OS11P-09 1105h

Bioturbation Effect on Mineralisation Rates of Organic Matter in Estuarine Sediments: The Importance of gas Exchange

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Bioturbation has a profound influence on mineralisation of organic matter and the profiles of organic carbon, nutrients and oxidised and reduced chemical species in the sediment. However, the interaction between bioturbation and mineralisation is a complex phenomenon that can be divided into different components. Here we present results from an experiment in which simulated improved transport of dissolved gases, pure physical mixing of organic and mineral particles, and bioturbation by *Nereis diversicolor* ($\sim$1500 m^{-2}) were investigated with respect to mineralisation rates. These were combined with some preliminary results from a similar experiment in which the influence of bioturbation by *Nereis diversicolor* on the degradation ^{13}C enriched fresh algal material was investigated.

Mineralisation rates were derived from sediment ΣCO_2 production measured in closed sediment cores placed in a continuous flow system combined with ΣCO_2 and NH_4^+ pore water profiles. During the experiment ΣCO_2 accumulated in the pore water of the control cores while in the other treatments ΣCO_2 was, to a different extent, removed from the bioturbated zone. In order to get the true mineralisation rates the measured ΣCO_2 production rates were corrected for these differences in inventory ΣCO_2, resulting in an enhancement of mineralisation rate by the presence of *Nereis diversicolor* (125%), simulated improved gas transport (60%) and physical mixing (15%). Pore water profiles of the ^{13}C enriched cores revealed that bioturbated sediment, in contrast to defaunated sediment, showed elevated levels of $\delta\ ^{13}C$ (also in the deeper parts) while $\Sigma^{13}CO_2$ levels were much lower. This indicates mineralisation of labile organic matter throughout the sediment column and an efficient mechanism to transport CO_2 out of the sediment. $\delta\ ^{13}C$ depth profiles of particulate organic carbon should reveal whether this was the result of burrow ventilation or physical mixing. NH_4^+ pore water profiles showed the same pattern as ΣCO_2 with the difference that ammonium was almost absent in the bioturbated zone of the *Nereis diversicolor* and the improved gas transport treatments.

It was concluded that improved transport of dissolved gases is more important with regard to mineralisation rate enhancement of refractory organic matter than pure physical mixing of organic and mineral particles and that this might be the result of stimulated coupled nitrification/denitrification. In the case of labile organic matter physical mixing might play a more significant role in enhancement of mineralisation rates.

URL: http://www.nioo.knaw.nl/cemo.htm

OS11P-10 1120h

Relative influences of bioturbation and physical mixing on degradation of algal material deposited on the sediment-water interface: evidence from chloropigments

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We have conducted a series of microcosm experiments to test the relative influences of biological mixing (bioturbation) versus physical turbulence on degradation of algal organic matter deposited on the sediment-water interface. Isotopically labeled (13C and 15N) algal cells were initially spiked on the top 1 mm of homogenized sediment cores, simulating a natural deposition of bloom-produced organic matter. Biological mixing was carried out by adding group macrofauna or individual species into sediment cores which were previously sieved. Physical mixing was manipulated by mechanically stirring the top 5 cm of the sieved sediment cores. We followed the time-dependent and depth-dependent variations of chlorophyll-a and phaeopigments in different mixing regimes. The analysis results showed that chlorophyll-a degraded at different rates in biological and physical mixing regimes, which was likely related to redox conditions established in different mixing regimes. Physical stirring moved the fresh algal materials permanently down to the anoxic zone, resulting in a remarkable slower degradation for algal chlorophyll-a. No matter how frequently the physical stirring events occur, similar amounts of chlorophyll-a were remained in sediment cores over one month incubation. Bioturbation created an oscillated oxic/anoxic environment for organic matter degradation but the roles depended on animal species and their behaviors. Crustacea used in our experiments played a much stronger influence on chlorophyll-a degradation than polychaeta and mollusca. In no mixing cases, chlorophyll-a in spiked algal material degraded on the interface with oxic conditions and the rate was similar to that in bioturbation case.

OS11P-11 1135h

Controls on the Benthic Oxygen Flux in Estuarine Sediments: Impact of Macrobenthic Organisms During a Long-term Laboratory Experiment

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Periodic O_2 depletion is an annually recurring condition in the bottom water of the Neuse River estuary in North Carolina (USA). In the mesohaline portion of the estuary, intervals of anoxic bottom water lasting hours to days are common during the summer. Continuous monitoring records show that minimum daily bottom-water O_2 concentrations are highly variable between June and August, but fall below 1 mg L^{-1} about 50% of the time. Oxygen consumption in the sediments and sub-pycnocline water column are comparable ($\sim$30 mmol m^{-2} d^{-1}), indicating that both benthic and pelagic respiration contribute to bottom water hypoxia.

