



# OCEAN SURFACE TOPOGRAPHY DATASETS AND SERVICES AT PO.DAAC

Jessica Hausman

PO.DAAC Ocean Surface Topography Data Engineer

Also visit poster OCEAN SURFACE TOPOGRAPHY RELEVANT SERVICES AT PO.DAAC

# Stewardship of Satellite Ocean Data

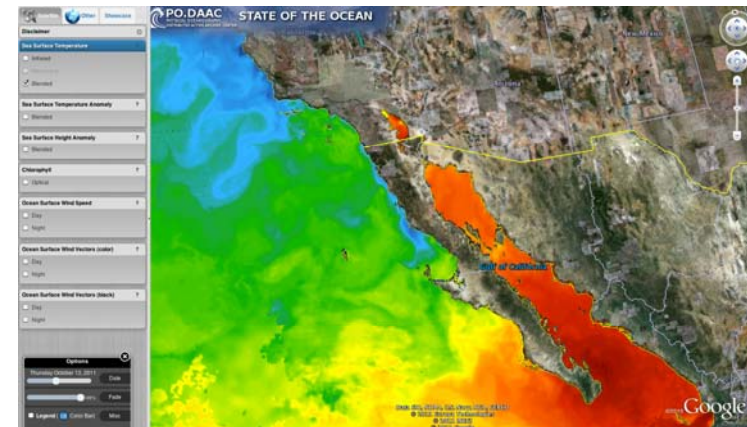
## Data Management

Preserve NASA's data for the benefit of future generations



## Data Access

Provide intuitive services to discover and utilize satellite ocean data



## Science User Support

Provide a knowledgebase to help a broad user community interpret satellite ocean data and related information

Home > Forums > GHRSSST Science Team Forums >

### GHRSSST SCIENCE/USER QUESTIONS

Login to post new content in forum.  
Unanswered topics

Last post [dropdown] Down [dropdown] Sort [dropdown]

Topic / Topic starter	Replies	Views	Last post
Foundation SST: how to define? by Alexey on 08/04/2011 - 12:54	8	0	by Alexey 08/05/2011 - 11:20
Foundation Temperature by jorge.vazquez@j... on 08/04/2011 - 12:51	0	0	by jorge.vazquez@j... 08/04/2011 - 12:51
GHRSSST AUS-TAG forum by jorge.vazquez@j... on 03/30/2011 - 15:19	1	0	by jorge.vazquez@j... 05/24/2011 - 14:47

New posts No new posts Hot topic with new posts Hot topic without new posts Sticky topic Locked topic

Login to post new content in forum.  
Unanswered topics

# PO.DAAC Data Holdings

## NASA Missions & Projects

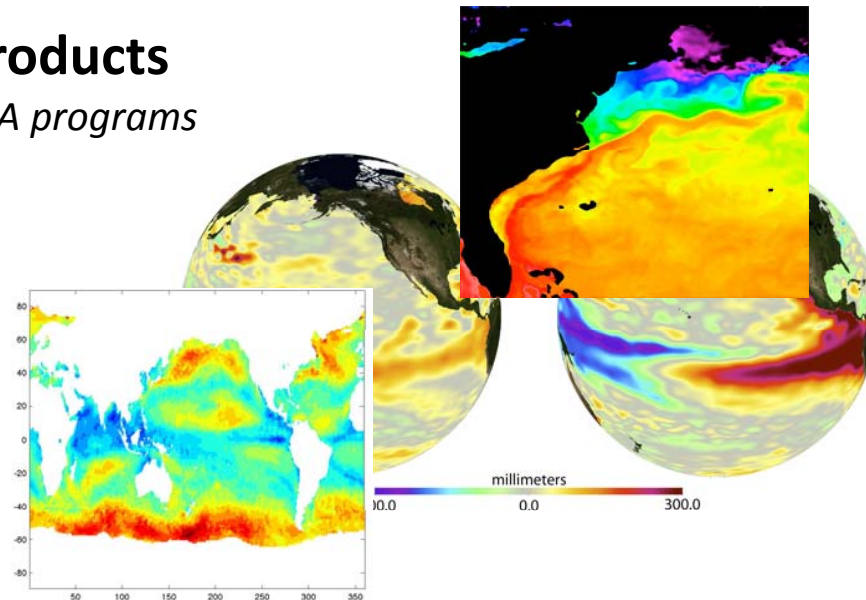
Seasat, TOPEX/Poseidon, Jason-1, NSCAT,  
SeaWinds on ADEOS-II, QuikSCAT,  
GRACE, GHRSSST, MeASUREs, Aquarius



