



# NOAA CoastWatch/ OceanWatch Ocean Color Data Dissemination

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and the NOAA CoastWatch/OceanWatch Team

\*Global Science & Technology, Inc.

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**STAR** Center for Satellite  
Application and Research  
National Environmental Satellite, Data, and Information Service (NESDIS)



# NOAA CoastWatch/OceanWatch Team

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Full Time Technical Team	With Support From
Heng Gu	Veronica Lance
Phil Keegstra	Emily Smail
Sathya Ramachandran	John Stachnewicz
Michael Soracco	Ryan Wattam

# Suomi NPP VIIRS OC Data Products

- Near Real Time (Days 1-14)

- Global
- Regional



*Code has been transitioned,  
OSPO is now producing test data.*

- Science Quality (Day 15 – 2 Jan 2012\*)

- Global
- Regional

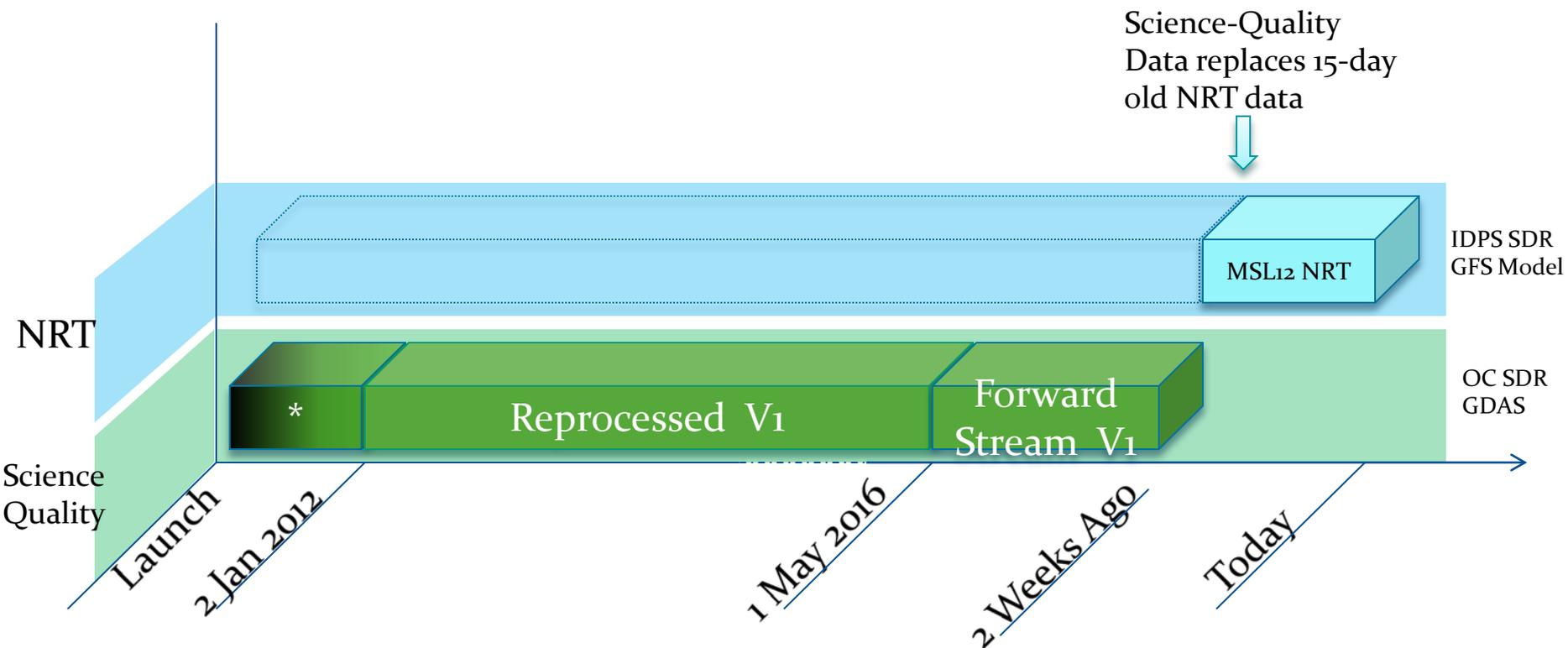
\* *Data from early mission (since launch Nov. 2011 to 2 Jan 2012) are available only upon special request and will be provided with a quality warning.*



# NRT & Science Quality Data

Attribute	Near-Real Time	Delayed-Mode/Science-Quality
Latency:	Best effort, as soon as possible (~12-24h)	Best effort, on a 2-week delay
Processing System:	<b>MSL12</b>	<b>MSL12</b>
SDR:	<b>IDPS Operational SDR</b>	<b>OC-improved SDR</b>
Ancillary Data:	Global Forecast System (GFS) Model	Science quality (assimilated; GDAS) from NCEP
Spatial Coverage:	May be gaps due to various issues	Complete global coverage
Processed by:	CoastWatch, transferring to OSPO (operational) FY16	NOAA/STAR
Distributed by:	CoastWatch , OSPO	CoastWatch, NCEI
Archive Plans:	Yes, from OSPO to NCEI	Yes, from CoastWatch to NCEI
Full Mission Reprocessing:	No	Yes, every ~2-3 years or as needed

# Example “Snapshot”



*\*Early mission data are not publically distributed due to quality issues. They can be specially requested but will come with a quality warning.*

# L2 & L3 Global Products

- Standard:

- Chlorophyll-a
  - Kd490
  - KdPAR
  - nLw\_412
  - nLw\_445
  - nLw\_488
  - nLw\_555
  - nLw\_672
- L2\_flags
  - Latitude
  - Longitude

