



# NOAA CoastWatch/PacIOOS Satellite and Ocean Data Training Course

February 10-13 (FJT), 2026

Join at [slido.com](https://www.slido.com)

#3344 988

<https://app.sli.do/event/rwiBiP9TeUkVGn6MiVfzwU>



## Course objectives and overview

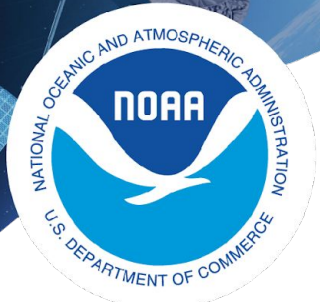
- Learn where to find satellite, remote sensing, and ocean parameter data
- Become familiar with the ERDDAP platform to visualize, subset, and download data
- Learn to judge which products are appropriate for your application or who to contact to get guidance
- Apply what you learn on a personal project so that you leave the course with ready-to-use workflows

9am live sessions, 11am self-paced work, 2pm Q&A session (optional)

*Our goal is to provide tools and resources for you to access and use satellite and ocean data on your own!*



NOAA CoastWatch/PacIOOS Satellite and Ocean Data Training Course Feb.10-13,  
virtual, 9am (FJT)



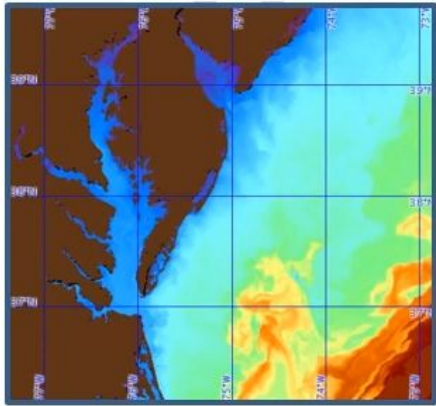
# Introduction to NOAA CoastWatch and OceanWatch Central Pacific

NOAA CoastWatch Satellite Course

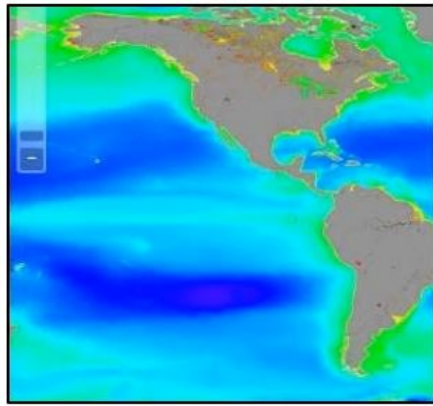
[coastwatch.info@noaa.gov](mailto:coastwatch.info@noaa.gov); [pi.oceanwatch.info@noaa.gov](mailto:pi.oceanwatch.info@noaa.gov)



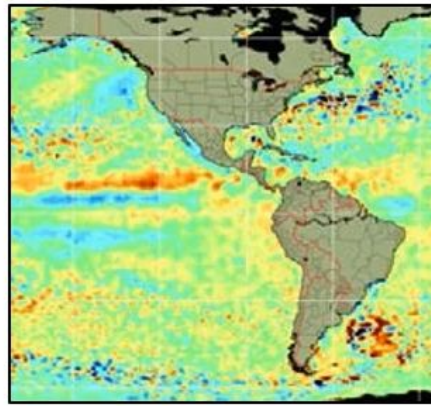
# NOAA CoastWatch is a national program to distribute ocean satellite data



