

Year of the Maritime Continent (YMC, 2017-2018)

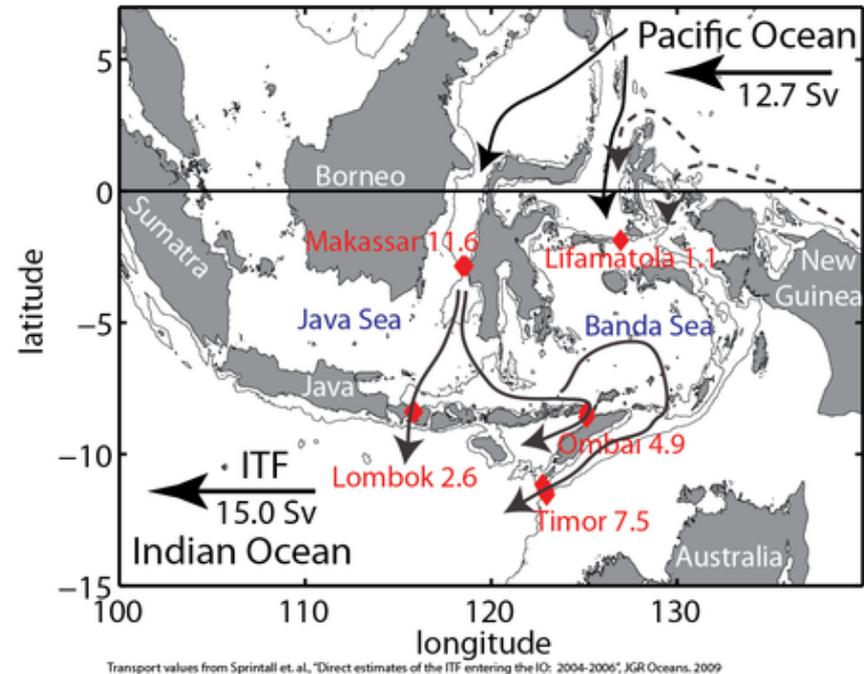
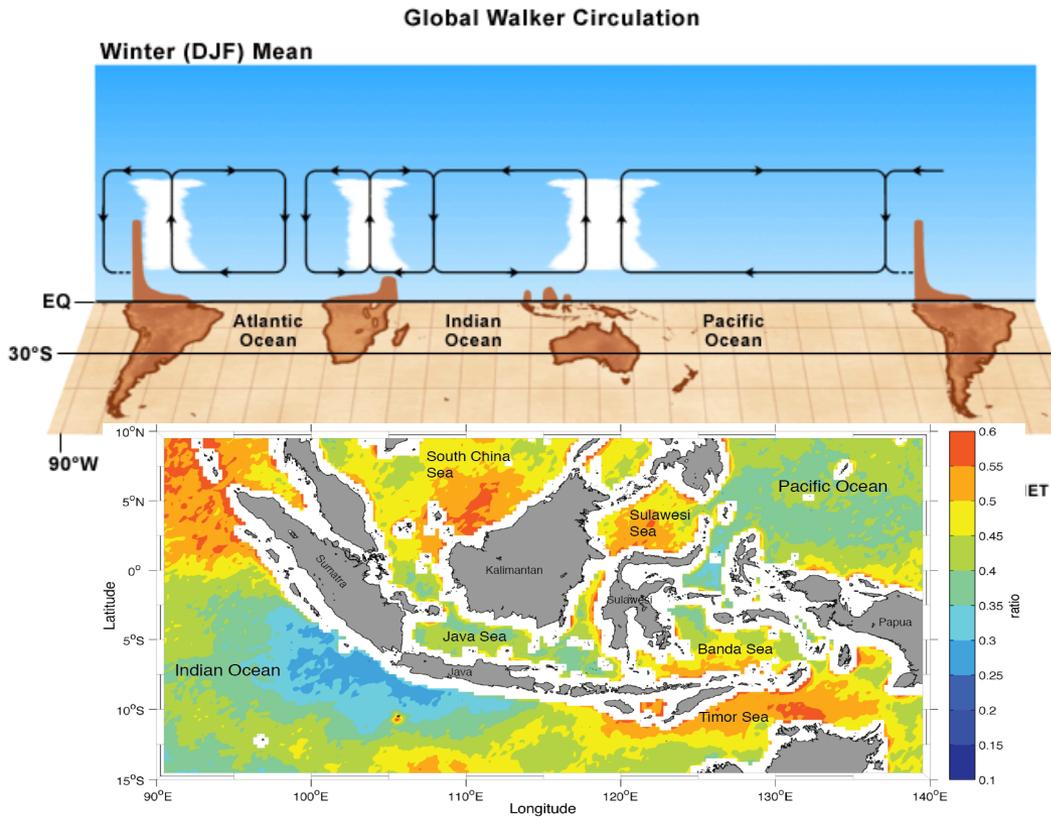
An International Framework for Multi-Disciplinary Field Observations



