



NATIONAL CLIMATE REVIEW IN KMA (total 7 pages)

Division	Meteorological Resources Division
Contact	LEE Jae-Won
Phone/email	+82-2-2181-0882/ 2seun@korea.kr
Release	December 10, 2012

Monthly (November) and Seasonal (September–November) 2012 Climate Summary

- ◇ The mean maximum temperature (11.7 °C) for November 2012 nationwide was the 5th lowest and the days of rain (11 days) were the 5th highest in a record extending back to 1973.
- ◇ The mean temperature (13.7 °C) for the Fall 2012 nationwide was below-normal (14.1 °C) and the monthly amount of precipitation (363.3 mm) was the 4th largest in a record extending back to 1973.

- Climate features and long-term trends of November and Fall (September–November) 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 November 2012 can be described as follows:**

o For Korea (whole nation),

- The mean temperature (6.6 °C) and the mean maximum temperature (11.7 °C) and the mean minimum temperature (1.9 °C) were lower than the normals, 1.0 °C, 1.9 °C, 0.6 °C, respectively. The days of daily temperature range over 10 °C were 13.6 days, which are 3.9 days below normal. The days of daily minimum temperature less than 0 °C were 10.4 days, which are 0.7 days above normal.

- The nationally-averaged precipitation was 55.5 mm, which is 122% above normal. The days of rain (11.0 days) were the 5th highest in a record extending back to 1973.

※ Updated in daily precipitation extremes (5th largest ranked)

- Dongducheon (second, 36.5 mm, 11 November), Munsan (second, 32.5 mm, 11 November), Baengnyeongdo (fifth, 17.5 mm, 4 November), Heuksando (first, 40.0 mm, 10 November)

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

- Cheorwon (fourth, 2.5 cm, 19 November), Baengnyeongdo (fourth, 0.0 cm, 30 November)

- Total hours of sunshine were 178 hours, which is 106% above normal.

o For Seoul,

- The mean temperature (5.5 °C) and the mean maximum temperature (9.5 °C) and the mean minimum temperature (1.8 °C) were lower than normals, 1.7 °C, 2.1 °C, 1.4 °C, respectively. The days of daily temperature range over 10 °C were 5 days, which are 3.4 days below normal. The days of daily minimum temperature less than 0 °C were 13 days, which are 5.7 days above normal.
- The nationally-averaged precipitation was 67.8 mm, which is 129% above normal. The days of rain were 13.0 days, which are 4.3 days above normal. The First snow event of this season was 13 November, which is 8 days earlier than normal.
- Total hours of sunshine were 181 hours, which is 118% above normal.

□ **The climatological characteristics in Fall 2012 can be described as follows:**

o For Korea (whole nation),

- The mean temperature (13.7 °C) and the mean maximum temperature (19.3 °C) and the mean minimum temperature (9.0 °C) were lower than normals, 0.4 °C, 0.8 °C, 0.2 °C, respectively. The days of daily temperature range over 10 °C were 48.6 days, which are 4.3 days below normal. The days of daily minimum temperature less than 0 °C were 10.6 days, which are 0.1 days below normal.
- The nationally-averaged precipitation was 363.3 mm, which is 142% above normal and the 4th highest in a record extending back to 1973. The days of rain were 26.6 days, which are 4.8 days above normal.
- Total hours of sunshine were 594 hours, which is 110% above normal.

o For Seoul,

- The mean temperature (13.9 °C) and the mean maximum temperature (18.3 °C) and the mean minimum temperature (10.1 °C) were lower than normals, 0.5 °C, 0.8 °C, 0.2 °C, respectively. The days of daily temperature range over 10 °C were 23 days, which are 3.4 days below normal and the 5th lowest in a record extending back to 1908. The days of daily minimum temperature less than 0 °C were 13 days, which are 5.5 days above normal.
- The nationally-averaged precipitation was 379.1 mm, which is 139% above normal. The days of rain were 30 days which are 5.9 days above normal.
- Total hours of sunshine were 607 hours, which is 115% above normal.

