KMA'S BRIEFING IN CLIMATE CHARACTERISTICS

(total 6 pages)

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August and Summer (June~August) 2009, Climate

◇ August and Summer Mean temperatures for the national average are 0.5℃ and 0.2℃ lower than normal,respectively.

◇ August and Summer precipitations for the national average are 57.9% and 111.6% relative to normal, respectively.

☐ Climate characteristics of August and Summer (June, July, and August), and their long-term trends are analyzed based on 60 Korean meteorological stations (national average) for the period 1973-2009 (1908-2009 in Seoul).

☐ **August, 2009 climate is as follows:**

o For the national average,

- the mean temperature(24.5℃) is 0.5℃ lower than normal. The mean maximum (29.0℃) and the mean minimum (20.8℃) temperatures are 0.6℃ and 0.5℃ lower than normal, respectively.
- the amount of precipitation (153.5mm) is 57.9% relative to normal.
- the average rainy days (11 days) are 1.6 days smaller than normal.

o For Seoul,

- both the mean temperature (25.7℃) and the mean minimum temperatures (22.4℃) are 0.3℃ higher than normal. The mean maximum temperature(29.5℃) is equal to normal.
- The amount of precipitation (285.3mm) is 82.0% relative to normal.
- The average rainy days (14 days) are 0.2 days greater than normal.

☐ **Summer (June, July, and August), 2009 climate is as follows:**

o For the national average,

- All of the mean (23.3℃), mean maximum (28.0℃), and mean minimum(19.4℃) temperatures are 0.2℃ lower than normal.

- the amount of precipitation (780.8mm) is 11.6% greater than normal.
- the average rainy days (40.4 days) are 3.6 days greater than normal.
- days with heavy precipitation above 30mm/1 hour are 1.7 times greater than normal, making it the second highest record since 1973.
- both days with heavy precipitation above 80mm/day and above 150mm/day are 1.6 times greater than normal.

o For Seoul,

- the mean temperature (24.1℃) is equal to normal.
- the mean maximum temperature (28.1℃) is 0.3℃ lower than normal.
- the mean minimum temperature (20.7℃) is 0.1℃ higher than normal.
- The amount of precipitation (1076.7mm) is 33.1% greater than normal.
- The average rainy days (45 days) are 5.7 day greater than normal.
- days with heavy precipitation above 80mm/day are 3.8 days greater than normal, making it the second highest record since 1973.

□ **Long term trend of August and Summer climate**

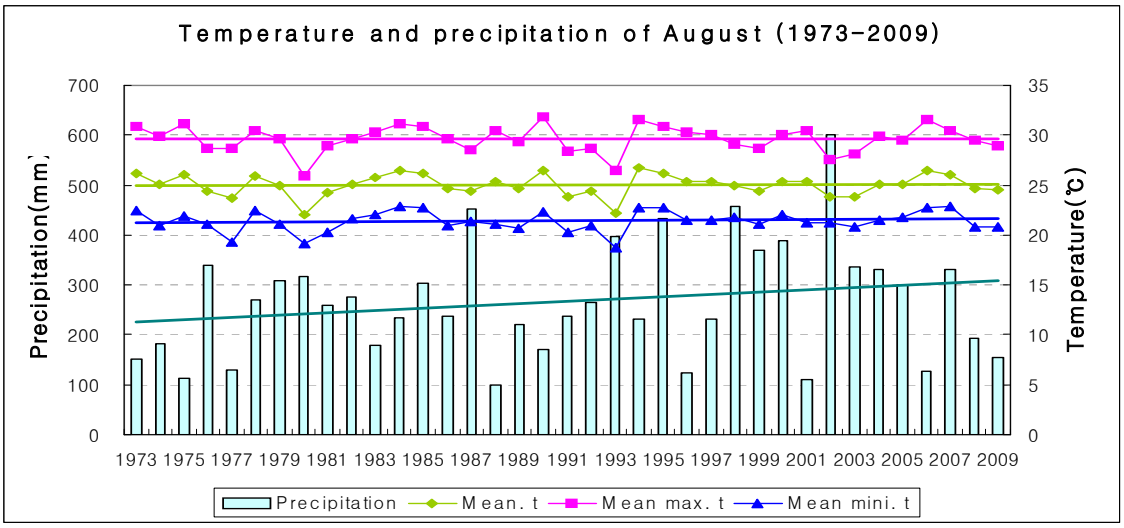
o For the national average, mean temperatures of August 2000s is 0.2℃ higher than that of the 1970, however, for Seoul, the mean temperature of August 2000s is 0.8℃ higher than that of the 1970s.

