



PROMOTING OSTST SCIENCE, RESEARCH, AND SOCIETAL BENEFITS

*Margaret Srinivasan
Altimeter Applications Lead
Jet Propulsion Laboratory
California Institute of Technology*

*Ocean Surface Topography Science Team Meeting
18-20 October 2010
Lisbon, Portugal*



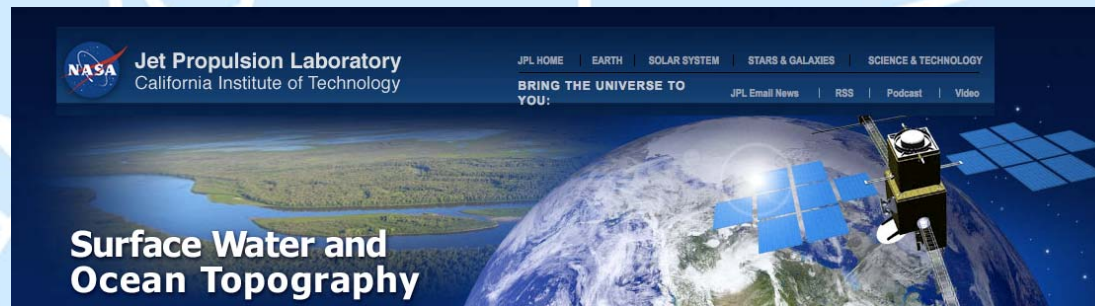
Web Resources



NASA/JPL OST “Sealevel” <http://sealevel.jpl.nasa.gov>



NASA/JPL SWOT <http://swot.jpl.nasa.gov>



NASA Climate Change <http://climate.nasa.gov/>





Promoting the OSTST



WEB

- Feature stories
- Literature database
- Science Team pages
- Newsroom Press Releases
- Sea Level

Site Highlights

Societal Benefits
Data and images from TOPEX/Poseidon and Jason altimeters are being used for practical applications. Look through the slides to discover more about some of these important practical uses of ocean altimetry data.

Sea Level Viewer
Check out the Sea Level Viewer on the Climate web site.

Literature Database
A searchable database of ocean surface topography related published works.

El Niño/La Niña Watch
The data from the TOPEX/Poseidon and Jason missions helps us study and understand the complex interactions between the oceans and the atmosphere that affect global weather and climate events. El Niño is one well-known example of this interaction.

OST Science Team
The Ocean Surface Topography Science Team is composed of a group of international and interdisciplinary scientists dedicated to the study of Earth's oceans, utilizing ocean altimeter data from space. You will find updates on the latest research being completed by the team.

Ocean Surface Topography From Space

Search

SCIENCE

OST Science Team

The Ocean Surface Topography Science Team is composed of a group of international and interdisciplinary scientists dedicated to the study of Earth's oceans, utilizing ocean altimeter data from space. You will find updates on the latest research being completed by the team, links to scientific publications, information on some of the science team members, and OSTST meetings below.

Science Team News
News items on altimetry-related science research and science team members.

Recent Publications
A list of recent publications, by month, from OST science team members.

Literature Database
A searchable database of ocean surface topography related published works

Scientist Links
Links to web sites of some OSTST members and affiliates.

Science Team Meetings
Upcoming and past OSTST meeting links and information.

Ocean Surface Topography From Space

Search

SCIENCE

Scientist Links

This page contains information about OST/Jason-2 scientists, a summary of their scientific investigations, and links to research web sites (where available).

You can also view past Scientific Investigations.

ANDERSEN, Ole B.
Danish National Space Center (DNSC)
Satellite Altimetry for coastal and inland water

ARNALD, Sabine - LOCEAN/IRD

ARNAUS (Altitude sur un Rail Atlantique et Mesures In Situ) : a Tropical Atlantic Dynamics Investigation

BECKER, Matthias - TECHNISCHE UNIVERSITÄT DARMSTADT
Spatial and Temporal Resolution Limits for Regional Mass Transport and Mass Distribution (STREMP-OST)

BENJAMIN, Juan José - Technical University of Catalonia
Implementation of Iboza and l'Estartit Cal/Vai Spanish Sites for Jason-2/OSTM and Jason-1.

