

Data Stewardship Advances and Solutions at the NASA Physical Oceanography Distributed Active Archive Center

David.F.Moroni@jpl.nasa.gov

Edward M. Armstrong, Eric P. Tauer, Charles K. Thompson, Nga T. Chung,
Vardis M. Tsonetos, and Jessica K. Hausman

Jet Propulsion Laboratory
California Institute of Technology
Pasadena, CA



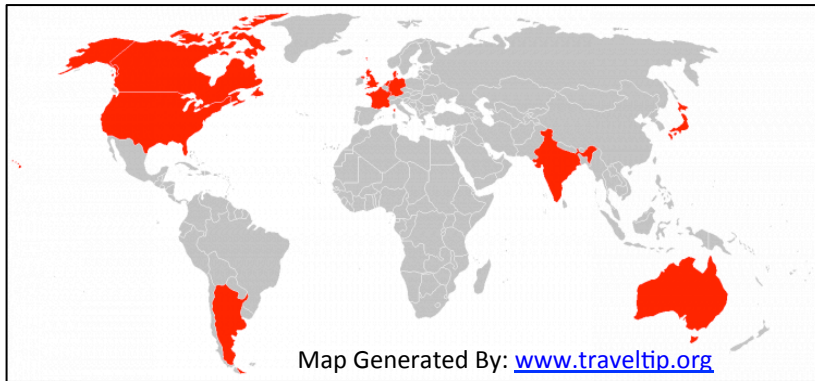
Preview

- The Role of PO.DAAC
- Dataset Lifecycle Policy
- PO.DAAC's Data Sources
- Tools and services
 - Web Portal
 - HiTide
 - Live Access Server
 - Web Services
 - Webification
- Conclusions

The Role of PO.DAAC

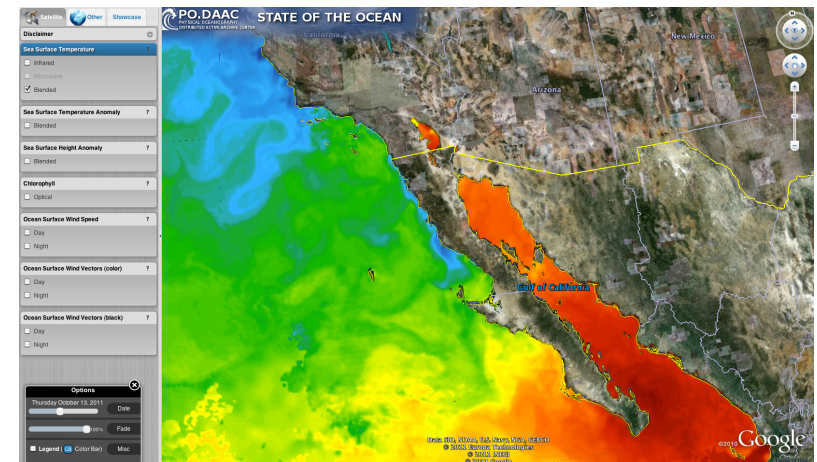
Data Management & Stewardship

Preserve and distribute oceanographic data for the benefit of future generations domestically and abroad.



Data Access

Provide intuitive services to discover, select, extract and utilize oceanographic data.



Science Information Services

Provide a user support interface and knowledgebase to help the user community understand and utilize datasets and corresponding resource materials.

HELP



Questions? **Answers.**

FOLLOW US



Ask PO.DAAC.

