Primary production, incubated in situ, 24 hours from RVIB Nathaniel B. Palmer and R/V Roger Revelle cruises in the Southern Ocean, 1997-1998 (U.S. JGOFS AESOPS project)

Website: https://www.bco-dmo.org/dataset/2729
Version: final
Version Date: 2002-09-10

Project
» U.S. JGOFS Antarctic Environment and Southern Ocean Process Study (AESOPS)

Program
» U.S. Joint Global Ocean Flux Study (U.S. JGOFS)

Contributors	Affiliation	Role
Barber, Richard	Duke University	Principal Investigator
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Dataset Description

Primary Production, incubated in situ, 24 hours

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Parameters

Parameter	Description	Units
event	event number, from event log	
sta	station number, from event log	
cast	cast number	
sta_name	name of revisited locations on AESOPS cruises	
cast_type	TM = trace metal rosette CTD = CTD rosette	
bot	Goflo or Niskin bottle number	
depth_n	nominal depth sampled by Goflo or Niskin	meters
chl_a	chlorophyll_a as measured by fluorometric method	mg Chl m-3
chl_a_int_depth	depth to which chl_a is integrated	meters
chl_a_int	integrated from 0 meters to the depth of the deepest sample bottle (chl_a_int_depth)	mg Chl m-2
depth_in_situ	depth where samples were incubated in situ	meters
pp24	primary production, carbon assimilation (24 hours)	mmol C m-3 d-1
pb24	carbon assimilation per unit chl_a (24 hours)	mmol C mg Chl-1 d-1
pp24_int_1	primary production, carbon assimilation (24 hours) integrated from 0 meters to the depth of the 1% light level based on Morel optical model (depth_1%) Note: 1% light level productivity was interpolated or extrapolated from the in situ productivity profile.	mmol C m-2 d-1
pp24_opt	optimum primary production for profile, carbon assimilation (24 hours)	mmol C m-3 d-1
pb24_opt	optimum carbon assimilation per unit chl_a for profile (24 hours)	mmol C mg Chl-1 d-1
depth_light_1	depth of 1% light level based on Morel optical model	meters
depth_light_0d1	depth of 0.1% light level based on Morel optical model	meters
pp24_int_0d1	primary production, carbon assimilation (24 hours) integrated from 0 meters to the depth of the 0.1% light level based on Morel optical model (depth_0.1%) Note: 1% and 0.1% light level productivity values were interpolated or extrapolated from the in situ productivity profile.	mmol C m-2 d-1

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Instruments

Dataset-specific Instrument Name	Niskin Bottle
Generic Instrument Name	Niskin bottle
Dataset-specific Description	CTD clean rosette (Niskin) bottles were used to collect water samples.
Generic Instrument Description	A Niskin bottle (a next generation water sampler based on the Nansen bottle) is a cylindrical, non-metallic water collection device with stoppers at both ends. The bottles can be attached individually on a hydrowire or deployed in 12, 24, or 36 bottle Rosette systems mounted on a frame and combined with a CTD. Niskin bottles are used to collect discrete water samples for a range of measurements including pigments, nutrients, plankton, etc.

Dataset-specific Instrument Name	Trace Metal Bottle
Generic Instrument Name	Trace Metal Bottle
Dataset-specific Description	Trace metal (TM) clean rosette bottles were used to collect water samples.
Generic Instrument Description	Trace metal (TM) clean rosette bottle used for collecting trace metal clean seawater samples.

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Deployments

NBP-96-04A

Website	https://www.bco-dmo.org/deployment/57718
Platform	RVIB Nathaniel B. Palmer
Report	http://usjgofs.whoi.edu/aesops/p1.html
Start Date	1996-10-02
End Date	1996-11-08
Description	Ross Sea Process Study 1 **Methods & Sampling** PI: Richard Barber, Duke University John Marra, Lamont Doherty Earth Observatory Walker Smith, University of Tennessee dataset: Primary Production, incubated in situ, 24 hours technician: Michael Hiscock, Duke University dates: October 18, 1996 to November 02, 1996 location: N: -76.5012 S: -77.9638 W: 168.9967 E: -175.9047 project/cruise: AESOPS/NBP-96-4A - Ross Sea Process Cruise 1 ship: R/V Nathaniel B. Palmer Methodology: - Chapter 19 of the JGOFS protocols (1994) "Primary Production by 14C" - Hiscock, M.R., Marra, J., Smith, W.O., Jr., Goericke, R., Measures, C.I., Vink, S., Olson, R.J., Sosik, H.M., Barber, R.T., in press. Primary Productivity and its Regulation in the Pacific Sector of the Southern Ocean. Deep Sea Research II. - Barber, Richard T. 1993. In Situ Primary Production Protocols. U.S. JGOFS Equatorial Pacific Protocols, 1993, section 7. - Smith, W. O., Jr., R. T. Barber, M. R. Hiscock and J. Marra (submitted) The Seasonal Cycle of Phytoplankton Biomass and Primary Productivity in the Ross Sea, Antarctica. Deep-Sea Research II. - Barber, R. T., L. Borden, Z. Johnson, J. Marra, C. Knudsen, and C.C.Trees (1997) Ground truthing modeled kpar and on deck primary productivity incubations with in situ observations. SPIE 2963, 834-839. - Barber, R. T. and F. P. Chavez (1991) Regulation of primary productivity rate in the equatorial Pacific Ocean. Limnol. Oceanogr. 36, 1803-1815. - Morel, A. (1988) Optical modelling of the upper ocean in relation to its biogenous matter content (Case 1 waters). Journal of Biophysical Research 93, 10749-10768.

