



NATIONAL CLIMATE REVIEW OF KMA (total 6 pages)

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Monthly (August) and Seasonal (Summer : June-August) 2013 Climate Summary

- ◇ The mean temperature (27.3 °C) of August 2013 nationwide is above normal and the monthly precipitation (164.0 mm) is below normal.
 - The mean temperature and maximum temperature of August 2013 nationwide are the warmest on a record extending back to 1973.
- ◇ The mean temperature (25.4 °C) of summer 2013 nationwide is above normal and precipitation (567.5 mm) is nearly normal.
 - The mean temperature and minimum temperature of Summer 2013 nationwide are the warmest on a record extending back to 1973.

- Climate features and long-term trends of August and Summer 2013 have been analyzed with the data collected at the 45 meteorological stations throughout Korea (national average) from 1973 to 2013 (1908-2013 for Seoul).
 - ※ Normal : Average value of climatic element data collected from 1981 to 2010

□ The climatic characteristics of August 2013 are described as follows:

- o For Korea (whole country),
 - The mean temperature (27.3 °C), the mean maximum temperature (32.3 °C) and the mean minimum temperature (23.4 °C) were 2.2 °C, 2.5 °C and 1.9 °C above normals, respectively. The mean temperature and maximum temperature of August 2013 nationwide are the warmest, the mean minimum temperature is the seconde warmest on a record extending back to 1973.
 - The nationally-averaged precipitation was 164.0 mm, which was 60% of normal. The number of the days of rain was 10.6 days, which was 2.6 days below normal.
 - The total number of the hours of sunshine was 246.3 hours, which was 142% of normal.
- o For Seoul,
 - The mean temperature (27.7 °C), the mean maximum temperature (31.1 °C) and the mean minimum temperature (24.8 °C) were 2.0 °C, 1.5 °C and 2.4 °C above normals, respectively. The mean temperature of August 2013 is the seconde warmest, the mean minimum temperature is the warmest on a record extending back to 1908.
 - The amount of precipitation was 148.6 mm, which was 41% of normal, which was below normal.
 - The number of the days of rain was 12.0 days, which is 2.6 days less than normal.
 - The total number of the hours of sunshine was 217.9 hours, which was 143% of normal.

□ **The climatic characteristics of summer 2013 are described as follows:**

- o For Korea (whole country),
 - The mean temperature (25.4 °C), the mean maximum temperature (30.1 °C) and the mean minimum temperature (21.7 °C) were 1.8 °C, 1.7 °C and 2.0 °C above normals, respectively. The mean temperature and minimum temperature of Summer 2013 nationwide are the warmest, the mean maximum temperature is the seconde warmest on a record extending back to 1973.
 - The nationally-averaged precipitation was 567.5 mm, which was 78% of normal. The number of the days of rain was 37.1 days, which was 0.2 days less than normal.
 - The total number of the hours of sunshine was 586.1 hours, which was 117% of normal.
- o For Seoul,
 - The mean temperature (25.9 °C), the mean maximum temperature (29.5 °C) and the mean minimum temperature (22.9 °C) were 1.6 °C, 1.1 °C and 2.1 °C above normals, respectively. The mean temperature of Summer 2013 is the seconde warmest, the mean minimum temperature is the warmest on a record extending back to 1908.
 - The amount of precipitation was 853.1 mm, which was 96% of normal, which was nearly normal.
 - The number of the days of rain was 46.0 days, which is 5.2 days more than normal.
 - The total number of the hours of sunshine was 542.9 hours, which was 119% of normal.

□ **Long-term trend of August and Summer 2013 climate**

- o For Korea (whole country),
 - The national mean temperatures of August and Summer 2000s (2001-2010) are 0.4 °C, 0.3 °C above those of the same month and season of 1970s.
 - The nationally-averaged precipitation of August and Summer 2000s (2001-2010) are 58.8 mm, 154.2 mm more than that of the same month and season of 1970s, respectively.
 - The number of the days of rain of August and Summer 2000s are 2.4 days, 3.3 days more than those of the same month and season of 1970s.
 - The total sunshine of August and Summer 2000s are 30.2 hours, 84.3 hours less than those of the same month and season of 1970s, respectively.
- o For Seoul,
 - The mean temperatures of August and Summer 2000s (2001-2010) are 0.9 °C, 1.1 °C above those of the same month and season of 1970s.
 - The precipitation of August and Summer 2000s (2001-2010) are 48.5 mm, 248.8 mm more than that of the same month and season of 1970s.
 - The number of the days of rain of August and Summer 2000s are 2.4 days, 4.5 days more than those of the same month and season of 1970s, respectively.
 - The total sunshine of August and Summer 2000s are 8.5 hours, 57.9 hours less than those of the same month and season of 1970s, respectively.

