Ice core physical properties from ARSV Laurence M. Gould LMG0106 in the Southern Ocean from July 2001 (SOGLOBEC project)

Website: https://www.bco-dmo.org/dataset/3121
Data Type: Cruise Results
Version: 1
Version Date: 2009-05-12

Project
» U.S. GLOBEC Southern Ocean (SOGLOBEC)

Program
» U.S. GLOBal ocean ECosystems dynamics (U.S. GLOBEC)

Contributors	Affiliation	Role
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Abstract
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Coverage

Spatial Extent: **N**:-66.3667 **E**:70.725 **S**:-68.205 **W**:67.8
Temporal Extent: 2001-07-28 - 2001-08-18

Dataset Description

A key component of our program was ice properties studies. The goal was to describe the physical and morphological properties of the snow cover and the ice cover. This includes determining the distribution of snow depth, ice thickness, and flooded ice, as well as the salinity and crystallographic structure of the ice. There were three elements to this work: snow and ice surveys, ice cores, and snow pits.

In 2001, over 120 ice cores, at more than 30 sites were taken for analysis. Typically four cores were taken at each site; one for temperature, salinity, and oxygen isotopes; one for structural analysis; and two for biology. In 2002, cores were taken at 21 sites and analyzed for temperature, salinity, oxygen isotopes, and structure.

Related datasets:
ice thickness, snow pits, sea ice, ice optics

Methods & Sampling

A Sipre 3-inch core barrel was used. The cores were drilled by hand to avoid contamination by oil and gasoline. Both the ice core length and the ice thickness were recorded. There was often a discrepancy between these values due to gaps in the core or the inability to obtain a core sample from the bottom part of the ice floe.

Vertical thin sections were made from the structure cores. These thin sections were photographed using transmitted natural light and through crossed-polaroids to analyze the crystallographic structure of the ice. The relative amounts of granular and columnar ice were determined. Averaging all cores together there was 66% granular ice and 34% columnar in 2001. In 2002, there was 78% granular and 22% columnar ice. The structural analysis of the thin sections was performed by A.J. Gow.

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Data Files

File
ice_properties.csv (Comma Separated Values (.csv), 33.84 KB) MD5:99c7ec22c1922b215fc1cb280b93dd51 Primary data file for dataset ID 3121

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Parameters

Parameter	Description	Units
sample_id	sample identification	unitless
core_len	core length	centimeters?
freebrd	freeboard...?	?
depth_cm	depth in core; mid-point of interval sampled	centimeters
temp	temperature	degree Celsius
brine_vol	volume of brine in the core	?
depth_interval	depth interval between samples	centimeters
sal	salinity	PSU?
d180	delta-18O; ratio of stable isotopes (oxygen-18:oxygen-16)	per mil
crystal_desc	description of ice crystals: g=granular; c=columnar	unitless
station_desc	description of station	unitless
comments	comments	unitless

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Instruments

Dataset-specific Instrument Name	
Generic Instrument Name	Ice Corer
Generic Instrument Description	An ice corer is used to drill into deep ice and remove long cylinders of ice from which information about the past and present can be inferred. Polar ice cores contain a record of the past atmosphere - temperature, precipitation, gas content, chemical composition, and other properties. This can reveal a broad spectrum of information on past environmental, and particularly climatic, changes. They can also be used to study bacteria and chlorophyll production in the waters from which the ice core was extracted.

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Deployments

LMG0106

Website	https://www.bco-dmo.org/deployment/57639
Platform	ARSV Laurence M. Gould
Report	http://www.ccpo.odu.edu/Research/globec/cruises01/lmg0106_menu.html
Start Date	2001-07-21
End Date	2001-09-01

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Project Information

U.S. GLOBEC Southern Ocean (SOGLOBEC)

Website: http://www.ccpo.odu.edu/Research/globec_menu.html

Coverage: Southern Ocean

The fundamental objectives of United States Global Ocean Ecosystems Dynamics (U.S. GLOBEC) Program are dependent upon the cooperation of scientists from several disciplines. Physicists, biologists, and chemists must make use of data collected during U.S. GLOBEC field programs to further our understanding of the interplay of physics, biology, and chemistry. Our objectives require quantitative analysis of interdisciplinary data sets and, therefore, data must be exchanged between researchers. To extract the full scientific value, data must be made available to the scientific community on a timely basis.

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Program Information

U.S. GLOBal ocean ECosystems dynamics (U.S. GLOBEC)

Website: http://www.usglobec.org/

Coverage: Global

U.S. GLOBEC (GLOBal ocean ECosystems dynamics) is a research program organized by oceanographers and fisheries scientists to address the question of how global climate change may affect the abundance and production of animals in the sea.

The U.S. GLOBEC Program currently had major research efforts underway in the Georges Bank / Northwest Atlantic Region, and the Northeast Pacific (with components in the California Current and in the Coastal Gulf of Alaska). U.S. GLOBEC was a major contributor to International GLOBEC efforts in the Southern Ocean and Western Antarctic Peninsula (WAP).

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Funding

Funding Source	Award
NSF Antarctic Sciences (NSF ANT)	ANT-9910098

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