

CSHOR field program on MJO related air-sea coupling in the southeast Indian Ocean

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First Institute of Oceanography collaborators



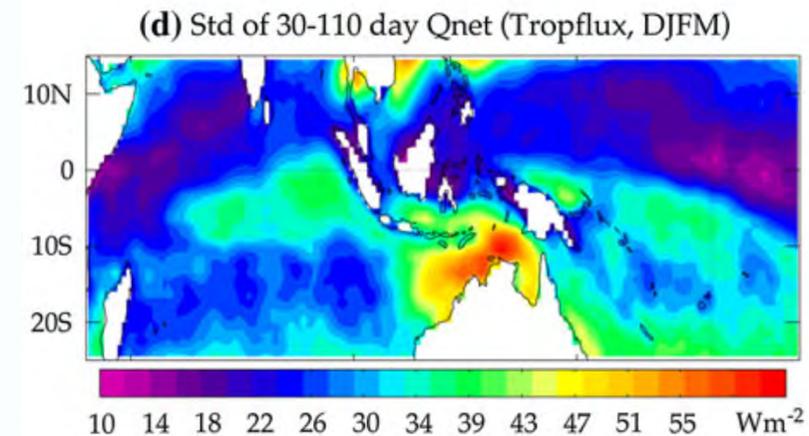
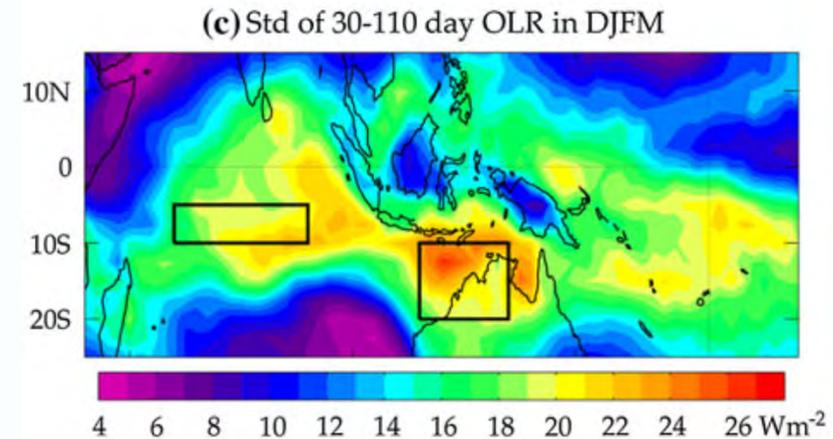
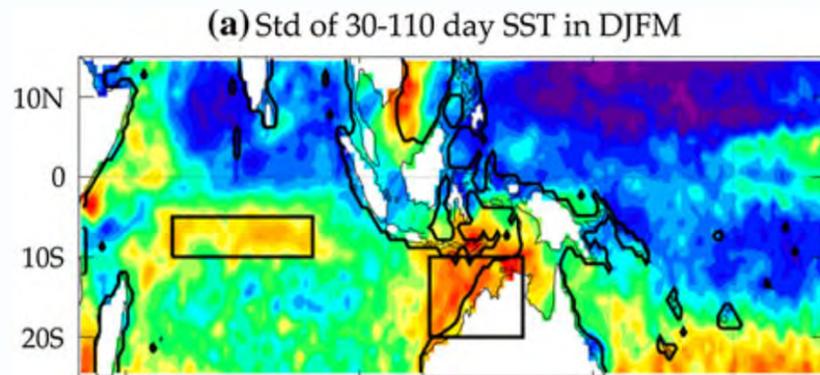
Weidong Yu, air-sea fluxes, Bailong buoy



Lin Liu, oceanography, Bailong buoy

Chunlin Ning, **Yongliang Duan**

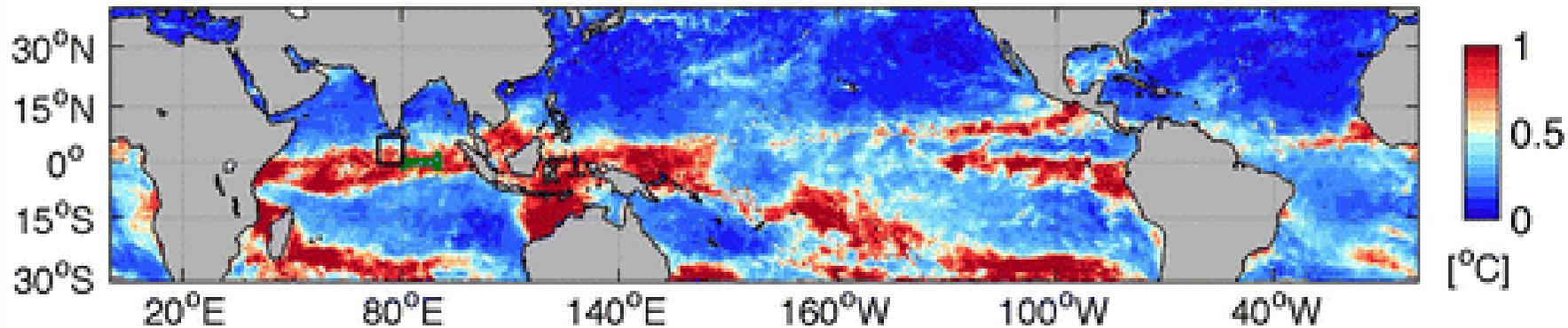
Strongest SST response to MJO off NW Australia



