

GOFC-GOLD SEARRIN – An Overview



*Providing the International
Coordination needed for Global
Observation
of Forest, Fire and Land
Cover Dynamics.*

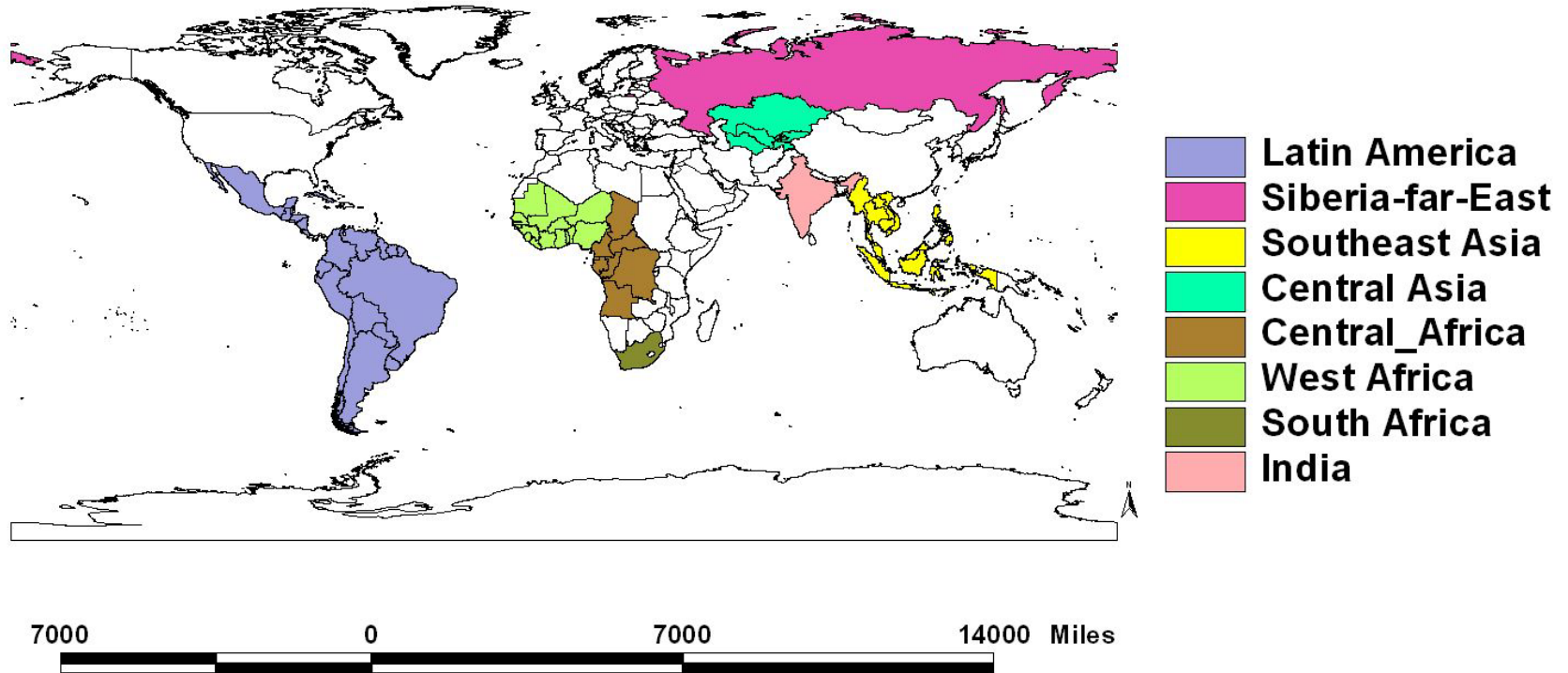
Krishna Vadrevu and Chris Justice
NASA MSFC and UMd



Canadian Space
Agency



GOFC Regional Networks



*The principal role of GOFC/GOLD is **to act as a coordinating mechanism for national and regional activities**. To achieve its goals GOFC/GOLD has developed a number of regional networks across the world.*

Regional networks are expected to cater the regional users needs and foster lateral transfer of technology and methods within and between regions relating to Land use/cover, forestry and fire activities.

Regional Networks

1. RedLatiF – Latin America - Alberto Setzer / **Gerardo López Saldaña**
2. SAFNET – Southern Africa – **Philip Frost** /Navashni Govender
3. Miombo - Southern Africa – **Natasha Ribeiro**
4. WARN – West Africa – **Vincent von Vordzogbe**
5. OSFAC - Central Africa – Landing Mane
6. SEARRIN - South East Asia – **Israr Alabar**
7. CARIN – Central Asia - Nadija Muratova / **Alim Pulatov**
8. SCERIN – South-Central Europe - **Jana Albrechtova.**

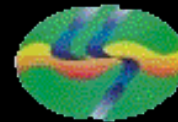
Blue highlighted networks focus on Fires

On-going projects in Southeast Asia

- *The research teams presented in these slides regularly attend annual SARI meetings; they are eager to collaborate with GOFC*
- *SARI meetings are funded by multiple organizations. GOFC researchers are invited for SARI meetings. Primary contributor – JAXA funds through NIES*

7 SouthEast Asian Studies (7-SEAS)

- *Briefing and updates*



Malaysian
Meteorology Service



George Lin, National Central U.,

Si-Chee Tsay, Brent Holben, Hal Maring,
Christina Hsu, NASA/GSFC

Jeff Reid, Naval Research Lab,

7-SEAS team of TH/TW/VN

7-SEAS activities since 2007

- ❏ 10 workshops and training courses
- ❏ 2007 VBBE (Virtual BB Experiment)
- ❏ 2012 Cruise mission in southern SE Asia

In-situ Experiments in northern SE Asia: Phase I (2010-2012)

- ❏ 2010 Dongsha Experiment
- ❏ 2011 Son La Campaign I
- ❏ 2012 Son-La Campaign II

