# NOAA *CoastWatch/OceanWatch* Quarterly Newsletter

Issue 4                              July/August/September 2006



**The *CoastWatch* 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

With guidance from Eileen Maturi, Bayesian GOES products are now available. A new cloud masking methodology based on a probabilistic (Bayesian) approach has been implemented for improved retrieval accuracy. This new GOES SST Bayesian algorithm provides SST retrievals with an estimate of the probability of cloud contamination. This indicates the confidence level of the cloud detection for the retrieval, which can be related to retrieval accuracy.



## Node Updates

➤ **Carribbean/Gulf of Mexico**

A proposal was funded for three years through the Gulf of Mexico Cooperative Institute Ocean and Atmospheric Research to develop a forecasting technique to predict ecosystem response to hurricanes during the last 10 years. This will be accomplished using *CoastWatch* SST imagery with other NOAA environmental data and fisheries-dependent and independent data acquired in the Northern Gulf of Mexico. The principal investigator is Mr. Erik Davenport of the National Ocean Service, Beaufort, N.C.

A new program was developed and implemented to automatically detect and retrieve new MER_RR__1 and MER_RR__2 MERIS files from ESA. This program permits selecting scenes by region and/or time frame, largely enhancing the retrieval and archiving procedures. This will contribute greatly since the extension request has been approved by ESA. Through this extension, the Node will aspire to have near-real-time access to MERIS imagery for the whole CONUS region, as well as Alaska and Hawaii.

The NOAA - VOR agreement continued in this quarter, whereas operational meteorological and oceanographic information was provided to the fleet participating in the Volvo Ocean Race 2005-2006. Customized web pages were continuously updated to display and distribute a comprehensive range of products for Leg#8 (Portsmouth- Rotterdam) and Leg#9 (Rotterdam-Gothenburg). Procedures have been implemented to get access to the full set of observed data collected from each vessel that participated in the race.

In collaboration with Dr. Rik Wanninkhof of NOAA/AOML, estimated monthly global sea-air $CO_2$ flux and flux anomaly fields from 1995 through 2005 were completed. The team used, as references, the monthly $pCO_2$ climatology of Takahashi with daily ocean surface winds and sea surface anomalies from NCEP. It was also necessary to implement a state-of-the-art algorithm modified for the ENSO
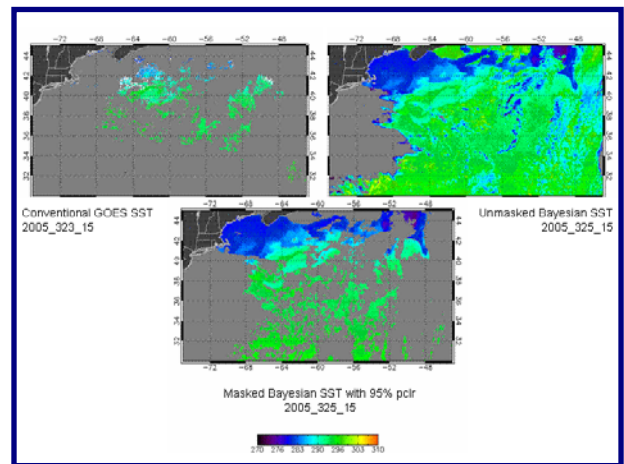
cycle in the Equatorial Pacific, which is a starting point to obtain global CO2 and pCO2 fields from remote sensing data. The intention is to expand this product by using operational remote sensing data. Related to this project, a 10-year series of annual net global sea-air CO2 fluxes was computed.  The annual mean, 2nd and 3rd moments (about the origin and about the mean) for each cell of the Takahashi grid using 10-m wind retrievals from the SSM/I and QuikSCAT sensors were obtained.

During this quarter, the Node experienced a major hardware failure that affected the website and data access capabilities.  New hardware, OS and all the applications and packages had to be installed. The node was approximately offline for 24 hours.  Also this quarter, a new multiprocessor computer was set up.  Non-routine maintenance on the satellite receiving system and the web server were also performed.

A new set of hurricane drifters were added into the IDS database. Through the web site, data from these platforms are rapidly available for operational applications, as comparing drifter velocities with altimeter-derived currents provided by the Node.

Agreements with the IOOS/ Caribbean Regional Association (CaRA) were established to collaborate and provide operational products developed for this region.

## ➢ **Central Pacific**

*OceanW*atch Central Pacific (OWCP) created various scripting routines that routinely check the inventory and status of the entire OWCP satellite remote sensing datasets.  In view of the large data holdings housed by OWCP, these tools will help expedite the analysis and maintenance of the RS datasets.

In conjunction with other research divisions of the Pacific Islands Fisheries Science Center (PIFSC), OWCP has worked to identify suitable metadata infrastructure standards for applying to the Center's data resources.  Included are those remote sensing datasets available from OWCP.

