



Government of Nepal  
Ministry of Forest and Environment  
Department of Environment  
Babarmahal, Kathmandu

# Air quality status of Nepal 2016-2020

Volume IX

Gandaki Boarding School Pokhara air quality  
monitoring station



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# 1 GBS Pokhara Air Quality Monitoring Station

- Address : Gandaki Boarding School, Pokhara
- Location: 28.258 latitude, 83.968 longitude
- The station is situated inside Gandaki Boarding school premises in Pokhara.
- Establish year: 2017 (2074)
- Brief introduction of the instruments installed in the station
  1. PM instrument- GRIMM EDM 180
  2. Met sensor luffth WS 700
  3. Data logging and data transmission and power backup system

## 2 Air Quality Status of GBS Pokhara station (2017-2020)

### 2.1 Air quality status, 2017

#### 2.1.1 Annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP

The annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP of the GBS Pokhara monitoring station was calculated as shown below.

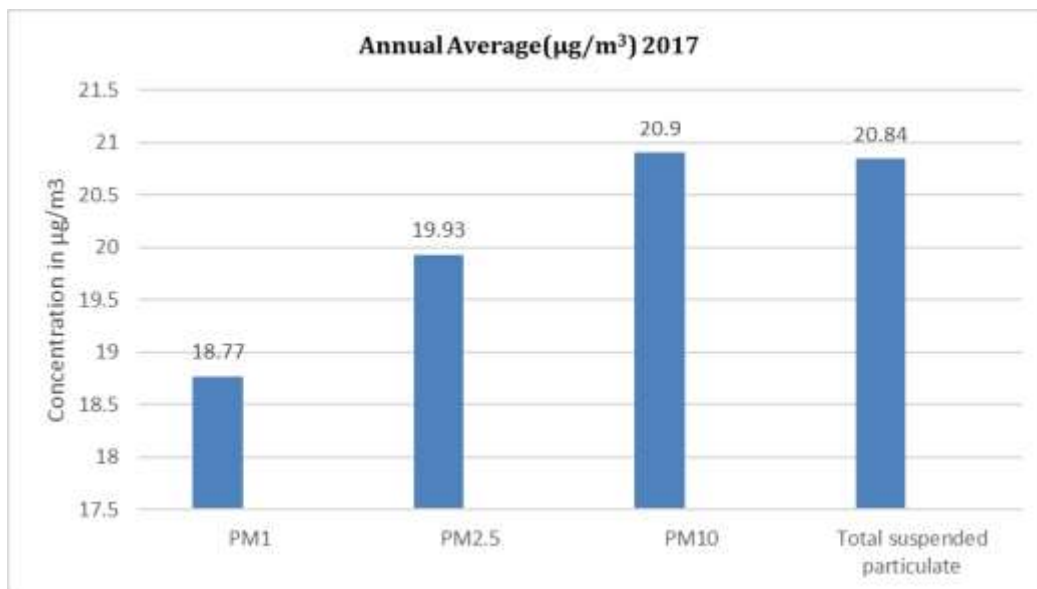


Figure 1: Annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP in 2017

## 2.1.2 Temporal variation of PM<sub>1</sub>

### Annual average of PM<sub>1</sub>

The annual average of PM<sub>1</sub> at GBS Pokhara station was found to be 18.77  $\mu\text{g}/\text{m}^3$ . Histogram of hourly average of PM<sub>1</sub> is shown in the figure below.

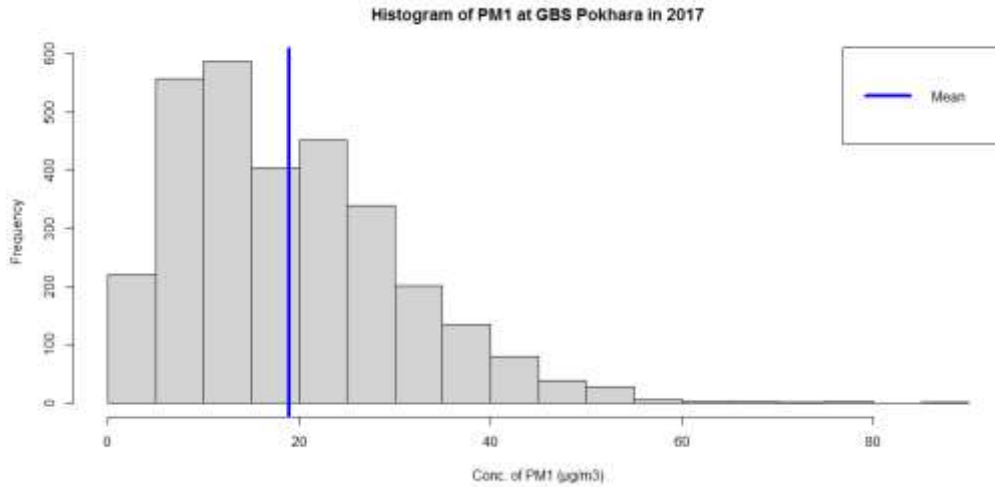


Figure 2 : Histogram of PM<sub>1</sub>.

### Daily average of PM<sub>1</sub>

Daily average concentration of PM<sub>1</sub> was high during December and was found low during August.

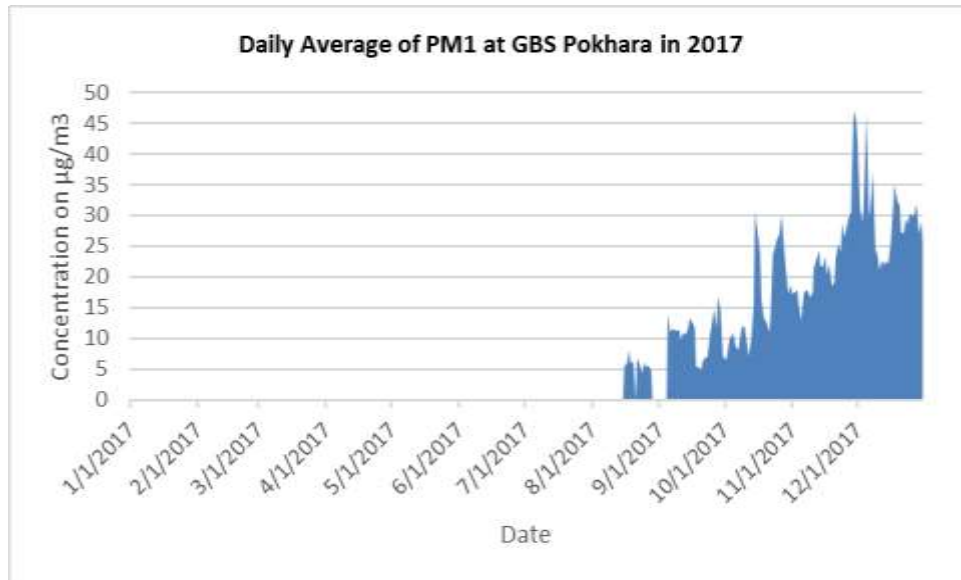


Figure 3: Daily average of PM<sub>1</sub>

### Monthly average of PM<sub>1</sub>

The highest and the lowest concentration of PM<sub>1</sub> was found during December and August respectively. The mean value for those months were found to be 29.19 and 5.86  $\mu\text{g}/\text{m}^3$  respectively.

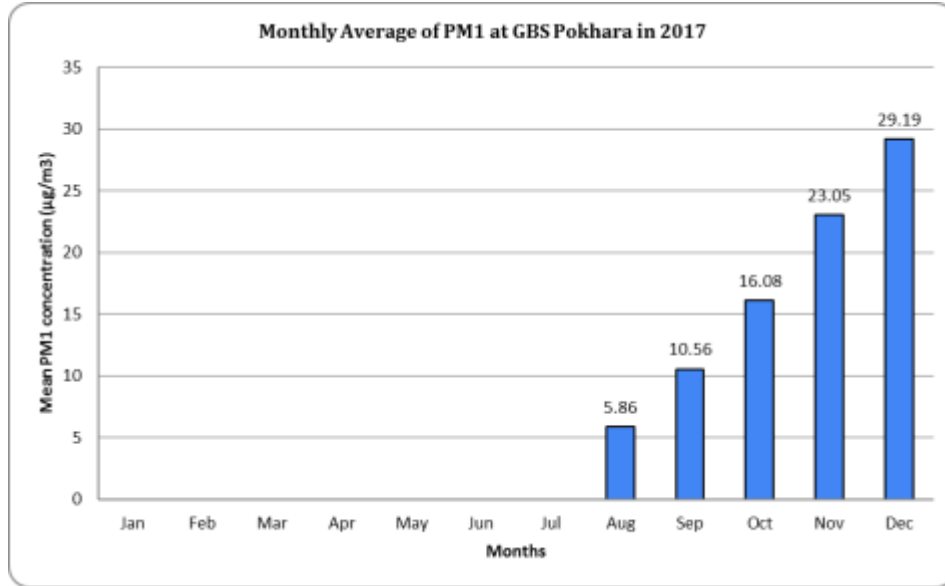


Figure 4: Monthly Average of PM<sub>1</sub>

### Monthly variation of PM<sub>1</sub>

Variation in concentration of PM<sub>1</sub> was found more during December whereas low during August.

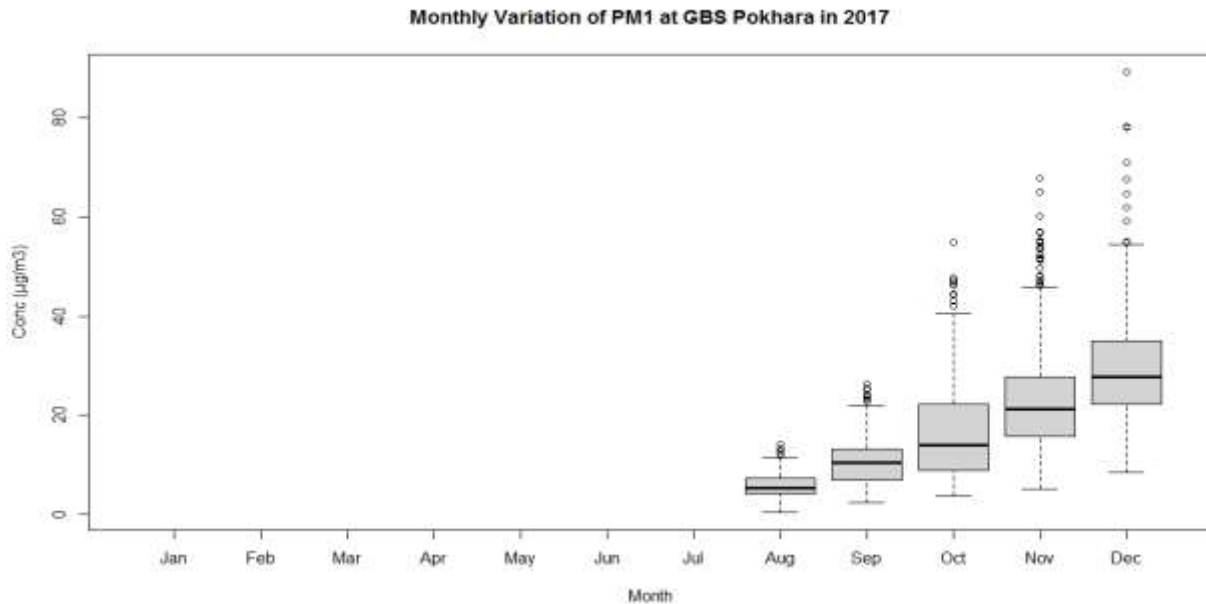


Figure 5: Monthly Variation of PM<sub>1</sub>

### Diurnal variation of average PM<sub>1</sub> concentration

The diurnal variation of average PM<sub>1</sub> concentrations can be shown in the figure below. The variation in PM<sub>1</sub> concentration was high at around 7 am and 5-6 pm and low at 3 am.

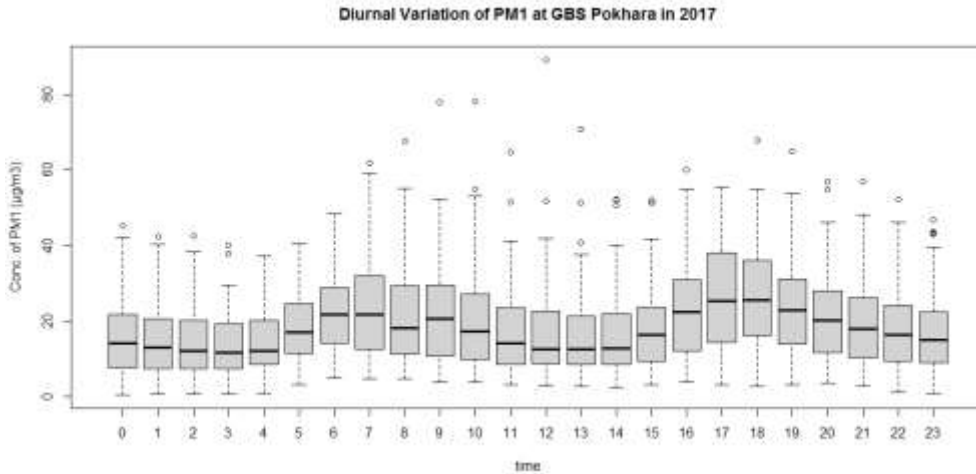


Figure 6: Diurnal variation of PM<sub>1</sub>

### 2.1.3 Temporal variation of PM<sub>2.5</sub>

#### Annual average of PM<sub>2.5</sub>

The annual average of PM<sub>1</sub> at GBS Pokhara station was found to be 19.93 µg/m<sup>3</sup>. Histogram of hourly average PM<sub>1</sub> is shown in the figure below.

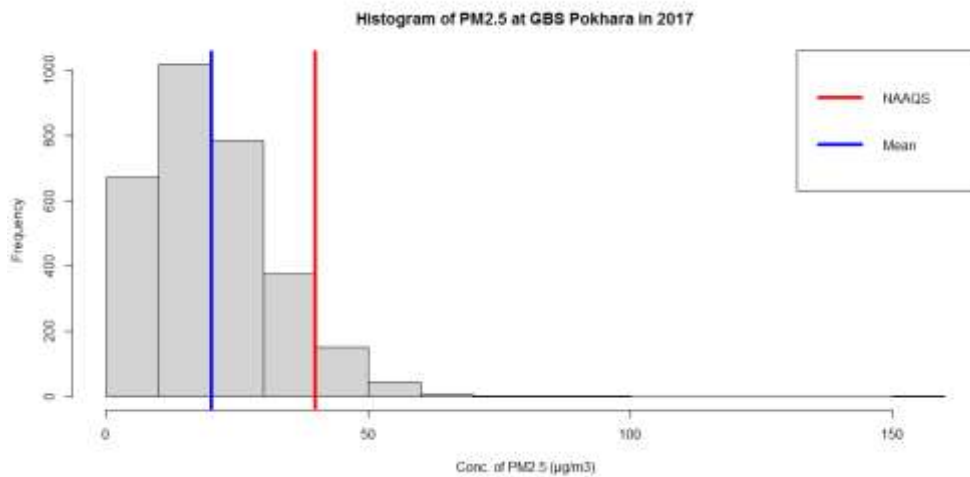


Figure 7 : Histogram of PM<sub>2.5</sub>

#### Daily average of PM<sub>2.5</sub>

Daily average concentration of PM<sub>2.5</sub> was high during December and was found low during August.

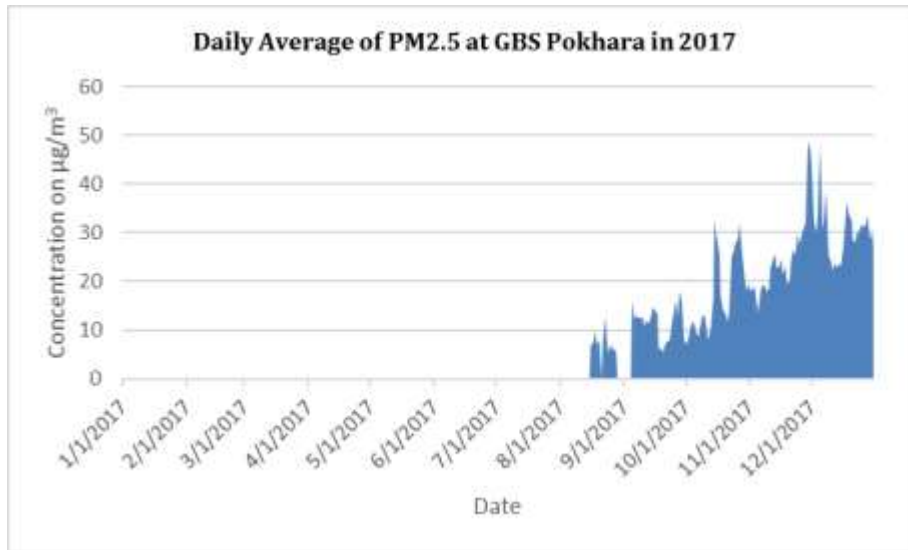


Figure 8: Daily average of PM<sub>2.5</sub>

### Monthly average of PM<sub>2.5</sub>

The highest and the lowest concentration of PM<sub>2.5</sub> was found during December and August respectively. The mean value for those months were found to be 30.4 and 7.44 µg/m<sup>3</sup> respectively.

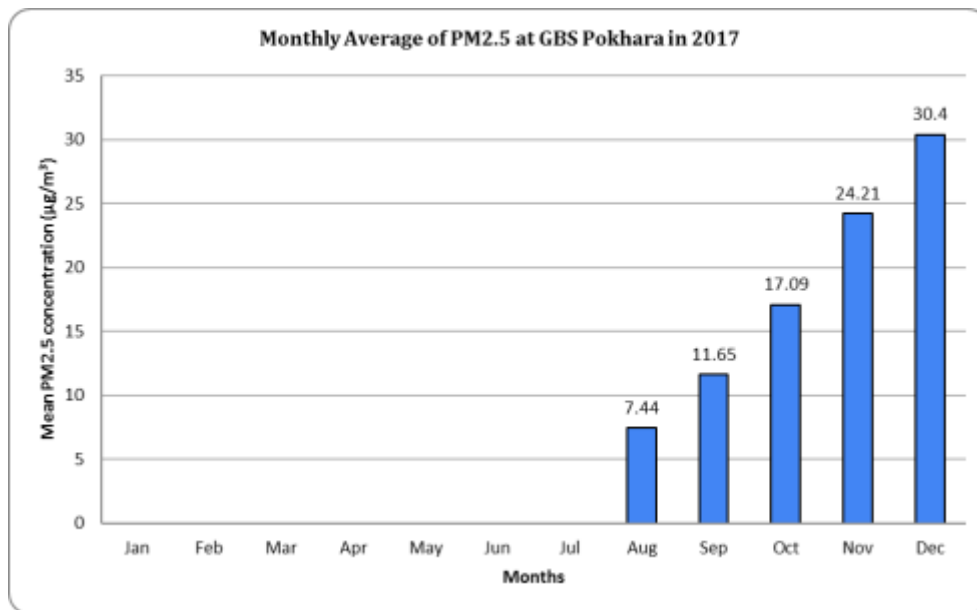


Figure 9: Monthly Average of PM<sub>2.5</sub>

### Monthly variation of PM<sub>2.5</sub>

Variation in concentration of PM<sub>2.5</sub> was found more during December whereas low during August.

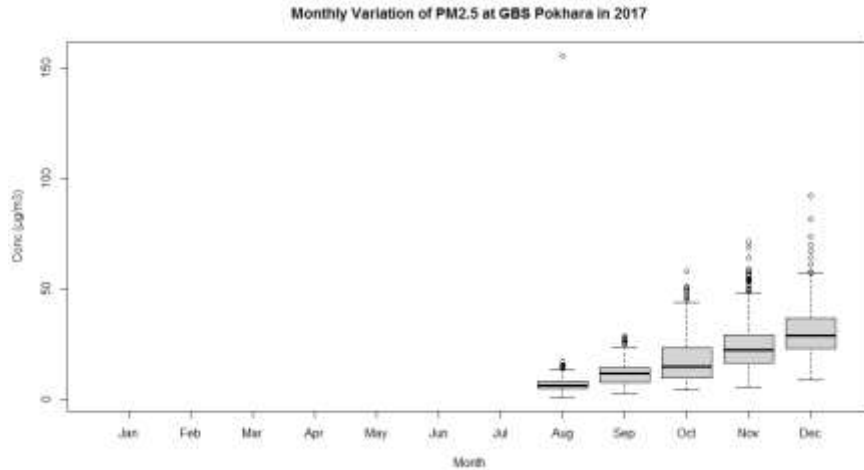


Figure 10: Monthly Variation of PM<sub>2.5</sub>

### Diurnal variation of average PM<sub>2.5</sub> concentration

The diurnal variation of average PM<sub>2.5</sub> concentrations can be shown in the figure below. The variation in PM<sub>2.5</sub> concentrations was high at around 5 pm and low at 3 am.

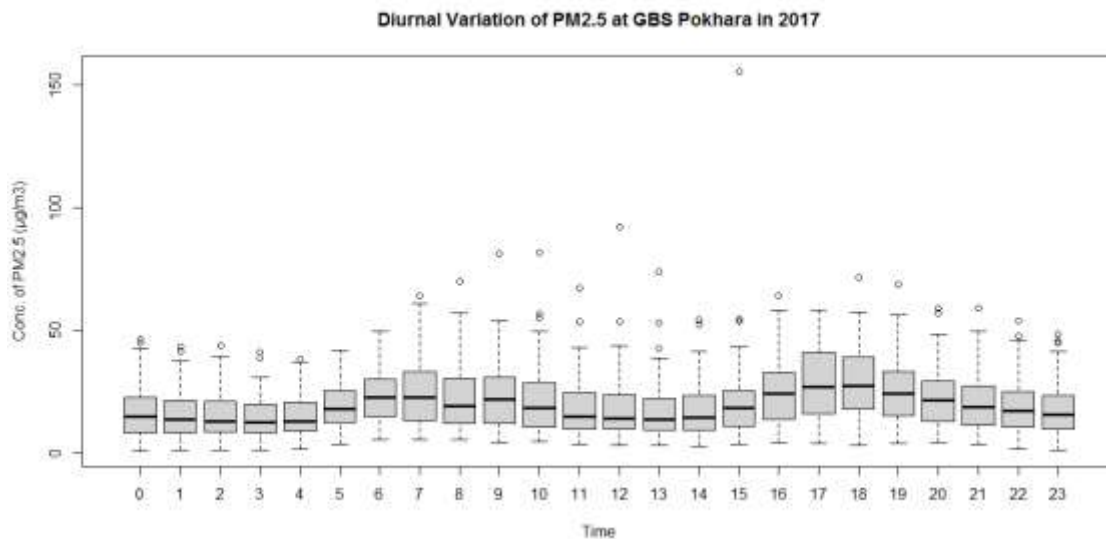


Figure 11: Diurnal variation of PM<sub>2.5</sub>

### Compliance status of PM<sub>2.5</sub>

The total days of PM<sub>2.5</sub> monitored in the year 2017 counts 130, of which 4 days exceed the NAAQS guideline.

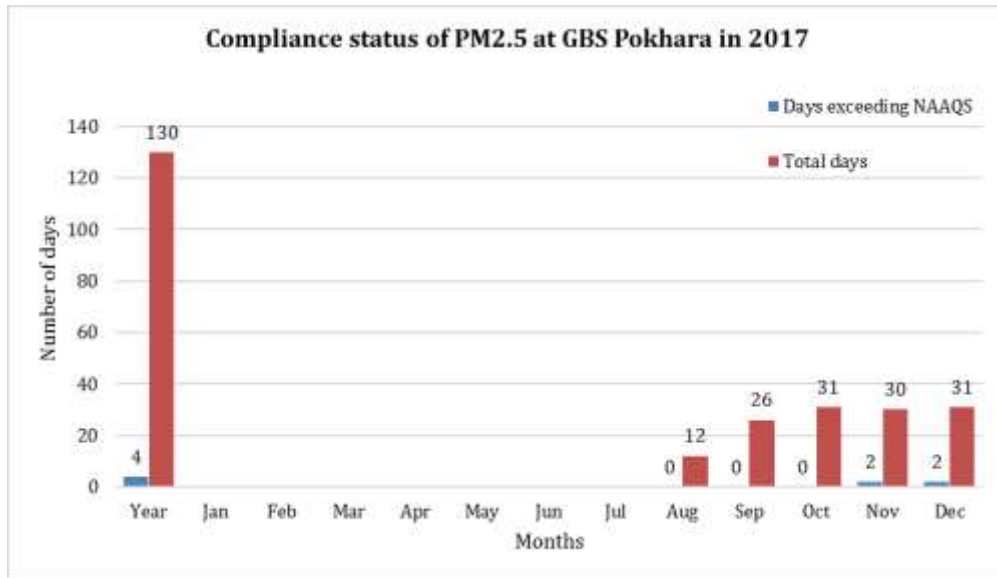


Figure 12: Compliance status of PM<sub>2.5</sub>

#### 2.1.4 Temporal variation of PM<sub>10</sub>

##### Annual average of PM<sub>10</sub>

The annual average of PM<sub>10</sub> at GBS Pokhara station was found to be 20.9 µg/m<sup>3</sup>. Histogram of hourly average PM<sub>10</sub> is shown in the figure below.

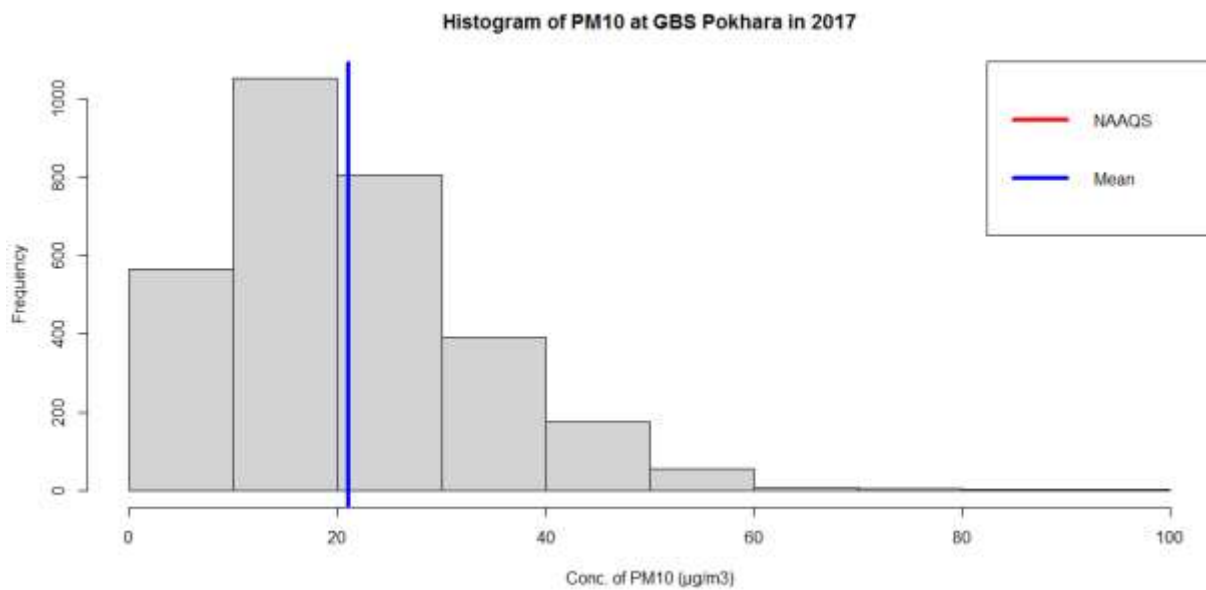


Figure 13 : Histogram for the ambient concentration of PM<sub>10</sub>.

### Daily average of PM<sub>10</sub>

Daily average concentration of PM<sub>10</sub> was high during December and was found low during July and August.

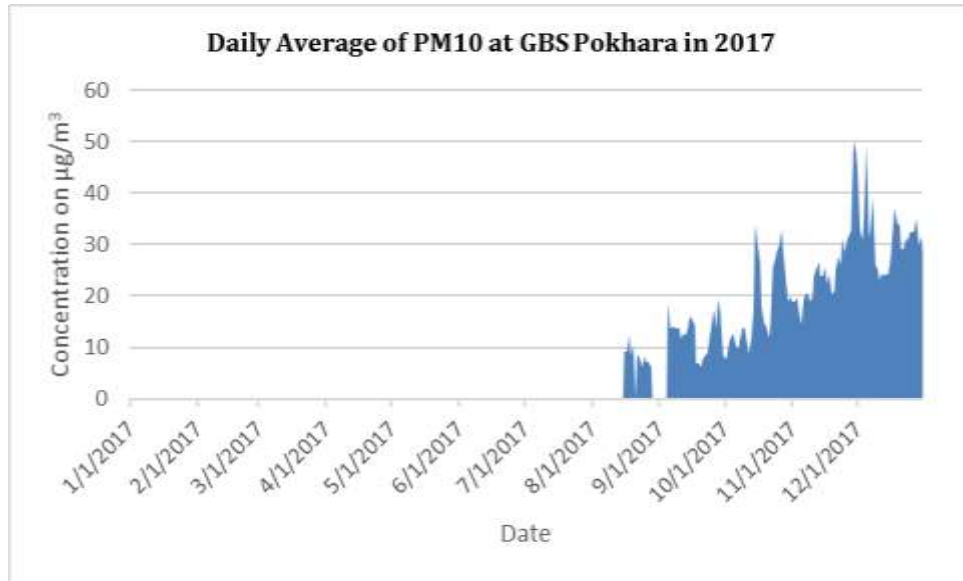


Figure 14: Daily average of PM<sub>10</sub>

### Monthly average of PM<sub>10</sub>

The highest and the lowest concentration of PM<sub>10</sub> was found during December and August respectively. The mean value for those months were found to be 31.35 and 8.36 µg/m<sup>3</sup> respectively.

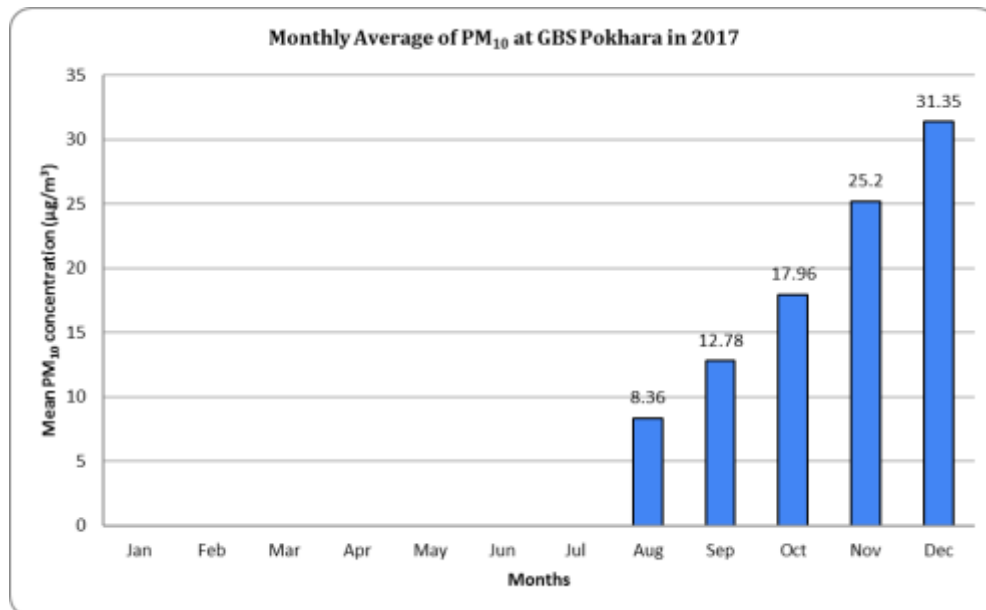


Figure 15: Monthly average of PM<sub>10</sub>



### Monthly variation of PM<sub>10</sub>

Variation in concentration of PM<sub>10</sub> was found more during December and low during August.

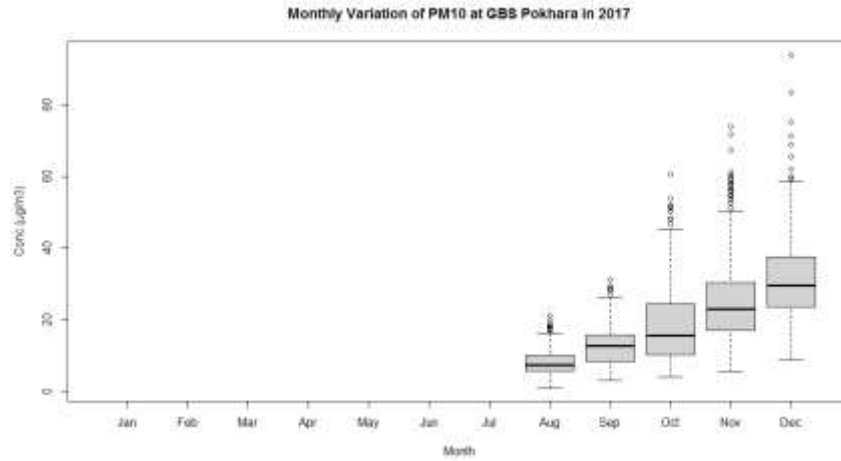


Figure 16: Monthly Variation of PM<sub>10</sub>

### Diurnal variation of average PM<sub>10</sub> concentration

The diurnal variation of average PM<sub>10</sub> concentrations can be shown in the Figure 17 below. The variation in PM<sub>10</sub> concentration was high at around 5 pm and low at 3 am.