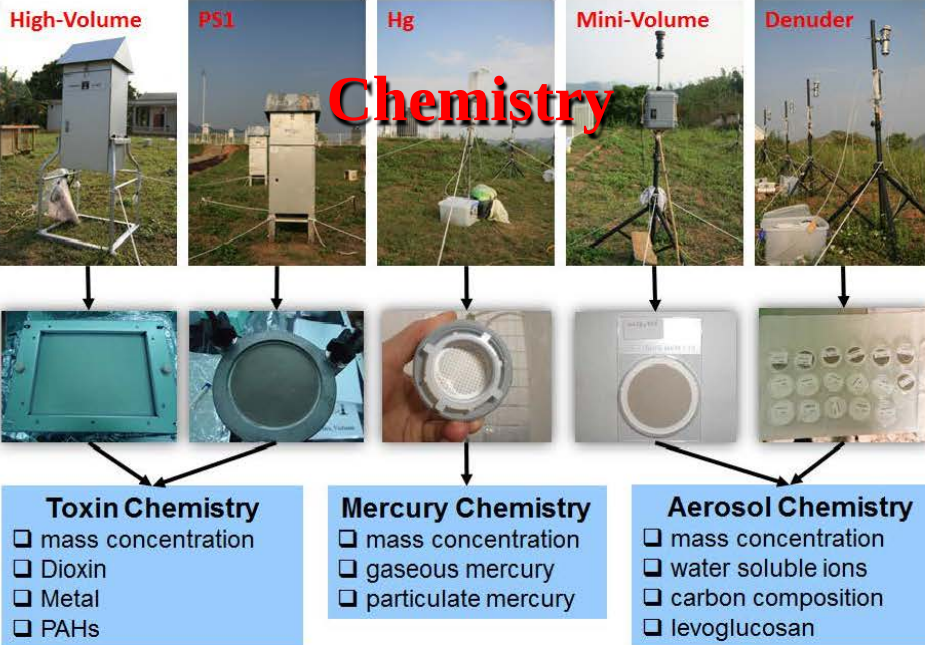
Phase II (2013-2015)

- ❏ 2013 BASELInE I
- ❏ 2014 BASELInE II
- ❏ 2015 BASELInE III

Phase III (2016-2018): Data and network

7-SEAS 2010-2015 *in-situ* instrumentation

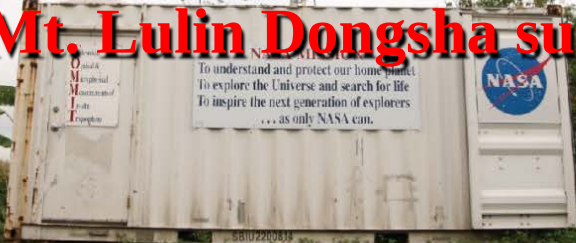
Chemistry



Physics



NASA COMMIT- Dongsha, Son La **Air quality mobile - Hengchun**
NASA ACHIEVE Yen Bai
NCU mobile 1 - Doi Ang Khang
NCU mobile 2 – Hengchun
NCU Mt. Lulin Dongsha supersites

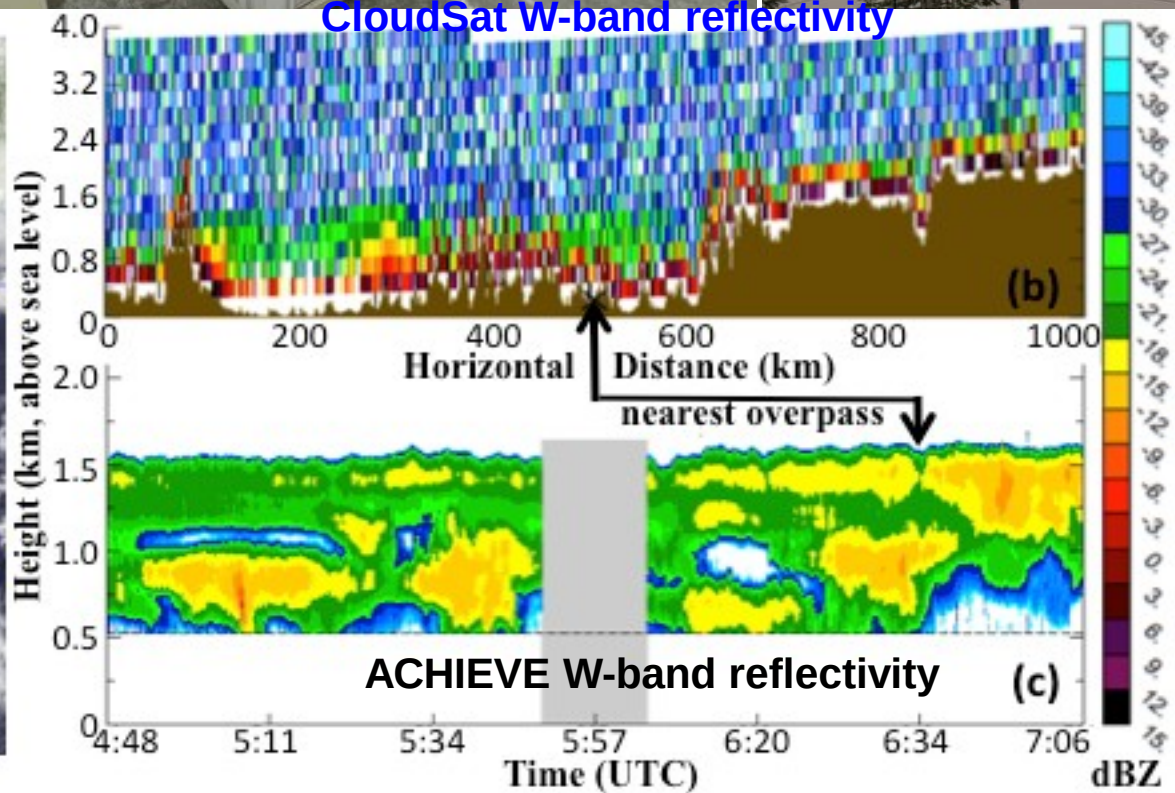
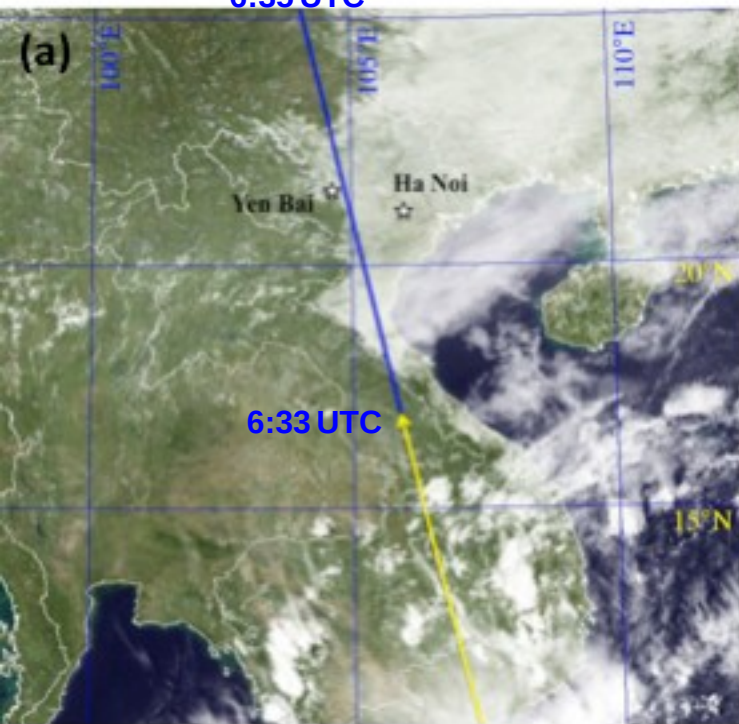