Vialard et al. 2013

Coupled Impacts of the Diurnal Cycle of Sea Surface Temperature on the MJO

(a) November 15-19 diurnal SST amplitude (dSST) CF1

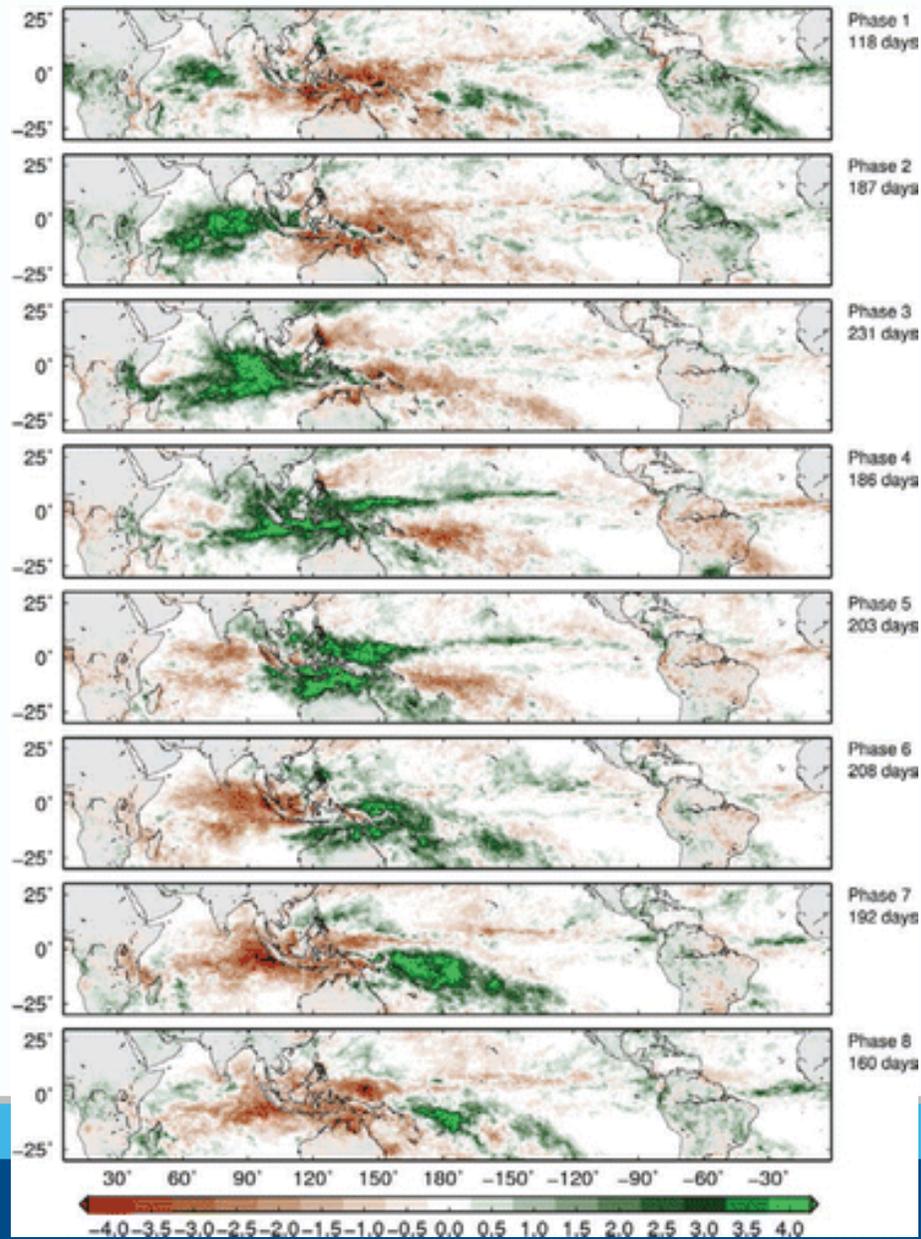


Diurnal SST variability in the build up of column moist static energy and the strength of MJO convection via stronger time-mean latent heat flux and diurnal moistening

Seo et al., 2014

Madden-Julian Oscillation

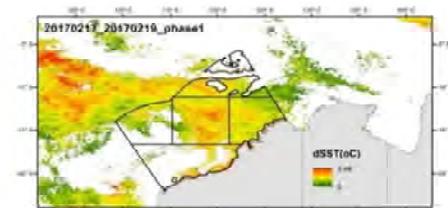
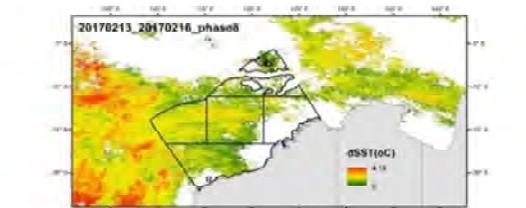
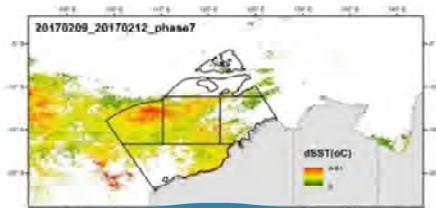
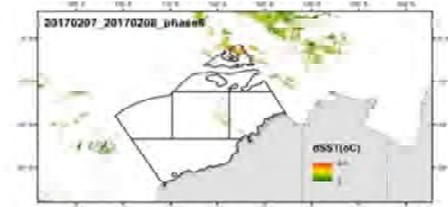
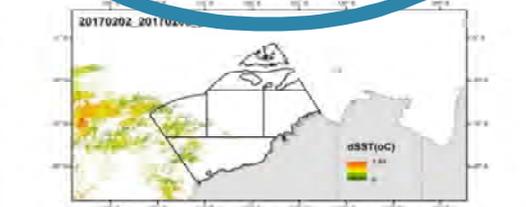
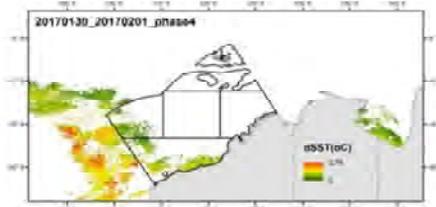
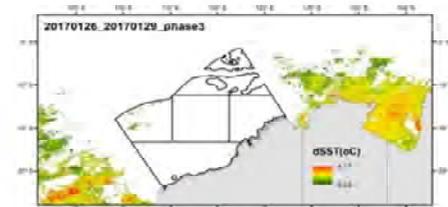
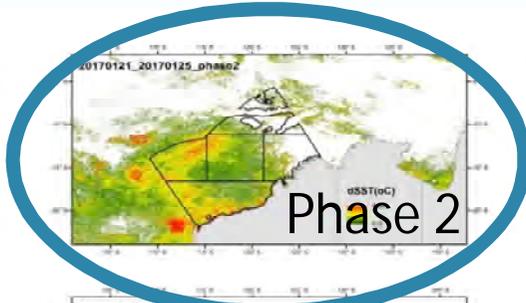
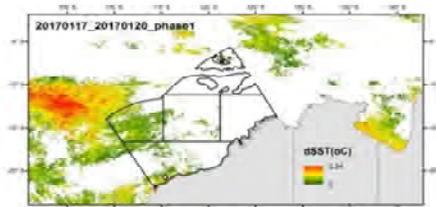
Influence on Indo-Pacific precipitation anomalies