Once click access to:

You can reach us by email at:
podaac@podaac.jpl.nasa.gov

ABOUT US

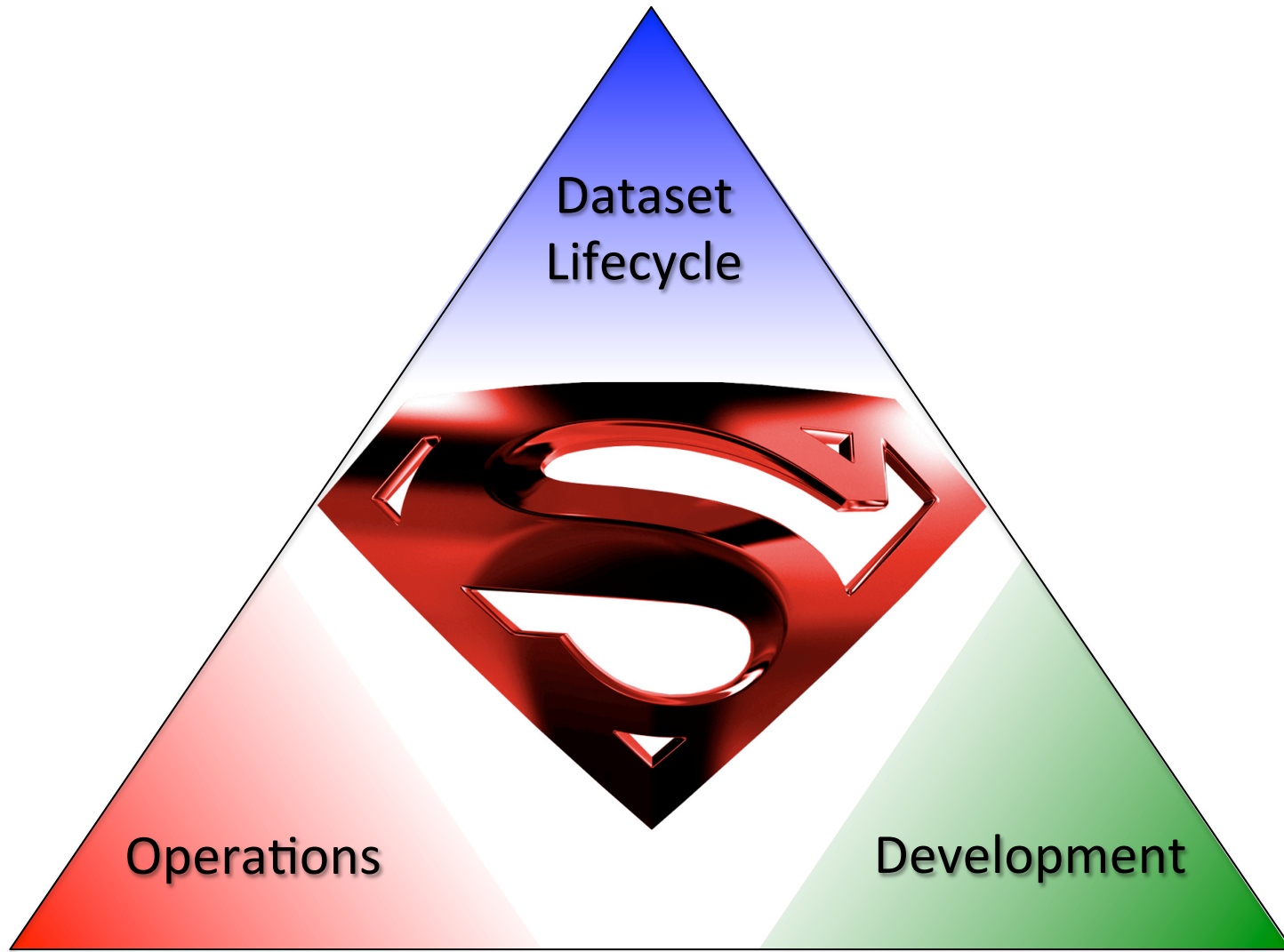
ACRONYMS

GLOSSARY

DATA
TERMINOLOGY
& FORMATS

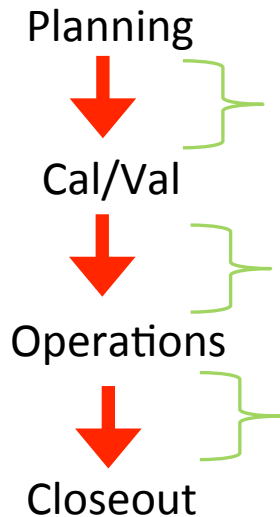
CITING PO.DAAC
& DATA

The System Focus

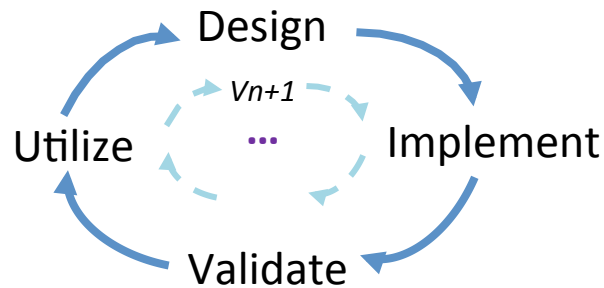


Dataset Lifecycle Policy

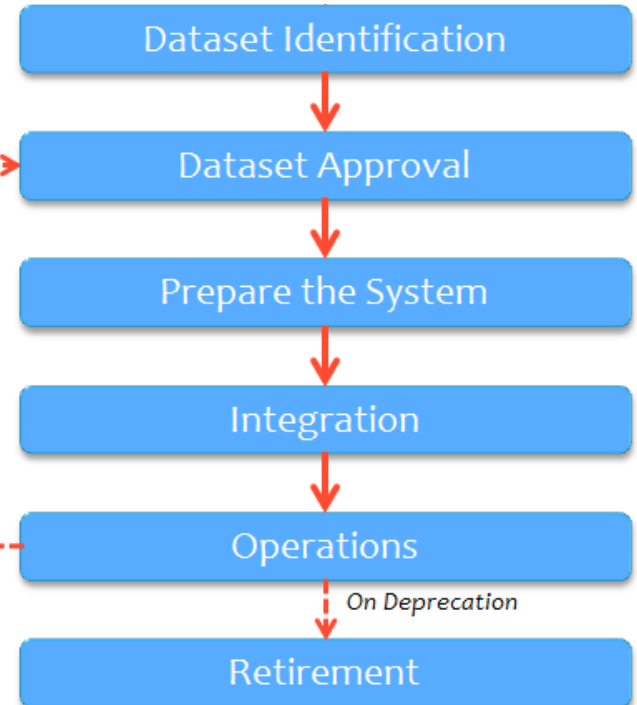
Mission Phases



Dataset Production Lifecycle



