

UTILIZATION OF SATELLITE DATA TO GRASP SALINITY DISTRIBUTION AT THE BAY IN FLOOD

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Recently, the studies about behavior of low salinity water at the bay are carried out by field measurements and satellite image analyses have been reported (Ishikawa et al. (2004), Kudo et al. (2002)). The reported results in snow melt season are so reasonable. However, in fact, the field measurement at the bay in flood is almost impossible. Therefore, to grasp salinity distribution at the bay in flood, the development of the utilization method only with satellite data without measured turbidity is indeed.

In present study, using 4 bands of Landsat-7, the method of satellite image analysis without field measurement is investigated. Three kinds of investigations are carried out. First investigation method is the utilization of the upper stream data measured at the measuring station which is situated at 30km above the New-Kitakami river mouth. Second investigation method is to obtain the salinity directly from the CCT value of satellite data corresponding to the river mouth. Third investigation method is to obtain the salinity from the relationship between water temperature and salinity.

In detail, using 4 bands (the 256 gray levels discrete radiant brightness, hereafter it is called as the "CCT value") of Landsat-7, above depicted method is investigated. Three kinds of investigations are carried out. For the first investigation method, to begin with, Band1 (wavelength range of blue color), Band2 (wavelength range of green color) and Band3 (wavelength range of red color) of LANDSAT-7 data are normalized. Then, the relationships of CCT values between Band1, Band2 and Band3 are compared respectively. Finally, with regression line, whole satellites images used in this study are converted to maps of salinity distribution. Besides, for the second investigation method, at first, turbidity of river mouth is estimated from the regression line between CCT value and turbidity. And next, the satellite image is converted to salinity distribution. At the end, for the third investigation method, the utilization of Landsat-7 Band6 (wavelength range of thermal infrared rays), which is known to have a high correlation with temperature, is introduced as the auxiliary measures to grasp the salinity distribution when the data of Band2 and Band3 is saturated due to a big flood.

In conclusion, in this study three kinds of investigation methods are carried out to grasp the salinity distribution at the bay in flood. Generally, from the results shown in Fig. 1 as one sample, it is confirmed that the salinity distributions obtained from above three investigation methods are quite reasonable and clear. In the future, to apply this method

more widely, the investigation to find more sensitive index for the special purpose is indeed.

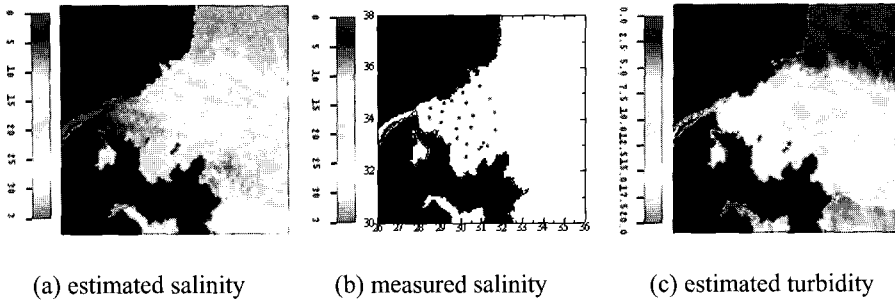


Fig. 1 Salinity distribution directly estimated from CCT value.

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