher anomalies (more than 2 °C) were located in North China, Northwest China, and South China.

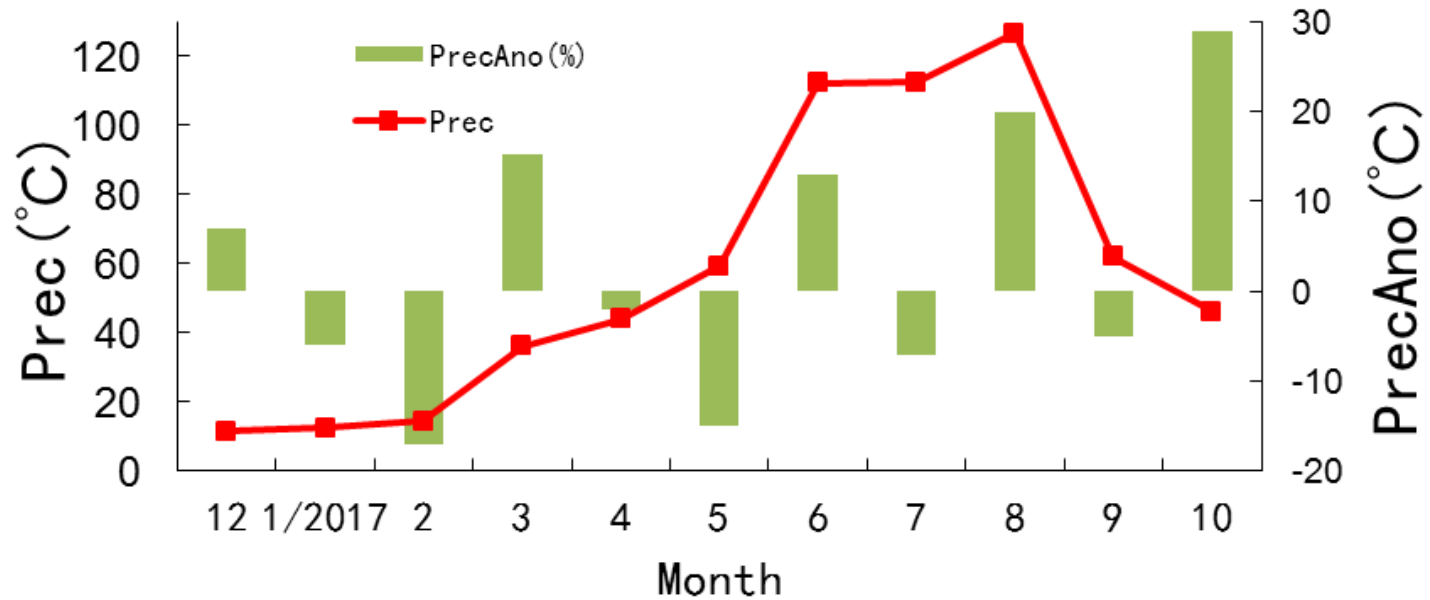
Warm: the most remarkable climate characteristic



Monthly mean temperature and its anomalies over Mainland China since Dec 2016



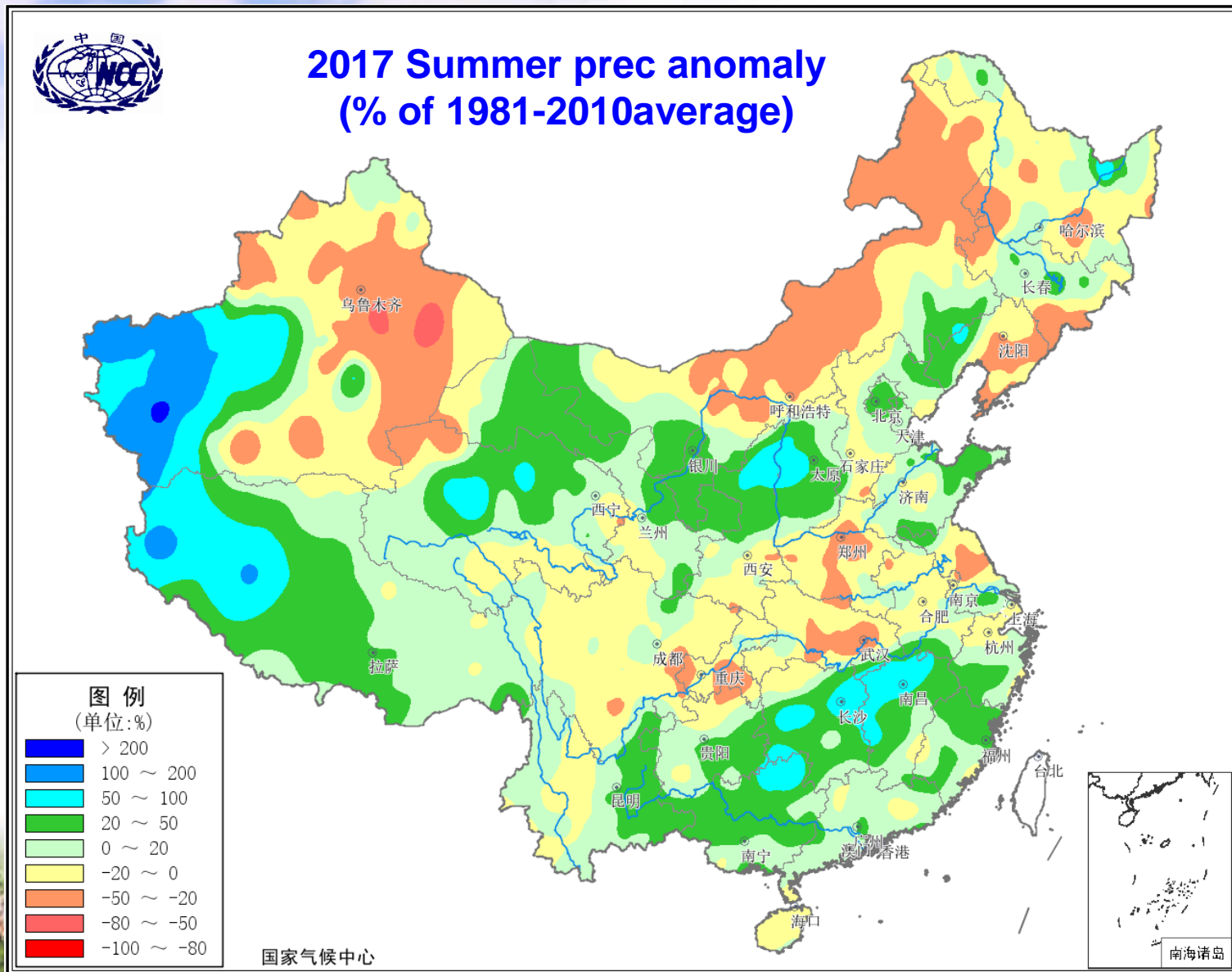
Precipitation: spatial and **temporal** uneven