Zhang 2013

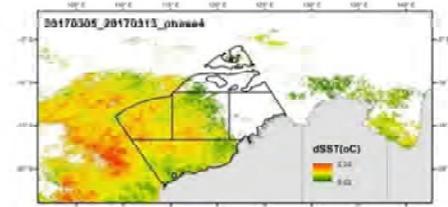
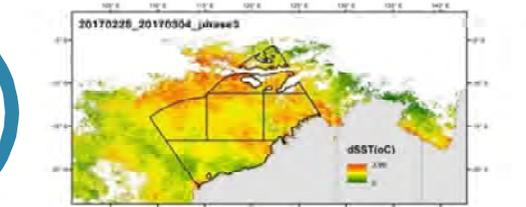
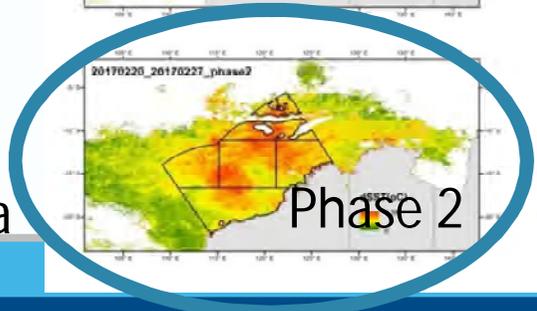
MJO event: SST diurnal variation in 16-17 summer (Himawari)

Phase 1

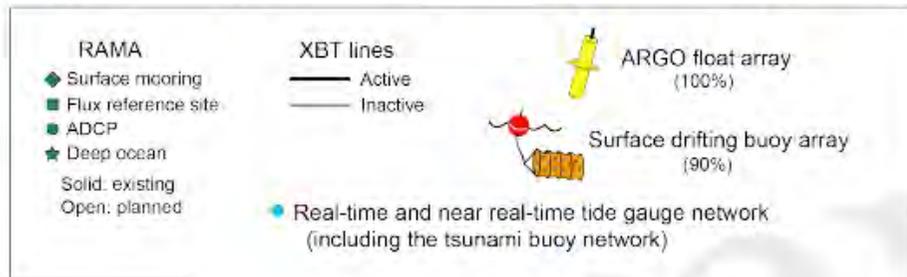
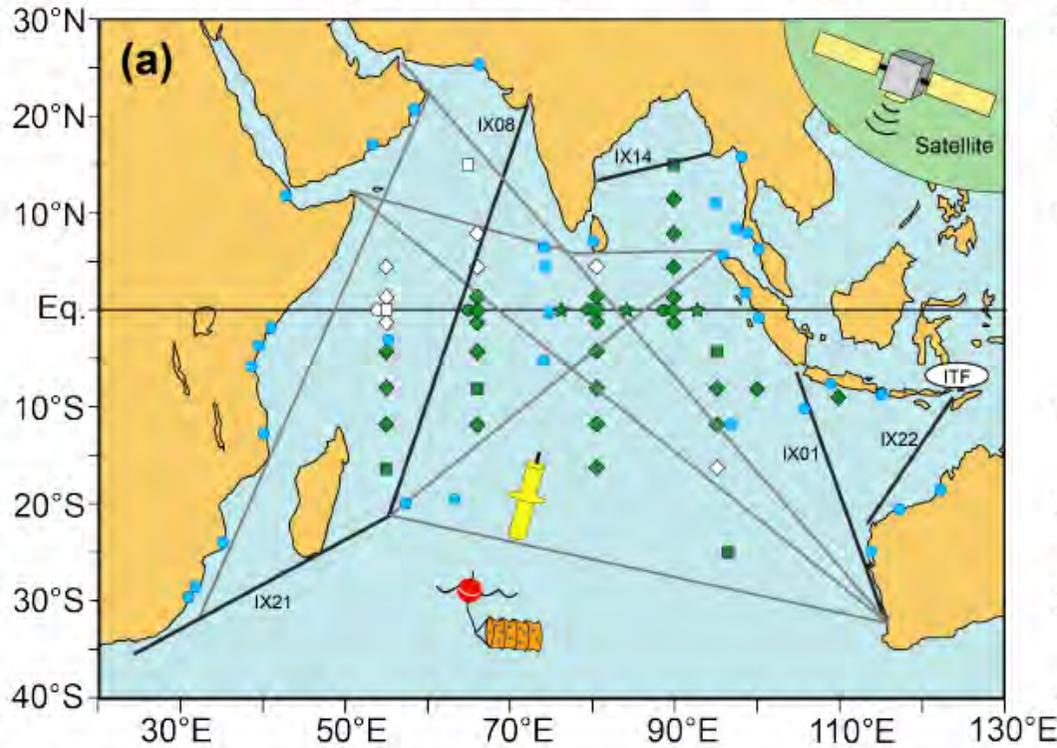