□ **Long-term trend of November and Seasonal(September-November) 2012 climate**

o For Korea (whole nation),

- National mean temperatures of November and Fall 2000s (2001-2010) were higher than 0.7 °C those of the 1970s. The days of daily minimum temperature less than 0 °C in November and Fall 2000s were lower than 1.4 days and 1.9 days those of the 1970s.
- The Nationally-averaged precipitation in November 2000s were less than 7.4 mm those of the 1970s, but those in Fall 2000s were greater than 33.7mm those of the 1970s. And the days of rain in November and Fall 2000s were less than 1.3 days and 0.5 days those of 1970s.
- Total hours of sunshine in November 2000s were larger than 2.5 hours those of the 1970s, but those in Fall 2000s were less than 27.1 hours those of 1970s.

o For Seoul,

- The mean temperatures of November and Fall 2000s (2001-2010) were higher than 0.8 °C and 1.0 °C those of the 1970s. The days of daily minimum temperature less than 0 °C in November and Fall 2000s were lower than 3.1 days and 3.2 days those of the 1970s.
- The Nationally-averaged precipitation in November and Fall 2000s were less than 1.5 mm and 100.8 mm those of the 1970s and the days of rain in November and Fall 2000s were less than 1.0 days and 0.7 days those of 1970s.
- Total hours of sunshine in November 2000s were larger than 6 hours those of the 1970s, but those in Fall 2000s were less than 24 hours those of 1970s.

Appendix 1 Climate features in November 2012

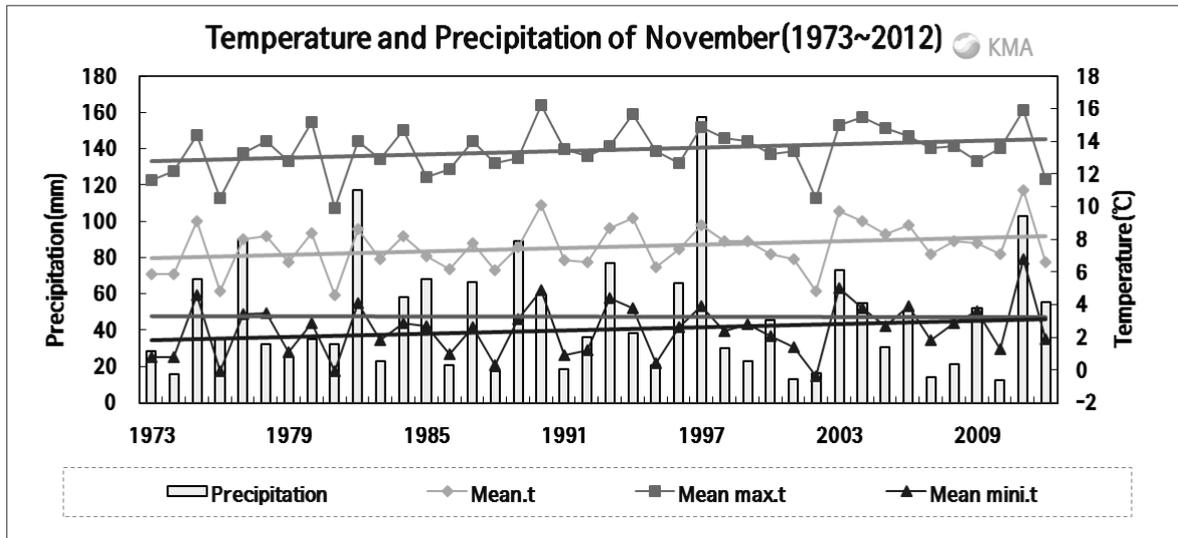


Fig 1. Temperatures (mean, mean maximum, and minimum), and precipitation in South Korea during November (1973–2012).

