



KMA'S BRIEFING ON CLIMATE CHARACTERISTICS

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Monthly (August) and Seasonal (June-August) 2011 Climate Summary.

- ◇ The monthly average of rainy days(17.7 days) for August 2011 was the third highest in a record extending back to 1973. But, sunshine duration(111.5 hours) was the third lowest for the same period.
- ◇ The mean minimum temperature (20.7 °C) for summer 2011 was the fourth highest in a record extending back to 1973. Also, the amount of precipitation(1048.1 mm) and the rainy days (48.3 days) were the first highest for the same period.

- Climate features of August 2011 and the Summer 2011 (June-August 2011) and their long-term trends are analyzed using 47 meteorological stations in Korea (the national average) during 1973-2011 (1908-2011 for Seoul).
- **The climatological features in August 2011 can be described as follows:**
 - o Korea (whole nation)
 - The mean temperature (25.2 °C) and the mean maximum temperature (29.2 °C) were 0.0 °C, -0.6 °C below-normal, respectively. The mean minimum temperature (22.3 °C) was 0.7 °C above-normal.
 - The monthly amount of precipitation (284.7 mm) was 104% of normal.
 - The monthly average of rainy days (17.7 days) was more than 4.5 days of normal, making it the third highest in a record extending back to 1973 (1st 18.5 days in 2010; 2nd 18.0 days in 1980; 3rd 17.7 days 2011).
 - Days with heavy precipitation above 30 mm/hour (0.6 days) was the fifth highest in a record extending back to 1973 (1st 1.8 days in 1998; 2nd 1.4 days in 2010; 3rd 1.4 days 1995; 4th 1.4 days in 1987; 5th 1.2 days in 2011).
 - The monthly average of sunshine duration (111.5 hours) was 64% of normal, making it the third lowest in a record extending back to 1973 (1st 98.8 hours in 1980; 2nd 100.2 hours in 2002; 3rd 111.5 hours in 2011).

o Seoul

- The mean temperature (25.8 °C) and the mean minimum temperature (23.0 °C) were 0.1 °C and 0.6 °C above normal, respectively. The mean maximum temperature (29.5 °C) was 0.1 °C below normal.
- The monthly amount of precipitation (166.8 mm) was 46% of normal.
- The number of rainy days (17.0 days) was more than 2.4 days of normal.
- The total of sunshine duration (94.0 hours) was 62% of normal, making it the fifth lowest in a record extending back to 1973 (1st 52.4 hours in 2002; 2nd 76.4 hours in 1980; 3rd 83.0 hours in 2003; 4th 85.7 hours in 1965; 5th 94.0 hours in 2011).

□ **The climatological characteristics of Summer 2011 (June-August) were as follows:**

o Korea (whole nation)

- The mean temperature (24.1 °C) and the mean maximum temperature (28.4 °C) were 0.4 °C and 0.1 °C higher than normal, respectively. The mean minimum temperature (20.7 °C) was 0.8°C higher than normal, making it the fourth highest in a record extending back to 1973 (1st 21.2 °C in 2010; 2nd 20.9 °C in 1978; 3rd 20.8 °C in 1994; 4th 20.7 °C in 2011).
- The seasonal amount of precipitation (1048.1 mm) was 322.4 mm higher than normal, making it the first highest in a record extending back to 1973.
The seasonal average of rainy days (48.3 days) increased by 10.9 days compared to normal and was the first highest in a record extending back to 1973.
- Days with heavy precipitation above 30 mm/hour (2.8 days) was the first highest.
- The seasonal average of sunshine duration (396.9 hours) was 79% of normal, making it the fourth lowest in a record extending back to 1973 (1st 359.4 hours in 2003; 2nd 380.4 hours in 1980; 3rd 393.2 hours in 1993; 4th 396.9 hours in 2011).

o Seoul

- The mean temperature (24.1 °C) and the mean maximum temperature (28.0 °C) were 0.2 °C and 0.4 °C lower than normal, respectively. The mean minimum temperature (21.1 °C) was 0.3 °C higher than normal.
- The seasonal amount of precipitation (1702.3 mm) was 810.2 mm higher than normal, making it the second highest in a record extending back to 1908 (1st 1783.7 mm in 1998; 2nd 1702.3 mm in 2011). The number of rainy days (52 days) increased by 11.2 days compared to normal, and is the third highest.(1st: 54 days in 1961; 2nd: 53 days in 1990; 3rd: 52 days in 2011).