Phase 1

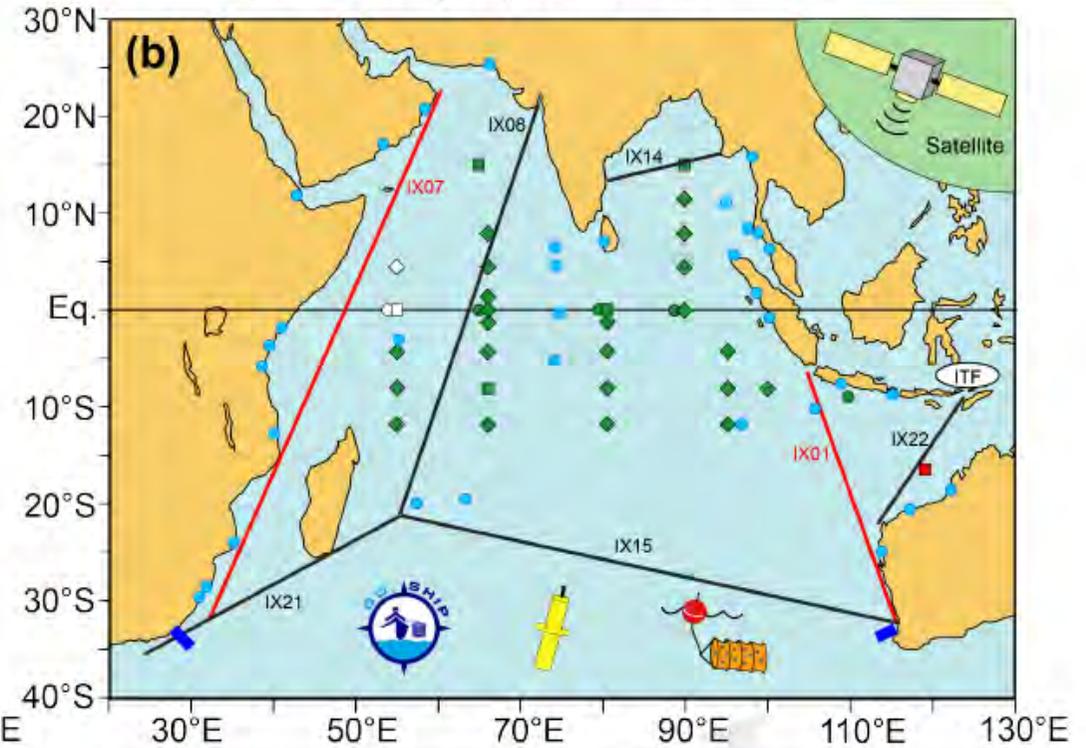
Zhi Huang
Geoscience Australia



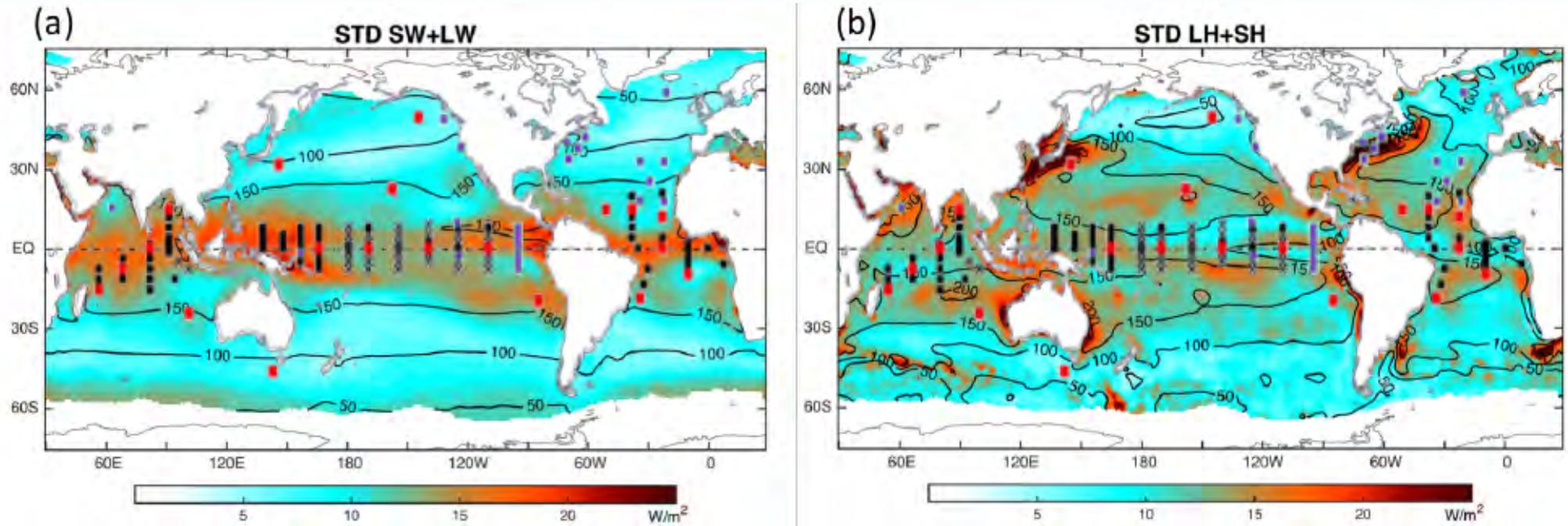
IndOOS: original design and current status



