

PARTNERSHIPS FOR NEW GEOSS APPLICATIONS (PANGEA)



DBCP XXV S&T Workshop
UNESCO Paris, France
28 September 2009

Dr. Sidney Thurston
NOAA Climate Program Office
Office of Climate Observation (OCO)

Presentation Overview

- Establishment of A US National Climate Service is Underway
- Indian Ocean Implementation Remains a High Priority
- Observations for Socio-Economic Applications Are Key to This Process--Resource Sharing *PANGEA* Partnerships Are Important to Success
- Update on NOAA's Indian Ocean Partnerships:
 - Indonesia,
 - India,
 - ASCLME.
- Western Indian Ocean Capacity Building



New NOAA Chief

Climate change is real. It is here, and it is happening now, in our backyards and around the globe. NOAA is committed to helping governments, businesses, and communities manage climate risks, adapt to changing conditions, and reduce the threat of climate change.

Jane Lubchenco, Ph.D.

**Under Secretary of Commerce for Oceans and
Atmosphere**

**Administrator, National Oceanic and Atmospheric
Administration (NOAA)**



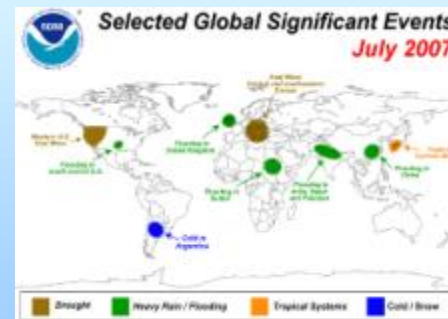
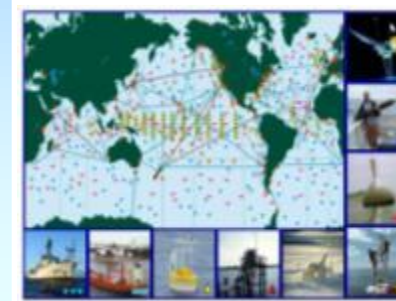
Understand the Past and Current State of the Climate

• Climate System Observations

- Ocean
- Atmosphere
- Arctic
- Carbon

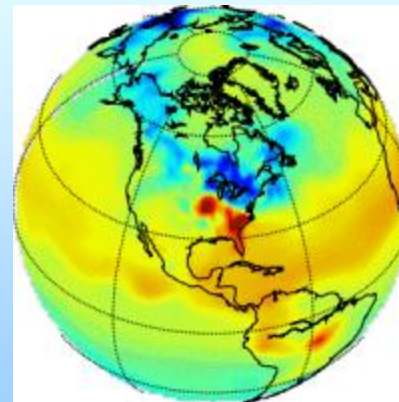
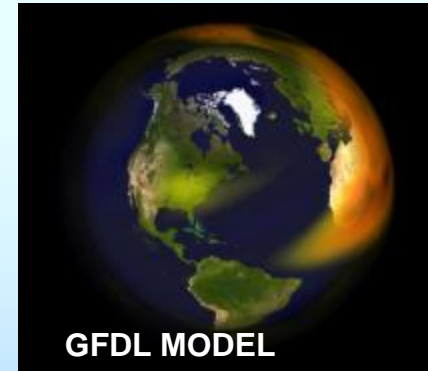
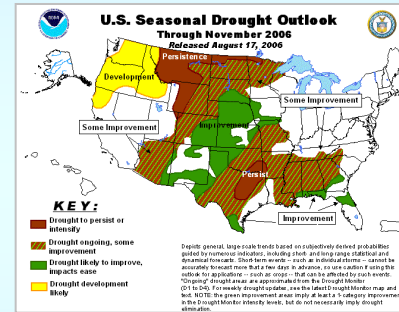
• Data Management and Information

- NOAA's Comprehensive Large Array-data Stewardship System (CLASS)
- State of the Climate Report
- Climatological Statistics and Summaries



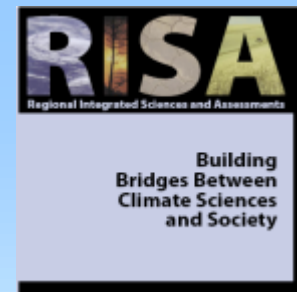
Advance Predictive Understanding and Skill about the Future State of Climate