6:35 UTC



CloudSat W-band reflectivity



Atmospheric Environment

2013 Nov (78) special issue on:

“Observation, Modeling and Impact Studies of Biomass Burning and Pollution in the SE Asian Environment – From BASE-ASIA and Dongsha Experiment to 7-SEAS”

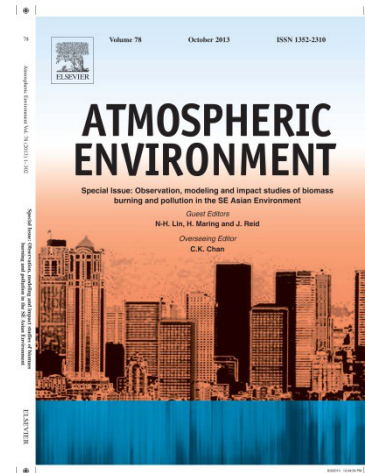
Guest Editors:

George Lin, NCU (nhlin@cc.ncu.edu.tw)

Hal Maring, NASA

Jeff Reid, NRL

**28 papers – overview,
aerosols/gases/toxics, remote sensing,
modeling and impact studies.**



Aerosol and Air Quality Research

2nd special issue on:

**“Aerosol Impact on Physical, Chemical
and Biological Processes in Southeast
Asia and the Maritime Continent”**

Guest Editors:

James Campbell, NRL

Guey-Rong Sheu, NCU

Somporn Chantara, CMU

Published in Nov. 2016

27 papers



7-SEAS 2018 spring campaign

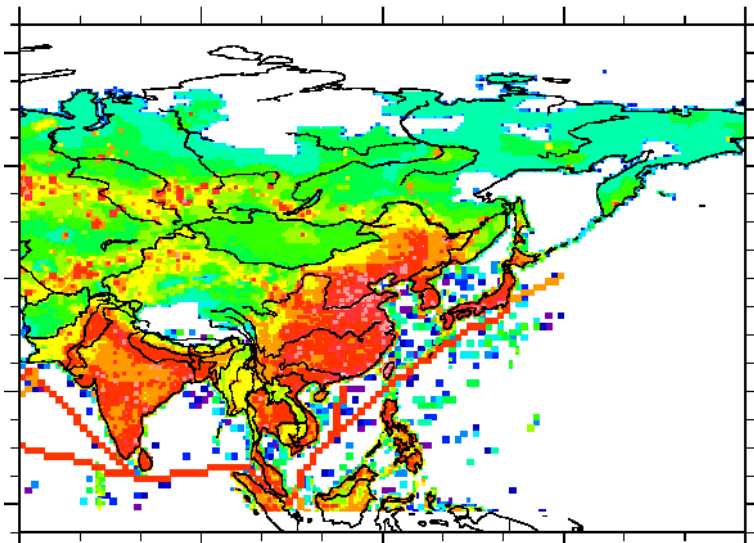
- **March - mid-April 2018**
- **Plume transport observation:**
TH-VN-CN/HK-TW

Vertical profiling

- **Aerosol-cloud interaction in N. VN**
- **Sources from southern China?**
- **Impact studies**

Regional Emissions Inventory on Asia (REAS version 2.1)

NIES, Japan – Toshimasa Ohara



Kurokawa et al., ACP, 2013

Item	Description
Target Areas	E, SE, S, and Central Asia Asian part of Russia
Target Years	2000-2014
Spatial Resolution	0.25 x 0.25 degree
Temporal Resolution	Monthly (if possible)
Japan	JEI-DB/OPRF*
Korea and Taiwan	Officially estimated data

	SO ₂	NO _x	CO	PM ₁₀	PM _{2.5}	BC	OC	NMV	NH ₃	CH ₄	N ₂ O	CO ₂
Fossil Fuel Biofuel	●	●	●	●	●	●	●	●	●	●	●	●
Industrial Process	●		●	●	●	●	●	●	●		●	●
Fertilizer use		●							●	●	●	
Livestock									●	●	●	
Agriculture		●						●				