IndOOS: proposed evolution



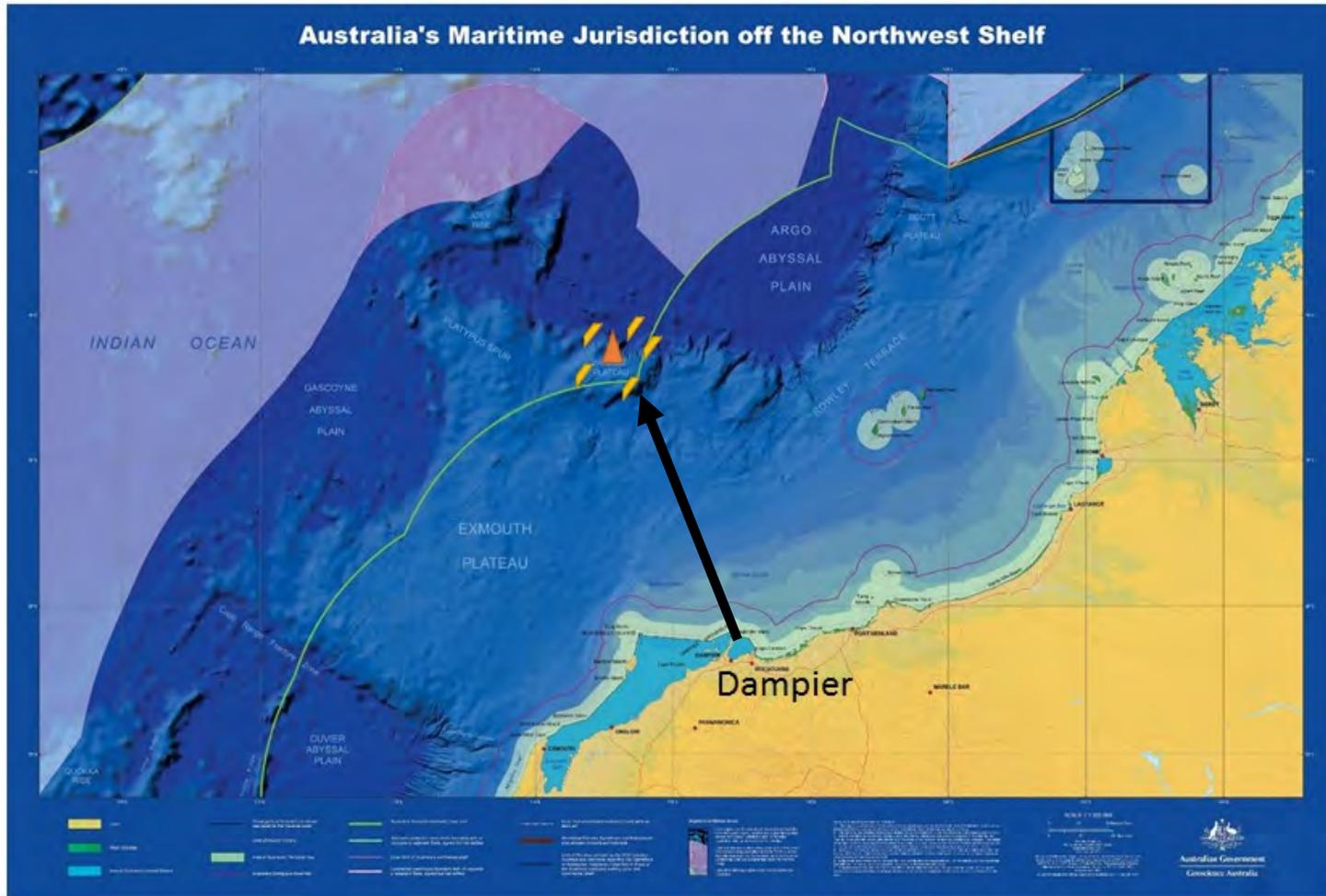
Errors in air-sea fluxes



CSHOR Project objectives

1. Obtain **new insights into air-sea coupling in the east Indian Ocean warm pool** region northwest of Australia, using fast ocean profiling platforms (resolving the very near surface temperature)
2. Understand **coupled model sensitivities** in capturing the scale, strength and atmospheric responses to **diurnal warming events**
3. Quantify the drivers of the decadal variations of the **Indian Ocean heat storage** and the poleward heat transport in the Indian Ocean using numerical model outputs

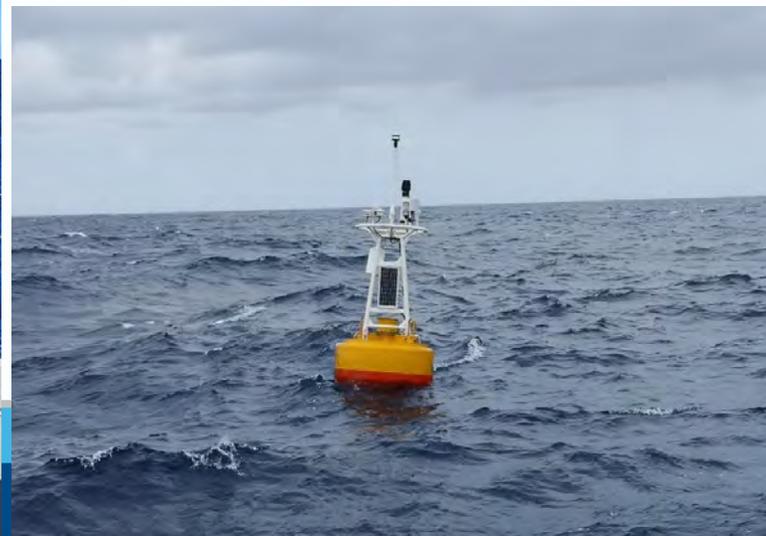
Outlook to 2018/19 – November 2018 field deployment



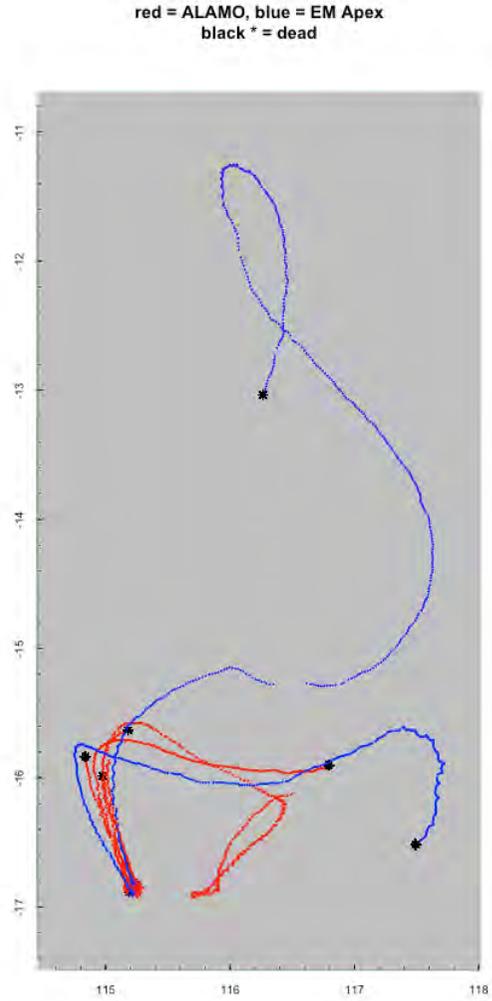
FIO Bailong buoy



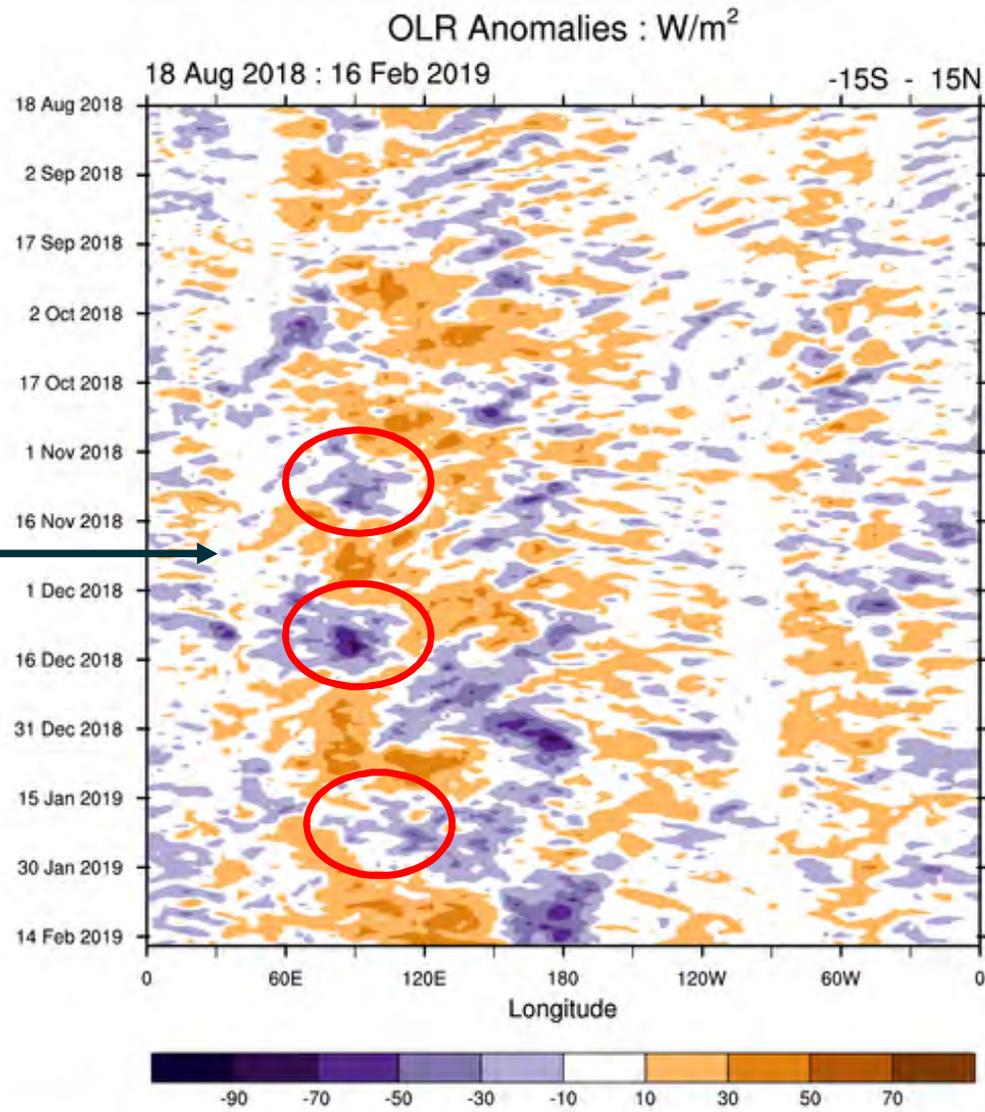
China-Australia Joint Research on the Air-Sea Interactions during the MJO and Australian Monsoon Onset



