

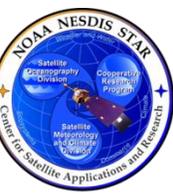


Ocean EDRs and Initiatives: Overview

VIIRS ocean data products responding to operational user needs and applications

Paul M. DiGiacomo and Veronica P. Lance





WE HAVE HEARD FROM OUR USERS

Our users are **sensor-agnostic**;

In addition to high-quality Level 2 EDRs from VIIRS, they have expressed the critical need for:

- *Consistently* processed data sets for *multiple* sensors (NOAA and non-NOAA, including foreign, data)
 - **NOAA ACSPO** for SST: VIIRS, AVHRR, MODIS, ABI, AHI;
 - **NOAA MSL12** for Ocean Color: VIIRS, OLCI, S-GLI;
 - **PGRR funded**: Gladkova et al., Multi-sensor high-resolution gridded (super)-collated SST ACSPO L3C/L3S products
- Even better, a fully merged/integrated multi-sensor (not only JPSS) time series extending as far back into the past as possible (e.g., complete retrospective for MODIS, AVHRR, SeaWiFS et al.)

HOW DO WE GET THIS DONE?





WE HAVE HEARD FROM OUR USERS

- **New product development**

- Phytoplankton Functional Types

- SOCD funded projects:

- Zheng and DiGiacomo (2018) Detecting phytoplankton diatom fraction based on the spectral shape of satellite-derived algal light absorption coefficient, *Limnology and Oceanography*, 63(S1), S85-S98 <https://doi.org/10.1002/lno.10725>
 - Joaquim Goes (LDEO, U. Columbia);
 - Dariusz Stramski and Rick Reynolds (Arctic) (SIO, UCSD)
 - Chris Brown and Tim Moore (NOAA, UNH)
 - Andrea Vander Woude and Sherry Palacios (NOAA/GLERL, NASA/BAERI)

- **PGRR funded:** Hyde et al., Optimization of phytoplankton functional type algorithms for VIIRS ocean color data in the Northeast US Continental Shelf Ecosystem

- **PGRR funded:** Ahmed et al., Extending and evaluating VIIRS ocean color neural network retrievals of harmful algal blooms and IOPs (inherent optical properties) to complex inshore, bay and inland waters and examining their applicability to different bloom types.

- Ocean Heat Content
 - Ocean Acidification/primary productivity, etc.



