



KMA'S BRIEFING ON CLIMATE CHARACTERISTICS

(total 6 pages)

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Monthly (December 2011) and Annual (2011) Climate Summary

- ◇ Mean temperatures during December and annual were below-normal nationwide.
- ◇ Monthly precipitation in December (17.6 mm) was below-normal (34%) but annual precipitation in 2011 (1307.7 mm) was above-normal (24%) nationwide.

- Climate features of December 2011, the 2011 climate, and their long-term trends are analyzed using 45 meteorological stations in Korea (average of the mainland) during 1973-2011 (1908-2011 for Seoul).

※ Normal: average from 1981 to 2010.

※ National average indicates average values of 45 meteorological stations starting from 1973.

※ In Seoul, data are analyzed from 1908.

- **The climatological features in December 2011 can be described as follows:**

o Korea (whole nation)

- The mean temperature (0.7 °C), the mean maximum temperature (5.5 °C) and the mean minimum temperature (-3.6 °C) were 0.8 °C, 1.5 °C and 0.4 °C below-normal, respectively.
- The monthly average amount of precipitation (17.6 mm) was 66% of normal.
- The monthly average of rainy days (6.3 days) was 0.3 days smaller than that of the normal.
- The monthly average of sunshine duration (172.6 hours) was 102% of normal.

o Seoul

- The mean temperature (-0.9 °C), the mean maximum temperature (2.9 °C) and the mean minimum temperature (-4.1 °C) were 1.3 °C, 1.4 °C and 0.9 °C below-normal, respectively.
- The monthly precipitation (7.1 mm) was 33% of normal.
- The number of rainy days (6.0 days) was 1.4 days smaller than that of normal.
- The total of sunshine duration (195.6 hours) was 128% of normal.

□ **The climatological characteristics of 2011 were as follows:**

o Korea (whole nation)

- The mean temperature (12.4 °C), the mean maximum temperature (17.7 °C) were 0.1 °C, 0.4 °C below-normal, respectively. and the mean minimum temperature (7.8 °C) was 0.1 °C above-normal nationwide.
- The monthly average amount of precipitation (1622.6 mm) was 124% of normal, making it the fifth highest rainfall on record (period of record 1973-2011).
- The monthly average of rainy days (113.0 days) was 9.5 days more than that of the normal.
- The monthly average of sunshine duration (2098.9 hours) was 96% of normal.

o Seoul

- The mean temperature (12.0 °C), the mean maximum temperature (16.4 °C) and the mean minimum temperature (8.6 °C) were 0.5 °C, 0.6 °C and 0.2 °C below-normal, respectively.
- The monthly amount of precipitation (2039.3 mm) was 141% of normal, making it the fifth highest rainfall on record (period of record 1908-2011).
- The number of rainy days (108.0 days) was 0.9 days smaller than that of normal.
- The total of sunshine duration (2073.8 hours) was 100% of normal.

□ **Long-term December and Annual climate trends**

- o The mean temperatures for December and annual 2000's in Korea were 0.5°C, 0.7°C higher compared with the 1970's, exhibiting an upward trend.
- o For Seoul, the mean minimum temperature of December 2000's were 3.2 °C and 0.6 °C higher than those of the 1920s and 1970s, respectively.
- o The precipitation amounts for December 2000's in Korea was (5.7 mm) less than the corresponding values for the 1970's. but annual was (148.9 mm) more than the corresponding values for the 1970's.

