



# KMA'S BRIEFING ON CLIMATE CHARACTERISTICS

(total 6 pages)

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## Monthly (December 2010) and Annual (2010) climate Summary

- ◇ Temperature averaged 0.5 °C below normal during December 2010, and 0.3 °C above normal during all of the year 2010.
- ◇ Precipitation anomalies are 118% of normal during December 2010, and 114% of normal during the year 2010.

- Climate characteristics of December 2010, the 2010 climate, and their long-term trends are analyzed, based on 60 meteorological stations over Korea (national average) for the period of 1973-2010 (1908-2010 for Seoul).
- **The climatological characteristics in December 2010 can be described as follows:**
  - o Korea (whole nation)
    - The mean temperature (1.0 °C), the mean maximum temperature (6.4 °C), the mean minimum temperature(-3.8 °C) were 0.5 °C and 0.7 °C and 0.6 °C below normal, respectively
    - The amount of precipitation (32.4 mm) was 118% of normal.
    - The average days of rain (8.2 days) had 1.3 more days compared to normal.
  - o Seoul
    - The mean temperature (-1.3 °C), mean maximum (3.1 °C), and mean minimum (-5.1°C) temperatures were 1.5 °C, 1.1 °C, and 1.7 °C below normal, respectively.
    - The amount of precipitation (16.1 mm) accounted for 65% of the normal precipitation.
    - The average days of rain (9.0 days) had 1.7 more days compared to normal.
- **The climate characteristics during 2010 can be described as follows:**
  - o Korea
    - All of the mean (12.7 °C) and mean minimum (8.2 °C) temperatures were 0.3 °C and 0.6 °C above normal, respectively.

while the mean maximum temperature(17.9 °C) was similar to normal

- The amount of precipitation (1499.1mm) was 114% of normal.
- Days with heavy precipitation above 30mm per hour was 1.3 times greater than normal, making it the second highest on record since 1973.
- Days with heavy precipitation above 80mm per day was 0.3 times greater than normal.
- The average days of rain (128.4 days) was 23.4 days more than normal, making it the first highest on record since 1973.

o Seoul

- The mean (12.1 °C), mean maximum (16.3 °C) temperatures were 0.1 °C, 0.6 °C lower than normal, respectively. while the mean minimum temperature(8.5 °C) was 0.3 °C higher than normal.
- The amount of precipitation (2043.5 mm) was 152% of normal, making it the fourth highest rainfall on record since 1908.
- The average days of rain (136 days) was 28.4 days more than normal, marking the second rank in the historic record from 1908.

□ **Long-term trend of December and the 2010 climate**

- o Korea's mean, mean maximum, and mean minimum temperatures in 2001-2010 were 0.3 °C, 0.1 °C, and 0.5°C higher than those of the 1970s, respectively.
- o For Seoul, the mean minimum temperature of December during the 21st century were 3.3 °C and 0.6 °C higher than those of the 1920s and 1970s, respectively.
- o Foggy days in all of Korea during 2001-2010 were 3.6 days less than those of the 1970s, however, that of Seoul was 17.2 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.

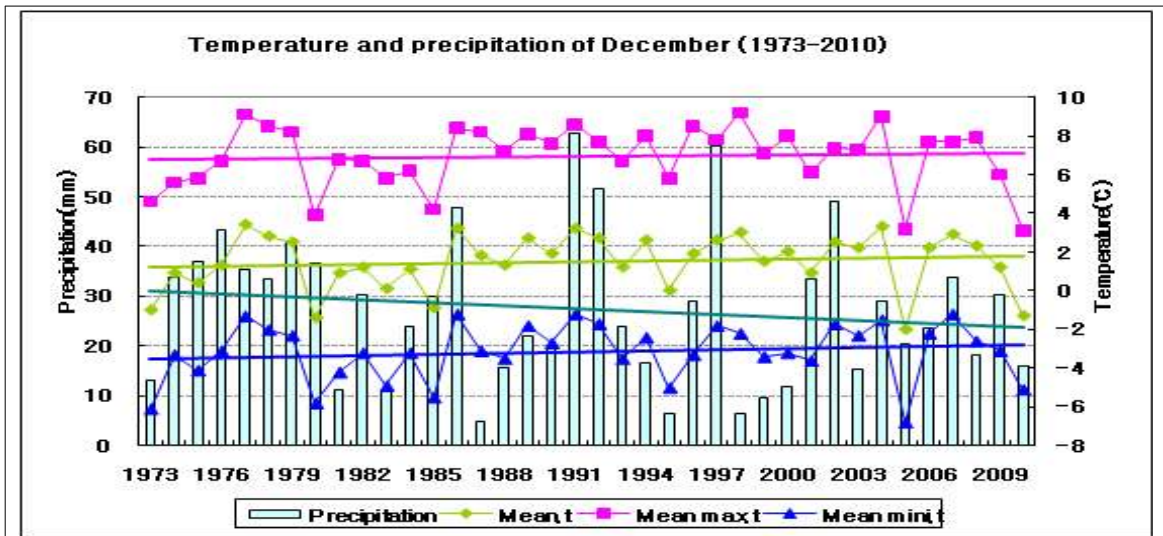
※ In Seoul, data are analyzed from 1908.