- **Understanding Climate Processes -**
 - NOAA's Research Laboratories,
 - Centers, and Cooperative Institutes
 - Competitive Grants
- **Earth System Modeling, Predictions, and Projections -**
 - GFDL and NCEP coupled climate models
 - Earth system model development
- **Analysis and Attribution -**
 - Reanalysis
 - Emerging focus on Integrated Earth System Analysis and attribution



Capturing the global distribution of the short-lived Aerosols spreading out from the source regions

Assessing Evolving User Needs and Context



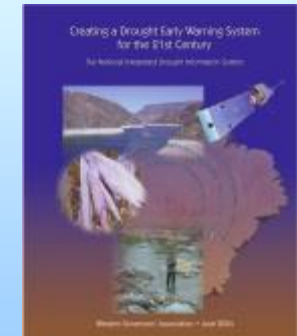
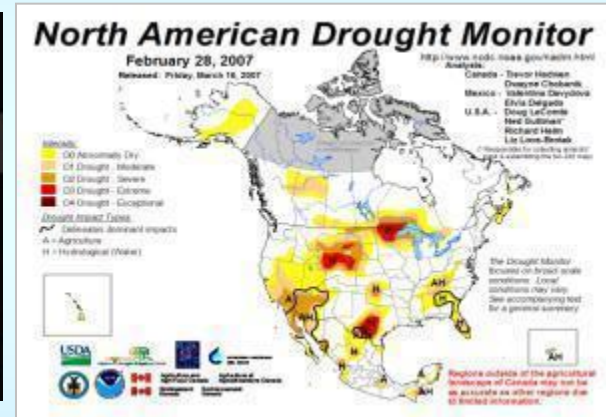
- **Assessing Climate, Impacts and Adaptation -**

- Global, national, regional, sectoral assessments of vulnerability, impacts and adaptation



- **Climate Services Development and Delivery -**

- National Integrated Drought Information System (NIDIS)
- Emerging foci on Coasts, Arctic, Fisheries,...
- Regional
- International

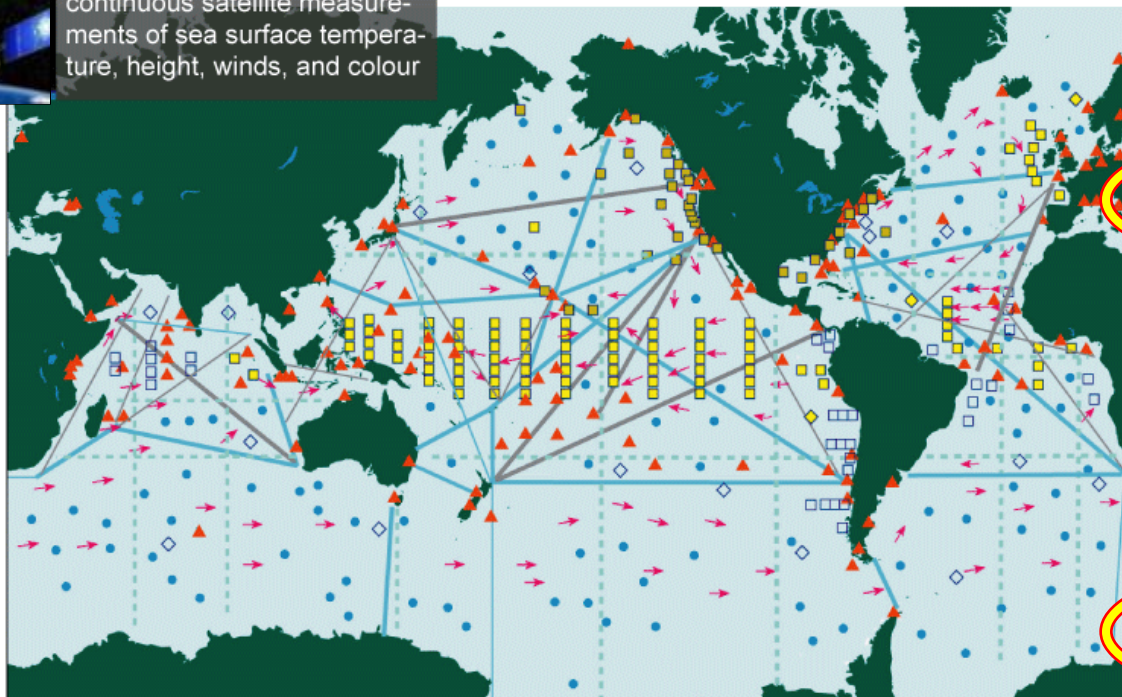


Initial Global Ocean Observing System for Climate

Status against the GCOS Implementation Plan and JCOMM targets

Total *in situ* networks **61%** February 2009

continuous satellite measurements of sea surface temperature, height, winds, and colour