- Days with heavy precipitation above 30 mm/hour (5.0 days) was the third highest. (1st: 7 days in 1998; 2nd: 7 days in 1966; 3rd: 5 days in 2011)
- The total of sunshine duration (345.2 hours) was 76% of normal

□ **Long-term August and summertime climate trends**

- o The mean temperatures for August and summer 2000's in Korea were 0.4°C higher compared with the 1970's. The minimum temperatures for the 2000's were 0.6°C (August) and 0.5°C (summer) higher compared with the corresponding values for the 1970's, exhibiting an upward trend.
- o The precipitation amounts for August and summer 2000's in Korea were 26.2% and 28.5% higher than the corresponding values for the 1970's.

※ Normal: average from 1981 to 2010.

※ National average indicates average values of 47 meteorological stations starting from 1973.

※ In Seoul, data are analyzed from 1908.

※ 1920's: average from 1921 to 1930

※ 1970's: average from 1973 to 1980

※ 2000's: average from 2001 to 2010

Appendix 1. August 2011 climate

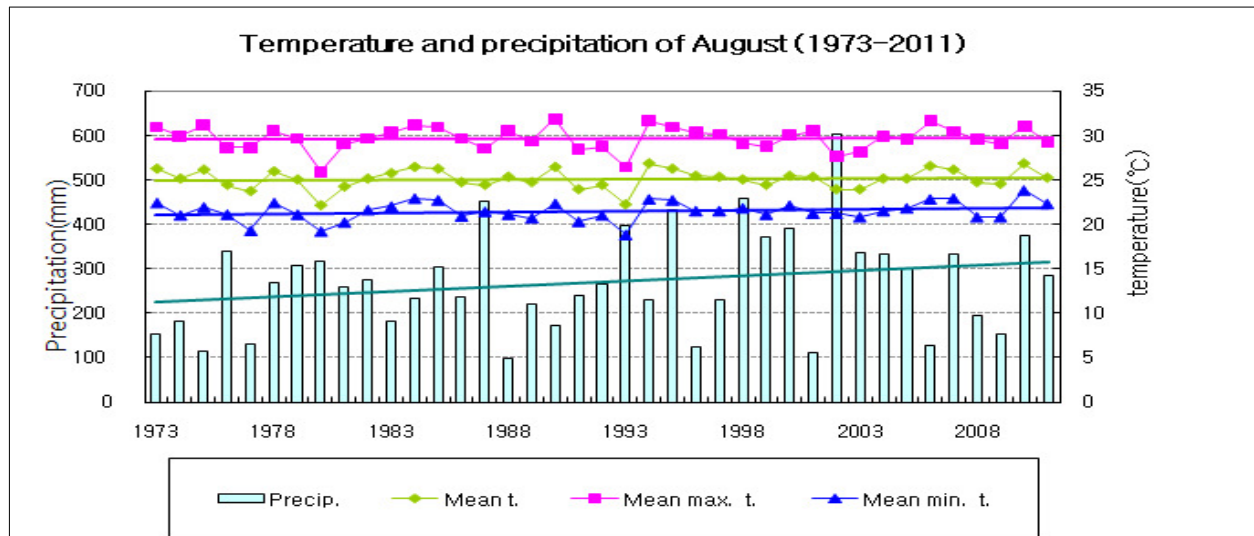


Fig. 1. Temperatures (mean, mean maximum, and mean minimum), and precipitation in South Korea during August 1973-2011.

