investigator. The students thus meet and solve a full spectrum of challenges from operational to scientific. The experience provides the students with the knowledge and skills needed to carry out multi- and interdisciplinary research, and to communicate the results of that research to colleagues and the public.

OS11B HC: Hall III Monday 0830h

Oceanic Time-Series Measurements: Assessment of the Past and Planning for the Future I

Presiding: **N R Bates,** Bermuda Biological Station for Research, Inc.,**; L Campbell,** Texas A & M University

OS11B-12 0830h POSTER

Seasonal and Interannual Dynamics of Phytoplankton Community Structure in the Subtropical Oligotrophic Ocean: a Comparison of the Hawaii Ocean Time-Series and the Bermuda Atlantic Time-Series Stations.

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Phytoplankton play a key role in the biogeochemistry of the ocean as the principal components of the biological pump of CO2 into the ocean interior. Results from the Hawaii Ocean Time-Series (HOT) and the Bermuda Atlantic Time-Series (BATS) have provided extended data sets from which we can begin to compare the seasonal and interannual dynamics of the phytoplankton communities in the North Pacific and Atlantic. Both HOT and BATS represent oligotrophic regions of the ocean where the phytoplankton community structure is dominated by the picoplankton. Biomass contributed by the prokaryotes, unicellular cyanobacteria *Prochlorococcus* (*Pro*) and *Synechococcus* (*Syn*), often exceeds the contribution by small eukaryotic algae. The contribution of *Pro* and *Syn* to total photosynthetic biomass is greater at HOT (60-85 %) than at BATS (20-58 %). At HOT *Pro* is 100-fold more abundant than the other picophytoplankton groups and remains the dominant component of the phytoplankton biomass (50 - 80 %) year-round, with *Syn* contributing only a small fraction (2 %). In contrast, the two groups alternate in abundance at BATS with *Pro* contributing up to 50 % of the photosynthetic biomass in summer months and *Syn* contributing an average of 20 % in Winter-Spring. Significant differences are also evident in the timing of the seasonal succession in abundance patterns of the three picoplankton groups and interannual variations, which may be related to ENSO events at HOT. Differences are also evident in the relationship between the percentage of the total phytoplankton carbon in the picoplankton fraction (% *Pro+Syn*) and primary productivity (PP). Although the overall range in PP is similar at the two sites (200 - 1000 mgC m^{-2} d^{-1}), at BATS there is a significant negative correlation between phytoplankton composition (% *Pro+Syn*) and integrated PP: the % *Pro+Syn* ranges from 20 - 60 % and is a larger component of the biomass when total integrated PP is lower. At HOT, however, the % *Pro+Syn* varies between 60 - 80 % and is not significantly correlated with PP. The differences in nutrient dynamics between HOT and BATS are also consistent with observed community structure dynamics.

OS11B-13 0830h POSTER

A spatial and temporal study on long-term variability of phytoplankton community structure at the Bermuda Atlantic Time-series Study (BATS) site and Bermuda to Puerto Rico transect based on pigment analyses using the 'CHEMTAX' matrix