NBP-97-01

Website	https://www.bco-dmo.org/deployment/57720
Platform	RVIB Nathaniel B. Palmer
Report	http://usjgofs.whoi.edu/aesops/p2.html
Start Date	1997-01-13
End Date	1997-02-11
Description	Ross Sea Process Study 2 **Methods & Sampling** PI: Richard Barber, Duke University John Marra, Lamont Doherty Earth Observatory Walker Smith, University of Tennessee technician: Michael Hiscock, Duke University dataset: Primary Production, incubated in situ, 24 hours dates: January 13, 1997 to February 06, 1997 location: N: -74.0027 S: -78.043 W: 163.3482 E: -176.0241 project/cruise: AESOPS/NBP-97-1 - Ross Sea Process Cruise 2 ship: R/V Nathaniel B. Palmer Methodology: - Chapter 19 of the JGOFS protocols (1994) "Primary Production by 14C" - Hiscock, M.R., Marra, J., Smith, W.O., Jr., Goericke, R., Measures, C.I., Vink, S., Olson, R.J., Sosik, H.M., Barber, R.T., in press. Primary Productivity and its Regulation in the Pacific Sector of the Southern Ocean. Deep Sea Research II. - Barber, Richard T. 1993. In Situ Primary Production Protocols. U.S. JGOFS Equatorial Pacific Protocols, 1993, section 7. - Smith, W. O., Jr., R. T. Barber, M. R. Hiscock and J. Marra (submitted) The Seasonal Cycle of Phytoplankton Biomass and Primary Productivity in the Ross Sea, Antarctica. Deep-Sea Research II. - Barber, R. T., L. Borden, Z. Johnson, J. Marra, C. Knudsen, and C.C.Trees (1997) Ground truthing modeled kpar and on deck primary productivity incubations with in situ observations. SPIE 2963, 834-839. - Barber, R. T. and F. P. Chavez (1991) Regulation of primary productivity rate in the equatorial Pacific Ocean. Limnol. Oceanogr. 36, 1803-1815. - Morel, A. (1988) Optical modelling of the upper ocean in relation to its biogenous matter content (Case 1 waters). Journal of Biophysical Research 93, 10749-10768.

NBP-97-03

Website	https://www.bco-dmo.org/deployment/57721
Platform	RVIB Nathaniel B. Palmer
Report	http://usjgofs.whoi.edu/aesops/p3.html
Start Date	1997-04-04
End Date	1997-05-11
Description	Ross Sea Process Study 3 **Methods & Sampling** PI: Richard Barber, Duke University John Marra, Lamont Doherty Earth Observatory Walker Smith, University of Tennessee technician: Michael Hiscock, Duke University dataset: Primary Production, incubated in situ, 24 hours dates: April 14, 1997 to April 29, 1997 location: N: -73.979 S: -77.9369 W: 168.9630 E: -176.1544 project/cruise: AESOPS/NBP-97-3 - Ross Sea Process Cruise 3 ship: Nathaniel B. Palmer Methodology: - Chapter 19 of the JGOFS protocols (1994) "Primary Production by 14C" - Hiscock, M.R., Marra, J., Smith, W.O., Jr., Goericke, R., Measures, C.I., Vink, S., Olson, R.J., Sosik, H.M., Barber, R.T., in press. Primary Productivity and its Regulation in the Pacific Sector of the Southern Ocean. Deep Sea Research II. - Barber, Richard T. 1993. In Situ Primary Production Protocols. U.S. JGOFS Equatorial Pacific Protocols, 1993, section 7. - Smith, W. O., Jr., R. T. Barber, M. R. Hiscock and J. Marra (submitted) The Seasonal Cycle of Phytoplankton Biomass and Primary Productivity in the Ross Sea, Antarctica. Deep-Sea Research II. - Barber, R. T., L. Borden, Z. Johnson, J. Marra, C. Knudsen, and C.C.Trees (1997) Ground truthing modeled kpar and on deck primary productivity incubations with in situ observations. SPIE 2963, 834-839. - Barber, R. T. and F. P. Chavez (1991) Regulation of primary productivity rate in the equatorial Pacific Ocean. Limnol. Oceanogr. 36, 1803-1815. - Morel, A. (1988) Optical modelling of the upper ocean in relation to its biogenous matter content (Case 1 waters). Journal of Biophysical Research 93, 10749-10768.