Dataset Archival Lifecycle



Quality

Quantity

Continuity

Latency



Overview of Data Sources

Supported NASA Missions & Projects

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

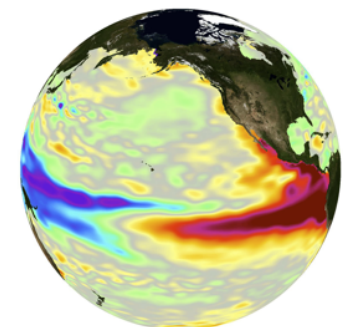
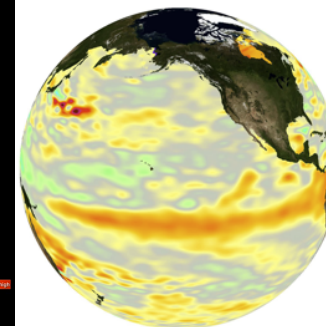
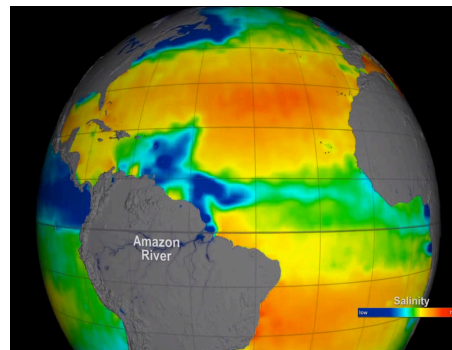
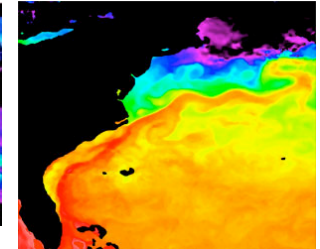
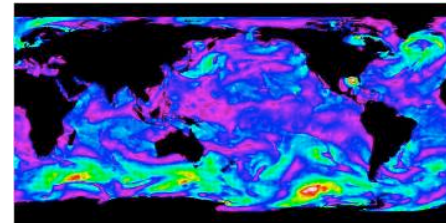
Other Missions & Projects