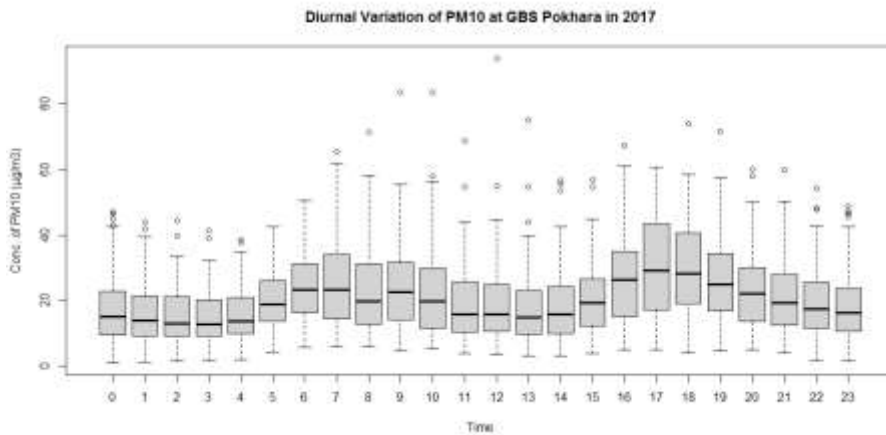


Figure 17: Diurnal variation of PM<sub>10</sub> concentration

### Compliance status of PM<sub>10</sub>

The total days of PM<sub>10</sub> monitored in the year 2017 counts 130 of which none of the days exceed the NAAQS guideline.

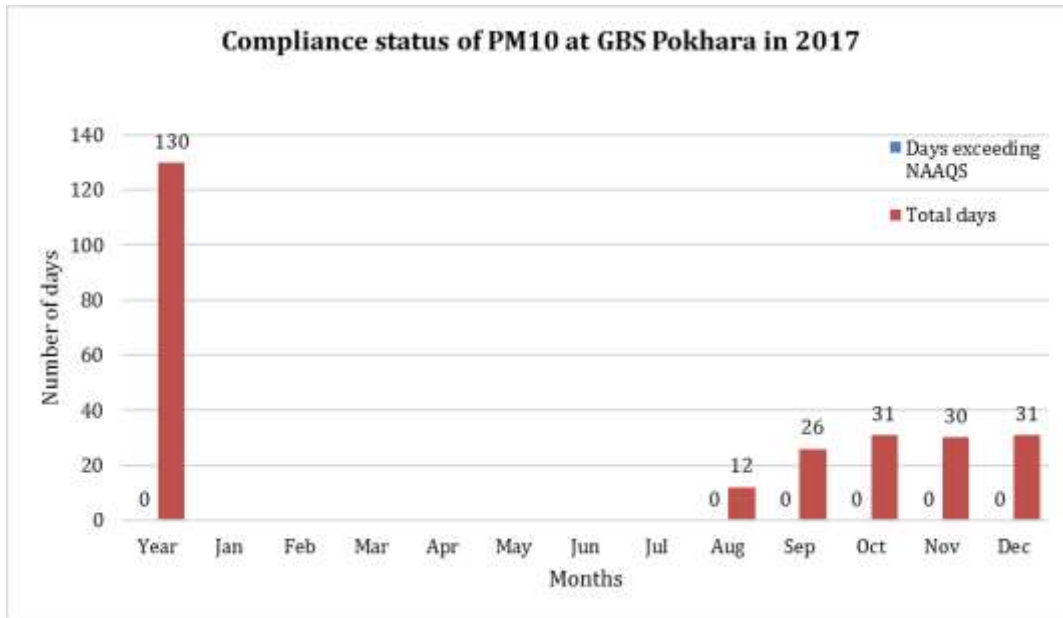


Figure 18: Compliance status of PM<sub>10</sub>

### 2.1.5 Temporal variation of TSP

#### Annual average of TSP

The annual average of TSP at GBS Pokhara station was found to be 20.84  $\mu\text{g}/\text{m}^3$ . Histogram of hourly average TSP is shown in the figure below.

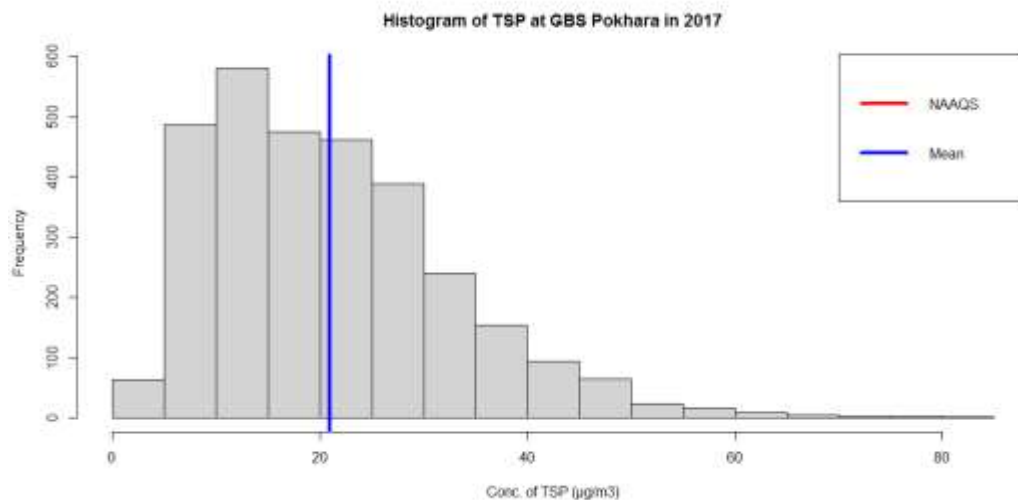


Figure 19 : Histogram for the ambient concentration of TSP

#### Daily average of TSP:

Daily average concentration of TSP was high during December and was found low during August.

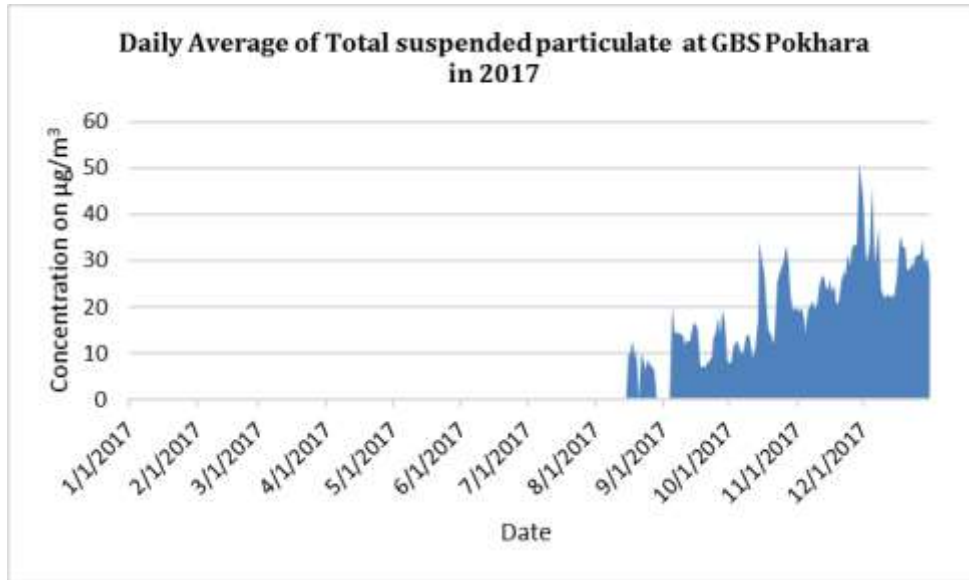


Figure 20: Daily average of TSP

### Monthly average of TSP

The highest and the lowest concentration of TSP was found during December and August respectively. The mean value for those months were found to be 29.86 and 8.88  $\mu\text{g}/\text{m}^3$  respectively.

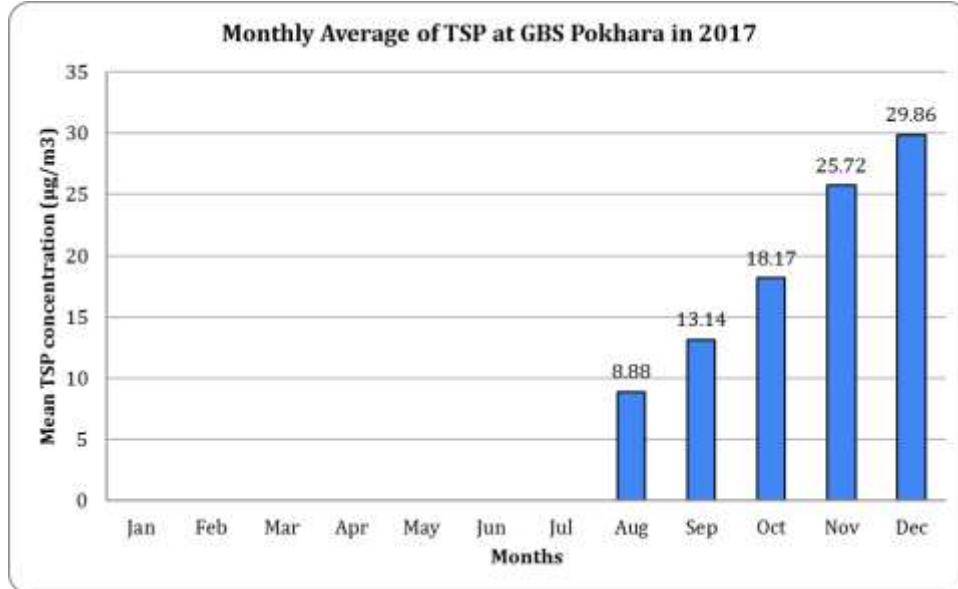


Figure 21: Monthly Average of TSP

### Monthly variation of TSP

Variation in concentration of TSP was found more during December and low during August.

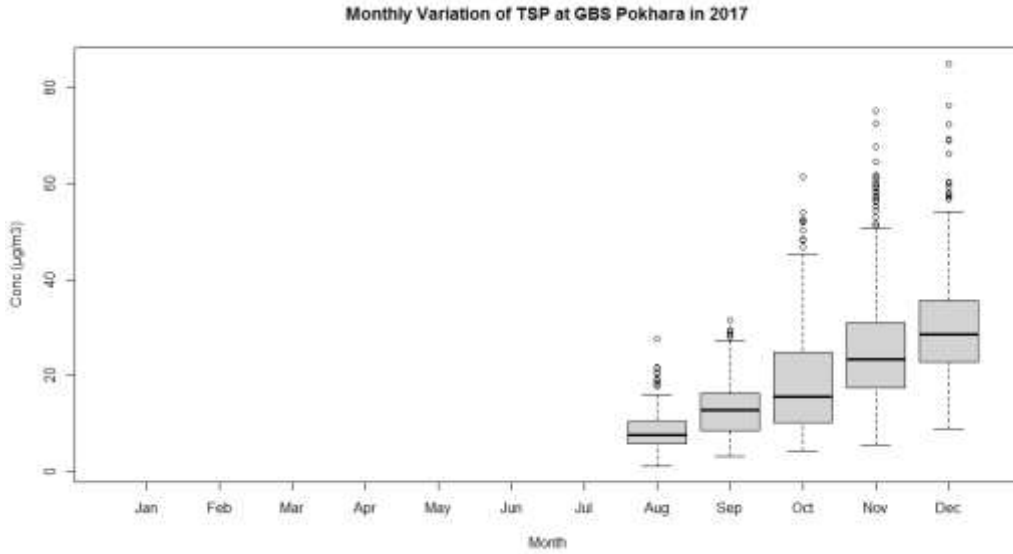


Figure 22: Monthly Variation of TSP.

### Diurnal variation of average TSP concentration

The diurnal variation of average TSP concentrations can be shown in the figure below. The variation in TSP concentration was high at around 5-6 pm and low at 3 am.

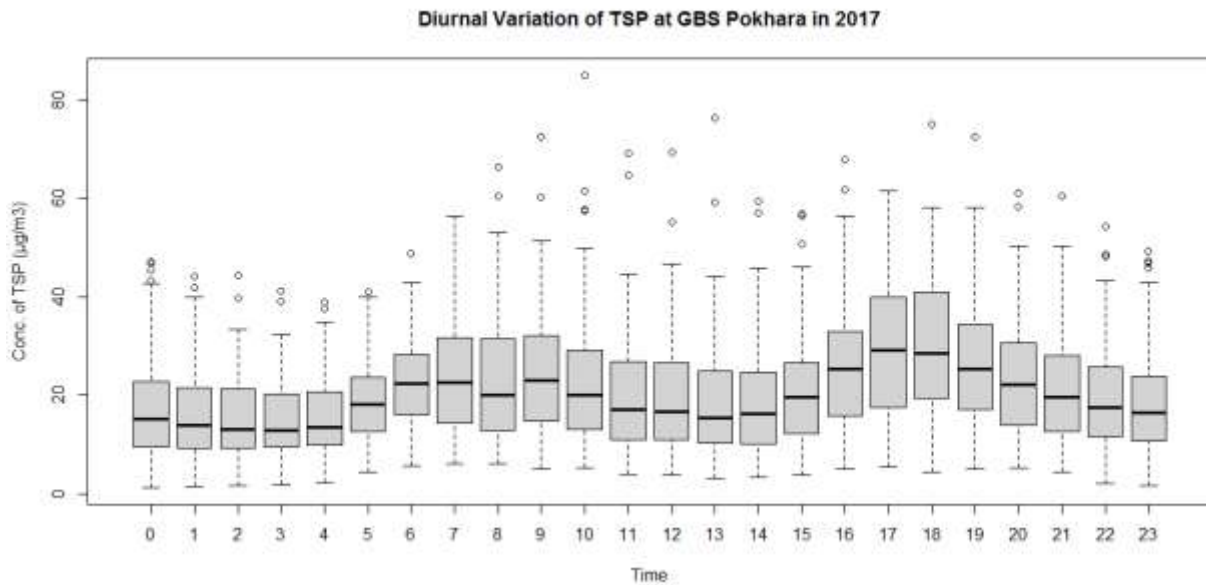


Figure 23: Diurnal Variation of TSP

### Compliance status of TSP

The total days of TSP monitored in the year 2017 counts 130 of which none of the days exceed the NAAQS guideline.

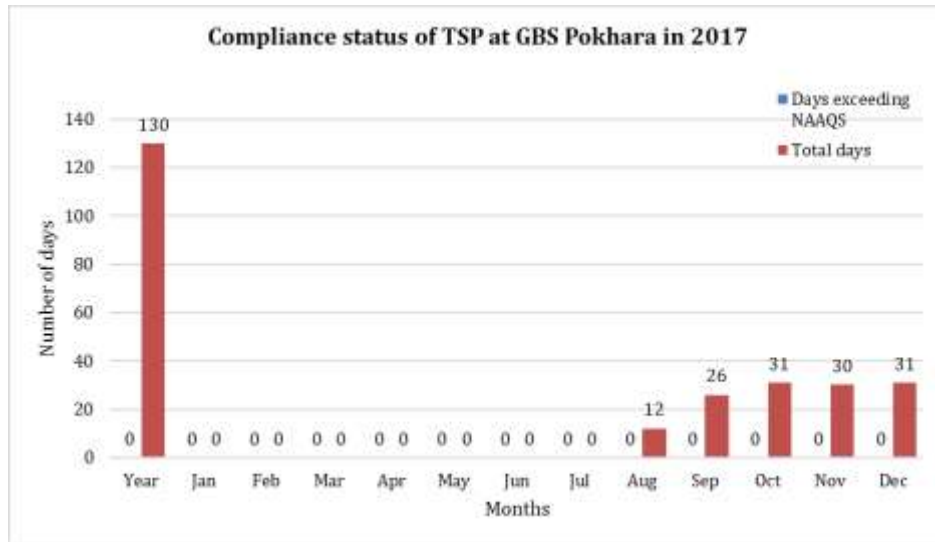


Figure 24: Compliance status of TSP

## 2.2 Air quality status, 2018

### 2.2.1 Annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP

The annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP of the GBS Pokhara monitoring station was calculated as shown below.

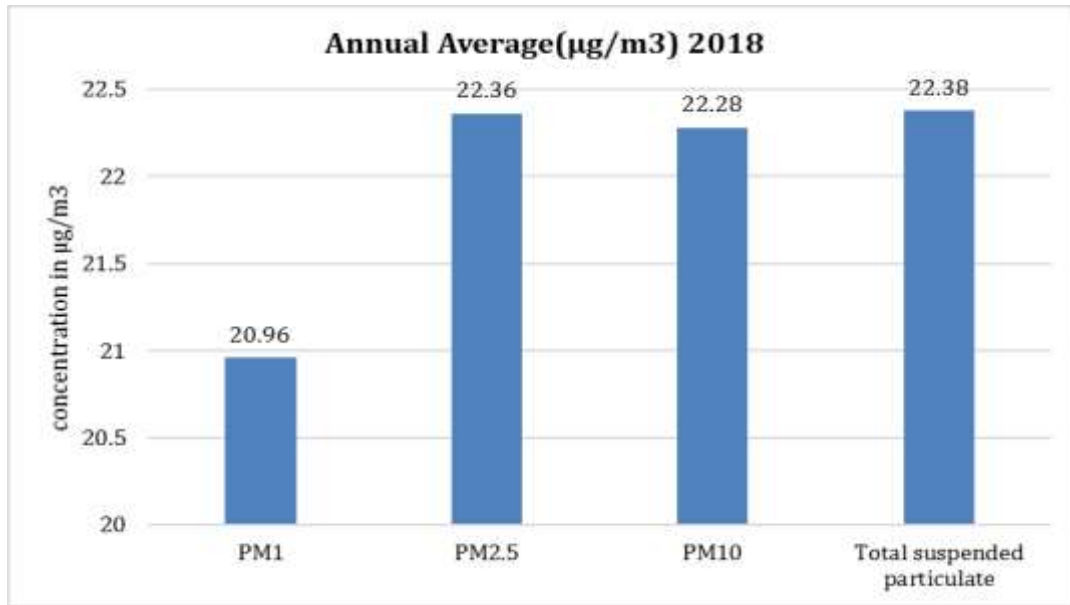


Figure 25: Annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP in 2017

### 2.2.2 Temporal variation of PM<sub>1</sub>

#### Annual average of PM<sub>1</sub>

The annual average of PM<sub>1</sub> at GBS Pokhara station was found to be 20.96 µg/m<sup>3</sup>. Histogram of hourly average of PM<sub>1</sub> is shown in the figure below.

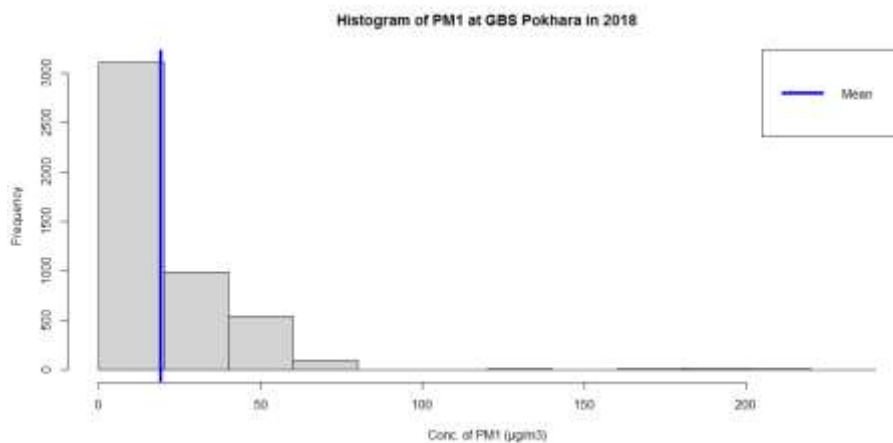


Figure 26 : Histogram of PM<sub>1</sub>.

### Daily average of PM<sub>1</sub>

Daily average concentration of PM<sub>1</sub> was high during December and was found low during August.

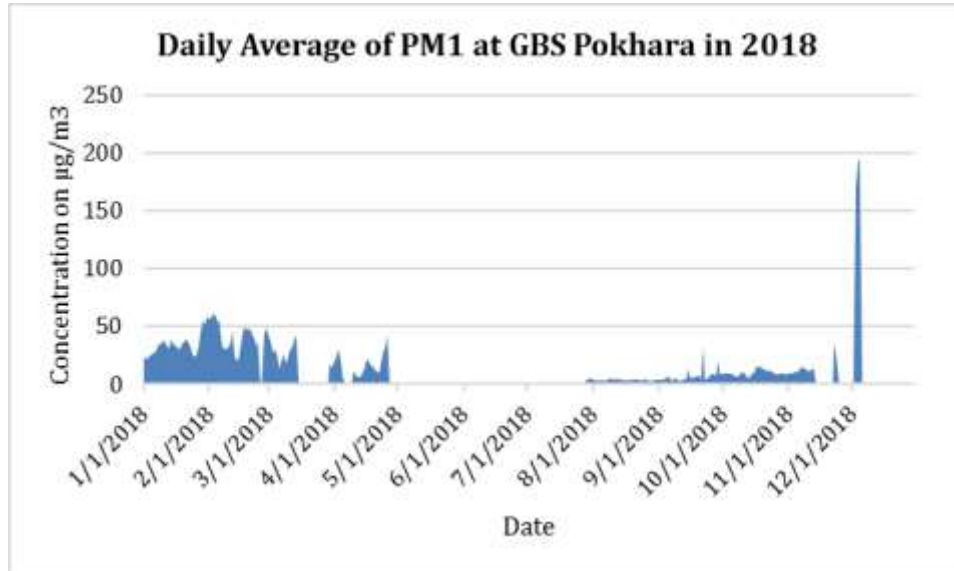


Figure 27: Daily average of PM<sub>1</sub>

### Monthly average of PM<sub>1</sub>

The highest and the lowest concentration of PM<sub>1</sub> was found during December and July respectively. The mean value for those months were found to be 187.09 and 3.54 µg/m<sup>3</sup> respectively.

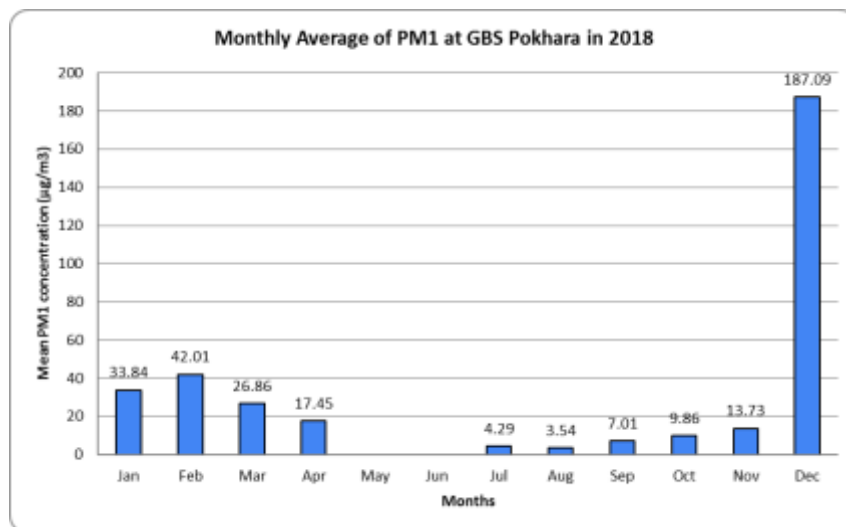


Figure 28: Monthly Average of PM<sub>1</sub>

### Monthly variation of PM<sub>1</sub>

Variation in concentration of PM<sub>1</sub> was found more during February whereas low during August.

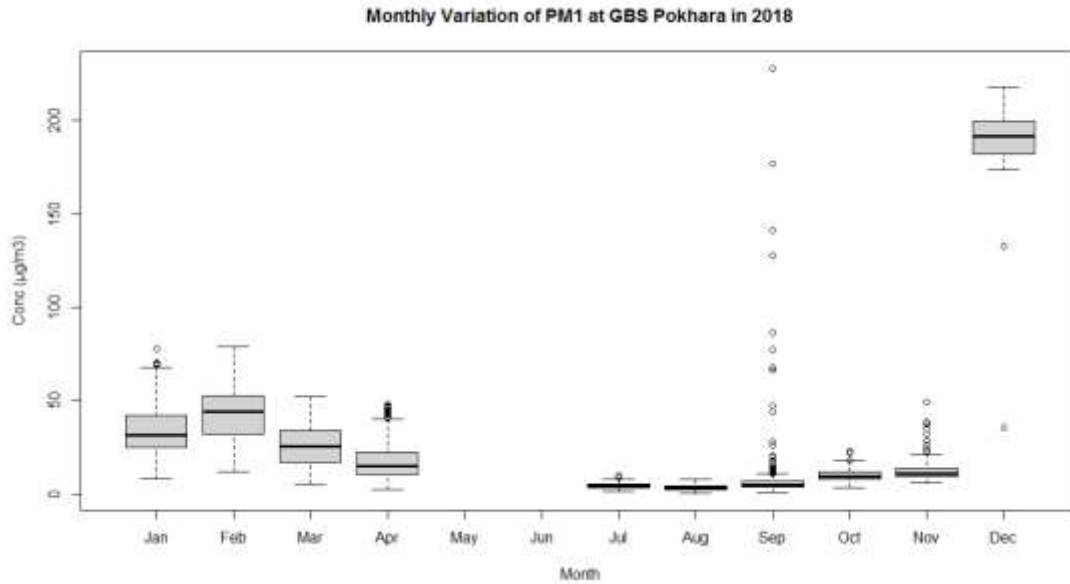


Figure 29: Monthly Variation of PM<sub>1</sub>

### Seasonal variation PM<sub>1</sub> concentration

Ambient concentration of average PM<sub>1</sub> during winter and post-monsoon can be shown in the figure below. The concentration of PM<sub>1</sub> was found higher during winter (35.01 µg/m<sup>3</sup>) than post-monsoon season (10.2 µg/m<sup>3</sup>) **Error! Reference source not found..**

Figure 30: Seasonal variation of PM<sub>1</sub>



## Diurnal variation of average PM<sub>1</sub> concentration

The diurnal variation of average PM<sub>1</sub> concentrations can be shown in the figure below. The variation in PM<sub>1</sub> concentration was high at around 6 pm and low at 2 pm.

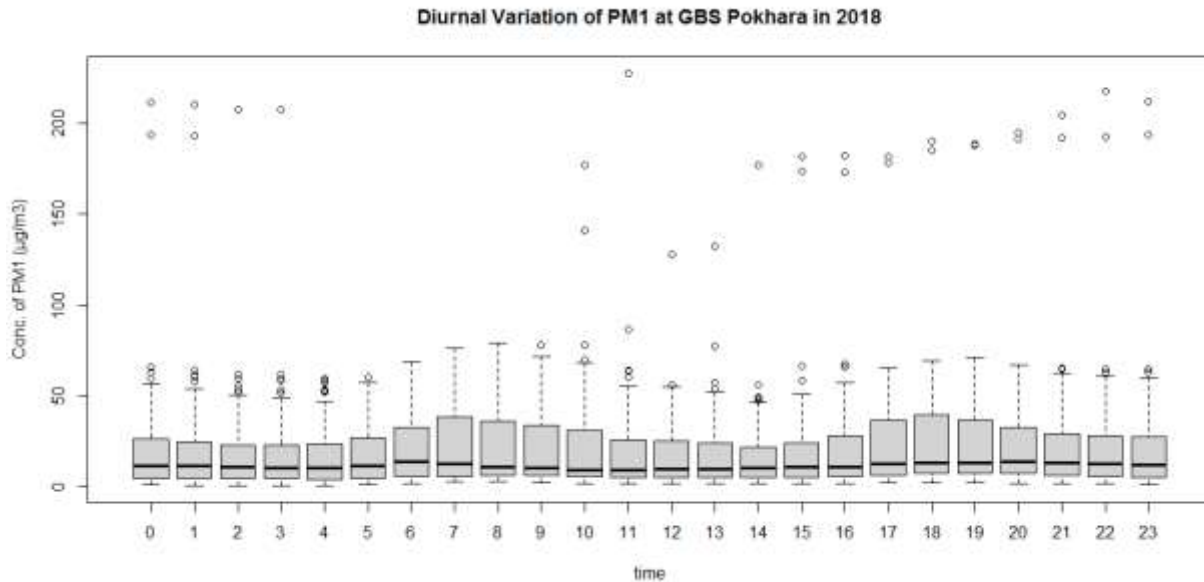


Figure 31: Diurnal variation of PM<sub>1</sub>

### 2.2.3 Temporal variation of PM<sub>2.5</sub>

#### Annual average of PM<sub>2.5</sub>

The annual average of PM<sub>2.5</sub> at GBS Pokhara station was found to be 22.36 µg/m<sup>3</sup>. Histogram of hourly average of PM<sub>2.5</sub> is shown in the figure below.

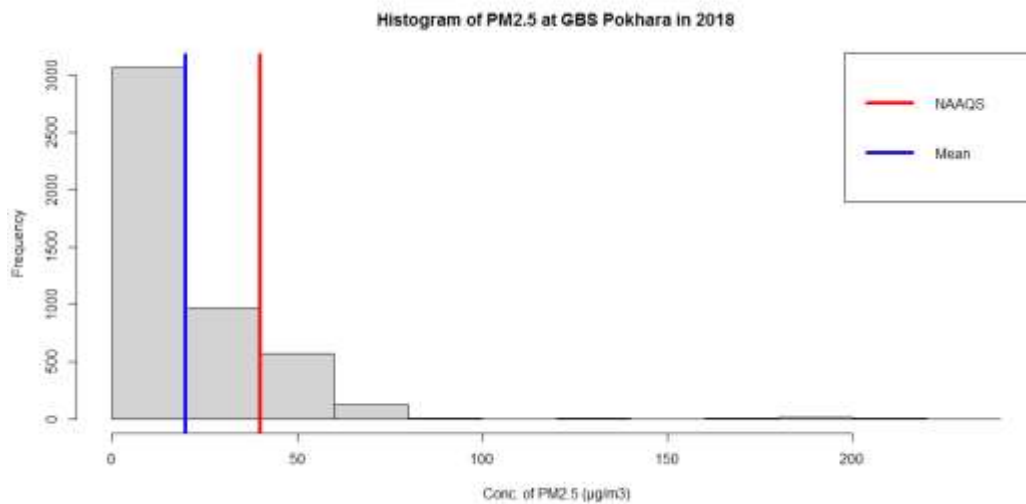


Figure 32 : Histogram of PM<sub>1</sub>.

### Daily average of PM<sub>2.5</sub>

Daily average concentration of PM<sub>2.5</sub> was high during December and was found low during August.

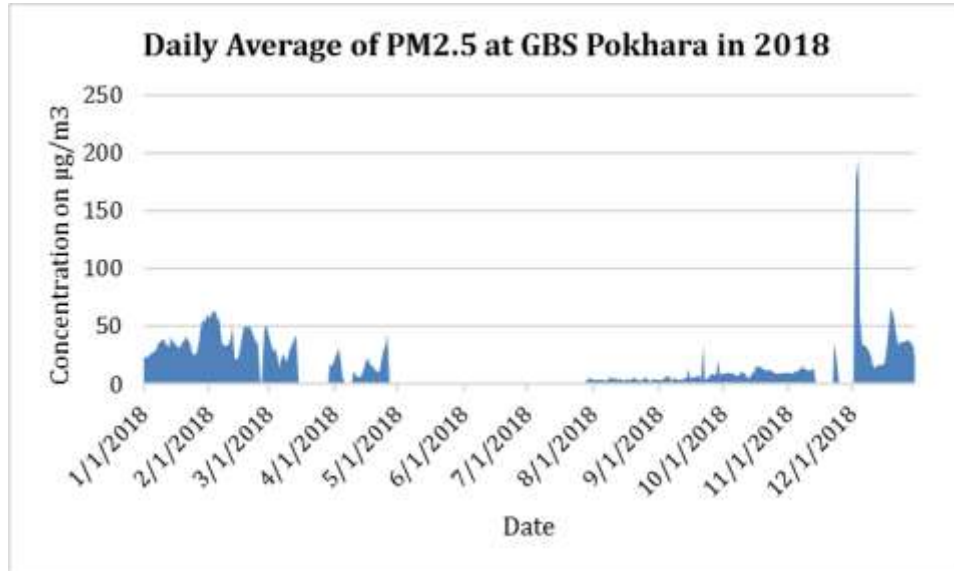


Figure 33: Daily average of PM<sub>2.5</sub>

### Monthly average of PM<sub>2.5</sub>

The highest and the lowest concentration of PM<sub>2.5</sub> was found during December and August respectively. The mean value for those months were found to be 44.35 and 3.8 µg/m<sup>3</sup> respectively.

