

SEA-TRUTH OF COASTAL WATERS USING SATELLITE-DERIVED DATA IN HOKKAIDO

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Monitoring of water quality in coastal waters using satellite-derived data commenced in Hokkaido in 1997. Coastal sea areas such as Ishikari bay and Nemuro bay were investigated using LANDSAT(TM) and Orbview □(SeaWiFS). An important component of the work involved sea-truthing the remotely sensed data.

More than 3 million people live in the vicinity of Ishikari bay. The major freshwater source in the bay is the Ishikari River. During spring-thaw and large rain events, the freshwater flow in the river can exceed 5,000m³/sec. We categorized the subsequent river plume diffusion patterns into many types with SeaWiFS.

In 1999, the extreme water cloudiness, triggered by heavy rain, covered over Ishikari Bay. The plume moved along the coastal areas to northern part of Hokkaido and reached the sea of Okhotsk. The water quality of the plume was defined using chemical species from direct sampling, including CODMn., nutrients, chlorophyll-a and SS, to substrate(accumulating speed etc.), and compared with satellite derived data. There are good relationships among chemical species and SeaWiFS derived data, especially with SS.

Coastal water pollution, caused mainly by material from Lake Huuren lagoon at Nemuro bay in Hokkaido, was investigated during 1997-1999. The tidal range in Lake Huuren was 153cm, so that more than three-fourths of the lake volume (20 million m³: calculated by ADCP at the mouth of the lake) was discharged to the Nemuro bay. The retention time of fresh water in the bay was calculated to be nearly 30 days. This means that the fresh water is not easily transferred off-shore and it retains its sea surface temperature signature in the off-shore region. This agrees with the observation of SST from LANDSAT. There a good relationship between chlorophyll-a and LANDSAT derived data in the Nemuro Bay in 1997.