87% Surface measurements from volunteer ships (VOSclim)

200 ships in pilot project



100% Global drifting surface buoy array

5° resolution array: 1250 floats



62% Tide gauge network (GCOS subset of GLOSS core network)

170 real-time reporting gauges



81% XBT sub-surface temperature section network

51 lines occupied



100% Profiling float network (Argo)

3° resolution array: 3000 floats



43% Repeat hydrography and carbon inventory

Full ocean s...

Reference time series **24%**

58 sites



48% Global reference mooring network



29 moorings planned



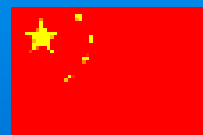
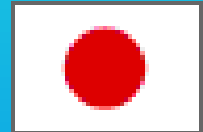
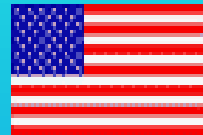
79% Global tropical moored buoy network



119 moorings planned

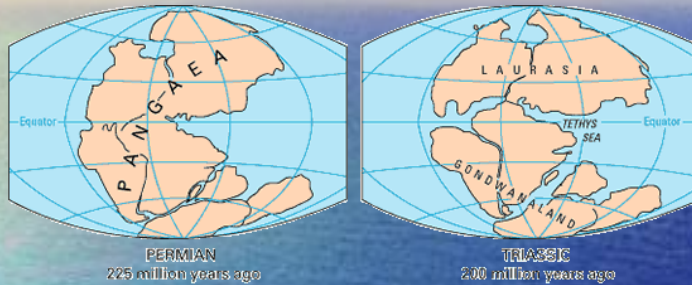


International Cooperation



- **USA (NOAA) and India (MoES) sign MOU in 2008**
- USA (NOAA) and Japan (JAMSTEC) sign MOU in 2008
- USA (NOAA) and Indonesia (DKP and BPPT) sign MOU in 2007
- China (SOA) and Indonesia (DKP) sign MOU in 2007
- U. Paris and U. Capetown are committing ship time to expand RAMA into SW Indian Ocean/MOU's under discussion

Partnerships for New GEOSS Applications (*PANGEA*)



- 230M Years ago the Super-continent PANGEA Existed
- Reunite Met/Ocean Institutes to Increase in-situ Ocean Observations
- Demonstrate Socio-economic Applications of Ocean Data

PANGEA Promotes the Use of Ocean Observations for Regional Socio-Economic Benefits Through:

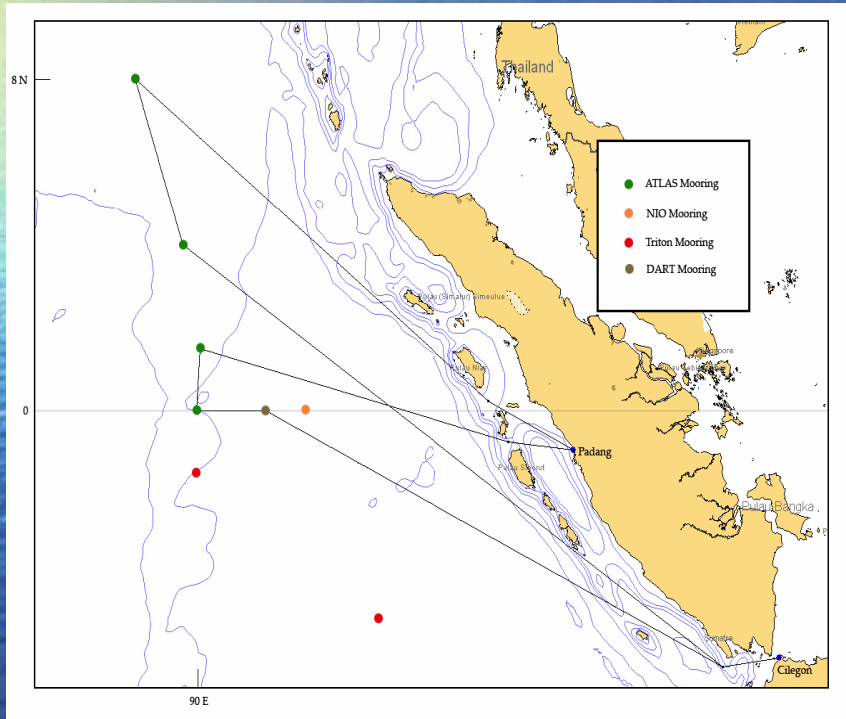
- Sharing required resources such as ship time and training between Partners,
- Annual and repeatable training workshops conducted in exchange for annual sea days aboard PANGEA partner's ships for deployments and routine maintenance of ocean observations,
- In-country practical applications training of ocean data provided to large and diverse groups of regional participants, rather than a few selected individuals traveling to a workshop far away,
- Establishing New sources of ocean observational data by deploying new instruments,
- Government Officials responsible for making policy and setting budgets are invited to participate in PANGEA workshops,

