foraminiferal response towards changes in hydrographic conditions and therefore improve paleoceanographic proxies.

In order to increase the understanding of factors defining Mg/Ca and Sr/Ca in foraminiferal calcite and the refinement of Mg/Ca thermometry, we have carried out Mg/Ca, Sr/Ca and oxygen and carbon isotopic analyses, on six years bimonthly sediment trap samples (April 1978-May 1984), (Deuser, 1987; Deuser and Ross, 1989), on seasonally abundant planktonic foraminiferal species from the deep Sargasso Sea (32°05.4'N, 64°15.4'W; mooring depth-3200m). The species under study are *Globigerinoides ruber* (white), *Globigerinoides ruber* (pink), *Globigeriella aequilateralis*, *Globigerinoides sacculifer*, *Globigerinoides conglobatus*, *Globorotalia truncatulinoides*, *Globorotalia hirsuta*, *Globorotalia inflata*, *Globorotalia crassiformis*, *Neogloboquadrina dutertrei*, *Orbulina universa*, and *Pulleniatina obliquiloculata*. Foraminifera were picked from >125 μm size fractions and subsamples of the same crushed powder were analysed for trace elements and isotopes. Subsamples for Mg/Sr/Ca were cleaned to remove clays and organic matter prior to analysis.

Similar seasonal variations occur in oxygen isotopes and Mg/Ca ratios of foraminiferal tests. Results available to date demonstrate that *G. ruber*, both white and pink, shows a seasonal cycle in Mg/Ca and δ^{18}O that varies from approximately 3.0 to 5.0 mmol/mol and -0.3 to - 1.6 per mil, from April to November respectively. In addition, both white and pink *G. ruber* shows seasonal variation in Sr/Ca and δ^{13}C. We have also observed annual variation in Mg/Ca and δ^{18}O for *G. aequilateralis* and *G. truncatulinoides*. Calcification temperatures have been estimated using foraminiferal oxygen isotope data. Our results for *G. ruber* show a strong temperature dependence with a $\sim$10% change in Mg/Ca per °C change in isotopic temperature, similar to culture calibrations.

OS51D-0510 0830h INVITED POSTER

Effect of Zooplankton Community Structure on Particle Flux and Nutrient Cycling at the Bermuda Atlantic Time-series Study (BATS) Site

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The structure of zooplankton communities has a significant impact on vertical transport and cycling of elements in the sea. Zooplankton play an integral role in the flux of material out of the euphotic zone at BATS via active transport by vertical migrators and by production of rapidly sinking fecal pellets. Zooplankton biomass in the upper 200 m at BATS is on average 1.7 times higher at night than day due to vertical migration. Migrating zooplankton actively transport a substantial amount of dissolved inorganic and organic carbon and nitrogen to deep water at BATS (via respiration and excretion), which can be significant relative to the passive flux of sinking particles. Active transport of C is equal to a mean of 8% (maximum 39%), and N equal to a mean of 13% (maximum 164%) of the gravitational vertical export of particulate organic C and N, respectively, measured with sediment traps at 150 m. Substantial excretion of dissolved organic material by migrators (mean of 24% of total C and 32% of total N metabolized) could be important to the microbial community at depth. Dissolved material exported by zooplankton is usually not at a Redfield C:N ratio of 6.6, contributing to non-Redfield remineralization patterns seen at depth.

Changes in the zooplankton community can also dramatically affect the composition and sedimentation rate of fecal pellets, and thus the export of organic material. However, zooplankton biomass alone is not necessarily a good predictor of flux; the species composition of the resident community may at times more considerably affect export of organic material to the deep ocean. For example, there is a positive but weak relationship between monthly zooplankton biomass and organic C flux at BATS. Analysis of the bloom dynamics of salps (large gelatinous zooplankton) over the ten-year time series at BATS indicates salps graze on average 4% of the primary production, but fecal flux from salps can constitute on average 33% (maximum over 10-fold) of the sediment trap flux. An effort is underway to analyze the species composition of the BATS zooplankton time series in order to better understand how diel, seasonal and interannual changes in the taxa affect biogeochemical cycles in the Sargasso Sea.

OS51D-0511 0830h INVITED POSTER

Interactions Between Dissolved Organic Matter and Microbial Processes and Community Structure at the Bermuda Atlantic Time-Series Station.

