



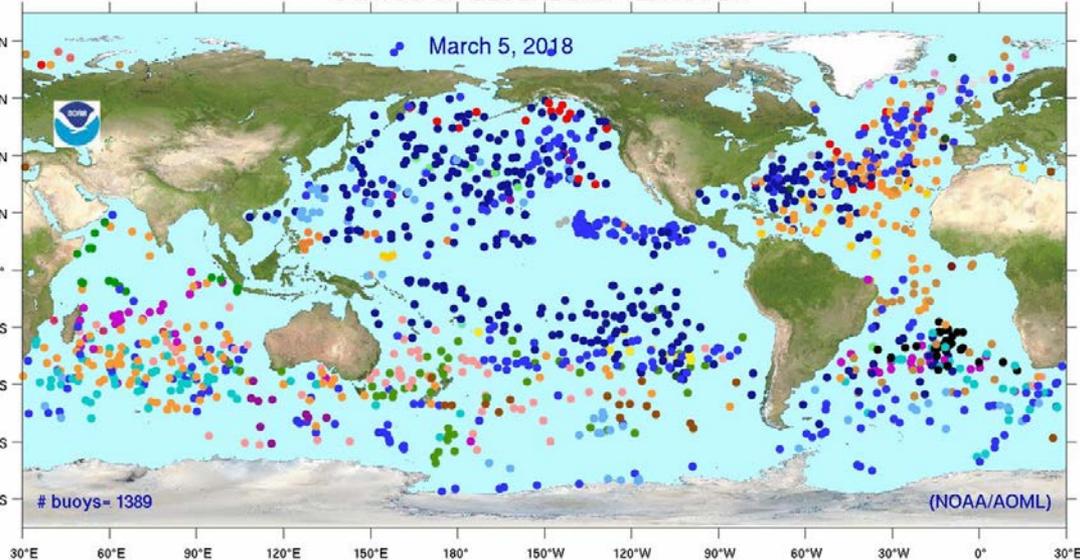
NOAA's Global Drifter Program



Mixed layer currents, sea surface temperature, atmospheric pressure, winds and salinity

www.aoml.noaa.gov/phod/dac/

STATUS OF GLOBAL DRIFTER ARRAY



Deploying Country					
Australia (62)	Europe (4)	India (22)	Korea, Rep. of (63)	Palau (13)	Spain (17)
Brazil (25)	France (171)	Indonesia (3)	Mauritius (1)	Peru (10)	UK (47)
Canada (27)	Gabon (1)	Italy (19)	New Zealand (47)	Senegal (3)	USA-NOAA (344)
Chile (2)	Germany (33)	Japan (15)	Netherlands (5)	Seychelles (1)	USA-other (342)
China (6)	Greenland (4)	Kenya (15)	Norway (3)	South Africa (79)	Unknown (5)

March 2018: the global array consists of ~1400 drifters; >70% (and growing) are Iridium.

Observations used for improved weather forecasting, ocean state estimation, and monitoring ocean surface currents and transports.

Data, products, and more information at the GDP web page.



Rick Lumpkin, NOAA/AOML



The satellite-tracked drifter

Spherical surface float

Polyurethane impregnated tether

Holey Sock nylon drogue centered at 15-m depth

D-cells batteries inside the float

Cost: ~\$1800

Sensors:

