

SHIP SCHEDULING REVIEW

Report of Meeting

27 June 1995

**National Science Foundation
4201 Wilson Boulevard, Room 730
Arlington, VA 22230**



SHIP SCHEDULING REVIEW MEETING
27 JUNE 1995
NATIONAL SCIENCE FOUNDATION, ROOM 730

A Ship Scheduling Review meeting was held at the National Science Foundation, 4201 Wilson Blvd. Arlington, VA on 27 June 1995. The meeting was opened by the Chair of the Ship Scheduling Committee (SSC), Don Moller, at 0830 hrs. Present were the SSC Vice Chair, Robert Hinton; NSF Representative, Dolly Dieter; ONR Representative, Annette DeSilva; NOAA Representative, Scott McKellar and UNOLS Executive Secretary, Jack Bash. Also present were Rose Dufour, Scripps; Elizabeth Rios, Scripps; Norman Cherkis, NRL; Pat Dennis, USN/JOI; Captain Martin Mulhern, NOAA; Paul Dauphin, NSF; Geoffrey Johnson, Department of Commerce; and Mary D'Andrea, UNOLS (*Appendix I*).

UNOLS ship schedulers had provided via e-mail their proposed ship schedules for 1996 (also filed on Oceanic) and the estimated costs to support these schedules (see *Appendix II*). Also provided, where appropriate, were ship tracks (see *Appendix III*). The UNOLS Office developed an inventory of the ship time requests (Form 831) included as *Appendix IV*. This information was used as the basis of the review deliberations. The purpose of the deliberations was to ensure all funded science was assigned to the ship(s) that could provide the most effective and efficient platform. Recommendations for consolidation of schedules and lay-up periods were suggested in an effort to develop the most cost effective schedules possible while maintaining appropriate platforms for the science. This review was the first cut at the 1996 scheduling process. All funding decisions have not been confirmed. In some cases, additional cruises could develop. Below is a summary of the discussion concerning each of the ships in the order they were addressed.

LAURENTIAN - University of Michigan: The proposed cruises of Cuhel and Wimbush have been declined funding. The proposed cruise of Stoermer has been funded. The funding decision of the three Jude cruises has not yet been made. The combination of these funding decisions leaves LAURENTIAN with a very light schedule of approximately 79 days. The University of Michigan is encouraged to work with NOAA, EPA, and USGS to coordinate science programs and ship use to make the maximum efficient use of the facilities available.

BARNES - University of Washington: The proposed cruises of Devol, Jumars and Murray have been declined. A five day Murray cruise has been funded. The Kiel work remains pending. BARNES should still have a healthy schedule of about 150 days.

BLUE FIN - Skidaway: The schedule proposed for BLUE FIN should stand, with the exception of the two Wiebe cruises which were declined funding. A reasonable 115 day schedule remains.

CALANUS - University of Miami/RSMAS: The cruises of Reid and Torres have been declined funding leaving only the single 24 day cruise of Fell on the CALANUS schedule. Unless additional cruises are generated it is recommended that the Fell cruise be passed to SEA DIVER and CALANUS lay-up for 1996.

LONGHORN - University of Texas: The proposed cruise of Montagna has been declined. This leaves a light 87 days of funded cruises for LONGHORN.

PELICAN - LUMCON: The ten day cruise of Dagg has been declined funding leaving a light 80 day schedule for 1996.

CAPE HENLOPEN - University of Delaware: The five day cruise of Salmun has been declined funding. The pending Garvine and Boynton cruises have been funded and the NRL/ONR cruises remain pending but funding prospects look good. It should be noted that the NRL/ONR cruise of Marmorino is a multi-ship program that must be coordinated with the Davis NRL program. The Church work will not be funded for 1996. A healthy 203 day schedule appears likely.

EDWIN LINK - Harbor Branch Oceanographic Institution: The cruise of Young has been declined funding. The pending cruise of MacDonald should not be considered at this time. The LINK schedule is primarily dependent upon NOAA/NURP funding for 1996.

