

SUMMARY

International YMC Workshop on Implementation Plan

Jakarta, Indonesia, November 24-26, 2015

The second international YMC workshop was held in November 24-26, 2015 in Jakarta, Indonesia. It was hosted by the Agency for Meteorology Climatology and Geophysics (BMKG) of Indonesia. The main objectives of this workshop are to (1) review the progress made in preparation for YMC since the first international YMC workshop held in Singapore, January 28-30, 2015 and hosted by the Centre for Climate Research Singapore (CCRS), and (2) start drafting a YMC Implementation Plan. About 80 people from 12 countries and regions attended the workshop. The workshop agenda is given in Appendix A.

In the opening remarks for the workshop, Prof. Edvin Aldrian, Director of Research and Development Center of BMKG, Dr. Andi Eka Sakya, Director General of BMKG, Dr. Zainal Arifin, Deputy for Earth Science of LIPI, and Prof. Wimpie Agoeng Noegroho, Deputy for Natural Resources Development Technology of BPPT all emphasized the importance of YMC to advancement of knowledge and technology, to improvement of weather and climate prediction, to enhancement of societal vigilance and resilience to high-impact weather and climate change, and to capacity building in the MC region. They also pointed out the essence of international collaboration and participation by scientists from MC countries to the success of YMC.

The workshop presentations and discussions covered a broad range of issues related to past, current, and future observations in the MC region, observing and modeling capabilities of the MC countries, funded and planned components of the YMC field campaign, procedure of applying for research permit from Indonesia, and international collaborations during YMC. These and other topics are summarized below. In addition to in situ observations, satellite observations are also important to YMC, which are not included in this summary.

1. Pilot Studies of the YMC Field Campaign

The following field observations in the MC region were designed as pilot studies of the YMC field campaign:

(a) JAMSTEC R/V Mirai cruise, November - December 2015, offshore west Sumatra near the Bengkulu land site. Instruments onboard of R/V Mirai include a C-band polarimetric Doppler radar, 3 hourly radiosondes, videosonde, surface meteorology, radiometer, Seasnake, disdrometer, ceilometer, Raman Lidar, radiometer, and wave-glider, etc. Instruments at the land site are X-band Polarimetric Doppler radar, 3 hourly radiosondes, videosonde, surface meteorology measurement, and disdrometer.

(b) Two EMAPEX microstructure (temperature, salinity, velocity, and turbulence) floats to be deployed in the Indonesian Seas from an Indonesian ship. The floats will be in the

upper 200 m most of the time with occasional dives to 1000 m.

Both pilot studies have been granted with research permit from Indonesia, which was applied by their Indonesian collaborators.

2. Funded Field Observations during YMC

The following observations during YMC have received funding support:

(a) *BMKG facilities*. In addition to the existing sounding, radar, and surface meteorology observing networks, BMKG plans to add during the YMC field campaign enhanced rawinsonde launches (4/day) at five locations, a Seaglider in the Karimata Strait, five sun photometers, a pyrheliumeter, a Portable Weather Station (PWS), ten Automatic Weather Stations (AWS), four high-frequency coastal radars, and five coastal buoys. The objective is to gain comprehensive understanding of multi-scale interaction and air-sea interaction in the MC and to improve prediction and simulation of local weather and climate.

(b) *LAPAN Airborne Facility*. They include the LAPAN Surveillance UAV (LSU), the LAPAN Surveillance Aircraft (LSA), a transportable radar, experimental radiosond system, CO₂ sondes, surface CO₂ towers, Rocketsondes, ground stations, among others. The LSA is equipped with probes for cloud droplet (2-50 μm), 2D cloud imaging (25-1550 μm, and precipitation imaging, Cloud-Aerosol Precipitation Spectrometer, Cloud Condensation Nuclei Counter, Chemical Ionization Mass Spectrometer, and a dropsonde system. 1 – 2 month flight time of LSA, 720 radiosondes, 2 Rocketsondes, and three ground station will be available for the YMC field campaign. The objectives are to study multiscale interaction of convective processes, land-air-sea interaction, and atmospheric chemistry, to build the capacity of research through international collaboration, and to improve prediction for Indonesia.

(c) *Alfred-Wegener-Institut Facilities*. A StraoClim ground station in Palau will collect data during January 2016 – December 2018. Instruments include Fourier Transform Infrared Spectrometer, Ozonesondes, Water vapour sondes, Backscatter sondes, Microlidar, Multi-wavelength aerosol, and cloud lidar. The objective is to study troposphere-stratosphere interaction. Operating at the same time are a JAMSTEC X-band Doppler radar and the operation soundings.

