

DATA REPORT: OHER - OTEC CRUISE
Compiled and Edited by We 22m, WS
CENTER FOR ENERGY AND ENVIRONMENT RESEARCH
UNIVERSITY OF PUERTO RICO - U.S. DEPARTMENT OF ENERGY

DATA REPORT: OHER - OTEC CRUISE
JULY 30 - AUG. 3, 1980
Compiled and Edited By José Manuel López, PhD.

TABLE OF CONTENTS

Cruise Plan

List of Participants

Weather Code

List of Figures

Figure 1: Station Plan

Figure 2: Small Scale Study

Figure 3: Vertical distribution of isotherms at Benchmark station during July 30 through July 31, 1980

Figure 4: XBT graphs for the series of stations 1-6 on July 31, 1980

Figure 5: XBT graphs for a series of stations in the vicinity of Benchmark July 31 and August 1, 1980

Figure 6: Progression of XBT graphs from casts while underway from 5-6 toward Vieques on August 1, 1980

Figure 7: XBT graphs in a transect while underway from V-6 towards Pt-6 on August 1, 1980

Figure 8: XBT graphs in a transect while underway from J-6 towards G-6 on August 2, 1980

Figure 9: XSP graphs from casts while underway from Guayanilla to Cabo Rojo on August 3, 1980

Figure 10: Salinity versus depth at Benchmark stations on July 30-31, 1980

Figure 11: Temperature versus depth at Benchmark stations on July 30-31, 1980

Figure 12: Salinity versus Temperature composite, July 30 - Aug. 3, 1980

Figure 13: Salinity versus Depth composite, July 30 - Aug. 3, 1980

Figure 14: Temperature versus depth composite, July 30 - Aug. 3, 1980

Figure 15: Temperature versus salinity at Benchmark stations on July 30-31, 1980

Figure 16: Dissolved Oxygen versus depth at Benchmark station July 31, 1980

Figure 17: Dissolved Oxygen versus depth at Benchmark stations on July 30-31, 1980

Figure 18: Dissolved Oxygen versus depth composite, July 30 - Aug. 3, 1980

Figure 19: Phosphate versus depth at Benchmark, July 30-31, 1980

Figure 20: Phosphate concentrations versus temperature at Benchmark 17°37.3N, 65°51.5W during July 30 and 31, 1980

1980. Mean phosphate concentrations versus mean depth at Benchmark 17°57.3", 65°51.5W during July 30 and 31, 1980. Phosphate concentrations versus depth in a transect south of Vieques on Aug. 1, 1980.

Figure 23, Figure 29, Figure 30, Figure 22, Figure 34, Figure 38, Figure 29, Figure 40.

List of Figures (cont.)

1. Phosphate concentrations versus depth in a transect south of Punta Tuna on Aug. 1-2, 1980.
2. Phosphate concentrations versus depth in a transect south of Jobos Bay on Aug. 2, 1980.
3. Phosphate concentrations versus depth in a transect south of Guayanilla on Aug. 3, 1980.
4. Nitrate-Nitrite concentrations versus depth at Benchmark, July 30-31, 1980.
5. Nitrate-Nitrite concentrations versus temperature at Benchmark 17°57.3M, 65°51.5W during July 30 and 31, 1980.
6. Mean Nitrate-Nitrite concentrations versus mean depth at Benchmark 17°57.3, 65°51.5W during July 30 and 31, 1980.
7. Nitrate-Nitrite concentrations versus depth in a transect South of Vieques on Aug. 1, 1980.
8. Nitrate-Nitrite concentrations versus depth in a transect south of Punta Tuna on Aug. 1-2, 1980.
9. Nitrate-Nitrite concentrations versus depth in a transect south of Jobos Bay on Aug. 2, 1980.
10. Nitrate-Nitrite concentrations versus depth in a transect south of Guayanilla on Aug. 3, 1980.
11. Silicate concentrations versus depth (m) at Benchmark 17°57.30, 65°51.5H during July 30 and 31, 1980.
12. Silicate concentrations versus temperature at Benchmark 17°57.3N, 65°51.5W during July 30 and 31, 1980.
13. Mean Silicate concentrations versus depth at Benchmark 17°57.3, 65°51.5 during July 30 and 31, 1980.
14. Silicate concentrations versus depth in a transect south of Vieques on Aug. 1, 1980.
15. Silicate concentrations versus depth in a transect south of Punta Tuna on Aug. 1 and 2, 1980.
16. Silicate concentrations versus depth in a transect south of Jobos Bay on Aug. 2, 1980.
17. Silicate concentrations versus depth in a transect south of Guayanilla on Aug. 3, 1980.