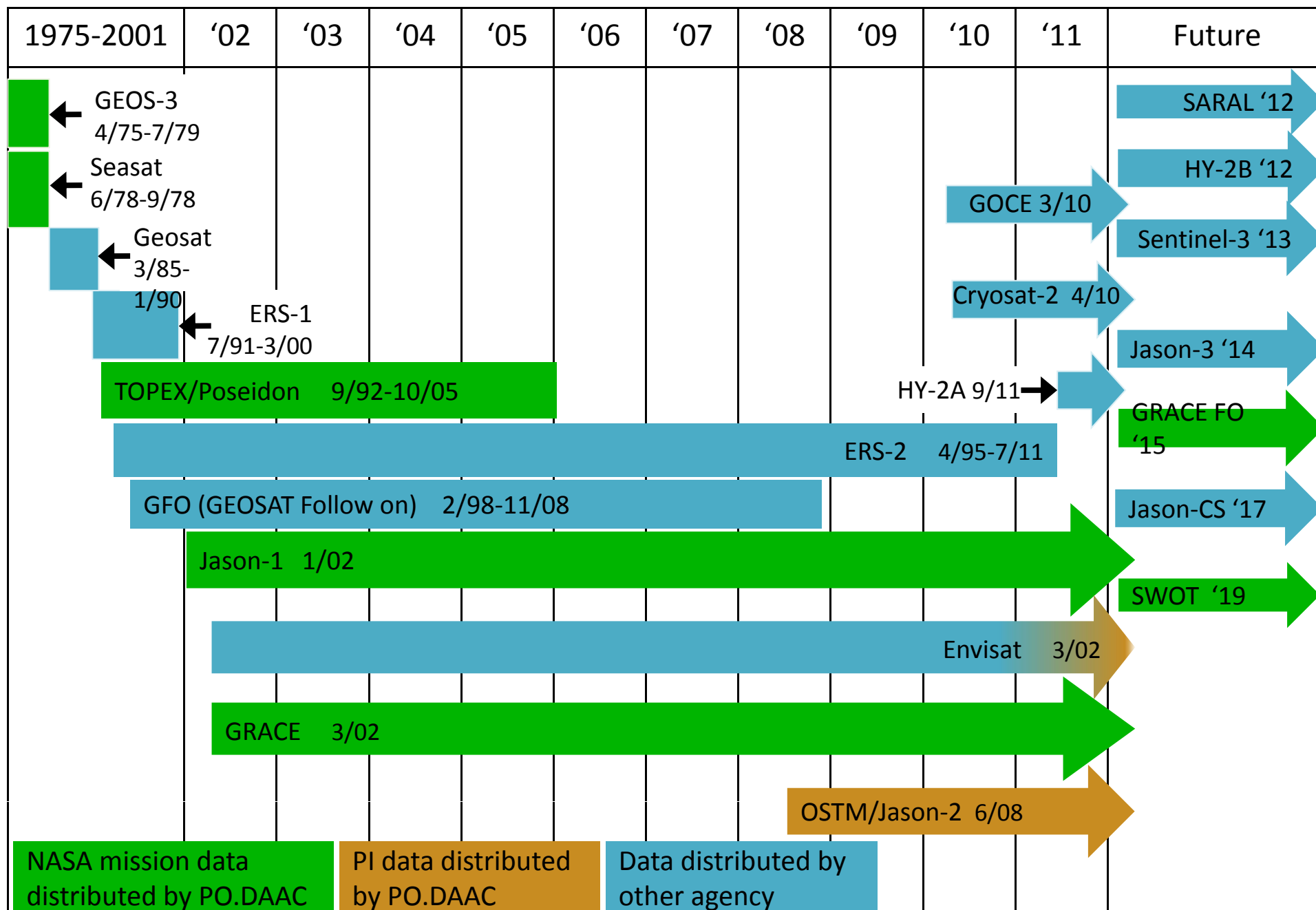
## Ocean & Climate Science Products

*Value-added datasets in support of NASA programs*

Sea Surface Temperature  
Ocean Vector Winds  
Ocean Surface Topography  
Gravity  
Ocean Surface Salinity  
Ocean Circulation & Currents  
Sea Ice



# Missions Measuring Sea Surface Height



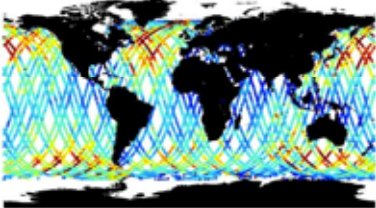


# Building a Knowledge Base

PO.DAAC is striving towards providing users with a means to access (or link to) all available ocean related datasets derived from satellites

Please contact us to suggest relevant datasets

All Datasets > Platform: OSTM/Jason-2



**OSTM/Jason-2 Altimeter Geophysical Data Record Version T**  
(OSTM\_L2\_GDR\_T)  
SHARE THIS PAGE

Please contact us if there are any discrepancies or inaccuracies found below.