Multiple data requests were received this quarter from a variety of users:
- The World Wildlife Fund – Indonesia asked for data to support their ongoing sea turtle migration and behavioral studies.  For this, various datasets were provided that included GOES SST, Jason-1 SSH, and Aqua/MODIS ocean color.
- IUCN Species Survival Commission requested customized monthly oceanographic satellite data to support their cetacean movement investigations within the Indonesia region.  Datasets included monthly AVHRR-GAC SST, Jason-1 SSH, and Aqua/MODIS ocean color.
- Collaboration efforts with Hawaii Pacific University continued with customized monthly QuikSCAT wind stress and wind stress curl data for the HOT oceanographic station located north of Hawaii.  Data provided will aid in the understanding of the ocean-atmosphere interactions that resulted in the observed carbon dioxide flux variations.
- John Wiley and Son, Ltd (Australia) requested a high-resolution AVHRR-SST image for use in a new oceanography publication. The AVHRR image consisted of 3-day sea-surface temperature conditions for the Australian region.
- BAE Industries requested specific GOES SST imagery for the main Hawaiian Islands region for use in a research manuscript submitted for publication. The GOES SST images depict the formation of meso-scale eddies in Hawaii.
- In support of the ongoing tuna movement investigations throughout the Pacific Ocean, AVHRR-GAC 3-day data was provided to researchers at the NOAA PIFSC – Fishery Biology and Stock Assessment Division.  The satellite data will be utilized in conjunction with physical-oceanographic models for better constraining the Pacific migration routes of tagged tunas. Other datasets were provided to support PIFSC oceanographic cruise, such as monthly time-series of satellite-based oceanographic data for the Northwestern Hawaiian Islands including Jason-1 SSH, AVHRR-GAC SST, QuikSCAT wind stress, QuikSCAT wind stress curl, and Aqua/MODIS ocean color.  In addition, high-resolution ASTER true color imagery was

processed and provided to support their regional operations, whereas daily satellite imagery during the larval billfish research cruise conducted off the Island of Hawaii required customized regional GOES SST and SSH charts.

## ➢ East Coast

This last quarter of FY06, was the first quarter of operations for the East Coast Node.  All of the standard *CoastW*atch products are currently available online, including AVHRR and GOES SST, MODIS Chl-a, and both QuikSCAT and SSMI winds.  MODIS K490 and Rrs667 data products are also available through the *CoastW*atch Earth Data Access Client (EDAC) in near real-time as planned.

A new product is currently being developed, as a follow up to the Remote Sensing Symposium held at the end of January, earlier this year.  A SeaWiFS Chl-a product will be available using new ocean color algorithms for the Chesapeake Bay.  Images will be available online in the CWHDF format soon.

Webalizer has been installed to analyze the web access log of the ECN web service. Monthly reports are generated by Webalizer to include monthly, daily and hourly statistics of the ECN web usage and information such as total hits, total visits, total files, and total Kbytes downloaded, etc.  The top 30 user sites by number of hits and top 10 user sites by number of Kbytes downloaded are also listed in the report.
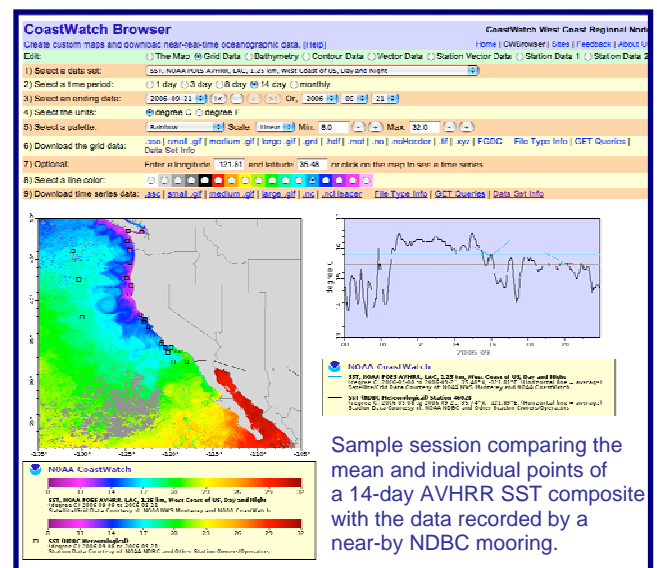
## ➢ Great Lakes

Stephanie Wegscheider, a summer intern student from Germany worked on an upwelling classification and forecasting project for the Great Lakes using AVHRR SST imagery. This project continues the work that Stephen Plattner (a previous summer intern student) started on Lake Michigan (publication now in print). She will continue this work as a school project back in Germany.

Continue to convert the GLSEA composite chart to 1024x1024 format to include a new compositing algorithm.  This involves reformatting the winter ice cover produced by the National Ice Center to the new format. The SST imagery for 2003 - 2006 has been extracted to create retrospective GLSEA composite charts.  The Great Lakes shore line file, in text format, has been made and sent to NIC.  The Node is waiting for the NIC to produce a more accurate ice overlay.

