

Calcium carbonate concentrations from sediment cores collected during R/V Thomas G. Thompson cruise TT013 in the Equatorial Pacific in 1992 during the U.S. JGOFS Equatorial Pacific (EqPac) project

Website: <https://www.bco-dmo.org/dataset/2703>

Version: August 01, 2002

Version Date: 2002-08-01

Project

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

Program

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

Contributors	Affiliation	Role
Leinen, Margaret	University of Rhode Island (URI-GSO)	Principal Investigator
Chandler, Cynthia L.	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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Dataset Description

Calcium Carbonate concentrations, sediment cores

Methods & Sampling

PI: Margaret Leinen
of: University of Rhode Island, Grad. School of Oceanography
dataset: Calcium Carbonate concentrations, sediment cores
dates: November 07, 1992 to November 29, 1992
location: N: 4.0433 S: -4.9605 W: -140.1467 E: -139.4015
project/cruise: EqPac/TT013 - Benthic survey
ship: R/V Thomas Thompson

Carbonate analysis methodology: Calcium carbonate was determined from inorganic carbon measurements made on a Coulometrics Inc. Model 5011 CO₂ coulometer with a Model 5030 carbonate carbon apparatus. Between 5 and 10 mg of sample were acidified with 2ml 2N HCl to evolve CO₂. The CO₂ gas was bubbled into a titration cell where CO₂ was converted to hydroxyethylcarbonic acid which was automatically titrated with a coulometrically-generated base to a colorimetric endpoint. Grams of carbon in the sample are calculated based on factory standardization of the coulometric titration. Calcium carbonate content was calculated by assuming that all inorganic carbon in the sample was present as calcium carbonate, a reasonable assumption for these biogenic sediments which contain little or no dolomite. The CO₂ coulometer has an accuracy of 0.15 µg carbon. The precision of the complete procedure is ±0.52 wt% calcium carbonate based on the standard deviation of a lab standard of deep sea sediment which we developed from the study area.

Duplicate analyses were performed on every tenth sample and an additional analysis was made for every pair which differed by more than 2 wt%.

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Data Files

File
CaCO3_core.csv (Comma Separated Values (.csv), 66.88 KB) MD5:84f1d8c65e3f6d00fcf11487974d851f Primary data file for dataset ID 2703

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Parameters

Parameter	Description	Units
event	event number from event log	dimensionless
sta	sta number from event log	dimensionless
lat	latitude, negative denotes South	decimal degrees
lon	longitude, negative denotes West	decimal degrees
depth_w	depth of water	meters
core_type	core type	dimensionless
depth_core	depth in core, mid-point of interval sampled	centimeters
CaCO3	Calcium Carbonate	weight per cent

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Instruments

Dataset-specific Instrument Name	CO2 Coulometer
Generic Instrument Name	CO2 Coulometer
Dataset-specific Description	Model 5011 CO coulometer with a Model 5030 carbonate carbon apparatus.
Generic Instrument Description	A CO2 coulometer semi-automatically controls the sample handling and extraction of CO2 from seawater samples. Samples are acidified and the CO2 gas is bubbled into a titration cell where CO2 is converted to hydroxyethylcarbonic acid which is then automatically titrated with a coulometrically-generated base to a colorimetric endpoint.

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Deployments

TT013

Website	https://www.bco-dmo.org/deployment/57732
Platform	R/V Thomas G. Thompson
Start Date	1992-10-30
End Date	1992-12-13
Description	Purpose: Benthic Survey, 12°N-12°S at 140°W TT013 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.

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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.

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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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