NOAA CoastWatch

CoastWatch.noaa.gov

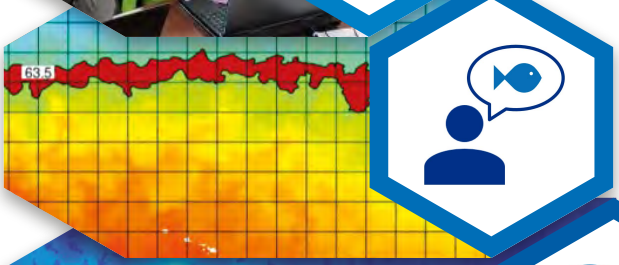
Satellite data products for understanding and managing our oceans and coasts

Our capabilities

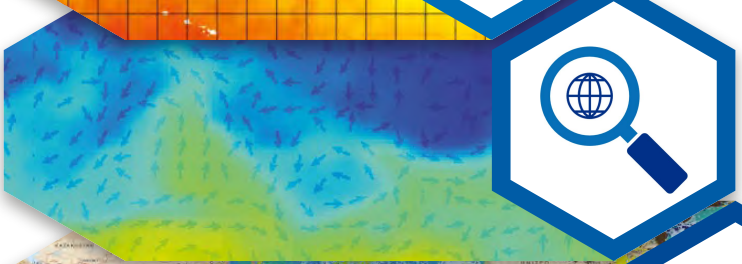
Data access
Access and download CoastWatch oceanographic satellite data

Data portal
Visualize CoastWatch oceanographic satellite data within the portal

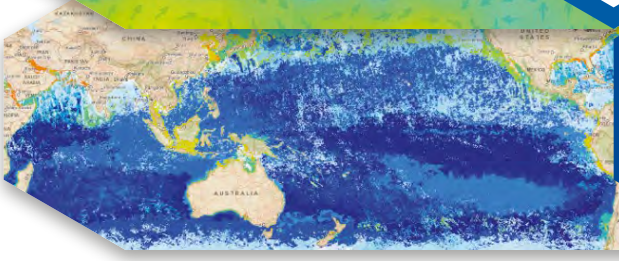
Training
Learn how to maximize the use of CoastWatch oceanographic satellite data



Collaborations
Work with CoastWatch to incorporate oceanographic satellite data into products and tools



Data monitoring
Assess the state, availability and stability of oceanographic satellite data products



Value-added products
Leverage novel and innovative satellite data products developed and/or curated by CoastWatch

Our purpose

NOAA CoastWatch helps people access and make sense of satellite data for use in coastal and ocean applications.

The NOAA CoastWatch/OceanWatch/PolarWatch Program ("CoastWatch") operates across a central hub and multiple regional nodes, See Page 3.

Updated April 4, 2024

Case studies

Harmful Algal Blooms

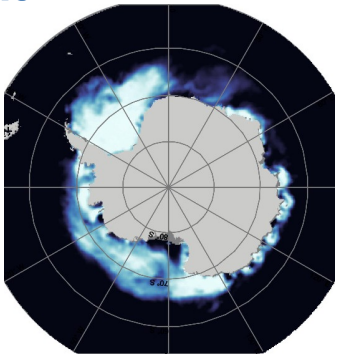
Our East Coast Node monitors Harmful Algal Blooms in various regions of the US in order to protect human health and ensure safe drinking water.

Ice Breaking Operations

In order to understand ice formation and the types of ice in the Great Lakes, the NOAA Great Lakes Environmental Research Laboratory (GLERL) and the U.S. Coast Guard use Synthetic Aperture Radar (SAR) data from the NOAA CoastWatch Great Lakes Node to monitor six different types of ice, ice thickness, and ice cover.

