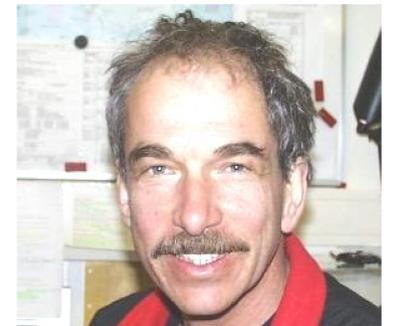


# 25 Years of Polarstern Meteorology

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**Gert König-Langlo, Bernd Loose**  
*Alfred-Wegener-Institute for Polar and Marine Research (AWI)*



*Gert.Koenig-Langlo@awi.de*

## Introduction

The most important tool in Germany's polar research program is the research and supply vessel Polarstern. The ship was commissioned in 1982. The owner of the ship is the Alfred Wegener Institute for Polar and Marine Research in Bremerhaven, Germany. Within the last 25 years Polarstern performed a total of 44 expeditions to the Arctic and Antarctic.

The ship is well equipped for meteorological research as well as for routine meteorological services. The meteorological office is permanently manned with a weather technician/observer from the German Weather Service (DWD) who performs the routine 3-hourly synoptic observations and the daily upper air soundings. Additionally, a weather forecaster is responsible to advice the ships captain as well as the helicopter pilots and all scientists in any weather related question.

**Fig. 1**



Polarstern breaking its way through moderate pack ice

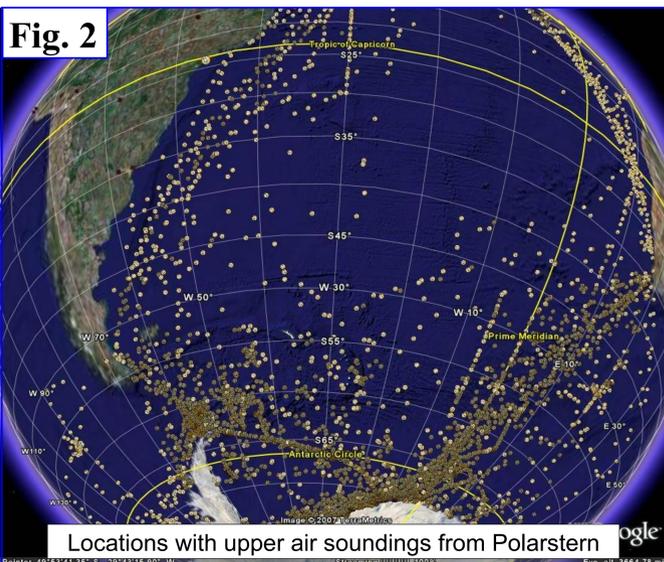
## Datasets

Within the last 25 years a unique set of meteorological data was collected. As an example see Fig. 2, Fig. 3 and Fig. 5. The data can be divided into 3 different categories:

- 3-hourly meteorological surface observations,
- daily upper air soundings,
- continuous meteorological surface measurements.

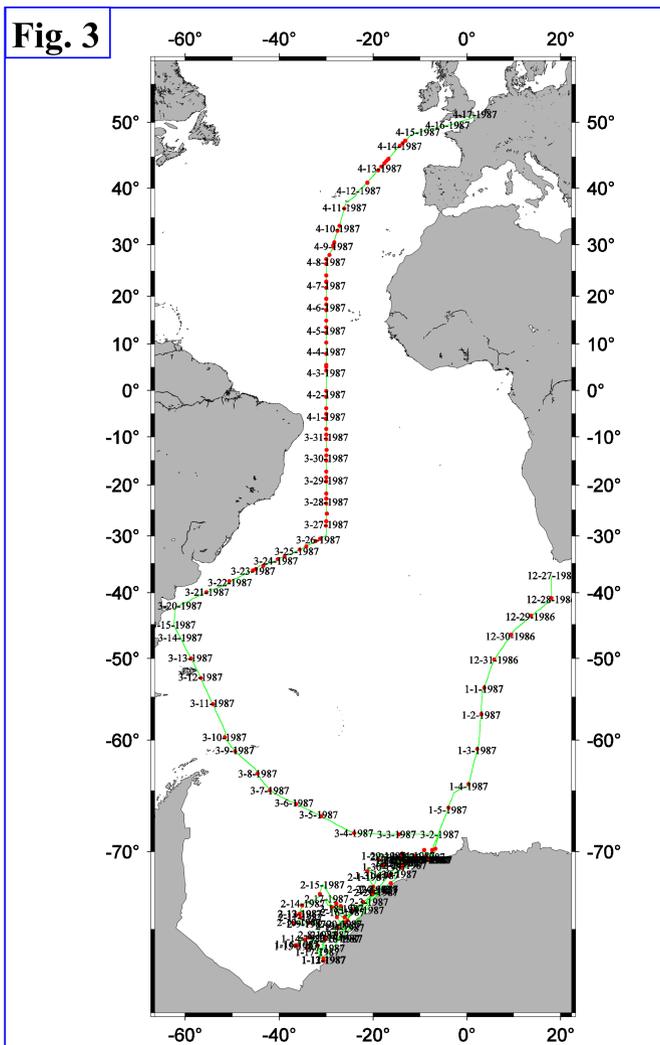
The datasets complement each other. The routine 3-hourly observations perform the most complete datasets including many visual observations also covering basic ice information. The upper air soundings are routinely performed once a day and contain all meteorological relevant vertical profile data sometimes including ozone concentrations. The continuous meteorological surface measurements (available since 1993) offer the only continuous dataset based on measurements averaged over 10 minutes.