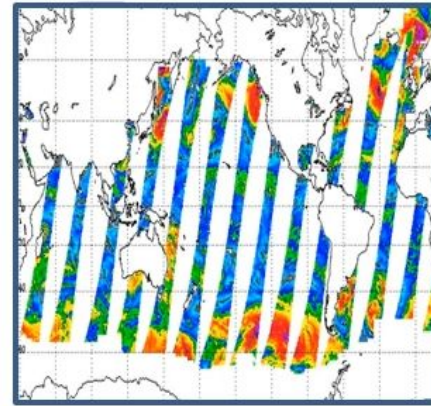
Temperature



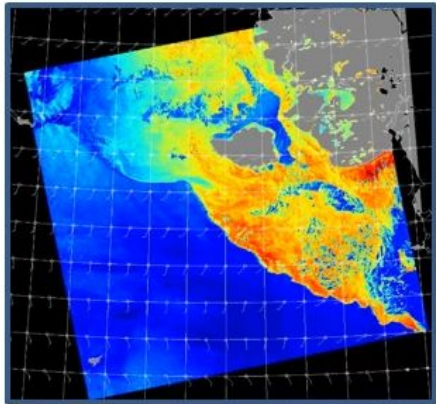
Ocean Color



Altimetry



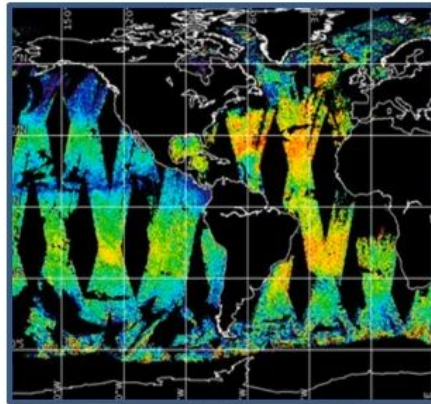
Ocean Vector Winds



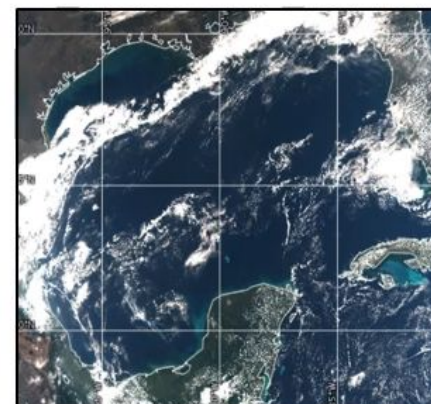
Synthetic  
Aperture  
Radar



Sea Ice



Salinity



Imagery

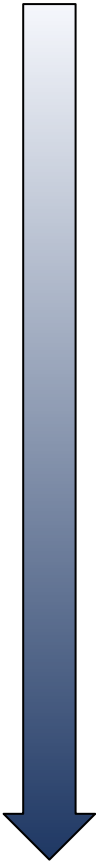
**MISSION: PROVIDE ACCESS TO AND PROMOTE THE USE OF SATELLITE DATA PRODUCTS FOR OCEANIC, FRESHWATER, & POLAR APPLICATIONS**

Supported by NOAA National Environmental Satellite, Data, and Information Service, Center for Satellite Applications and Research