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

Elements (National) average	November 2012(a)	November 2011(b)	Nomals of November (1981–2010)(c)	a-b	a-c	Rank since 1973 (within 5th)
Mean temperature (°C)	6.6	11.0	7.6	-4.4	-1.0	-
Mean maximum temp. (°C)	11.7	15.9	13.6	-4.2	-1.9	the fifth lowest
Mean minimum temp. (°C)	1.9	6.8	2.5	-4.9	-0.6	-
Amount of precipitation (mm)	55.5	102.8	46.7	-47.3(65%)	8.8(122%)	-
Days of rain (day)	11.0	10.4	7.1	0.6	3.9	the fifth highest
Sunshine duration (hour)	177.9	128.4	167.6	49.5	10.3	-
Mean cloud amount (1/10)	4.6	5.8	4.1	-1.2	0.5	-
Days of range of daily temperature over 10°C (day)	13.6	11.5	17.5	2.1	-3.9	-
Days of minimum temperature less than 0°C (day)	10.4	4.9	9.7	5.5	0.7	-

□ Average values of meteorological elements across Korea during November 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 range of daily temperature over 10°C (day)	Days of minimum temperature less than 0°C (day)
1973–1980(a)	7.1	13.0	2.1	41.3	7.5	167.5	4.2	16.9	10.7
1981–1990(b)	7.3	13.1	2.3	55.1	7.8	165.8	4.4	16.6	10.3
1991–2000(c)	7.7	13.8	2.5	51.2	7.3	166.9	4.0	18.2	9.6
2001–2010(d)	7.8	13.7	2.6	33.9	6.2	170.0	3.9	17.7	9.3
2012(e)	6.6	11.7	1.9	55.5	11.0	177.9	4.6	13.6	10.4
d-a	0.7	0.7	0.5	-7.4	-1.3	2.5	-0.3	0.8	-1.4
d-b	0.5	0.6	0.3	-21.2	-1.6	4.2	-0.5	1.1	-1.0
d-c	0.1	-0.1	0.1	-17.3	-1.1	3.1	-0.1	-0.5	-0.3
e-d	-1.2	-2.0	-0.7	21.6	4.8	7.9	0.7	-4.1	1.1

Appendix 2 Climate features in November 2012

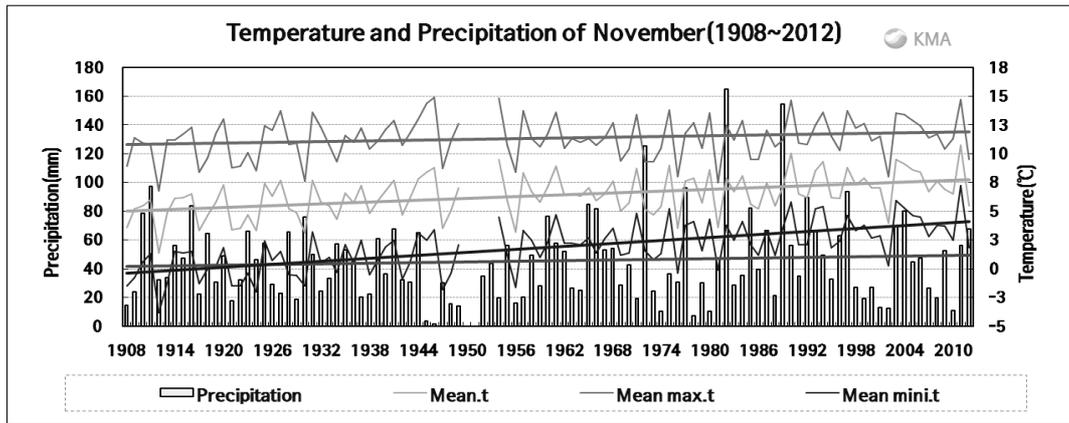


Fig 2. Temperatures (mean, mean maximum, and min minimum), and prediction in Seoul during November (1908–2012).

