Introduction to NOAA CoastWatch and the PolarWatch Sea Ice Course

Cara Wilson

NOAA Southwest Fisheries Science Center, Monterey, CA

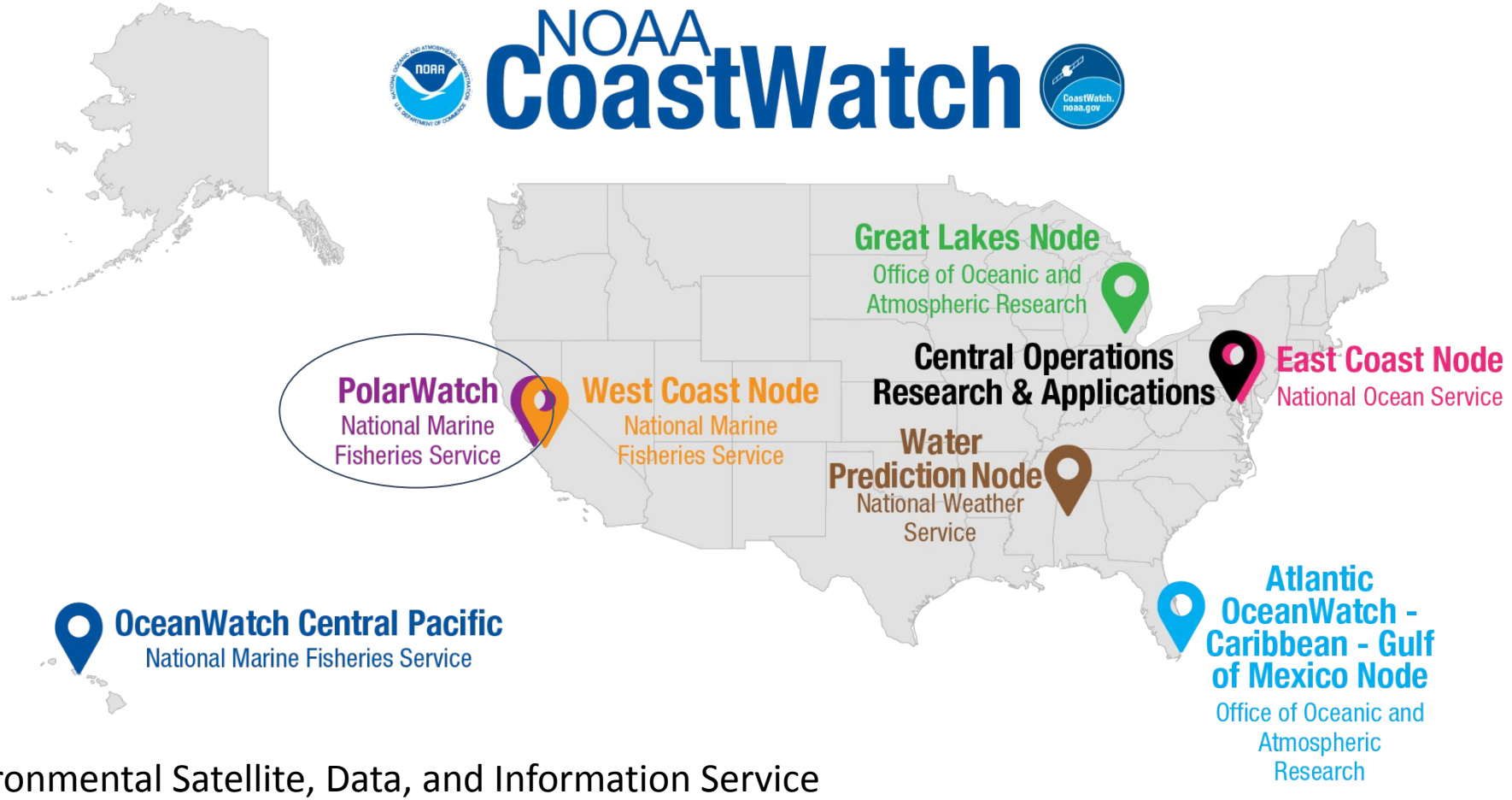
PI of PolarWatch and West Coast node of CoastWatch

