Workshop on Observations, data and products from the Global Ocean Observing System
Monday, June 1, 2009
Location: SEFSC conference room

Organizers: Gustavo J. Goni, NOAA/AOML/PHOD and John Lamkin, NOAA/SEFSC

The present ocean observing system has mainly been formed by components established through consensus within the international oceanographic community to satisfy the collective needs for research and operational applications. The range of ocean observations collected addresses many fields of study, including climate, weather, ocean currents, fisheries, and environment. At the heart of this system there is a vision that observations need to be part of integrated networks providing global, sustained, and high-quality data in a cost-effective manner that can be distributed either in real- or delayed-time. This presentation provides an introduction to the systematic global ocean observations made from ship-based, autonomous *in situ*, and remote sensing platforms.

As our laboratories work towards building new collaborative research endeavors in the coming years, we can look towards existing mutual programs between AOML and SEFSC as examples for future scientific relationships. Elizabeth Johns and Ryan Smith (AOML/PhOD) have been working together with John Lamkin and Trika Gerard (SEFSC/ELH) since 2002 on multiple interdisciplinary research projects in the western Caribbean and south Florida and more recently in the northeastern Caribbean. Their two major collaborative projects include the Meso-American System Transport and Ecology Research program (MASTER), and the Coral Reef Ecosystem Research program (CRER). Combining traditional oceanographic sampling methodology with biological sampling protocols, AOML and SEFSC are producing assessments of regional connectivity in terms of larval transport, recruitment, and life-history patterns.

The objective of this talk is to present to the NOAA/SEFSC different types of ocean data and products that are already available to the community, and particularly those in which NOAA/AOML is involved. Emphasis will be given to data and products derived from several key components of the ocean observing system that are available and may be of interest to those involved in fisheries research. Some of these observations and products may be of particular interest to those studying processes with short periods and small spatial scales, while others are related to longer scale variability.

The presentation will focus specifically on:

- *Satellite and drifter observations to monitor and study surface currents and fronts:* Observations from satellite altimetry provide global sea height data every ten days, which can be used to, among other things, estimate geostrophic surface currents. A CoastWatch/AOML web-based tool will be presented to illustrate how global surface currents can be visualized in real-time mode and in delayed-time mode with data from 1993 to the present. Also available in this tool are surface current observations collected

by autonomous surface drifters that can be used to validate satellite-based estimates of surface currents. Sea surface temperature and ocean color products obtained from satellites and distributed through the CoastWatch Gulf of Mexico and Caribbean Regional node at AOML will be also presented and analyzed. Several examples will be presented to discuss various methodologies to determine ocean fronts, mainly in the Gulf of Mexico and in the Gulf Stream region, and of regions of upwelling.

- *Ocean and Climate Indexes:* Some observations, such as sea surface temperature and sea surface height are used to compute ocean and climate indexes. For example, the Western Hemisphere Warm Pool, the region determined by SSTs larger than 28.5°C, has been linked to hurricane genesis and rainfall from South America to North America, and may be linked to environmental dynamics. AOML/PHOD also creates other long-term indexes, such as the global warming index and the index for the Atlantic Multidecadal Oscillation, a fluctuating climate mode wherein the sea surface temperature of the North Atlantic can vary on multidecadal timescales of 30-80 years. These and other indexes that are routinely posted in AOML or other web pages will be discussed.

- *EXpendable BathyThermograph (XBT) and profiling float observations to monitor the vertical temperature structure:* These observations provide vertical temperature profiles at different spatial and temporal scales. Time series of these data, some of which extend over several decades, allow for the identification of long term signals that are potentially related to some observed long term trends in fish stock abundance. XBT deployments performed along fixed transects also allow monitoring the variability of surface currents and undercurrents within the upper 800m. Several examples will illustrate how the vertical temperature structure can be monitored with these and other systems.

- *ThermoSalinoGraph (TSG) observations to monitor sea surface salinity (SSS):* Observations from TSGs allow for the identification of frontal regions defined by large SSS gradients. One vessel providing TSG data is the M/V Oleander, which crosses the Gulf Stream twice a week between Boston and Bermuda. This vessel provides a good example of how the differing programs in the ocean observing system interconnect, as XBTs are also deployed along this transect providing simultaneous observations of the upper ocean vertical temperature structure.

Other observational platforms will be briefly presented, such as moorings, cable measurements, and surface winds. Additionally, results will be presented on the usage of some of these products, for example, as a link between oceanographic features in the Gulf of Mexico and bluefin tuna catch rates as part of a project with G. Diaz, C. Rivero and F. Bringas.

It is hoped that immediately after the end of this presentation, scientists from AOML and SEFSC will engage in further discussions regarding these data and products. Furthermore it is hoped that these two important groups will explore ways of collaborating in on-going or future research programs of relevance to both laboratories.

Draft Agenda (May 1, 2009)
AOML/SEFSC Workshop
Monday, June 1, 2009, 9:00-4:30PM
NOAA/SESFC
Miami, Florida

Organizers: Gustavo Goni (NOAA/AOML), John Lamkin (NOAA/SEFSC)

9:00 Observations, data, and products from the Global Ocean Observing System (G. Goni).
9:30 SEFSC Priorities, research programs, and needs (J. Lamkin).
9:40 Current AOML/SEFSC collaboration (E. Johns).
9:50 Current AOML/SEFSC collaboration (J. Serafi / J. Browder).
10:00 Preliminary results of use of satellite data for stock assessment in the GOM (G. Diaz/C. Rivero, F. Bringas).
10:10 Monitoring ocean currents with surface drifters (R. Lumkin)
10:20-10:30 Break
10:20 Investigation of the link between Ocean dynamics, HABs and fisheries (M. Olascoaga, RSMAS)
10:30 Presentation by ROFFS (Mitch Roffer).
10:40 CoastWatch and ocean observations and products (J. Trinanes).
10:50 Using models to understand ocean current variability and fisheries links (V. Kourafalou)
11:00 - noon or 1:00PM Discussion: what ocean observations and products are needed by SEFSC that AOML could help provide?

2:00PM - 4:00PM. Continuation of discussion. Identification of one or two topics in which AOML can help SEFSC

AOML participants:
R. Atlas
G. Goni
L. Johns
R. Smith
N. Melo
R. Lumpkin
M. Baringer
J. Trinanes
R. Molinari
C. Meinen
C. Kelble
F. Bringas

SEFSC participants:
B. Ponwith
J. Lamkin
C. Rivero
B. Muhling
T. Gerard
S. Whitcraft
S. Epperly
J. Serafy
L. Garrison
J. Browder
M. Schirripa
J. Walter
T Gedam

Other participants:
G. Diaz
M. Roffer
M. Olascoaga (RSMAS)
V. Kourafalou (RSMAS