

Outline of Oceanographic Conditions in the North Pacific Ocean during the summer of 2001

Tomonori Azumaya and Masa-aki Fukuwaka

*Hokkaido National Fisheries Research Institute, Fisheries Research Agency
116 Katsurakoi, Kushiro 085-0802, Japan*

Submitted to the

NORTH PACIFIC ANADROMOUS FISH COMMISSION

by

JAPAN

October 2001

THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:

Azumaya, T., and M. Fukuwaka. 2001. Outline of oceanographic conditions in the North Pacific Ocean during the summer of 2001. (NPAFC Doc. 544). 4 p. Hokkaido National Fisheries Research Institute, Fisheries Research Agency, 116 Katsurakoi, Kushiro 085-0802, Japan.

Outline of Oceanographic Conditions in the North Pacific Ocean

during the summer of 2001

Abstract

Oceanographic conditions in the North Pacific during the summer of 2001 are described using data obtained by salmon research vessel. The dichothermal structure existed in the North Pacific and Bering Sea. Although sea surface temperature (SST) anomalies showed negative values in the Bering Sea, the positive anomalies of SST were found in the North Pacific in July 2001. Temperature of dichothermal layer was lower than the averaged temperature from 1991 to 2001. These results suggested that the waters in the Bering Sea and North Pacific Ocean were more cooled in the last winter of 2001.

Introduction

Oceanographic conditions in the North Pacific during the summer of 2001 are described using temperature and salinity data obtained by salmon research vessel. Temperature and salinity structures, and their anomalies are analyzed.

Materials

Figure 1 shows the locations of CTD, XCTD and XBT stations by R/V *Wakatake-Marui*. Horizontal distributions of sea surface temperature (SST) anomalies are estimated from "GLBSST" by Japan Meteorological Agency (JMA). Averaged SST in July is calculated using SST fields from 1946 to 2001. Vertical sections of temperature, salinity and their anomalies are showed using the hydrographic data by R/V *Wakatake-Marui* (Figure 3). These anomalies are defined as the difference that subtracted the averaged fields (1991-2001) from 2001.

Results

1. Horizontal distribution of SST anomalies

SST anomalies in July were negative in the Bering Sea, Okhotsk Sea and the west coast of North America, and positive the North Pacific and around Japan (Figure 2).

(1) Vertical sections along the 180° meridian

The dichothermal structure which was sub surface temperature minimum existing in around 100-200 m depth at 46-48°N and 53-58°N (Figure 3(a)). These water temperatures were about 2-3°C Alaskan stream which has relatively low saline waters occurred in less than 100 m at 48-51°N (Figure 3(b)). Thermohaline was seen at the depth of 200 m both in the North Pacific and in the Bering Sea. This result indicated that the mixed layer in the last winter was about 200 m in depth. In 2001, the depth of mixed layer was deeper than that of mean mixed layer in the North Pacific. Vertical sections of anomalies of temperature and salinity were showed Figure 3(c), (d). In the Bering Sea, the negative anomalies of temperature existed in the surface layer and in around 100-200 m. On the other hand, positive anomalies appeared in the surface layer in the North Pacific, but negative anomalies occurred in 20-300m at 41-48°N. The negative anomalies of salinity existed around 40-45°N and in the Alaskan stream. These results suggested that the

waters in these areas were more cooled from the air in the last winter.