Sea Ice Course - Oct 21, 2024

coastwatch.info@noaa.gov

NOAA CoastWatch is a national program funded by NOAA/NESDIS[1]

MISSION: PROVIDE ACCESS TO AND PROMOTE THE USE OF SATELLITE DATA PRODUCTS
for oceanic, freshwater, & polar applications



[1]National Environmental Satellite, Data, and Information Service

PolarWatch (PW) – NOAA Fisheries

Personnel

Cara Wilson – Manager

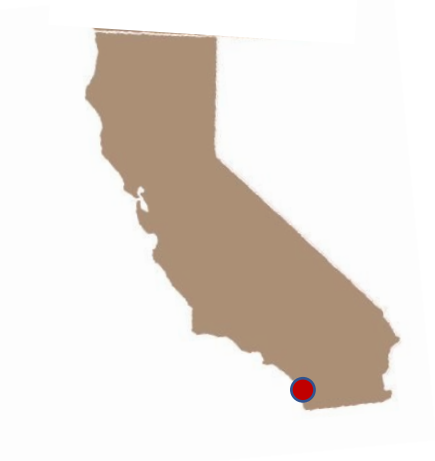
Dale Robinson – Deputy Manager

Sunny Bak Hospital – Coordinator

Location

Housed at SWFSC, CA

Focused on high latitude regions



Node Highlights

Providing easier access to polar satellite data

Previewing data online with polar maps

Serving sea ice datasets

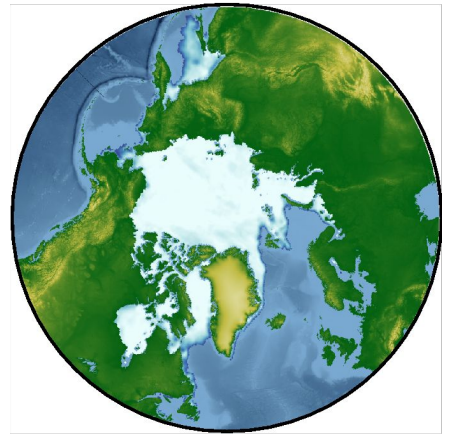
Serving polar projected datasets

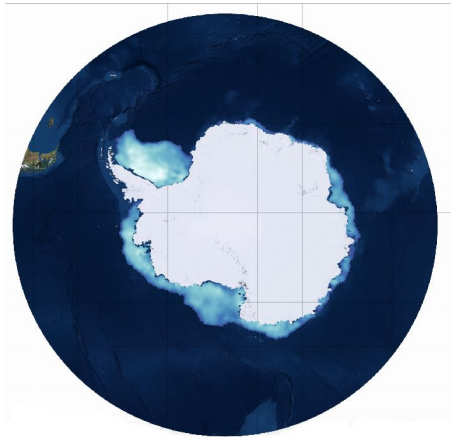
Collaborators

National Ice Center (NIC)

National Snow and Ice Data Center (NSIDC)

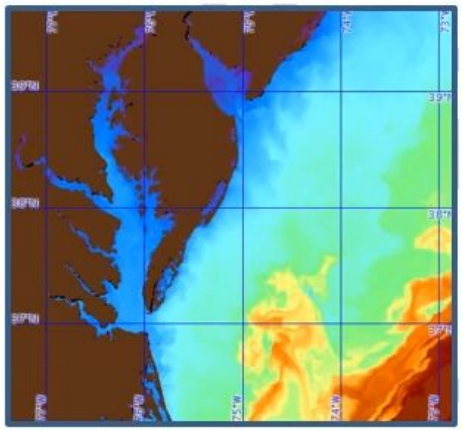
STAR Science Teams (Sea Ice, SAR, LSA)



