

# CRUISE REPORT

SHIP UTILIZATION DATA

UNOLS  
Rev. 4/8

SHIP NAME <b>CONRAD</b>		OPERATING INST. <b>Columbia Univ.</b>		PARTICIPATING PERSONNEL			
CRUISE (LEG) NO. <b>29-06</b>		DATES		CODE	NAME	TITLE	AFFILIATION
AREA OF OPERATIONS:  <b>Western Tropical Atlantic</b>		PORT CALLS:		1.	Katz, Eli J. (Dr.)	Sr. Research Sci.	L-DGO
		PLACE	DATES	2.	Maccio, Miguel	Electronic Engineer	L-DGO
		Recife	31 May	3.	O'Hara, Suzanne	Programmer	L-DGO
		Barbados	20 June	4.	Guerrero, Raul	Lic. in Oceanography	I.N.I.A.P. (Argentina)
DAYS AT SEA <b>20</b>	DAYS IN PORT <b>7</b>	Use Reverse If Additional Space Required.					

WAS RESEARCH CONDUCTED IN FOREIGN WATERS? \_\_\_\_\_ COUNTRY: \_\_\_\_\_  
 PRIMARY PROJECTS (those which govern the principal operations, area and movements of the ship)

PROJECT TITLE AND PRINCIPAL INVESTIGATOR	SPONSORING ACTIVITY	GRANT OR CONTRACT NUMBER	PARTICIPATING PERSONNEL (AS CODED ABOVE)
Waves, Annual Cycle and Interannual variability of the Thermocline in the Equatorial Atlantic. Drs. Eli Katz & Silvia Garzoli	NSF	OCE 84-15319	1, 2, 3, 4, 5
DISCIPLINE			

ANCILLARY PROJECTS (which are accomplished on a not-to-interfere basis and contribute to the overall effectiveness of the cruise)

PROJECT TITLE AND PRINCIPAL INVESTIGATOR	SPONSORING ACTIVITY	GRANT OR CONTRACT NUMBER	PARTICIPATING PERSONNEL (AS CODED ABOVE)
French TOGA Program	O.R.S.T.O.M.		6, 7

SIGNATURE *Eli Joel Katz* DATE 6/20/88  
 CHIEF SCIENTIST

TOTAL SCIENTISTS 2 TOTAL TECHNICIANS 5  
 TOTAL GRAD STUDENTS 0 TOTAL STUDENTS/OBSERVERS 1

COST ALLOCATION DATA		
DAYS CHARGED	AGENCY OR ACTIVITY CHARGED	GRANT OR CONTRACT NO.
27	<i>National Science Foundation</i>	OCE-86-16405

SIGNATURE *John R. Kelly* DATE 8 Aug 88  
 Institution Official

ATTACH PAGE SIZE CRUISE TRACK

CRUISE REPORT  
CONRAD 29-06

BACKGROUND

This cruise was the third of four cruises whose objective is to maintain an array of inverted echo sounders in the western tropical Atlantic Ocean and a wind recorder on St. Peter and St. Paul rocks (SPP) for a period approximating five years. It is conceptually a continuation of the SEQUAL/FOCAL field expedition of 1982-1984. The latter's goal was to record the annual variation of the oceanic response to the annual wind cycle in the tropics. The present goal is to record the interannual variation of the sea surface slope along several key lines defined by the S/F study and attempt to then relate the interannual differences to variations in the wind forcing from one year to the next.

The two earlier cruises were the ENDEAVOR EN-136, October-November, 1985; and CONRAD 87-01, in January 1987. The last cruise will be scheduled for late 1989.

The study is sponsored by the U.S. National Science Foundation and the U.S. TOGA Office (National Oceanic and Atmospheric Administration), Grant OCE 84-15319, "Waves, Annual Cycle and Interannual Variability of the Thermocline in the Equatorial Atlantic".

As on several of the previous cruises, O.R.S.T.O.M. sent personnel to service equipment that they are maintaining at SPP.

CRUISE SUMMARY

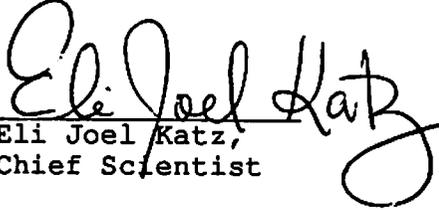
CONRAD 29-06 left Recife, Brazil, on 31 May 1988. A list of the scientific personnel, their affiliations, and their activities are found in Table 1. Lt. Jose Helvecio Moraes de Rezende (from the Diretoria de Hidrografia e Navegacao, RJ) was on board as an observer from the Brazil government. Permission to conduct research in Brazilian waters was given by Presidential Decree No.95.908, dated April 11, 1988.

The ship sailed directly from Recife to SPP (see chart), arriving on the 3 June. A meteorological station consisting of a wind recorder and atmospheric pressure gauge was refurbished, an ORSTOM rain gauge was refurbished and an Aanderaa tide gauge redeployed at a depth of 11m.