□ Average values of meteorological elements in Korea during August (1973-2011)

statistics for climate elements (national)	August 2010	August 2011(a)	normals of August (1981-2010)(b)	a-b	rank since 1973 (within 5th)
mean temperature (°C)	26.9	25.2	25.2	0	
mean maximum t (°C)	31.1	29.2	29.8	-0.6	
mean minimum t (°C)	23.9	22.3	21.6	0.7	
Days with max. temp.(≥30°C)	21.6	13.4	16.0	-2.6	
amount of precipitation (mm)	372.9	284.7	275.0	9.7(104%)	
days of rainy	18.5	17.7	13.2	4.5	the third highest
days with precip. greater than 30mm/hour	1.4	1.2	0.7	0.5	the fifth highest
days with precip. greater than 80mm/day	0.9	0.6	0.7	-0.1	
Sunshine duration (hr)	146.4	111.5	175.1	-63.6(64%)	the third lowest

□ Average values of meteorological elements in Korea during August for each decade (1973-2010)

year	mean temp (°C)	mean max. temp. (°C)	mean min. temp. (°C)	days with max. temp. (≥30°C)	days with min. temp. (≥25°C)	amount of rain (mm)	days of rain(≥0.1mm)	days with precip. ≥30mm/h	days with precip. ≥80mm/d	sunshine duration (hr)
1973-1980(a)	24.9	29.4	21.2	222.0	15.3	1.6	222.0	11.7	0.5	0.5
1981-1990(b)	25.4	30.1	21.6	240.4	16.9	1.8	240.4	12.2	0.6	0.6
1991-2000(c)	25.0	29.5	21.4	304.4	14.9	2.6	304.4	13.4	0.9	0.8
2001-2010(d)	25.3	29.8	21.8	280.1	16.2	3.2	280.1	14.1	0.7	0.7
d-a	0.4	0.4	0.6	58.1	0.9	1.6	58.1	2.4	0.2	0.2
d-b	-0.1	-0.3	0.2	39.7	-0.7	1.4	39.7	1.9	0.1	0.1
d-c	0.3	0.3	0.4	-24.3	1.3	0.6	-24.3	0.7	-0.2	-0.1

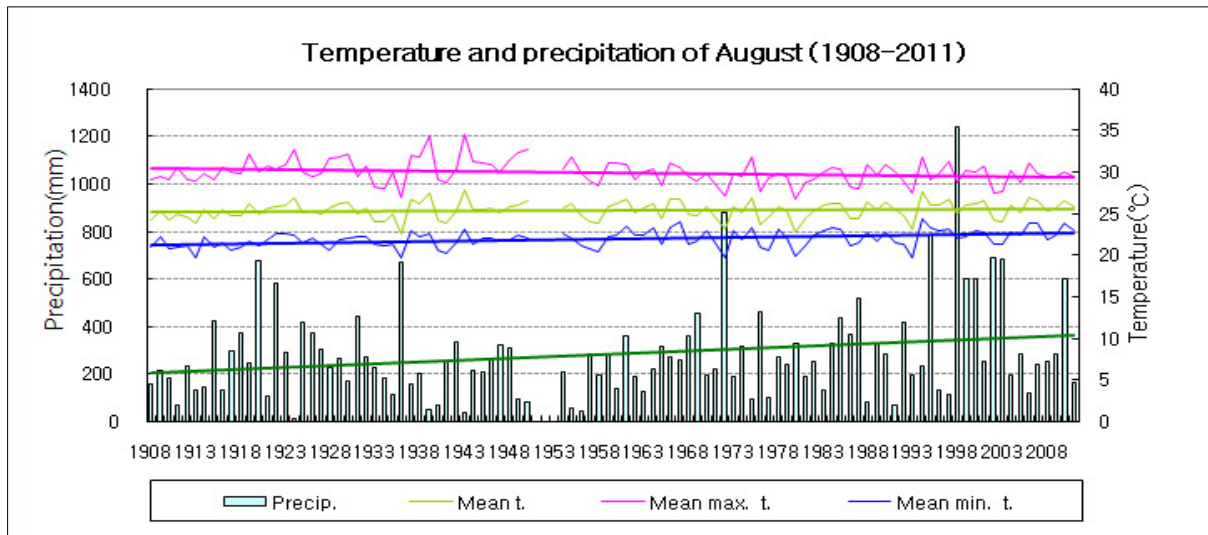


Fig. 2. Temperatures (mean, mean maximum, and mean minimum) and precipitation in Seoul during August 1908-2011