- Importance of the MC in global weather-climate continuum
- Model errors and biases
- International and US Interest/plan

Importance of the MC in Global Weather-Climate Continuum

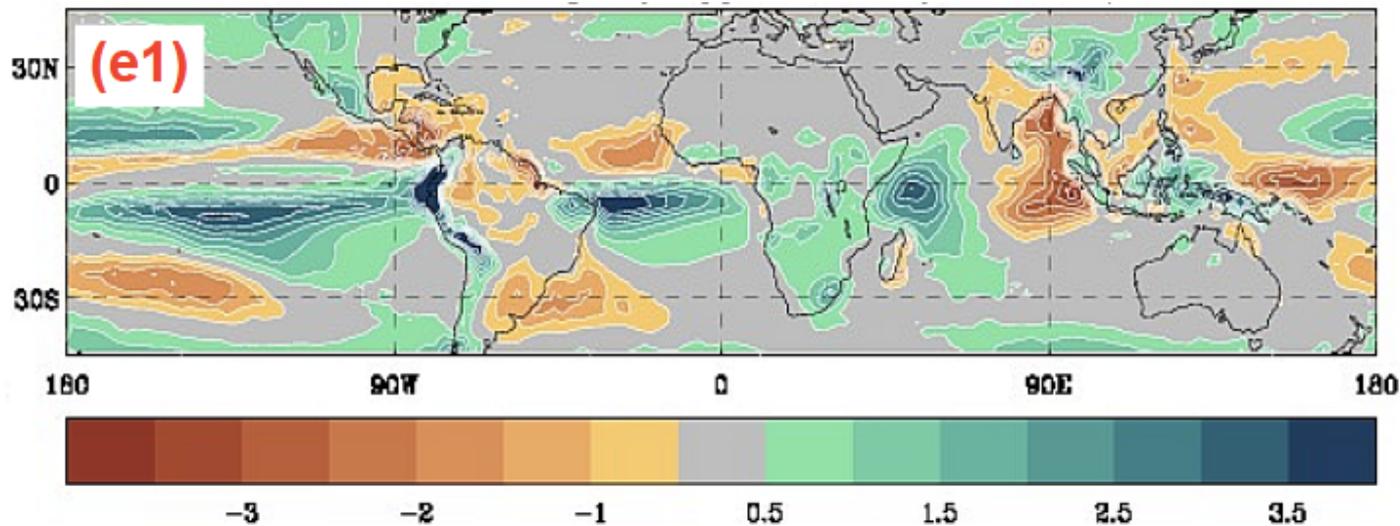
- **Mean Convective Center: Walker Circulation, ENSO**
- **Center of the Indo-Pacific Warm Pool**
- **MJO Barrier**
- **Biomass Burning Aerosol**
- **Indonesian ThroughFlow (ITF) and mixing in Indonesian Seas: impact on regional SST, heat balance and rainfall patterns on MJO, Monsoon, to ENSO time scales**



Transport values from Sprintall et al., "Direct estimates of the ITF entering the IO: 2004-2006", JGR Oceans, 2009

Model Errors and Biases:

- **Wrong diurnal peak time in parameterized convection;**
- **MJO prediction barrier;**
- **Mean Precipitation Biases (mm/day) in CMIP5 Models against CMAP (1979-2005);**