Monthly mean precipitation and its anomalies over Mainland China since Dec 2016



Precipitation: **spatial** and temporal uneven



Outline

1 Climate Characteristics

2 Rainy Season Process

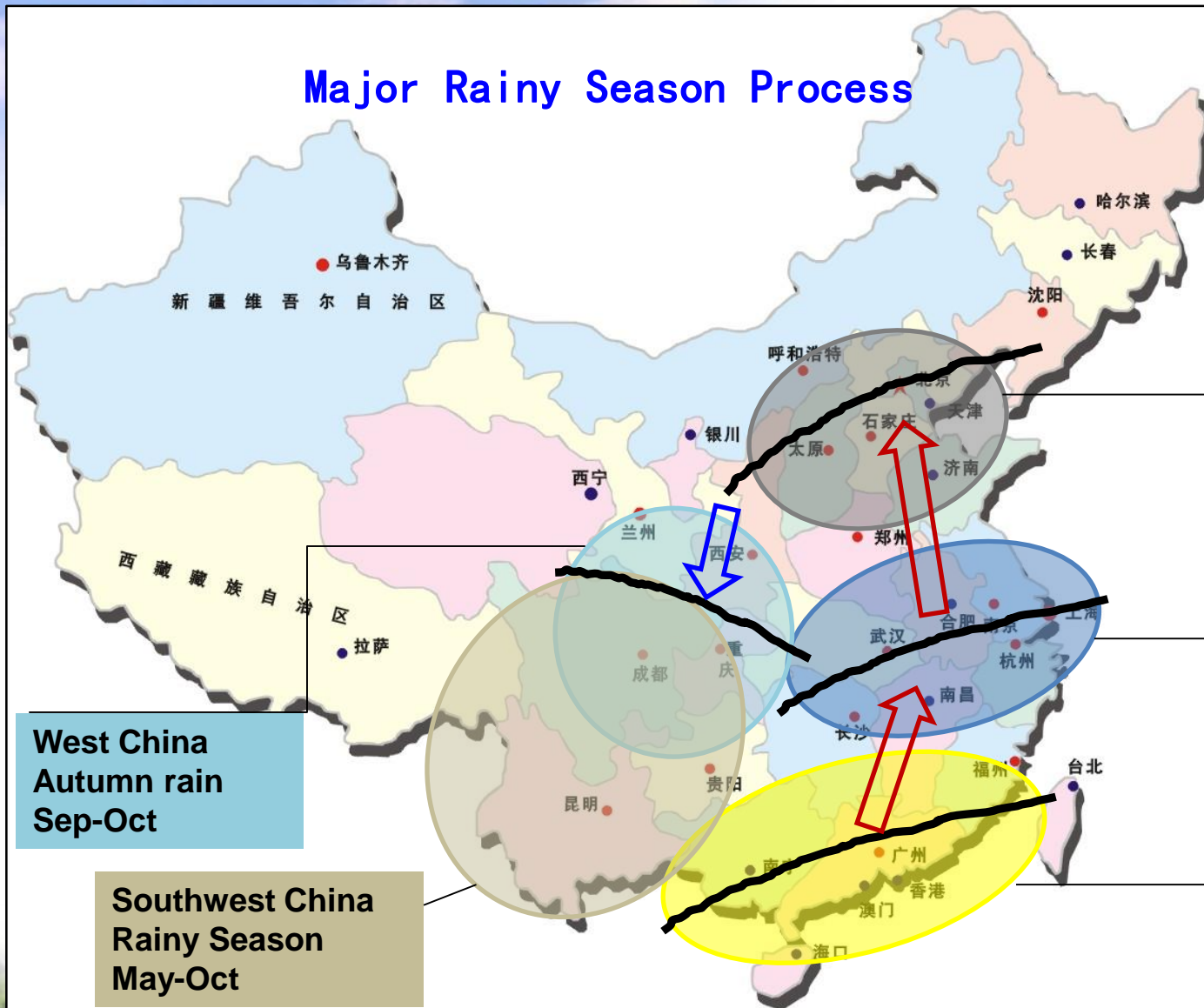


3 Major high impact events

4 Outlook



Major Rainy Season Process



North China
Rainy season
Late Jul-mid
Aug

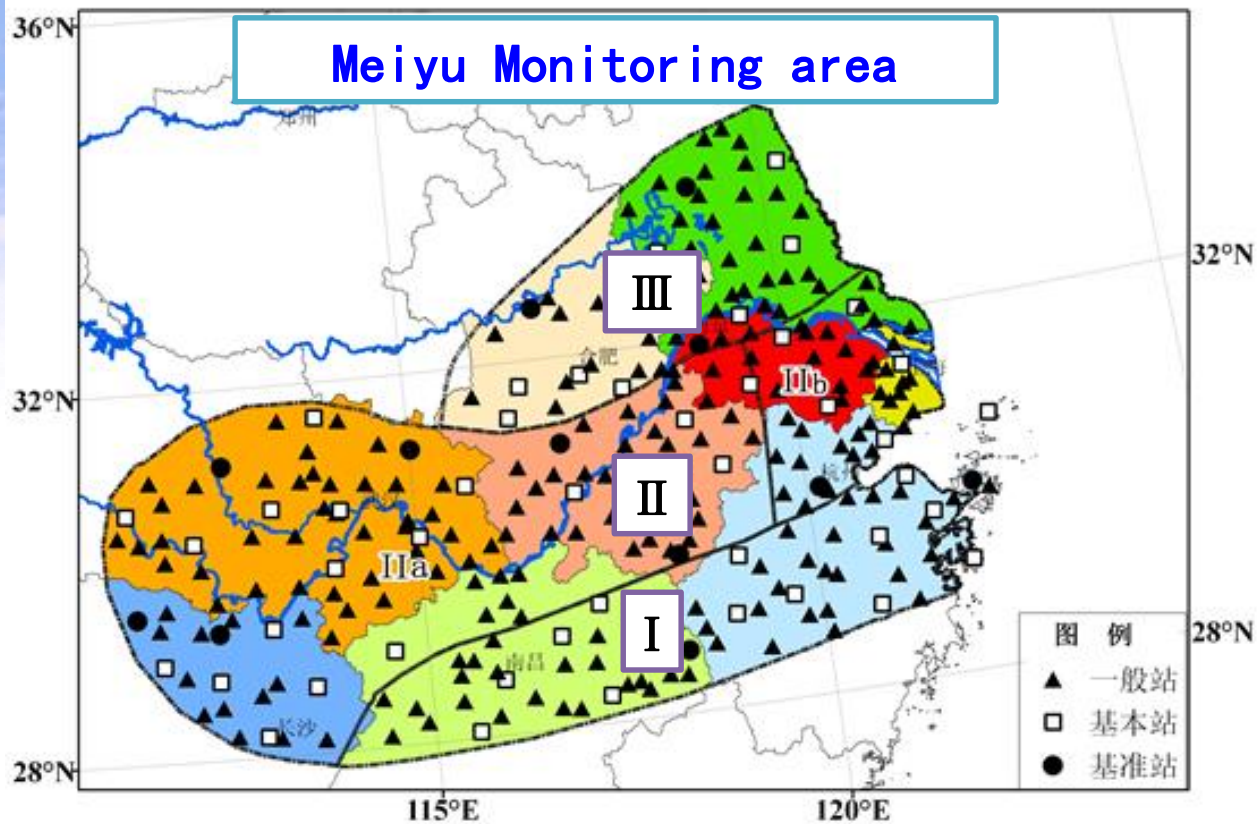
Meiyu Season
Jun-mid Jul

South China
Rainy season
Early Apr-Late
Jun

West China
Autumn rain
Sep-Oct

Southwest China
Rainy Season
May-Oct





Region	I	II	III
Start (anomalies)	June 4th	June 21st	June 30th
	4 d earlier	7d later	9 d later
End	July 6th	July 6th	July 11th
	2 d earlier	7 d earlier	4 d earlier
Duration	32d	15d	11d
	2d longer	14d shorter	13d shorter
Amount	491.9 mm	166.4 mm	116.2 mm
	34.6% more	40.8% less	56.1% less