AVHRR-Pathfinder, DMSP (SSM/I, SSMIS),
ERS-1/2, GEOS-3, GOES, MetOp-A/B,
Oceansat-II, WindSat.

Physical Oceanographic Data

- 356 Publicly Distributed Datasets
- 30 in Near-Real-Time Distribution

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



millimeters
-300.0 0.0 300.0

Access Protocols

File Transfer Protocol (**FTP**): <ftp://podaac.jpl.nasa.gov>

➤ **356** Datasets

Open-source Project for a Network Data Access Protocol (**OPeNDAP**):

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

➤ **317** Datasets

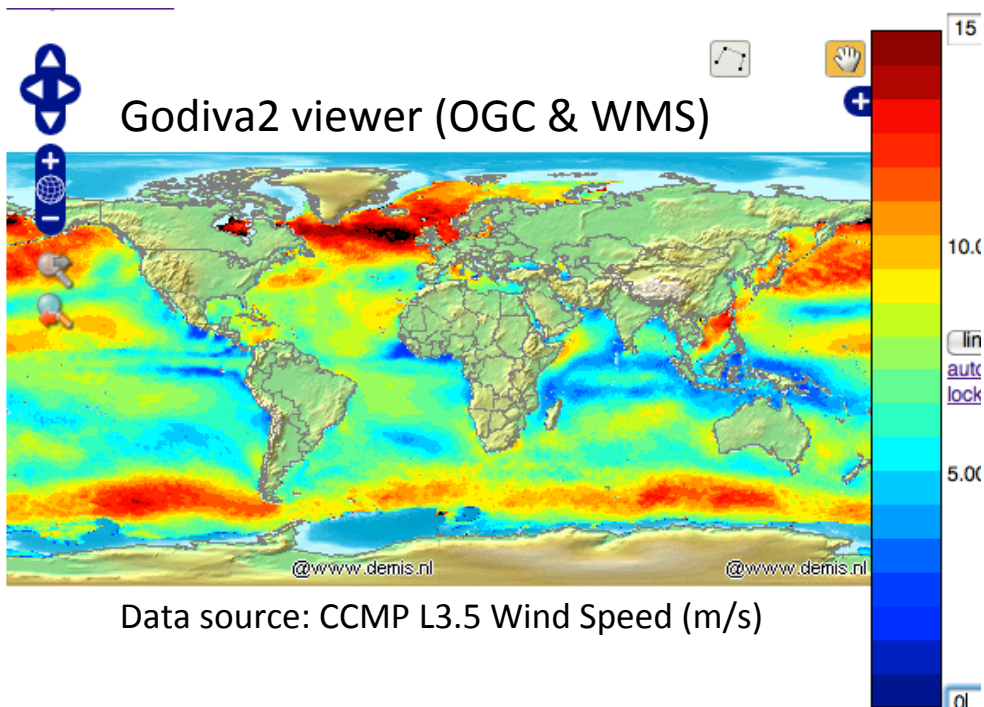
Thematic Real-time Environmental
Distributed Data Service (**THREDDS**):

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

➤ **20** Datasets

➤ Access plug-ins: OPeNDAP, WCS, WMS, NetcdfSubset, NCML, UDDC, ISO

➤ Web-based Data Viewers: IDV, NetCDF-Java ToolsUI, Godiva2





New Web Portal



- More intuitive and streamlined layout
- Dynamic look and feel
- Tabs to reduce clutter
- Announcements more pronounced