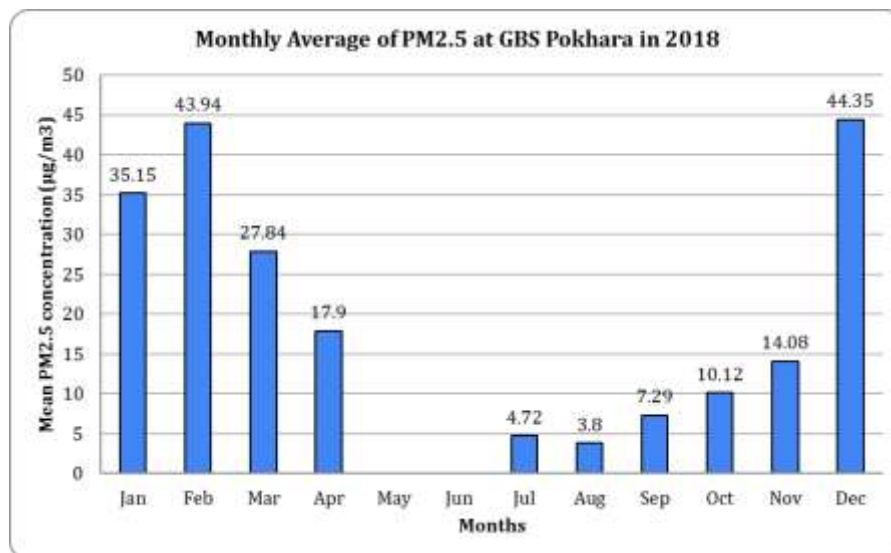


Figure 34: Monthly Average of PM<sub>2.5</sub>

## Monthly variation of PM<sub>2.5</sub>

Variation in concentration of PM<sub>2.5</sub> can be shown in figure below.

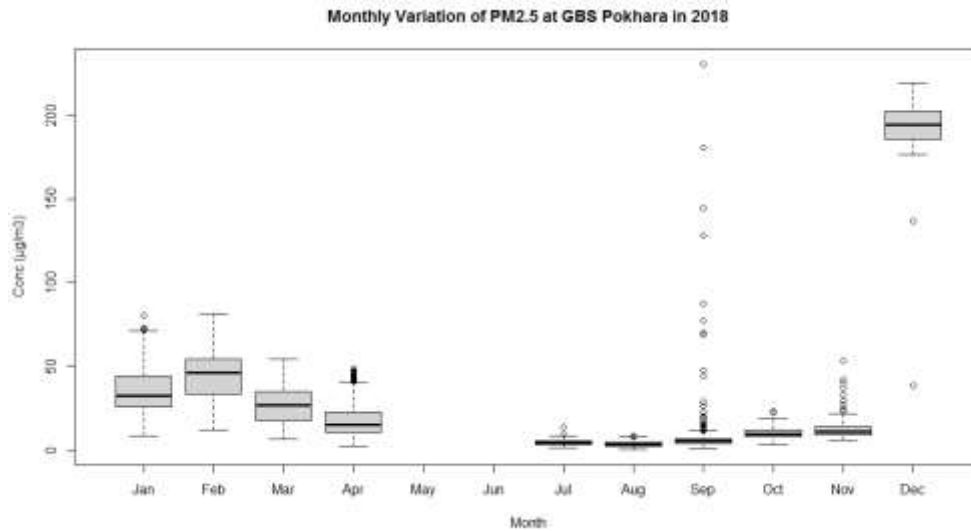


Figure 35: Monthly Variation of PM<sub>2.5</sub>

## Seasonal variation of average PM<sub>2.5</sub> concentration

Ambient concentration of average PM<sub>2.5</sub> during winter and post-monsoon can be shown in the figure below. The concentration of PM<sub>2.5</sub> was found higher during winter (36.5 µg/m<sup>3</sup>) than post-monsoon season (10.5 µg/m<sup>3</sup>) **Error! Reference source not found..**

Figure 36: Seasonal variation of PM<sub>2.5</sub>

### Diurnal variation of average PM<sub>2.5</sub> concentration

The diurnal variation of average PM<sub>2.5</sub> concentrations can be shown in the figure below. The variation in PM<sub>2.5</sub> concentration was high at around 5-6 pm and low at 2-3 am.

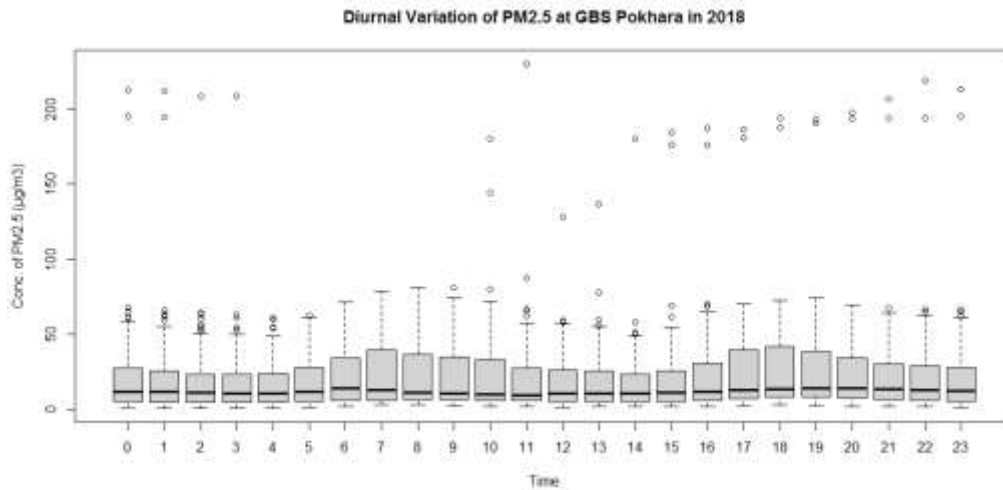


Figure 37: Diurnal variation of PM<sub>2.5</sub>

### Compliance status of PM<sub>2.5</sub>

The total days of PM<sub>2.5</sub> monitored in the year 2018 counts 234, of which 33 days exceed the NAAQS guideline.

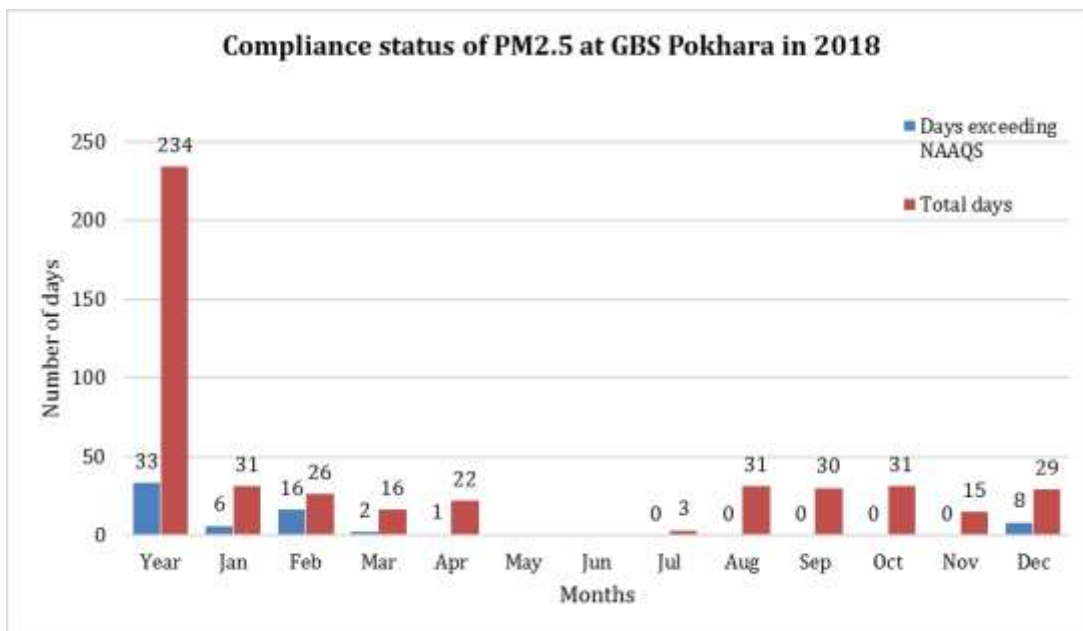


Figure 38: Compliance status of PM<sub>2.5</sub>

## 2.2.4 Temporal variation of PM<sub>10</sub>

### Annual average of PM<sub>10</sub>

The annual average of PM<sub>10</sub> at GBS Pokhara station was found to be 22.28 µg/m<sup>3</sup>. Histogram of hourly average of PM<sub>10</sub> is shown in the figure below.

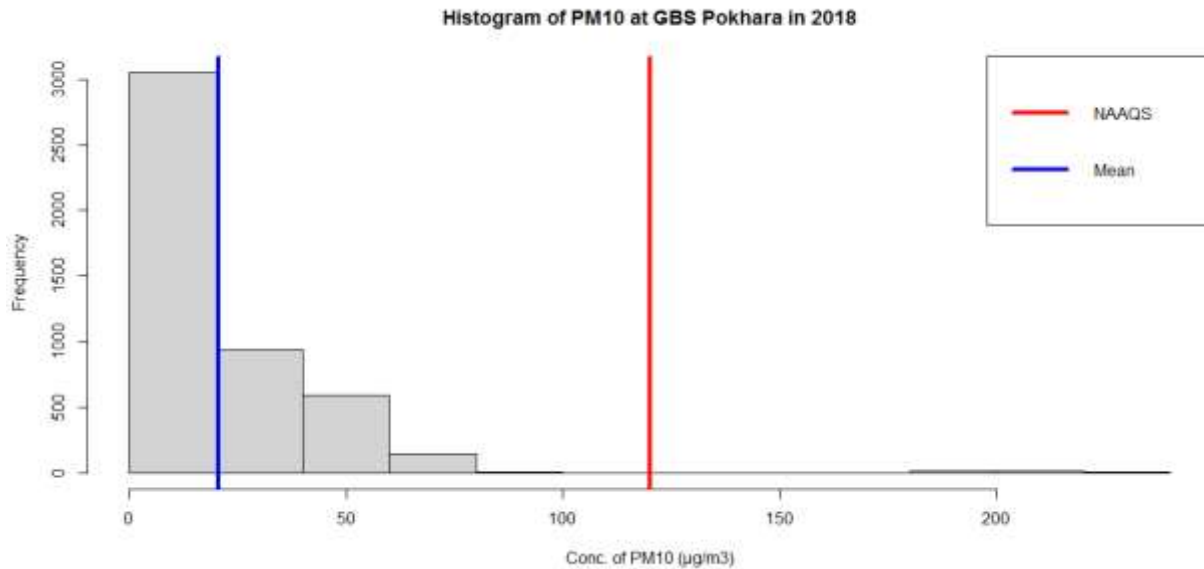


Figure 39 : Histogram for the ambient concentration of PM<sub>10</sub>.

### Daily average of PM<sub>10</sub>:

Daily average concentration of PM<sub>10</sub> was high during December and was found low during August.

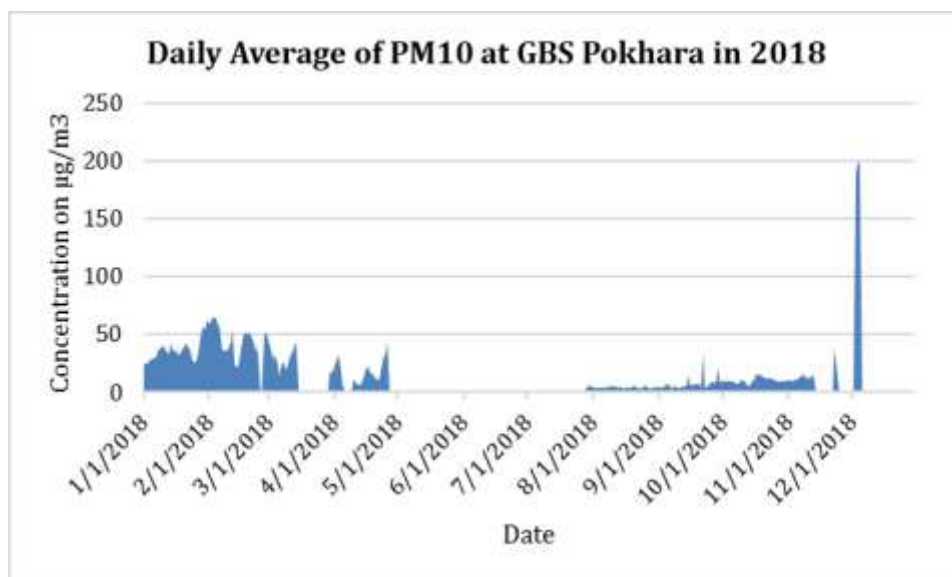


Figure 40: Daily average of PM<sub>10</sub>

### Monthly average of PM<sub>10</sub>

The highest and the lowest concentration of PM<sub>10</sub> was found during December and June respectively. The mean value for those months were found to be 137.5 and 16.68  $\mu\text{g}/\text{m}^3$  respectively.

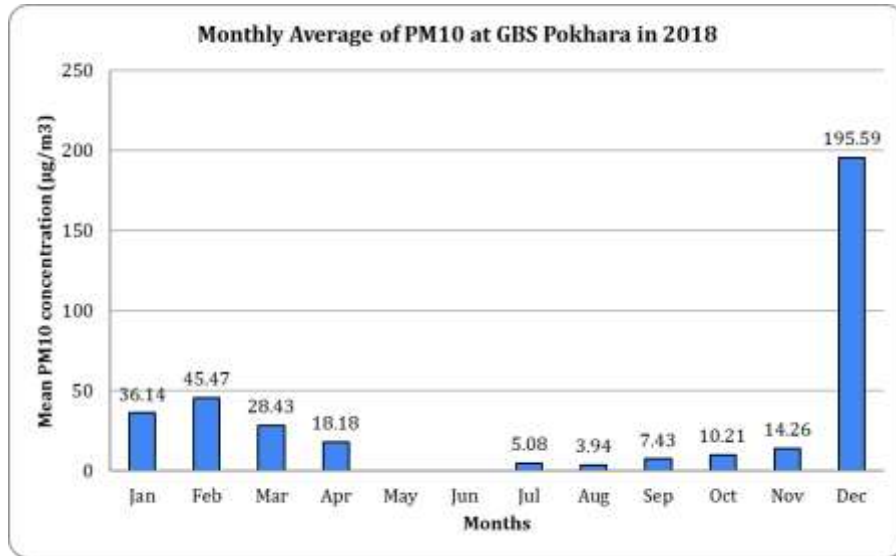


Figure 41: Monthly average of PM<sub>10</sub>

### Monthly variation of PM<sub>10</sub>

Variation in concentration of PM<sub>10</sub> was found more during November and low during June as shown in figure below.

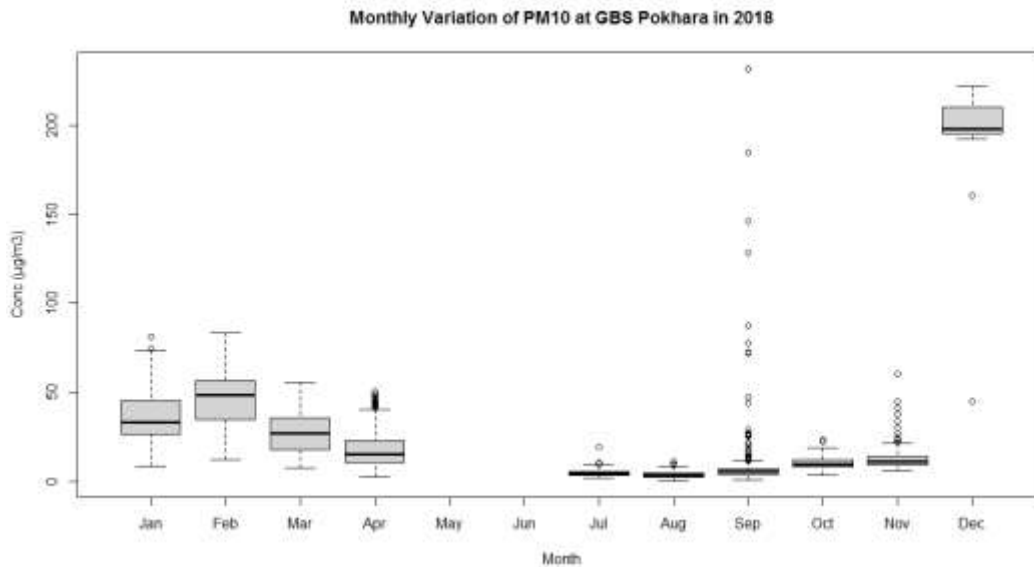


Figure 42: Monthly Variation of PM<sub>10</sub>

### Seasonal variation of average PM<sub>10</sub> concentration:

Ambient concentration of average PM<sub>10</sub> during winter and post-monsoon can be shown in the figure below. The concentration of PM<sub>10</sub> was found higher during winter (37.66 µg/m<sup>3</sup>) than post-monsoon season (10.63 µg/m<sup>3</sup>).

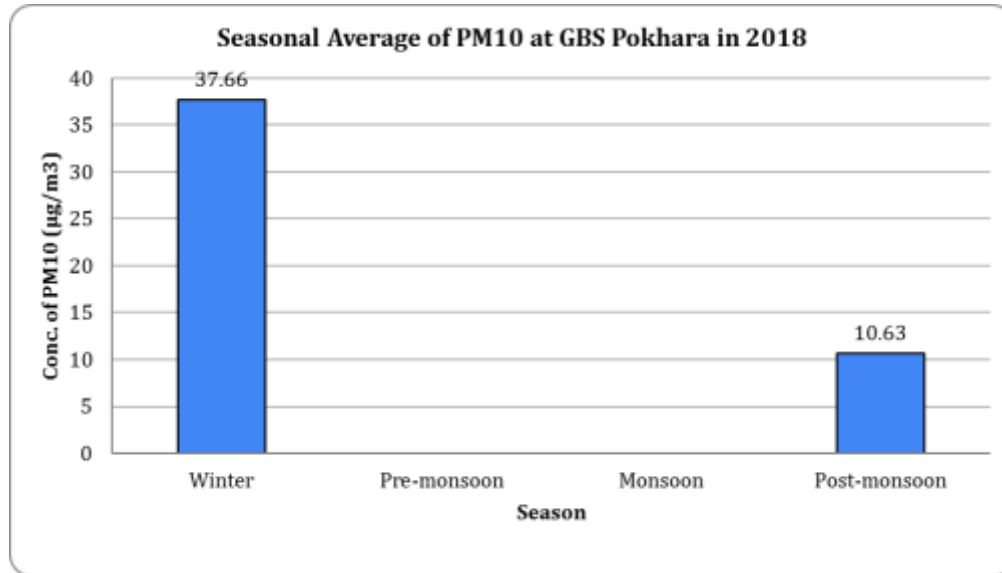


Figure 43: Seasonal variation of PM<sub>10</sub>.

### Diurnal variation of average PM<sub>10</sub> concentration

The diurnal variation of average PM<sub>10</sub> concentrations can be shown in the Figure 17 below. The variation in PM<sub>10</sub> concentration was high at around 5 pm and low at 2 to 3 am.

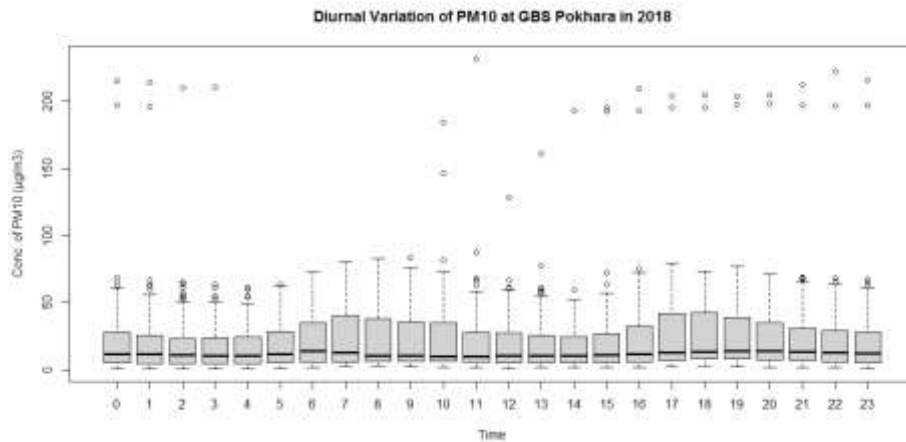


Figure 44: Diurnal variation of PM<sub>10</sub> concentration

## Compliance status of PM<sub>10</sub>

The total days of PM<sub>10</sub> monitored in the year 2020 counts 208 of which 3 days exceed the NAAQS guideline.

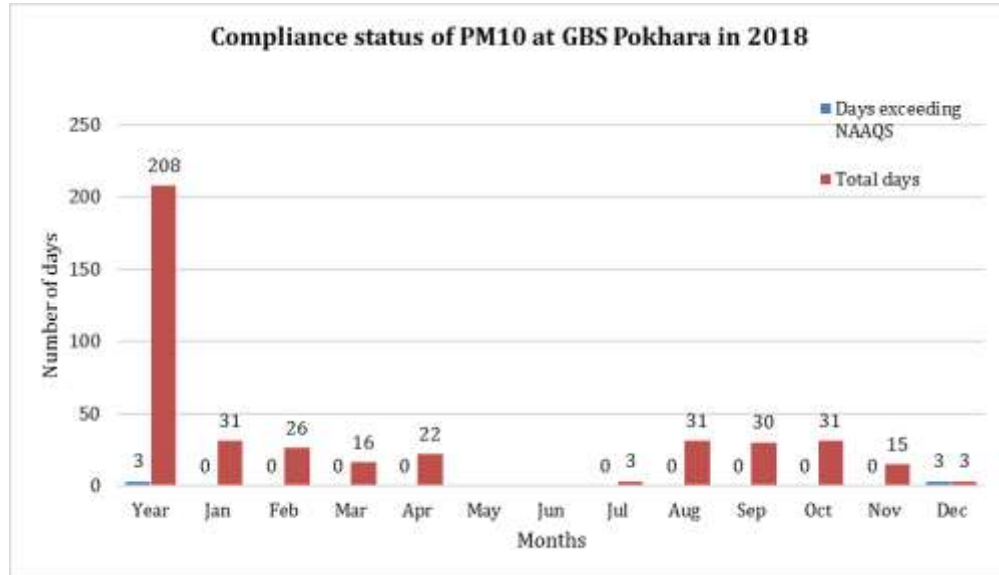


Figure 45: Compliance status of PM<sub>10</sub>

### 2.2.5 Temporal variation of TSP

#### Annual average of TSP

The annual average of TSP at GBS Pokhara station was found to be 18.77  $\mu\text{g}/\text{m}^3$ . Histogram of hourly average of TSP is shown in the figure below.

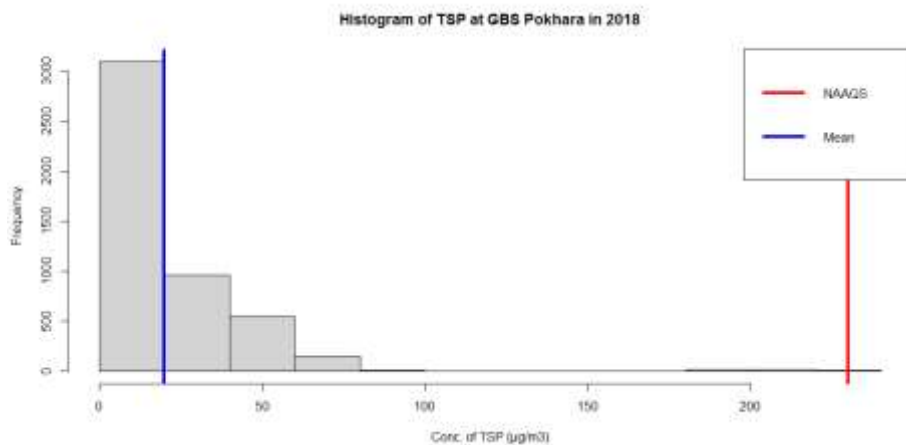


Figure 46 : Histogram for the ambient concentration of TSP



### Daily average of TSP:

Daily average concentration of TSP was high during December and was found low during July and August.

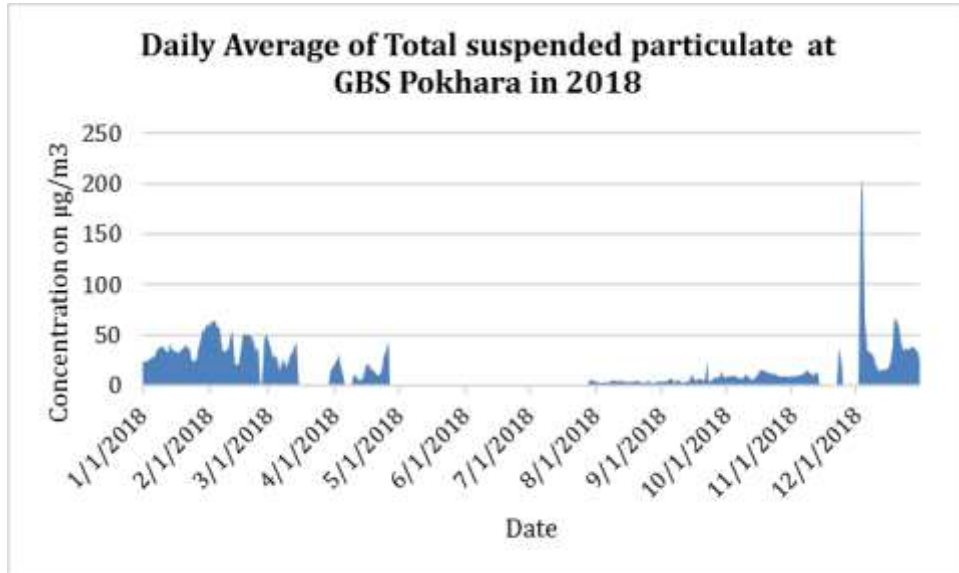


Figure 47: Daily average of TSP

### Monthly average of TSP

The highest and the lowest concentration of TSP was found during December and August respectively. The mean value for those months were found to be 45.49 and 3.66 µg/m<sup>3</sup> respectively.

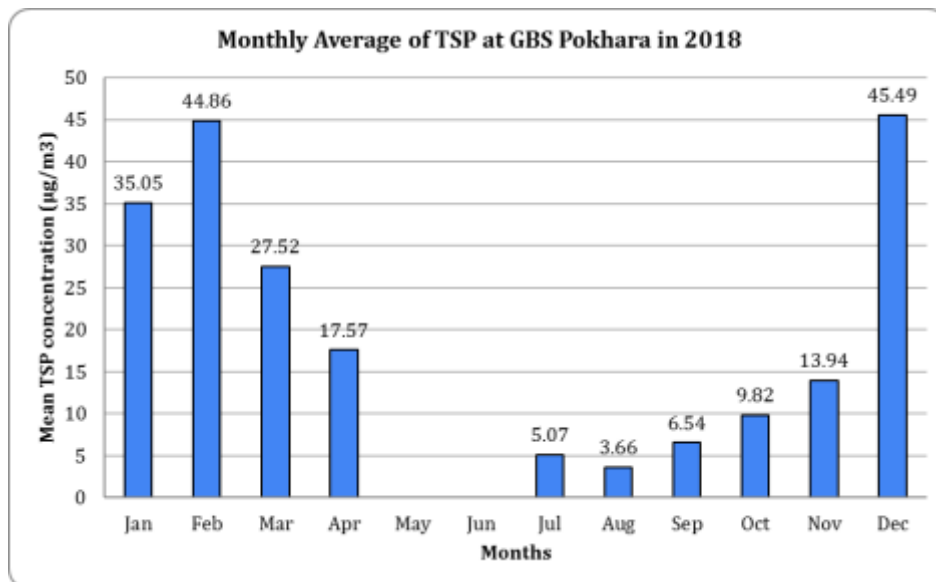


Figure 48: Monthly Average of TSP

## Monthly variation of TSP

Variation in concentration of TSP was found more during February and low during July.

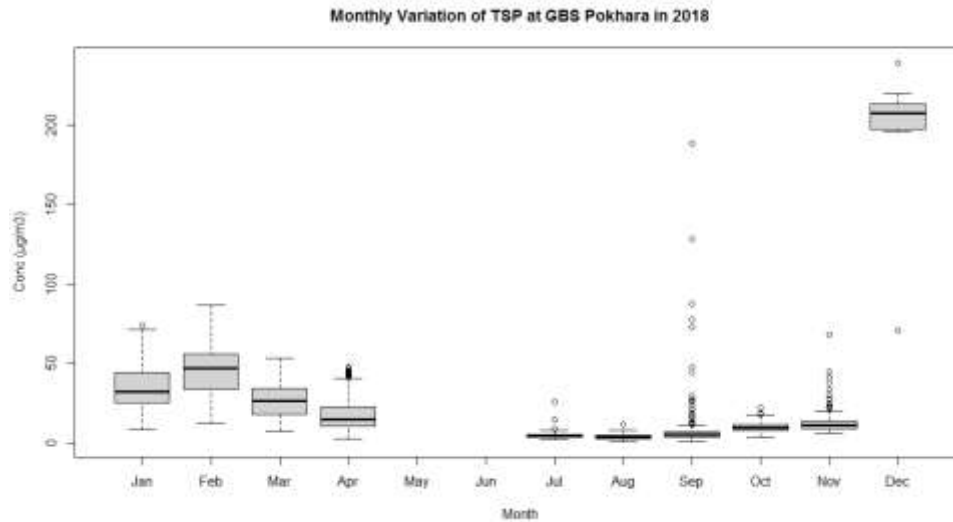


Figure 49: Monthly Variation of TSP.

## Seasonal variation of average TSP concentration

Ambient concentration of average TSP during winter (December-Februarys), and post-monsoon (October-November) can be shown in the figure below. The concentration of PM<sub>2.5</sub> was found higher during winter (36.59 µg/m<sup>3</sup>) than post-monsoon season (10.1 µg/m<sup>3</sup>).

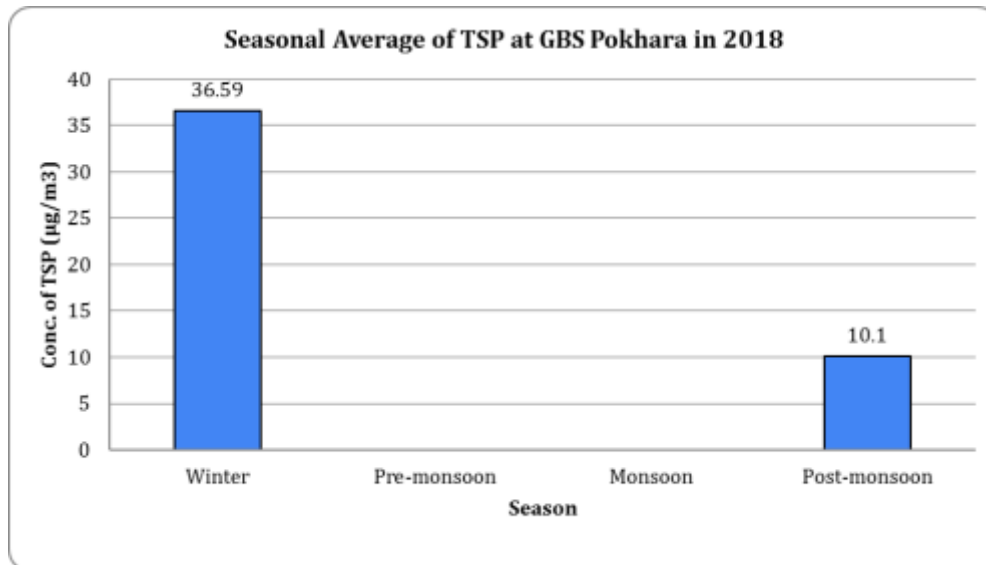


Figure 50: Seasonal variation of TSP

### Diurnal variation pf average TSP concentration

The diurnal variation of average TSP concentrations can be shown in the figure below. The variation in TSP concentration was high at around 6 pm and low at 2 to 3 am.