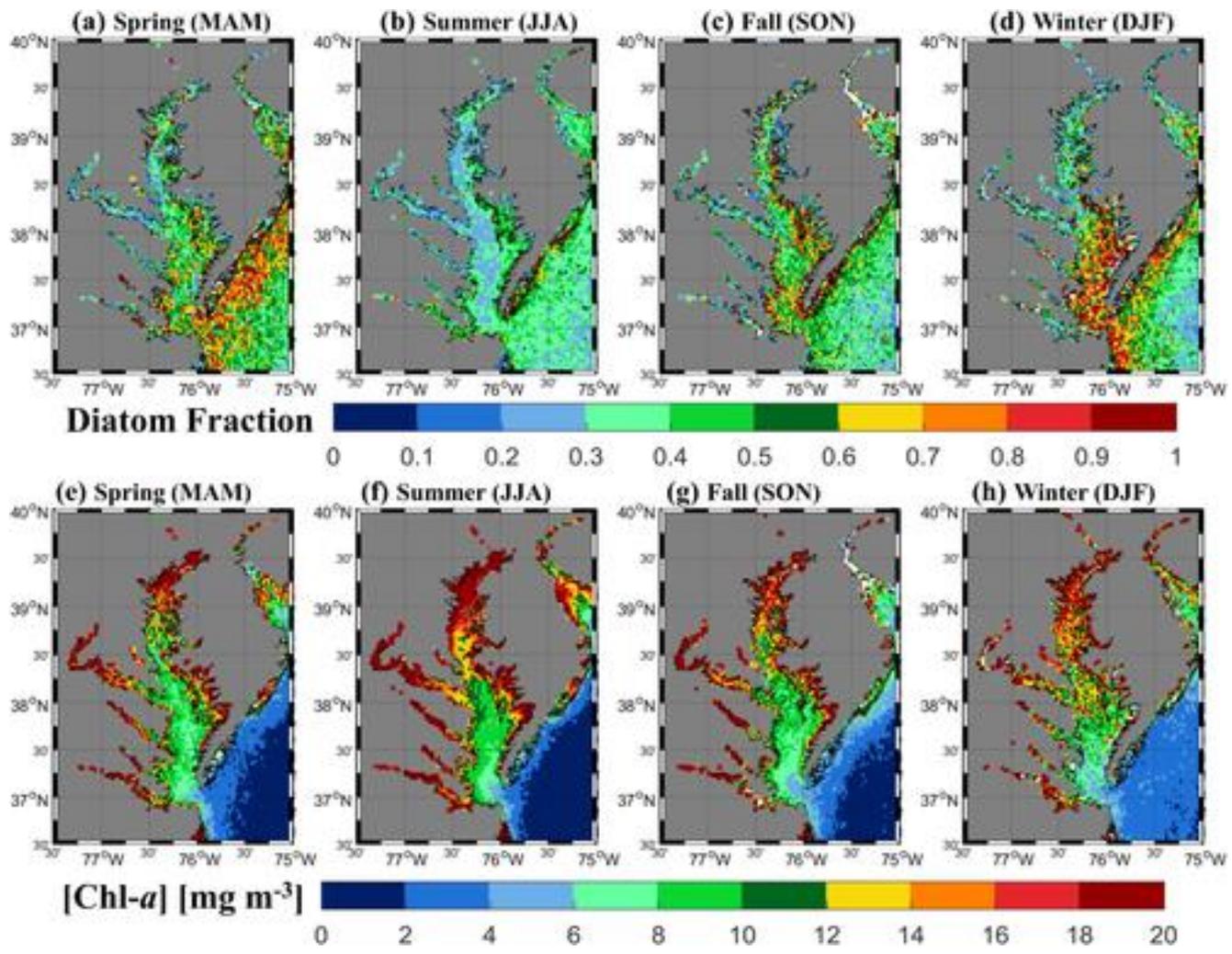


Fig. 5 from paper:
 Seasonal climatology of diatom fraction (a–d) and [Chl a] (e–h) in the Chesapeake Bay derived from VIIRS data during the period of 2012–2016. The diatom fraction is calculated from GSCM-derived $aph(670)/aph(440)$ ratio using Eq. 1. The [Chl a] is calculated based on GSCM-derived $aph(670)$ using Eq. 2.

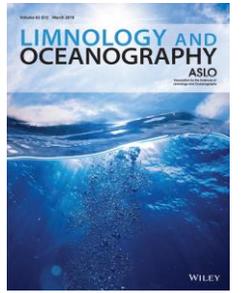


Fig. 5 from Zheng and DiGiacomo, Detecting phytoplankton diatom fraction based on the spectral shape of satellite-derived algal light absorption coefficient, Volume: 63, Issue: S1, Pages: S85-S98, First published: 23 October 2017, DOI: (10.1002/lno.10725)



WE HAVE HEARD FROM OUR USERS

- **Downstream services: Improved data discovery, access and multi-sensor interpretation**
 - **PGRR funded:** DiGiacomo et al., NOAA CoastWatch/OceanWatch – Implement, process and serve JPSS program ocean products tailored for downstream user needs.
 - Includes Data Portal
 - Serving chlorophyll anomaly and DINEOF gap-filled chlorophyll and K_d (downwelling attenuation coefficient) products derived from MSL12 EDRs by the ocean color science team
 - *VIIRS common-gridded products (MSL12 Ocean Color and ACSPO SST in common grid) was cut*
 - PolarWatch Data Portal (VIIRS, AMSR-2 et al.)
 - Access to higher resolution data sets: Sentinel-2, Landsat-8; GCOM-C SGLI
 - CW/OW: additional complementary in situ measurements for validation, environmental context etc.
 - Ocean monitoring (both intra- and inter-themed comparison tools)
 - Use VIIRS in fisheries models:
 - **PGRR funded:** Elliot Hazen, et al., Using VIIRS to operationalize dynamic EBFM (ecosystem-based management) tools on the US East and West Coasts
 - **PGRR funded:** Michael Jacox, et al., Assimilating NOAA VIIRS data into near real-time ocean models to support fisheries applications off the US West Coast.