Indonesia's Ministry of Marine and Fisheries (DKP) and Agency for Assessment and Application of Technology (BPPT)

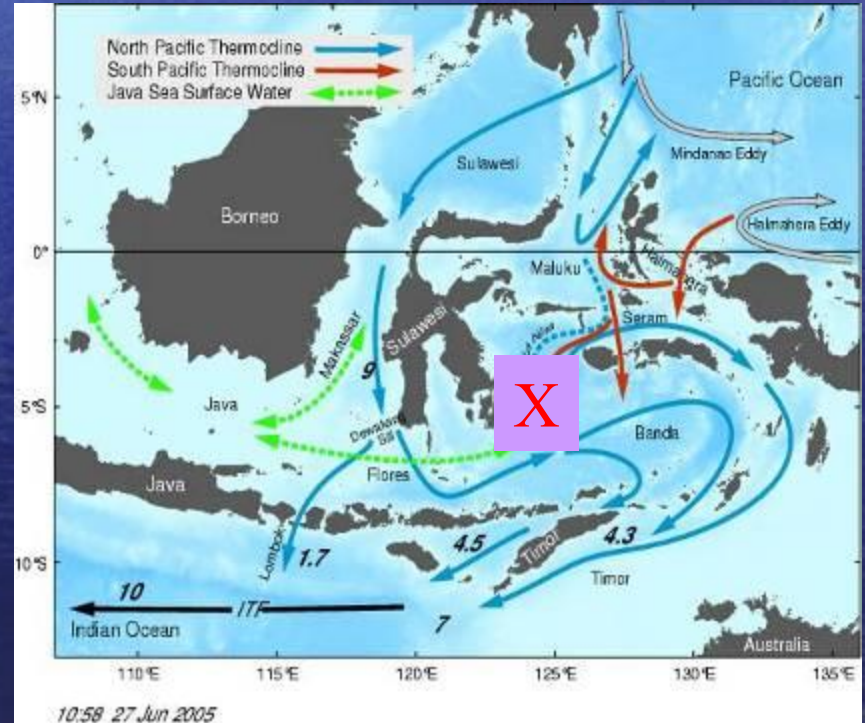


NOAA's Collaborative Activities Eastern Indian Ocean Observations

ATLAS Climate & DART Tsunami Moorings



Indonesian Throughflow Monitoring



World Ocean Conference 2009

11-15 May Manado North Sulawesi

*"Climate Change Impacts To Oceans and The Role of Oceans
To Climate Change"*



- **Capacity Building Workshops**
- **ATLAS Moorings**
- **Education**
- **Shiptime**
- **Jointly Develop InaGOOS and RAMA**

5th DKP-BPPT-NOAA Capacity Building Workshop

Theme: *Planning For Climate Change in the Coastal and Marine Environment*



Sanur Bali Indonesia
6-10 October, 2009

- Demonstrate the Crucial Role of Ocean Observations for Understanding and Predicting climate,
- Demonstrate the Societal and Economic Benefits of Delivering Enhanced Ocean Observing System Data for Better Informed Decisions,
- Learn Practical Application of a Planning Model for Addressing Impacts from Climate Change in the Coastal and Marine Environment,
- Become Familiar with Tools for Assessing Community Resilience, Vulnerability and Risk to Local Communities and Natural Resources,
- Learn How to Select and Evaluate Adaptation Measures (Soft and Hard) for Managing Impacts From Climate Change.