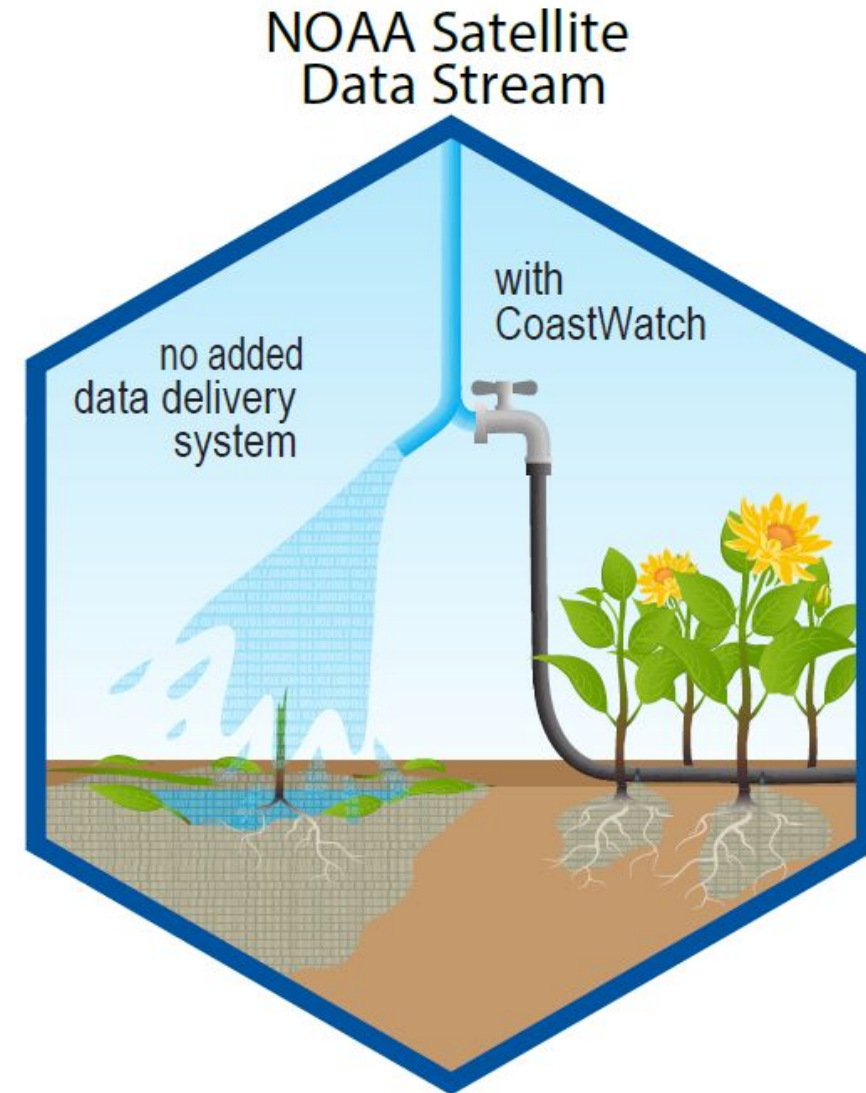


# CoastWatch offers several levels of service to help users with satellite data

INCREASING  
ASSISTANCE TO USER



- Provide access to datasets with data servers
- Develop tools and tutorials to help users interact with the server and use the data
- Provide training and hands-on assistance
- Find or create products and tools to address users needs
- Work directly with users on projects



# Easy access to satellite datasets using ERDDAP



ERDDAP

Easier access to scientific data

## ERDDAP > griddap > Make A Graph

Dataset Title: **Chlorophyll a concentration, ESA OC CCI - 8-Day, 1997-present. v6.0**

Institution: Plymouth Marine Laboratory (Dataset ID: esa-cci-chla-8d-v6-0)

Information: [Summary](#)  | [License](#)  | [FGDC](#) | [ISO 19115](#) | [Metadata](#) | [Background](#)  | [Data Access Form](#)

**Graph Type:** surface

**X Axis:** longitude

**Y Axis:** latitude

**Color:** chlor\_a

**Dimensions**

**Start** **Stop**

time (UTC) specify just 1 value → 2024-12-26T00:00:00Z

latitude (degrees\_north) 89.97916666666667 -89.97916666666666

longitude (degrees\_east) 0.020833333333314386 359.97916666666663

**Graph Settings**

Color Bar: Continuity: Scale:

Minimum: Maximum: N Sections:

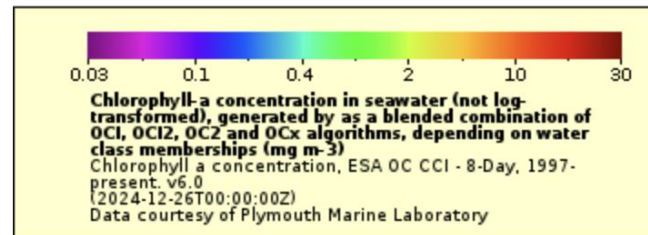
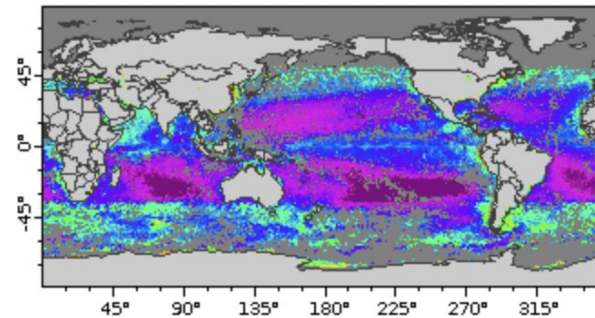
Draw land mask:

Y Axis Minimum: Maximum: Ascending

**Redraw the Graph** (Please be patient. It may take a while to get the data.)

Click on the map to specify a new center point.

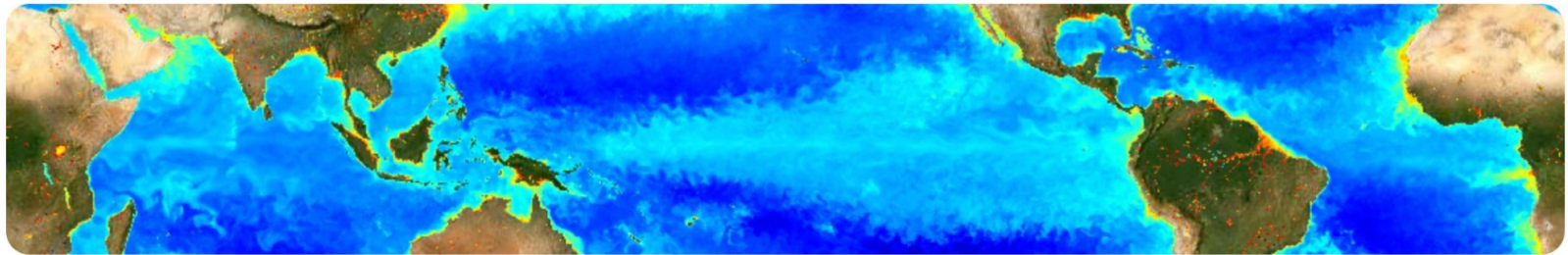
**Zoom:** Data | Out 8x | Out 2x | Out | In | In 2x | In 8x