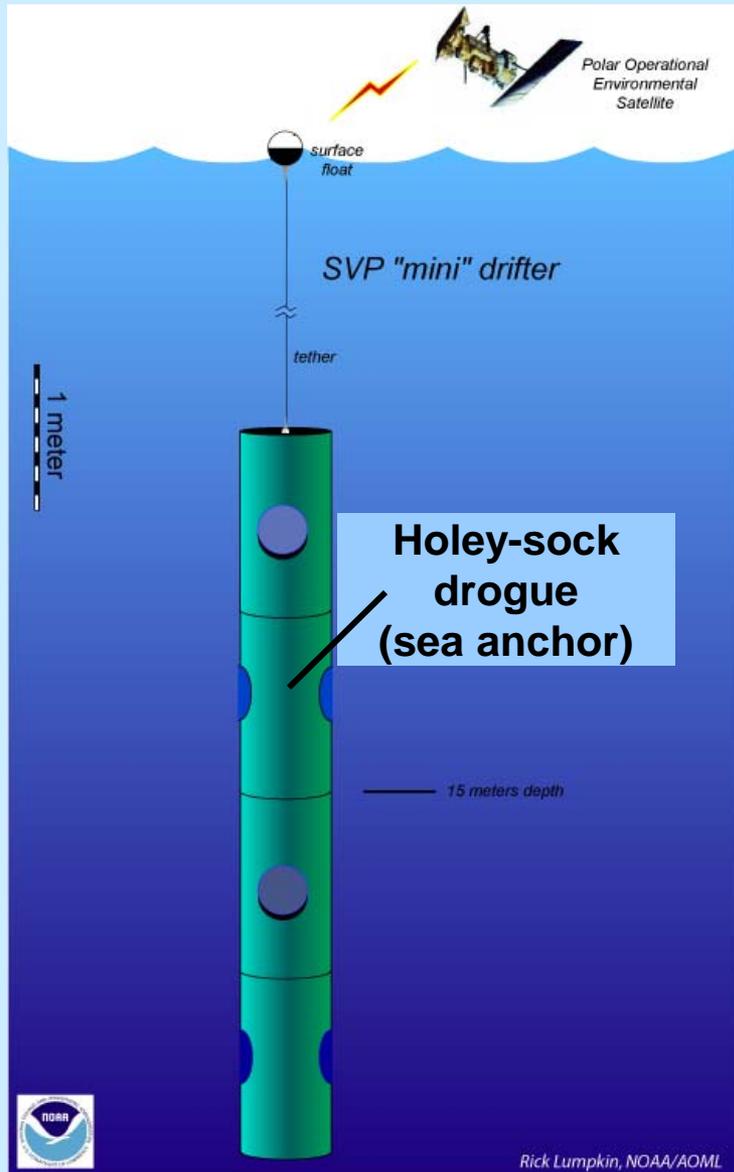
Tether strain: for drogue detection

GPS: location; can provide directional wave spectrum once drogue is lost

Thermistor: SST near base of surface float

Other sensors that have been added:

Barometric pressure, sonic anemometer, subsurface temperatures, salinity, ocean color



Organization of the Global Drifter Program



Funding from NOAA's Ocean Observations and Monitoring Division. Additional development and instruments at Scripps funded by ONR.



NOAA Global Drifter Center

AOML (Miami, FL)

Rick Lumpkin

Drifter Operations
Center (DOC)

Drifter Data
Assembly Center
(DAC)



