



# KMA'S BRIEFING ON CLIMATE CHARACTERISTICS

(total 7 pages)

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## Monthly (August) and Seasonal (June-August) 2012 Climate Summary.

- ◇ The mean minimum temperature (23.1 °C) for August 2012 nationwide was the second highest and the days of amount of precipitation greater than 80mm/day was the third highest in a record extending back to 1973.
- ◇ The mean minimum temperature (21.0 °C) for Summer 2012 nationwide was the second highest and the mean temperature (24.7 °C) was the third highest in a record.
  - The mean minimum temperature (22.1 °C) for Seoul was the second highest and the mean temperature (25.5 °C) was the third highest in a record extending back to 1908.

- Climate features of August and Summer 2012 and their long-term trends are analyzed using 45 meteorological stations in Korea (the national average) during 1973-2012 (1908-2012 for Seoul).

※ Normal : average from 1981 to 2010.

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

o For Korea (whole nation),

- The mean temperature (26.4 °C) and the mean maximum temperature (30.7 °C) and the mean minimum temperature (23.1 °C) were 1.3 °C, 0.9 °C, 1.6 °C above-normal, respectively. In addition the mean temperature at August 2012 was the fifth highest and the mean minimum temperature second highest in a record extending back to 1973.
  - 'Days of maximum temperature greater than 30°C' were 2.6 days above-normal and 5.1 days more than those in 2011.
- The nationally averaged precipitation (408.5 mm) was 149% of normal and the fifth highest in a record. The days of rain (16.4 days) was 3.2 days above-normal and 1.3 days smaller than those in 2011.
  - 'Days of amount of precipitation greater than 80mm/day' were 0.7 days above-normal and the third highest in a record extending back to 1973.
- The total of sunshine duration (155.9 hours) was 17.8 hours below-normal.

o For Seoul,

- The mean temperature (27.1 °C), the mean maximum temperature (30.9 °C), and the mean minimum temperature (23.9 °C) were 1.3~1.5 °C above-normal. Also, the mean temperature was the fourth highest, the mean minimum temperature was the third highest in a record extending back to 1908.
- 'Days of maximum temperature greater than 30°C' were 0.5 days above-normal.
- The monthly amount of precipitation (464.9 mm) was 128% of normal, the days of rain (16.0 days) was 1.4 days above-normal.
- The total of sunshine duration (158.7 hours) was 6.2 hours above-normal.

※ **Updated in monthly temperature and precipitation extremes (up to the fifth ranked)**

o Temperature extremes (warm extremes)

- The mean temperature (24 stations) : Suwon 31.9 °C, Seoul 31.8 °C and so on
- The maximum temperature (24 stations) : Yeongwol 38.7 °C, Jeonju 38.3 °C and so on
- The minimum temperature (12 stations) : Incheon 28.2 °C, Seogwipo 28.2 °C and so on

o Precipitation extremes (increased intensity)

- Daily precipitation (3 stations) : Yeosu 308.9 mm and so on
- 1-hour precipitation (5 stations) : Haenam 87.5 mm, Jindo 76.0 mm and so on
- 10-minutes precipitation (3 stations) : Haeman 87.5 mm and so on

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

o For Korea (whole nation),

- The mean temperature (24.7 °C) and the mean maximum temperature (29.2 °C) and the mean minimum temperature (21.0 °C) were 0.8~1.3 °C above-normal. and the mean and the third, fifth, second highest in a record extending back to 1973, respectively.
- 'Days of maximum temperature greater than 30°C' were 5.4 days above-normal.
- The nationally averaged precipitation (770.6 mm) was 106% of normal and 47.4 mm above-normal, the days of rain (38.3 days) was 1.0 days above-normal.
- 'Days of amount of precipitation greater than 30mm/hour' were 0.6 days above-normal and the fifth highest in a record extending back to 1973.
- The total of sunshine duration (505.2 hours) was 2.2 hours above-normal.