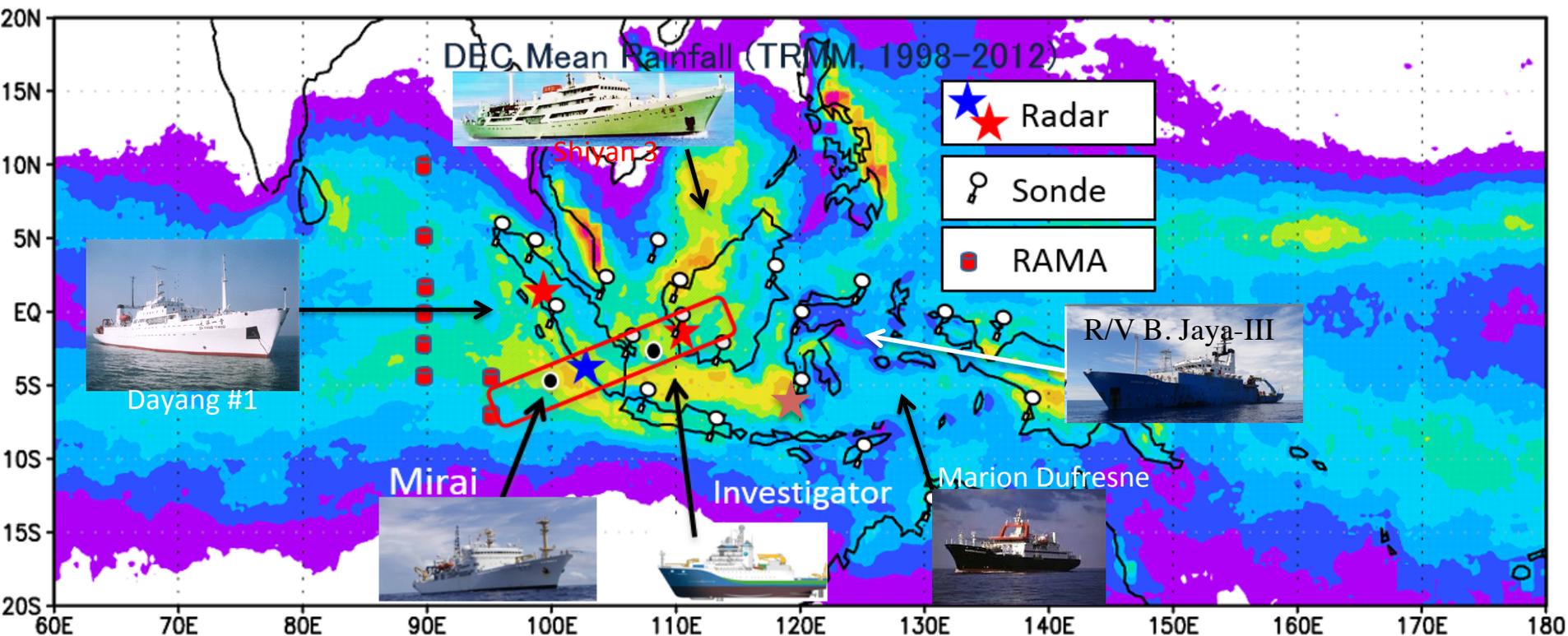
Courtesy of T. Toniazzo

YMC Hypotheses (under development)

- 1. Up-scale effects of the convective diurnal cycle on the MJO, monsoon, and mean precipitation**
- 2. Interaction between the sources, transport, and removal of aerosol and convection/circulation on the diurnal cycle, MJO, and monsoon timescales**
- 3. Air-sea interaction and upper-ocean processes on the diurnal, MJO, monsoon timescales**

YMC (2017 – 2018)

A year of field campaign with several IOPs



Observational Targets:

- Atmospheric convection (diurnal cycle, on-off shore development)
- Aerosol from biomass burning and sea spray (physical and chemical properties)
- Upper Ocean mixing (tidal, inertial, turbulent mixing, nutrient flux, SST feedback)
- Upwelling and through flows