(d) *JAMSTEC Facilities*. They include R/V Mirai and several ground sites during October 2017 - January 2018. The R/V Mirai cruise will be offshore west Sumatra near Bengkulu. Main instruments onboard include C-band polarimetric Doppler Radar, 3-hourly radiosondes, Videosonde, Radiometer, Seasnake, GPS water vapor station, surface meteorology, disdrometer, ceilometer, Raman Lidar, Sky Radiometer, MAX-DOAS, High Volume Air Sampler and Gas Analyzers, 6-hourly CTDs, water sampling, etc. The ground sites are Bengkulu (X-band radar, enhanced 8/day soundings), Kototabang (Equatorial Atmospheric Radar, Ozone/Water Vapor Sondes), Palau (X-band radar, LIDAR, AWS, Aeroclippers), Tacloban and Guiuan, Philippines (enhanced radiosondes). The objective is to study convective diurnal cycle and its interaction with the MJO, air-

sea interaction, and troposphere-stratosphere interaction.

In addition, the NASA CAMPEX and ONR PISTON projects are also funded, both to be conducted in the MC region.

3. Planned YMC Field Observations

The following observations have been planned for YMC with proposals for funding submitted or to be submitted:

(a) *R/V Investigator 2017 Cruise*. A proposal has been submitted for a cruise in November – December 2017 along the northern coast of Australia between Cairns and Darwin. The objective is to study ocean-atmosphere biochemistry and interaction. Chemistry instruments in addition to the standard equipment (see (b) below) will be operating during this cruise. Feedback on the submitted proposal is expected by March 2016.

(b) *R/V Investigator 2018-19 Cruise*. This research vessel is equipped with a Dual-Pol C-band Doppler radar, a cloud radar and lidar, and instruments measuring radiative and air-sea fluxes and atmospheric composition. A radiosonde system may be supplied by the Taiwan Consortium (see (c) below). The main location is between Christmas Island and Java under the main flight pattern of the UK research airplane (see (d) below). The science objective is to collect data to help reduce large precipitation and other biases in the MC region in global numerical models. Pre-proposal for this is due July 2016.

(c) *Taiwan YMC Consortium Facilities*. They include a portable C-Pol radar, a mobile X-band radar, a surface met buoy, a research airplane (CWB ASTRA), R/V OR1, UAV, radiosonde systems, and a land flux tower. The main deploy location is the South China Sea (SCS), with two exceptions. One is the flux tower to be deployed on Borneo. The other is one radiosonde system that may be deployed onboard of R/V Investigator in her 2018-2019 cruise (see (b) above). Two one-month IOPs over the SCS are planned for fall 2017 and spring 2018, and two 2-month IOPs are planned for fall 2018 and spring 2019. The main objective is to improve understanding of convective interaction between the MC and SE Asian monsoon. Proposals for the field observations have been submitted.

(d) *UK YMC Consortium Facilities*. They include a research airplane (FAAM BAe146-301) equipped to measure flight-level meteorology, cloud and aerosol, surface fluxes, and atmospheric profiles via dropsondes, Seaglidars, and two land sites (Christmas Island, West Coast of Java). Instruments on Christmas Island include a 94 GHz cloud radar, a Doppler LIDAR, a microwave radiometer, a radiosonde system, and flux towers. Instruments at the Java site include an X-band Doppler radar, a Doppler Lidar, a scanning radiometer, a boundary-layer wind profiler, a radiosonde system, and flux towers. The flight patterns will be between the two land sites and between Java and Sumatra. Seaglidars will be deployed from Christmas Island. The deployment time is 5.5 week deployment in Jan-Feb 2019. The main science objectives is to advance understanding of the diurnal cycle, its interaction with lower-frequency variability (e.g., the MJO), and air-sea interaction. A joint proposal for the field observations has been submitted.

(e) *Equatorial Line Observations.* A collaboration of Scripps Institution of Oceanography, University of East Anglia, Naval Research Laboratory (Monterey), and Jet Propulsion Laboratory/UCLA proposes to establish a land-oceanic observation along Equator (95-110°E) between Sumatra and Celebes Sea during November 2018 – February 2019. The objective is to study scale interaction and air-sea interaction of convectively coupled Kelvin waves and the MJO. Oceanic observations will be made by 2 Seagliders west of Sumatra, 2 Seagliders in the Celebes Sea, a moored thermistor chain instruments between Sumatra and Borneo (on Equator). Land observations will be near the west coast of Sumatra (Padang) and at Pontianak of Kalimantan (Borneo). Land instruments include a disdrometer, an MRR radar, a ceilometer, an MPL lidar, a microwave radiometer, a radiosonde system, and measurement of surface fluxes. A proposal will be submitted in 2016.

