

# TOPEX Reprocessing

## OSTST

## October 2011

October 21, 2011

Phil Callahan

# Outline

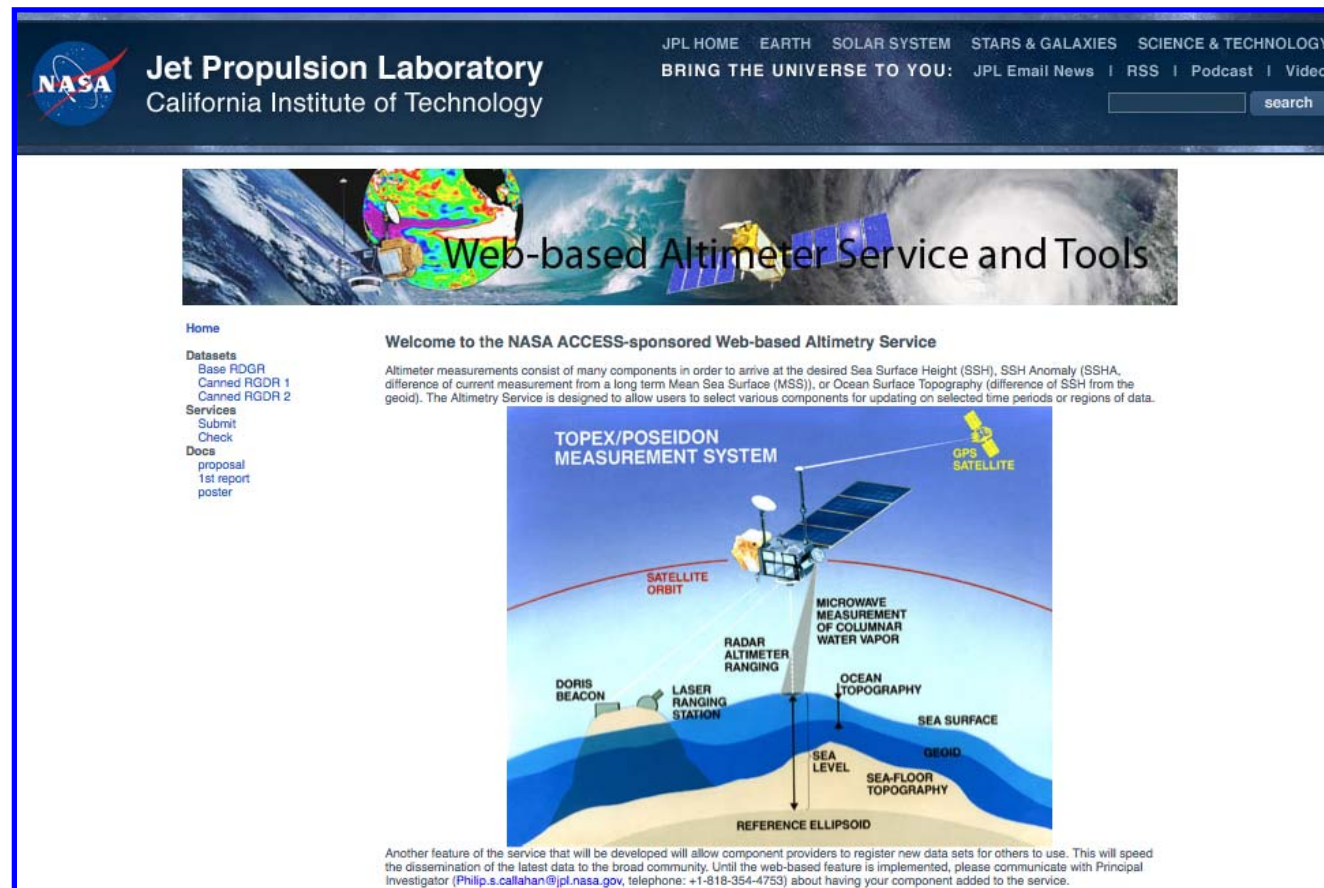
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- Background
- Currently Available Data
- NOAA Climate Data Records Grant
- Detailed Plans
- -----