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The North Atlantic subtropical gyre near Bermuda is the site of the U.S. JGOFS Bermuda Atlantic Time-series Study (BATS) site. Since 1991 it has been a site where microbial processes and their interaction with dissolved organic matter has been studied. The northwestern Sargasso Sea displays seasonal dynamics in DOC accumulation and distribution of bacterial biomass and community structure. Studies conducted at the BATS site show that DOC stocks accumulate rapidly within the euphotic zone shortly after restratification of the water column and remain at elevated concentrations in the surface waters through the summer into early autumn. Deep convective mixing during the winter can result in a portion of the seasonally accumulated DOC to be mixed to a depths below the euphotic zone. Elevated microbial biomass is also enhanced below the euphotic zone following deep convective mixing. Following stratification, the exported DOC becomes trapped within the aphotic zone and DOC is removed on time scale of weeks to months. Microbial community structure as well as nutrient regime differ significantly at depth compared to the surface waters. It is hypothesized that microbial community structure present at depth may be adapted to utilize more recalcitrant DOM otherwise unavailable to surface water microbial communities.

From 1994 to 1999 the maximum deep mixing depth shoaled approximately 100 m with a subsequent accumulation of 4 micro-mol C per liter in the surface 140 m during this time period. Accumulation of suspended organic matter in the surface 140m may be associated with the fact that there was limited export of semilabile organic matter into a depth horizon where microbial community structure and nutrient regime would promote utilization of semi-labile DOC. An overview of time series data as well as experimental work addressing this issue will be presented.

OS51E MC: 132 Friday 0830h

Calibration and Validation Efforts Under Way by the Ocean Color Missions II *(joint with B)*

Presiding: **G S Fargion,** NASA / Goddard Space Flight Center; **C R McClain,** NASA / Goddard Space Flight Center

OS51E-01 0830h

Simultaneous Determination of Oceanic and Atmospheric Parameters for Ocean Color Imagery by Spectral Optimization: A Validation

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We report application of a spectral optimization algorithm to processing SeaWiFS data in Case 1 waters. The algorithm couples a simplified aerosol model with a sophisticated water-reflectance model to simultaneously retrieve both atmospheric and ocean parameters. The retrieved ocean properties – the absorption coefficient of colored detrital material and the chlorophyll *a* concentration – are validated by comparison with "surface" truth obtained with airborne and space borne sensors. We show that employing a complete water reflectance model significantly improves the decoupling between the oceanic and atmospheric optical signals. Methodologies for applying the algorithm to Case 2 waters and for delineating terrestrial vs. marine CDOM are suggested.

OS51E-02 0845h

Use of a Neural Network Approach to Improve Atmospheric Correction of Ocean Color Imagery

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The retrieval of ocean constituents from satellite ocean color measurements is very sensitive to the atmospheric correction. Existing operational algorithms generally fail when strongly absorbing aerosols (pollution, mineral dust ...) are present in the atmosphere. Improved atmospheric correction algorithms, which simultaneous estimate ocean and aerosol optical properties, have recently been developed. These new methods have been shown to perform well even for absorbing aerosols. However their requirements in terms of computer-time prevent from using them within operational ocean color data processing.

In this context, advanced programming techniques such as Neural Network (NN) can help in implementing improved atmospheric correction algorithms in operational processing. The formalism of the Spectral Optimization Algorithm (Chomko and Gordon, 1998) is particularly adapted to a NN approach.

The first step is to design specific NNs, referred as the direct model, which enables to estimate the SEAWIFS top-of-atmosphere (TOA) reflectances in the visible for the case 1 waters. These NNs compute aerosol and marine reflectances as well as atmospheric transmittances given the geometry of the measurement, the aerosol type and concentration, and the chlorophyll concentration. The various NN were trained using a set of radiative transfer simulations. For most of the cases, the accuracy was found to be better than 5% RMS on the whole visible spectrum.

The second step is to invert the direct model to retrieve aerosol and marine parameters by minimizing the distance between observed and computed TOA reflectances. This variational method is easy to implement since it is straightforward to compute the gradients (adjoints) of a direct model based on NN. We will show the first results of our NN inversion applied to a plume of pollution aerosols off the U.S. East Coast, and we will discuss these results in terms of both rapidity and accuracy.

