

CoastWatch's ShipWatch Service

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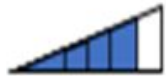
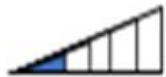
⁵NMFS/Southwest Fisheries Science Center/Director's Office

NOAA 2022 Environmental Data Management Workshop, Sept 15, 2022

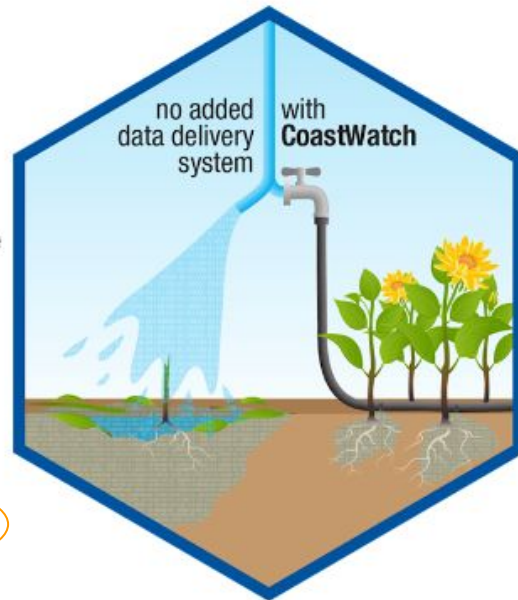


NOAA's CoastWatch Program: a Value Added Provider of oceanographic satellite data

INCREASING
ENGAGEMENT
WITH USER



- Provide access to global and regional **curated, monitored, datasets**
- Develop **tools** and tutorials to help users access and use data; Viewing tools are either an end solution or give a “shop-before-you-buy” experience
- Provide **training** and hands-on assistance; One-on-one consultations, helpdesk and user forum, multi-day satellite courses, conference tutorial sessions, etc.
- Create tailored **products** in response to NOAA mission needs
- **Collaborate directly with users** on applications and developmental projects



