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Study of year-to year variability of chlorophyll-*a* in the East China Sea using 7-year SeaWIFS data

IM SANG OH[1], HYUN-CHEOL KIM[1,2] and DANLING TANG[1,3]

[1]*School of Earth and Environmental Sciences and Research Institute of Oceanography, Seoul National University*
[2]*Korea Ocean Research & Development Institute*
[3]*LED, South China Institute of Oceanography, Chinese Academy of Sciences*

Evaporation and freshwater discharge over a large area may be influenced by global climate changes. These influences may also affect the world of biology in many ways. Ocean color is a very useful tool because it is an excellent index of biological information such as chlorophyll a. Ocean color data were archived over seven years from 1997. With these ocean color data, we would like to analyze its variability, and learn more about the circulation of the East China Sea. East China Sea is complicated because it is affected by more than three water masses, such as the Yangtze Diluted Water, the Kuroshio Water, and the Yellow Sea Cold Water.

The 8-day mapped data of 334 images and monthly data of 85 images from SeaWiFS were used in this study. We applied an EOF analysis method of Eslingler *et al.* (1989), which is known to be an adjusted method to the cloud-containing data. The data only from April to October were used because the numbers of the missing data in these months were less than 30% of the total. The first EOF mode explained 14.88% of its total variance in the series, which shows a significant shift in 2001; the positive signals over a period from 1998 to 2001, and then the negative signals over a period from 2001 to 2004. The second mode explained 8.11% of the variance. The pattern of the mode seems to explain the expansion of Yangtze Diluted Water. There are 3- to 4-year period signals. The third mode which is not identified yet, is similar to the second mode. The forth mode explained 5.14% and its period is about 6-year in the Kuroshio region.

From this ongoing study, we got the following preliminary results: 1) The variation of Yangtze River discharges mainly effects to the variability of chlorophyll-*a* in the East China Sea. 2) The variability of the North Pacific seems to be tele-connected to the East China Sea with some time lags. In order to have more confirmative conclusions, we need to analyze and compare the present results with the other signals together such as SST, sea surface level, sea surface height, sea surface wind from the North Pacific.