
The state of the western North Pacific in the first half of 2000

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Mr. Satoshi Sugimoto is Scientific Officer of the Oceanographical Division of the Climate and Marine Department at the Japan Meteorological Agency (JMA). He is working as a member of a group in charge of monitoring and forecasting sea surface temperature and sea surface current in the western North Pacific. Based on in situ and satellite data, this group provides various oceanographical products. One of the main products is the "Monthly Ocean Report", which is published and distributed by JMA every month. Mr. Sugimoto is now involved in developing a new analysis system for sea surface and subsurface temperature to improve sea surface temperature forecasts in the western North Pacific.



Sea Surface Temperature

Figure 1 shows monthly mean sea surface temperature (SST) anomalies in the western North Pacific from January to June 2000, computed with respect to JMA's 1961-90 climatology. Satellite-derived SSTs (NOAA/AVHRR) and *in situ* observations are used for the area between 20°N and 50°N from 120°E to 160°E, and only *in situ* observations are used in the other region.

Positive SST anomalies prevailed zonally between 30°N and 40°N in January 2000, which continued from the second half of 1999. From February to May, the area of negative anomalies increased in the seas adjacent to Japan. In June, the area of negative anomalies decreased and that of positive anomalies prevailed again around Japan (Fig. 1). The positive anomalies around Japan after June were comparable to those of 1999 for regions 1-4 (Fig. 2).

South of 20°N, positive anomalies predominated around the Philippines and negative anomalies prevailed near the date line throughout the period. This happened in three consecutive years.

Kuroshio

The Kuroshio meandered throughout the period, shifting its path south of Japan to and fro. The southernmost position of the meander was 31.5°N, 138.5°E in the last 10-day of March. Since May, the Kuroshio flowed

southeastward from 135°E to 140°E and than turned northward, shifting the turning position eastward gradually (Fig. 3).

Sea ice in the Sea of Okhotsk

The first and last dates of drift ice in sight at the meteorological stations along the coast of Hokkaido are shown in Table 1, with the location of the stations in Figure 4. The first dates of drift ice on shore and the first dates of shore lead appearance are also included. The drift ice around Hokkaido was generally characterized by normal date arrival and normal date retreat this season.

The sea ice extent was above normal (20-year averaged values from 1971 to 1990) in early February and from late February to early April. It came to a maximum on March 20th with a value of $133.76 \times 10^4 \text{ km}^2$. It has been 12 years since the sea ice extent in the Sea of Okhotsk was over $130 \times 10^4 \text{ km}^2$ (Fig. 5).

Drift ice flowed out into the Pacific from early February to mid-April, and was observed at Kushiro in late February. Some drift ice flowed out into the Japan Sea through the Soya Straits on the Sakhalin side from late January to early March, but was not observed at Wakkanai. Drift ice flowed out into the Japan Sea again from the end of April to the beginning of May, which was the latest observation since JMA started to analyze sea ice in the Sea of Okhotsk using satellite data.

