

**UNOLS SHIP SCHEDULING  
COMMITTEE**

**REPORT OF MEETINGS**

*East and Gulf - June 16, 1992*

*West - June 17, 1992*

**National Academy of Science  
Room 280  
2101 Constitution Avenue, NW  
Washington, D.C.**



# UNOLS SHIP SCHEDULING MEETINGS

National Academy of Science  
Room 208  
2101 Constitution Avenue, NW  
Washington, D.C.

June 16 - 17, 1992

## *Appendices*

- I. Ship Scheduling Meetings Agenda
- II. Scheduling Meetings Attendance List
- III. Ship Use and Cost Summaries, 1992 & 1993
- IV. NSF Funding Slides
- V. NOAA Correspondences regarding Fleet Use
- VI. 1993 Cruise Tracks
- VII. G. Brass correspondence to Ned A. Ostenso, NOAA

## **INTRODUCTION:**

This report will summarize the UNOLS scheduling meetings held at the National Academy of Science in Washington DC on 16 and 17 June 1992. It includes the East and Gulf Coast meeting on the 16th, the West Coast meeting on the 17th and the Scheduling Review Panel meeting. The reports from the Federal agency representatives were given at both the East/Gulf and West Coast sessions and will be summarized as a single report.

The June scheduling meetings this year were held in Washington to permit a more active participation of the various project managers. The result was a significant turnout providing helpful background information and clarifying several conflicting bits of shiptime request information. Also helpful in these meetings was the information collected in advance by the UNOLS Office. Schedulers were responsive in providing a copy of the Shiptime requests (Form 831) which permitted a near complete inventory of all requests submitted. Proposed schedules were posted on SHIP.SCHED93 providing a cross check of information. In addition, the cost figures for the proposed schedules were available in adequate time to compile a complete cost picture before the meeting. All of these actions were significantly effective in streamlining the scheduling process and reducing problems of duplication and missing requests.

This year's scheduling meeting had reason to look into the out years of 1994 and 1995. This was brought about by several factors. JGOFS is planning a major program in the Arabian Sea for 1994/5 which will require two Class I/II ships. In addition, NOAA presented to UNOLS a series of potential cruises for 1994/5 and requested feedback as to whether or not UNOLS ships could accommodate their needs. This exercise provided NOAA participants an opportunity to take an active roll in the UNOLS scheduling process.

A single agenda was published for these meetings which is included as Appendix I. The attendance list is included as Appendix II. The combined cost estimates for both 1992 and 1993 are included as Appendix III. The summary of comments discussed at the Scheduling Review Panel meeting are incorporated at the end of this report. These comments are meant as advice and guidance to the ship schedulers to assist them in refining their schedules and helping to resolve duplicate scheduling. As funding information becomes known schedule changes will become necessary.

As in the past the estimated cost of operating the fleet exceeds the funding likely to be available. Last year at this time the fleet estimate for 1992 operations was \$54.588 million. This number was reduced to \$48.741 (about 11%) when the funded programs become known. This year the estimated 1993 costs are \$53.325 million. If the NSF requested increase of \$3.8 million is realized and all else remains level funded, the gap (pain factor) would be somewhat less.

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**The ship scheduling meetings were called into session by Ken Palfrey, Chair.**

Lee Stevens of JOI/COA provided the Committee with insight on the workings of Congress with respect to Oceanographic bills. He reviewed briefly some of the language that is expected to go into the NOAA Fleet Modernization Planning which included statements that required NOAA to coordinate its shiptime needs with UNOLS for better efficiency of Oceanographic assets.

**AGENCY PRESENTATIONS:**

NSF - Dolly Dieter provided the NSF funding figures for 1990, 1991, the estimated figures for 1992 and the requested figures for 1993. The requested ship operations funding increases from \$30.2 M to \$34.0 M or an increase of 12.5%. It should be emphasized that this is a requested number and in the funding atmosphere of Washington today this number could be vulnerable. The slides presented by Dolly are included as Appendix IV.

Dolly also announced that NSF and ONR have agreed to proceed on plan for Group Insurance for the fleet. The details of the plan are brief but basically calls for the insurance to be handled as a group plan and coordinated through a central point. When implemented individual ship budgets would not include a cost for insurance, but instead these expenses would be handled by the funding agencies through a coordinating group. The plan calls for a substantial deductible and a more uniform cap.

Dennis Nixon is working with NSF and ONR to provide a letter that will outline the plan. This letter will hopefully be on the street soon. The proposed schedule is to execute the plan where possible starting in 1993. It is recognized that there are many questions and individual needs that must be addressed. The letter will require a reply by all institutions.

**ONR** - Keith Kaulum provided a brief summary of funding plans for ONR. ONR is anticipating level funding in the \$6 to \$7 million range for ship support. This includes money for ALVIN as well as technician support. Last year all Navy (ONR plus other Navy money) ship support amounted to \$5.2 M. This is not expected to change much for 1993. Keith announced that RV WASHINGTON will be retired in August. Its possible transfer to a foreign country is still unknown. Keith also advised the group that the Navy's three pool AGORs are being phased out. The science conducted on these vessels will be looking for a home. However, it may take a year or two for the Navy to reprogram funding to support this science on other ships such as the UNOLS fleet.

**NOAA** - Captain Scott McKellar provide a prospective of NOAA activities for the coming years. Funding for science outside the NOAA fleet in support of the NOAA Fleet Modernization Program has been or is anticipated to be funded as follows: 1992- \$1.5M, 1993- \$1.5M, 1994- \$4.0M. Much of this money has been or will be spent on UNOLS ships. NOAA is planning to receive from the Navy two or possibly three TAGOS vessels for their survey work. One will be located on the East coast and the second on the West coast. The third will be part of a joint venture with USGS and will also be located on the West coast.

Captain Mike McCallister of NOAA helped the group work its way through the requirements presented in the letter from John Knauss to Garry Brass. This letter provides NOAA requirements for outside ship support in FY 94/95 and is included as, Appendix V. Mike indicated that 109 days of this proposed work is likely to be funded for non NOAA vessels. This had been planned out at \$12,000/day with the cruise originating and returning to Seattle and a transit speed of 15 Kts. The Scheduling Committee took this information along with loading and equipment details to determine which ships could meet the requirements. Those with ships capable of the work and likely to be available were to provide the UNOLS Office with their cost information. This would be consolidated and be included as part of the UNOLS response to Knauss's letter.

#### **REVIEW OF 1993 SCHEDULES (SHIP BY SHIP):**

**University of Michigan - LAURENTIAN.** Linda Goad presented a schedule reflecting 94 days of shiptime with 68 of these days presently funded. The work was concentrated in the months April through October. Additional work may materialize and a reasonable schedule is expected.

**Woods Hole Oceanographic Institution - ATLANTIS II.** Don Moller provide two AII/ALVIN schedules. Option A provided for work in the Mid Atlantic Ridge then transit to the Pacific for the remainder of the year in the Juan de Fuca area then south to Mexican waters. Option B kept the ship in the Mid Atlantic Ridge longer thus missing the weather window in the Juan de Fuca area so that the remainder of the year would be spent in the Pacific East Pacific Rise area. Option A provided 258 operating days while Option B had 260. Funding considerations would determine the option chosen.

**KNORR.** Don presented a full KNORR schedule which included 344 operating days. The ship would finish a 1992 WOCE leg in Punta Arenas on 22 January and start the 1993 schedule from that Chilean city. After completing a WOCE line near Panama the ship would transit the Canal and spend the remainder of the year in the Atlantic completing in Woods Hole just before Christmas.

**OCEANUS.** The OCEANUS schedule was fully coordinated with the schedule of ENDEAVOR. Both ships are planning for a midlife refit. Don scheduled 162 days of ship time working out of Woods Hole with the exception of two cruises to the Azores. The operating year ends in mid August when the ship expects to start the midlife.

**University of Rhode Island - ENDEAVOR.** Bill Hahn presented a schedule that had been coordinated with that of OCEANUS. Because of a midlife refit ENDEAVOR is not expected to return to service until 1 June '93. Bill has scheduled 204 days for '93 which includes a trip to the Pacific for Martin's work. This cruise is scheduled Panama to Panama with proposed cruises Narragansett to the Canal before and the Canal to Narragansett after. This last cruise, Sigurdsson, has been also planned aboard EWING which offers a platform more in keeping with the science requirements. Only 77 of the 204 days are presently funded. A proposed cruise track is appended as part of Appendix VI.

**Lamont-Doherty Geological Observatory - EWING.** The EWING schedule was presented by Mike Rawson. Three options in all were offered. All options are the same for the first half of the year which is anchored by Kastens, Smethie and Weatherly in the Equatorial Atlantic (Mike was advised that this work, although funded, could slip into 1994). The remainder of this option has the ship returning to the North Atlantic for the remainder of the year. The second option has EWING working south from the Equator ending the year in Cape Town. The third option and least preferred because of the transit requirements, has the ship proceeding to the Pacific and working up the west coast for funded projects in Alaska waters. Cruise chart locations are included in Appendix VI.

**University of Delaware - CAPE HENLOPEN.** Waddy Owen provided the proposed CAPE HENLOPEN schedule which contained 264 operating days. This included work in the Chesapeake, Mid Atlantic and Bermuda areas. Waddy was advised by NSF that the 50 days of Sharp would not be funded. The schedule also contains another 94 ship days yet to be funded.

**Duke/UNC - CAPE HATTERAS.** The CAPE HATTERAS proposed schedule was presented by Joe Ustach. This schedule included two options, one plans to fill in for WEATHERBIRD II and the other without this work. Joe was advised that the WEATHERBIRD II overhaul was to be funded which quickly eliminated the second option. The schedule reflects many short cruises with a total of 254 days, 138 of which are presently funded.

**Skidaway - BLUE FIN.** No schedule was submitted by Skidaway.

**Harbor Branch Oceanographic Institution - EDWIN LINK.** The schedules of EDWIN LINK and SEWARD JOHNSON were presented by Tim Askew. LINK's schedule includes 102 days, 90 of which are planned for NOAA funding. The ship is scheduled to work in the mid Atlantic and Caribbean. A track chart is included in Appendix VI.

**SEWARD JOHNSON.** Tim presented a 212 day schedule for JOHNSON. NOAA is scheduled for 83 of these days and HBOI for another 83. All of this work is planned for the Western North Atlantic which is shown on the track chart in Appendix VI.

**University of Miami - COLUMBUS ISELIN.** The proposed schedules of ISELIN and CALANUS were presented by Ron Hutchinson. The ISELIN schedule reflects 247 days, however, only 65 of these days are presently funded. ISELIN is one of four ships including the work of Martin in the Galapagos.

**CALANUS** schedule of 155 days is about normal for this ship. About half of these days are presently funded.

**Louisiana Universities Marine Consortium - PELICAN.** Steve Rabalais provided the PELICAN's proposed schedule. Nearly all of the 134 days on the schedule are currently funded. NOAA accounts for 41 of these days, MMS 30 and DOE 14. All of PELICAN's work is in the Gulf of Mexico.

**University of Texas - LONGHORN.** UT did not participate in the scheduling process this year.

**Texas A & M - GYRE.** Dean Letzring presented a light schedule of 88 days for 1993. All cruises are in the Gulf working out of Galveston. The State is scheduled for 29 days and DOE had 17. Thirty two of the 42 NSF days have yet to be funded.

**Scripps Institution of Oceanography - MELVILLE.** Rose Dufour provided the proposed schedules for the Scripps ships. Two options were offered for MELVILLE the first half of '93. Both of these options were essentially the same except option 1 included 6 days of 1992 pending work. MELVILLE is scheduled to work in the Easter Island to Papeete area until returning to San Diego in July. The schedule continues with Deep Tow, OBS and WOCE work ending the year at Punta Arenas and continuing into 1994 with WOCE lines. This work ends in Australia in April '94. A track line is included in Appendix VI.

**NEW HORIZON** is proposed for 252 operating days with 193 of these already funded. Most of these projects are working in and out of San Diego with one series of cruises working up to Astoria and return. A cruise with Huntley has been jointly scheduled with WECOMA. A chart with cruise locations is included in Appendix VI.

**SPROUL** is planned for 145 days of operation in the San Diego area. Only 52 of these days are funded to date.

**University of Southern California - VICKERS.** Don Newman presented a schedule reflecting 272 scheduled days. NOAA work accounts for 82 days of this schedule. Two excursions to the Western Pacific are included, one for NOAA and one for NSF. A third excursion to the Galapagos for John Martin's work has been scheduled for several other ships and looks doubtful for VICKERS because of the transit time. A cruise track chart for this work is included in Appendix VI.

**Moss Landing Marine Laboratories - POINT SUR.** The POINT SUR proposed schedule for 1993 was presented by Mike Prince. It includes 206 days operating mostly out of Moss Landing. This strong schedule has all but 5 days funded. A chart reflecting this work is included in Appendix VI.

**Oregon State University - WECOMA.** Ken Palfrey has scheduled 222 days of ship operations for 1993 with 186 of these days presently funded. The ship starts the year in Guam and works to Pohnpei then on to Honolulu. This funded COARE work anchors the first quarter of the year. The ship then returns to Newport and operates the remainder of the year out of Oregon. One cruise, Tracy Villareal, still needs to find a home. A cruise chart is included in Appendix VI.

**University of Washington - THOMAS THOMPSON.** The THOMPSON's schedule for 1993 was presented by Robert Hinton. It starts the year in Honolulu with a JGOFS cruise ending in Papeete. The ship is scheduled to return to Honolulu and then to Seattle for proposed NSF work. After additional proposed work to Alaska it completes the year with WOCE ending in Japan. This positioned the ship for 1994 JGOFS Arabian Ocean work which has now been delayed. In all 285 days have been scheduled of which 74 are currently funded.

**BARNES.** A light BARNES schedule was presented reflecting 137 days of which 49 has been funded. All of this work is out of Seattle.

**University of Alaska - ALPHA HELIX.** Tom Royer presented the schedule for ALPHA HELIX. It included 225 operating days which if funded will be a very full schedule. Much of this work is with DPP which is still in the "To Be Proposed" category.

**University of Hawaii - MOANA WAVE.** The MOANA WAVE proposed schedule was presented by Roy Wilkens. The ship starts the year in Guam with TOGA COARE work which also carried over from 1992. All but 58 of the 283 ship days scheduled are funded. After mid year work in the Hawaii area along with a 46 day shipyard period the ship transits to Easter Island for funded work with Sinton. The ship continues west ending the year in Suva in the Fiji Islands to position for 1994 work. A track chart is included in Appendix VI.

#### DISCUSSION:

A general discussion followed concerning ship time requirements for 1994 and 1995. This included the NOAA work that was reported earlier along with the JGOFS work in the Arabian Sea. The JGOFS program has been delayed from the first of 1994 until October 1994. This delay will cause UW and Scripps to rethink their '93 schedules since ending the year in the Western Pacific may not be prudent. The JGOFS and WOCE work in the Arabian Sea will probably use two Class I/II ships for well over a year each. A major program in the Atlantic, GLOBEC, is planned for the '94/95 time frame. This will probably use intermediate ships and will need at least a ship year of time.

*The formal scheduling meetings were adjourned at 1200 on 17 June.*

#### **NOAA NEEDS MEETING**

A meeting was held over the noon hour on 17 June with the ship schedulers likely to be available for the NOAA work in 1994. This included schedulers from Scripps, UW, Hawaii, USC, WHOI and LDGO. They reviewed with Mike McCallister the NOAA needs and will provide the UNOLS Office their proposals for handling this work. This information will be part of a reply to the letter from John Knauss which is included as Appendix VII.



## SCHEDULING REVIEW PANEL

The Scheduling Review Panel met in the afternoon of 17 June to review the schedules presented and to suggest improvements and efficiencies in these schedules. Present were, Ken Palfrey, SSC Chair; Ron Hutchinson, SSC Vice Chair; Dolly Dieter, NSF; Keith Kaulum, ONR; Scott McKeller, NOAA; Jack Bash, UNOLS Executive Secretary; and Garry Brass, UNOLS Chair. The schedules were reviewed one by one with comments made where appropriate. These recommendations should be used by the Schedulers to increase the efficiency of their respective schedules and to prepare for potential problems as indicated.