Information	Data Access	Granule (File) Listing
<b>REMOTE-FTP</b>	ftp://data.nodc.noaa.gov/pub/data.nodc/jason2/gdr/gdr/	
<b>Format (Compression)</b>	NETCDF (NONE)	
<b>Granules (Files) per Day</b>	-	

# NRT GPS orbit based SSHA

Uses more accurate GPS orbit than DORIS, thus more accurate SSHA

Developed by the Orbiter and Radio Metric Systems group at JPL

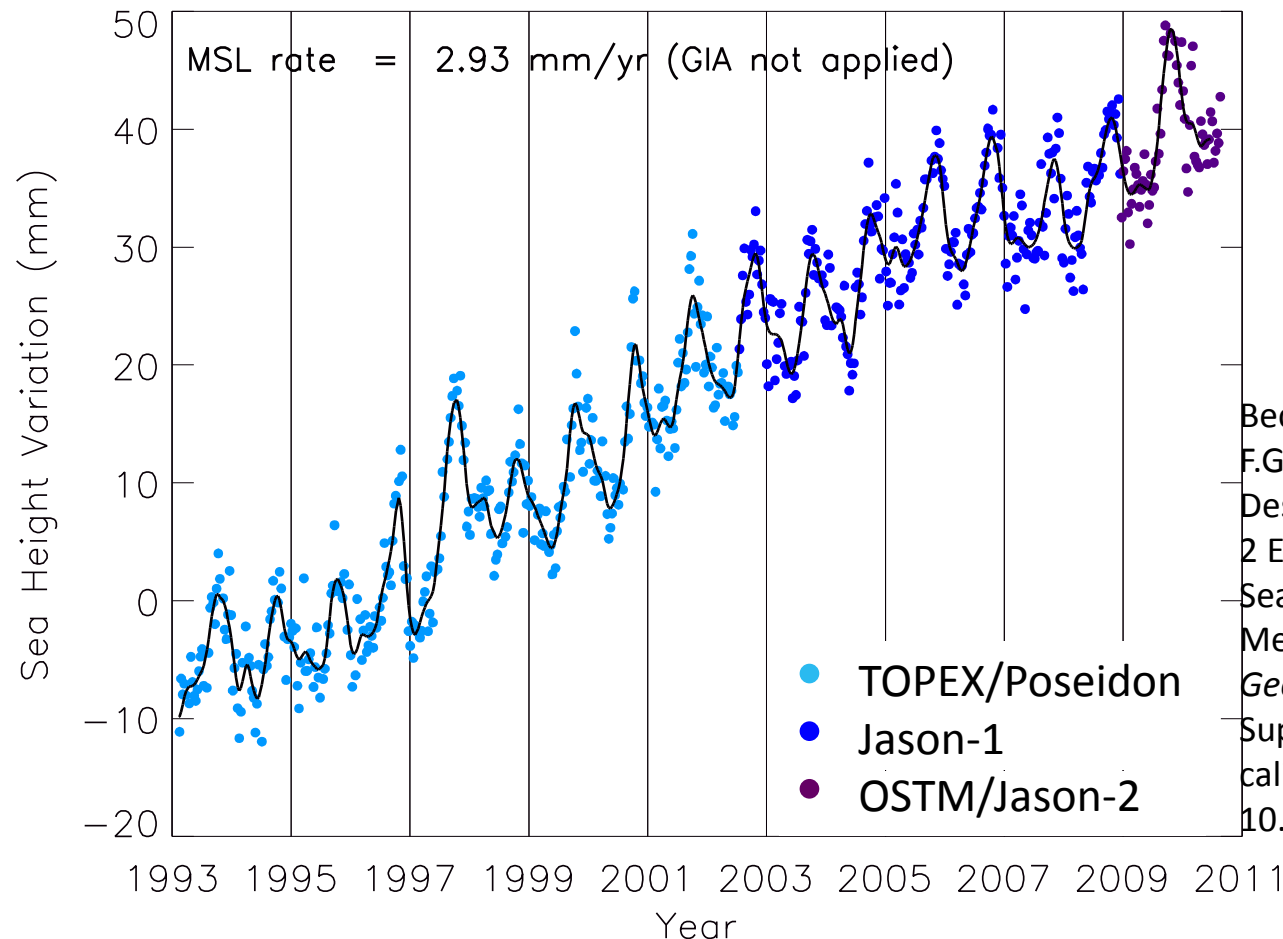
Mission	Time lag (hr)	Improved Radial orbital accuracy RMS (cm)	DORIS Radial orbital accuracy RMS (cm)	SSHA Accuracy (cm)
OSTM/Jason-2	3-5	1	3-5	<3.5
Jason-1	7-9	2	10-25	<4
Envisat	7-9	<3	10-25	<5

# Integrated Multi-Mission Altimeter

Covers September 1992 to August 2010, updated every 6-12 months

Contains TOPEX/Poseidon, Jason-1 and OSTM/Jason-2 data

Instrument biases removed and applies cross calibration to orbits, uses the same atmospheric and geophysical corrections to all 3 missions to obtain a consistent altimetric time series

