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### Short Note

I am very much grateful to NOWPAP/WESTPAC/PICES and IOCCG for their support and hospitality during the training program.

8-10-2011

At exactly 9 am a very grand opening ceremony of the Training program held at V.I.II'ichev Pacific Oceanological Institute (POI). Mr. Genki Terauchi briefly explained about the training program, CEARAC activities. After that representative from POI, Far Eastern Federal University, PICES explained briefly about their activities and upcoming events. It was very interesting and encouraging. After reaching my place I submitted my research work to one of the event. After a small tea break the real training program was started and it more interested. Prof. Leonid Mitnik gave the first lecture on Fundamentals of Satellite Oceanography. He covered all the aspects of ocean features like eddies, oil spills and ocean's response due to typhoons. Overall his lecture he stressed the advantage of SAR data. The second lecture is very important and excellent information on ocean color by Dr. Roland Doerffer. The lecture is most useful one for my academic and research purpose. He explained the problems and uncertainties in ocean color observations from space and the solution to solve the problem by pixel by pixel using different techniques like neural network. He also showed us one movie relating to the science of ocean color. It was amazing movie. In that he explained ocean color studies from ancestors to present generation. Also the basic mechanism of ocean color i.e., how the light photon interaction with the water molecules. After the lunch break again Dr. Roland Doerffer continued his lecture on the same topic but the role of atmosphere on ocean color. In this lecture, he gave detailed information about the influence of aerosols, other particles on ocean color observations and also corrections to overcome problem. The last lecture was given by Prof. Vyacheslav Lobanov on Global Ocean Observing System and the availability of the different satellite products to study the ocean features in the Northwest Pacific Ocean. It inspires me on the Northwest region. At end of the day Dr. Mati Kahru explained briefly about the WIM software, its utilities and different

modules. It is most important lecture for me, because I want to learn this software for my research work.

9-10-2011

Dr. Rapael Kudela explained about the harmful algal bloom (HAB) and red tide. The role of remote sensing in detecting the HAB and red tides and also the practical problems during processing the remote sensing data. Next topic is on primary productivity (PP) which is key parameter in Global Bio-Geo-Chemical cycle. Dr. Joji Ishizaka covered all the aspects of PP (from basics to advance level), controlling parameters and also role of remote sensing in calculation of the PP. After his lecture once again Dr. Kudela continued his lecture on net primary production (NPP) using satellite based four important models. Finally he concluded that no model is perfect to estimate the NPP. After the lunch break the most important sessions are BEAM software and verification of ocean color data using WIM software. Dr. Ronald Doerffer explained the processing of MERIS data using BEAM software. He took South China Sea image for that purpose and showed the atmospheric correction, radiometric correction, different visualization tools. After that Dr. Mati Kahru demonstrated different menus and options available in WIM and some exercises using Chl-a data from 1998 - 2009. It was very interesting and most useful session for me. I completed the tasks successfully without any error. After that we went city site seeing, the Vladivostok city was very beautiful I liked the submarine museum.

10-10-2011

An eutrophication phenomenon is one of the important processes in Biological Oceanography. Dr. Ishizaka gave a wonderful talk on eutrophication, critical depth theory and timing of blooms in East China Sea, Yellow Sea. The results are very interesting and also inspiring. Dr. Yu-Hwan Ahn introduced a new space borne instrument, GOCI which is situated in geostationary orbit. This is the only one instrument give the ocean color data from 35,000 km distance with high resolution but the disadvantage is it covers only the region around Korean peninsula. He explained different payload, spectral bands, processing software and applications. After the lunch break only one session working with WIM software was conducted by Dr. Kahru. He explained the time series analysis, annual and seasonal trend of sea ice and chlorophyll using WIM software. I tried to do the same analysis for the North Indian Ocean and I successfully completed with the help of Dr. Kahru.

11-10-2011

SAR is very useful sensor to detect ocean features like internal waves and oil spills from space. Dr. Natalya Evtushenko covered all the aspects of SAR with good images and also showed few images relating to oil spills. She also introduced new software to process and analysis of SAR images to identifying the oceanic features. Dr. Sung Ling explained the most important task in remote sensing, radiometric calibration. Prof. Mitnik gives details on Landsat images and its spectral bands. After lunch break, Dr. Evtushenko showed their software for the processing and analysis of different satellite sensors like IRS, MODIS etc.

12-10-2011

Today is the last one. Prof. Mitnik's presentation on oil spills and its identification is very interesting. He covered all the aspects of oil spills for example evolution, classification and behavior of oil, global inputs like shipping, oil drilling and role of remote sensing. He also showed some good and latest example of oil slicks in Yellow sea and also the role of NOWPAP CEARAC on monitoring and assessment of marine environment in the Northwest

Pacific region. Coastal marine habitat is an important topic to the researchers. Dr. Teruhisa Komatsu explained the usefulness of coastal habitat, *in-situ*, remote sensing methods and also WESTPAC activities on developing these habitats in coastal regions. After lunch break Mr. Terauchi gave one assignment relating to WIM software. I completed the task without any errors. After completion of the assignment session Mr. Terauchi announced the closing ceremony. All the participants and higher officials like the president of Far Eastern Branch of the Russian Academy of Science, directors were gathered at the farewell party. In that party one by one shared their experience, it was very nice one.

I gained lot of knowledge on remote sensing which will be useful to my academic and research carrier. Entire the course I am very much interested on practical sessions of Dr. Mati Kahru. I earnestly request the organizers next time allot more time and also more exercises like identify the oceanic eddies, rings, meanders and cyclones effect on upper ocean, softwares like SeaDAS, Bilko (UNESCO). Once again thanks for the support.