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

Elements (Seoul) average	November 2012(a)	November 2011(b)	Nomals of November (1981–2010)(c)	a-b	a-c	Rank since 1908 (within 5th)
Mean temperature (°C)	5.5	10.7	7.2	-5.2	-1.7	-
Mean maximum temp. (°C)	9.5	14.7	11.6	-5.2	-2.1	-
Mean minimum temp. (°C)	1.8	7.2	3.2	-5.4	-1.4	-
Amount of precipitation (mm)	67.8	56.2	52.5	11.6(121%)	15.3(129%)	-
Days of rain (day)	13.0	11.0	8.7	2.0	4.3	-
Sunshine duration (hour)	181.1	129.5	153.2	51.6	27.9	-
Mean cloud amount (1/10)	4.5	6.0	4.1	-1.5	0.4	-
Days of range of daily temperature over 10°C (day)	5.0	3.0	8.4	2.0	-3.4	-
Days of minimum temperature less than 0°C (day)	13.0	5.0	7.3	8.0	5.7	-

□ Average values of meteorological elements across Seoul during November 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 range of daily temperature over 10°C (day)	Days of minimum temperature less than 0°C (day)
1911–1920(a)	5.2	10.7	0.1	51.7	8.8	179.8	4.5	16.9	15.6
1921–1930	5.0	10.4	-0.3	43.2	9.6	176.6	4.3	16.5	16.0
1931–1940(b)	6.0	11.4	1.2	40.2	9.4	176.9	4.4	16.1	11.8
1941–1949	6.6	12.2	1.2	29.0	7.0	200.0	4.1	18.0	11.6
1954–1960	6.6	11.6	1.9	38.1	6.7	159.5	4.2	13.7	9.3
1961–1970	6.6	11.2	2.4	50.7	10.3	153.9	4.9	10.0	9.7
1971–1980(c)	6.6	11.3	2.7	39.1	9.1	141.8	4.5	8.8	9.9
1981–1990	6.7	11.2	2.7	69.6	9.6	156.9	4.4	8.5	8.6
1991–2000	7.4	11.9	3.3	50.4	8.3	155.1	4.0	10.6	6.5
2001–2010(d)	7.4	11.7	3.6	37.6	8.1	147.8	3.9	6.2	6.8
2012(e)	5.5	9.5	1.8	67.8	13.0	181.1	4.5	5.0	13.0
d-a	2.2	1.0	3.5	-14.1	-0.7	-32.0	-0.6	-10.7	-8.8
d-b	1.4	0.3	2.4	-2.6	-1.3	-29.1	-0.5	-9.9	-5.0
d-c	0.8	0.4	0.9	-1.5	-1.0	6.0	-0.6	-2.6	-3.1
e-d	-1.9	-2.2	-1.8	30.2	4.9	33.3	0.6	-1.2	6.2

