



# KMA'S BRIEFING ON CLIMATE CHARACTERISTICS

(total 6 pages)

Division	Meteorological Resources Division
Contact	Jang-Keun Yoo
Phone/email	+82-2-2181-0885/ jangkn@korea.kr
Release	January 13, 2010

## December and the 2009 climate

- ◇ The mean temperature for December was lower than normal by 0.3°C, while the 2009 was 0.7°C warmer than normal.
- ◇ The mean precipitation for December and the 2009 accounted for 110.6% and 96.2%, respectively, compared to normal.

□ Climate characteristics of December and the 2009 climate, and its long-term trends are analyzed, based on 60 meteorological stations across Korea (national average) for the period of 1973-2009 (1908-2009 for Seoul).

□ The climatological characteristics in December 2009 can be described as follows:

o For Korea, (whole nation)

- The mean temperature (1.2°C) and the mean maximum temperature (6.0°C) were 0.3°C and 1.1°C lower than normal, respectively, while the mean minimum temperature (-3.1°C) was 0.1°C higher than normal.
- The amount of precipitation (30.3mm) was 111% of normal.
- The average number of rainy days (8.7 days) had 1.8 more day compared to normal.

o For Seoul,

- The temperature (-1.0°C), mean maximum (2.5°C), and mean minimum (-4.2°C) temperatures were 1.2°C, 1.7°C, and 0.8°C lower than normal, respectively.
- The amount of precipitation (21.5mm) accounted for 86.3% of the normal precipitation.
- The average number of rainy days (10 days) had 2.7 more day compared to normal.

□ The climatological characteristics during 2009 can be described as follows:

o For Korea,

- All of the mean (13.1°C), mean maximum (18.6°C), and mean minimum (8.3°C) temperatures were 0.7°C higher than normal, respectively.

- The amount of precipitation (1265.7mm) was 96.2% of normal.
  - Days with heavy precipitation above 30mm per hour was 1.5 times greater than normal, making it the fourth highest rainfall on record since 1973.
  - Days with heavy precipitation above 80mm per day was 1.3 times greater than normal.
  - The average number of rainy days (107.7 days) was 2.4 days more than normal.
- o For Seoul,
  - The mean (13.0°C), mean maximum (17.3°C), and mean minimum (9.2°C) temperatures were 0.8°C, 0.4°C, and 1.0°C higher than normal, respectively.
  - The amount of precipitation (1564.0mm) was 116.3% of normal.
  - The average number of rainy days (113 days) was 5.4 days more than normal.

□ **Long-term trend of December and the 2009 climate**

- o Korea's mean, mean maximum, and mean minimum temperatures from 2000 to 2009 were 0.7°C, 0.7°C, and 0.8°C higher than those of the 1970s, respectively.
- o For Seoul, the mean minimum temperature of December during the 21st century was 3.5°C and 0.8°C higher than those of the 1920s and 1970s, respectively.
- o For Korea, foggy days during 2000 and 2009 were 3.4 days less than those of the 1970s, however, for Seoul, the figures are 18.1 days less than those of the 1970s.

※ 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.

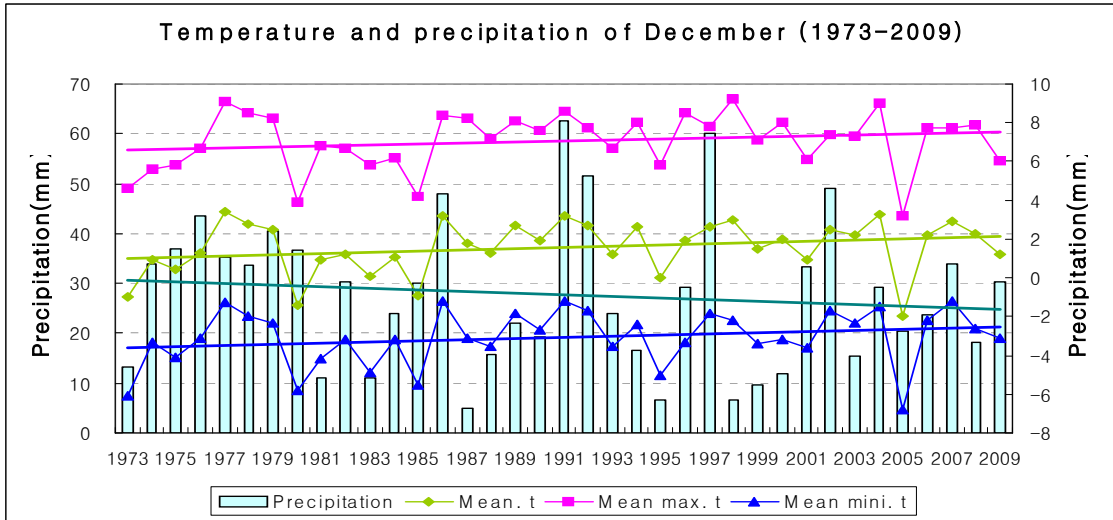
※ 1920s: average from 1921 to 1930

※ 1970s: average from 1973 to 1980

※ 2000s: average from 2001 to 2009

## Appendix 1. December, 2009 climate

**Fig. 1. Temperatures (mean, mean maximum, and mean minimum), and precipitation across South Korea during December (1973-2009)**