Asian Brown Cloud – AERONET – SKYNET – Measuring Stations



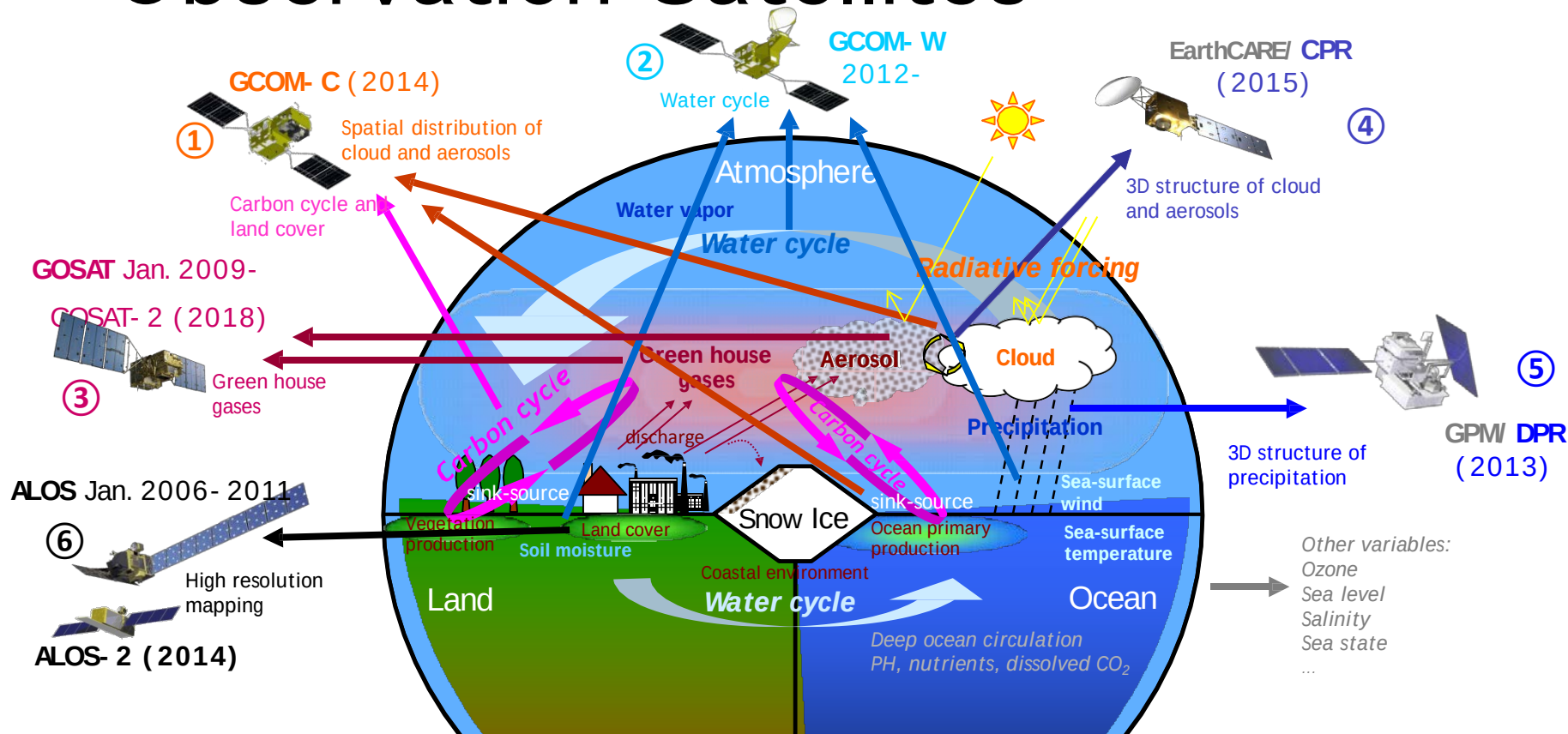
Monitoring stations for atmospheric aerosols by ABC, AERONET, and SKYNET in Asia.

SKYNET is an observation network to understand **aerosol -cloud-radiation interaction** in the atmosphere. The main instruments consist of a sky radiometer and radiation instruments such as a pyranometer and pyrgeometer as a basic site, and a super site has more instruments extended for analyzing atmospheric parameters of aerosol , cloud and radiation.



http://atmos.cr.chiba-u.ac.jp/skyenet_index.html

JAXA Earth Environment Observation Satellites



① **GCOM- C:**

Long- term observation of the horizontal distribution of aerosol, cloud, and ecosystem CO₂ absorption and discharge

② **GCOM- W:**

Long- term observation of water- cycle such as the snow/ice coverage, water vapor, and SST

③ **GOSAT:**

Observation of distribution and flux of the atmospheric greenhouse gases, CO₂ and CH₄