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CoastWatch.NOAA.gov

Facilitate the use of ocean /aquatic satellite data in the value chain from observations to decision-making

Latest News

Mark your calendar and plan to attend the First International Operational Satellite Oceanography Symposium, 18-19 June 2019 in College Park, MD, convenient to Washington DC [more].

Satellite data products for understanding and managing our oceans and coasts

18-19 June 2019

1st International Operational Satellite Oceanography Symposium





CoastWatch Data Portal

Interactive search Lat: 65.33, Long: -24.88

Remove all layers

Active Layers

- SMOS Salinity (daily)
- Global multi-sensor 5km

Remove all layers

Layer Tools

SMOS Salinity (daily) Layer

Palette:

Data range: 30 - 40 psu

Opacity:

Image Swipe (side-by-side comparison)

select layer

Add to Cart

Shopping Cart

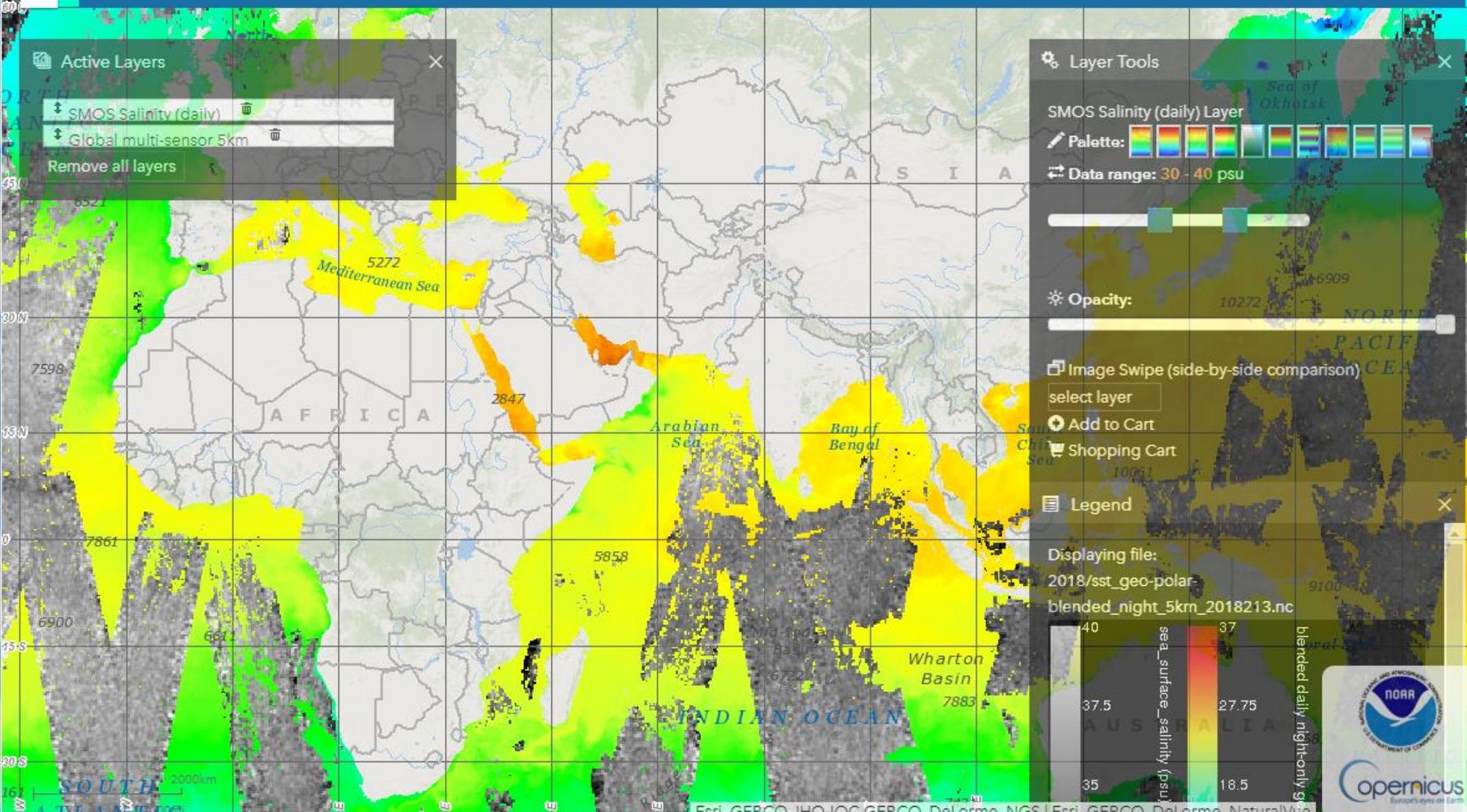
Legend