※ 1970's: average from 1973 to 1980

※ 2000's: average from 2001 to 2010

Appendix 1. Additional Climate Summary in December 2011

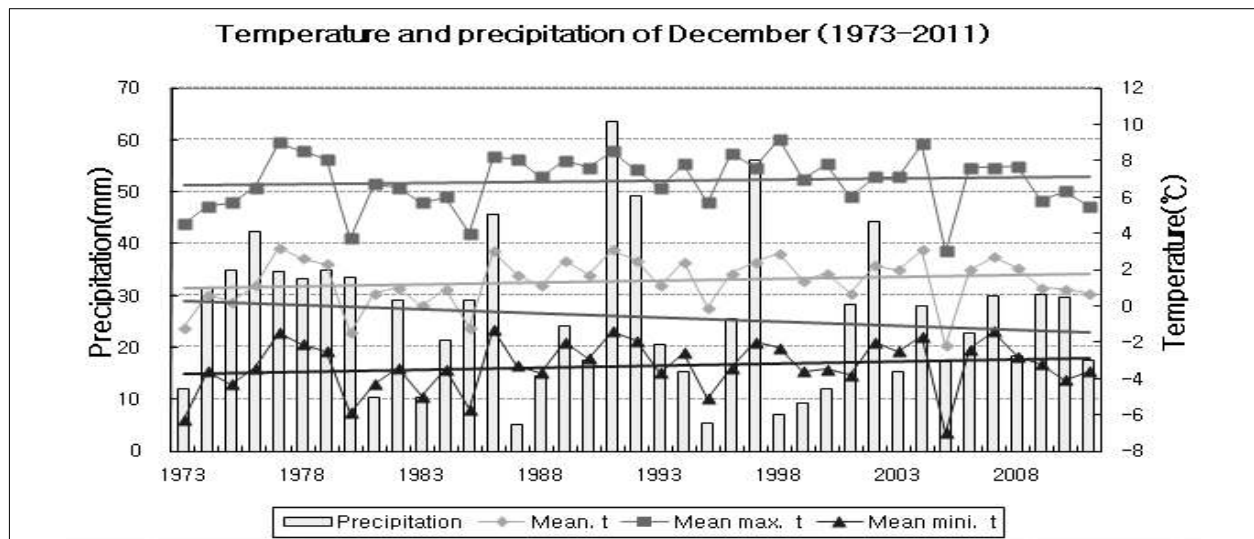


Fig. 1. Temperatures (mean, mean maximum, and mean minimum), and precipitation in South Korea during December 1973-2011.

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

statistics for climate elements (national)	December 2010	December 2011(a)	Normals of December (1981-2010)(b)	a-b	rank since 1973 (within 5th)
Mean temperature (°C)	0.9	0.7	1.5	-0.8	-
Mean maximum t (°C)	6.3	5.5	7.0	-1.5	the fifth lowest
Mean minimum t (°C)	-4.1	-3.6	-3.2	-0.4	-
Days with min. temp. (<-10°C)	3.6	3.0	2.5	0.5	-
Days with max. temp. (< 0°C)	5.0	2.8	2.3	0.5	-
Amount of precipitation (mm)	29.7	17.6	24.5	-6.9(66%)	-
Days of rainy	7.9	6.3	6.6	-0.3	-
Sunshine duration (hr)	170.6	172.6	169.4	3.2(102%)	-

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

year	Mean temp (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Days with min. temp. (<-10°C)	Days with max. temp. (< 0°C)	Amount of rain (mm)	Days of rainy	Sunshine duration (hr)
1973-1980(a)	0.9	6.4	-3.7	3.5	3.1	32.1	7.1	169.5
1981-1990(b)	1.2	6.8	-3.5	2.8	2.6	20.7	6.8	173.4
1991-2000(c)	1.9	7.6	-3.0	2.0	1.7	26.4	6.3	167.4
2001-2010(d)	1.4	6.7	-3.1	2.5	2.6	26.4	7.0	167.3
d-a	0.5	0.3	0.6	-1.0	-0.5	-5.7	-0.1	-2.2
d-b	0.2	-0.1	0.4	-0.3	0	5.7	0.2	-6.1
d-c	-0.5	-0.9	-0.1	0.5	0.9	0	0.7	-0.1