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Upper ocean algal chlorophyll and carotenoid distributions have been measured monthly at the BATS site (31 40.00' N, 64 10.00' W) since December 1989 using high-performance liquid chromatography (HPLC) analysis. The 'CHEMTAX' program was used, using ratios calculated specifically for BATS, to interpret the HPLC data from December 1989 to February 2000 and calculate the abundance of diatoms, dinoflagellates, haptophytes, prasinophytes, chlorophytes (+ prochlorophytes), and cryptophytes throughout the time series. The protocol we employ does not permit the resolution of Chl b and divinyl Chl b and therefore our chlorophyte group likely includes prochlorophytes. Results indicate the presence of a phytoplankton community structure seen throughout the upper 80 m that is dominated by chlorophytes (+ prochlorophytes) (>50 percent) from 1991 to 1997 and 1999 to 2000 and a loss of the chlorophyte (+ prochlorophyte) (<20 percent) population from 1997 to 1999. From 1997 to 1999, the community structure was dominated by the cyanobacteria (> 40 percent) and the haptophytes resembling such species as Emiliania huxleyi (30 percent). Data from 1989 to 1990 hint at a similar shift on community structure. Macro-climate indices such as North Atlantic Oscillation (NAO) and Southern Oscillation Index (SOI) are being investigated as to their role in the biogeochemical change and indirectly the community structure. A negative NAO during the time period of 1997 to 1999 caused deeper mixing in the water column. In 1991, the NAO was positive but was close to zero and deeper mixing was observed in February, possibly due to eddy circulation. The change in species composition was coincident with a change in the pattern of Dissolved Organic Matter (DOM) cycling. Spatial variability in September 2000 and October 2001 was also studied. Results will be discussed along with comaprisons to temporal variability.

OS11B-14 0830h POSTER

Spatial and Temporal Dynamics of Virioplankton in the North Atlantic in the Vicinity of the Bermuda Atlantic Time-series Study Site.

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Viruses have been shown to play an important role in bacterial mortality. Viral infection and mortality of microbes (both bacterioplankton and phytoplankton) can potentially affect microbial trophic structure and in turn the biogeochemical cycling of nutrients and energy in pelagic ecosystems. However, little is known regarding the dynamics of viruses in oceanic gyres. We initiated a study to assess the spatial and temporal variability of virus-like particles (VLP) at the Bermuda Atlantic Time-series Study (BATS) site. Monthly profiles of were collected in the surface 400 m of the BATS site since January 1999, stained with SYBR Green II, and enumerated using image analysis.

Concentrations of VLP ranged from 0.5 - 7 E+9 particles / l. whereas concentrations of bacterioplankton ranged from 0.1 - 3 E+9 cells / l within the euphotic zone of the BATS site. Over the three year time-series VLP dynamics demonstrated a regular seasonal pattern. During winter, VLP concentrations were low (0.5 - 2E+9 particles /l) and were homogeneously distributed throughout the surface mixed layer. After stratification of the water column in late spring and early summer, a strong subsurface maximum in VLP concentration (4 to 7 E+9 particles / l) developed between 80 and 150 m. The VLP subsurface maximum persisted at elevated concentrations throughout the summer and early autumn before returning to background concentrations in late autumn-early winter. The summer subsurface VLP maximum was located deeper in the water column than the subsurface maximum for bacterioplankton (40 to 60 m) and was not well correlate with the deep Chl a maximum. We will present these dynamics and relate these trends to other biogeochemically relevant parameters such as bacterioplankton biomass, productivity, Chl a, and primary productivity and pigment tracers of specific phytoplankton taxa.

OS11B-15 0830h POSTER

Abundance trends of Calanus finmarchicus in the Gulf of Maine, Scotian Shelf, western and eastern North Atlantic (Z - line)

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Yearly changes in Calanus finmarchicus populations were measured with the Continuous Plankton Recorder (CPR) in the western and eastern North Atlantic, Scotian Shelf and Gulf of Maine. There were close similarities in abundance trends in the four regions. It was possible to use Gulf of Maine data to fill in missing years (1977 to 1990) of data on the Scotian shelf. Analyses of CPR plus net sample data from the Scotian shelf suggested the period, between 1977 and 1990, was one of high abundance of C. finmarchicus on the Scotian Shelf and the numbers declined about 10x in the late 1990s. The seasonality of C. finmarchicus stages 1 – 4 on the western and eastern North Atlantic, Scotian shelf and the Gulf of Maine were distinctly different. The Atlantic populations showed seasonal peaks in July and August, the Scotian shelf and Gulf of Maine populations had peaks between May and June. These data suggest that C. finmarchicus populations in the four regions had different reproductive patterns with the Gulf population showing a much higher level of abundance than the other regions.

