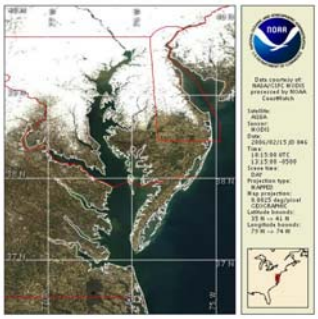


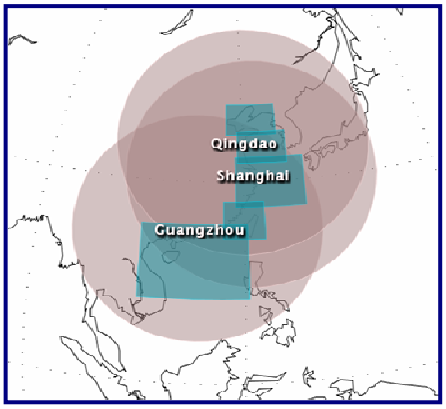
NOAA *Coast*Watch/*Ocean*Watch Quarterly Newsletter

Issue 2 **January/February/March 2005**

The *Coast*Watch quarterly newsletters are to share the exciting news and updates that are happening with the program, as well as showcase the hard work that has been accomplished. If you have any comments or suggestions, please email them to Shawna.Karlson@noaa.gov.

Central Operations

China *Coast*Watch: Status: 25% completed. Presently, 2 of the 3 stations have been established, Shanghai and Qingdao. Although data are being processed, currently there is not a means for distribution. A website will hopefully be available soon! Plans for the 3rd station in Guangzhou will be discussed at the 1st China CoastWatch meeting this winter 2006. In the meantime, a visit of the Official Delegation of Shanghai Fishery University will be in May for a NASA sponsored remote sensing and fisheries conference in Monterey, CA. They propose a joint center with NOAA to further develop the utilization of ocean remote sensing in marine fisheries.



Transition to Operations: Effective April 17, 2006, operations and maintenance of the Okeanos processing system of processors and FTP servers will transition from NESDIS/ORA to NESDIS/OSDPD personnel. The change should not cause any disruption in the product distribution nor in the user interface. Help desk inquiries related to Okeanos products will be fielded by OSDPD personnel. The point of contact will be Dr. Linda Stathoplos: Phone - (301) 763-8142 x137, Fax - (301) 899-9196, Email - Linda.Stathoplos@noaa.gov.

Node Updates

➢ Carribbean/Gulf of Mexico

All the files comprising oceanographic and meteorological data obtained by the "Explorer of the Seas" cruise ship during 2005 were processed. The cruise tracks were repeated on a bi-weekly basis alternating from an eastern track from Miami to St. Maarten and a western track between Miami and Mexico. All information was collocated with satellite data from multiple sources, thus a huge volume of Level-2 products from MODIS, AVHRR, TMI, AMSR-E, QuikSCAT, SeaWiFS, etc. was used for this purpose. This effort will allow expansion of multiyear series of sea-air carbon fluxes by obtaining empirical relationships between field and satellite-derived parameters. This task will be carried out during the next quarter.

NOAA – VOR agreement: This quarter Joaquin Trinanes saw the end of the first leg of the Volvo Ocean Race between Europe and South Africa. During these months, the 2nd (South Africa-Australia), 3rd (Australia-New Zealand), and 4th (New Zealand-Brazil) legs were completed. There were also two in-port races. For each leg, we created a web page to supply operational

meteorological and oceanographic data and graphics in multiple formats. We are also routinely pushing near-real-time data to the NOAA education website "Ocean Race Adventure".

With the objective of accessing MERIS operational color data for the Caribbean and Gulf of Mexico regions, Joaquin Trinanes submitted a proposal to the European Space Agency (ESA). This dataset will allow NOAA to compare current ocean color algorithms with MERIS products and to apply existing routines on MERIS radiances. The proposal has been officially approved by ESA and we are waiting for ESA to provide the account details.

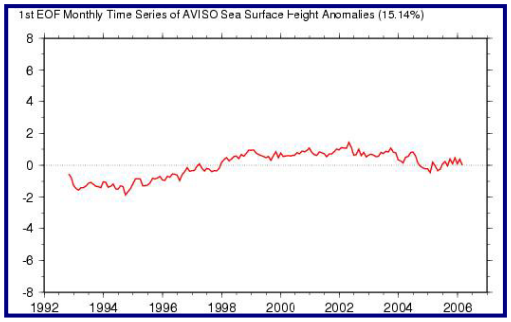
Exhaustive tests were performed on the HRPT satellite receiving system. The objective was to modify the configuration to make reception of the Chinese Feng Yun-1D satellite possible. This satellite data stream, named CHRPT, includes visible channels which can be used to estimate ocean color parameters. All this work was done in collaboration with Seaspace, the HRPT receiver's manufacturer. Final results showed a receiver upgrade was needed in order to allow CHRPT receiving capabilities.

