Nitrogen-15 uptake rates for labeled substrates from R/V Thomas G. Thompson cruises TT007, TT008, TT011, TT012 in the Equatorial Pacific in 1992 during the U.S. JGOFS Equatorial Pacific (EqPac) project

Website: https://www.bco-dmo.org/dataset/2649
Version: final
Version Date: 1995-08-14

Project
» U.S. JGOFS Equatorial Pacific (EqPac)

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

Contributors	Affiliation	Role
McCarthy, James J.	Harvard University	Principal Investigator
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Dataset Description

Nitrogen-15 Uptake rates for labeled substrates

Methods & Sampling

See Platform deployments for cruise specific documentation

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Parameters

Parameter	Description	Units
sta	station number from event log	
cast	TM cast number, from event log	
event	event number from event log	
depth	sample depth based on wire out	meters
pNO2	N-15 uptake from nitrite labeled substrate	mMol N /kg/h
pNO3	N-15 uptake from nitrate labeled substrate	mMol N /kg/h
pNH4	N-15 uptake from ammonium labeled substrate	mMol N /kg/h
depth_n	nominal depth of sample incubation	meters
NO3_int	integrated nitrate uptake rates	mmol/m2/day
psNH4	uptake rates of N-15 labeled saturated ammonium	umol/liter/day
NH4_int	integrated ammonium uptake rates	mmol/m2/day

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Instruments

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

TT007

Website	https://www.bco-dmo.org/deployment/57728
Platform	R/V Thomas G. Thompson
Start Date	1992-01-30
End Date	1992-03-13
Description	Purpose: Spring Survey Cruise; 12°N-12°S at 140°W TT007 was one of five cruises conducted in 1992 in support of the U.S. Equatorial Pacific (EqPac) Process Study. The five EqPac cruises aboard R/V Thomas G. Thompson included two repeat meridional sections (12°N - 12°S), 2 equatorial surveys, and a benthic survey (all at 140° W). The scientific objectives of this study were to observe the processes in the Equatorial Pacific controlling the fluxes of carbon and related elements between the atmosphere, euphotic zone, and deep ocean. As luck would have it, the survey window coincided with an El Nino event. A bonus for the research team. **Methods & Sampling** PI: James McCarthy of: Harvard University dataset: Nitrogen-15 Uptake rates for labeled substrates of NO2, NO3 & NH dates: February 04, 1992 to March 09, 1992 location: N: 12.015 S: -12.1113 W: -140.511 E: -135 project/cruise: EQPAC/TT007 - Spring Survey ship: Thomas Thompson PI-Notes: Due to the strong diel patterns in nitrogen uptake and the resulting possible misinterpretation of these profile data through simple integration and daily mulitpliers, the user community is directed to the areal summary data files and the Deep Sea Research paper (see McCarthy et al., in prep).

TT008

Website	https://www.bco-dmo.org/deployment/57729
Platform	R/V Thomas G. Thompson
Start Date	1992-03-19
End Date	1992-04-15
Description	Purpose: Spring Time Series; Equator, 140°W TT008 was one of five cruises conducted in 1992 in support of the U.S. Equatorial Pacific (EqPac) Process Study. The five EqPac cruises aboard R/V Thomas G. Thompson included two repeat meridional sections (12°N - 12°S), 2 equatorial surveys, and a benthic survey (all at 140° W). The scientific objectives of this study were to observe the processes in the Equatorial Pacific controlling the fluxes of carbon and related elements between the atmosphere, euphotic zone, and deep ocean. As luck would have it, the survey window coincided with an El Nino event. A bonus for the research team. **Methods & Sampling** PI: Patricia Wheeler of: Oregon State University dataset: Nitrogen-15 Uptake rates for labeled substrates of nitrate and saturated ammonium dates: March 23, 1992 to April 09, 1992 location: N: 0.0238 S: -0.0167 W: -140 E: -139.9722 project/cruise: EQPAC/TT008 - Spring Time Series ship: Thomas Thompson PI-Notes: Patricia Wheeler notes: 1) These incubations were all run in parallel with Dick Barber's in situ 14C measurements. 2) The new production (nitrate uptake) estimates are based on the mean of duplicate incubations for each depth. 3) Saturated ammonium uptake was measured at concentrations of about 5 µM and are single incubations for each depth. These rates are "potential" uptake rates and need to be interpreted carefully. Analytical methods reported in: Wheeler, P.A. 1993. New production in the subarctic Pacific Ocean: Net changes in nitrate concentrations, rates of nitrate assimilation and accumulation of particulate nitrogen. Prog. Oceanogr. 32:137-161.