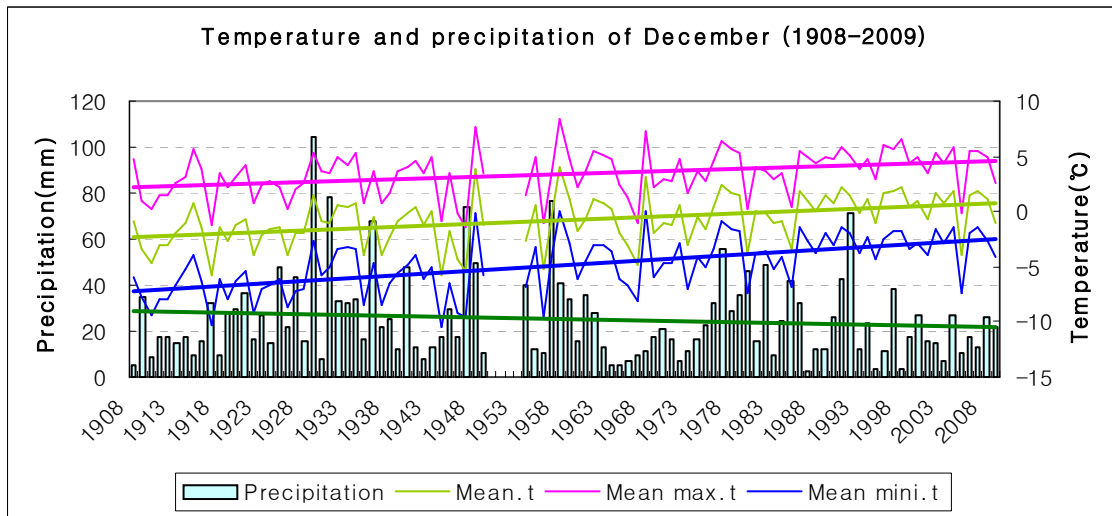
### □ Average values of meteorological elements across Korea (1973-2009)

Elements (National average)	December 2009 (a)	Normals of December(1971-2000) (b)	a-b	rank since 1973 (within 5th)
mean temperature (°C)	1.2	1.5	-0.3	-
mean maximum t (°C)	6.0	7.1	-1.1	-
mean minimum t (°C)	-3.1	-3.2	0.1	-
amount of precipitation (mm)	30.3	27.4	2.9(110.6%)	-
rainy days	8.7	6.9	1.8	-
foggy days	1.9	1.6	0.3	-

### □ Average values of meteorological elements across Korea for each decade (1973-2009)

Year	Mean t (°C)	Mean Maximum t (°C)	Mean Minimum t (°C)	Precipitation (mm)	rainy days	foggy days
1973-1980 (a)	1.1	6.6	-3.5	34.2	7.5	2.0
1981-1990 (b)	1.3	6.9	-3.3	21.6	7.0	1.5
1991-2000 (c)	2.1	7.7	-2.8	27.9	6.2	1.5
2001-2009 (d)	1.7	6.9	-2.8	28.2	7.2	1.2
d-a	0.6	0.3	0.7	-6.0	-0.3	-0.8
d-b	0.4	0	0.5	6.6	0.2	-0.3
d-c	-0.4	-0.8	0	0.3	1.0	-0.3