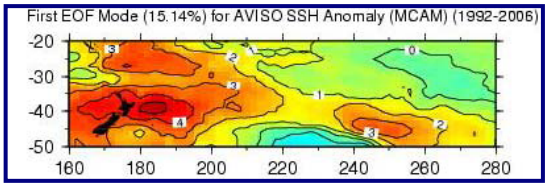
During this quarter, the operational drifter database has been fully redesigned and new QC procedures have been implemented to the input data stream. These data are available from the CW/GoM homepage as part of the GTS dataset or as a complement to the altimeter interface.

A research proposal prepared by Driggers, May, Felts, and Hughes for the new Northern Gulf of Mexico Cooperative Institute will study the recruitment of juvenile red snapper on artificial reef complexes in relation to environmental conditions on the Alabama Continental Shelf. CoastWatch satellite imagery will be used as collateral data in the analysis of the red snapper and *in situ* environmental data acquired during the three year study.

➢ Central Pacific

New SOPAC Empirical Orthogonal Function (EOF) Analysis: OceanWatch – Central Pacific (OWCP) completed the R&D phase of a new empirical orthogonal function analysis for the South Pacific Ocean (SOPAC). At present, the SOPAC EOF is now operational, and accessible via an updated EOF web page. This tool, along with the other EOFs available at OWCP for the Alaska, California, North Pacific and Equatorial regions, will provide forecasters, managers and researchers with timely information regarding environmental and climate variability.





OWCP continues to support ongoing projects and investigations by providing customized satellite remote sensing imagery when needed:

- Researchers at the World Wildlife Fund, in continuation of the previous work done by the National Park Service. The areas of interest included the Island of Hawaii. The datasets included AVISO sea-surface height (SSH), Aqua MODIS chlorophyll-a, as well as GOES SST and Pathfinder sea surface temperature.
- Researchers in Indonesia, members of the Asia-Pacific Oceanic Cetacean Program are working with the country's Ministry of Fisheries for establishing a Marine Protected Area of approximately 10.000.000 ha. The datasets included AVHRR SST and MODIS Ocean Color data for the region.

- Tuna recruiting grounds study throughout the Pacific involving AHVRR-GAC sea-surface temperature time-series data and comparisons of temperature distributions.
- NOAA oceanographic research cruise, American Samoa region. Maintained automatic data processing and distribution routines of AVHRR-GAC SST and AVISO SSH imagery.

➢ East Coast

The East Coast Node establishment is about 40% completed. The Node Manager is on staff, and efforts are being made to hire an Operations Manager. All of the equipment has been set up with the operating software installed, as well as an AVHRR web component as an initial demonstration. OPeNDAP has been installed for testing and the website is now under construction. A demo has been scheduled to show progress to Kent Hughes and other NCBO staff on April 13, 2006.

➢ Great Lakes

Starting Feb. 27, MODIS True Color Great Lakes synoptic images (6059x4052) have been downloaded from SSEC at University of Wisconsin-Madison. The operational program has been modified to process the images and provide the images on line in both geotiff and jpg formats.

Great Lakes Node will host a summer student from University of Munich in Germany, who will continue working on upwelling analysis in the Great Lakes using the AVHRR/SST product at GLERL this summer.

➢ West Coast

Bob Simons has developed a metadata standard for netCDF which combines in an unambiguous manner, many of the different conventions currently in use. For instance, files in this new format can be seamlessly interpreted by a number of desirable software packages including the IOOS DMAC-recommended Live Access Server and OPeNDAP server, as well as the CDAT program in the CoastWatch utilities. One very positive ramification of this work is our ability to serve large satellite datasets using the THREDDS server. THREDDS provides a mechanism by which large series of data files (such as a string of CoastWatch HDF files sitting on a web server) can be accessed as if they were all one file. This adds tremendous power for subsetting and "swimming through" data sets that are intended to accurately represent the ever changing condition of the oceans.

Having made major inroads in developing the infrastructure required to meet IOOS DMAC recommendations, the WCRN is now enhancing its product suite to meet demands of data users. We have added three new experimental products to our near real time data stream.

- Photosynthetic available radiation (PAR) derived from AVHRR Shortwave absorbed radiation data (SWAR). Kudos to John Sapper for hooking up the data fix to SWAR.
- Near real time primary productivity product derived from MODIS Aqua. This provides estimates of primary productivity rates for the Pacific Basin using the Vertically Integrated model of Behrenfield and Falkowski (1997). The product uses sea surface temperature from the MODIS Aqua spacecraft and locally derived PAR.