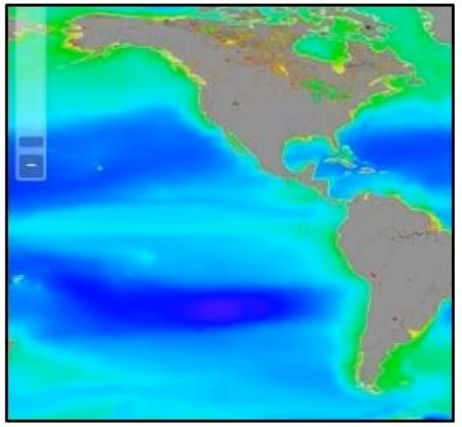


https://polarwatch.noaa.gov/

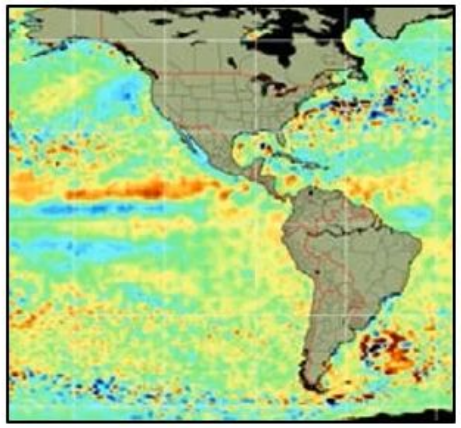
CoastWatch distributes ocean satellite data