### RECOMMENDATIONS/COMMENTS:

**LAURENTIAN:** Schedule looks fine, no comment.

**ATLANTIS II:** It is too early to evaluate this schedule since funding considerations for ALVIN are still being considered.

**KNORR:** Several programs will depend on funding results from ODP. Only 300 days should be considered for the KNORR '93 schedule. Coordination with L-DGO for passing some work to EWING may be necessary.

**OCEANUS:** Schedule Katz on OCEANUS during Azores transit. The cruises of Scheltema should be considered for WEATHERBIRD and Stanton for a coastal vessel.

**ENDEAVOR:** The work of Tindale, Martin and Sigurdsson should be evaluated for effectiveness to science and reducing transit time. Coordination with EWING and ISELIN will be necessary. It appears that Sigurdsson should be scheduled on EWING for science reasons. ISELIN will have the fewest transit days for Martin if the remainder of the schedule is viable. Zehr might then be considered for ENDEAVOR. As funding decisions become clear the most economic distribution should evolve.

**EWING:** The Pacific schedule option is only viable if more funded projects materialize. The Atlantic work is anchored around Smethie and Weatherly. Although funded this could slip into 1994. Gordon still is on DISCOVERY which jeopardizes the South Atlantic schedule. There may be a trade option with DISCOVERY that would increase the efficiency of the South Atlantic work. Work with ENDEAVOR with respect to Sigurdsson. If the funding does not jell it may be necessary for a longer maintenance layup period.

**CAPE HENLOPEN:** The Sharp work has been declined. The Asper April cruise could go to ISELIN. If the pending cruises of Burdige and Luther do not get funded this schedule will be significantly weakened.

**CAPE HATTERAS:** The Bermuda stand-in schedule looks viable. The Mullins and Gardulski cruises might be more efficiently handled aboard ISELIN reducing transits. Witman would be more cost effective aboard OCEANUS or ENDEAVOR. These options should be explored with Miami, URI and WHOI.

**BLUE FIN:** No schedule submitted, no comment.

**EDWIN LINK:** No comment.

**SEWARD JOHNSON:** No comment.

**COLUMBUS ISELIN:** Very little of this schedule has been funded. If funding is not forthcoming for Colwell, Christensen and Harbinson, ISELIN would be a candidate for a layup. If the schedule does work out to be viable the cruises of Mullins, Tindale and Martin should be considered.

**CALANUS:** No comment.

**LONGHORN:** Texas did not participate in the scheduling process.

**GYRE:** The GYRE schedule does not seem viable at this time.

**WEATHERBIRD II:** The \$700K for an overhaul will be funded. The first quarter of the year should be covered by HATTERAS.

An interpretation of the WEATHERBIRD II schedule presented suggests loading and unloading days are listed as operating days. In addition, it appears that chargeable weather days have been added. These practices are not within the scheduling guidelines. The funding agencies will only pay for operating days, "All days away from homeport in an operating status incident to the scientific mission. Includes days in other ports for the purpose of fueling, changing personnel etc. Includes transit time. Includes day of arrival and day of departure from home port. Does not include maintenance or lay days." A careful scrutiny should be made of the proposed schedule to ensure that it complies with the published guidelines.

**MELVILLE:** This is a reasonable schedule as presented. Roemmich will be scheduled aboard THOMPSON.

**NEW HORIZON:** Assuming ISELIN or ENDEAVOR will be supporting the Martin work it should not be scheduled aboard NEW HORIZON. Webb cruises should be coordinated with OSU to eliminate transit where possible. Kuhn should be scheduled on THOMPSON if it will fit.

**SPROUL:** Niiler is not funded by NSF for ship-time but should get this from NOAA.

**VICKERS:** The transit in March must be paid by NOAA. The cruise of Garmany on VICKERS requires excessive transit. This cruise could go aboard THOMPSON if Fisk and Kulm do not get funded. THOMPSON is likely to be the most cost effective ship for the Warren work. A check of the Webster funding is necessary. If in Hawaii, VICKERS might be able to handle a HOTS cruise.

**POINT SUR:** Schedule looks good, no comment.

**WECOMA:** Need to find home for Villareal, VICKERS?, THOMPSON?, ALPHA HELIX?

**THOMPSON:** Plan to take the Garmany cruise if Kulm and Fisk do not get funded. The WOCE work could slip into 1994. The THOMPSON schedule will need close watching.

**ALPHA HELIX:** Schedule looks good, no comment.

**MOANA WAVE:** Can Murray be handled by WAVE? Where are the cruises of Shor, Stern, Coffin and Keeting? Can WAVE pick up WOCE P31 or should it go aboard THOMPSON?

*The Scheduling Review Panel adjourned about 3:30 PM on 17 June.*

## AGENDA

## UNOLS SHIP SCHEDULING MEETINGS

MEETING:	East and Gulf	West
DATE:	16 June 1992	17 June 1992
PLACE:	National Academy of Science Room 280 2101 Constitution Avenue NW Washington, DC	Same
TIME:	8:30 AM	8:30 AM

The Ship Scheduling meetings will be called into session by Ken Palfrey, Chair.

**AGENCY PRESENTATIONS.** Representatives from NSF, ONR and NOAA will provide scheduling guidance, science program ship requirements and priorities, science funding decision outlook, ship ops funding outlook and related matters.

**REVIEW AND UPDATE SCHEDULES.** Each scheduler will present and update their respective ship(s) schedule and cost information. Viewgraphs for this presentation are recommended.

**IDENTIFY CONFLICTS AND UNRESOLVED ISSUES.** A discussion on cruises not scheduled and those double booked. (Note: We will attempt to account for all cruises on the inventory list distributed by Jack Bash).

**COSTS.** UNOLS Office will provide summary of cost figures.

**PRE-MEETING ACTION.** All ship's schedules should be on OMNET SHIP.SCHEDULERS.EAST.GULF OR SHIP.SCHEDULERS.WEST by this time. Cost figures in the following format for both 1992 and 1993 should be passed to the UNOLS Office no later than 1 June.

SHIP	NSF DAYS/\$	NAVY DAYS/\$	OTHER DAYS/\$	TOTAL DAYS/\$
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**WHAT TO BRING TO THE MEETING:**

1. Viewgraphs and one hard copy to illustrate your schedule.
2. An extra copy of each Form 831, Ship Time Request not yet submitted to the UNOLS Office.

SHIP SCHEDULING MEETINGS  
 Washington, DC - East & Gulf, July 16, 1992  
 Washington, DC - West Coast, July 17, 1992

NAME	East	West
Neil Anderson, National Science Foundation	x	x
Timothy Askew, Harbor Branch Oceanographic Institution	x	
Rodger Baier, National Science Foundation	x	x
Howard Barnes, Bermuda Biological Station for Research	x	
John Bash, UNOLS Office	x	x
Garrett Brass, UNOLS	x	x
Joseph Coburn, Woods Hole Oceanographic Institution	x	x
William Coste, University of Hawaii		x
Mary D'Andrea, UNOLS Office	x	x
Emma R. Dieter, National Science Foundation	x	x
Rose Dufour, Scripps Institution of Oceanography		x
David Epp, National Science Foundation/MGG	x	x
Andrew Ferguson, Council on Ocean Affairs	x	
Linda Goad, University of Michigan	x	
William Hahn, University of Rhode Island	x	x
Roger Hanson, National Science Foundation/OCE	x	x
Robert Hinton, University of Washington	x	x
Ron Hutchinson, University of Miami	x	x
Eric Itsweire, National Science Foundation/OCE	x	x
Keith Kaulum, Office of Naval Research/1121RF	x	x
Robert Knox, Scripps Institution of Oceanography	x	x
Ron LaCount, Joint Oceanographic Institutions	x	x
Richard Lambert, National Science Foundation/OCE	x	x
Dean Letzring, Texas A&M	x	x
Eric Lindstrom, US WOCE		x
Paul Ljunggren, Lamont Doherty Geological Observatory	x	
Captain Michael McCallister, NOAA	x	x
Russell McDuff, University of Washington		x
Scott McKellar, NOAA	x	x
Donald Moller, Woods Hole Oceanographic Institution	x	x
Captain Roger Morris, NOAA/OAR	x	
Captain Martin Mulhern, NOAA/ERL		x
Donald Newman, University of Southern California		x
Wadsworth Owen, University of Delaware	x	x
Kennard Palfrey, University of Oregon	x	x
Isabella Pearson, Bermuda Biological Station for Research	x	
Michael Prince, Moss Landing Marine Laboratory		x
Steve Rabalais, Louisiana Universities Marine Consortium	x	
Michael Rawson, Lamont Doherty Geological Observatory	x	x
Lisa Rom, National Science Foundation	x	x
Tom Royer, University of Alaska		x
Martha Scott, National Science Foundation/OCE		x
Sergio Signorini, National Science Foundation/OCE	x	x
William Siren, Naval Postgraduate School	x	x
Lee Stevens, Council on Ocean Affairs	x	x
Phil Taylor, National Science Foundation/OCE	x	x
Joseph Ustach, Duke University	x	
Richard West, National Science Foundation	x	
Roy Wilkens, University of Hawaii		x

## SUMMARY OF SHIP USE AND COSTS

YEAR: 1992

SHIP/CLASS	NSF		NAVY		OTHER		TOTAL	DAILY	
	DAY	\$	DAY	\$	DAY	\$			
MELVILLE	152	2,043	20	269	5	67	177	2,379	13,441
KNORR	271	4,684	0	0	0	0	271	4,684	17,284
ATLANTIS II	146	2,774	7	133	27	513	180	3,420	19,000
EWING	259	4,100	40	633	0	0	299	4,733	15,829
T.G. THOMPSON	228	3,500	5	215 <sup>a</sup>	38	583	271	4,160	15,351
T. WASHINGTON	94	1,084	10	115	2	23	106	1,222	11,528
MOANA WAVE	219	2,152	61	599	7	69	287	2,820	9,826
<b>CLASS II TOTAL</b>	<b>1,369</b>	<b>20,337</b>	<b>143</b>	<b>1,964</b>	<b>79</b>	<b>1,255</b>	<b>1,591</b>	<b>23,418</b>	<b>--</b>
<b>AVE: (7)</b>	<b>196</b>	<b>2,905</b>	<b>20</b>	<b>281</b>	<b>11</b>	<b>179</b>	<b>227</b>	<b>3,345</b>	<b>--</b>
EDWIN LINK	23	179	17	133	107	835	147	1,147	7,800
ENDEAVOR	148	1,598	38	410	0	0	186	2,008	10,796
OCEANUS	175	1,378	128	1,008	15	118	318	2,504	7,874
GYRE	41	270	0	0	78	429	119	699	5,874
ISELIN	200	2,046	24	245	0	0	224	2,291	10,228
NEW HORIZON	144	1,382	19	182	34	326	197	1,890	9,594
SEWARD JOHNSON	38	296	24	187	145	1,131	207	1,615	7,800
VICKERS	54	621	0	0	152	1,748	206	2,369	11,500
WECOMA	231	1,964	41	348	0	0	272	2,312	8,500
<b>CLASS III TOTAL</b>	<b>1,054</b>	<b>9,735</b>	<b>291</b>	<b>2,513</b>	<b>531</b>	<b>4,587</b>	<b>1,876</b>	<b>16,834</b>	<b>--</b>
<b>AVE: (9)</b>	<b>117</b>	<b>1,082</b>	<b>32</b>	<b>279</b>	<b>59</b>	<b>510</b>	<b>208</b>	<b>1,870</b>	<b>--</b>
PELICAN	34	126	0	0	127	469	161	595	3,696
LONGHORN	14*	42*	0*	0*	54*	162*	68	204	3,000
POINT SUR	79	474	75	450	36	216	190	1,140	6,000
CAPE HATTERAS	163	1,109	20	143	29	208	212	1,460	6,887
ALPHA HELIX	102	971	0	0	44	419	146	1,389	9,514
R. SPROUL	115	563	20	98	36	177	171	838	4,901
CAPE HENLOPEN	121	720	2	12	40	238	163	970	5,951
WEATHERBIRD II	254	971	0	0	3	11	257	982	3,823
<b>CLASS 1V TOTAL</b>	<b>882</b>	<b>4,976</b>	<b>117</b>	<b>703</b>	<b>369</b>	<b>1,900</b>	<b>1,368</b>	<b>7,579</b>	<b>--</b>
<b>AVE: (8)</b>	<b>110</b>	<b>622</b>	<b>15</b>	<b>88</b>	<b>46</b>	<b>238</b>	<b>171</b>	<b>947</b>	<b>--</b>
BLUE FIN	80	129	0	0	36	57	116	186	1,603
LAURENTIAN	28	114	0	0	30	122	58	236	4,074
BARNES	110	224	5	10	21	42	136	276	2,029
CALANUS	67	141	27	57	7	15	101	212	2,101
<b>CLASS 1V TOTAL</b>	<b>285</b>	<b>608</b>	<b>32</b>	<b>67</b>	<b>94</b>	<b>236</b>	<b>411</b>	<b>911</b>	<b>--</b>
<b>AVE: (4)</b>	<b>71</b>	<b>152</b>	<b>8</b>	<b>17</b>	<b>24</b>	<b>59</b>	<b>103</b>	<b>228</b>	<b>--</b>
<b>FLEET TOTAL</b>	<b>3,590</b>	<b>35,655</b>	<b>583</b>	<b>5,247</b>	<b>1,073</b>	<b>7,978</b>	<b>5,246</b>	<b>48,741</b>	<b>--</b>
<b>AVE: (28)</b>	<b>128</b>	<b>1,273</b>	<b>21</b>	<b>187</b>	<b>38</b>	<b>285</b>	<b>187</b>	<b>1,741</b>	<b>--</b>
<b>NOTES:</b>									
* Figures have not been updated since Sept. 91 Scheduling Meeting									
a Navy includes NAVSEA \$ 138K									