(f) *NCAR Facilities.* They include a ground site and a research airplane. Instruments at the ground site include the S-Pol radar, Integrated Sounding System (ISS), X-band Doppler radar On Wheels (DOW), Integrated Surface Flux System (ISFS), radiometer, Ka-band and S-band vertical pointing radars. The research airplane (C-130) will be equipped with instruments for cloud microphysics and aerosol, clouds, and atmospheric and oceanic dropsonde systems. The currently preferred ground site is Padang, Sumatra with an alternative site near the northern coast of Borneo. The tentative aircraft flight patterns include transects between Java-Borneo-Sumatra-Benda Sea. Facility request proposals will be submitted in January 2016.

(g) *KITCube.* The Karlsruhe Institute of Technology (KIT) plans to deploy its KITCube to Sarawak (Borneo) for December 2018 – February 2019. Main instruments of KITCube include Doppler Lidar, Windcube, cloud radar, X-band radar, temperature and humidity profiler, radiosonde system, rain gauges, disdrometers, and measurement of surface meteorology, fluxes, and soil moisture, etc. The objective is to study the diurnal cycle of convection, cloud-aerosol interaction, and tropical-tropopause layer (TTL) dynamics/exchange. Proposals will be submitted.

(h) *University of Notre Dame Facilities.* They include microwave radiometers, 4 surface towers (with 15 Sonic anemometers), and 2 ceilometers, during the entire YMC field campaign, and 2 radiosonde systems, 2 SODAR/RASS systems, a Tethersonde, 4 Doppler Lidars, etc for November 2018 – February 2019. The proposed sites are in Malaysia, Singapore, and Thailand. It is proposed to deploy The objective is to study interaction of the intraseasonal oscillation (ISO) and diurnal cycle in boreal summer and winter, the role of the PBL in ISO through convectively and shear driven vertical transport, and the role of land surface fluxes in ISO propagation.

(i) *Philippine Facilities.* They include cruises of research ship (M/V DA-BFAR) and ground meteorology and aerosol instruments, in addition to existing networks of C-band radars, radiosondes, surface met stations, and Micropulse Lidar (MPL). The objectives are to study the diurnal cycle in coastal regions, the characteristics and transport of aerosol, to aid NWP development, to improve quantitative rainfall estimate.

(j) *China YMC Consortium Facilities*. They include air-sea flux towers in the South China Sea (SCS) and in the MC (to be build in collaboration of MC scientists), research vessels cruises and deployment of buoys in the SCS. The objectives are to study the circulation and upper-ocean mixing of the Indonesian Throughflow (ITF) and SCS Throughflow and their interaction, interaction of the MJO and MC, and to develop regional models. Proposal for funding will be submitted.

4. Other Field Observations during YMC

- Transport, Internal Waves and Mixing in the Indonesian Throughflow (TIMIT) cruises: 1 – 18 October 2015, deploy 2 moorings in the Makassar strait and 1 mooring in the Lombok strait plus CTDs; Sept - Oct 2016, Mooring recovery and re-deployment; Sept - Oct 2017, Mooring recovery
- LIPI IIOE-2 E-Cruise, 2017, north-western Sumateran waters, 25 - 30 days, R/V Baruna Jaya VIII

Other planned and funded ship cruises during YMC are listed in Appendix C.

5. Modeling studies

Modeling activities with focuses on the MC include climate downscaling, research model diagnostics and numerical experiments, and developing regional prediction capability.

(a) *Climate downscaling*. This is organized by the Southeast Asia Regional Climate Downscaling (SEACLID) / CORDEX Southeast Asia Project. It involves 17 institutions from 13 countries of the Southeast Asia region. Its first phase (downscale to 25 km × 25 km grid spacing) is nearly completed. Proposals for the second phase (downscaling to 3 km x 3 km over key vulnerable areas).

(b) *Research Model Diagnostics and Numerical Experiments*. Main objectives of research modeling activities are to understand the processes of the diurnal cycle, the MJO, their interaction and air-sea interaction in the MC. Regional (WRF) models use cloud-permitting grid spacing (e.g., 2-4 km). These models show certain skill of reproducing the diurnal cycle and the MJO, but suffer from obvious biases and errors (e.g., over-producing rain), even though they are much small than coarser-resolution simulations with cumulus parameterization (e.g., 12 km). Numerical experiments were conducted to explore roles of land configurations of the MC and the diurnal cycle in the MJO. Preliminary results are intriguing and in some cases counter-intuitive. Ocean modeling and air-sea coupled modeling focusing on the MC have also been conducted. Opportunities exist to include land models, to make real-time forecast using regional cloud-permitting configurations, and to make detailed model-observation comparison once the YMC field campaign is completed.