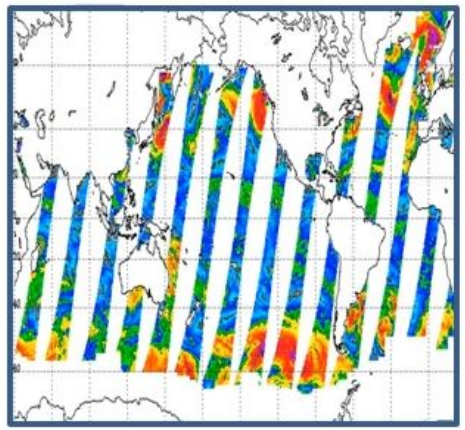
Temperature



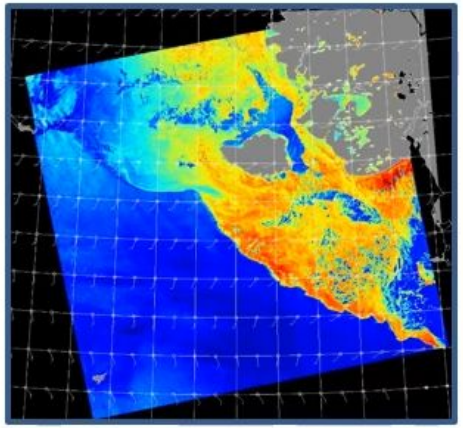
Ocean Color



Altimetry

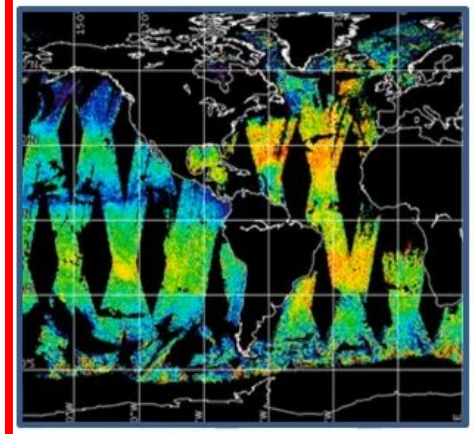


Ocean Vector Winds

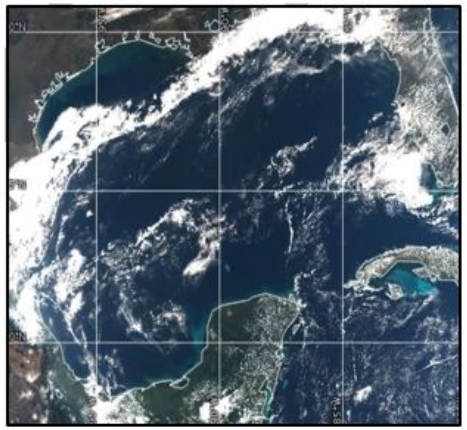


Synthetic Aperture Radar

Sea Ice



Salinity



Imagery

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

INCREASING ASSISTANCE TO USER

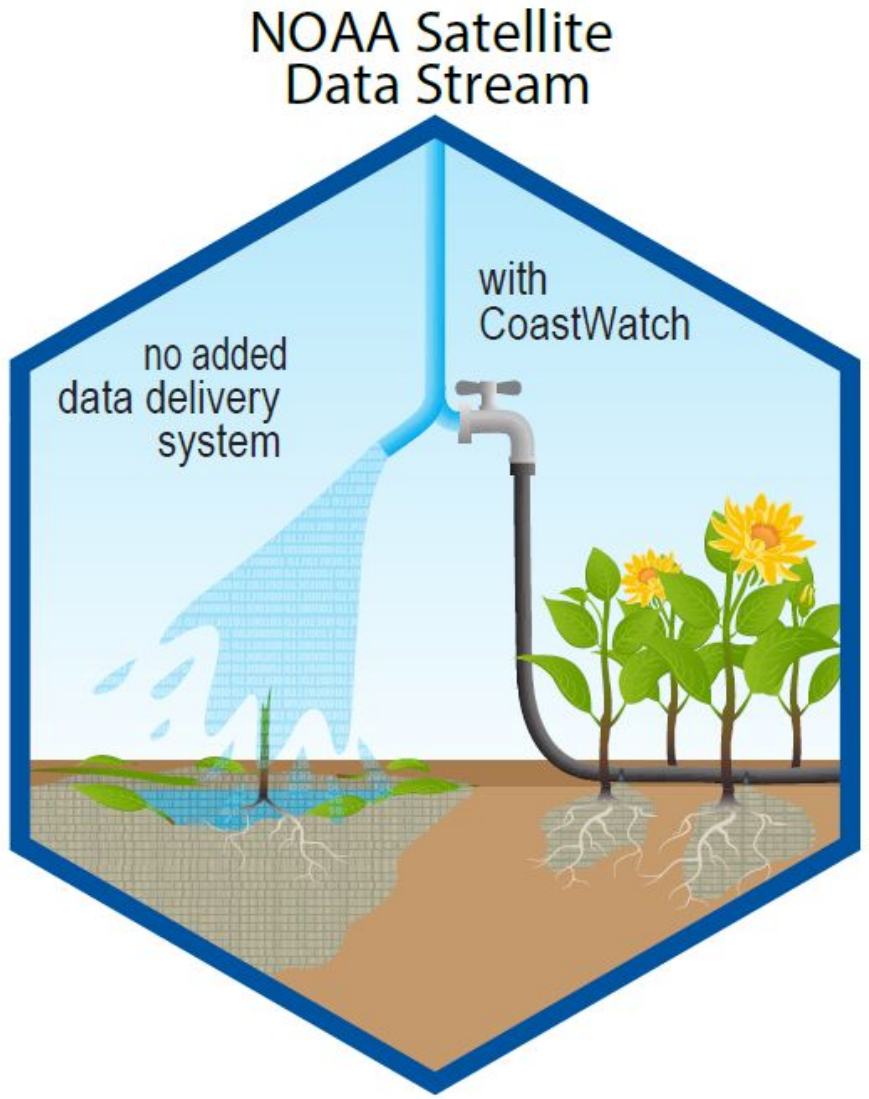
Provide access to datasets with data servers