- Recent reprocessing
  - 2007 OSTST: Retracked with hand-fit PTRs. General agreement with GDR; SSB more consistent with Jason
  - 2009 OSTST: Retracked with automated-fit PTRs and updated weights
    - Alt-A changed GDR trend
    - Alt-B generally agrees with GDR
    - Both Alt-A and Alt-B SSB more like original GDR, less like Jason
  - 2010 OSTST: question about CG correction and 59 day variation
    - CG correction validated. Other 59 d variation not fully resolved
- NASA ACCESS Work – Altimeter Web Service
  - **Converted TOPEX RGDR 2009 to netcdf with updated orbits, GOT 4.7 tide**
  - Develop tool to update netCDF altimeter data on demand – initially TOPEX with orbits, tides, along-track corrections (point files)
  - Can “install” improved data for implemented types

# Background and Currently Available Data (2 of 2)

- TOPEX netCDF RGDR 2009 data available at PODAAC
  - <http://podaac.jpl.nasa.gov/dataaccess> second bar → PODAAC\_Labs
  - <http://podaac.jpl.nasa.gov/> → PODAAC\_Labs on far right on Home page



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 Canned RGDR 1  
 Canned RGDR 2  
 Services  
 Submit  
 Check  
 Docs  
 proposal  
 1st report  
 poster

**Web-based Altimeter Service and Tools**

**Welcome to the NASA ACCESS-sponsored Web-based Altimetry Service**

Altimeter measurements consist of many components in order to arrive at the desired Sea Surface Height (SSH), SSH Anomaly (SSHA, difference of current measurement from a long term Mean Sea Surface (MSS)), or Ocean Surface Topography (difference of SSH from the geoid). The Altimetry Service is designed to allow users to select various components for updating on selected time periods or regions of data.

**TOPEX/POSEIDON MEASUREMENT SYSTEM**

GPS SATELLITE  
 MICROWAVE MEASUREMENT OF COLUMNAR WATER VAPOR  
 RADAR ALTIMETER RANGING  
 LASER RANGING STATION  
 OCEAN TOPOGRAPHY  
 SEA SURFACE  
 SEA LEVEL  
 SEA-FLOOR TOPOGRAPHY  
 REFERENCE ELLIPSOID  
 DORIS BEACON  
 SATELLITE ORBIT

Another feature of the service that will be developed will allow component providers to register new data sets for others to use. This will speed the dissemination of the latest data to the broad community. Until the web-based feature is implemented, please communicate with Principal Investigator (Philip.s.callahan@jpl.nasa.gov, telephone: +1-818-354-4753) about having your component added to the service.

- **Select Submit a Job**
- User enters email to send link to results, selects updates to do.
- Click on links for data subsetting: Cycle/Pass or Space/Time.
- When all selections are made, a job is submitted on the server. When the job is completed, an email is sent to the user with a link to retrieve the data.
- Plots of data can be viewed on web page

- **Generation of Altimeter Climate Data Records Using Retracking and Updated Corrections**
  - With Shannon Brown, Shailen Desai, Bruce Haines
- **Three year effort (FY12-14) to deliver updated, climate-quality TOPEX data to PODAAC and NOAA**
  - Develop and apply systematic PTR fitting and retracking
  - Assess and correct the 59 day variation in the data
  - Apply the newest versions of orbits, tide model(s) (1 or 2), mean sea surface, and atmospheric corrections
  - Apply reprocessed radiometer data
  - Fit the newly processed data to estimate the SSB for each altimeter
- **➔ Make compatible with GDR standard of ~ 2013**
- **Work just starting. First tasks**
  - Assess 59 day variations
  - Review, revise PTR and weights fitting
  - Consider new retracking methods. Cooperation with CNES/CLS

