

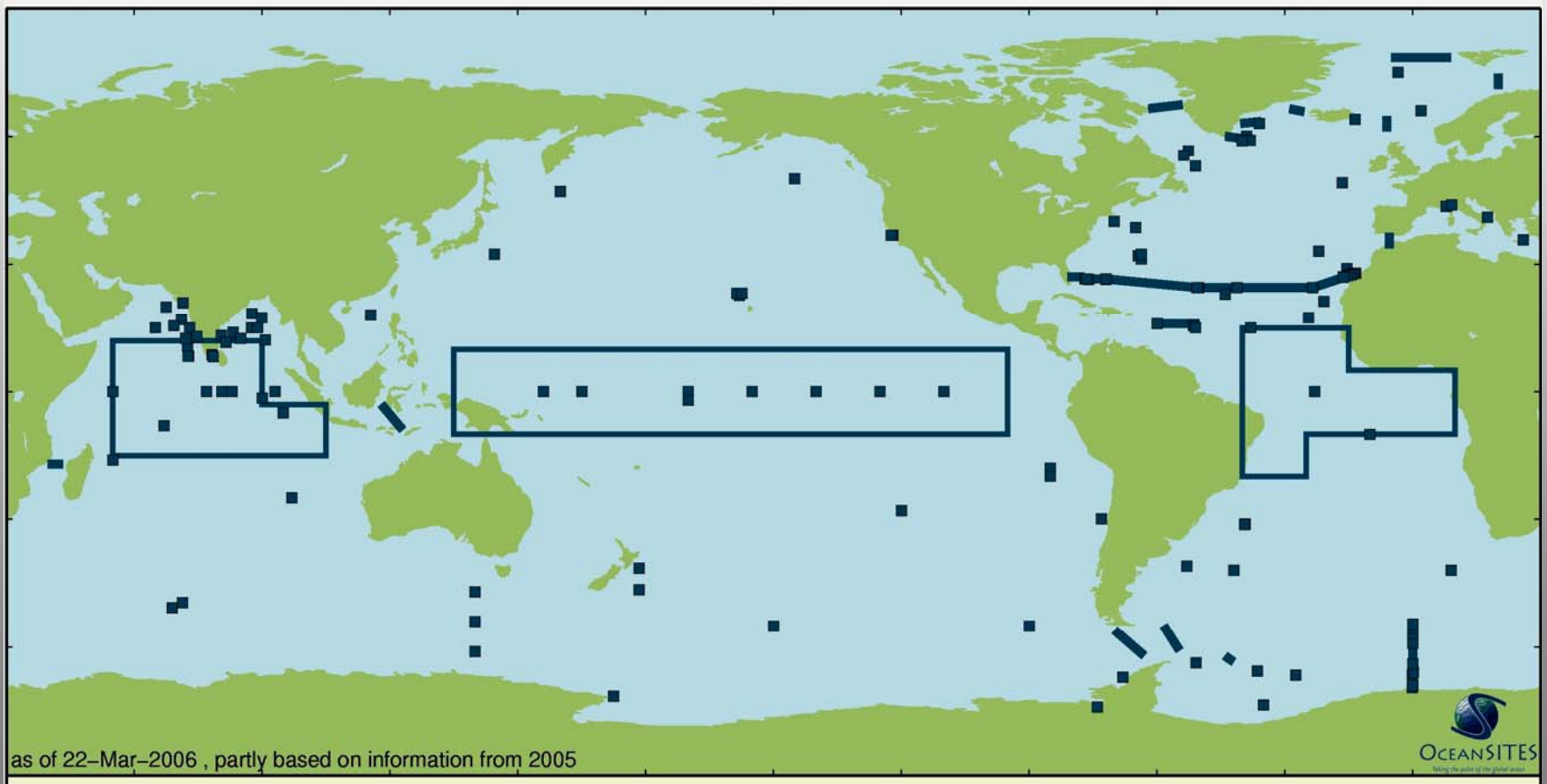
OceanSITES

and wave observations

Continuous measurements from
the deep ocean in real time

OceanSITES: a global network of fixed open-ocean sites which

- collect timeseries of atmospheric, physical, biogeochemical, or ecosystem variables
 - are sustained or planned to be sustained
 - use mooring or ship-board (min. monthly) or cable or glider observations
 - share data freely and in real-time/with minimum delay
 - want to cooperate to be part of the network