We conducted a long-term laboratory experiment to better understand factors that control sediment O_2 demand. Triplicate sediment cores were collected from the central channel at mid-estuary and incubated in the dark at in situ temperature (27°C) for >400 days. The overlying water was replaced frequently and sediments were subjected to periodic anoxia (lasting 1-4 days) to simulate natural O_2 dynamics. Benthic fluxes of O_2, NH_4, and NO_3 were monitored on weekly to biweekly intervals. Fluxes of ΣCO_2, ΣH_2S, and Fe(II) were also measured, but less frequently. Oxygen microelectrode profiles were determined on several occasions and macro- and meiofauna populations were sampled at the end of the experiment.

Despite the lack of new primary production in the benthic chambers, sediment O_2 demand increased at the outset of the experiment from an initial value of 30 mmol m^{-2} d^{-1} to almost 60 mmol $m^{-2} d^{-1}$ at day 120. The O_2 flux decreased gradually thereafter, reaching a value at day 440 comparable to the initial flux. Populations of deposit-feeding bivalves (*Macoma balthica*) and polychaete worms (*Spionidae*) were present throughout the experiment in spite of periodic anoxia and lack of fresh phytoplankton. Macrofauna contributed to the initial increase in sediment O_2 demand via respiration, porewater irrigation, an increase in sediment surface topography (creation of mounds and burrows), and excretion of pseudofeces. The O_2 penetration depth through surface fecal matter was less than 0.1 mm, implying O_2 consumption rates of 350 μM min^{-1}. A short distance from the fecal deposit, O_2 penetration increased to 1 mm and the consumption rate dropped to 70 μM min^{-1}. The fact that these sediments maintained high O_2 demand after >1 year without fresh phytoplankton input suggests an abundant stock of reactive organic matter. This implies that bottom water hypoxia in the Neuse River estuary will respond slowly to decreases in anthropogenic nutrient loading.

OS11Q HC: 317 A Monday 0830h

Satellite-Measured Ocean Color Variability in the Ocean I

Presiding: **A Thomas,** University of Maine**; C McClain,** NASA GSFC

OS11Q-01 0830h INVITED

SeaWiFS Mission Highlights After Four Years of Data Collection

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The Sea-viewing Wide Field-of-View Sensor (SeaWiFS) has been operational for over four years and has provided routine global ocean and land data of exceptional quality. It is the first ocean color data set to provide global coverage over an entire seasonal cycle. During its operation, a wide variety of events have occurred ranging from the global (e.g., the 1997-1998 El Nio-La Nia) to the regional (e.g., persistent coccolithophore blooms in the Bering Sea) in scale. The presentation will review some of the more dramatic geophysical events that have been captured in the imagery and scientific highlights that have been derived from the data set. Also, with a fourth complete data set reprocessing being planned in early 2002, a preliminary summary of the processing improvements will be described.

OS11Q-02 0845h

Decadal Changes in Global Ocean Chlorophyll

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The global ocean chlorophyll archive produced by the Coastal Zone Color Scanner (CZCS) was revised using compatible algorithms with the Sea-viewing Wide Field-of-view Sensor (SeaWiFS). Both archives were then blended with in situ data. This methodology permitted a quantitative comparison of decadal changes in global ocean chlorophyll from the CZCS (1979-1986) and SeaWiFS (Sep. 1997-Dec. 2000) records. Here we show that global spatial distributions and seasonal variability of ocean chlorophyll were similar, but global means decreased over the two observational segments. Major changes were observed regionally: chlorophyll concentrations decreased in the high latitudes while chlorophyll in the low latitudes increased. Mid-ocean gyres exhibited limited changes. The overall spatial and seasonal similarity of the two data records suggests that the changes are due to natural variability, and provides evidence of how the Earth's climate may be changing and how ocean biota respond. Furthermore, the results have implications for the global ocean carbon cycle.

OS11Q-03 0900h

A Global Perspective of Chlorophyll from SeaWifs: 1998-2000

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This study focuses on developing a multiscale perspective on the distribution of sea surface chlorophyll with respect to their underlying water masses. Three years of available Chlorophyll data from SeaWifs have been analyzed to determine the monthly and seasonal distribution in six different oceanic regions. These regions are North and South Atlantic, North and South Pacific and North and South Indian Oceans. Monthly

average Chlorophyll fields are then analyzed in association with available monthly water mass climatology data sets from Levitus (1994).