- Experimental:

- IOPs
- PAR

*Future  
inclusion  
as released by MECB*

# L2 & L3 Regional Products

- Standard:

- Chlorophyll-a
- Kd490
- KdPAR
- nLw\_412
- nLw\_445
- nLw\_488
- nLw\_555
- nLw\_672
- L2\_flags
- Latitude
- Longitude
- Edgemask

- Experimental:

- IOPs
- PAR

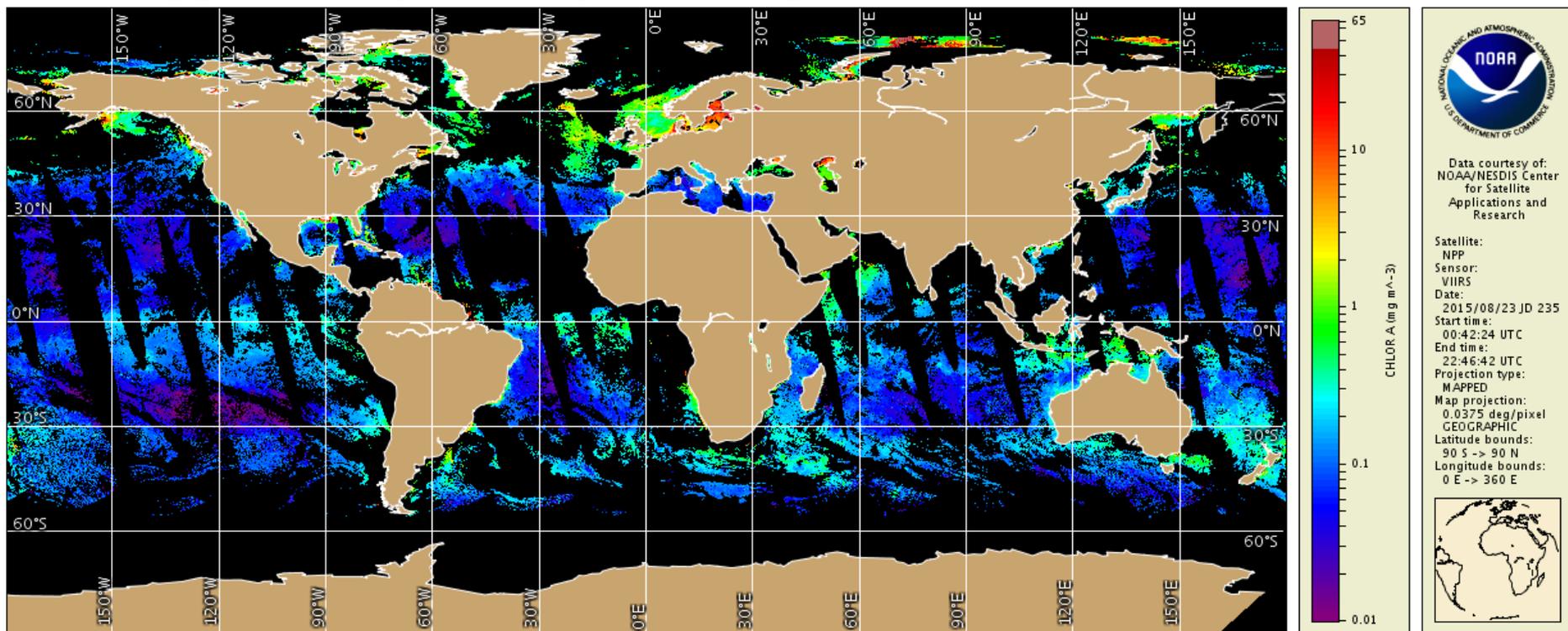
*Future  
inclusion  
as released by MECB*

- User Driven (“Customized” routine production; considered upon request):

- HAB anomaly product
- $R_{rs}$
- Special projections
- Etc.

