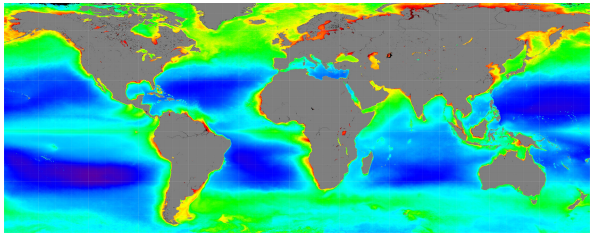
Journal Club Presentation: Ocean Color

Kenneth Bellock, Leshi Chen, Danielle Durrance, Andrew Yen

April 4, 2018



Source: https://www.nasa.gov/press/2015/march/new-nasa-mission-to-study-ocean-color-airborne-particles-and-clouds

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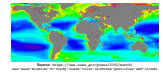

Assumptions:

1. TODO: List assumptions.

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Table of contents
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1. A road map is a great thing to have.
2. A joke or reference to current events in common culture would be great here if the audience appears receptive.

Introduction

Ocean Color refers to the multi-colored ocean map products created from the measurements of chlorophyll by global satellites. The satellites, equipped with temporal scanners, collect water-leaving radiances of the Earths oceans.
Ocean color products are useful to gain insight of the physical and chemical processes occurring in Earths oceans. Chlorophyll concentration maps can be used for climate studies, measuring the salinity of oceans, estimating carbon levels of ocean regions, and studying phytoplankton species.

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1. TODO: Write Introduction

Biospheric Primary Production During an ENSO Transition

Authors	Michael J. Behrenfield, James T. Randerson, Charles R. McClain, Gene C. Feldman, Sietse O. Los, Compton J. Tucker, Paul G. Falkowski, Christopher B. Field, Robert Frouin, Wayne E. Esaias, Dorota D. Kolber, Nathan H. Pollack
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Methods	TODO: Include methods.
Findings	TODO: Include findings.

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2. There can be more than one note.

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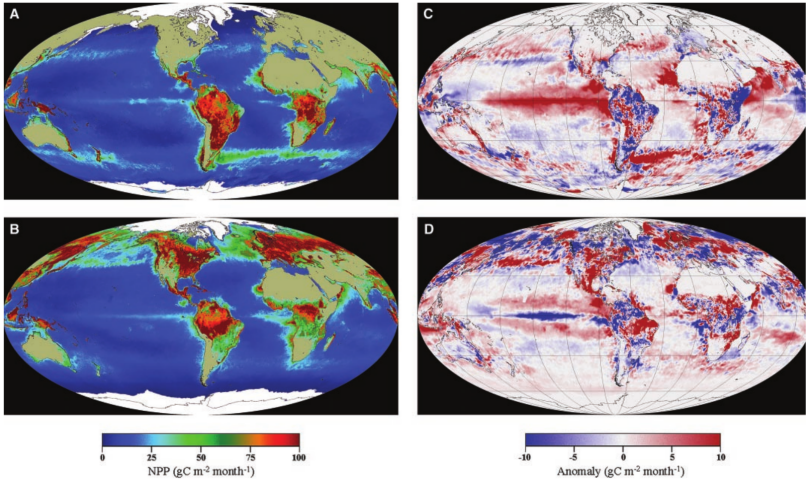

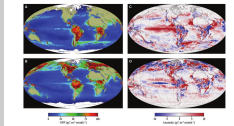

1. Pretty picture

Performance of the MODIS semi-analytical ocean color algorithm for chlorophyll-a

Authors K.L. Carder, F.R. Chen, J.P. Cannizzaro, J.W. Campbell, B.G. Mitchell

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Decadal changes in global ocean chlorophyll

Authors Watson W. Gregg, Margarita E. Conkright

Objectives The authors aim at finding decadal trends in global ocean chlorophyll between data obtained by CZCS (1979-1986) and those by SeaWiFS (1992 2000).

Methods

- Chlorophyll data from CZCS and SeaWiFS are combined for reanalysis at 1 spatial resolution.
- To increase compatibility and to reduce residual errors, both archives are blended with in situ data.

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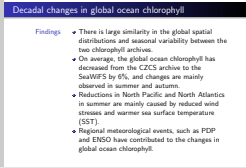
Decadal changes in global ocean chlorophyll

Findings

- There is large similarity in the global spatial distributions and seasonal variability between the two chlorophyll archives.
- On average, the global ocean chlorophyll has decreased from the CZCS archive to the SeaWiFS by 6%, and changes are mainly observed in summer and autumn.
- Reductions in North Pacific and North Atlantics in summer are mainly caused by reduced wind stresses and warmer sea surface temperature (SST).
- Regional meteorological events, such as PDP and ENSO have contributed to the changes in global ocean chlorophyll.