Appendix 1 Climate features of August 2013(Nationwide)

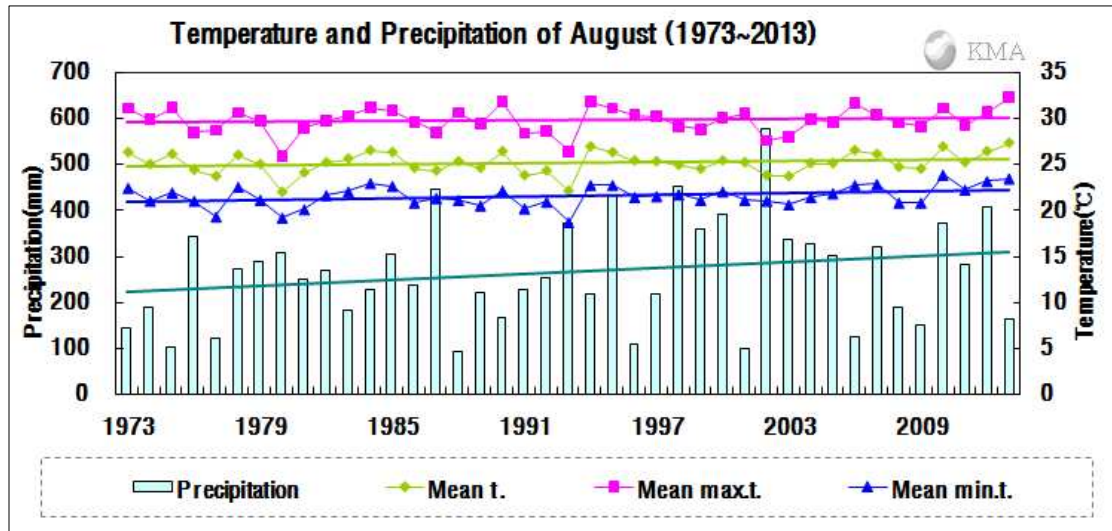


Fig 1. Temperatures (mean, mean maximum, and mean minimum) and precipitation in South Korea during August (1973~2013).

□ Average values of meteorological elements across Korea during August (1973~2013)

Elements (whole country)	August 2013(a)	August 2012(b)	Normals of August (1981-2010) (c)	a-b	a-c	Rank since 1973 (within 5th)
Mean temperature (°C)	27.3	26.4	25.1	0.9	2.2	the warmest
Mean maximum temp. (°C)	32.3	30.7	29.8	1.6	2.5	the warmest
Mean minimum temp. (°C)	23.4	23.1	21.5	0.3	1.9	second warmest
Precipitation (mm)	164.0	408.5	274.9	-244.5(42%)	-110.9(60%)	
Days of rain (day)	10.6	16.4	13.2	-5.8	-2.6	
Sunshine duration (hour)	246.3	155.9	173.7	90.4(158%)	72.6(142%)	the longest
Mean cloud amount (1/10)	5.1	7.1	6.2	-2.0	-1.1	forth least
precipitation more than 80mm/day(day)	0.3	1.4	0.7	-1.1	-0.4	
precipitation more than 30mm/hour(day)	0.6	1.2	0.7	-0.6	-0.1	
maximum temperature more than 33°C(day)	13.0	8.6	5.3	4.4	7.7	the largest