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



COASTWATCH IS A VALUE ADDED PROVIDER

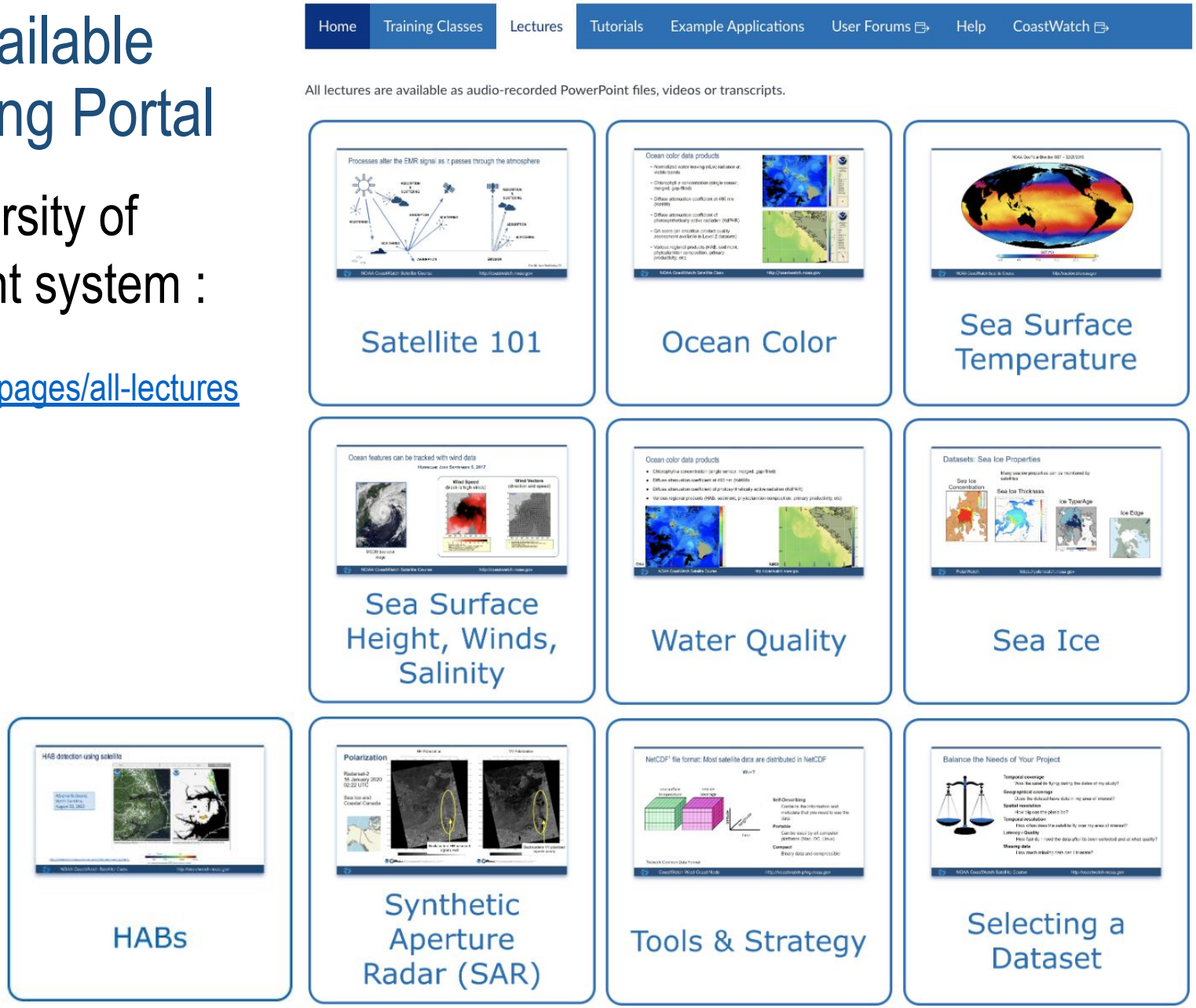
NOAA CoastWatch Resources in a Nutshell

- Easy access to satellite datasets using ERDDAP
- Online (short, ~20 minutes) videos explaining the basics of all the satellite products (SST, ocean color, sea surface height, etc.)
- Code notebooks in R and Python on GitHub to do demonstrate basic data extraction (from ERDDAP) and plotting examples
- Periodic courses offered on understanding and accessing satellite data
- Helpdesk: Coastwatch.info@noaa.gov