Interesting bloom signatures in the Spring and Fall are evident in the coastal regions of all oceans, which can be associated with particular water mass types in the density space. The monthly variability distribution peaks during the winter months, probably due to storm events. A striking feature of this distribution is the similarity in pattern for all three oceans in the Southern Hemisphere. The North Pacific and the North Atlantic are found to be most variable, while the north Indian Ocean has a distinctly different signature from the other oceans, probably due to its tropical nature and high salinity contrast. A cluster analysis of the temperature, salinity and chlorophyll data set for North Atlantic during April resulted in four distinct clusters, which will be discussed. Future plans include application of data mining and knowledge acquisition techniques to develop low order models for the combined multivariate biophysical (T-S-Chl) system.

OS11Q-04 0915h

Aplication of Ocean Color to Describe the Dynamics of the Transition Zone Chlorophyll Front and Implications for Marine Resources

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Pelagic ecosystem dynamics on all temporal scales may be driven by the dynamics of very specialized oceanic habitat. One such habitat is the basin-wide chlorophyll front located at the boundary between the low chlorophyll subtropical gyres and the high chlorophyll subarctic gyres. Global satellite maps of surface chlorophyll clearly show this feature in all oceans. In the North Pacific the front is over 8000 km long and migrates seasonally north and south about 1,000 km. In the winter this front is located at about 30° -35°N latitude and in the summer at about 40°-45°N. The front represents a zone of surface convergence as cool, vertically mixed, high chlorophyll surface water on the north side sinks beneath warm, stratified, low chlorophyll water on the south side. Satellite telemetry data on movements of loggerhead turtles and detailed fisheries data for albacore tuna show that both apex predators travel along this front as they migrate across the North Pacific. The front is easily monitored with ocean color satellite remote sensing. A change in the position of the TZCF between 1997 and 1998 appears to have altered the spatial distribution of loggerhead turtles. A change in the extent the front formed meanders varied substantially between the 1998 El Nino and 1999 La Nina and this may have been responsible for changes in the movement dynamics of albacore foraging along the TZCF.

OS11Q-05 0930h

East-West Variability of Chlorophyll a and Primary Production in the subarctic North Pacific during 1997-2000 using Multi-Sensor Remote Sensing

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The objectives of this study were to describe and understand the processes controlling the temporal and spatial variability of chlorophyll-a (chl-a) and primary production in the subarctic north Pacific Ocean during 1997-2000.Remotely sensed data from multi sensors, including ocean color (OCTS and SeaWiFS), sea surface temperature, (SST, AVHRR) and wind (SSM/I) datasets were utilized for the purpose of this study. We also attempt to calculate primary production using a modified VGPM Model (Behrenfeld and Falkowski, 1997) developed by Kameda and Ishizaka (2000). Ocean color imagery clearly showed seasonal and interannual variability in the spatial abundance and distribution of chl-a and primary production in the study area. Chl-a concentration at WSG (Western Subarctic Gyre) and AG (Alaskan Gyre) was generally low (< about 1.0mg/m^3) throughout the year, and there is no signal such a spring and fall bloom in both stations. Magnitude of chl-a seasonal variability at WSG is greater than that at AG. Interannual variability of chl-a was seen during 1997/1998 ENSO events. Chl-a and primary production at WSG in fall 1998 was higher than that at AG. In contrast, chl-a and primary production at AG in fall 1997 was higher than that at WSG. Chl-a and primary production at both WSG and AG were nearly equal in fall 2000. High SST anomaly was correspond to chl-a variability for each regions.