SEA DIVER - Harbor Branch Oceanographic Institution: The first Frank cruise on SEA DIVER's schedule is funded however the second one, indicated as funded, has been declined. Szmant's work also has been declined. As with LINK, the SEA DIVER schedule is dependent upon NOAA/NURP funding.

WEATHERBIRD II - BERMUDA BIOLOGICAL STATION: The cruise of Bates has been declined funding. Funding for the Sayles cruises remain pending. The OCE listed for Dickey is not valid. WEATHERBIRD II's day rate appears inordinately high at \$7435 causing the BATS work to be excessively expensive. NSF program managers continue to evaluate the days scheduled for BATS.

ROBERT GORDON SPROUL - SCRIPPS: The funding decisions for Swift, Winant, Latz and Constable remain pending. The Dorman NSF work is funded, however, the ONR work needs to be sorted out. The ONR status of Orcutt/Constable is unknown. Jaffe should be listed as P.I. for the cruise listed as Ohman which is funded. Barbara Block has requested both SPROUL and POINT SUR. POINT SUR is the preferred ship for scientific reasons, however, SPROUL is the most cost effective. Scripps and MLML should work together to resolve this problem taking into

consideration how the added days to POINT SUR's schedule will improve the day rate. SPROUL retains a solid schedule of between 140 and 155 days.

POINT SUR - MOSS LANDING MARINE LABORATORIES: POINT SUR's schedule is constructed to permit the first three months of the year to be open. This time coupled with the time in December 1995 has been set aside for a mid-life overhaul of POINT SUR. If funding does not materialize for this work the schedule will be open for additional operating time. It appears that NPS funding will again be available for POINT SUR. The Ken Smith work has not been funded and Collins will probably not have sea time. There is no information on the Noble work. Kunze has not submitted a proposal and should not be considered for 1996. The work of Barbara Block should be coordinated as discussed above. A modest schedule between 110 and 125 days should be available for POINT SUR.

ALPHA HELIX - University of Alaska: The OPP funding for the work of Hunt, Estes and Cowan will not be known for several months. Weingartner is still pending but looks promising. ALPHA HELIX should have a reasonable schedule at 145 days.

NEW HORIZON - SCRIPPS: Funding for the proposed cruises of Ken Smith has been declined. The Spiess work should probably remain on NEW HORIZON in spite of the transit time. The Webb deployment should also be considered during this time period. For efficiency of operations the Brzeninski cruise should remain on NEW HORIZON and not be scheduled aboard MOANA WAVE. The Felbeck work should remain on WECOMA and only be considered if mid-life overhaul funding does not materialize. Considering the overhaul time, a schedule of about 158 days appears good.

MOANA WAVE - University of Hawaii: MOANA WAVE's schedule is centered around the HOTS work off Hawaii. Brzeninski will be scheduled on NEW HORIZON obviating the need for the Raleigh transit cruise. It is questionable whether or not the Taylor work should go on MOANA WAVE in 1996 because of the long transits involved. Additional suitable Western Pacific work would be necessary to make this cost effective. The Murray work could be a possibility and should be pursued through discussions with UW.

WECOMA - Oregon State University: Funding declines were announced for K. Smith, Banse, Trehu, and Chave. The proposed cruises of Siebenaller and Barth are funded. Richardson is pending, but looks promising for 33 days. There is no information on the Huyer cruise. The Webb recovery cruise needs to go 90 days after the deployment cruise (October seems most likely). The Felback cruise is dependent on the French and could be delayed. If NEW HORIZON does not get funded for a mid-life overhaul the Felback cruise will need to be re-evaluated for the most cost effective option. Based on the above information OSU should package the remaining work such that it is concentrated in a contiguous period for maximum efficiency with the potential of a partial lay-up in the year. A 125 day operating year is likely.