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

Year	Mean temp. (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Prep. (mm)	Days of rain (day)	Sunshine duration (hour)	Mean cloud amount (1/10)	prep. more than 80mm/d ay(day)	prep. more than 30mm/hour (day)	maximum temperature more than 33°C(day)
1973-1980(a)	24.8	29.5	21.0	221.6	11.7	187.1	6.1	0.5	0.5	4.1
1981-1990(b)	25.3	30.1	21.5	240.2	12.1	191.8	6.0	0.6	0.6	5.6
1991-2000(c)	24.9	29.5	21.3	303.9	13.4	172.3	6.2	0.9	0.8	4.6
2001-2010(d)	25.2	29.7	21.7	280.4	14.1	156.9	6.3	0.7	0.7	5.7
2013(e)	27.3	32.3	23.4	164.0	10.6	246.3	5.1	0.3	0.6	13.0
d-a	0.4	0.2	0.7	58.8	2.4	-30.2	0.2	0.2	0.2	1.6
d-b	-0.1	-0.4	0.2	40.2	2.0	-34.9	0.3	0.1	0.1	0.1
d-c	0.3	0.2	0.4	-23.5	0.7	-15.4	0.1	-0.2	-0.1	1.1
e-d	2.1	2.6	1.7	-116.4	-3.5	89.4	-1.2	-0.4	-0.1	7.3

Appendix 2 Climate features of August 2013(Seoul)

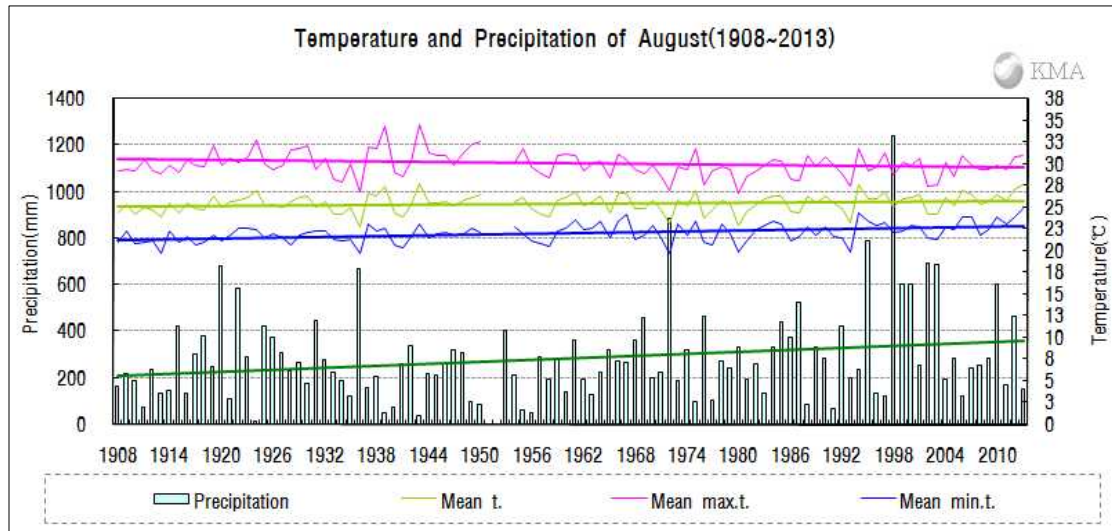


Fig 2. Temperatures (mean, mean maximum, and mean minimum) and precipitation in Seoul during August (1908-2013).

□ Average values of meteorological elements in Seoul during August (1973~2013)

Elements (Seoul)	August 2013(a)	August 2012(b)	Normals of August (1981-2010)(c)	a-b	a-c	Rank since 1908 (within 5th)
Mean temperature (°C)	27.7	27.1	25.7	0.6	2.0	seconde warmest
Mean maximum temp. (°C)	31.1	30.9	29.6	0.2	1.5	
Mean minimum temp. (°C)	24.8	23.9	22.4	0.9	2.4	the warmest
Amount of precipitation (mm)	148.6	464.9	364.2	-316.3(32%)	-215.6(41%)	
Days of rain (day)	12.0	16.0	14.6	-4.0	-2.6	
Sunshine duration (hour)	217.9	158.7	152.5	59.2(137%)	65.4(143%)	
Mean cloud amount (1/10)	6.2	6.8	6.4	-0.6	-0.2	
precipitation more than 80mm/day(day)	0.0	2.0	1.2	-2.0	-1.2	
precipitation more than 30mm/hour(day)	1.0	2.0	1.3	-1.0	-0.3	
maximum temperature more than 33°C(day)	2.0	9.0	4.0	-7.0	-2.0	