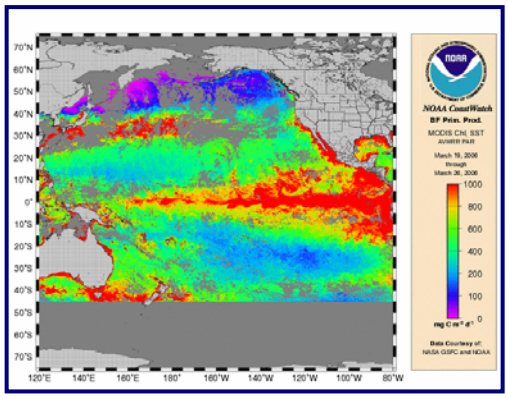


Figure 1: Sample NRT primary productivity product for 3/26/06, based on an 8-day average of 2.5km MODIS chl and SST data.

- DELI: Debris Estimated Likelihood Index. This product is a culmination of 7 years work on the marine debris transport. The product uses near real time satellite measurements of chlorophyll and sea surface temperature as well as concurrent observation from a NOAA P-3 aircraft. The result is a simple index to optimize the allocation of resources in future efforts to locate this debris while at sea. The principal user for this product is the Ghostnet project, a consortium of Scientists and engineers led by Tim Veenstra of Airborne Technologies Inc. in Wasilla, AK, Jim Churnsides of NOAA ETL and Bill Pichel of NOAA STAR/SOCD. Bill Pichel will be taking the lead at writing up this work for submission to a peer-reviewed journal. These results will also have roles in a number of projects presently pending funding.

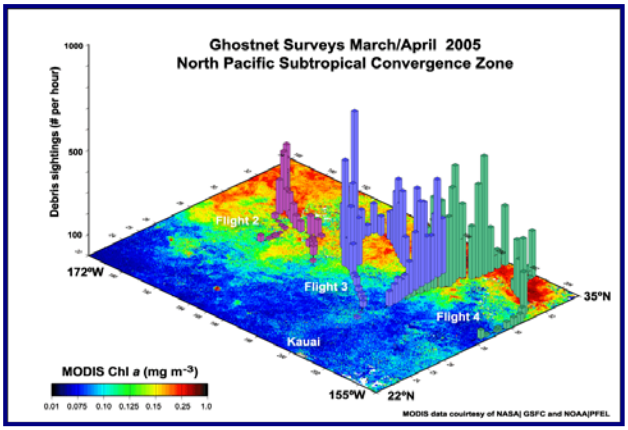


Figure 2: Sightings of marine debris from a NOAA P-3 aircraft, overlaid on a 14-day composite image of MODIS (Aqua) Chlorophyll *a* concentration during late March, 2005.

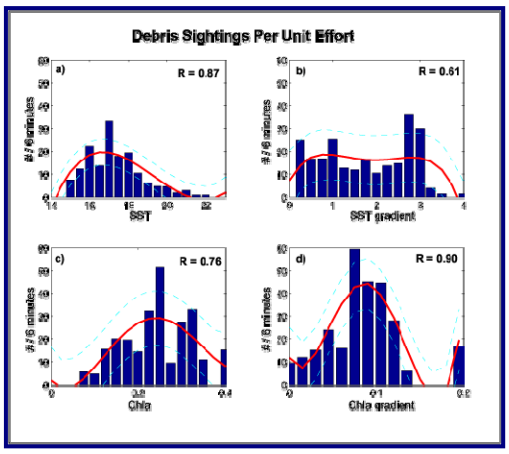


Figure 3: Effort-corrected probability distribution functions showing debris sightings per 6-minute observing segment for a variety of satellite-derived environmental variables.

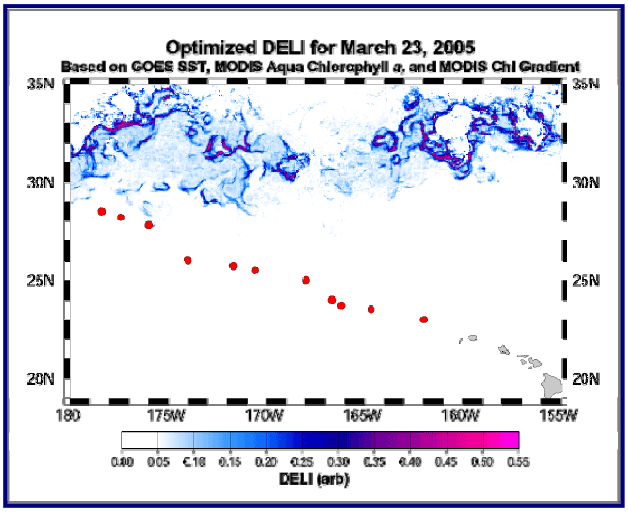


Figure 4: Synthesis of all data. This image applies the PDFs from Figure 3, to the satellite based fields for SST, Chlorophyll a, and Chlorophyll a gradient, to deliver a simple index for field people involved in interdiction.