## SUMMARY OF SHIP USE AND COSTS

YEAR: 1993 - OPTIONS A & B

SHIP/CLASS	NSF		NAVY		OTHER		TOTAL		DAILY RATE	
	DAY	\$	DAY	\$	DAY	\$	DAY	\$		
MELVILLE	281	4,035	24	345	0	0	305	4,380	14,361	
KNORR	248	3,844	96	1,488	0	0	344	5,332	15,500	
ATLANTIS II	-- a	-- a	-- a	-- a	-- a	-- a	250	4,000	16,000	
EWING	319	5,359	0	0	0	0	319	5,359	16,799	
T.G. THOMPSON	232	3,381	0	0	53	774	285	4,155	14,579	
MOANA WAVE	244	2,471	39	395	0	0	283	2,866	10,127	
<b>CLASS II TOTAL</b>	<b>1,324</b>	<b>19,090</b>	<b>159</b>	<b>2,228</b>	<b>53</b>	<b>774</b>	<b>1,786</b>	<b>26,092</b>	<b>--</b>	
<b>AVE: (6)</b>	<b>265</b>	<b>3,818</b>	<b>32</b>	<b>446</b>	<b>11</b>	<b>155</b>	<b>298</b>	<b>4,349</b>	<b>--</b>	
EDWIN LINK	12	94	0	0	90	702	102	796	7,800	
ENDEAVOR	182	1,949	22	236	0	0	204	2,185	10,711	
OCEANUS	71	710	71	710	20	200	162	1,620	10,000	
GYRE	42	335	0	0	46	367	88	702	7,977	
ISELIN	217	2,170	9	90	21	210	247	2,470	10,000	
NEW HORIZON	141	1,253	79	702	32	284	252	2,239	8,885	
SEWARD JOHNSON	28	218	18	140	166	1,295	212	1,654	7,800	
VICKERS	199	2,353	0	0	74	875	273	3,228	11,824	
WECOMA	163	1,760	59	637	0	0	222	2,397	10,797	
<b>CLASS III TOTAL</b>	<b>1,055</b>	<b>10,842</b>	<b>258</b>	<b>2,515</b>	<b>449</b>	<b>3,933</b>	<b>1,762</b>	<b>17,290</b>	<b>--</b>	
<b>AVE: (9)</b>	<b>117</b>	<b>1,205</b>	<b>29</b>	<b>279</b>	<b>50</b>	<b>437</b>	<b>196</b>	<b>1,921</b>	<b>--</b>	
PELICAN	63	252	0	0	85	340	148	592	4,000	
LONGHORN	b	b	b	b	b	b	b			
POINT SUR	106	621	81	475	19	111	206	1,207	5,859	
CAPE HATTERAS - A	173	1,349	0	0	9	70	182	1,419	7,797	
CAPE HATTERAS - B	245	1,452	0	0	9	53	254	1,505	5,925	
ALPHA HELIX	221	1,994	0	0	4	36	225	2,030	9,021	
R. SPROUL	98	496	8	41	35	177	141	714	5,064	
CAPE HENLOPEN	254	1,518	11	66	0	0	265	1,584	5,977	
WEATHERBIRD II	176	1,097	6	37	0	0	182	1,134	6,231	
<b>CLASS 1V - A</b>	<b>1,091</b>	<b>7,327</b>	<b>106</b>	<b>619</b>	<b>152</b>	<b>734</b>	<b>1,349</b>	<b>8,680</b>	<b>--</b>	
<b>CLASS 1V - B</b>	<b>1,163</b>	<b>7,430</b>	<b>106</b>	<b>619</b>	<b>152</b>	<b>717</b>	<b>1,421</b>	<b>8,766</b>	<b>--</b>	
<b>AVE: (8) - opt A</b>	<b>156</b>	<b>1,047</b>	<b>15</b>	<b>88</b>	<b>22</b>	<b>105</b>	<b>193</b>	<b>1,240</b>	<b>--</b>	
<b>AVE: (8) - opt B</b>	<b>166</b>	<b>1,061</b>	<b>15</b>	<b>88</b>	<b>22</b>	<b>102</b>	<b>203</b>	<b>1,252</b>	<b>--</b>	
BLUE FIN	70	108	0	0	50	77	120	185	1,542	
LAURENTIAN	89	363	0	0	5	20	94	383	4,074	
BARNES	118	231	0	0	19	37	137	268	1,956	
CALANUS	91	200	44	97	20	44	155	341	2,200	
<b>CLASS 1V TOTAL</b>	<b>368</b>	<b>902</b>	<b>44</b>	<b>97</b>	<b>94</b>	<b>178</b>	<b>506</b>	<b>1,177</b>	<b>--</b>	
<b>AVE: (4)</b>	<b>92</b>	<b>225</b>	<b>11</b>	<b>24</b>	<b>24</b>	<b>45</b>	<b>127</b>	<b>294</b>	<b>--</b>	
<b>FLEET TOTAL - A</b>	<b>3,838</b>	<b>38,161</b>	<b>567</b>	<b>5,459</b>	<b>748</b>	<b>5,619</b>	<b>5,403</b>	<b>53,239</b>	<b>--</b>	
<b>AVE: (27) - A</b>	<b>154</b>	<b>1,526</b>	<b>23</b>	<b>218</b>	<b>30</b>	<b>225</b>	<b>208</b>	<b>2,048</b>	<b>--</b>	
<b>FLEET TOTAL - B</b>	<b>3,910</b>	<b>38,264</b>	<b>567</b>	<b>5,459</b>	<b>748</b>	<b>5,602</b>	<b>5,475</b>	<b>53,325</b>	<b>--</b>	
<b>AVE: (27) - B</b>	<b>156</b>	<b>1,531</b>	<b>23</b>	<b>218</b>	<b>30</b>	<b>224</b>	<b>211</b>	<b>2,051</b>	<b>--</b>	
<b>NOTES:</b>		a Not available until after ARC meeting 6/9 - 6/11								
		b No cost figures provided								

**OCEAN SCIENCES DIVISION**

	<b>Actual FY 1990</b>	<b>Actual FY 1991</b>	<b>Estimated FY 1992</b>	<b>Requested FY 1993</b>
<b>Ocean Sciences Division</b>	\$147.4 M	\$164.8 M	\$178.8 M	\$206.4 M
<b>Ocean Sciences Research</b>	72.9 M	82.1 M	90.8 M	109.3 M
<b>Ocean Drilling Program</b>	32.0 M	35.0 M	36.4 M	37.8 M
<b>Oceanographic Facilities</b>	42.5 M	47.7 M	51.6 M	59.3 M

**OCEANOGRAPHIC FACILITIES DETAIL**

<b>Operations</b>				
<b>Ship Operations</b>	\$ 22.4 M*	\$ 26.7 M*	\$ 30.2 M*	\$ 34.0 M*
<b>ALVIN, Aircraft, etc.</b>	1.4 M	1.8 M	1.3 M	1.5 M
<b>Marine Techs</b>	<u>3.7 M</u>	<u>4.0 M</u>	<u>4.3 M</u>	<u>4.6 M</u>
	27.5 M	32.5 M	35.8 M	40.1 M
<b>Infrastructure</b>				
<b>Science Instruments</b>	\$ 1.8 M	\$ 1.9 M	\$ 4.0 M	\$ 4.5 M
<b>Shipboard Equipment</b>	2.1 M	2.2 M		
<b>Ships, Upgrades</b>	3.4 M	3.7 M	3.3 M	6.1 M
<b>UNOLS, Misc.</b>	<u>0.6 M</u>	<u>0.6 M</u>	<u>0.7 M</u>	<u>0.7 M</u>
	7.9 M	8.4 M	8.0 M	11.3 M
<b>Technology, Centers, Reserves</b>				
<b>Technology Development</b>	\$ 3.5 M	\$ 4.2 M	\$ 4.5 M	\$ 5.0 M
<b>AMS Center</b>	1.8 M	1.7 M	1.5 M	1.1 M
<b>Cross Directorate/Reserves</b>	<u>1.8 M</u>	<u>0.9 M</u>	<u>1.8 M</u>	<u>1.8 M</u>
	7.1 M	6.8 M	7.8 M	7.9 M

\* Plus \$1.0 M from ODP (1990), \$1.6 M (1991 and 1992) , \$1.5 M (1993)



OCEAN SCIENCES DIVISION

	<u>Actual FY 1990</u>	<u>Actual FY 1991</u>	<u>Estimated FY 1992</u>	<u>Requested FY 1993</u>
<b>Ocean Sciences Division</b>	\$147.4 M	\$164.8 M	\$178.8 M	<del>\$206.4 M</del>
<b>Ocean Sciences Research</b>	72.9 M	82.1 M	90.8 M	<del>109.3 M</del>
<b>Ocean Drilling Program</b>	32.0 M	35.0 M	36.4 M	<del>37.8 M</del>
<b>Oceanographic Facilities</b>	42.5 M	47.7 M	51.6 M	<del>59.3 M</del>

OCEANOGRAPHIC FACILITIES DETAIL

<b>Operations</b>				
<b>Ship Operations</b>	\$ 22.4 M*	\$ 26.7 M*	\$ 30.2 M*	\$ 34.0 M*
<b>ALVIN, Aircraft, etc.</b>	1.4 M	1.8 M	1.3 M	1.5 M
<b>Marine Techs</b>	<u>3.7 M</u>	<u>4.0 M</u>	<u>4.3 M</u>	<u>4.6 M</u>
	27.5 M	32.5 M	35.8 M	40.1 M
<b>Infrastructure</b>				
<b>Science Instruments</b>	\$ 1.8 M	\$ 1.9 M	\$ 4.0 M	\$ 4.5 M
<b>Shipboard Equipment</b>	2.1 M	2.2 M		
<b>Ships, Upgrades</b>	3.4 M	3.7 M	3.3 M	6.1 M
<b>UNOLS, Misc.</b>	<u>0.6 M</u>	<u>0.6 M</u>	<u>0.7 M</u>	<u>0.7 M</u>
	7.9 M	8.4 M	8.0 M	11.3 M
<b>Technology, Centers, Reserves</b>				
<b>Technology Development</b>	\$ 3.5 M	\$ 4.2 M	\$ 4.5 M	\$ 5.0 M
<b>AMS Center</b>	1.8 M	1.7 M	1.5 M	1.1 M
<b>Cross Directorate/Reserves</b>	<u>1.8 M</u>	<u>0.9 M</u>	<u>1.8 M</u>	<u>1.8 M</u>
	7.1 M	6.8 M	7.8 M	7.9 M

\* Plus \$1.0 M from ODP (1990), \$1.6 M (1991 and 1992) , \$1.5 M (1993)



UNITED STATES DEPARTMENT OF COMMERCE  
The Under Secretary for  
Oceans and Atmosphere  
Washington, D.C. 20230

MAY 18 1992

Dr. Garret W. Brass  
Chair, University-National Oceanographic  
Laboratory System Council  
Rosentiel School of Marine and Atmospheric Sciences  
4600 Rickenbacker Causeway  
Miami, Florida 33140-1098

Dear Dr. Brass:

In response to my request for an academic spokesperson, D. James Baker responded identifying the Joint Oceanographic Institutions Incorporated (JOI) as the appropriate representative. Based on his letter, NOAA anticipated that JOI would identify excess ship capacity within the academic fleet for possible use in support of NOAA needs. However, subsequent discussion between NOAA and JOI has identified that you, as chair of the University-National Oceanographic Laboratory System (UNOLS) Council, should be the contact in regard to possible excess ship time.

I am presently in the process of determining how NOAA can accommodate high-endurance research platform requirements during the initial years of our fleet modernization. UNOLS has suggested that it may have the capacity to respond to NOAA's needs for the interim period. The feasibility of this depends on the availability and costs of your ship resources, specifically for substantial blocks of dedicated Class I - Class II high-endurance ship time in locations that will not require unreasonable transit times.

During fiscal years (FY) 1994 and 1995 we have identified a shortfall of approximately 250 days at sea per year. Depending upon funding for NOAA's fleet modernization, this shortfall could be increased by as much as 325 days per year. Furthermore, we expect a shortfall of at least 250 days per year to continue through FY 98. It is for this 5-year shortfall that we are pursuing alternative solutions. Accordingly, we need to know if the university community can commit to satisfying NOAA's shortfall of at least this level over the entire 5-year period. NOAA's needs are summarized in the enclosure.

My decision on satisfying this shortfall must be made soon in order that our research programs not be affected. I ask that you review the availability of UNOLS fleet assets in FYs 94 and 95 and identify the support level which the university community can commit to NOAA. I also ask you to provide a cost estimate which

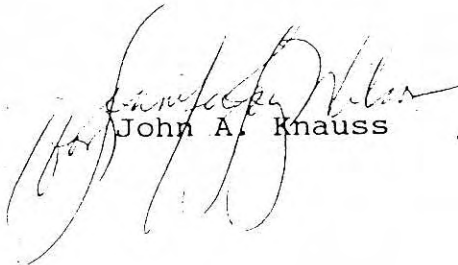


THE ADMINISTRATOR

will include all ancillary equipment and technician support. In conducting the review, UNOLS should not include augmentation of the university fleet with the express intent of meeting NOAA's programmatic needs. I encourage you to contact and coordinate your review with Captain David Yeager at (301) 443-8007. I also ask that, if at all possible, you respond by July 1, 1992.

I look forward to working with you on this issue.

Sincerely,



John A. Knauss

Enclosures

SHIP TIME REQUIREMENTS FOR  
FY 94 - 95 NOAA PROGRAMS

The FY 94 - 95 NOAA programs to be provided for are:

FY 94 - 249 Days at Sea (DAS)\*

TOGA and EPOCS - 194 DAS		
Oct-Dec 93	Eastern Equatorial Pacific	62 DAS
Feb-Mar 94	Central Equatorial Pacific	52 DAS
Apr-May 94	Eastern Equatorial Pacific	39 DAS
Aug-Sep 94	Central Equatorial Pacific	49 DAS

DISCO  
52  
57

VENTS - 55 DAS		
June-Aug 94	Northeast Pacific	55 DAS

FY 95 - 245 DAS

ACCP - 90 DAS		
Jan-Feb 95	Atlantic Ocean	45 DAS
Jun-Jul 95	Atlantic Ocean	45 DAS

25 IRON/  
TRACER

RITS - 60 DAS		
Mid Austral Summer	Australia, New Zealand	60 DAS

Tracer Studies - 25 DAS		
Fall, Winter	Western Equatorial Pacific	25 DAS

CO2 - 70 DAS		
Feb-Mar	South Atlantic	35 DAS
May-Jul	North Atlantic	35 DAS

TOGA, EPOCS, ACCP, RITS, CO2, and VENTS are all seasonal or cyclical projects requiring dedicated blocks of ship time in order to meet efficiently program requirements, accommodate weather patterns, and reduce logistic/transit overhead. Specific vessel requirements for the various projects follow.

\* A day at sea is counted as a day actually at sea rather than away from home port.

TOGA TAO/EPOCS: 194 DAS

Area: Equatorial Pacific Ocean

Time frame:

- 63 DAS Q1
- 52 DAS Q2
- 30 DAS Q3
- 49 DAS Q4
- must be spread across year because of equipment replacement timing, personnel scheduling

Vessel capabilities:

- speed 14 kts sustained
- endurance 35 days
- scientific party berthing for 8 personnel
- minimum 2000-2400 sq ft deck storage
- GPS/sat \*nav
- swath sonar system desirable but not required (accurate depth sounder required)
- XBT launcher and recorder
- shipboard computer system

Oceanographic equipment:

- acoustic doppler current profiler
- Neil Brown CTD system
- reversing thermometers
- salinometer
- thermosalinograph

Deck/handling equipment:

- winch capable of CTD/rosette casts to 6000 m
- A-frame, cranes and winches for mooring deployments (anchor weights up to 6500 \*lb; crane must be able to lift 5 m vertical load over ship's rail)

VENTS: 55 DAS

Area of operations: Northeast Pacific Ocean

Time frame:

- 55 DAS in Northern Hemisphere summer
- Project is weather-dependent (camera, ROV tows)

Vessel capabilities:

- speed 12 kts sustained
- endurance 30 days
- scientific berthing for 25 personnel
- minimum 1500 sq ft deck storage (incl 2 vans)
- 440 V power to deck area for vans
- 1000 sq ft laboratory space (incl 300 sq ft wet)
- separate photographic lab space (200 sq ft)
- "clean" power to lab

- differential GPS/sat nav/Loran-C
- heave/pitch/roll/gyro heading outputs
- swath sonar system (SeaBeam or equivalent)
- 3.5 kHz echo sounder, receiver and plotter
- gravimeter \*(GPS and \*Loran-C \*nav co-recorded)
- XBT launcher and recorder
- 5 sq ft freezer, 30 sq ft refrig storage
- shipboard computer system

Oceanographic equipment:

- acoustic doppler current profiler
- Autosal salinometers (2)
- Neil Brown CTD system and rosette
- reversing thermometers (10 unprotected, 20 protected) for water depths from 1500 to 4000 m
- thermosalinograph

Deck/handling equipment:

- CTD winch capable of both casts and tows to depths up to 4000 m
- deep sea traction winch capable of handling 0.6811 electromechanical cable and 0.5" wire
- A-frame, cranes and winches capable of handling camera sled and ROV package

ACCP: 90 DAS

Area of operations: Atlantic Ocean

Time frame:

- 45 DAS in Jan-Feb
- 45 DAS in Jun-Jul

Vessel Capabilities:

- Speed 13-14 knots
- endurance 30 days
- scientific berths for 15-20
- deck space for 1-2 vans
- 440 3 phase power on deck for vans
- 220v power to laboratory spaces
- 500 sq ft laboratory space
- "clean" power to lab spaces
- GPS/satnav
- freezer and refrigerator space
- mast-mounted anemometer
- Vax shipboard computer with VMS operating system for CTD acquisition and processing and for input from thermosalinograph, GPS, and ADCP
- capability to transmit acoustic pulses at 10KHz and receive at frequencies from 10 KHz thru 13 KHz with ugr type readout. Receive transducer beam width should be on the order of 90 degrees to allow transponder signals at various depths in the water

column to be received at some distance from the vessel.