※ The 1.5cm diameter hail event occurred in Cheongju and Cheonan on 12 June 2012.

o For Seoul,

- The mean temperature (25.5 °C), the mean maximum temperature (29.9 °C), and the mean minimum (22.1 °C) were above-normal. Also, the mean temperature was the third highest and the mean minimum temperature was the second highest in a record extending back to 1908.
- 'Days of maximum temperature greater than 30°C' were 9.8 days above-normal.
- The monthly amount of precipitation (1005.7 mm) was 113% of normal, the days of rain (37.0 days) was 3.6 days below-normal.
- The total of sunshine duration (534.7 hours) was 118% of normal and 80.1 hour above-normal.
- Days of thunder storm (9.0 days) were 3.6 days below-normal and 9.0 days smaller than those in 2011.

**Long-term trend of August and Summer climate**

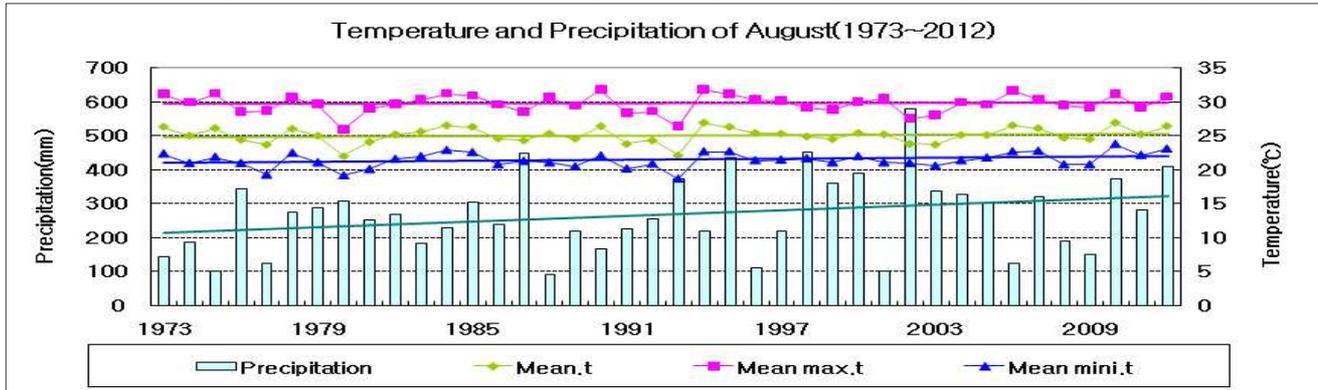
o For Korea (whole nation),

- National mean temperatures of August and Summer 2000s (2001-2010) were 0.4 °C and 0.3 °C higher than those of the 1970s. Also, the mean minimum temperatures of August and Summer 2000s were 0.7 °C and 0.5 °C higher than those of the 1970s.
- Nationally averaged precipitation in August and Summer 2000s were 58.8 mm and 154.2 mm larger than those of the 1970s. And days of rain in August and Summer 2000s were 2.4 days and 3.3 days larger than those of the 1970s, respectively.
- Nationally total of sunshine duration of August and summer 2000s were 30.2 hours and 84.3 hours less than those of the 1970s.

o For Seoul,

- The mean temperatures of August and Summer 2000s were 0.9 °C and 0.6 °C higher than those of the 1970s. Also, the mean minimum temperatures of August and Summer 2000s were 1.0 °C and 0.8 °C higher than those of the 1970s.
- Nationally averaged precipitation in August and Summer 2000s were 48.5 mm and 248.8 mm larger than those of the 1970s. And days of rain in August and Summer 2000s were 2.4 days and 4.5 days larger than those of the 1970s, respectively.
- Nationally total of sunshine duration of August and summer 2000s were 8.5 hours and 57.9 hours less than those of the 1970s.