Other Rainy Season information this year

Rainy Season	Start	End
South China	April 20 th 14d later	June 30 th 0d later
Southwest China	June 11 th 26d later	October 22 nd 8d later
North China	July 21 st 3d later	August 11 th 7d earlier
West China	August 24 th 16d earlier	Still in progress

Outline

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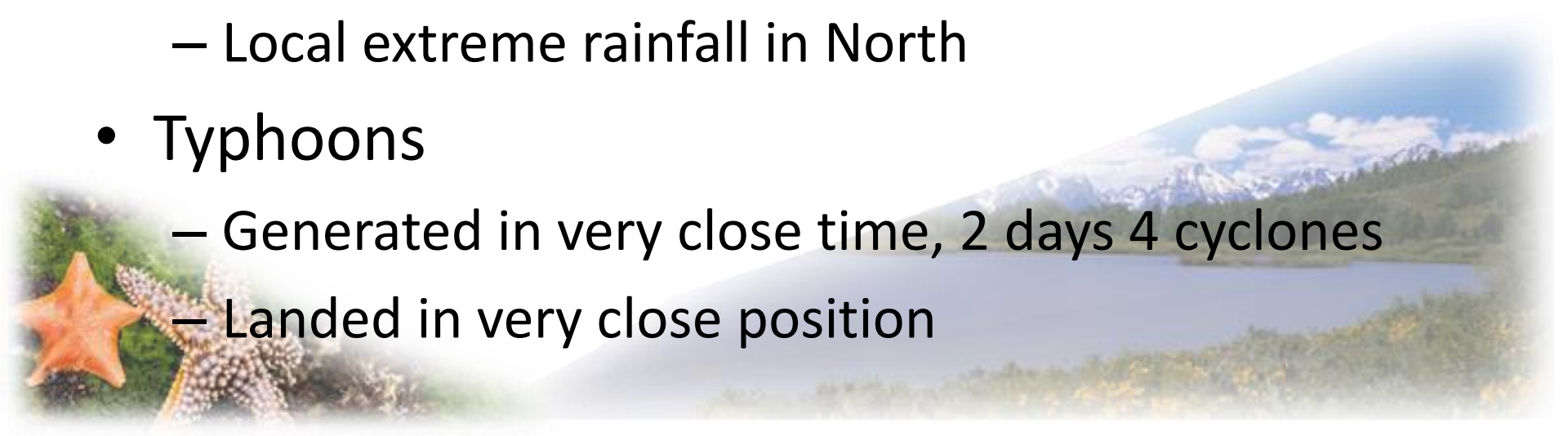
3 Major high impact events



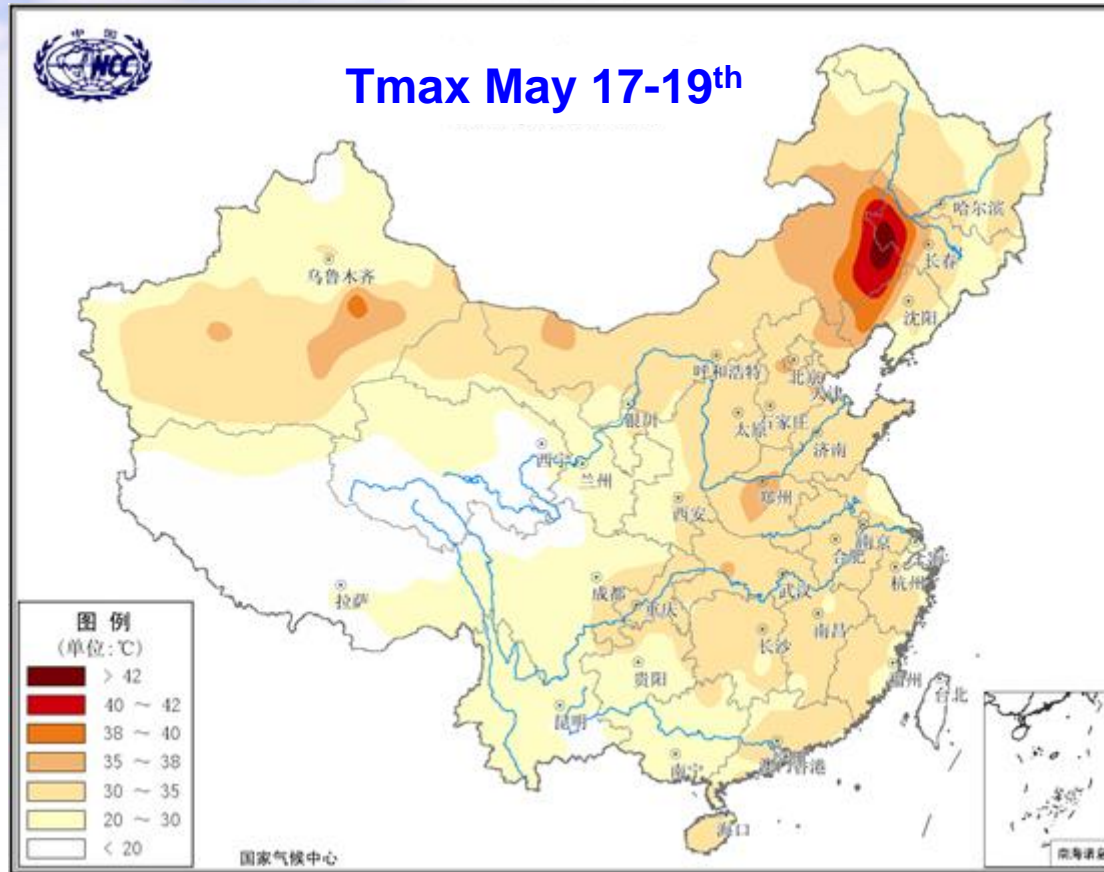
4 Outlook

Major high impact events and features

- Severe Heat Wave
 - Start pretty early (in Spring)
 - Wide range, high intensity, fast developed
- Severe Flooding
 - River basin flooding in South
 - Local extreme rainfall in North
- Typhoons
 - Generated in very close time, 2 days 4 cyclones
 - Landed in very close position