o days with heavy precipitation of August (above 30mm/1 hour, 80mm/day, 150mm/day) during 2000s increased approximately 1~2 times compared to those of the 1970s, approximately 1.6~2.6 times for the Summer, both in national average and in seoul.

※ Normal: average from 1971 to 2000.
※ National average is used average values of 60 meteorological stations starting from 1973.
※ In Seoul, data are analyzed from 1908.
※ 1910s: average from 1911 to 1920
※ 1970s: average from 1973 to 1980
※ 2000s: average from 2001 to 2009

Appendix 1. August , 2009 Climate

Fig. 1. Time series of August temperatures (mean, mean maximum, and mean minimum), and precipitation across the South Korea for the period 1973-2009.



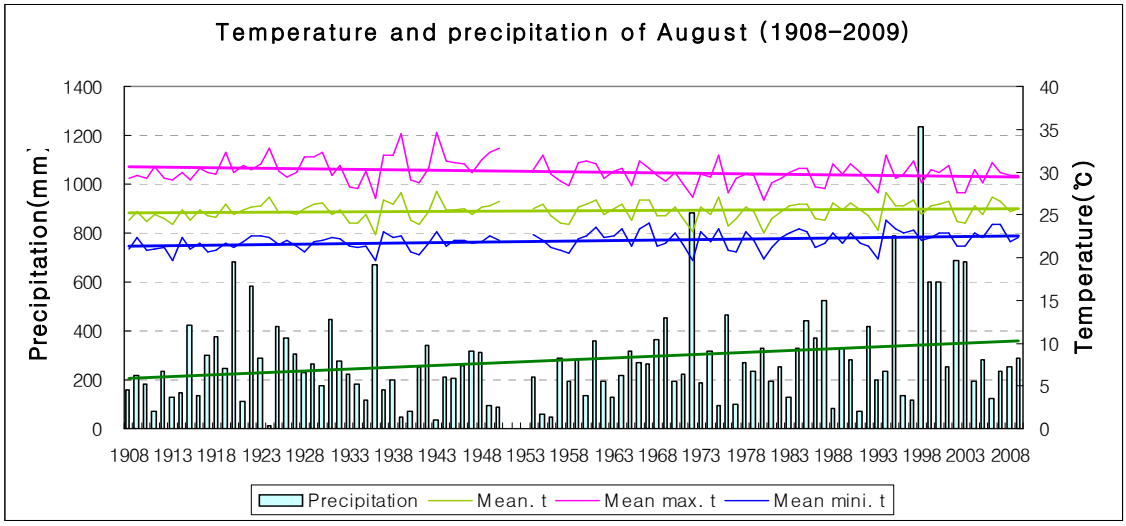
☐ National average values of August meteorological elements (1973-2009)

Elements (National) average	August 2009 (a)	Normals of August (1971-2000) (b)	a-b	rank since 1973 (within 5th)
mean temperature(℃)	24.5	25.0	-0.5	-
mean maximum t (℃)	29.0	29.6	-0.6	-
mean minimum t(℃)	20.8	21.3	-0.5	-
amount of precipitation (mm)	153.5	265.0	-111.5(57.9%)	-
rainy days	11.0	12.6	-1.6	-
days with greater than 30mm/1hour	0.3	0.7	-0.4	fourth lowest
days with greater than 80mm/day	0.4	0.7	-0.3	-
days with greater than 150mm/day	0.0	0.1	-0.1	-
precipitation intensity (mm/day)	14.0	21.0	-7.0	-