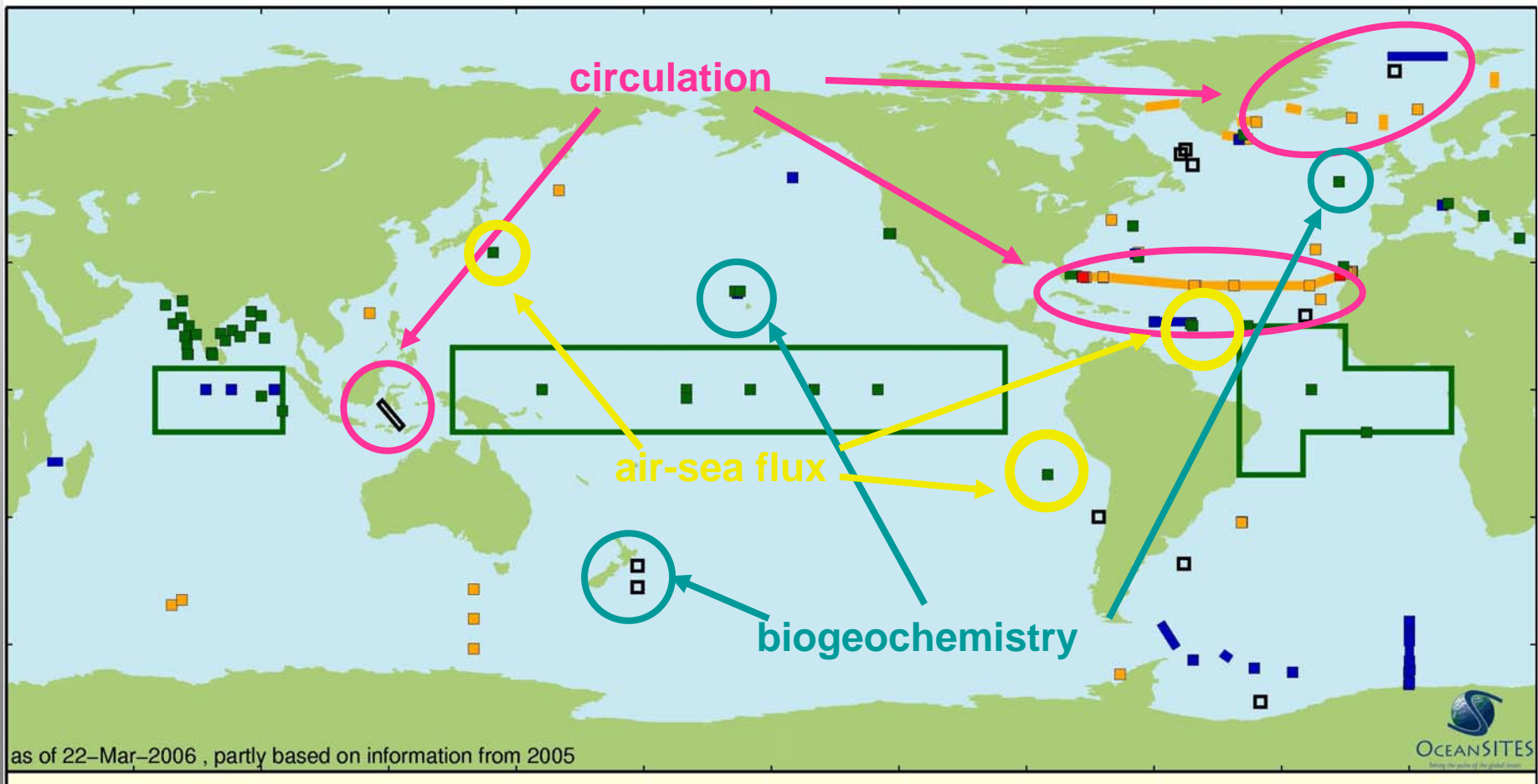


Unique contributions and strengths of fixed timeseries:

- high sampling rate to resolve rapid processes (**e.g. waves**) and continued measurements to catch events (**storms**)
- long sustained timeseries in fixed places allow observations of small changes and trends without danger of aliasing → potential for early detection of changes and discovery (similar to Keeling curve) (**e.g. wave climate changes**)
- most accurate since recovery and sensor post-calibration possible
- enables simultaneous measurements of many variables, which is best chance to unravel linkage and forcing between parameters
- unique capability for vertical coverage, i.e. atmospheric and oceanic surface boundary layer, full water column coverage, and benthic observations

