



# NATIONAL CLIMATE REVIEW IN KMA (total 4 pages)

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## Monthly (December) 2012 Climate Summary

- ◇ The mean temperature ( $-1.7\text{ }^{\circ}\text{C}$ ) for December 2012 nationwide was the 2nd lowest in a record extending back to 1973.
- ◇ The monthly amount of precipitation (60.4mm) was the 2nd largest and the days of rain (11.2 days) were the 1st largest in a record extending back to 1973.
- ◇ The number of days with daily snowfall were 10 days and the 3rd largest in record extending back to 1908. The number of days with daily snow cover were 23 days and the 1st largest in record extending back to 1908.

- Climate features and long-term trends of December 2012 are analyzed by using 45 meteorological stations in Korea (the national average) from 1973 to 2012 (1908-2012 for Seoul).

※ Normal : average from 1981 to 2010.

- **The climatological characteristics in December 2012 can be described as follows:**

o For Korea (whole nation),

- The mean temperature was  $-1.7\text{ }^{\circ}\text{C}$ , which was 3.2 below normal and the 2nd lowest in a record extending back to 1973. The mean maximum temperature was  $3.0\text{ }^{\circ}\text{C}$ , which was 4.0 below normal and 2nd lowest in record extending back to 1973. The mean minimum temperature was  $-6.0\text{ }^{\circ}\text{C}$ , which was 2.8 below normal and 3rd in a record extending back to 1973. The days of daily minimum temperature less than  $10\text{ }^{\circ}\text{C}$  were 7.2 days, which were 4.7 days above normal and the 2nd largest in record extending back to 1973. The days of daily maximum temperature less than  $0\text{ }^{\circ}\text{C}$  were 7.6 days, which were 5.3 days above normal and the 1st largest in record extending back to 1973.
- The nationally-averaged precipitation was 60.4 mm, which was 261% above normal and the 2nd largest in a record extending back to 1973. The days of rain were 11.2 days, which were 4.6 above normal and the 1st largest in a record extending back to 1973.

※ Updated in daily maximum depth of snowfall extremes (5th ranked)

- Changwon (12.0 cm, 28 December), Tongyeong (5.8 cm, 28 December), Gosan (2.0 cm, 24 December), Jinju (14.6 cm, 28 December)
- Total hours of sunshine were 176 hours, which was 104% above normal.

o For Seoul,

- The mean temperature ( $-4.1\text{ }^{\circ}\text{C}$ ) and the mean maximum temperature ( $-0.5\text{ }^{\circ}\text{C}$ ) and the mean minimum temperature ( $-7.4\text{ }^{\circ}\text{C}$ ) were lower than normals,  $4.5\text{ }^{\circ}\text{C}$ ,  $4.8\text{ }^{\circ}\text{C}$ ,  $4.2\text{ }^{\circ}\text{C}$ , respectively.
- The days of daily minimum temperature less than  $10\text{ }^{\circ}\text{C}$  were 13 days, which were 10.7 days above normal. The days of daily maximum temperature less than  $0\text{ }^{\circ}\text{C}$  were 17 days, which were 11.2 days above normal.
- The nationally-averaged precipitation was 41.4 mm, which is 193% above normal. The days of rain were 10 days, which were 2.6 days above normal.
- The number of days with daily snowfall were 10 days and the 3rd largest in record extending back to 1908. The number of days with daily snow cover were 23 days and the 1st largest in record extending back to 1908.
- Total hours of sunshine were 194 hours, which was 127% above normal.

**Long-term trend of December 2012 climate**

o For Korea (whole nation),

- National mean temperatures of December 2000s (2001-2010) were higher than  $0.5\text{ }^{\circ}\text{C}$  those of the 1970s. The days of daily minimum temperature less than  $-10\text{ }^{\circ}\text{C}$  in December 2000s were less than 1 days those of the 1970s. The days of daily maximum temperature less than  $0\text{ }^{\circ}\text{C}$  in December 2000s were less than 0.5 days those of the 1970s.
- The Nationally-averaged precipitation in December 2000s were less than 5.7 mm those of the 1970s. And the days of rain in December 2000s were less than 0.1 days those of 1970s.
- Total hours of sunshine in December 2000s were less than 2.2 hours those of the 1970s.

o For Seoul,

- National mean temperatures of December 2000s (2001-2010) were higher than  $0.6\text{ }^{\circ}\text{C}$  those of the 1970s. The days of daily minimum temperature less than  $-10\text{ }^{\circ}\text{C}$  in December 2000s were less than 0.4 days those of the 1970s. The days of daily maximum temperature less than  $0\text{ }^{\circ}\text{C}$  in December 2000s were similar those of the 1970s.
- The Nationally-averaged precipitation in December 2000s were less than 10.3 mm those of the 1970s. And the days of rain in December 2000s were less than 0.2 days those of 1970s.
- Total hours of sunshine in December 2000s were larger than 8.2 hours those of the 1970s.