OFFICE *of* MARINE & AVIATION OPERATIONS



Bell M. Shimada



Ronald H. Brown



Rainer



Pisces



Oscar Elton Sette



Thomas Jefferson



Oscar Dyson



Oregon II



Okeanos Explorer



Nancy Foster



Reuben Lasker



Henry F. Bigelow



Gordon Gunter



Ferdinand R. Hassler



Fairweather



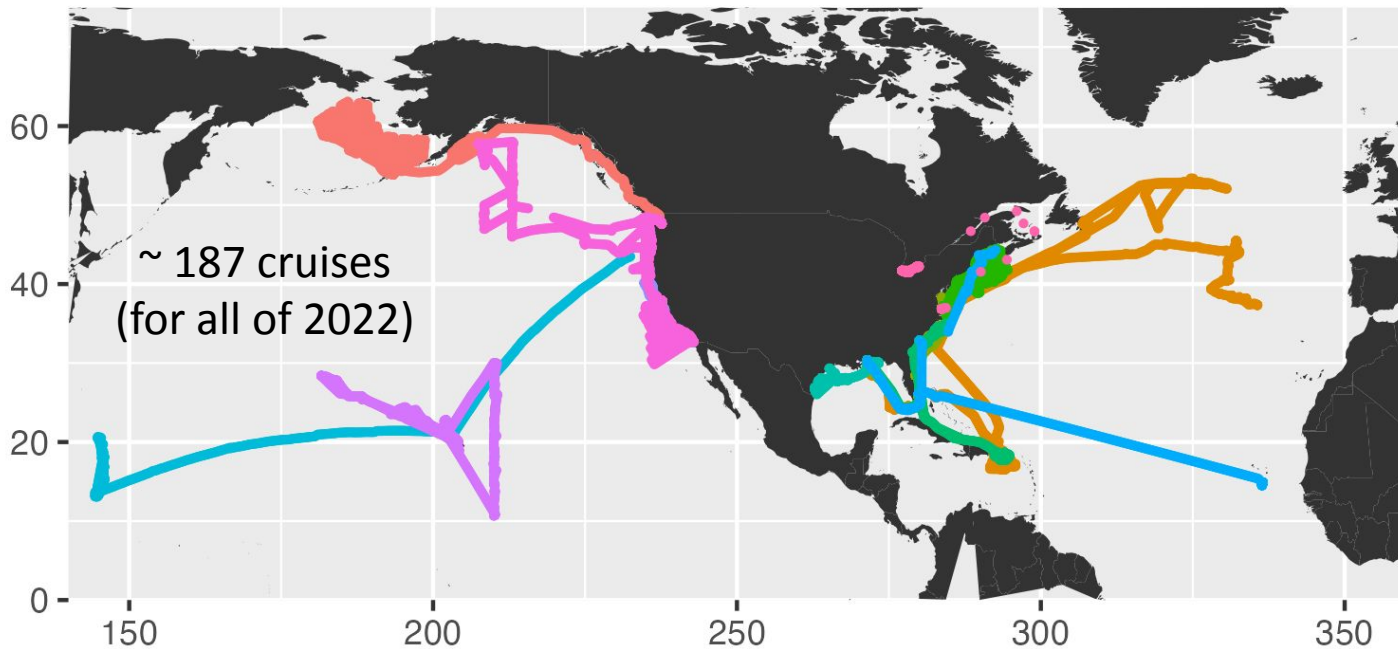
2022 OMAO Days at Sea Statistics

Total Days at Sea	2473	= 6.8 years!!
NMFS	1094	44.2%
NOS	652	26.4%
OAR	293	11.8%
NESDIS	12	0.5%
OMAO	422	17.1%

Data from sdats.noaa.gov



2022 NOAA Ship Tracks, as of 2022-08-23



Ship Tracks from <https://coastwatch.pfeg.noaa.gov/erddap>

ship

- DY
- EX
- FA
- FH
- HB
- NF
- PC
- RA
- RB
- RL
- SE
- SH
- TJ



The Issue

- **Satellite data can provide useful situational awareness** during oceanographic cruises, indicating any nearby chlorophyll blooms, temperature fronts or eddies that might be of scientific interest.
- These data can be used to help make decisions about where to sample or to better understand the data being collected.
- However, often scientists are not aware of the utility of satellite data in this context, and traditionally they have not had access to these data while at sea

The Solution

- CoastWatch sends automated daily emails to NOAA ships with maps of satellite sea-surface temperature, chlorophyll and sea-surface height around the ship
- Emails are sent to the ship's survey technician and chief scientist using designated email addresses
- The ship's location is determined by the underway data served on ERDDAP at <https://coastwatch.pfeg.noaa.gov/erddap>
- Phase I of the Service started Sept 8, 2022



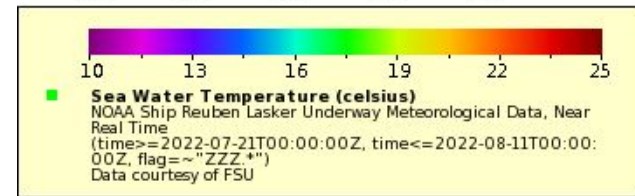
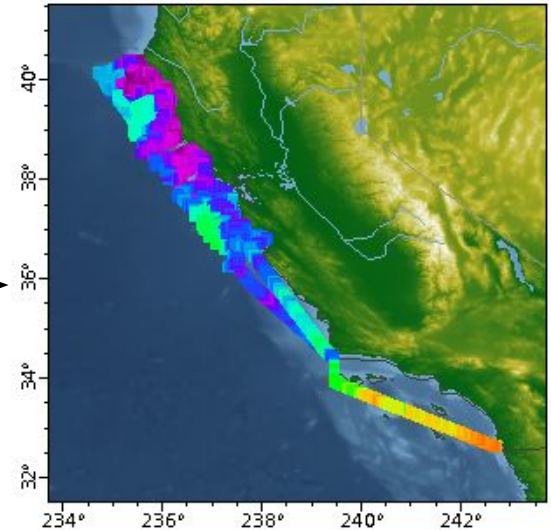
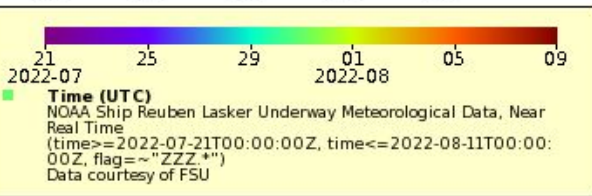
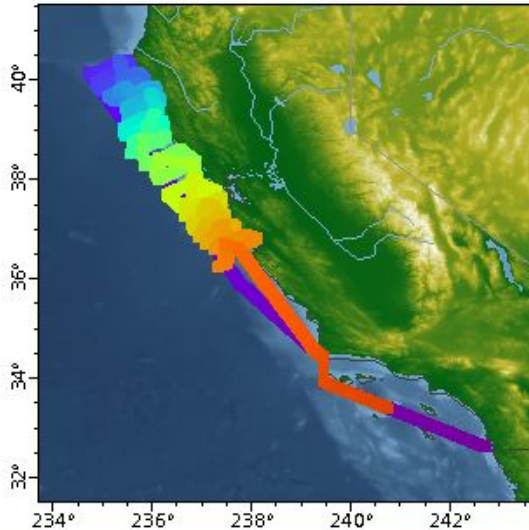
Lasker Cruise, 7/21/22 - 8/10/22