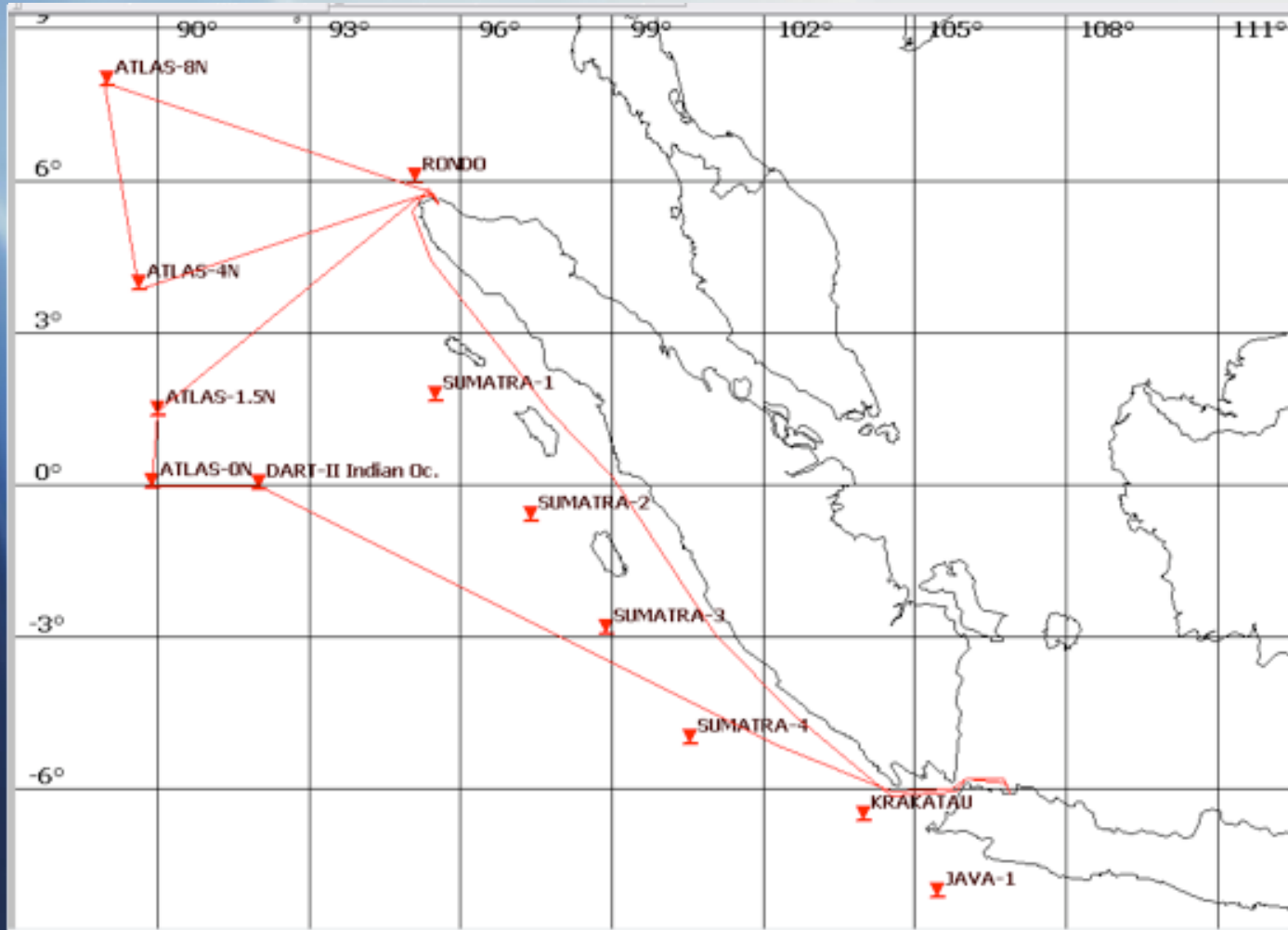
10 Steps to the Climate Change Management Process

- **Understanding Climate Change**
- **Impacts on the Coastal and Marine Environment From Climate Change**
- **Overview of the Process Model for Planning for Climate Change**
- **Human and Natural Resource Coastal Community Resiliency**
- **From High Tech to Low Tech: The Role of Information in Predicting and Managing Impacts From Climate Change**