However... difficult to develop users and demonstrate value of the network because :

- Current sites are very inhomogeneous
- Difficult or no data access and comparable QC procedures
- lack of products useful for the community



New initiatives and current activities as of this year

A) Assure data are useful and used by providing easy access

- 2 GDAC's now exist and cooperate: Coriolis/France and NDBC/USA
- national/regional DAC's have been defined and their roles agreed
- a unified data format (NetCDF) is under revision and test
- data from 12 timeseries site operators will flow routinely within 12 months, from ONE place in ONE format
- 2 working groups established to agree on unified QC and best practices

B) Facilitate sharing of platforms, shiptime, etc via OceanSITES website

C) Develop/provide products to a variety of users via www.oceanSITES.org, e.g.

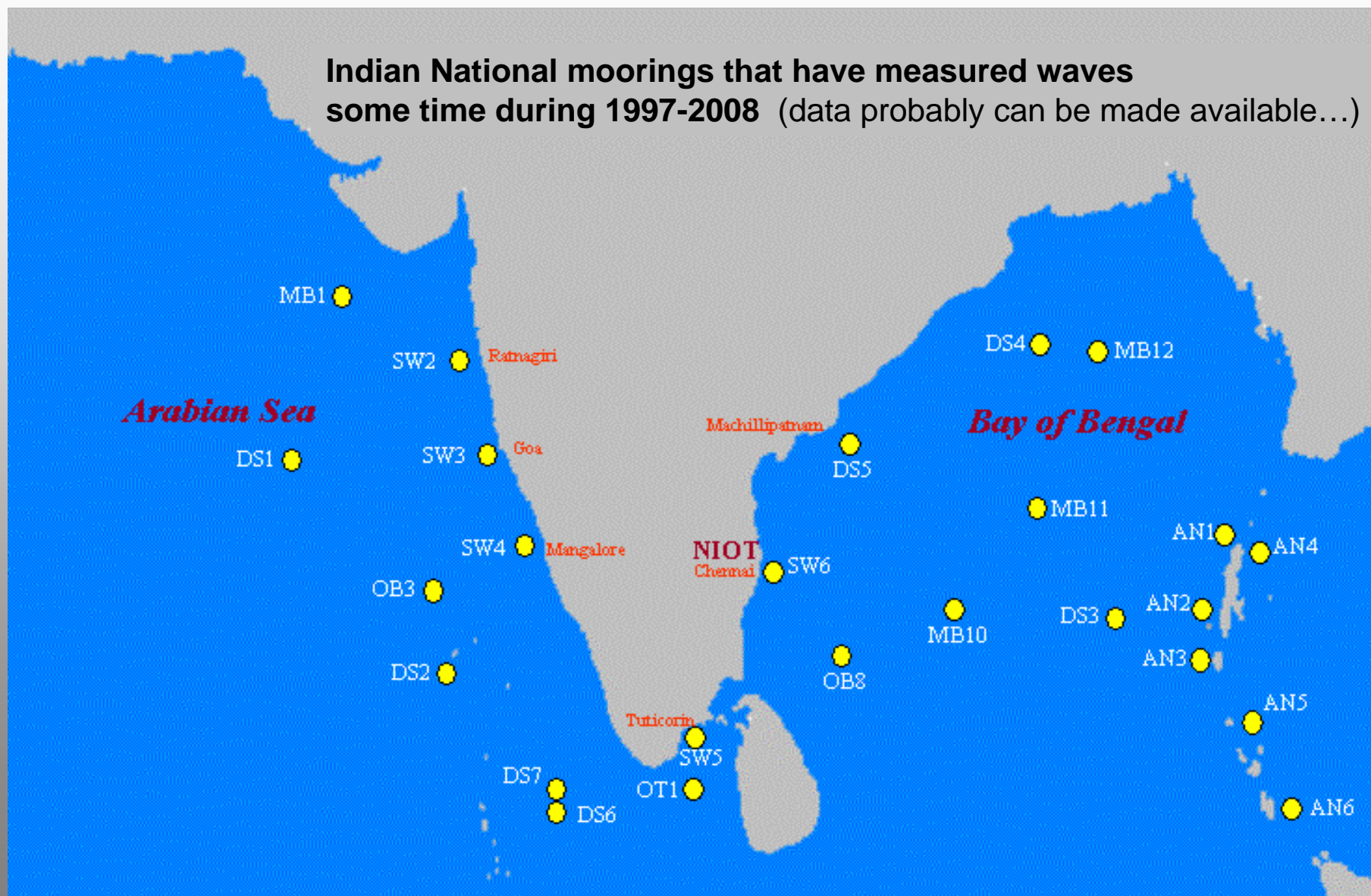
- air-sea flux data from all flux sites for model validation
- 15m currents for validation of drifter and satellite current products
- sea surface salinities for remote sensing validation
- wave data measured by surface moorings for wave products/validation
- column integrated chlorophyll estimates for remote sensing/model validation
- more....