KeyWords : Ocean Color, Atmospheric Correction, Neural Network, Variational Method, Oceanic and Atmospheric Transfer Models

OS51E-03 0900h

Refining SeaWiFS Vicarious Calibration Using Spectra Slopes

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The current calibration of SeaWiFS involves two steps, correction for temporal changes using lunar observations, and vicarious calibration of the radiance based on comparison with the Marine Optical Buoy (MOBY) sites. The later has potential uncertainty of 0.5 % in the top-of-atmosphere (TOA) radiance calibration (Barnes et al. 2000). The vicarious gains are periodically checked and updated. In coastal areas, the calibration of the 412 nm band is of particular concern owing to the need to correct for absorbing aerosols in the atmosphere and the interest in monitoring or compensating for colored dissolved organic matter (CDOM) in the water. Calibration errors of 0.5-1% between bands in the blue (412 nm, 443 nm, 490 nm) can introduce significant errors in algorithms used for both these purposes. We propose a supplemental step to the current procedure. A large field data set suggests the slope of remote sensing reflectance between 444 and 490 nm, particularly in case 2 waters, can be used to determine

a range of realistic slopes of remote sensing reflectance between 412 and 444 nm. The analysis gives the same results for different atmospheric corrections, showing robustness, and does not use simultaneous field data. Our results indicate the current gain for 412 is underestimated by 1.0%.

OS51E-04 0915h

Evaluation of Chlorophyll-a Ocean Color Algorithms for the Southern Ocean

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An ocean color chlorophyll-a (chl-a) algorithm (SPGANT) has been developed by combining new in situ spectral reflectance and chl-a data obtained during the US JGOFS AESOPS (Antarctic Environment and Southern Ocean Process Study) and the AMLR (Antarctic Marine Living Resources) programs. The results are compared to previous ocean color algorithms recommended for the Southern Ocean (Mitchell and Holm-Hansen, Deep Sea Research, 38:1,009; 1991) and also were evaluated with respect to in situ match-up data for both chl-a and normalized water-leaving radiances (Lwn). The SPGANT algorithm minimizes the bias of NASAs standard SeaWiFS chl-a algorithm (OC4) that underestimates near-surface chl-a for the Southern Ocean by about 30-40% in the range of 0.8 - 3 mg chl m^{-3}. At low (< 0.4) and high chl-a (> 4) the OC4 algorithms overestimates relative to in situ observations. The SPGANT algorithm is based on fluorometric estimates of chl-a, and these were compared to HPLC estimates available for a majority of the optics stations.. Significant issues have been found between HPLC and fluorometric estimates of chl-a for the JGOFS Polar Front cruises but there was good agreement for other cruises. We have compared our large global data set (25% of the NASA SeaWiFS algorithm data) to our Southern ocean data. Evaluation of the Lwn spectra relative to spectral absorption and backscattering coefficients indicates that differences in Southern Ocean chl-a algorithms compared to low latitude data (e.g. the NASA global data set used for OC4) are attributed to changes in both absorption and backscattering relative to chl-a.

OS51E-05 0930h

In-situ validation of ocean color (SeaWiFS) using the GEP&CO Cruises

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Quarterly observations of the concentration of pigments in the surface water, the water absorption, the water reflectance, and the phytoplankton composition, have been obtained on the commercial shipline between Le Havre (France)and Noumea (New Caledonia)for the validation of ocean color observations. It covers the North Atlantic and the South Pacific from 1998. A comparaison between in-situ measurements and SeaWiFS estimates is presented for chlorophyl concentration anf water reflectances.

OS51E-06 1005h

An Ocean Color Assessment of Sediment Plumes and Phytoplankton Blooms in the Santa Barbara Channel, California

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The characterization of the substances, processes, and mechanisms that regulate coastal ocean color variability is crucial for the application of ocean color imagery to the management of marine resources. Here, satellite and in situ observations from a six-year observational program are used to assess sources and modes of ocean color variability within the Santa Barbara Channel, California. Results from an empirical orthogonal function analysis show that nearly two-thirds of the observed variability in remote sensing reflectance is contained in a backscattering mode whereas phytoplankton absorption makes a much smaller contribution to the observed variance. Particulate backscattering associated with suspended sediment concentrations is the dominant driver of ocean color variability for this environment. However, sediment plumes appear to play a much smaller role on biological processes. An empirical partitioning of physical, biological and chemical oceanographic parameters suggests that physical oceanographic processes (i.e., upwelling and horizontal advection) have the dominant role in determining phytoplankton pigment biomass for this region. Similar partitioning is found spatially using satellite ocean color imagery from the SeaWiFS mission.