(c) *Regional Prediction Capability*. Development of national modeling capability is a high priority of for the MC countries (e.g., Indonesia, Philippines, Singapore). For example, under the SINGV project, the Meteorological Service Singapore is working on

its regional convective scale (1.5 km) forecast system, starting to include radar reflectivity in the data assimilation system and to test with 300 m grid spacing. LAPAN is running an experimental numerical weather prediction system for the Indonesian region (95E-140E, 10S-10N).

6. Endorsement and Connection to other Programs

YMC has been endorsed by WWRP/WG on Tropical Meteorology Research and is scheduled to be endorsed by WWRP in November 2015. Endorsements by WCRP/CLIVAR Indian Ocean Panel (with GOOS) Monsoon Panel (with GEWEX) are under the review. The YMC field campaign has been taken as a pilot study for the Tropical Pacific Observing System (TPOS) 2020 Planetary-Boundary-Layer Task Team (PBL TT) to explore the optimal location, instruments and variables and regional ownership and collaboration for sustained observations. For this the IIOE-2 Steering Committee has created a joint Working Group with YMC.

The MJO Task Force (MJOTF) has recently developed a new subproject on Maritime Continent Intraseasonal Processes and Prediction. Meanwhile, there is a new Joint Effort on the Maritime Continent (MC) organized by the MJOTF and WMO Subseasonal to Seasonal Prediction Project (S2S). Both are directly relevant to YMC. They provide global modeling resources (e.g., multi-model prediction and simulation data) that complement the regional emphasis of YMC. A workshop on Intraseasonal Processes and Prediction in the Maritime Continent will be held in 11-13 April 2016, Singapore, at which connection between YMC and other global MJO and MC activities will be further discussed.

Some cruises in the eastern Indian Ocean close to Sumatra and Java during the period of 2017 – 2019 will contribute equally to YMC and International Indian Ocean Expedition 2 (IIOE-2) and its Eastern Indian Ocean Upwelling Research Initiative (EIOURI) (e.g., LIPI E-Cruise 2017, R/V Hakuho-Maru Cruise Nov-Dec 2018)

7. Reports of Breakout Discussions

(a) *Ocean Observations.* There are substantial resources and opportunities for ocean observations related to YMC. Appendix C lists proposed and planned cruises in the MC region in the coming years. International collaborations can take place in several manners. For example, research in the Indonesian EEZ may be conducted through:

- Indonesia R/V and Foreign R/V working in EEZ/territorial water in tandem arrangement;
- Foreign scientists provide equipment to Indonesian R/Vs and conduct research onboard Indonesian R/Vs;
- Foreign R/Vs work in Indonesian EEZ with Indonesian scientists on board as collaborators.

Indonesia is proposing 80 ship days focusing on ocean-climate and marine pollution in Indian Ocean and Banda Sea, through a new consortium research funding scheme from Ministry of Research, Technology and Higher Education (Menristekdikti), which is expected for 2017.

(b) *Airborne Observations*. Four research airplanes (NCAR C-130, UK FAAM BAe146-301, LAPAN LSA, and Taiwan CWB ASTRA) are planned to be deployed during the YMC field campaign, in addition to the NASA P-3 in CAMPeX. They are several issues that need to be addressed for foreign airplane conduct research in the Indonesian airspace.

- Procedure of applying for permit, which involves many ministries including defence
- An Indonesian Military Observer on board during flight missions
- Permit for dropsondes over the ocean might be unprecedented
- Communication with local air traffic control
- Low level flight over land and ocean for flux measurement
- Indonesian scientists on board during flight missions

LAPAN wishes to build its airborne observation capability through YMC in the following aspects:

- Knowledge transfer from UK/USA to LAPAN on research airplanes
- Exchange visits between UK/USA/LAPAN
- Information on instrumentation
- Flight strategy

(c) *Ground Observations*

- BMKG is the Indonesian agency that coordinates site survey and selection;
- Issues that need to be address:
 - Research permit
 - Local office/station, Site survey/Logistics
 - radio wave frequencies clearance
 - Custom clearance / Tax exemption
 - MOUs and IAs with contribution to capacity building
 - Coordination with other countries
 - Collaborations with air-borne and ocean observations
 - Data transfer to GTS
 - Data sharing
 - Workshops on observational data

(d) *Modeling*

- Capacity building is very important. It may include
 - Sharing codes and accessible datasets with sufficient documentation
 - Tutorials/training for modeling, especially targeting interesting events during the field program
 - ACTION ITEM: generate list of desired deliverables to support capacity building.
- Coordination of modeling experiments is desired
 - Need to coordinate with observationalists. OSSE might be useful.
 - It is useful to coordinate in terms of domains and other aspects. Possible sensitivity tests.
- Hierarchy of models to improve parameterizations
 - Inhomogeneity in the MC would be a challenge.
 - Modeling design needs information of field observations.
- Making sure we have good real-time forecasting activities
 - Easy access to regional information from ECMWF, NCEP, etc

- Access to forecast information from regional models.
- Common websites from where forecasts can be accessible for specific regions.
- It is likely that ECMWF will support YMC as they did for CINDY/DYNAMO, with will be shared with YOPP.
- Observations from field measurements should go into the GTS for assimilation systems.
- Need to coordinate with ECMWF and other centers on data denial experiments.
- Land modeling needs to be included.
- Coordination with S2S-MJO task force subproject desired, although modeling needs might differ.
- Need to point people to coordinate various modeling activities.
- For coordination set up email list
- Sub-modeling groups for mesoscale models and global models?
- The difficulty of data assimilation cannot be overlooked.

