

**N₂O MEASUREMENT AT GLOBAL GAW
STATION BUKIT KOTOTABANG (INDONESIA)
DURING PERIODE JUNE 2013 TO MAY 2014**

Agusta Kurniawan

Agusta.kurniawan@bmkg.go.id

Jeju Oct 22nd 2015

OUTLINE

1. BRIEFLY BUKIT KOTOTABANG STATION
2. N₂O MEASUREMENT AT BKT STATION
3. N₂O MONTHLY AVERAGE DATA
4. COMPARE DATA MEASUREMENT AND SAMPLING DATA FROM NOAA NETWORK

BUKIT KOTOTABANG GAW STATION



STasiun Peringatan Al-Waqaf Al-Islami
Bukit Kototabang
Kab. Bogor Prov. Jawa Barat

BUKIT KOTOTABANG GAW STATION

Global Atmosphere Watch Station Bukit Kototabang is located on the island of Sumatra, Indonesia ($0^{\circ}12'07''\text{S}$ - $100^{\circ}19'05''\text{E}$). The station is 17 km north of the city toward Bukittinggi and approximately 120 km north of the city of Padang, the capital of West Sumatra province. The station is located in a remote area of the equatorial region at an altitude of 864.5 m above sea level and 40 km from the west coastline.



Taken from http://histmove.ouvaton.org/fic/chr/pag_002/maps/map_01_s.jpg

N₂O MEASUREMENT AT BUKIT KOTOTABANG

INSTRUMENT

Thermo Scientific™ IRIS 4600 Mid-IR Laser-Based N₂O Analyzer.

Start operated in June 2013

PRINCIPLE OF MEASUREMENT

Basic principle: Lambert Beer's Law.

Technology of measurement: *Tunable Diode Laser Absorbance Spectroscopy (TDLAS)* mixed with *Difference Frequency Generation (DFG)*. It has advantage measure at low level mixing ratio and simultaneous measure both of N₂O and water vapor (H₂O). It assure that dry N₂O measure with this instrument.

INLET

Combine with Picarro G 1301 CO₂/CH₄ Analyzer and Valve Box at three different level of height.