From there the ship sequentially visited seven inverted echo sounder sites, recovering a sounder deployed on the previous cruise and deploying a new sounder at six of the sites (Table II).

Along the track, at and between the echo sounder sites, a total of forty CTD stations were made (measuring temperature, conductivity, and pressure) to depths of one kilometer and deeper (Table III). An occasional expendable bathythermograph was launched and the data transmitted directly to IGOS by satellite. A new data acquisition system for the Neil Brown & Assocs.'s CTD was being developed during the cruise.

The cruise maintained its planned schedule throughout, without interference from weather nor problems with either hull or machinery. A total of 127 hours was spent on station and the cruise ended in Bridgetown, Barbados, on 20 June 1988.

  
Eli Joel Katz,  
Chief Scientist

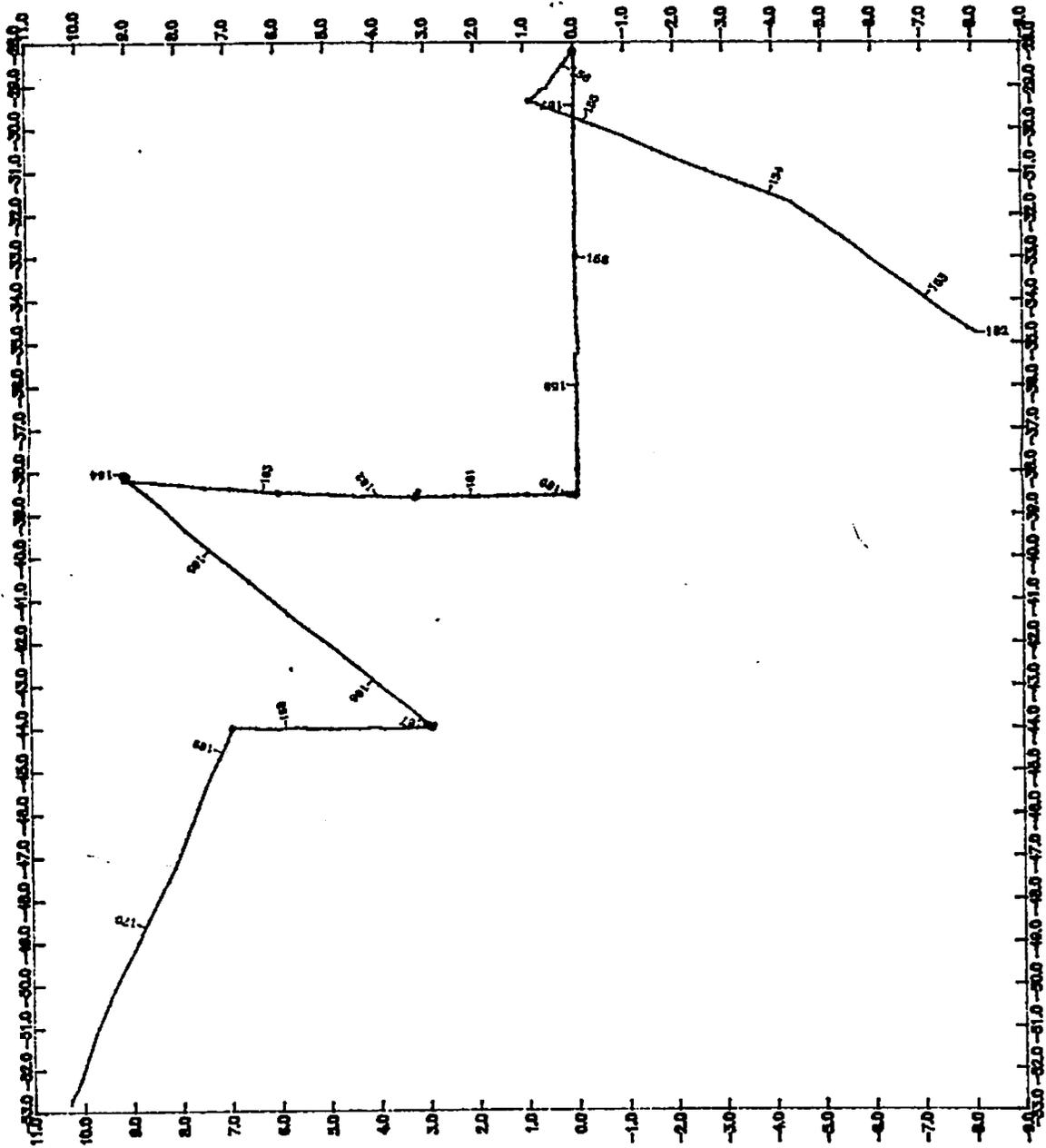


TABLE I: SCIENTIFIC PERSONNEL

1. Dr. Eli Katz	Lamont-Doherty Geological Observatory
2. Dr. Claire Levy	Laboratoire Oceanographique Dynamique Universite de Paris VI
3. Mr. Miguel Maccio	Lamont-Doherty Geological Observatory
4. Ms. Suzanne O'Hara	Lamont-Doherty Geological Observatory
5. Mr. Jacques Callende	Office de Recherche Scientifique et Technique de Outre-Mer
6. Mr. Christophe Peignon	Office de Recherche Scientifique et Technique de Outre-Mer
7. Mr. Raul Guerrero	Inst. Nacional de Investigacion des Arrollo Pesquero, Argentina