- **Gathering Information From Local Communities on Community Resiliency**
- **Moving From Resiliency Analysis to Building Adaptation and Resiliency Strategies in the Coastal and Marine Environment (Physical, Biological, Social and Governance Strategies)**
- **Selecting and Evaluating Adaptation and Resiliency Strategies**
- **Measuring Success**
- **Communication and Awareness Building**

Baruna Jaya ATLAS RAMA Mooring Servicing





Overview Of MoES-NOAA Partnership

- Based on Science Drivers & Societal Applications
- Broad Memorandum of Understanding (MOU)
- NOAA-Wide Implementing Arrangements (IA)
 - *Research moored Array for African-Asian-Australian Monsoon Analysis and prediction (RAMA) – OAR/PMEL, Signed April 2008*
 - *Climate Model and Ocean Assimilation Analyses for the Indian Ocean Region – OAR/GFDL, Signed September 2008*
 - *Climate Monitoring and Prediction System for the South Asian Region – NWS/CPC, Signed September 2008*
 - *South Asian Regional Reanalysis (SARR)– CPO/U Md, Signed September 2008*
 - *INSAT-3D Satellite Data –NESDIS, To Be Signed*
 - *Carbon Cycle Greenhouse Gas Measurements and Research – OAR/ESRL, Signed Autumn 2009*
 - ***Frame work for India–US Collaboration On Tropical Cyclone Research– OAR/HRD, Signed Autumn 2009***

India Ministry of Earth Sciences (MoES)– NOAA Joint Executive Meeting 10/09

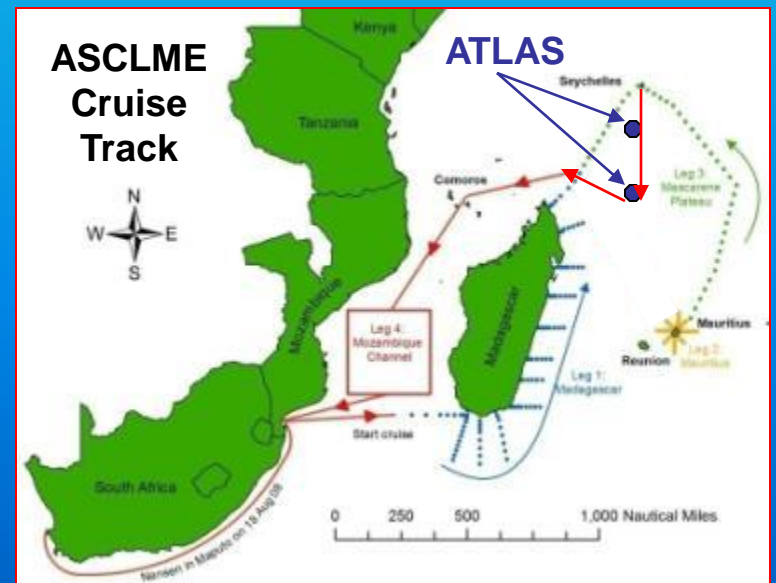
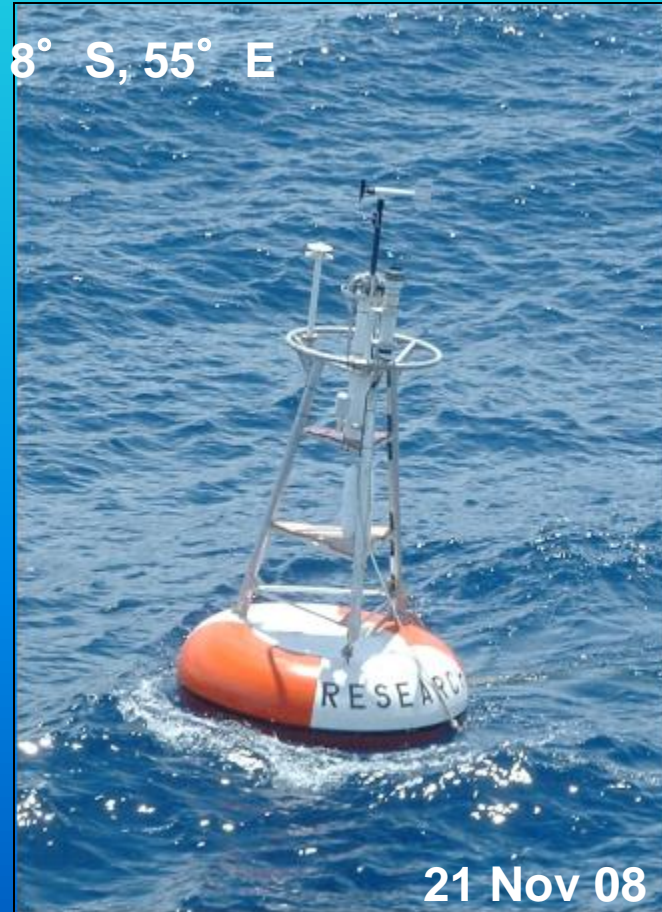


