

## **Continuous Monitoring System of Coastal Environment in the Bungo Channel**

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Center for Marine Environmental Studies (CMES), Ehime University started to operate an autonomous coastal water monitoring program in the Bungo Channel in 2000. This program is consisted of a) autonomous water quality monitoring system at the Hayasui Strait and b) water temperature monitoring buoys. The objective of this program is to monitor the coastal water environment in the Bungo Channel continuously in real time.

The Bungo Channel is a semi-enclosed sea with two boundaries, which connects the Pacific Ocean and the Seto Inland Sea. In this channel, two types of intrusion from the south of the channel have a strong effect on the coastal environment mainly around summer. One is the Kyucho (Takeoka et al, 1992) which is the intrusion of warm water into the surface layer. The other one is the bottom intrusion (Kaneda et al, in review) which is the intrusion of cold water into the bottom layer. These intrusions would generate not only the change of water temperature but the change of the nutrient concentrations and affect the biological production. Bungo channel is one of the greatest grounds of fish culture and pearl oyster culture in Japan. The intrusions would play an important role in fisheries production in this channel. However, since these intrusions occur sporadically, it is difficult to observe them by the traditional monthly ship surveys. Therefore the continuous monitoring system is needed.

The water quality monitoring system is situated at the Sada Point. The surface water is pumped up and temperature, salinity, pH, DO and nutrient concentrations (nitrate, ammonia, reactive phosphate and reactive silicate) are measured every hour automatically. Data are stored in the computer and we can access the data from the remote place with FTP in any time. The water column is vertically well mixed all the year at the Hayasui Strait caused by the strong tidal current. Therefore, even in summer when the Bungo Channel is stratified, if the nutrient rich water intrudes into the bottom layer, the nutrients are mixed up to the surface layer at this point.

The water temperature monitoring buoys are situated at several places in the Bungo Channel. The temperature data are transferred to the host PC in our center via ORBCOM satellite system in real time. Now we show these data in the

www web-page

(<http://ccserv.adm.ehime-u.ac.jp/~cmes/database/suionjyouhou.htm>).

The program is under developing, but some interesting information has been already taken. For example, when the water temperature at the Hayasui Strait suddenly increased by the propagation of Kyucho, nitrate and reactive phosphate concentrations abruptly decreased on July 9, 2000. It indicates that even at the northern end of the Bungo Cannel, the nutrient concentration is affected by the intrusion of the water from the open ocean.