D) Provide global ocean timeseries indicators on www.oceanSITES.org, e.g.

- pCO₂ and pH from all the sites in the network measuring this
- boundary current transports
- assembled heat and freshwater content timeseries
- eddy energy timeseries where available
- geostrophic transports between pairs measuring dynamic height
- work towards ocean acidification and ecosystem indices

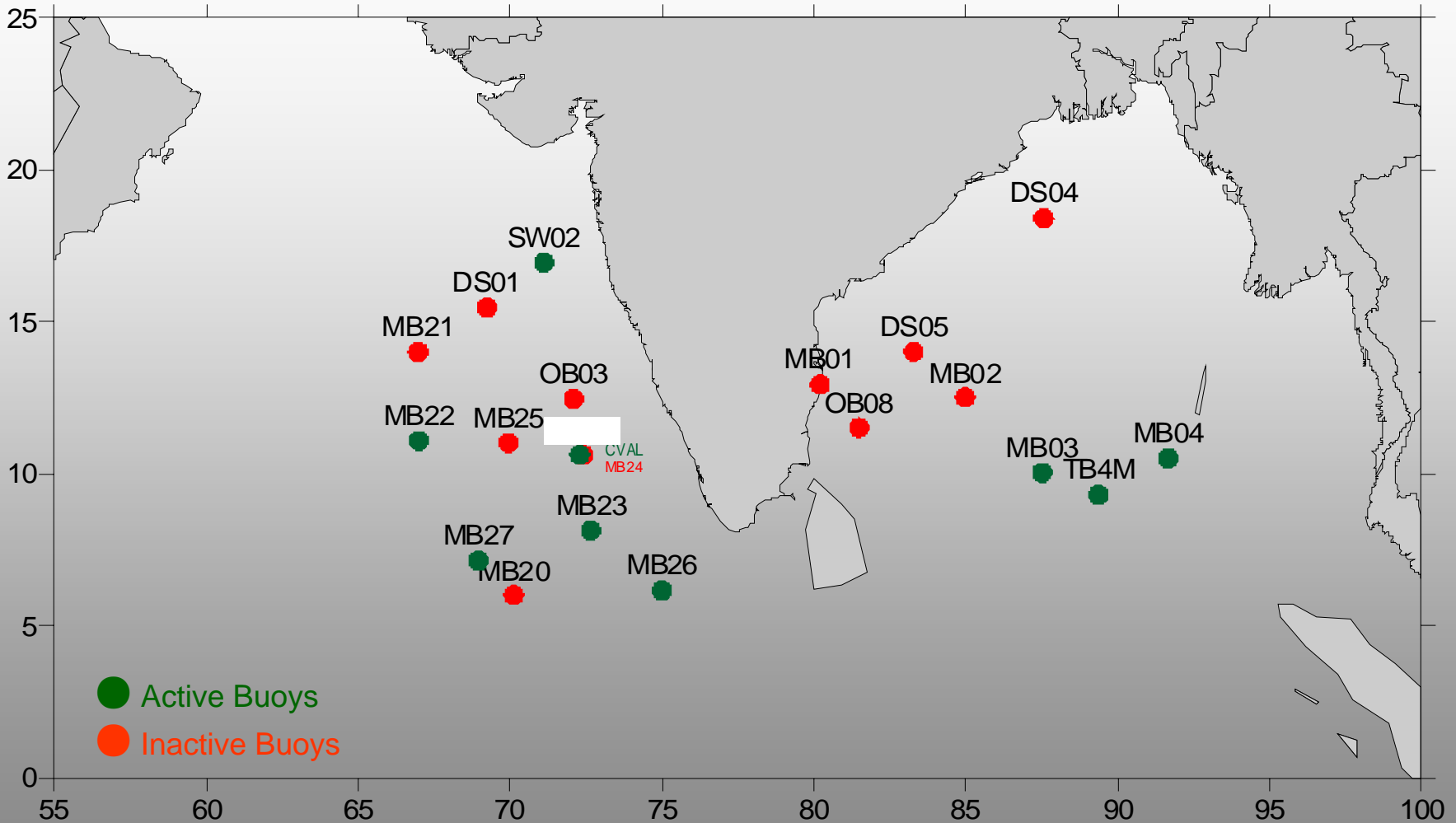
Some OceanSITES locations are already measuring waves....