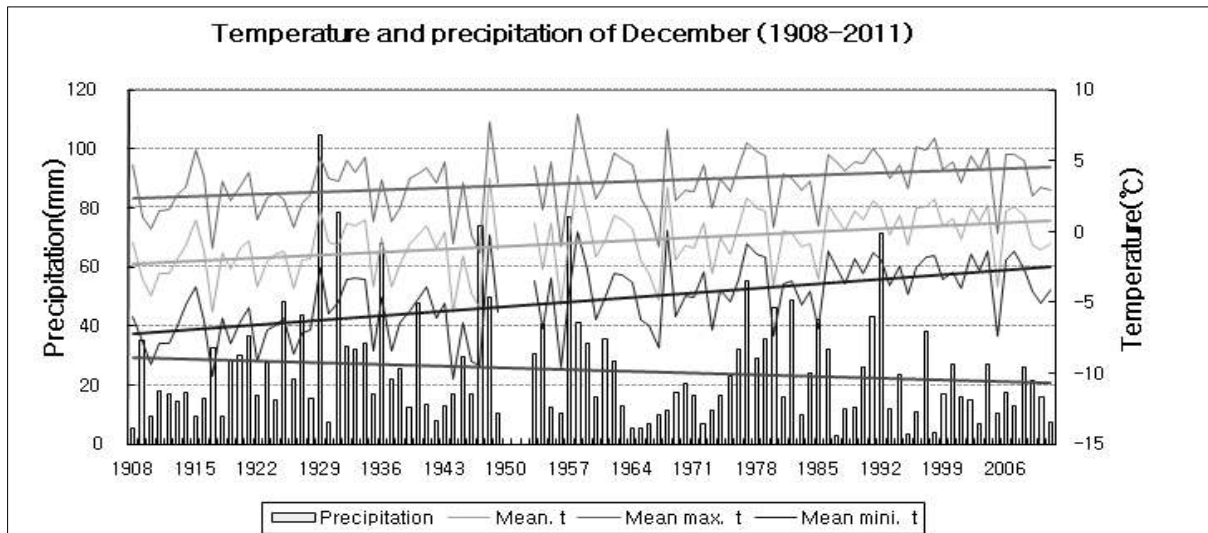


Fig. 2. Temperatures (mean, mean maximum, and mean minimum) and precipitation in Seoul during December 1908-2011

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

statistics for climate elements (Seoul)	December 2010	December 2011(a)	Normals of December (1981-2010) (b)	a-b	rank since 1908 (within 5th)
Mean temperature (°C)	-1.3	-0.9	0.4	-1.3	-
Mean maximum t (°C)	3.1	2.9	4.3	-1.4	-
Mean minimum t (°C)	-5.1	-4.1	-3.2	-0.9	-
Days with min. temp.($\leq -10^{\circ}\text{C}$)	7.0	3.0	2.3	0.7	-
Days with max. temp.($< 0^{\circ}\text{C}$)	10.0	7.0	5.8	1.2	-
Amount of precipitation (mm)	16.1	7.1	21.5	-14.4(33%)	-
Days of rainy	9.0	6.0	7.4	-1.4	-
Sunshine duration (hr)	157.8	195.6	152.6	43(128%)	-

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

year	Mean temp (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Days with min. temp. ($\leq -10^{\circ}\text{C}$)	Days with max. temp. ($< 0^{\circ}\text{C}$)	Amount of rain (mm)	Days of rainy	Sunshine duration (hr)
1911-1920년	-2.1	2.6	-6.8	7.6	9.1	19.1	7.9	175.2
1921-1930년(a)	-1.7	2.6	-6.5	7.7	8.4	33.7	9.2	150.7
1931-1940년	-1.1	3.2	-5.3	5.6	6.5	37	8.7	158.3
1941-1949년	-1.7	2.7	-6.3	8.4	9.6	25.8	9.1	170.0
1954-1960년	-0.6	3.4	-4.7	5.4	9.0	33.0	7.7	146.8
1961-1970년	-0.8	3.4	-4.6	4.5	7.7	15.3	6.4	141.1
1971-1980년	-0.4	3.8	-3.9	2.9	6.9	27.2	8	146.0
1981-1990년	0	3.9	-3.6	2.9	6.1	22.5	7.3	154.9
1991-2000년	1.1	5.0	-2.6	1.4	4.5	25	6.7	148.7
2001-2010년(b)	0.2	4.0	-3.3	2.5	6.9	16.9	8.2	154.2
b-a	1.9	1.4	3.2	-5.2	-1.5	-16.8	-1	3.5

Appendix 2. Additional Climate Summary in 2011 (annual)

