STATE OF ACID DEPOSITION ON SOME MONITORING SITES IN INDONESIA

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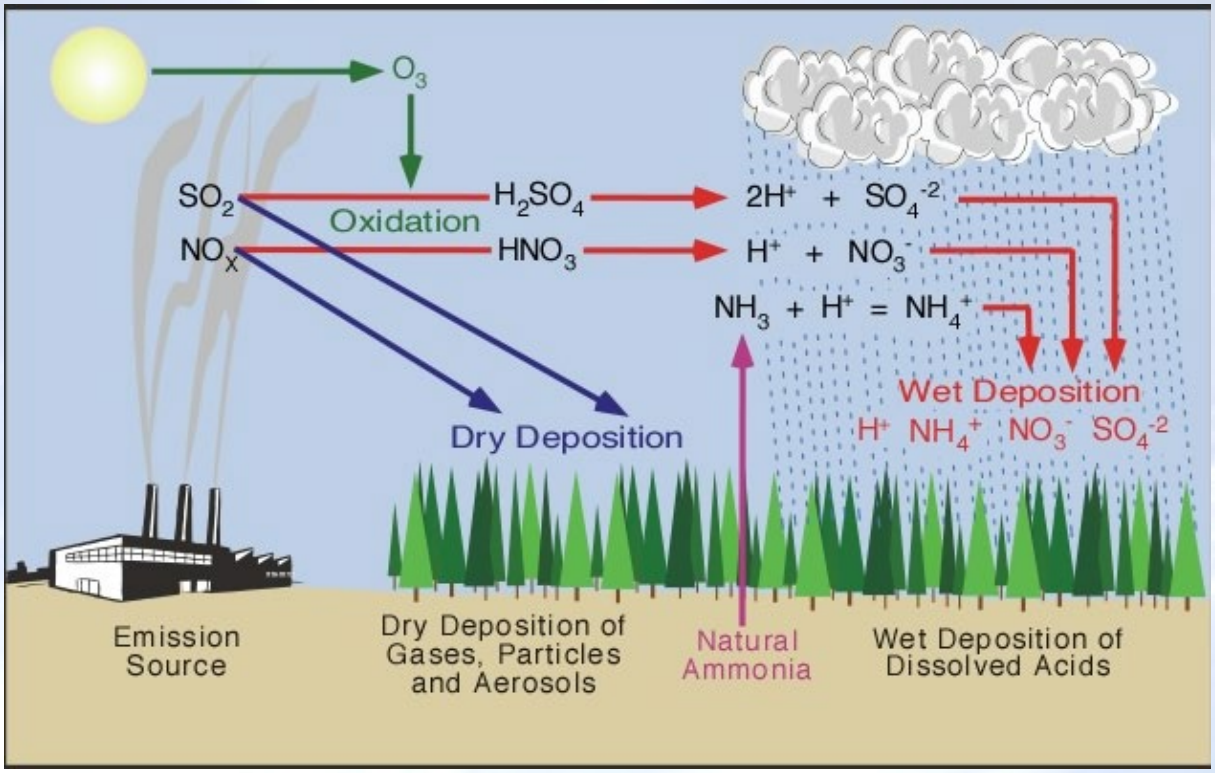
INTRODUCTION (1)



Several processes can result in the formation of acid deposition, Nitrogen oxides (NOx) and sulfur dioxide (SO2) released into the atmosphere from a variety of sources call fall to the ground simply as dry deposition. Most wet acid deposition forms when nitrogen oxides (NOx) and sulfur dioxide (SO2) are converted to nitric acid (HNO3) and sulfuric acid (H2SO4) through oxidation and dissolution.
(Pidwirny, 2006)

INTRODUCTION (2)

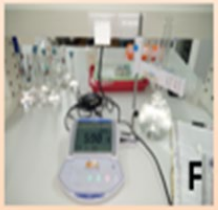
This study investigated the variations in dry and wet deposition in Indonesia and compared the acid deposition and MERRA-2 model