**Indian National moorings that have measured waves
some time during 1997-2008** (data probably can be made available...)



Current status: active buoys

None provide wave data at moment, but 3 new ones with wave measurements being deployed in Bay of Bengal



Parameters Measured: Air Temperature, Air Pressure, Humidity, Winds, SST

Most sites measuring waves use special buoys designed for this (waverider, etc), here a model developed in India.

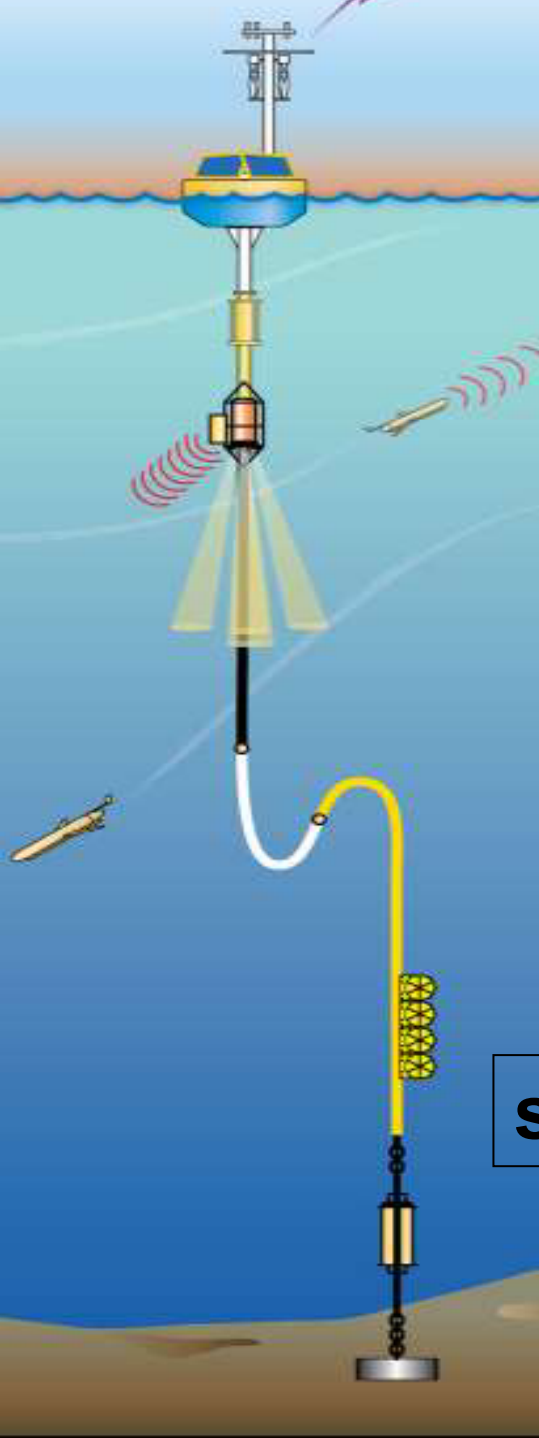
Similar in Eastern Mediterranean, some NDBC buoys (see separate presentation), etc.

But that is not the typical OceanSITES buoy...