Oceanographic equipment:

- 2 autosals accurate to 2ppm located in a temperature controlled space
- Neil Brown CTD system
- Large Rosette with s4, 10L bottles
- Thermosalinograph
- ADCP

Deck/handling equipment:

- WOCE standard CTD winch and cable (.322 wire and 6000m capability)

RITS: 60 DAS

Area of operations:

- Australia, New Zealand

Time frame:

- Southern Hemisphere summer
- timing critical due to weather

Vessel capabilities:

- speed 14 kts-sustained
- endurance 35 days
- scientific berthing for 30 personnel
- minimum 2000 sq ft deck space (4-6 vans, 8' X 8' X 20')
- 440 V power to deck area for vans
- 1000 sq ft lab space (500 sq ft wet)
- 220 V power to wet lab
- GPS/sat nav
- uncontaminated seawater flow to lab spaces of at least 100 l/min
- compressed air to oceanographic lab and lab vans (125 psi, 20 l/min)
- 20 sq ft freezer space, 20 sq ft refrig storage
- mast-mounted anemometer
- Vax shipboard computer with VMS operating system for CTD acquisition and processing and for input from thermosalinograph, GPS, and ADCP

oceanographic equipment:

- Autosal salinometers (2)
- Neil Brown CTD system
- reversing thermometers
- large rosette and 24 10 l niskin bottles
- thermosalinograph
- ADCP

Deck/handling equipment:

- CTD winch capable of casts to 6000 m
- mounting pads on bow for bow tower

**Tracer Studies: 25 DAS**

Area of operations: Western Equatorial Pacific

Time frame:

- Late fall, winter

Vessel capabilities:

- speed 14 kts sustained
- endurance 25 days
- scientific berthing for 30 personnel
- 500 sq ft deck storage (3 vans, 8' X 20')
- 220/440 V power on deck to vans
- 2000 sq ft laboratory space (1000 sq ft wet)
- "clean" power in labs (110 V)
- Real-time data acquisition/ processing system
- GPS/sat nav
- uncontaminated seawater flow to lab spaces of at least 20 gal/min
- Shipboard computer system

Oceanographic equipment

- acoustic doppler current profiler
- Autosal salinometers (2)
- CTD system with 24 bottle rosette
- reversing thermometers
- thermosalinograph

Deck/handling equipment:

- Winch for CTD and pump deployments

**CO2: 70 DAS**

Area of operations: North and south Atlantic

Time frame:

- Feb-Mar, S. Atlantic, 35 DAS
- May-Jul, N. Atlantic, 35 DAS
- Timing vital for scientific continuity

Vessel capabilities:

- speed 14 kts sustained
- endurance 35 days
- scientific party berthing for 30 personnel
- minimum 2000 sq ft deck storage ( does not include any moorings)
- 440 V power to deck area for 3 CO2 vans
- minimum 2000 sq ft laboratory space (1000 wet)



- "clean" power to laboratories (110 V)
- SCS or other real-time computer data acquisition/processing system
- GPS/sat nav
- precision depth sounder
- XBT launcher and recorder
- uncontaminated seawater flow to lab spaces of at least 50 l/min

Oceanographic equipment:

- acoustic doppler current profiler - reversing thermometers
- salinometers (2)
- thermosalinograph

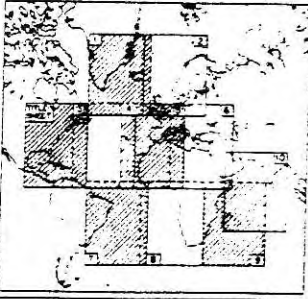
Deck/handling equipment:

- winch for CTD/rosette casts to 6000 m - A-frame, cranes and winches for mooring deployments (anchor weights to 6500 lb)

3

# N. M. L. PLOTING SHEET SERIES

MERCATOR PROJECTION  
1° LONGITUDE = 0.75 INCHES - SCALE 1:5,845,000

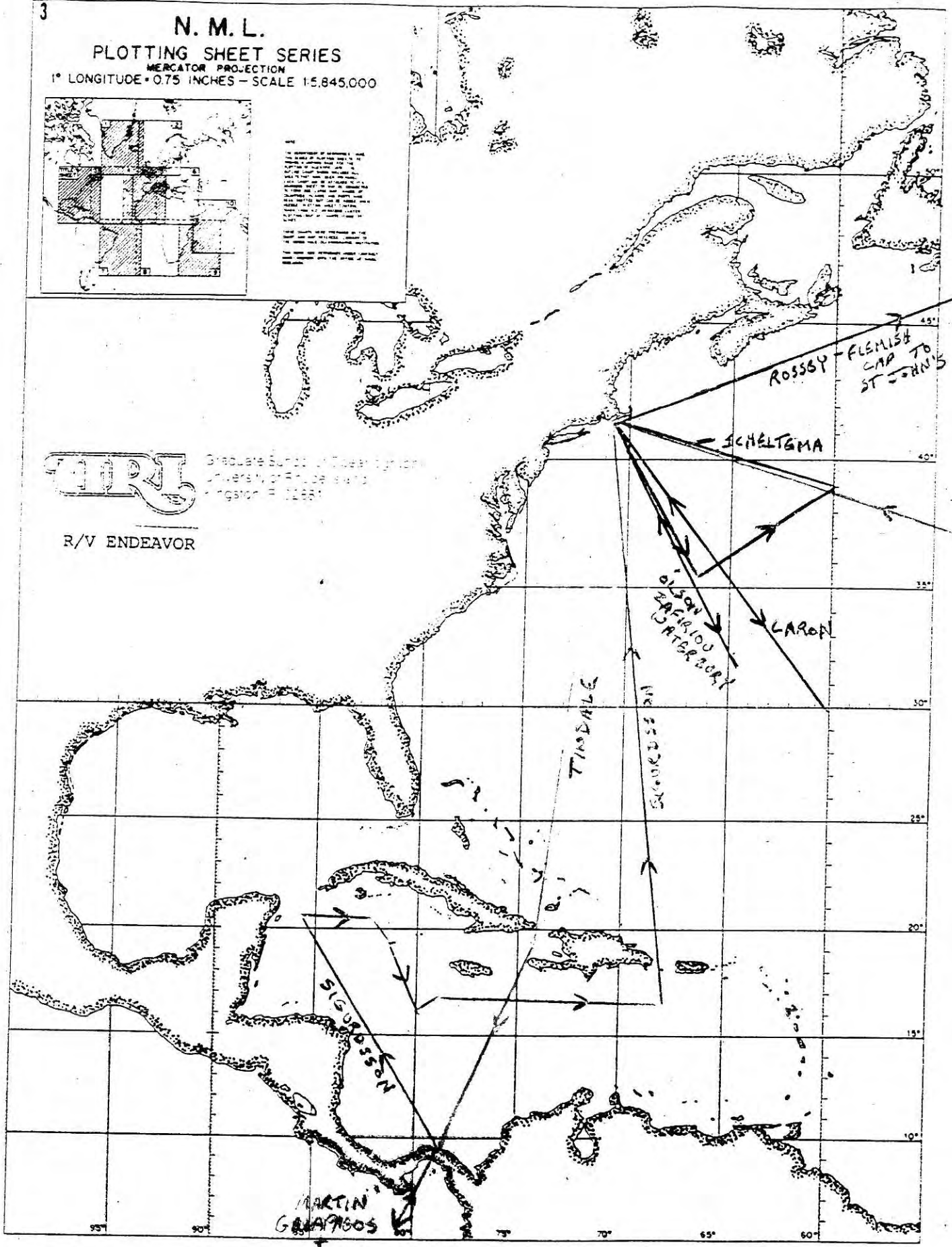


1. Symbols for rocks, reefs, shoals, and wrecks are shown in black. 2. Symbols for rocks, reefs, shoals, and wrecks are shown in black. 3. Symbols for rocks, reefs, shoals, and wrecks are shown in black. 4. Symbols for rocks, reefs, shoals, and wrecks are shown in black. 5. Symbols for rocks, reefs, shoals, and wrecks are shown in black. 6. Symbols for rocks, reefs, shoals, and wrecks are shown in black. 7. Symbols for rocks, reefs, shoals, and wrecks are shown in black. 8. Symbols for rocks, reefs, shoals, and wrecks are shown in black. 9. Symbols for rocks, reefs, shoals, and wrecks are shown in black. 10. Symbols for rocks, reefs, shoals, and wrecks are shown in black.