METHODS

Sampling Equipments

A	Wet sampler only	Rainwater sampling
B	Filter pack	Ambient air sampling

Analytic Instruments



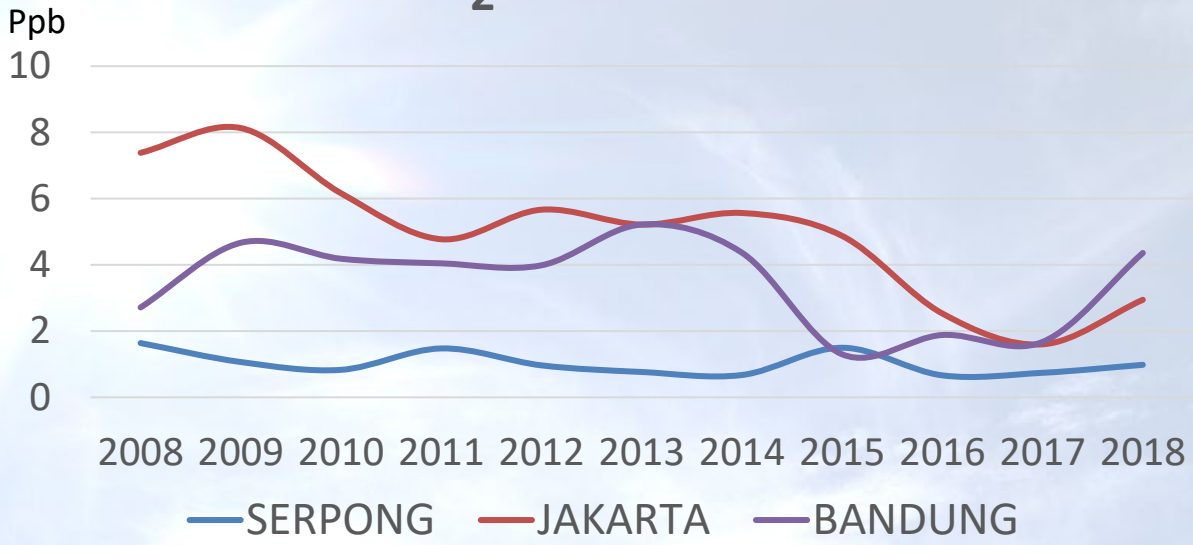
E	Ion Chromatography	Anion and cation analysis
F	pH meter	pH analysis
G	EC meter	Conductivity analysis
H	Spectrophotometer	NO2 analysis

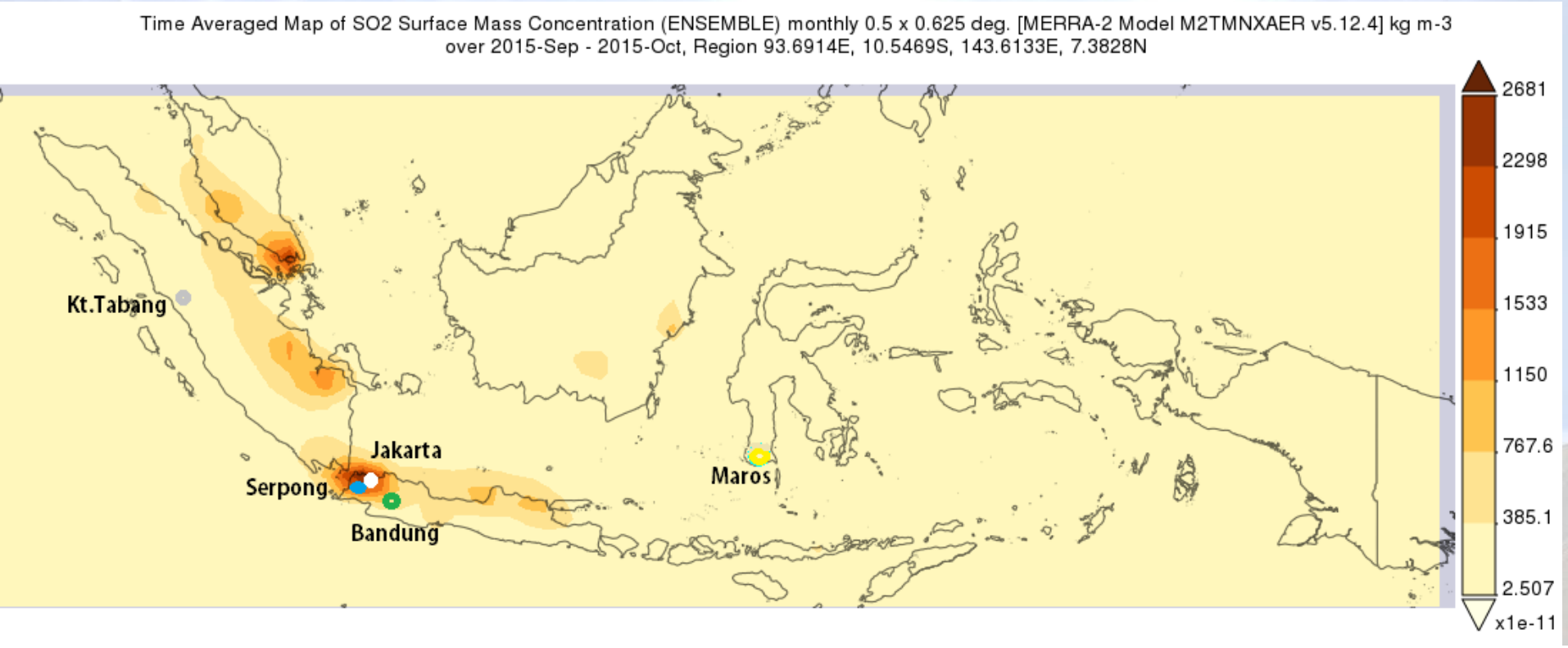
Wet deposition samples in Indonesia were collected using rainwater sampler in several sites, namely Serpong, Bandung, Jakarta, Kototabang, and Maros. In each site, measurement of rainwater precipitation, pH, electro conductivity, and analysis of ions were performed.