Start pretty early

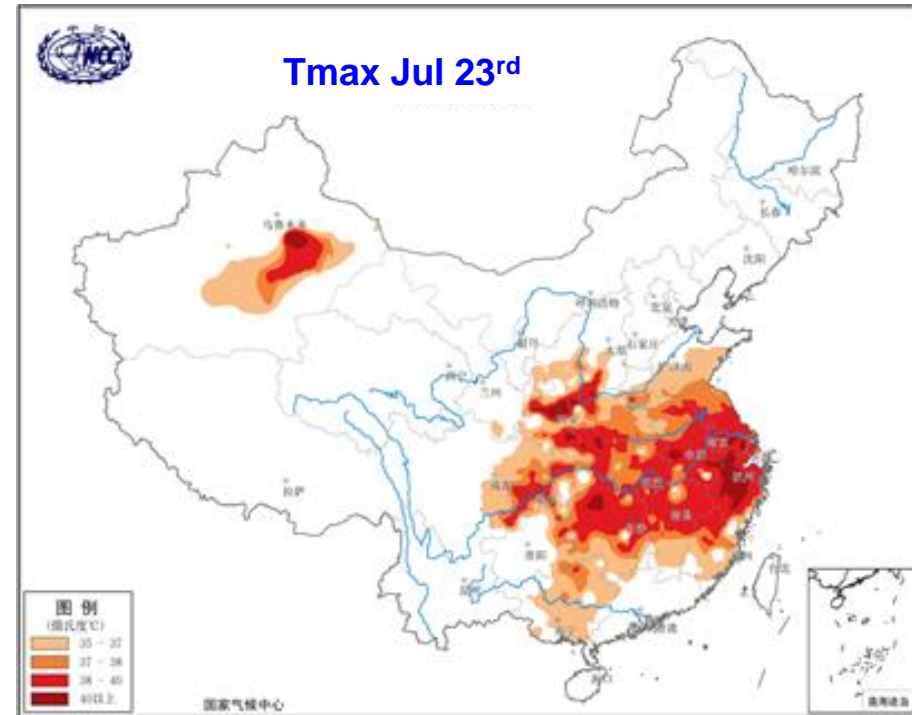
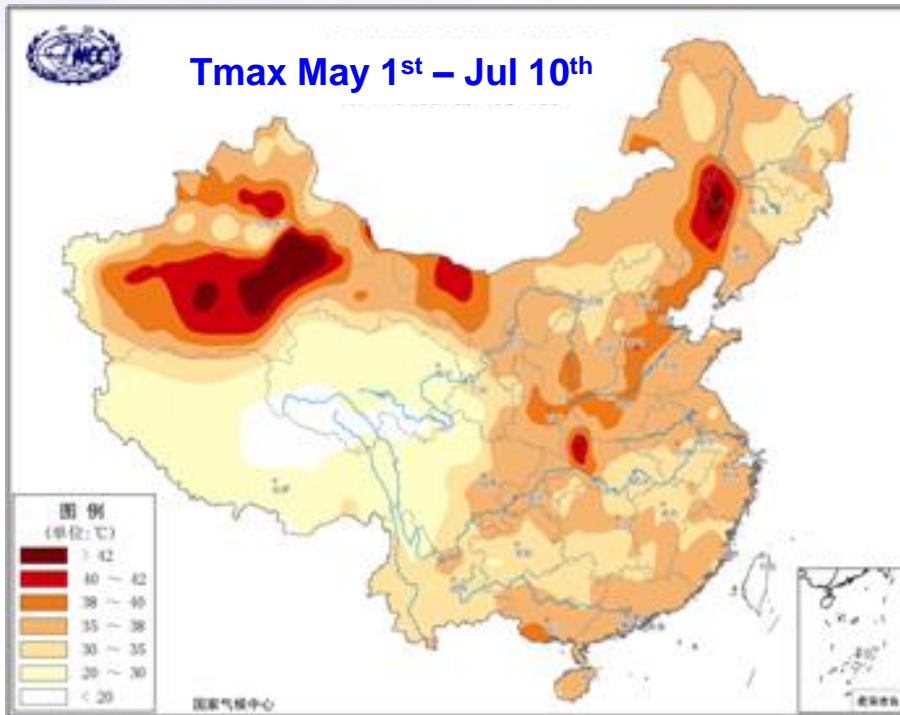


May 17-19th Heat wave affected west part of SE China and east part of N China.

$T_{\text{max}} > 35^{\circ}\text{C}$, some area $> 40^{\circ}\text{C}$, several stations $> 42^{\circ}\text{C}$.

48 stations had broken their seasonal T_{max} records. And 15 stations for historical records
Earliest heat wave event in North part of China.

Wide range, high intensity, fast developed



Frequent heat wave processes(4)
Long duration (14days among 4)
More high temperature days

80.3% area Tmax > 38°C
42.3% area Tmax > 40°C
Shanghai 42.3°C, broke 100~ record

Selected Significant Climate Anomalies and Events

July 2017

GLOBAL AVERAGE TEMPERATURE

July 2017 average global land and ocean temperature was the second highest for July since records began in 1880.

NORTH AMERICA

Warmer- to much-warmer-than-average conditions were present across much of North America, tying with 2016 as the fifth highest July temperature since continental records began in 1910.

ARCTIC SEA ICE EXTENT

July 2017 sea ice extent was 16.1 percent below the 1981–2010 average—the fifth smallest July sea ice extent since satellite records began in 1979.

ASIA

Near- to -cooler-than-average conditions were observed across much of northern Asia, while the majority of the southern half of Asia had much-warmer-than-average conditions, with several locations across Mongolia and China having record warm July temperatures. Overall, Asia had its fifth highest July temperature in its 108-year record.

CONTIGUOUS UNITED STATES

Nearly 12% of the contiguous U.S. was in drought by the end of July. Drought intensified across the Northwest, Northern Rockies and Central to Northern Plains.

EUROPE

Europe had near to warmer-than-average conditions during July 2017, resulting in the coolest July temperature since 2011 and the 17th highest on record.

KINGDOM OF BAHRAIN

The Kingdom of Bahrain, as a whole, had its highest July mean and maximum temperature on record. The nation's July minimum temperature was the third highest on record.

AFRICA

Much-warmer-than-average temperatures engulfed much of Africa during July 2017, with several locations in the southern half of Africa experiencing record warmth. Overall, this was Africa's highest July temperature on record.

ISLAND OF FIJI

Below to much-below-average conditions affected much of Fiji during July 2017.

SOUTH AMERICA

July 2017 ranked as the seventh highest July temperature in the 108-year record.

AUSTRALIA

Drier and warmer-than-average conditions were present across much of Australia during July 2017. The national average temperature was the highest since 1975 and the third highest in the nation's 108-year record.

ANTARCTIC SEA ICE EXTENT

July 2017 sea ice extent was 4.5 percent below the 1981–2010 average—the smallest July sea ice extent on record.

NEW ZEALAND

Wetter-than-average conditions were present across New Zealand, with several locations recording more than double their monthly precipitation totals.

Please Note: Material provided in this map was compiled from NOAA's State of the Climate Reports. For more information please visit: <http://www.ncdc.noaa.gov/sotc>



Selected Significant Climate Anomalies and Events

August 2017

GLOBAL AVERAGE TEMPERATURE

August 2017 average global land and ocean temperature was the third highest for August since records began in 1880.