Graphic Scale of Distances  
1:5,845,000  
1950

R/V ENDEAVOR

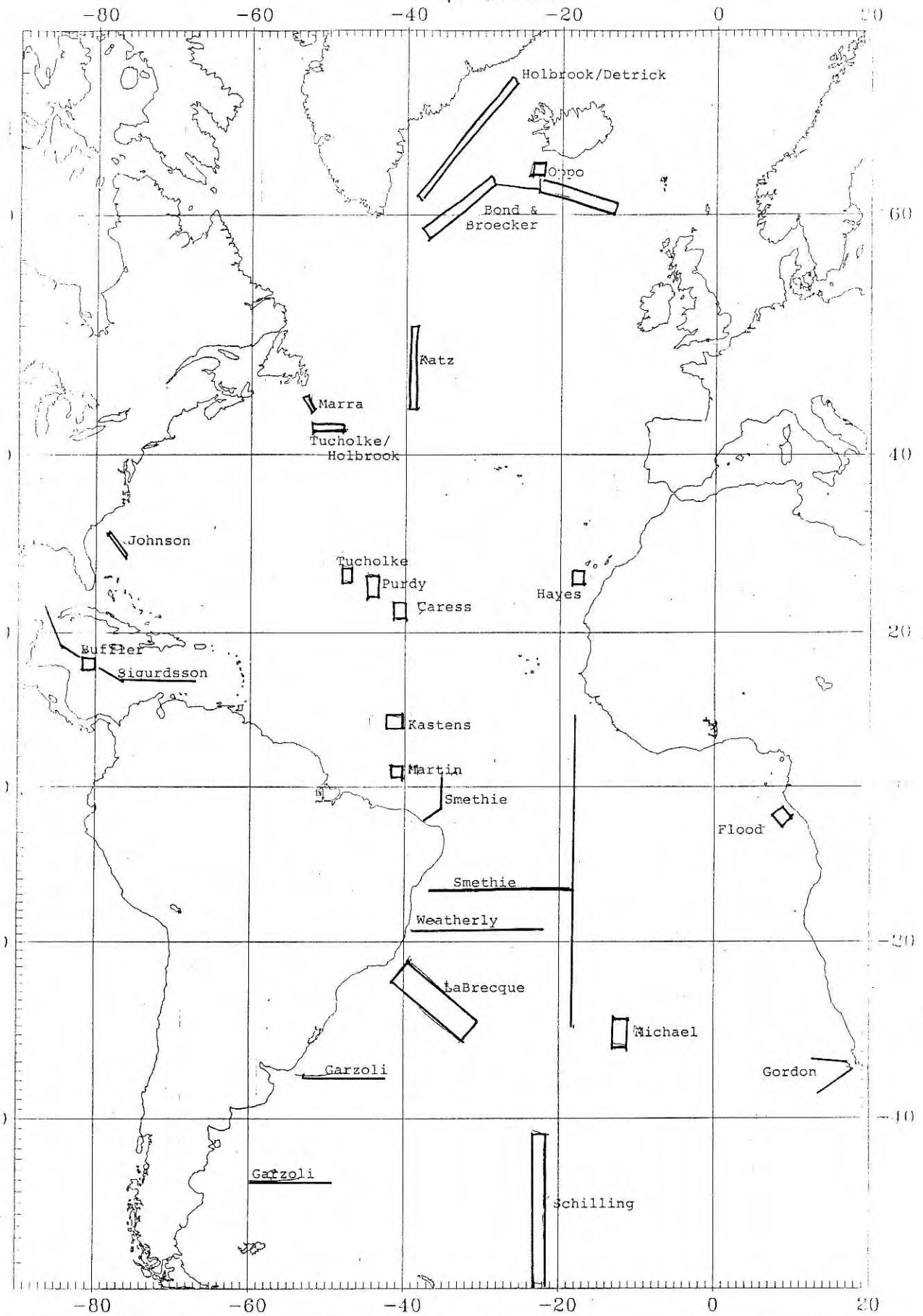


BOATS ST JOHN'S

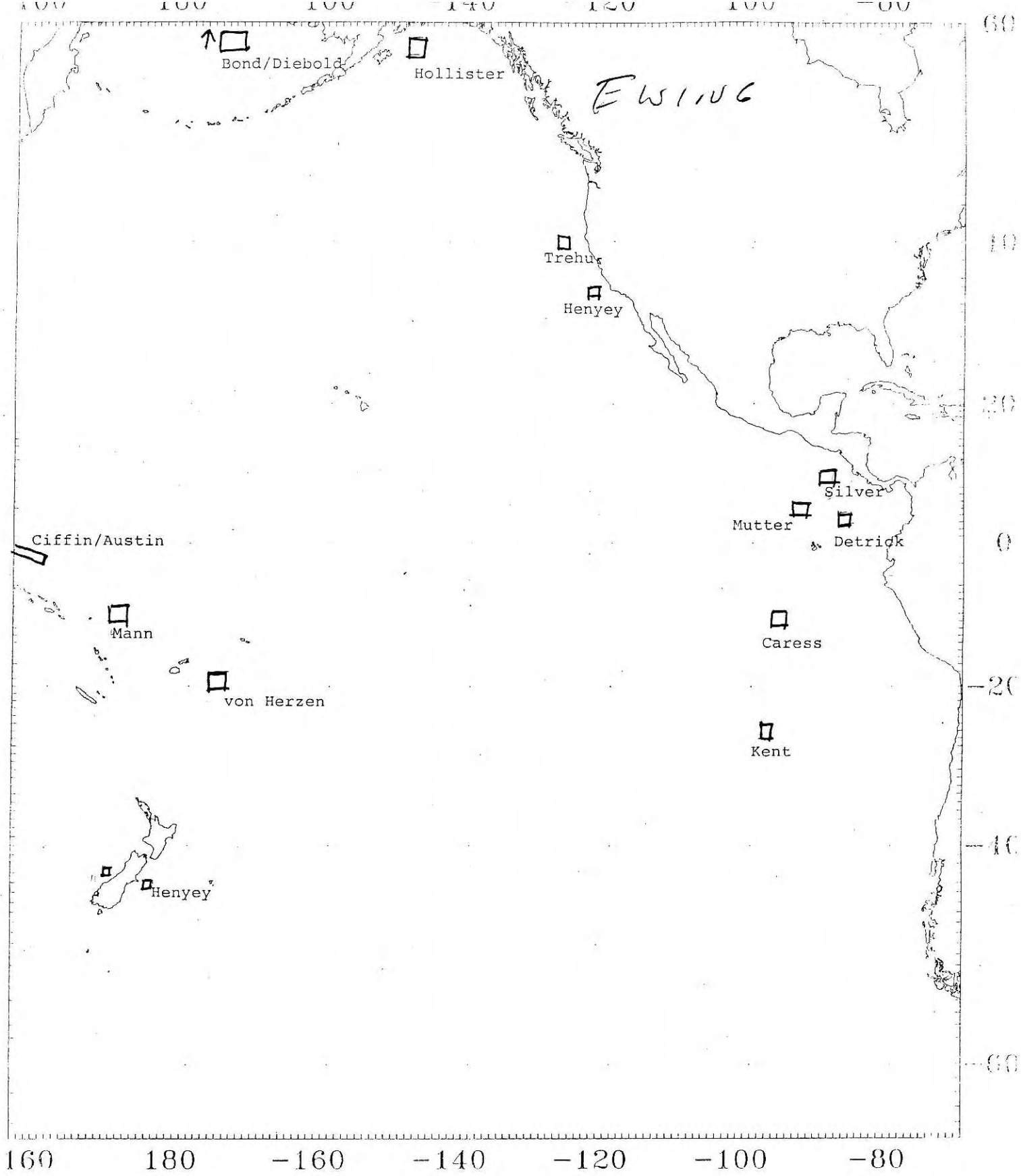
MARTIN GRAYBOS

RETURN

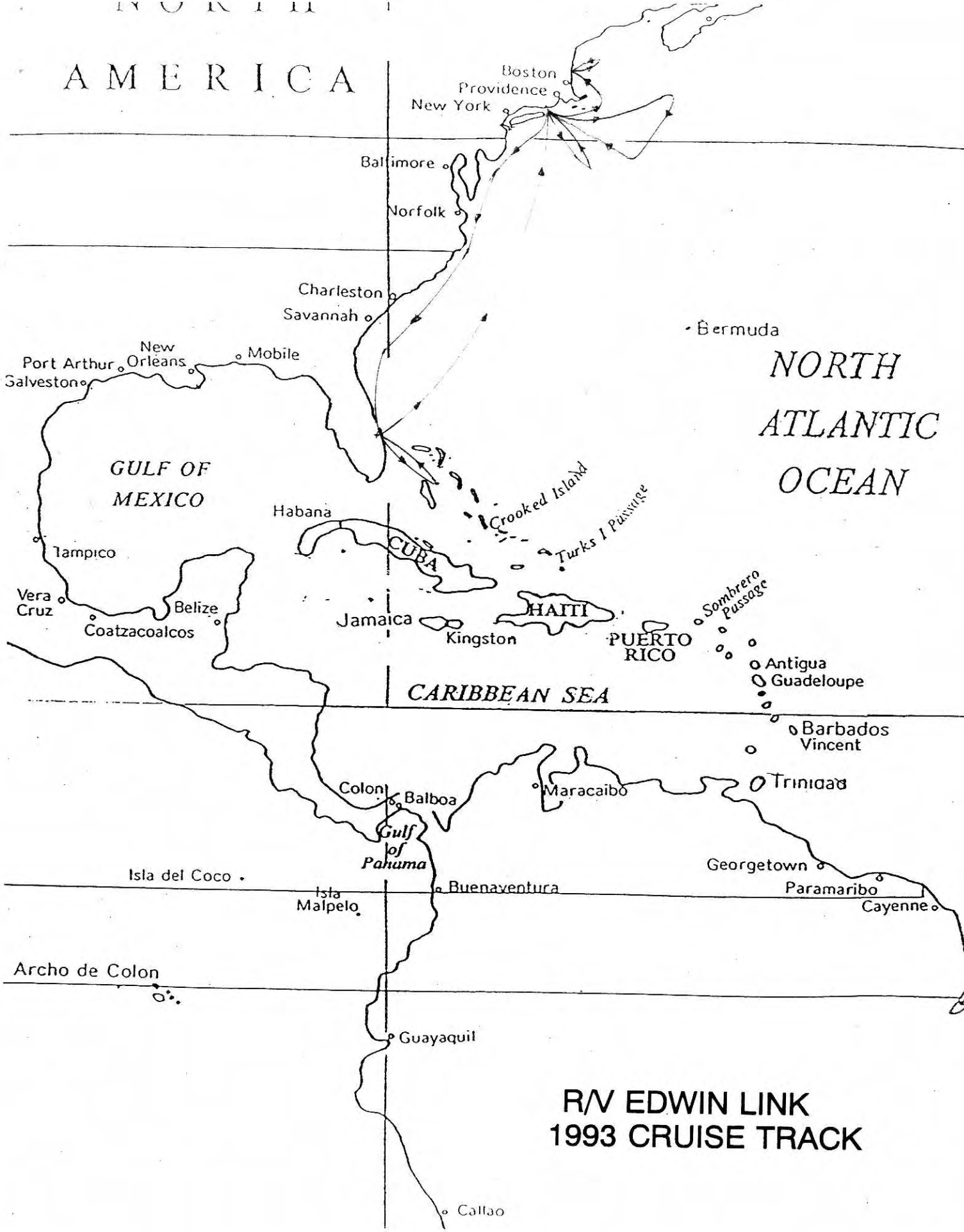
EWING



Atlantic Ocean, plotted: 06 17 day 135 at 0.0909 inch/deg longitude

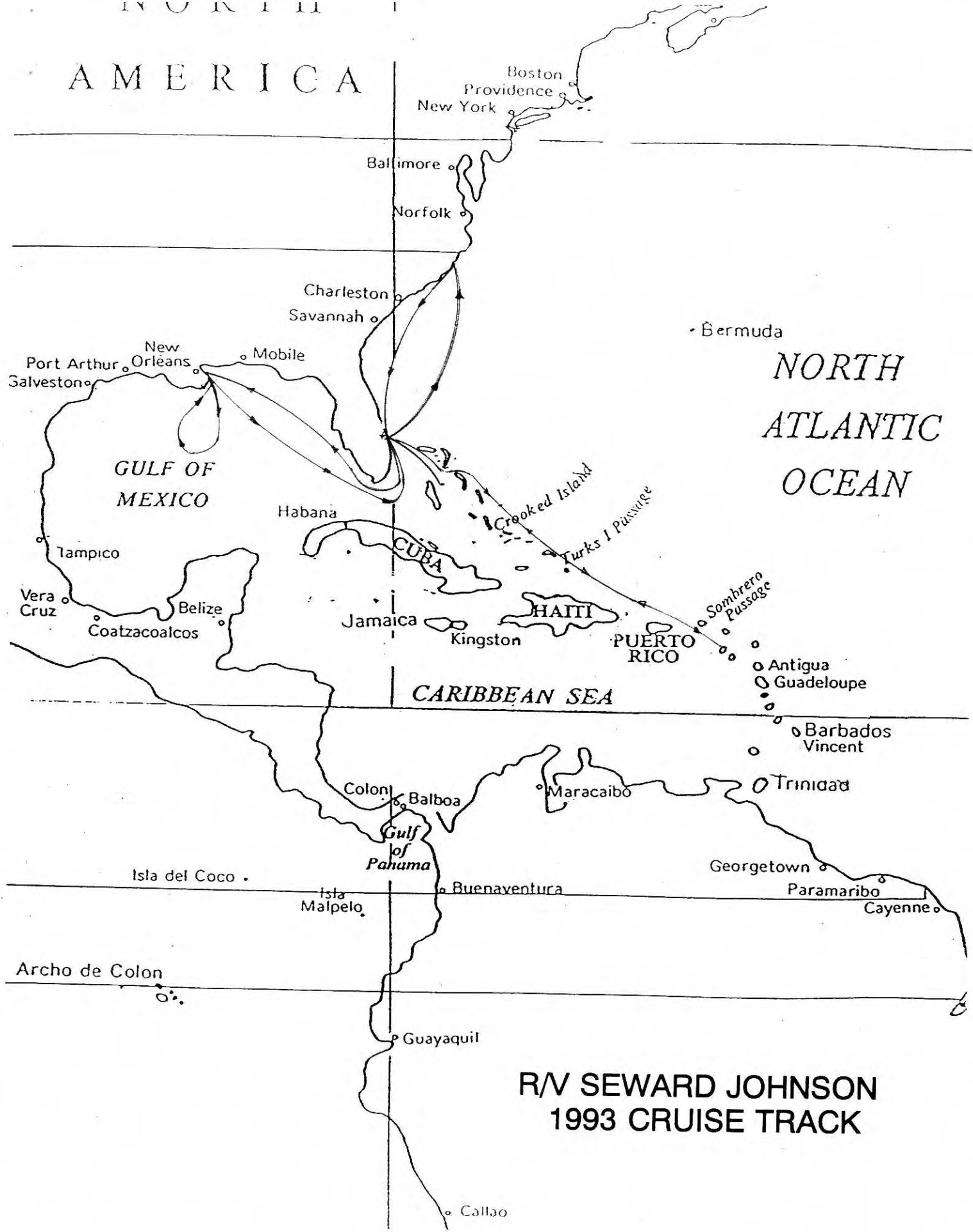


N O R T H  
A M E R I C A



**R/V EDWIN LINK  
1993 CRUISE TRACK**

A M E R I C A

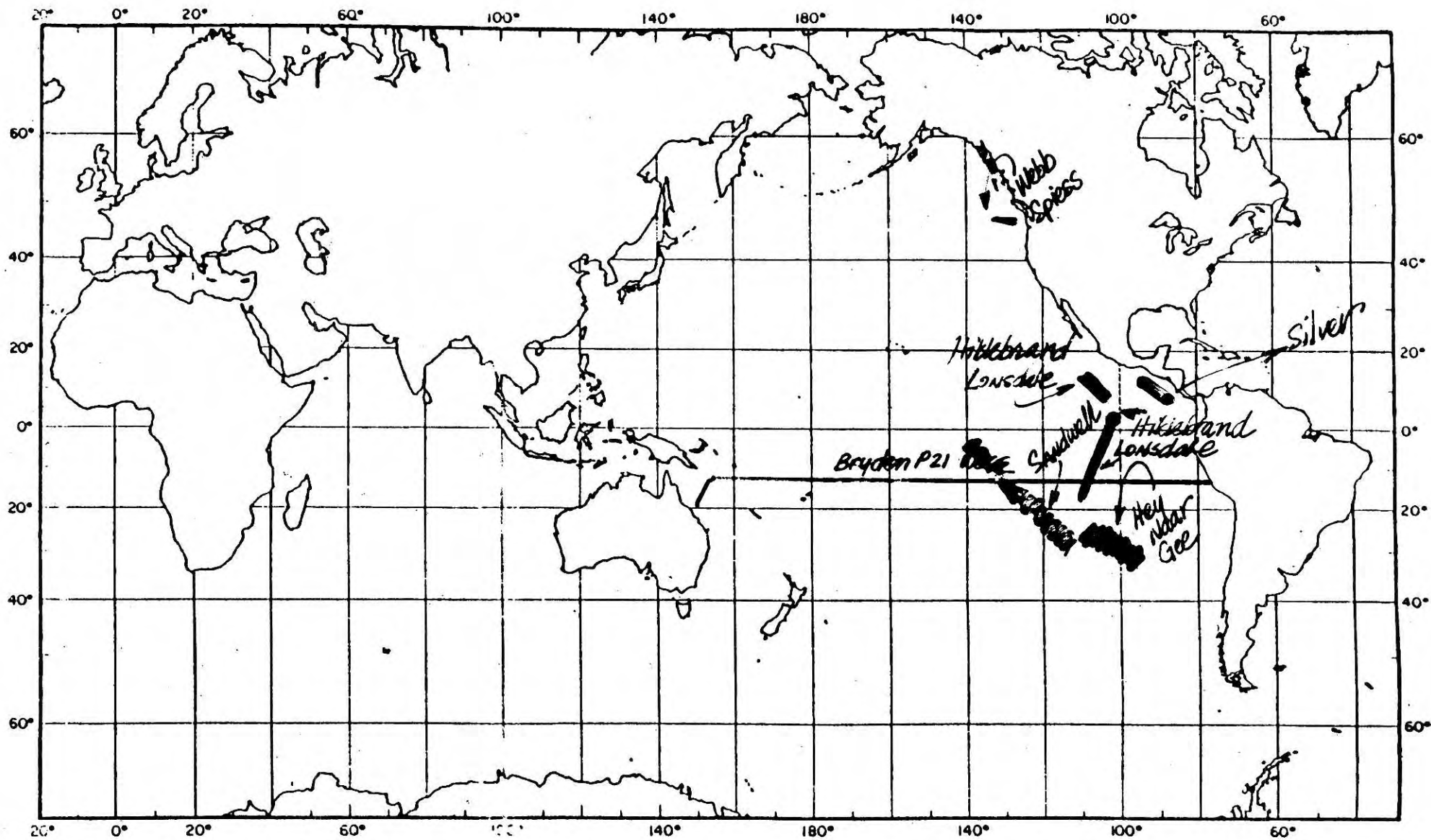


NORTH ATLANTIC OCEAN

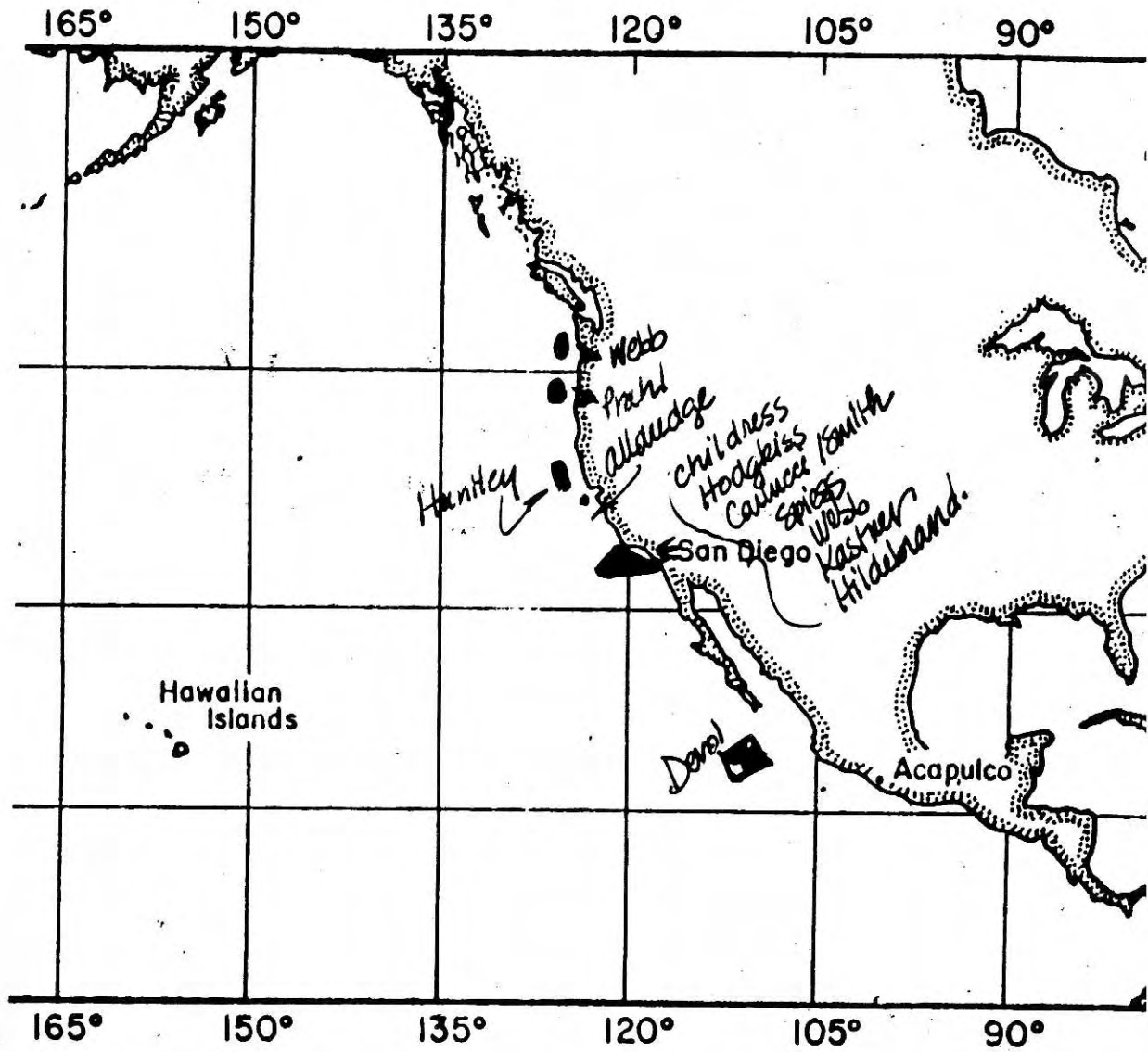
CARIBBEAN SEA

R/V SEWARD JOHNSON  
1993 CRUISE TRACK

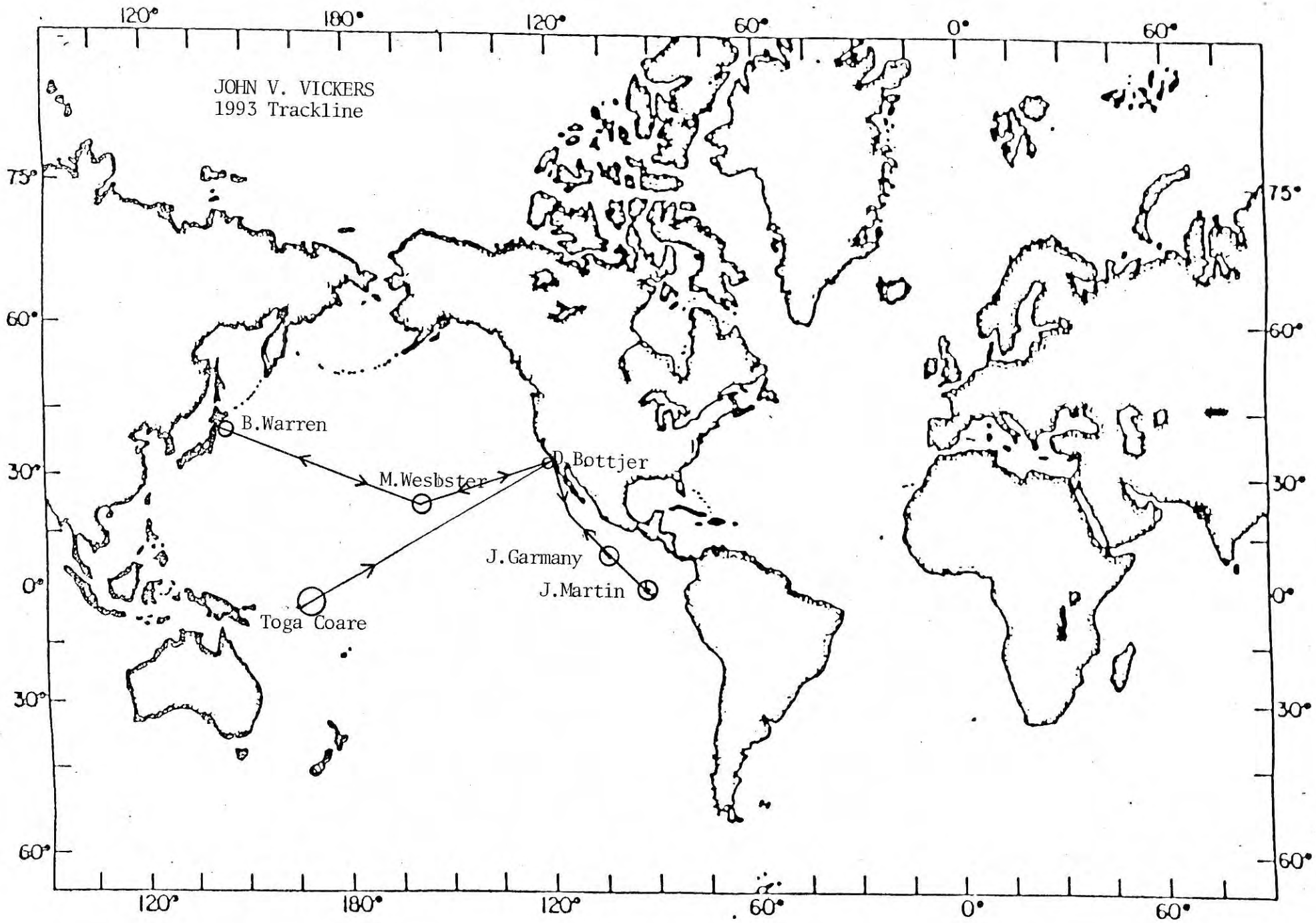
# Melville 1993-1994



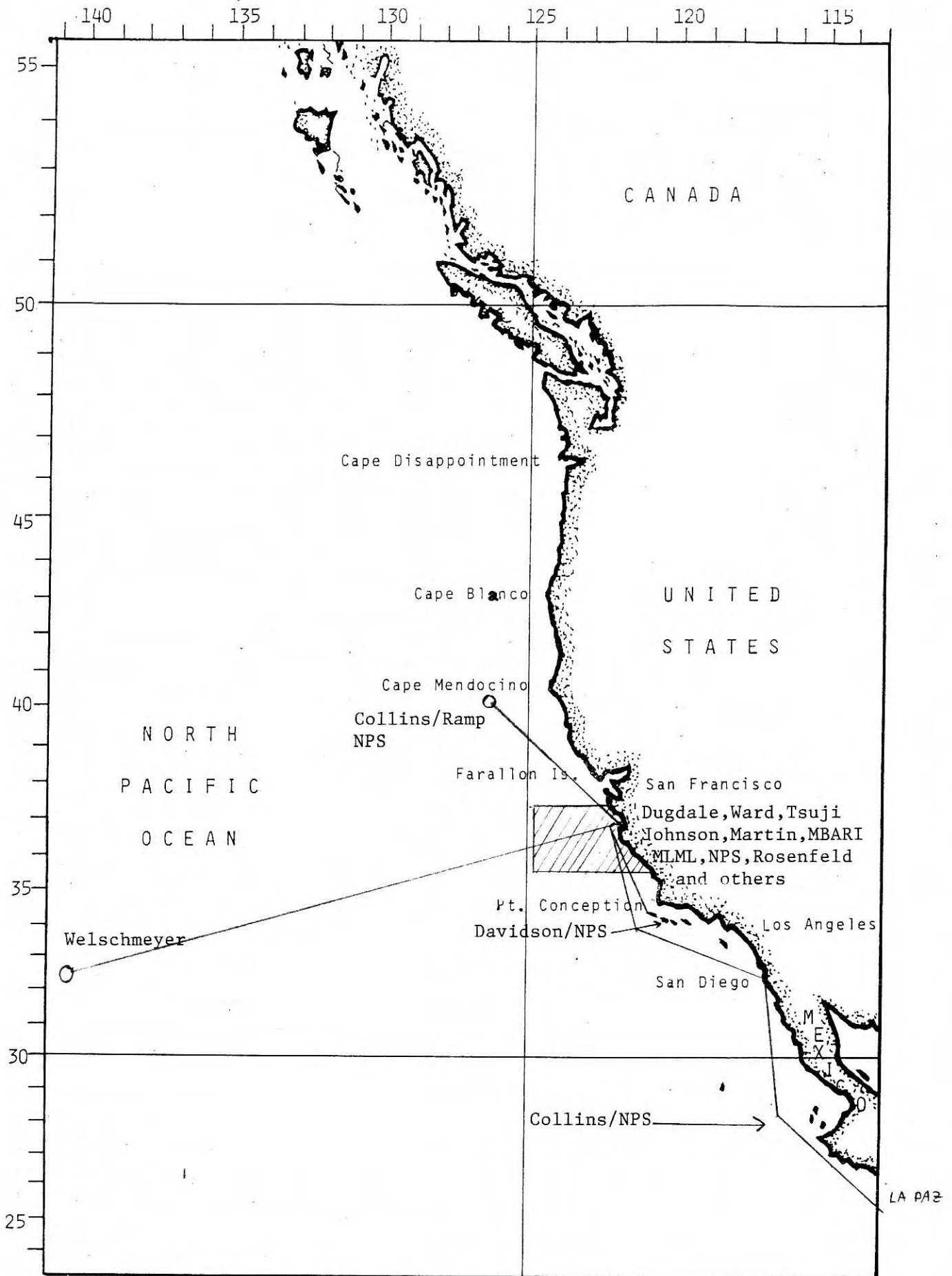
# 1993 New Horizon

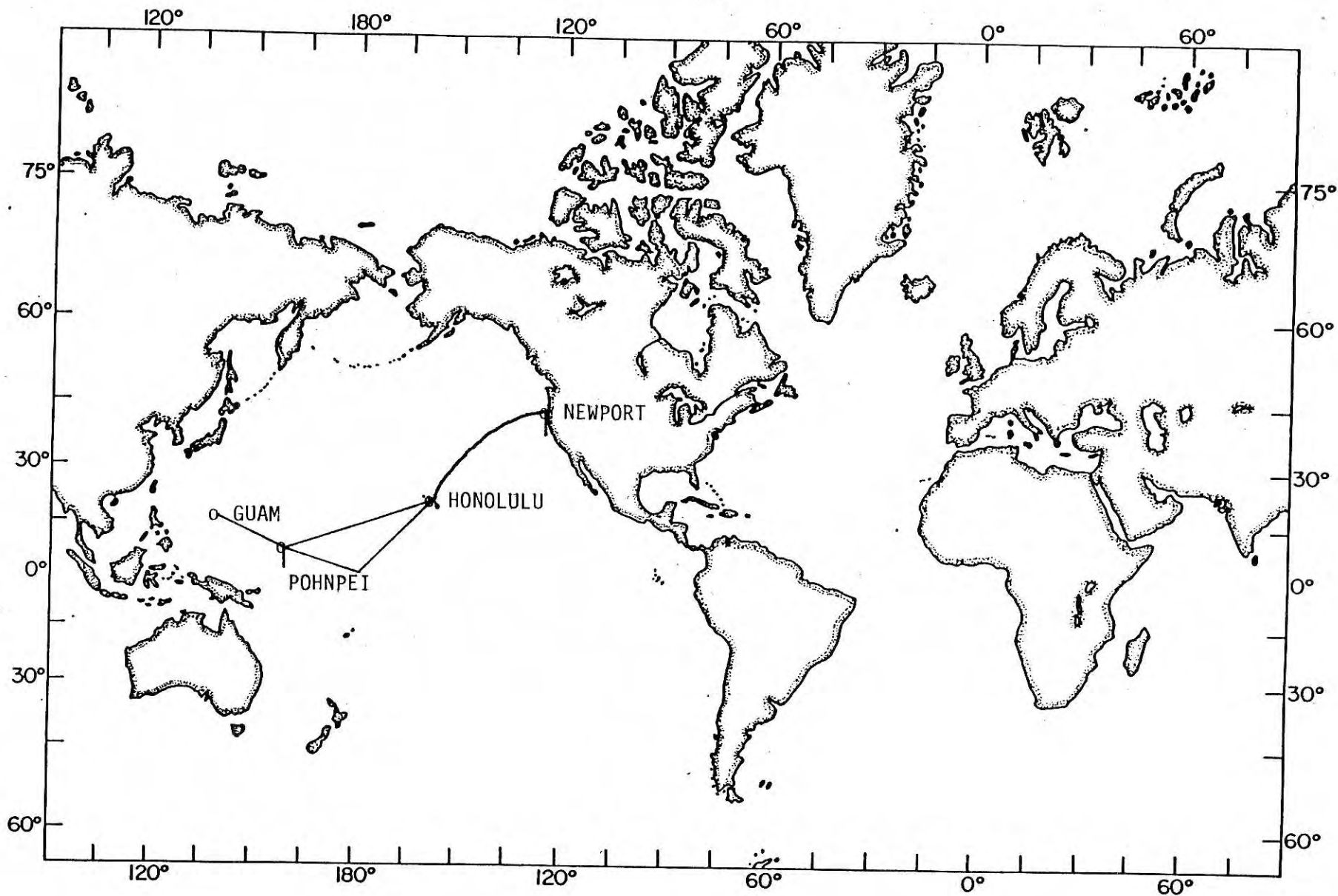




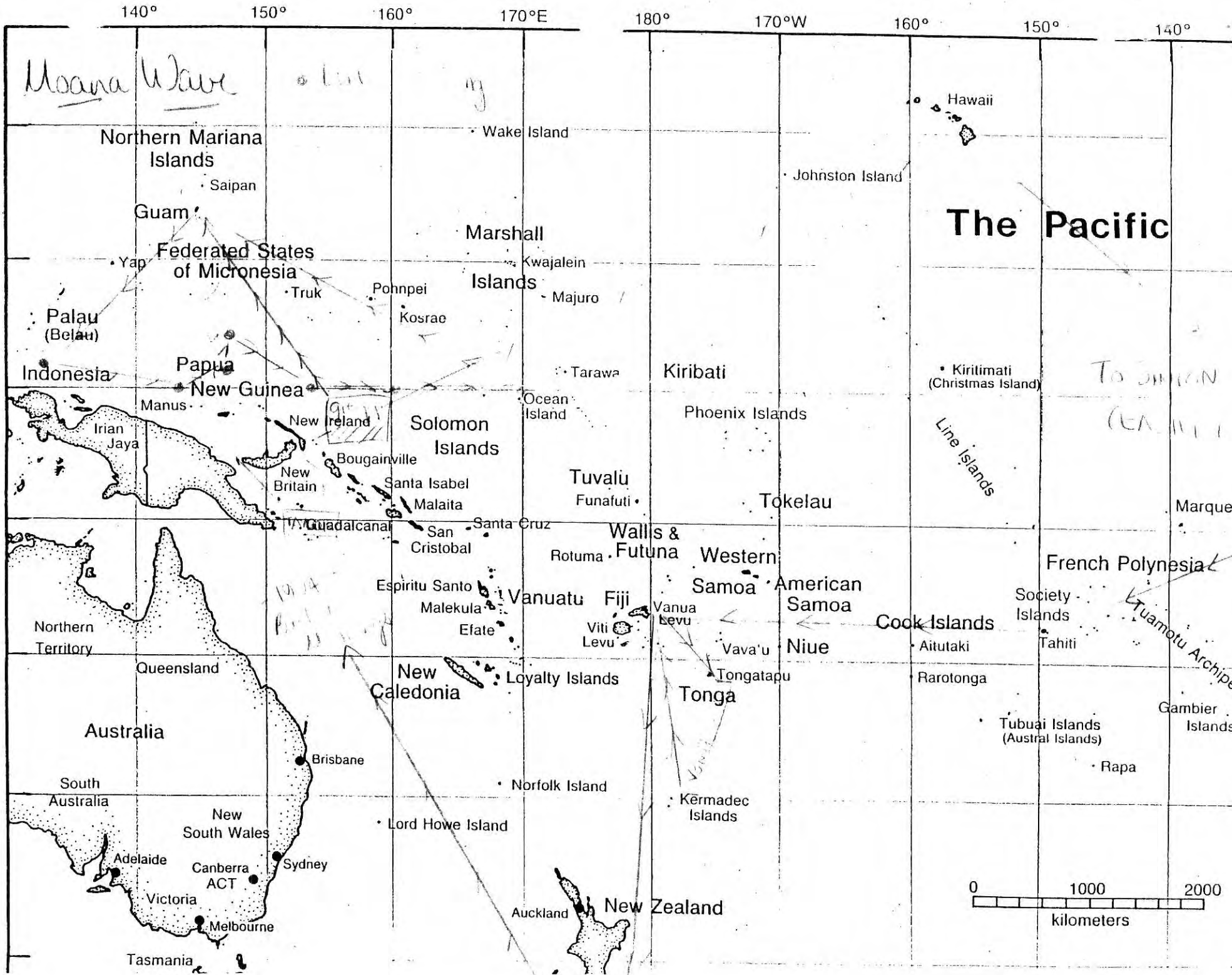


1993 R/V POINT SUR CRUISE TRACKS





**1993  
PROPOSED CRUISE TRACKS  
R/V WECOMA  
OREGON STATE UNIVERSITY**

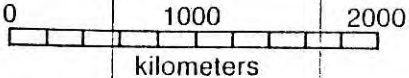


# The Pacific

*Moana Waive*

*To 3000  
(LA 111)*

*Line Islands*



## UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM

An association of Institutions  
for the coordination and support  
of university oceanographic facilities

RSMAS-MGG, Univ. of Miami  
4600 Rickenbacker Cswy  
Miami, FL 33149

Dr. Ned A. Ostenso, Asst. Administrator  
National Oceanic and Atmospheric Administration  
United States Department of Commerce  
Silver Spring, MD 20910

6 July 1992

Dear Ned,