Recorded Lectures are Available on the CoastWatch Learning Portal

Presently housed on the University of Maryland learning management system :

https://umd.instructure.com/courses/1336575/pages/all-lectures



Tutorials are Available on the CoastWatch Learning Portal

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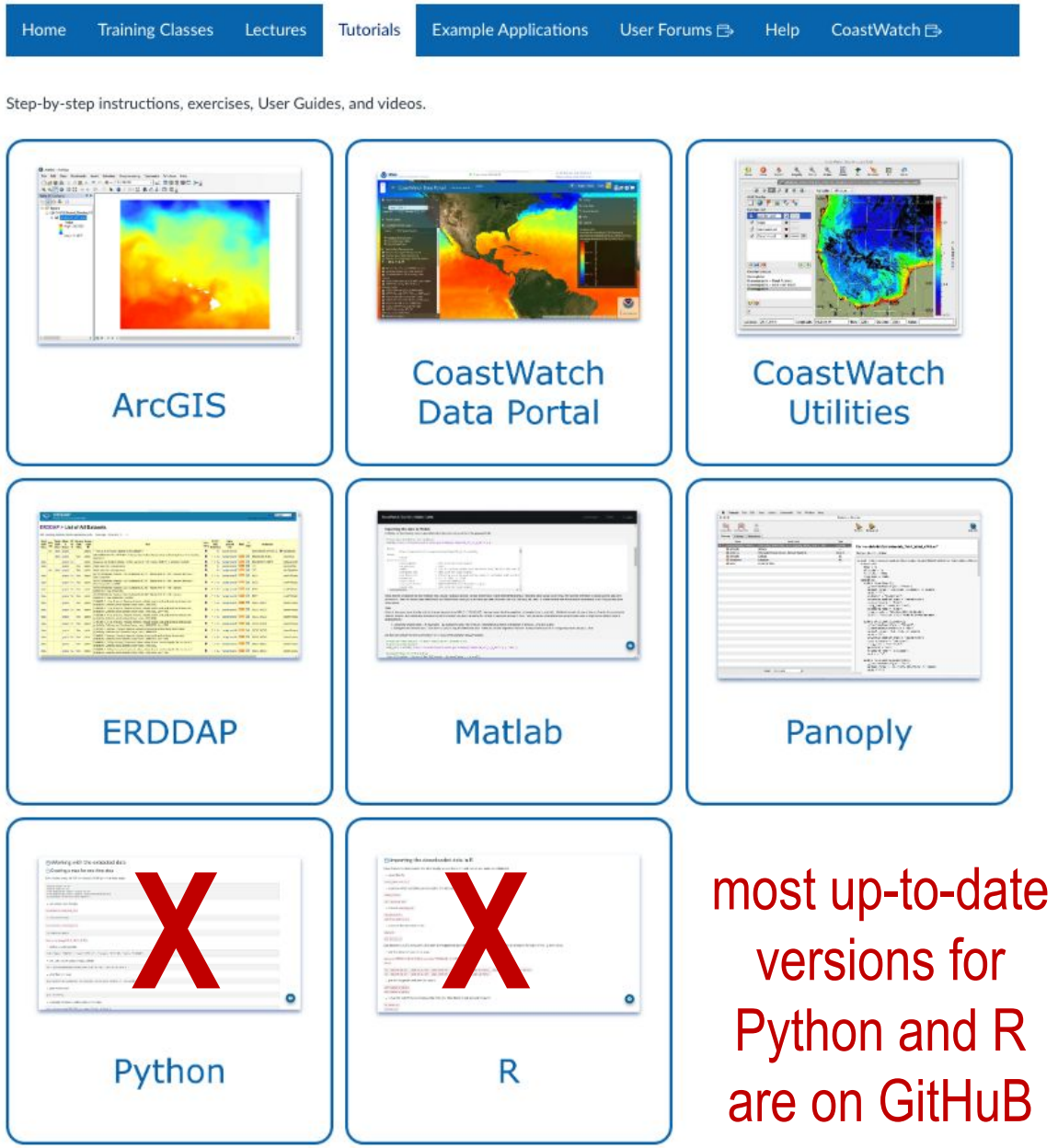