NBP-97-08

Website	https://www.bco-dmo.org/deployment/57722
Platform	RVIB Nathaniel B. Palmer
Report	http://usjgofs.whoi.edu/aesops/p4.html
Start Date	1997-11-05
End Date	1997-12-13
Description	Ross Sea Process Study 4 SeaWiFS transmits images to U.S. JGOFS scientists aboard the Palmer, for first time on November 23, 1997. **Methods & Sampling** PI: Richard Barber, Duke University John Marra, Lamont Doherty Earth Observatory Walker Smith, University of Tennessee dataset: Primary Production, incubated in situ, 24 hours technician: Michael Hiscock, Duke University dates: November 16, 1997 to December 11, 1997 location: N: -76.4993 S: -76.6213 W: 169.0023 E: -177.963 project/cruise: AESOPS/NBP-97-8 - Ross Sea Process Cruise 4 ship: Nathaniel B. Palmer Methodology: - Chapter 19 of the JGOFS protocols (1994) "Primary Production by 14C" - Hiscock, M.R., Marra, J., Smith, W.O., Jr., Goericke, R., Measures, C.I., Vink, S., Olson, R.J., Sosik, H.M., Barber, R.T., in press. Primary Productivity and its Regulation in the Pacific Sector of the Southern Ocean. Deep Sea Research II. - Barber, Richard T. 1993. In Situ Primary Production Protocols. U.S. JGOFS Equatorial Pacific Protocols, 1993, section 7. - Smith, W. O., Jr., R. T. Barber, M. R. Hiscock and J. Marra (submitted) The Seasonal Cycle of Phytoplankton Biomass and Primary Productivity in the Ross Sea, Antarctica. Deep-Sea Research II. - Barber, R. T., L. Borden, Z. Johnson, J. Marra, C. Knudsen, and C.C.Trees (1997) Ground truthing modeled kpar and on deck primary productivity incubations with in situ observations. SPIE 2963, 834-839. - Barber, R. T. and F. P. Chavez (1991) Regulation of primary productivity rate in the equatorial Pacific Ocean. Limnol. Oceanogr. 36, 1803-1815. - Morel, A. (1988) Optical modelling of the upper ocean in relation to its biogenous matter content (Case 1 waters). Journal of Biophysical Research 93, 10749-10768.

KIWI7

Website	https://www.bco-dmo.org/deployment/57725
Platform	R/V Roger Revelle
Report	http://usjgofs.whoi.edu/aesops/RRp1.html
Start Date	1997-12-02
End Date	1998-01-03
Description	Polar Front Process I **Methods & Sampling** PI: Richard Barber, Duke University John Marra, Lamont Doherty Earth Observatory Walker Smith, Virginia Institute of Marine Science dataset: Primary Production, incubated in situ, 24 hours technician: Michael Hiscock, Duke University dates: December 12, 1997 to December 26, 1997 location: N: -55.6603 S: -62.4 W: -171.754 E: -168.8333 project/cruise: AESOPS/RR_KIWI07; APFZ Process Cruise 1 ship: R/V Roger Revelle Methodology: - Chapter 19 of the JGOFS protocols (1994) "Primary Production by 14C" - Hiscock, M.R., Marra, J., Smith, W.O., Jr., Goericke, R., Measures, C.I., Vink, S., Olson, R.J., Sosik, H.M., Barber, R.T., in press. Primary Productivity and its Regulation in the Pacific Sector of the Southern Ocean. Deep Sea Research II. - Barber, Richard T. 1993. In Situ Primary Production Protocols. U.S. JGOFS Equatorial Pacific Protocols, 1993, section 7. - Smith, W. O., Jr., R. T. Barber, M. R. Hiscock and J. Marra (submitted) The Seasonal Cycle of Phytoplankton Biomass and Primary Productivity in the Ross Sea, Antarctica. Deep-Sea Research II. - Barber, R. T., L. Borden, Z. Johnson, J. Marra, C. Knudsen, and C.C.Trees (1997) Ground truthing modeled kpar and on deck primary productivity incubations with in situ observations. SPIE 2963, 834-839. - Barber, R. T. and F. P. Chavez (1991) Regulation of primary productivity rate in the equatorial Pacific Ocean. Limnol. Oceanogr. 36, 1803-1815. - Morel, A. (1988) Optical modelling of the upper ocean in relation to its biogenous matter content (Case 1 waters). Journal of Biophysical Research 93, 10749-10768.

