Mean respiration and excretion rates for fish from ARSV Laurence M. Gould and RVIB Nathaniel B. Palmer cruises LMG0104, LMG0203, and NBP0204 in the Southern Ocean from 2001-2002 (SOGLOBEC project)

Website: https://www.bco-dmo.org/dataset/2370
Data Type: Cruise Results
Version: 1
Version Date: 2002-12-04

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
Mean respiration and excretion rates for fish from ARSV Laurence M. Gould and RVIB Nathaniel B. Palmer cruises LMG0104, LMG0203, and NBP0204 in the Southern Ocean from 2001-2002 (SOGLOBEC project)

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Coverage

Temporal Extent: 2001 - 2002

Dataset Description

Mean respiration and excretion rates for fish Southern Ocean GLOBEC

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Methods & Sampling

Collection of specimens. Crustaceans were collected using either mouth-closing Tucker trawls (9.0 m^2 or 2.25 m^2 mouth area) or downward-looking, vertically deployed plummet nets (1 m^2 mouth area). Tucker trawls were equipped with either blind or thermal-turbulence-protecting cod-ends (Childress etal. 1978); plummet nets terminated in bind cod-ends only. Specimens were taken in the upper 1000m of the water column in the vicinity of the marginal ice zone during spring (November-December) 1983, fall (March) 1986, and winter (June-August) 1988 as part of the AMERIEZ (Antarctic Marine Ecosystem Research at the Ice Edge Zone) program to study ice edge biology. Sampling locations were all in the Scotia-Weddell Sea region but moved with seasonal movement of the pack ice edge. Thus, spring and winter collections were in the Scotia Sea in the vicinity of 60 °S, 40 °W; fall sampling took place further south, 65 °S, 46 °W. Collections were made on a continuum from deep in the pack ice out to 300 km seaward of the ice edge in fall and winter. In spring, collections were made in the open water only. Station locations are given in Donnelly etal (1990).

Data Processing Description

Oxygen consumption rates were determined by allowing individuals to deplete the oxygen in a sealed container filled with filtered (0.45 um pore size) seawater. Temperature was maintained at 0.5 °C (+/- 0.1 °C) using a refrigerated water bath. Oxygen partial pressure (PO_2) was continuously monitored using a Clark polarographic oxygen electrode (Clark 1956) as an individual reduced oxygen levels to low (10 to 20 mm Hg) partial pressures. Electrodes were calibrated using air- and nitrogen-saturated seawater at the experimental temperature. The time required for consumption of oxygen to low levels varied from 12 to 18 h. Streptomycin and Neomycin (each 25 mg 1^{-1}) were added to the seawater to minimize microbial growth. To control for possible oxygen consumption by microorganishs, an individual was removed after selected runs, its volume was replaced with fresh seawater, and oxygen consumption was again measured for 2 to 4 h. In all cases microbial oxygen consumption was negligibly low.

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Data Files

File
mean_rates_fish_rs.csv (Comma Separated Values (.csv), 1.40 KB) MD5:4027fdf57faa959331cb14043a006370
Primary data file for dataset ID 2370

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Parameters

Parameter	Description	Units
species	Species name.	text
season	Season of the year (fall or winter).	text
number	Number of individuals in the calculation of the mean, four cruises represented.	integer
size_class	Size of the animal.	unitless

WetMass	Mean wet mass of individuals in milligrams, four cruises represented.	mg
WetMass_stdev	Standard deviation of WetMass.	mg
H2O	Mean percent water in animals, four cruises represented.	percent
H2O_stdev	Standard deviation of H2O.	percent
Ash	Mean percent Ash in animal, four cruises represented.	percent
Ash_stdev	Standard deviation of Ash.	percent
O2_consumed	Mean O2 consumed per individual per hour, four cruises represented.	uL O2 per individual per hour
O2_consumed_stdev	Standard deviation of O2_consumed.	uL O2 per individual per hour
VO2	Mean oxygen consumed per mg wet weight per hour, four cruises represented.	uL O2 per mg wet weight per hr
VO2_stdev	Standard deviation of VO2.	uL O2 per mg wet weight per hr
N_excrete	Mean of micrograms nitrogen excreted per individual per hour, four cruises represented.	ug per individual per hour
N_excrete_stdev	Standard deviation of N_excrete.	ug per individual per hour
N_excrete_mass	Mean of micrograms nitrogen excreted per milligram of wet mass per hour, four cruises represented.	ug N per mg wet mass per hour
N_excrete_mass_stdev	Standard deviation of N_excrete_mass.	ug N per mg wet mass per hour
OtoN	mean oxygen to nitrogen ratio, four cruises represented	unitless
OtoN_stdev	Standard deviation of OtoN.	unitless