10 meter

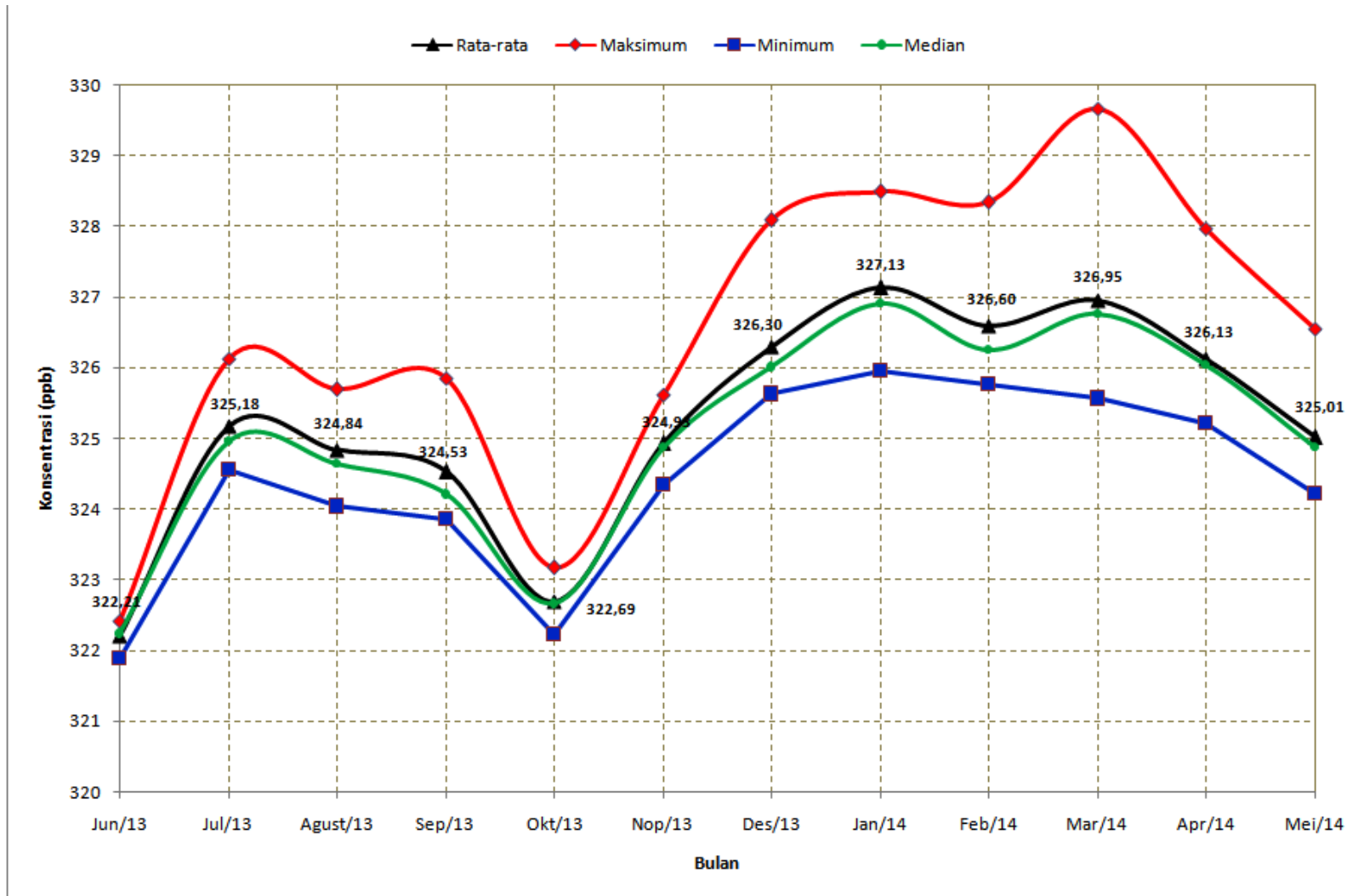
20 meter

32 meter

DATA

Different time resolution 1s, 10 s, etc. Both of UTC and LST are available

N₂O MONTHLY AVERAGE DATA AT BUKIT KOTOTABANG DURING JUNE 2013-MAY 2014



SIMPLE CORRELATION PEARSON WITH METEOROLOGY DATA

Parameter On Monthly Basis	R (June 2013 to May 2014)
RH (%)	-0.39
Air Pressure	0.19
Air Temperature	-0.02
Soil Temperature (100 cm depth)	0.75
Soil Temperature (10 cm depth)	0.63
Soil Moisture (100 cm depth)	0.54
Soil Moisture (10 cm depth)	-0.29
Mixing Ratio NO	0.02

COMPARISON N₂O DATA BETWEEN FLASK SAMPLING (NOAA) AND ANALYZER

Month	N ₂ O-Flask Sampling (NOAA)	N ₂ O Analyzer-IRIS 4600
June 2013	326.6	322.21
July 2013	327.2	325.18
August 2013	327.5	324.84
September 2013	327.4	324.53
October 2013	326.8	322.69
November 2013	327.7	324.93
December 2013	327.3	326.30
January 2014	327.7	327.13
February 2014	327.8	326.60
March 2014	328.2	326.95
April 2014	327.0	326.13
May 2014	328.1	325.01

**Thank You Very Much
For Your Attention**

**GLOBAL GAW STATION BUKIT KOTOTABANG
(INDONESIA).**

Address:

**Jl. Raya Bukittinggi-Medan Km.17, Kecamatan
Palupuh, Agam, Sumatera Barat, Indonesia**

Email:

Stagaw.kototabang@bmkg.go.id

Website:

www.gaw-kototabang.com