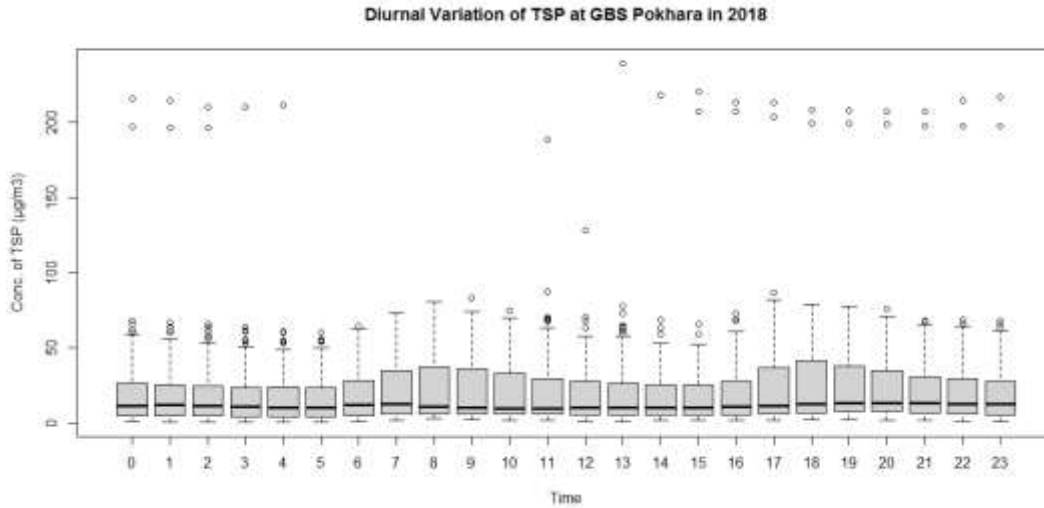


Figure 51: Diurnal Variation of TSP

### Compliance status of TSP

The total days of TSP monitored in the year 2018 counts 234 of which none of the days exceed the NAAQS guideline.

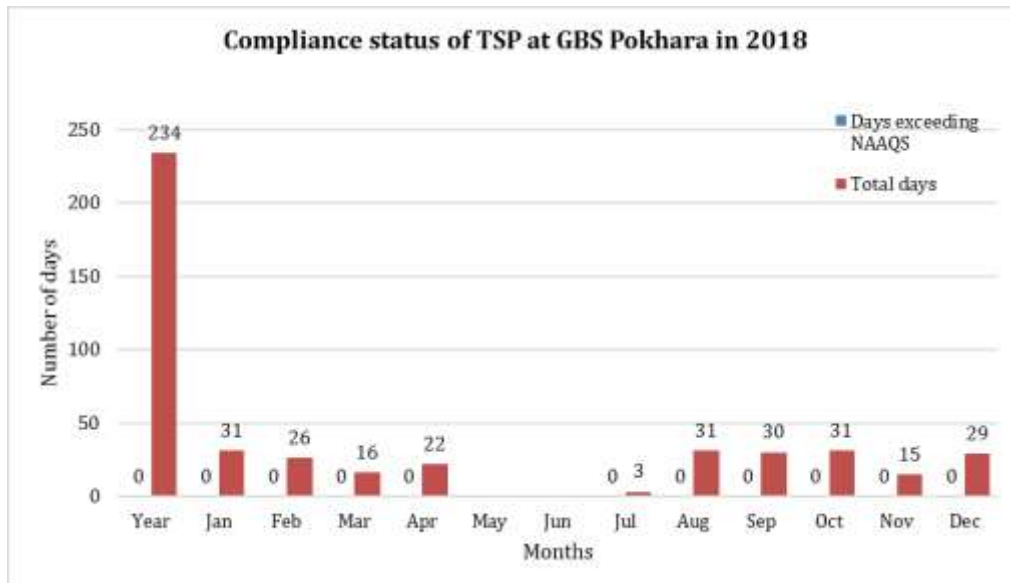


Figure 52: Compliance status of TSP

## 2.3 Air quality status, 2019

### 2.3.1 Annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP

The annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP of the GBS Pokhara monitoring station was calculated as shown below.

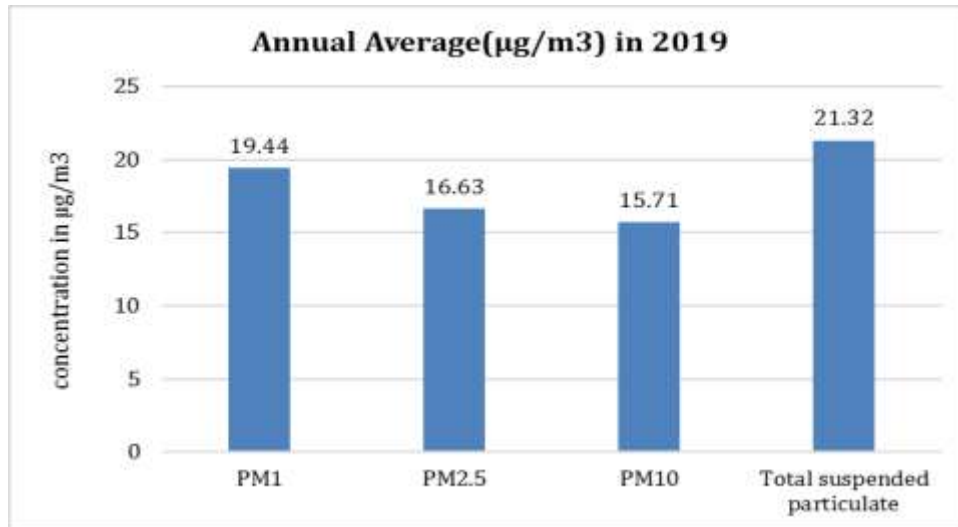


Figure 53: Annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP in 2019

### 2.3.2 Temporal variation of PM<sub>1</sub>

#### Annual average of PM<sub>1</sub>

The annual average of PM<sub>1</sub> at GBS Pokhara station was found to be 19.44 µg/m<sup>3</sup>. Histogram of hourly average of PM<sub>1</sub> is shown in the figure below.

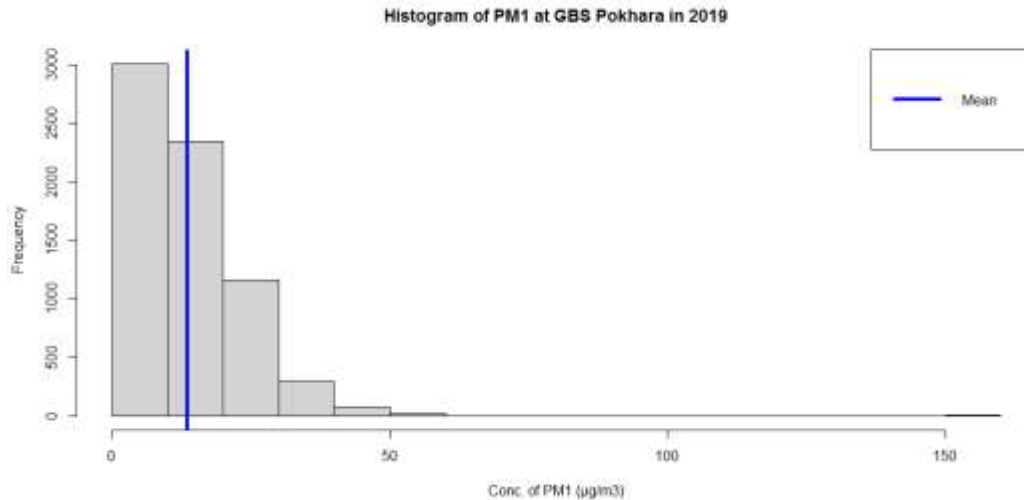


Figure 54 : Histogram of PM<sub>1</sub>.

### Daily average of PM<sub>1</sub>

Daily average concentration of PM<sub>1</sub> was high during November and was found low during August.

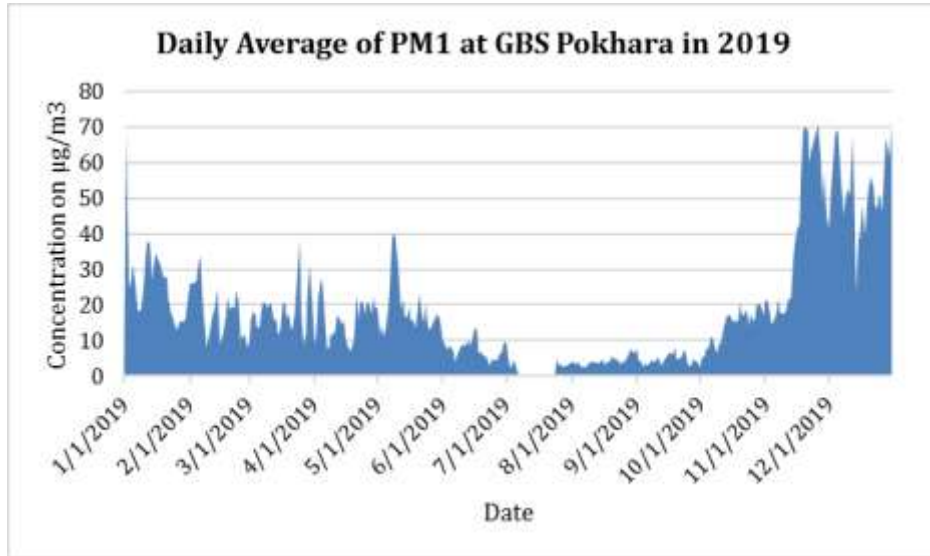


Figure 55: Daily average of PM<sub>1</sub>

### Monthly average of PM<sub>1</sub>

The highest and the lowest concentration of PM<sub>1</sub> was found during January and July respectively. The mean value for those months were found to be 25.88 and 3.89 µg/m<sup>3</sup> respectively.

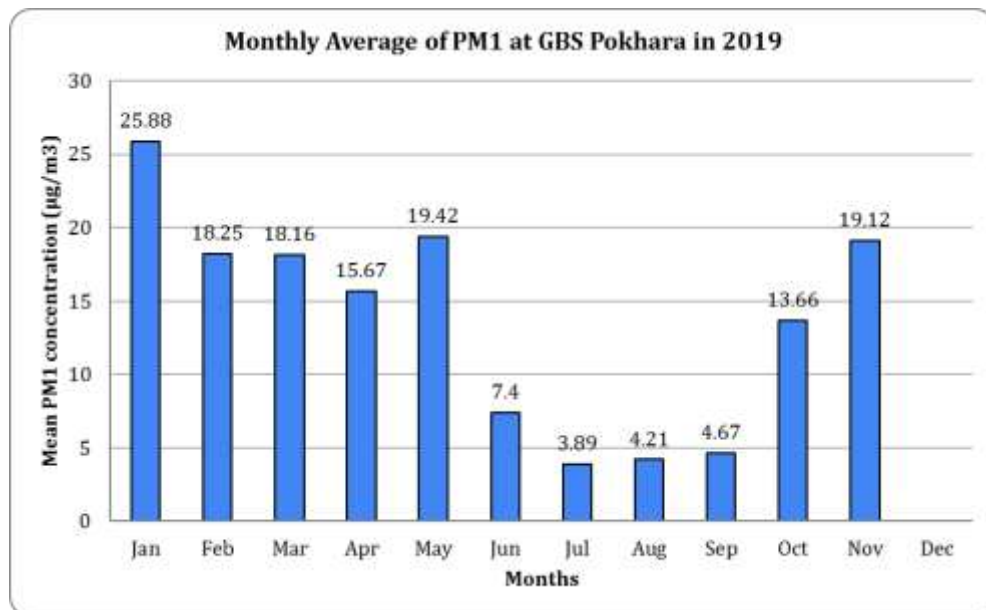


Figure 56: Monthly Average of PM<sub>1</sub>

## Monthly variation of PM<sub>1</sub>

Variation in concentration of PM<sub>1</sub> was found more during January whereas low during July.

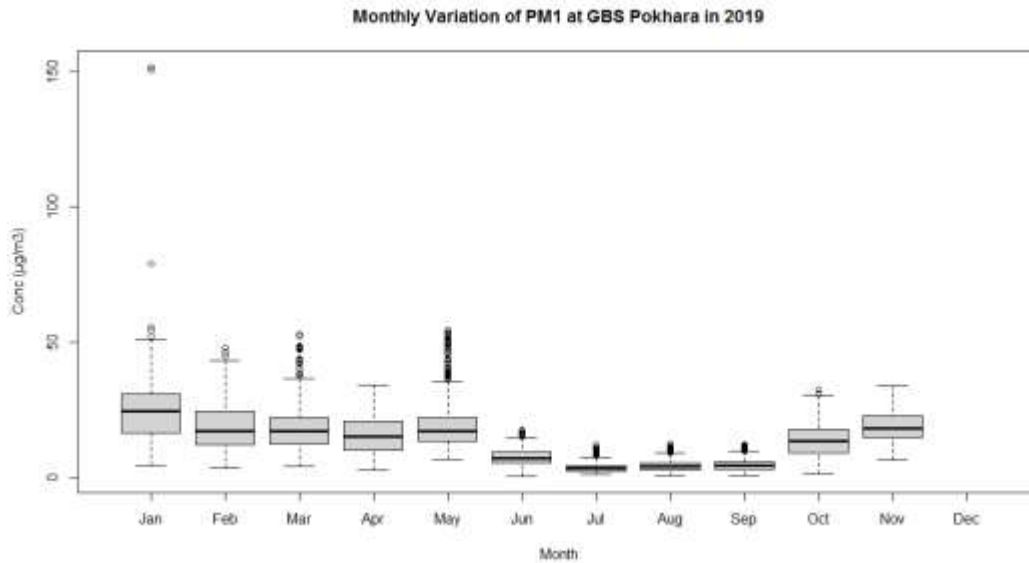


Figure 57: Monthly Variation of PM<sub>1</sub>

## Seasonal variation of PM<sub>1</sub> concentration

Ambient concentration of average PM<sub>1</sub> during winter, pre-monsoon, monsoon and post-monsoon can be shown in the **Error! Reference source not found.** below. The concentration of PM<sub>1</sub> was found the highest and lowest during winter (77.08 µg/m<sup>3</sup>) than monsoon season (5.17 µg/m<sup>3</sup>) respectively.

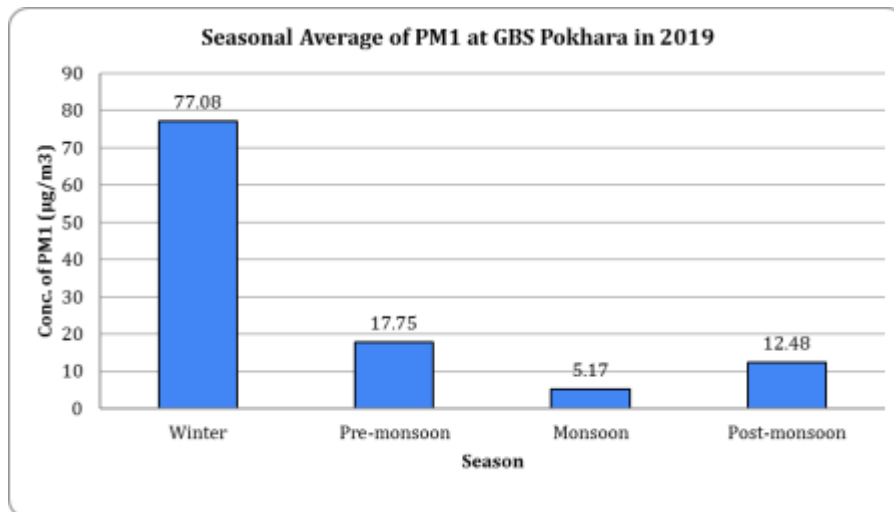


Figure 58: Seasonal variation of PM<sub>1</sub>

## Diurnal variation of average PM<sub>1</sub> concentration

The diurnal variation of average PM<sub>1</sub> concentrations can be shown in the figure below. The variation in PM<sub>1</sub> concentration was high at around 6-8 pm and low at 1 pm.

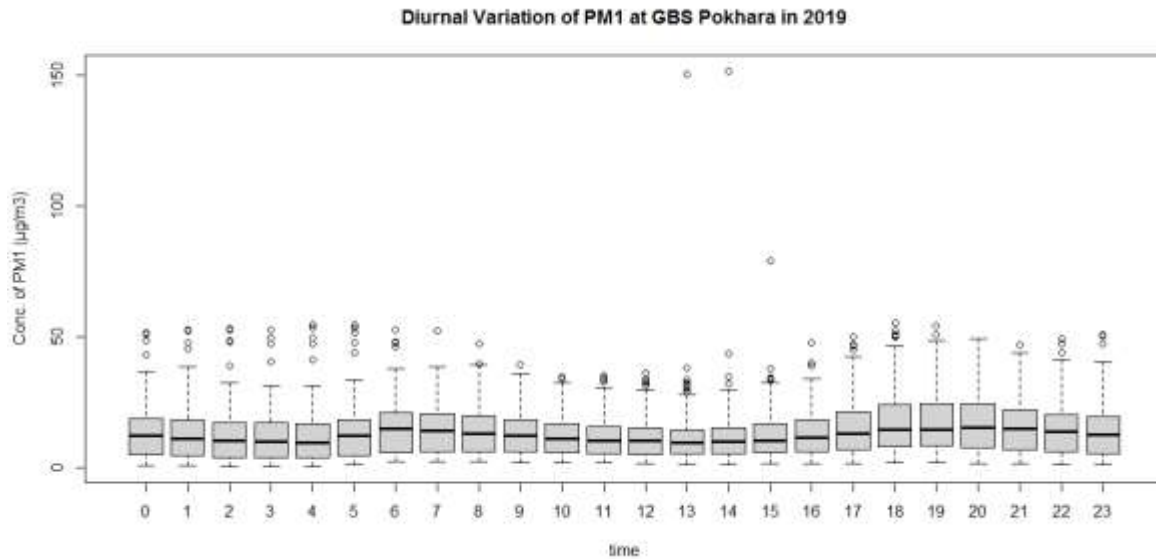


Figure 59: Diurnal variation of PM<sub>1</sub>

### 2.3.3 Temporal variation of PM<sub>2.5</sub>

#### Annual average of PM<sub>2.5</sub>

The annual average of PM<sub>2.5</sub> at GBS Pokhara station was found to be 16.63 µg/m<sup>3</sup>. Histogram of hourly average of PM<sub>2.5</sub> is shown in the figure below.

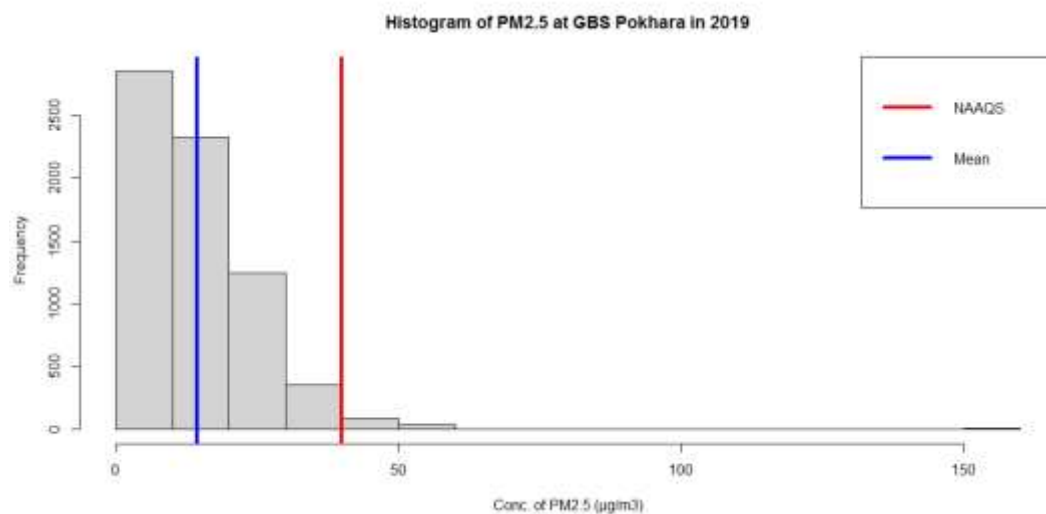


Figure 60 : Histogram of PM<sub>2.5</sub>

### Daily average of PM<sub>2.5</sub>:

Daily average concentration of PM<sub>2.5</sub> was high during November and was found low during August.

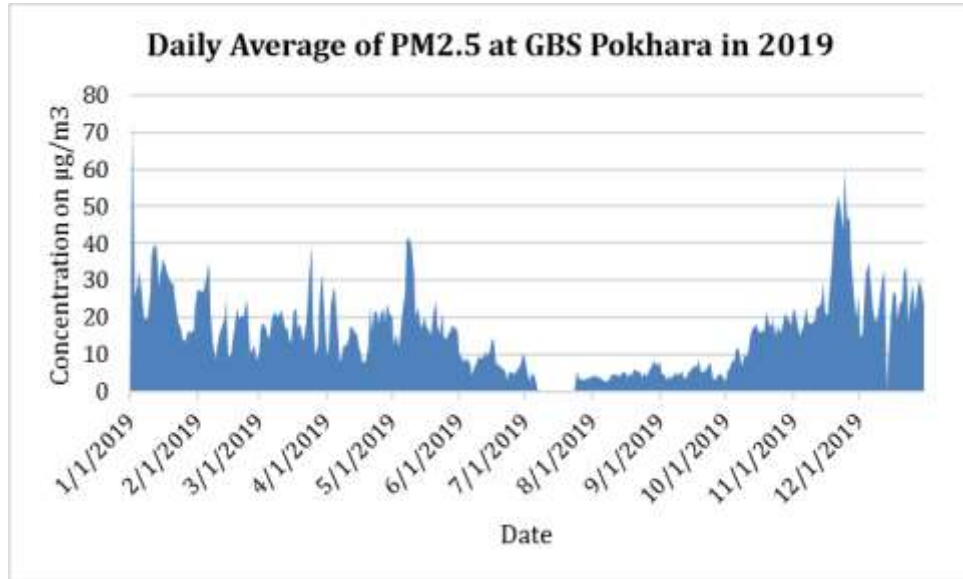


Figure 61: Daily average of PM<sub>2.5</sub>

### Monthly average of PM<sub>2.5</sub>

The highest and the lowest concentration of PM<sub>2.5</sub> was found during January and July respectively. The mean value for those months were found to be 27.04 and 4.24 µg/m<sup>3</sup> respectively.

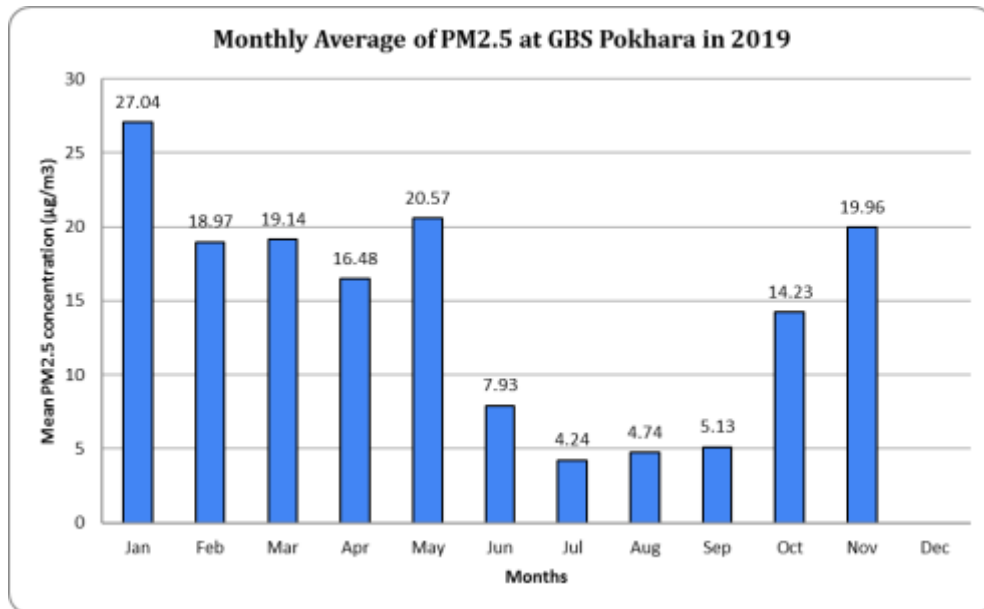


Figure 62: Monthly Average of PM<sub>2.5</sub>



## Monthly variation of PM<sub>2.5</sub>

Variation in concentration of PM<sub>2.5</sub> was found more during January whereas low during July.

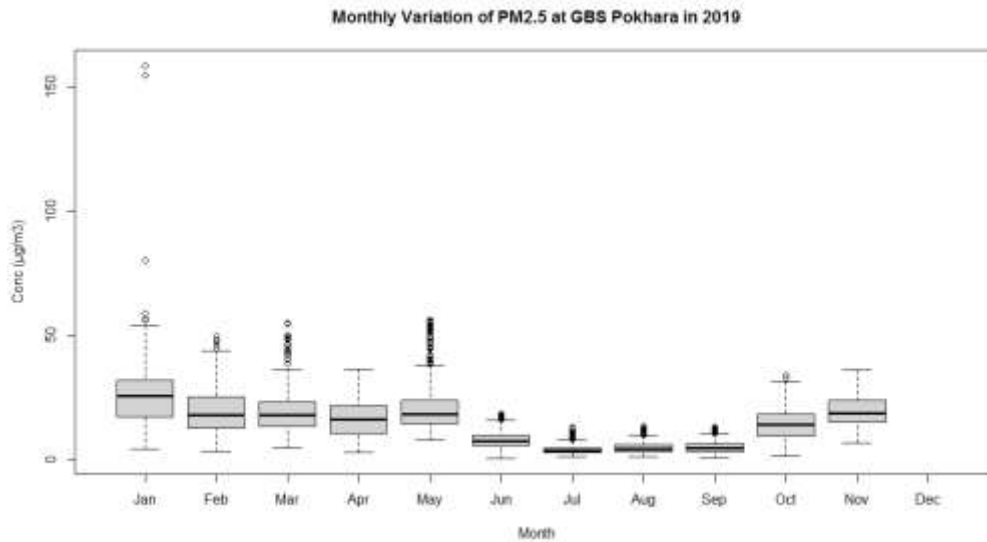


Figure 63: Monthly Variation of PM<sub>2.5</sub>

## Seasonal variation of average PM<sub>2.5</sub> concentration

Ambient concentration of average PM<sub>2.5</sub> during winter, pre-monsoon, monsoon and post-monsoon can be shown in the Figure 6 below. The concentration of PM<sub>2.5</sub> was found the highest and lowest during winter (30.12 µg/m<sup>3</sup>) than monsoon season (5.64 µg/m<sup>3</sup>) respectively .

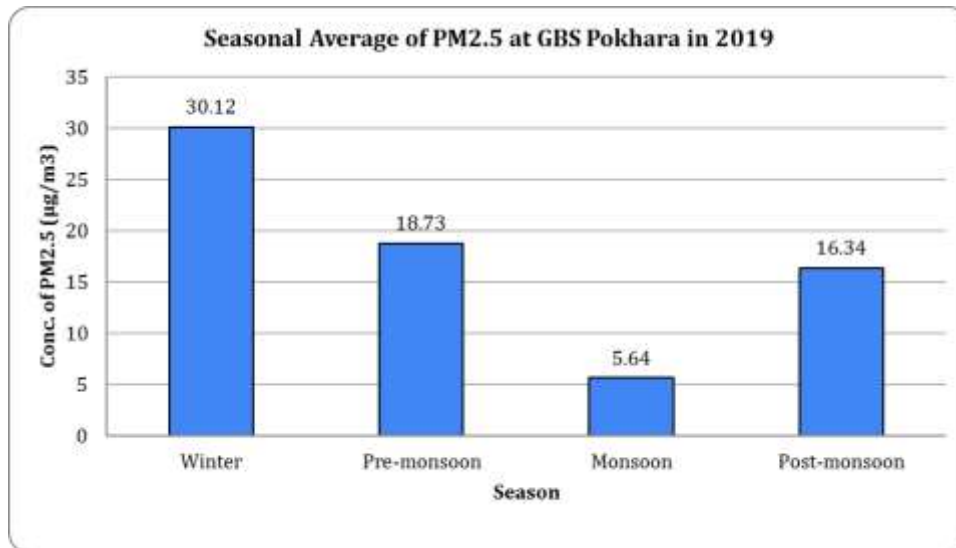


Figure 64: Seasonal variation of PM<sub>2.5</sub>

### Diurnal variation of average PM<sub>2.5</sub> concentration

The diurnal variation of average PM<sub>2.5</sub> concentrations can be shown in the figure below. The variation in PM<sub>2.5</sub> concentration was high at around 6-7 pm and low at 11am to 2 pm.

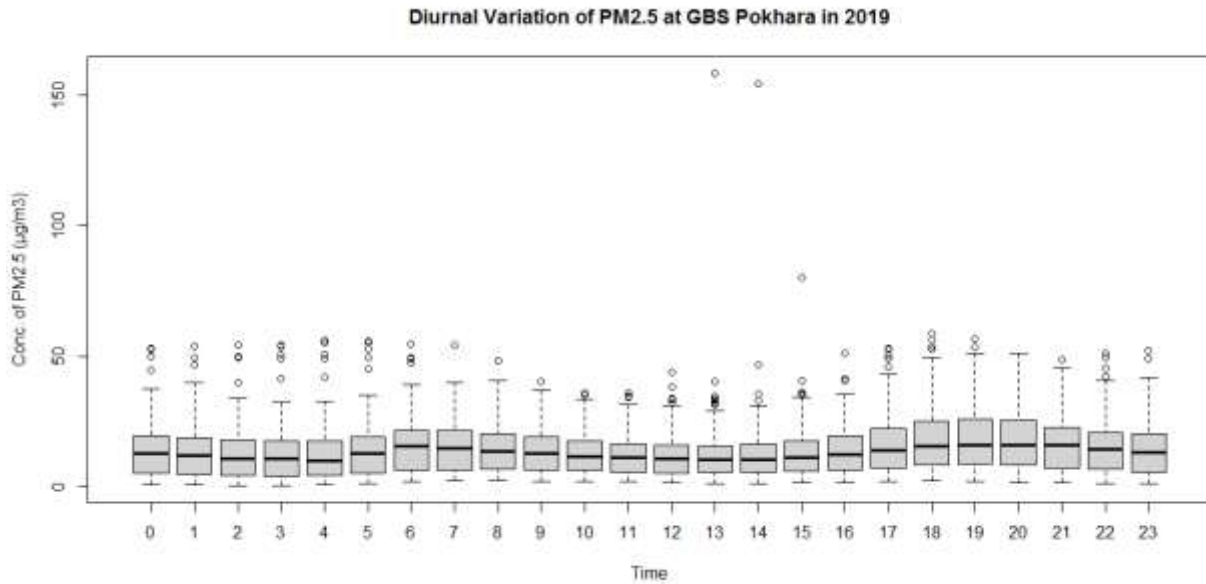


Figure 65: Diurnal variation of PM<sub>2.5</sub>

### Compliance status of PM<sub>2.5</sub>

The total days of PM<sub>2.5</sub> monitored in the year 2019 counts 299, of which 3 days exceed the NAAQS guideline.

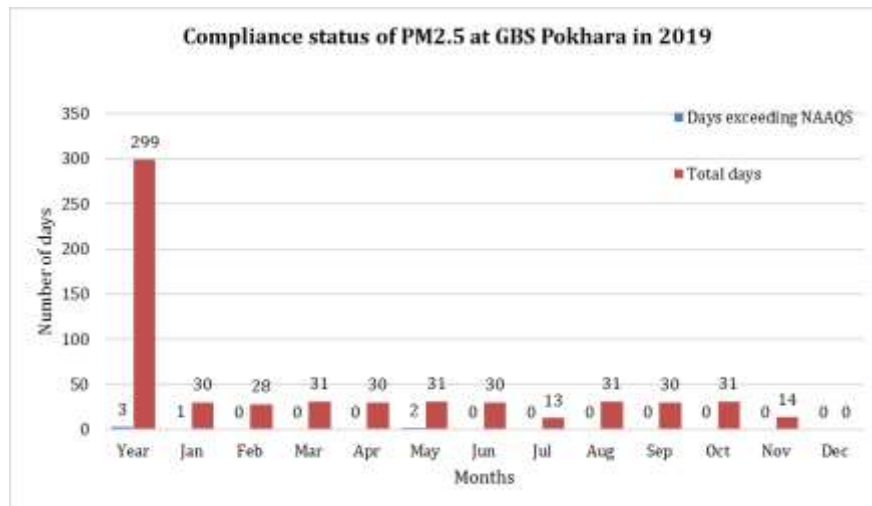


Figure 66: Compliance status of PM<sub>2.5</sub>

### 2.3.4 Temporal variation of PM<sub>10</sub>

#### Annual average of PM<sub>10</sub>

The annual average of PM<sub>10</sub> at GBS Pokhara station was found to be 15.71 µg/m<sup>3</sup>. Histogram of hourly average of PM<sub>10</sub> is shown in the figure below.

