Study on the groundwater cycle in coastal area and submarine groundwater discharge- Investigation of Kurobe alluvial fan-

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In Kurobe alluvial fan, it is expected that groundwater flows directly into sea because of the existence of higher mountain range and of higher precipitation rates compared with reverine discharge and evaporationspiration. Such groundwater discharge is generally called submarine groundwater discharge. According to the review by Zektzer et al.(1973) and Fairbridge(1966), submarine groundwater discharge should exist almost all coastal zones in the world. However, researches on this problem have started very recently and we do not have sufficient information to evaluate the effects of submarine groundwater discharge on freshwater discharge and chemical influx into sea.

We explored the submarine groundwater discharge sites at offshore Kurobe alluvial fan by measuring electric conductivity, temperature and water depth at slightly above the sea-bottom. This was because the anomalies of electric conductivity and temperature are considered to be used as one of the indices of submarine groundwater discharge.

The following conclusions were obtained by this study.

1.Generally speaking, the electric conductivity and temperature are nearly constant as long as water depth does not change much.

2.At several locations, temperature and electric conductivity vary according to the change of water depth.

3.There exists positive correlation in temperature and electric conductivity. Thus, it is necessary to conduct temperature correction with a suitable technique. In this study, the technique by Weyl (1964) was used.

4.We found anomalies of electric conductivity after correcting temperature and these locations coincided with locations of fresh submarine groundwater discharge.

5.We obtained fresh submarine groundwater without any seawater contaminated by new technique.

6.Major ion chemistry (except for Mg^{2+}) and stable isotope data were similar with that of shallow groundwater of Kurobe alluvial fan.

7.The existence of NO_3^- in the fresh submarine groundwater suggests the possibility of the contribution of submarine groundwater discharge to sea-water contamination.