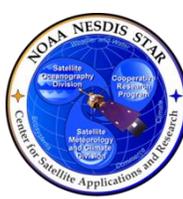
Displaying file:
2018/sst_geo-polar-blended_night_5km_2018213.nc

sea_surface_salinity (psu)

blended daily night-only 5km

40
37.5
35
37
27.75
18.5





Oceanwatch Monitor

- Data and Regions 3
- Satellite Products
- Reference Data
- Regions of Interest
- Intra-thematic Plots 4
- Maps
- Histograms
- Timeseries Graphs
- Dependence Series
- Inter-thematic Plots 3
- Event Media (future)
- On-Demand (future)
- 20-min Quickstart Guide

Partners & collaborators

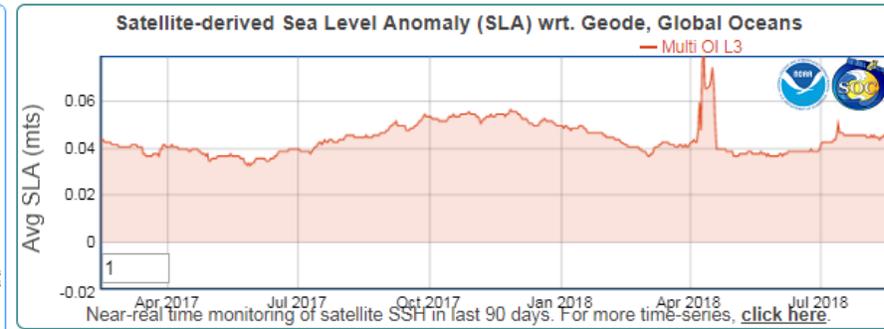
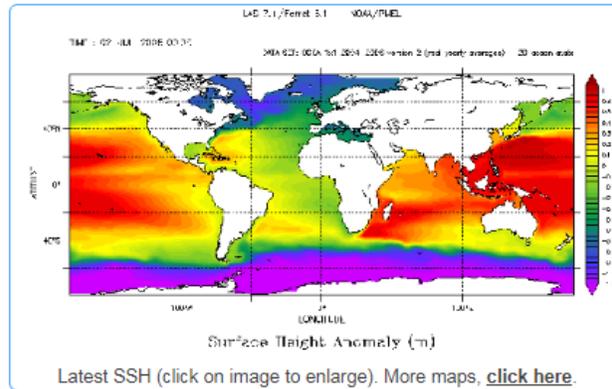


NOAA SOCD Enterprise Oceanwatch Monitor (OM)

The Oceanwatch Monitor (OM) provides a first look at the performances of products ingested in the Oceanwatch systems. These remotely sensed products include: **Sea Surface Temperature (SST)**, **Ocean Color (OC)**, **Sea Surface Height (SSH)**, **Sea Surface Salinity (SSS)** and **Sea Surface Wind (SSW)**.