References

Japan Meteorological Agency: GLBSST data

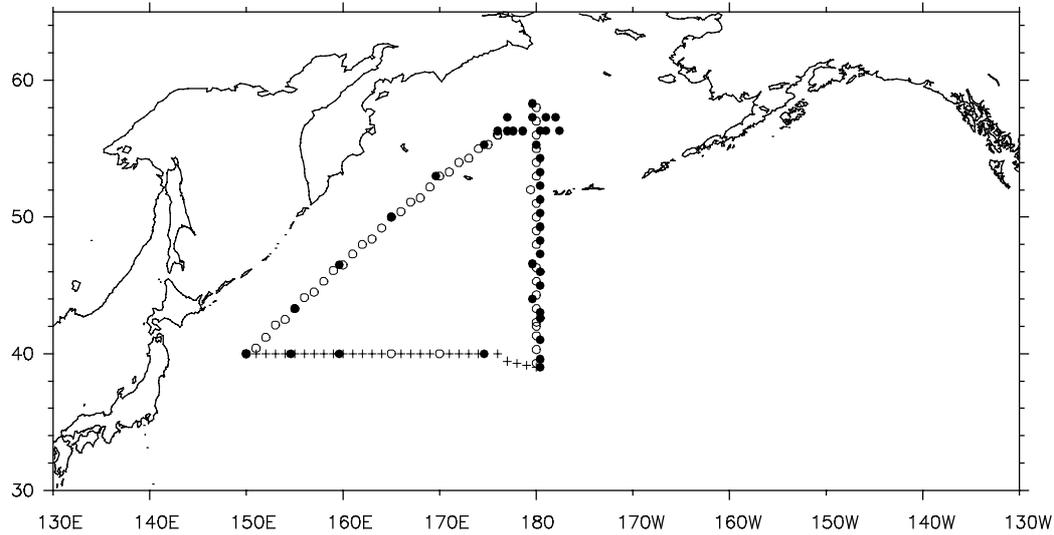


Figure 1. Observation points of R/V *Wakatake-Maru*. Solid circles represent CTD. Open circles represent XCTD. Crosses represent XBT.

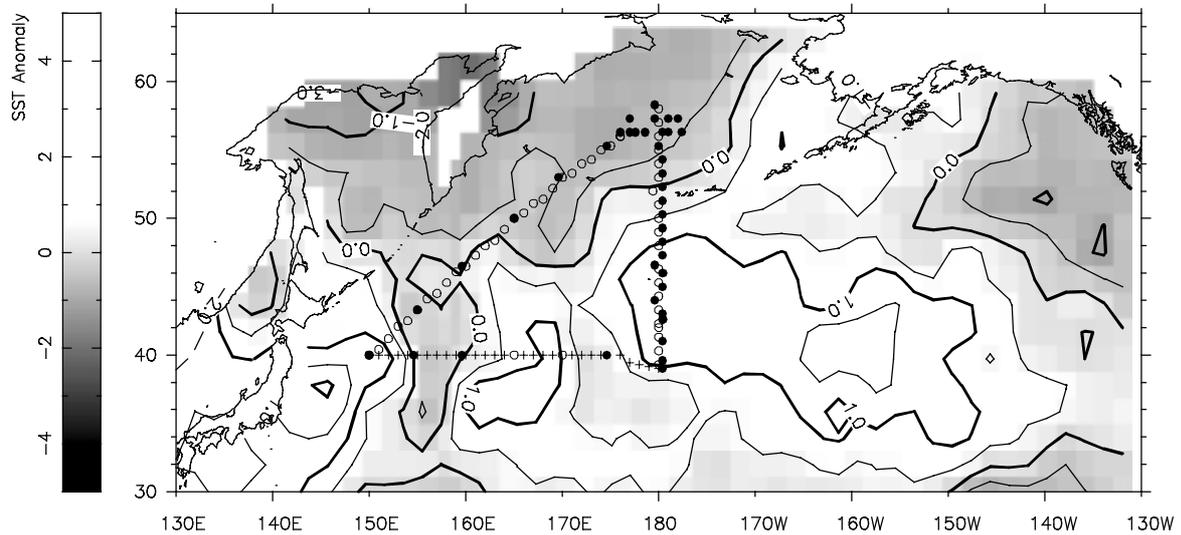


Figure 2. Horizontal distribution of sea surface temperature (SST) anomaly in July 2001.