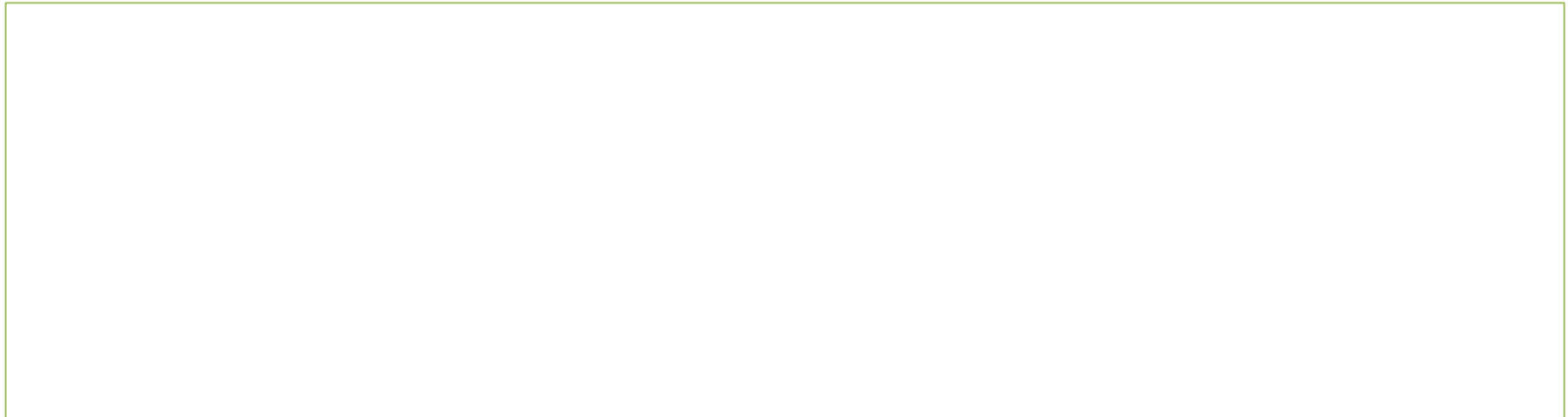
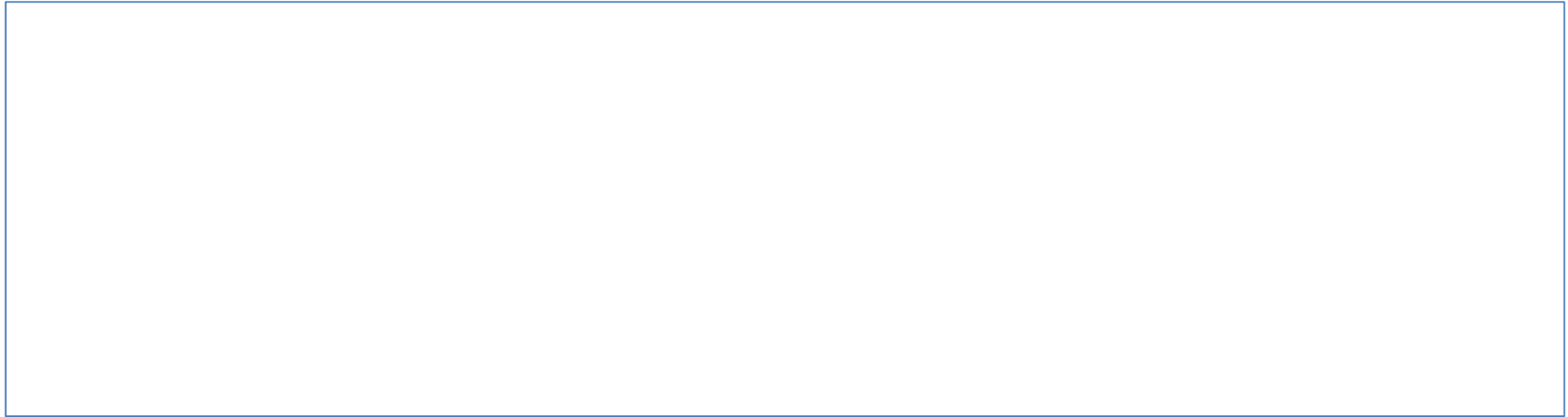


Beckley, B.D., N.P. Zelensky, S.A. Holmes, F.G. Lemoine, R.D. Ray, G.T. Mitchum, S. Desai, S.T. Brown, Assessment of the Jason-2 Extension to the TOPEX/Poseidon, Jason-1 Sea-Surface Height Time Series for Global Mean Sea Level Monitoring, *Marine Geodesy*, 33(S1): 447-471, 2010, Supplemental Issue on OSTM/Jason-2 calibration/validation, Vol. 1, DOI: 10.1080/01490419.2010.491029.

