

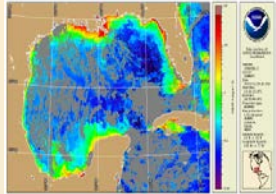
NOAA'S OPERATIONAL OCEAN COLOR PRODUCTS FROM THE COASTWATCH OKEANOS SYSTEM



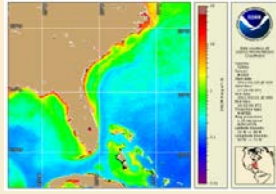
Okeanos (Greek god of the great 'river ocean' and the waters surrounding the Earth) system is a flexible, expandable software system for generating CoastWatch operational ocean color products.

Ocean color is the water hue due to the presence of tiny plants containing the pigment chlorophyll, sediments, and colored dissolved organic material.

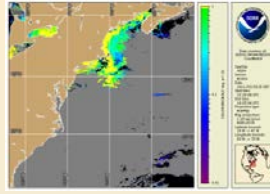
Operational Ocean Color Products



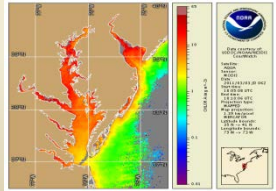
Daily chlorophyll concentration



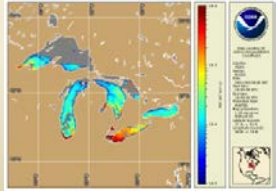
Bimonthly-mean chlorophyll concentration



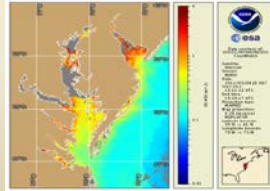
New algal growth (Positive chlorophyll concentration anomaly)



Chesapeake Bay daily chlorophyll concentration



Suspended sediment proxy (Remote sensing reflectance at 667 nm)



Water turbidity (Diffuse attenuation coefficient at 490 nm)

Products Users and Applications

Users

- National Ocean Service & NESDIS
- NOAA ocean forecast model
- Federal, state and local marine scientists, and coastal managers
- Fisheries managers
- General public

Applications

- Track potential harmful algal blooms
- Assess air quality through marine isoprene fluxes
- Assess water quality
- Assess habitat
- Review ocean features

Predict Harmful Algal Bloom

Gulf of Mexico Harmful Algal Bloom Bulletin
11 December 2007
NOAA Ocean Service
Coastwatch System Version 2.0.0

Conditions Report:
New A satellite and information Service
Coastwatch System Version 2.0.0

Florida: A harmful algal bloom has been identified from southern Volusia to southern Indian River County. Primary maximum impacts are possible today through Thursday from southern Volusia to southern Indian River County, with peaks high impacts possible in southern Indian and southern Indian River Counties today through Thursday, December 13.

Analysis:
FL Florida: A harmful algal bloom has been identified in southern Collier County. Primary use the impacts are possible today through Thursday. No other impacts are expected in southern Florida through Thursday, December 13.

Analysis:
This is a separate event unrelated to the South Florida Bulletin number 2007-084 issued Monday December 10, 2007.

Recent samples confirm that the harmful algal bloom currently located in eastern Collier County as far south as southern Indian River County. High concentrations of Karenia brevis were confirmed at River Park, in Indian River County, as well as at two locations within the Ft. Lee County at Mangrove Island and South City Park. Background concentrations of K. brevis were also detected in southern Manatee County and southern Pasco County, FL. This is a separate event unrelated to the Florida Bulletin number 2007-084 issued Monday December 10, 2007.

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Other areas which will likely observe the potential for impacts along the coast of Florida and Indian River Counties through Thursday.

Allen, Keller
Web conditions from St. Augustine, FL

Estimating marine Isoprene Emissions

- Overall emission flux into the atmosphere (Palmer and Shaw, 2005):
$$E_{iso} = K_{AS} * (C_{IP} - H * C_i)$$

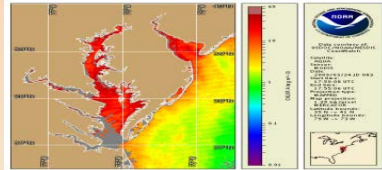
$$\Rightarrow E_{iso} = K_{AS} * C_{IP}$$
- Determine C_{IP} (Marine isoprene concentration)
$$C_{IP} = \frac{P - L_{MAX}}{K_{BOG} + K_{BOG} * \frac{L_{MAX}}{Z_{MIX}}}$$

$$C_{IP} = \frac{\int_{Z_{MIX}}^{H_{MAX}} EF * \ln(PAR) * dh - L_{MAX}}{\sum_{i=1}^n (K_{BOG} + K_{BOG} * \frac{L_{MAX}}{Z_{MIX}}) * H_i}$$

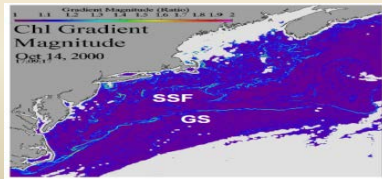
(Palmer and Shaw, 2005) (Revised based on Gantt et al.)
- Derive H_{MAX} : $H_{MAX} = (-\ln(\frac{2.5}{L_0}) / K_{BOG})$ (Gantt et al. 2009)
- L_0 - ground radiation; K_{490} - diffuse attenuation coefficient in water

(Refer to D. Tang @ NOAA Air Resources Laboratory)

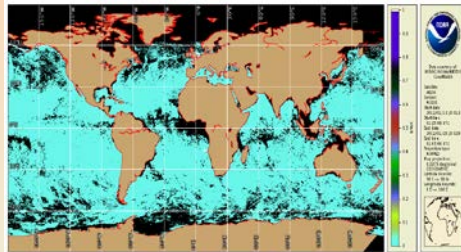
New/Upcoming Operational Ocean Color Products



Operational daily chlorophyll concentration using the NIR-SWIR method



Daily chlorophyll front (Operational Target: summer 2013)



Global map of 8-days, 4 km composite of *E. hux* from 01/13/2012 to 01/20/2012. *E. hux* bloom occurs off west coast of Africa in South Hemisphere. (Operational Target: 2013)

Additional Information

- **Satellites:** MODIS/Aqua and MODIS/TERRA
- **Coverage:** 1/3 of the globe (13 regions)
- **Access Information:**
 - Okeanos ftp server: <ftp://okeanos.noaa.gov/>
 - CoastWatch web portal: <http://coastwatch.noaa.gov>
 - HAB Bulletin Web Portal: <http://tidesandcurrents.noaa.gov/hab/>
- **Team Members:** B. Yan (lead), I. Simpson, E. Rodriguez, K. Hughes, H. Gu, P. Keegstra, S. Ramachandran, J. Guo, X. Liu, and M. Soracco.
- **Contact Information:** Banghua.Yan@noaa.gov
- **Acknowledgements:** Thanks to M. Hopkins, C. Brown and N. Parsons for development, and L. Stathoplos and R. Lindsay for operational deployment of the Okeanos system