# BACKUP

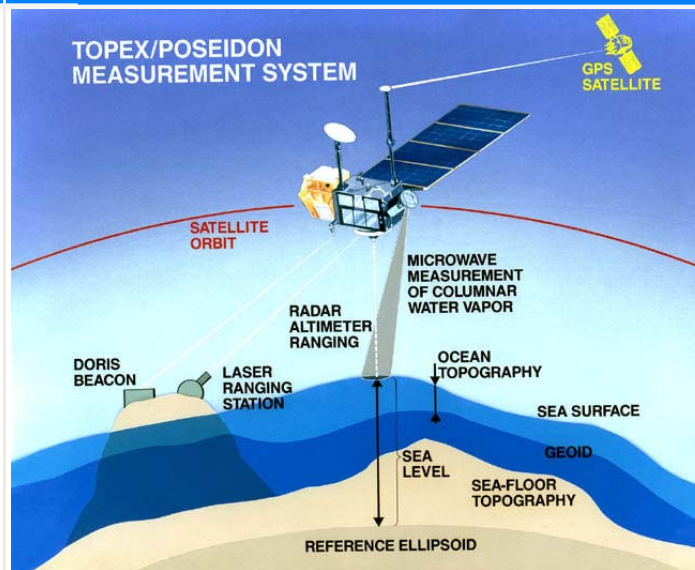
# ALTIMETER WEB SERVICE

# Web-based Altimeter Service

Phil Callahan, JPL

## Objectives

- Develop a web-based tool for subsetting and updating altimeter data
  - Altimeter data consist of several specialized “components” that are updated by different groups at irregular intervals.
  - Specialized data exist for localized areas.
- Work with providers to get tool access to data and models as they are updated.
  - Locate specialized models for coastal areas.



## Altimeter Sea Surface Height Measurement Components for Updating:

- Orbit
- Tides
- Radiometer
- Atmospheric - range, inverse barometer
- Geoid
- Range processing, corrections

## Approach

- Build on SciFlo system for user interface, data access, algorithm control
- Modularize Geophysical Data Record (GDR) update algorithms to provide processing functionality
- Integrate SciFlo and GDR algorithms
- Work with scientists, data centers to get access to models and data sets

## Co-Is

- Rob Raskin (JPL), Brian Wilson (JPL)

## Accomplishments

- ✓ Web interface has email login and status checking capabilities
- ✓ Data can be selected by cycle, pass ranges or set of passes that go through a lat, lon box
- ✓ Produced capability to update orbits using standard POD format
- ✓ Produced capability to update tides in Goddard format
- ✓ Produced capability to update any point-by-point correction
- ✓ Produced TOPEX data in netCDF format compatible with ongoing Jason missions
- ✓ Generate updated sea surface height (SSH) and anomalies (SSHA) data
- ✓ Introduced “webification” – inline display of attributes and plotting of netCDF data
- ✓ Will link to new PO.DAAC pages

TRL\_in = 5-6; TRL\_out = 7

**ACCESS**

Advancing Collaborative Connections  
for Earth System Science



# First User Screen



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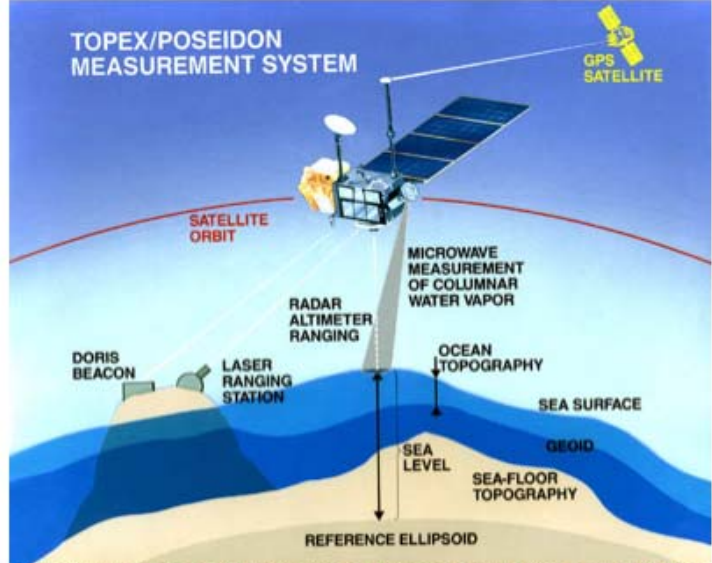
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- Home
- Datasets
  - Base RDGR
  - Canned RGDR 1
  - Canned RGDR 2
- Services
  - Submit
  - Check
- Docs
  - proposal
  - 1st report
  - poster

### Welcome to the NASA ACCESS-sponsored Web-based Altimetry Service

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# Second User Screen – Submit



## Home

### Datasets

Base RDGR  
Canned RGDR 1  
Canned RGDR 2

### Services

Submit  
Check

### Docs

1st report  
poster

## Submit A Job

Please provide your email address:

Click to select a method:

[by spatial and temporal constraints](#)  
[by cycle and pass number](#)

Check operators:

- aws.component.orbit.Updater
- aws.component.orbit1.Updater
- aws.component.tide.Updater
- aws.component.tide1.Updater
- aws.product.ssha.Creator

- User enters email to send link to results, selects updates to do.
- Click on links for data subsetting: Cycle/Pass or Space/Time.
- When all selections are made, a job is submitted on the server. When the job is completed, an email is sent to the user with a link to retrieve the data.
- Data can be viewed through a browser as shown below.