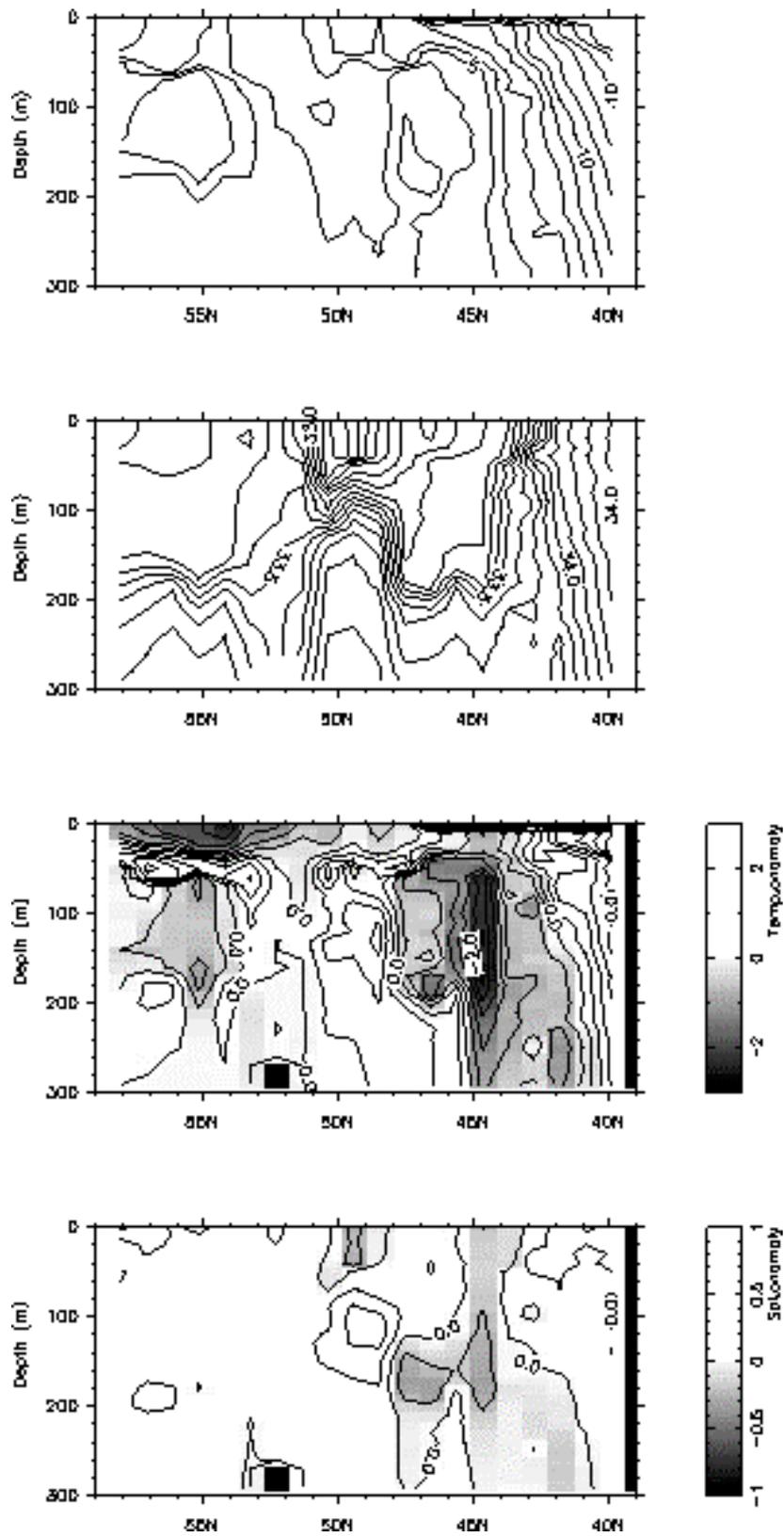


Figure 3. Vertical sections (a) temperature, (b) salinity, (c) anomaly of temperature, and (d) anomaly of salinity along the 180° meridian in 2001.