④ **EarthCARE/ CPR:**

Observation of vertical structure of clouds and aerosols

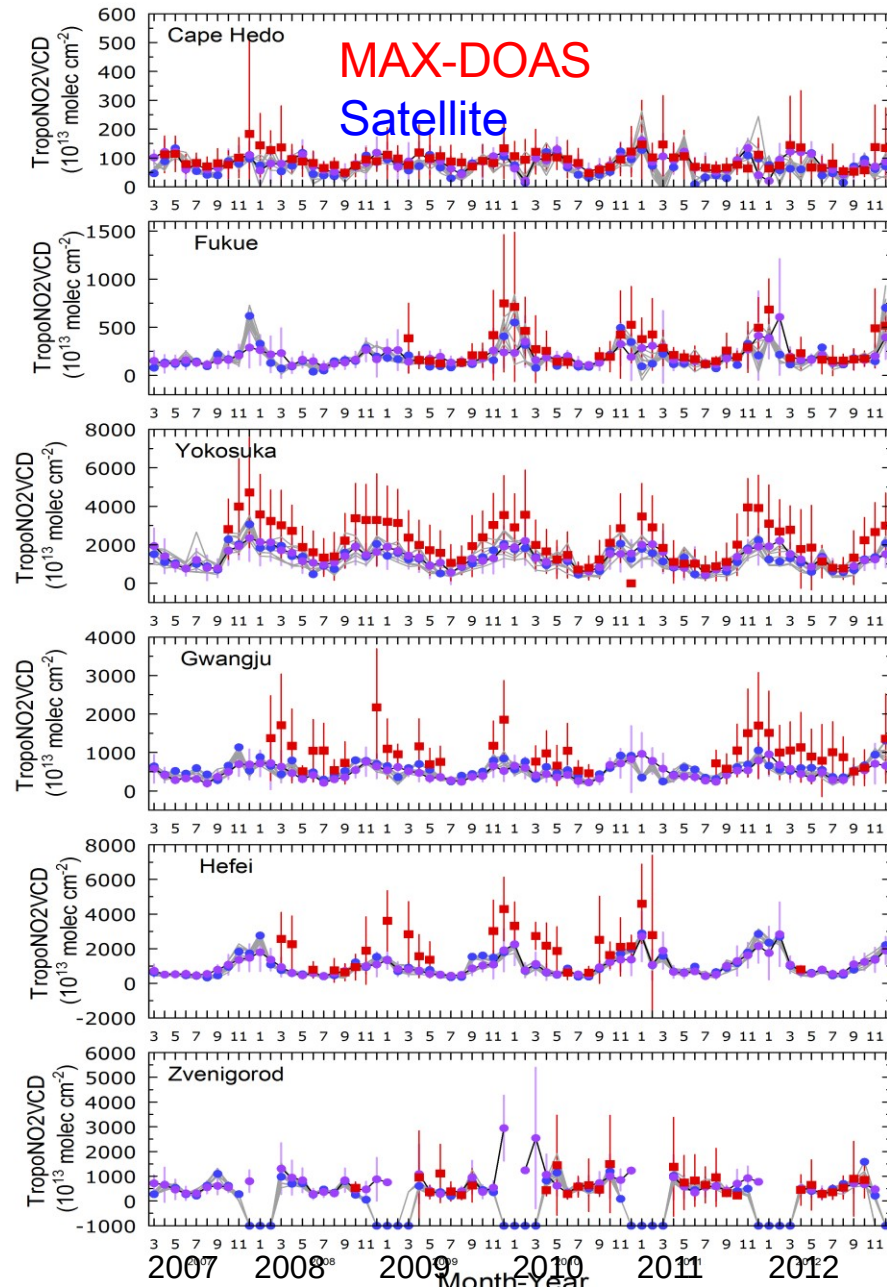
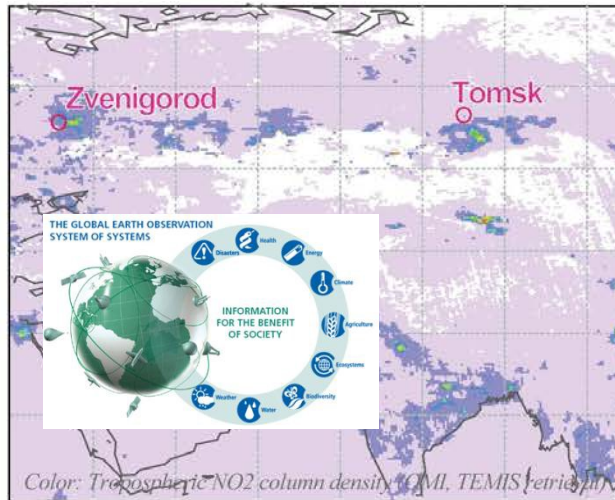
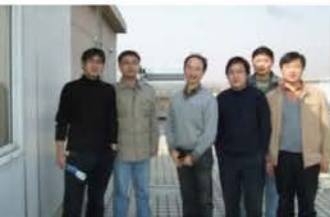
⑤ **GPM/ DPR:**

Accurate and frequent observation of precipitation with active and passive sensors

⑥ **ALOS, - 2**

Fine resolution mapping by SAR instruments

MAX-DOAS network over Asia and Russia

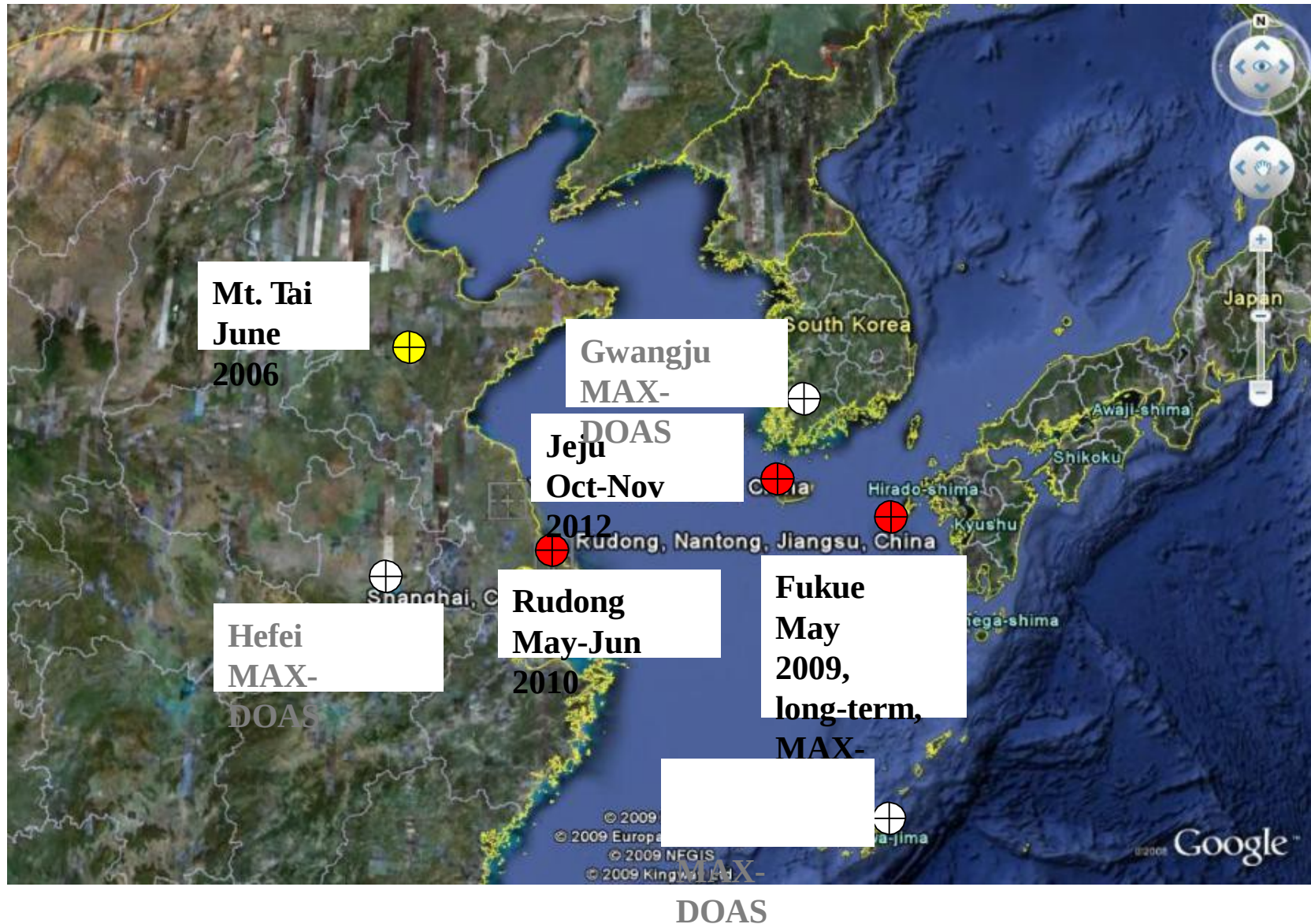


- Wanted: partners for obs in SE/S Asia!
- Climatology of NO₂ and aerosols
- Validation of satellite & model