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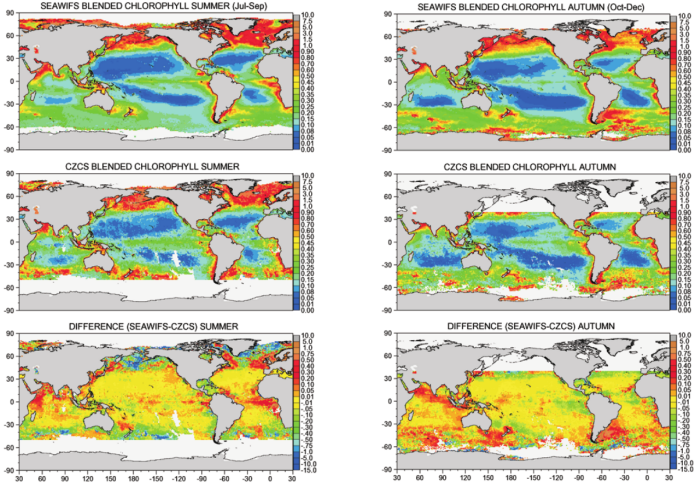
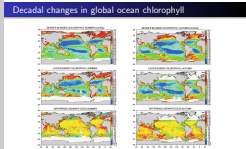
Decadal changes in global ocean chlorophyll





1. Pretty pictures

Corrections to the Calibration of MODIS Aqua Ocean Color Bands Derived From SeaWiFS Data

Authors Gerhard Meister, Bryan A. Franz, Ewa J. Kwiatkowska, Charles R. McClain

Summary A new calibration method was needed to correct a problem affecting the Moderate Resolution Imaging Spectroradiometer, MODIS Aquas, ability to provide accurate ocean color data. The system uses bands 8-14 to detect water leaving radiances from the Earths surface. The problem affected temporal information collected for wavelengths between 412-443 nm. Prior to the calibration issues, the MODIS Calibration and Support Team (MCST) used onboard calibrators and lunar irradiances to sufficiently calibrate the MODIS systems. Now, the calibration methods are based on the Ocean Biology Processing Groups (OBPG) calibration solution for MODIS Terra, which experienced a similar problem. In this method, the MODIS system is cross-calibrated with SeaWiFS to recharacterize the data to correct for the temporal trend error. Now, ocean color data is made with SeaWiFS and MODIS Aqua data merged together. Each data set is processed on its own and then reconfigured.

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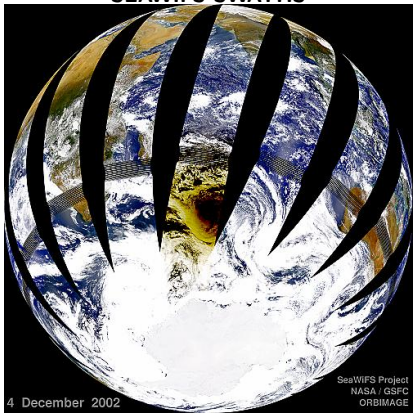
SEAWIFS SWATHS



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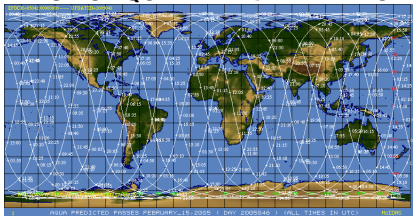
MODIS AQUA PREDICTED PATHS



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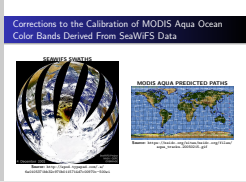

Summary

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1. TODO: Write Summary

Conclusion

Ocean color is best sensed by global satellites to fully capture all available data for accurate analysis. Calculations are performed to compare differing levels of chlorophyll in the Earths oceans in different seasons or years. The chlorophyll levels offer insight on the non-water contents of the oceans to monitor for potentially harmful changes. Chlorophyll levels are affected primarily by water temperature, water currents, and nutrient levels. Significant shifts in chlorophyll concentrations can indicate the occurrence of certain events. Ocean color mapping is a useful tool to find the source of problematic events so problem solving can begin.

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Goodbye Everyone, I'll see you all in "... the next unit.