8. YMC Data Policy

The YMC data policy should be in compliance with the World Meteorological Organization (WMO) Resolution 40 on the policy and practice for the exchange of meteorological and related data and products including guidelines on relationships in commercial meteorological activities: *"As a fundamental principle of the World Meteorological Organization (WMO), and in consonance with the expanding requirements for its scientific and technical expertise, the WMO commits itself to broadening and enhancing the free and unrestricted international exchange of meteorological and related data and products."* Additional YMC data policy requires:

- YMC Data (field observations, operational observations, satellite data, reanalyses, and model output) Archive Centers (YDACs) will be established and maintained at several institutes with links to each other.
- Within 12 months following the end of the field campaign, all data shall be promptly provided by YMC investigators responsible for data acquisition to other YMC investigators upon request and notification of the intent of data use.
- All YMC investigators participating in the field campaign are required to submit their field data to one of the YDACs no later than 12 months following the end of the field campaign.
- During the first 24 months following the end of the field campaign, all YMC data will be accessible only to YMC investigators to facilitate inter-comparison, quality control checks and inter-calibrations, as well as an integrated interpretation of the combined data set. No public release of the data (sharing with non-YMC colleagues, conference presentations, publications, commercial and media use, etc.) is allowed without the permission of the YMC PIs who are responsible for collecting the data.
- Quality control procedures should be carried out by YMC investigators within 24 months following the end of the field campaign, unless unforeseeable issues emerge. After that, YMC field data will be made available to the broader scientific community. Any remaining data quality issues should be made clear in the data documentation files. Improving YMC data quality will be a continuous effort. The suitability of the released data for scientific investigations and publications should be decided at the discretion of the YMC investigators responsible for field data collection and quality control and data users.

- The authorship decision for publications resulting from using YMC data should follow the ethic rules of the journals and professional organizations (e.g., AMS, AGU, JMSJ). YMC investigators responsible for field data collection are encouraged to make contributions to data analysis and writing of manuscripts, in addition to providing the data, to be co-authors of publications using YMC data.
- The following acknowledgements are suggested to be included in all publications using YMC data: The xxxx data were collected as part of YMC by investigator(s) YYYY under the support by www (if YYYY is not a co-author)]. The data are archived at the YMC Data Archive Center maintained by ZZZZ.

9. YMC Science Steering Committee (SSC)

The YMC SSC consists of two co-chairs and members representing each major participating country or region.

The Terms of Reference for the YMC SSC are:

1. Develop the YMC science and implementation plans;
2. Promote, coordinate and oversee the YMC field campaign, data sharing, modeling, forecast improvement, and outreach/capacity building activities;
3. Provide scientific, technical and programmatic guidance to ensure that YMC progresses towards achieving its scientific objectives;
4. Coordinate YMC participating institutes to maximize the outcome of YMC activities;
5. Provide liaison between YMC research and operation components and promote research-operation collaboration;
6. Coordinate and provide oversight and guidance to YMC working groups;
7. Coordinate between YMC and other relevant international projects and programs to leverage resources and achieve common goals;
8. Organizing international workshops and meeting sessions on YMC sciences;
9. Report progress to international YMC oversight organizations.

Candidates for the YMC SSC are:

Co-Chairs:

Kunio Yoneyama (JAMSTEC)
Chidong Zhang (University of Miami)

Members:

Edvin Aldrian (BMKG)
Olivia Cabrera (University of the Philippines)
Andreas Fink (Karlsruhe Institute of Technology)
Hans Huang (Meteorological Service Singapore)
Adrian Matthews (University of East Anglia)
Chung-Hsiung Sui (National Taiwan University)
Fredolin Tangang (National University of Malaysia)
Matthew Wheeler (Australian Bureau of Meteorology)
Weidong Yu (First Institute of Oceanography, China)

It was suggested that a YMC Implementation Advisory Committee would be necessary to help with the logistical and practical issues of the YMC activities. Members

of this committee should be from the countries of the MC region.

