

GEOSTROPHIC FLOW BETWEEN 30°E AND 120°E IN THE ANTARCTIC OCEAN (EXTENDED ABSTRACT)

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The ocean current north of the Antarctic Divergence is called the West Wind Drift, and that south of the Divergence is called the East Wind Drift. It is important to know the flow of currents in the Antarctic Ocean for the study of biological environment of living organisms.

In some parts of the Antarctic Ocean the horizontal pattern of the flow has showed a geostrophic flow (KHIMITSA, 1976; NASU and NAGANOBU, 1981; STEIN and RAKUSA-SUSZCZEWSKI, 1983). This report deals with the geostrophic flow pattern based on the data taken from a relatively wide area in the Indian Ocean sector of the Antarctic Ocean.

The materials used are based on the Nansen castings from the KAIYO MARU (Japan Fisheries Agency), down to 2000 m. The areas surveyed were south of 61°S, between 30 and 120°E and the southernmost navigable areas near the pack ice edge at approxi-

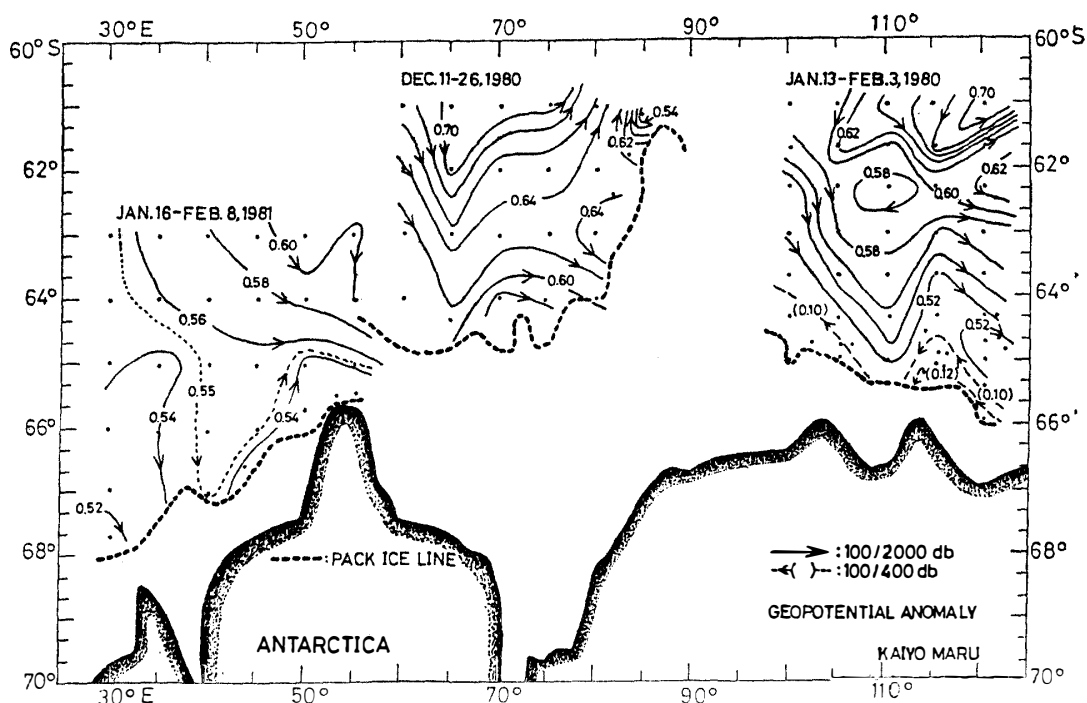


Fig. 1. Geopotential anomaly at the 100 decibar relative to the 2000-decibar surface (400-decibar surface on the continental shelf) in the Antarctic Ocean between 30 and 120°E.

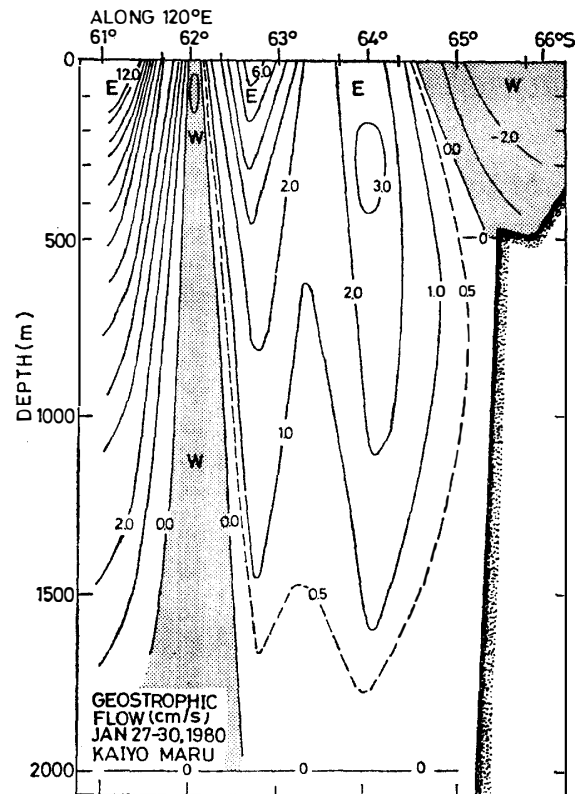


Fig. 2. Geostrophic flow relative to the 2000-decibar surface along 120°E.

mately 68°S. The period of survey extended over two successive years: the area between 100 and 120°E was surveyed from January 13 to February 3, 1980, and the area between 30 and 85°E was surveyed from December 11, 1980 to February 8, 1981.

Figure 1 shows the geopotential anomaly at the 100-decibar surface relative to the 2000-decibar surface (400-decibar surface on the continental shelf) in the area between 30 and 120°E. The area is divided into three parts, 30–55°E, 60–85°E, and 100–120°E, because of different observation periods. This division is necessary because observation in high latitude areas was restricted by the presence of pack ice.

Overall observation between 30 and 120°E shows a dominant eastward flow with meanders. There is a clockwise eddy centered at 62°20'S, 110°E. Between 30 and 55°E the geostrophic flow is relatively weak.

In the vicinity of the pack ice, a westward flow is observed south of 64°40'S, between 100 and 120°E. Between 60 and 85°E, where the observation was made in early summer from December 11 to 27, the flow pattern south of 64°20'S was unknown because the pack ice covered the continental shelf area. Between 30 and 55°E, the pack ice had retreated to the southernmost limit but the westward flow was not observed near the coast, different from the case between 100 and 120°E.

Figure 2 shows the vertical distribution of the geostrophic flow along 120°E. The offshore increase in the eastward component of flow is recognized except in the area around 62°S and on the continental shelf where a westward flow has a maximum velocity of 2 cm/s even at the bottom.

References

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