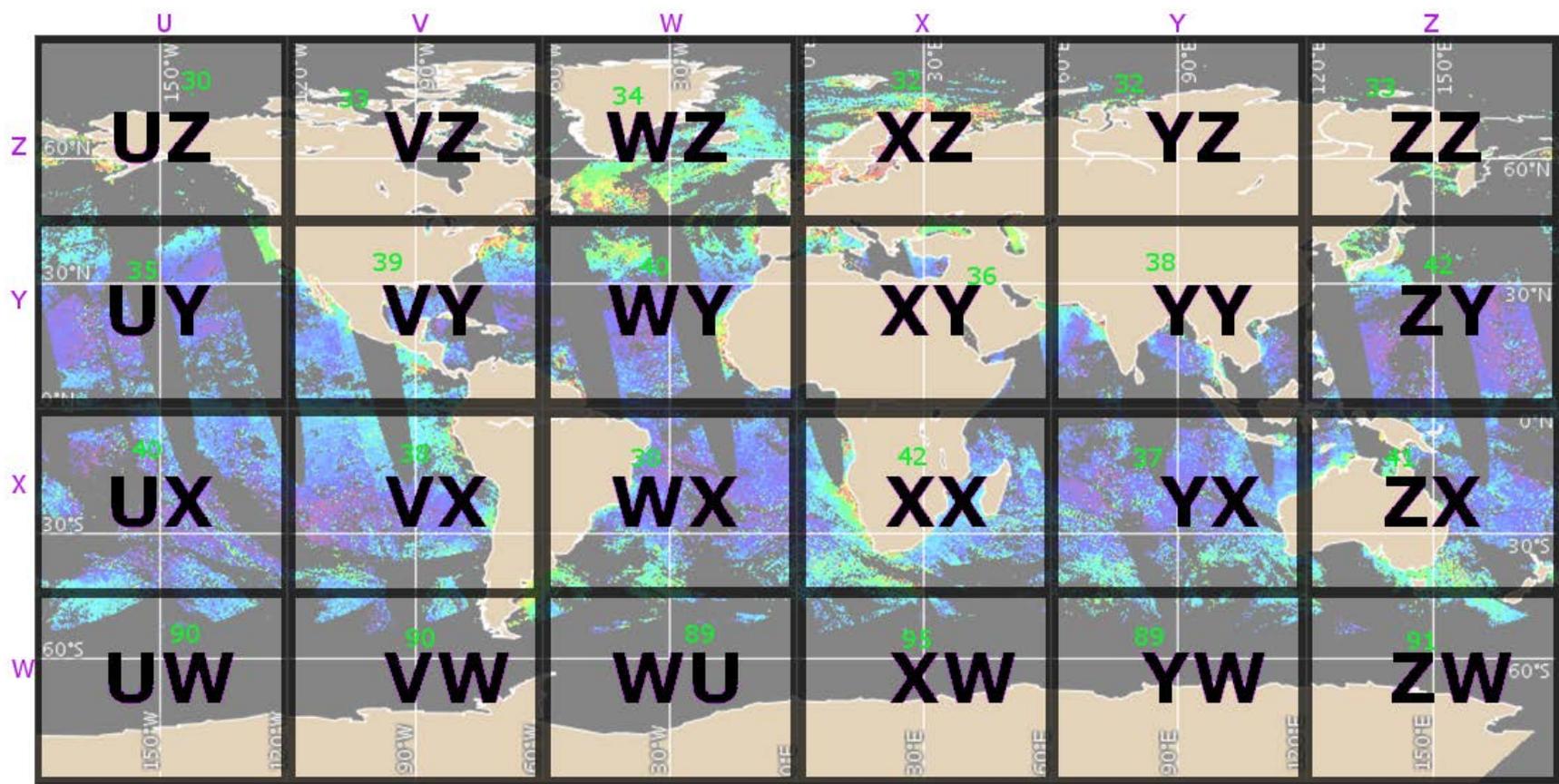
# L3 Global 4km

(mapped, daily, weekly monthly)



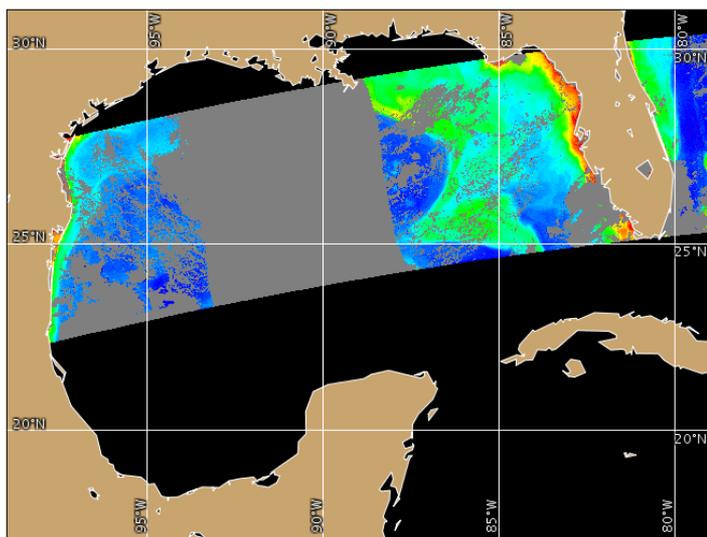
Pictured is daily NRT Chlorophyll-a [mg m<sup>-3</sup>];

# L3 Global 750m Sectors

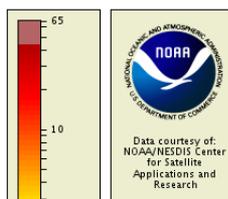


# L3 Regional

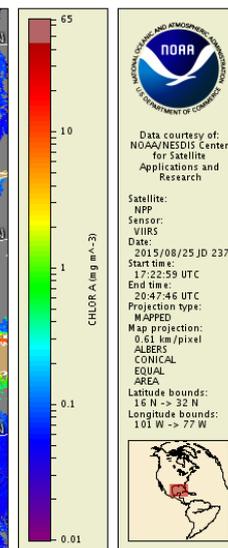
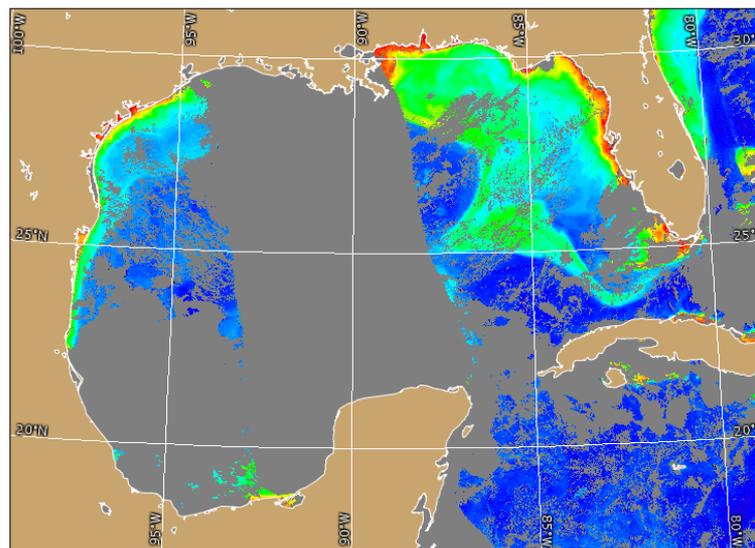
- “CONUS” 750m regions: Hawaii, West Coast, Great Lakes, Northeast, Southeast, Gulf of Mexico, Caribbean