**Fig. 2**

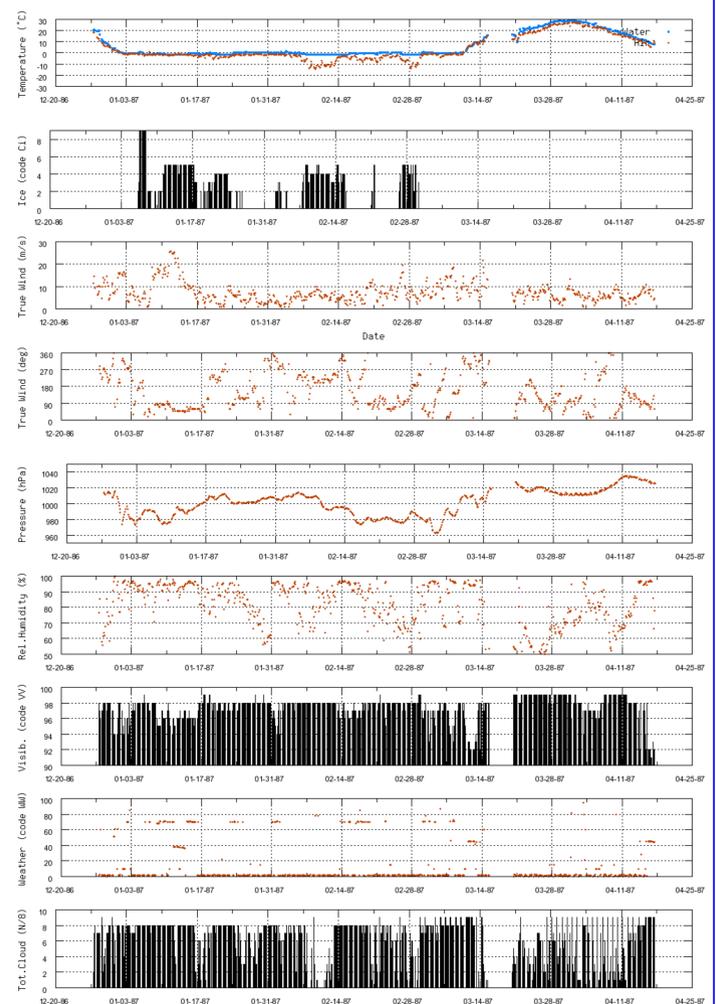


Locations with upper air soundings from Polarstern

**Fig. 3**



Cruise track and time series from voyage ANT-V/4,5 (1986-12-26 till 1987-4-19) based on the 3-hourly synoptic observations. Red dots in the cruise track denote upper air soundings

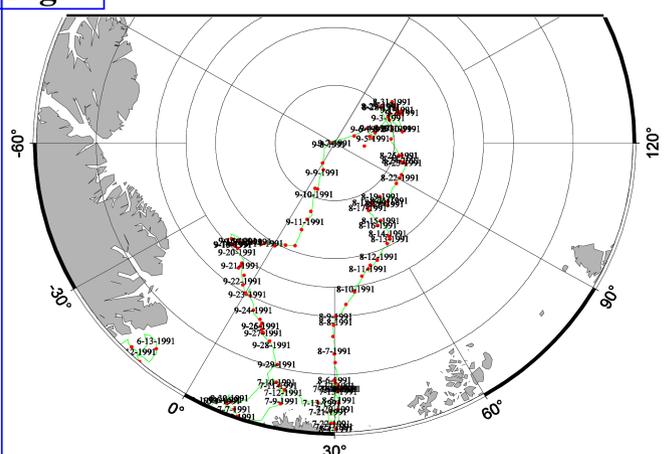


**Fig. 4**



Launching an ozone sonde from Polarstern

**Fig. 5**



Polarstern reaching the North Pole for the first time (1991-9-7)

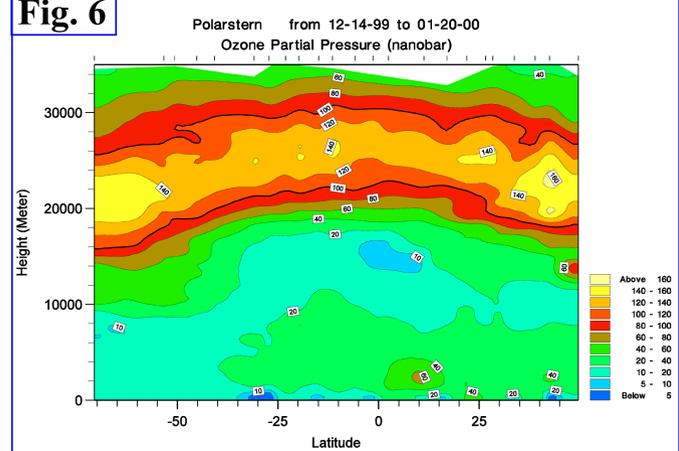
## Data availability

All data are published in the Word Data Center for Marine and Environmental Science (Gert König-Langlo, et al. WDC-MARE Reports, 0004, 2006). Copies from The report can be obtained from the author during the conference.

The WDC-MARE report is accompanied by a CD-ROM that contains the project related datasets. The content of the medium represents the information as stored in the information system for Publishing Network for Geoscientific & Environmental Data **PANGAEA** at the time of publication. All data are also available online (<http://www.pangaea.de>).

Via the homepage from the Alfred Wegener Institute for Polar and Marine Research (<http://www.awi.de>) data subsets can be selected online from the Meteorological Information System at **AWI MISAWI**. The data archiving is ongoing and includes the most recent data.

**Fig. 6**



Meridional-height section of ozone during a meridional Atlantic cruise from Bremerhaven to Antarctica