## Appendix 1. Climate features in August 2012



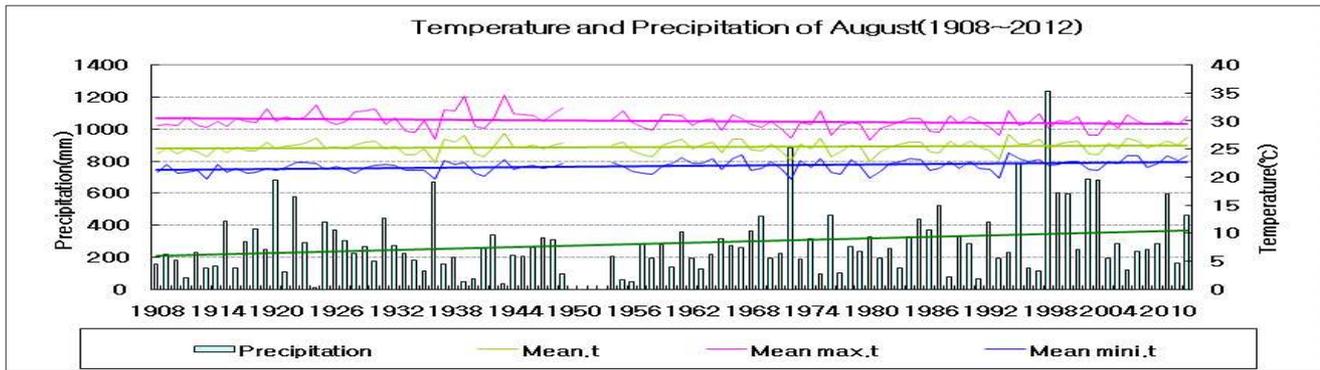
**Fig. 1. Temperatures (mean, mean maximum, and mean minimum), and precipitation in South Korea during August 1973-2012.**

### □ Average values of meteorological elements across Korea during August (1973-2012)

Elements (National) average	August 2012 (a)	August 2011 (b)	Normals of August (1981-2010) (c)	a-b	a-c	Rank since 1973 (within 5th)
Mean temperature (°C)	26.4	25.2	25.1	1.2	1.3	the fifth highest
Mean maximum t (°C)	30.7	29.2	29.8	1.5	0.9	
Mean minimum t (°C)	23.1	22.2	21.5	0.9	1.6	the second highest
Amount of precipitation(mm)	408.5	282.5	274.9	126.0	133.6(149%)	the fifth highest
Days of rain(day)	16.4	17.7	13.2	-1.3	3.2	
Sunshine duration(hour)	155.9	109.5	173.7	46.4	-17.8	
Days of maximum temperature greater than 30°C(day)	18.6	13.5	16.0	5.1	2.6	
Days of amount of precipitation greater than 30mm/hour(day)	1.2	1.3	0.7	-0.1	0.5	
Days of amount of precipitation greater than 80mm/day(day)	1.4	0.6	0.7	0.8	0.7	the third highest
Days of thunderstorm(day)	3.6	3.4	3.8	0.2	-0.2	

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

Year	Mean temp (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Amount of rain (mm)	Days of rain (day)	Sunshine duration (hour)	Days of maximum temperature greater than 30°C (day)	Days of amount of precipitation greater than 30mm/hour (day)	Days of amount of precipitation greater than 80mm/day (day)	Days of thunderstorm (day)
1973-1980(a)	24.8	29.5	21.0	221.6	11.7	187.1	15.3	0.5	0.5	2.1
1981-1990(b)	25.3	30.1	21.5	240.2	12.1	191.8	17.0	0.6	0.6	3.3
1991-2000(c)	24.9	29.5	21.3	303.9	13.4	172.3	14.9	0.8	0.9	3.5
2001-2010(d)	25.2	29.7	21.7	280.4	14.1	156.9	16.1	0.7	0.7	4.6
2012(e)	26.4	30.7	23.1	408.5	16.4	155.9	18.6	1.2	1.4	3.6
d-a	0.4	0.2	0.7	58.8	2.4	-30.2	0.8	0.2	0.2	2.5
d-b	-0.1	-0.4	0.2	40.2	2.0	-34.9	-0.9	0.1	0.1	1.3
d-c	0.3	0.2	0.4	-23.5	0.7	-15.4	1.2	-0.1	-0.2	1.1
e-d	1.2	1.0	1.4	128.1	2.3	-1.0	2.5	0.5	0.7	-1.0