URL: http://www.icess.ucsb.edu/PnB/PnB.html

OS51E-07 1020h

An Evaluation of SeaWiFS Derived Chlorophyll Concentration in Massachusetts Bay

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The Massachusetts Water Resources Authority (MWRA) has constructed a 9.5 mile outfall to discharge secondary treated wastewater into Massachusetts Bay. The impact of this discharge has been studied by an extensive water-quality monitoring program that includes monthly and seasonal, nearfield and farfield surveys conducted on research vessels, as well as satellite measurements of Sea Surface temperature and chlorophyll concentrations. We have used the shipboard measurements of chlorophyll concentrations to evaluate 4 chlorophyll algorithms including OC4, the current operational SeaWiFS algorithm. We will present the results of this analysis along with a description of seasonal and interannual variability in Massachusetts Bay. We will also present the comparison of three years of SeaWiFS data (Sept. 1997-Sept. 2000) from before the outfall was turned on to one year of SeaWiFS data (Sept. 2000 - Oct. 2001) after the outfall went operational and discuss its possible impact on the ecosystem of Massachusetts Bay.

OS51E-08 1035h

Validation of Ocean Color Algorithms in East Asian Marginal Seas

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Current standard ocean color algorithms are designed to work in open ocean (Morel Case-1) waters where optical properties are dominated by phytoplankton and pure water. In turbid coastal waters (Case-2) optical properties diverge significantly from Case-1 waters and current algorithms are not generally valid.

Ocean spectral reflectance (Rrs) data and supporting in situ measurements (chlorophyll-a, suspended solids, particulate and dissolved absorption, particulate organic carbon) were collected in East Asian marginal seas including the Sea of Japan (East Sea), East China Sea and South China Sea (near Hong Kong and the Pearl River estuary). Comparison with Case-1 Rrs chlorophyll-a relationships shows that in Case 2 waters Rrs is highly variable and can be either higher or lower than corresponding Rrs of Case-1 waters at similar chlorophyll-a concentration. Normalizing the Rrs spectrum to a Rrs value at a longer wavelength reduces the effects of particle scattering and enhances the effects of absorption. Rrs ratios in the turbid coastal waters show distinct clusters that diverge significantly from Case-1 relationships and cause significant overestimation of chlorophyll-a when using standard Case-1 algorithms. The divergence from Case-1 waters of Rrs - chl-a relationships for the Asian waters studied are caused by the non-correlation of chl-a with inorganic and organic detrital particles, and dissolved material.

OS51E-09 1050h

Dusty Skies and Varied Waters: Validation of SeaWiFS Algorithms in the Tropical Atlantic Ocean

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As a part of the Sensor Intercomparison and Merger for Biological and Interdisciplinary Oceanic Studies (SIMBIOS) program, we participated in two cruises in the tropical Atlantic Ocean. One of the primary objectives of our cruises is to study the effect of dust events originating in Africa on ocean biogeochemistry of the tropical Atlantic Ocean. The other objective of these cruises is to study the influence of the Amazon River on the biogeochemistry of this region. These two cruises were organized to coincide with high and low dust events and Amazon River flow in the tropical Atlantic Ocean. During our cruise in January/February 2001, we encountered two severe dust events that could be tracked by satellite imagery and extended over our measurement site. During our cruise in July/August 2001, we characterized the Amazon River plume and also encountered an extremely dense bloom of the diatom Hemiaulus containing the endosymbiotic diazotrophic cyanobacteria Richelia. We have used our measurements of aerosol optical thickness, in-situ downwelling irradiance, upwelling radiance and chlorophyll concentrations to evaluate the current atmospheric correction and chlorophyll algorithms for the SeaWiFS and MODIS sensors.

URL: http://www.usc.edu/dept/LAS/biosci/tricho/bc/

OS51E-10 1105h

A Global Survey of Shipboard Measurements of Aerosol Optical Properties over the Oceans

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Marine aerosols contribute to the global albedo in two ways: direct scattering of incoming solar radiation to space (the direct effect) and modulation of the scattering properties of marine clouds (the indirect effect). The shortwave scattering and absorption characteristics of the marine atmosphere vary widely in space and time due to the variety of aerosol types, aerosol concentrations, and cloud structures that can be present. Aerosols over the oceans may originate from a variety of sources. Some are locally produced by wind-wave interaction while others are advected over great distances by the wind. In clear skies, advected continental aerosols can have a significantly different radiative impact than those that are locally produced. In cloudy skies, continental aerosol can cause modifications to the cloud droplet distribution in marine boundary layer clouds. Therefore, it is important to understand the spatial, temporal, and physical characteristics of aerosol over the world's oceans.