OS11B-16 0830h POSTER

Characterization of DOC Dynamics and Subsequent Response by Microbial Assemblages in Mesocosm Experiments Performed at the Bermuda Atlantic Time-Series Study Site

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In autumn 2000 and spring 2001 experiments using water isolated from the northwestern Sargasso Sea were conducted to trace the dynamics of DOC production and subsequent microbial response in mesocosms. Seawater was amended with NO3, PO4 and SiO4 and incubated in constant light over the course of 12-18 days. The resulting primary production within the mesocosms was dominated by picoeukaryotes and cyanobacteria. In the spring 2001 experiment, primary production and Chl a concentrations reached maxima of 6 uM C/day and 9.03 ug/L respectively by day 5. Cyanobacterioplankton abundances increased 3-fold and correlated well with primary production. 14-C labeled DOC

MON

increased to a maximum of 3 uM/d by day 5. Increasing concentrations of specific components of the DOC pool were also observed over the course of the experiment. For example, chromophoric DOM (compounds that absorbed at 325 nm of light) doubled over the first 8 days of the experiment with maximal values lagging 3 days behind the maxima in Chl a and primary production. Furthermore, 50% of the CDOM maximum persisted above background values through day 12 of the incubation. Concentrations of the dissolved combined neutral sugar (DCNS) pool were measured using HPLC with pulsed amperometric detection. We observed significant DCNS production of fucose, rhamnose, galactose and mannose with net increases of 81%, 270%, 139% and 41%, respectively, over the course of 9 days. Subsequent responses in bacterioplankton production and community structure shifts were examined throughout these experiments. Bacterioplankton biomass increased exponentially with a 4-fold increase in cell abundance by day 9 of the incubation. Bacterioplankton community structure dynamics as monitored by PCR fingerprinting techniques will also be discussed.

OS11B-17 0830h POSTER

Sources and Sinks of Hydrogen Peroxide at Station ALOHA

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Hydrogen peroxide (H_2O_2) dynamics were studied in the water column at station ALOHA (22°45N 158°W). Samples were taken twice a day during 16 cruises from 1994 to 1997 to assess diel and seasonal variability. Measurements were made using the dimerization of (p-hydroxyphenyl) acetic acid by H_2O_2 in the presence of peroxidase and detected by fluorometry. In 2001 the same protocol was used in conjunction with a continuous flow surface pumping and detection system. The average vertical distribution of total peroxide (H_2O_2 plus organic peroxide) showed a "typical" profile with high near uniform concentrations (40 to 70nM) from the surface to about 50m followed by an exponential decrease in concentrations to about 10nM at 150m. In deeper waters, concentrations of <5nM were observed and dominated by organic peroxides. Although this pattern represents the mean condition of peroxides distribution at station ALOHA, seasonal and higher frequency variations were observed reflecting the different sources and sinks for this compound. Near surface (0-50m) H_2O_2 concentrations ranged between 20nM to 140nM. Seasonal patterns were observed with lower concentrations (20-40nM) in winter and higher concentrations (70-140nM) in summer. The seasonality is mainly due to the high irradiance occurring in summer which sustains a photoproduction of H_2O_2. The effect of wet deposition during episodic rainfalls and a variety of biogenic sources and sinks of H_2O_2 was also documented. Extremely low concentrations (<10nM) of (H_2O_2) were observed in surface waters on rare occasions, especially during large blooms of the cyanobacterium *Trichodesmium*. This H_2O_2 scavenging is probably related to high catalase activity in this N_2 fixing microorganism and may be a large sink for H_2O_2 during selected periods. The continuous pumping/detection system documented the dynamic of the diel distribution of H_2O_2 concentrations in the surface waters. Important variations (>50nM in amplitude) were observed with maximum concentrations (90nM) around 3 pm and minimum (15nM) a few hours after sunset. By contrast, during *Trichodesmium* blooms we observed only small variations (mean 26 ± 7.5 nM) over diel cycle.