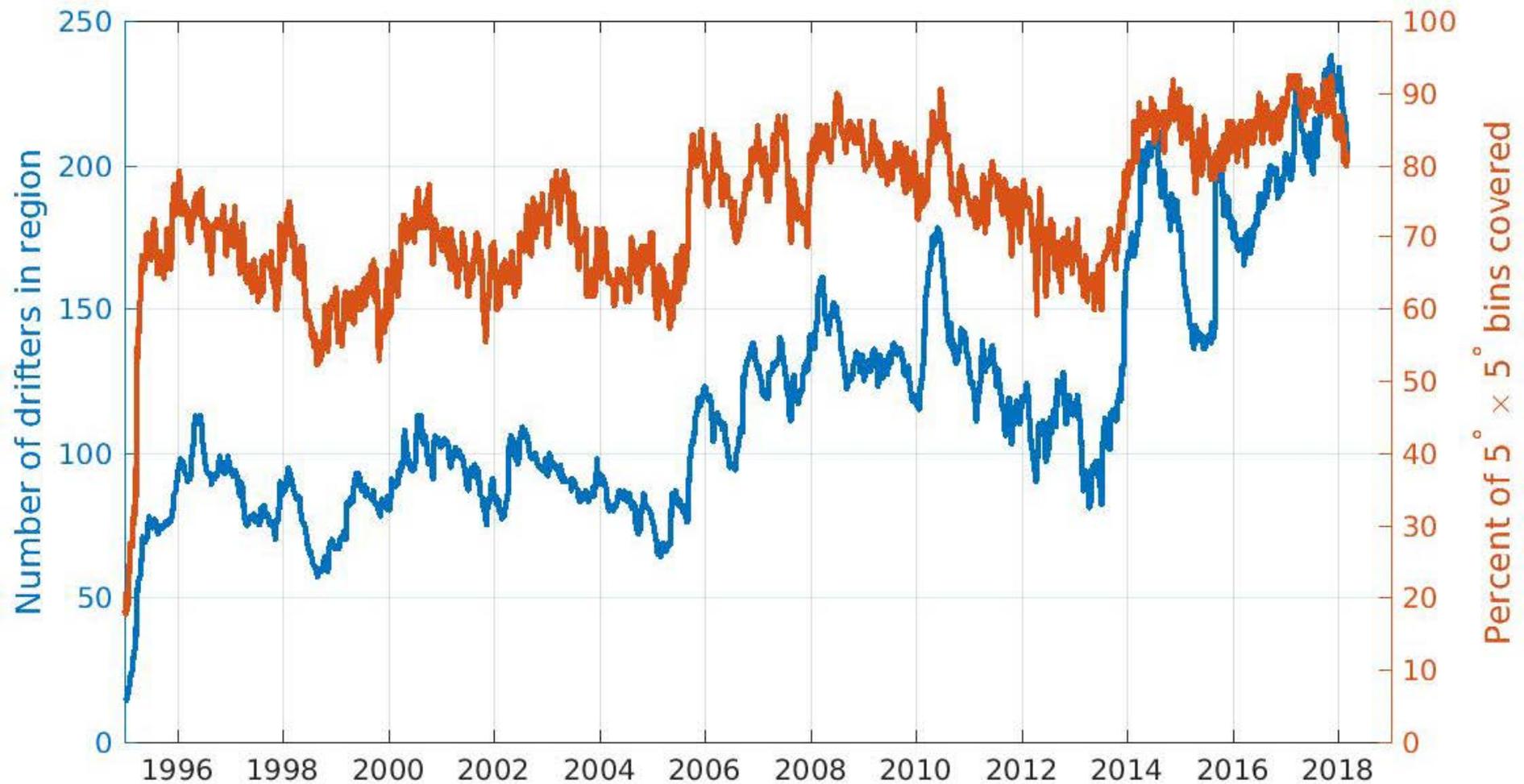
Lagrangian Drifter Lab

Scripps (La Jolla, CA)

Luca Centurioni

Supervises the industry,
upgrades the technology, and
manages several aspects of
Iridium data stream

Manufacturers in
private industry, who
build the drifters
according to closely
monitored specifications



Time series of number of drifters in Indian Ocean (blue) and percent of 5°x5° bins covered (red). Large-scale deployments began in 1995 in this basin.

Since 1996, around 60—80% of region is sampled. This has increased to 80—95% in the last several years thanks to initiatives sponsored by US ONR and partnerships in RAMA.

Major GDP Partnerships for Indian Ocean observations

Australian Bureau of Meteorology: nearly 40 barometer drifters per year in the equatorial and South Indian Ocean.

GO-SHIP lines such as I05, I06S and I07N in years that they are occupied.

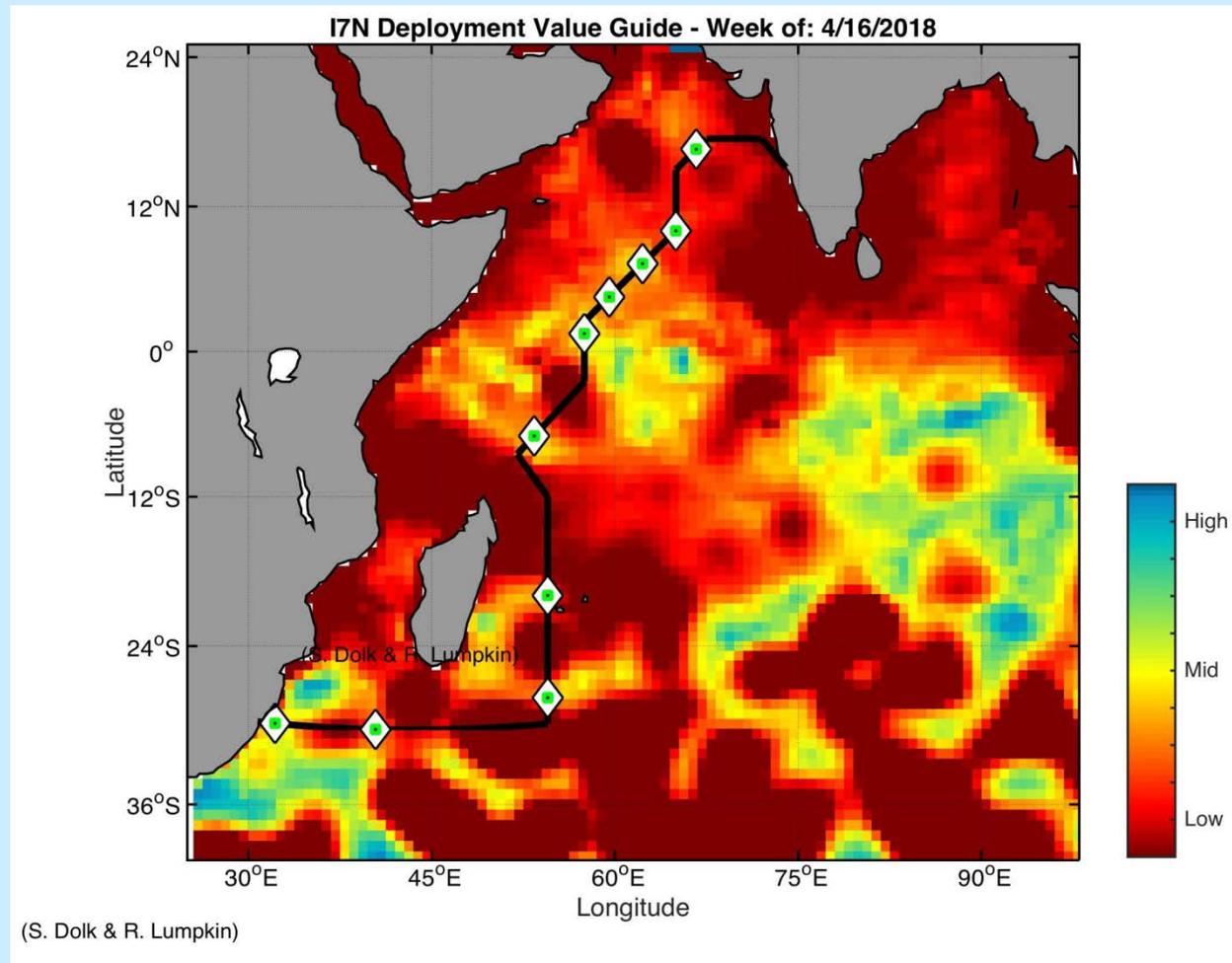
NOAA/PMEL: deployments during RAMA mooring cruises originating from Indonesia.