Appendix 3 Climate features in Fall 2012

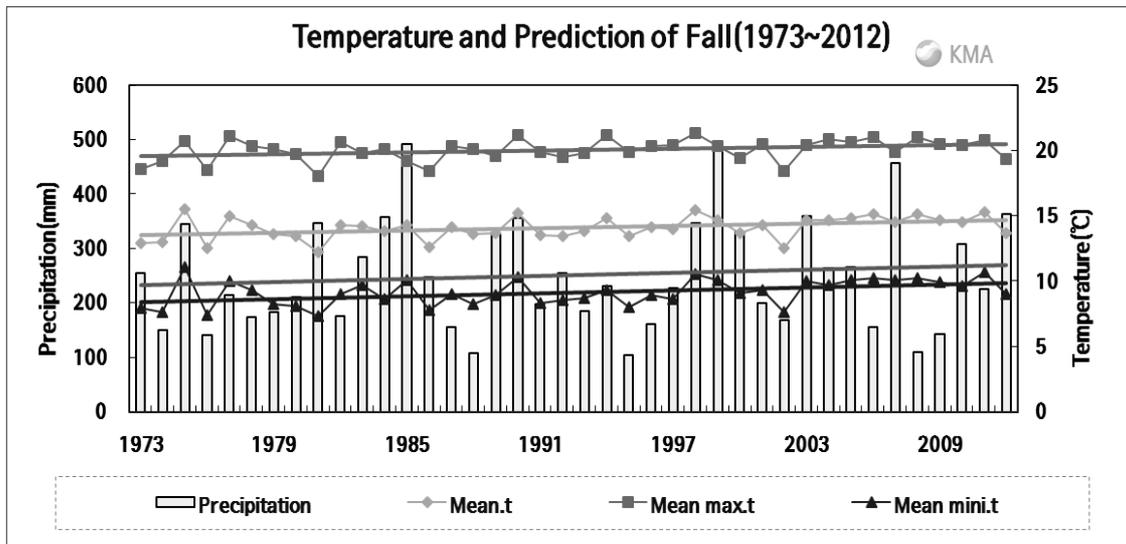


Fig 3. Temperatures (mean, mean maximum, and minimum), and prediction in South Korea during the Fall (1973–2012).

□ Average values of meteorological elements across Korea during the Fall (1973~2012)

Elements (National) average	Fall 2012(a)	Fall 2011(b)	Nomals of Fall (1981-2010) (c)	a-b	a-c	Rank since 1973 (within 5th)
Mean temperature (°C)	13.7	15.3	14.1	-1.6	-0.4	-
Mean maximum temp. (°C)	19.3	20.8	20.1	-1.5	-0.8	-
Mean minimum temp. (°C)	9.0	10.7	9.2	-1.7	-0.2	-
Amount of precipitation (mm)	363.3	225.5	259.7	137.8(78%)	103.6(142%)	the fourth highest
Days of rain (day)	26.6	24.2	21.8	2.4	4.8	-
Sunshine duration (hour)	593.9	510.0	538.4	83.9	55.5	-
Mean cloud amount (1/10)	4.6	5.0	4.6	-0.4	0.0	-
Days of range of daily temperature over 10°C (day)	48.6	46.1	52.9	2.5	-4.3	-
Days of minimum temperature less than 0°C (day)	10.6	5.8	10.7	4.8	-0.1	-

□ Average values of meteorological elements across Korea during the Fall 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 range of daily temperature over 10°C (day)	Days of minimum temperature less than 0°C (day)
1973-1980(a)	13.8	19.8	8.7	208.9	22.5	549.3	4.7	53.9	11.9
1981-1990(b)	13.8	19.7	8.9	284.6	22.8	544.3	4.8	52.2	11.5
1991-2000(c)	14.1	20.2	9.0	251.9	20.7	548.8	4.4	55.3	10.5
2001-2010(d)	14.5	20.4	9.7	242.7	22.0	522.2	4.6	51.1	10.0
2012(e)	13.7	19.3	9.0	363.3	26.6	560.9	4.7	48.6	10.6
d-a	0.7	0.6	1.0	33.7	-0.5	-27.1	-0.1	-2.8	-1.9
d-b	0.7	0.6	0.8	-41.9	-0.8	-22.1	-0.3	-1.1	-1.5
d-c	0.4	0.2	0.7	-9.2	1.3	-26.6	0.1	-4.2	-0.5
e-d	-0.8	-1.1	-0.7	120.7	4.6	38.7	0.2	-2.5	0.6