OS11B-18 0830h POSTER

In vitro measurements of net community production in the euphotic zone of the subtropical North Pacific

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It has been argued that oligotrophic ocean areas are not in oxygen balance. Station ALOHA (22°45'N, 158°00'W) of the Hawaii Ocean Time - series in the subtropical North Pacific was used as an example of an oligotrophic open ocean location to study net community production in the euphotic zone. A free floating array profiling 6 depth integrals from 5 to 150 m was used to make 24-hour *in situ*, light and dark bottle incubations to measure the changes in dissolved oxygen. Direct measurements of net community production and dark bottle respiration were made as well as calculated estimates of gross primary production. The study was started in May 2001 with subsequent monthly measurements to ultimately compile an annual time series. Relative changes in dissolved oxygen concentration were measured using a computer controlled, high precision, Winkler titration with a photometric endpoint detector. Initial results show both net production and net consumption of dissolved oxygen in the upper 25 m while there is a consistent net consumption of dissolved oxygen at depths below 45 m. The calculated gross primary production rates integrated from 0 to 150 m varied from 68 ± 5 to 86 ± 8 mmol O_2 m^{-2} d^{-1}. Net consumption of dissolved oxygen measured at various depths from 45 to 150 m ranged from 0.14 ± 0.04 to 0.60 ± 0.07 mmol O_2 m^{-3} d^{-1}. Depth integrated values of net oxygen flux have shown a net production, net consumption balance (community compensation point) at a range of depths from 25 to 105 m. These findings primarily show profiles that are different from month to month and only with the ongoing time series of this project will the trends of oxygen flux become apparent. Until such a time series is obtained it remains an open question as to whether oligotrophic areas are, or are not, in oxygen balance.

OS11B-19 0830h POSTER

Primary Productivity at CaTS (Caribbean Time Series)

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From 1995 to 2000, daily integrated, water column phytoplankton primary production was estimated at the CaTS (Caribbean Time-Series Station, 17° 36'N, 67° 00'W) using available algorithms that relate phytoplankton photosynthetic pigment biomass and available photosynthetic radiation (PAR). Radiocarbon experiments using a photosynthetron were conducted to generate P vs. E (photosynthesis vs. irradiance) curves from which to obtain the photosynthetic parameters α^B, the Maximum Light Utilization Coefficient (from 0.01 to 0.19 ([mg C mg $chla^{-1}$ hr^{-1}] [μ Einstein m^{-2} sec^{-1}]$^{-1}$) and PBS, the Potential Maximum Photosynthetic Rate (from 0.56 to 3.49 mg C $m^{-3}hr^{-1}$). Average daily integrated primary production was between 132 and 750 mg C m^{-2} d^{-1}. Annual production was 149 g C m^{-2} $yr^{-1}$and showed maxima in April, July, October and November. SeaWiFS derived chlorophyll-a concentrations for the Northeastern Caribbean Sea followed the same pattern. Increases in primary production were associated to large ${P^B}_s$(or ${P^B}_m$),α^B and ${a^*}_{ph}$(PAR) values during maximum influence of Amazon and Orinoco River plume waters. A deeper euphotic layer was observed from February to April and in July reaching down to 166 m. Maximum solar irradiance at the end of April and a deep euphotic layer allow maximum light penetration that can easily reach the deep chlorophyll-a maximum located near 100 m.