Cruise tracks from ERDDAP

← Colored by time

Colored by →
Sea Surface Temperature

Data collected every minute, but only updated publicly every 24 hours (at midnight GMT)

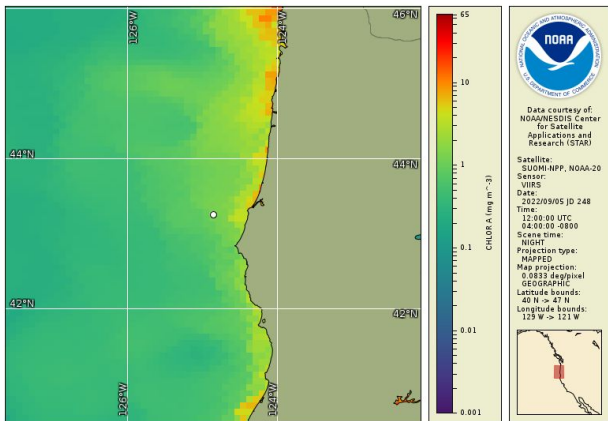


Ship Tracks from <https://coastwatch.pfeg.noaa.gov/erddap>

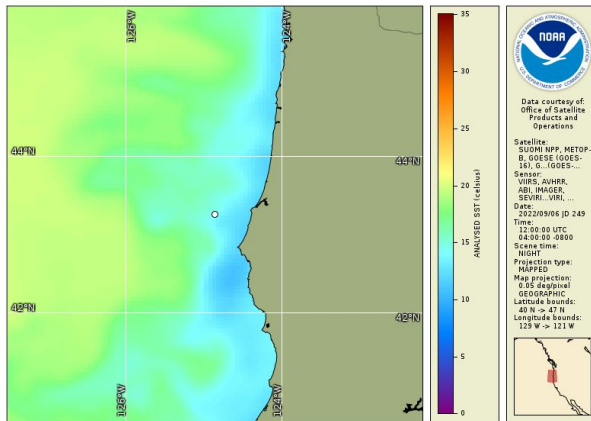


Example: Bell Shimada Maps for 9/7/22

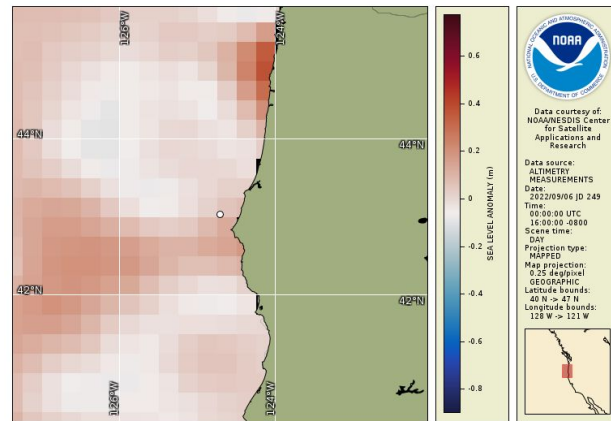
Chlorophyll, DINEOF Gap-filled



NOAA Geo-Polar Blended SST



NOAA SSH anomaly



- It is challenging to get optimal parameter ranges when maps are created by an automated service, over a wide range of oceanic conditions.
- Emails also contain the urls to modify any of the images using ERDDAP (assuming internet connectivity)
- Thanks to Peter Hollemans for implementing change in CW Utilities to add ship markers to maps

CoastWatch's ShipWatch Timeline

Jun 2022	CoastWatch-Central sends out satellite maps with fixed coordinates to the <i>Sette</i>
Jul 2022	CoastWatch-Central sends out satellite maps using NRT location information to the <i>Lasker</i>
	CoastWatch-Great Lakes Node sends out SST maps using NRT location information to the <i>Jefferson</i> in Lake Erie
Aug 2022	CoastWatch-Central sends out satellite maps using NRT location information to the <i>Shimada</i> (they requested the service!)
Sept 2022	CoastWatch-Central rolls out Phase I of ShipWatch to the NOAA Fleet
Dec 2022	Give a briefing on the service (and an ERDDAP tutorial) at the annual training session for OMAO Survey Technicians
2023	Approach UNOLS about offering this service to their ships?