# Reconstructed Sea Level

CCAR/CU Boulder (Ben Hamlington and Bob Leben)

Cyclo-Stationary EOF tuned to AVISO  $\frac{1}{4}^\circ$  grids, which is then applied to tide gauges to produce reconstructed sea levels back to 1950 (See poster by Ben Hamlington and Bob Leben)



Hamlington, B. D., R. Leben, S. Nerem, W. Han, and K.-Y. Kim (2011), Reconstructing sea level using cyclostationary empirical orthogonal functions, *J. Geophys. Res.*, doi:10.1029/2011JC007529, in press.



# Data Access

**Discovery** – Find or sort through all datasets through PO.DAAC

The screenshot displays the PO.DAAC (Physical Oceanography Distributed Active Archive Center) website interface. The main navigation bar includes links for HOME, DATASET DISCOVERY, DATA ACCESS, MEASUREMENTS, MISSIONS, and ANIMATIONS & IMAGES. The URL <http://podaac.jpl.nasa.gov> is visible in the top right.

The left sidebar, titled "BROWSE DATASETS", offers various filtering options: Parameter, Collections, Platform, Sensor, Spatial Coverage, and Latency. A search bar at the bottom of this sidebar shows the query "sig" with a dropdown menu listing results like "Significant Wave Height", "Sigma Naught", "sigma naught", "sigma-0", and "sigma0".

The central content area is divided into two columns. The left column, "BROWSE DATASETS", lists filters for Processing Levels (Any, Level-2, Level-3), Swath Spatial Resolution (5 km, 8 km), Temporal Resolution (1 Month, 10 day, 30 day), Parameter (Ocean Waves), Platform (ENVISAT, GEOS-3, JASON-1, etc.), and Sensor (AMR, DORIS, etc.). The right column, "All Datasets > Parameter: Ocean Waves", shows search results for "Ocean Waves". It indicates "Found 20 matching dataset(s)" and includes a search input field, a "Sort By" dropdown set to "Popularity (All Time)", and a help icon. Below this, four dataset entries are listed, each with a world map thumbnail and descriptive text:

- 11. **Jason-1 Sensor Geophysical Data Record (SGDR) NetCDF** (JASON-1\_SGDR\_NETCDF)  
Significant Wave Height, Sea Surface Height  
Platform/Sensor: JASON-1/POSEIDON-2, JASON-1/JMR, JASON-1/TRSR ... more  
Processing Level: 2  
Along/Across Track Resolution: 11.2 km x 5.1 km  
Start/End Date: 2002-Jan-14 to Present  
Description: The Sensory Geophysical Data Record (SGDR) files contain full accuracy altimeter data, with a high precision orbit (accuracy ~2.5 cm), provided approximately 35 days after data col ... more
- 12. **OSTM GPS based orbit and SSHA OGDR** (OSTM\_L2\_OST\_OGDR\_GPS)  
Significant Wave Height, Sea Surface Height  
Platform/Sensor: OSTM/Jason-2/POSEIDON-3, OSTM/Jason-2/AMR  
Processing Level: 2  
Along/Across Track Resolution: 11.2 km x 5.1 km  
Start/End Date: 2009-May-31 to Present  
Description: This dataset is similar to the OSTM/Jason-2 Operation Geophysical Data Record (OGDR) that is distributed at NOAA (ftp://data.nodc.noaa.gov/pub/data.nodc/jason2/ogdr/), but also inc ... more
- 13. **Jason-1 Level 2 PO.DAAC generated Sea Surface Height from Jason-1 GDR-C** (JASON-1\_L2\_OST\_SSHA\_Ver-C)  
Significant Wave Height, Sea Surface Height, Sigma Naught, Total Electron Content  
Platform/Sensor: JASON-1/POSEIDON-2, JASON-1/JMR  
Processing Level: 2  
Along/Across Track Resolution: 11.2 km x 5.1 km  
Start/End Date: 2002-Jan-14 to Present  
Description: This dataset contains the PO.DAAC produced Sea Surface Height Anomalies (SSHA) calculated from Jason-1 Geophysical Data Record version C (GDR-C, http://podaac.jpl.nasa.gov/dataset/ ... more
- 14. **Jason-1 L2 Near Real Time Sea Surface Height Anomaly** (JASON-1\_L2\_OST\_NRTSSHA)  
Significant Wave Height, Sea Surface Height  
Platform/Sensor: JASON-1/POSEIDON-2, JASON-1/JMR, JASON-1/TRSR ... more  
Processing Level: 2  
Along/Across Track Resolution: 11.2 km x 5.1 km  
Start/End Date: 2002-Jan-14 to Present

**Download** – Obtain data via FTP, OPeNDAP or THREDDS

# Visualize and Subset – PO.DAAC has developed it's own tools to visualize datasets and/or subset them temporally and spatially

<http://podaac-tools.jpl.nasa.gov/soto/>

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

The image displays three screenshots of NASA's PO.DAAC tools. The top-left screenshot shows the 'STATE OF THE OCEAN' tool, featuring a globe visualization of ocean data with a color scale ranging from -10.0 to 10.0. The top-right screenshot shows the PO.DAAC website interface, including the NASA Earth Data logo, Jet Propulsion Laboratory logo, and the POET v2.0 tool description. The bottom screenshot shows a detailed map interface with a color scale for ocean currents, ranging from -0.5 to 0.5 m/s, and a search bar.