KIWI9

Website	https://www.bco-dmo.org/deployment/57727
Platform	R/V Roger Revelle
Report	http://usjgofs.whoi.edu/aesops/RRp2.html
Start Date	1998-02-13
End Date	1998-03-19
Description	Polar Front Process II **Methods & Sampling** PI: Richard Barber, Duke University John Marra, Lamont Doherty Earth Observatory Walker Smith, Virginia Institute of Marine Science dataset: Primary Production, incubated in situ, 24 hours technician: Michael Hiscock, Duke University dates: February 24, 1998 to March 14, 1998 location: N: -54.3333 S: -70.4077 W: -173.3333 E: -165.9245 project/cruise: AESOPS/RR_KIWI09; APFZ Process Cruise 2 ship: R/V Roger Revelle Methodology: - Chapter 19 of the JGOFS protocols (1994) "Primary Production by 14C" - Hiscock, M.R., Marra, J., Smith, W.O., Jr., Goericke, R., Measures, C.I., Vink, S., Olson, R.J., Sosik, H.M., Barber, R.T., in press. Primary Productivity and its Regulation in the Pacific Sector of the Southern Ocean. Deep Sea Research II. - Barber, Richard T. 1993. In Situ Primary Production Protocols. U.S. JGOFS Equatorial Pacific Protocols, 1993, section 7. - Smith, W. O., Jr., R. T. Barber, M. R. Hiscock and J. Marra (submitted) The Seasonal Cycle of Phytoplankton Biomass and Primary Productivity in the Ross Sea, Antarctica. Deep-Sea Research II. - Barber, R. T., L. Borden, Z. Johnson, J. Marra, C. Knudsen, and C.C.Trees (1997) Ground truthing modeled kpar and on deck primary productivity incubations with in situ observations. SPIE 2963, 834-839. - Barber, R. T. and F. P. Chavez (1991) Regulation of primary productivity rate in the equatorial Pacific Ocean. Limnol. Oceanogr. 36, 1803-1815. - Morel, A. (1988) Optical modelling of the upper ocean in relation to its biogenous matter content (Case 1 waters). Journal of Biophysical Research 93, 10749-10768.

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Project Information

U.S. JGOFS Antarctic Environment and Southern Ocean Process Study (AESOPS)

Website: http://usjgofs.whoi.edu/research/aesops.html

Coverage: Southern Ocean, Ross Sea

The U.S. Southern Ocean JGOFS program, called Antarctic Environment and Southern Ocean Process Study (AESOPS), began in August 1996 and continued through March 1998. The U.S. JGOFS AESOPS program focused on two regions in the Southern Ocean: an east/west section of the Ross-Sea continental shelf along 76.5°S, and a second north/south section of the Southern Ocean spanning the Antarctic Circumpolar Current (ACC) at ~170°W (identified as the Polar Front). The science program, coordinated by Antarctic Support Associates (ASA), comprised eleven cruises using the R.V.I.B Nathaniel B. Palmer and R/V Roger Revelle as observational platforms and for deployment and recovery of instrumented moorings and sediment-trap arrays. The Ross-Sea region was occupied on six occasions and the Polar Front five times. Mapping data were obtained from SeaSoar, ADCP, and bathymetric systems. Satellite coverage was provided by the NASA SeaWiFS and the NOAA/NASA Pathfinder programs.

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Program Information

U.S. Joint Global Ocean Flux Study (U.S. JGOFS)

Website: http://usjgofs.whoi.edu/

Coverage: Global

The United States Joint Global Ocean Flux Study was a national component of international JGOFS and an integral part of global climate change research.

The U.S. launched the Joint Global Ocean Flux Study (JGOFS) in the late 1980s to study the ocean carbon cycle. An ambitious goal was set to understand the controls on the concentrations and fluxes of carbon and associated nutrients in the ocean. A new field of ocean biogeochemistry emerged with an emphasis on quality measurements of carbon system parameters and interdisciplinary field studies of the biological, chemical and physical process which control the ocean carbon cycle. As we studied ocean biogeochemistry, we learned that our simple views of carbon uptake and transport were severely limited, and a new "wave" of ocean science was born. U.S. JGOFS has been supported primarily by the U.S. National Science Foundation in collaboration with the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, the Department of Energy and the Office of Naval Research. U.S. JGOFS, ended in 2005 with the conclusion of the Synthesis and Modeling Project (SMP).

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