NORTH AMERICA

North America had its coolest August temperature since 2009 and the 22nd highest since continental records began in 1910.

ARCTIC SEA ICE EXTENT

August 2017 sea ice extent was 24.3 percent below the 1981–2010 average—the third smallest August sea ice extent since satellite records began in 1979.

ASIA

Asia had its third highest August temperature in its 108-year record. Much of the continent experienced warmer- to much-warmer-than-average conditions. Several locations across the center of the continent had near- to cooler-than-average temperatures during the month.

KINGDOM OF BAHRAIN

The Kingdom of Bahrain, as a whole, had its highest August mean, maximum, and minimum temperatures on record.

EUROPE

Europe had its third warmest August on record. Portugal, Spain, and Austria had a top eight warm August.

CONTIGUOUS UNITED STATES

Several locations across the state of Texas received over 1016 mm (40 inches) of rain due to Hurricane Harvey. This event produced devastating floods and resulted in the wettest month for Texas.

AFRICA

Much-warmer-than-average temperatures engulfed much of Africa during August 2017. Overall, this was Africa's second highest August temperature on record, behind 2015.

SOUTH AMERICA

Much-warmer-than-average temperatures engulfed much of South America, resulting in the third highest August temperature on record.

AUSTRALIA

Australia had its ninth highest August temperature on record. Regionally, Queensland and Western Australia had top ten warm August. Meanwhile, Tasmania and Victoria had cooler-than-average conditions during the month.

ANTARCTIC SEA ICE EXTENT

August 2017 sea ice extent was 3.6 percent below the 1981–2010 average—the second smallest August sea ice extent on record, behind 2002.

NEW ZEALAND

Several locations across New Zealand had record or near-record August temperatures. Overall, New Zealand had its third highest August temperature on record.

Please Note: Material provided in this map was compiled from NOAA's State of the Climate Reports. For more information please visit: <http://www.ncdc.noaa.gov/sotc>

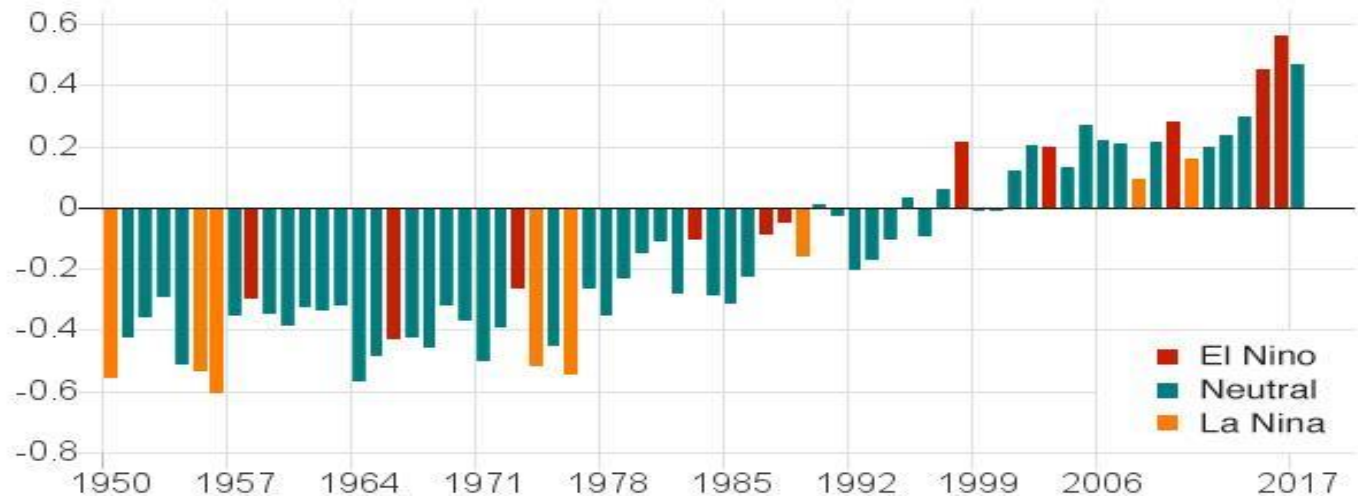


One world, one word: hot!

- The twenty-third session of the Conference of the Parties (COP 23) is taking place from 6-17 November in Bonn.
- The WMO says 2017 is 'very likely' in top three warmest years on record.
- It will likely be the hottest year in the absence of the El Niño phenomenon.

How has global mean temperature changed since 1950?

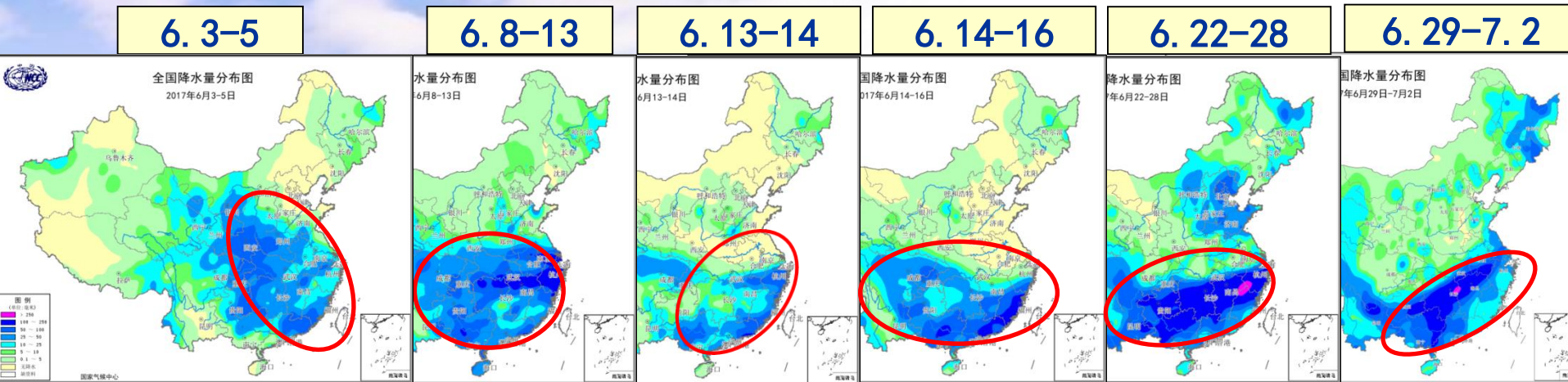
Compared to 1981-2010 average (celsius)



Source: WMO

BBC

River basin flooding in South

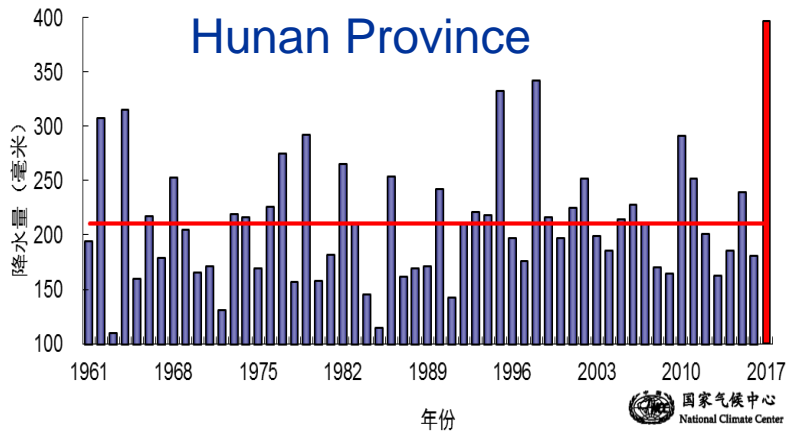


6 rain storm processes with high intensity, focused the same regions.

