SEASONAL VARIATION OF THE OCEANIC WATER INTRUSIONS INTO KAGOSHIMA BAY DERIVED FROM SATELLITE SST AND CHL-A IMAGES
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ABSTRACT
This research is aimed at figuring out the oceanic water intrusion in Kagoshima bay for each season by satellite SST (sea surface temperature) and chl-a (chlorophyll-a) images using the MODIS/Aqua ocean color sensor. It is relatively easy to find the oceanic water intrusion in winter by satellite SST images. However, it is difficult to find it during the summer season considering that it is accompanied by thermal stratification and the fact that SST shows almost the same temperature between the inner bay and the ocean. In this research, the satellite chl-a images taken by MODIS/Aqua were employed to reveal the oceanic water intrusion in each season. The enclosed bay has the tendency to undergo eutrophication by organic materials from land and show a difference in chl-a concentration of the bay.

STUDY AREA & DATA
Study area: Kagoshima bay and Fukiage seashore (Southern Kyushu, Japan, Fig.1)
Satellite data: MODIS/Aqua (Level2 Processed data of SST & chlorophyll a with 1km resolution)

RESULTS
1. SEASONAL VARIATION OF THE CHL-A AND SST DISTRIBUTIONS
Distribution of low concentration chl-a with oceanic water intrusion in the summer season shows almost the same pattern in the winter season (Fig.3(a)). On the other hand, in other seasons, images are available to differentiate the oceanic water intrusion. Therefore, applying the suitable satellite sensor images for each season is effective in the monitoring of oceanic water intrusion.

II. INTRUDING PATTERNS
Distribution of low concentration chl-a have typical three patterns (Fig.5).
Pattern (a) and (b) are similar to the warm oceanic water intrusions in the winter season.

CONCLUDING REMARKS
It is important to monitor this oceanic water intrusion for all seasons because this event will contribute to the water exchange in the coastal environment. The seasonal variations of the oceanic water intrusion into Kagoshima bay have a similar tendency of a semi-geostrophic gravity flow influenced by the Coriolis effect. Complementary application of SST and chl-a images is effective for consecutive monitoring and analysis. However, clear scenes are still not enough because of atmospheric conditions. It is further recommended to use few days of composite images to bring better and improved results.

REFERENCES

ACKNOWLEDGEMENTS
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The Landsat scene was acquired from EOSAT: SeaDAS (Ver.5) of the Goddard Space Flight Center, version 5.1 is used for processing and visualization.