**Fig. 2. Temperatures (mean, mean maximum, and mean minimum), and precipitation across Seoul (1908-2009)**



**□ Average values of meteorological elements across Seoul during December (1908-2009)**

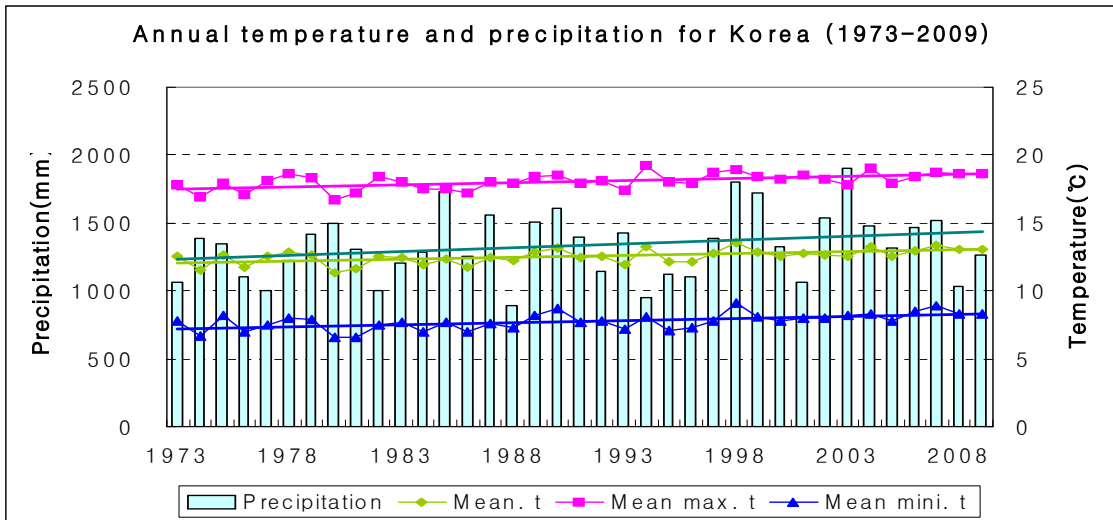
Elements (Seoul) average	December 2009 (a)	Normals of December (1971-2000) (b)	a-b	rank since 1908 (within 5th)
mean temperature (°C)	-1.0	0.2	-1.2	-
mean maximum t (°C)	2.5	4.2	-1.7	-
mean minimum t (°C)	-4.2	-3.4	-0.8	-
amount of precipitation (mm)	21.5	24.9	-3.4(86.3%)	-
rainy days	10	7.3	2.7	-
foggy days	0	1.6	-1.6	-

**□ Meteorological elements across Seoul during December for each decade (1911-2009)**

Year	Mean t (°C)	Mean Maximum t (°C)	Mean Minimum t (°C)	Precipitation (mm)	rainy days	foggy days
1911-1920	-2.1	2.6	-6.8	19.1	7.9	-
1921-1930(a)	-1.7	2.6	-6.6	33.7	9.2	-
1931-1940	-1.1	3.2	-5.3	37.0	8.7	-
1941-1949	-1.7	2.7	-6.3	25.8	9.1	-
1954-1960	-0.6	3.4	-4.7	33.0	7.7	-
1961-1970	-0.8	3.4	-4.6	15.3	6.4	-
1971-1980	-0.4	3.8	-3.9	27.2	8.0	2.7
1981-1990	0.0	3.9	-3.6	22.5	7.3	1.3
1991-2000	1.1	5.0	-2.6	25.0	6.7	0.9
2001-2009 (b)	0.3	4.1	-3.1	16.9	8.1	0.2
b-a	2.0	1.5	3.5	-16.8	-1.1	-

## Appendix 2. The 2009 climate

**Fig. 3. Annual temperatures (mean, mean maximum, and mean minimum), and precipitation across South Korea (1973-2009)**



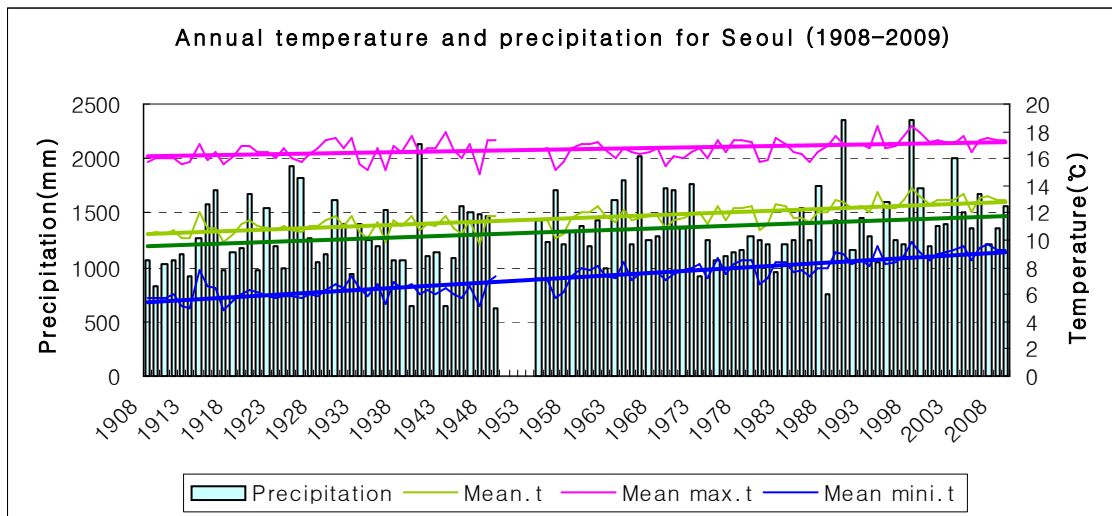
### □ Average values of meteorological elements across Korea (1973-2009)