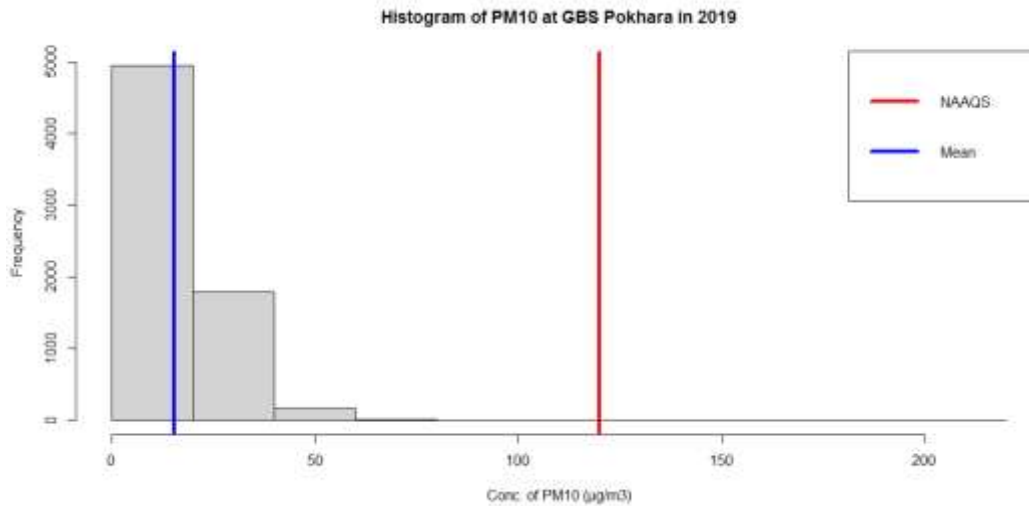


Figure 67 : Histogram for the ambient concentration of PM<sub>10</sub>.

#### Daily average of PM<sub>10</sub>:

Daily average concentration of PM<sub>10</sub> was high during May and was found low during August.

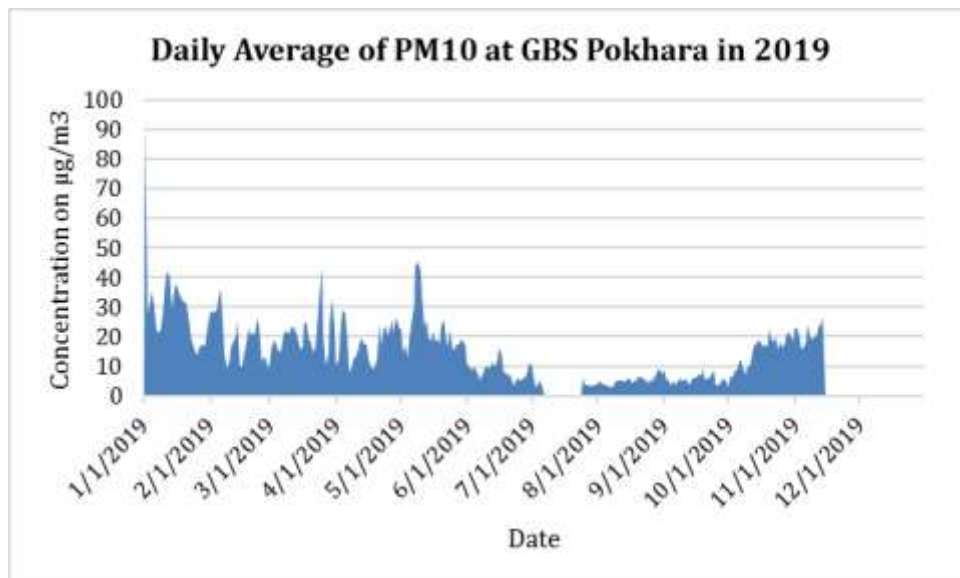


Figure 68: Daily average of PM<sub>10</sub>

### Monthly average of PM<sub>10</sub>

The highest and the lowest concentration of PM<sub>10</sub> was found during January and July respectively. The mean value for those months were found to be 29.42 and 4.58  $\mu\text{g}/\text{m}^3$  respectively.

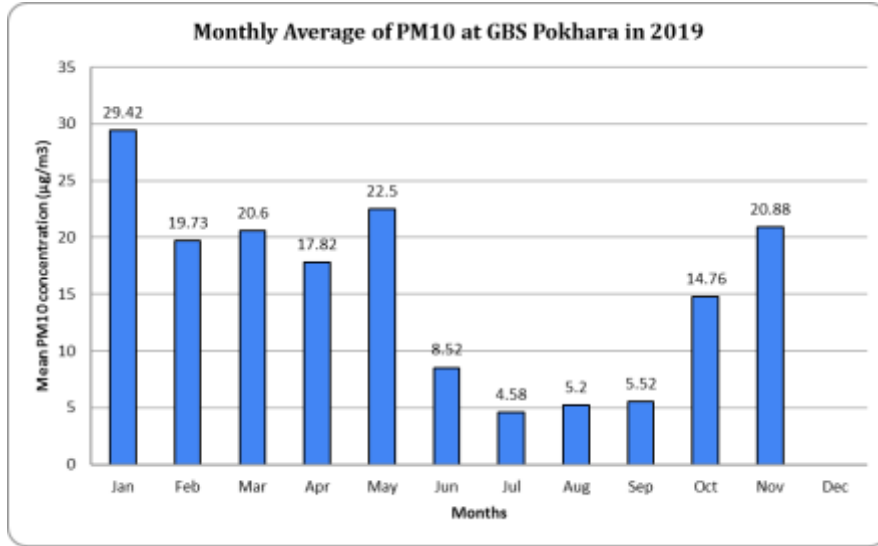


Figure 69: Monthly average of PM<sub>10</sub>

### Monthly variation of PM<sub>10</sub>

Variation in concentration of PM<sub>10</sub> was found more during January and low during July.

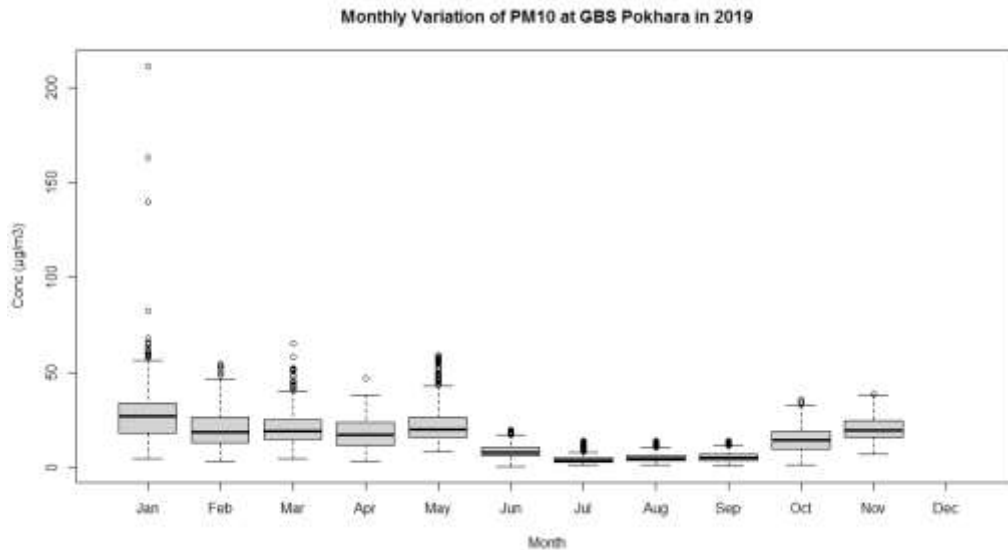


Figure 70: Monthly Variation of PM<sub>10</sub>

### Seasonal variation of average PM<sub>10</sub> concentration:

Ambient concentration of average PM<sub>2.5</sub> during winter, pre-monsoon, monsoon and post-monsoon can be shown in the figure below. The concentration of PM<sub>2.5</sub> was found the highest and lowest during winter (81.58  $\mu\text{g}/\text{m}^3$ ) than monsoon season (6.1 $\mu\text{g}/\text{m}^3$ ) respectively.

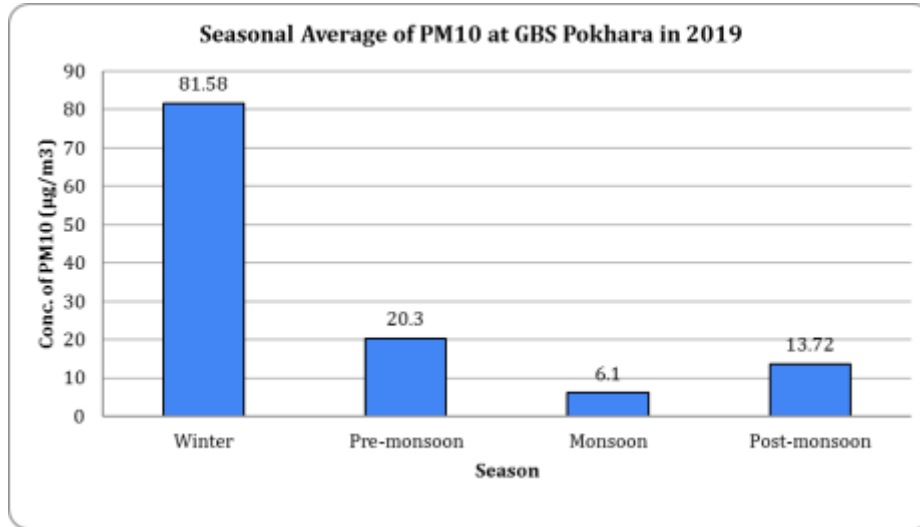


Figure 71: Seasonal variation of PM<sub>10</sub>.

### Diurnal variation of average PM<sub>10</sub> concentration

The diurnal variation of average PM<sub>10</sub> concentrations can be shown in the figure below. The variation in PM<sub>10</sub> concentration was high at around 6-7 pm and low at 1 pm.

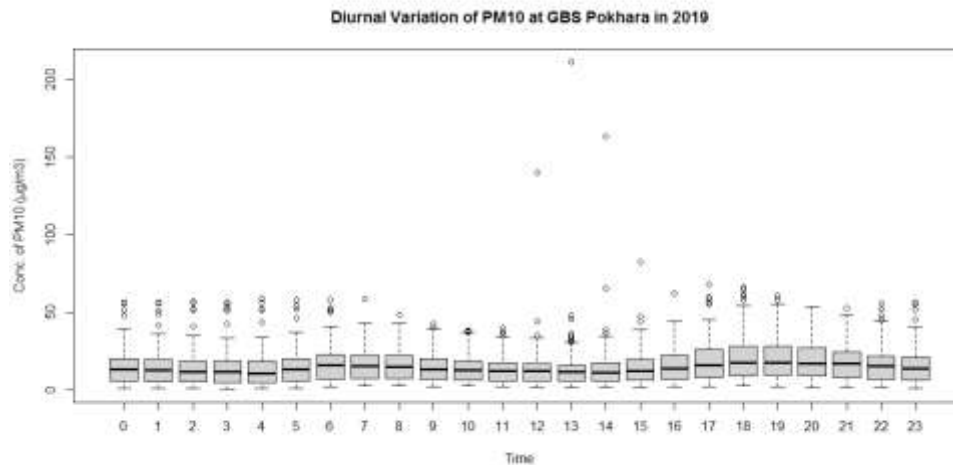


Figure 72: Diurnal variation of PM<sub>10</sub> concentration

### Compliance status of PM<sub>10</sub>

The total days of PM<sub>10</sub> monitored in the year 2019 counts 299 of which none of the days exceed the NAAQS guideline.

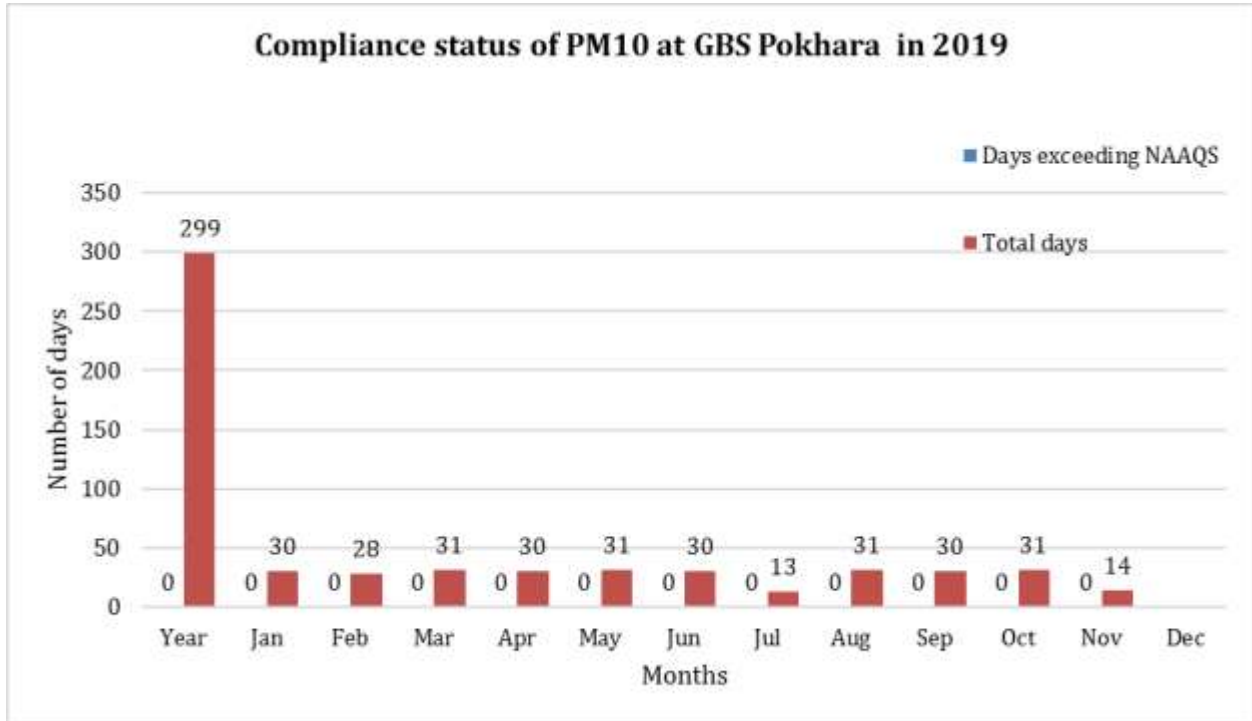


Figure 73: Compliance status of PM<sub>10</sub>

### 2.3.5 Temporal variation of TSP

#### Annual average of TSP

The annual average of TSP at GBS Pokhara station was found to be 21.32  $\mu\text{g}/\text{m}^3$ . Histogram of hourly average of TSP is shown in the figure below.

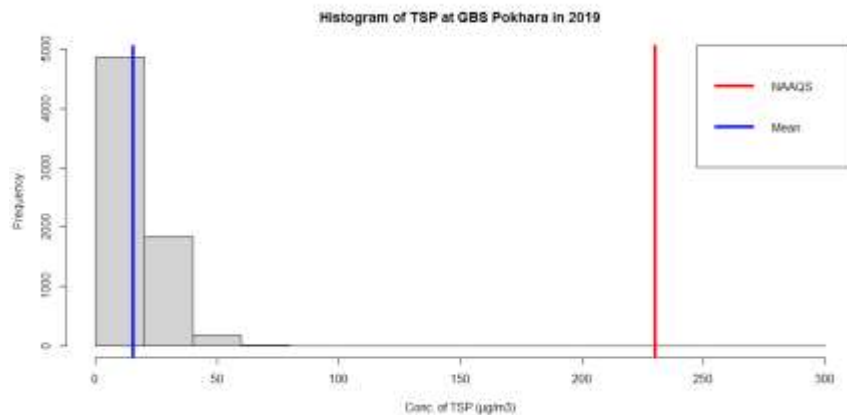


Figure 74 : Histogram for the ambient concentration of TSP

### Daily average of TSP:

Daily average concentration of TSP was high during November and December and was found low during August.

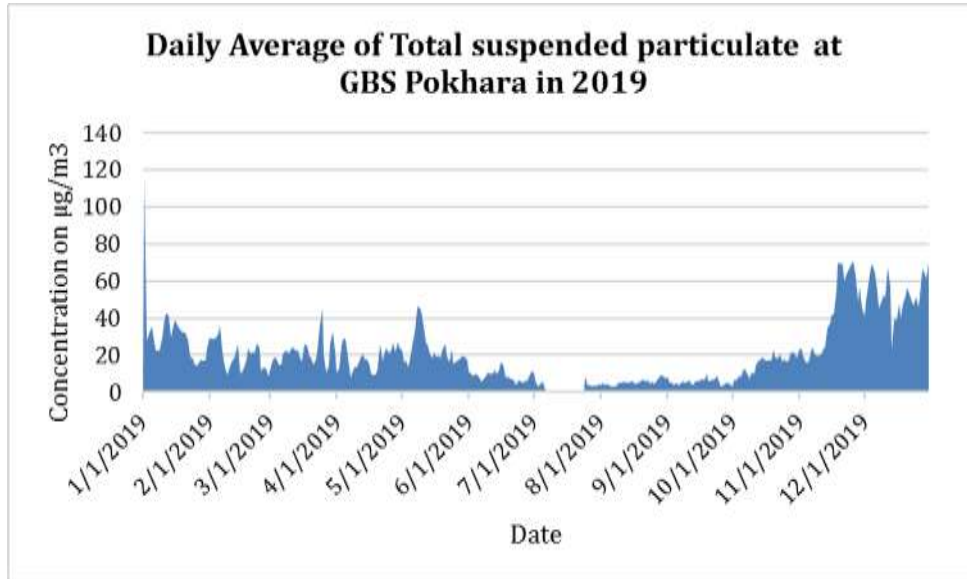


Figure 75: Daily average of TSP

### Monthly average of TSP

The highest and the lowest concentration of TSP was found during January and July respectively. The mean value for those months were found to be 30.61 and 4.8 µg/m<sup>3</sup> respectively.

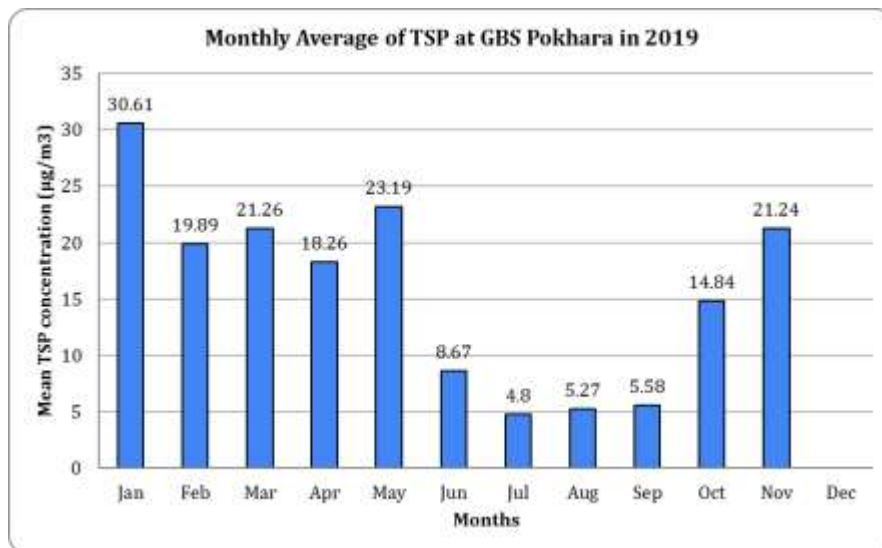


Figure 76: Monthly Average of TSP

## Monthly variation of TSP

Variation in concentration of TSP was found more during January and low during July.

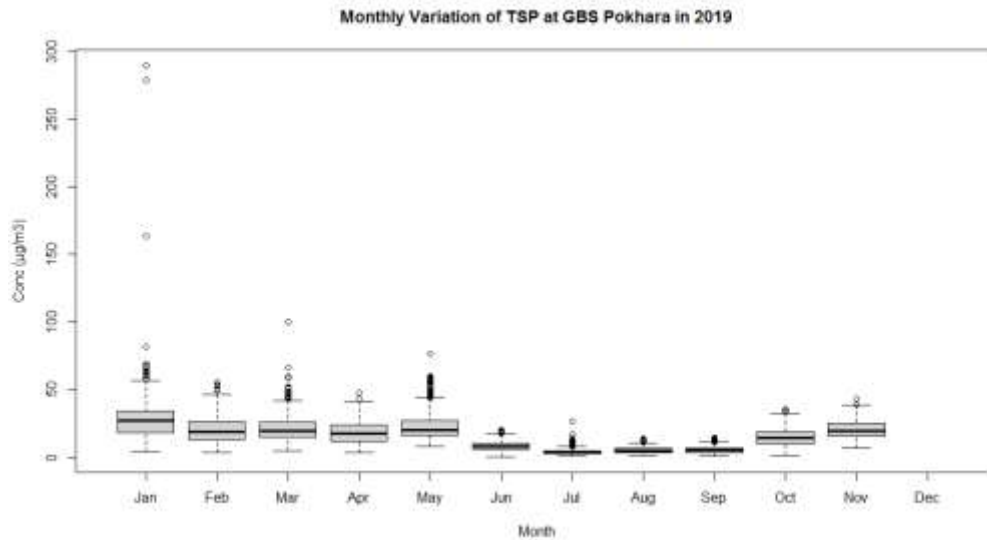


Figure 77: Monthly Variation of TSP.

## Seasonal variation of average TSP concentration

Ambient concentration of average TSP during winter, pre-monsoon, monsoon and post-monsoon can be shown in the figure below. The concentration of TSP was found the highest and lowest during winter ( $31.99 \mu\text{g}/\text{m}^3$ ) than monsoon season ( $6.25 \mu\text{g}/\text{m}^3$ ) respectively.

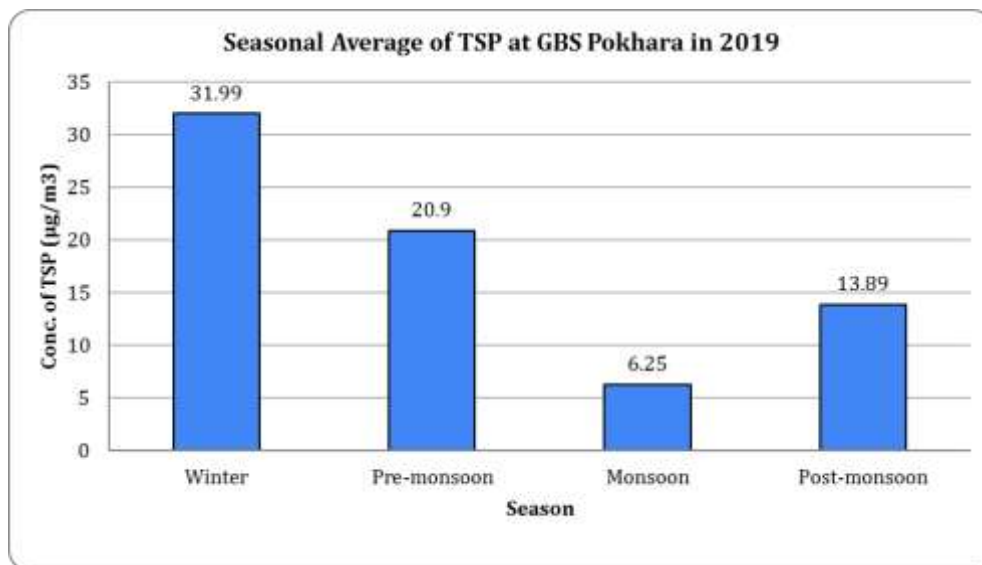


Figure 78: Seasonal variation of TSP



### Diurnal variation of average TSP concentration

The diurnal variation of average TSP concentrations can be shown in the figure below. The variation in TSP concentration was high at around 6-7 pm and low at 12 to 2 pm.

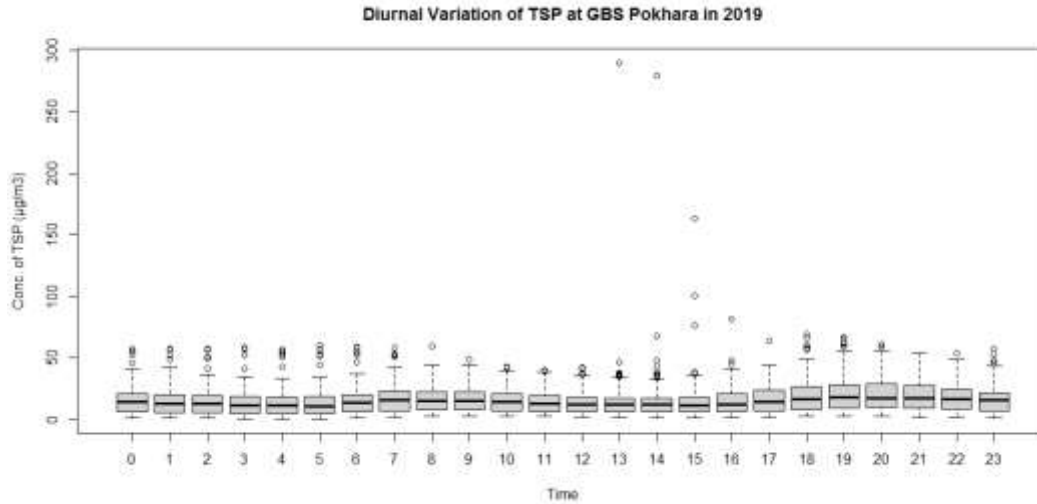


Figure 79: Diurnal Variation of TSP

### Compliance status of TSP

The total days of TSP monitored in the year 2019 counts 299 of which none of the days exceed the NAAQS guideline.

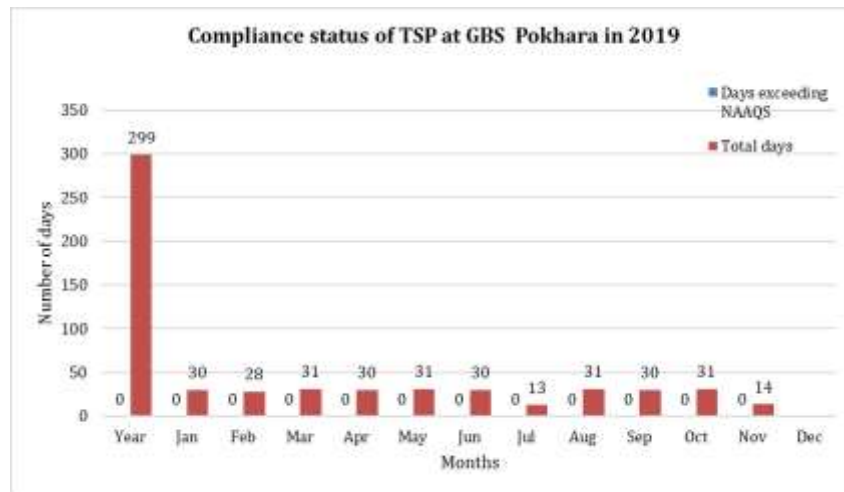


Figure 80: Compliance status of TSP

## 2.4 Air quality status, 2020

### 2.4.1 Annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP

The annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP of the GBS Pokhara monitoring station was calculated as shown in figure below.

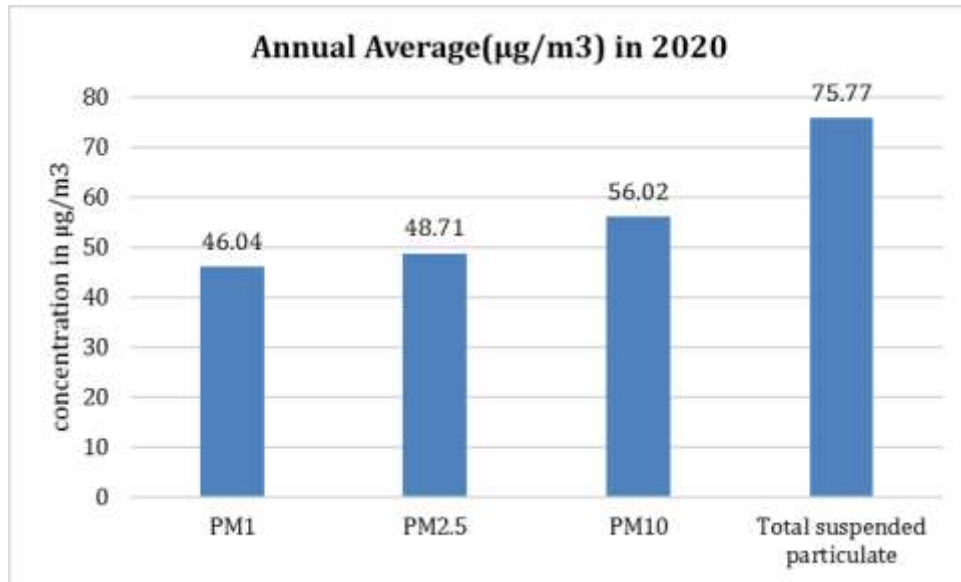


Figure 81: Annual average of PM<sub>1</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and TSP in 2020

### 2.4.2 Temporal variation of PM<sub>1</sub>

#### Annual average of PM<sub>1</sub>

The annual average of PM<sub>1</sub> at GBS Pokhara station was found to be 46.04 µg/m<sup>3</sup>. Histogram of hourly average of PM<sub>1</sub> is shown in the figure below.

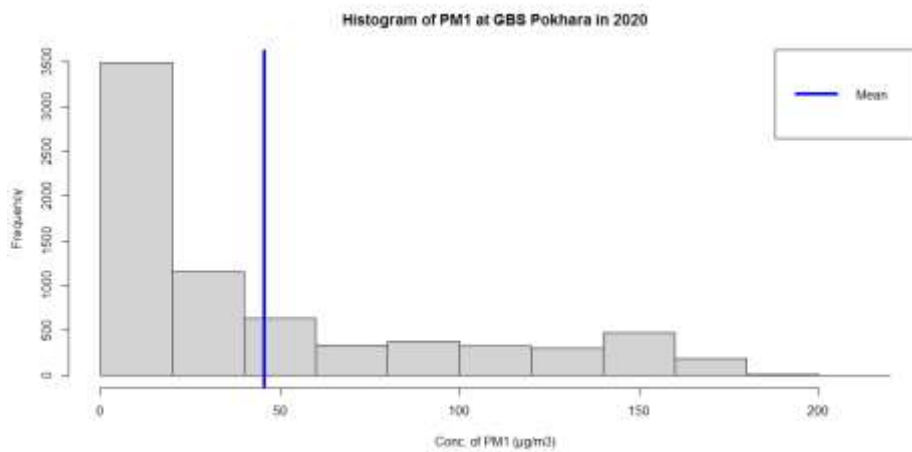


Figure 82 : Histogram of PM<sub>1</sub>.

### Daily average of PM<sub>1</sub>:

Daily average concentration of PM<sub>1</sub> was high during December and was found low during July.

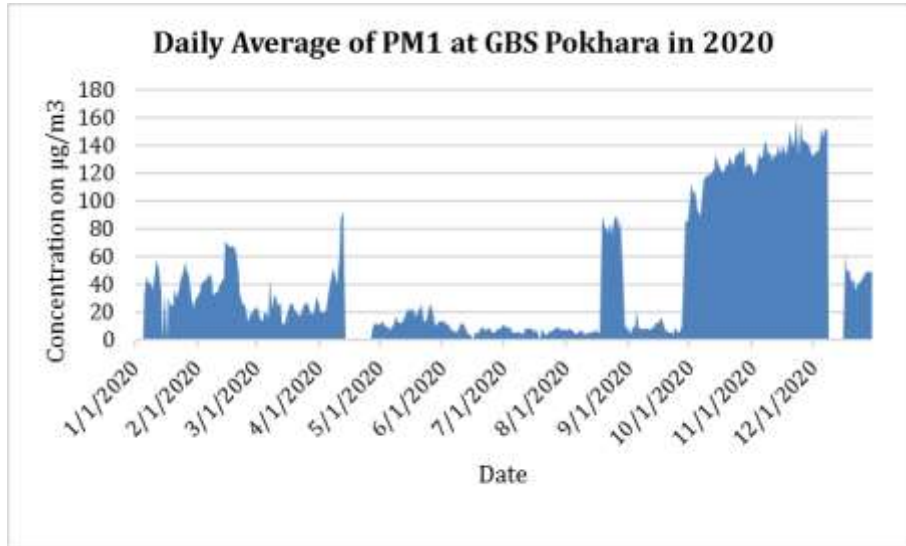


Figure 83: Daily average of PM<sub>1</sub>

### Monthly average of PM<sub>1</sub>

The highest and the lowest concentration of PM<sub>1</sub> was found during November and July respectively. The mean value for those months were found to be 137.63 and 6.74 µg/m<sup>3</sup> respectively.