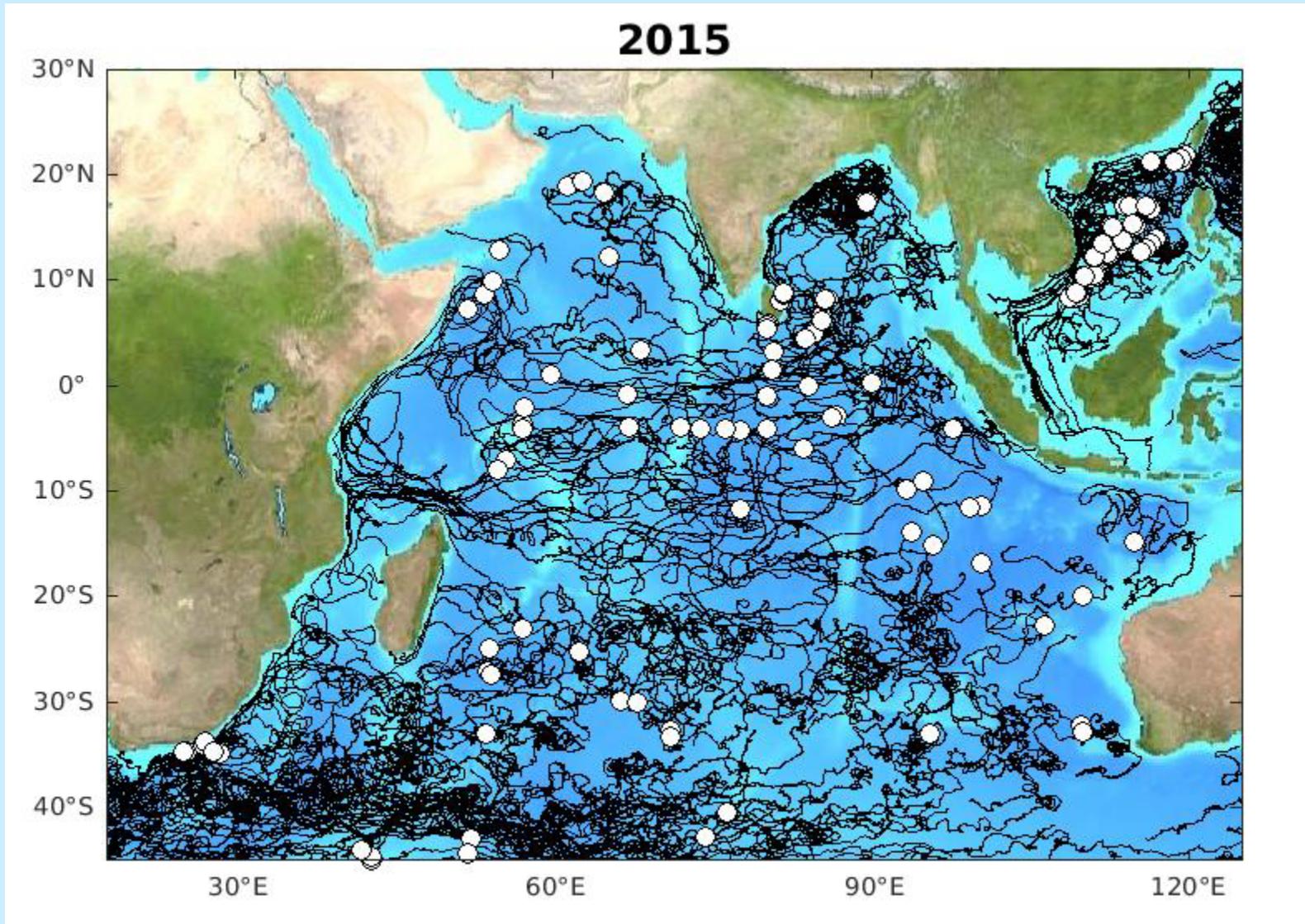
Kenyan Meteorological Agency, US Naval Oceanographic Office, and the Royal Australian Navy: over 50 drifters per year in the western and northern Arabian Sea.

