

# CEER-O-083

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DATA REPORT

OTHER ? OTEC CRUISE

MAY 24-29, 1980

CENTER FOR ENERGY AND ENVIRONMENT RESEARCH,

CEER-0-083,

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Figure 22. Vertical distribution of Chlorophylla at Benchmark in successive hydrocasts during May 25 and 26, 1980.

Figure 28. Vertical distribution of Chlorophylla in a transect south of Punta Tena on May 27 and 28, 1980.

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?The ability to detect the effects of an OTEC plant on the marine environment is dependent upon the magnitude of its effects relative to the scale and intensity of variability (pattern) within this ecosystem.

?The scale of pattern examined in this study is approximately 10 km<sup>2</sup> which has been estimated to be the area whose alteration by the operation of an OFBC plant can be physically measured. In addition, we studied the structure of the ocean in transects extending 50 km south of the site.

?The purpose of this cruise was to determine the magnitude of variability

?to various ecosystem components within and between such areas. Small

scale and large scale transects were run to determine the presence of

?environmental gradients, if any, and the magnitude of between station

variability. ?The cruise was conducted on the R/V CRANFORD during May

24 through 29, 1980. This was the fourth cruise in our series of bi-monthly cruises.

## Hydrographic Data

Bydrocasts were made with 5 Liter or 12 Liter Miskin bottles usually lowered to depths of 1090 m. Sotties were placed at nominal depths of 0, 10, 25, 50, 75, 100, 150, 200, 250, 300, 400, 500, 650, 800, 1000 m for determinations of temperature, salinity, oxygen, chlorophyll and nutrients (nitrate-nitrite, phosphate, and silicate).

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?Temperature was measured with paired deep goa reversing thermometers, The thermometers were recently calibrated at the Physical Chemical Oceanographic Uata Facility (PCODF) at Scripps Institution of Oceanography and measurements vere considered accurate to 0.01°C. unprotected thermoneters were placed on bottles sampling at depths of 100 motors or greater.

Salinity was determined with a Hytech induction salinometer.

Headings are considered accurate to 0.002"/,



Dissolved oxygen was determined by the Winkler method as revised by Carpenter (1955) and modified by Anderson (1971).

Measurements are accurate to 0.02 ml/l, Nutrients were measured

Sh # Technicon Autoanalyzer using methods described by Strickland and Parsons (1968). Chlorophyll *a* was measured with a Turner Model 121 fluorometer using methods described by Strickland and Parsons (1968).

Station depths were obtained through an E.D.O. Depth Recorder permanently installed on the ship or estimated from a chart, NOS 26659.

Sonic depths obtained in Pathos were converted to meters but were not corrected for speed of sound variations. Chart depths are indicated by (C) and sonic depths by an (S) besides the number. All depths are in meters.

Densities ( $\sigma_t$ ) were calculated from the handbook of Oceanographic Tables (Stetson, 1966),

Station times are given in Greenwich Mean Time (GMT), Plankton

Sampling Times are in local time. Puerto Rico is 4 hours behind G.M.T.

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ocean pad with 202 = mesh, Volume of water filtered was calculated

from a flowmeter suspended off center in the mouth of the net

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Figure 6, Vertical distribution

Jobos Bay (PT-2 to 9-1)

land J-6 to G-6 on May

28, 1980.

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saLinity 0/00

to May 25 to 29, 1980

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DEPTH IN METERS

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TEMPERATURE °C

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stare {%6) weraus pth (2) com

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DEPTH IN METERS

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Figure 9, Salinity (+/,,) versus Depth (a) com  
posite May 25 to 23, 1980.