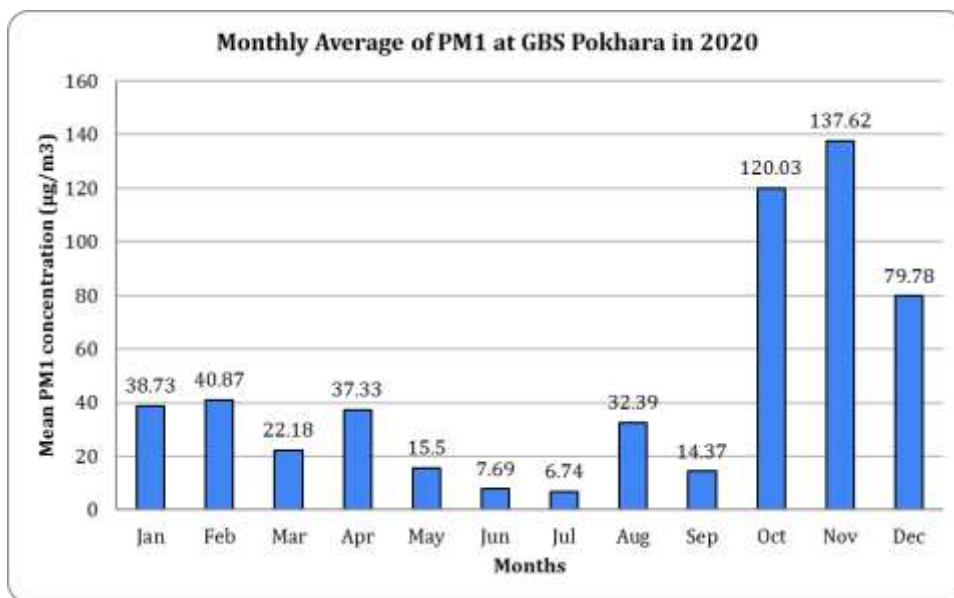


Figure 84: Monthly Average of PM<sub>1</sub>

## Monthly variation of PM<sub>1</sub>

Variation in concentration of PM<sub>1</sub> was found more during December whereas low during June and July.

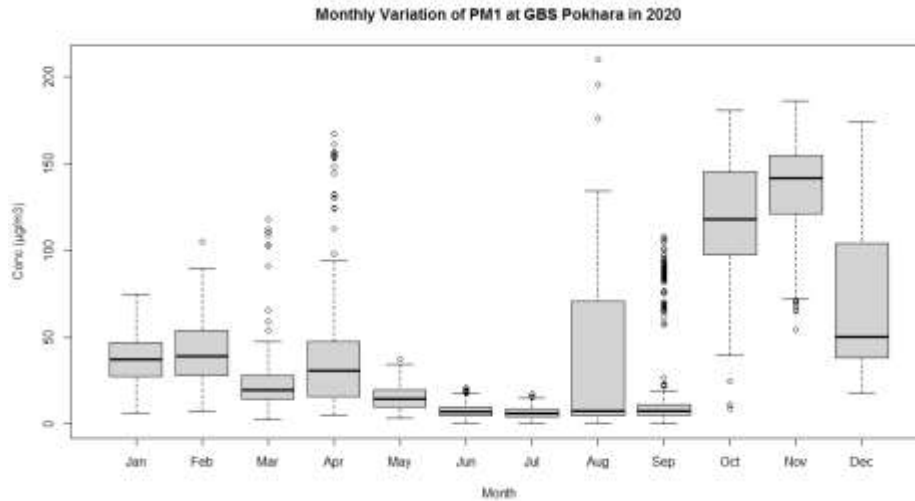


Figure 85: Monthly Variation of PM<sub>1</sub>

## Seasonal variation of PM<sub>1</sub> concentration

Ambient concentration of average TSP during pre-monsoon, monsoon and post-monsoon can be shown in the figure below. The concentration of PM<sub>1</sub> was found the highest and lowest during post-monsoon (90.67 µg/m<sup>3</sup>) than monsoon season (15.61 µg/m<sup>3</sup>) respectively.

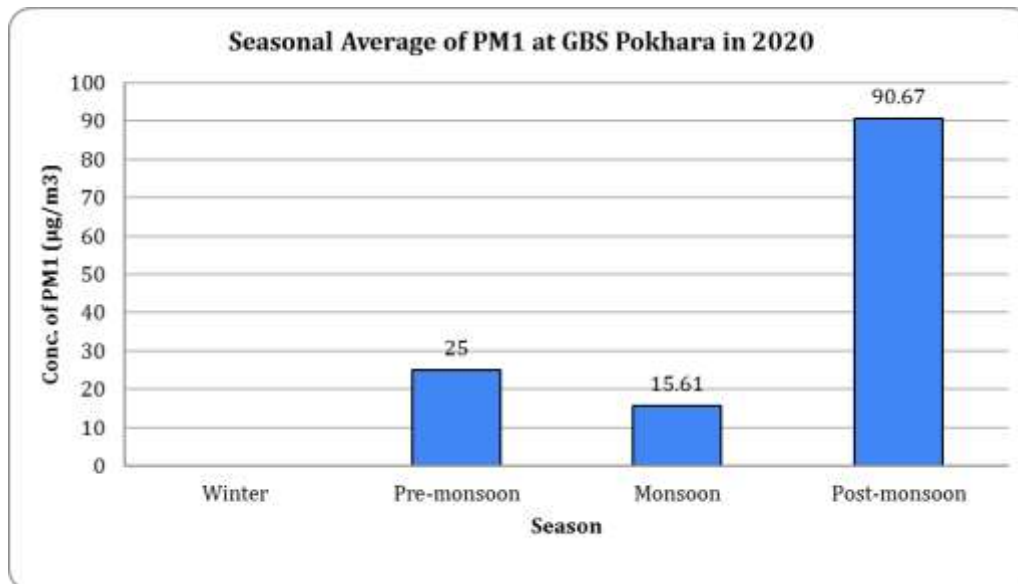


Figure 86: Seasonal variation of PM<sub>1</sub>

## Diurnal variation of average PM<sub>1</sub> concentration

The diurnal variation of average PM<sub>1</sub> concentrations can be shown in the figure below.

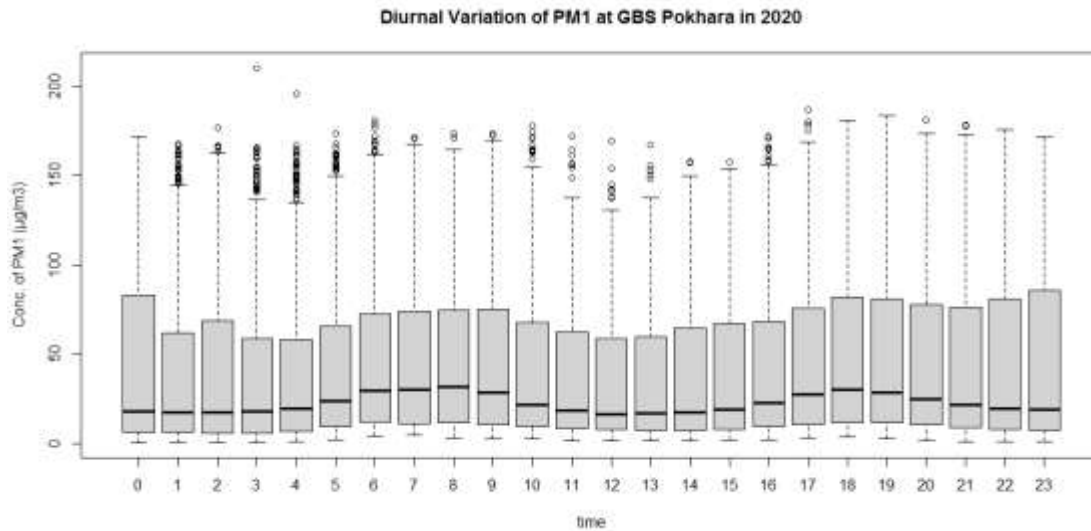


Figure 87: Diurnal variation of PM<sub>1</sub>

### 2.4.3 Temporal variation of PM<sub>2.5</sub>

#### Annual average of PM<sub>2.5</sub>

The annual average of PM<sub>2.5</sub> at GBS Pokhara station was found to be 48.71 µg/m<sup>3</sup>. Histogram of hourly average of PM<sub>2.5</sub> is shown in the figure below.

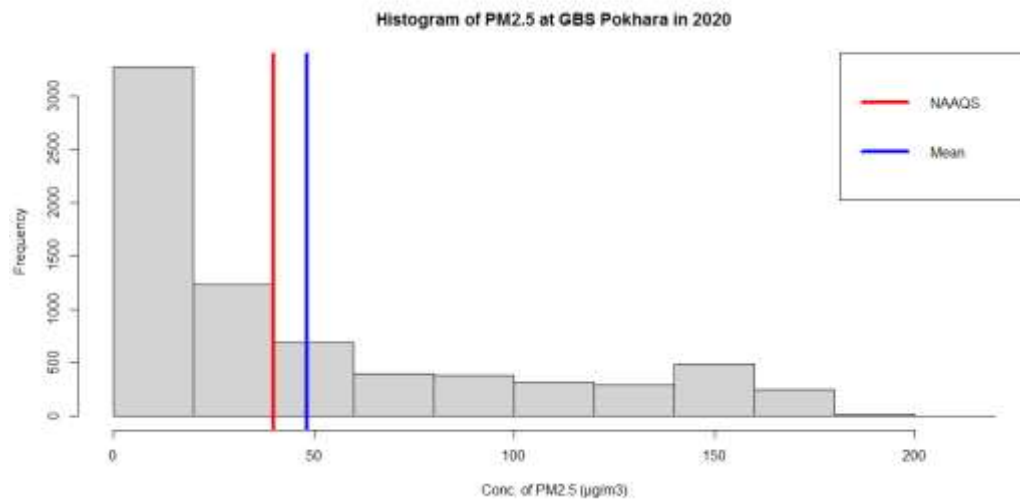


Figure 88 : Histogram of PM<sub>2.5</sub>

### Daily average of PM<sub>2.5</sub>:

Daily average concentration of PM<sub>2.5</sub> was high during December and was found low during July.

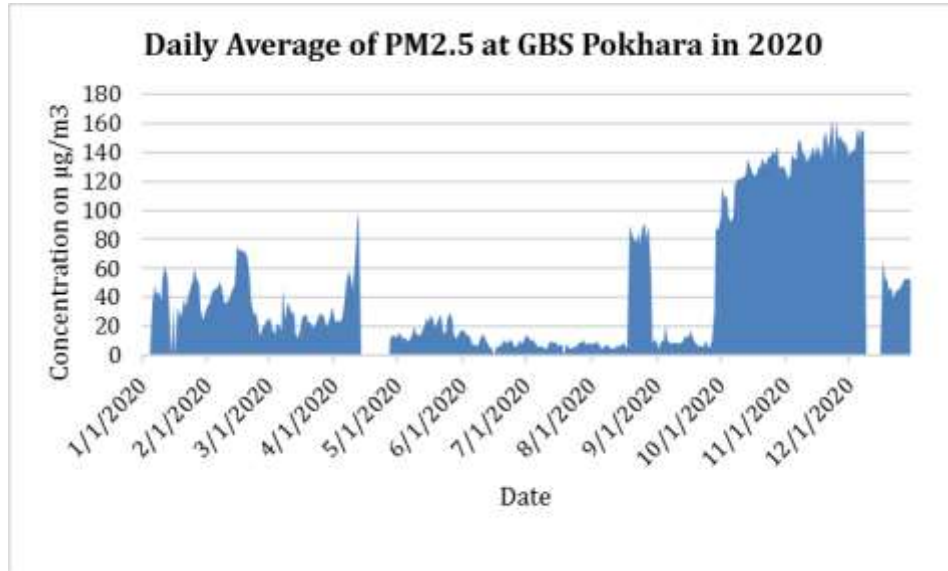


Figure 89: Daily average of PM<sub>2.5</sub>

### Monthly average of PM<sub>2.5</sub>

The highest and the lowest concentration of PM<sub>2.5</sub> was found during November and July respectively. The mean value for those months were found to be 141.94 and 8.06 µg/m<sup>3</sup> respectively.

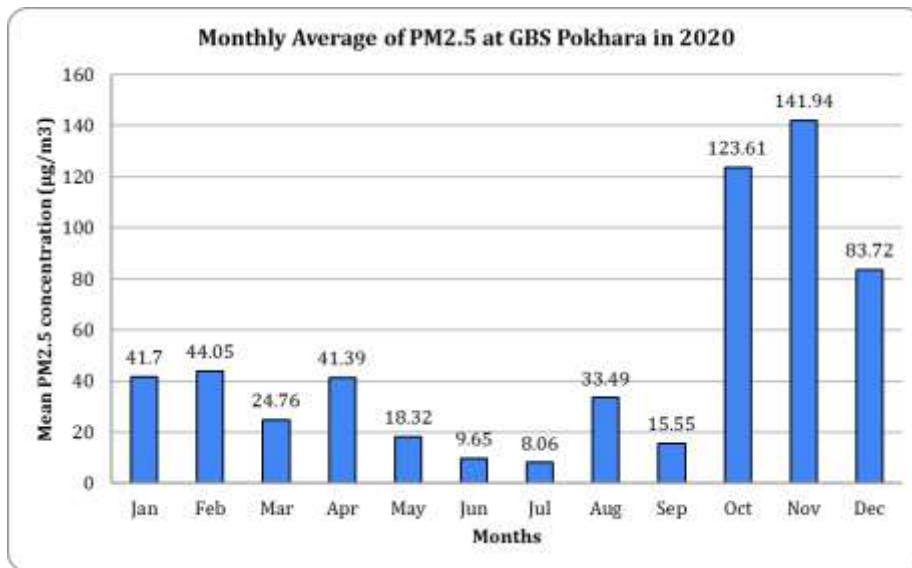


Figure 90: Monthly Average of PM<sub>2.5</sub>

## Monthly variation of PM<sub>2.5</sub>

Variation in concentration of PM<sub>2.5</sub> was found more during December whereas low during July.

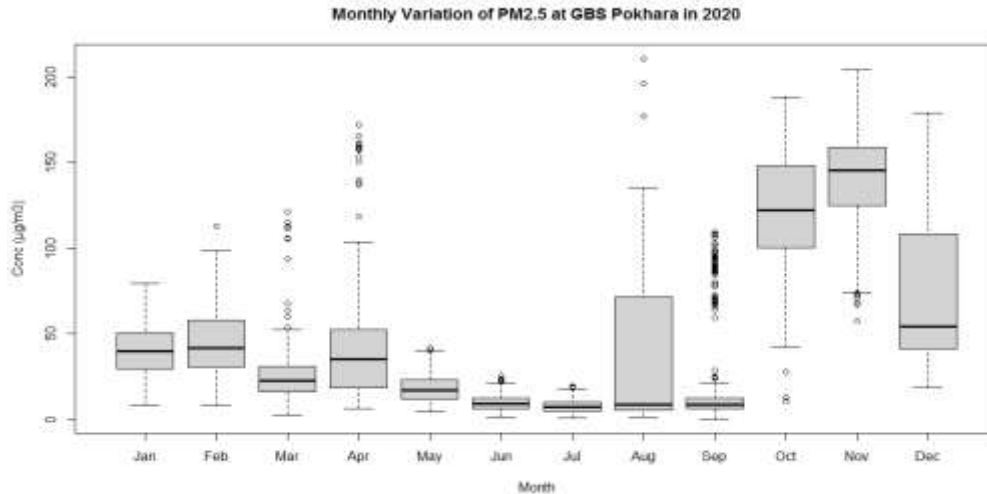


Figure 91: Monthly Variation of PM<sub>2.5</sub>

## Seasonal variation of average PM<sub>2.5</sub> concentration

Ambient concentration of average TSP during winter, pre-monsoon, monsoon and post-monsoon can be shown in the figure below. The concentration of PM<sub>2.5</sub> was found the highest and lowest during post-monsoon (93.7 µg/m<sup>3</sup>) than monsoon season (17.07 µg/m<sup>3</sup>) respectively **Error! Reference source not found.**

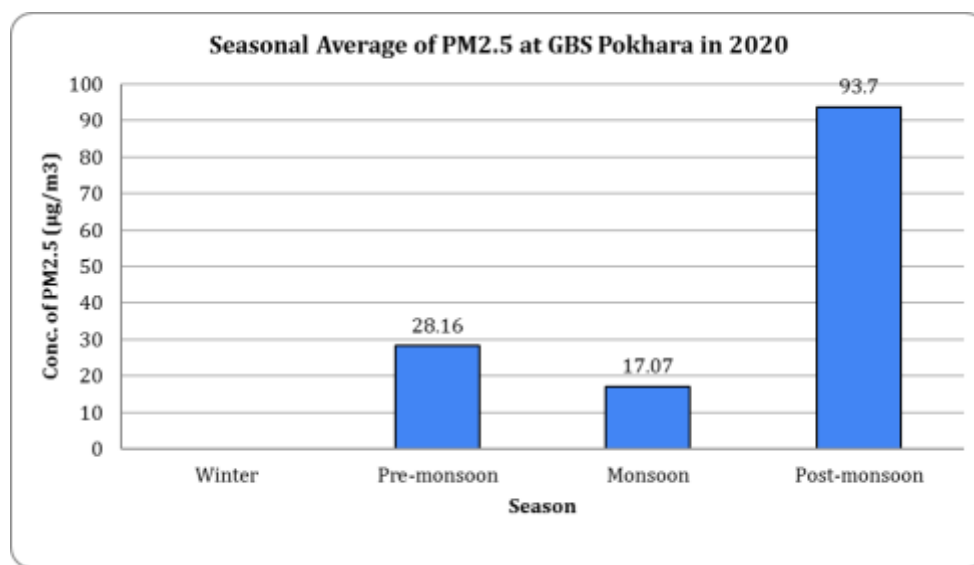


Figure 92: Seasonal variation of PM<sub>2.5</sub>

## Diurnal variation of average PM<sub>2.5</sub> concentration

The diurnal variation of average PM<sub>2.5</sub> concentrations can be shown in the figure below.

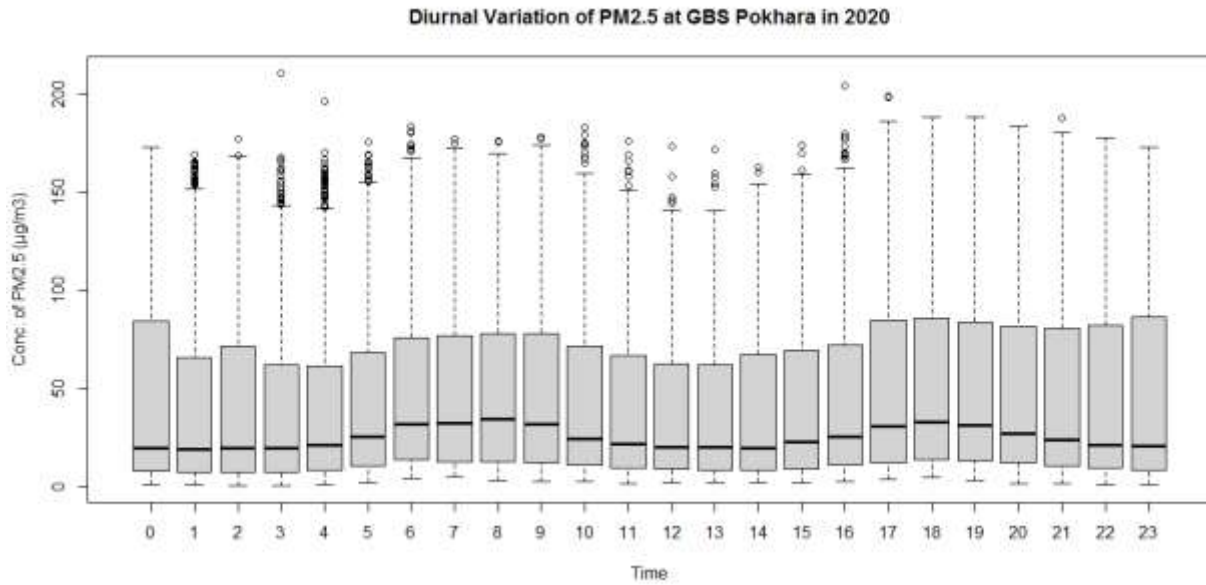


Figure 93: Diurnal variation of PM<sub>2.5</sub>

## Compliance status of PM<sub>2.5</sub>

The total days of PM<sub>2.5</sub> monitored in the year 2020 counts 334, of which 131 days exceed the NAAQS guideline.

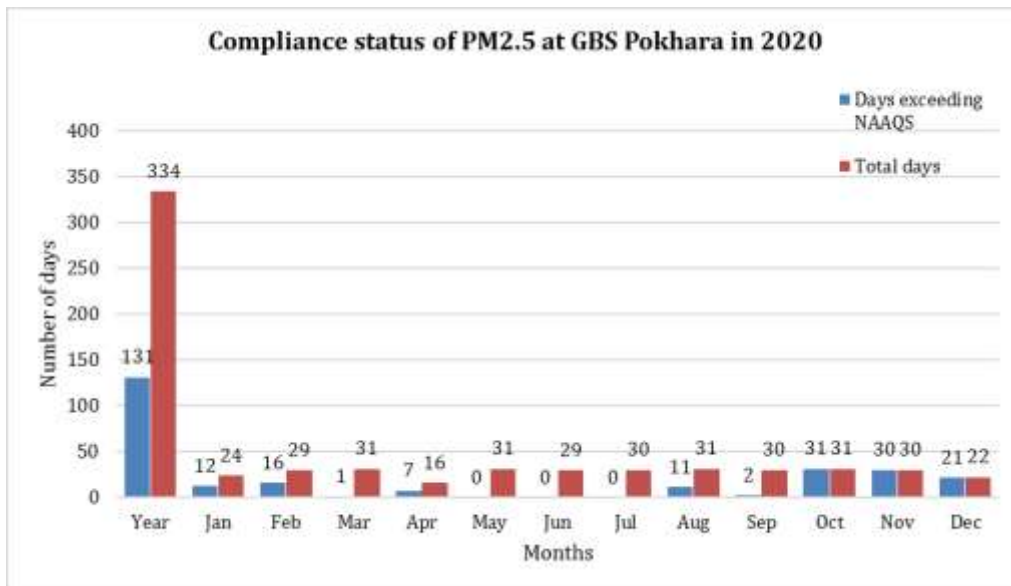


Figure 94: Compliance status of PM<sub>2.5</sub>



#### 2.4.4 Temporal variation of PM<sub>10</sub>

##### Annual average of PM<sub>10</sub>

The annual average of PM<sub>10</sub> at GBS Pokhara station was found to be 56.02 µg/m<sup>3</sup>. Histogram of hourly average of PM<sub>10</sub> is shown in the figure below.

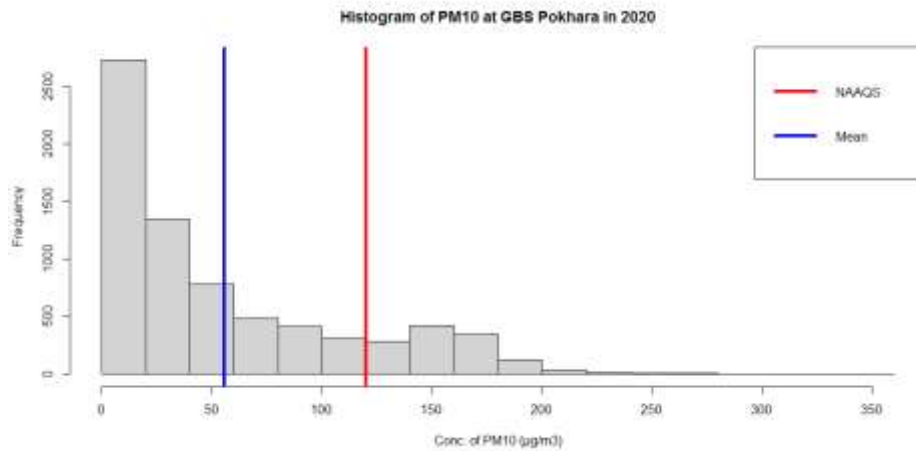


Figure 95 : Histogram for the ambient concentration of PM<sub>10</sub>.

##### Daily average of PM<sub>10</sub>:

Daily average concentration of PM<sub>10</sub> was high during November and was found low during July.

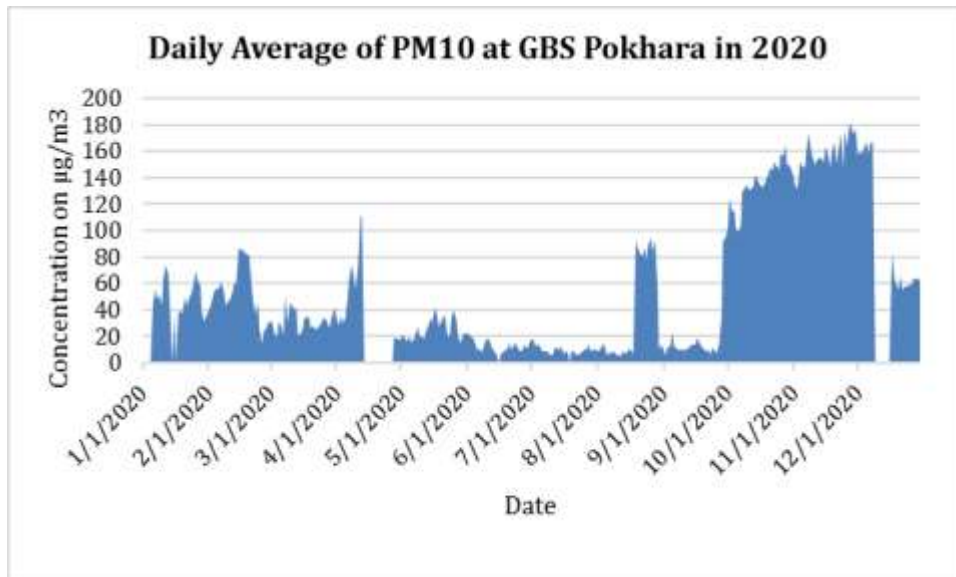


Figure 96: Daily average of PM<sub>10</sub>

### Monthly average of PM<sub>10</sub>

The highest and the lowest concentration of PM<sub>10</sub> was found during November and July respectively. The mean value for those months were found to be 158.18 and 9.95 µg/m<sup>3</sup> respectively.

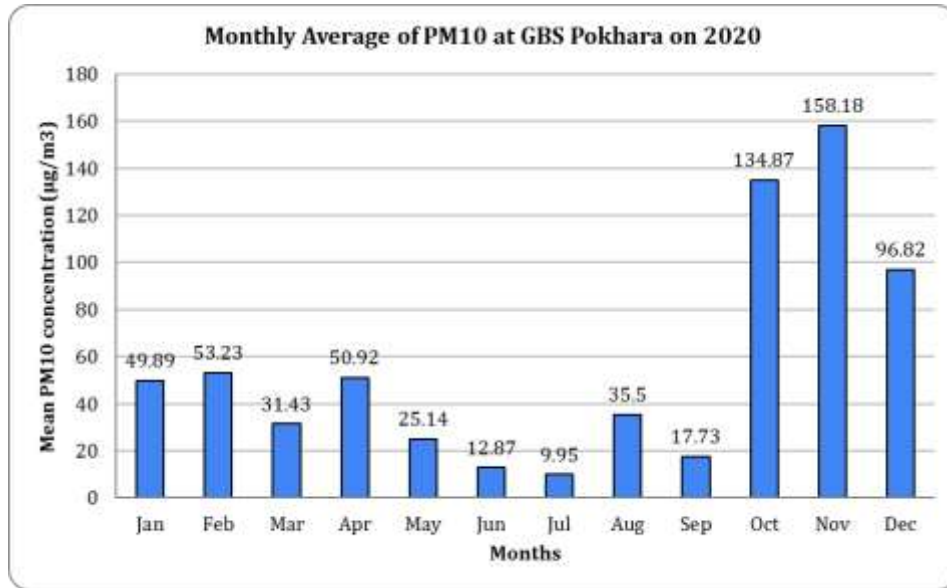


Figure 97: Monthly average of PM<sub>10</sub>

### Monthly variation of PM<sub>10</sub>

Variation in concentration of PM<sub>10</sub> was found more during December and low during July.

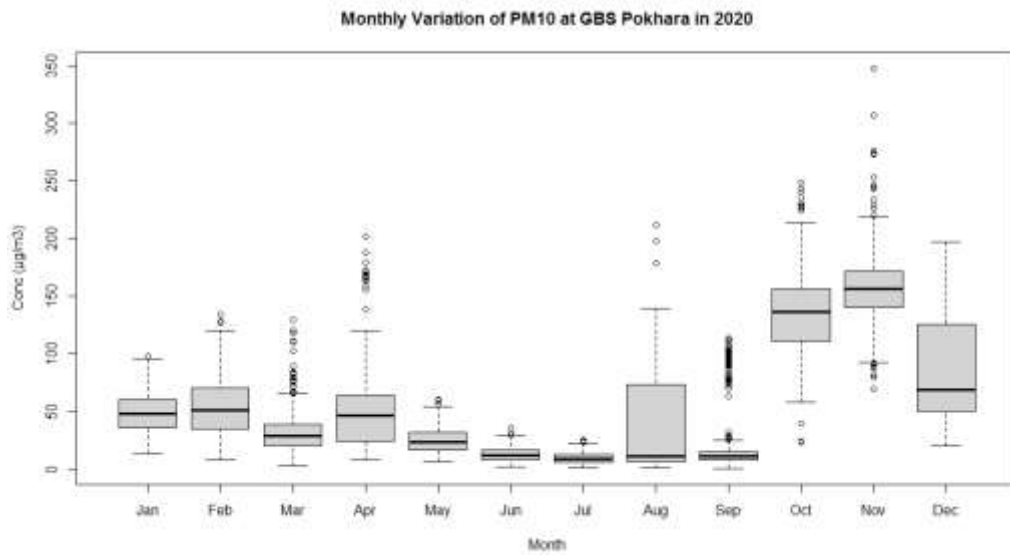


Figure 98: Monthly Variation of PM<sub>10</sub>

### Seasonal variation of average PM<sub>10</sub> concentration:

Ambient concentration of average TSP during winter, pre-monsoon, monsoon and post-monsoon can be shown in the figure below. The concentration of PM<sub>2.5</sub> was found the highest and lowest during winter (31.99 µg/m<sup>3</sup>) than monsoon season (6.25 µg/m<sup>3</sup>) respectively.

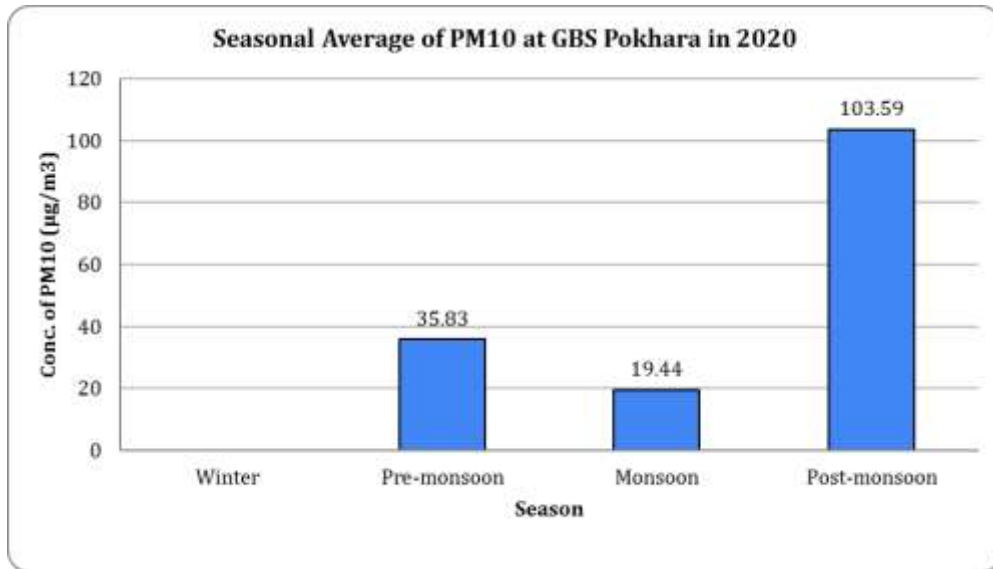


Figure 99: Seasonal variation of PM<sub>10</sub>

### Diurnal variation of average PM<sub>10</sub> concentration

The diurnal variation of average PM<sub>10</sub> concentrations can be shown in the figure below.