I am writing to respond to John Knauss's letter of 18<sup>th</sup> May concerning the availability of UNOLS vessels. I am afraid that I am confused and unhappy about the guidance we received at the UNOLS Scheduling Meeting in Washington concerning NOAA's intentions to buy some time on the large UNOLS vessels. When we discussed this matter at JOI on May 18th Bill Stubblefield gave us a "heads up" that the number of ship days in John's letter was not correct and that the real number was more like 100. You also agreed that this time was not to be on Vickers but was to be exclusively on the large UNOLS vessels. I received a letter from Bill at the scheduling meeting which gave a more accurate number of 109 days in FY 1994. I had called upon the large ship operators at WHOI, L-DGO, SIO and UW to be prepared to discuss the availability of their ships for this work. I was very surprised to learn at this meeting that the request was not for 109 days. Instead it appears to be for a dollar amount of 1.3 million which translates to 109 days only if the day rate for large UNOLS vessels is \$12,000/day. Captain McCallister informed me that this amount was calculated based upon the use of Vickers! Surely your people know that this is a ridiculous day rate for these calculations. I hope that no one at NOAA was under the impression that this day rate was the starting point for some sort of haggling over costs. UNOLS operators are not at liberty to bargain with you in these matters. In addition, I noted that the result of my comment that the large UNOLS vessels can make 14 knots but do not generally do so has been to raise the transit speed requirement to 15 knots. The operators agreed that operation at high speed would probably necessitate a fuel surcharge over and above the standard UNOLS day rate.