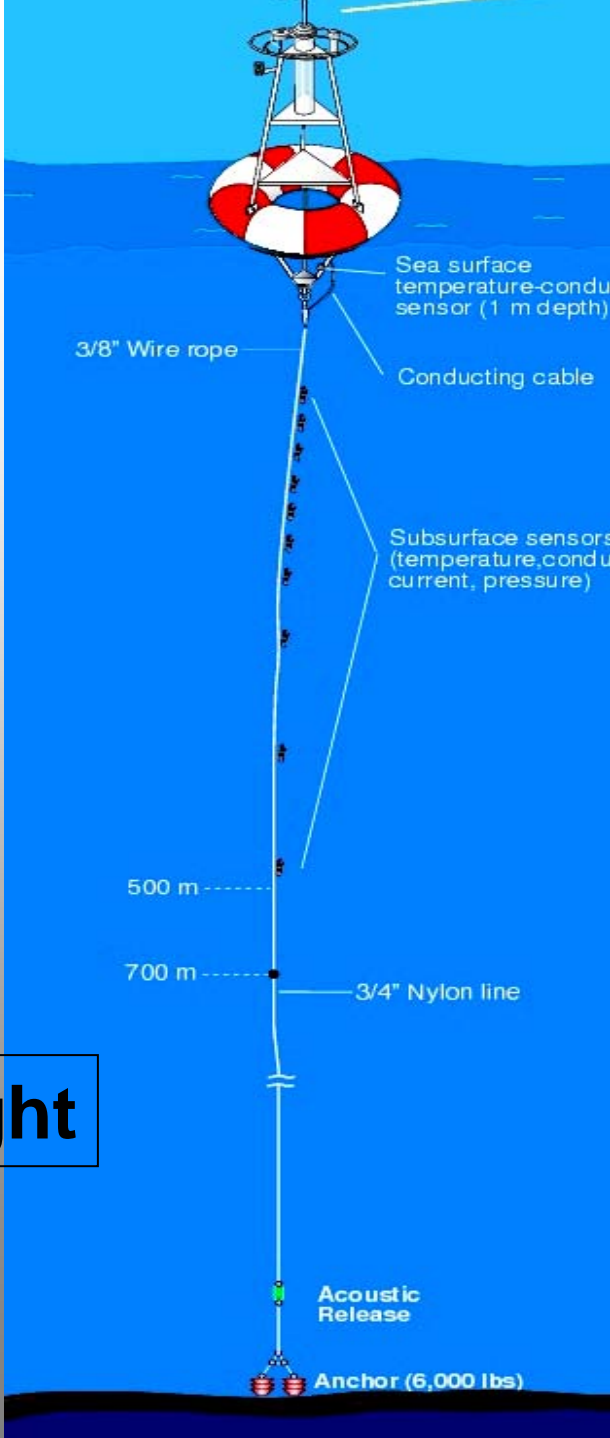
These buoys were not designed to measure/follow waves, they may roll (round hull), have resonances, or not respond well to waves...





slack

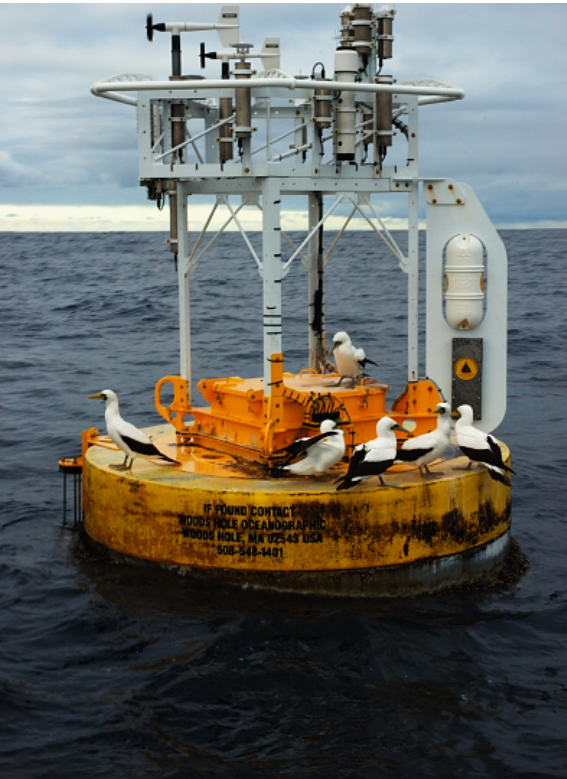
Worse – many buoys may be tightly moored, i.e. always under tension and thus not free to follow waves (actually not MEANT to follow waves):



taught

This needs careful study and expertise from wave obs community.

WHOI has started exploring this on their STRATUS mooring with NDBC hardware:



Recent Marine Data

National Data Buoy Center.