Sea Surface Height

Satellite altimeters use active radar to observe the surface height of the ocean which is not smooth or flat. Fluid hills and valleys deviate from a reference (mean geoid) height at the ocean surface. These vertical gradients are of interest for sea level rise, storm predictions, ocean currents, ecosystem ecology and other applications.



Ocean Monitor will be incorporated into CoastWatch.NOAA.gov website



The First Operational Satellite Oceanography Symposium

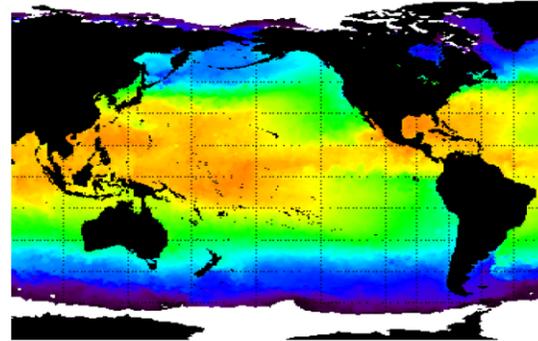
18 & 19 June 2018 here at NCWCP

Aims to

- enable the understanding the barriers (perceived or actual) and
- facilitate the widespread incorporation of satellite ocean observations into the value chain from data to useful information across the range of operational applications.

Satellite operators, information producers and users will exchange facts and ideas to

- understand user needs and expectations, and
- develop interoperability standards and establish best practices that will lead to more universal use of ocean satellite data.



18 to 19 June 2019
Washington, DC Area
FIRST INTERNATIONAL
OPERATIONAL SATELLITE
OCEANOGRAPHY SYMPOSIUM

Satellite remote sensing of ocean properties is a technology of continuously increasing maturity and scope. Sea surface temperature, sea surface height, ocean color, sea ice, ocean winds, roughness-derived parameters (e.g., oil spills) and other measurements are now available on a routine and sustainable basis. Some of these products are integral to operational applications for routine and event-driven environmental assessments, predictions, forecasts and management. Yet ocean satellite data are still underutilized and have a huge potential for contributing further to societal needs and the “blue economy”.

The First Operational Satellite Oceanography Symposium aims to enable the understanding the barriers (perceived or actual) and facilitate the widespread incorporation of satellite ocean observations into the value chain from data to useful information across the range of operational applications. In this symposium, an international community of satellite operators, information producers and users will exchange facts and ideas to 1) understand user needs and expectations, and 2) develop interoperability standards and establish best practices that will lead to more universal use of ocean satellite data.



NOAA Center for
Weather and
Climate
Prediction

18 & 19 June 2019
College Park, MD
USA

Convenient
access from
Washington DC

HTTPS://
CoastWatch.NOAA.gov
/OSOSymposium

STEERING COMMITTEE

Bojan Bojkov (EUMETSAT)
 Christopher Brown (NOAA)
 Paul DiGiacomo (NOAA)
 Veronica Lance (NOAA)
 Francois Montagner
 (EUMETSAT)

Posted 24 May 2018 – More details to follow

Prior to the symposium, an ocean satellite data training course for users will also be held!



What: Global Water Quality Service for Inland & Coastal Waters

Mission Statement: Deliver, on a routine and sustained basis, timely, consistent, accurate and fit-for-purpose water quality data products & information to support water resource management and decision making in coastal and inland waters.

How: Develop, implement and maintain a global inland and coastal water quality monitoring and forecasting service, via a system of systems approach.