# Third User Screen – Webification

[http://altiserv/aws/dataset/base\\_rgdr/cvc362/Trgdr\\_362\\_021.nc/?output=html](http://altiserv/aws/dataset/base_rgdr/cvc362/Trgdr_362_021.nc/?output=html)

Parent URL



ATTRIBUTES (60)

[agc\\_c](#) [meta: [json](#), [html](#)] [data: [netcdf](#), [big-endian](#), [little-endian](#), [json](#)]

s, (2833,)

ATTRIBUTES (6)

\_FillValue: [32767]  
 comment: AGC is corrected for instrumental error  
 coordinates: lon lat  
 long\_name: C band corrected AGC  
 scale\_factor: [ 0.01]  
 units: dB

[agc\\_ku](#) [meta: [json](#), [html](#)] [data: [netcdf](#), [big-endian](#), [little-endian](#), [json](#)]

s, (2833,)

ATTRIBUTES (7)

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1, (2833,)

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Parent URL



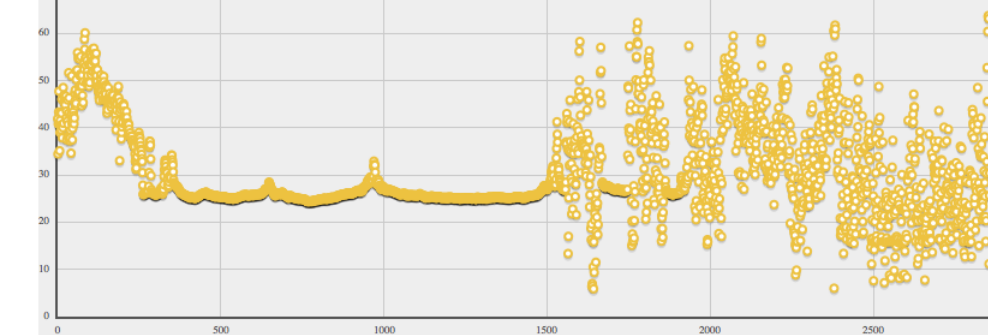
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s, (2857,)

ATTRIBUTES (6)

Plot of [agc\\_c\[0:2857\]](#), valid:2857, total:2857

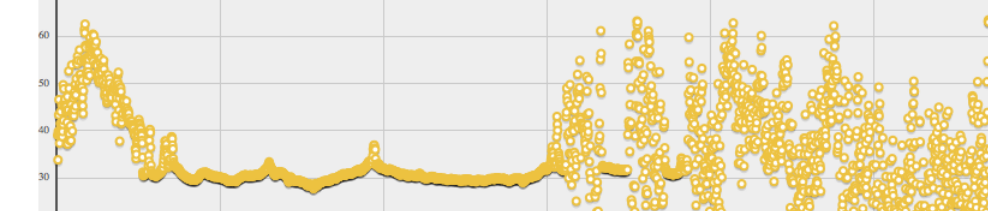


[agc\\_ku](#) [meta: [json](#), [html](#)] [data: [netcdf](#), [big-endian](#), [little-endian](#), [json](#)]

s, (2857,)

ATTRIBUTES (6)