OS11Q-06 0945h

Subtropical Gyre Variability Observed by Ocean Color

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The subtropical gyres of the world are extensive, coherent regions that occupy about 40% of the surface of the earth. Once thought to be homogeneous and static habitats, there is increasing evidence that mid-latitude gyres exhibit substantial physical and biological variability on a variety of timescales. While biological productivity within these oligotrophic regions may be relatively small, their immense size makes their total contribution significant. Global distributions of dynamic height derived from satellite altimeter data, and chlorophyll concentration derived from satellite ocean color data, show that the dynamic center of the gyres, the region of maximum dynamic height where the thermocline is deepest, does not coincide with the region of minimum chlorophyll concentration. The physical and biological processes by which this distribution of ocean properties is maintained, and the spatial and temporal scales of variability associated with these processes, are analyzed using ocean color, sea surface height, winds, and sea surface temperature derived from satellite data (SeaWiFS, OCTS, CZCS, TOPEX/Poseidon, NSCAT, SeaWinds, and AVHRR). Short-term trends and seasonal variability are analyzed using the 4.5 years of SeaWiFS data (Sep 97-Present) and contemporaneous T/P and AVHRR data. Long-term trends and interannual variability in SST are analyzed using 20 years (1982-present) of AVHRR data. The trends and interannual variability in the shorter records of altimeter (10 years) and chlorophyll (4.5 years of SeaWiFS and 7.5 years of CZCS) data are analyzed to evaluate variations in areal extent of the gyres, and to place these variations in context of climate variability and measured changes in other ocean properties (i.e., wind forcing, Ekman pumping, and vertical mixing).

OS11Q-07 1020h

Antarctic Circumpolar Wave impact on marine biology

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Biological productivity in the Southern Ocean is limited by the availability of iron and the intensity of light in surface waters. Iron is supplied to surface waters by atmospheric dust deposition, resuspension of coastal sediments and mixing with iron-rich deep waters. Light intensity depends on the solar angle, the cloud cover and the stratification of the ocean surface. Ocean stratification is predicted to increase in the decades to come as a consequence of global warming. If the ocean stratifies, less iron will be available but light will be more intense, driving opposite effects on biological productivity. The net impact is unknown. Here we use the observed interannual variations caused by Antarctic Circumpolar Waves (ACWs) as a natural laboratory to determine how changes in marine productivity respond to changes in ocean stratification. We show that surface chlorophyll observed by SewWiFS satellite (a proxy for marine biomass) varies nearly in phase over the entire Southern Ocean in spite of large east-west dipoles in surface temperature and surface height caused by the passage of ACWs. We use the relationship between chlorophyll and sea surface height anomalies and estimate that 35% of the most productive regions south of 50^{o}S is dominated by light limitation or atmospheric iron input, and the remaining 65% by iron limitation from the deep ocean. Climate-driven stratification of the Southern Ocean, if it is homogeneous, would lead to little net change in biological productivity, but to large spatial redistribution with productive regions becoming more productive and poor regions more desertic.

OS11Q-08 1035h

The Effect of Rossby Waves on Surface Chlorophyll in the Indian Ocean

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Correlations between the biological and physical signatures of Rossby waves in the Indian Ocean are examined using SeaWiFS chlorophyll and TOPEX SSH data from Sept. 1997-Sept. 2001. Specifically, Rossby waves along 10°N in both the Arabian Sea and the Bay of Bengal, and in the southern tropical Indian Ocean (STIO) between $10 - 20$°S are examined. There is considerable interannual variability in the 4-year long data sets due to the anomalous conditions in the Indian Ocean associated with the 1997/98 Dipole Mode event. Interannual variability in the seasonal chlorophyll cycle in the western Indian Ocean is remotely forced by Rossby waves initiated at the eastern boundary. For example, the reduced chlorophyll bloom in the western Arabian Sea during the 1998 Northeast Monsoon is the result of the annual upwelling Rossby wave generated off the southern tip of India being weaker than usual. Analysis of the complete TOPEX record indicates that the SeaWiFS timeperiod (1998-2001) is anomalous in the STIO. Prior to 1997 Rossby waves propagated completely across the basin, whereas after 1997 waves often terminate in mid-basin, thus disrupting the annual arrival of upwelling and downwelling waves in the western STIO. As a result, in the western STIO downwelling occurs throughout 1998 until mid-1999, when upwelling is established. Consequently throughout 1998 chlorophyll was lower in 1998 compared to 1999 and 2000.

OS11Q-09 1050h

Interannual Chlorophyll Variability in Four Eastern Boundary Currents

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The first 4 years of SeaWiFS data are used to quantify interannual variability of large-scale surface chlorophyll patterns along the full latitudinal extent of the four major global eastern boundary currents (EBCs). The California, Peru-Chile, Benguela and Canary Currents are among the world's most biologically productive regions. Data are used first to contrast latitudinal differences within each EBC region and then to compare between current regimes. SeaWiFS data first become available in September 1997. During the first seven months, data from the Pacific EBC regions are coincident with strong hydrographic anomalies associated with the 1997-98 El Nino. Contrasts between the first and the latter three years document the extent to which chlorophyll patterns were affected by El Nino conditions and illustrate differences between the northern and southern hemisphere in the timing and magnitude of El Nino impacts. In the two Atlantic regions, interannual variability is also present, weakest in the Benguela. Atlantic interannual variability is less coherent over the latitudinal extent of the regions and weaker

than that of the Pacific regions. SeaWiFS chlorophyll patterns are compared to coincident large-scale wind forcing and satellite-measured surface temperature to estimate linkages between physical forcing and biological response. Concentration differences during the El Nino period were not due to local differences in wind forcing.