□ Average values of meteorological elements in Seoul during August for each decade (1911-2010)

Year	Mean temp. (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Prep. (mm)	Days of rain (day)	Sunshine duration (hour)	Mean cloud amount (1/10)	prep. more than 80mm/day(day)	prep. more than 30mm/hour (day)	maximum temperature more than 33°C(day)
1911-1920(a)	25.0	30.0	21.1	274.5	12.4	227.5	6.4	0.9	-	4.5
1921-1930	25.8	31.0	21.9	275.8	13.2	218.7	6.7	1.0	-	8.4
1931-1940(b)	25.1	30.1	21.7	239.5	15.0	186.8	7.5	0.5	0.0	6.7
1941-1949	25.6	31.2	21.8	226.7	12.6	230.8	6.5	0.7	0.6	10.0
1954-1960	25.2	30.2	21.7	174.0	11.0	188.5	6.4	0.3	0.3	6.6
1961-1970	25.7	29.9	22.6	276.8	14.9	145.0	7.1	0.5	0.7	3.5
1971-1980(c)	24.8	29.0	21.6	311.2	13.4	136.7	6.8	1.0	0.6	2.1
1981-1990	25.6	29.7	22.3	293.7	14.2	167.0	6.6	0.7	0.9	4.4
1991-2000	25.7	29.8	22.4	439.1	13.9	162.3	6.3	1.7	1.7	4.3
2001-2010(d)	25.7	29.5	22.6	359.7	15.8	128.2	6.4	1.1	1.3	3.2
2013(e)	27.7	31.1	24.8	148.6	12.0	217.9	6.2	0.0	1.0	2.0
d-a	0.7	-0.5	1.5	85.2	3.4	-99.3	0.0	0.2	-	-1.3
d-b	0.6	-0.6	0.9	120.2	0.8	-58.6	-1.1	0.6	1.3	-3.5
d-c	0.9	0.5	1.0	48.5	2.4	-8.5	-0.4	0.1	0.7	1.1
e-d	2.0	1.6	2.2	-211.1	-3.8	89.7	-0.2	-1.1	-0.3	-0.2

Appendix 3 Climate features of Summer 2013(Nationwide)

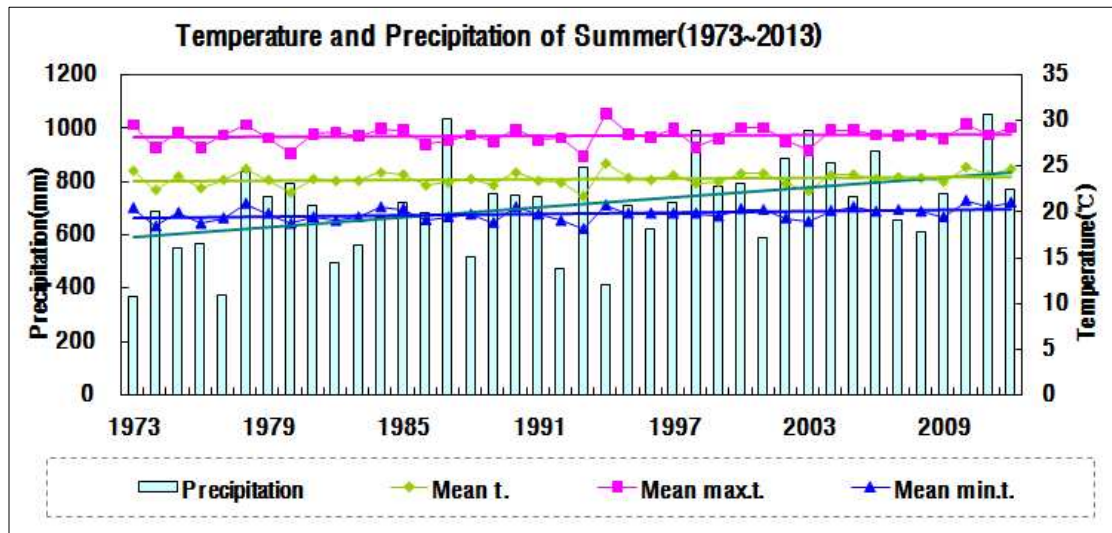


Fig 3. Temperatures (mean, mean maximum, and mean minimum) and precipitation in South Korea during Summer (1973~2013).

