The Yellow Pages Directory of Ocean Altimetry Applications

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A directory of ocean altimetry data applications, the Satellite Altimetry Yellow Pages, has been developed as an index to applications and data users. The Yellow Pages directory is designed to serve as a tool to identify both operational and research applications of these highly effective ocean-observing systems, and to identify the individual users. The directory serves as a professional guide for satellite altimetry users, both experienced and new.

This ready reference of practical and research uses of ocean altimetry systems is meant to be a tool for acquainting existing and potential users of the many opportunities to enhance research and operational activities with ocean surface topography data. Each entry includes a summary of the application, how the data are being used, and contact information on the specific user. This database of altimetry applications will be the reference standard for the international satellite ocean altimetry community.

The Yellow Pages is also intended to serve as a working guide to define and track altimetry applications, and to facilitate communication between current and potential data users. It is also designed to serve as a model working method for close collaboration between scientists and commercial users to clarify distinct uses and to accurately describe and present the practical applications and societal benefits of altimetry data.

The Yellow Pages directory "lives" on the AVISO website, with a link from the NASA/JPL Ocean Surface Topography website. A standardized format has been developed that provides a consistent layout for entries, and to aid information and content searches. A searchable database is planned for this project that will further enhance its utility to users.

Example applications presented here include near real-time monitoring of global lakes and reservoirs, Ssalto/Duacs NRT multimission altimeter products for operational oceanography, and a real-time ocean surface current analysis project (OSCAR).

For more information

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The Yellow Pages website

http://www.aviso.oceanobs.com/html/swt/yp/

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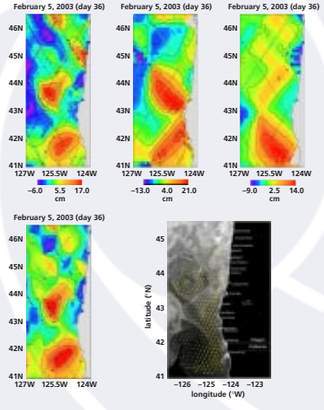
Yellow Page Examples

Tandem Mission Applications; Mesoscale Circulation in the California Current

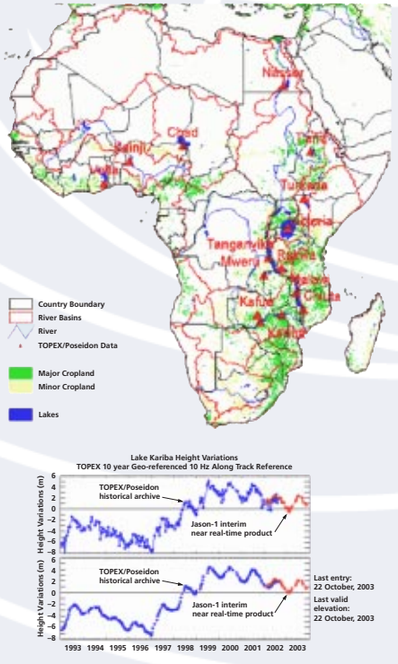
Methods to combine the altimeter SSH and CODAR surface velocities to better define the coastal circulation are being developed by research scientists within the Cooperative Institute for Oceanographic Satellite Studies (CIOSS), a new partnership between COAS/OSU and the NOAA/NESDIS Office of Research and Applications. Such fields have many applications, including search and rescue, tracking of harmful algal blooms, fisheries research, etc. These efforts will help prepare for the higher resolution altimeter SSH fields anticipated in the future, from sensors such as the Wide Swath Ocean Altimeter, planned for launch on the joint NASA/NOAA/CNES Ocean Surface Topography Mission (OSTM).



Top — Left: Surface height field formed from three satellite altimeters (Jason-1, Topex/Poseidon, and GFO), using 17 days of data centered on February 5, 2003. Middle: Surface height field formed from only the Jason altimeter, using 10 days of data centered on February 5, 2003. Right: Surface height field formed from only the Topex/Poseidon altimeter, using 10 days of data centered on February 5, 2003. Bottom — Left: Surface height field formed from the Jason-1 and Topex/Poseidon altimeters, using 10 days of data centered on February 5, 2003. Right: Surface velocity data on February 5, 2003, from three coastal radar sites located at Crescent City, Cape Blanco, and near the Umpqua River.