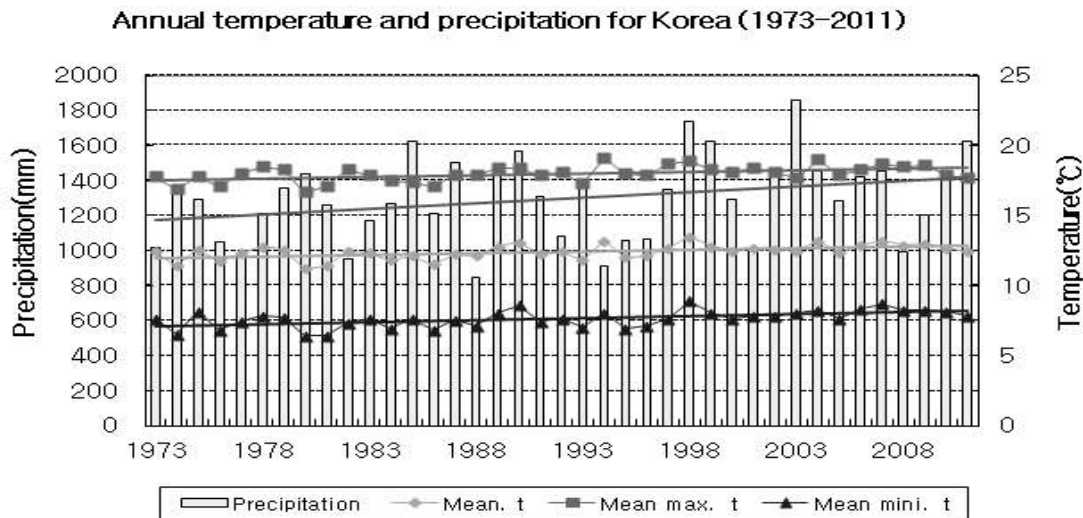


Fig. 1. Temperatures (mean, mean maximum, and mean minimum), and precipitation in South Korea during Annual (1973-2011)

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

statistics for climate elements (national)	Annual 2010	Annual 2011(a)	Normals of annual (1981-2010)(b)	a-b	Rank since 1973 (within 5th)
Mean temperature (°C)	12.7	12.4	12.5	-0.1	-
Mean maximum t (°C)	17.9	17.7	18.1	-0.4	-
Mean minimum t (°C)	8.1	7.8	7.7	0.1	-
Amount of precipitation (mm)	1444.9	1622.6	1307.7	314.9(124%)	the fifth
Days of rainy	126.2	113.0	103.5	9.5	-
Days with precip. $\geq 30\text{mm/h}$	2.8	3.2	1.7	1.5	the first
Days with precip. $\geq 80\text{mm/d}$	2.4	3.5	2.3	1.2	the second
Days with precip. $\geq 150\text{mm/d}$	0.3	1.0	0.4	0.6	the first
Sunshine duration (hr)	2018.5	2098.9	2185.3	-86.4(96%)	-

□ Average values of meteorological elements during Annual for each decade (1973-2010)

year	Mean temp (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Amount of rain (mm)	Days of rainy	Days with precip. $\geq 30\text{mm/h}$	Days with precip. $\geq 80\text{mm/d}$	Days with precip. $\geq 150\text{mm/d}$	Sunshine duration (hr)
1973-1980(a)	12.1	17.6	7.3	1209.6	104.6	1.2	1.7	0.2	2261.1
1981-1990(b)	12.2	17.8	7.4	1284.1	104.2	1.6	2.1	0.4	2263.6
1991-2000(c)	12.5	18.2	7.6	1280.5	99.3	1.6	2.4	0.4	2211.2
2001-2010(d)	12.8	18.3	8.1	1358.5	106.9	2.0	2.5	0.4	2081.1
d-a	0.7	0.7	0.8	148.9	2.3	0.8	0.8	0.2	-180
d-b	0.6	0.5	0.7	74.4	2.7	0.4	0.4	0	-182.5
d-c	0.3	0.1	0.5	78	7.6	0.4	0.1	0	-130.1