□ Average values of meteorological elements across Korea during Summer(1973~2013)

Elements (whole country)	Summer 2013(a)	Summer 2012(b)	Normals of Summer (1981-2010) (c)	a-b	a-c	Rank since 1973 (within 5th)
Mean temperature (°C)	25.4	24.7	23.6	0.7	1.8	the warmest
Mean maximum temp. (°C)	30.1	29.2	28.4	0.9	1.7	seconde warmest
Mean minimum temp. (°C)	21.7	21	19.7	0.7	2.0	the warmest
Precipitation (mm)	567.5	770.6	723.2	-203.1(74%)	-155.7(78%)	
Days of rain (day)	37.1	38.3	37.3	-1.2	-0.2	
Sunshine duration (hour)	586.1	505.2	503	80.9(116%)	83.1(117%)	
Mean cloud amount (1/10)	6.3	6.9	6.5	-0.6	-0.2	
precipitation more than 80mm/day(day)	1.2	2	1.7	-0.8	-0.5	
precipitation more than 30mm/hour(day)	1.5	2.1	1.5	-0.6	0.0	
maximum temperature more than 33°C(day)	18.2	15	9.8	3.2	8.4	seconde largest

□ Average values of meteorological elements across Korea during Summer for each decade (1973~2010)

Year	Mean temp. (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Prep. (mm)	Days of rain (day)	Sunshine duration (hour)	Mean cloud amount (1/10)	prep. more than 80mm/day(day)	prep. more than 30mm/hour (day)	maximum temperature more than 33°C(day)
1973-1980(a)	23.4	28.1	19.5	616.0	36.5	538.0	6.6	1.2	1.0	8.5
1981-1990(b)	23.6	28.4	19.6	689.7	36.1	542.4	6.5	1.5	1.3	9.7
1991-2000(c)	23.5	28.3	19.7	709.7	36.1	512.8	6.5	1.8	1.5	10.0
2001-2010(d)	23.7	28.4	20.0	770.2	39.8	453.7	6.6	1.9	1.7	9.8
2013(e)	25.4	30.1	21.7	567.5	37.1	586.1	6.3	1.2	1.5	18.2
d-a	0.3	0.3	0.5	154.2	3.3	-84.3	0.0	0.7	0.7	1.3
d-b	0.1	0.0	0.4	80.5	3.7	-88.7	0.1	0.4	0.4	0.1
d-c	0.2	0.1	0.3	60.5	3.7	-59.1	0.1	0.1	0.2	-0.2
e-d	1.7	1.7	1.7	-202.7	-2.7	132.4	-0.3	-0.7	-0.2	8.4

Appendix 4 Climate features of Summer 2013(Seoul)