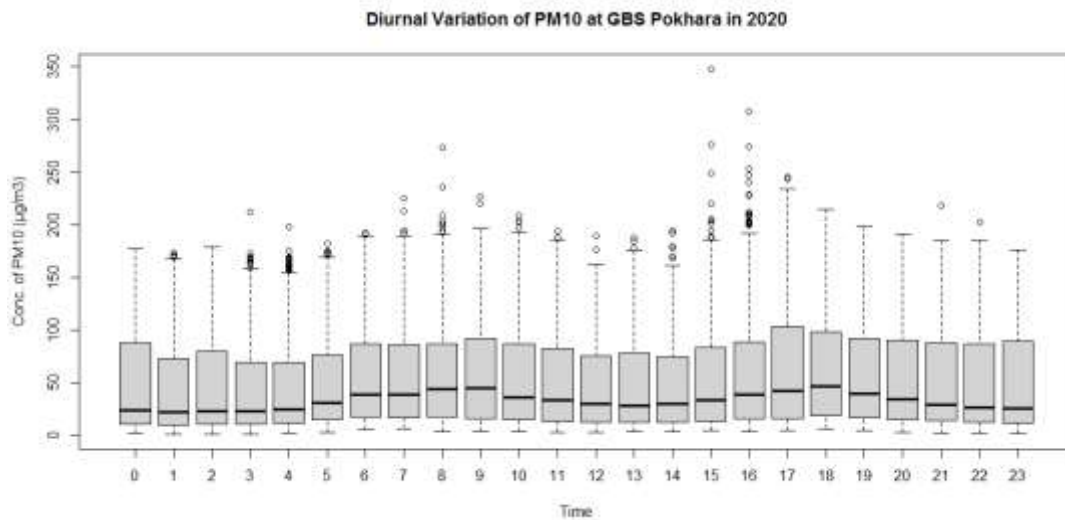


Figure 100: Diurnal variation of PM<sub>10</sub> concentration

## Compliance status of PM<sub>10</sub>

The total days of PM<sub>10</sub> monitored in the year 2020 counts 334 of which 63 days exceed the NAAQS guideline as shown in figure below.

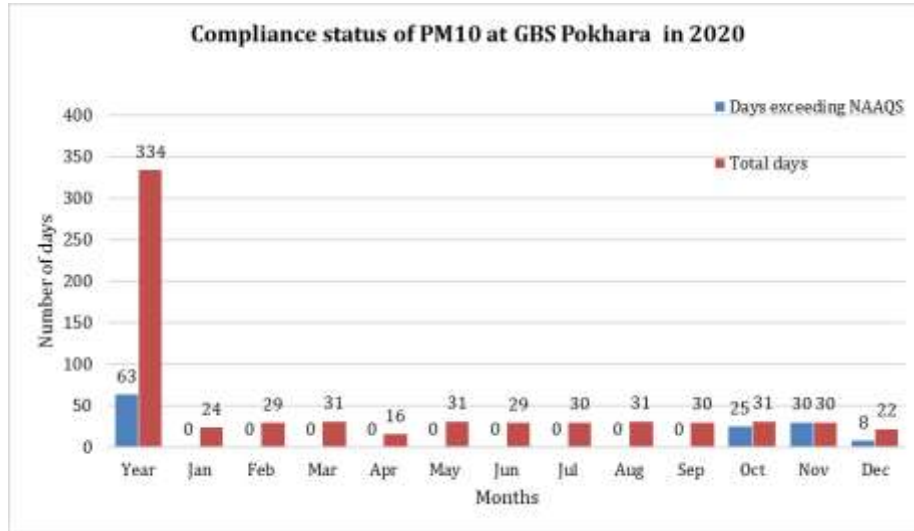


Figure 101: Compliance status of PM<sub>10</sub>

## 2.4.5 Temporal variation of TSP

### Annual average of TSP

The annual average of TSP at GBS Pokhara station was found to be 75.77  $\mu\text{g}/\text{m}^3$ . Histogram of hourly average of TSP is shown in the figure below.

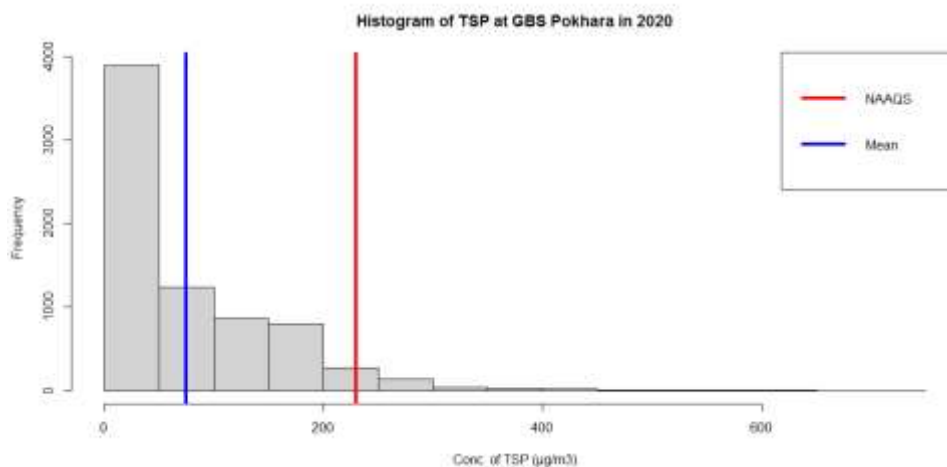


Figure 102 : Histogram for the ambient concentration of TSP

### Daily average of TSP:

Daily average concentration of TSP was high during November and December and was found low during July.

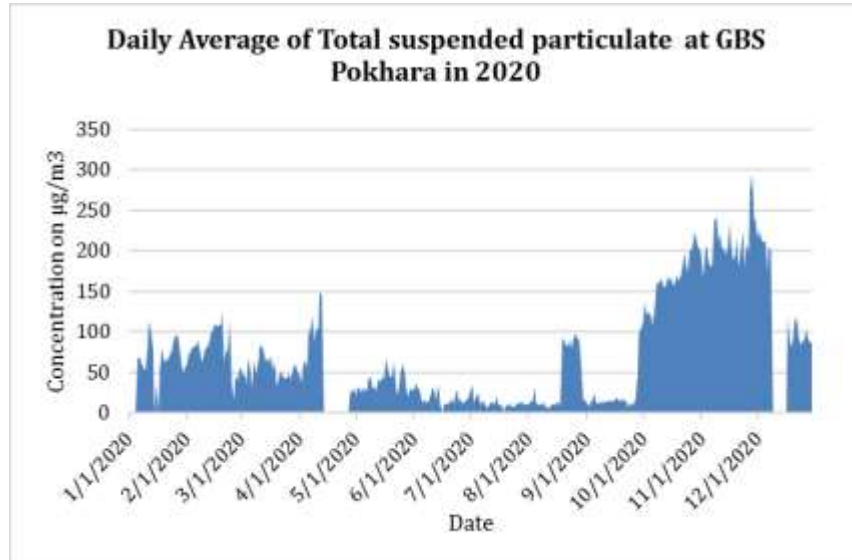


Figure 103: Daily average of TSP

### Monthly average of TSP

The highest and the lowest concentration of TSP was found during November and July respectively. The mean value for those months were found to be 210.47 and 13.05  $\mu\text{g}/\text{m}^3$  respectively.

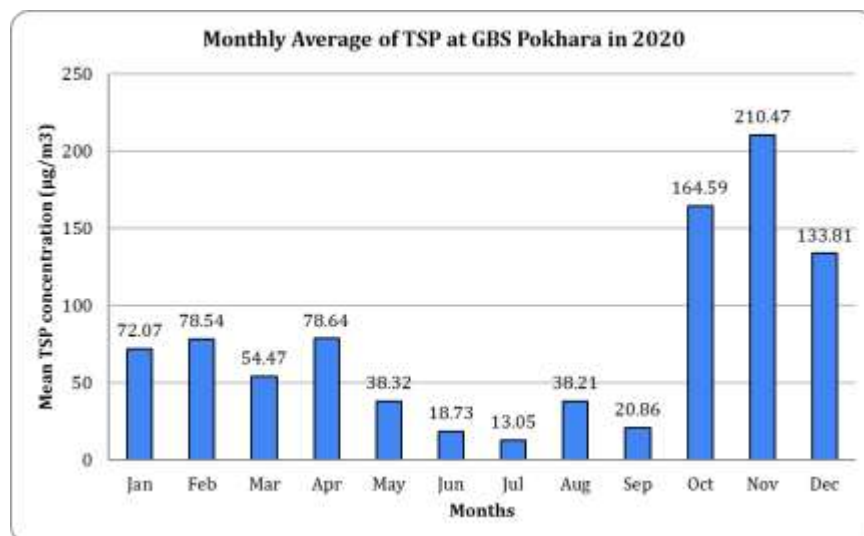


Figure 104: Monthly Average of TSP

## Monthly variation of TSP

Variation in concentration of TSP was found more during December and low during July.

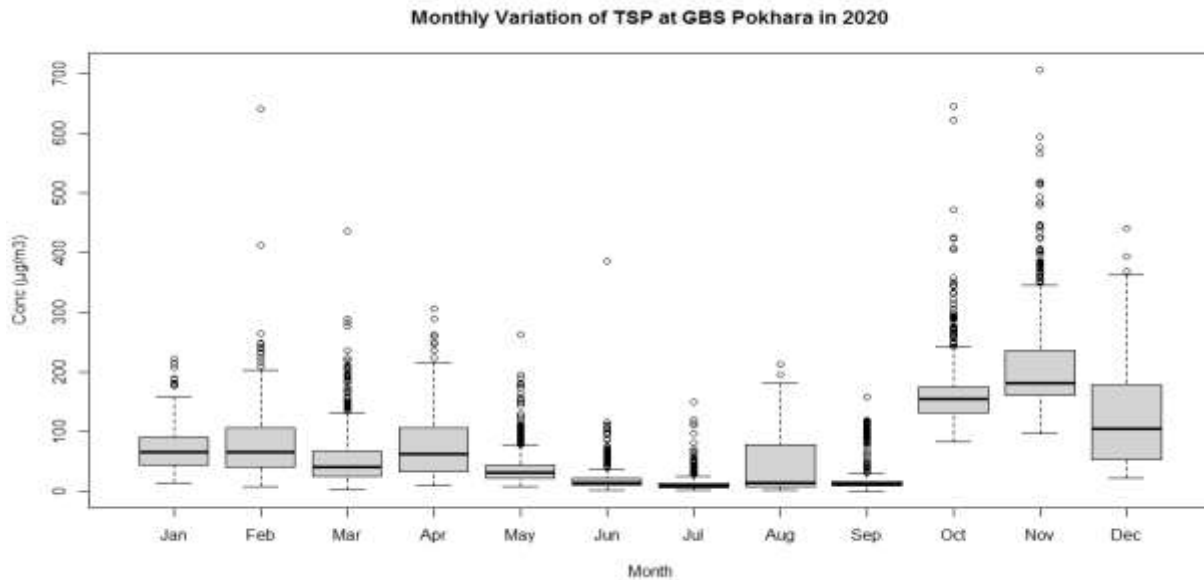


Figure 105: Monthly Variation of TSP.

## Seasonal variation of average TSP concentration

Ambient concentration of average TSP during winter, pre-monsoon, monsoon and post-monsoon can be shown in the figure below. The concentration of TSP was found the highest and lowest during post monsoon (131.97  $\mu\text{g}/\text{m}^3$ ) than monsoon season (23.33  $\mu\text{g}/\text{m}^3$ ) respectively.

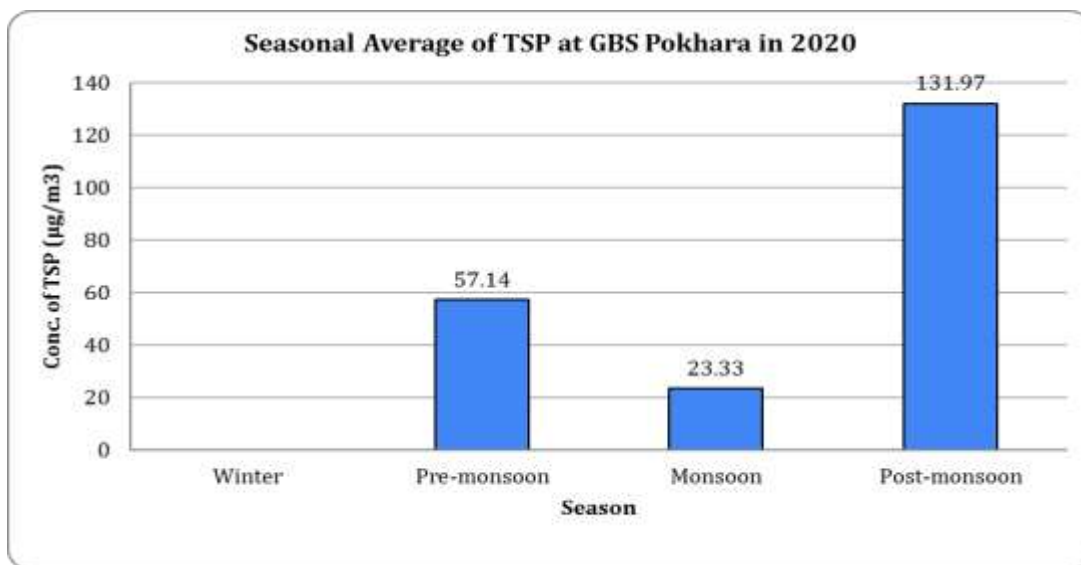


Figure 106: Seasonal variation of TSP

### Diurnal variation of average TSP concentration

The diurnal variation of average TSP concentrations can be shown in the figure below. The variation in TSP concentration was high at around 10 am and low at 3 am.

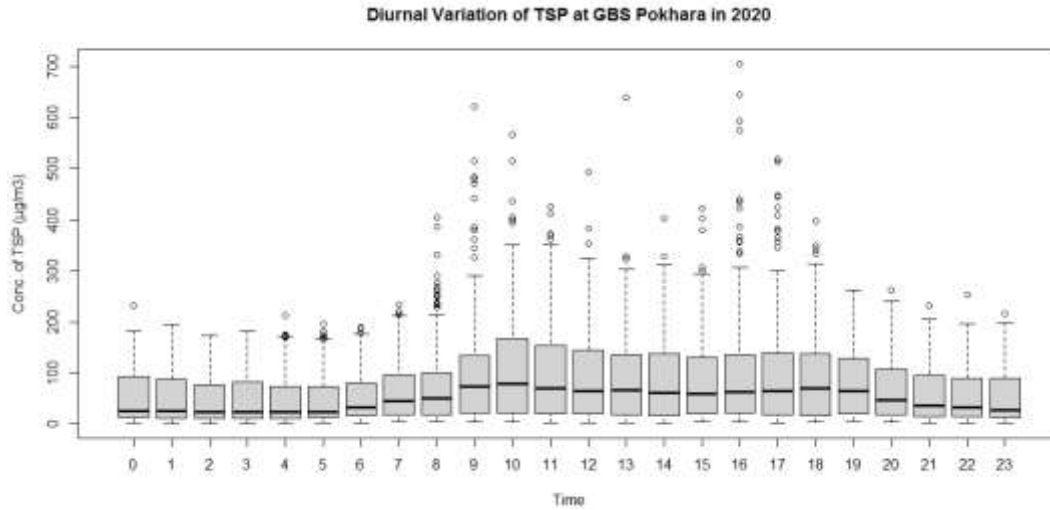


Figure 107: Diurnal Variation of TSP

### Compliance status of TSP

The total days of TSP monitored in the year 2020 counts 334 of which 7 days exceed the NAAQS guidelines as shown in figure below.

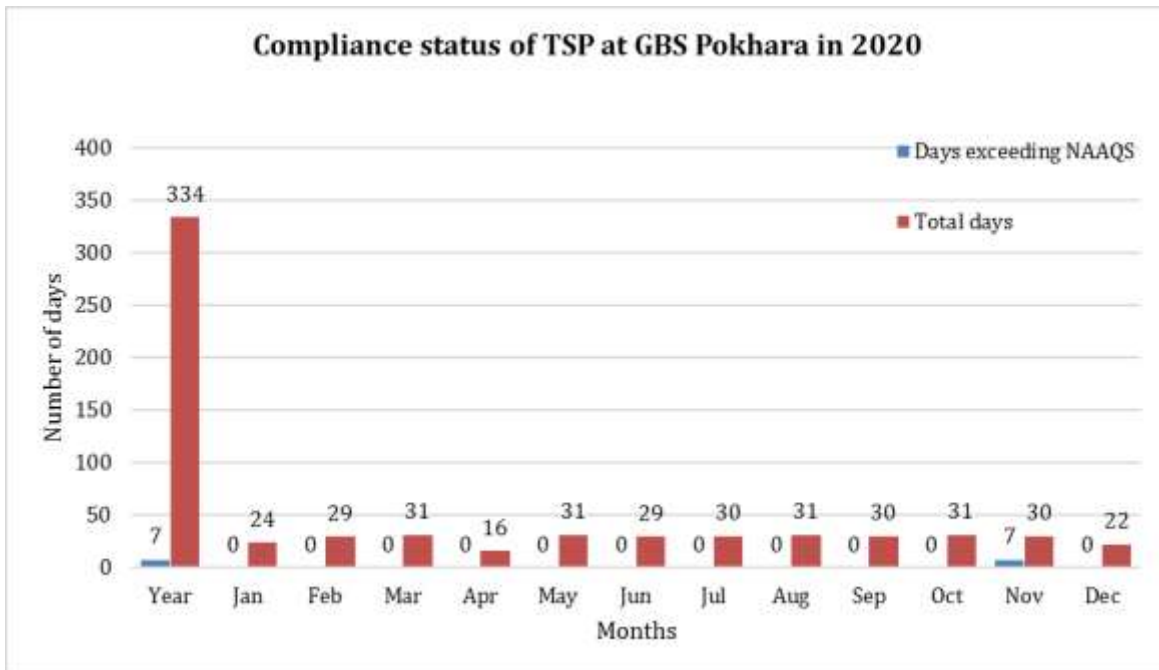


Figure 108: Compliance status of TSP

## Annex

GBS Pokhara

PM1

Date	Value	Date	Value	Date	Value	Date	Value
1/1/2017		1/1/2018	24.15651	1/1/2019		1/1/2020	
1/2/2017		1/2/2018	21.7834	1/2/2019	68.37929	1/2/2020	
1/3/2017		1/3/2018	22.29862	1/3/2019	24.5974	1/3/2020	
1/4/2017		1/4/2018	24.21655	1/4/2019	27.24031	1/4/2020	
1/5/2017		1/5/2018	25.95048	1/5/2019	31.52113	1/5/2020	
1/6/2017		1/6/2018	26.92277	1/6/2019	26.79478	1/6/2020	32.48827
1/7/2017		1/7/2018	29.11453	1/7/2019	19.21818	1/7/2020	45.56621
1/8/2017		1/8/2018	33.33664	1/8/2019	17.91977	1/8/2020	39.88912
1/9/2017		1/9/2018	35.11618	1/9/2019	18.8704	1/9/2020	41.75331
1/10/2017		1/10/2018	37.04527	1/10/2019	25.48215	1/10/2020	35.40957
1/11/2017		1/11/2018	37.64543	1/11/2019	35.09143	1/11/2020	49.07081
1/12/2017		1/12/2018	32.69775	1/12/2019	38.24016	1/12/2020	57.70868
1/13/2017		1/13/2018	31.51533	1/13/2019	37.18592	1/13/2020	49.9125
1/14/2017		1/14/2018	39.41793	1/14/2019	26.83721	1/14/2020	34.52143
1/15/2017		1/15/2018	34.38969	1/15/2019	30.54932	1/15/2020	
1/16/2017		1/16/2018	33.26853	1/16/2019	34.60391	1/16/2020	33.86656
1/17/2017		1/17/2018	31.89587	1/17/2019	32.47521	1/17/2020	
1/18/2017		1/18/2018	30.07217	1/18/2019	30.74007	1/18/2020	30.73923
1/19/2017		1/19/2018	34.30364	1/19/2019	29.32235	1/19/2020	24.22476
1/20/2017		1/20/2018	35.8306	1/20/2019	27.4596	1/20/2020	25.21467
1/21/2017		1/21/2018	39.46184	1/21/2019	28.04194	1/21/2020	36.23262
1/22/2017		1/22/2018	36.06985	1/22/2019	21.80508	1/22/2020	30.36485
1/23/2017		1/23/2018	33.99533	1/23/2019	18.02075	1/23/2020	37.4062
1/24/2017		1/24/2018	25.85121	1/24/2019	15.92059	1/24/2020	43.44458
1/25/2017		1/25/2018	24.05114	1/25/2019	13.61684	1/25/2020	48.00795
1/26/2017		1/26/2018	24.93634	1/26/2019	12.86771	1/26/2020	56.59479
1/27/2017		1/27/2018	34.10114	1/27/2019	14.90133	1/27/2020	50.4968
1/28/2017		1/28/2018	42.81577	1/28/2019	15.73013	1/28/2020	45.67967



1/29/2017		1/29/2018	54.85496	1/29/2019	15.14015	1/29/2020	30.30832
1/30/2017		1/30/2018	51.3623	1/30/2019	15.87412	1/30/2020	22.71084
1/31/2017		1/31/2018	59.0672	1/31/2019	22.03675	1/31/2020	27.80665
2/1/2017		2/1/2018	55.52836	2/1/2019	26.45055	2/1/2020	30.70594
2/2/2017		2/2/2018	58.12353	2/2/2019	26.21104	2/2/2020	33.53823
2/3/2017		2/3/2018	61.34922	2/3/2019	25.96793	2/3/2020	40.05554
2/4/2017		2/4/2018	59.56728	2/4/2019	26.80556	2/4/2020	41.58875
2/5/2017		2/5/2018	53.01486	2/5/2019	30.14104	2/5/2020	43.39944
2/6/2017		2/6/2018	53.67709	2/6/2019	33.86215	2/6/2020	43.85771
2/7/2017		2/7/2018	33.66818	2/7/2019	20.9374	2/7/2020	47.82674
2/8/2017		2/8/2018	30.44126	2/8/2019	12.47536	2/8/2020	43.90535
2/9/2017		2/9/2018	30.80233	2/9/2019	8.008371	2/9/2020	32.073
2/10/2017		2/10/2018	30.84894	2/10/2019	10.90472	2/10/2020	33.79667
2/11/2017		2/11/2018	37.2844	2/11/2019	14.86757	2/11/2020	34.62542
2/12/2017		2/12/2018	47.26666	2/12/2019	16.99054	2/12/2020	38.39278
2/13/2017		2/13/2018	23.38566	2/13/2019	19.04881	2/13/2020	41.49674
2/14/2017		2/14/2018	20.81472	2/14/2019	24.60312	2/14/2020	44.14167
2/15/2017		2/15/2018	21.70965	2/15/2019	9.064912	2/15/2020	70.7332
2/16/2017		2/16/2018	35.39389	2/16/2019	9.62864	2/16/2020	68.63806
2/17/2017		2/17/2018	47.77534	2/17/2019	12.72622	2/17/2020	67.15569
2/18/2017		2/18/2018	49.37995	2/18/2019	17.03284	2/18/2020	67.18611
2/19/2017		2/19/2018	47.29989	2/19/2019	22.28557	2/19/2020	67.44569
2/20/2017		2/20/2018	47.76414	2/20/2019	18.66763	2/20/2020	63.40063
2/21/2017		2/21/2018	44.70196	2/21/2019	19.38448	2/21/2020	50.65583
2/22/2017		2/22/2018	40.3688	2/22/2019	19.28844	2/22/2020	34.71347
2/23/2017		2/23/2018	32.72923	2/23/2019	23.92777	2/23/2020	26.75299
2/24/2017		2/24/2018	36.58458	2/24/2019	21.46257	2/24/2020	25.32667
2/25/2017		2/25/2018		2/25/2019	9.64193	2/25/2020	22.86264
2/26/2017		2/26/2018		2/26/2019	10.69715	2/26/2020	12.59361
2/27/2017		2/27/2018	44.09752	2/27/2019	11.94007	2/27/2020	17.78508
2/28/2017		2/28/2018	49.13092	2/28/2019	8.11166	2/28/2020	18.75021
3/1/2017		3/1/2018	43.75492	3/1/2019	9.571895	2/29/2020	21.80694
3/2/2017		3/2/2018	36.57695	3/2/2019	15.71275	3/1/2020	23.34896
3/3/2017		3/3/2018	27.02062	3/3/2019	18.21159	3/2/2020	23.2875

3/4/2017		3/4/2018	29.83196	3/4/2019	17.14934	3/3/2020	15.16736
3/5/2017		3/5/2018	25.47171	3/5/2019	13.76009	3/4/2020	12.98625
3/6/2017		3/6/2018	12.72829	3/6/2019	13.74773	3/5/2020	17.73333
3/7/2017		3/7/2018	18.37894	3/7/2019	18.85861	3/6/2020	19.53104
3/8/2017		3/8/2018	25.99859	3/8/2019	20.86258	3/7/2020	15.10653
3/9/2017		3/9/2018	18.27688	3/9/2019	20.58844	3/8/2020	43.43424
3/10/2017		3/10/2018	20.22318	3/10/2019	19.2009	3/9/2020	21.6816
3/11/2017		3/11/2018	28.92985	3/11/2019	20.89431	3/10/2020	33.21153
3/12/2017		3/12/2018	32.75221	3/12/2019	19.42998	3/11/2020	31.39924
3/13/2017		3/13/2018	37.20353	3/13/2019	15.58522	3/12/2020	24.52646
3/14/2017		3/14/2018	42.85086	3/14/2019	15.56938	3/13/2020	26.64229
3/15/2017		3/15/2018		3/15/2019	11.52972	3/14/2020	13.19708
3/16/2017		3/16/2018		3/16/2019	12.87443	3/15/2020	10.21965
3/17/2017		3/17/2018		3/17/2019	20.24562	3/16/2020	16.07007
3/18/2017		3/18/2018		3/18/2019	20.99638	3/17/2020	22.65847
3/19/2017		3/19/2018		3/19/2019	16.28201	3/18/2020	25.41757
3/20/2017		3/20/2018		3/20/2019	17.51045	3/19/2020	26.13167
3/21/2017		3/21/2018		3/21/2019	12.88252	3/20/2020	20.62187
3/22/2017		3/22/2018		3/22/2019	13.3191	3/21/2020	20.19668
3/23/2017		3/23/2018		3/23/2019	18.01	3/22/2020	17.5075
3/24/2017		3/24/2018		3/24/2019	29.05062	3/23/2020	18.26993
3/25/2017		3/25/2018		3/25/2019	38.28118	3/24/2020	21.80819
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3/29/2017		3/29/2018		3/29/2019	22.56049	3/28/2020	18.92792
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3/31/2017		3/31/2018	14.60075	3/31/2019	19.74729	3/30/2020	21.88465
4/1/2017		4/1/2018	19.92348	4/1/2019	9.064236	3/31/2020	31.33181
4/2/2017		4/2/2018	22.39183	4/2/2019	10.45299	4/1/2020	25.59028
4/3/2017		4/3/2018	30.77934	4/3/2019	22.2475	4/2/2020	19.35812
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8/24/2017	4.317332	8/24/2018	2.47453	8/24/2019	3.288819	8/23/2020	84.50146
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9/9/2017	11.23321	9/9/2018	4.728206	9/9/2019	3.979306	9/8/2020	7.230476
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8/1/2017		8/1/2018	3.901054	8/1/2019	3.79337	7/31/2020	9.09141
8/2/2017		8/2/2018	3.71625	8/2/2019	4.707435	8/1/2020	7.733406
8/3/2017		8/3/2018	3.177292	8/3/2019	3.608125	8/2/2020	8.189092
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8/19/2017	6.832803	8/19/2018	3.413445	8/19/2019	4.353681	8/18/2020	5.649592
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8/24/2017	5.170165	8/24/2018	2.639653	8/24/2019	3.690903	8/23/2020	85.17062
8/25/2017	7.233837	8/25/2018	4.316002	8/25/2019	5.004306	8/24/2020	76.25579

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9/2/2017		9/2/2018	3.910645	9/2/2019	4.707997	9/1/2020	7.486736
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9/5/2017	15.77131	9/5/2018	6.714413	9/5/2019	4.279236	9/4/2020	9.49098
9/6/2017	12.27752	9/6/2018	6.967609	9/6/2019	3.368542	9/5/2020	21.44112
9/7/2017	12.84921	9/7/2018	2.843883	9/7/2019	3.875417	9/6/2020	10.48479
9/8/2017	12.51244	9/8/2018	5.804403	9/8/2019	5.208425	9/7/2020	8.768611
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9/11/2017	10.66938	9/11/2018	3.118888	9/11/2019	5.751736	9/10/2020	9.047348
9/12/2017	11.84967	9/12/2018	4.136445	9/12/2019	3.858681	9/11/2020	7.558958
9/13/2017	11.46953	9/13/2018	4.40212	9/13/2019	3.253217	9/12/2020	8.733186
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9/16/2017	14.02984	9/16/2018	5.207917	9/16/2019	6.109167	9/15/2020	12.93758
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9/18/2017	6.021098	9/18/2018	6.395486	9/18/2019	6.373843	9/17/2020	17.67874
9/19/2017	6.168236	9/19/2018	6.762708	9/19/2019	8.875667	9/18/2020	12.18754
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9/24/2017	11.73919	9/24/2018	4.65192	9/24/2019	7.853264	9/23/2020	5.171316
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PM10

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8/2/2017		8/2/2018	3.844097	8/2/2019	4.938835	8/1/2020	8.911014
8/3/2017		8/3/2018	3.316458	8/3/2019	3.757361	8/2/2020	10.20999
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8/24/2017	6.181699	8/24/2018	2.717693	8/24/2019	4.016667	8/23/2020	87.07035
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8/26/2017	7.105533	8/26/2018	5.61256	8/26/2019	4.536667	8/25/2020	90.19875
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9/4/2017		9/4/2018	5.447431	9/4/2019	3.466389	9/3/2020	12.40104
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9/6/2017	13.58858	9/6/2018	7.141125	9/6/2019	3.748958	9/5/2020	23.09363
9/7/2017	14.17605	9/7/2018	2.955326	9/7/2019	4.210764	9/6/2020	12.65958
9/8/2017	13.8292	9/8/2018	6.02827	9/8/2019	5.807166	9/7/2020	10.50403
9/9/2017	13.66404	9/9/2018	5.136747	9/9/2019	5.146111	9/8/2020	9.445729
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9/24/2017	12.73897	9/24/2018	4.733674	9/24/2019	8.35125	9/23/2020	6.158421
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9/28/2017	19.24084	9/28/2018	8.778915	9/28/2019	5.244724	9/27/2020	13.4759
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11/8/2017	20.69449	11/8/2018	15.77519	11/8/2019	20.31382	11/7/2020	158.7005
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12/12/2017	24.4537	12/12/2018		12/12/2019		12/11/2020	
12/13/2017	23.76742	12/13/2018		12/13/2019		12/12/2020	
12/14/2017	24.36893	12/14/2018		12/14/2019		12/13/2020	
12/15/2017	24.1332	12/15/2018		12/15/2019		12/14/2020	
12/16/2017	27.52697	12/16/2018		12/16/2019		12/15/2020	
12/17/2017	30.85729	12/17/2018		12/17/2019		12/16/2020	
12/18/2017	37.07444	12/18/2018		12/18/2019		12/17/2020	83.38212
12/19/2017	34.32474	12/19/2018		12/19/2019		12/18/2020	63.02063
12/20/2017	33.64558	12/20/2018		12/20/2019		12/19/2020	61.02799
12/21/2017	29.07197	12/21/2018		12/21/2019		12/20/2020	55.05458
12/22/2017	29.06538	12/22/2018		12/22/2019		12/21/2020	65.59855
12/23/2017	31.22056	12/23/2018		12/23/2019		12/22/2020	55.17361
12/24/2017	30.64307	12/24/2018		12/24/2019		12/23/2020	57.55431
12/25/2017	32.45379	12/25/2018		12/25/2019		12/24/2020	57.85653
12/26/2017	32.54004	12/26/2018		12/26/2019		12/25/2020	58.40271
12/27/2017	32.39368	12/27/2018		12/27/2019		12/26/2020	58.88583
12/28/2017	35.02611	12/28/2018		12/28/2019		12/27/2020	64.13014
12/29/2017	29.88168	12/29/2018		12/29/2019		12/28/2020	63.35806
12/30/2017	31.67088	12/30/2018		12/30/2019		12/29/2020	63.69111
12/31/2017	27.89708	12/31/2018		12/31/2019		12/30/2020	62.62562
						12/31/2020	62.39944