BERTIGER, William - California Institute of Technology - JPL

Technology
Precision Orbit Determination To Support Altimetry

Missions
BINGHAM, Rory - Proudman Oceanography Laboratory
Using altimetry to understand the ocean's response to a changing climate

Newsroom
BIRKETT, Charon - University of Maryland, College Park (website)

Education
The Application of Multiple Satellite Radar Altimetry Data Sets to Inland Surface Water Projects

Gallery
BIROLI, Florence - LEGOS
Regional CALVAL and altimetry activities at the Centre de Topographie des Océans et de l'Hydrosphère (CTO)

BLANC, Frédérique - CNRS
Altimetry data serving and interoperability: requirements, implementation, control, education, use

BONNEFOND, Pascal - OCA/GeoAzur

FOAM: From Ocean to inland waters Altimetry Monitoring

BOSCH, Wolfgang - Deutsches Geodätisches Forschungsinstitut (DGF)
Global Multi-Mission Calibration of Contemporaneous Altimeter Systems (MUMCCAM)

BROWN, Shannon - California Institute of Technology - JPL
Error Characterization and Interpolation of the Wet Path Delay Measurements from the TOPEX/Poseidon.



Scientist Links



- Missing → many CNES science plans
- Science Investigations
- Science Team News
- Latest Citations

Advanced Altimeter Data Assimilation for Physical Ocean Prediction and Ecosystem Monitoring

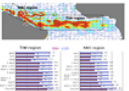
Authors:

Jacques Verron (LEGI/CNRS)

Co-Investigator(s):
 Joaquin Ballabrera (CSIC)
 Eric Blayo, Laurent Debreu, Maelle Nodet, Arthur Vidard (LIK)
 Laurent Bertino, Geir Evensen (NERSC)
 Jean Michel Brankart, Pierre Brasseur, Emmanuel Cosme, Achim Wirth, Bernard Barnier, Thierry Penduff (LEGI)

Lionel Gourdeau (IRD)
 Jens Schröter (AWI)
 Peter-Jan van den IJssel (UJ)

Abstract:
 The general objectives of this project are to improve data assimilation methods for ocean and ecosystem monitoring in the prospect of programmes such as GMES and the related ocean climate (CLIVAR, IMBER) and the related ocean data assimilation methodological approaches will be statistical optimal estimation and optimal control.



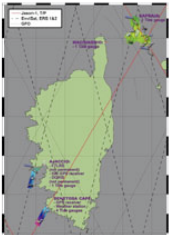
Larger image

FOAM: From Ocean to inland waters Altimetry Monitoring

Authors:

Pascal Bonnefond (OCA/GeoAzur)

Co-Investigator(s):
 P. Exertier, O. Laura (OCA/GeoAzur)
 Y. Ménard (CNES)
 F. Lyard, S. Calmant (LEGOS)
 G. Jan (NOVELTIS)
 V. Ballu (IPGP)



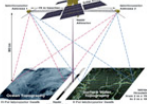
Larger image and caption

Abstract:
 In collaboration with the CNES and NASA oceanographic program, the OCA developed a verification site in Corsica since 1996. CALibration/VAlidation embraces a wide variety of activities: interpretation of information from internal-calibration modes of the fully corrected sea-level estimates using in situ data. Harvest platform (NASA side), an operating calibration sites continuous monitoring with a high level of accuracy: a point instantaneous bias estimates with a 10-day repeatability of a deviation) and mean errors of 3-4 mm (standard error).

Wide swath altimetry for high resolution oceanographic hydrology: the SWOT mission

Authors:
 Nelly Mognard (LEGOS)

Co-Investigator(s):
 Paul Bates (University of Bristol)
 Lee-Lueng Fu (California Institute of Technology)
 Douglas Alsdorf (OSU)
 Ernesto Rodriguez (California Institute of Technology)



Larger image

Abstract:
 A critical drawback of profiling altimeters for the ocean is the 200 km between orbital tracks that prevents sampling of two-dimensional mesoscale processes that contain 90% of the kinetic energy. In contrast, observations, surface fresh water measurements are limited mostly of gauges that record water surface elevations at fixed points along SWOT (Surface Water Ocean Topography) mission will provide a global improved resolution that will revolutionize the ocean and hydrology.