Bailong buoy and fast profiling floats deployment in November 2018

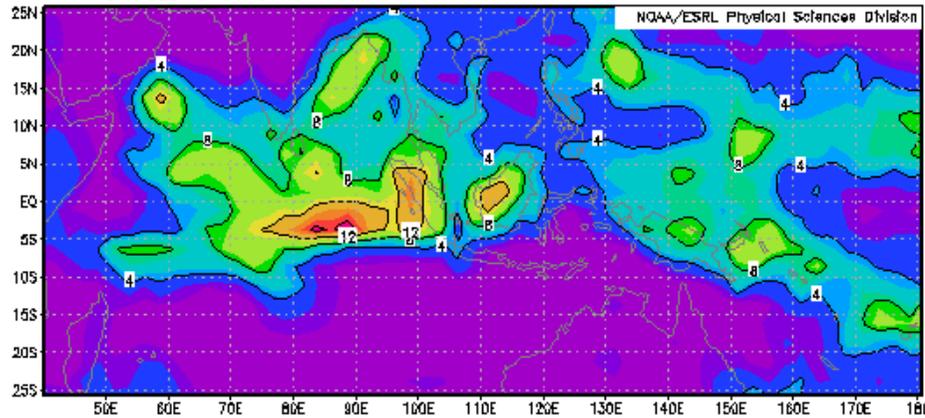


Deployment



t: Oct 2018
lev: 0

Mean precip mm/day

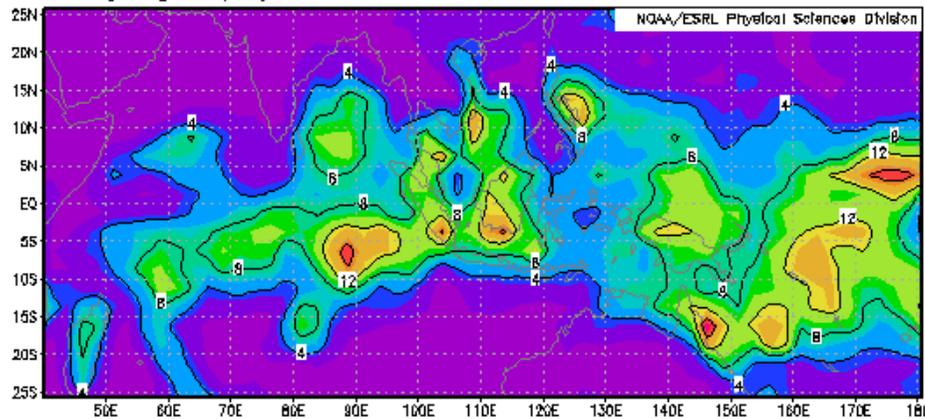


MAX=17.2265
MIN=0.00145295

GPCP Version 2.3 Combined Precipitation Dataset GrADS image

t: Dec 2018
lev: 0

Mean precip mm/day



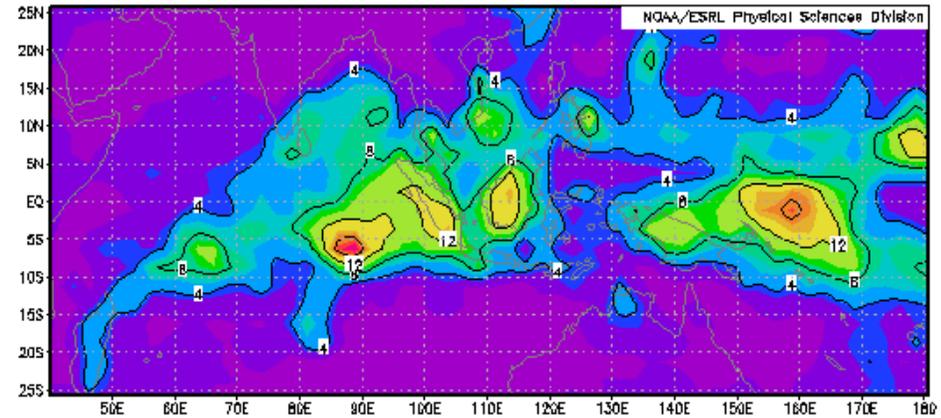
MAX=19.0191
MIN=0.00165101

GPCP Version 2.3 Combined Precipitation Dataset GrADS image



