Ser. Cient. INACH 35: 65-80, 1986

Iceberg Sightings During the Chilean SIBEX-Phase II Cruise in the Bransfield Strait, Antarctica, 1985

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ABSTRACT

Icebergs were counted during SIBEX-Phase II, 1985, according to instructions of the Norsk Polar Research Institute aboard the M/N ALCAZAR. A total of 196 hours of iceberg counts revealed a larger concentration of these on the SE part of the Bransfield Strait. These results agree with the physical oceanographic pattern of that Antarctic sector; but more observations are needed to conclude better causes of their drift and aggregations.

RESUMEN

Se presentan conteos de témpanos a la deriva observados durante SIBEX-Fase II, 1985, a bordo de la M/N "ALCAZAR". Los controles se guiaron por instrucciones distribuidas por el Instituto de Investigaciones Polares de Noruega. La mayor concentración de témpanos se observó en el tercio SE del estrecho Bransfield, coincidiendo con la oceanografía física del lugar. Es necesario realizar mayor cantidad de controles para obtener conclusiones más valederas sobre deriva y agrupamientos de hielos.

INTRODUCTION

Iceberg presence in navigational areas are not only dangerous to that logistic activity, but also can report useful knowledge about marine currents, winds, origin of those icebergs (from nearby glaciers or icebarriers), time of greater production of icebergs, etc., when they are appropriately registered. This information would be even more valuable if iceberg detections were performed by various cruises at a time, in the same area, but chronologically discontinuous with the aim to follow longevity and drift within a certain period of time.

With this purpose, our country —as reported previously by Eberhard (1984)— is contributing with iceberg data collection during estival Antarctic activities, according to recomendations suggested by the SCAR Working Group of Glaciology (Norsk Polar Research Institute, 1982). On this occasion observations aimed to locate iceberg concentrations and if there were or not indicative of their origin and oceanographic currents which could explain those drifts and iceberg aggregations. To solve this relations, iceberg were controled daily from M/N Alcazar, between January 21st and February 15th, 1985, time when Chile was active for SIBEX-Phase II.

METHODS

Iceberg observations were essentialy done along 13 transects in the Bransfield Strait area from January 23rd to February 14th. Transects followed mainly a north-south axis (Fig. 1). Additional cruises and strip routes covered adjacent areas (Fig. 1), these were also searched for iceberg presence during Chilean SIBEX activities.

Iceberg controls were performed from the main ship bridge at 8 m above sea level with simple eyes or 10 x 40 binoculars and when the ship was on cruise. Observations were done amongst sea-

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bird census. Icebergs were classified according to iceberg survey-leaflet distributed to SCAR nations by Norsk Polar Res. Institute (1982) and as detailed previously by Eberhard (1984). Daily registrations started at 06:30 and ended at 20:30, Chilean time, during 14 effective control days. A total of 196 hours of iceberg observations were completed. All iceberg geographic positions were confirmed through satelite information. Distance control of iceberg from the ship did not go farther than 100 m within a complete perimeter of M/N ALCAZAR. Radar checking was helpful for iceberg size estimation and distance.

RESULTS AND DISCUSSION

During visual controls at sea, in straits and larger bays, icebergs were observed either solitary or in groups, during 34 instances in the 14 effective days of observations. Icebergs of size class 10-50 m were the most frequently sighted (73% of the total iceberg seen), then followed by size class 50-200 m (20%) and 200-500 m (4,9%). One iceberg was most relevant to observe, it measured probably more than 1000 m in diameter and was seen NE of Joinville Island (62°49' S; 54°15'W). Our survey agrees partially with those realized by Eberhard (1984) aboard the AP Piloto Pardo during 1983, but due to its recording in a short time basis and rather reduced area, they do not agree with similar iceberg survey reported between years 1981 and 1985. Then small size icebergs did not represent more than 34.8% around all the contour of the Antarctic continent where surveys were taken (Orheim, pers. com., Norsk Polar Res. Inst., 1985).

The distribution of iceberg groups in numbers over 2 units are represented in Fig. 2. There, most of quantitative important aggregations are observed at the SE corner of Bransfield Strait, along the NW of Tierra de O'Higgins and adjacent islands plus islets. This indicates not only that continental glaciers of the Antarctic peninsula are continually delivering icebergs, but also that there could be an important iceberg contribution with water flux towards the SW, resulting from currents coming through the Antarctic Sound and originated in the Weddell Sea (Deacon, 1937) and which are extended down to Trinidad Island (Kelly *et al.*, 1985). It is very probable also that icebergs coming from the SE, originated from the Palmer archipelagos, are also included amongst the many registered in that sector.