Although information about aerosol optical properties over the world's oceans is critical, shipboard sun photometer measurements of these properties are relatively sparse. As part of our NASA SIMBIOS work and with additional support from the Department of Energy's (DOE) Atmospheric Radiation Program (ARM) program, the number of shipboard measurements has increased exponentially due to the development of a marine version of the Fast-Rotating, Shadow-band spectral Radiometer (FRSR). This instrument makes continuous, semi-automated shipboard measurements of the direct-normal, diffuse, and global irradiance in seven channels (415 nm, 500 nm, 610 nm, 660 nm, 862 nm, 936 nm, and broadband) and does

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not require a mechanically stabilized platform, thereby making it cost effective and reliable. The aerosol optical thickness is computed continuously from the direct-normal component of irradiance using calibration constants obtained using the Langley technique. The FRSR has been deployed on numerous cruises of opportunity (over 20) and is semi-permanently deployed on several operational research vessels. The data base of cruises has reasonable global coverage and the current FRSR data base contains years of data. In addition to routine cruises, the FRSR database includes data from the following field experiments: Aerosols99, INDOEX, Nauru99, and ACE-Asia.

The FRSR data base have been analyzed for the purpose of classifying the various aerosol regimes over the world's oceans and quantifying the aerosol optical properties in these regimes. Uncertainties in the measurements have been quantified and are used as filtering criteria. Data from the instrument, after significant processing, are combined with aerosol chemical classifications, when available, to provide a unique view of aerosol structure over the world's oceans. Different aerosol regimes have been identified and their characteristics determined from the FRSR measurements. The FRSR can distinguish differences between the aerosol radiative properties, namely the aerosol optical thickness, the angstrom exponent, and the diffuse irradiance, in different aerosol regimes. Differences in the aerosol characteristics in different regimes are delineated in the FRSR data and interesting patterns are documented.

URL: http://www.gim.bnl.gov/

OS51E-11 1120h

Comparison of Satellite Estimates of Aerosol Optical Thickness and Cloud Cover with Shipboard Measurements

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An important component of the data calibration and validation programs for the ocean color satellite missions, such as NASA SIMBIOS, is the validation of the algorithm for the atmospheric correction. Correction of satellite radiance for the impacts of the intervening atmosphere is necessary because atmospheric aerosols scatter incoming solar radiation in the same blue and green wavelengths that contain scattered light from the ocean surface layer. Only about 5% of the radiance measured at the satellite has been scattered from within the ocean (water-leaving radiance); the vast majority has been scattered by the turbid atmosphere. Atmospheric correction is accomplished by measuring the aerosol optical thickness in two near-infrared channels that contain no radiance contribution from the underlying ocean. These two near-infrared measurements are used in conjunction with aerosol and radiative transfer models to infer the aerosol scattering properties in the blue and green wavelengths. Once these characteristics are estimated, the radiance due to aerosol scattering can be subtracted from the total satellite radiance leaving the water-leaving radiance as a residual.

Validation of the aerosol component of the atmospheric correction algorithms actually involves answering several important questions: (1) Is the sky clear in the satellite pixel?; (2) Does the satellite accurately measure the aerosol optical thickness in its near-infrared reference channels?; and (3) is the model used to estimate the aerosol optical thickness in the blue and green wavelengths from the aerosol properties in the near-infrared wavelengths adequate?

As part of our NASA SIMBIOS work and with additional support from the Department of Energy's (DOE) Atmospheric Radiation Program (ARM) program, we developed and deployed a new instrument during the past two years: the ship-board Fast-Rotating Shadowband Spectral Radiometer. This instrument makes continuous, semi-automated shipboard measurements of the direct-normal, diffuse, and global irradiance in seven channels (415 nm, 500 nm, 610 nm, 660 nm, 862 nm, 936 nm, and broadband) and does not require a mechanically stabilized platform, thereby making it cost effective and reliable. The aerosol optical thickness is computed continuously from the direct-normal component of irradiance using calibration constants obtained using the Langley technique. This instrument has been deployed extensively during the past three years traversing parts of all three oceans.