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Instruments

Dataset-specific Instrument Name	Tucker Trawl
Generic Instrument Name	Tucker Trawl
Dataset-specific Description	Tucker trawls (9.0 m2 or 2.25 m 2 mouth area) were equipped with either blind or thermal-turbulence-protecting cod-nets (Childress etal. 1978)
Generic Instrument Description	The original Tucker Trawl, a net with a rectangular mouth opening first built in 1951 by G.H. Tucker, was not an opening/closing system, but shortly thereafter it was modified so that it could be opened and closed. The original had a 183 cm by 183 cm flexible rectangular mouth opening 914 cm long net with 1.8 cm stretched mesh for the first 457 cm and 1.3 cm mesh for last 457 cm. 152 cm of coarse plankton or muslin netting lined the end of the net. Tucker designed the net to collect animals associated with the deep scattering layers, principally euphausiids, siphonophores, and midwater fish. (from Wiebe and Benfield, 2003). Currently used Tucker Trawls usually have 1-m2 openings and can have a single net or multiple nets on the frame.

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Deployments

LMG0104

Website	https://www.bco-dmo.org/deployment/57637
Platform	ARSV Laurence M. Gould
Report	http://www.ccpo.odu.edu/Research/globec/cruises/gould0103_0104.doc
Start Date	2001-04-20
End Date	2001-06-05
Description	**Methods & Sampling** Collection of specimens. Crustaceans were collected using either mouth-closing Tucker trawls (9.0 m2 or 2.25 m2 mouth area) or downward-looking, vertically deployed plummet nets (1 m2 mouth area). Tucker trawls were equipped with either blind or thermal-turbulence-protecting cod-ends (Childress etal. 1978); plummet nets terminated in bind cod-ends only. Specimens were taken in the upper 1000m of the water column in the vicinity of the marginal ice zone during spring (November-December) 1983, fall (March) 1986, and winter (June-August) 1988 as part of the AMERIEZ (Antarctic Marine Ecosystem Research at the Ice Edge Zone) program to study ice edge biology. Sampling locations were all in the Scotia-Weddell Sea region but moved with seasonal movement of the pack ice edge. Thus, spring and winter collections were in the Scotia Sea in the vicinity of 60S, 40W; fall sampling took place further south, 65S, 46W. Collections were made on a continuum from deep in the pack ice out to 300 km seaward of the ice edge in fall and winter. In spring, collections were made in the open water only. Station locations are given in Donnelly etal (1990). **Processing Description** Oxygen consumption rates were determined by allowing individuals to deplete the oxygen in a sealed container filled with filtered (0.45 um pore size) seawater. Temperature was maintained at 0.5C (+-0.1C) using a refrigerated water bath. Oxygen partial pressure (PO2) was continuously monitored using a Clark polarographic oxygen electrode (Clark 1956) as an individual reduced oxygen levels to low (10 to 20 mm Hg) partial pressures. Electrodes were calibrated using air- and nitrogen-saturated seawater at the experimental temperature. The time required for consumption of oxygen to low levels varied from 12 to 18 h. Streptomycin and Neomycin (each 25 mg 1-1) were added to the seawater to minimize microbial growth. To control for possible oxygen consumption by microorganishs, an individual was removed after selected runs, its volume was replaced with fresh seawater, and oxygen consumption was again measured for 2 to 4 h. In all cases microbial oxygen consumption was negligibly low.