- Simple interface for both data visualization and downloads
- Machine-to-machine data exchange and access data within analysis tools (R, Matlab, python)



# Recorded Lectures on satellite products on CoastWatch Youtube Channel



## CoastWatch Training

@CoastWatchTraining · 11 subscribers · 1 video

This is the YouTube Channel for the CoastWatch Learning Portal. All lectures are available...more  
[umd.instructure.com/courses/1336575/modules](http://umd.instructure.com/courses/1336575/modules) and 1 more link

Subscribe

Home Videos

### Lectures & Tutorials

Satellite 101, Part 1  
NOAA Coastwatch Satellite Course  
14 videos

Lectures - Closed Captions  
CoastWatch Training · Playlist  
View full playlist

Using Satellite Data in GIS  
Michael Stronaco  
NOAA Affiliate for NOAA CoastWatch  
College Park, MD  
5 videos

Tutorials - Closed Captions  
CoastWatch Training · Playlist  
View full playlist

Satellite 101, part a  
NOAA Coastwatch Satellite Course  
16 videos

Open Captions - All Videos  
CoastWatch Training · Playlist  
View full playlist

Satellite 101, part a  
NOAA Coastwatch Satellite Course  
4 videos

Audio Descriptions - All Lectures  
CoastWatch Training · Playlist  
View full playlist

- Short (~20 minutes when narrated) videos explaining the basics of all satellite products (SST, ocean color, sea surface height, etc.)
- Explain how to access satellite data via the CoastWatch data portal, ERDDAP and GIS.