t: Nov 2018
lev: 0

Mean precip mm/day

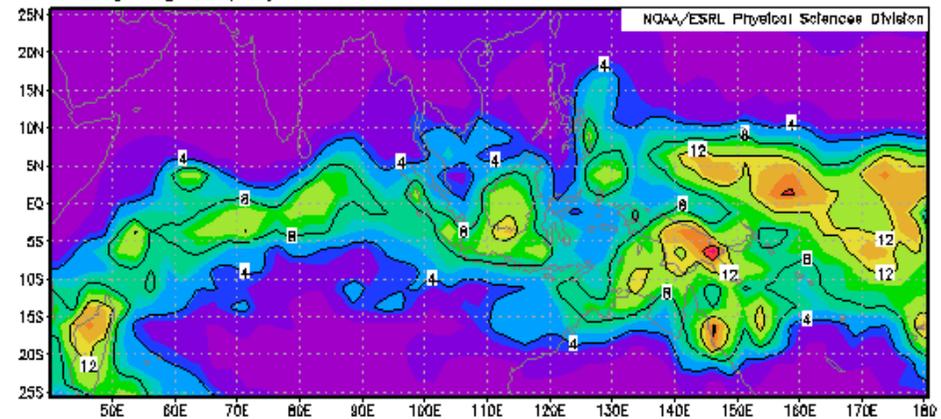


MAX=19.261
MIN=3.90044e-05

GPCP Version 2.3 Combined Precipitation Dataset GrADS image

t: Jan 2019
lev: 0

Mean precip mm/day

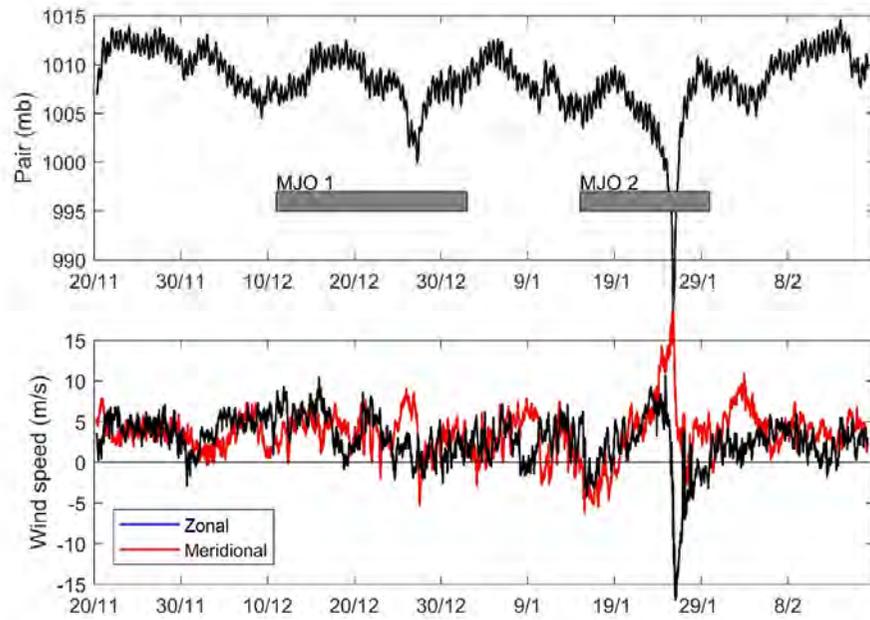


MAX=18.7103
MIN=9.98214e-06

GPCP Version 2.3 Combined Precipitation Dataset GrADS image



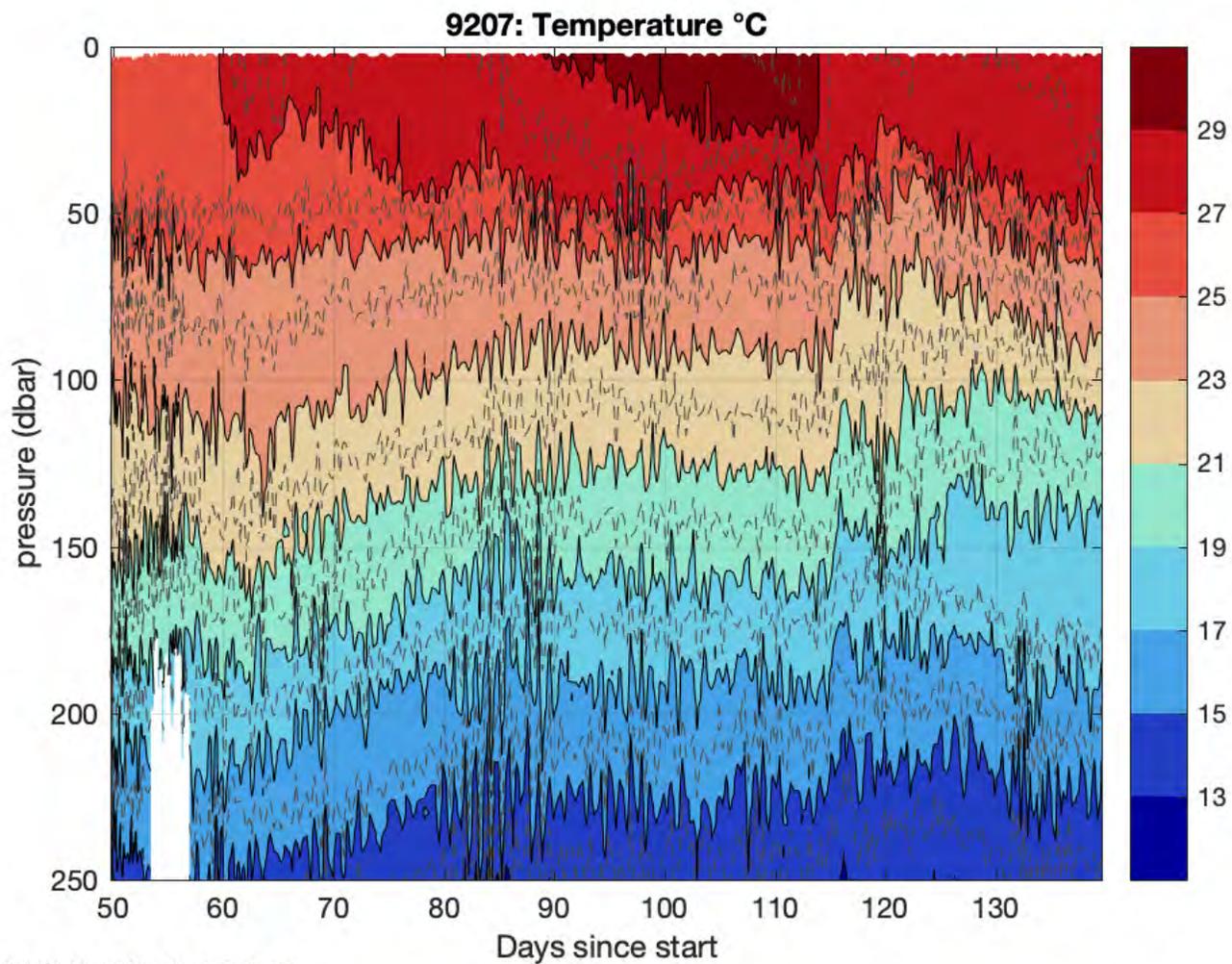
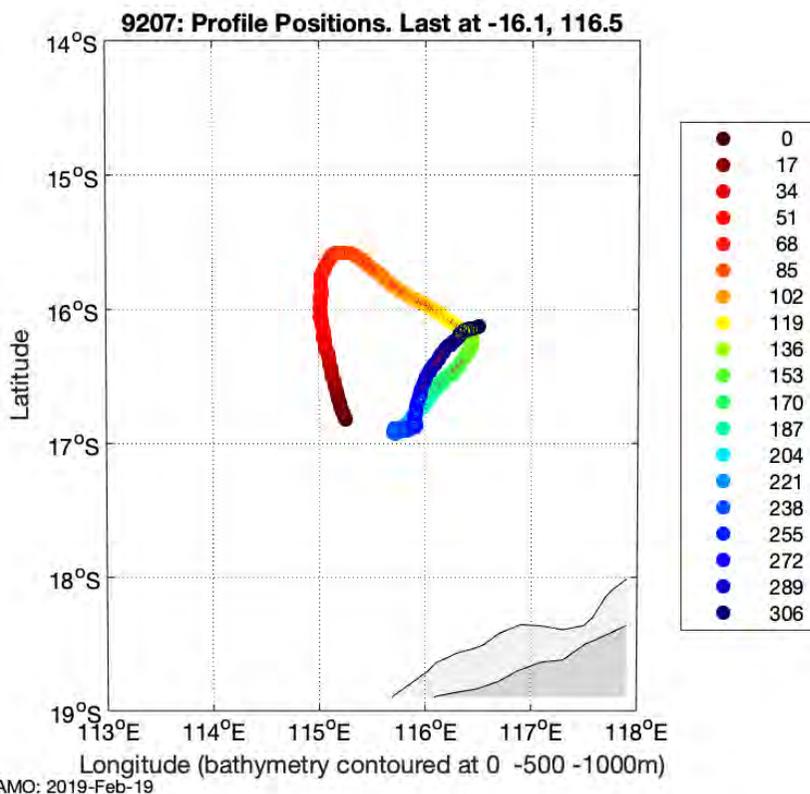
Monthly Precipitation