## ➢ West Coast

This quarters milestone was to develop a system to extract, display, and disseminate comparisons between *in-situ* and satellite measurements for all data sets on the browser.  The initial system that provides local validation of satellite data sets has been developed and deployed on the *CoastW*atch Web browser.  At present, the capability is limited to those variables readily available from the NOAA National Data Buoy Center (e.g., wind vectors and sea surface temperature).  Since many users are suspicious of satellite-derived oceanographic data, the system allows the user to test the satellite data at a location with trusted *in-situ* measurements.  The comparison will show not only the mean values but also the individual measurements used to calculate that mean. If the values found are within the expected parameters (as above), then the user can go on to apply the satellite data elsewhere with greater confidence.  This



Sample session comparing the mean and individual points of a 14-day AVHRR SST composite with the data recorded by a near-by NDBC mooring.

may also lead to the development of regional algorithms, which could greatly enhance the local

applicability of the AVHRR data, especially in the near-shore regime.  The most difficult problem is the lack of readily available data for ocean color and altimetry products.  It is reasonable to assume that these will become more available as the emerging Regional Associations of the Integrated Ocean Observing System comes on-line.  The CoastWatch Browser may be viewed at http://coastwatch.pfel.noaa.gov/coastwatch/CWBrowser.jsp

At the request of the Alaskan Fisheries Science Center, and using funding obtained under the NESDIS R&O program, the Node has developed a specific CoastWatch browser for the Alaska region. Completion is planned for December 31, 2006.
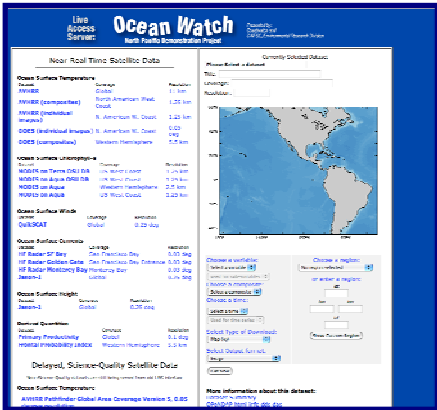


The *OceanWatch* demonstration project has a new look and feel thanks to the development of a java-based interface to replace the Live Access Server default.  This interface allows for one-click changes of data type or composite duration, while also maintaining the full power of the Live Access Server to extract data along any of four dimensions (well, three for satellites).  The LAS also now get data directly from the *OceanWatch* THREDDS server, so it can access long time series, which help place current events within the context of regional ocean dynamics.

## **Education and Outreach**

The annual MTS/IEEE Oceans conference was held in Boston, MA from September 18-21, 2006.  *CoastWatch* exhibited with other NOAA offices to promote NOAA's products and services.  Many attendees stopped to hear about all the oceanographic satellite datasets available….and to get their *CoastWatch* goodies too!



Cara Wilson, Dave Foley, and Luke Spence of the West Coast Node, with Carlos Rivero (NMFS/SEFSC) taught the first NOAA Fisheries Ocean Satellite Data Course at Oregon State University in Corvallis, August 22-24.  The course focused on methods of accessing and utilizing the suite of available environmental satellite datasets, and was attended by 30 participants from every Fishery science center and NOS.  During the course, participants worked on individual projects, all aimed at utilizing satellite data to better characterize the ecosystems of living marine resources and marine sanctuaries.  The course was extremely successful, and the instructors received strong encouragement from all participants to hold similar courses in the future.  The class was made possible by funding from NOAA's Research and Operations (R&O) project in NESDIS.

Dave Foley was part of a multi-national team of instructors to provide training in the application of oceanographic data for fisheries management in Indonesia.  The course, part of NOAA's PANGEA program, was held at the Institute of Technology of Bandung, in Bandung, Indonesia. It was designed to train Indonesian fishery scientists, in return for Indonesian ship time to assist NOAA in deploying ocean observing assets in the Indian Ocean.  In addition to the satellite applications class taught by Foley, there were classes on *in-situ* data analysis, regional ocean modeling, and a joint class on ocean observing system design.  This work is likely to continue next June at the newly established SEACORM center in Bali. This workshop is a great "One NOAA" example of international cooperation to train foreign scientists and expand the global ocean observing network.

Central Pacific conducted various outreach efforts during the 2006 Hawaiian International Billfish Tournament (HIBT).  During this event, OWCP distributed daily near real-time satellite imagery to a

total of 30 participating teams and general public. In addition, during the HIBT Science Night event, OWCP showcased the latest satellite imagery available via its web site, in addition to distributing various printed outreach materials and paraphernalia.

## **Presentations/Publications**

G.A. Leshkevich Satellite SAR Remote Sensing of Great Lakes Ice Cover Ice Classification and Mapping Using ERS-2 and RADARSAT Data, GLERL, September 21.

## **Contact**

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