Elements (National) average	2009 (a)	Normals (1971-2000) (b)	a-b	rank since 1973 (within 5th)
mean temperature (°C)	13.1	12.4	0.7	-
mean maximum t (°C)	18.6	17.9	0.7	-
mean minimum t (°C)	8.3	7.6	0.7	fifth highest
amount of precipitation (mm)	1265.7	1315.9	-50.2(96.2%)	-
rainy days	107.7	105.3	2.4	-
days with greater than 30mm/1hour	2.4	(1.6)	0.8	fourth highest
days with greater than 80mm/day	2.8	(2.2)	0.6	-
days with greater than 150mm/day	0.5	(0.4)	0.1	-
foggy days	22.3	31.7	-9.4	second lowest

### □ Average values of meteorological elements across Korea for each decade (1973-2009)

Year	Mean t (°C)	Mean Maximum t (°C)	Mean Minimum t (°C)	Precipitation (mm)	rainy days	days with greater than 30mm/1hour	days with greater than 80mm/day	days with greater than 150mm/day	foggy days
1973-1980(a)	12.2	17.7	7.5	1255.0	107.4	1.3	1.8	0.2	29.0
1981-1990(b)	12.3	17.9	7.5	1335.5	106.4	1.7	2.3	0.4	33.0
1991-2000(c)	12.6	18.3	7.8	1338.8	101.6	1.8	2.6	0.5	31.2
2001-2009(d)	12.9	18.4	8.3	1397.6	107.3	2.1	2.6	0.5	25.6
d-a	0.7	0.7	0.8	142.6	-0.1	0.8	0.8	0.3	-3.4
d-b	0.6	0.5	0.8	62.1	0.9	0.4	0.3	0.1	-7.4
d-c	0.3	0.1	0.5	58.8	5.7	0.3	0.1	0	-5.6

**Fig. 4. Annual temperatures (mean, mean maximum, and mean minimum), and precipitation across Seoul (1908-2009)**



**□ Average values of meteorological elements across Seoul (1908-2009)**

Elements (Seoul) average	2009 (a)	Normals (1971-2000) (b)	a-b	rank since 1973 (within 5th)
mean temperature (°C)	13.1	12.4	0.7	-
mean maximum t (°C)	18.6	17.9	0.7	-
mean minimum t (°C)	8.3	7.6	0.7	fifth highest
amount of precipitation (mm)	1265.7	1315.9	-50.2(96.2%)	-
rainy days	107.7	105.3	2.4	-
days with greater than 30mm/1hour	2.4	(1.6)	0.8	fourth highest
days with greater than 80mm/day	2.8	(2.2)	0.6	-
days with greater than 150mm/day	0.5	(0.4)	0.1	-
foggy days	22.3	31.7	-9.4	second lowest

**□ Meteorological elements across Seoul for each decade (1911-2009)**

Year	Mean t (°C)	Mean Maximum t (°C)	Mean Minimum t (°C)	Precipitation (mm)	rainy days	days with greater than 30mm/1hour	days with greater than 80mm/day	days with greater than 150mm/day	foggy days
1911-1920	10.8	16.2	6.0	1263.0	114.3	-	2.3	0.8	-
1921-1930(a)	11.1	16.5	6.0	1355.8	111.8	0.1	2.7	0.7	-
1931-1940	11.0	16.4	6.4	1260.4	114.2	0.0	2.2	0.5	-
1941-1949	11.1	16.7	6.3	1182.2	109.7	0.1	1.8	0.2	-
1954-1960	11.3	16.4	7.1	1353.2	112.9	1.7	2.1	0.4	-
1961-1970	11.7	16.4	7.6	1506.1	112.9	3.3	3.3	0.4	-
1971-1980	11.9	16.7	8.0	1231.5	109.4	1.2	1.8	0.5	28.0
1981-1990	12.1	16.7	8.1	1371.7	107.9	2.3	2.7	0.3	16.6
1991-2000	12.8	17.4	8.8	1429.6	105.7	3.1	3.3	0.6	15.4
2001-2009(b)	13.0	17.2	9.2	1495.3	110.4	3.3	3.4	1.0	9.9
b-a	1.9	0.7	3.2	139.5	-1.4	3.2	0.7	0.3	-