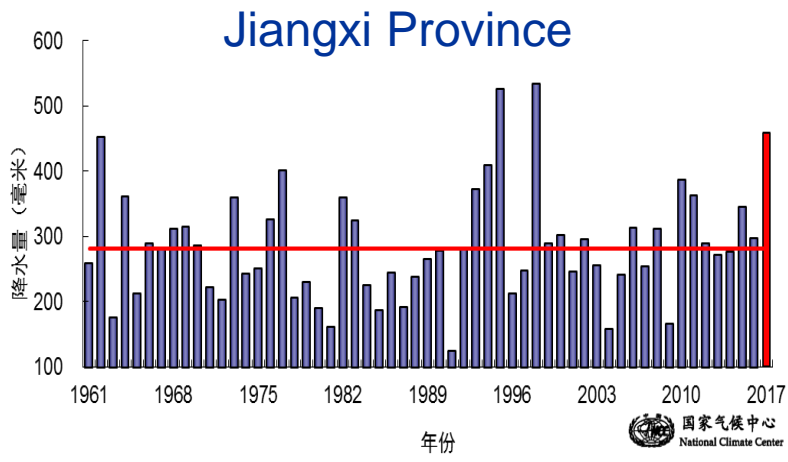
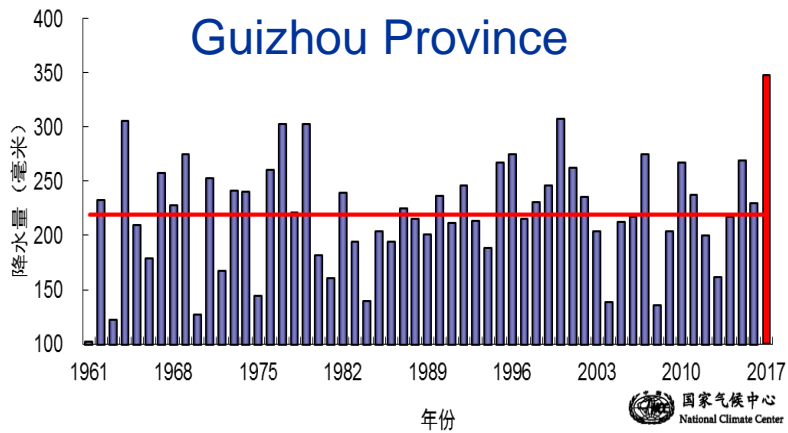
6 920 000 people were affected. 27 casualties. 299 000 ha crops were affected. Direct economic losses more than 19 billion yuan.

Mean precipitation in June in Hunan Province and Guizhou Province broke their historical records. Jiangxi Province was the third largest.