South African Weather Service: deployments primarily in South Atlantic that can enter southern Indian Ocean

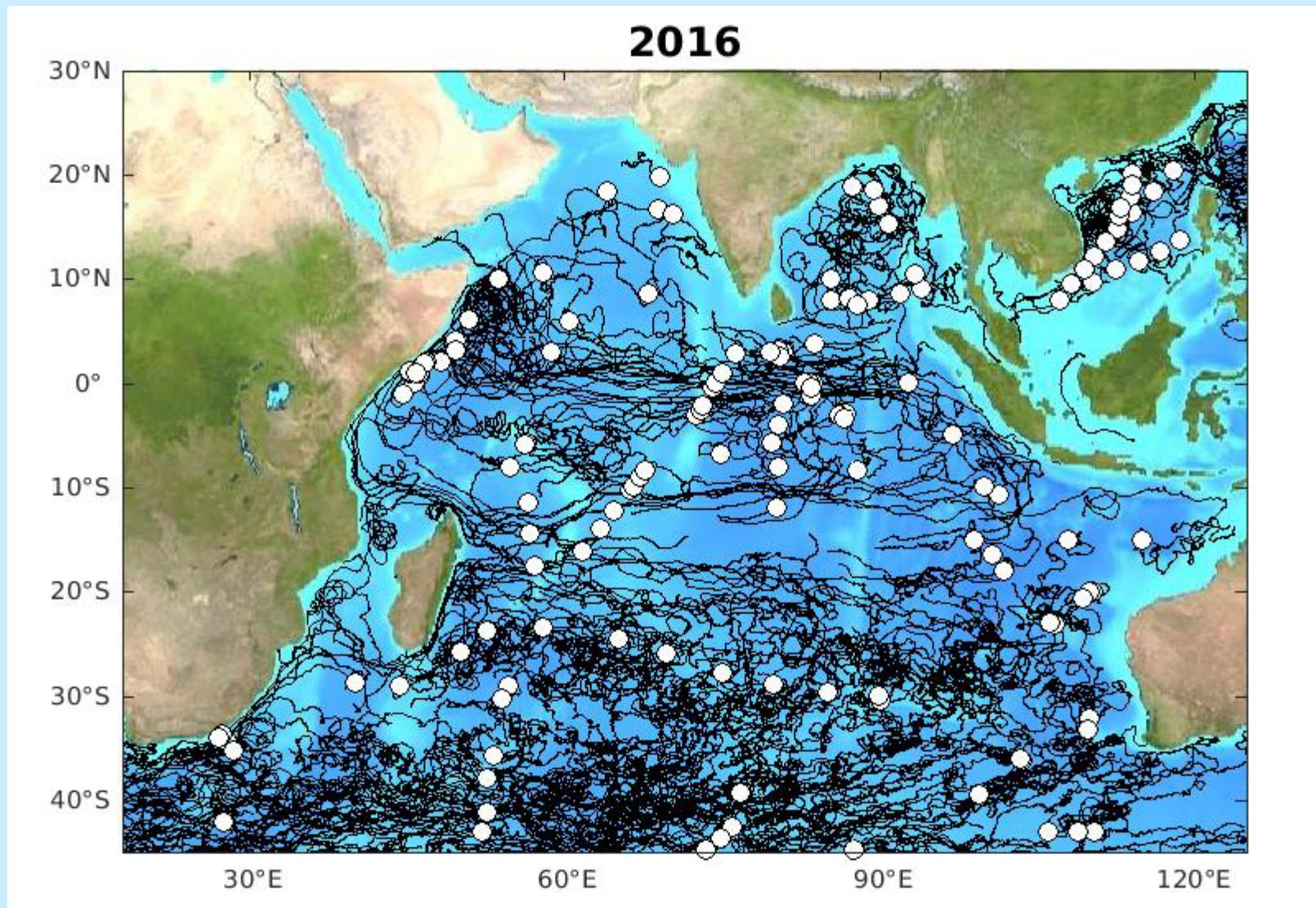
Example of deployment planning

Planned cruise track for I07N (R/V Ronald H. Brown, 2018):
Automatic routine developed by GDP picks optimal locations for deployments based on configuration of array; to be updated closer to actual cruise.