Granule

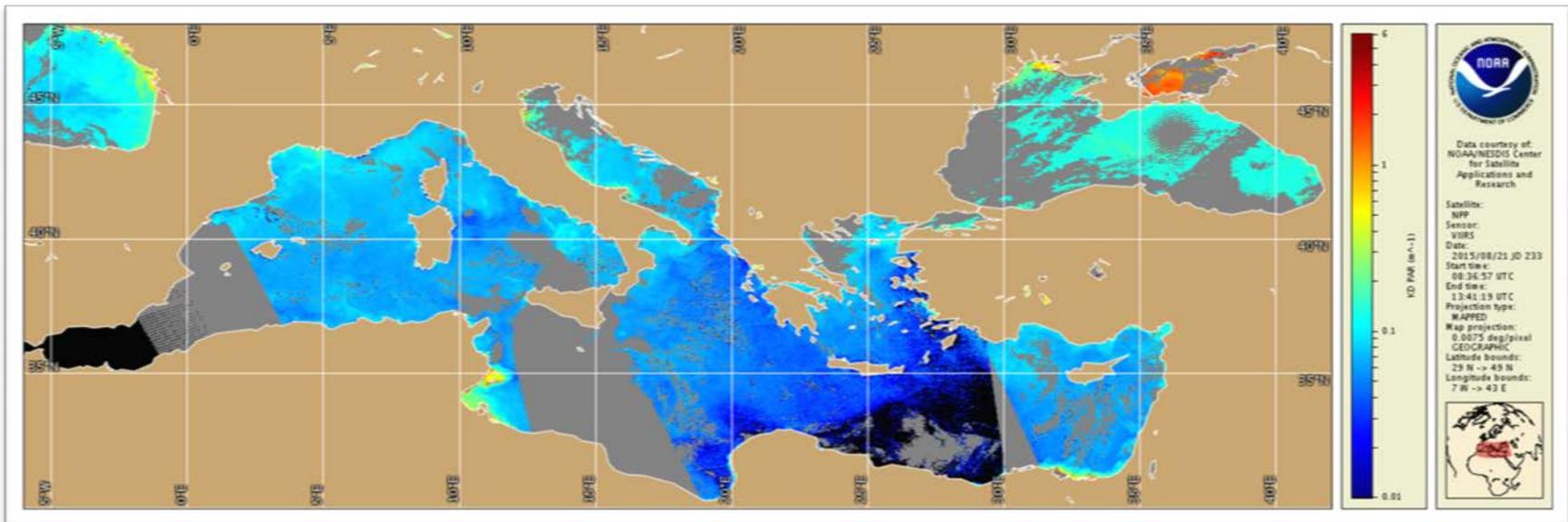


Daily Merge



# L2 Regional Partners (1)

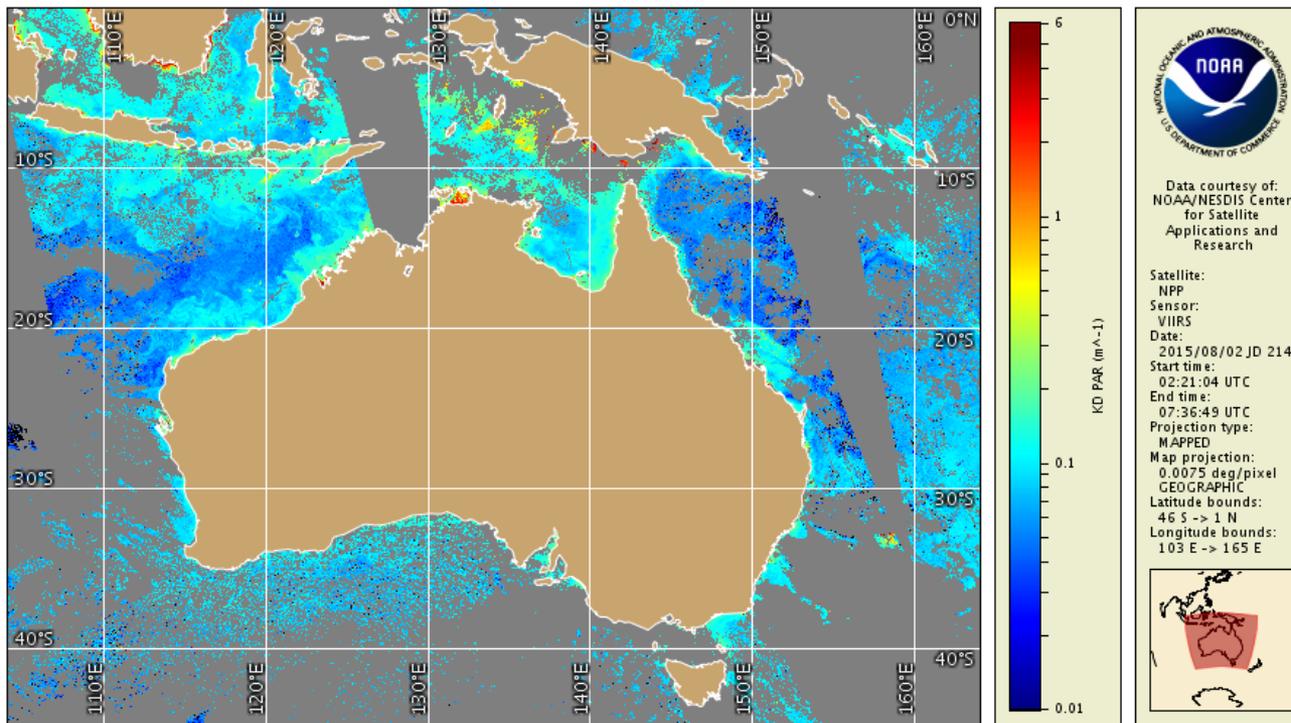
- EUMETSAT
  - Processing and staging of L2 750m Mediterranean datasets
  - EUMETcast (Copernicus Service) broadcasts VIIRS data to EU