Distribution of CoastWatch Courses is Transitioning to GitHub

Upcoming Trainings:

Oct 25, 2024 - Animal Telemetry
online, 10 am-5 pm PST

Nov 26, 2024 - PGRSC
in person, 1-6 pm Fiji Time

https://coastwatch-training.github.io/CoastWatch-Workshops/

Distribution of CoastWatch Tutorials is Transitioning to GitHub

The R and python code on GitHub are the most up-to-date versions.

Polar Projection Specific Examples

- 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.
- 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.
- 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.
- matchup-polar-satellite-data-to-buoy-data Extract sea ice thickness (remote sensing) data in a polar stereographic projection using the buoy's location and dates.
- matchup-polar-data-to-animal-track-locations Extract sea ice concentration data in polar projection 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.
- subset-polar-data-with-shapefile Download remote sensing data in polar stereographic projection from ERDDAP and subset it within the boundaries of Lake Iliamna in Alaska, where the lake shape data is presented in a different projection.

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

Why a Course Dedicated to just Sea Ice?

- Data come from many providers: NOAA, NASA, NSIDC, NIC etc.
- Different sensor types are used - Visible, SAR, microwave, IR etc.
- Parameters unique to high latitude regions are measured.
    - sea ice concentration, sea ice temperature, thickness, extent etc.
- High latitude data are typically provided in different map projections.
- Over 100 people registered for this course; clearly people are interested in learning more about satellite sea ice data

Some Acronyms…

NOAA National Oceanic and Atmospheric Administration
responsible for operational satellites

NASA National Aeronautics and Space Administration
responsible for research satellites

NIC US National Ice Center
a multi-agency organization composed of contributions from the U.S. Navy, NOAA and the U.S. Coast Guard (USCG) to generate operational (real time) ice products

NSIDC National Snow and Ice Data Center
a science center for cryospheric data and research

JPSS Joint Polar Satellite System
collaboration between NOAA and NASA to launch a series of polar-orbiting operational environmental satellites

NESDIS National Environmental Satellite, Data, and Information Service
a NOAA line office