ENDEAVOR - University of Rhode Island: The DOE cruises scheduled on ENDEAVOR do not look promising and should not drive scheduling of other funded cruises. The CM&O Experiment tightly couples the schedules of ENDEAVOR, OCEANUS and SEWARD JOHNSON. The approximately 110 days of funded work on ENDEAVOR should be scheduled to permit the maximum lay-up at the end of the year. Possible additional work could come from funded Corliss work and remnants of the CAPE HATTERAS schedule. It was noted that Rossby may not be going on HUDSON as originally planned and could possibly be an additional cruise for ENDEAVOR or OCEANUS.

OCEANUS - Woods Hole Oceanographic Institution: The funding for the Waterbury work has been declined. As with ENDEAVOR, the DOE work should not drive scheduling decisions because of the low probability of its being funded. Funding for the Martin work remains pending. The Chave (WOCE) work will not exceed 30 days if funded. Approximately 145 days of ship time remain for OCEANUS. This should be concentrated in the later part of the year of 1996. OCEANUS is expected to be laid up in late 1995 and the first several months of 1996. Scheduling of the three Corliss cruises should be coordinated with ENDEAVOR, also some of CAPE HATTERAS' work could be appropriate for OCEANUS. It was noted the Chisholm will probably need 14 days rather than the 11 scheduled.

SEWARD JOHNSON - Harbor Branch Oceanographic Institution: The Cowen cruise has been funded permitting a solid schedule for the first half of the year. As noted above with ENDEAVOR and OCEANUS, the DOE work does not look promising at this time. Add 14 days of the pending NRL work for Saunders. It appears more cost effective to transfer the fall GLOBEC work to OCEANUS or ENDEAVOR. SEWARD JOHNSON should be scheduled for about 220 days in 1996. If the DOE funding falls out the second Capone work should be scheduled.

CAPE HATTERAS - Duke/UNC: Funding for the Riggs work has been declined. Because of the very weak schedule, CAPE HATTERAS should plan for a year's lay-up. Cutter, Martens and Friedrichs could be postponed or transferred to other ships. The Davis work needs to be coordinated with the NRL work of Marmorino on CAPE HENLOPEN.

GYRE - Texas A & M University: The work of Powell and Phillips has been declined. The Owens work is pending and the Nittrouer cruise should be scheduled aboard WECOMA. The work of Bryant/Silva is also pending. The funding status of the NOAA Wellington work is unknown.

Large ship considerations: Considerable discussion centered around the large ship schedules. Driving the concern was the coordination of the research tools to be used. Specifically, the coordination of HMR-1, OBS instruments and ARGO-

II/JASON/AMS-120 vehicles. The schedules recommended below were predicated on coordination of these three facilities.

EWING - Lamont Doherty Earth Observatory: EWING has the strongest schedule in the UNOLS fleet. Funding for Toomey and the first Detrick cruise has been declined. The cruises of Boucot, Hall and Zelt will likely be submitted for the next panel and would be considered for 1997. If necessary Ryan could go aboard KNORR. The remainder of the schedule remains firm with approximately 300 operating days. To aid in the coordination of the OBS instruments and HMR-1 the schedule review group considered this schedule as in-place and adjusted the remaining large ship schedules around that of EWING. EWING will have approximately 300 operating days in 1996.

KNORR - Woods Hole Oceanographic Institution: KNORR completes its WOCE work in Mombasa in January 1996 and will work its way back to Woods Hole through the Atlantic. The cruises of Madsen and Michael are totally dependent on the full operational capability of Sea Beam. If the software problem with Sea Beam is not corrected by this time, these cruises will be assigned to another ship, probably THOMPSON. After Michael, KNORR will do the Cutter then Fornari work. Because the funding for Klinkhammer has been declined, KNORR will proceed to Woods Hole for shipment of JASON to Seattle and THOMPSON. If the Ryan work materializes KNORR will be considered for this cruise. There is also a potential for NUWC work in the Eastern Atlantic. It is unlikely that KNORR will be in position to do the Silva work in the Gulf if it were to be funded. KNORR will stand down upon returning to Woods Hole. Approximately 220 operating days are expected for KNORR in 1996.