10. Drafting the YMC Implementation Plan

A drafting team was suggested. It would be desire for the drafting team to start working on the draft soon after the workshop, interacting with YMC participants on parts of the Implementation Plan in early 2016 and have a complete draft in late April 2016. The tentative structure of the plan and the responsibility of the drafting team are:

Abstract

Introduction and Background (Zhang)

Summary of the YMC Science Plan (Zhang)

Activity 1: Data Sharing (Yoneyama, Haryoko)

Activity 2: Field Campaign (Zhang, Pandoe)

Activity 3: Modeling (Maloney, Narisma, Satiadi)

Activity 4: Prediction and Application (Birch, Huang, Makmur)

Activity 5: Outreach and Capacity Building (Hermanwan)

Synthesis of the Five YMC Activities

Leverage and Coordination with Other Programs (Yoneyama)

Appendix A YMC Pilot Studies (Yoneyama)

Appendix B Past Field Observations in the MC Region (Zhang)

Table 1 List of contributors to the Implementation Plan

Table 2 List of YMC Field Components (Zhang)

Figure x Proposed YMC Ground Sites, Airplane Flight Patterns, and Ship cruises (Zhang)

Figure y Timetable of YMC Field Campaign (Zhang)

Appendix A Workshop Agenda

AGENDA WORKSHOP ON YEARS OF MARITIME CONTINENT (YMC) IMPLEMENTATION PLAN Jakarta, Indonesia, 24-26 November 2015

Time	Title	Speaker
Day 1, 24 November 2015, BMKG Headquarters Office		
08.30 – 09.00	Registration	
09.00 – 09.05	Remarks	Prof. Dr. Edvin Aldrian , Director Research and Development Center, BMKG
09.05 – 09.15	Opening Address	Dr. Andi Eka Sakya , Director General Agency for Meteorology Climatology and Geophysics (BMKG)
09.15 – 09.20	Remarks	Prof. Ir. Wimpie Agoeng N.A. , MSCE, Ph.D, Deputy Director Technology of Natural Resources, Agency for the Assessment and Application of Technology (BPPT)
09.20 - 09.25	Remarks	Prof. Iskandar Zulkarnain , Deputy Director Indonesian Institute of Sciences (LIPI)
09.25 – 09.45	Overview of YMC Science Plan	Prof. Chidong Zhang University of Miami
09.45 – 10.00	Photo Session	
10.00 – 10.30	Morning Tea and Press Conference	
SESSION 1: Progress Reports since the Singapore Workshop - Observations		
Chair: Dr. Anastasia RTD Kuswardani , Ministry of Marine Affairs and Fisheries Republic of Indonesia (KKP)		
10.30 – 10.50	Australian YMC plans for the period late 2018 to early 2019: RV Investigator on the Christmas Island to Java line	Dr. Matthew C. Wheeler Bureau of Meteorology
10.50 – 11.10	Proposed observation for studying "Interaction of convection over the SCS-MC with large-scale motion"	Prof. Chung-Hsiung Sui and Po-Hsiung Lin Department of Atmospheric Sciences, National Taiwan University
11.10 – 11.30	UK University and Met Office contribution to YMC	Dr. Cathryn Birch Institute for Climate and Atmospheric Science, School of Earth and Environment, University of Leeds
11.30 – 11.50	BPPT Indonesian Research Vessels Capacity: Some Results and Developments	Dr. Wahyu Widodo Pandoe Agency for The Assessment and Application of Technology (BPPT)
11.50 – 13.00	Lunch	
SESSION 2: Current Observations in the MC		
Chair: Dr. Erwin Eka Syahputra Makmur , MBKG		
13.00 – 13.20	Japanese activities - A live report from Pre-YMC campaign in Sumatra	Dr. Kunio Yoneyama JAMSTEC
13.20 – 13.40	Current Research on ITF and Eastern Indian Ocean	Dr. Anastasia RTD Kuswardani KKP
13.40 – 14.00	International research collaborations on stratosphere-troposphere dynamical coupling in the tropics under YMC	Prof. Shigeo Yoden Kyoto University
14.00 – 14.20	Current status of marine geological research in Indonesia	Dr. Rina Zuraida PPGL
14.20 – 14.40	E-WIN and E-Cruise 2017: Indonesian contributions to IIOE-2 and YMC 2017	Dr. Aan Johan Wahyudi LIPI
14.40 – 15.00	Coffee break	
SESSION 3: Current status of YMC		
Chair: Dr. Wahyu Widodo Pandoe , BPPT		
15.00 – 15.20	Indonesia Proposal	Prof. Dr. Edvin Aldrian , BMKG
15.20 – 15.40	Relationship with International Bodies – Current status	Dr. Kunio Yoneyama JAMSTEC
15.40 – 16.00	1N-line: the role of Maritime Continent on CCKW propagation	Dr. Piotr Flatau Scripps Institution of Oceanography
16.00 – 16.20	Indonesian Maritime Fulcrum Policy	Dr. Saleh Nugrahadi Coordinating Ministry of Maritime Affairs
16.20 – 16.30	Update on Coordination Procedure for the Field Campaign	Prof. Chidong Zhang University of Miami
18.30 – 20.30	Welcome Dinner	