Vertical

"Distribution of chlorophyll in a transect south of Punta Tuna on Aug. 1 and 2, 1980. Vertical distribution of chlorophyll at Benchmark in successive hydrocasts during July 30-31, 1980.

Introduction: 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 km², which has been estimated to be the area whose alteration by the operation of an OTEC 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 July 30 through Aug. 2, 1980. This was the fifth cruise in our series of bimonthly cruises.

Hydrographic Data: Hydrocasts were made with 5 Liter or 12 Liter Niskin bottles, usually lowered to depths of 1000 m. Bottles were placed at nominal depths of 0, 10, 25, 50, 75, 100, 150, 200, 250, 300, 400, 500, 650, 900, 1000 m for determinations of temperature, salinity, oxygen, chlorophyll, and nutrients (nitrate, nitrite, phosphate, and silicate). Temperature was measured with paired deep-sea reversing thermometers. The thermometers were recently calibrated at the Physical Chemical Oceanographic Data Facility (PCODF) at Scripps Institution of Oceanography and measurements were considered accurate.

To 0.01°C, unprotected thermometers were placed on bottles sampling at depths of 100 meters or greater. Salinity was determined with a Hytech induction salinometer. Readings are considered accurate to 0.003°. Dissolved oxygen was determined by the Winkler method as revised."

By Carpenter (1965) and modified by Anderson (1971). Measurements are accurate to 0.02 mt/t. Nutrients were measured with a Technicon Autoanalyzer using methods described by Strickland and Parsons (1968). Chlorophyll was measured with a Turner Model 111 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, OS 26659. Sonic depths obtained in Fathoms 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) beside the number. All depths are densities (D) were calculated from a Handbook of Oceanographic Tables (Bialek, 1966). Station times are given in Greenwich Mean Time (GMT). Plankton Tow Times are in local time. Puerto Rico is 4 hours behind GMT. Net tows. Zooplankton tows were made with a 75 cm opening-closing net equipped with 202 um mesh. Volume of water filtered was calculated from a flowmeter suspended off-center in the mouth of the net.

BIBLIOGRAPHY

Anderson, G.C. 1971. Oxygen analysis. S10 Ref. No. 71-10, 8% Marine Technicians Handbook, Grant Pub. No. 1.

Bialek, B.T. (compiler), 1966. Handbook of Oceanographic Tables. U.S. Naval Oceanographic Office, Washington, D.C. Special Publication.

Carpenter, D.H. 1965. The Chesapeake Bay Institute technique for Winkler dissolved oxygen method. *Limnol. Oceanogr.* 10: 141-143.

Strickland, J.D.H. and T.R. Parsons. 1968. A practical handbook of seawater analysis, Fish. Res. Board Of Canada. Bull. No. 16 311 pp.

HYDROGRAPHIC DATA

The rest of the text appears to be a mix of random characters and phrases that don't form coherent sentences or information and therefore cannot be corrected.

The text provided appears to be a jumble of symbols, numbers, and letters which doesn't form coherent sentences or phrases. I'm unable to fix it as it doesn't provide any meaningful information or context. If there are specific parts you'd like to clarify or correct, please provide additional details.

I'm sorry, but the text you've provided is too garbled and appears to contain a mix of random characters and numbers. It's not clear what it's supposed to say, and I can't fix it without more context or information. Please provide a clearer version of the text.

I'm sorry, but the provided text seems to be scrambled or encrypted. It doesn't follow any recognizable language or pattern that I can correct. Please provide the correct context or a clearer version of the text.