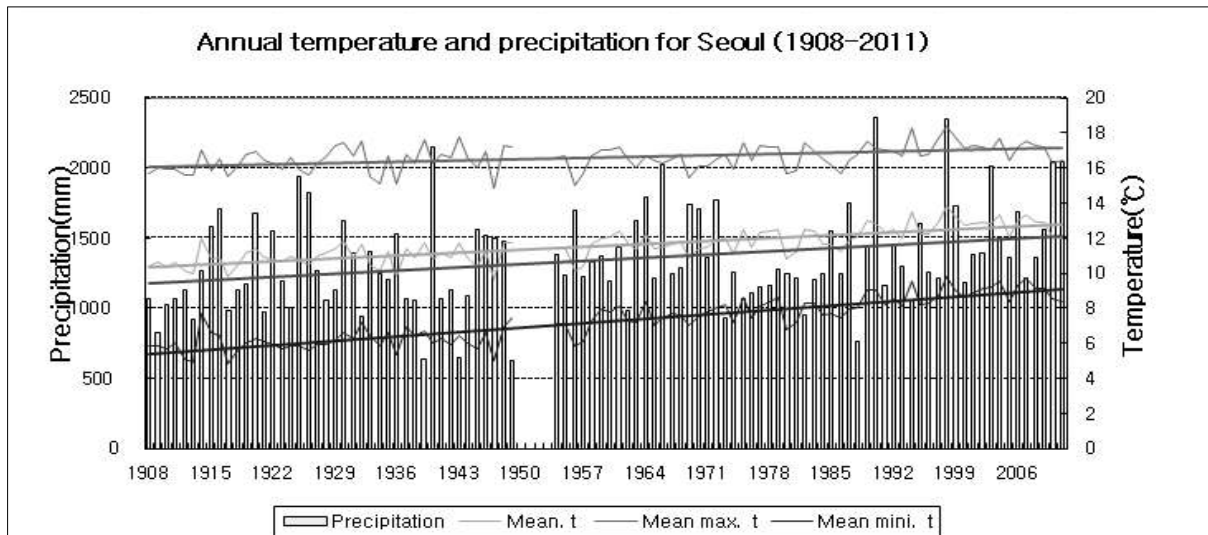


Fig. 2. Temperatures (mean, mean maximum, and mean minimum) and precipitation in Seoul during Annual 1908-2011

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

statistics for climate elements (Seoul)	Annual 2010	Annual 2011(a)	Normals of annual (1981-2010)(b)	a-b	Rank since 1908 (within 5th)
Mean temperature (°C)	12.1	12.0	12.5	-0.5	-
Mean maximum t (°C)	16.3	16.4	17.0	-0.6	-
Mean minimum t (°C)	8.5	8.4	8.6	-0.2	-
Amount of precipitation (mm)	2043.5	2039.3	1450.5	588.8(141%)	the fifth
Days of rainy	136.0	108.0	108.9	-0.9	-
Days with precip. $\geq 30\text{mm/h}$	7.0	5.0	3.0	2.0	the fifth
Days with precip. $\geq 80\text{mm/d}$	6.0	5.0	3.2	1.8	-
Days with precip. $\geq 150\text{mm/d}$	1.0	3.0	0.6	2.4	the first
Sunshine duration (hr)	1855.3	2073.8	2066.0	7.8(100%)	-

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

Mean temp (°C)	Mean temp (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Amount of rain (mm)	Days of rainy	Days with precip. $\geq 30\text{mm/h}$	Days with precip. $\geq 80\text{mm/d}$	Days with precip. $\geq 150\text{mm/d}$	Sunshine duration (hr)
1911-1920년	10.7	16.2	5.9	1263	114.3	-	2.3	0.8	2515.3
1921-1930년(a)	11.0	16.4	6.0	1355.8	111.8	-	2.7	0.7	2444.5
1931-1940년	10.9	16.4	6.4	1261.4	114.2	1.0	2.2	0.5	2451.3
1941-1949년	11.0	16.7	6.2	1177.9	110.0	1.1	1.8	0.2	2599.8
1954-1960년	11.3	16.4	7.0	1346.1	112.9	1.7	2.1	0.4	2179.7
1961-1970년	11.6	16.4	7.5	1506.1	112.9	3.3	3.3	0.4	2114.2
1971-1980년	11.9	16.7	7.9	1231.5	109.4	1.2	1.8	0.5	1999.8
1981-1990년	12.0	16.6	8.0	1371.7	107.9	2.3	2.7	0.3	2209.5
1991-2000년	12.7	17.3	8.7	1429.6	105.7	3.1	3.3	0.6	2133.2
2001-2010년(b)	12.8	17.1	9.1	1550.2	113.0	3.7	3.7	1.0	1855.5
b-a	1.8	0.7	3.1	194.4	1.2	-	1.0	0.3	-589.0