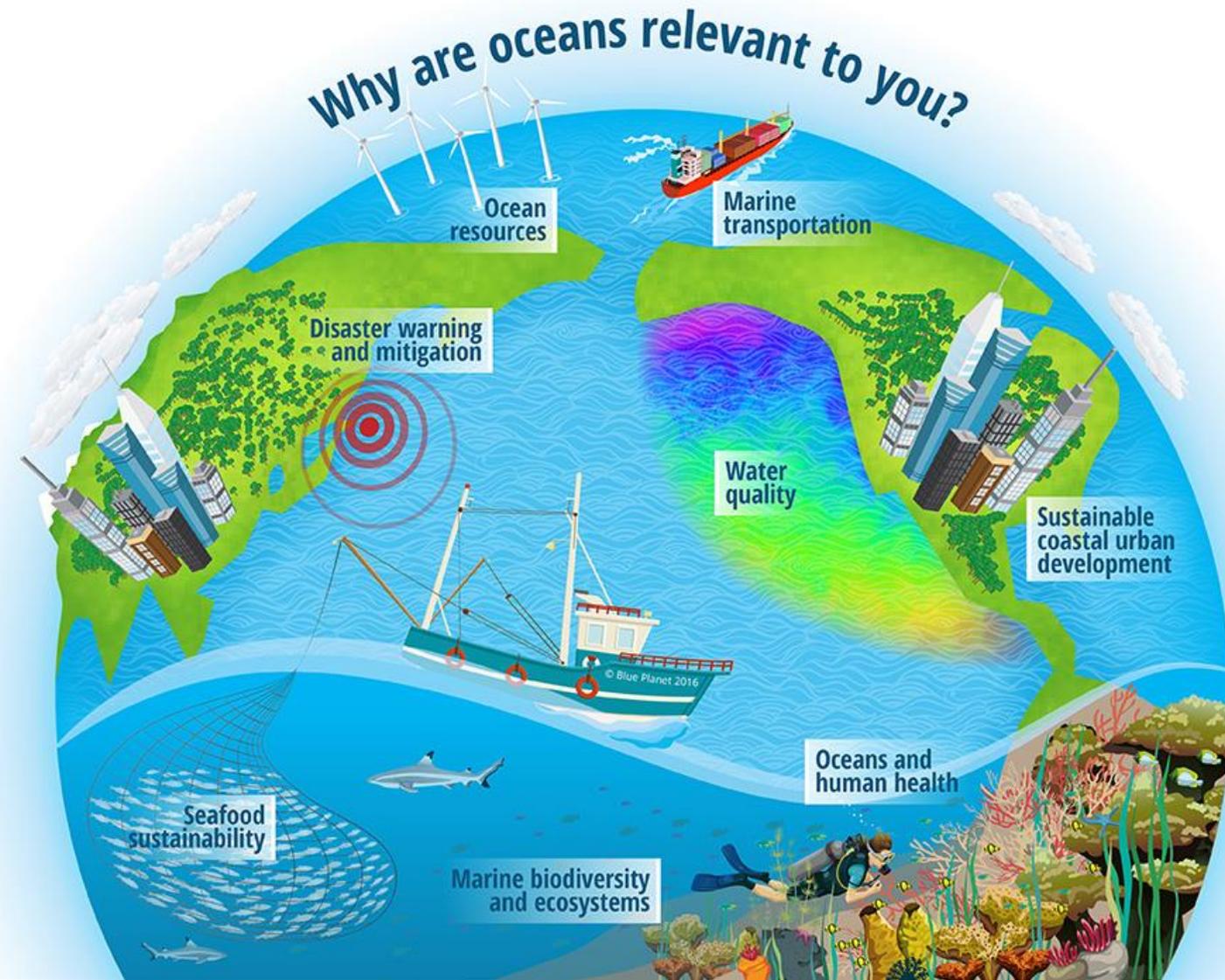
Who: This task will be facilitated by the recently implemented





Ocean and Coastal Information for Societal Benefit

<http://geoblueplanet.org/>



GEO GROUP ON EARTH OBSERVATIONS

BLUE PLANET
Oceans and Society

