

# Cyanobacteria, phototrophic and heterotrophic pico-nanoplankton from 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/2661>

**Version:** final

**Version Date:** 2002-12-20

## Project

» [U.S. JGOFS Equatorial Pacific](#) (EqPac)

## Program

» [U.S. Joint Global Ocean Flux Study](#) (U.S. JGOFS)

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## Dataset Description

Cyanobacteria, phototrophic and heterotrophic pico-nanoplankton

## Methods & Sampling

See Platform deployments for cruise specific documentation

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## Parameters

Parameter	Description	Units
cast	CTD cast number from event log	
sta	station number from event log	
event	event/operation number from event log	
lat_n	latitude, nominal	degrees
bot	CTD rosette bottle number	
depth_n	nominal depth of sample	meters
syn_ab	abundance synechococcus-type cyanobacteria	cells/milliliter
syn_biov	biovolume synechococcus-type cyanobacteria	cubic micrometers
syn_biom	biomass synechococcus-type cyanobacteria	micrograms of carbon per liter
p_ab	abundance phototrophic eucaryotic pico- and nanoplankton	cells per liter
p_biov	biovolume phototrophic eucaryotic pico- and nanoplankton	cubic micrometers
p_biom	biomass phototrophic eucaryotic pico- and nanoplankton	micrograms of carbon per liter
h_ab	abundance heterotrophic eucayotic pico- and nanoplankton	cells per liter
h_biov	biovolume heterotrophic eucayotic pico- and nanoplankton	cubic micrometers
h_biom	biomass heterotrophic eucayotic pico- and nanoplankton	micrograms of carbon per liter
coccus_s	abundance synechococcus-type cyanobacteria	cells/milliliter
coccus_s_biov	biovolume synechococcus-type cyanobacteria	cubic micrometers
coccus_s_C	biomass synechococcus-type cyanobacteria	micrograms of carbon per liter
pepnp	abundance of phototrophic eucaryotic pico- and nanoplankton	cells per liter
pepnp_biov	biovolume phototrophic eucaryotic pico- and nanoplankton	cubic micrometers
pepnp_C	biomass phototrophic eucaryotic pico- and nanoplankton	micrograms of carbon per liter
hepnp	abundance heterotrophic eucayotic pico- and nanoplankton	cells per liter
hepnp_biov	biovolume heterotrophic eucayotic pico- and nanoplankton	cubic micrometers
hepnp_C	biomass heterotrophic eucayotic pico- and nanoplankton	micrograms of carbon per liter

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## Instruments

<b>Dataset-specific Instrument Name</b>	Niskin Bottle
<b>Generic Instrument Name</b>	Niskin bottle
<b>Dataset-specific Description</b>	CTD clean rosette (Niskin) bottles were used to collect water samples.
<b>Generic Instrument Description</b>	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.

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## Deployments

### TT007

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57728">https://www.bco-dmo.org/deployment/57728</a>
<b>Platform</b>	R/V Thomas G. Thompson
<b>Start Date</b>	1992-01-30
<b>End Date</b>	1992-03-13
<b>Description</b>	<p>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.</p> <p><b>Methods &amp; Sampling</b></p> <p>PI: Michael Sieracki of: Virginia Institute of Marine Science dataset: Cyanobacteria, phototrophic and heterotrophic pico-nanoplankton dates: February 05, 1992 to March 08, 1992 location: N: 12.0039 S: -12.0306 W: -140.4726 E: -134.9948 project/cruise: EQPAC/TT007 - Spring Survey ship: Thomas Thompson Methodology: U.S. JGOFS Equatorial Pacific Process Study Sampling and Analytical Protocols (section 23) PI note: Biomass is calculated using a constant carbon density factor of 220 femtograms C per <math>\mu\text{m}^3</math> of biovolume, and is expressed in units of micrograms of carbon per liter. Biovolume is defined as average cell size.</p>

### TT008

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57729">https://www.bco-dmo.org/deployment/57729</a>
<b>Platform</b>	R/V Thomas G. Thompson
<b>Start Date</b>	1992-03-19
<b>End Date</b>	1992-04-15
<b>Description</b>	<p>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.</p> <p><b>Methods &amp; Sampling</b>  PI: Michael Sieracki of: Virginia Institute of Marine Science dataset: Cyanobacteria, phototrophic and heterotrophic pico-nanoplankton dates: March 23, 1992 to April 09, 1992 location: N: 0.0018 S: -0.0145 W: -140.0003 E: -139.9833 project/cruise: EQPAC/TT008 - Spring Time Series ship: Thomas Thompson Methodology: U.S. JGOFS Equatorial Pacific Process Study Sampling and Analytical Protocols (section 23) PI note: Biomass is calculated using a constant carbon density factor of 220 femtograms C per <math>\mu\text{m}^3</math> of biovolume, and is expressed in units of micrograms of carbon per liter. Biovolume is defined as average cell size.</p>

#### TT011

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57730">https://www.bco-dmo.org/deployment/57730</a>
<b>Platform</b>	R/V Thomas G. Thompson
<b>Start Date</b>	1992-08-05
<b>End Date</b>	1992-09-18
<b>Description</b>	<p>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.</p> <p><b>Methods &amp; Sampling</b>  PI: Michael Sieracki of: Virginia Institute of Marine Science dataset: Cyanobacteria, phototrophic and heterotrophic pico-nanoplankton dates: August 29, 1992 to August 29, 1992 location: N: 0.1783 S: 0.1783 W: -139.915 E: -139.915 project/cruise: EQPAC/TT011 - Fall Survey ship: Thomas Thompson Methodology: U.S. JGOFS Equatorial Pacific Process Study Sampling and Analytical Protocols (section 23) PI-Note: Biomass is calculated using a constant carbon density factor of 220 femtograms C per <math>\mu\text{m}^3</math> of biovolume, and is expressed in units of micrograms of carbon per liter. Biovolume is defined as average cell size.</p>

#### TT012

<b>Website</b>	<a href="https://www.bco-dmo.org/deployment/57731">https://www.bco-dmo.org/deployment/57731</a>
<b>Platform</b>	R/V Thomas G. Thompson
<b>Start Date</b>	1992-09-24
<b>End Date</b>	1992-10-21
<b>Description</b>	<p>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.</p> <p><b>Methods &amp; Sampling</b>  PI: Michael Sieracki of: Virginia Institute of Marine Science dataset: Cyanobacteria, phototrophic and heterotrophic pico-nanoplankton dates: October 11, 1992 to October 20, 1992 location: N: 0.013 S: -0.0122 W: -140.1523 E: -139.983 project/cruise: EQPAC/TT012 - Fall Time Series ship: Thomas Thompson Methodology: U.S. JGOFS Equatorial Pacific Process Study Sampling and Analytical Protocols (section 23) PI note: Biomass is calculated using a constant carbon density factor of 220 femtograms C per <math>\mu\text{m}^3</math> of biovolume, and is expressed in units of micrograms of carbon per liter. Biovolume is defined as average cell size.</p>

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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 Baldrige 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.

## 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).