OS11Q-10 1105h

Sverdrup's Critical Depth Hypothesis and the North Atlantic Spring Bloom

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The spring bloom of phytoplankton in the North Atlantic Ocean has long fascinated oceanographers. In 1953, Harald Sverdrup developed a simple, quantitative relationship for the necessary conditions leading to a spring bloom. Although this model has been applied extensively across a variety of aquatic ecosystems its application requires knowledge of the community compensation irradiance, the in situ light level where photosynthetic and community respiration processes balance. Here, we use satellite ocean color imagery from the SeaWiFS mission and available hydrological data to characterize the North Atlantic spring bloom and to estimate values of compensation irradiance. Ocean color imagery are used to determine the day of the onset of the spring bloom, as well as the fluxes of incident radiation and penetrating radiation at depth. Following Sverdrup's hypothesis, the value of the mixed layer depth when the spring bloom starts is equivalent to the critical depth which enables spatial distributions of the compensation irradiance to be made for an entire ecosystem. Average values of community compensation irradiance from 40°N to 75°N are 1.3 ± 0.3 Einstein m^{-2} d^{-1} and there are no consistent spatial variations. These estimates are roughly twice typical values found for phytoplankton populations alone and indicate that phytoplankton respiration accounts for roughly one-half of the total community respiration. This approach for estimating community compensation provides a powerful way of remotely quantifying heterotrophic processes in pelagic ecosystems.

OS11Q-11 1120h

Spatial Distribution of Optical Water Types in the Northwest Atlantic as Revealed by Feature-Based Classification of Satellite Ocean Colour Data

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We have undertaken an analysis of the spatial and geographic distribution of optical water types in the Northwest Atlantic based on remotely-sensed ocean colour data. Application of our novel optical water type classification approach to CZCS and SeaWiFS imagery of the Northwest Atlantic region has revealed that pixels from several different locations project into distinct clusters in water-leaving radiance feature space, suggesting that these waters can be distinguished using a few spectral bands of ocean colour data. We have constructed a classifier training set for the Northwest Atlantic, and developed two different feature-based classification techniques: the Euclidean Distance Classifier and the Eigenvector Classifier. These classifiers had very high success rates when applied to a test dataset with known class memberships; both classifiers averaged more than 290 correctly classified pixels of a possible 300. We applied these classifiers to ocean colour images of the Northwest Atlantic, and were able to map the geographical location and spatial extent of each water type. Our analysis exposed striking patterns of water type distribution throughout the region. The Northwest Atlantic appears to be dominated by six clearly distinguishable optical water types, and classifier application reveals that waters of the same optical type form well-defined, cohesive water masses that remain in the same general geographical regions over time. To interpret our classifier results, we applied our Classification Goodness of Fit measure, which indicates how closely a given pixel is associated with its assigned class. This measure confirmed that sharp boundaries generally exist between water masses of different optical types, with pixels on either side of the boundaries being strongly associated with their water type class. We anticipate that our classification techniques will facilitate long-term time series studies by tracking optical water types through seasonal and interannual changes, thereby furthering our understanding of the spatial and temporal dynamics of ecologically and biogeochemically important properties of the upper ocean.

OS11Q-12 1135h

Mesoscale and Submesoscale Ocean Color Variability About the Bermuda Atlantic Time-series Site (BATS)

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Study of mesoscale ocean color variability (20–200 km) is extended to the submesoscale (1–20 km) by applying geostatistical techniques to high resolution ($\sim$1.1 km) SeaWiFS images from the Bermuda area. One goal of this study is to determine whether the patterns observed from an analysis of global, mesoscale resolution ocean color data are reflected also in higher resolution data that better resolves the submesoscale. In particular, the earlier global analysis of the standard mapped image (SMI) data showed that much of the high frequency space and time variability in oligotrophic regions is unresolved at $\sim$9 km resolution. This suggests either a significant submesoscale signal or a substantial contribution from instrument and algorithmic noise. To pursue this question an initial analysis of SeaWiFS data ($\sim$1.1 km resolution) from an approximately 10° square around the BATS site is presented. The nugget (or unresolved variability) is larger in the high resolution data while the relative sill (or variability of the geophysical signal) is approximately the same. Additionally, the range (or the decorrelation scale length) for both the SMI and high resolution data are approximately the same with the high resolution values being slightly smaller. Statistical tests on the significance of these differences will be presented along with the results from the 12 month comparison between high resolution and SMI data at Bermuda. The ramifications for the application of mesoscale SMI ocean color variability at global scales and the relative contribution of submesoscale versus mesoscale processes will be explored.