Time	Title	Speaker
Day 2, 25 November 2015, Grand Mercure Hotel, Kemayoran		
SESSION 4: Progress Reports since the Singapore Workshop - Observation		
<i>Chair: Prof. Edvin Aldrian, BMKG</i>		
08.30 – 08.50	NCAR Ground and Airborne Observations during YMC	Prof. Courtney Schumacher TAMU
08.50 – 09.10	Atmospheric composition observations during the YMC from a new research station on Palau: Constraining the atmospheric oxidizing capacity in the tropical West Pacific.	Dr. Markus Rex Alfred-Wegener-Institut, Helmholtz-Zentrum für Polar- und Meeresforschung
09.10 – 09.30	Potential contribution of the Institute for Meteorology and Climate Research (KIT, Germany) to the YMC campaign	Prof. Andreas Fink Karlsruhe Institute of Technology
09.30 – 09.50	RV Investigator sea-time proposal for the Australian Monsoon period 2017/2018 - Understanding biogenic emissions in the Maritime Continent	Prof. Robyn Schofield University of Melbourne
09.50 – 10.10	SEACLID/CORDEX South East Asia	Dr. Dodo Gunawan BMKG
10.10 – 10.30	<i>Coffee break</i>	
SESSION 5: Progress Reports since the Singapore Workshop - Modeling		
<i>Chair: Dr. Tri Wahyu Hadi, Bandung Institute of Technology (ITB)</i>		
10.30 – 10.50	Convection-permitting modelling of the diurnal cycle and gravity waves over the maritime continent	Prof. Todd Lane School of Earth Sciences, University of Melbourne
10.50 – 11.10	Nested coupled air/sea modeling for multi-scale processes in the Maritime Continent	Prof. Julie Pullen Stevens Institute of Technology
11.10 – 11.30	Understanding MJO Interactions with the Maritime Continent: The joint S2S-MJO Task Force subproject	Prof. Eric Maloney Colorado State University
11.30 – 11.50	Simulations of MC Convection by a Coupled Atmosphere-Ocean High Resolution Model	Prof. Shuyi Chen University of Miami
11.50 – 12.10	Madden Julian Oscillations simulated by NICAM	Dr. Tomoki Miyakawa University of Tokyo
12.10 – 13.10	<i>Lunch</i>	
SESSION 6: Progress Reports since the Singapore Workshop - Modeling/Observation		
<i>Chair: Dr. Akhmad Faqih, Bogor Agricultural University (IPB)</i>		
13.10 – 13.30	Tropical Convective-Scale Modeling and Data Assimilation	Dr. Hans Xiang-Yu Huang Meteorological Service Singapore
13.30 – 13.50	Proposed Philippine Component for the YMC	Dr. Cesar L. Villanoy University of the Philippines
13.50 – 14.10	Plan of LAPAN airborne observation to contribute YMC	Dr. Halimurrahman Indonesian National Institute of Aeronautics and Space (LAPAN)
14.10 – 14.30	Toward a mesoscale hydrological and marine meteorological observing network in the South China Sea	Dr. Dongxiao Wang South China Sea Institute of Oceanology, Chinese Academy of Sciences
14.30 – 14.50	Occurrence of microplastic from Cilacap Coastal and Segara Anakan Lagoon	Dr. Agung Dhamar Syakti Center for Maritime Bioscience Studies, Jenderal Soedirman University
14.50 – 15.10	<i>Coffee break</i>	
15.10 – 16.00	<i>Breakout Sessions</i>	
Day 3, 26 November 2015, Grand Mercure Hotel, Kemayoran		
08.30 – 08.50	Research Permit Procedures	Mr. Sri Wahyono Research Permit Administration Section, RISTEKDIKTI
8.50 – 10.00	Reports of Breakout Sessions	
10.00 – 10.15	<i>Coffee break</i>	
10.15 – 12.00	Drafting a YMC Implementation plan	Prof. Chidong Zhang
12.00 – 13.00	<i>Lunch</i>	
13.00 – 14.00	YMC data policy and Science Steering Committee	Dr. Kunio Yoneyama
14.00 – 14.15	Action Items	Prof. Chidong Zhang
14.15 – 14.30	Concluding Remarks	Prof. Edvin Aldrian