<https://www.youtube.com/@CoastWatchTraining>

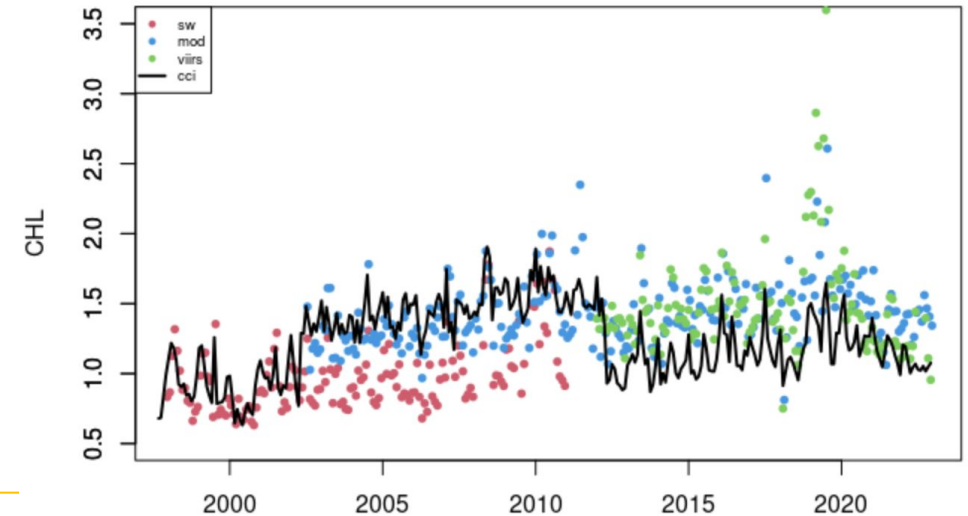


# Tutorials and code gallery on CoastWatch Github

## Tutorial Module Descriptions

- [ERDDAP-basics](#) An introduction to what ERDDAP is and an overview of the different CoastWatch ERDDAP servers. Learn how to visualize and download data from ERDDAP, and how to interpret an ERDDAP url.
- [netcdf-and-panoply-tutorial](#) Learn how to use NASA's Panoply software to open and view netCDF data.
- [Tutorial1-basics](#) Learn to access satellite data from CoastWatch ERDDAP data server and to work with NetCDF files. Visualize sea surface temperature on a map and plot time series data. R and python versions.
- [Tutorial2-timeseries-compare-sensors](#) Learn common ways to download data from ERDDAP servers to access time-series chlorophyll data from four different satellite datasets and summarize and visualize the data for comparison. R and python versions.
- [calculate-seaice-extent](#) View sea ice concentration (SIC) data on a map with the polar stereographic projection. Calculate and compare sea ice area/extent from multi-year SIC datasets. R and python versions.
- [convert-180+180-to-0-360-longitude](#) Work with datasets with  $-180^{\circ}$  to  $+180^{\circ}$  longitude values in a region that crosses the antimeridian. Convert the coordinates from  $(-180, +180)$  to  $(0, 360)$  and visualize data on a map. Python only.
- [create-virtual-buoy-with-satellite-data](#) Create a "virtual" buoy using satellite data to fill the gaps in in-situ data collected by a physical buoy. Extract data from a location close to an existing buoy. Clean dataset by removing outliers, and aggregate (resample) to achieve a reduced temporal resolution. Plot time series data. R and python versions.
- [extract-satellite-data-within-boundary](#) Extract sea surface temperature satellite data for a non-rectangular geographical region from an ERDDAP server using a shapefile, make maps, and plot a timeseries of the seasonal cycle of SST within the boundary. R and python versions.
- [map-data-with-different-projections](#) Download and examine a polar stereographic projected dataset, plot the data on a projected map. Add animal track data with geographical coordinates onto the projected map. R and python versions.
- [matchup-satellite-buoy-data](#) Temporally and geospatially subset satellite data to match with buoy data (tabular), run statistical analysis and produce a map of the satellite data with overlaying buoy data. R only.
- [matchup-satellite-data-to-track-locations](#) Extract satellite data along a set of points defined by longitude, latitude, and time coordinates like that produced by an animal telemetry tag, a ship track, or a glider track. R and python versions.
- [transform-to-another-map-projection](#) Access satellite data with polar stereographic coordinates and transform it into a different coordinate system using EPSG code. R and python versions.

- Codes for basic data extraction and plotting examples
- Software tutorials for tools used to access, explore, or manage data prior to analysis.



<https://github.com/coastwatch-training/CoastWatch-Tutorials>



# Annual and periodic courses on understanding and accessing satellite data


## Upcoming Training:

### Satellite 201 Summer Series

Virtual, July 2026

Registration open:

<https://forms.gle/ZX3joqrPu4S5FzKo9>



- Main
- Upcoming Trainings ∨
  - 2026 PGRSC Course
  - 2026 Satellite 201 Summer Series
- Past Trainings >
- Office Hours

[Upcoming Trainings](#) > 2026 Satellite 201 Summer Series

## Satellite 201 Summer Lecture Series

July 10, 17, 24 and 31, 2026, Virtual 11am - 1pm (Pacific Time)

### Course Description

This lecture series provides a deeper dive into satellite oceanography, exploring advanced topics beyond the regular CoastWatch satellite course. [Link to registration page](#)

### Schedule & Attendance

Frequency: Sessions are held every Friday for one month.

Duration: Approximately 2.5 hours per session.

Flexibility: Attendance for all sessions is not required; feel free to join the topics most relevant to you.

### 2026 Curriculum

The inaugural 2026 course will cover the following subjects: \* Alternative Data Access: Methods for accessing data not hosted on ERDDAP servers. \* CoastWatch Utilities: An introduction to using the CoastWatch proprietary software suite. \* Beyond Chlorophyll: Exploring ocean color products other than chlorophyll. \* SAR Data: An introduction to Synthetic Aperture Radar.



# New training website - one stop shop for all training resources and information



## CoastWatch Training Website

This site provides information on CoastWatch Satellite Training courses such as upcoming or past trainings, training tutorials, course lectures, and more to support scientists working with oceanographic satellite data.

### What you'll find here

- Step-by-step coding and software tutorials for accessing and analyzing satellite data
- Training materials developed through NOAA CoastWatch courses, including information on upcoming and past trainings
- Resources and support options, including scheduled office hours, to help you integrate satellite data into research and management workflows

### Not sure where to start?

- **Interested in participating in a training course?**

Visit the [Training Classes](#) page to see upcoming trainings or past trainings to get an idea of what to expect.

- **Looking for hands-on examples?**

Check out the [Training Tutorials](#) to explore workflows in Python, R, and MATLAB, as well as software tutorials exploring NASA's Panoply and CoastWatch Utilities.