TT011

Website	https://www.bco-dmo.org/deployment/57730
Platform	R/V Thomas G. Thompson
Start Date	1992-08-05
End Date	1992-09-18
Description	Purpose: Fall Survey; 12°N-12°S at 140°W TT011 was one of five cruises conducted in 1992 in support of the U.S. Equatorial Pacific (EqPac) Process Study. The five EqPac cruises aboard R/V Thomas G. Thompson included two repeat meridional sections (12°N - 12°S), 2 equatorial surveys, and a benthic survey (all at 140° W). The scientific objectives of this study were to observe the processes in the Equatorial Pacific controlling the fluxes of carbon and related elements between the atmosphere, euphotic zone, and deep ocean. As luck would have it, the survey window coincided with an El Nino event. A bonus for the research team. **Methods & Sampling** PI: James J. McCarthy of: Harvard University dataset: Nitrogen-15 uptake rates for labeled substrates of NO2, NO3 & NH4 dates: August 10, 1992 to September 14, 1992 location: N: 12.025 S: -11.9433 W: -140.7383 E: -134.935 project/cruise: EQPAC/TT011 - Fall Survey ship: Thomas Thompson PI-Notes: Due to the strong diel patterns in nitrogen uptake and the resulting possible misinterpretation of these profile data through simple integration and daily mulitpliers, the user community is directed to the areal summary data files and the Deep Sea Research paper (see McCarthy et al., in prep).

TT012

Website	https://www.bco-dmo.org/deployment/57731
Platform	R/V Thomas G. Thompson
Start Date	1992-09-24
End Date	1992-10-21
Description	Purpose: Fall Time Series; Equator, 140°W TT012 was one of five cruises conducted in 1992 in support of the U.S. Equatorial Pacific (EqPac) Process Study. The five EqPac cruises aboard R/V Thomas G. Thompson included two repeat meridional sections (12°N - 12°S), 2 equatorial surveys, and a benthic survey (all at 140° W). The scientific objectives of this study were to observe the processes in the Equatorial Pacific controlling the fluxes of carbon and related elements between the atmosphere, euphotic zone, and deep ocean. As luck would have it, the survey window coincided with an El Nino event. A bonus for the research team. **Methods & Sampling** PI: Patricia Wheeler of: Oregon State University dataset: Nitrogen-15 Uptake rates for labeled substrates of nitrate and saturated ammonium dates: October 02, 1992 to October 20, 1992 location: N: 0.0745 S: -0.0308 W: -140.1228 E: -139.9627 project/cruise: EQPAC/TT012 - Fall Time Series ship: Thomas Thompson PI-Notes: Patricia Wheeler notes: 1) These incubations were all run in parallel with Dick Barber's in situ 14C measurements. 2) The new production (nitrate uptake) estimates are based on the mean of duplicate incubations for each depth. 3) Saturated ammonium uptake was measured at concentrations of about 5 uM and are single incubations for each depth. These rates are "potential" uptake rates and need to be interpreted carefully. Analytical methods reported in: Wheeler, P.A. 1993. New production in the subarctic Pacific Ocean: Net changes in nitrate concentrations, rates of nitrate assimilation and accumulation of particulate nitrogen. Prog. Oceanogr. 32:137-161.

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Project Information

U.S. JGOFS Equatorial Pacific (EqPac)

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

Coverage: Equatorial Pacific

The U.S. EqPac process study consisted of repeat meridional sections (12°N -12°S) across the equator in the central and eastern equatorial Pacific from 95°W to 170°W during 1992. The major scientific program was focused at 140° W consisting of two meridional surveys, two equatorial surveys, and a benthic survey aboard the R/V Thomas Thompson. Long-term deployments of current meter and sediment trap arrays augmented the survey cruises. NOAA conducted boreal spring and fall sections east and west of 140°W from the R/V Baldridge and R/V Discoverer. Meteorological and sea surface observations were obtained from NOAA's in place TOGA-TAO buoy network.

The scientific objectives of this study were to determine the fluxes of carbon and related elements, and the processes controlling these fluxes between the Equatorial Pacific euphotic zone and the atmosphere and deep ocean. A broad overview of the program at the 140°W site is given by Murray et al. (Oceanography, 5: 134-142, 1992). A full description of the Equatorial Pacific Process Study, including the international context and the scientific results, appears in a series of Deep-Sea Research Part II special volumes:

Topical Studies in Oceanography, A U.S. JGOFS Process Study in the Equatorial Pacific (1995), Deep-Sea Research Part II, Volume 42, No. 2/3.

Topical Studies in Oceanography, A U.S. JGOFS Process Study in the Equatorial Pacific. Part 2 (1996), Deep-Sea Research Part II, Volume 43, No. 4/6.

Topical Studies in Oceanography, A U.S. JGOFS Process Study in the Equatorial Pacific (1997), Deep-Sea Research Part II, Volume 44, No. 9/10.

Topical Studies in Oceanography, The Equatorial Pacific JGOFS Synthesis (2002), Deep-Sea Research Part II, Volume 49, Nos. 13/14.

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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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