☐ National average values of August meteorological elements in each decade (1973-2009)

Year	Mean t (℃)	Mean Maximum t (℃)	Mean Minimum t (℃)	Precipit-ation (mm)	rainy days	days with greater than 30mm/1hour	days with greater than 80mm/day	days with greater than 150mm/day	precipitation intensity (mm/day)
1973-1980(a)	24.8	29.4	21.1	225.9	11.8	0.5	0.6	0.1	19.1
1981-1990(b)	25.3	30.1	21.6	243.1	12.2	0.6	0.6	0.1	19.9
1991-2000(c)	24.9	29.4	21.4	313.4	13.5	0.9	0.9	0.2	23.2
2001-2009(d)	25.0	29.6	21.5	275.9	13.8	0.7	0.7	0.2	20.0
d-a	0.2	0.2	0.4	50.0	2.0	0.2	0.1	0.1	0.9
d-b	-0.3	-0.5	-0.1	32.8	1.6	0.1	0.1	0.1	0.1
d-c	0.1	0.2	0.1	-37.5	0.3	-0.2	-0.2	0	-3.2

Fig. 2. Time series of August temperatures (mean, mean maximum, and mean minimum), and precipitation in Seoul for the period 1908–2009.



☐ Average values of August meteorological elements in Seoul (1908–2009)

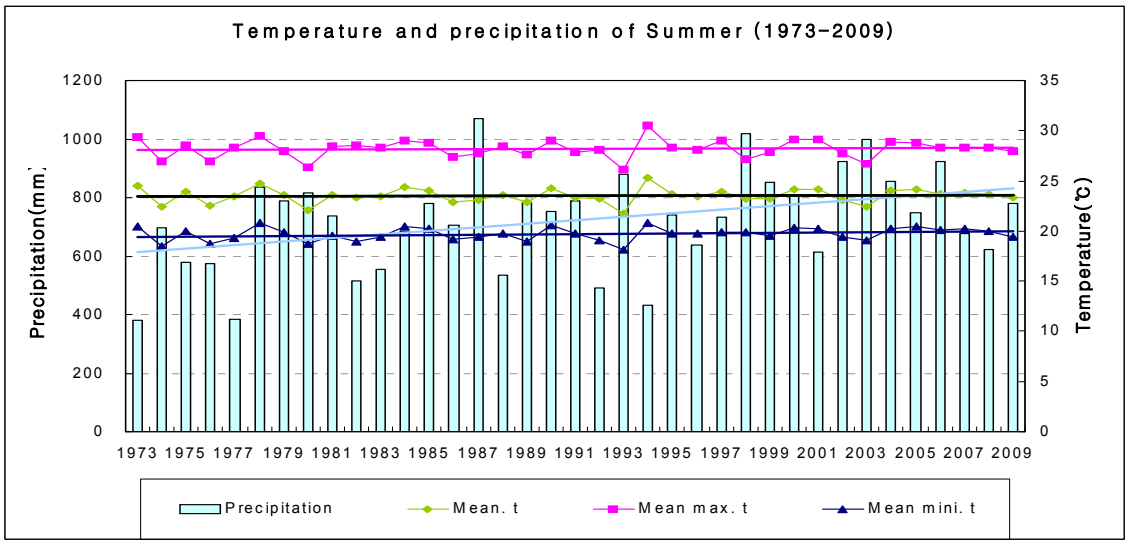
Elements (Seoul) average	**August 2009 (a)**	Normals of **August** (1971-2000) **(b)**	**a-b**	rank since 1908 (within 5th)
mean temperature(℃)	25.7	25.4	0.3	-
mean maximum t (℃)	29.5	29.5	0	-
mean minimum t(℃)	22.4	22.1	0.3	-
amount of precipitation (mm)	285.3	348.0	-62.7(82.0%)	-
rainy days	14	13.8	0.2	-
days with greater than 30mm/1hour	0	1.1	-1.1	-
days with greater than 80mm/day	2	1.1	0.9	-
days with greater than 150mm/day	0	0.2	-0.2	-
precipitation intensity (mm/day)	20.4	25.2	-4.8	-