LMG0203

Website	https://www.bco-dmo.org/deployment/57642
Platform	ARSV Laurence M. Gould
Report	http://www.ccpo.odu.edu/Research/globec/main_cruises02/lmg0203/menu.html
Start Date	2002-04-07
End Date	2002-05-20
Description	**Methods & Sampling** Collection of specimens. Crustaceans were collected using either mouth-closing Tucker trawls (9.0 m2 or 2.25 m2 mouth area) or downward-looking, vertically deployed plummet nets (1 m2 mouth area). Tucker trawls were equipped with either blind or thermal-turbulence-protecting cod-ends (Childress etal. 1978); plummet nets terminated in bind cod-ends only. Specimens were taken in the upper 1000m of the water column in the vicinity of the marginal ice zone during spring (November-December) 1983, fall (March) 1986, and winter (June-August) 1988 as part of the AMERIEZ (Antarctic Marine Ecosystem Research at the Ice Edge Zone) program to study ice edge biology. Sampling locations were all in the Scotia-Weddell Sea region but moved with seasonal movement of the pack ice edge. Thus, spring and winter collections were in the Scotia Sea in the vicinity of 60ï¿½ S, 40ï¿½ W; fall sampling took place further south, 65ï¿½ S, 46ï¿½ W. Collections were made on a continuum from deep in the pack ice out to 300 km seaward of the ice edge in fall and winter. In spring, collections were made in the open water only. Station locations are given in Donnelly etal (1990). **Processing Description** Oxygen consumption rates were determined by allowing individuals to deplete the oxygen in a sealed container filled with filtered (0.45 um pore size) seawater. Temperature was maintained at 0.5ï¿½C (ï¿½0.1ï¿½C) using a refrigerated water bath. Oxygen partial pressure (PO2) was continuously monitored using a Clark polarographic oxygen electrode (Clark 1956) as an individual reduced oxygen levels to low (10 to 20 mm Hg) partial pressures. Electrodes were calibrated using air- and nitrogen-saturated seawater at the experimental temperature. The time required for consumption of oxygen to low levels varied from 12 to 18 h. Streptomycin and Neomycin (each 25 mg 1-1) were added to the seawater to minimize microbial growth. To control for possible oxygen consumption by microorganishs, an individual was removed after selected runs, its volume was replaced with fresh seawater, and oxygen consumption was again measured for 2 to 4 h. In all cases microbial oxygen consumption was negligibly low.

NBP0204

Website	https://www.bco-dmo.org/deployment/57643
Platform	RVIB Nathaniel B. Palmer
Report	http://globec.whoi.edu/so-dir/reports/nbp0204/nbp0204b.html
Start Date	2002-07-31
End Date	2002-09-18
Description	Also see NBP0204 Cruise Data Report **Methods & Sampling** Collection of specimens. Crustaceans were collected using either mouth-closing Tucker trawls (9.0 m2 or 2.25 m2 mouth area) or downward-looking, vertically deployed plummet nets (1 m2 mouth area). Tucker trawls were equipped with either blind or thermal-turbulence-protecting cod-ends (Childress etal. 1978); plummet nets terminated in bind cod-ends only. Specimens were taken in the upper 1000m of the water column in the vicinity of the marginal ice zone during spring (November-December) 1983, fall (March) 1986, and winter (June-August) 1988 as part of the AMERIEZ (Antarctic Marine Ecosystem Research at the Ice Edge Zone) program to study ice edge biology. Sampling locations were all in the Scotia-Weddell Sea region but moved with seasonal movement of the pack ice edge. Thus, spring and winter collections were in the Scotia Sea in the vicinity of 60ï¿½ S, 40ï¿½ W; fall sampling took place further south, 65ï¿½ S, 46ï¿½ W. Collections were made on a continuum from deep in the pack ice out to 300 km seaward of the ice edge in fall and winter. In spring, collections were made in the open water only. Station locations are given in Donnelly etal (1990). **Processing Description** Oxygen consumption rates were determined by allowing individuals to deplete the oxygen in a sealed container filled with filtered (0.45 um pore size) seawater. Temperature was maintained at 0.5ï¿½C (ï¿½0.1ï¿½C) using a refrigerated water bath. Oxygen partial pressure (PO2) was continuously monitored using a Clark polarographic oxygen electrode (Clark 1956) as an individual reduced oxygen levels to low (10 to 20 mm Hg) partial pressures. Electrodes were calibrated using air- and nitrogen-saturated seawater at the experimental temperature. The time required for consumption of oxygen to low levels varied from 12 to 18 h. Streptomycin and Neomycin (each 25 mg 1-1) were added to the seawater to minimize microbial growth. To control for possible oxygen consumption by microorganishs, an individual was removed after selected runs, its volume was replaced with fresh seawater, and oxygen consumption was again measured for 2 to 4 h. In all cases microbial oxygen consumption was negligibly low.

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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-9910100

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