THOMPSON - University of Washington: THOMPSON is scheduled to do the work of Devol then Hodell south of Capetown. From here the ship could go east or west to return to Seattle. The preferred route is east to possibly pick up the Murray work. This work, including its State component, will end in Papeete where the Forsyth MELT cruise will follow ending in San Diego. After MELT, THOMPSON will drop off the OBS then transit to Seattle. JASON will be picked up in Seattle for the Johnson/Tivey cruise in the Juan de Fuca area. The ship is scheduled for State work after this. The cruises of Lilley and Delaney have been declined. UW should work with the Navy for possible survey work. THOMPSON will have approximately 210 operating days in 1996.

MELVILLE - SCRIPPS: MELVILLE is expected to start the year with Sempere then Kevin Johnson's cruise. Bloomer's cruise would be next then transit to Hawaii. The Orcutt work will be done out of Honolulu. The timing for this work is critical in that there is a deployment on the first cruise then a pick up three months later. Several issues need to be resolved. Is MOANA WAVE capable of the pick up? If it is necessary to use MELVILLE, can the pick up wait five months? Answers to these questions will suggest whether Orcutt's deployment cruise goes early (before the stand down in Hawaii) or at the end of the stand down period. The later deployment option

would suggest MELVILLE would return to Hawaii after completing the MacDonald and Lonsdale cruises. Haymond should probably go in early 1997 to permit adequate time for JASON and crew to complete the Johnson work on THOMPSON. The operating days for 1996 are about 280.

REVELLE - SCRIPPS: The REVELLE schedule was not addressed by the Review group.

ATLANTIS II - Woods Hole Oceanographic Institution: Don Moller presented a schedule for AII which included a six month stand down at WHOI the first half of 1996. During this time ALVIN would be overhauled. The schedule went on to show ALVIN dives in the Atlantic, the Pacific off San Diego, then northern EPR. AII completes 1996 in Panama. It was noted by Dolly Dieter that the science programs, specifically those of Craig Smith and DeMaster, require that they be completed in early (Jan/Feb) 1996. This then reverses the plan and would have AII and ALVIN end 1995 in San Diego prepared to complete required dive programs off California and the northern EPR followed by work in the Atlantic during the first half of 1996. The ship would finish up mid-year in Woods Hole and be retired. It should be noted that the number of ALVIN dive programs and timing of cruises to be run in 1996 have not been determined. Anticipated operating days are about 120.

As a final note Marty Mulhern suggested that NOAA's DISCOVERER will be in the Eastern Pacific completing WOCE work and could possibly be available for the Murray and/or Taylor work on an exchange basis.

APPENDIX I

ATTENDEES

<u>NAME</u>	<u>INSTITUTION/ ORGANIZATION</u>	<u>PHONE</u>	<u>FAX</u>	<u>E-MAIL</u>
Jack Bash	UNOLS	(401) 792-6825	(401) 792-6486	unols@gsosun1.gso.uri.edu
Norman Cherkis	NRL	(202) 767-6956		cherkis@hp8c.nrl.navy.mil
Mary D'Andrea	UNOLS	(401) 792-6825	(401) 792-6486	unols@gsosun1.gso.uri.edu
Paul Dauphin	NSF	(703) 306-1577	(703) 306-0390	jdauphin@nsf.gov
Patrick Dennis	USN/JOI	(202) 653-1295	(202) 653-1435	dennisp@onrhq.onr.mil
Annette DeSilva	ONR	(401) 792-6825	(401) 792-6486	desilva@gsosun1.gso.uri.edu
Dolly Dieter	NSF	(703) 306-1577 x7233	(703) 306-0390	e.dieter@nsf.gov
Rose Dufour	UCSD/SIO	(619) 534-2841	(619) 535-1817	shipsked@ucsd.edu
Robert Hinton	U of Washington	(206) 543-5062	(206) 543-6073	hinton@ocean.washington.edu
Geoffrey Johnson	Dept. of Commerce	(202) 482-2754	(202) 482-0924	
Scott McKellar	NOAA	(301) 413-0107	(301) 413-0109	SMcKellar@RDC.NOAA.GOV
Don Moller	WHOI	(508) 289-2277	(508) 457-2185	dmoller@whoi.edu
Marty Mulhern	NOAA	(301) 413-0106	(301) 443-9399	mmulhern@banyan.doc.gov
Elizabeth Rios	UCSD/SIO	(619) 534-2841	(619) 535-1817	shipsked@ucsd.edu