Shown: L3 Daily merge, mapped,  $k_d$ PAR [ $m^{-1}$ ]

# L3 Regional Partners (2)

- CSIRO
  - Processing and staging of L3 Australia 750m datasets



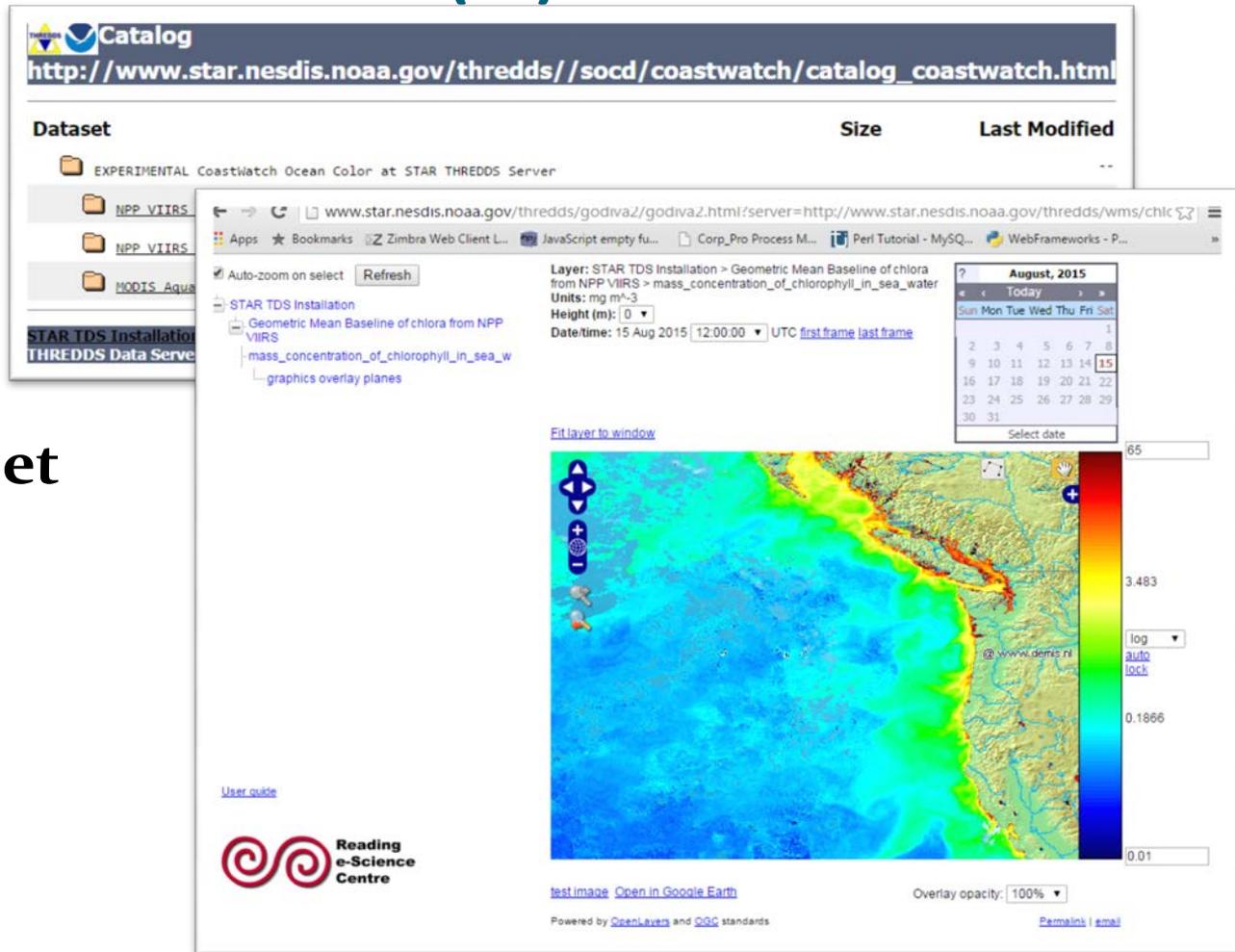
Daily Merge, mapped,  $k_d$ PAR [ $m^{-1}$ ]

# Data Formats

- Global / Sector:
  - NetCDF (v4 CF)
  - GeoTIFF & PNG
- Regional:
  - NetCDF(v4 CF)
  - GeoTIFF & PNG
  - HDF (v4 with CoastWatch metadata; to be phased out)

# Access & Protocols (1)

- HTTP
- FTP
- THREDDS
  - OPENDAP
  - NetcdfSubset
  - WCS
  - WMS
  - NCML
  - ISO
  - UDDC



The screenshot displays a web browser interface for a THREDDS catalog. The address bar shows the URL: [http://www.star.nesdis.noaa.gov/thredds//socd/coastwatch/catalog\\_coastwatch.html](http://www.star.nesdis.noaa.gov/thredds//socd/coastwatch/catalog_coastwatch.html). The page lists a dataset titled "EXPERIMENTAL Coastwatch Ocean Color at STAR THREDDS Server" with sub-folders for "NPP\_VIIRS" and "MODIS\_Aqua".