Appendix 4 Seoul, Climate features in Fall 2012

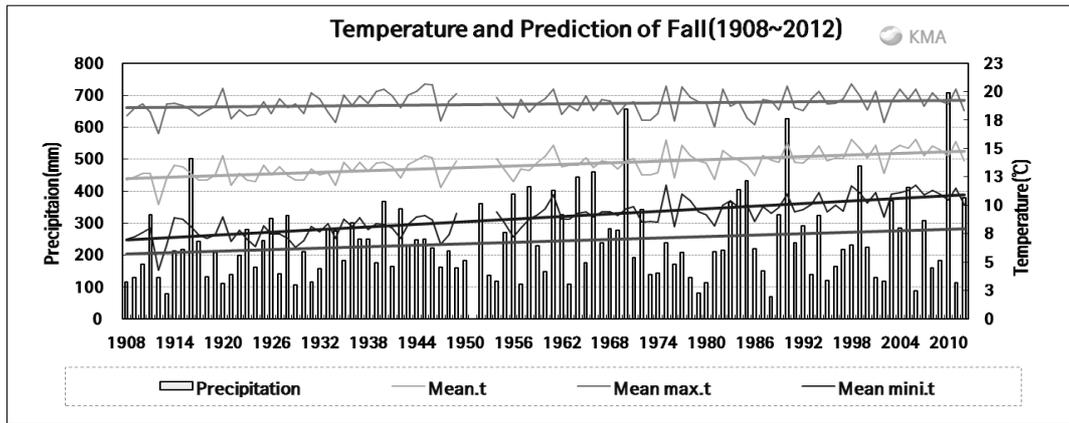


Fig 4. Temperatures (mean, mean maximum, and minimum), and prediction in the Fall during the Fall (1973~2012).

□ Average values of meteorological elements across Seoul during the Fall (1908~2012)

Elements (Seoul) average	Fall 2012(a)	Fall 2011(b)	Nomals of Fall (1981-2010) (c)	a-b	a-c	Rank since 1908 (within 5th)
Mean temperature (°C)	13.9	15.6	14.4	-1.7	-0.5	-
Mean maximum temp. (°C)	18.3	20.2	19.1	-1.9	-0.8	-
Mean minimum temp. (°C)	10.1	11.5	10.3	-1.4	-0.2	-
Amount of precipitation (mm)	379.1	113.8	273.6	265.3(333%)	105.5(139%)	-
Days of rain (day)	30.0	20.0	24.1	10.0	5.9	-
Sunshine duration (hour)	607.3	525.2	528.3	82.1	79.0	-
Mean cloud amount (1/10)	4.6	4.8	4.4	-0.2	0.2	-
Days of range of daily temperature over 10°C (day)	23.0	28.0	32.9	-5.0	-9.9	the fifth lowest
Days of minimum temperature less than 0°C (day)	13.0	5.0	7.5	8.0	5.5	-

□ Average values of meteorological elements across Seoul during the Fall for each decade (1911~2010)

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 range of daily temperature over 10°C (day)	Days of minimum temperature less than 0°C (day)
1911-1920(a)	12.7	18.5	7.6	215.9	26.3	625.7	5.0	56.3	16.9
1921-1930	12.6	18.4	7.2	211.6	24.7	619.5	4.7	58.0	17.7
1931-1940(b)	13.2	19.2	8.2	235.5	25.6	630.1	4.8	58.1	12.8
1941-1949	13.4	19.5	8.2	221.4	24.1	646.5	4.6	61.2	12.3
1954-1960	13.4	18.8	8.7	239.7	23.4	561.4	4.7	48.7	9.7
1961-1970	13.8	18.9	9.4	337.0	27.0	537.3	4.9	42.3	9.7
1971-1980(c)	13.8	18.8	9.5	175.5	24.8	510.7	4.7	38.7	10.1
1981-1990	13.9	18.7	9.7	301.8	23.7	556.4	4.8	35.4	8.9
1991-2000	14.4	19.2	10.2	242.6	24.4	541.7	4.3	37.2	6.7
2001-2010(d)	14.8	19.3	10.9	276.3	24.1	486.7	4.3	26.1	6.9
2012(e)	13.9	18.3	10.1	379.1	30.0	607.3	4.6	23.0	13.0
d-a	2.1	0.8	3.3	60.4	-2.2	-139.1	-0.7	-30.2	-10.0
d-b	1.6	0.1	2.7	40.8	-1.5	-143.4	-0.5	-32.0	-5.9
d-c	1.0	0.5	1.4	100.8	-0.7	-24.0	-0.4	-12.6	-3.2
e-d	-0.9	-1.0	-0.8	102.8	5.9	120.7	0.3	-3.1	6.1