The absence of important iceberg groups in the middle and septentrional area of the Bransfield Strait is no doubt due to the drift of surface water with general NE direction (Sievers, 1982 and Kelly *et al.*, 1985) and which also besets their uniform distribution in that strait.

Another large number of icebergs was observed at the NW extreme of the Weddell Sea, NE of Joinville Island. There, the largest iceberg was also registered. That larger size and relative great number of icebergs indicates that there is an important drift of ice coming from the Weddell Sea which gather with those originated in the Bransfield Strait and could be a demonstration of the Weddell-Scotia current confluence (Kelly *et al.*, 1985). Iceberg presence south of the South Shetland Archipelago was not important during our expedition.

Registrations briefly analized and discussed here agree in general terms with register maps of all the Antarctic continent contour and with observations collected by the different countries during season 1981 to 1985 (Orheim, 1985 pers. com.). Also, iceberg distribution tends to agree with the dinamic pattern of the physical oceanography of Bransfield Strait. Only with an important collection of data as it is being channelled by the Norsk Polar Research Institute, it will be possible to have an idea of iceberg drift. Satelite information about marked icebergs or fitted with tracking equipment will illustrate us about that drift in different regions of the Antarctic continent. Some icebergs can be used as a careful tool to indicate direction of drift for surface water currents.

ACKNOWLEDGEMENTS

To Captain M. Lagunas and crew who permited and helped with the use of instruments of the ship with the aim of measuring distances, geographical location and iceberg size. The present research was financed by INACH, 1985.

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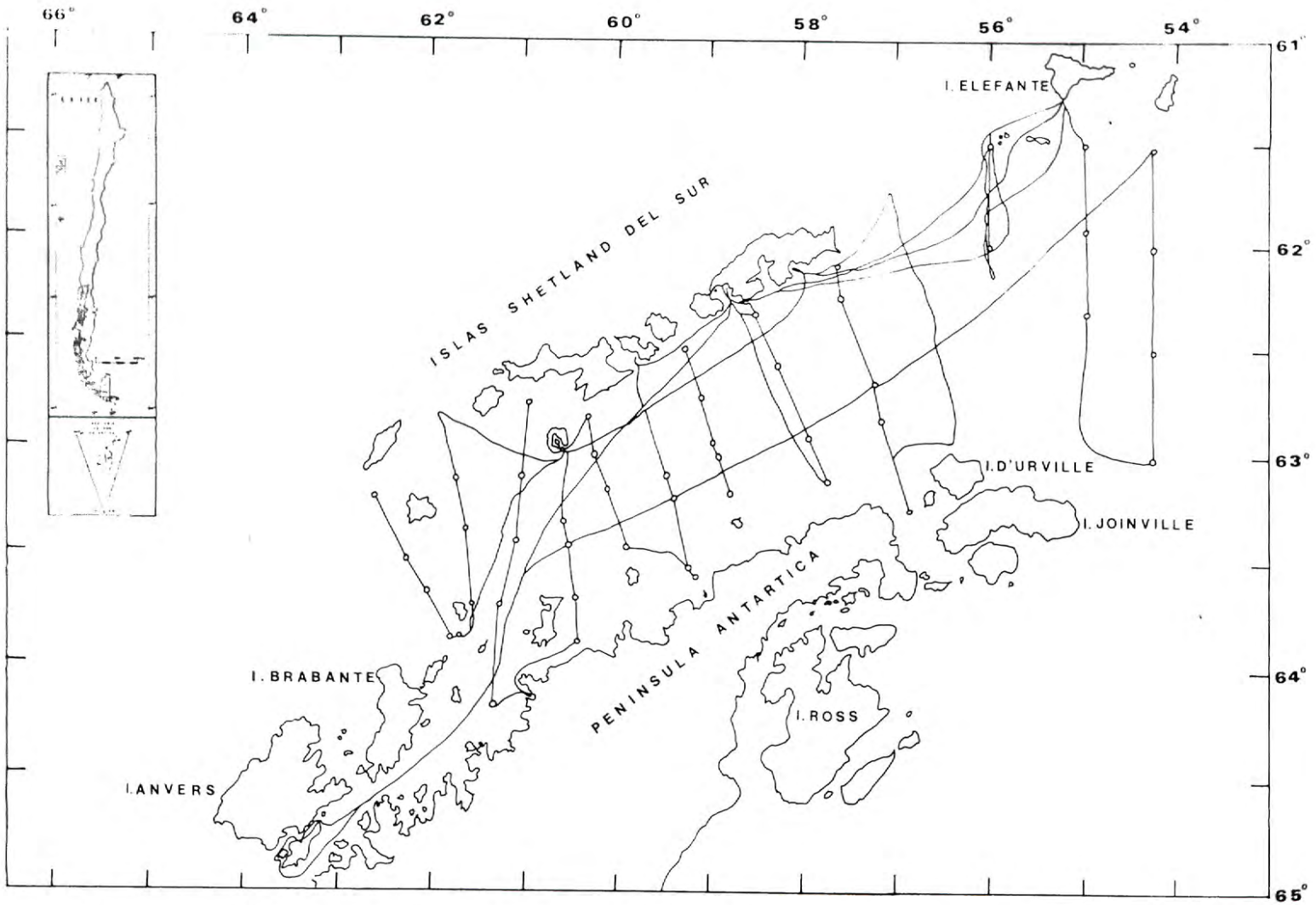