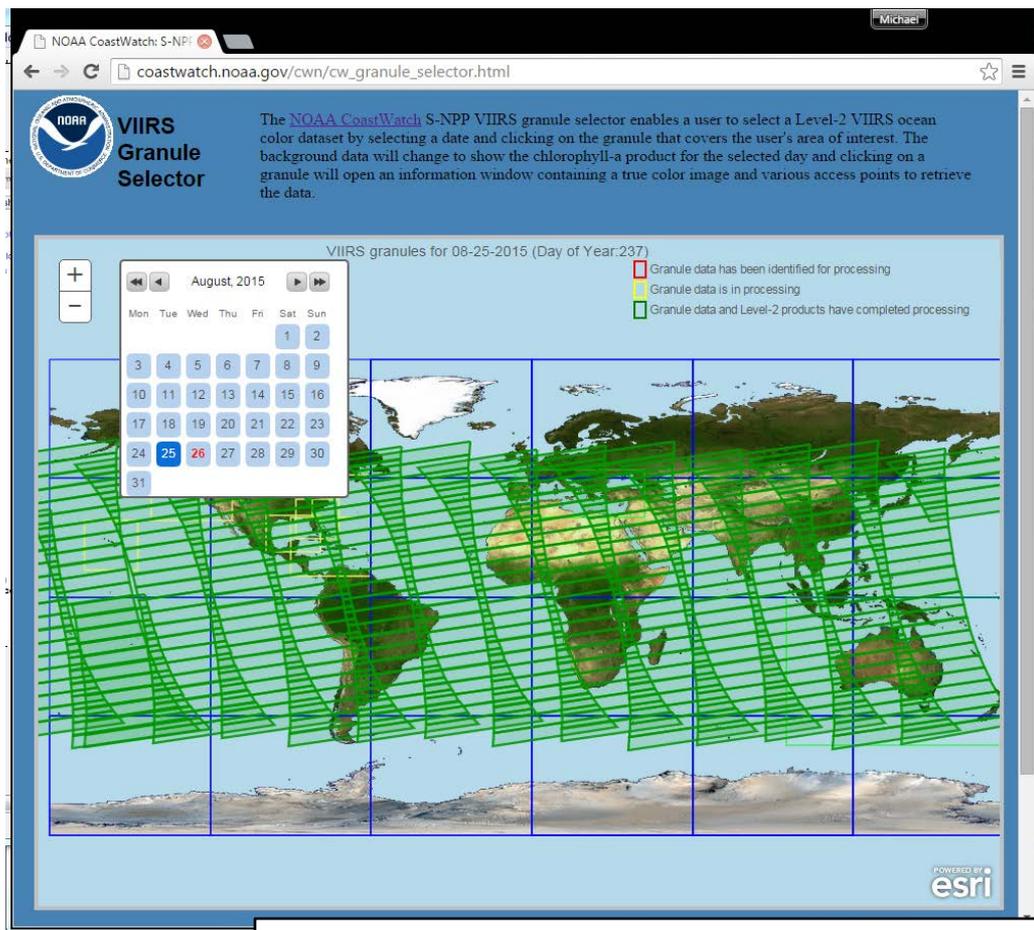
The main content area shows a selected layer: "STAR TDS Installation > Geometric Mean Baseline of chlora from NPP VIIRS > mass\_concentration\_of\_chlorophyll\_in\_sea\_water". The units are "mg m<sup>-3</sup>". The visualization is a map of the coastal region, color-coded by chlorophyll concentration. A color scale on the right ranges from 0.01 (blue) to 65 (red). The current date is August 15, 2015, at 12:00:00 UTC. The map includes navigation controls and a "Fit layer to window" button.

At the bottom of the page, there is a logo for the "Reading e-Science Centre" and a note: "Powered by OpenLayers and OGC standards".

# Access & Protocols (2)

- HTTP:
  - Present: <http://coastwatch.noaa.gov>
- FTP:  
<ftp://star.nesdis.noaa.gov/pub/socd/mecb/coastwatch/viirs/>
  - Present:
    - L2 datasets covering Mediterranean for EUMETSAT
    - L3 for Gulf of Mexico (CW HDF) for support of NOS HAB
    - Soon: FTP access to include THREDDS holdings (Q4 2015)
- THREDDS: <http://coastwatch.noaa.gov/thredds>

# L2 Granule Selector



NOAA CoastWatch: S-NPP  
coastwatch.noaa.gov/cwn/cw\_granule\_selector.html

**VIIRS Granule Selector**

The NOAA CoastWatch S-NPP VIIRS granule selector enables a user to select a Level-2 VIIRS ocean color dataset by selecting a date and clicking on the granule that covers the user's area of interest. The background data will change to show the chlorophyll-a product for the selected day and clicking on a granule will open an information window containing a true color image and various access points to retrieve the data.