Near-Real-Time Monitoring of Global Lakes and Reservoirs

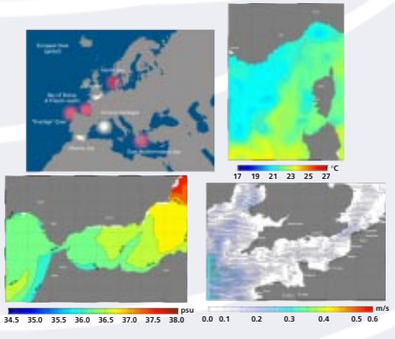
Satellite radar altimeters allow scientists to monitor the variation of surface water height of large inland water bodies, such as these large lakes in Africa. Near-real-time altimetry data from the Jason satellite is used to construct time series of surface water height variations. A semi-automated data management system delivers time series water level products to a website for public access and to serve the USDA/FAS for its flood/drought investigations. This project is unique, being the first of its kind to utilize near-real-time altimeter data over inland water in such an operational manner.



Above: Near-real-time ocean altimetry data provides long term monitoring capabilities of lake levels on the African continent.

ROSES: Real-time Ocean Services for Environment and Security Tracks Oil Pollution and Toxic Algae Blooms

ROSES is a real-time, multi-application service focusing on the marine environment and coordinating all the major European players in the operational oceanography arena. ROSES collects data from various sources — satellites, in situ observations, ocean models — then disseminates them to the organizations responsible for making pollution-related decisions. Altimetry, among others, is needed for assimilation into ocean models. The information is provided either as homogeneous data or, after tailored processing and assimilation, in models designed to monitor each type of pollution or environmental factor. In the initial phase, ROSES is focusing on two environmental protection applications of a particularly sensitive nature: detecting and tracking oil slicks (including those caused by illegal dumping at sea), and predicting the proliferation of toxic algae that could be dangerous to aquaculture. Both applications are based on current models and offer a service that will expand as dissemination becomes more widespread.

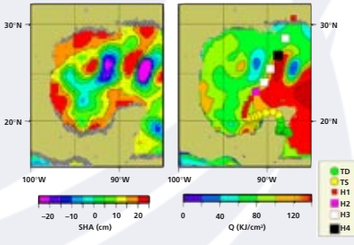


Above: ROSES test areas, and some examples of Mercator maps made for this project (salinity in the Alboran Sea, current velocities in the English Channel, sea-surface temperature near Corsica). Those areas were chosen since they are fragile, especially with respect to an important maritime traffic.

Yellow Pages Coming Soon!

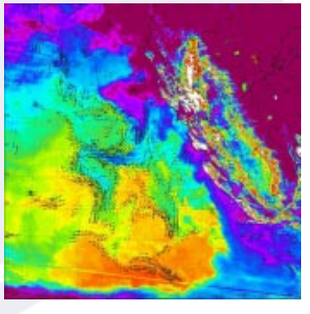
Hurricane Tracking

Altimeter data are being used to study the relationship between hurricane intensification and upper ocean thermal structure underneath the storm track. Preliminary results show that the intensification of most hurricanes in the tropical Atlantic and Gulf of Mexico during the period 1993–2000 were linked to the variability of the integrated vertical temperature under the storm track. Jason data are also being routinely used by the U.S. National Hurricane Prediction Center as input to models used in tracking and monitoring hurricanes.



Above: Altimeter-derived sea height anomaly (a) and hurricane heat potential (Q) during October 1995 (b). The track of hurricane Opal is superimposed, indicating its evolving intensity from tropical depression (TD) to tropical storm (TS) and hurricane 1 through 4 (H1-H4).
http://www.aoml.noaa.gov/phod/cyclone/data

Surface Current Mapping Off California



Above: Ten-day composite of California surface currents for September 20 – September 30, 1999.
http://ccar.colorado.edu/research/cali