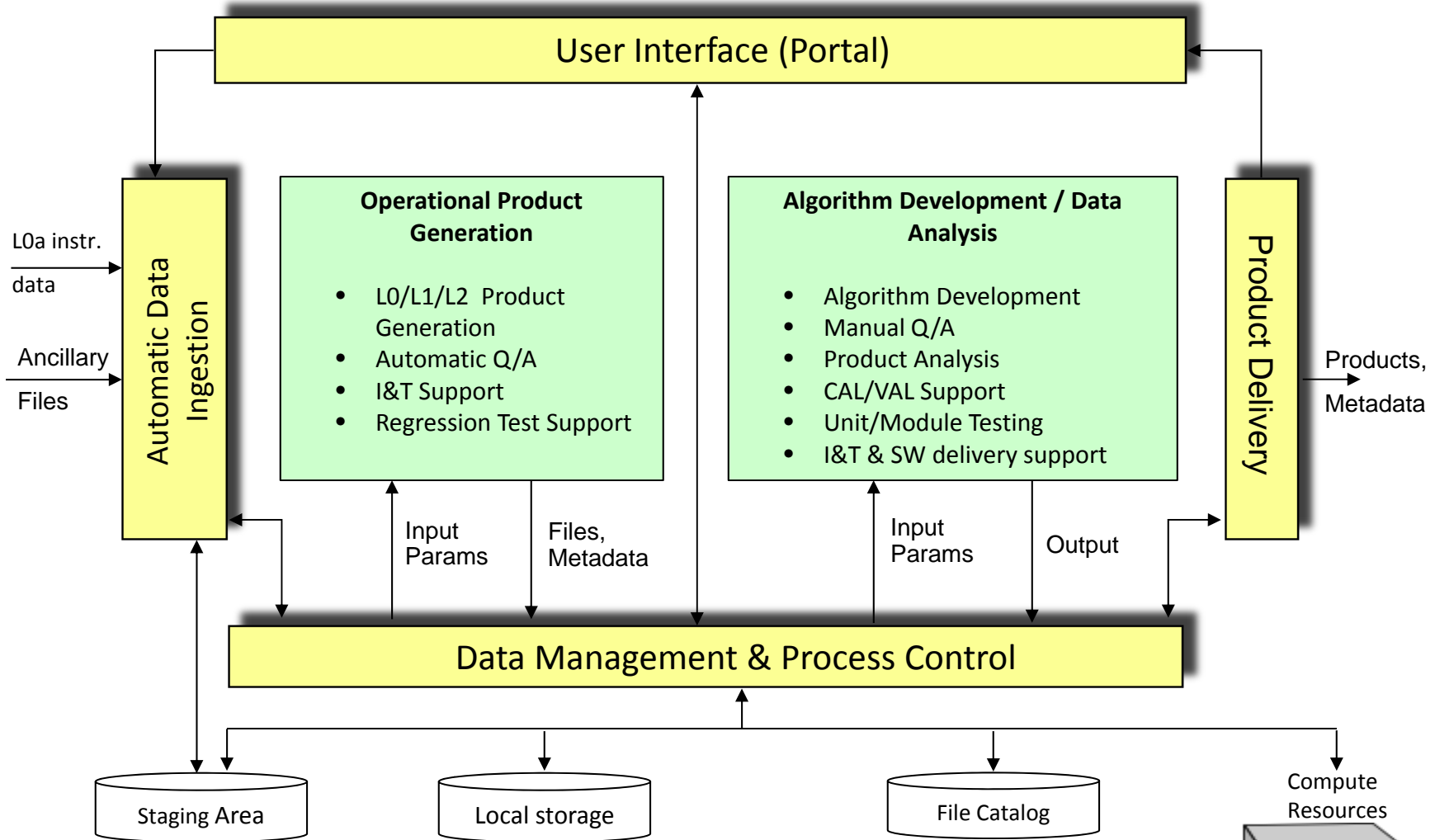
Plot of [agc\\_ku\[0:2857\]](#), valid:2857, total:2857