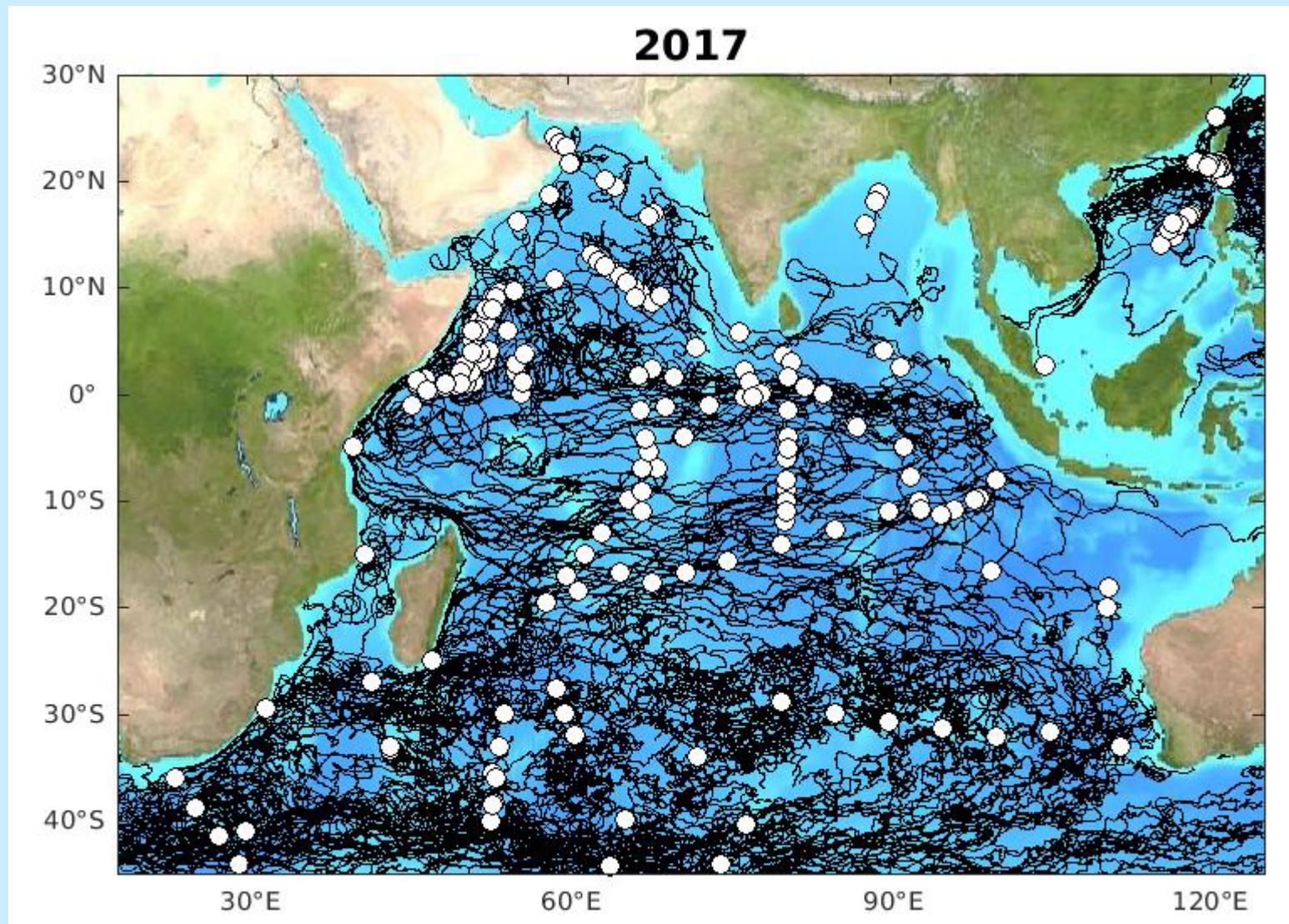




Drifter data coverage (black trajectories) and deployment locations

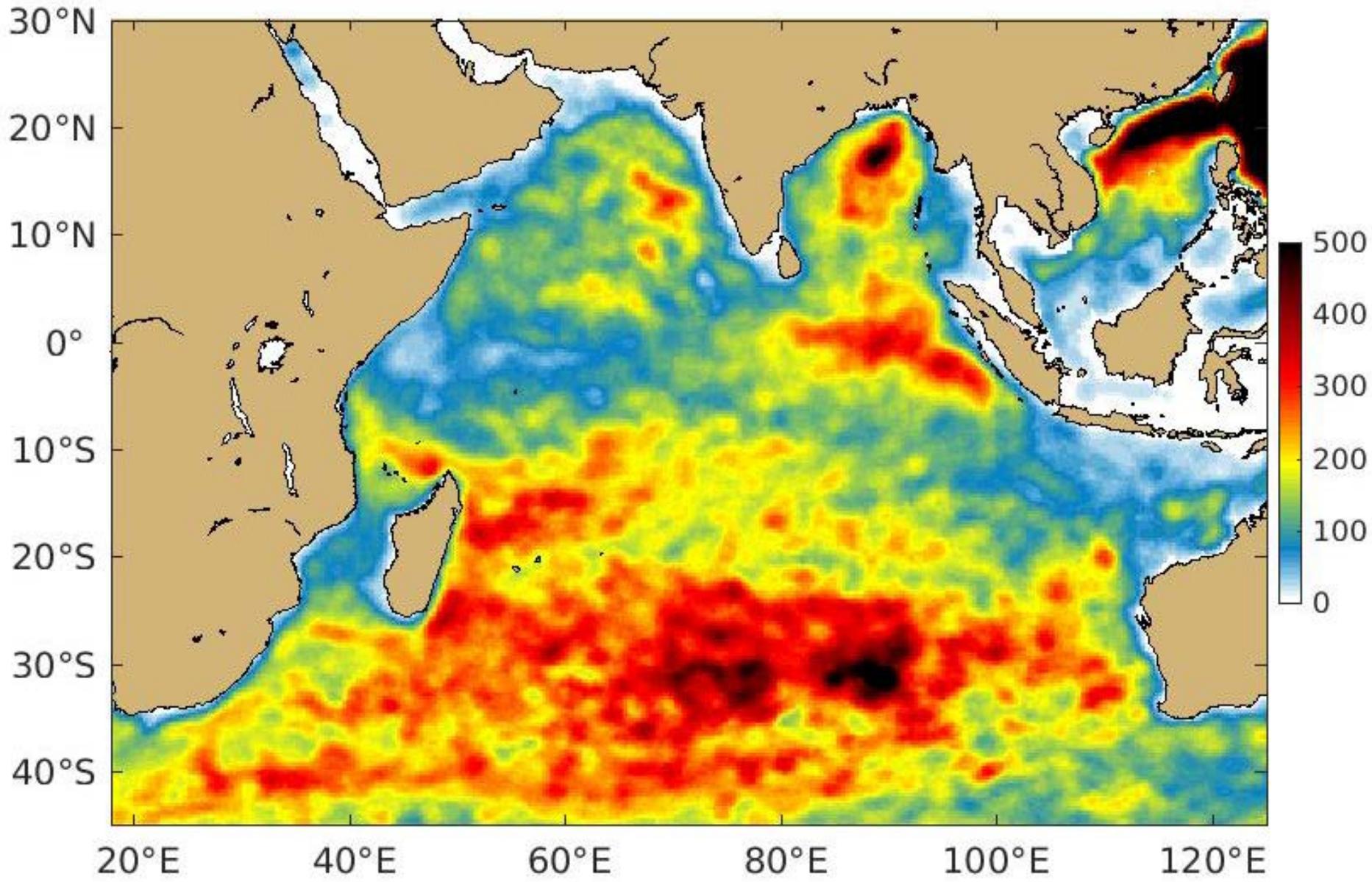


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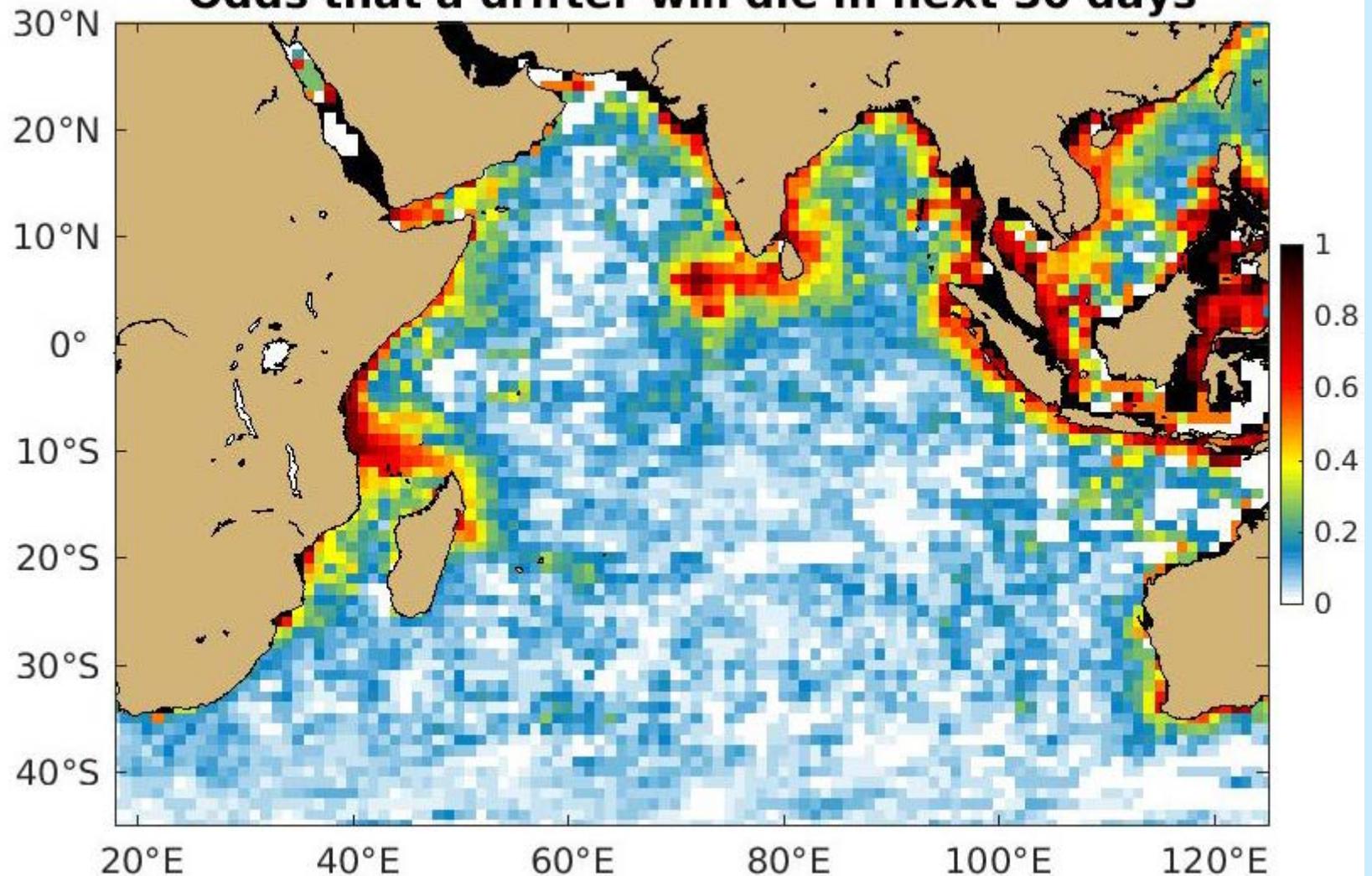


Drifter data coverage (black trajectories) and deployment locations

Overall historical density of data (drifter days per square degree)



Odds that a drifter will die in next 30 days



The average lifetime of a drifter is 450 days. However, this varies spatially; here is the time-mean chance that a drifter will die in the next 30 days for any reason if it enters a cell. Deployments should be avoided where this is >0.2 .



Data Policy Compliance

