

The distribution patterns of PM10 concentration in major cities and provinces in Korea

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1. Introduction

The spatial and temporal distribution of PM10 concentration was investigated using its measurement data collected from a total of 152 AQM stations(Seoul and 6 wide cities, 9 provinces) located all across the South Korea during 1998 to 2003.

2. Method of investigation

Using PM10 data, we analysis comparatively 6 years(72 monthes) from January, 1998 to December. We used monthly average data of 19 sites (197 stations) basically. Actually we got monthly average PM10 data of 152 stations from secondary statistical analysis. And so we compared to the characterization of PM10 distribution in 16 sites.

3. discussion

3.1 The comparison of spacial concentration distribution

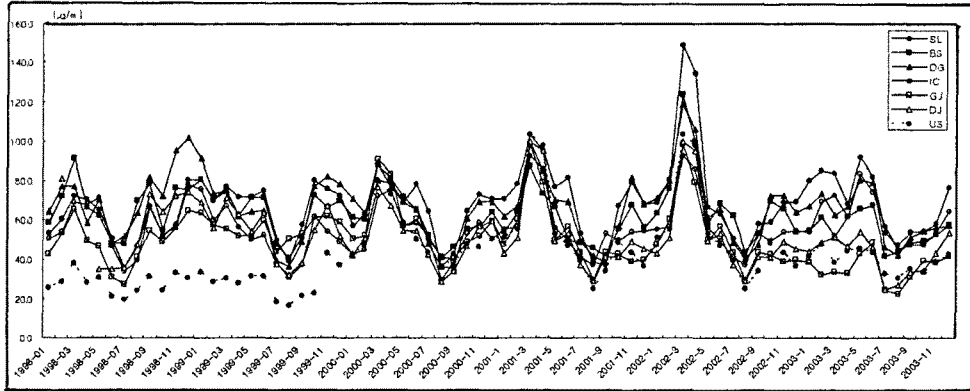
Table 1. A statistical summary of PM10 data collected from each district.

Full name	Short name	Mean	SD	Min	Max	N
Seoul	SL	68.2	19.3	36.1	149.3	72
Busan	BS	63.0	14.6	41.0	124.0	72
Daegu	DG	66.5	17.1	35.7	119.0	72
Incheon	IC	56.4	13.9	29.7	93.0	72
Gwangju	GJ	50.5	15.4	22.8	98.8	72
Daejeon	DJ	51.8	17.1	25.0	100.0	69
Ulsan	US	42.4	18.5	16.5	103.7	72
Gyunggi	GG	65.3	17.1	34.5	135.9	72
Gangwon	GW	51.5	21.1	15.0	115.3	51
Chungbuk	CB	59.4	19.0	27.0	110.7	59
Chungnam	CN	55.3	17.4	32.0	99.7	60
Jeonbuk	JB	51.1	19.6	22.0	119.3	70
Jeonnam	JN	47.0	14.0	24.0	95.0	72
Gyeongbuk	GB	52.8	15.5	24.0	108.9	59
Gyeongnam	GN	48.9	13.0	28.7	105.4	72
Jeju	JJ	39.2	16.4	19.0	103.0	71
Korea(total)	KOR	54.3	16.8	27.1	111.3	67.9

3.2 The comparison of concentration distribution with time

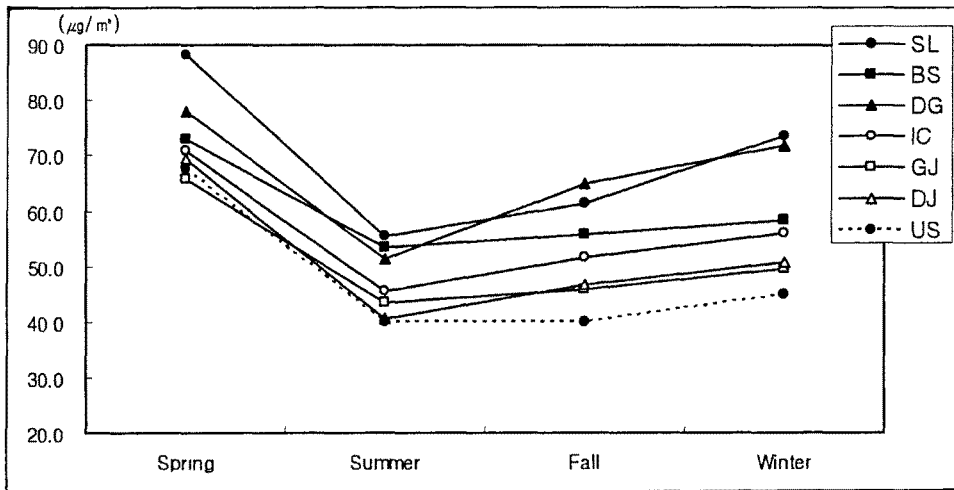
3.2.1 Variation of monthes

(A) PM10 results for seven major city areas



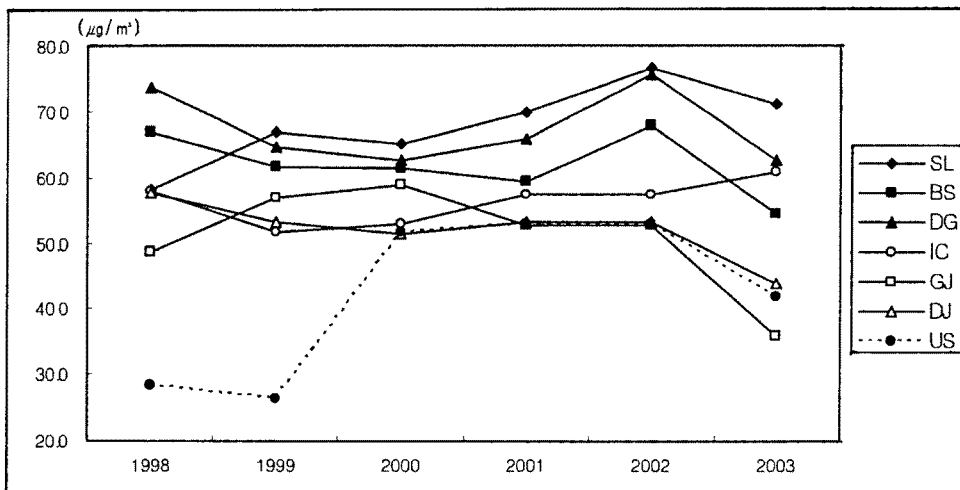
3.2.2 1 Variation of seasons

(A) PM10 results from seven major city areas



3.2.3 Variation of years

(A) Seven major city areas



4. Result

The distribution of PM10 was investigated using its measurement data collected from a total of 152 AQM stations located all across the South Korea during 1998 to 2003. It is found that PM10 concentration is the highest in springtime due to the common occurrences of massive wind-blown dusts during the Asian Dust(AD) period. It's concentration level then tends to decrease in the summertime, when a lot of rainfall drop ends. When the PM10 data sets were compared across different cities, the patterns contrasted sharply. The highest PM10 concentration was measured in Seoul (68.2 $\mu\text{g}/\text{m}^3$), while the lowest PM10 concentration was measured in Jeju (39.2 $\mu\text{g}/\text{m}^3$). The results of our analysis indicate that PM10 concentrations can exhibit a strong relationship with the scale of cities. In view of the correlation analysis results, it was evident that PM10 concentrations of near-by cities were found to affect each other.

5. Reference

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