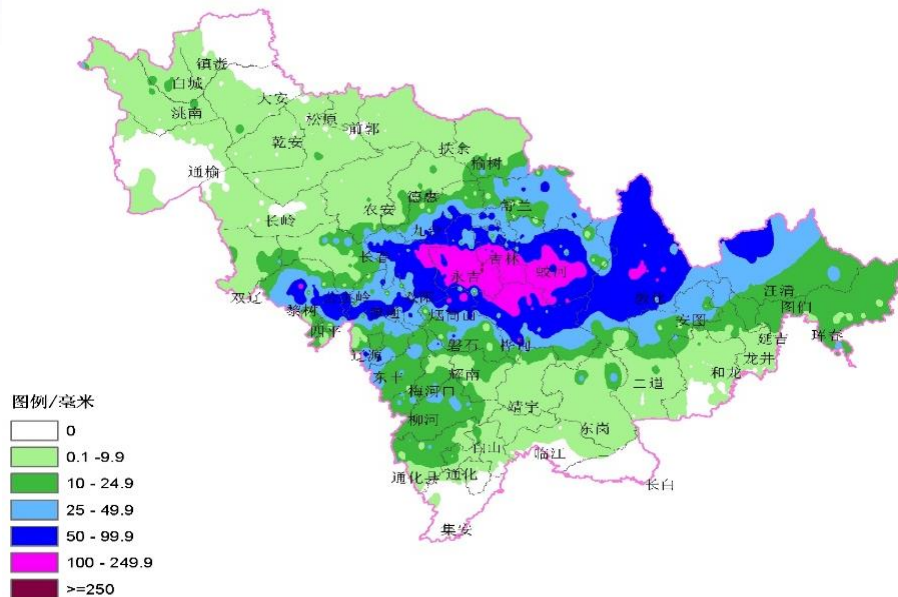


Juzizhoutou 橘子洲头

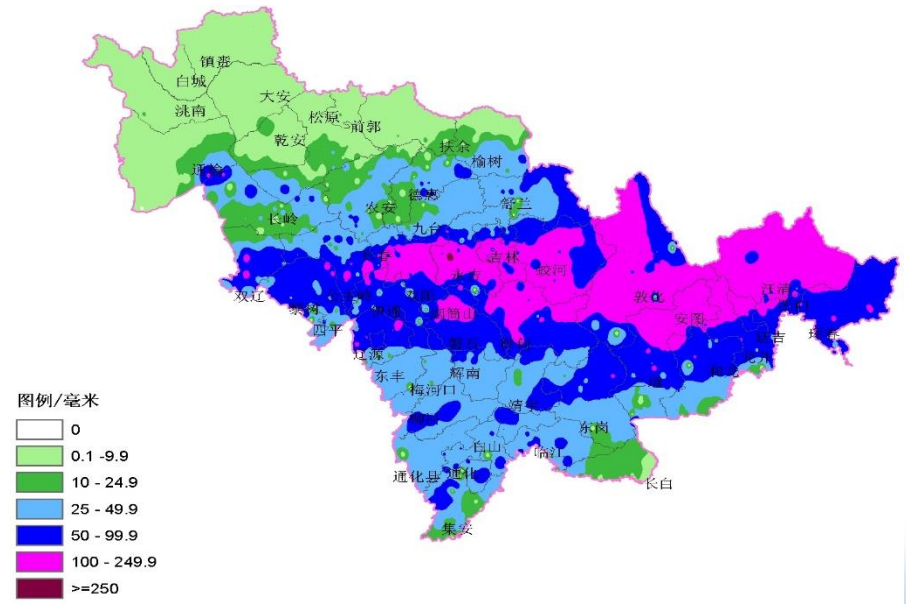


Local extreme rainfall in North

Rainfall amount July 13-14th

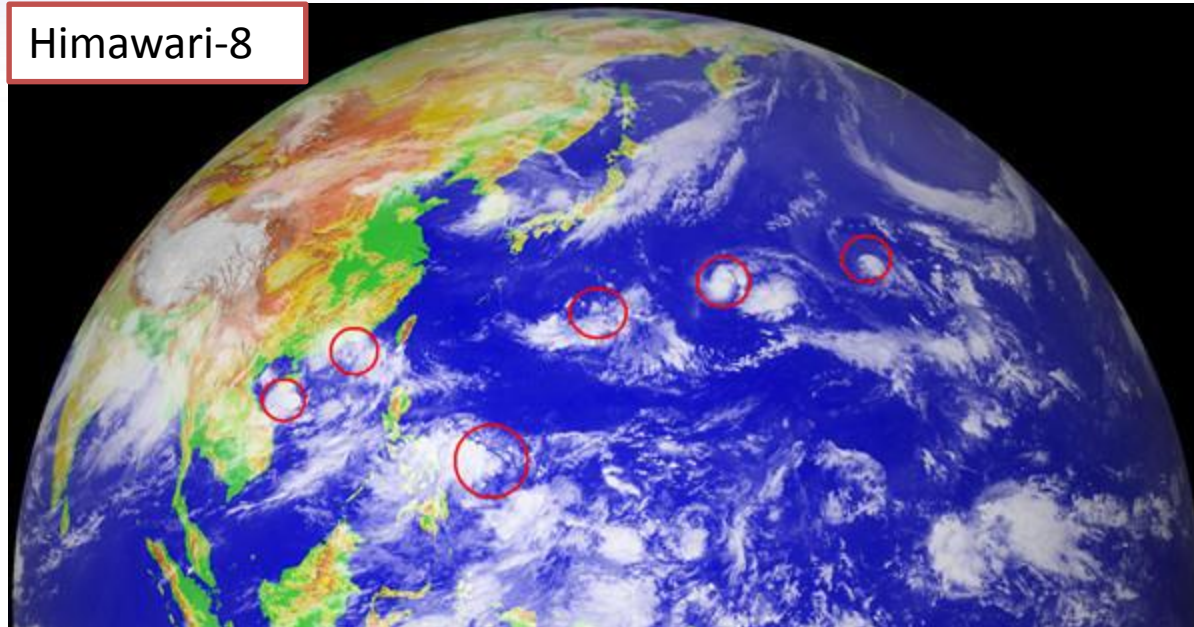


Rainfall amount July 19-21st



For Yongji County, day max prec is 296mm, broke record. Just one week later, same place, day max prec is 389mm. Broke the record again. Severe city flooding.

Generated in very close time 2 days 4 cyclones



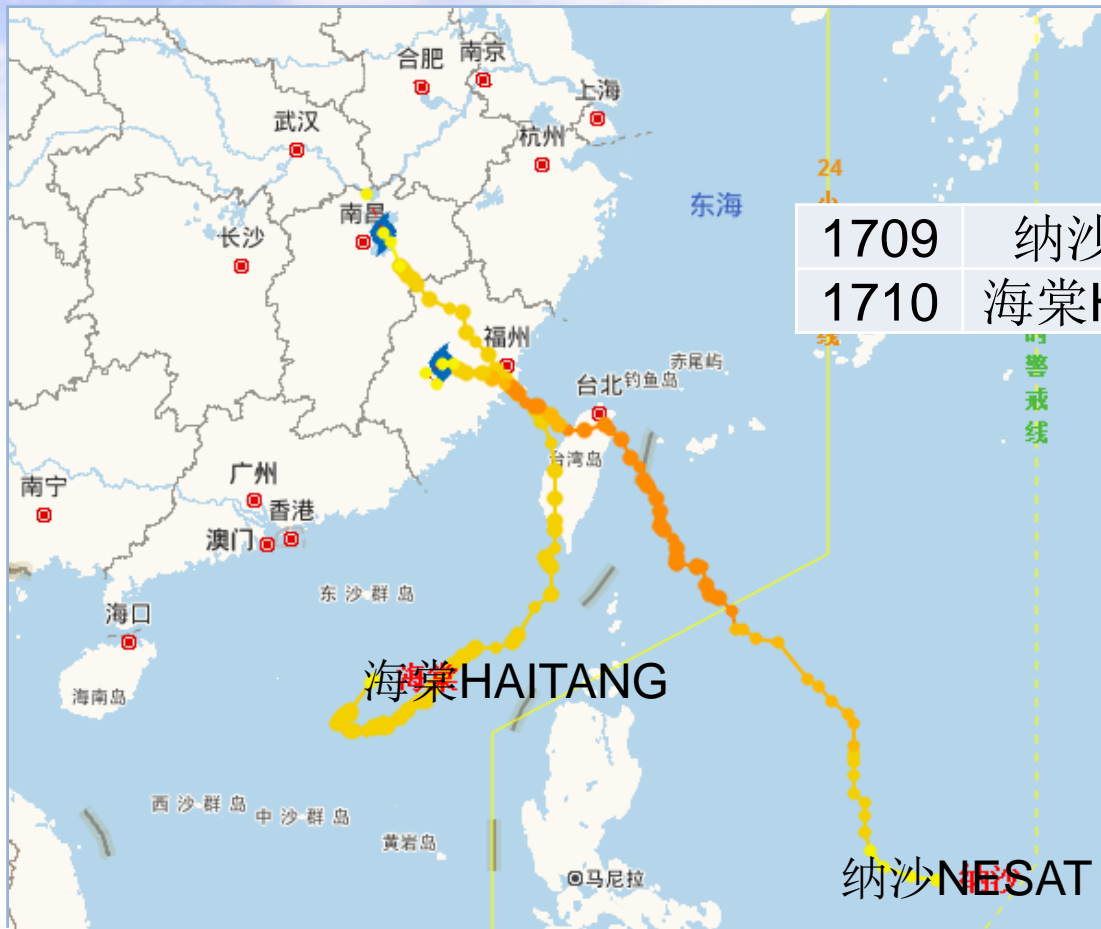
1705	奥鹿NORU	July 21 st 08:00
1706	玫瑰KULAP	July 21 st 14:00
1707	洛克ROKE	July 22 nd 17:00
1708	桑卡SONCA	July 22 nd 17:00