I'm sorry, but the text you've provided is too scrambled and lacks context for me to be able to correct it appropriately. Could you please provide a clearer text or more context?

I'm sorry, but the text you provided is mostly nonsensical and appears to contain random characters and numbers. If you have a specific text, please provide it in a clear and understandable format so that I can assist you better.

The text appears to be a series of fragmented scientific measurements and descriptions. I will correct the grammatical errors as best as I can, but please note that the content may not make complete sense due to the lack of context:

Figure 19: Salinity versus depth composite, M6 gq 34.50, 35.00, 36.00, 37.00, 37.50. Salinity ‰,,.

Depth in meters: 50, 100, 250.4, 500, 1000, 116. Figure 14: Temperature versus depth composite, July 30 - Aug. 3, 1980, Sa 3.0, 5.0, 10.00, 15.00, 20.00, 25.00, 30.00. Temperature °C.

Temperature °C 21, 5.04, 10.04, So 2, 5, 25.0, 30.0, 34.50. Figure 15: Temperature versus salinity at Benchmark stations on July 30-31, 1980. 35.00, 36.00, 37.00, 37.50. Salinity ‰/00.

Depth in meters: 04, 504, 1004, 2504, 5004. Figure 16: Dissolved oxygen versus depth at Benchmark station, July 31, 1980. 10004. Ge 25, 3.0, 4.0, 5.0, 5.5. Dissolved Oxygen ml/L.

Figure 17: Dissolved oxygen versus depth at Benchmark stations on July 30-31, 1980. 10004. 16, 25, 3.0, 4.0, 5.0, 5.5. Dissolved Oxygen ml/L.

Depth in meters: 50, 100, 250, 1000. Figure 18: Dissolved oxygen versus depth composite, July 30 - Aug. 3, 1980. 25, 3.0, 4.0, 5.0, 5.5. Dissolved Oxygen ml/L.

Depth in meters: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000. Figure 19: Phosphate $\mu\text{gAT PO}_4\text{-P/L}$ 0.2, 0.4, 0.6, 0.8, 1.9, 1.2, 1.4, 1.6, 1.8, 2.0. Phosphate versus depth at Benchmark, July 20-31, 1980.

Temperature in °C: 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11. Phosphate $\mu\text{gAT PO}_4\text{-P/L}$: 0.1, 0.65, 0.8, 1.9, 1.2, 1.4, 1.6. Figure 20: Phosphate concentrations versus temperature at Benchmark 1757.38, 65°51.5N during July 30 and 31, 1980.

Phosphate $\mu\text{gAT PO}_4\text{-P/L}$: 8, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0. Depth in meters: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000. Figure 21: Mean phosphate concentrations versus mean depth at Benchmark 17°57.3, 65°51.5W during July 30 and 31, 1980.

Depth in meters: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 1100. Phosphate $\mu\text{gAT PO}_4\text{ P/L}$: 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.4. Vel 0.5 mi offshore V3 3.5 mi offshore V5 15.5.

"Figure 22 illustrates phosphate concentrations versus depth in a transect south of Vieques on Aug. 1, 1980.

Figure 23 illustrates phosphate concentrations versus depth in a transect south of Punta Tuna, Aug. 12, 1980.

Figure 24 illustrates phosphate concentrations versus depth in a transect south of Jobos Bay on Aug. 2, 1980.

Figure 25 illustrates phosphate concentrations versus depth in a transect south of Guayanilla on Aug. 3, 1980.

Figure 26 illustrates nitrite-nitrate concentrations versus depth at Benchmark, dated between July 30-31, 1980.

Figure 27 illustrates nitrate-nitrite concentrations versus temperature at Benchmark 17°57.3N, 65°51.5W during July 30 and 31, 1980.

Figure 28 illustrates mean nitrate-nitrite concentrations versus mean depth at Benchmark 17°57.34, 65°51.5W during July 30-31, 1980.

The last figure illustrates nitrate-nitrite concentrations at a distance of 0.5 mi offshore."

Figure 29: Nitrate-Nitrite concentrations versus depth in a transect, 35 mi offshore, south of Vieques on Aug. 1, 1980.