- NOAA-Wide Participation
- RAMA
- Ocean Data Assimilation
- Fisheries Management
- Tsunami
- Water Resource Mgt
- Climate Services

NOAA and ASCLME

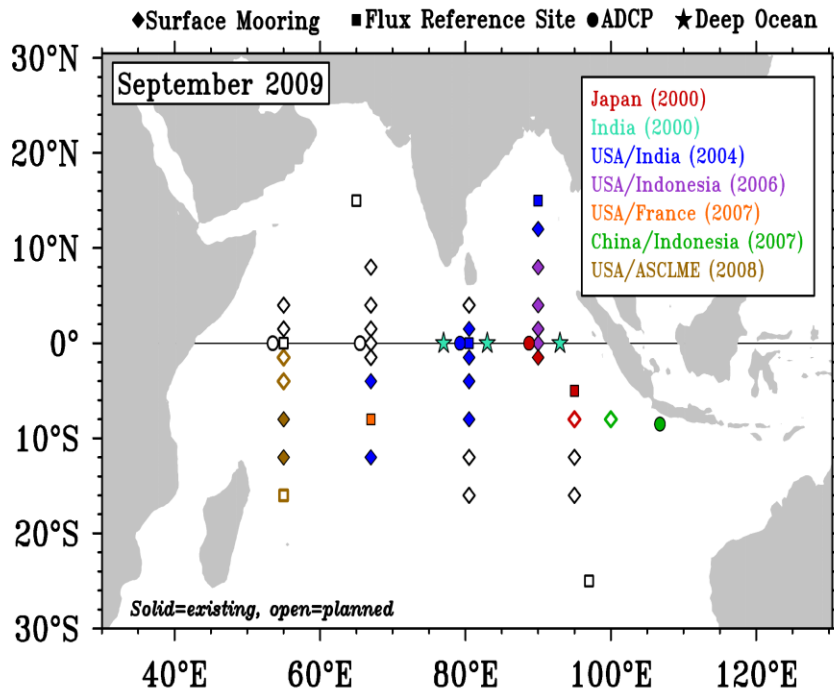
2 ATLAS and 4 Argo floats deployed during ASCLME cruise on *R/V Fridtjof Nansen*

Mahe, Seychelles to Pemba, Mozambique
18-27 Nov 2008



RAMA Implementation Status

Research Moored Array for African-Asian-Australian Monsoon Analysis and Prediction (*RAMA*)



- Number of sites occupied: 24, or 52% of the IOP plan.
- Planned and proposed sites for September 2010: 80%



United Nations
Educational, Scientific and
Cultural Organization

Organisation
des Nations Unies
pour l'éducation,
la science et la culture



Intergovernmental
Oceanographic
Commission

Commission
océanographique
intergouvernementale

50

1960-2010

A bathymetric map of the Western Indian Ocean region. The landmasses are shown in green and yellow, while the ocean depths are shown in shades of blue. Labels for countries and regions include Somalia, Kenya, Tanzania, Mozambique, South Africa, Seychelles, Comoros, Madagascar, and Mauritius. The African Plateau is also labeled.

**DBCP CAPACITY BUILDING WORKSHOP
FOR
THE WESTERN INDIAN OCEAN REGION**

February, 2010

Lunch Meeting Tomorrow

Summary

- The Global Demand for Climate & Ocean Information, Services and Products is Increasing, So Too Is the Demand for Global Ocean Observations for Socio-Economic Applications
- Society's Return on Investment For Ocean Observations is Great for Applications to Climate Forecasting, Natural Hazards Warnings, Weather Prediction, Marine Environment Monitoring
- The International GCOS Ocean Plan is 61% Implemented, Much Work Remains-Resource Sharing Partnerships Will Be Critical to Success
- NOAA Seeks to Advance Implementation Collaboration via *PANGEA* Partnerships

Merci!



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