- **Need help or have questions?**

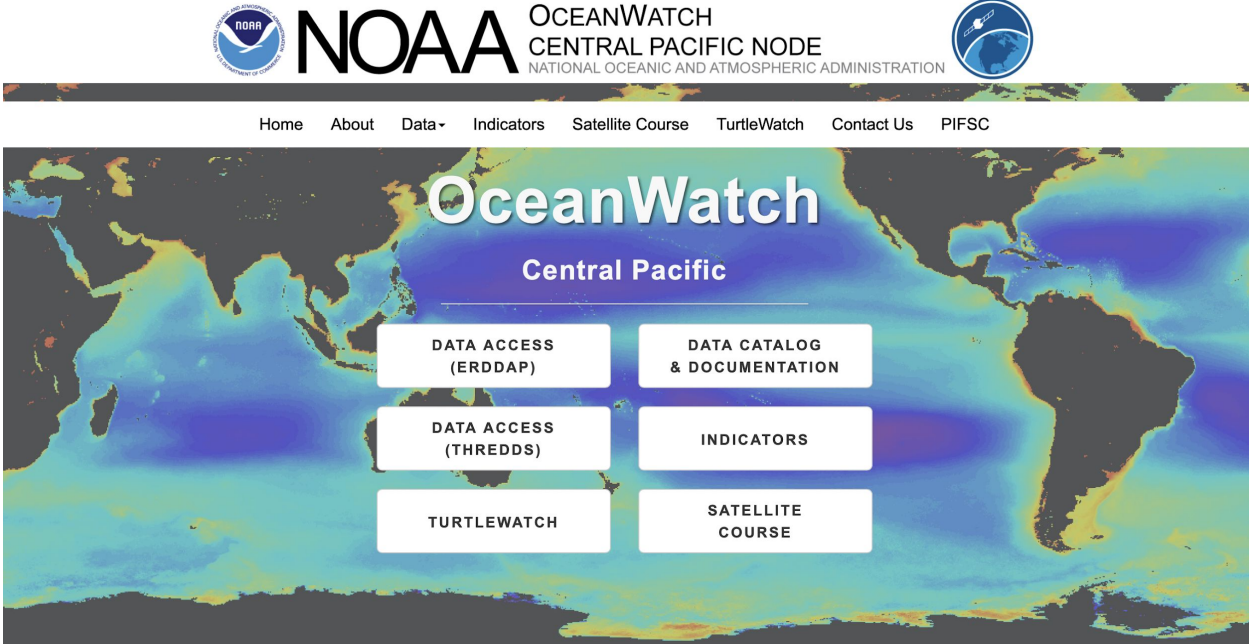
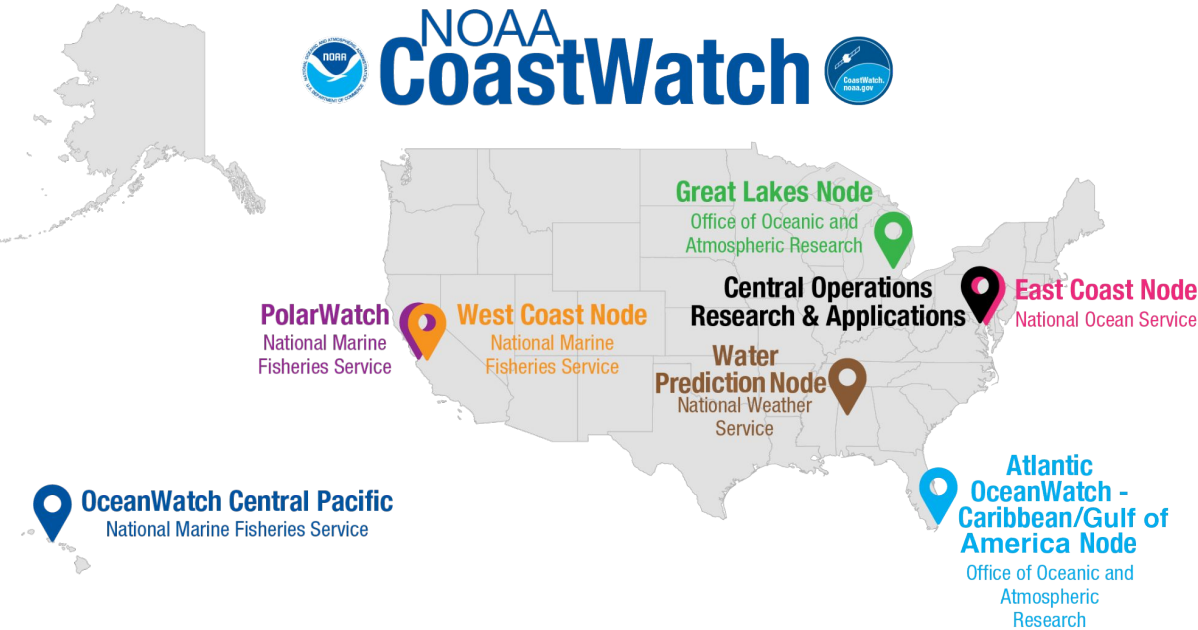
The [Help](#) page points you to FAQs, resources, and support options.