ShipWatch Phased Development

Phase 0 Jun-Aug 2022	Test runs sent out outside of CoastWatch Central processing
Phase I Sept 8, 2022	Initial deployment to ships from CoastWatch Central Best effort M-F/8-5
Phase II	Add dynamic scaling to images Add 'shadow positions' of prior day locations when ship is underway Verify dateline proximity code block Verify in port proximity (not to be confused with anchoring) code block Others based on feedback
Phase III	If warranted, promote to monitoring (requires coordination and approval)



Feedback

“This was useful during the cruise. We used these largely to reason why anomalies in the ctd profile (e.g., anomalies in the oxygen profile) changed from day to day and why the ship sometimes had a hard time maintaining wire angles, and for comparisons with striking changes in the ADCP and EK80 output.”

-Ryan Rykaczewski, Sette Cruise, June 2022. (see image on next slide)

“Love that the Science Party is receiving additional information to help the mission!”

-Ops Officer, Lasker Cruise, July 2022

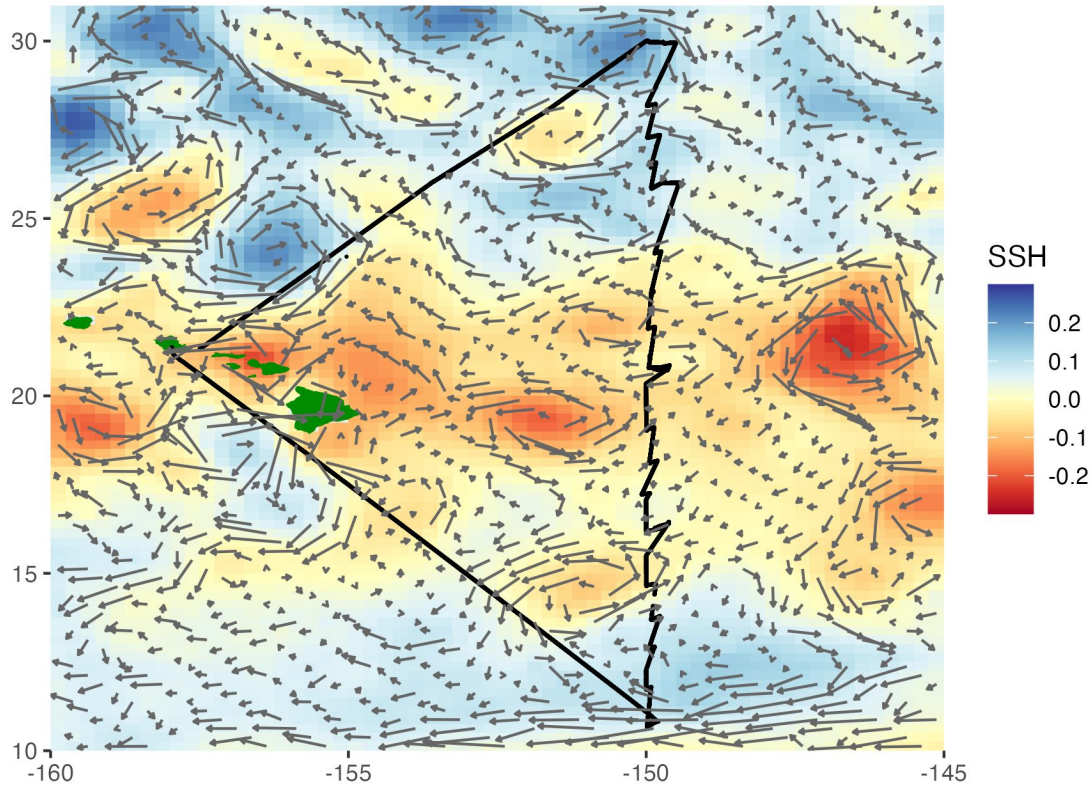
“Maps were helpful in understanding why we were getting what we were getting in trawls and CUFES fish egg samples”

-Chief Scientist, Lasker Cruise, July 2022



NOAA Ship *Oscar Elton Sette*, Cruise 6/23 - 7/7 2022

SSH data from 7/1/2022



Questions???



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