☐ August meteorological elements in Seoul in each decade (1911–2009)

Year	Mean t (℃)	Mean Maximum t (℃)	Mean Minimum t (℃)	Precipit-ation (mm)	rainy days	days with greater than 30mm/1hour	days with greater than 80mm/day	days with greater than 150mm/day	precipitation intensity (mm/day)
1911-1920	25.0	30.0	21.1	274.5	12.4	-	0.9	0.4	22.1
1921-1930	25.8	31.0	21.9	275.8	13.2	0.1	1.0	0.1	20.9
1931-1940	25.1	30.1	21.7	239.5	15.0	0.0	0.5	0.0	16.0
1941-1950	25.7	31.4	21.9	212.4	12.2	0.1	0.6	0.1	17.4
1954-1960	25.2	30.2	21.7	174.0	11.0	0.3	0.3	0.0	15.8
1961-1970	25.7	29.9	22.6	276.8	14.9	0.7	0.5	0.0	18.6
1971-1980(a)	24.8	29.0	21.6	311.2	13.4	0.6	1.0	0.2	23.2
1981-1990	25.6	29.7	22.3	293.7	14.2	0.9	0.7	0.0	20.7
1991-2000	25.7	29.8	22.4	439.1	13.9	1.7	1.7	0.5	31.6
2001-2009(b)	25.6	29.4	22.5	333.1	14.9	1.0	0.9	0.3	22.4
b-a	0.8	0.4	0.9	21.9	1.5	0.4	-0.1	0.1	-0.8

Appendix 2. Summer, 2009 Climate

Fig. 3. Time series of Summer temperatures (mean, mean maximum, and mean minimum), and precipitation across the South Korea for the period 1973-2009.



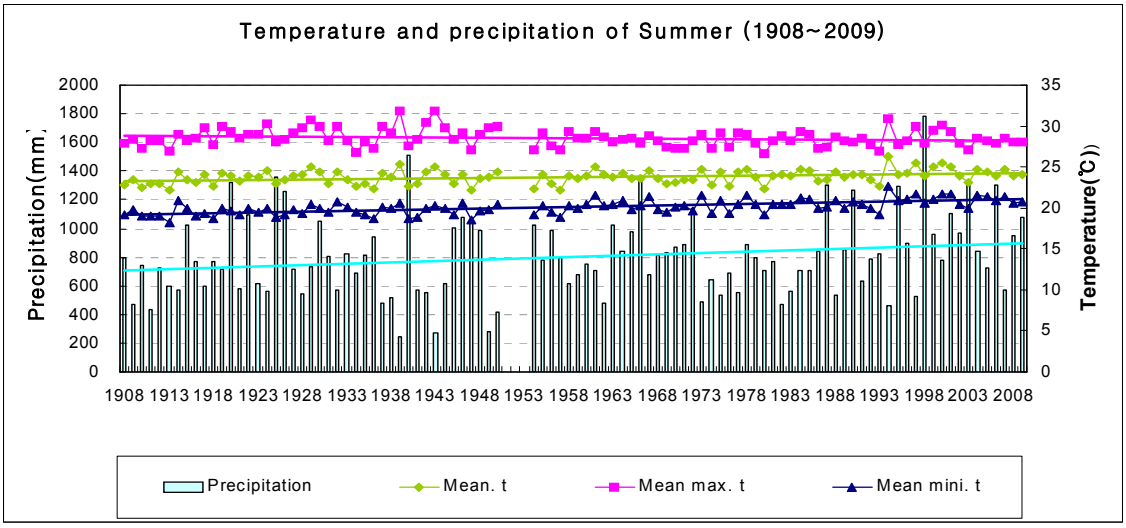
☐ National average values of Summer meteorological elements (1973-2009)