□ Average values of meteorological elements in Seoul during August (1908-2011)

statistics for climate elements (Seoul)	August 2010	August 2011(a)	normals of August (1981-2010) (b)	a-b	rank since 1908 (within 5th)
mean temperature (°C)	26.5	25.8	25.7	0.1	
mean maximum t (°C)	30.0	29.5	29.6	-0.1	
mean minimum t (°C)	23.8	23.0	22.4	0.6	
Days with max. temp.(≥30°C)	17.0	13.0	15.5	-2.5	
amount of precipitation (mm)	598.7	166.8	364.2	-197.4(46%)	
days of rainy	24.0	17.0	14.6	2.4	
days with precip. greater than 30mm/hour	4.0	-	1.3	-1.3	
days with precip. greater than 80mm/day	3.0	-	1.2	-1.2	
Sunshine duration (hr)	96.5	94.0	152.5	-58.5(62%)	the fifth lowest

□ Meteorological elements in Seoul during August for each decade (1911-2010)

year	mean temp (°C)	mean max. temp. (°C)	mean min. temp. (°C)	days with max. temp. (≥30°C)	days with min. temp. (≥25°C)	amount of rain (mm)	days of rain(≥0.1mm)	days with precip. ≥30mm/h	days with precip. ≥80mm/d	sunshine duration (hr)
1911-1920	25.0	30.0	21.1	274.5	12.4		0.9	17.0	0.3	227.5
1921-1930	25.8	31.0	21.9	275.8	13.2		1.0	19.8	1.8	218.7
1931-1940	25.1	30.1	21.7	239.5	15.0		0.5	16.0	1.1	186.8
1941-1950	25.7	31.4	21.9	212.4	12.2	0.5	0.6	21.6	1.5	239.7
1954-1960	25.2	30.2	21.7	174.0	11.0	0.3	0.3	17.9	1.1	239.7
1961-1970	25.7	29.9	22.6	276.8	14.9	0.7	0.5	16.9	2.7	145.0
1971-1980(a)	24.8	29.0	21.6	311.2	13.4	0.6	1.0	12.9	1.5	136.7
1981-1990	25.6	29.7	22.3	293.7	14.2	0.9	0.7	15.9	3.3	167.0
1991-2000	25.7	29.8	22.4	439.1	13.9	1.7	1.7	15.8	4.9	162.3
2001-2010(b)	25.7	29.5	22.6	359.7	15.8	1.3	1.1	14.9	5.8	128.2
b-a	0.9	0.5	1.0	48.5	2.4	0.7	0.1	2.0	4.3	-8.5