Figure 1.—Cruise routes of M/N ALCAZAR, during SIBEX-Phase II, Jan 21st to Feb 14th, 1985 with indications of transect and oceanographic stations (open circles). Icebergs were registered all along the cruise.

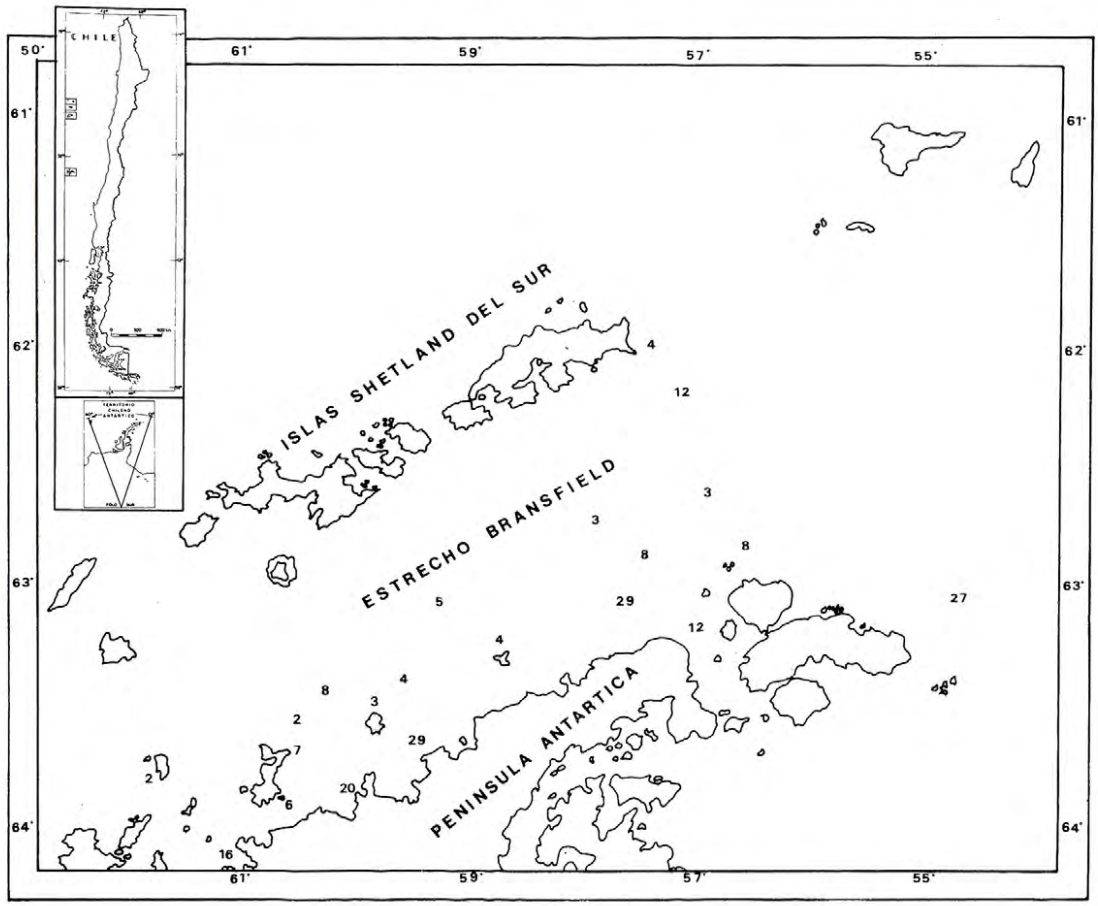

Figure 2.—Numerical distribution of icebergs for groups equal or larger than the pair unit observed during SIBEX-Phase II in Bransfield Strait.