<http://ebcrpa.jamstec.go.jp/maxdoashp/>

JAMSTEC - Representatives

MAX-DOES Network over Asia – China, Korea, Japan (as of now)



Continuous observation of aerosols in East Asia using a ground-based lidar network (AD-NET)

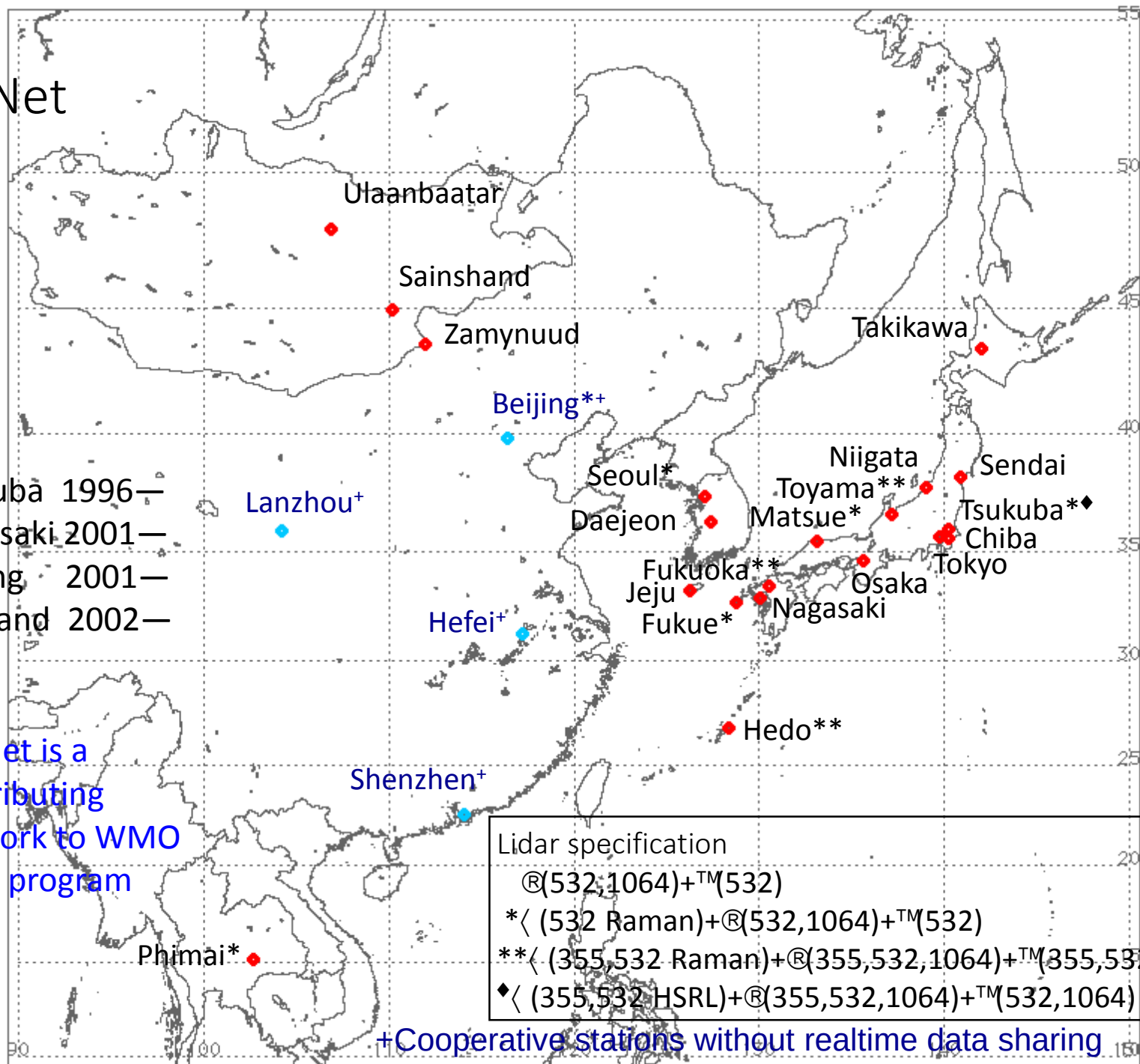
Asian Dust (AD-Net) is an evolving advanced multi-
parameter lidar network