van Gogh: The Starry Night



Landed in very close position in short time

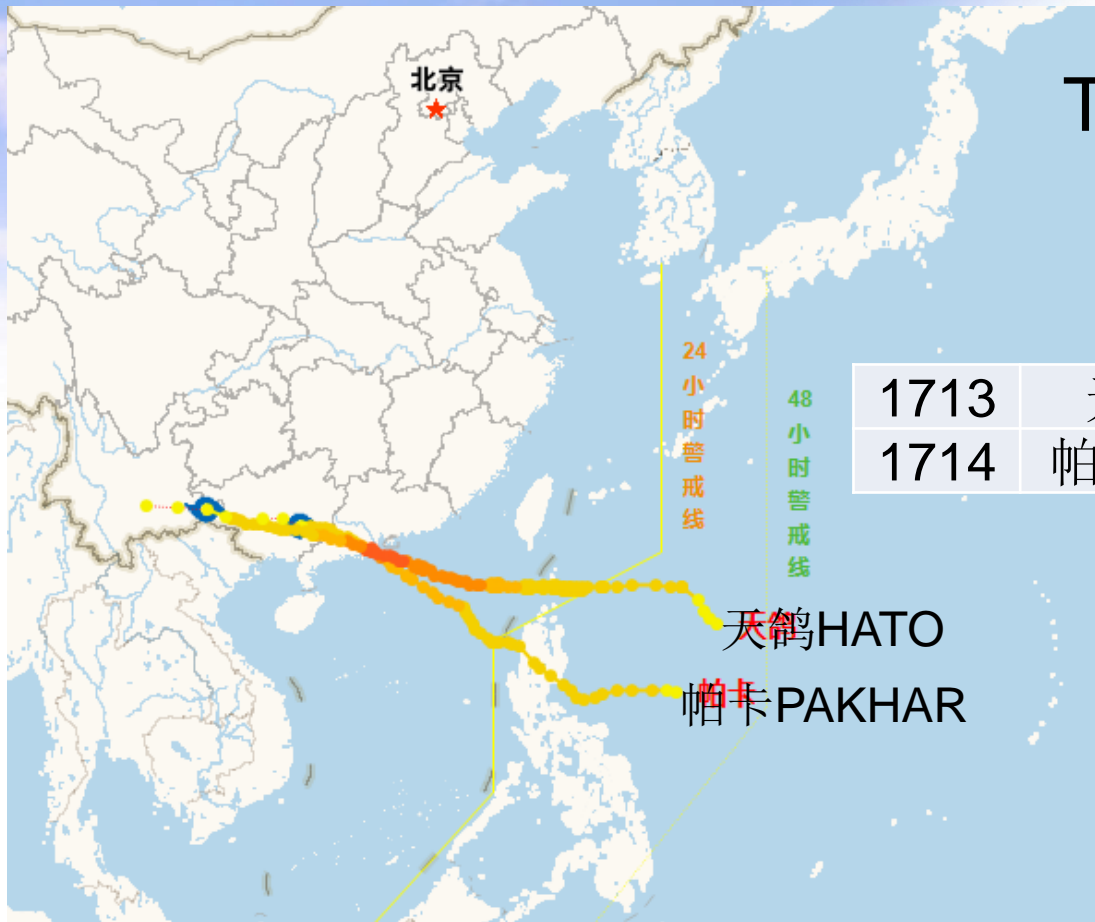


1709	纳沙NESAT	July 26 th 11:00
1710	海棠HAITANG	July 28 th 10:00

No. 9 Nesat landed Fuqing county Fujian province on July 30th.
No. 10 Haitang landed same place next day.



Typhoon trails overlap



1713	天鸽HATO	Aug 20 th 14:00
1714	帕卡PAKHAR	Aug 24 th 20:00

No. 13 Hato landed near Macao on August 24th .

No. 14 Pakhar landed same place on August 27th.

No. 13 Hato was strongest typhoon in August. CMA issued the first typhoon red warning signal this year.

8 casualties in Macao. Head of weather agency was resigned.

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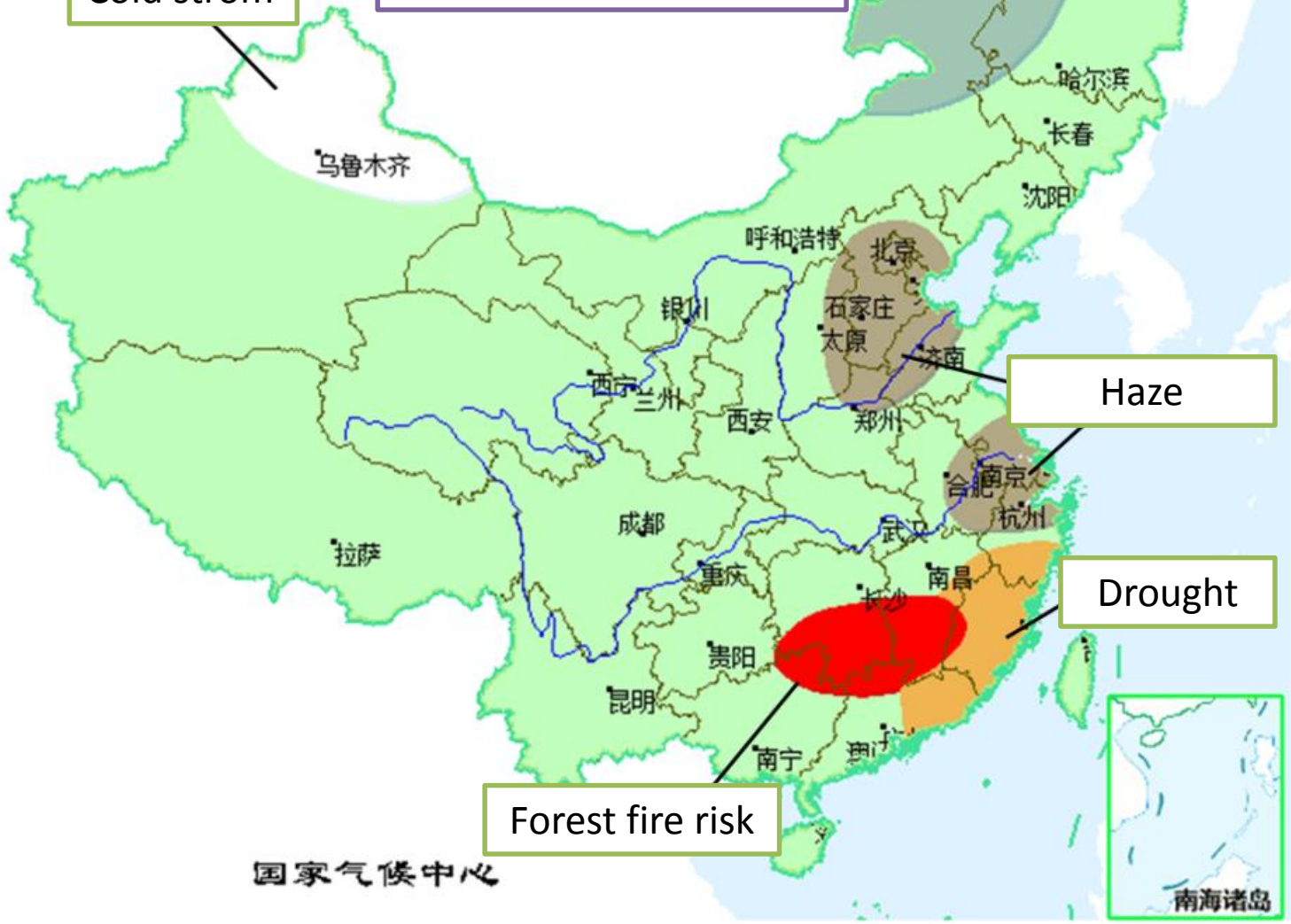
Outlook



Climate risk prediction
Dec 2017-May 2018

Cold strom

Cold strom



Haze

Drought

Forest fire risk

国家气候中心

南海诸岛

谢 谢

Thank you