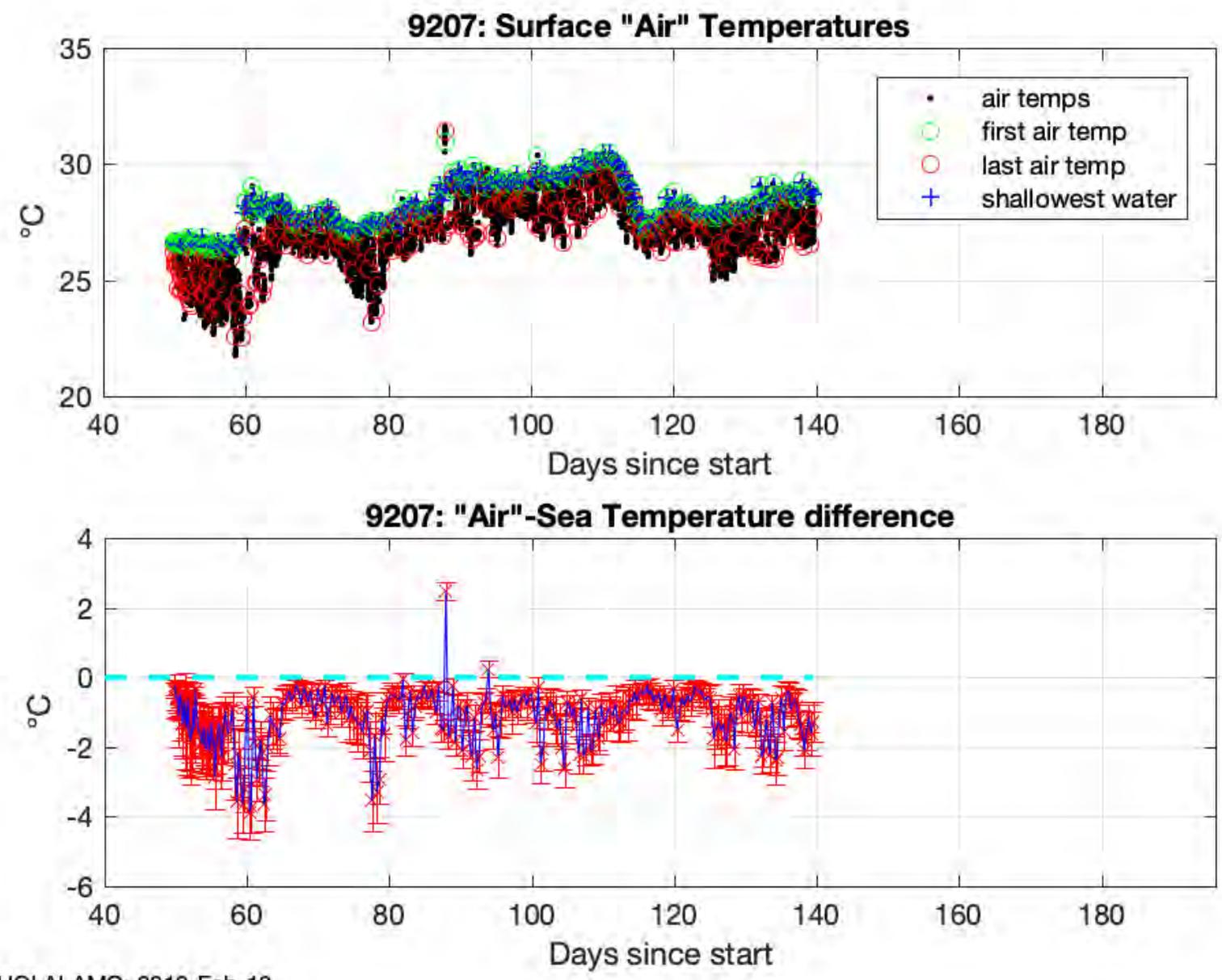
Sea level pressure

Zonal and meridional winds

Temperature record from Alamo floats



Air – sea temperature from Alamo floats



EM APEX Float data shows multiscale variations of the upper ocean