**Fig. 2. Temperatures (mean, mean maximum, and mean minimum) and precipitation in Seoul during August 1908-2012.**

**□ Meteorological elements across Seoul during August (1908-2012)**

Elements (National) average	August 2012 (a)	August 2011 (b)	Normals of August (1981-2010) (c)	a-b	a-c	Rank since 1908 (within 5th)
Mean temperature (°C)	27.1	25.8	25.7	1.3	1.4	the fourth highest
Mean maximum t (°C)	30.9	29.5	29.6	1.4	1.3	
Mean minimum t (°C)	23.9	23.0	22.4	0.9	1.5	the third highest
Amount of precipitation(mm)	464.9	166.8	364.2	298.1	100.7(128%)	
Days of rain(day)	16.0	17.0	14.6	-1.0	1.4	
Sunshine duration(hour)	158.7	94.0	152.5	64.7	6.2	
Days of maximum temperature greater than 30°C(day)	16.0	13.0	15.5	3.0	0.5	
Days of amount of precipitation greater than 30mm/hour(day)	2.0	0.0	1.3	2.0	0.7	
Days of amount of precipitation greater than 80mm/day(day)	2.0	0.0	1.2	2.0	0.8	
Days of thunderstorm(day)	4.0	5.0	5.2	-1.0	-1.2	

**□ Meteorological elements across Seoul during August for each decade (1911-2012)**

Year	Mean temp (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Amount of rain (mm)	Days of rain (day)	Sunshine duration (hour)	Days of maximum temperature greater than 30°C (day)	Days of amount of precipitation greater than 30mm/hour (day)	Days of amount of precipitation greater than 80mm/day (day)	Days of thunderstorm (day)
1911-1920(a)	25.0	30.0	21.1	274.5	12.4	227.5	17	0	0.9	3.5
1921-1930	25.8	31.0	21.9	275.8	13.2	218.7	19.8	0	1	3.6
1931-1940(b)	25.1	30.1	21.7	239.5	15	186.8	16	0	0.5	3.1
1941-1949	25.6	31.2	21.8	226.7	12.6	230.8	21.2	0.6	0.7	1.4
1954-1960	25.2	30.2	21.7	174	11	188.5	17.9	0.3	0.3	2.1
1961-1970	25.7	29.9	22.6	276.8	14.9	145	16.9	0.7	0.5	3.9
1971-1980(b)	24.8	29.0	21.6	311.2	13.4	136.7	12.9	0.6	1	3.5
1981-1990	25.6	29.7	22.3	293.7	14.2	167	15.9	0.9	0.7	5.7
1991-2000	25.7	29.8	22.4	439.1	13.9	162.3	15.8	1.7	1.7	4.5
2001-2010(d)	25.7	29.5	22.6	359.7	15.8	128.2	14.9	1.3	1.1	5.3
2012(e)	27.1	30.9	23.9	464.9	16.0	158.7	16.0	2.0	2.0	4.0
d-a	0.7	-0.5	1.5	85.2	3.4	-99.3	-2.1	1.3	0.2	1.8
d-b	0.6	-0.6	0.9	120.2	0.8	-58.6	-1.1	1.3	0.6	2.2
d-c	0.9	0.5	1.0	48.5	2.4	-8.5	2.0	0.7	0.1	1.8
e-d	1.4	1.4	1.3	105.2	0.2	30.5	1.1	0.7	0.9	-1.3