Appendix 2. Summer, 2011 climate

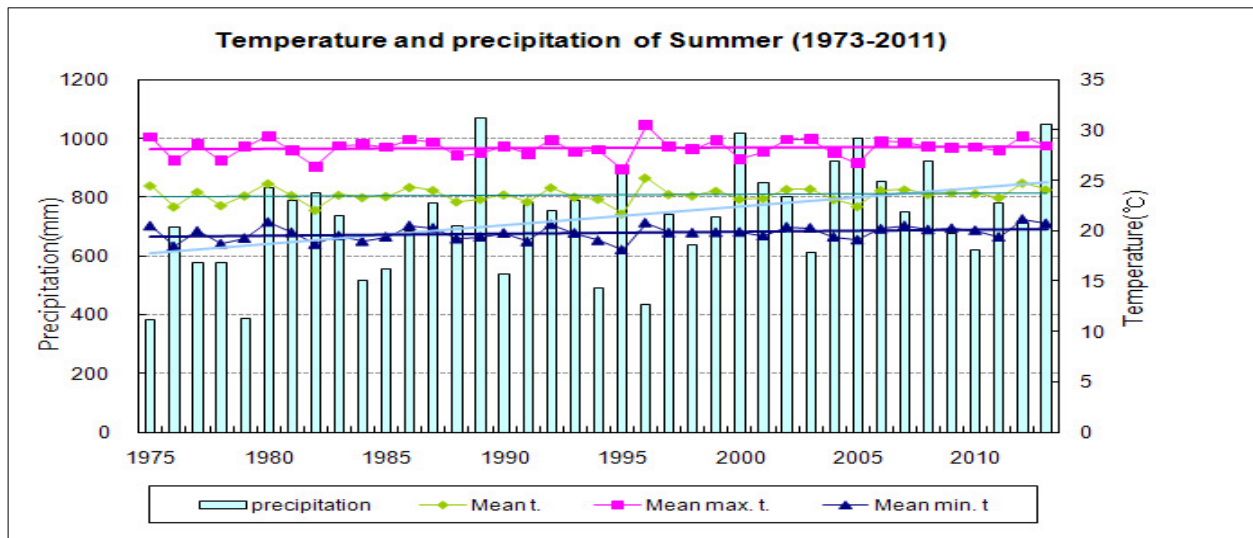


Fig. 1. Temperatures (mean, mean maximum, and mean minimum), and precipitation in South Korea during the summer seasons(1973-2011)

□ Average values of meteorological elements in Korea during the summer seasons (1973-2011)

statistics for climate elements (national)	Summer 2010	Summer 2011(a)	normals of Summer (1981-2010) (b)	a-b	rank since 1973 (within 5th)
mean temperature (°C)	24.9	24.1	23.7	0.4	
mean maximum t (°C)	29.5	28.4	28.3	0.1	
mean minimum t (°C)	21.2	20.7	19.9	0.8	the fourth highest
Days with max. temp.(≥30°C)	45.3	32.8	33.4	-0.6	
amount of precipitation (mm)	702.8	1048.1	725.7	322.4(143%)	the first highest
days of rainy	43.8	48.3	37.4	10.9	the first highest
days with precip. greater than 30mm/hour	2.2	2.8	1.5	1.3	the first highest
days with precip. greater than 80mm/day	1.8	2.9	1.8	1.1	the first highest
Sunshine duration (hr)	474.8	396.9	504.2	-107.3(79%)	the fourth lowest

□ Average values of meteorological elements during the Summer seasons for each decade (1973-2010)

year	mean temp (°C)	mean max. temp. (°C)	mean min. temp. (°C)	days with max. temp. (≥30°C)	days with min. temp. (≥25°C)	amount of rain (mm)	days of rain(≥0.1mm)	days with precip. ≥30mm/h	days with precip. ≥80mm/d	sunshine duration (hr)
1973-1980(a)	23.4	28.1	19.6	618.2	36.7	1.0	1.2	31.0	2.9	537.9
1981-1990(b)	23.6	28.4	19.7	694.5	36.2	1.3	1.5	33.7	3.2	543.0
1991-2000(c)	23.6	28.3	19.8	713.7	36.2	1.5	1.8	32.6	5.1	512.1
2001-2010(d)	23.8	28.4	20.1	794.1	40.6	1.8	2.0	33.8	5.1	451.9
d-a	0.4	0.3	0.5	175.9	3.9	0.8	0.8	2.8	2.2	-86
d-b	0.2	0	0.4	99.6	4.4	0.5	0.5	0.1	1.9	-91.1
d-c	0.2	0.1	0.3	80.4	4.4	0.3	0.2	1.2	0	-60.2