APPENDIX II

SUMMARY OF SHIP USE AND COSTS YEAR: 1996

As of:6/27/95

SHIP/CLASS	NSF		NAVY		OTHER		TOTAL		DAILY RATE			
	DAY	\$	DAY	\$	DAY	\$	DAY	\$				
R. REVILLE							0	0	#DIV/0!			
MELVILLE	300	5,304	0	0	0	0	300	5,304	17,680			
KNORR	253	4,175	0	0	0	0	253	4,175	18,502			
ATLANTIS II	151	2,643	0	0	14	245	165	2,888	17,503			
EWING	302	4,730	0	0	4	630	306	5,360	17,516			
T.G. THOMPSON	231	3,705	11	176	44	706	286	4,587	16,038			
MOANA WAVE	184	2,263	0	0	20	278	184	2,539	13,799			
CLASS II	1,401	22,820	0	11	176	0	82	1,857	0	1,494	24,853	-
AVE: (7)	200	3,260	0	2	25	0	12	265	0	213	3,550	-
EDWIN LINK	49	392	0	0	152	1,216	201	1,608	8,000			
ENDEAVOR	148	1,421	50	480	64	614	262	2,515	9,599			
OCEANUS	150	1,290	58	499	53	456	261	2,245	8,602			
GYRE	95	599	41	258	65	410	201	1,287	6,303			
ISELIN	0	0	0	0	0	0	0	0	NA			
NEW HORIZON	162	1,841	6	61	17	172	185	1,874	10,130			
SEWARD JOHNSON	216	1,944	37	333	36	324	289	2,601	8,000			
WECOMA	109	1,254	93	1,069	0	0	202	2,323	11,500			
CLASS III	929	8,541	0	285	2,700	0	387	3,192	0	1,601	14,433	-
AVE: (8)	116	1,068	0	36	338	0	48	399	0	200	1,804	-
PELICAN	24	89	0	0	66	245	90	334	3,711			
LONGHORN	73	292	0	0	32	128	105	420	4,000			
POINT SUR (a)(b)	80	443	42	310	39	281	140	1,034	9,462			
CAPE HATTERAS	17	192	42	474	29	327	88	993	11,284			
ALPHA HELIX	80	803	14	141	51	612	145	1,456	10,043			
R. SPROUL	91	532	23	134	26	152	140	818	5,843			
CAPE HENLOPEN	170	935	38	209	0	0	208	1,144	5,500			
WEATHERBIRD II	229	1,425	0	0	0	0	229	1,425	6,223			
SEA DIVER	24	96	0	0	74	296	98	392	4,000			
CLASS IV - TOTAL	768	4,807	0	159	1,268	0	316	1,941	0	1,243	8,016	-
AVE: (9)	85	534	0	18	141	0	35	216	0	138	891	-
BLUE FIN	123	210	0	0	0	0	123	210	1,707			
LAURENTIAN	103	375	0	0	15	55	118	430	3,644			
BARNES	168	173	20	21	17	18	205	212	1,034			
CALANUS	24	72	0	0	10	30	34	102	3,000			
CLASS IV TOTAL	418	830	0	20	21	0	42	103	0	480	954	-
AVE: (4)	105	208	0	5	5	0	11	26	0	120	239	-
Fleet Total	3,516	36,998	0	475	4,165	0	827	7,093	0	4,818	48,256	-
AVE: (28)	126	1,321	0	17	149	0	30	253	0	172	1,723	-

NOTES: a. NPS (CNOC) days only

b. A 9 month operating schedule is available at a reduce costs.