TSP

Date	Value	Date	Value	Date	Value	Date	Value
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1/3/2017		1/3/2018	24.48	1/3/2019	28.14	1/3/2020	
1/4/2017		1/4/2018	24.98	1/4/2019	32.09	1/4/2020	
1/5/2017		1/5/2018	27.00	1/5/2019	35.51	1/5/2020	
1/6/2017		1/6/2018	27.58	1/6/2019	30.79	1/6/2020	67.66
1/7/2017		1/7/2018	30.94	1/7/2019	22.51	1/7/2020	68.01



1/8/2017		1/8/2018	34.94	1/8/2019	22.16	1/8/2020	59.43
1/9/2017		1/9/2018	36.78	1/9/2019	22.21	1/9/2020	56.35
1/10/2017		1/10/2018	39.69	1/10/2019	29.01	1/10/2020	52.57
1/11/2017		1/11/2018	37.59	1/11/2019	39.60	1/11/2020	81.16
1/12/2017		1/12/2018	34.33	1/12/2019	42.18	1/12/2020	113.39
1/13/2017		1/13/2018	32.96	1/13/2019	41.65	1/13/2020	100.35
1/14/2017		1/14/2018	41.39	1/14/2019	29.51	1/14/2020	77.96
1/15/2017		1/15/2018	35.24	1/15/2019	33.53	1/15/2020	
1/16/2017		1/16/2018	34.52	1/16/2019	38.79	1/16/2020	36.46
1/17/2017		1/17/2018	32.55	1/17/2019	36.20	1/17/2020	
1/18/2017		1/18/2018	31.92	1/18/2019	34.71	1/18/2020	54.69
1/19/2017		1/19/2018	36.04	1/19/2019	33.06	1/19/2020	79.27
1/20/2017		1/20/2018	36.41	1/20/2019	32.07	1/20/2020	63.25
1/21/2017		1/21/2018	40.85	1/21/2019	31.99	1/21/2020	64.77
1/22/2017		1/22/2018	38.25	1/22/2019	28.92	1/22/2020	65.42
1/23/2017		1/23/2018	36.02	1/23/2019	19.12	1/23/2020	71.42
1/24/2017		1/24/2018	25.64	1/24/2019	18.35	1/24/2020	77.74
1/25/2017		1/25/2018	24.08	1/25/2019	15.20	1/25/2020	86.69
1/26/2017		1/26/2018	25.21	1/26/2019	13.83	1/26/2020	94.09
1/27/2017		1/27/2018	34.57	1/27/2019	16.36	1/27/2020	96.61
1/28/2017		1/28/2018	44.76	1/28/2019	17.65	1/28/2020	89.84
1/29/2017		1/29/2018	55.82	1/29/2019	17.17	1/29/2020	66.15
1/30/2017		1/30/2018	52.84	1/30/2019	17.58	1/30/2020	48.64
1/31/2017		1/31/2018	60.79	1/31/2019	23.90	1/31/2020	57.85
2/1/2017		2/1/2018	58.20	2/1/2019	29.09	2/1/2020	57.43
2/2/2017		2/2/2018	61.84	2/2/2019	28.64	2/2/2020	72.10
2/3/2017		2/3/2018	63.51	2/3/2019	28.74	2/3/2020	76.27
2/4/2017		2/4/2018	63.61	2/4/2019	29.48	2/4/2020	80.08
2/5/2017		2/5/2018	57.80	2/5/2019	32.41	2/5/2020	82.54
2/6/2017		2/6/2018	58.14	2/6/2019	36.46	2/6/2020	82.15
2/7/2017		2/7/2018	36.58	2/7/2019	21.65	2/7/2020	91.84
2/8/2017		2/8/2018	33.22	2/8/2019	13.60	2/8/2020	78.16
2/9/2017		2/9/2018	34.31	2/9/2019	9.15	2/9/2020	61.50
2/10/2017		2/10/2018	36.42	2/10/2019	12.20	2/10/2020	67.89

2/11/2017		2/11/2018	46.25	2/11/2019	16.36	2/11/2020	79.06
2/12/2017		2/12/2018	55.25	2/12/2019	18.57	2/12/2020	80.82
2/13/2017		2/13/2018	21.60	2/13/2019	20.15	2/13/2020	89.13
2/14/2017		2/14/2018	20.15	2/14/2019	26.09	2/14/2020	97.73
2/15/2017		2/15/2018	22.03	2/15/2019	9.65	2/15/2020	102.96
2/16/2017		2/16/2018	38.58	2/16/2019	10.32	2/16/2020	111.74
2/17/2017		2/17/2018	48.92	2/17/2019	13.66	2/17/2020	107.37
2/18/2017		2/18/2018	50.47	2/18/2019	17.90	2/18/2020	107.48
2/19/2017		2/19/2018	49.35	2/19/2019	23.50	2/19/2020	110.00
2/20/2017		2/20/2018	50.80	2/20/2019	20.68	2/20/2020	125.06
2/21/2017		2/21/2018	48.02	2/21/2019	21.36	2/21/2020	63.50
2/22/2017		2/22/2018	41.84	2/22/2019	21.34	2/22/2020	78.28
2/23/2017		2/23/2018	34.01	2/23/2019	26.33	2/23/2020	74.39
2/24/2017		2/24/2018	38.12	2/24/2019	23.54	2/24/2020	110.85
2/25/2017		2/25/2018		2/25/2019	11.00	2/25/2020	33.98
2/26/2017		2/26/2018		2/26/2019	13.31	2/26/2020	15.29
2/27/2017		2/27/2018	46.83	2/27/2019	12.88	2/27/2020	47.41
2/28/2017		2/28/2018	50.63	2/28/2019	8.86	2/28/2020	38.02
3/1/2017		3/1/2018	44.36	3/1/2019	10.99	2/29/2020	54.70
3/2/2017		3/2/2018	36.89	3/2/2019	17.06	3/1/2020	54.35
3/3/2017		3/3/2018	27.28	3/3/2019	19.11	3/2/2020	46.47
3/4/2017		3/4/2018	31.02	3/4/2019	18.09	3/3/2020	45.10
3/5/2017		3/5/2018	26.61	3/5/2019	14.99	3/4/2020	35.93
3/6/2017		3/6/2018	13.39	3/6/2019	15.02	3/5/2020	68.33
3/7/2017		3/7/2018	20.22	3/7/2019	20.50	3/6/2020	47.07
3/8/2017		3/8/2018	26.57	3/8/2019	22.20	3/7/2020	30.52
3/9/2017		3/9/2018	18.11	3/9/2019	21.69	3/8/2020	63.94
3/10/2017		3/10/2018	19.92	3/10/2019	21.34	3/9/2020	47.88
3/11/2017		3/11/2018	29.19	3/11/2019	24.10	3/10/2020	64.42
3/12/2017		3/12/2018	33.13	3/12/2019	23.94	3/11/2020	82.24
3/13/2017		3/13/2018	37.30	3/13/2019	22.46	3/12/2020	82.58
3/14/2017		3/14/2018	43.18	3/14/2019	22.49	3/13/2020	74.23
3/15/2017		3/15/2018		3/15/2019	17.31	3/14/2020	63.42
3/16/2017		3/16/2018		3/16/2019	17.16	3/15/2020	68.12

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3/18/2017		3/18/2018		3/18/2019	25.38	3/17/2020	72.64
3/19/2017		3/19/2018		3/19/2019	19.00	3/18/2020	52.63
3/20/2017		3/20/2018		3/20/2019	19.06	3/19/2020	63.02
3/21/2017		3/21/2018		3/21/2019	15.00	3/20/2020	32.88
3/22/2017		3/22/2018		3/22/2019	17.79	3/21/2020	40.65
3/23/2017		3/23/2018		3/23/2019	22.54	3/22/2020	52.32
3/24/2017		3/24/2018		3/24/2019	35.60	3/23/2020	45.38
3/25/2017		3/25/2018		3/25/2019	45.13	3/24/2020	41.98
3/26/2017		3/26/2018		3/26/2019	20.24	3/25/2020	42.57
3/27/2017		3/27/2018		3/27/2019	10.44	3/26/2020	47.85
3/28/2017		3/28/2018		3/28/2019	13.92	3/27/2020	40.75
3/29/2017		3/29/2018		3/29/2019	25.70	3/28/2020	48.64
3/30/2017		3/30/2018	17.02	3/30/2019	33.04	3/29/2020	57.98
3/31/2017		3/31/2018	16.12	3/31/2019	21.94	3/30/2020	61.14
4/1/2017		4/1/2018	21.13	4/1/2019	10.84	3/31/2020	52.89
4/2/2017		4/2/2018	25.37	4/2/2019	12.41	4/1/2020	46.67
4/3/2017		4/3/2018	31.69	4/3/2019	25.14	4/2/2020	36.96
4/4/2017		4/4/2018	18.23	4/4/2019	28.59	4/3/2020	57.85
4/5/2017		4/5/2018	7.46	4/5/2019	28.38	4/4/2020	65.66
4/6/2017		4/6/2018		4/6/2019	18.54	4/5/2020	55.22
4/7/2017		4/7/2018		4/7/2019	8.07	4/6/2020	97.87
4/8/2017		4/8/2018		4/8/2019	9.79	4/7/2020	104.58
4/9/2017		4/9/2018		4/9/2019	13.12	4/8/2020	119.15
4/10/2017		4/10/2018	11.34	4/10/2019	13.23	4/9/2020	87.41
4/11/2017		4/11/2018	8.94	4/11/2019	15.35	4/10/2020	103.41
4/12/2017		4/12/2018	6.67	4/12/2019	19.16	4/11/2020	103.84
4/13/2017		4/13/2018	5.27	4/13/2019	20.29	4/12/2020	148.58
4/14/2017		4/14/2018	7.64	4/14/2019	17.84	4/13/2020	145.41
4/15/2017		4/15/2018	12.67	4/15/2019	17.73	4/14/2020	
4/16/2017		4/16/2018	21.76	4/16/2019	14.29	4/15/2020	
4/17/2017		4/17/2018	20.25	4/17/2019	9.90	4/16/2020	
4/18/2017		4/18/2018	16.66	4/18/2019	9.40	4/17/2020	
4/19/2017		4/19/2018	14.73	4/19/2019	9.65	4/18/2020	

4/20/2017		4/20/2018	12.97	4/20/2019	12.91	4/19/2020	
4/21/2017		4/21/2018	10.08	4/21/2019	25.53	4/20/2020	
4/22/2017		4/22/2018	10.54	4/22/2019	17.05	4/21/2020	
4/23/2017		4/23/2018	16.56	4/23/2019	22.54	4/22/2020	
4/24/2017		4/24/2018	28.27	4/24/2019	23.98	4/23/2020	
4/25/2017		4/25/2018	34.19	4/25/2019	21.13	4/24/2020	
4/26/2017		4/26/2018	44.14	4/26/2019	22.88	4/25/2020	
4/27/2017		4/27/2018		4/27/2019	26.80	4/26/2020	
4/28/2017		4/28/2018		4/28/2019	22.01	4/27/2020	
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4/30/2017		4/30/2018		4/30/2019	23.86	4/29/2020	25.33
5/1/2017		5/1/2018		5/1/2019	22.84	4/30/2020	30.99
5/2/2017		5/2/2018		5/2/2019	15.45	5/1/2020	20.30
5/3/2017		5/3/2018		5/3/2019	17.53	5/2/2020	32.16
5/4/2017		5/4/2018		5/4/2019	13.10	5/3/2020	30.94
5/5/2017		5/5/2018		5/5/2019	20.39	5/4/2020	23.82
5/6/2017		5/6/2018		5/6/2019	25.42	5/5/2020	31.41
5/7/2017		5/7/2018		5/7/2019	31.89	5/6/2020	28.02
5/8/2017		5/8/2018		5/8/2019	45.55	5/7/2020	29.29
5/9/2017		5/9/2018		5/9/2019	46.50	5/8/2020	41.63
5/10/2017		5/10/2018		5/10/2019	44.20	5/9/2020	45.89
5/11/2017		5/11/2018		5/11/2019	35.52	5/10/2020	29.55
5/12/2017		5/12/2018		5/12/2019	25.90	5/11/2020	33.07
5/13/2017		5/13/2018		5/13/2019	25.80	5/12/2020	26.41
5/14/2017		5/14/2018		5/14/2019	20.41	5/13/2020	40.63
5/15/2017		5/15/2018		5/15/2019	18.56	5/14/2020	38.49
5/16/2017		5/16/2018		5/16/2019	21.92	5/15/2020	43.46
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5/18/2017		5/18/2018		5/18/2019	19.88	5/17/2020	69.27
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5/22/2017		5/22/2018		5/22/2019	19.27	5/21/2020	63.16
5/23/2017		5/23/2018		5/23/2019	16.44	5/22/2020	47.35

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5/25/2017		5/25/2018		5/25/2019	15.60	5/24/2020	33.20
5/26/2017		5/26/2018		5/26/2019	15.99	5/25/2020	49.16
5/27/2017		5/27/2018		5/27/2019	17.57	5/26/2020	60.17
5/28/2017		5/28/2018		5/28/2019	17.66	5/27/2020	47.63
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5/30/2017		5/30/2018		5/30/2019	18.75	5/29/2020	19.34
5/31/2017		5/31/2018		5/31/2019	17.25	5/30/2020	32.15
6/1/2017		6/1/2018		6/1/2019	11.11	5/31/2020	29.15
6/2/2017		6/2/2018		6/2/2019	10.04	6/1/2020	27.73
6/3/2017		6/3/2018		6/3/2019	8.41	6/2/2020	36.60
6/4/2017		6/4/2018		6/4/2019	9.87	6/3/2020	29.56
6/5/2017		6/5/2018		6/5/2019	9.18	6/4/2020	29.64
6/6/2017		6/6/2018		6/6/2019	7.44	6/5/2020	15.80
6/7/2017		6/7/2018		6/7/2019	5.97	6/6/2020	11.93
6/8/2017		6/8/2018		6/8/2019	6.99	6/7/2020	17.33
6/9/2017		6/9/2018		6/9/2019	9.01	6/8/2020	10.90
6/10/2017		6/10/2018		6/10/2019	10.40	6/9/2020	16.55
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6/13/2017		6/13/2018		6/13/2019	11.87	6/12/2020	24.85
6/14/2017		6/14/2018		6/14/2019	9.98	6/13/2020	14.88
6/15/2017		6/15/2018		6/15/2019	12.27	6/14/2020	36.28
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6/17/2017		6/17/2018		6/17/2019	14.83	6/16/2020	
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6/19/2017		6/19/2018		6/19/2019	8.26	6/18/2020	10.37
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6/23/2017		6/23/2018		6/23/2019	3.46	6/22/2020	10.93
6/24/2017		6/24/2018		6/24/2019	6.29	6/23/2020	17.60
6/25/2017		6/25/2018		6/25/2019	5.57	6/24/2020	28.51
6/26/2017		6/26/2018		6/26/2019	5.12	6/25/2020	12.30

6/27/2017		6/27/2018		6/27/2019	5.97	6/26/2020	17.37
6/28/2017		6/28/2018		6/28/2019	6.57	6/27/2020	11.33
6/29/2017		6/29/2018		6/29/2019	7.50	6/28/2020	14.56
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7/1/2017		7/1/2018		7/1/2019	10.44	6/30/2020	18.53
7/2/2017		7/2/2018		7/2/2019	6.18	7/1/2020	26.75
7/3/2017		7/3/2018		7/3/2019	2.77	7/2/2020	34.32
7/4/2017		7/4/2018		7/4/2019	4.25	7/3/2020	12.55
7/5/2017		7/5/2018		7/5/2019	5.75	7/4/2020	18.96
7/6/2017		7/6/2018		7/6/2019	3.09	7/5/2020	24.47
7/7/2017		7/7/2018		7/7/2019		7/6/2020	16.08
7/8/2017		7/8/2018		7/8/2019		7/7/2020	9.21
7/9/2017		7/9/2018		7/9/2019		7/8/2020	15.67
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7/24/2017		7/24/2018		7/24/2019		7/23/2020	6.53
7/25/2017		7/25/2018		7/25/2019	8.50	7/24/2020	8.08
7/26/2017		7/26/2018		7/26/2019	3.55	7/25/2020	7.96
7/27/2017		7/27/2018		7/27/2019	3.75	7/26/2020	11.85
7/28/2017		7/28/2018		7/28/2019	3.20	7/27/2020	10.74
7/29/2017		7/29/2018	5.38	7/29/2019	3.45	7/28/2020	14.42
7/30/2017		7/30/2018	4.70	7/30/2019	3.32	7/29/2020	12.93

7/31/2017		7/31/2018	5.12	7/31/2019	4.12	7/30/2020	10.17
8/1/2017		8/1/2018	3.81	8/1/2019	3.95	7/31/2020	11.03
8/2/2017		8/2/2018	3.63	8/2/2019	5.00	8/1/2020	9.21
8/3/2017		8/3/2018	3.17	8/3/2019	3.78	8/2/2020	13.78
8/4/2017		8/4/2018	3.14	8/4/2019	4.32	8/3/2020	14.18
8/5/2017		8/5/2018	3.07	8/5/2019	3.35	8/4/2020	32.72
8/6/2017		8/6/2018	3.33	8/6/2019	3.26	8/5/2020	13.91
8/7/2017		8/7/2018	2.76	8/7/2019	2.97	8/6/2020	9.43
8/8/2017		8/8/2018	3.43	8/8/2019	3.06	8/7/2020	11.22
8/9/2017		8/9/2018	5.47	8/9/2019	4.63	8/8/2020	8.17
8/10/2017		8/10/2018	4.58	8/10/2019	5.29	8/9/2020	13.30
8/11/2017		8/11/2018	4.03	8/11/2019	5.25	8/10/2020	7.71
8/12/2017		8/12/2018	4.62	8/12/2019	5.54	8/11/2020	7.07
8/13/2017		8/13/2018	3.73	8/13/2019	4.88	8/12/2020	5.63
8/14/2017		8/14/2018	4.73	8/14/2019	4.93	8/13/2020	10.02
8/15/2017		8/15/2018	3.73	8/15/2019	5.80	8/14/2020	11.25
8/16/2017	10.25	8/16/2018	2.38	8/16/2019	5.96	8/15/2020	9.69
8/17/2017	9.48	8/17/2018	4.11	8/17/2019	4.12	8/16/2020	12.01
8/18/2017	12.78	8/18/2018	3.43	8/18/2019	5.32	8/17/2020	12.03
8/19/2017	8.63	8/19/2018	3.20	8/19/2019	4.97	8/18/2020	7.09
8/20/2017	11.04	8/20/2018	5.40	8/20/2019	6.42	8/19/2020	92.82
8/21/2017		8/21/2018	4.22	8/21/2019	6.34	8/20/2020	87.34
8/22/2017	9.97	8/22/2018	3.18	8/22/2019	5.58	8/21/2020	84.43
8/23/2017	8.02	8/23/2018	3.16	8/23/2019	6.21	8/22/2020	82.44
8/24/2017	6.54	8/24/2018	2.53	8/24/2019	4.06	8/23/2020	90.01
8/25/2017	8.77	8/25/2018	3.94	8/25/2019	5.61	8/24/2020	78.93
8/26/2017	7.34	8/26/2018	5.17	8/26/2019	4.61	8/25/2020	91.97
8/27/2017	7.36	8/27/2018	3.03	8/27/2019	6.12	8/26/2020	97.69
8/28/2017	6.33	8/28/2018	2.22	8/28/2019	7.05	8/27/2020	89.54
8/29/2017		8/29/2018	2.78	8/29/2019	8.99	8/28/2020	93.06
8/30/2017		8/30/2018	4.00	8/30/2019	8.69	8/29/2020	56.79
8/31/2017		8/31/2018	3.37	8/31/2019	7.29	8/30/2020	13.08
9/1/2017		9/1/2018	3.92	9/1/2019	8.78	8/31/2020	18.13
9/2/2017		9/2/2018	3.78	9/2/2019	5.39	9/1/2020	12.32

9/3/2017		9/3/2018	3.75	9/3/2019	5.07	9/2/2020	6.71
9/4/2017		9/4/2018	5.05	9/4/2019	3.53	9/3/2020	13.10
9/5/2017	20.27	9/5/2018	6.54	9/5/2019	4.89	9/4/2020	15.46
9/6/2017	14.17	9/6/2018	6.88	9/6/2019	3.81	9/5/2020	24.75
9/7/2017	14.47	9/7/2018	2.71	9/7/2019	4.25	9/6/2020	13.54
9/8/2017	14.39	9/8/2018	5.66	9/8/2019	5.87	9/7/2020	10.98
9/9/2017	13.93	9/9/2018	4.86	9/9/2019	5.22	9/8/2020	14.13
9/10/2017	14.13	9/10/2018	3.83	9/10/2019	4.92	9/9/2020	10.53
9/11/2017	11.89	9/11/2018	2.93	9/11/2019	6.12	9/10/2020	15.74
9/12/2017	12.81	9/12/2018	3.80	9/12/2019	4.07	9/11/2020	12.04
9/13/2017	12.45	9/13/2018	4.17	9/13/2019	3.54	9/12/2020	15.40
9/14/2017	14.51	9/14/2018	5.41	9/14/2019	5.76	9/13/2020	13.54
9/15/2017	16.60	9/15/2018	12.00	9/15/2019	6.06	9/14/2020	14.96
9/16/2017	15.98	9/16/2018	5.12	9/16/2019	6.29	9/15/2020	13.84
9/17/2017	15.08	9/17/2018	5.39	9/17/2019	7.34	9/16/2020	15.40
9/18/2017	7.04	9/18/2018	6.01	9/18/2019	6.63	9/17/2020	20.03
9/19/2017	7.24	9/19/2018	6.41	9/19/2019	9.97	9/18/2020	15.30
9/20/2017	6.98	9/20/2018	6.92	9/20/2019	5.51	9/19/2020	13.51
9/21/2017	7.76	9/21/2018	3.66	9/21/2019	6.18	9/20/2020	17.97
9/22/2017	8.41	9/22/2018	24.19	9/22/2019	6.12	9/21/2020	14.86
9/23/2017	9.14	9/23/2018	3.83	9/23/2019	7.18	9/22/2020	13.94
9/24/2017	12.99	9/24/2018	4.57	9/24/2019	8.40	9/23/2020	6.48
9/25/2017	14.52	9/25/2018	6.72	9/25/2019	4.19	9/24/2020	11.64
9/26/2017	17.79	9/26/2018	8.67	9/26/2019	3.20	9/25/2020	12.47
9/27/2017	13.90	9/27/2018	7.98	9/27/2019	3.97	9/26/2020	7.86
9/28/2017	19.39	9/28/2018	8.26	9/28/2019	5.28	9/27/2020	18.37
9/29/2017	17.02	9/29/2018	15.45	9/29/2019	5.32	9/28/2020	48.35
9/30/2017	8.78	9/30/2018	7.85	9/30/2019	4.58	9/29/2020	98.69
10/1/2017	7.78	10/1/2018	9.40	10/1/2019	2.97	9/30/2020	103.87
10/2/2017	8.14	10/2/2018	9.22	10/2/2019	6.58	10/1/2020	113.43
10/3/2017	11.40	10/3/2018	8.95	10/3/2019	6.22	10/2/2020	136.18
10/4/2017	12.54	10/4/2018	9.66	10/4/2019	8.48	10/3/2020	121.50
10/5/2017	12.67	10/5/2018	9.41	10/5/2019	8.71	10/4/2020	123.40
10/6/2017	10.67	10/6/2018	8.42	10/6/2019	11.79	10/5/2020	119.42



10/7/2017	9.76	10/7/2018	7.46	10/7/2019	11.95	10/6/2020	107.55
10/8/2017	11.22	10/8/2018	6.41	10/8/2019	8.96	10/7/2020	124.73
10/9/2017	13.93	10/9/2018	7.87	10/9/2019	7.05	10/8/2020	161.73
10/10/2017	13.97	10/10/2018	10.98	10/10/2019	10.45	10/9/2020	157.55
10/11/2017	10.54	10/11/2018	10.33	10/11/2019	9.71	10/10/2020	163.92
10/12/2017	8.90	10/12/2018	7.96	10/12/2019	14.40	10/11/2020	163.52
10/13/2017	11.52	10/13/2018	4.66	10/13/2019	16.72	10/12/2020	156.22
10/14/2017	17.34	10/14/2018	6.02	10/14/2019	17.85	10/13/2020	154.64
10/15/2017	34.12	10/15/2018	8.66	10/15/2019	18.86	10/14/2020	168.32
10/16/2017	30.24	10/16/2018	10.85	10/16/2019	17.85	10/15/2020	162.12
10/17/2017	26.99	10/17/2018	14.88	10/17/2019	16.82	10/16/2020	167.43
10/18/2017	18.49	10/18/2018	14.76	10/18/2019	17.29	10/17/2020	155.76
10/19/2017	15.14	10/19/2018	14.41	10/19/2019	16.68	10/18/2020	161.30
10/20/2017	14.15	10/20/2018	13.44	10/20/2019	22.81	10/19/2020	169.75
10/21/2017	12.06	10/21/2018	12.53	10/21/2019	19.01	10/20/2020	163.41
10/22/2017	14.25	10/22/2018	11.43	10/22/2019	18.41	10/21/2020	169.64
10/23/2017	25.65	10/23/2018	11.82	10/23/2019	20.34	10/22/2020	178.87
10/24/2017	27.51	10/24/2018	11.42	10/24/2019	16.06	10/23/2020	197.21
10/25/2017	29.03	10/25/2018	10.54	10/25/2019	18.51	10/24/2020	177.72
10/26/2017	29.98	10/26/2018	9.29	10/26/2019	16.44	10/25/2020	173.73
10/27/2017	33.32	10/27/2018	8.29	10/27/2019	17.29	10/26/2020	202.02
10/28/2017	29.12	10/28/2018	8.87	10/28/2019	21.17	10/27/2020	201.53
10/29/2017	23.67	10/29/2018	8.90	10/29/2019	21.73	10/28/2020	223.51
10/30/2017	19.19	10/30/2018	9.41	10/30/2019	20.34	10/29/2020	219.88
10/31/2017	19.99	10/31/2018	8.24	10/31/2019	18.52	10/30/2020	205.33
11/1/2017	19.07	11/1/2018	9.55	11/1/2019	22.83	10/31/2020	200.92
11/2/2017	19.24	11/2/2018	9.36	11/2/2019	22.91	11/1/2020	197.20
11/3/2017	19.84	11/3/2018	8.61	11/3/2019	19.61	11/2/2020	166.13
11/4/2017	17.59	11/4/2018	9.77	11/4/2019	16.01	11/3/2020	201.04
11/5/2017	14.62	11/5/2018	10.68	11/5/2019	16.37	11/4/2020	206.65
11/6/2017	19.37	11/6/2018	11.30	11/6/2019	18.58	11/5/2020	184.98
11/7/2017	20.26	11/7/2018	13.10	11/7/2019	24.28	11/6/2020	181.06
11/8/2017	21.34	11/8/2018	15.23	11/8/2019	20.88	11/7/2020	181.30
11/9/2017	19.46	11/9/2018	12.63	11/9/2019	19.47	11/8/2020	239.02

11/10/2017	20.54	11/10/2018	11.87	11/10/2019	19.90	11/9/2020	240.40
11/11/2017	24.79	11/11/2018	10.69	11/11/2019	20.29	11/10/2020	211.53
11/12/2017	25.89	11/12/2018	12.62	11/12/2019	23.98	11/11/2020	220.33
11/13/2017	26.86	11/13/2018	13.46	11/13/2019	23.98	11/12/2020	201.08
11/14/2017	24.10	11/14/2018		11/14/2019	35.06	11/13/2020	204.36
11/15/2017	24.00	11/15/2018		11/15/2019	36.80	11/14/2020	194.49
11/16/2017	26.15	11/16/2018		11/16/2019	41.28	11/15/2020	202.36
11/17/2017	23.10	11/17/2018		11/17/2019	42.69	11/16/2020	234.03
11/18/2017	24.61	11/18/2018		11/18/2019	54.86	11/17/2020	208.49
11/19/2017	20.50	11/19/2018		11/19/2019	69.19	11/18/2020	187.44
11/20/2017	21.20	11/20/2018		11/20/2019	69.82	11/19/2020	196.19
11/21/2017	25.49	11/21/2018		11/21/2019	68.82	11/20/2020	216.27
11/22/2017	27.79	11/22/2018		11/22/2019	59.92	11/21/2020	179.30
11/23/2017	26.78	11/23/2018	38.48	11/23/2019	64.10	11/22/2020	202.34
11/24/2017	31.38	11/24/2018	21.72	11/24/2019	66.41	11/23/2020	224.91
11/25/2017	28.95	11/25/2018		11/25/2019	68.21	11/24/2020	179.77
11/26/2017	32.31	11/26/2018		11/26/2019	70.58	11/25/2020	208.16
11/27/2017	33.45	11/27/2018		11/27/2019	62.49	11/26/2020	199.09
11/28/2017	33.29	11/28/2018		11/28/2019	48.49	11/27/2020	272.18
11/29/2017	51.15	11/29/2018		11/29/2019	57.29	11/28/2020	295.06
11/30/2017	48.54	11/30/2018		11/30/2019	45.23	11/29/2020	239.02
12/1/2017	43.45	12/1/2018		12/1/2019	41.39	11/30/2020	239.82
12/2/2017	31.83	12/2/2018		12/2/2019	49.69	12/1/2020	215.68
12/3/2017	29.40	12/3/2018	191.35	12/3/2019	58.52	12/2/2020	224.23
12/4/2017	33.10	12/4/2018	206.31	12/4/2019	68.07	12/3/2020	210.86
12/5/2017	45.94	12/5/2018	67.01	12/5/2019	69.11	12/4/2020	210.86
12/6/2017	29.31	12/6/2018	33.69	12/6/2019	64.72	12/5/2020	212.10
12/7/2017	31.45	12/7/2018	33.99	12/7/2019	53.54	12/6/2020	176.09
12/8/2017	37.05	12/8/2018	31.93	12/8/2019	45.18	12/7/2020	206.33
12/9/2017	24.24	12/9/2018	29.51	12/9/2019	48.46	12/8/2020	200.21
12/10/2017	23.02	12/10/2018	23.15	12/10/2019	52.64	12/9/2020	
12/11/2017	21.88	12/11/2018	16.87	12/11/2019	50.96	12/10/2020	
12/12/2017	22.92	12/12/2018	13.96	12/12/2019	67.23	12/11/2020	
12/13/2017	21.88	12/13/2018	16.65	12/13/2019	56.76	12/12/2020	

12/14/2017	22.84	12/14/2018	15.59	12/14/2019	23.17	12/13/2020	
12/15/2017	21.96	12/15/2018	16.72	12/15/2019	39.03	12/14/2020	
12/16/2017	25.63	12/16/2018	16.90	12/16/2019	38.84	12/15/2020	
12/17/2017	28.79	12/17/2018	22.66	12/17/2019	48.14	12/16/2020	
12/18/2017	35.64	12/18/2018	40.10	12/18/2019	39.41	12/17/2020	118.45
12/19/2017	33.03	12/19/2018	65.82	12/19/2019	48.28	12/18/2020	89.73
12/20/2017	32.65	12/20/2018	64.39	12/20/2019	52.49	12/19/2020	80.67
12/21/2017	27.99	12/21/2018	56.33	12/21/2019	56.27	12/20/2020	92.92
12/22/2017	28.14	12/22/2018	45.63	12/22/2019	53.21	12/21/2020	119.91
12/23/2017	29.32	12/23/2018	33.93	12/23/2019	48.40	12/22/2020	109.96
12/24/2017	28.66	12/24/2018	37.03	12/24/2019	46.88	12/23/2020	92.87
12/25/2017	30.96	12/25/2018	35.49	12/25/2019	51.69	12/24/2020	83.89
12/26/2017	31.16	12/26/2018	36.64	12/26/2019	46.25	12/25/2020	88.87
12/27/2017	31.62	12/27/2018	38.25	12/27/2019	51.60	12/26/2020	89.33
12/28/2017	34.59	12/28/2018	38.34	12/28/2019	66.86	12/27/2020	102.41
12/29/2017	29.35	12/29/2018	35.81	12/29/2019	63.89	12/28/2020	89.62
12/30/2017	30.51	12/30/2018	32.06	12/30/2019	61.19	12/29/2020	86.57
12/31/2017	27.35	12/31/2018	23.00	12/31/2019	70.21	12/30/2020	86.47
						12/31/2020	89.66