View below:



National Oceanic and Atmospheric Administration's

National Data Buoy Center

Center of Excellence in Marine Technology

[Home](#)

[News](#)

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Storm Special! View the latest observations near [Atlantic Subtropical Storm L](#)

Station 32012 - Woods Hole Stratus Wave S

Owned and maintained by [Woods Hole Oceanographic Institution](#)

2.4-meter discus buoy

WAMDAS payload

19.620 S 85.379 W (19°37'13" S 85°22'44" W)

For meteorological data at this station, see [32ST0](#).

[Search And Rescue \(SAR\) Data](#)

[Meteorological Observations from Nearby Stations and Ships](#)

[Latest Satellite Wind Map for this Area](#)

**Conditions at 32012 as of
(3:50 am CDT)
0850 GMT on 09/30/2008:**

Unit of Measure: Time Zone:

Click on the graph icon in the table below to see a time series plot of the last five days

	Wave Height (WVHT):	6.6 ft
	Dominant Wave Period (DPD):	15 sec
	Average Period (APD):	7.0 sec
	Mean Wave Direction (MWD):	SSW (199 deg true)

A) Slack moorings

Study to what extent buoy follows waves, measure spectral response/transfer function. E.g. WHOI deployed buoy together with bottom wave-measuring ADCP near WHOI for calibration. Then can try to use just accelerometer/tilt sensors.

B) Taught moorings

Waves “go by” the buoy....

- 3 pressure/immersion sensors on the buoy hull ?
- upward/sideways looking ADCP or sonar ?

C) Moorings with mixed behaviour (responds to some, not to other frequencies)

Is a MIX of above sensors possible/useful ?

Message from OceanSITES Steering Committee:

- **Happy to host hardware, but need to know more about it (physical factors, power and telemetry needs, etc)**
- **we have no expertise in calibrating/making sense of the data, and putting sensors on moorings only makes sense once known who will use it / help to make it work / whether it will work**
- **Data analysis and manpower for it would have to be provided by the wave obs community.**
- **Participation in OceanSITES by the wave community welcome, to make the collaboration happen**

(sharing the effort, i.e. funding, operation, etc, would also be welcome)



The image shows a screenshot of a web browser displaying the OceanSITES website. The browser's address bar shows the URL "http://oceansites.org/". The website's header features the "OceanSITES" logo in large white letters, with the tagline "Taking the pulse of the global ocean" to its right. Below the logo, a banner reads "A worldwide system of deepwater reference stations providing: The full depth of the ocean".

The main content area is divided into three columns. The left column contains a vertical navigation menu with the following items: Home, Global Network, Data, Global Team, Meetings, Documents, Links, and Contact. The middle column is titled "Putting eyes and ears in the deep ocean" and contains two paragraphs of text. The right column features a "News:" section with a brochure cover image, followed by the text "OceanSITES Brochure Spring 2006" and a link "Order Copies Here!". Below this is another news item: "QARTOD IV Workshop June 21 - 23, 2006" with the text "Quality Assurance of" below it.

Home

Global Network

Data


Global Team

Meetings

Documents

Links

Contact



Putting eyes and ears in the deep ocean

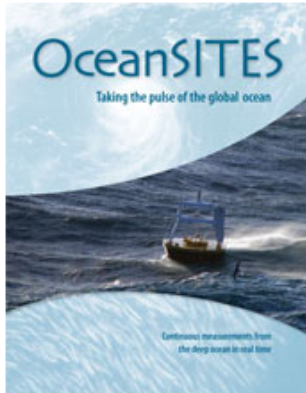
OceanSITES is a worldwide system of long-term, deepwater reference stations measuring dozens of variables and monitoring the full depth of the ocean from air-sea interactions down to 5,000 meters.

Since 1999, the international OceanSITES science team has shared both data and costs in order to capitalize on the enormous potential of these moorings. The growing network now consists of about 30 surface and 30 subsurface arrays. Satellite telemetry enables near real-time access to OceanSITES data by scientists and the public.

OceanSITES moorings are an integral part of the Global Ocean Observing System. They complement satellite imagery and ARGO float data by adding the dimensions of time and depth.

For more information or to coordinate your research with

News:



OceanSITES Brochure
Spring 2006
[Order Copies Here!](#)

QARTOD IV Workshop
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Quality Assurance of