Faceted and Keyword Searching



HiTide: Swath/Level 2 data visualizer and subsetter

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

Filters

- DataSets +
 - ASCATA-L2-25km
- Region +
 - Global
- DateRange +
 - Entire Range

Legend

25.00
22.50
20.00
17.50
15.00
12.50
10.00
7.50
5.00
2.50
0.00

Units : m s⁻¹

Saved Filters

Data Preview

➤ **6 Datasets Available**

* Displaying the first 10 items

	Granule Name	Start Time	End Time	Lower Bo...	Upper Bo...	NetCDF3	HDF4
☒	ascat_20131203_172700_metopa_36967_eps_o_250_2200_ovw.l2.nc	2013-12-03T17:27:...	2013-12-03T19:08:...	-180 -88.08...	180 87.7865		
☐	ascat_20131203_154500_metopa_36966_eps_o_250_2200_ovw.l2.nc	2013-12-03T15:45:...	2013-12-03T17:26:...	-180 -88.8507	180 89.23384		
☐	ascat_20131203_140300_metopa_36965_eps_o_250_2200_ovw.l2.nc	2013-12-03T14:03:...	2013-12-03T15:44:...	0.59526 -8...	348.11182 ...		
☐	ascat_20131203_122100_metopa_36964_eps_o_250_2200_ovw.l2.nc	2013-12-03T12:21:...	2013-12-03T14:02:...	-180 -88.17...	180 89.0194		
☐	ascat_20131203_104200_metopa_36963_eps_o_250_2200_ovw.l2.nc	2013-12-03T10:42:...	2013-12-03T12:20:...	-180 -89.27...	180 88.4029		
☐	ascat_20131203_090000_metopa_36962_eps_o_250_2200_ovw.l2.nc	2013-12-03T09:00:...	2013-12-03T10:41:...	-180 -87.47...	180 88.44302		
☐	ascat_20131203_071800_metopa_36961_eps_o_250_2200_ovw.l2.nc	2013-12-03T07:18:...	2013-12-03T08:59:...	-180 -89.30...	180 88.99119		
☐	ascat_20131203_053600_metopa_36960_eps_o_250_2200_ovw.l2.nc	2013-12-03T05:36:...	2013-12-03T07:17:...	-180 -88.09...	180 87.76248		

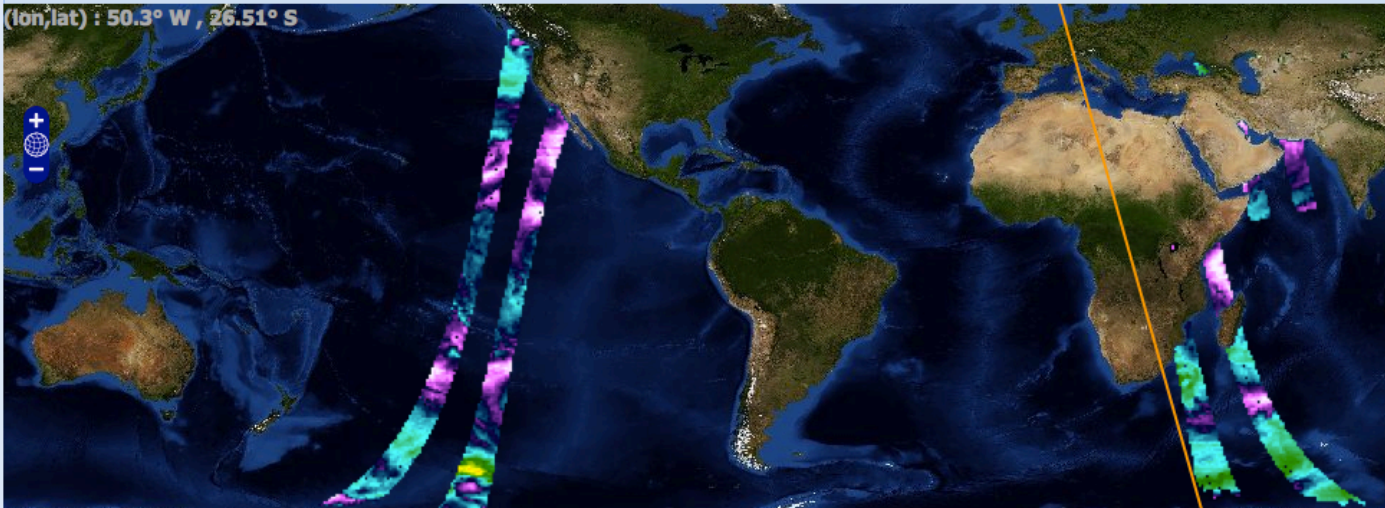
Get Next 10
 Download Selected
 Download All