Comparisons between FRSR-measured aerosol properties and the satellite aerosol properties deduced from a combination of near-infrared radiance measurements and models have been performed. These comparisons are a mechanism to evaluate the integrity of current atmospheric correction algorithms. The comparisons include FRSR and satellite measurements of the aerosol optical thickness in the near-infrared wavelengths, FRSR measurements and satellite-based estimates of the aerosol optical thickness in the blue and green wavelengths, and tests of the cloud filters used in the satellite algorithms.

URL: http://www.gim.bnl.gov/

OS51E-12 1135h

Maritime Aerosol Optical Model Based on the Aerosol Robotic Network (AERONET) Measurements.

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The quality of bio-optical products of satellite ocean color sensors is strongly dependent on the accuracy of atmospheric correction algorithms. Atmospheric correction of ocean color imagery requires better aerosol modeling. Aerosol optical properties over the oceans vary considerably. In order to simulate aerosol optical conditions over the oceans three major sources should be considered, which we can define in terms of generalized source trajectories: continental air, pure oceanic air, and desert dust. In the current study we consider primarily pure oceanic air. To retrieve a "pure maritime" component we?ve considered the data set with the aerosol optical depth smaller than 0.15 and Angstrom parameter less than 1. Aerosol optical model include information about optical (aerosol optical depth and its spectral and diurnal dependence, phase function and single scattering albedo) and microphysical (size distribution and its parameters, refractive index) characteristics and eigen vectors of covariance matrix. Day-to-day variations, diurnal variations, frequency of occurrences are presented for Bermuda (Atlantic Ocean), Lanai, Hawaii (Pacific Ocean) and Kaashidhoo, Maldives (Indian Ocean). Daily averages and instantaneous measurements are considered in the analysis. Comparison of the columnar volume size distributions for each site is presented. Derived "maritime" component in the size distribution appeared to be very similar for the sites considered. Estimates are made for the fractional contribution of the fine and coarse modes to aerosol optical depth and total concentration. The intercorrelation of aerosol optical depth values at different wavelengths reveals that correlation factors are generally high for both instantaneous and daily averaged measurements. Spectral dependence of the first two eigen vectors of covariance matrix is similar. For all three sites the first vector explains about 92-93% of the total spectral variance of optical depth and the second vector explains 6-7%. The first two eigen vectors are clearly sufficient to simulate the principal features of the optical depth spectral behavior.

OS52A MC: Hall D Friday 1330h

Calibration and Validation Efforts Under Way by the Ocean Color Missions III *(joint with B)*

Presiding: **G S Fargion,** NASA / Goddard Space Flight Center**; C R McClain,** NASA / Goddard Space Flight Center

OS52A-0512 1330h POSTER

SeaWiFS On-orbit Calibration Changes Derived from Four Years of Lunar Measurements

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Lunar measurements are an integral part of the calibration of the Sea-viewing Wide Field-of View Sensor (SeaWiFS). The first measurements of the moon were made on 14 November 1997. Regular, monthly lunar measurements have continued since then, providing a four year data set. The SeaWiFS Project uses the moon as a stable reflectance target over the lifetime of the mission. However, corrections must be made to the lunar measurements for geometric factors, such as the lunar phase angle. The four year lunar data set shows the greatest calibration change to occur at 865 nm. The changes decrease with decreasing wavelength to a minimum near 500 nm. There is a small increase in the calibration change in the blue at 412 and 443 nm. The sensitivity of the lunar technique is sufficient to detect small annual oscillations in some of the bands due to improper correction factors for the temperatures of the focal planes. Over time, the rates of the calibration changes in the SeaWiFS bands are decreasing, based on the lunar measurement set. At the next SeaWiFS reprocessing, these changes will be fitted to exponential time series.

OS52A-0513 1330h POSTER

A Three Year Intercomparison of Oceanic Optical Properties from MOS and SeaWiFS

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Since 1996, following in the success of CZCS, a fleet of space-borne sensors with ocean color capability have been put into operation by various research institutions throughout the world. The NASA SIMBIOS Project has been funded to evaluate the consistency of oceanic optical properties retrieved by these different sensors, with the ultimate goal of merging data from multiple missions to enhance temporal, spectral, or spatial resolution of the global dataset. The work presented here is a long-term comparison between two such missions: Germany's Modular Optoelectronic Scanner (MOS), and the Sea-viewing Wide Field-of-view Sensor (SeaWiFS) operated by NASA and the OrbImage Corporation.

While the MOS sensor is a technology demonstrator with limited geographic coverage, it is unique among the latest generation of space-borne ocean color instruments in that it has been in operation since early 1996, and thus spans the lifetime of all the global ocean