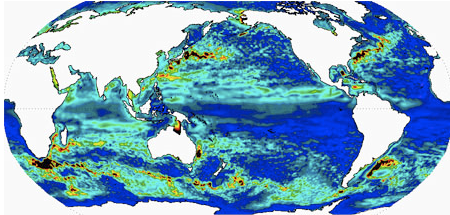
The SWOT mission ocean science questions are:

1. What is the small-scale (1-100 km) variability of ocean surface topography that determines the velocity of ocean currents? How are fronts and eddies formed and evolving? How is oceanic kinetic energy dissipated?
2. What is the synoptic variability of coastal currents? How do the coastal currents interact with the open ocean variability? What are the effects of coastal currents?

MERCATOR, Global Operational Ocean Monitoring and Forecasting

Authors:
 Eric Dombrowsky (MERCATOR OCEAN)

Co-Investigator(s):
 Pierre Bahurel
 Dominique Obaton
 Yann Drillet (MERCATOR Océan)
 Marie Drevillon (CERFACS)
 Mounir Benkiran (CLS)
 Didier Jourdan (SHOM)



Larger image with caption



Promoting the OSTST



Jet Propulsion Laboratory
California Institute of Technology

JPL HOME | EARTH | SOLAR SYSTEM | STARS & GALAXIES | SCIENCE & TECHNOLOGY

BRING THE UNIVERSE TO YOU: JPL Email News | RSS | Podcast | Video

Ocean Surface Topography From Space

<http://sealevel.jpl.nasa.gov>

Search Go

- Home
- Overview
- Science
- Technology
- Missions
- Newsroom
- Education
- Gallery

Patzert Gets Athelstan Spilhaus Award
Our own Dr. Bill Patzert is honored by the AGU

Features [Feature Archive >](#)

- NASA Demonstrates Tsunami Prediction System**
JPL scientist Tony Song's team verifies findings with Jason data.
- Tracking the Loop Current**
This Gulf of Mexico feature has implications for the transport of leaked oil.
- Alex, the first 2010 Atlantic hurricane**
Altimeter data 'sees' ocean heat fueling hurricanes.

Opportunities to promote your:

→ science → research → activities → awards



Promoting the OSTST



<http://climate.nasa.gov>

NASA National Aeronautics and Space Administration

GLOBAL CLIMATE CHANGE

NASA's Eyes on the Earth

Measuring sea level from space: Jason-1

VITAL SIGNS OF THE PLANET

ARCTIC SEA ICE MINIMUM ↓ 11.2 % per decade	CARBON DIOXIDE ↑ 350 parts per million	SEA LEVEL ↑ 57 mm since 1993	GLOBAL TEMPERATURE ↑ 1.5 ° F avg. temp. since 1880	LAND ICE ↓ 24 (Greenland) cubic miles per year
--	--	--	--	--

Key Indicators
Evidence
Causes
Effects
Uncertainties
Solutions
NASA's Role
Missions
Climate Time Machine
Key Websites
Earth Science Week 2010
A WARMING WORLD

Earth Science Week Resources for educators

THE GLOBAL AVERAGE SEA LEVEL HAS RISEN 4-8 INCHES OVER THE PAST CENTURY

VIEW INTERACTIVE DATA

COOL STUFF

- Eyes on the Earth 3D
Fly alongside NASA satellites in 3D
- Sea Level Viewer
Explore sea level from space
- Climate Time Machine
Travel through Earth's recent

NASA National Aeronautics and Space Administration

GLOBAL CLIMATE CHANGE

NASA's Eyes on the Earth

Home
Key Indicators
Evidence
Causes
Effects
Uncertainties
Solutions
NASA's Role
Missions
Climate Time Machine
Key Websites
Earth Science Week 2010
A WARMING WORLD
IMAGES OF CHANGE

KEY INDICATORS
SEA LEVEL | CARBON DIOXIDE CONCENTRATION | GLOBAL SURFACE TEMPERATURE | ARCTIC SEA ICE | LAND ICE

Sea Level
Data updated 06/30/10

GROUND DATA: 1870-2000	RATE OF CHANGE	SATELLITE DATA: 1993-PRESENT	RATE OF CHANGE
Data source: Coastal tide gauge records.	↑ 1.70 mm per yr*	Data source: Satellite sea level observations.	↑ 3.26 mm per yr*