I am not sure how this misunderstanding has come about but I hope you understand that it has had two very bad effects. First, it has given the very strong impression that NOAA does not, in fact, intend to cooperate with UNOLS. Indeed, Capt. McCallister was refreshingly frank with me and made it quite clear that he hoped that there would not be any use of the large UNOLS ships by NOAA. Second, it has placed me in the very unpleasant position of having broadcast to JOI and the UNOLS system (and, I might add, the Congress) my own assurance that NOAA would come to the table in a cooperative frame of mind. It appears that this assurance on my part may have been unwise.

In spite of these difficulties the large ship operators with the addition of the operators of Vickers and Moana Wave met with Capt. McCallister to work out their response to the request for 109



days in FY 1994 in detail with costs, timing and ports based upon the information Capt. McCallister has provided. It may be that, in spite of the unrealistic day rates and speeds used in the NOAA calculations, these vessels may be able to meet NOAA's request because of the likelihood that these cruises would start and end in Hawaii rather than in Seattle; the savings to come from the much reduced transit. The operators have responded to the UNOLS office and Jack Bash is sending you their response under separate cover.


We are not prepared to respond in any detail to the request for FY 1995 or the possibility that UNOLS might supply an additional 240-250 days until we have a clear statement that NOAA is seeking time on the large UNOLS vessels at realistic day rates and that NOAA has understood our repeated comments about UNOLS billing practices including charges for days in transit and in port. There is insufficient detail in the plans of other agencies to give an accurate picture for 1995 but I believe that there will indeed be unused ship time in the UNOLS Fleet. Let me suggest that UNOLS could probably respond, at least tentatively, at the September Scheduling Meeting when everyone's plans and budgets should be better defined.

Let me repeat my distress at this process has unfolded. In the thirty days between the 18<sup>th</sup> of May and the 17<sup>th</sup> of June I received: 1. A letter from the Administrator requesting a response to a shortfall of 250 days of "Class I-Class II high-endurance ship time" with a potential for another 325 days; 2. I have been informed that the 250 days will become around 100; 3. I have subsequently received notification that the shortfall is 109 days with the possibility of an additional 240-250 days and finally; 4. I have been told that NOAA expects to use 109 days on Major UNOLS vessels for the same day rate as Vickers. The process may have been affected by a certain degree of ignorance or inattention to the facts of life but, given what I thought was an open and fruitful discussion in May, it is hard to dismiss the impression that there is also somewhere in NOAA some measure of downright ornery unwillingness.

UNOLS has other options for the solution of our large ship surplus. There is, for example, considerable discussion of an early conversion of Knorr to a submersible support ship with the concomitant retirement of Atlantis II from the fleet. The exercise of this option would remove much of the surplus of large vessel time almost overnight and leave NOAA to deal with commercial operators and ship owners like Chouest for the solution to their problems.

It would be a great help to UNOLS if, in the future, NOAA could speak with one, authoritative voice on these matters.

Sincerely,

  
Garrett W. Brass  
Chair, UNOLS

cc: UNOLS Council  
D.J. Baker, JOI  
R. Pittenger, WHOI

Estimate of costs involved for MOANA WAVE tending of NOAA buoy arrays.

Second Quarter, 1994	From	To	Mileage	Days	Work	
	Suva, Fiji	8S, 180W	615	2.6		
	8S, 180W	8N, 180W	960	4.0	6.4	
	8N, 180W	Honolulu	1509	6.3		
	Honolulu	8N, 170W	1063	4.4		
	8N, 170W	8S, 170W	960	4.0	4.9	
	8S, 170W	8S, 155W	891	3.7		
	8S, 155W	8N, 155W	960	4.0	2.7	
	8N, 155W	Honolulu	816	3.4		
				32.4	14.0	46.4
Fourth Quarter, 1994	Honolulu	8N, 155W	816	3.4		
	8N, 155W	8S, 155W	960	4.0	4.9	
	8S, 155W	Honolulu	1767	7.4		
	Honolulu	8N, 170W	1063	4.4		
	8N, 170W	8S, 170W	960	4.0	3.2	
	8S, 170W	8S, 180W	594	2.5		
	8S, 180W	8N, 180W	960	4.0	1.2	
	8N, 180W	Honolulu	1509	6.3		
				36.0	9.3	45.3

Assuming Suva as the port of origination (above), the total projected time is 91.7 days.

Option B, assuming Suva but doing the easternmost array first (in order to only stage 2 moorings out of Fiji), the total projected time is 94.8 days.

Option C, assuming both legs out of Honolulu, the total projected time is 95.3 days.

	Option A	Option B	Option C
Ship Time (@ \$10,450/day)	958,265	990,660	995,885
Technicians (3 @ \$525/day ea.)	144,428	149,310	150,098
Basic Underway Services (@ \$275/day)	25,218	26,070	26,208
ADCP (@ \$18/day)	1,651	1,706	1,715
Bathymetry (@ \$40/day)	3,668	3,792	3,812
CTD Stations (42 @ \$250 ea.)	<u>10,500</u>	<u>10,500</u>	<u>10,500</u>
<u>Total Cost Estimate</u>	1,143,730	1,182,038	1,188,318

Technicians: 1 Electronics technician, 1 Deck technician, 1 Computer System Manager

Basic Underway Services: All data logging, access to Sun workstation network, daily email (internet) messaging to and from Wave, corrected navigation, data processing (ADCP, digitized bathymetry, etc.) as time allows.

ADCP: Data collection. Reduction as time permits.

Bathymetry: Raw paper data and files of digitized depths.

CTD stations: Seabird CTD. Rosette by arrangement.

MOANA WAVE page 2.

I looked at the arrays at 140, 125, 110, and 95W. Since I did not know whether there were deployments or service of existing moorings involved, it was not possible to make a full estimate. I've calculated that a Honolulu - Manzanillo - Honolulu set of 2 cruises would involve 53.7 days exclusive of work on station.

A Honolulu - Honolulu cruise to the westernmost 2 arrays (140 & 125W) would involve 25.7 days exclusive of work on station.

Let me know if you'd like further information.

Roy Wilkins



Posted: Fri, Jun 26, 1992 1:41 PM PDT  
From: SCRIPPS.INST  
To: unols.office  
CC: scripps.inst  
Subj: NOAA/TOGA Proposal (resending)

Msg: DGJC-5288-4386

Mr. Jack Bash  
UNOLS Secretary  
P.O Box 392  
Saunderstown, RI 02874

26 June 1992

Dear Jack,

We are submitting four possibilities on ways that Melville could attempt to do the NOAA/TOGA mooring work in 1994.

Version I consists of two cruises, San Diego to San Diego. We propose to do the work for the second and fourth quarters each as one leg operations, with a one day port stop added in Honolulu for fuel. At a cost of under \$2 million, we could do full CTD casts at each mooring deployment site.

Version II is similar to Version I, with a modified hydrographic program. Using a Sea Bird CTD instead of the Neil Brown CTD with technician decreases the cost to approximately \$1.9 million.

Versions III and IV are more economical as well as more feasible from a scheduling standpoint. Our plan would be to break the WOCE P21 line in Papeete, to insert the NOAA 2nd quarter work. WOCE will have to store gear in Tahiti for the 2nd quarter NOAA/TOGA work, for a cost of \$5,000. WOCE would then resume the last leg on P21 after the 2nd quarter NOAA work was completed. Again, version III consists of the full Neil Brown CTD sampling, while four is the rental of the Sea Bird. The costs for both quarter cruises is approximately \$1.5 million, which comes closer to NOAA's budget of \$1.3 million.

At this point we can not give firm dates because there are still several pending cruises on Melville's 1993 and 1994 schedule. However, it seems possible to schedule the first NOAA cruise for the end of January 1994, Tahiti to Tahiti. The fourth quarter cruise is less clear. We are hoping to have Melville in the Indian Ocean by the fall of 1994. We will have to look at other schedule elements as they develop to see that we can fit both the NOAA and Indian Ocean work with a sensible itinerary.

Other things to consider:

a) We do not now have a suitable capstan on the ship. We can install one if NOAA can provide it, and/or NOAA could arrange to rent or borrow a mooring winch elsewhere. We can try to obtain such a capstan between now and then, but have no

assured funds in hand at the moment. If this is a major issue, we would welcome further discussion with NOAA about possible solutions.

b). NOAA should be aware that, like several other UNOLS operators, our day rates adjust slightly as the calendar year unfolds, and are not finally settled until after the close of the calendar year. Thus changes to user charges can and do take place after the actual work at sea. Since we are obliged to treat all Federal users (NSF, ONR, etc.) alike, such adjustments may affect NOAA.

c) We have budgeted for ordinary echo sounding and no use of Sea Beam swathmapping. If Sea Beam use is desired there is an extra charge of \$2,303 per day (includes overhead). The ship carries the Sea Beam system and is capable of this work if funded.

Sincerely,

Robert A. Knox  
Associate Director  
Scripps Institution of Oceanography

## NOAA/TOGA Version I San Diego - San Diego

Description of Charges	PER DAY CHARGE	# OF DAYS	Total
Ship Costs* R/V Melville @14 kts	\$14,131	99	\$1,398,969
Surcharge for Extra Fuel during transit 4` E	1,500	72	108,000
Technician Costs	1,733	99	171,567
CTD technician	409	99	40,491
OT/SPD	82	99	8,118
Employee benefits			11,699
Total CTD Tech			60,308
Supplies and Materials (2 Cruises)			
21 Shallow NBIS CTD casts @\$68			1,428
2 salinometers @\$14/ea/day		99	2,772
Set up charge, \$300 ea			1,200
Computer time/supplies 20 casts @ \$48			960
2 rosette frames			n/c
12 1.7-liter botls. @ \$2/ea/day		99	2,376
Shop Support			7,232
Total S & M			15,968
<b>TOTAL DIRECT COSTS</b>			<b>\$1,754,812</b>
Indirect costs @ 13%			218,210
Indirect costs @ 27.8%			21,205
<b>TOTAL COSTS</b>			<b>\$1,994,227</b>

\*Ship Cost equals 50 sea days and 1 port day in Honolulu during the 2nd quarter cruise and 47 sea days and 1 port day in Honolulu during the 4th quarter cruise; the port day is a day to fuel.

## NOAA/TOGA Version II San Diego - San Diego

Description of Charges	PER DAY CHARGE	# OF DAYS	Total
Ship Costs R/V Melville @14kts	\$14,131	99	\$1,398,969
Surcharge for Extra Fuel during transit	1,500	72	108,000
Technician Costs	1,733	99	171,567
Supplies and Materials (2 Cruises)			
SeaBird rental (instead of CTD tech)		99	4,000
2 Salinometers @ \$14/ea/day plus set up chg \$300 each		99	2,772
Set up charge \$300 eac			1,200
2 Rosette frames			n/c
12 1.7-liter bottles. @ \$2/ea/day		99	2,376
24 vials std. water @ \$21		99	1,008
24 DSRTs @ \$2/ea/day			4,752
Shop Support			1,933
Total S&M			18,041
TOTAL DIRECT COSTS			\$1,696,577
Indirect Costs @ 13%			218,210
Indirect Costs @ 27.8%			5,015
TOTAL COSTS			\$1,919,802

Note: the ship is designed to sustain 14 kts. The fuel curve increases to about 4500 gal/per day which increase the daily rate by \$750 per day.

**NOAA/TOGA Version III Papeete to Papeete**

Description of Charges	PER DAY CHARGE	# OF DAYS	Total
Ship Costs* R/V Melville @14kts	\$14,131	77	\$1,088,087
Surcharge for Extra Fuel during transit	1,500	44	66,000
Technician Costs	1,733	77	133,441
CTD technician	409	77	31,493
OT/SPD	82	77	6,314
Employee benefits			9,099
Total CTD Tech			46,906
Supplies and Materials (2 cruises)			
21 Shallow NBIS CTD casts @68			1,428
2 salinometers @\$14/ea/day		77	2,156
Set up charge, \$300 ea			1,200
Computer time/supplies 20 casts @ \$48			960
2 rosette frames			n/c
12 1.7-liter botls. @ \$2/ea/day		77	1,848
Shipping:			
1500#, SD-Papeete, RT, @ \$3.50/# twice			10,500
Insurance			600
Shop Support			5,625
Storage fee*			5,000
Total S & M			29,317
Travel:			
2 RT SD-Papeete @ \$3000			6,000
4 days per diem @ \$180/day			720
Misc. (exc. baggage, etc.)			200
Total Travel			6,920
<b>TOTAL DIRECT COSTS</b>			<b>1,370,671</b>
Indirect costs @ 13%			167,378
Indirect costs @ 27.8%			23,114
<b>TOTAL COSTS</b>			<b>\$1,561,163</b>

\* Ship Costs equals to 36 sea days and 4 port days in 2nd quarter and 33 sea days and 4 port days during the 4th quarter

\*\*Storage in Tahiti to offload WOCE equipment.

## NOAA/TOGA Version IV Papeete to Papeete

Description of Charges	PER DAY CHARGE	# OF DAYS	Total
Ship Costs* R/V Melville @14kts	\$14,131	77	\$1,088,087
Surcharge for Extra			
Fuel during transit	1,500	44	66,000
Technician Costs	1,733	77	133,441
Supplies and Materials (2 Cruises)			
SeaBird rental (instead of CTD tech)			4,000
2 Salinometers @ \$14/ea/day		77	2,156
plus set up chg \$300 each			1,200
2 Rosette frames			n/c
12 1.7-liter bottles. @ \$2/ea/day		77	1,848
24 vials std. water @ \$21			1,008
24 DSRTs @ \$2/ea/day		77	3,696
Shipping: 1500#, SD-Papeete, RT, @ \$3.50/# twice			10,500
Insurance			600
Shop Support			3,001
Total S&M			28,009
<b>TOTAL DIRECT COSTS</b>			<b>\$1,315,537</b>
Indirect Costs @ 13%			167,378
Indirect Costs @ 27.8%			7,786
<b>TOTAL COSTS</b>			<b>\$1,490,701</b>

Other costs to consider: shipping to Papeete

Note: the ship is designed to sustain 14 kts. The fuel curve increases to about 4500 gal/per day which increase the daily rate by \$1500 per day.