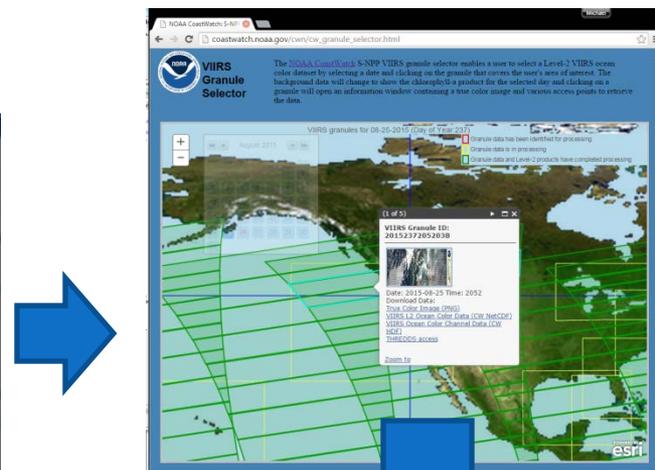
VIIRS granules for 08-25-2015 (Day of Year:237)

Granule data has been identified for processing  
 Granule data is in processing  
 Granule data and Level-2 products have completed processing

August 2015

Mon	Tue	Wed	Thu	Fri	Sat	Sun
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

POWERED BY esri



NOAA CoastWatch: S-NPP  
coastwatch.noaa.gov/cwn/cw\_granule\_selector.html

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VIIRS granules for 08-25-2015 (Day of Year:237)

Granule data has been identified for processing  
 Granule data is in processing  
 Granule data and Level-2 products have completed processing

VIIRS Granule ID:  
20152372052030

Date: 2015-08-25 Time: 2052

Download Data:  
 True Color Image (PNG)  
 VIIRS L2 Ocean Color Data (CW NetCDF)  
 VIIRS Ocean Color Channel Data (CW HDF)  
 THREDDS access



Date: 2015-08-25 Time: 2052  
 Download Data:  
True Color Image (PNG)  
VIIRS L2 Ocean Color Data (CW NetCDF)  
VIIRS Ocean Color Channel Data (CW HDF)  
THREDDS access

[http://coastwatch.noaa.gov/cwn/cw\\_granule\\_selector.html](http://coastwatch.noaa.gov/cwn/cw_granule_selector.html)

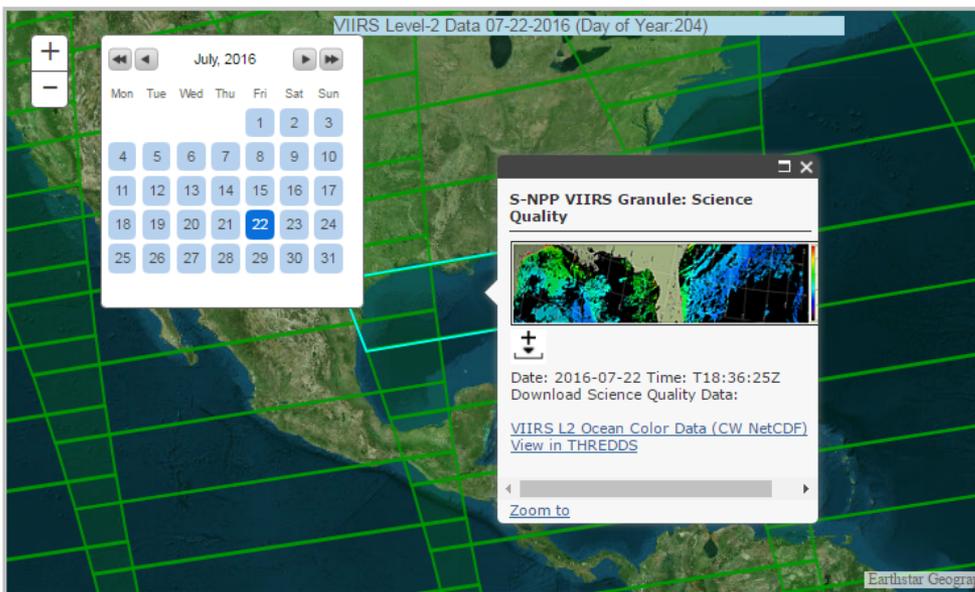
# Science Quality 'Life-of-Mission'



## CoastWatch Level-2 Granule Viewer

The [NOAA CoastWatch](#) The granule selector enables a user to select a Level-2 dataset by selecting a date and clicking on the map covers the user's area of interest. Clicking a granule will open an information window containing a link to the preview file. If multiple files are desired, clicking on the download icon (↓) will add the selected granule to a list that can be used to retrieve files.

Sensor: VIIRS on S-NPP Layers:  MGRS Grid for S-2 regions  CoastWatch Regions



- FTP OC 2012 to [Present – 15 days]:

<ftp://ftp.star.nesdis.noaa.gov/pub/socd1/mecb/coastwatch/viirs/science/L2/>

- Integrated with the same L2 Granule Selector tool
  - Present – 15 days: NRT Granules
  - 15 days old and prior: Science Quality
  - Includes data preview and data cart
- VIIRS SST RAN<sub>1</sub> will be included when ready
- OLCI OC will be included when ready for release

[http://coastwatch.noaa.gov/cw\\_n/cw\\_granule\\_selector.html](http://coastwatch.noaa.gov/cw_n/cw_granule_selector.html)

# Example of VIIRS OC Data Cart

Science Quality (forward processing)

Near real-time

Item	Data
1	VRSVCW.B2016216.181536.nc
2	V2016204184040_NPP_SCINIR_L2.nc

Clear Cart \* Removes all items

FTP List

For batch download



# Data Stewardship and Long-Term Archive by NCEI

- NOAA CoastWatch/OceanWatch is prepared to deliver MSL12 full mission science quality data (L2 and L3) for data stewardship and long-term archiving by NCEI.
- Arrangements among STAR (via CoastWatch), NCEI and CLASS are in progress.