Contact: Dr. Nobuo Sugimoto
National Institute for Environmental Studies, Japan

AD-Net

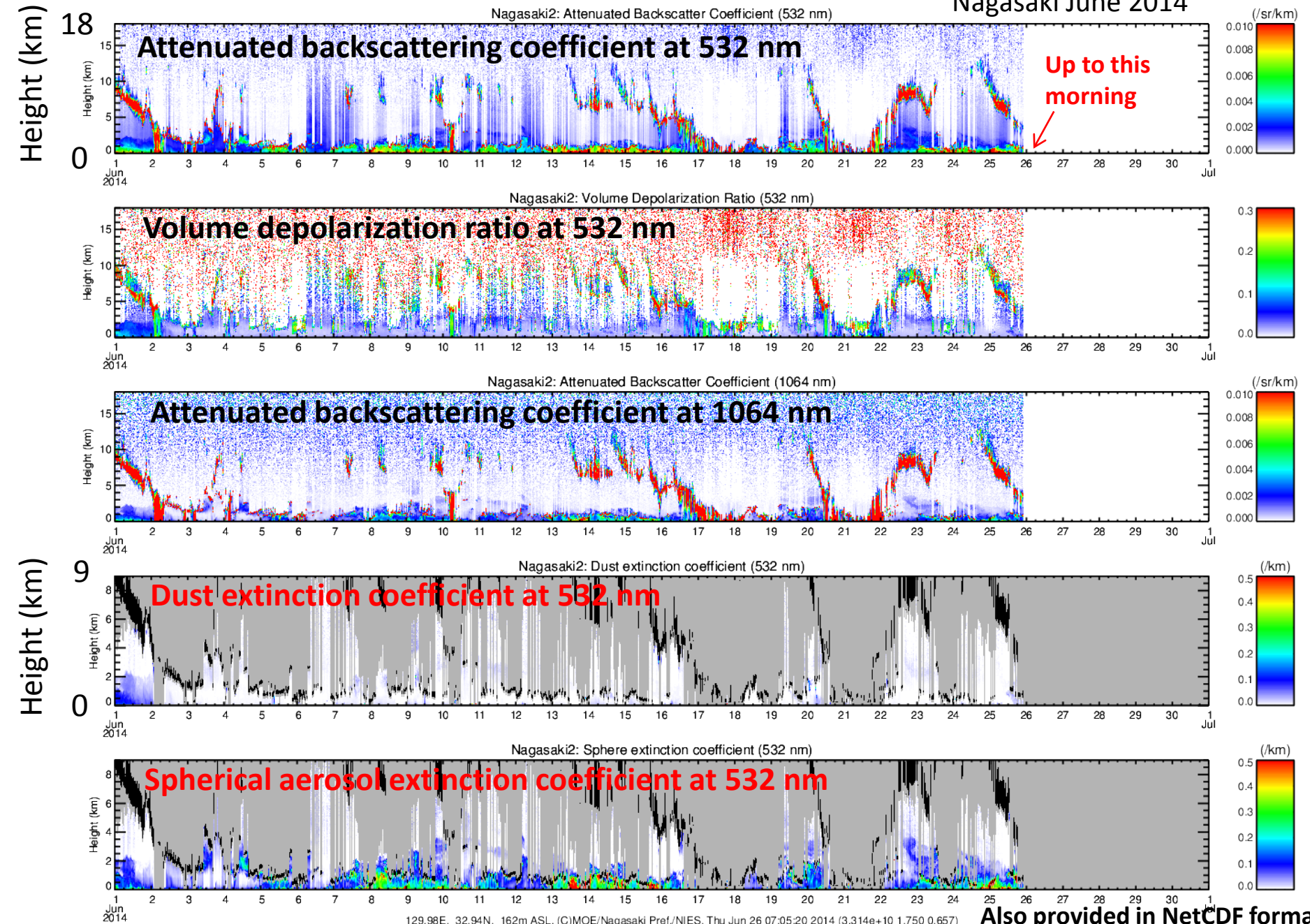
Tsukuba 1996—
Nagasaki 2001—
Beijing 2001—
Thailand 2002—
...

AD-Net is a
contributing
network to WMO
GAW program



Standard near realtime AD-Net data products (updated every hour)

Nagasaki June 2014



129.98E, 32.94N, 162m ASL, (C)MOE/Nagasaki Pref./NIES, Thu Jun 26 07:05:20 2014 (3.314e+10 1.750 0.657)

Also provided in NetCDF format

LIDAR Instrument useful for measuring:

non-spherical (dust)
weak-absorption fine (sulfate, etc.)
weak-absorption coarse (sea salt)
strong-absorption fine (black carbon)



α : extinction,
 β : backscattering,
 δ : depolarization



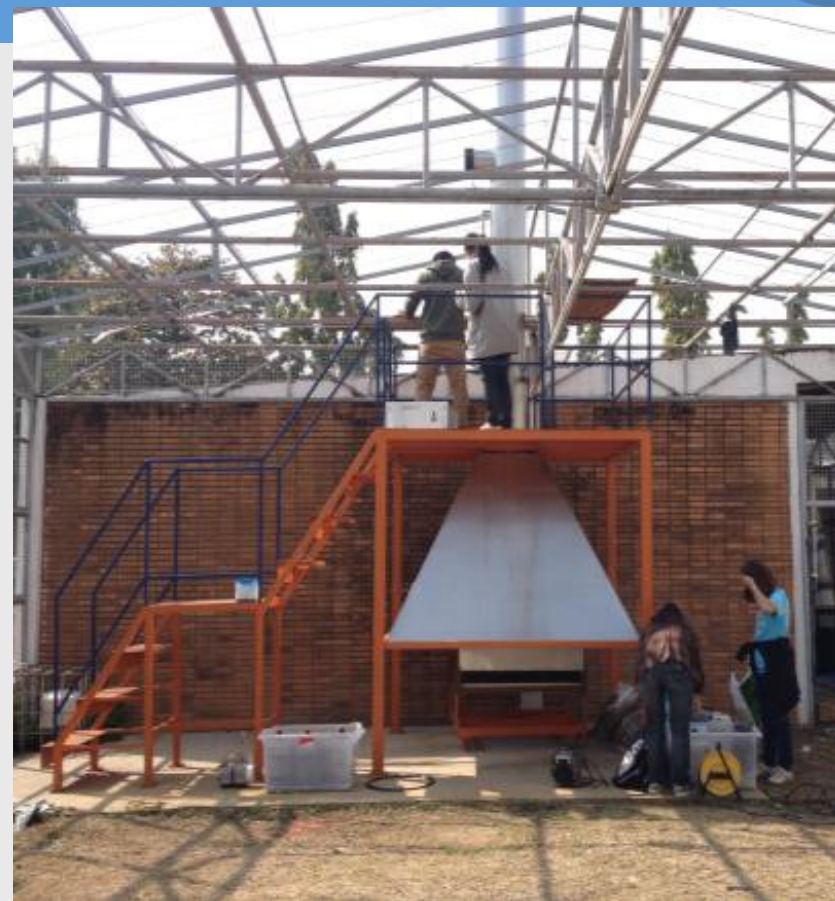
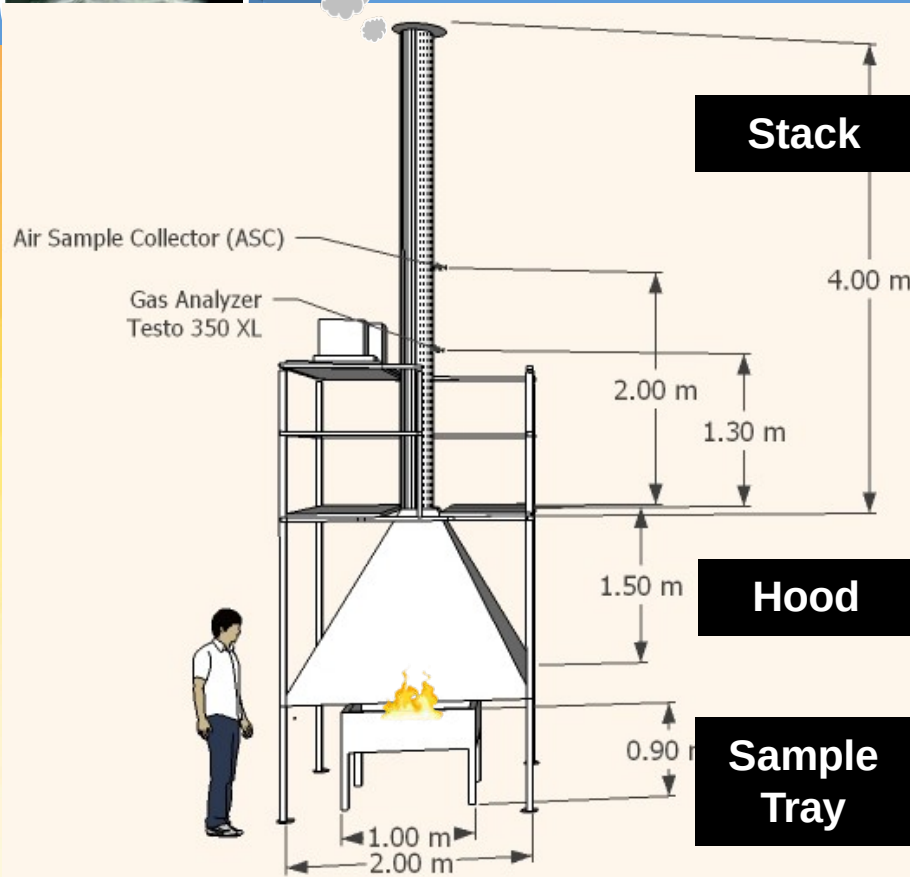
Emissions of Biomass Burning Simulated in Open Burning Combustion Chamber