JOHN V. VICKERS TOGA/TOA  
NOAA -- 2ND QUARTER FY94

Leg 1 1. Start Los Angeles  
Service 180 degrees return Hilo 29 days

Leg 2 2. Start Hilo service 170 degrees and  
155 degrees return Honolulu 23 days

52 days @ \$12,000/day = \$624,000

NCAA 4TH QUARTER FY94

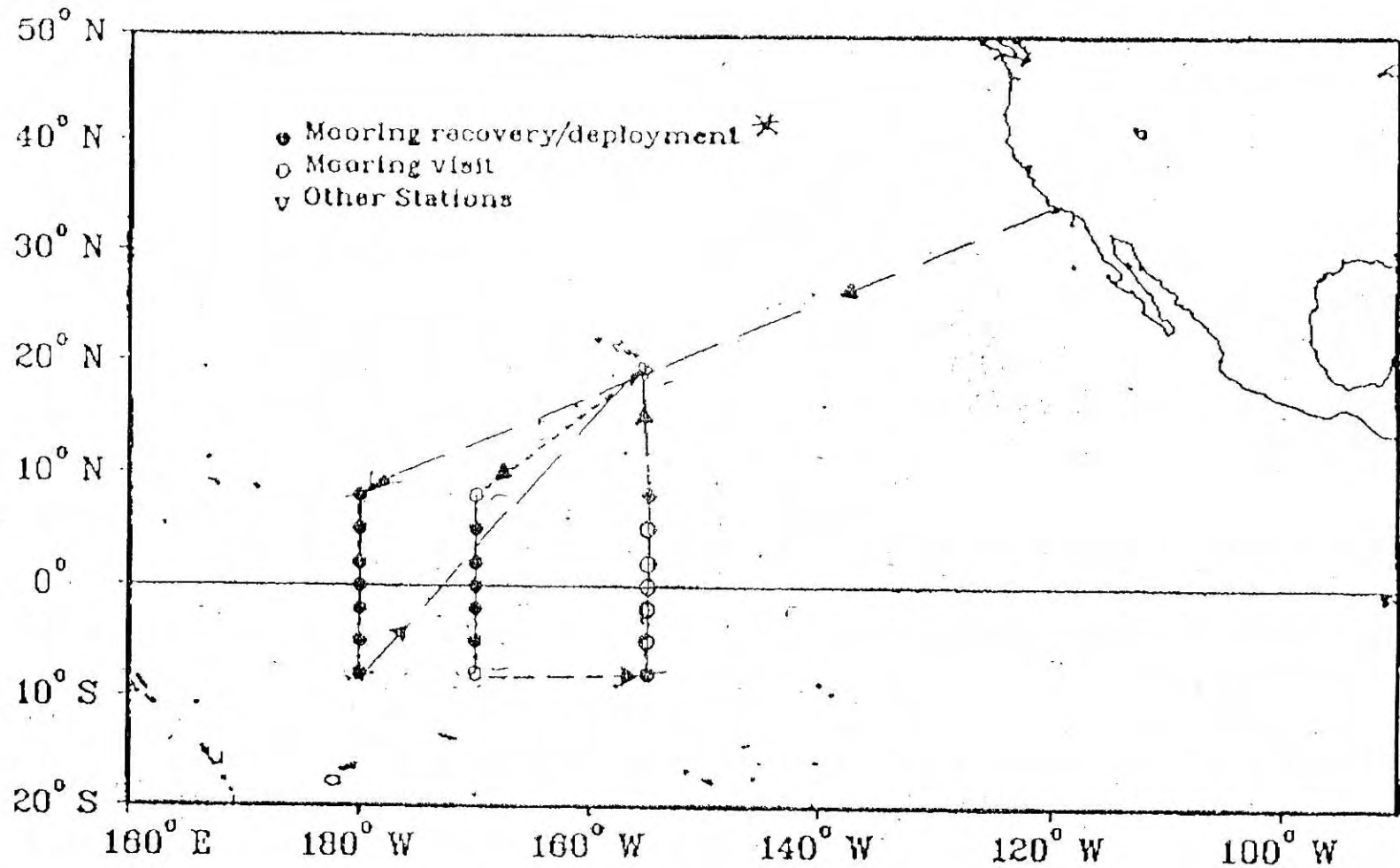
Leg 1 1. Start Los Angeles service 180 degrees and  
170 degrees return Hilo 32 days

Leg 2 2. Start Hilo service 155 degrees and return to  
Honolulu 25 days

57 days @ \$12,000/day = \$684,000

TOTAL: \$1,308,000

PROPOSED NOAA CRUISE  
2nd Quarter FY94

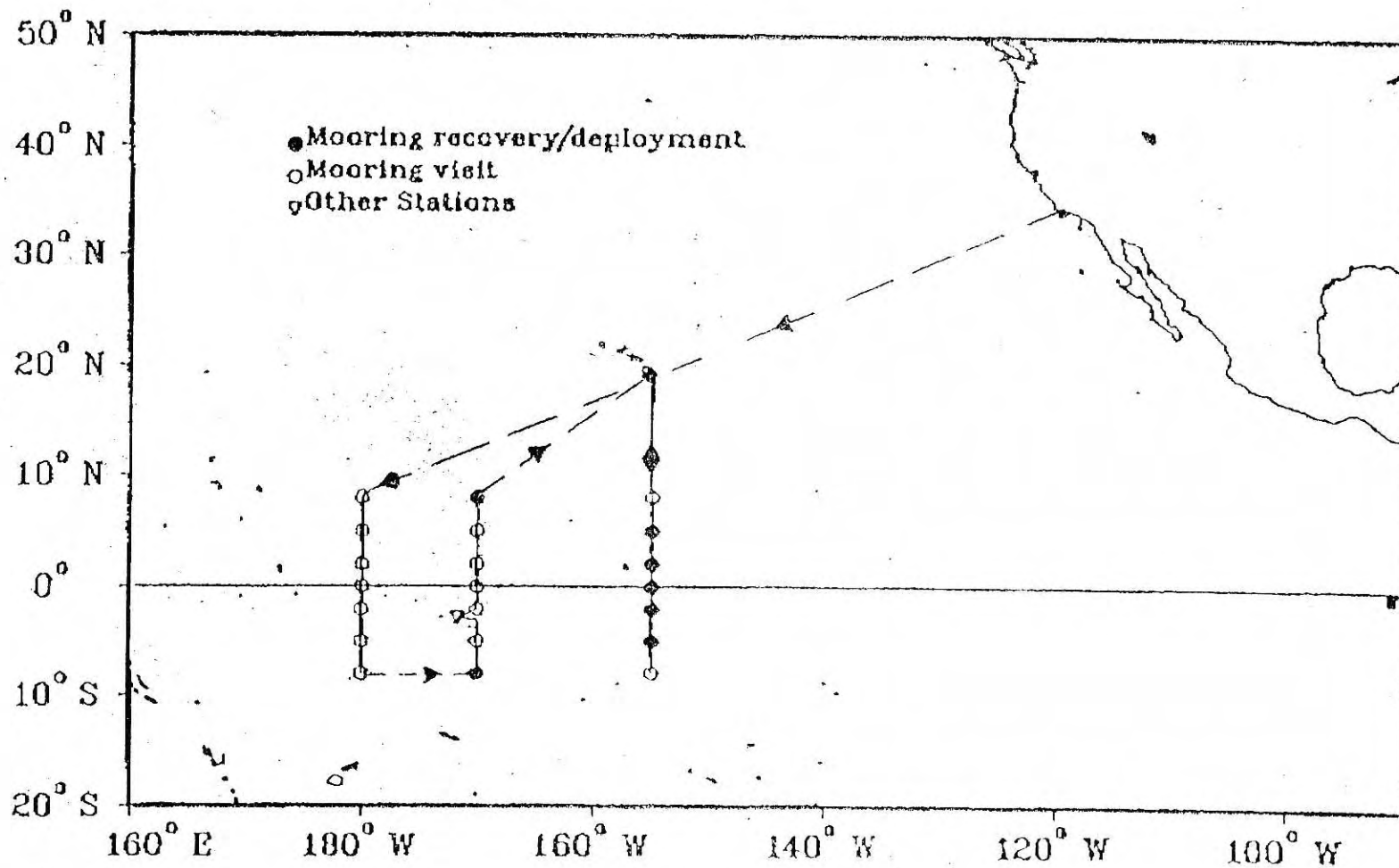


\* TYPICAL "MOORING DEPLOYMENT / RECOVERY" TIME = 12 HRS.

("MOORING VISIT" = 2-3  
HRS)



PROPOSED NOAA CRUISE  
4th Quarter FY94



# FAX MEMO

FROM: MICHAEL RAWSON rawson@lamont.lidgo.columbia.edu  
LAMONT-DOHERTY GEOLOGICAL OBSERVATORY  
PALISADES, N.Y. 10964 TEL: (914) 359-2900  
FAX: (914) 359-6817

DATE: June 30, 1992

TO: UNOLS Office

FAX NO: 401 792 6486

Please find attached the revised cost proposals for the R/V MAURICE EWING to conduct the two planned TOGA-TAO Mooring Deployment and recoveries in Feb-Mar 1994 (2d Q FY94) and Aug-Sep 1994 (4th Q FY94) as outlined in the presentation by Captain Mike McCallister of PMEL, Seattle during the UNOLS Schedule Meeting of 16-17 June 1992.

The total proposed costs are based on an estimated 1994 ship cost of \$16,000 per day. Each cruise will include 52 days at sea and 8 port days for mobilization, demobilization and days in port between legs 1 & 2. The science costs include the estimated costs for CTD and operator, ADCP, PDR & pinger and a prorated shipping and communications charge for general shared-use equipment support based on an estimated 52 days at sea for both legs. The science costs and the ship day costs are estimates that will be revised once the operating schedule for the EWING in 1994 is better determined.

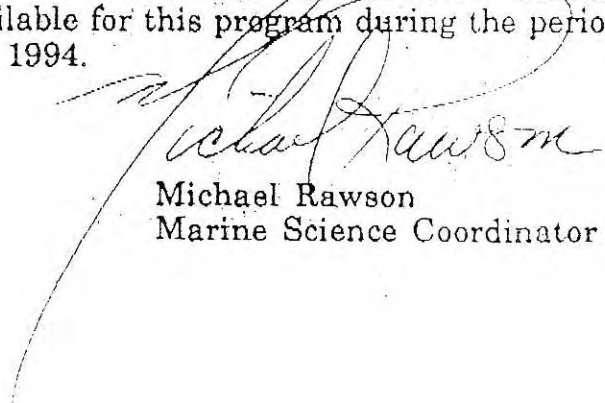
The total proposed costs for the two cruises are:

	2D Q FY94	4th Q FY94
Ship Costs:	\$960,000	\$960,000
Science Costs	<u>179,883</u>	<u>179,883</u>
Total Costs	\$1,139,883	\$1,139,883

We have computed the transit times to the first stations and between stations at a very conservative fuel efficient 11 knots.

The current schedule for the R/V MAURICE EWING indicates that the vessel can be made available for this program during the periods indicated in Calendar Year 1994.

Sincerely,

  
Michael Rawson  
Marine Science Coordinator

R/V MAURICE EWING

PROPOSED NOAA CRUISE: TOGA-TAO MOORINGS  
2D QUARTER FY94 (Feb-Mar 1994)

				Speed: Knots
Leg 1	PORT/STA.	MILES		11
Transits:	Honolulu			DAYS:
	Sta 1	1620		6.14
	Sta 14	3000		11.36
	Hilo	1200		4.55
Stations:		Hrs/ea		
MOORINGS	14	22		12.83
"VISIT"	7	4		1.17
TOTAL LEG 1				36.05
				Speed Knots:
Leg 2	PORT/STA.	MILES		11
Transits:	Hilo			DAYS:
	Sta 15	600		2.27
	Sta 21	1200		4.55
	Honolulu	1800		6.82
Stations:		Hrs/ea		
MOORINGS	2	22		1.83
"VISIT"	5	4		0.83
TOTAL LEG 2				16.30
TOTAL LEG 1 & 2		CRUISE DAYS		52.35
		PORT DAYS		<u>8.00</u>
				60.35 = 60
SHIP COST PER DAY:	\$16,000			\$960,000
SCIENCE COSTS	Table 2			\$179,883
TOTAL COSTS				\$1,139,883

MG&amp;G Budget93 (v 3/27/92)

## ESTIMATED DATA ACQUISITION AND DATA REDUCTION BUDGET - 1994

## R/V MAURICE EWING EQUIPMENT SUPPORT

P.I.: NOAA TOGA-TAO Moorings: Aug/Sep 1994

AREA: Honolulu/Hilo/Hilo (2 Legs)

I. DATA ACQUISITION	Rate	Days	On	Off	Total
			Campus	Campus	
BASE DIRECT COSTS (And ICR Rates)	\$		\$	\$	\$
A. Base Costs (33% on & 67% off)	1,860	52	31,918	64,802	96,720
B. Project Specific Equipment Use					
1. PDR 12 & 3.5 kHz (33% On & 67% Off)	129	52	2,214	4,494	6,708
2. CTD (33% on & 67% off)	200	52	3,432	6,968	10,400
3. Ship & Comm. (all on campus)	153	52	7,956		7,956
4. ADCP (33% on & 67% off)	150	52	2,574	5,226	7,800
<b>TOTAL DIRECT COSTS</b>			48,094	81,490	129,584
D. Indirect Costs					
On Campus Rate	54.60%		26,259		
Off Campus Rate	29.50%			24,040	
<b>TOTAL INDIRECT COSTS</b>					50,299
<b>TOTAL DATA ACQUISITION COSTS</b>					<b>179,883</b>

NOTE: THESE COSTS ARE ESTIMATES, FINAL COSTS WILL BE DETERMINED BY REVIEW OF 1991-92 OPERATIONAL YEAR COSTS.

MG&G Budget93 (v 3/27/92)

ESTIMATED DATA ACQUISITION AND DATA REDUCTION BUDGET - 1994  
 R/V MAURICE EWING EQUIPMENT SUPPORT

P.I.: NOAA TOGA-TAO Moorings: Feb/Mar 1994  
 AREA: Honolulu/Hilo/Honolulu (2 Legs)

	Rate	Days	On Campus	Off Campus	Total
<b>I. DATA ACQUISITION</b>					
BASE DIRECT COSTS (And ICR Rates)	\$		\$	\$	\$
A. Base Costs (33% on & 67% off)	1,860	52	31,918	64,802	96,720
B. Project Specific Equipment Use					
1. PDR 12 & 3.5 kHz (33% On & 67% Off)	129	52	2,214	4,494	6,708
2. CTD (33% on & 67% off)	200	52	3,432	6,968	10,400
3. Ship & Comm. (all on campus)	153	52	7,956		7,956
4. ADCP (33% on & 67% off)	150	52	2,574	5,226	7,800
<b>TOTAL DIRECT COSTS</b>			48,084	81,490	129,584
D. Indirect Costs					
On Campus Rate	54.60%		26,259		
Off Campus Rate	29.50%			24,040	
<b>TOTAL INDIRECT COSTS</b>					50,299
<b>TOTAL DATA ACQUISITION COSTS</b>					179,883

NOTE: THESE COSTS ARE ESTIMATES, FINAL COSTS WILL BE DETERMINED BY  
 REVIEW OF 1991-92 OPERATIONAL YEAR COSTS.

## R/V MAURICE EWING

## PROPOSED NOAA CRUISE: TOGA-TAO MOORINGS

4TH QUARTER FY94 (Aug/Sep 1994)

Leg 1	PORT/STA.	MILES	Speed: Knots
Transits:	Honolulu		11
	Sta 1	1620	6.14
	Sta 14	3000	11.36
	Hilo	1200	4.55
Stations:		Hrs/ea	
MOORINGS	12	22	11.00
"VISIT"	2	4	0.33
TOTAL LEG 1			33.38
Leg 2	PORT/STA.	MILES	Speed Knots:
Transits:	Hilo		11
	Sta 15	600	2.27
	Sta 21	1200	4.55
	Hilo	1800	6.82
Stations:		Hrs/ea	
MOORINGS	5	22	4.58
"VISIT"	2	4	0.33
TOTAL LEG 2			18.55
TOTAL LEG 1 & 2		CRUISE DAYS	51.93
		PORT DAYS	<u>8.00</u>
			59.93 = 60
SHIP COST PER DAY:	\$16,000		\$960,000
SCIENCE COSTS	Table 4		\$179,883
TOTAL COSTS			\$1,139,883