

Smetacek, Victor; de Baar, Hein JW; Bathmann, Ulrich; Lochte, Karin; Rutgers van der Loeff, Michiel M (1997): Ecology and biogeochemistry of the Antarctic circumpolar current during austral spring: Southern Ocean JGOFS Cruise ANT X/6 of R.V. Polarstern. *Deep-Sea Research Part II-Topical Studies in Oceanography*, **44(1-2)**, 1-21, doi:10.1016/S0967-0645(96)00100-2

Documentation of ice coverage data

21. Ice coverage.

Jan van Franeker (IBN)

Icecover is an important parameter in JGOFS studies because of its influence on the light regime, stability and salinity of the underlying water, all strongly affecting growth conditions for phytoplankton. Furthermore, the ice contains important communities of ice algae. Methods for ice observations have been developed in the "Protocol for ship- and airborne observations on the structure, physical properties and coverage of sea ice in the framework of Southern Ocean (SO) JGOFS activities. (Ackley S.F, Eicken H., van Franeker J.A., and Wadhams P. 1992). Following these methods ice observations during SO-JGOFS were conducted at every station position, and when thought useful, in between station positions. Results have been summarized in an ice database (ICESUM_ANTX/6. available in MAC Excel3, and MS_DOS Lotus3 or ASCII file).

Parameters listed in the database are:

- SO-JGOFS stationnumber and transectnumber. Observations at intended but cancelled station positions have station number 0, and underway observations have no number. Positions of ice edge crossings have been included as "edge". Edge positions given are for the outer ice edge, that is the most northern border of loose bands or fields of ice.
- date, time and position (minutes of latitude/longitude expressed in decimals!)
- Range (in km) around position for which observations are considered valid. It was attempted to give a description of icecover in a larger (5 to 10 km) area, but visibility or other circumstances sometimes reduced the area of observation.
- Percentages of open water and total icecover. Within total icecover a subsequent distinction is made between coverage by:
 - Floes: relatively flat pieces of first-year or older ice, covered by snow. - New ice: new ice types (grease/slush; pancake ice; dark nilas; light nilas; and grey/greywhite ice) were recorded separately when possible but have been combined in one figure in the database. New ice generally has no or little snowcover.
 - Brash ice: defined as small fragments of the wreckaged forms of other forms of ice.
 - Floediameter lists the estimated average diameter of floes dominating in icecover (in meters).
- Additional to the sea ice cover the total number of icebergs in a 12 nautical mile range around the ship was counted from the ships radar.
- For each station, the distance in km's from the ice edge was calculated (latitudinal difference between ship position and edge position).
- Finally the database lists temperature and salinity of the surface water, and air temperature (10 minute average from Polarstern INDAS datasystem).

Filenames have the following convention:

- ICE10-??XLS: These contain 10 minute observations of the various parameters. Some files are combined which are designated by both transect numbers (e.g. ICE10-78.XLS, has the data of transect 7 and 8). Exceptions are ICE10-11.XLS and IXE10-12.XLS, respectively transect 11 and 12.
- ICEJGOFS.XLS: Ice observation data according to JGOFS protocol.

Some further parameters were recorded during JGOFS observations, such as thickness of icefloes and snowcover, different types of young ice, frequency of rafted floes and frequency of brown

ice. These have not been included because they were considered too specific, hardly variable or of low reliability.

In addition to the standard JGOFS observations, ice conditions were estimated on a much finer scale during each ten-minute period of top predator observations in a narrow transect band (including minimum-maximum figures for icecover and floesize). Part of these observations will be included in the database of the surface registration group.

If such data are required please obtain further information from Jan van Franeker, see address list.

26. Top predators (birds, marine mammals)

Jan van Franeker (IBN)