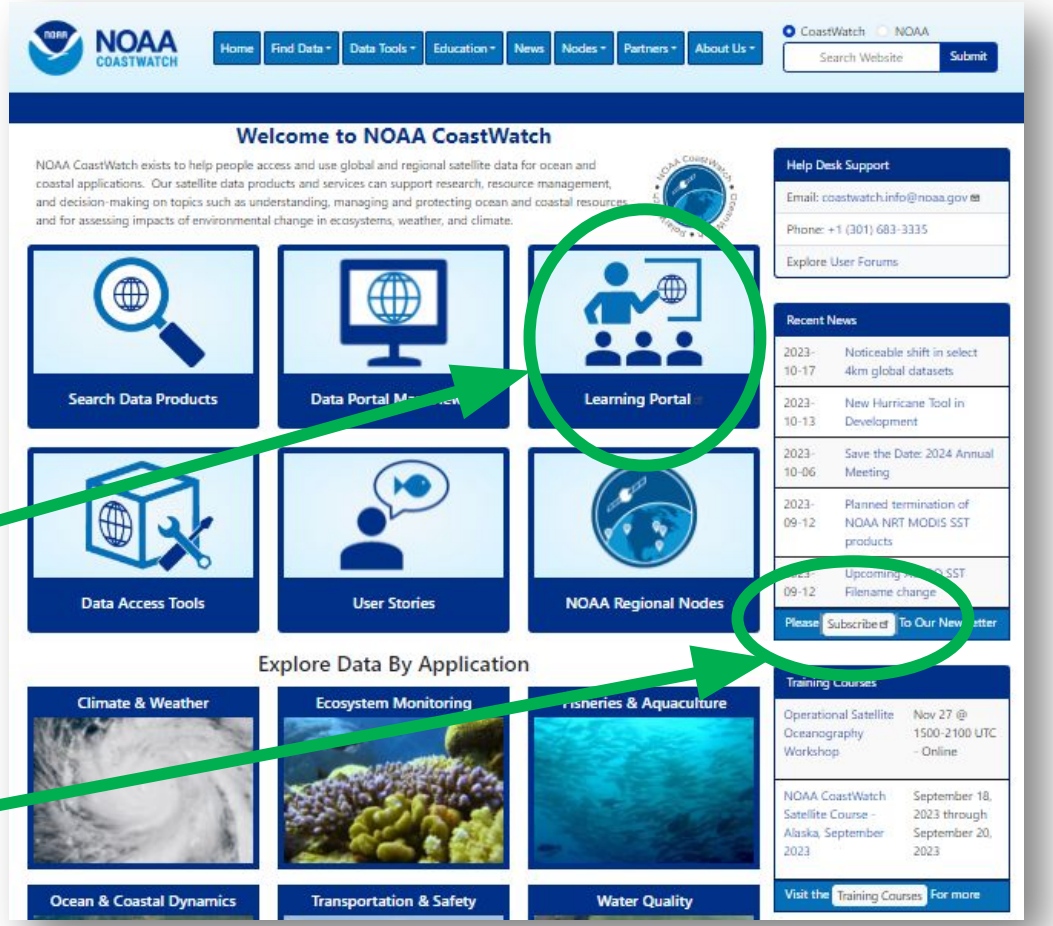
Questions?
Coastwatch.info@noaa.gov

Learning Portal has links to recorded lectures and tutorials

Subscribe to our newsletter for announcements for satellite classes:

subscribe

coastwatch.noaa.gov



We will be using Slido to interact with participants:

Go to www.slido.com

#seaice

2024 PolarWatch Sea Ice Training

October 21, 2024 Virtual 9am - 4pm (Pacific Time)

Resources

- Coastwatch Tutorials (on GitHub)
- Coastwatch Lecture series
- JPSS Sea Ice Microlesson

Schedule

Time (PST)	Topic	Presenter
9:00 - 9:30	Presentation 1: Introduction to NOAA CoastWatch	Cara Wilson
9:30 - 10:00	Presentation 2: Overview of Sea Ice Remote Sensing	Ludovic Brucker
10:00 - 10:30	Presentation 3: JPSS Sea Ice Microlesson	Kevin Fuell
10:30 - 10:45	Break	
10:45 - 11:15	Presentation 4: Sea Ice from SAR	Chris Jackson
11:15 - 11:30	Presentation 5: Projections - Why they Matter	Michael Soracco
11:30 - 11:45	Presentation 6: Ice in the Great Lakes	Andrea VanderWoude
11:45 - 12:45	Lunch break	
12:45 - 13:00	Presentation 7: Projections in Action	Peter Hollemans
13:00 - 13:30	Presentation 8: ERDDAP Demo	Cara Wilson
13:30 - 13:45	Presentation 9: PolarWatch Portal Demo	Sunny Hospital
13:45 - 14:00	Presentation 10: CoastWatch Viewer Demo	Michael Soracco
14:00 - 14:15	Break	
14:15 - 14:30	Presentation 11: Overview of Tutorials	Cara Wilson
14:30 - 16:00	Hand's on time, with instuctor's guidance available	