- Code gallery/tutorials and software tutorials for accessing and analyzing satellite data
- Training materials developed by NOAA CoastWatch, including educational lectures, materials from past trainings
- Announcements on upcoming trainings
- Resources and support options, including helpdesk and scheduled office hours

<https://coastwatch-training.github.io/> :)



# OceanWatch Central Pacific - a regional node of CoastWatch



**PROVIDE ACCESS TO SATELLITE OCEANOGRAPHY OBSERVATIONS, DEVELOP VALUE-ADDED PRODUCTS BASED ON USER NEEDS IN THE PACIFIC ISLANDS REGION, AND ORGANIZE TRAININGS TO BUILD CAPACITY**

<https://oceanwatch.pifsc.noaa.gov>

<https://coastwatch.noaa.gov>



# Provide a selection of satellite data products for the Pacific Islands region

Products	Variables	Spatial resolution	Coverage	Temporal resolution	Time span	Dataset names
Sea Surface Temperature	SST	2, 4, 5km	global	Daily to monthly	1981-present	ACSPO, CoralTemp, Geopolar blended, AVHRR Pathfinder
Coral Reef Watch Datasets	SST anomaly, Coral Bleaching Hotspot, Degree Heating Week, Bleaching Alert Area	5km	global	Daily	1985-present	Coral Bleaching Hotspot, Degree Heating Week, Bleaching Alert Area
Ocean Color	Chlorophyll-a, Kd490, PAR	750m, 4, 9km	Pacific Islands, global	Daily to monthly	1997-present	VIIRS-SNPP, ESA OC-CCI, MODIS-Aqua, SeaWIFS
Wind	U, V, windspeed, wind stress, wind stress curl	¼ degree, 40km	global	6 hr to monthly	1987-present	CCMP NRT, CCMP, ASCAT, QuickSCAT
Altimetry	Sea level anomaly, Geostrophic Currents	¼ degree	global	Daily	2012-2019	NOAA LSA/NESDIS/STAR DT
Salinity	Ocean surface salinity	1 degree	global	Daily to monthly	2010-present	Aquarius, Miras SMOS

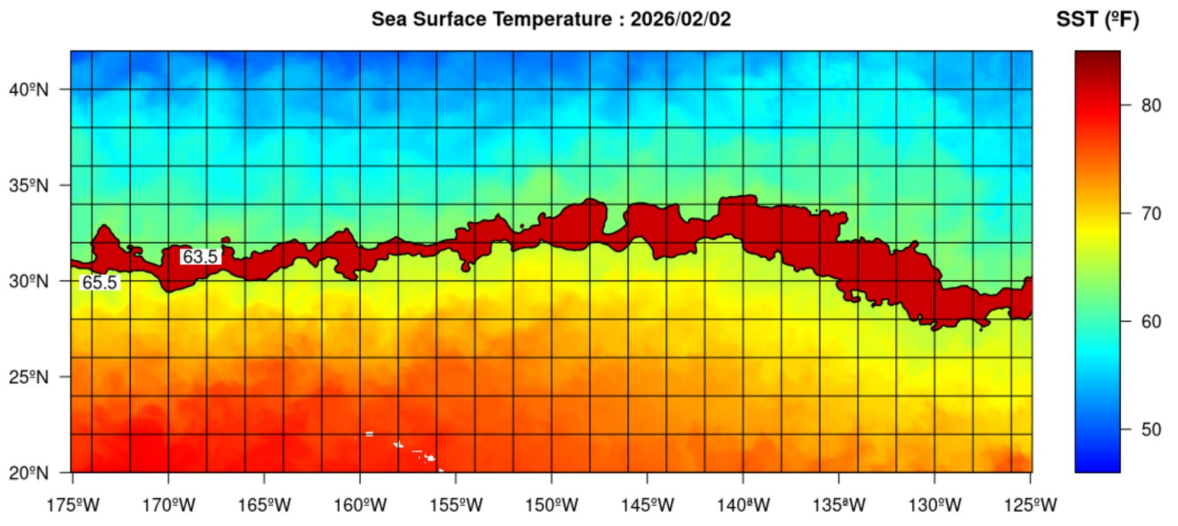


# Develop value-added products for users

## TurtleWatch: thermal habitat of loggerhead sea turtles in the North Pacific Ocean

### EXPERIMENTAL PRODUCT

Avoid fishing between solid black 63.5°F and 65.5°F lines to help reduce loggerhead sea turtle interactions



**NOAA**  
 PACIFIC ISLANDS FISHERIES SCIENCE CENTER  
 ECOSYSTEM SCIENCES DIVISION  
 1845 Wasp Blvd, Honolulu, HI 96818  
<http://www.pifsc.noaa.gov/eod/turtlewatch.php>  
 contact: [hui.shi@noaa.gov](mailto:hui.shi@noaa.gov)  
 Data provided by the OceanWatch - Central Pacific node