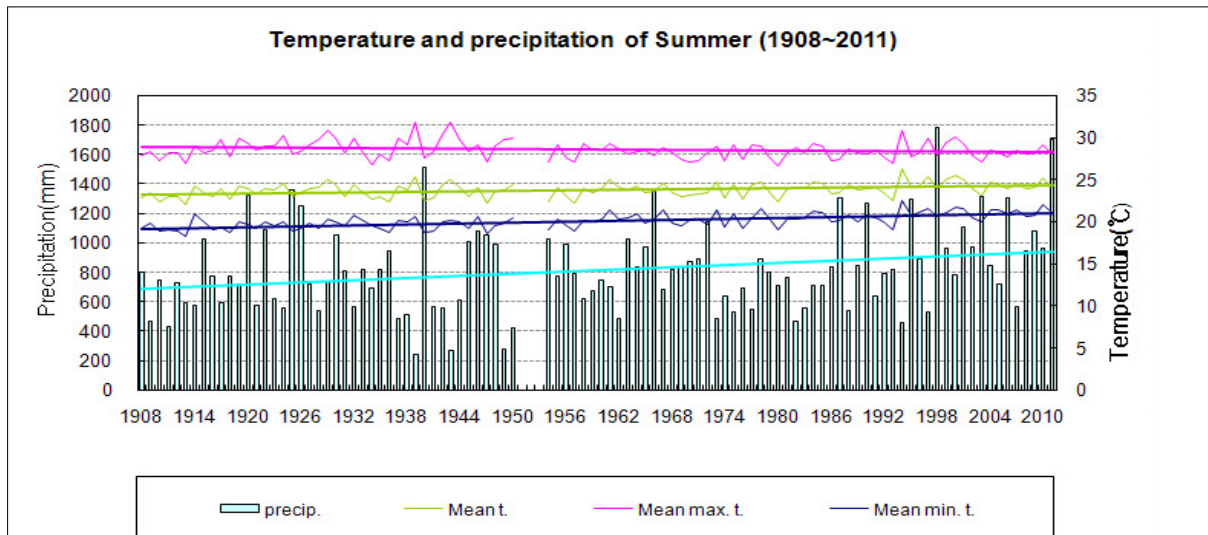


Fig. 2. Temperatures (mean, mean maximum, and mean minimum) and precipitation in Seoul during Summer 1908-2011

□ Average values of meteorological elements in Seoul during Summer (1908-2011)

statistics for climate elements (Seoul)	Summer 2010	Summer 2011(a)	normals of August (1981-2010) (b)	a-b	rank since 1908 (within 5th)
mean temperature (°C)	25.2	24.1	24.3	-0.2	
mean maximum t (°C)	29.2	28.0	28.4	-0.4	
mean minimum t (°C)	22.1	21.1	20.8	0.3	
Days with max. temp.(≥30°C)	40.0	27.0	31.2	-4.2	
amount of precipitation (mm)	965.5	1702.3	892.1	810.2(191%)	the second highest
days of rainy	51.0	52.0	40.8	11.2	the third highest
days with precip. greater than 30mm/hour	4.0	5.0	2.6	2.4	the third highest
days with precip. greater than 80mm/day	4.0	5.0	2.6	2.4	the fifth highest
Sunshine duration (hr)	389.3	345.2	454.6	-109.4(76%)	

□ Meteorological elements in Seoul during Summer for each decade (1911-2010)

year	mean temp (°C)	mean max. temp. (°C)	mean min. temp. (°C)	days with max. temp. (≥30°C)	days with min. temp. (≥25°C)	amount of rain (mm)	days of rain(≥0.1mm)	days with precip. ≥30mm/h	days with precip. ≥80mm/d	sunshine duration (hr)
1911-1920	23.4	28.6	19.4	753.4	39.0		2.0	33.2	0.9	659.4
1921-1930	23.9	29.3	19.6	851.0	38.7		2.7	40.0	2.3	646.6
1931-1940	23.5	28.7	19.7	739.6	41.3		1.6	34.1	2.3	590.6
1941-1950	23.8	29.4	19.7	682.1	39.5	0.9	1.4	43.5	2.1	682.0
1954-1960	23.3	28.2	19.8	803.6	42.1	1.4	1.7	32.4	1.7	682.0
1961-1970	23.8	28.2	20.4	857.7	44.1	2.8	2.2	30.9	4.3	452.8
1971-1980(a)	23.7	28.1	20.3	732.4	39.5	1.2	1.6	26.8	4.3	423.3
1981-1990	24.0	28.3	20.5	800.4	40.3	1.8	2.1	28.9	4.6	507.2
1991-2000	24.5	28.8	20.9	894.8	38.1	2.8	2.8	34.6	9.4	491.1
2001-2010(b)	24.3	28.3	21.1	981.2	44.0	3.2	3.0	30.0	7.7	365.4
b-a	0.6	0.2	0.8	248.8	4.5	2.0	1.4	3.2	3.4	-57.9