Coverage Preview - displaying Granule Name : ascat_20131203_172700_metopa_36967_eps_o_250_2200_ovw.l2.nc

Variable: wind_speed

Generate Image Preview
 Legend

(lon,lat) : 50.3° W , 26.51° S





Live Access Server (LAS) – Level 3 subsetter

<http://thredds.jpl.nasa.gov/las/getUI.do>



Live Access Server

About LAS

PO.DAAC LAS v7.3

➤ 25 Datasets Available

OPeNDAP (F-TDS)

Choose dataset

Update Plot ☒

Set plot options

Animate

Compare

Google Earth

Show Values

Export to Desktop Application

Save As ...

Link To ...

Print

Ocean Surface Topography / CSEOF Reconstructed Sea Level (loading of Date selection may cause a few seconds delay)

reconstructed SSHA

Close

Select a dataset category.

- ☒ Chlorophyll
- ☒ Climate Intercomparison
- ☒ Gravity
- ☒ Ocean Surface Currents
- ☒ Ocean Surface Topography
 - ☒ CSEOF Reconstructed Sea Level
 - ☒ reconstructed SSHA
- ☒ Ocean Temperature
- ☒ Ocean Winds
- ☒ Sea Surface Salinity

Download Data

Selected Region

Longitude range: [37.96875, 397.96875]

Latitude range: [-130.78125, 49.21875]

Select Format

☒ NetCDF

ASCII

CSV

arcGrid

Select Time

16-Jun-1950

OK

Web Services

<http://podaac.jpl.nasa.gov/ws/>

- Integrated set of PO.DAAC Web-services for dataset/granule search & subsetting
- WS: APIs that can be accessed via web protocols (HTTP) with well-defined parameter extensions
(General Form: <http://podaac.jpl.nasa.gov/ws/service?parameters>)
- Returns: response as XML structure or in JSON (*JavaScript Object Notation*) format
- Utility: programmatic calls to CWS via HTTP request and sequentially drill down dataset information hierarchy

Dataset Discovery



Dataset Metadata



Granule Search



Granule Metadata



Granule Subset/Extract

WebServices

The following is the list of available PO.DAAC Web Services

Name	Description
Dataset Metadata	Dataset metadata service retrieves the metadata of a dataset on PO.DAAC's dataset catalog using the following parameters: datasetId, shortName, and format.
Granule Metadata	Granule metadata service retrieves the metadata of a granule on PO.DAAC's catalog using the following parameters: format and other optional parameters.
Search Dataset	Dataset Search service searches PO.DAAC's dataset catalog, over Level 2, Level 3, and Level 4 datasets, using the following parameters: datasetId, shortName, startTime, endTime, bbox, and others.
Search Granule	Search Granule does granule searching on PO.DAAC level 2 swath datasets (individual orbits of a satellite), and level 3 & 4 gridded datasets (time averaged to span the globe). The following parameters are supported: datasetId, shortName, startTime, endTime, bbox, and others.