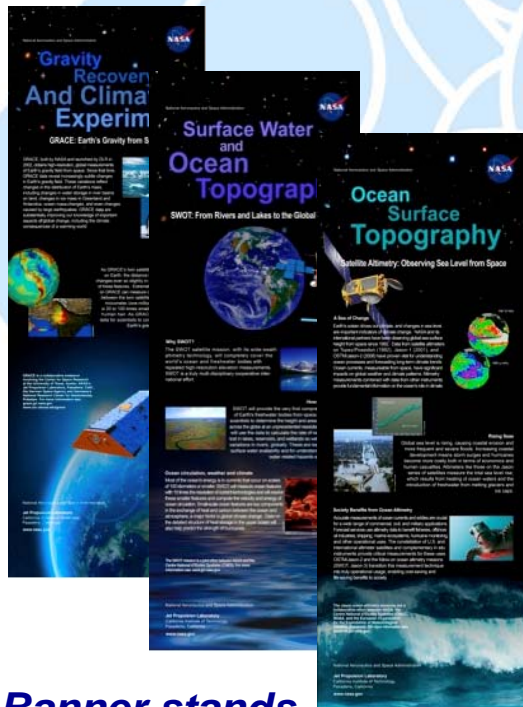


Promoting the OSTST

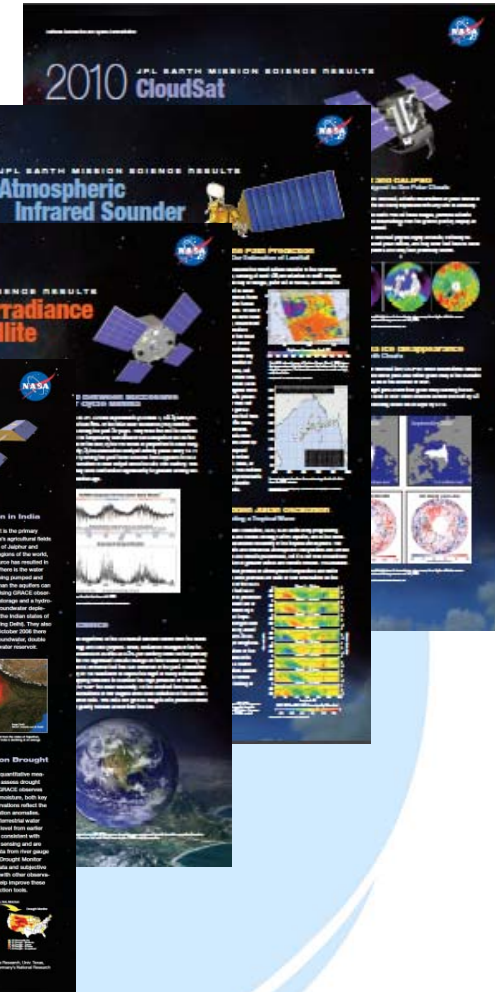
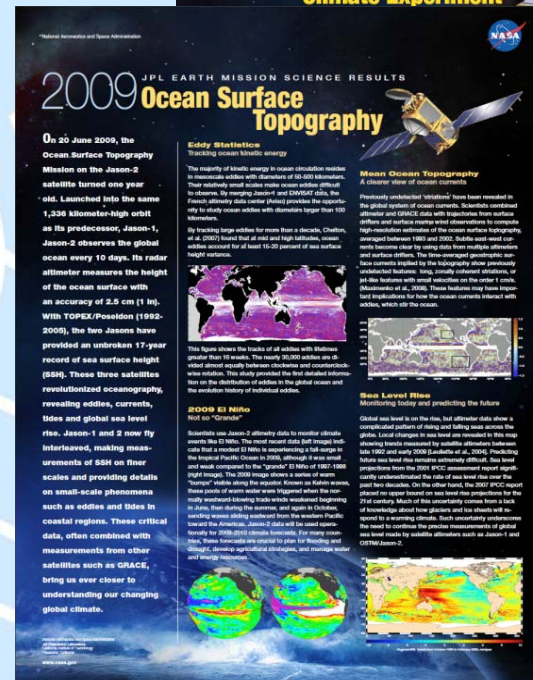