※ 1920s: average from 1921 to 1930

※ 1970s: average from 1973 to 1980

※ 2000s: average from 2001 to 2010

## Appendix 1. December, 2010 climate



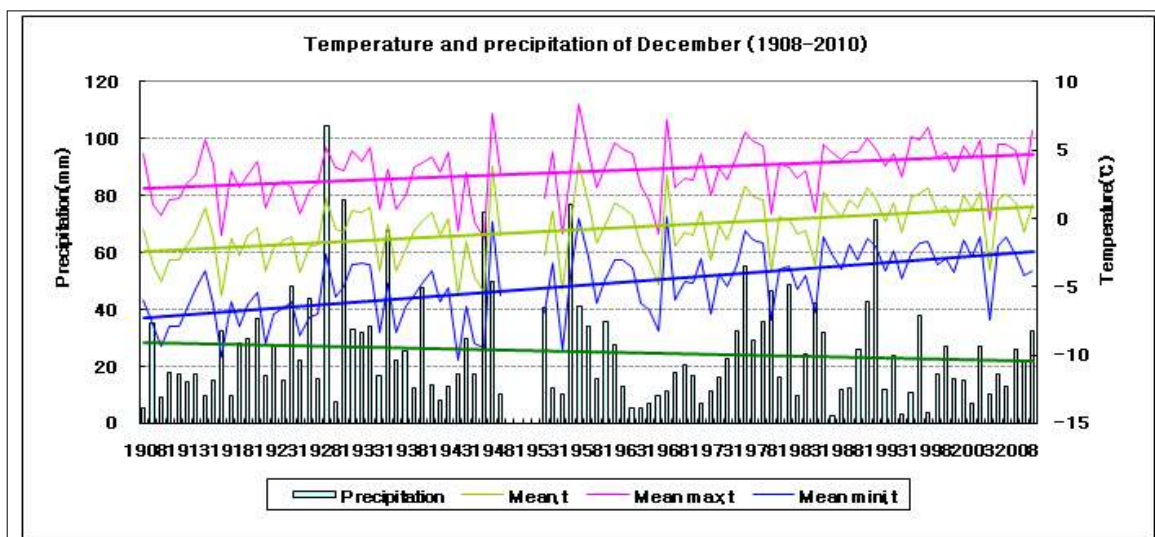
**Fig. 1. Temperatures (mean, mean maximum, and mean minimum), and precipitation over South Korea during December 1973-2010.**

### □ Average values of meteorological elements over Korea during 1973-2010

Elements (National average)	December 2010 (a)	Normals of December(1971-2010) (b)	a-b	rank since 1973 (within 5th)
mean temperature (°C)	1.0	1.5	-0.5	-
mean maximum t (°C)	6.4	7.1	-0.7	-
mean minimum t (°C)	-3.8	-3.2	-0.6	-
amount of precipitation (mm)	32.4	27.4	0.5(118%)	-
rainy days	8.2	6.9	1.3	-
foggy days	1.7	1.7	0	-

### □ Average values of meteorological elements over Korea for each decade (1973-2010)

Year	Mean T (°C)	Mean Maximum T (°C)	Mean Minimum T (°C)	Precipitation (mm)	Rain Events (days)	Fog Event (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
2001-2010 (d)	1.7	6.9	-2.9	28.6	7.3	1.2
d-a	0.6	0.3	0.6	-5.6	-0.2	-0.8
d-b	0.4	0	0.4	7.0	0.3	-0.3
d-c	-0.4	-0.8	-0.1	0.7	1.1	-0.3