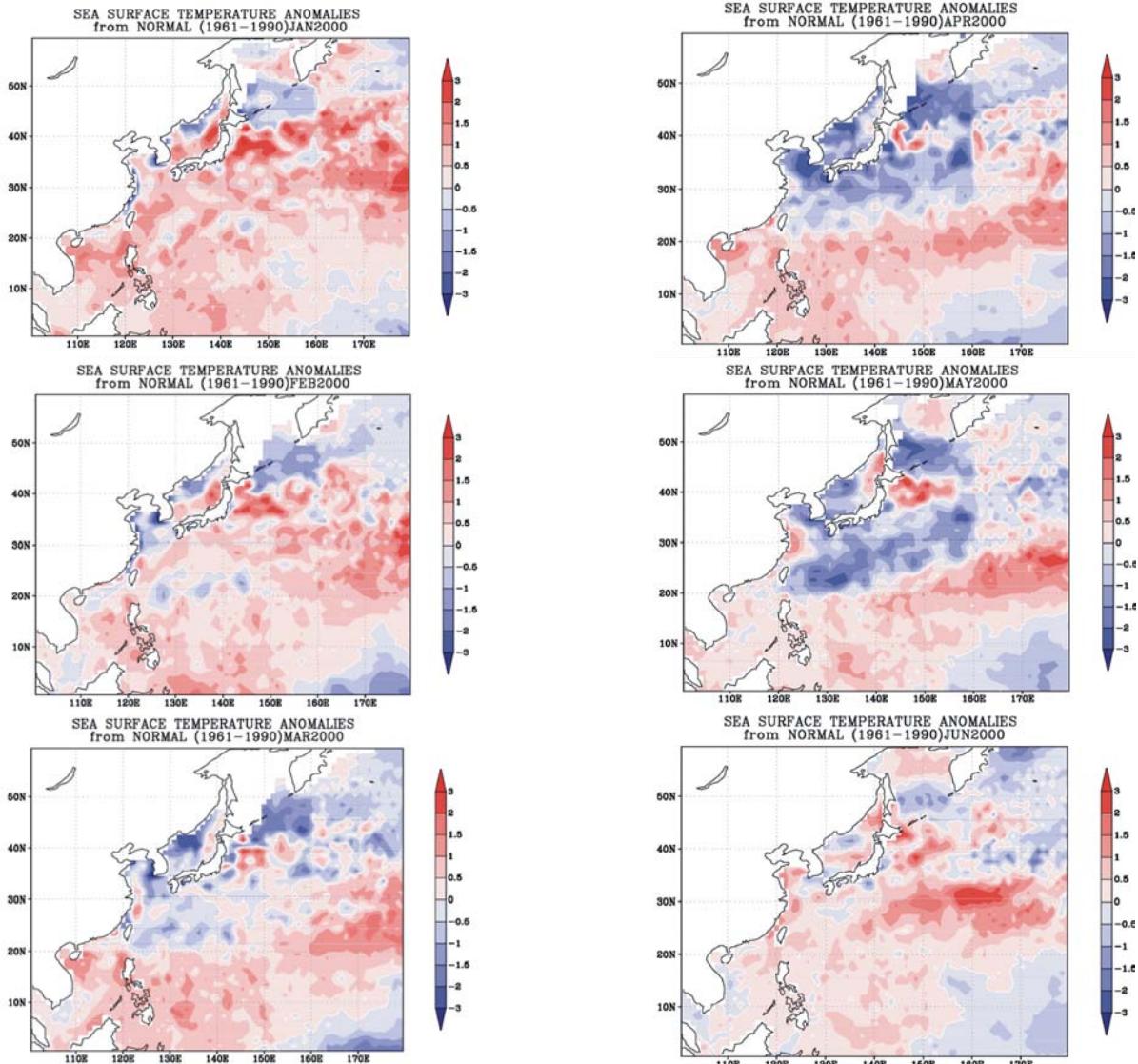


Fig. 1 Monthly mean sea surface temperature anomalies ($^{\circ}\text{C}$). Anomalies are departures from JMA's 1961–1990 climatology.

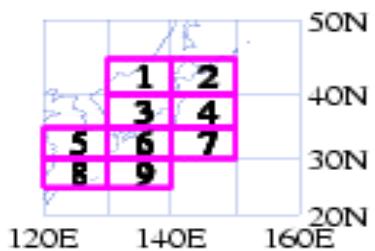
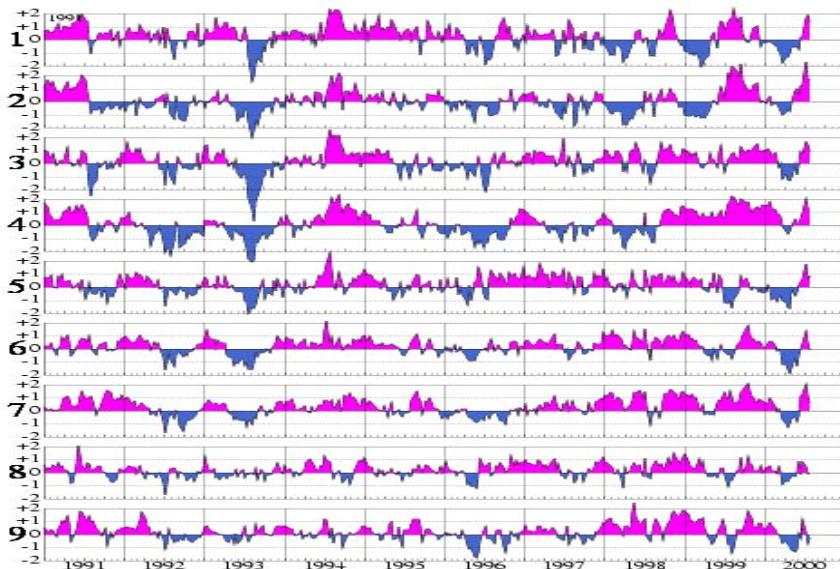


Fig. 2 Time series of the ten-day mean sea surface temperature anomalies ($^{\circ}\text{C}$), computed from JMA's 1961–1990 climatology.