Institute/ Agency	Facilities	Observational Target	Location	Time	Status	Contact
DOE ARM	AMF2/MAOS C-band radar	Atmospheric convection and aerosol	Pontiank, or Makassar or Pameungpeuk, Indonesia	August 2017 – July 2018	Proposal due May 1, 2014	Chidong Zhang czhang@rsmas.miami.edu
NASA	P-3	Aerosol-cloud interaction	?	Aug – Sept 2017	Proposal due 2015	Jeff Reid jeffrey.reid@nrlmry.navy.mil
NCAR	S-PolKa, ISS, DOW	Atmospheric convection and their environment	?	?	Proposal due January 2015	Courtney Schumacher cschu@tamu.edu
NCAR	C-130 or G5	Aerosol, microphysics, large-scale gradient	Singapore/Darwin	?	Proposal due January 2015	Andrew Heymsfield heyms1@ucar.edu
NOAA	S-band profiler	Cloud hydrometers	At the primary site of YMC-ARM	August 2017 – July 2018	?	Christopher Williams christopher.williams@colorado.edu
CSU	Filter collections	Ice nucleating particle concentrations	At the MAOS site	August 2017 – July 2018	ready	Sonia M Kreidenweis sonia@atmos.colostate.edu
NCAR/ NOAA/NSF	Rain gauge and distrometer network	Precipitation and drop size distribution	MC	August 2017 – July 2018	?	David Gochis gochis@ucar.edu
BMKG	20 radiosonde stations 176 surface stations	Large-scale conditions	Indonesia	2015 -	In progress	Noer Hayati noerha_04@yahoo.co.uk
NUM	soundings	Large-scale conditions	Malaysia	2017 -	?	
PAGASA	soundings	Large-scale conditions	Philippines	2017-18	?	
NEA	Soundings, radars	Convection	Singapore	2017-18	?	Chris Gordon Chris_GORDON@nea.gov.sg
KIT	KITcube	Atmospheric convection and aerosol	?	?	?	Andreas Fink andreas.fink@kit.edu
CNR	WV Raman lidar	Atmospheric water vapor	?	?	?	Gian Liberti gianluigi.liberti@artov.isac.cnr.it
JAMSTEC	X-band radar lidar	Atmospheric convection	Sumatra, Indonesia	Oct 2017 – Mar 2018	Funded	Shuichi Mori morishu@jamstec.go.jp
JAMSTEC	X-band radar, lidar	Atmospheric convection	Aimeliik, Palau	April 2017 – Mar 2018	Funded	Ryuichi Shirooka shiro@jamstec.go.jp
JAMSTEC	radiosondes	Monsoon	Philippines	July – Aug 2017	Funded	Hisayuki Kubota kubota@jamstec.go.jp
Kyoto Univ.	Equatorial Atmosphere Radar	Atmospheric profiles	Kototabang (west Sumatra)	May 2014 – June 2018	Funded	Hiroyuki Hashiguchi hasiguti@rish.kyoto-u.ac.jp
ETH – Zurich	Ice Nucleus Counter	IN concentrations A-CI	?	?	?	Zamin Kanji zamin.kanji@env.ethz.ch
NTU/PCCU/ NCU/ RCEC	Soundings, rain gauges, disdrometers, soil moisture measurements	Atmospheric convection, topographic precipitation	?	?	?	Wei-Ting Chen weitingc@ntu.edu.tw Cheng-Ku Yu yuku@faculty.pccu.edu.tw
CNES	superpressure balloons (Strateole-2)	Tropospheric- stratospheric interaction	Equatorial IO, MC, WP	?	Funded	Philippe Cocquerez philippe.cocquerez@cnes.fr
JAMSTEC	R/V Mirai	Equatorial upwelling, atmospheric convection	Eastern equatorial Indian Ocean	Nov 2017 – Feb 2018	Proposal due May 7, 2014	Kunio Yoneyama yoneyamak@jamstec.go.jp
BOM/ CSIRO	R/V Investigator	Monsoon convection and air-sea interaction	Indonesian Seas	Early 2018	Proposal due July 2015	Wheeler Matthew M.Wheeler@bom.gov.au
FIO	R/V Dayang #1	upwelling	Eastern Indian Ocean	?	?	Weidong Yu wdyu@fio.org.cn
SCSIO	R/V Shiyang-3	Monsoon air-sea interaction	South China Sea	?	?	Dongxiao Wang dxwang@scsio.ac.cn
LEGOS	R/V Marion Dufresne	Mixing, ITF	Banda Sea	?	?	Ariane Koch-Larrouy Ariane.Koch-Larrouy@legos.obs-mip.fr
IHD/MGI	R/V Baruna Jaya R/V Geomarin III	mixing	Banda Sea	?	?	Ariane Koch-Larrouy Ariane.Koch-Larrouy@legos.obs-mip.fr

Connections to Other Projects:

- Second International Indian Ocean Expedition (IIOE-2)
- The Tropical Pacific Observation System 2020 (TPOS2020)
- The Seven SouthEast Asian Studies (7-SEAS)
- MJO Task Force – Subseasonal to Seasonal Prediction MC subproject