**Fig. 2. Temperatures (mean, mean maximum, and mean minimum), and precipitation over Seoul during 1908-2010**

**□ Average values of meteorological elements over Seoul during December during 1908-2010**

Elements (Seoul) average	December 2010 (a)	Normals of December (1971-2000) (b)	a-b	rank since 1908 (within 5th)
mean temperature (°C)	-1.3	0.2	-1.5	-
mean maximum t (°C)	3.1	4.2	-1.1	-
mean minimum t (°C)	-5.1	-3.4	-1.7	-
amount of precipitation (mm)	16.1	24.9	-8.8(65%)	-
rainy days	9.0	7.3	1.7	-
foggy days	2.0	1.6	0.4	-

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

Year	Mean t (°C)	Mean Maximum t (°C)	Mean Minimum t (°C)	Precipitation (mm)	Rain Events (days)	Fog Event (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
2001-2010 (b)	0.2	4.0	-3.3	16.9	8.2	0.4
b-a	1.9	1.4	3.3	-16.8	-1.0	-

## Appendix 2. The 2010 climate

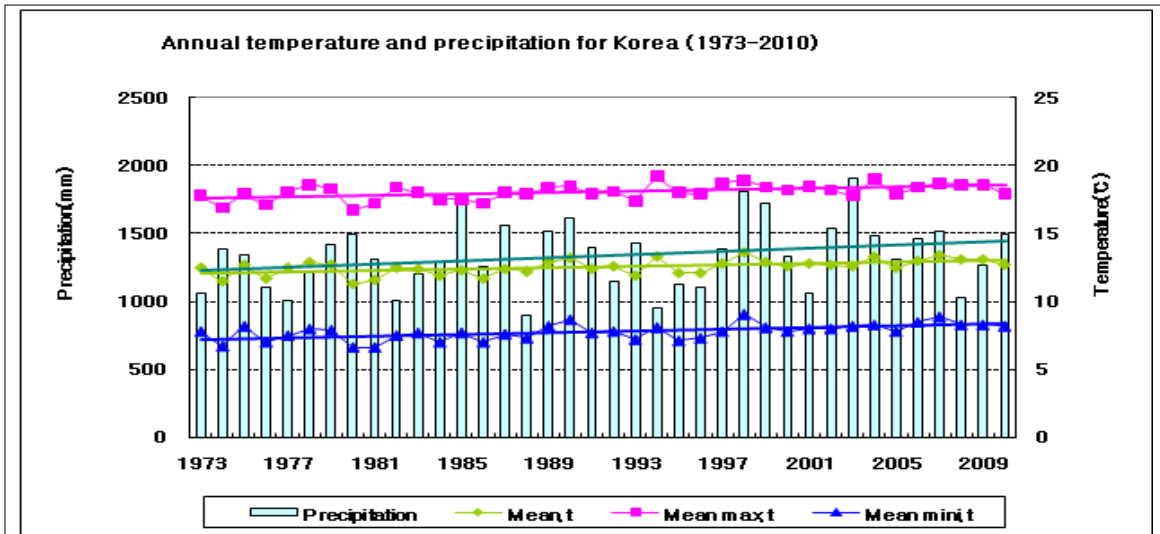


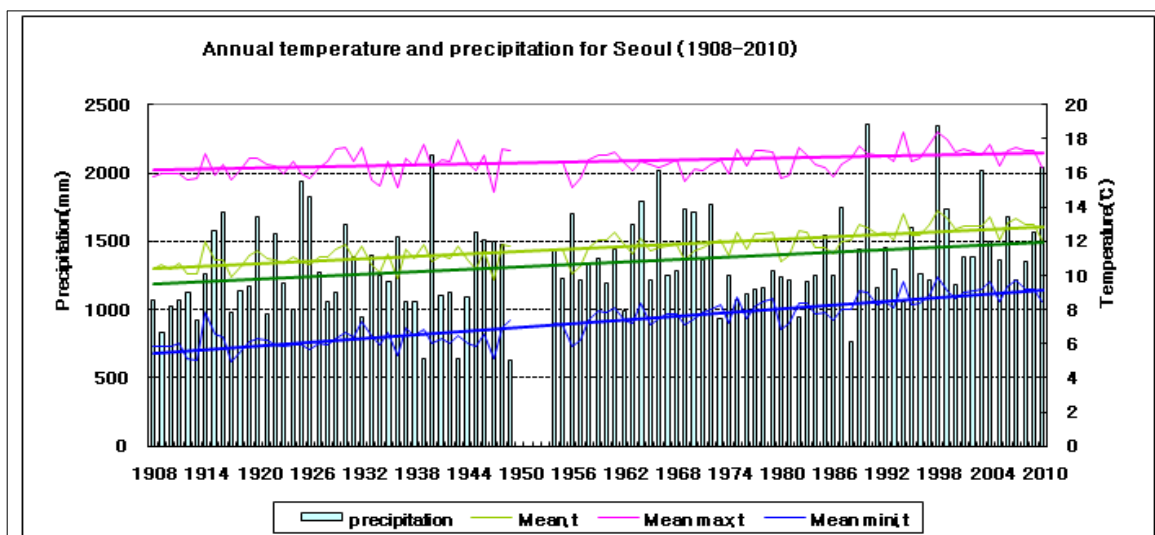
Fig. 3. Annual temperatures (mean, mean maximum, and mean minimum), and precipitation over South Korea during 1973-2010

### □ Average values of meteorological elements over Korea during 1973-2010.

Elements (National) average	2010 (a)	Normals (1971-2000) (b)	a-b	rank since 1973 (within 5th)
mean temperature (°C)	12.7	12.4	0.3	-
mean maximum t (°C)	17.9	17.9	0	-
mean minimum t (°C)	8.2	7.6	0.6	-
amount of precipitation (mm)	1499.1	1315.9	183.2(114%)	-
rainy days	128.4	105	23.4	first highest
days with greater than 30mm/1hour	2.9	1.6	1.3	second highest
days with greater than 80mm/day	2.5	2.2	0.3	-