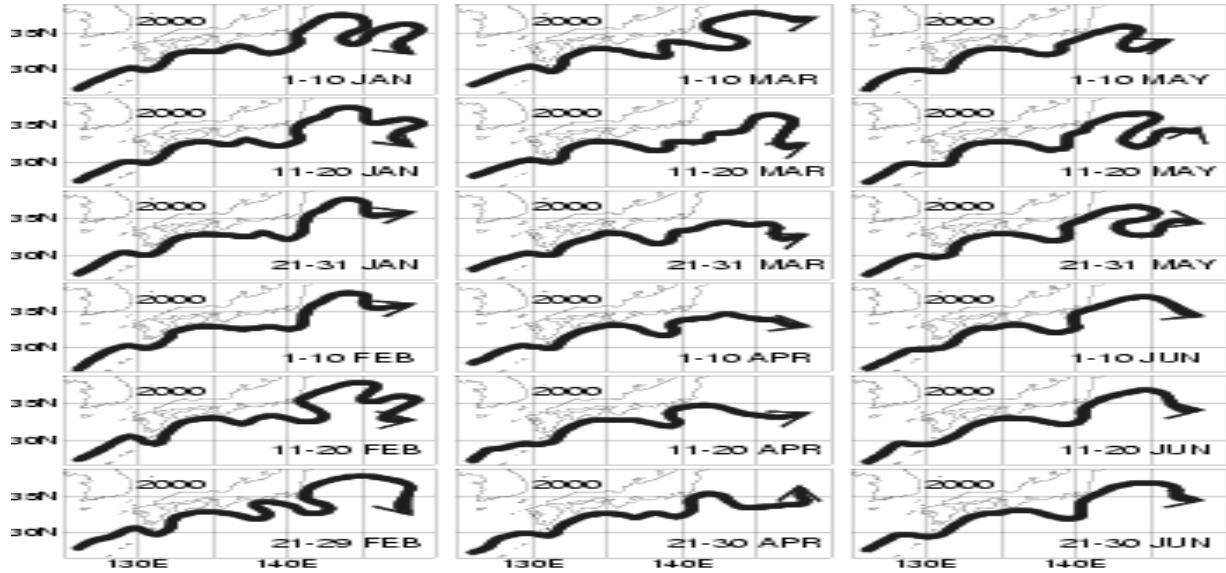


Fig. 3 Location of the Kuroshio axis from January to June 2000.

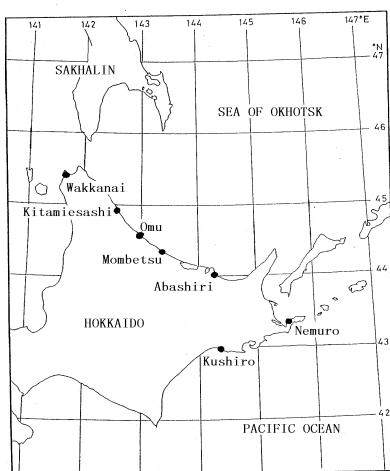


Fig. 4 Location of the sea ice stations along the coast of Hokkaido, Japan.

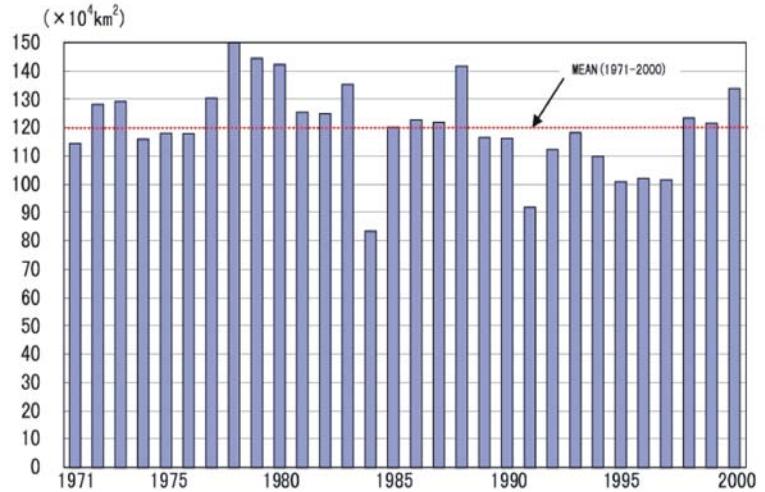


Fig. 5 The maximum area of sea ice extent area in the Sea of Okhotsk.

Table 1. The first and last dates of drift ice observed at coastal stations in the winter of 1999/2000.

Station	Drift ice				First date of drift ice on shore	First date of shore lead appearance
	First date	Last date	Period	Days		
WAKKANAI	#	#	#	#	#	*
KITAMIESASHI	1.19(-1)	4.2(+2)	75(+4)	57(+5)	1.19(-8)	3.23(+10)
OMU	1.21(+2)	4.3(-3)	74(-4)	64(+3)	1.21(-7)	3.21(+7)
MOMBETSU	1.22(+4)	4.1(-6)	71(-9)	63(-1)	1.25(-5)	3.23(+6)
ABASHIRI	1.18(+1)	4.4(-14)	78(-14)	69(-14)	1.31(0)	3.24(0)
NEMURO	2.10(+1)	4.3(+1)	54(+1)	42(+8)	2.11(-3)	*
KUSHIRO	2.26(-2)	2.26(-20)	1(-17)	1(*)	#	*

(): deviation from normal for the period from 1961 through 1990;

+: earlier or more than normal;

-: later or less than normal;

*: no observation or statistical value is not produced,

#: phenomenon was not observed.