OS11B-20 0830h POSTER

Long term monitoring of particle fluxes in the Bering Sea, 1990-1999, and the central subarctic Pacific,1990-2000

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A time-series particle flux study has been conducted for a total of nine years in the Bering Sea and ten years in the central subarctic Pacific, respectively. A significant seasonal and inter-annual variability in particle flux was observed at both stations. Annual primary flux maxima which occurred during spring through summer tended to vary considerably for their timing and magnitude, whereas fall secondary maxima tended to be fairly consistent for their timing and flux levels. Biogenic opal contributed the major portion of the time-series fluxes. Especially, diatoms such as *Neodenticula seminae* are important in the biogenic opal fluxes and drive bulk of the biological system. Calcium carbonate fluxes are comprised of six species of planktic foraminifers and mainly two species of coccolithophores. At Station AB, fall $CaCO_3$ flux maxima were characteristically higher than that of spring, whereas similar $CaCO_3$ flux maximum levels were recorded during both spring and fall at Station SA. The seasonal change in $CaCO_3$ flux is significantly different from that of biogenic opal, indicating its particular role in the ecosystem. As a preliminary result, a higher contribution by planktic foraminifers to total $CaCO_3$ flux is observed than that by coccoliths.

OS11B-21 0830h POSTER

Decadal long time-series Planktonic Foraminifer Fluxes: Their production and the contribution to the $CaCO_3$ fluxes during 1990 to 2000 in the Bering Sea and the central subarctic Pacific

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A decade-long study on biogenic sinking particle fluxes has been carried out in the Bering Sea (Station AB; 53.5° N, 177° W; water depth 3788m) and the central subarctic Pacific (Station SA; 49° N, 174° W; 5406m) since August 1990. Using sediment trap samples obtained in the study region, nine (Station AB) or ten (Station SA) year long foraminifer fluxes were measured. Fifty foraminifer shells of each species were measured in order to estimate their derived $CaCO_3$ fluxes Six foraminifer taxa were found in sinking particles, mostly comprised of *Neogloboquadrina pachyderma* and *Globigerina umbilicata*. The total flux in this study region showed a significant seasonal and inter-annual fluctuation during studied period. As the seasonal change, foraminifer flux tended to have a primary peak during fall season and a secondary peak during spring at Station AB whereas were appeared equally two peaks in spring and fall at Station SA. These seasonal changes were mainly affected by the thermal condition and the food availability. For the annual changes the planktonic foraminifer showed lower flux levels when the sea surface temperature anomaly (SSTa) showed negative values. Contrary, juvenile form foraminifers (microforaminifers: < 63 μm) showed higher fluxes during the periods of SSTa. The foraminiferal contribution to $CaCO_3$ production were 30 % at Station AB and 40 % at Station SA. Most of their production was derived by the 125 to 250 μm size fractions. These results showed that the production of planktonic foraminifer were controlled by the temperature conditions and their contribution to the $CaCO_3$ was higher than that of coccolith in the Bering Sea and the subarctic regions.

OS11B-22 0830h POSTER

Spatial and Temporal Variation of the Heat and Salt Budget of the North Atlantic Subtropical Gyre and the Relationship to the Bermuda Atlantic Time-series Study.

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In trying to understand the interactions between the ocean and atmosphere more fully, there is growing interest in the long term changes of deep ocean properties. Time-series studies, such as Hydrostation S, BATS, and HOT show considerable interannual and decadal variations of heat and salt budgets. In addition to the time series at BATS, a suite of BATS validation cruises have been made to assess spatial variability in the BATS vicinity. More recently these cruises have

been used to explore large scale gradients in nutrients and hydrography through the North Atlantic subtropical gyre. Two meridional transects along 64°W from 35°N to 19°N were conducted during Sept 2000 and Oct 2001 essentially repeating the WOCE line A22 of 1997. Variations in temperature, salinity, thickness, and depth of the subtropical mode water were examined through the gyre. The integrated heat content of the upper 1200m was estimated and correlated with the changes seen at the BATS and Hydrostation S sites, with the contribution from the mode water to the heat and salt budget being determined. Records from Hydrostation S and BATS show that the depth of the 18°C isotherm has steadily increased by approximately 100m during the past 12 years. Comparison of the recent transects with the WOCE survey show a similar general deepening trend throughout the gyre.