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PHOSPHATE UGAT POy-P/L

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temperature at Benchmark 1795738,  
65°51.5M during May 25 and 26, 3960,

TEMPERATURE °C

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PHOSPHATE UGAT PO<sub>y</sub> -P/L

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Figure 13, Mean phosphate concentrations

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DEPTH IN METERS

PHOSPHATE UGAT PO, P/t

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1 PES 15.5 mi. offshore

@ Pre 31.5 mi. offshore

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. Figure 14, Phosphate concentrations versus Depth (n)  
ina transect south of Punta Tuna on May  
27 and 23, 1980,

---Page Break---

NITRATE - NITRITE UGAT N/L

2 6 8 10 12 14 16 18 20 22 24 26 28 30

Figure 15. Nitrate-nitrite concentrations versus  
depth (m) at Benchmark 17°57', 65°51.53'  
during May 25 and 26, 1980.

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NITRATE/NITRITE UGAT N/L

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Figure 16,

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NUTRATE ~ NITRITE UAT N/L

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NITRATE ~ NITRITE UGAT N/L

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SILICATE UGAT Si/L

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Figure 19. Silicate concentrations versus  
at Benchmark 17°57.2N, 65°51  
May 25 and 26, 1980.

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SILICATE UGAT SI/t

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SILICATE UGAT SI/t

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# PRL 0.5 mi. offshore

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Figure 22. silicate concentrations versus depth (a) in 2

ransect south of punta Tuna on May 2" and 26,

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May 25 and 26, 1980.

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APPENDIX

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## MAY 1980 CRUISE PLAN (8005)

Depart Malecén

Arrive Benchmark station 17° 57.36 65° S1.5¥

xet

Hydrocast (primary productivity), 15 depths

xr

Oblique net tows (0-100, 100-200m)

Vertical net tow (1000-200m), x87

Light profile, secchi

Oblique net tows (0-100, 100-200m)

Vertical net tow (1000-200m), xBP

?Oblique net tow (0-200, 100-200n)

Vertical net tow (1000-2008)

Sydrocast

xr

Vertical net tow (100-200m), xBt

Oblique net tows (0-100, 100-200m)

Vertical net tow (2000-200)

Oblique net tows (0-100, 100-200=)

Vertical net tow (1000-200m)

xr

CbLique net tows (0-200, 100-200m)

Ryarocast

ver

Begin small scale pattern study

?Steam for station 1

Arrive S-1 17° 52.50 65° 52.90

Hydrocast at station 3-1 (primary productivity)

ObLique net tow (0-100m) station S-1, x87

Steam for station S-2 17° 54.20 65° 50.28

Oblique net tow (0-100m), xen

Steam for station 5-3 17° 55.88 65° 46.50

59

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DAY 2 (cont) crurse 2005,

as Oblique net tow (0-100), x87

1300 ?Steam for station S-4 17° 56.08 65° 55.58

1345 Oblique net tow (0-100), xBE

1430 ?Steam for station SS (Benchmark) 17° 57.68 65° 51.98

ass Oblique net tow (0-100m), xT

1600 Steam for etation 5-6 17°59,2N 65° 48.2¥

164s ebLique net tow (0-100), PZ

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1930 Bogin night series

Steam for S-1 17° 52.28 65° 53.8"

2000 Oblique net tow (0-100), xBT

Steam for 5-2 17% 54.26 65° 50.28

2200 Oblique net tow (0-100m), Br

Steans for 5-3 17° 55.0N 65" 46.50

2200 Oblique net tow (0-100m), x67

Byérocass

Steans for 5-4 17° 56.08 65° 55.58

2400 Oblique net cow (0-100m), xe7

Steans for S-5 (benchmark) 17° 57.6H 65° 51.9%

pay 3

2000 Oblique net tow (0-100m), XBT

Steam for S-6 17° 59.28 65° 48.28

0000 Oblique net tow (0-100m), xer

0200 ?Steam to Vieques

Begin large scale study

XBT at 30 min. intervals

0x20 XBT (underway)

0500 Arrive station V-1 18° 04.44 65° 32.64

Hydrocast (2 depth)

Shallow net tow

Steam for V2 16° 03.6N 65° 32.69

Shallow net tow

0800 Steam for V-3 18° 01.8N 65° 32.68

Nydrocast

Oblique net tow (0-100)