days with greater than 150mm/day	0.4	0.4	0	-
foggy days	27.9	31.7	-3.8	-

### □ Average values of meteorological elements over Korea for each decade (1973-2010)

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	1.0	1.4	0.2	29.5
1981-1990(b)	12.3	17.9	7.5	1335.5	106.4	1.9	2.3	0.4	33.4
1991-2000(c)	12.6	18.3	7.8	1338.8	101.6	1.8	2.6	0.5	31.6
2001-2010(d)	12.9	18.4	8.3	1407.8	109.4	2.2	2.6	0.5	25.9
d-a	0.7	0.7	0.8	152.8	2.0	1.2	1.2	0.3	-3.6
d-b	0.6	0.5	0.8	72.3	3.0	0.3	0.3	0.1	-7.5
d-c	0.3	0.1	0.5	69.0	7.8	0.4	0.0	0.0	-5.7



**Fig. 4. Annual temperatures (mean, mean maximum, and mean minimum), and precipitation across Seoul (1908-2010)**

**□ Average values of meteorological elements across Seoul (1908-2010)**

Elements (Seoul) average	2010 (a)	Normals (1971-2000) (b)	a-b	rank since 1973 (within 5th)
mean temperature (°C)	12.1	12.2	-0.1	-
mean maximum t (°C)	16.3	16.9	-0.6	-
mean minimum t (°C)	8.5	8.2	0.3	-
amount of precipitation (mm)	2043.5	1344.3	699.2(152%)	fourth highest
rainy days	136.0	107.6	28.4	second highest
days with greater than 30mm/1hour	7.0	2.2	4.8	second highest
days with greater than 80mm/day	6.0	2.6	3.4	-
days with greater than 150mm/day	1.0	0.5	0.5	-
foggy days	15.0	20.1	-5.1	-

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

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	28.1
1981-1990	12.1	16.7	8.1	1371.7	107.9	2.3	2.7	0.3	16.8
1991-2000	12.8	17.4	8.8	1429.6	105.7	3.1	3.3	0.6	15.4
2001-2010(b)	12.9	17.1	9.1	1550.2	113.0	3.7	3.7	1.0	10.9
b-a	1.8	0.6	3.1	194.4	1.2	3.6	1.0	0.3	-