OS11B-23 0830h POSTER

Subsurface methane production in the open ocean and its seasonal variation

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Time series measurement of methane dissolved in seawater had been made at the western North Pacific Ocean Time series site (Station KNOT: 44° N, 155° E) from 1999 to 2000. The concentrations of methane were supersaturated throughout the year in the upper 150 m layer, having a subsurface maximum below the pycnocline. The concentrations of methane were undersaturated with present atmospheric concentration and decreased with depth below 200 m. There was a seasonal variation of methane concentration at the subsurface maximum. The concentration of methane was 3.5 nM in May 1999 at 100 m depth, and increased in summer - fall season. In October 1999, methane concentration came up to 4.8 nM. This methane maximum was decreased in January and February 2000 due to the strong vertical mixing in winter. In May 2000, methane maximum was disappeared and methane concentration was down to 3.7 nM. This seasonal cycle of methane maximum is caused by in-situ production of methane at the subsurface layer in summer - fall season and outgassing of methane to the atmosphere in winter - spring season. Phytoplankton and microzooplankton mainly lived in surface mixed layer and hardly existed in subsurface layer all year round at station KNOT, suggesting that they are not related with subsurface methane production directly. Seasonal vertical migration of large zooplankton like Copepoda may be concerned with formation of subsurface methane maximum.

OS11B-24 0830h POSTER

Understanding Upper Ocean Particle Flux: Neutrally Buoyant Sediment Traps and Standard Surface-Tethered Sediment Traps

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Estimating particle flux in the upper ocean is quite difficult. Issues such as hydrodynamic interference and swimmers can bias flux estimates inferred from standard surface-tethered traps. Neutrally buoyant sediment traps (NBST) have recently been developed in order to address some of these problems and hopefully provide a more accurate estimate of the upper ocean particle flux.

In this study, we compared material collected in NBST to material collected in standard sediment traps (PITS) deployed during June and September, 2001, at the Bermuda Atlantic Time-series Study (BATS) site. We compared the total mass, POC, PON, 234-Thorium flux, and elemental fluxes (Si, Ca, Mg, Fe, Al, Ba, Sr, Mn, Ti, V, Ni, Cu, P, and S) of the material collected in both types of traps. Additionally, we examined microscopically the particles that were collected.

The mass, POC, PON and 234-Th did not vary greatly between the material collected in the NBST and the material collected in the PITS. The fluxes (and concentrations) of many of the other elements differed in June versus September, most likely as a consequence of changing particle types and flux. For example, in June, fluxes of certain elements (such as Fe and Ti) were higher in the NBST versus the PITS material whereas in September, fluxes of other elements (such as Ba) were higher in the PITS versus the NBST material. At all times, the NBST collected many fewer swimmers than the PITS. One deployment of NBST collected a large number of amphipods and their eggs, which were not caught by the PITS. Amphipods are known to associate with marine snow particles, so the collection of these animals and their eggs suggests that the NBST may be more efficient at collecting slowly settling marine snow. Additionally, intriguing blue particles were present only in material collected in the NBST. Overall, this study showed that flux estimates depend on both season and sediment trap type. Thus, one would infer different upper ocean fluxes and budgets for various elements depending upon the sinking particle characteristics and the tools used to sample these particles.

OS11B-25 0830h POSTER

The use of 210Pb/210Po Disequilibria to Determine Temporal Changes in Upper Water Column Particulate Organic Carbon Fluxes at DYFAMED Station

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210Pb and 210Po were measured in particulate and dissolved (<0.4 μm) phases in the Mediterranean upper water column within the JGOFS DYFAMED program. A temporal series of ∼monthly profiles (0-200 m) was obtained at DYFAMED station (43°25N, 7°52E) off Nice, France, between October 1993 and May 1994. Radionuclide profiles were converted to fluxes using modeling. Exported particulate organic carbon (POC) fluxes were then estimated using radionuclide/POC ratios obtained at that site. Results are discussed together with estimates of Po and POC fluxes from sediment traps time series obtained simultaneously.