# SCIENCE DATA CENTER BASELINE ARCHITECTURE

- Architecture Overview
- Scenarios and Margins
- Baseline

# Science Data System (SDS) Functional Architecture

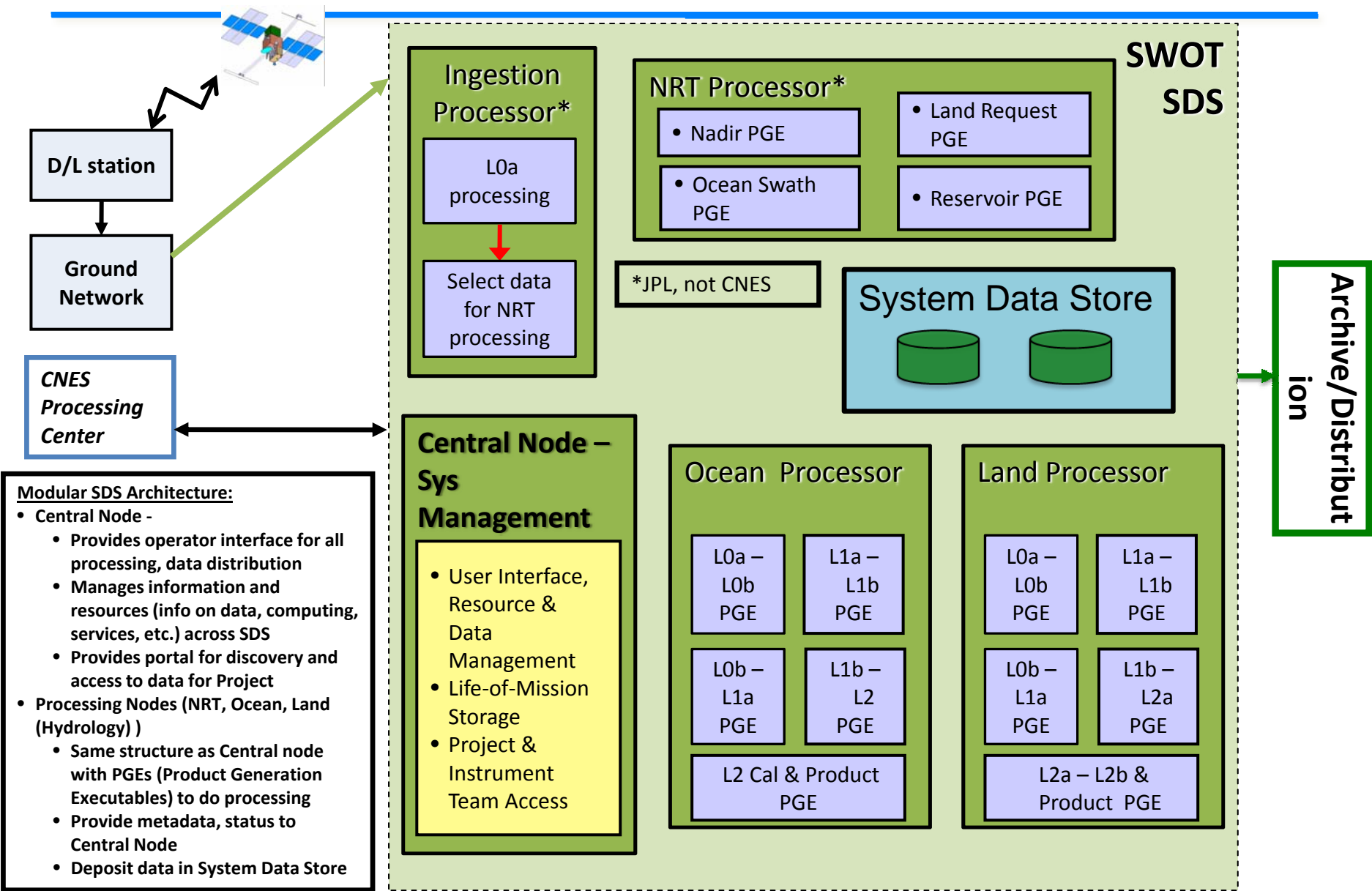


## Sec 388 Generic Science Processing Framework





# Science Data System High Level



- Modular SDS Architecture:**
- Central Node -
    - Provides operator interface for all processing, data distribution
    - Manages information and resources (info on data, computing, services, etc.) across SDS
    - Provides portal for discovery and access to data for Project
  - Processing Nodes (NRT, Ocean, Land (Hydrology))
    - Same structure as Central node with PGEs (Product Generation Executables) to do processing
    - Provide metadata, status to Central Node
    - Deposit data in System Data Store


- Central Node - Sys Management**
- User Interface, Resource & Data Management
  - Life-of-Mission Storage
  - Project & Instrument Team Access

**NRT Processor\***

- Nadir PGE
- Ocean Swath PGE
- Land Request PGE
- Reservoir PGE

\*JPL, not CNES

**System Data Store**



**Ocean Processor**

- L0a - L0b PGE
- L1a - L1b PGE
- L0b - L1a PGE
- L1b - L2 PGE
- L2 Cal & Product PGE

**Land Processor**

- L0a - L0b PGE
- L1a - L1b PGE
- L0b - L1a PGE
- L1b - L2a PGE
- L2a - L2b & Product PGE

**SWOT SDS**

**Archive/Distribution**