

## **Application of marine-GIS for visualization of the long-term fisheries and oceanographic dataset HUFO-DAT**

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Since 1957, Hokkaido University has carried out regular oceanographic and fishery surveys with the fisheries training vessels *Oshoro maru* and *Hokusei maru*. Biological and environmental data collected on these surveys are published annually in the “*Data Record of Oceanographic Observations and Exploratory Fishing*”. The Hokkaido University has collaborated closely with the Japan Oceanographic Data Center (JODC) to assemble close to 50 years of these data in a Long-Term Fisheries and Oceanographic Data Base (HUFO-DAT). Volume 1 contains hydrographic station data, nutrients, oxygen, zooplankton wet weight, and chlorophyll-*a* concentration. Volume 2, currently in preparation, will include experimental fishing and associated biological data. In this paper, we introduce an oceanographic research application of the HUFO-DAT using marine-GIS. Since 1995, Hokkaido University has carried out grid observations in the continental shelf region of southwestern Bering Sea. We analyzed those data in HUFO-DAT for understanding interannual variations of oceanographic structure and biological production in summer using 3-D visualization method. Surface warm layer ( $\geq 9^{\circ}\text{C}$ ) in 1997, 1998, 2000 and 2002 may be related El Niño events. Thermal stratification will restrict the transport of the nutrients from the bottom and following high chlorophyll-*a* in the euphotic zone. In 1995, 1997, 1999 and 2001, relatively weak stratification might be promoted high chlorophyll-*a* production.