<http://podaac-tools.jpl.nasa.gov/dataminer/aegina/src/dataminer.php>

Mouse (lon,lat) : 91.76° E , 90° S

Webpage	<a href="http://podaac.jpl.nasa.gov">http://podaac.jpl.nasa.gov</a>
FTP	<a href="ftp://podaac.jpl.nasa.gov">ftp://podaac.jpl.nasa.gov</a>
OPeNDAP	<a href="http://opendap.jpl.nasa.gov">http://opendap.jpl.nasa.gov</a>
THREDDS	<a href="http://podaac.jpl.nasa.gov/podaac_thredds">http://podaac.jpl.nasa.gov/podaac_thredds</a>
SOTO	<a href="http://podaac-tools.jpl.nasa.gov/soto/">http://podaac-tools.jpl.nasa.gov/soto/</a>
Dataminer	<a href="http://podaac-tools.jpl.nasa.gov/dataminer/">http://podaac-tools.jpl.nasa.gov/dataminer/</a>
POET	<a href="http://poet.jpl.nasa.gov/">http://poet.jpl.nasa.gov/</a>
PODAAC Labs	<a href="http://podaac.jpl.nasa.gov/PODAAC_Labs">http://podaac.jpl.nasa.gov/PODAAC_Labs</a>

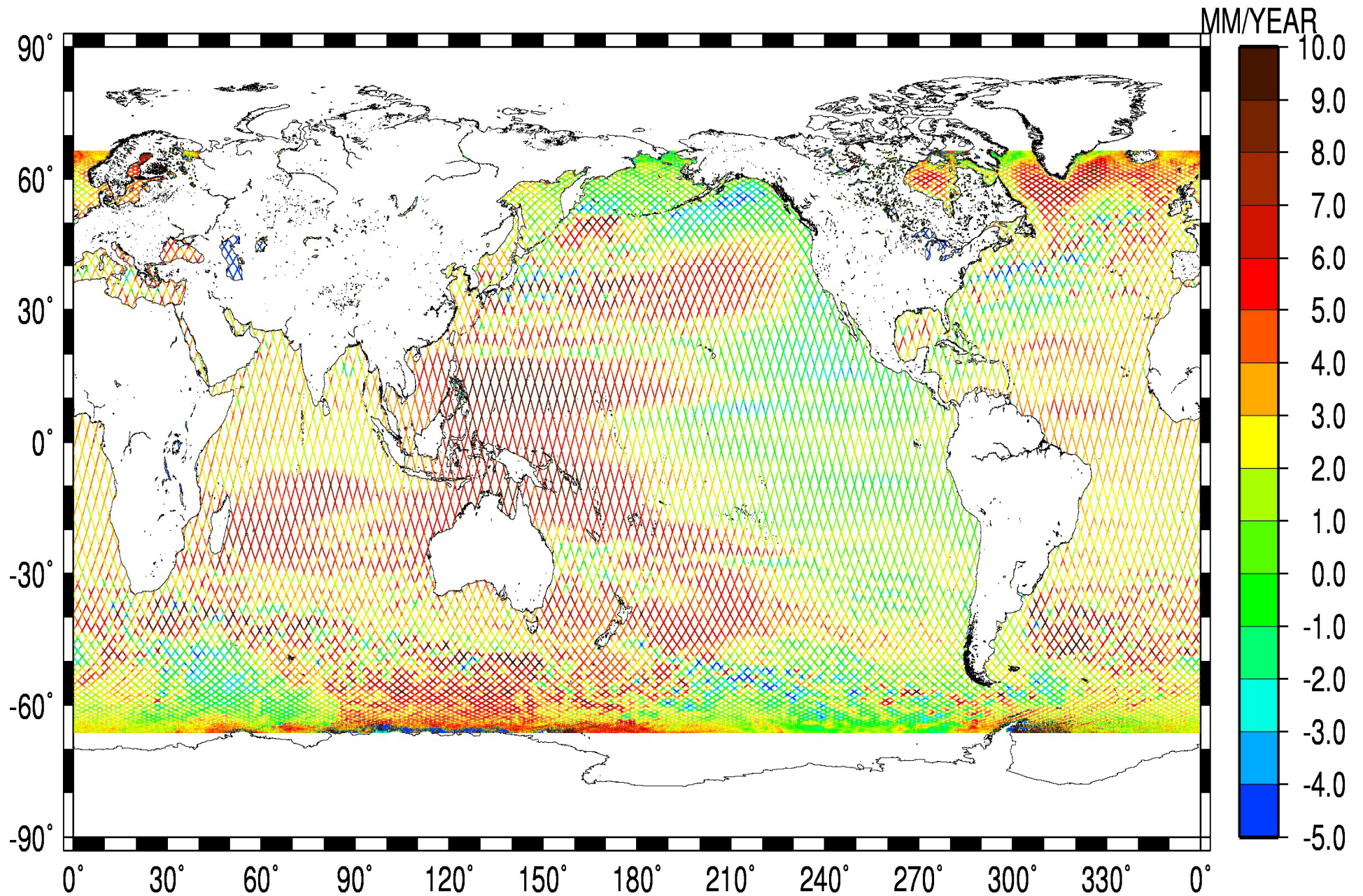
Questions, comments or to get on the PO.DAAC  
email list:

[podaac@podaac.jpl.nasa.gov](mailto:podaac@podaac.jpl.nasa.gov)

Acknowledgments: Thanks to Michelle Gierach, Ben Hamlington, Bob Leben and Brian Beckley for contributing material.



# Sea Level Trends October 1992-August 2010



# Importance of Metadata

**Search and Discovery** – High quality metadata will allow datasets to be discovered through free technologies (OPeNDAP, THREDDS, LAS) or self generated and get down to a file/granule level that can allow for subsetting or browsing

**Provenance** – Audit trail of the dataset, history, how certain parameters are calculated, versioning, etc

**Usability** – Tells user the contents of the file, format and allows for various visualization and subsetting tools to operate on these datasets

# Datasets at PO.DAAC

NASA missions swath (L0-L2) and mapped (L3)

Satellite ocean parameter datasets (L2 and higher)

NASA PI generated datasets

Others that support NASA science (ASCAT, GHRSSST, ...)

Earliest dataset dates back to 1975

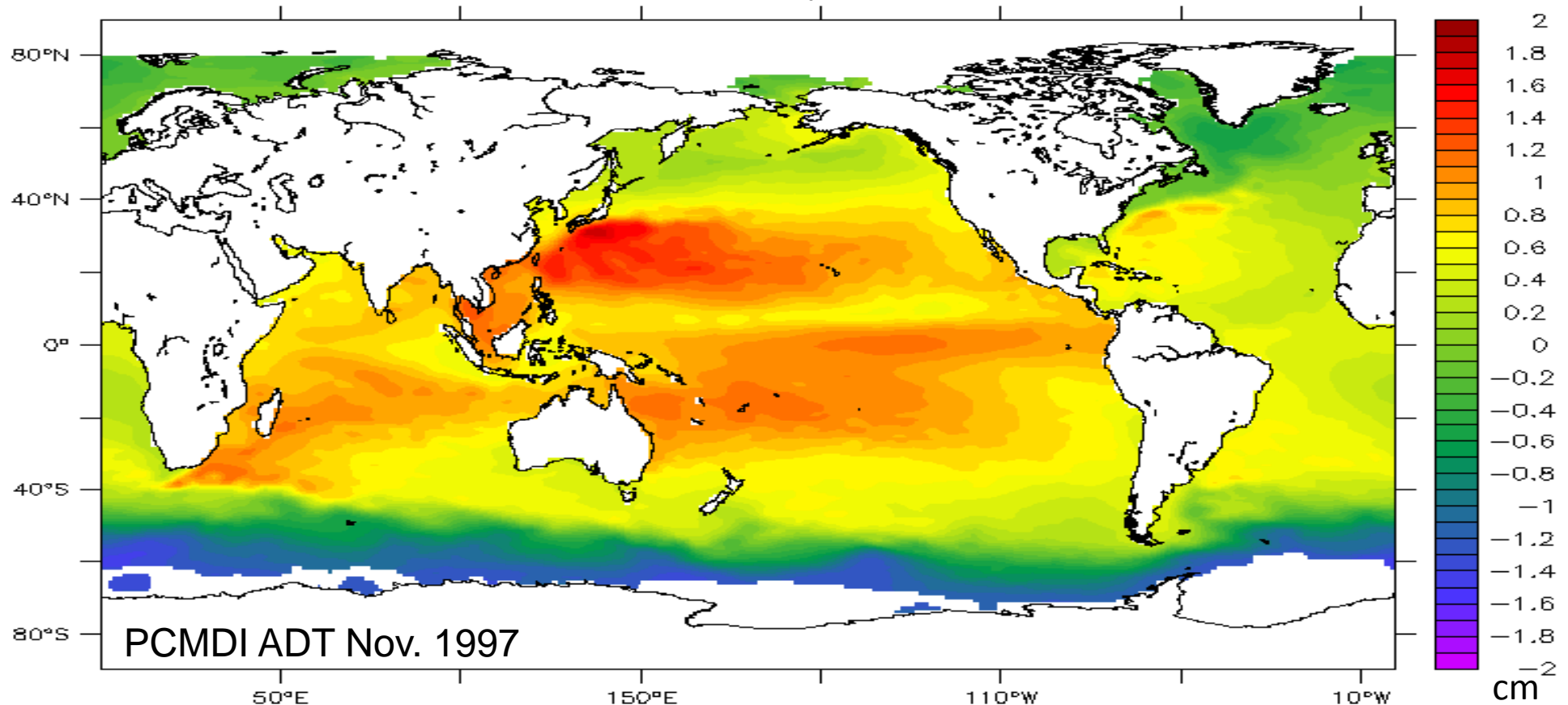


# Absolute Dynamic Topography Climate Data

Program for Climate Model Diagnosis and Intercomparison (PCMDI) effort for IPCC climate model comparison