Appendix B

Previous Ocean Observations in the MC

- Baruna Jaya I, 16 April – 15 May 2015, eastern Indian Ocean offshore Sumatra
BPPT cruises with CDT casts: SE and S coastline Lombok Island (2014), Banda –
Seram – Sorong (2014), Indian Ocean (21 Sept – 10 Nov 2015)
- Marine Geological Institute (MGI) Java Makassar Flores (JMF) Experiment, August
2015, Banda Sea
- More than 70 cruises from 1990 to 2014 by BPPT research vessels (Baruna Jaya I -
IV), with 2113 CTD/XCTD stations in the Indonesian waters, eastern Indian Ocean
and western Pacific Ocean
- 1st Monsoon Onset and Monitoring and Its Social and Ecosystem Impacts
(MOMSEI) Cruise, 22 Sept – 1 Oct 2013, south coast of Java
- Java Upwelling Variation Observation (JUVO), 2007 – 2014, west coast of Java
- The South-China Sea-Indonesian Seas Transport/Exchange 2006 – 2014.
- E-WIN cruises, 2015, west of Sumatra
- GEOMARIN I & III 2010 – 2014 Marine Geological Surveys
- Java Makassar Flores (JMF) Triangle Seas Experiment, August 2015
- Marine Pollution Studies, 2013, 2015, Cilacap and Segara Anakan Lagoons
- Five Cruises 2010 - 2015 by SCSIO research vessels (SHIYAN1), with GPS
sounding 4/day, surface meteorology, CTD/XCTD stations in the eastern Indian
Ocean

Appendix C
Proposed and Planned Cruises in the MC

No	Area	Activities	Time	PI	Project	R/V	Funding
1.	Indian Ocean						
A.	West Sumatra (90°E)	Ocean climate buoys and oceanographic obs.	30 days in Feb/Mar 2016 & 2017	Nurhayati (BMKG)	InaPRIMA	Baruna Jaya I	BMKG
B.	Equatorial IO	CTD, surface meteorology, GPS soundings	April every year	Dongxiao Wang (SCSIO)	Chinese NSF open routine cruise	Shiyan 1	Chinese NSF
C.	West Sumatra, South of equator	Leg-1: CTD along several lines Leg-2: On station	Nov 2017 –Jan 2018	Leg-1: Iwao Ueki Leg-2: Kunio Yoneyama (JAMSTEC)	Leg-1: EIOURI Leg-2: YMC	MIRAI	JAMSTEC
D.	Eastern IO (South of Java island – Timor)	Deploy one buoy in south of Timor	20 days in Oct 2017 & Apr 2018 (shared & coordinated with TIMIT)	Anna Kuswardani (AMFRD) Weidong Yu (FIO)	MOMSEI - YMC	Ship opportunity (targeting BJ-VIII)	SOA and AMFRD
E.	North of Australia	Air-sea chemical obs	2017-2018	Robyn Schofield (U of Melbourne)	Biogenic emissions in MC	Investigator	Proposal submitted
F.	Plan A: Java – Christmas island Plan B: near Weipa on Cape York	Obs of convection	2018-2019	Matthew Wheeler (BOM)	YMC	Investigator	Proposal to be submitted in 2016
G.	E. Equatorial IO	Oceanographic Obs.	Nov – Dec 2018	Yukio Masumoto (U of Tokyo)	EIOURI	Hakuho-Maru	Funded

2	Philippine Sea						
A	A. Western Luzon B. Bohol Sea	CTD, ADCP, Microstructure, Met, UW TS optics, radiosondes	June-August 2017/2018	? (U of Philippines)	SALICA	Tentative BFAR	
3	Indonesian Seas						
A	Makassar strait and Lombok strait	3 moorings, CTD casting	18 days in Sept-Oct 2016 & 2017	Anna Kuswardani (AMFRD), Zexun Wei (FIO)	TIMIT	Baruna Jaya VIII	AMFRD & FIO
B	Sulawesi Sea	Seismic survey, sediment sampling, CTD	2016	? (Marine Geological Institute)	LKI	Geomarin III	?
C1	Arafura Sea	Seismic survey, Sediment sampling, CTD (tentative)	2016-2019	? (Marine Geological Institute)	Systematic mapping	Geomarin III	?
C2	Banda Sea – Arafura Sea	Sediment sampling, CTD, water sampling	20-25 days in 2017 (tentative)	? (Marine Geological Institute)		Geomarin III	To be proposed in 2016
4	South China Sea						
A	North SCS	CTD, surface meteorology, GPS soundings	Summer every year	Dongxiao Wang (SCSIO)	Chinese NSF open routine cruise	Shiyan 1/3	Chinese NSF
B	West SCS	CTD, surface meteorology, GPS soundings	Late summer Every year	Dongxiao Wang (SCSIO)	Chinese NSF open routine cruise	Shiyan 1/3	Chinese NSF