Asst. Prof. Dr. Somporn Chantara

**Environmental Science Research Center (ESRC),
Faculty of Science, Chiang Mai University**

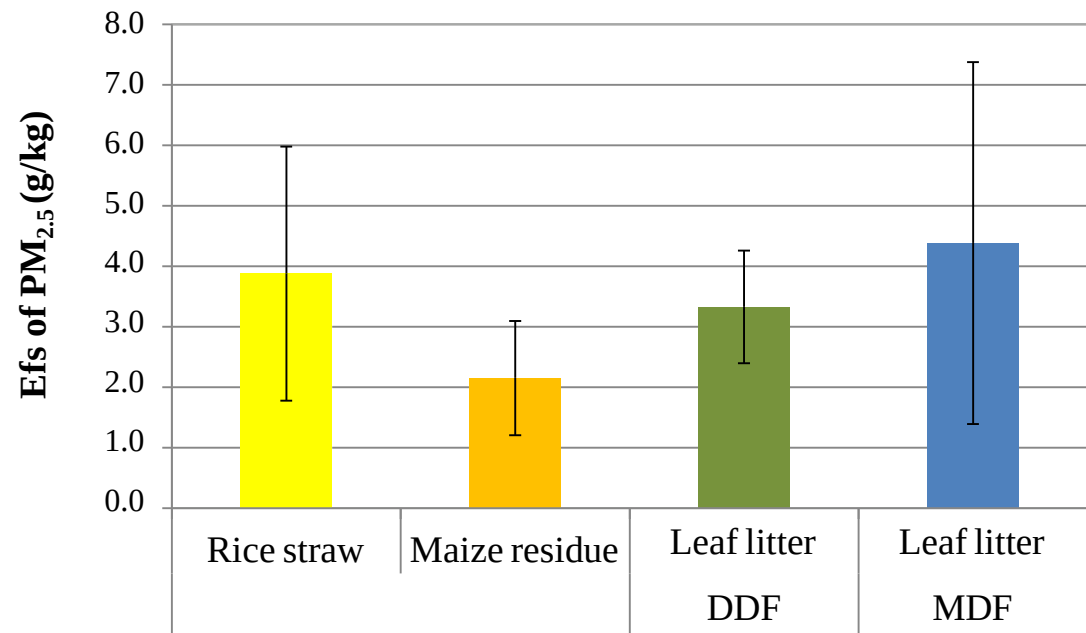
Open System Combustion Chamber





Emission factors of PM_{2.5} from biomass burning

Biomass	Efs of PM _{2.5} (g/kg) (n = 3)
Rice Straw	3.80±2.09 ^b
Maize Residues	2.11±0.91 ^a
Leaf Litters (DDF)	3.48±1.36 ^b
Leaf Litters (MDF)	4.20±2.74 ^b



2-different special issues on fires, biomass burning pollution in Asia 2017,2018



-Publications focusing on South and Southeast Asia

-Each article will undergo a regular peer review process of the journal.

Eds: Krishna Vadrevu, Toshimasa Ohara and Chris Justice.

Way forward - SEARRIN

Currently contributing to:

- Facilitating meetings/trainings in the region
- Participate/fund raising/cost-share with respect to SARI/SEARRIN meetings in the region (Ex: Phillippines meeting in May, 2018; Laos meeting during August-September, 2018;
- Facilitating field trips/campaigns share expertise in the region
- Contributing towards publications (Books, Journal special issues)
- Collaborating with SERVIR hubs on joint meetings/trainings

Way forward - SEARRIN

Action item on-going - ISRAR

- Re-build the website

www.searin.net (reserved)

- All the activities since establishment
- List of contacts with affiliations
- Upload documents, Pdf's, ppts;
- Portal for sharing all data