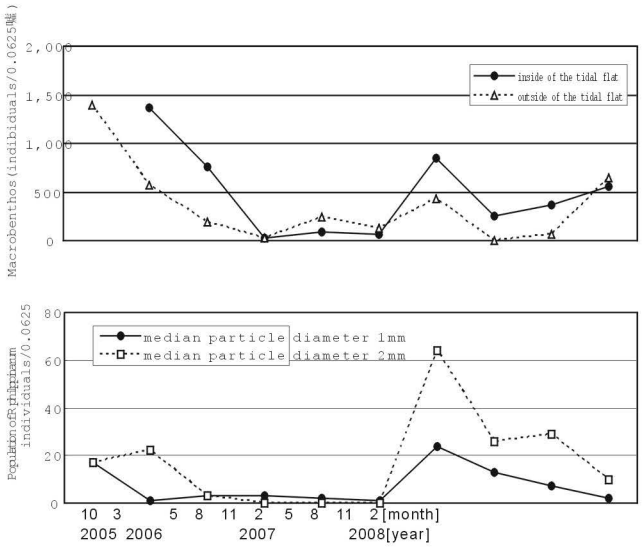

Measurement of turbidity distribution in the interior parts of the Ariake Sea by satellite remote sensing

Masahiro SEGUCHI [1], Masumi KOORIYAMA [1], Osamu KATO [1], Tomokazu HARAGUCHI [1] and Yong Hee SHIN [1]

[1] Department of Biological Production and Environmental Science, Saga University, 1Honjyo-machi, Saga, 840-8502 Japan

The purpose of this study is to establish a method for monitoring the distribution of turbidity in the interior parts of the Ariake Sea , which is located in Kyushu, Japan and is a very shallow and a strong closed bay with an area of 1,700km^2, using a satellite remote sensing data. The relationships between the spectrum of the sea surface and turbidity which have great influences on the outbreak of red tide, the removal of phosphorous in the sea-water, and the estuarine ecosystem etc., the properties of path radiance included in the satellite remote sensing data, and the methods of atmospheric correction for the removal of path radiance and measurement of turbidity distribution were discussed on the basis of *in situ* measurements and satellite remote sensing data.
The spectral radiance just above sea-surface in the wavelength range from 0.4 μm to 0.9 μm was closely related to the turbidity, but beyond the wavelength of 0.9 μm it was almost zero, and the path radiance, which occupied as much as 70% to 90% of the radiance over the sea area in the wavelength range from 0.4 μm to 0.9 μm, was dependent on the law of about -3th power of wavelength. This fact indicated that the path radiance was due to the Mie scattering of light by haze and aerosol in the atmosphere. A reasonable and simple method of atmospheric correction for satellite remote sensing data by using the radiance in the wavelength beyond that of 0.9 μm which seemed to be equivalent to the path radiance over the sea area and the dependence of path radiance on the wavelength was also presented. Moreover, the turbidity distributions in the study site were exactly measured by the regression equation between the turbidity and the ratio of radiance of Terra Aster Band-1 and Band-2 which were corrected for the atmospheric effects. Owing to the re-suspension of bottom mud by fast current velocity in this sea area, the measured turbidity was very high value of several hundreds mg/l near the river mouths and coastal areas where the large muddy tidal flats were formed.

Integrated management of estuary for diffused pollution of sediment in Dapeng Bay and Neighboring Rivers (Taiwan)

Shaowei LIAO [1]*, Jenjeng CHEN [1], Wenliang LAI [1], Chungyi CHUNG [1], Chunyen CHIU [1] & Changgai LEE [1]

[1] Department of Environmental Resources Management, Tajen University, Pingtung, Taiwan 10907
*E-mail: swliao@mail.tajen.edu.tw

This work investigated sediment samples collected from Dapeng Bay and three neighboring rivers (the Kaoping River, Tungkang River and Lingbeng River) in southwestern Taiwan. Multivariate statistical techniques such as cluster analysis (CA), factor analysis (FA), and canonical discriminant analysis (CDA) were used for evaluation of spatial variations, interpretation of pollution types and identification the sources of pollution from neighboring rivers. The result shows that the most important latent factors in Dapeng Bay are the soil texture causes factor, heavy metal influence factor, organic matter factor, and nutrient causes factor. From contour maps of factor scores it shows heavy metal accumulated in the lakesides especially southeastward. Cluster analysis was performed with factor scores computed from those latent factors. Then we classified these research areas into five distinct classes using sampling stations, it showed that in the three river classes the sediment properties were influenced by industrial wastewater, domestic wastewater, agricultural activities including farm activities and livestock breeding activities, respectively. Nevertheless in Dapeng Bay classes were more influenced by complicated biogeochemical processes and these could be identified as a pollution type. And