OS11Q-13 1150h

Meso-Scale Oceanic Eddies On The Synthetic Aperture Radar Images: Eddy Classification And Image Interpretation

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Continuous observations since 1991 by using the (SAR) aboard the Almaz-1, ERS-1/2 and RADARSAT satellites have shown that oceanic eddies are worldwide distributed in the ocean. This paper presents the results of classification of typical vortex motion in the ocean visible in the optical, IR and SAR satellite imagery and evaluation of spaceborne technique potential for oceanic eddy detection and monitoring. Main typical elements of ocean vortex dynamics detected in the satellite imagery include the ocean rings, spin-off eddies, eddies of open ocean, island wakes, eddies due to current interaction, eddies behind islands (in bays) and mushroom-like structures. Space/time and kinematic characteristics of different vortical types are also presented and their generation mechanisms considered. Manifestations of the oceanic eddies allow to retrieve the eddy's parameters such as dimensions, rotation direction, spiraling order, lifetimes, temperature contrasts and chlorophyll/suspend matter concentration. Unknown aspects of oceanic eddy formation and evolution are also discussed. By analyzing the satellite imagery it's shown the common features for most observed eddies are a broad spectrum of spatial/temporal scales (ranged from 0.5-1 up to 300-400 km and from 0.5-1 days till 1 year), spiral shape and shear nature. Usage of satellite imagery, first of all, SAR images plus visual and IR images allows to extract the exhausting information on vortex motions in the ocean. It is concluded that the spaceborne sensors give valuable information about the ocean eddies. Examples of satellite images showing the different eddy types are also presented and discussed.

OS11R HC: 317 B Monday 0830h

Synthesis of the Arabian Sea Expeditions I

Presiding: **S L Smith,** University of Miami**; P Burkill,** Plymouth Marine Laboratory**; S W Naqvi,** National Institute of Oceanography

M O N

OS11R-01 0830h

A Feature oriented regional modeling system for the Arabian Sea, Persian Gulf and the Red Sea

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An eddy-resolving primitive equation dynamical modeling system has been set up for the Arabian Sea, Persian Gulf and the Red Sea regions using a feature-oriented approach. The model domain extends from 10N to 30N and from 45E to 75E with a horizontal resolution of 15 km. In the vertical, sixteen levels are selected in a double-sigma configuration to resolve both the shallow coastal/Gulf regions and the deep basins.

The water mass property distributions of the major circulation features in this region have been 'feature modeled' by analyzing historical synoptic data sets. Specific 'feature models' for the southwest summer monsoon regime have been developed for (1) the equatorward Western India Coastal Current, (2) the poleward undercurrent along the western coast of India, (3) northward currents along the coast of Arabia and associated upwelling regions, and (4) the high salinity waters in the Red Sea and the Persian Gulf. Synoptic realizations of these features in the climatology background provide the initialization fields for dynamical simulations. Example short-term (1-3 days) and medium-range (7-10 days) simulation case studies to calibrate the impact of monsoon winds, evaporation and precipitation will be the focus of this study.

OS11R-02 0850h

On the Generation of Coastal Filaments During the Spring Intermonsoon

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Among the discoveries of the JGOFS Indian Ocean Expedition was the realization of the importance of coastal jets and filaments along the Oman coast during the SW monsoon. It was shown that such filaments are capable of exporting nutrient rich upwelled water hundreds of kilometers offshore and appear to play important roles in the large-scale phytoplankton bloom in the Arabian Sea during the summer monsoon season. As to whether the generation of these filaments is governed more by the offshore deflection of a coastal current or from an interaction between the wind field and pre-existing meso-scale features in still in debate. But what about filaments generated during the weakly-forced Spring Intermonsoon season? What are the mechanisms by which these filaments are generated? What role(s) might they play in pre-conditioning the coastal environment to the ecosystem consequences of the strong SW monsoon forcing? Such questions are