## Appendix 1 Climate features in December 2012(Nation)

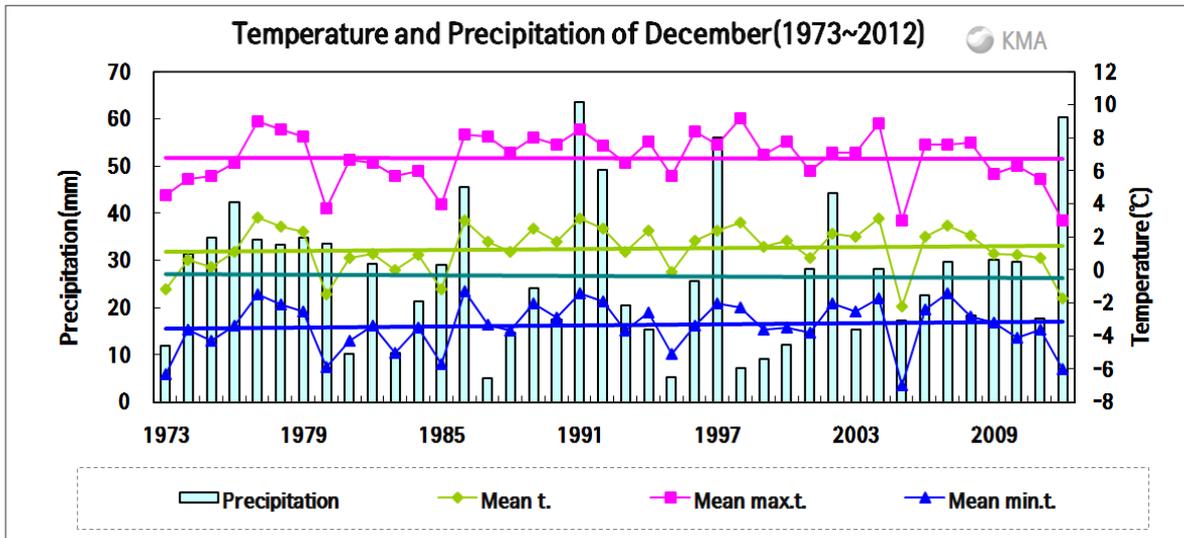


Fig 1. Temperatures (mean, mean maximum, and minimum) and precipitation in South Korea during December (1973–2012).

### □ Average values of meteorological elements across Korea during December (1973~2012)

Elements (National) average	December 2012(a)	December 2011(b)	Nomals of December (1981-2010)(c)	a-b	a-c	Rank since 1973 (within 5th)
Mean temperature (°C)	-1.7	0.7	1.5	-2.4	-3.2	the 2nd lowest
Mean maximum temp. (°C)	3.0	5.5	7.0	-2.5	-4.0	the 2nd lowest
Mean minimum temp. (°C)	-6.0	-3.6	-3.2	-2.4	-2.8	the 3rd lowest
Amount of precipitation (mm)	60.4	17.6	24.5	42.8	35.9(261%)	the 2nd largest
Days of rain (day)	11.2	6.3	6.6	4.9	4.6	the 1st largest
Sunshine duration (hour)	175.7	172.6	169.4	3.1	6.3(104%)	-
Mean cloud amount (1/10)	4.2	4.2	3.8	0.0	0.4	-
Days of minimum temperature less than -10°C (day)	7.2	3.0	2.5	4.2	4.7	the 2nd largest
Days of maximum temperature less than 0°C (day)	7.6	2.8	2.3	4.8	5.3	the 1st largest

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

Year	Mean temp. (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Amount of precipitation (mm)	Days of rain (day)	Sunshine duration (hour)	Mean cloud amount (1/10)	Days of minimum temperature less than -10°C (day)	Days of maximum temperature less than 0°C (day)
1973-1980(a)	0.9	6.4	-3.7	32.1	7.1	169.5	3.9	3.5	3.1
1981-1990(b)	1.2	6.8	-3.5	20.7	6.8	173.4	3.8	2.8	2.6
1991-2000(c)	1.9	7.6	-3.0	26.4	6.3	167.4	3.7	2.0	1.7
2001-2010(d)	1.4	6.7	-3.1	26.4	7.0	167.3	3.8	2.5	2.6
2012(e)	-1.7	3.0	-6.0	60.4	11.2	175.7	4.2	7.2	7.6
d-a	0.5	0.3	0.6	-5.7	-0.1	-2.2	-0.1	-1.0	-0.5
d-b	0.2	-0.1	0.4	5.7	0.2	-6.1	0.0	-0.3	0.0
d-c	-0.5	-0.9	-0.1	0.0	0.7	-0.1	0.1	0.5	0.9
e-d	-3.1	-3.7	-2.9	34.0	4.2	8.4	0.4	4.7	5.0