The drifter data management plan is described in the OceanObs'09 Community White Paper “Data Management System for Drifting Buoys”.

Near-real time: Drifter data are made available on the Global Telecommunications System for operational purposes. Any GTS server can be used; see http://www.aoml.noaa.gov/phod/dac/GTS_OSMC_database.php. NRT data is archived at NOAA's National Center for Environmental Information (NCEI).

Delayed mode (~ 3 months, following quality control): <http://www.aoml.noaa.gov/phod/dac/dacdata.php>. Work is underway to archive the delayed mode data at NOAA/NCEI where they will be assigned a digital object identifier.



Global Drifter Program recommendations for IndOOS:

- ❑ Deploy drifters in persistently undersampled regions such as the Somali Current, Great Whirl, and the region between Australia and Indonesia west of the Timor Sea.
- ❑ Sustain the array via international partnerships coordinated through the Data Buoy Cooperation Panel.
- ❑ Evaluate the GOOS/GCOS sampling requirements in light of the scales of motion in the basin. E.g., $5^{\circ} \times 5^{\circ}$ bins are very coarse compared to features such as the Wyrcki Jet, Somali Jet, and East India Coastal Current.
- ❑ Evaluate the value of barometric pressure observations in this region for numerical weather forecasting efforts, in order to evaluate if 100% of the drifters should collect these observations.