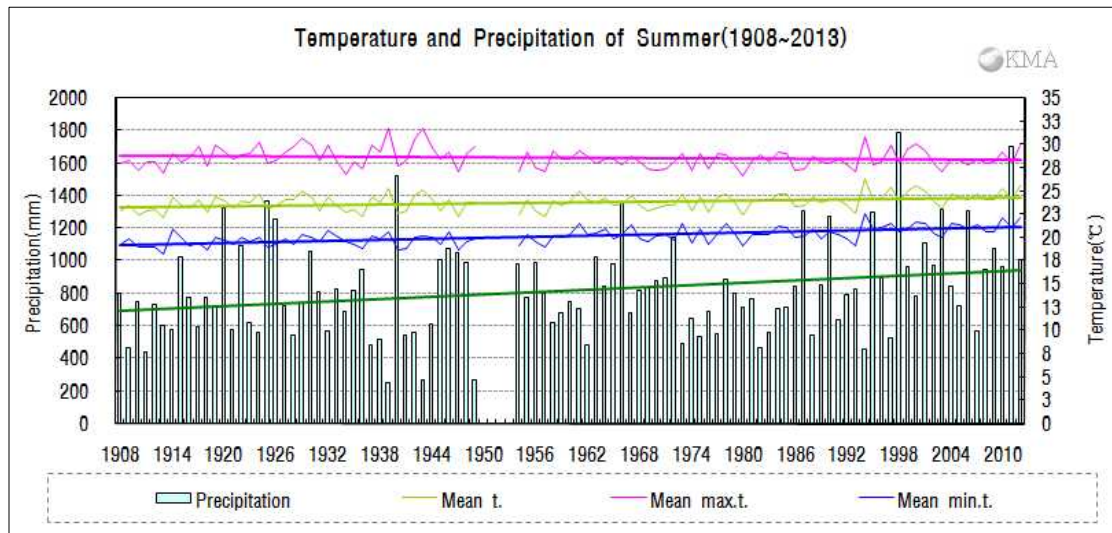


Fig 4. Temperatures (mean, mean maximum, and mean minimum) and precipitation in Seoul during Summer (1908~2013).

□ Average values of meteorological elements in Seoul during Summer (1973~2013)

Elements (Seoul)	Summer 2013(a)	Summer 2012(b)	Normals of Summer (1981-2010)(c)	a-b	a-c	Rank since 1908 (within 5th)
Mean temperature (°C)	25.9	25.5	24.3	0.4	1.6	seconde warmest
Mean maximum temp. (°C)	29.5	29.9	28.4	-0.4	1.1	
Mean minimum temp. (°C)	22.9	22.1	20.8	0.8	2.1	the warmest
Amount of precipitation (mm)	853.1	1005.7	892.1	-152.6(85%)	-39.0(96%)	
Days of rain (day)	46.0	37.0	40.8	9.0	5.2	
Sunshine duration (hour)	542.9	534.7	454.6	8.2(101%)	88.3(119%)	
Mean cloud amount (1/10)	6.7	6.5	6.6	0.2	0.1	
precipitation more than 80mm/day(day)	2.0	3.0	2.6	-1.0	-0.6	
precipitation more than 30mm/hour(day)	5.0	4.0	2.6	1.0	2.4	
maximum temperature more than 33°C(day)	2.0	14.0	6.6	-12.0	-4.6	

□ Average values of meteorological elements in Seoul during Summer for each decade (1911-2010)

Year	Mean temp. (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Prep. (mm)	Days of rain (day)	Sunshine duration (hour)	Mean cloud amount (1/10)	prep. more than 80mm/day(day)	prep. more than 30mm/hour (day)	maximum temperature more than 33°C(day)
1911-1920(a)	23.4	28.6	19.4	753.4	39.0	659.4	6.9	2.0	-	9.0
1921-1930	23.9	29.3	19.6	851.0	38.7	646.6	7.0	2.7	-	12.9
1931-1940(b)	23.5	28.7	19.7	740.6	41.3	590.6	7.4	1.6	0.3	11.8
1941-1949	23.7	29.3	19.6	706.9	39.9	674.9	6.9	1.6	1.0	16.3
1954-1960	23.3	28.2	19.8	796.4	42.1	507.0	7.1	1.7	1.4	9.6
1961-1970	23.8	28.2	20.4	857.7	44.1	452.8	7.3	2.2	2.8	6.6
1971-1980(c)	23.7	28.1	20.3	732.4	39.5	423.3	7.0	1.6	1.2	5.2
1981-1990	24.0	28.3	20.5	800.4	40.3	507.2	6.8	2.1	1.8	6.3
1991-2000	24.5	28.8	20.9	894.8	38.1	491.1	6.5	2.8	2.8	9.1
2001-2010(d)	24.3	28.3	21.1	981.2	44.0	365.4	6.7	3.0	3.2	4.3
2013(e)	25.9	29.5	22.9	853.1	46.0	542.9	6.7	2.0	2.0	5.0
d-a	0.9	-0.3	1.7	227.8	5.0	-294.0	-0.2	1.0	-	-4.7
d-b	0.8	-0.4	1.4	240.6	2.7	-225.2	-0.7	1.4	2.9	-7.5
d-c	0.6	0.2	0.8	248.8	4.5	-57.9	-0.3	1.4	2.0	-0.9
e-d	1.6	1.2	1.8	-128.1	2.0	177.5	0.0	-1.0	-1.2	0.7