## Appendix 2. Climate features in Summer 2012

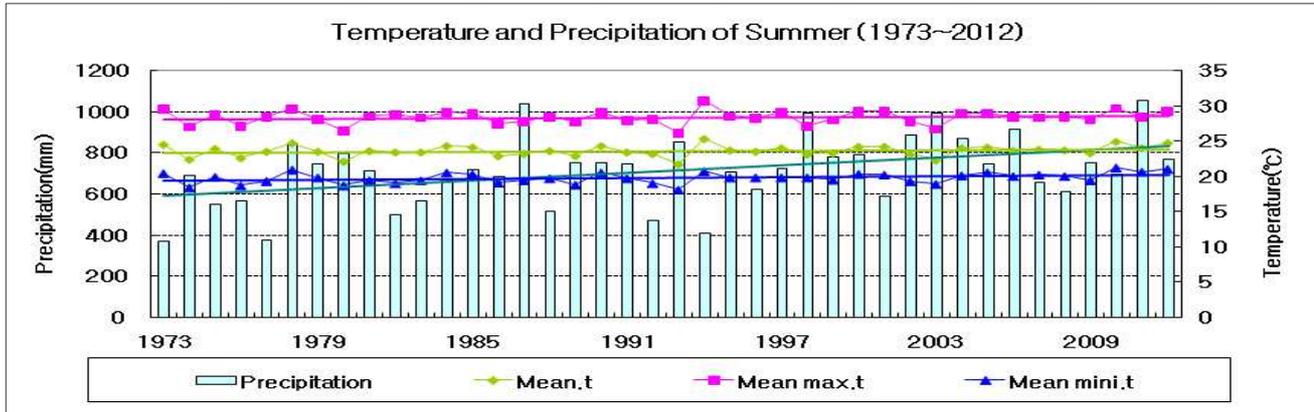


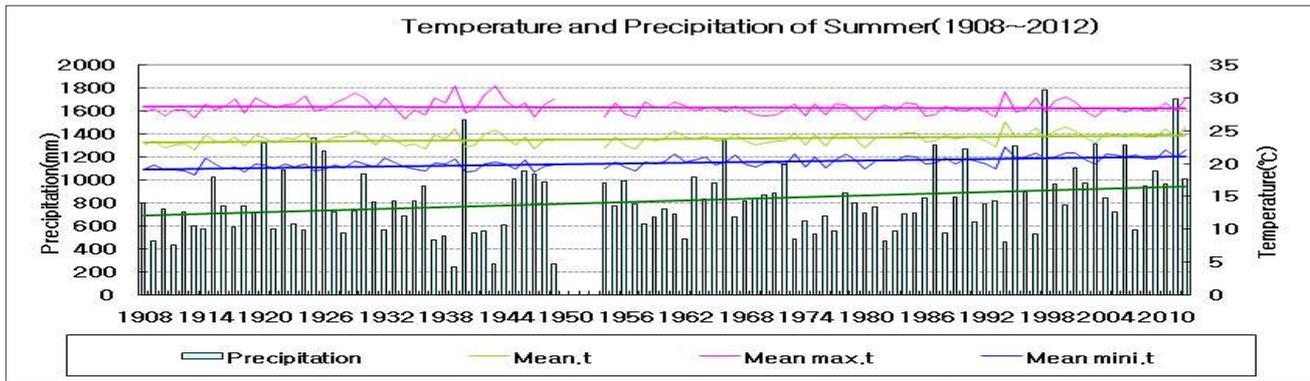
Fig. 3. Temperatures (mean, mean maximum, and mean minimum), and precipitation in South Korea during Summer 1973-2012.

### □ Average values of meteorological elements across Korea during Summer (1973-2012)

Elements (National) average	Summer 2012 (a)	Summe 2011 (b)	Normals of Summe (1981-2010) (c)	a-b	a-c	Rank since 1973 (within 5th)
Mean temperature (°C)	24.7	24.0	23.6	0.7	1.1	the third highest
Mean maximum t (°C)	29.2	28.4	28.4	0.8	0.8	the fifth highest
Mean minimum t (°C)	21.0	20.6	19.7	0.4	1.3	the second highest
Amount of precipitation(mm)	770.6	1053.6	723.2	-283.0	47.4(106%)	
Days of rain(day)	38.3	48.5	37.3	-10.2	1.0	
Sunshine duration(hour)	505.2	397.6	503.0	107.6	2.2	
Days of maximum temperature greater than 30°C(day)	39.0	32.9	33.6	6.1	5.4	
Days of amount of precipitation greater than 30mm/hour(day)	2.1	2.9	1.5	-0.8	0.6	the fifth highest
Days of amount of precipitation greater than 80mm/day(day)	2.0	3.0	1.7	-1.0	0.3	
Days of thunderstorm(day)	8.3	9.7	9.2	-1.4	-0.9	