Polar Regions

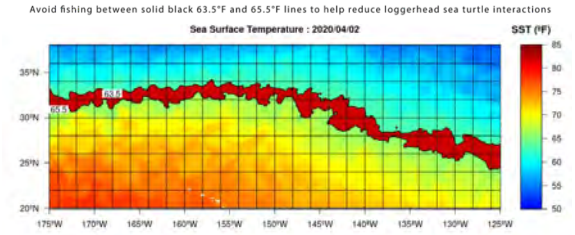
The PolarWatch Node distributes data for the Antarctic and Arctic regions in projections suitable for high-latitude areas. All data catalog products may be viewed using the in-browser Portal, and accessed in ERDDAP.



TurtleWatch

The TurtleWatch product was developed in 2006 to provide advice to Hawaii-based longline fishers targeting swordfish on areas they can avoid to reduce their probability of interacting with protected loggerhead turtles (Howell et all, 2008).

OceanWatch Central Pacific generates daily maps of sea surface temperature that highlight zones to avoid.

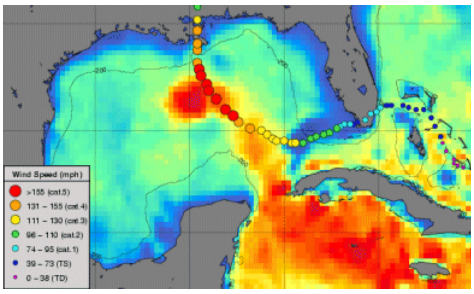


EcoCast

The EcoCast tool uses habitat suitability models and satellite data from our West Coast node to predict where broadbill swordfish and three bycatch species (leatherback turtle, blue shark and California sea lion) are likely to be each day. Daily EcoCast maps help fishers identify fishing spots, minimize fisheries bycatch and maximize fisheries target catch.

Hurricane Viewer

Our Gulf of Mexico Node develops and maintains the Hurricane OceanViewer interface.



Updated April 4, 2024

Training

CoastWatch organizes in-person and virtual training classes to build capacity in the use of ocean satellite data. These classes are free and open to anyone. Contents include:

- lectures on remote sensing basics, SST, ocean color, altimetry, wind, salinity, how choose a data product
- tutorials in R, Python, and ArcGIS
- one-on-one advice on individual projects

All course materials are available online.

Find out about upcoming courses

Program and organization

Satellites make routine observations from which several ocean parameters such as sea surface temperature, ocean color, sea level, ocean winds, visible imagery, water quality, and other ocean and inland water surface features can be derived.

Remotely-sensed observations from space have the advantage of broad spatial and temporal coverage that complement in-situ measurements.

NOAA routinely produces sustained ocean and coastal data products from both NOAA and non-NOAA, international satellites. These data products are freely and openly available through CoastWatch for government, academic, commercial, and general public users in addition to serving the mission requirements of NOAA's fisheries, ocean, weather services and research.

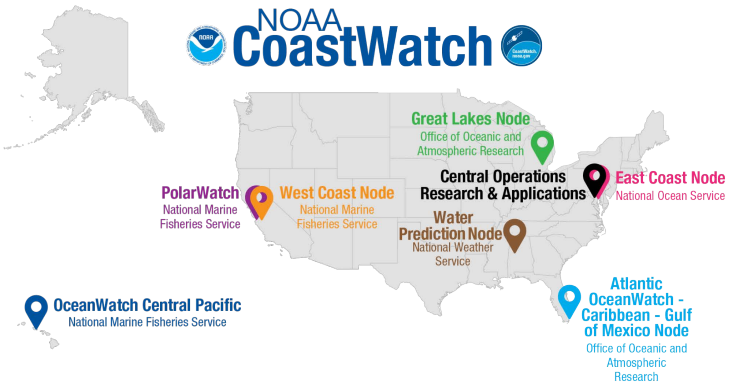
Subscribe to our newsletter to stay informed about all the latest NOAA CoastWatch news!