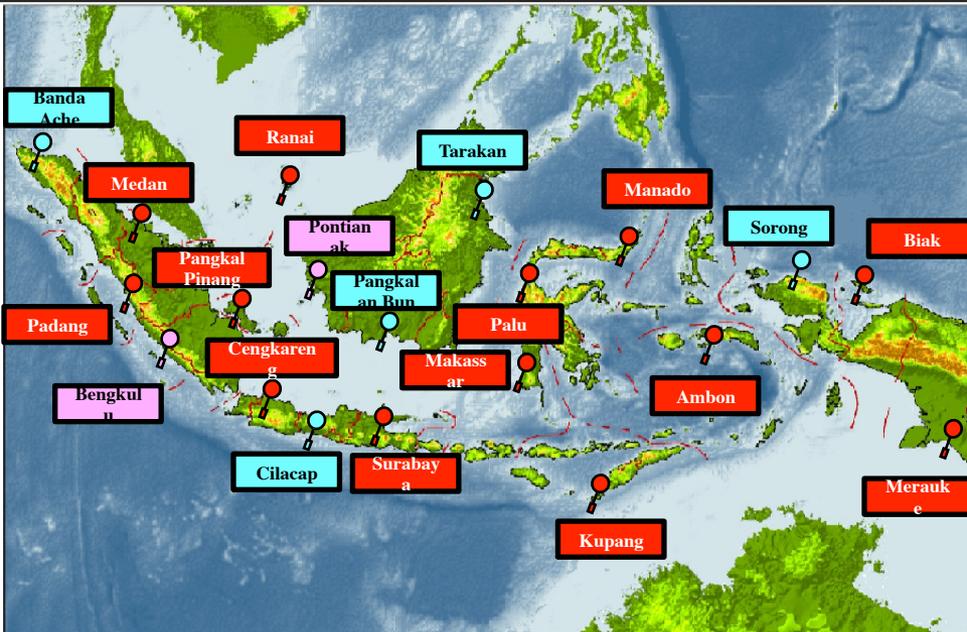
Current Status and Plans

- A 2-page white paper and seven appendices (MJO, aerosol, diurnal cycle, upper ocean mixing and SST, equatorial upwelling, South China Sea, TTL)
- DOE proposal submitted (May 2014)
- JAMSTEC proposal submitted (May 2014)
- Briefing at the US Clivar Summit (today)
- Briefing at the Hague pan-Clivar meeting (July 2014)
- MC session at the Sapporo AOGS meeting (July 2014)
- **Regional YMC planning meeting, Jakarta (September 2014)**
- MC session at the 2014 AGU meeting (December 2014)
- EOL facility request and NSF proposal to be submitted (January 2015)
- **International YMC planning meeting, Singapore (early 2015)**
- NASA proposal to be submitted (2015)
- R/V Instigator proposal to be submitted (July 2015)

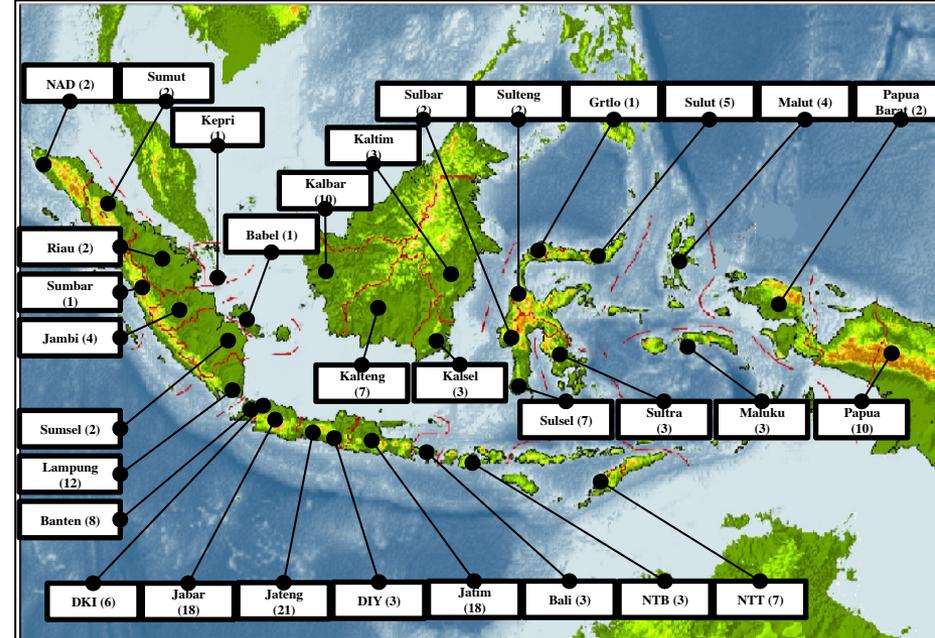
Anticipated YMC Legacy:

- Unprecedented field observations for improvement of understanding and numerical models
- Capacity building for regional applications of global weather and climate resources and for high-quality long-term environmental monitoring.

Routine Radiosonde Sounding Network



Automatic Weather Station



Input from the US Clivar and IAG needed:

How should the US participation in the YMC be best pursued?

- Proposal deadlines and procedures are different;
- Some components may need multi-agency cost sharing;
- Shall we have a US YMC data policy?
- Shall there be a US YMC Project Office?
- What overarching science document is needed at this stage?
- Shall we establish special graduate scholarships for students from the MC countries?
- What should be the role of US ships?
- Shall the US State Department stay away from the YMC or get involved early on?
- What is the oversight so far?