TurtleWatch



## Median phytoplankton size estimated by satellite SST and ocean color: parameter in fisheries forecast

Dataset Title: **EXPERIMENTAL - Median Phytoplankton Size, North Pacific. Monthly, 1998-present**   
 Institution: NOAA PIFSC (Dataset ID: md50\_exp)  
 Information: [Summary](#) | [License](#) | [FGDC](#) | [ISO 19115](#) | [Metadata](#) | [Background](#) | [Data Access Form](#)

**Graph Type:** surface

**X Axis:** longitude

**Y Axis:** latitude

**Color:** MD50

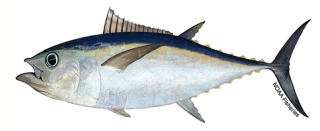
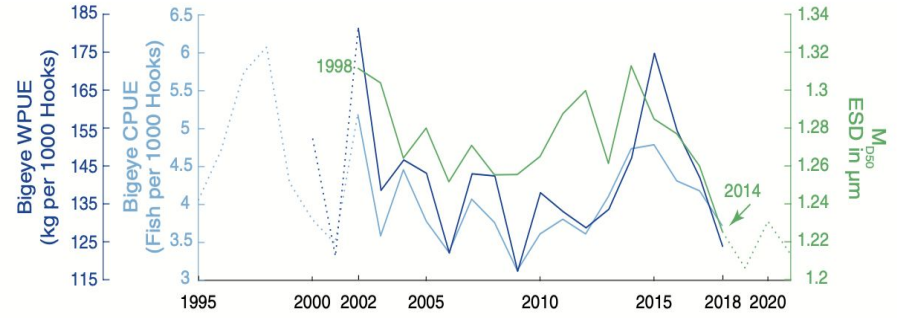
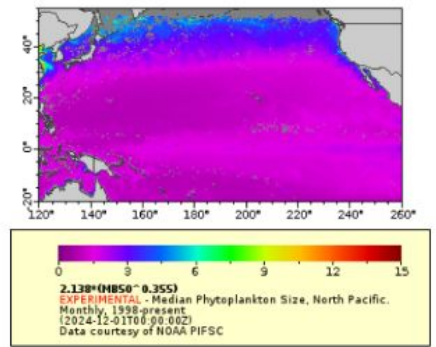
**Dimensions:** Start: 2024-12-01T00:00:00Z Stop: 2024-12-01T00:00:00Z

**Latitude (degrees\_north):** -20.0 to 55.0

**Longitude (degrees\_east):** 120.0 to 260.0

**Graph Settings:**  
 Color Bar: Continuity: Scale:   
 Minimum:  Maximum:  N Sections:   
 Draw land mask:  Maximum:  Ascending:

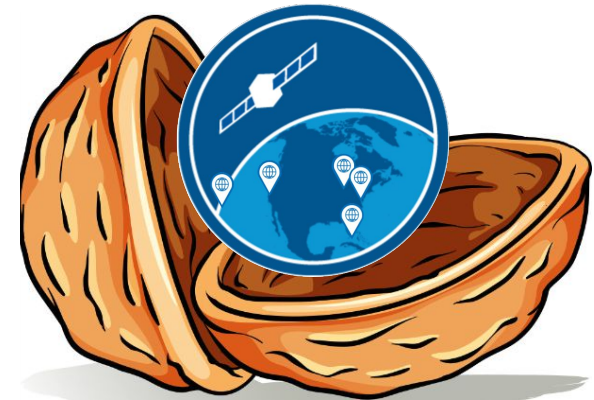
Click on the map to specify a new center point.  
**Zoom:** Data Out 8x Out 2x Out In In 2x In 8x



(Woodworth-Jefcoats and Wren, 2020)

# NOAA CoastWatch services in a Nutshell

- Serve satellite oceanography data and provide easy access to the datasets via ERDDAP
- Recorded video lectures explaining the basics of all satellite products, as well as tools and utilities to access them
- Coding-based and software-focused tutorials as well as code galleries to support users working with satellite data at different stages of their workflow
- In-person and online training courses to provide knowledge and tools needed to incorporate satellite data into research and management projects
- Helpdesk and office hours for questions and live assistance



## Contacts:

- Daisy Shi ([hui.shi@noaa.gov](mailto:hui.shi@noaa.gov))
- OceanWatch-Central Pacific ([pi.oceanwatch.info@noaa.gov](mailto:pi.oceanwatch.info@noaa.gov))
- CoastWatch helpdesk ([coastwatch.info@noaa.gov](mailto:coastwatch.info@noaa.gov))
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