Webification (w10n) Service

<http://podaac-w10n.jpl.nasa.gov>

Allows a user to gain “access into a data granule via the web and the power of a well-formed URL”.

A well-formed URL with output in JSON format: (example below)

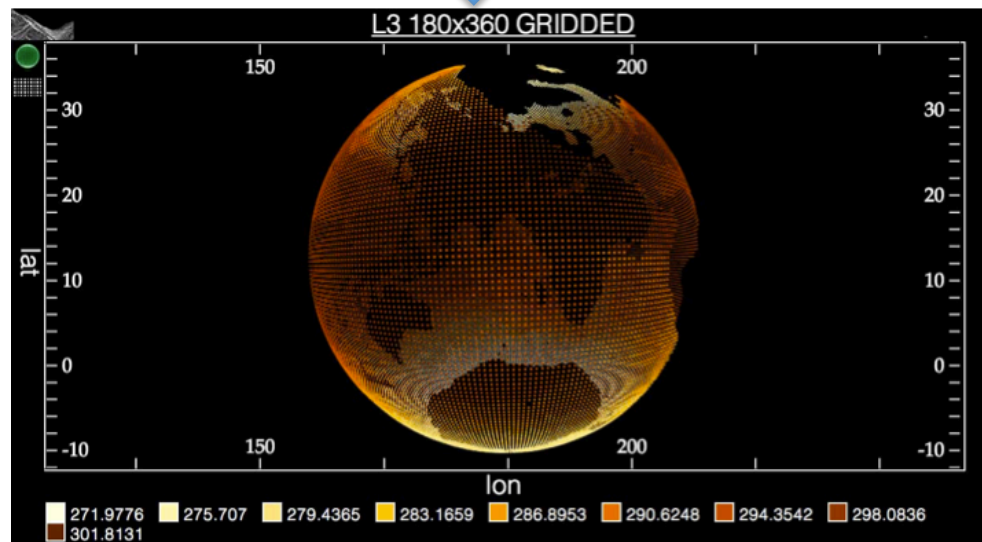
[http://podaac-w10n.jpl.nasa.gov/w10n/allData/ghrsst/data/L2P/MODIS_A/JPL/2013/168/20130617-MODIS_A-JPL-L2P-A2013168000000.L2_LAC_GHRSSST_D-v01.nc.bz2/sea_surface_temperature\[0:1,0:2030:135,0:1354:135\]?output=json](http://podaac-w10n.jpl.nasa.gov/w10n/allData/ghrsst/data/L2P/MODIS_A/JPL/2013/168/20130617-MODIS_A-JPL-L2P-A2013168000000.L2_LAC_GHRSSST_D-v01.nc.bz2/sea_surface_temperature[0:1,0:2030:135,0:1354:135]?output=json)

Output: netCDF file subset.

Implements the w10n specification, supporting formats like netCDF and HDF 4/5.

Embedded 3D Visualization Services

```
<script data-main="// .jpl.nasa.gov/widgets/plot/0.9/js/main.js"
src="//cds.jpl.nasa.gov/widgets/plot/0.9/components/requirejs/require.js"></script>
```





Conclusions

- **Where we are at:**
 - A system-focused data stewardship model
 - The Lifecycle Policy is maturing, a continued work in progress
 - continually growing and evolving data sources
 - continually expanding data access services and tools

- **Where are we going:**
 - DOI's are being scoped and to be rolled out by end of 2014
 - Create public info page on Dataset Lifecycle process for both users and data providers
 - QQCL items to be prioritized and fully implemented as a strategic task
 - Revise existing data and metadata model to accommodate airborne and in situ datasets

- **Where we want to go:**
 - Find or develop a workaround to enable THREDDS to accommodate Level 2 datasets
 - Reprocess non-HDF/netCDF datasets to netCDF format when feasible to promote interoperability
 - Develop an internal automated metadata checker to validate dataset and granule metadata with numerous metadata standards (i.e., CF, ACDD, ISO).
 - Public forum and knowledge-base for transparent and interactive user support.