Particulate organic carbon and nitrogen (POC, PON) and pigments from ARSV Laurence M. Gould LMG0602, LMG0414 in the Southern Ocean from 2004-2006 (SouthernSalps project)

Website: https://www.bco-dmo.org/dataset/3035
Version: 4 March 2009
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Project
» Salpa Thompsoni in the Southern Ocean: Bioenergetics, Population Dynamics and Biogeochemical Impact (SouthernSalps)

Contributors	Affiliation	Role
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Dataset Description

Particulate Carbon, Nitrogen and Pigments for LMG Cruises LMG0414 and LMG0602

Methods & Sampling

Sampling Protocol:
At each sampling station for salps, there was a CTD cast and water collected at several depths. Samples of water were filtered through both GF/F and GF/D (nominal 2um "pore") glass fiber filters. Filters to be used for elemental analysis (carbon and nitrogen) were pre-ashed (450 degC for 2-3 hours) and held in aluminum foil packets prior to use.

Data Processing Description

Analysis Protocol:
Pigment analysis of filters was done on shipboard. Immediately after water samples were filtered, filter pads were transferred into 6 ml of 90% acetone and the pigment was extracted in a dark refrigerator for 24 hours. Filter pads were removed and the test tubes centrifuged just prior to reading the fluorescence. Fluorescence was read with a Turner Designs 10 AU fluorometer. Following the initial fluorescence reading, samples were acidified with ~0.2ml of HCl and reread. The fluorometer was calibrated using a spectrophotometer during each cruise using standard Chl-a derived from spinach. Chlorophyll-a and total phaeopigments were calculated from standard equations (Strickland and Parsons 1972).

Immediately after filtration, pre-ashed filters for carbon and nitrogen were folded in half, placed in glassine envelopes, dried at 60degC in a drying oven, then stored in a -20deg C freezer and redried just prior to analysis. Elemental analysis was performed using a Carlo-Erba ES1500 elemental analyzer within 6 months of

collection. Background values were determined using blanks from the same filter supply as the samples, but without water filtration.

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Data Files

File
pigments_CN.csv (Comma Separated Values (.csv), 26.28 KB) MD5:f28c3e71cbbdbc3d6258764c9e7e9953 Primary data file for dataset ID 3035

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Parameters

Parameter	Description	Units
cruiseid	Cruise identification. (e.g. LMG0414)	none
year	Year in GMT, YYYY, (e.g. 2004)	yyyy
date_gmt	month, day and year samples were collected	mm/dd/yyyy
lat	Latitude. North is positive.	decimal degrees
lon	Longitude. South is negative.	decimal degrees
operation	sample collection method, sometimes coupled with depth information	if depth present,meters
depth	Depth sample was collected.	meters
filter_size	GFF = Glass Fiber Filters; 0.7um pore size.	microns
chla	Chlorophyll A; Plant pigment.	micrograms/kilogram
phaeo	Phaeophytin, a Chlorophyll a degradation product resulting from the loss of the magnesium at the center of the chlorophyll a molecule.	micrograms/kilogram
total_pig	chlorophyll a + phaeo	micrograms/kilogram
pcnt_phaeo	Percent phaeophytin in the sample	percent
pcnt_chl_tot	percent chlorophyll of the total pigment in the sample	percent
N	elemental Nitrogen	micrograms per liter
C	elemental Carbon	micrograms per liter
C_Chl_rat	ratio of Carbon to Chlorophyll in the sample	unitless
C_N_rat	ratio of Carbon to Nitrogen in the sample	unitless

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Instruments

Dataset-specific Instrument Name	Conductivity, Temperature, Depth
Generic Instrument Name	CTD - profiler
Generic Instrument Description	The Conductivity, Temperature, Depth (CTD) unit is an integrated instrument package designed to measure the conductivity, temperature, and pressure (depth) of the water column. The instrument is lowered via cable through the water column. It permits scientists to observe the physical properties in real-time via a conducting cable, which is typically connected to a CTD to a deck unit and computer on a ship. The CTD is often configured with additional optional sensors including fluorometers, transmissometers and/or radiometers. It is often combined with a Rosette of water sampling bottles (e.g. Niskin, GO-FLO) for collecting discrete water samples during the cast. This term applies to profiling CTDs. For fixed CTDs, see https://www.bco-dmo.org/instrument/869934.

Dataset-specific Instrument Name	Turner Design Digital 10-AU-05 Fluorometer
Generic Instrument Name	Turner Designs Fluorometer 10-AU
Generic Instrument Description	The Turner Designs 10-AU Field Fluorometer is used to measure Chlorophyll fluorescence. The 10AU Fluorometer can be set up for continuous-flow monitoring or discrete sample analyses. A variety of compounds can be measured using application-specific optical filters available from the manufacturer. (read more from Turner Designs, turnerdesigns.com, Sunnyvale, CA, USA)

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Deployments

LMG0602

Website	https://www.bco-dmo.org/deployment/57843
Platform	ARSV Laurence M. Gould
Start Date	2006-02-14
End Date	2006-03-16
Description	The goal of the LMG06-02 cruise was to continue the studies begun in 2004 (LMG04-14) on the population biology, feeding, and energetics of Salpa thompsoni in the waters near the Antarctic Peninsula.

LMG0414

Website	https://www.bco-dmo.org/deployment/57973
Platform	ARSV Laurence M. Gould
Start Date	2004-11-25
End Date	2004-12-14

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Project Information

Salpa Thompsoni in the Southern Ocean: Bioenergetics, Population Dynamics and Biogeochemical Impact (SouthernSalps)

Coverage: Southern Ocean

This project is also referred to as "B-307: Salpa thompsoni in the Southern Ocean". (B-307 was the USAP project/event number).

NSF Award Abstract:
Salps are planktonic grazers that have a life history, feeding biology and population dynamic strikingly different from krill, copepods or other crustacean zooplankton. Salps can occur in very dense population blooms that cover large areas and have been shown to have major impacts due to the their grazing and the production of fast-sinking fecal pellets. Although commonly acknowledged as a major component of the Southern Ocean zooplankton community, often comparable in biomass and distribution to krill, salps have received relatively little attention. Although extensive sampling has documented the seasonal abundance of salps in the Southern Ocean, there is a paucity of data on important rates that determine population growth and the role of this species in grazing and vertical flux of particulates. This proposed study will include: measurements of respiration and excretion rates for solitary and aggregate salps of all sizes; measurements of ingestion rates, including experiments to determine the size or concentration of particulates that can reduce ingestion; and determination of growth rates of solitaries and aggregates. In addition to the various rate measurements, this study will include quantitative surveys of salp horizontal and vertical distribution to determine their biomass and spatial distribution, and to allow a regional assessment of their effects. Measurements of the physical characteristics of the water column and the quantity and quality of particulate food available for the salps at each location will also be made. Satellite imagery and information on sea-ice cover will be used to test hypotheses about conditions that result in high densities of salps. Results will be used to construct a model of salp population dynamics, and both experimental and modeling results will be interpreted within the context of the physical and nutritional conditions to which the salps are exposed. This integrated approach will provide a good basis for understanding the growth dynamics of salp blooms in the Southern Ocean. Two graduate students will be trained on this project, and cruise and research experience will be provided for two undergraduate students. A portion of a website allowing students to be a virtual participant in the research will be created to strengthen students' quantitative skills. Both PI's will participate in teacher-researcher workshops, and collaboration with a regional aquarium will be developed in support of public education.

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Funding

Funding Source	Award
NSF Antarctic Sciences (NSF ANT)	ANT-0338290

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