NON-WEB

- Science Results Posters
- Banner stands



Banner stands



Science Results Posters



Societal Benefits Web Page



Jet Propulsion Laboratory
 California Institute of Technology

[JPL HOME](#) | [EARTH](#) | [SOLAR SYSTEM](#) | [STARS & GALAXIES](#) | [SCIENCE & TECHNOLOGY](#)
 BRING THE UNIVERSE TO YOU: [JPL Email News](#) | [RSS](#) | [Podcast](#) | [Video](#)

Ocean Surface Topography From Space

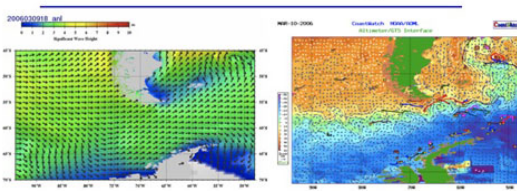
Go

- Home
- Overview
- Science
- [El Niño/La Niña & PDO](#)
 - [OST Science Team](#)
 - [The Tandem Mission](#)
 - [Monthly Time Series](#)
 - [Literature Database](#)
 - [Science Objectives](#)
 - [Societal Benefits](#)
- Technology
- Missions
- Newsroom
- Education
- Gallery

SCIENCE

Societal Benefits

2006 Volvo Ocean Race Support



Significant wave height and wind direction from NOAA WaveWatch III Model.

Geostrophic currents and drift trajectories

NOAA-AOML provided near-real time surface currents from altimetry, SSTs, and surface winds to 2006 Volvo Ocean Race teams. VOR, held every 4 years, covered 31,000 nautical miles in 9 legs, starting in Vigo, Spain in Nov. 2005 and finishing in Goteborg, Sweden in Jun. 2006. A dedicated AOML web page displayed data distributed to the sailboats (<http://www.aoml.noaa.gov/phod/VOR/>). Racing teams used this information to negotiate (un)favorable currents or winds during the race. This collaboration in turn provided feedback on data products, as well as atmospheric and sailboat drift data to NOAA from the teams, helping with validation efforts.

G.Goni, NOAA

Download Options: [PPT](#) | [JPEG](#) | [PDF](#)

2006 Volvo Ocean Race Support

NOAA-AOML provided near-real time surface currents from altimetry, SSTs, and surface winds to 2006 Volvo Ocean Race teams. VOR, held every 4 years, covered 31,000 nautical miles in 9 legs, starting in Vigo, Spain in Nov. 2005 and finishing in Goteborg, Sweden in Jun. 2006. A dedicated AOML web page displayed data distributed to the sailboats (<http://www.aoml.noaa.gov/phod/VOR/>). Racing teams used this information to negotiate (un)favorable currents or winds during the race. This collaboration in turn provided feedback on data products, as well as atmospheric and sailboat drift data to NOAA from the teams, helping with validation efforts.

G.Goni, NOAA

[<< Previous](#) [Next >>](#)

Government Made Easy

[PRIVACY](#) | [FEEDBACK](#) | [SITEMAP](#) | [LINKS](#)

Site Manager: Margaret Srinivasan
 Webmaster: Kristy Kawasaki
 JPL Clearance: CL01-1707