Elements (National) average	**Summer 2009 (a)**	Normals of **Summer** (1971-2000) **(b)**	**a-b**	rank since 1973 (within 5th)
mean temperature(℃)	23.3	23.5	-0.2	-
mean maximum t (℃)	28.0	28.2	-0.2	-
mean minimum t(℃)	19.4	19.6	-0.2	-
amount of precipitation (mm)	780.8	699.7	81.1(111.6%)	-
rainy days	40.4	36.8	3.6	-
days with greater than 30mm/1hour	2.4	1.4	1.0	second highest
days with greater than 80mm/day	2.6	1.6	1.0	-
days with greater than 150mm/day	0.5	0.3	0.2	-
precipitation intensity (mm/day)	19.3	19.0	0.3	-

☐ National average values of Summer meteorological elements in each decade (1973-2009)

Year	Mean t (℃)	Mean Maximum t (℃)	Mean Minimum t (℃)	Precipit-ation (mm)	rainy days	days with greater than 30mm/1hour	days with greater than 80mm/day	days with greater than 150mm/day	precipitation intensity (mm/day)
1973-1980(a)	23.4	28.0	19.5	632.1	37.1	1.1	1.2	0.2	17.0
1981-1990(b)	23.6	28.3	19.7	712.2	36.5	1.3	1.6	0.3	19.5
1991-2000(c)	23.5	28.2	19.7	737.2	36.7	1.6	1.9	0.4	20.1
2001-2009(d)	23.6	28.2	19.9	793.2	39.8	1.8	2.0	0.4	19.9
d-a	0.2	0.2	0.4	161.1	2.7	0.7	0.8	0.2	2.9
d-b	0	-0.1	0.2	81.0	3.3	0.5	0.4	0.1	0.4
d-c	0.1	0	0.2	56.0	3.1	0.2	0.1	0	-0.2

Fig. 4. Time series of Summer temperatures (mean, mean maximum, and mean minimum), and precipitation in Seoul for the period 1908-2009.



☐ Average values of Summer meteorological elements in Seoul (1908-2009)

Elements (Seoul) average	**Summer 2009 (a)**	Normals of **Summer** (1971-2000) **(b)**	**a-b**	rank since 1908 (within 5th)
mean temperature(℃)	24.1	24.1	0	-
mean maximum t (℃)	28.1	28.4	-0.3	-
mean minimum t(℃)	20.7	20.6	0.1	-
amount of precipitation (mm)	1076.7	809.2	267.5(133.1%)	-
rainy days	45	39.3	5.7	-
days with greater than 30mm/1hour	2	1.9	0.1	-
days with greater than 80mm/day	6	2.2	3.8	second highest
days with greater than 150mm/day	1	0.4	0.6	-
precipitation intensity (mm/day)	23.9	20.6	3.3	-

☐ Summer meteorological elements in Seoul in each decade (1911-2009)

Year	Mean t (℃)	Mean Maximum t (℃)	Mean Minimum t (℃)	Precipit-ation (mm)	rainy days	days with greater than 30mm/1hour	days with greater than 80mm/day	days with greater than 150mm/day	precipitation intensity (mm/day)
1911-1920	23.4	28.6	19.4	753.4	39.0	-	2.0	0.6	19.3
1921-1930	23.9	29.3	19.6	851.0	38.7	0.1	2.7	0.7	22.0
1931-1940	23.5	28.7	19.7	739.6	41.3	0.0	1.6	0.4	17.9
1941-1950	23.8	29.4	19.7	682.1	39.5	0.1	1.4	0.2	17.3
1954-1960	23.3	28.2	19.8	803.6	42.1	1.4	1.7	0.3	19.1
1961-1970	23.8	28.2	20.4	857.7	44.1	2.8	2.2	0.3	19.4
1971-1980(a)	23.7	28.1	20.3	732.4	39.5	1.2	1.6	0.5	18.5
1981-1990	24.0	28.3	20.5	800.4	40.3	1.8	2.1	0.1	19.9
1991-2000	24.5	28.8	20.9	894.8	38.1	2.8	2.8	0.6	23.5
2001-2009(b)	24.2	28.1	21.0	982.9	43.2	3.1	2.9	1.0	22.8
b-a	0.5	0	0.7	250.5	3.7	1.9	1.3	0.5	4.3