# Website Revamp in Progress (1)

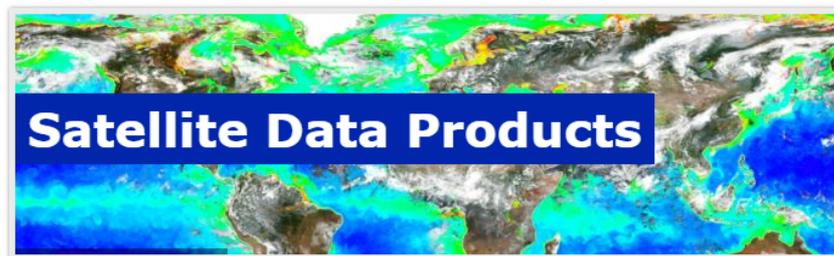
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[Satellite Data Products](#)
[Regional Nodes](#)
[Resources & Features](#)
[About](#)


**NOAA CoastWatch/OceanWatch**

[Stay Connected](#)

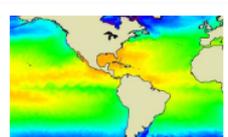






## NOAA CoastWatch/OceanWatch Mission

NOAA CoastWatch/OceanWatch provides easy access for everyone to global and regional satellite data products for use in managing and protecting ocean and coastal resources and for assessing impacts of environmental change in ecosystems, weather, and climate.



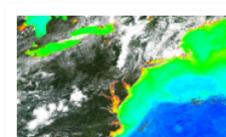
Satellite Data Products



Regional Nodes



Resources & Features



About

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- NOAA

Latest News

S-NPP VIIRS  
Life-of-Mission  
Science Quality  
Level-2 Ocean  
Color products  
are available.

CoastWatch  
Utility CDAT  
Version 3.3.2 is  
available.

# Website Revamp in Progress (2)

Home    Satellite Data Products    Regional Nodes    Resources & Features    About

 **NOAA CoastWatch/OceanWatch**    Stay Connected    

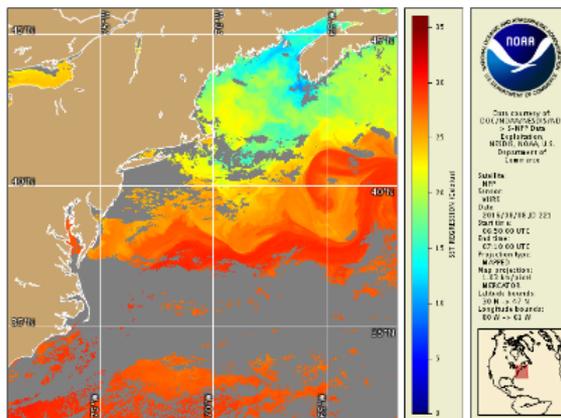
Data Access  
FTP  
Thredds

Documentation  
CATDB  
Users Guide

Information  
Contact

## VIIRS Sea Surface Temperature

Search  
Search  
 CoastWatch  
 NOAA



VIIRS SNPP ACSPO Near Real Time L3 Sea Surface Temperature [°C]

# Sentinel-3A

- A Cooperative Arrangement between the United States and the European Commission and technical arrangements between NOAA and EUMETSAT (and NOAA and ESA for S1 and S2) are all complete.
- NOAA is primary outlet in US for Sentinel 3 marine data.
- EUMETSAT data transfer via terrestrial multicast to NOAA/STAR is now routine. Data will be publically available as soon as EUMETSAT declares so.
- NOAA CoastWatch/OceanWatch to provide near real-time access to global OLCI and SLSTR data products from EUMETSAT. SRAL data also coming into STAR.
- OLCI data complements existing JPSS sensors:
  - 300m spatial resolution
  - Spectral bands meeting NOAA NOS HAB requirements
  - Relieves single point-of-failure for HAB forecasting



# Summary (1)

Both NRT and Science Quality VIIRS-SNPP Ocean Color data are now publically available through NOAA CoastWatch/OceanWatch.

## Science Quality

L2 global, granules:

FTP:

<ftp://ftp.star.nesdis.noaa.gov/pub/socd1/mecb/coastwatch/viirs/science/L2/>

THREDDS:

<http://www.star.nesdis.noaa.gov/thredds/catalog/swathNPPVIIRSSCIENCEL2WW00/catalog.html>

Or, you can interactively select and download data (or get your file list for automated commands) using the Granule Selector Tool here:

[http://coastwatch.noaa.gov/cwn/cw\\_granule\\_selector.html](http://coastwatch.noaa.gov/cwn/cw_granule_selector.html)

L3 global 4km mapped:

FTP:

<ftp://ftp.star.nesdis.noaa.gov/pub/socd2/mecb/coastwatch/viirs/science/L3/global/>



# Summary (2)

Both NRT and Science Quality VIIRS-SNPP Ocean Color data are now publically available through NOAA CoastWatch/OceanWatch.

## Near Real Time

THREDDS OC NRT main page:

[http://www.star.nesdis.noaa.gov/thredds/socd/coastwatch/catalog\\_coastwatch\\_viirs\\_global.html](http://www.star.nesdis.noaa.gov/thredds/socd/coastwatch/catalog_coastwatch_viirs_global.html)

Includes: L2 global granules (swath); L3 global 4km mapped, daily, weekly, monthly merged, and 750m regional sector files

Or, you can interactively select and download data (or get your file list for automated commands) using the Granule Selector Tool here:

[http://coastwatch.noaa.gov/cwn/cw\\_granule\\_selector.html](http://coastwatch.noaa.gov/cwn/cw_granule_selector.html)