Depth in meters: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000.

Nitrate - Nitrite UGAT N/L : 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 1.8, 2.0, 2.2, 2.4, 2.6, 2.8, 3.0.

Figure 30: Nitrate-Nitrite concentrations versus depth in a transect, south of Punta Tuna on Aug. 1-2, 1980. Locations: Pt-1 0.5 mi offshore, Pt-3 3.5 mi offshore, Pt-5 15.5 mi offshore, Pt-6 31.5 mi offshore.

Figure 31: Nitrate-Nitrite concentrations versus depth in a transect, south of Jobos Bay on Aug. 2, 1980. Locations: J-1 0.5 mi offshore, J-3 3.5 mi offshore, J-5 15.5 mi offshore, J-6 31.5 mi offshore.

Figure 32: Nitrate-Nitrite concentrations versus depth in a transect, south of Guayanilla on Aug. 3, 1980. Locations: G-1 0.5 mi offshore, G-3 3.5 mi offshore, G-5 15.5 mi offshore, G-6 31.5 mi offshore.

Figure 33: Silicate concentrations versus depth (m) at Benchmark 17°57.9N, 65°51.5W during July 30 and 31, 1989.

Figure 34: Silicate concentrations versus temperature at Benchmark 17°53.5N, 65°51.5W during July 30 and 31, 1980.

Figure 35: Mean Silicate concentrations versus depth at Benchmark 17°57.34N, 65°51.5W during July 30 and 31, 1980.

It seems like the text is scientific data mixed with figure descriptions which makes it hard to discern what needs to be fixed. However, I've tried to improve the structure and readability as much as possible:

August 31, 1980.

Figure 36: Silicate concentrations versus depth in a transect south of Vieques on August 1, 1960. Measurements were taken at various depths and distances offshore: 0.5 mi, 3.5 mi, 15.5 mi, and 31.5 mi.

Figure 37: Silicate concentrations versus depth in a transect south of Punta Tuna on August 1 and 2, 1980. Measurements were taken at various depths and distances offshore.

Figure 38: Silicate concentrations versus depth in a transect south of Jobos Bay on August 2, 1980. Measurements were taken at various depths and distances offshore: 0.5 mi, 3.5 mi, 15.5 mi, and 31.5 mi.

Figure 39: Silicate concentrations versus depth in a transect south of Guayanilla on August 3, 1980. Measurements were taken at various depths and distances offshore.

Figure 40: Vertical distribution of chlorophyll in a transect south of Punta Tuna on August 1 and 2, 1980. Measurements were taken at various distances offshore: 6.5 mi, 3.5 mi, and 15.5 mi.

Figure 41: Vertical distribution of chlorophyll at Benchmark during successive hydrocasts from July 30-31, 1980. Measurements were taken at various depths.

Various pages break with no clear content relevance.

End.

Note: Some parts of the text are left unchanged due to their unclear nature.

The text appears to be a cruise plan schedule with a list of activities and tasks to be performed at various stations. However, it contains several typographical errors and inconsistencies. Here's a corrected version:

100-200 Vertical Takeoff 100-200 Depart for Malecon

2. LIST OF PARTICIPANTS

1. Suan
2. Gonsitex - Chief Scientist
3. Dos A. Ramtron - Scientist
4. Brie Hawk - Scientist
5. Jorge Garcia - Technician
6. Jorge Capelia - Technician
7. Angel Nazario - Technician
8. Carlos Nonafé - Technician
9. Isabel Rodrigues - Technician
10. Angel Marquez - Technician
11. Terrence Morigan - Technician
12. Dennis Corales - Technician
13. Alfredo Mercado - Technician
14. Rawin Gonséa - Technician
15. Ivan Rosas - Technician
16. Ramón Gomes - Technician

WEATHER

- Cove Clear (no cloud at any level)
- Partly cloudy (scattered or broken clouds)
- Continuous layer (8) of cloud (s)
- Sandstorm, duststorm, or blowing snow
- Fog, thick dust, or haze
- Drizzle
- Rain
- Snow, or rain and snow mixed
- Shower (s)
- Thunderstorm (s)