A Live Report from Pre-YMC Campaign in Sumatra

Kunio Yoneyama and Japan & Indonesia Pre-YMC campaign Team

- An Update on Japanese Activities since Singapore Workshop -

Outline

1) Boreal winter of 2017/18 expected to be Oct 2017 ~ Jan 2018

2) Pilot Study in Sumatra for YMC Nov 2015 ~ Dec 2015

3) Others Plan of Boreal Summer Monsoon Study

Kids enjoy playing soccer since they don’t care about rain as far as those are due to diurnal cycle ...

At The YMC 2nd International Science & Planning WS in Jakarta, 24-26 Nov 2015
Proposed Observation by JAMSTEC in the Boreal Winter of 2017/2018

Purpose: Precipitation mechanism off and on Sumatra, with focus on the relationship with
1) local atmospheric circulation vs. MJO
2) IOD (SST condition over the oceanic upwelling region).

Period: Boreal Winter in 2017/18

Location: Eastern Indian Ocean ~ Sumatra

Observations:
- R/V Mirai: C-band Polarimetric Doppler radar, Radiosonde, CTD, etc.
- Bengkulu: X-band Polarimetric Doppler radar, Radiosonde, Surface Met, etc.
- Kototabang: Equatorial Atmosphere Radar (can measure stratosphere)
Proposed Observation Network

DEC-mean Precipitation by TRMM

Land-based at Bengkulu

R/V Mirai

Upper Air Stations RAMA, TAO/TRITON

Diurnal Cycle

From Mori et al. (2004)
Pre-YMC Field Campaign in Nov – Dec 2015

Ship-based
< Atmospheric Measurements >
1) C-band Polarimetric Doppler Radar
2) Radiosonde (3-hrly)
3) Video sonde
4) Surface Meteorology
5) Skin SST (Radiometer, Seasnake)
6) GPS water vapor
7) Disdrometer
8) Ceilometer
9) Raman Lidar
10) Sky Radiometer
11) MAX-DOAS (NO2, AOD)
12) High Volume Air Sampler & Gas Analyzers

< Oceanographic Measurements >
1) CTD (6-hrly)
   + water sampling (Nutrients, DO, Chl-a)
   + LADCP
2) Underway CTD (prior to on-station obs)
3) Ocean surface turbulence
4) Sea Surface Monitoring (T, S, DO, Chl-a, etc.)

Land-based
< Atmospheric Measurements >
1) X-band Polarimetric Doppler Radar
2) Radiosonde (3-hrly)
3) Video sonde
4) Surface Meteorology
5) Disdrometer
Radiosonde Observations at Bengkulu

Being done by members from JAMSTEC, BPPT, and BMKG
Radiosonde Observations at Bengkulu (Nov 9-18)

\[ \theta \text{ Anomaly} \quad \text{Pot. Temp. anomaly [K]} \]

\[ \text{RH} \quad \text{Relative humidity [%]} \]

\[ U \quad \text{Zonal wind [m/s]} \]

\[ V \quad \text{Meridional wind [m/s]} \]
Obtained Security Clearance with the Great Help of BPPT

We obtained Security Clearance on Nov 6, when the R/V MiRAI departed Japan !!!

SO & BMKG scientist embarked at off Talaud Islands
Wave-glider: Challenge for YMC, TPOS, and Beyond

First trial in the open ocean. It is equipped with surface met sensors.
Onboard the R/V Mirai
Videosonde (+ Polarimetric Radar)
Forecast using Numerical Model by JAMSTEC (SINTEX-F)

Predicted DJF2015/2018 SSTA from 1Nov2015 (9-member)

Predicted DJF2015/2016 tprepa from 1Nov2015 (9-member)

Nino3.4 SSTA (190°-240E, 5S-5N) forecast

http://www.jamstec.go.jp/frsgc/research/d1/iod/

Super Computer “Earth Simulator”
© JAMSTEC
Forecast using Global Cloud-system-resolving Model “NICAM”

1. 30-day ensemble forecasts (~14 km, 2 members, 1-2 times/wk)
2. 7-day ensemble forecasts (~7 km, 2 members, daily)

By T. Nasuno & M. Ikeda
Apply “downscaling with 3.5 km” onto WRF model, which run using NCEP Ensemble Forecast Products.

By M. Fujita
Stratosphere-Troposphere Interation Study at Kototabang

Equatorial Atmosphere Radar Site

47 MHz, Antenna array (110 m in diameter)
In conjunction with EAR, special sonde equipped with
1) High accurate water vapor sensor,
2) Ozone sensor, and
3) Cloud particle sensor
will be launched to study dehydration effect by equatorial waves in TTL.
Radars at Bengkulu ... Current Status as of Nov 23

C-band Doppler Radar (Selex)
No operation due to technical trouble.

X-band MPR (Selex)
Under setting.

JAMSTEC X-band MPR (Furuno)
Set-up was delayed.
Has just started since Nov 23, 06Z.
But it covers the range only within 30 km.
Radiosonde data (TEMP/PILOT) taken at Bengkulu have been sent to GTS via BMKG HQ. (We confirmed this procedure.)

However, only PILOT wind data can be monitored on GTS. According to NOAA/CPC, they have not received any TEMP data.

What’s happening ???
JAMSTEC YMC Site

http://www.jamstec.go.jp/ymc/

Campaigns Page

“YMC” – 4 Years of the Maritime Continent 2017 - 2019

Observing the weather and climate system of Earth’s largest continent to improve understanding and prediction of its local variability and global impact.

This is JAMSTEC YMC Page.

What’s New

- Provisional Agenda of 2nd International Science and Planning Workshop in Jakarta is now available.
- Check Publications page. We put recent relevant papers which help designing the coming campaign. Updates will be made constantly hereafter.
- 2015.05.15 JAMSTEC YMC Page is launched.
- 2015.03.20 Japanese group science meeting in Kyoto
- 2015.01.29-30 First International Science and Planning Workshop on YMC

What is YMC?

YMC is a 2-year (2017-2019) campaign. Through international collaboration and coordination, integrating observation and modeling, bridging research and operation, and outreach and capacity building, YMC is expected to advance to an unprecedented level our understanding and prediction of the MC weather-climate systems for socioeconomic benefit both locally and globally.
“Possible” Observation by JAMSTEC for Boreal Summer in 2018

Main targets: Monsoon & Northward Propagating ISV

Philippines (JAMSTEC + PAGASA)
Enhanced Radiosonde Sounding
AWS at Tacloban & Guiuan
Doppler Radar at Cebu, etc.

Palau Site by JAMSTEC (+ France)
X-band Doppler radar
LIDAR, AWS
(+ Aeroclipper with LMD, CNES)
“Possible” Observation by JAMSTEC for Boreal Summer in 2018

LMD, CNES and JAMSTEC (PIs: Jean-Philippe Duvel – Hugo Bellenger) – France & Japan

Instrument: Aeroclipper (surface layer measurements)
Time & Location: TBD (During boreal summer in Palau)

-> Pilot experiment in 2016 in Palau
Eastern Indian Ocean (off west and northwest coast of Australia) is hosting various oceanic phenomena.

Eastern Indian Ocean Upwelling Research Initiative (EIOURI) for IIOE-2

R/V Mirai Cruise - Nov 2017

R/V Hakuho-Maru Cruise - Nov-Dec 2018

- Sumatra Upwelling
- Java Upwelling
- Eastern pole of IOD
- Indonesian Throughflow
- Ningaloo Nino/Nina
- Meso-scale Eddies
- Leeuwin Current
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