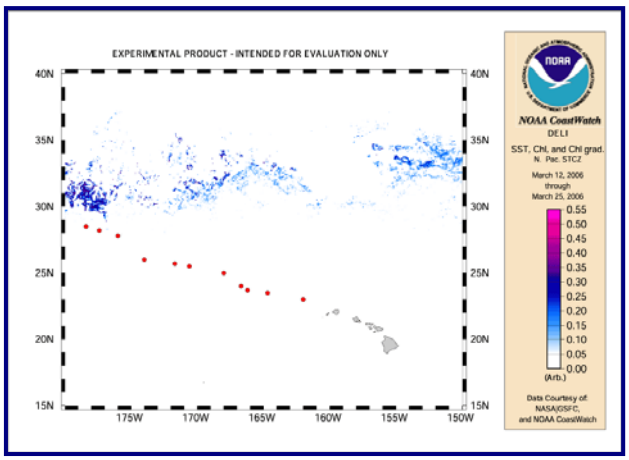


Figure 5: Sample near real time product from 3/25/06. Product uses GOES SST data from NOAA|NESDIS and MODIS Chlorophyll a data from NASA|GSFC. Data is also available in an ArcGIS ascii format as well as Matlab.

Education and Outreach

CoastWatch Central set up an exhibit at the 2006 Ocean Sciences Meeting, hosted by ASLO/TOS/AGU from February 20 – 26, 2006 in Honolulu, HI. Other NOAA offices in attendance were NESDIS/NODC and NOS/NCCOS. CoastWatch used this opportunity to introduce OceanWatch with the ocean community by displaying the new bannerstand. The next conference will be in Boston, MA, in September.

Nelson May of the CB/GoM Node will showcase all products available on April 21st at the 40th anniversary celebration of the opening of the John C. Stennis Space Center in Mississippi. The ceremony will be open to the public and includes a static test firing of the Space Shuttle engines.

Cara Wilson of the WCRN has completed a tour of all NOAA fisheries science centers to raise awareness of the many applications for satellite remote sensing to the research and management of living marine resources. In the course of this touring, Cara conducted an informal census of the uses of satellite data amongst the various fisheries agencies. This information will help us perform a gap analysis, leading to more effective targeting of collaborative products with this group of data users.

Dave Foley of the WCRN has been invited to participate in the Science and Math Investigative Learning Experience (SMILE) Challenge at Oregon State University April 20-21, 2006. Foley, along with NOAA Corps LT(jg) Luke Spence, will devise and lead a learning module on applying remotely-sensed oceanographic data as one of the tools students will use in a resource-management scenario. Dave Foley also served as a moderator at the “Otter Bowl”, the Regional Competition for the National Ocean Sciences Bowl. Foley will again serve as either a moderator or science judge during the National Competition to be held in Pacific Grove in May. Thanks to the timely support from the central office, we were able to provide each of the competitors with CoastWatch knick-knacks: CoastWatch is now regarded as a “sponsor” of the event.

During January 2005, Lucas Moxey of OWCP commenced work with a middle school in Oahu regarding the utilization and application of satellite remote sensing tools in everyday uses. During Q2, OWCP also began working with schools from the Island of Hawaii in an effort to encourage the exploration of remote sensing and its applications in the sciences.

GLERL/CoastWatch will display at the RDX06 Remote Sensing Across the Great Lakes Conference in Rochester, NY, April 4-6, 2006, as well as chair a session and give a CoastWatch presentation. Other presentations by Great Lakes include “A New MODIS Algorithm for Retrieval of Chlorophyll, Dissolved Organic Carbon, and Suspended Minerals for the Great Lakes” and “Development of a MODIS Image Product for Mapping Phycocyanin Pigment in Blue-Green Algal Blooms (Toxic Algae)” at the Lake Erie Milleunium Network/IFYLE Conference, The University of Windsor, Windsor, Ontario, Canada, Feb. 27 – Mar 2, 2006.

Publications

Stefan Plattner, Doran M. Mason, George A. Leshkevich, David J. Schwab, and Edward S. Rutherford. Classifying and Forecasting Coastal Upwellings in Lake Michingon Using Satellite Derived Temperature Image and Buoy Data, *Journal of Great Lakes Research 32:63-73, 2006*.

Contact

For more information on *C*oast*W*atch, please visit the Central Operations website: http://coastwatch.noaa.gov

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