Program structure

The origins of CoastWatch began in 1987 when satellite sea surface temperature data were used to diagnose events that led to an unusual harmful algal bloom in coastal North Carolina. Today, CoastWatch is a cross-NOAA program headquartered within NOAA National Environmental and Satellite Data and Information Service (NESDIS), Center for Satellite Applications and Research (STAR), Satellite Oceanography and Climatology Division with Regional Nodes housed in the other NOAA mission Line Offices. Four pillars underpin the success of CoastWatch:

- CoastWatch Central Operations
- Applications and Research
- Regional Nodes throughout the USA and embedded in different NOAA line offices
- Training and Outreach

The Regional Nodes are direct links to understand and address the needs and requirements of a wide range of stakeholders within and external to NOAA. Each Node has a federal manager and an operations manager tasked with distributing relevant data products, work with users on specific applications, and organize training courses to build capacity in each region. Access more information on the Nodes from the links in the figure right.



Updated April 4, 2024

Using CoastWatch data

Multiple ways to access data

- Data Portal:
coastwatch.noaa.gov/cw_html/cwViewer.html

- ERDDAP:
https://coastwatch.noaa.gov/erddap/info/index.html

- THREDDS:
https://www.star.nesdis.noaa.gov/thredds/socd/coastwatch/catalog_coastwatch.html

- Satellite Data Products Info Pages:
https://coastwatch.noaa.gov/cw/satellite-data-products.html

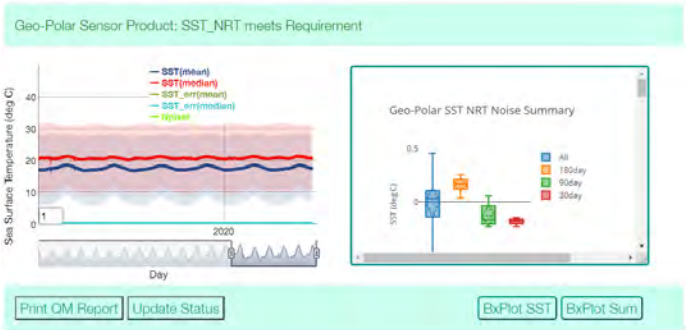
Data parameters

CoastWatch serves data products for all major ocean satellite parameters:

- Sea Surface Temperature (temperatures and fronts)
- Ocean Color (chlorophyll, turbidity, harmful algal blooms)
- Sea Level Height (sea level anomalies, surface currents, wave heights, etc. from altimetry)
- Sea Surface Salinity
- Ocean Surface Winds
- Synthetic Aperture Radar (high spatial resolution surface conditions, e.g., winds, oil spills, ship detection, etc.
- True Color Imagery (from polar-orbiting and geostationary satellites)

Data quality monitoring

The CoastWatch Quality and Data Availibility Dashboard allows users to quickly monitor any delay or quality issues.



Operational services

Operational systems are managed by CoastWatch Central Operations. Routine and automated monitoring ensure optimal data availability for two levels of service depending on the type of product and the requirements of the user.

Service	Best Effort	Moderate Assurance
Data availability target	90% (e.g. 72 h outage in rolling 30 days)	96.7% (e.g. 24 h outage in rolling 30 days
Monitoring frequency	business; 8 h per day by 5 days per week	extended; 12 h per day by 7 days per week
Communication of issues	Prolonged issues posted to website; emails to voluntary list subscribers when appropriate	Quick response (<12 h) emails to select, identified, pre-approved users

To report any service issues, please contact the CoastWatch Helpdesk

Getting assistance

If you have any question or request, please email our helpdesk:

coastwatch.info@noaa.gov

We also encourage you to contact the CoastWatch Node in your region. Our staff can assist you in finding data products suitable to your application or will put you in contact with relevant resources.

You can also consult our user forum at: vlab.ncep.noaa.gov/web/coastwatch/coastwatch-knowledge-base/forum/

Need help? Check out our User Forum to find answers or ask a new question

Updated April 4, 2024