OS11B-26 0830h POSTER

Global Structure of Bidecadal Precipitation Variability in Boreal Winter

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Three global monthly precipitation datasets, which are gauge precipitations,NCEP/NCAR reanalysis, and Climate Prediction Center Merged Analysis of Precipitation (CMAP), are analyzed with respect to Bidecadal Oscillation (BDO). Correlations between the gauge data and NPI (hereafter NPI), which is well known as Aleutian low strength in winter, exhibit substantial impacts of the BDO on precipitations around the Pacific Ocean. Statistically meaningful positive correlations are observed over the eastern China/southern Japan, Hawaii, mid-latitude North America, southeastern Australia, and negative correlations are over Florida, and western Australia. Coherency analysis between the raw gauge data averaged over high correlation region and NPI, indicated 99% significant bi-decadal peak (16-25-year) for Hawaii, Florida and eastern China/south Japan. In particular, the strongest precipitation in Hawaii is in phase with NPI through the 20th century, and explained variance by NPI for unfiltered precipitation is the highest (12%) in the world. The most energetic precipitation changes have occurred over the North Pacific, where positive correlations in the tropical and northern North Pacific and negative correlations in between is apparent in the reanalysis and CMAP data. Viz, the precipitation in the tropical and northern North Pacific decreases (increases) along with strengthened (weakened) Aleutian low and in between increases (decreases). This precipitation pattern in the North Pacific is quantitatively agrees well with the moisture flux convergence integrated from surface to 300 hPa level, and the contribution of evaporations generally small.

OS11C HC: Hall III Monday 0830h

Western Pacific Marginal Seas I

Presiding: **S S Chen,** RSMAS/University of Miami**; V Lobanov,** Russian Academy of Sciences of Sciences**; T Nakatsuka,** Hokkaido University

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OS11C-27 0830h POSTER

Development of real-time technique for visibility and sea wave monitoring on coasts

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Both sea fog and storm surge, one of the most frequent atmospheric phenomena on sea, discourage the activities in sea and cause some damage on ships or men to make economic loss due to poor visibility and high waves. In the military aspects, poor visibility and high waves could be a primary factor of natural phenomena to weaken the abilities of military operation. It is important to develop the technique for forecasting sea fog or sea wave in every respect of economy, society, and military. But it is so hard to enhance development of technique for forecasting sea fog because of lack in observation data in sea. It makes it difficult to produce initial data and to evaluate forecast outputs from numerical prediction models for sea fog. Therefore, set-up of real-time monitoring system for sea fog is needed to understand the mechanism of generation and maintenance of sea fog. Marine Meteorology and Earthquake Laboratory in Meteorological Research Institute installed the system for real-time weather monitoring on coast in the one of the weather stations in the coast of the East Sea. This system, newly designed for many users to monitor the weather on coast simultaneously on the real-time basis, could be also used in military. This system provides the remote-control on the Web using TCP/IP on real time basis, visibility meter of forward scattering type, AWS, coincident display of fixed and fan-tilt camera, retrieval of visibility digital data and figures not only in the present but also in the past. Especially, installed 20-times zoom camera of low-intensity(0.005 LUX) makes it possible to monitor coasts in the night time. Now it is only connected to LAN in Korea Meteorological Administration, but would be available for other institutes and military forces after establishing the mirror site and assigning ID to them. Wave radar system is equipped for observation of sea wave in one station in Cheju island. In this study we introduce the results of real-time observation system for sea wave and ones of forecast system.

OS11C-28 0830h POSTER

Analyses of sea fog from the field experiment in the Yellow Sea

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An intensive ocean and atmosphere observation experiment was conducted over the southeastern part of the Yellow Sea from 31 May to 3 June 2001. Not only