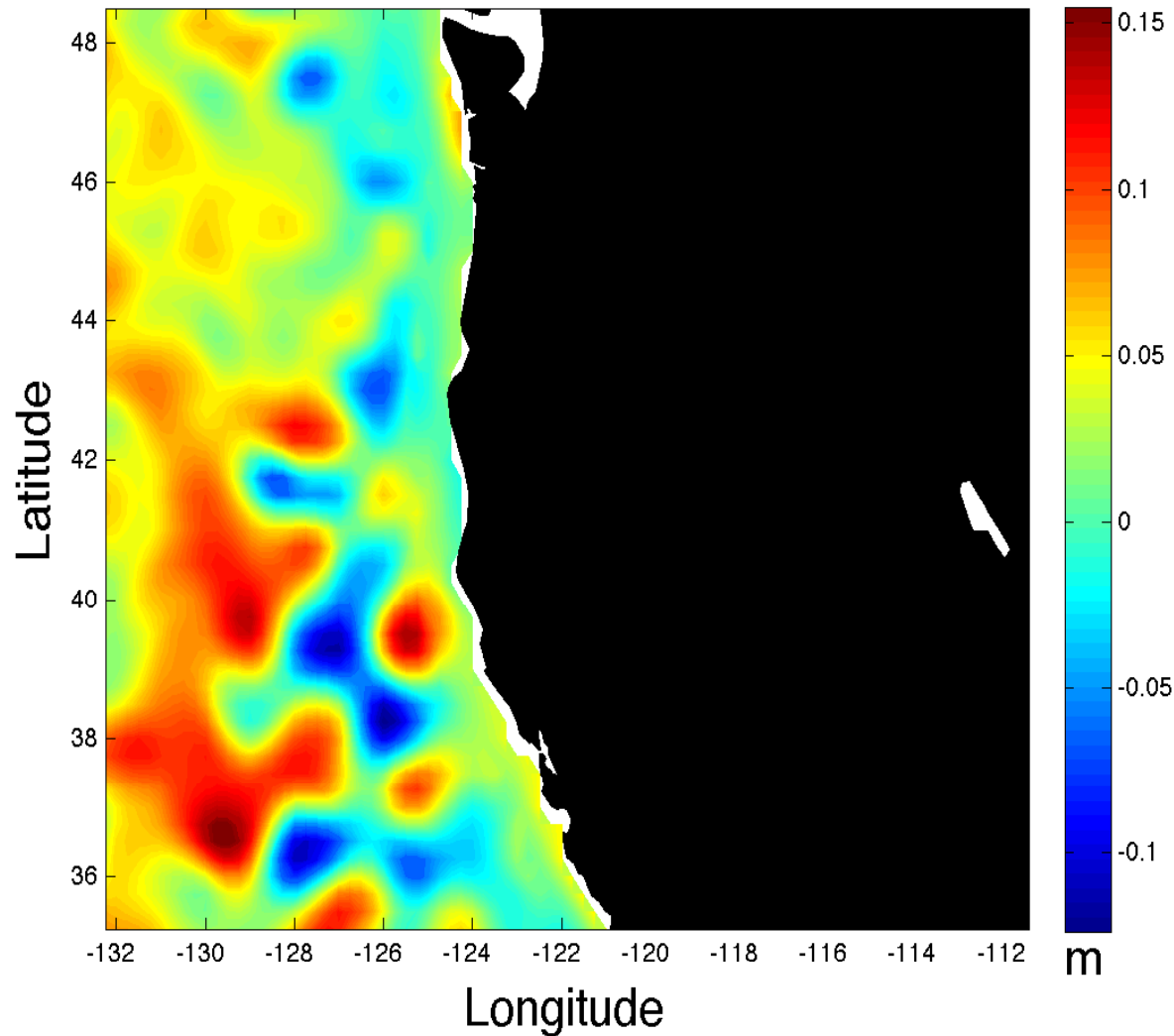
AVISO absolute dynamic topography (ADT) using ERS-1, TOPEX/Poseidon, ERS-2, GFO, Jason-1, Envisat, OSTM/Jason-2, covering 1992-2010

Data will soon be available on the Earth System Grid and at PO.DAAC



# US West Coast SSHA and currents

SSHA in meters November 4, 2009



OSU/COAS (Ted Strub)

Covers October 1992 to December 2009, and is updated annually

Sea Surface Height Anomaly (SSHA) and near shore currents are calculated using altimetry data and tide gauges  $0.75^\circ$  from the coast