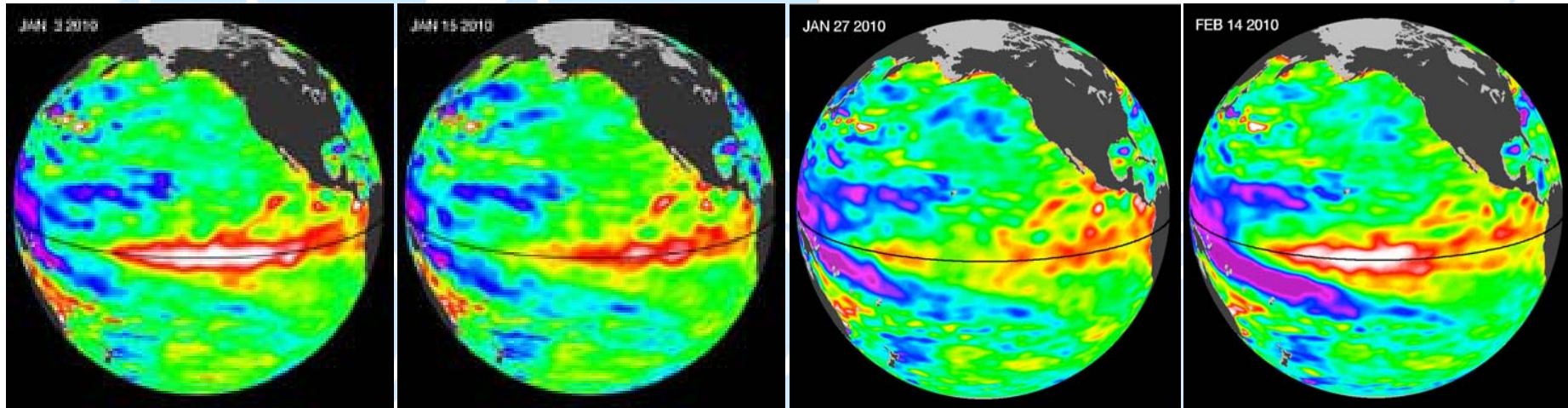
Methods



- *Features - monthly updates, blogs, image releases*
- *Science Investigations - summaries 40% complete*
- *Literature Database - quarterly updates*
- *Societal Benefits - slides downloadable*
- *Email listserve - sharing new science results*
- *Science Results poster series*
- *Display graphics - banner stands*



El Niño 2009/2010



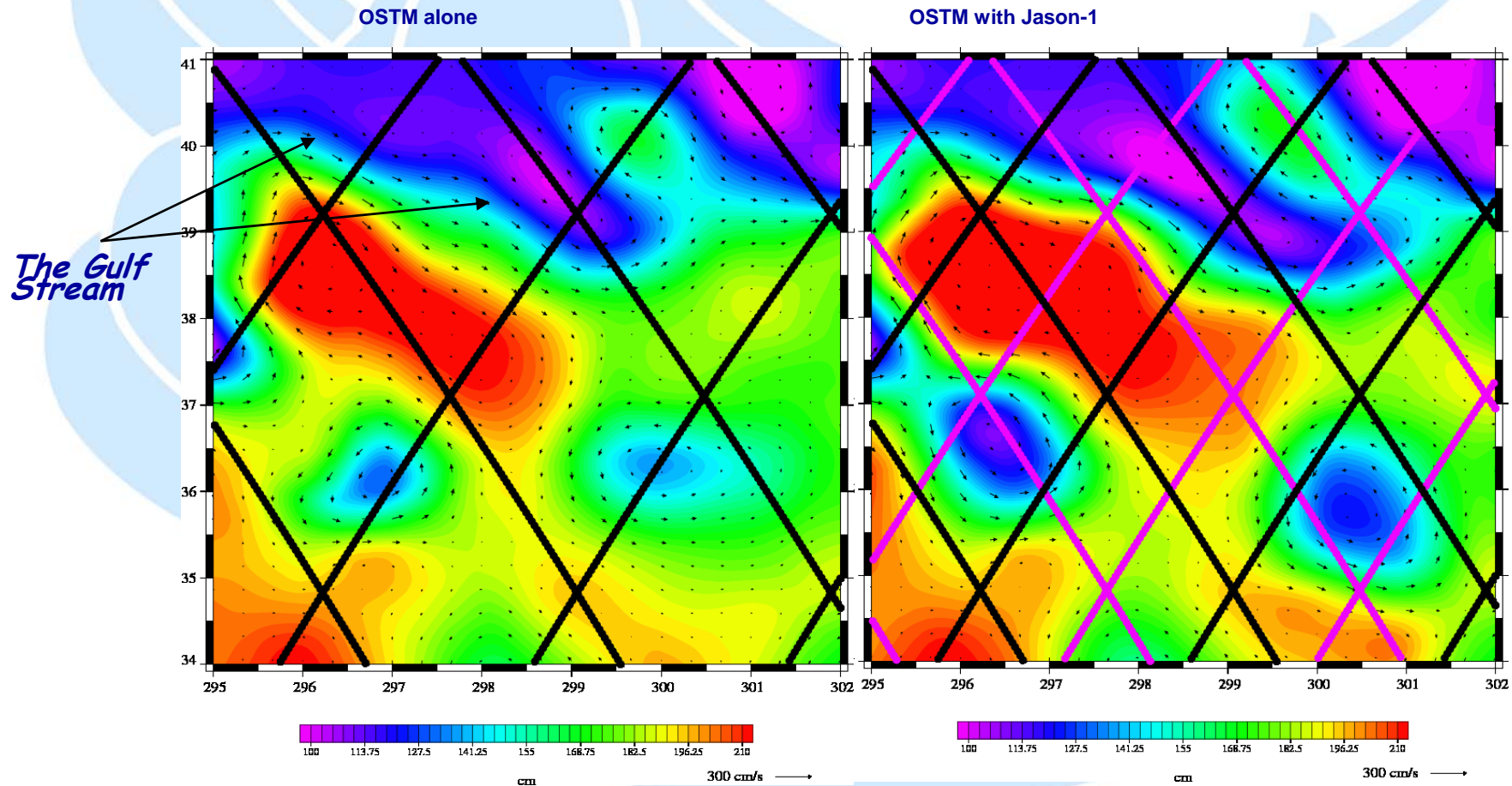
The eastward propagation of a warm Kelvin wave (red to white color) is apparent in these images from the U.S./European Ocean Surface Topography Mission/Jason-2 oceanography satellite data.