## Appendix 2 Climate features in December 2012(Seoul)

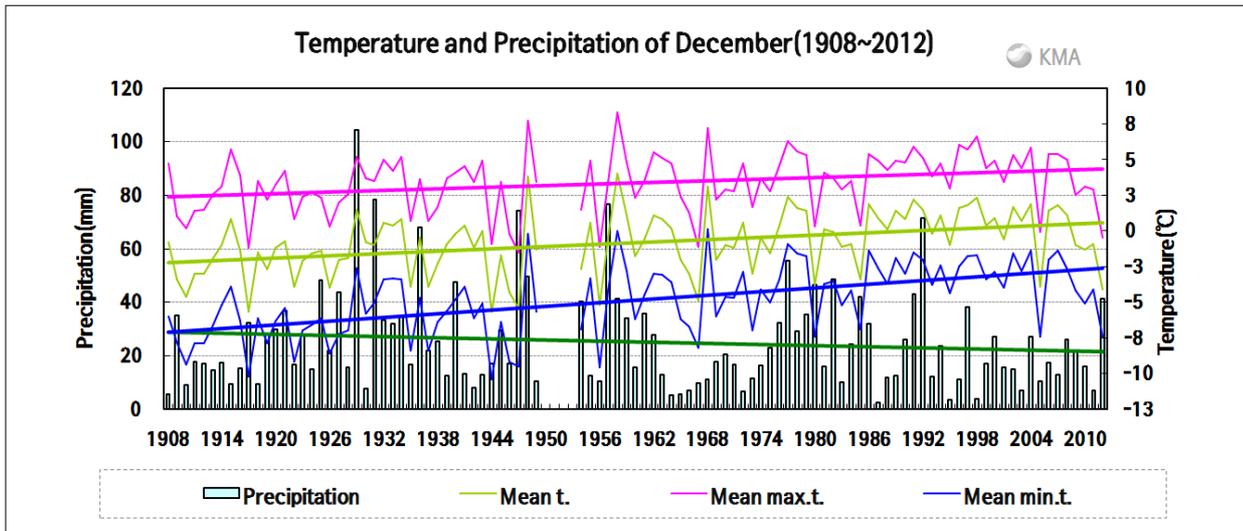


Fig 2. Temperatures (mean, mean maximum, and minimum), and precipitation in Seoul during December (1908–2012).

### □ Average values of meteorological elements across Seoul during December (1908–2012)

Elements (Seoul) average	December 2012(a)	December 2011(b)	Nomals of December (1981-2010)(c)	a-b	a-c	Rank since 1908 (within 5th)
Mean temperature (°C)	-4.1	-0.9	0.4	-3.2	-4.5	-
Mean maximum temp. (°C)	-0.5	2.9	4.3	-3.4	-4.8	-
Mean minimum temp. (°C)	-7.4	-4.1	-3.2	-3.3	-4.2	-
Amount of precipitation (mm)	41.4	7.1	21.5	34.3	19.9(193%)	-
Days of rain (day)	10.0	6.0	7.4	4.0	2.6	-
Sunshine duration (hour)	193.6	195.6	152.6	-2.0	41.0(127%)	-
Mean cloud amount (1/10)	3.5	3.9	3.9	-0.4	-0.4	-
Days of minimum temperature less than -10°C (day)	13.0	3.0	2.3	10.0	10.7	-
Days of maximum temperature less than 0°C (day)	17.0	7.0	5.8	10.0	11.2	-

### □ Average values of meteorological elements across Seoul during December for each decade (1911–2012)

Year	Mean temp. (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Amount of precipitation (mm)	Days of rain (day)	Sunshine duration (hour)	Mean cloud amount (1/10)	Days of minimum temperature less than -10°C (day)	Days of maximum temperature less than 0°C (day)
1911-1920(a)	-2.1	2.6	-6.8	19.1	7.9	175.2	4.3	7.6	9.1
1921-1930	-1.7	2.6	-6.6	33.7	9.2	150.7	4.6	7.7	8.4
1931-1940(b)	-1.1	3.2	-5.3	37.0	8.7	158.3	4.5	5.6	6.5
1941-1949	-1.7	2.7	-6.3	25.8	9.1	170.0	4.4	8.4	9.6
1954-1960	-0.6	3.4	-4.7	33.0	7.7	146.8	4.3	5.4	9.0
1961-1970	-0.8	3.4	-4.6	15.3	6.4	141.1	4.5	4.5	7.7
1971-1980(c)	-0.4	3.8	-3.9	27.2	8.0	146.0	4.2	2.9	6.9
1981-1990	0.0	3.9	-3.6	22.5	7.3	154.9	4.2	2.9	6.1
1991-2000	1.1	5.0	-2.6	25.0	6.7	148.7	3.8	1.4	4.5
2001-2010(d)	0.2	4.0	-3.3	16.9	8.2	154.2	3.6	2.5	6.9
2012(e)	-4.1	-0.5	-7.4	41.4	10.0	193.6	3.5	13.0	17.0
d-a	2.3	1.4	3.5	-2.2	0.3	-21.0	-0.7	-5.1	-2.2
d-b	1.3	0.8	2.0	-20.1	-0.5	-4.0	-0.9	-3.1	0.4
d-c	0.6	0.2	0.6	-10.3	0.2	8.2	-0.6	-0.4	0.0
e-d	-4.3	-4.5	-4.1	24.5	1.8	39.4	-0.1	10.5	10.1