Steam for Vd 17° 57.7 65° 22.6

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DAY 3 (cont)

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Oblique net tow (0-100)

Steam for V-5 17° 48.54 65° 32.6¥

Oblique net tow (0-100m)

Sydrocast



Steam for v-6

Hydrocast 17° 32.5N 65° 32.6W

Oblique net tow (0-100m)

Steam for PRG

XBT's at 30 min intervals

Arrive PE 6 17° 28'h 65° 53'W

Hydrocast net tow

Oblique net tow (0-100m)

Steam for PRS

arrive PI?

Oblique net tow (0-100m) 17° 44,248 65° 5348

Aydrocast

Steam for Pm

Arrive PI-ϕ 17° 52.0N 65° s3tw

Oblique net tow (0-100m)

Steam for PT-3 (benchmark)

Arcive PI-3 17° 56.0" 65° 53'W

Hydrocast

Oblique net tow (0-100m)

Steam for PR2

Arrive PI-2 17° 58.1N 65% 53'W

Oblique net tow

Steam for Pmt

Arrive PTI 17° 56.2'm 65° 53'w

Shallow hydrocast (2 depths)

Shallow net tow

Steam for g-1

Arrive Jo1 17° 54.8n 66° 16.8

Shallow hydrocast (2 depths)

Shallow net tow

Steam for s-2

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Day 5.

DAY 4 (cont)

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(CRUISE 8005

Arrive J-2 17° 53,7'N 64 16.0'W

oblique net tow

Steam for 3-3

Arrive 9-3 17° 51.7'N 66° 16.08

Oblique net tow (0-100m)

Steam for 3-4

Arrive J-4 17° 47.71 66° 16.0%

Oblique net tow (0-100m)

Steam for 3-5

Arrive J-5 17° 39.70 66° 16.08

Oblique net tow (0-100n)

Steam for 3-6

Arrive J-6 17° 24.50 66° 16,08

Hyarocast

Oblique net tow (0-100m)

Depart for 6-6

XBT (undervay)

Arrive G-6 17" 26.5'8 66° 45'w

Oblique net tow (0-100q)

Hydrocast

Depart for G-5

Arrive G5 17° 42.61N 66° 45'W

Hydrocast

Oblique net tow (0-100m)

Depart for G-4

Arrive G-4 17° 49.3"m 66° 4st

Oblique net tow (0-100m)

Depart for c-2

Arrive G-3 17° 53.496 66° 45'W

Oblique net tow (0-100m)

Hydrocast

Depart for G-2

Arrive G-2 17° 54.9" 66° 4st

Oblique net tow (0-100n)

Depart for G-1

Arrive G-1 17° 56.1n 66° 45'W

Oblique net tow

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DAY 5 (cont) cRUISE 9005

0815(cont) Shallow hydrocast

Depart 6-0

ses Arrive 6-0 17° S 8'm 6° 45.7"0

Oblique net tow

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José Manuel Lépez

?Juan 6. Gonzilez

Paul M. Yoshioka

Danie Pesante

George Anderson

José Ranfrez Barbot

Jorge Capella

Angel Nazario

Dennis Corales

carlos Bonasé

Jorge Garcfa

Alfredo mercado

Evelyn Nazario

vaine Gareta

Ange) Marquez

## LIST OF PARTICIPANTS

65

Chief scientist

Scientist

Scientist

Scientist

?Technician

Technician

?Technician

?Technician

Technician

Technician

?Technician

Technician

Technician

Technician

Technician

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WEATHER cone

Clear (no cloud at any level)

Partly cloudy (scattered or Broken clouds)

Continuous layer (s) of cloud (s)

Sandstorm, duststorm, or blowing snow

Fog, thick dust, or haze

Drizzle

Rain



?Snow, ox rain and snow mixed

Shower (s)

?Thunderstorm (2)

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