Principle Responsibilities:

1. Chief Scientist and co-Principle Investigator, with Dr. Silvia Garzoli, of NSF grant.
2. Ingenieur de Recherche and assisting, on this cruise, with the reduction of the inverted echo sounder and wind data.
3. Electronic Engineer responsible for deployment and recovery of the sounders and the wind recorder; co-architect of the CTD data acquisition program.
4. Programmer and co-architect of the CTD data acquisition program.
5. Doctorate Ingenieur responsible for rain gauge deployed on SPP.
6. Diver-technician responsible for deployment of the maregraph.
7. Technician responsible for the CTD operation.

TABLE IIa: IES DEPLOYMENTS \* CONRAD 29-6

SITE	UNIT no.	YR-DAY 1988	TIME gmt	WATER depth (m)	LATITUDE deg north	LONGITUDE deg west
QUIZA	41	156	03:34	4120	0 00.3	28 10.7
SUE	44	159	17:50	4350	0 01.4	38 34.5
SOL	39	161	07:59	4535	3 15.8	38 37.2
SID *	43	162	14:54	4625	6 01.5	38 31.5
SAL	50	164	00:20	4058	9 08.2	38 04.2
TOM	10	166	14:26	4195	2 58.2	43 59.9
TED	45	168	08:22	4628	6 57.2	43 59.1

\* lost

TABLE IIb: IES RECOVERIES \* CONRAD 29-6

SITE	UNIT no.	YR-DAY 1988	TIME gmt	IN WATER days	LATITUDE deg north	LONGITUDE deg west
QUIZA	44	156	15:35	508	0 00.2	28 10.7
SUE	43	160	08:05	507	0 00.4	38 34.8
SOL	50	161	19:06	507	3 16.1	38 36.8
SID	10	162	22:07	506	6 01.0	38 29.6
SAL	45	164	08:36	507	9 05.1	38 11.2
TOM	40	167	00:55	508	2 59.3	44 01.0
TED	14	168	20:25	509	6 57.4	43 59.4

TABLE III: CTD STATION LOCATIONS

sta #	lat.	long.	time	day	depth	XBT#
51	5 13.6	-32 24.3	1314	153	766	
52	0 0.7	-28 10.4	0544	156	4180	
53	0 1.0	-29 0.2	2006	156	1043	
54	0 0.0	-30 0.0	0246	157	1019	
55	0 0.0	-31 0.1	0916	157	1658	
56	0 0.2	-31 60.0	1551	157	1237	
57	0 0.3	-33 0.6	2329	157	998	
58	0 0.2	-33 59.8	0917	158	1222	
59	0 0.0	-34 59.5	1609	158	1030	
60	0 0.0	-36 0.1	2251	158	1778	
61	0 0.4	-36 59.6	0539	159	1018	
62	0 1.0	-38 0.3	1239	159	1513	
63	0 0.0	-38 34.5	1847	159	4231	
64	0 30.0	-38 34.8	1101	160	1018	390
65	1 0.0	-38 34.6	1454	160	1015	
66	1 29.8	-38 35.7	1831	160	1023	
67	2 0.2	-38 36.0	2217	160	1014	
68	2 30.0	-38 36.4	0202	161	1018	
69	3 10.4	-38 28.3	1150	161	4211	391
70	3 60.0	-38 35.0	2330	161	1008	
71	4 30.1	-38 33.9	0303	162	1036	
72	4 59.9	-38 32.4	0651	162	1034	
73	5 29.5	-38 31.7	1036	162	1023	
74	5 59.8	-38 29.2	1656	162	4644	
75	6 29.9	-38 27.1	0104	163	1023	
76	6 70.0	-38 23.9	0506	163	1025	
77	7 29.8	-38 22.0	0853	163	1387	
78	7 59.9	-38 17.9	1243	163	1044	
79	8 29.8	-38 15.1	1700	163	1025	
80	9 7.7	-38 4.4	0219	164	4059	
81	2 57.3	-43 58.8	1048	165	1384	392
82	2 56.9	-43 57.9	1533	166	4090	
83	3 31.3	-44 1.0	0441	167	1023	
84	3 59.5	-44 0.7	0834	167	1048	
85	4 30.0	-44 0.8	1224	167	995	
86	5 0.0	-44 60.2	1559	167	4565	
87	5 29.8	-43 59.9	2102	167	1046	
88	6 0.1	-43 59.9	0037	168	1022	
89	6 30.0	-34 59.9	0427	168	1021	
90	6 57.7	-43 59.7	1226	168	4530	394

D. Hayes