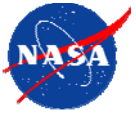


Jason-1 & OSTM Tandem Mission **JPL**

Enhanced Science Return Clearly Demonstrated

Jason-1 was maneuvered into a new orbit with ground tracks interleaving those of OSTM with a 5 day offset in time for maximum sampling of small-scale ocean features like currents, fronts and eddies.

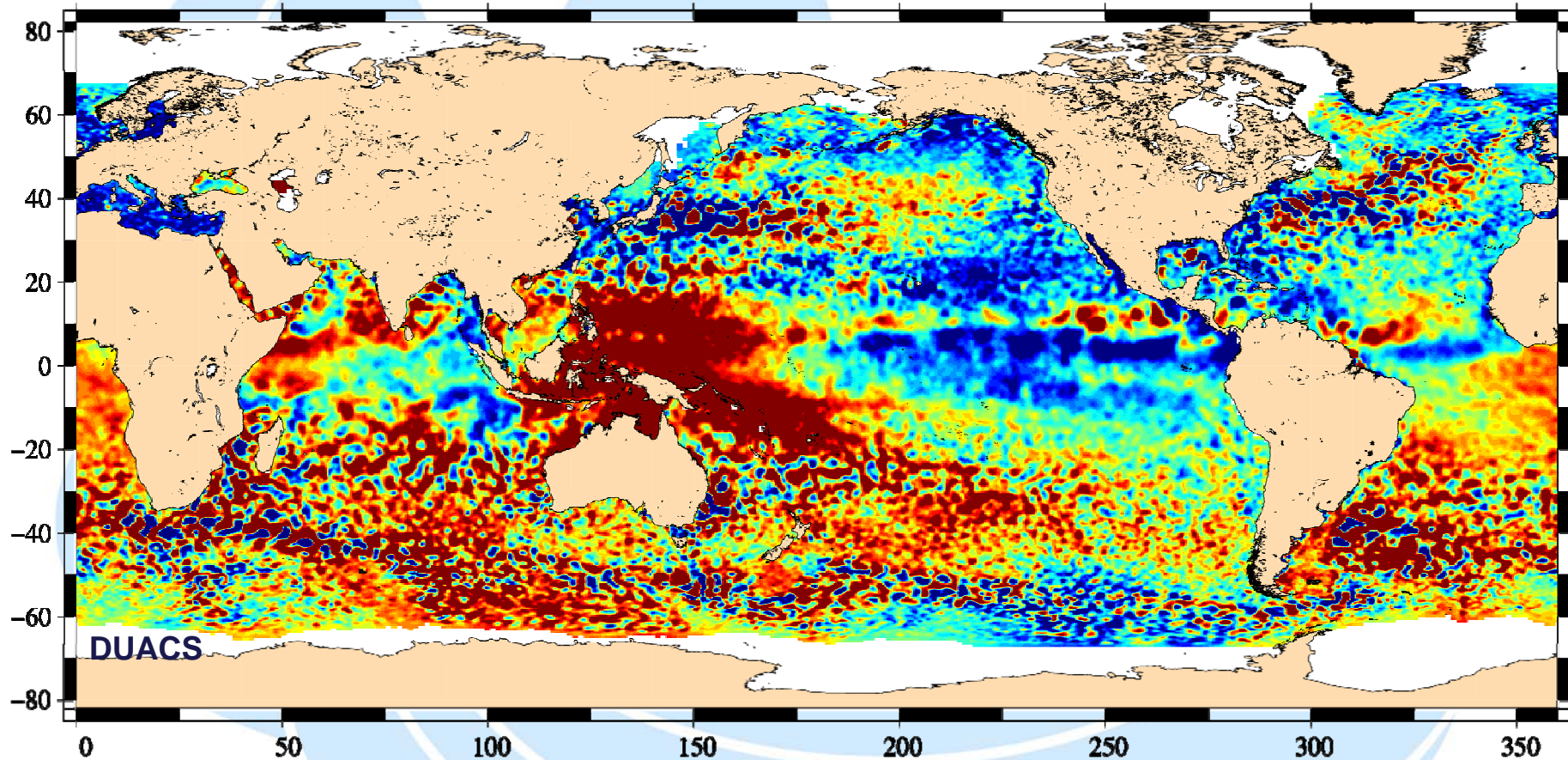




Sea Level Anomaly

JPL

Jason-1 + OSTM/Jason-2



Global map of sea surface height anomalies from combined OSTM + Jason-1 observations in the interleaved tandem mission. The eddy field revealed by the map contains 90% of the kinetic energy of ocean circulation.



JPL Web Site - Image Release **JPL**



Jet Propulsion Laboratory
California Institute of Technology

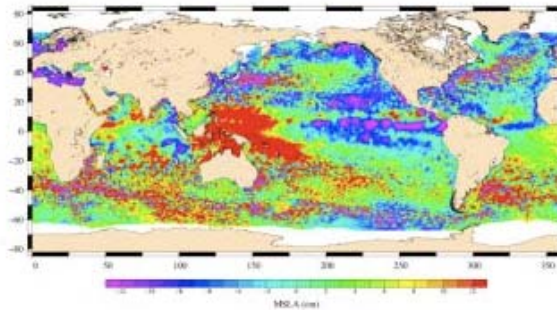
JPL HOME EARTH SOLAR SYSTEM STARS & GALAXIES SCIENCE & TECHNOLOGY
BRING THE UNIVERSE TO YOU: JPL Email News | RSS | Podcast | Video

PHOTOJOURNAL

Select An Image Gallery

PIA11859: First Jason-1 and OSTM/Jason-2 Tandem Global View

DUACS Map of Sea Level Anomaly - Jason2+Jason1



Target Name:	Earth
Is a satellite of:	Sol (our sun)
Mission:	Jason-1 (TOPEX/Poseidon) OSTM/Jason-2
Spacecraft:	Jason-1 (TOPEX/Poseidon) OSTM/Jason-2
Instrument:	Altimeter
Product Size:	3508 samples x 2479 lines
Produced By:	JPL
Full-Res TIFF:	PIA11859.tif (26.09 MB)
Full-Res JPEG:	PIA11859.jpg (1.128 MB)

Click on the image to download a moderately sized image in JPEG format (possibly reduced in size from original).

NASA's Planetary Photojournal



Your help...



- Consider potential and operational applications of your research
- Estimate the economic/practical effects/benefits
- Get your story out into the public domain;
 - Feature
 - Press Release
 - Image Release
 - Awards, Honors, Milestones



Your help...



- Consider potential and operational applications of your research
- Estimate the economic/practical effects/benefits
- Get your story out into the public domain;
 - Feature
 - Press Release
 - Image Release
 - Awards, Honors, Milestones

Obrigada!