Dry deposition measurement was conducted using filter pack method to determine the particulate component of NO_3^-, SO_4^{2-} and others and gases of SO_2, HNO_3, NH_3, and HCl. The air is inhaled using a pump with a flow rate of 1 L/min for 14 days continuously, and then passed into a four stage filter pack, whereas in each filter set is specifically absorbed each chemical component.

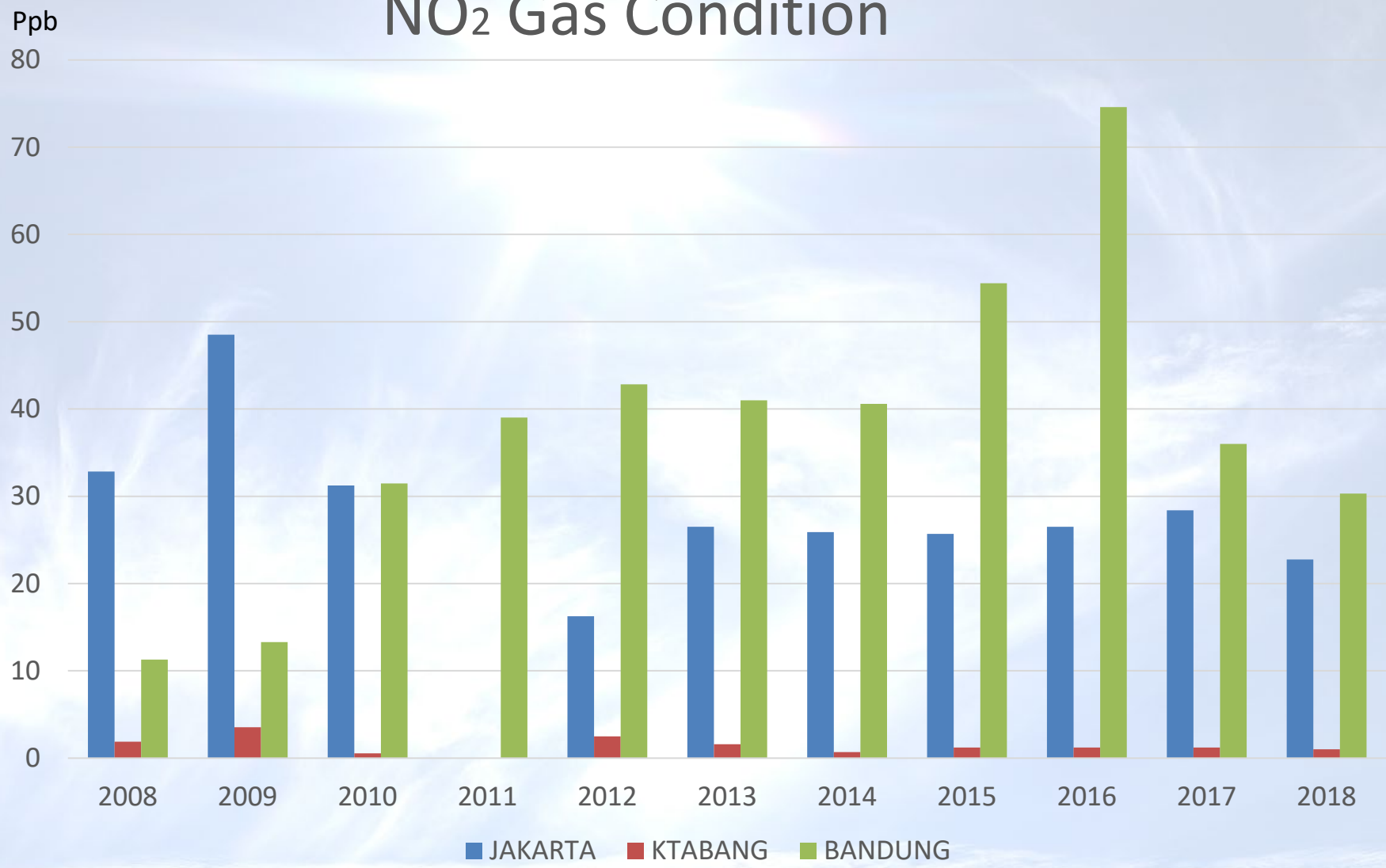
RESULT

SO_2 Condition

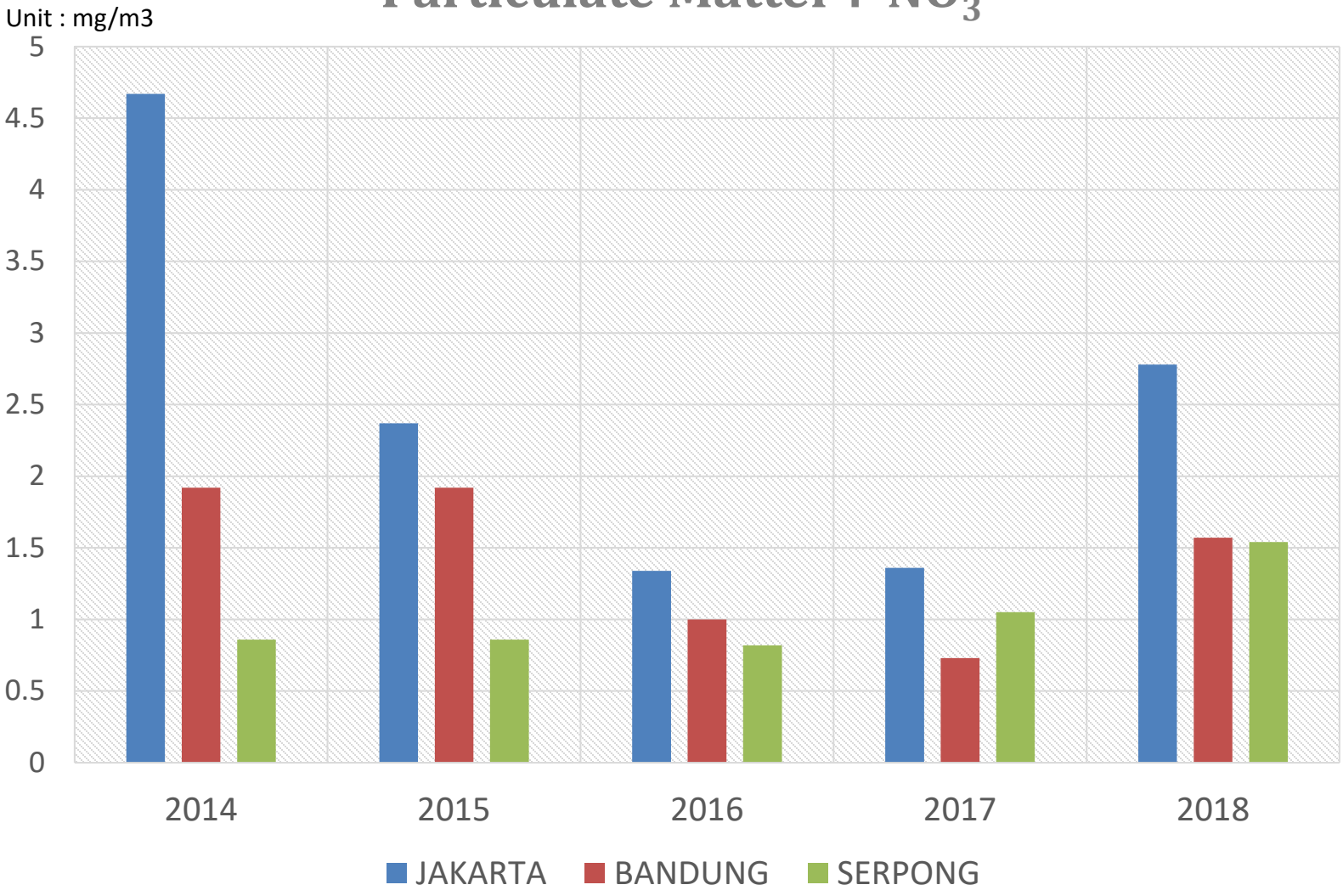


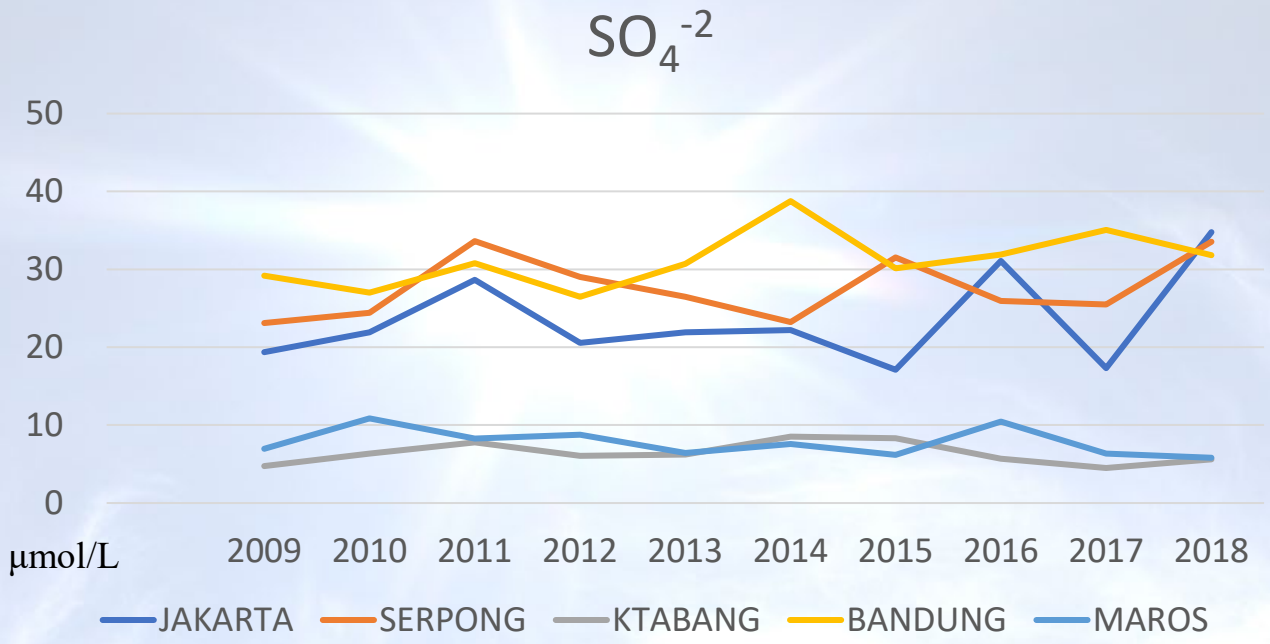


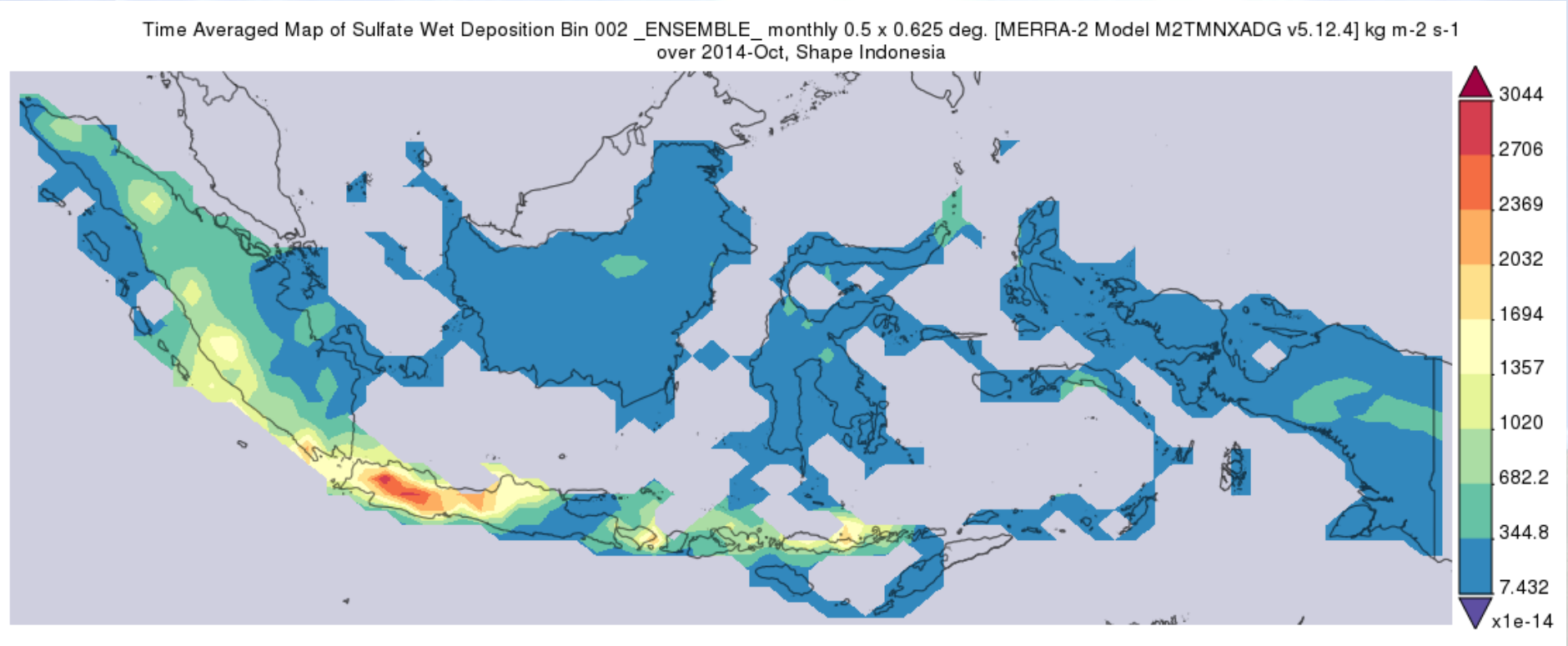
NO_2 Gas Condition



Particulate Matter : NO_3^-




SO_4^{-2}
50
40
30
20
10
0
µmol/L
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
JAKARTA
SERPONG
KTABANG
BANDUNG
MAROS


Time Averaged Map of Sulfate Wet Deposition Bin 002 _ENSEMBLE_ monthly 0.5 x 0.625 deg. [MERRA-2 Model M2TMNXADG v5.12.4] kg m-2 s-1
over 2014-Oct, Shape Indonesia
3044
2706
2369
2032
1694
1357
1020
682.2
344.8
7.432
x1e-14

CONCLUSION

The monitoring of dry deposition's result showed that NO_2 is the dominant component in gas phase, while SO_2 ion in aerosol. Minimum and maximum concentration of annual data in Jakarta for SO_2 is 1,6 – 8,1 ppb, while in Bandung is 1,3 – 5,2 ppb. Minimum and maximum concentration of annual data in Serpong for particulate SO_2. Pollutant sources from agricultural and farm sectors nearby the sampling sites potentially lead to high level of NH_3 in gas phase, while anthropogenic activities contributed to increase the SO_2 concentration in aerosol phase.