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

Year	Mean temp (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Amount of rain (mm)	Days of rain (day)	Sunshine duration (hour)	Days of maximum temperature greater than 30°C (day)	Days of amount of precipitation greater than 30mm/hour (day)	Days of amount of precipitation greater than 80mm/day (day)	Days of thunderstorm (day)
1973-1980(a)	23.4	28.1	19.5	616	36.5	538	31.4	1	1.2	6.3
1981-1990(b)	23.6	28.4	19.6	689.7	36.1	542.4	33.9	1.3	1.5	8.3
1991-2000(c)	23.5	28.3	19.6	709.7	36.1	512.8	32.9	1.5	1.8	8.5
2001-2010(d)	23.7	28.4	20	770.2	39.8	453.7	34	1.7	1.9	10.9
2012(e)	24.7	29.2	21.0	770.6	38.3	505.2	39.0	2.1	2.0	8.3
d-a	0.3	0.3	0.5	154.2	3.3	-84.3	2.6	0.7	0.7	4.6
d-b	0.1	0.0	0.4	80.5	3.7	-88.7	0.1	0.4	0.4	2.6
d-c	0.2	0.1	0.4	60.5	3.7	-59.1	1.1	0.2	0.1	2.4
e-d	1.0	0.8	1.0	0.4	-1.5	51.5	5.0	0.4	0.1	-2.6



**Fig. 4. Temperatures (mean, mean maximum, and mean minimum) and precipitation in Seoul during Summer 1908-2012**

**□ Meteorological elements across Seoul during Summer (1908-2012)**

Elements (National) average	Summe 2012 (a)	Summe 2011 (b)	Normals of Summe (1981-2010) (c)	a-b	a-c	Rank, since 1908 (within 5th)
Mean temperature (°C)	25.5	24.1	24.3	1.4	1.2	the third highest
Mean maximum t (°C)	29.9	28.0	28.4	1.9	1.5	
Mean minimum t (°C)	22.1	21.1	20.8	1.0	1.3	the second highest
Amount of precipitation(mm)	1005.7	1702.3	892.1	-696.6	113.6(113%)	
Days of rain(day)	37.0	52.0	40.8	-15.0	-3.8	
Sunshine duration(hour)	534.7	345.2	454.6	189.5	80.1	
Days of maximum temperature greater than 30°C(day)	41.0	27.0	31.2	14.0	9.8	
Days of amount of precipitation greater than 30mm/hour(day)	4.0	5.0	2.6	-1.0	1.4	
Days of amount of precipitation greater than 80mm/day(day)	3.0	5.0	2.6	-2.0	0.4	
Days of thunderstorm(day)	9.0	18.0	12.9	-9.0	-3.9	

**□ Meteorological elements across Seoul during Summer for each decade (1911-2012)**

Year	Mean temp (°C)	Mean max. temp. (°C)	Mean min. temp. (°C)	Amount of rain (mm)	Days of rain (day)	Sunshine duration (hour)	Days of maximum temperature greater than 30°C (day)	Days of amount of precipitation greater than 30mm/hour (day)	Days of amount of precipitation greater than 80mm/day (day)	Days of thunderstorm (day)
1911-1920(a)	23.4	28.6	19.4	753.4	39	659.4	33.1	0	2	8.4
1921-1930	23.9	29.3	19.6	851	38.7	646.6	40	0	2.7	9.8
1931-1940(b)	23.5	28.7	19.7	740.6	41.3	590.6	34.1	0.3	1.6	10.2
1941-1949	23.7	29.3	19.6	706.9	39.9	674.9	42.8	1	1.6	7.1
1954-1960	23.3	28.2	19.8	796.4	42.1	507	32.4	1.4	1.7	8.2
1961-1970	23.8	28.2	20.4	857.7	44.1	452.8	30.9	2.8	2.2	12.3
1971-1980(b)	23.7	28.1	20.3	732.4	39.5	423.3	26.8	1.2	1.6	8.9
1981-1990	24	28.3	20.5	800.4	40.3	507.2	28.9	1.8	2.1	14.2
1991-2000	24.5	28.8	20.9	894.8	38.1	491.1	34.6	2.8	2.8	11.3
2001-2010(d)	24.3	28.3	21.1	981.2	44	365.4	30	3.2	3	13.2
2012(e)	25.5	29.9	22.1	1005.7	37.0	534.7	41.0	4.0	3.0	9.0
d-a	0.9	-0.3	1.7	227.8	5.0	-294.0	-3.1	3.2	1.0	4.8
d-b	0.8	-0.4	1.4	240.6	2.7	-225.2	-4.1	2.9	1.4	3.0
d-c	0.6	0.2	0.8	248.8	4.5	-57.9	3.2	2.0	1.4	4.3
e-d	1.2	1.6	1.0	24.5	-7.0	169.3	11.0	0.8	0.0	-4.2