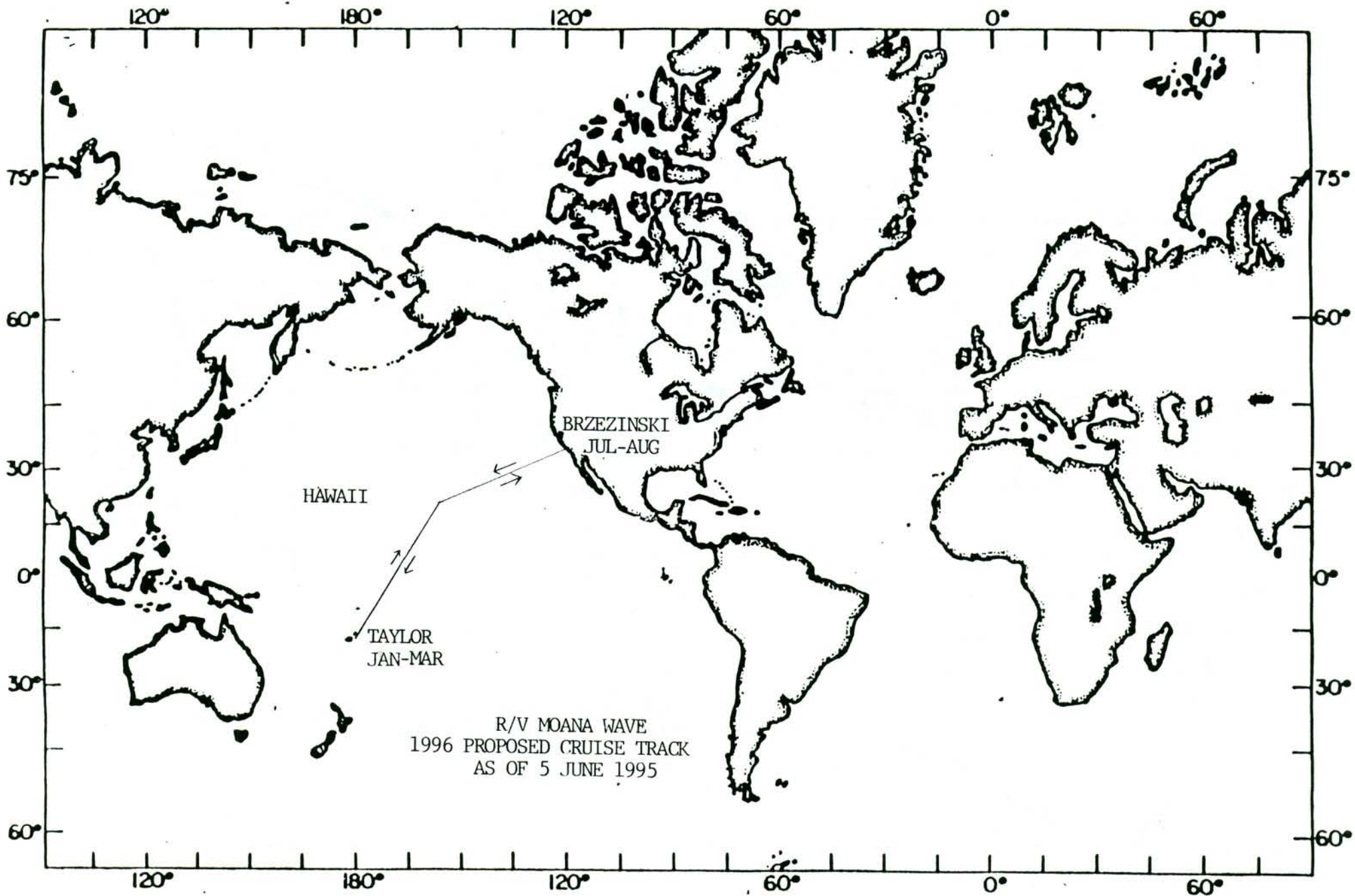
SUMMARY OF SHIP USE AND COSTS YEAR: 1995

As of: 6/27/95

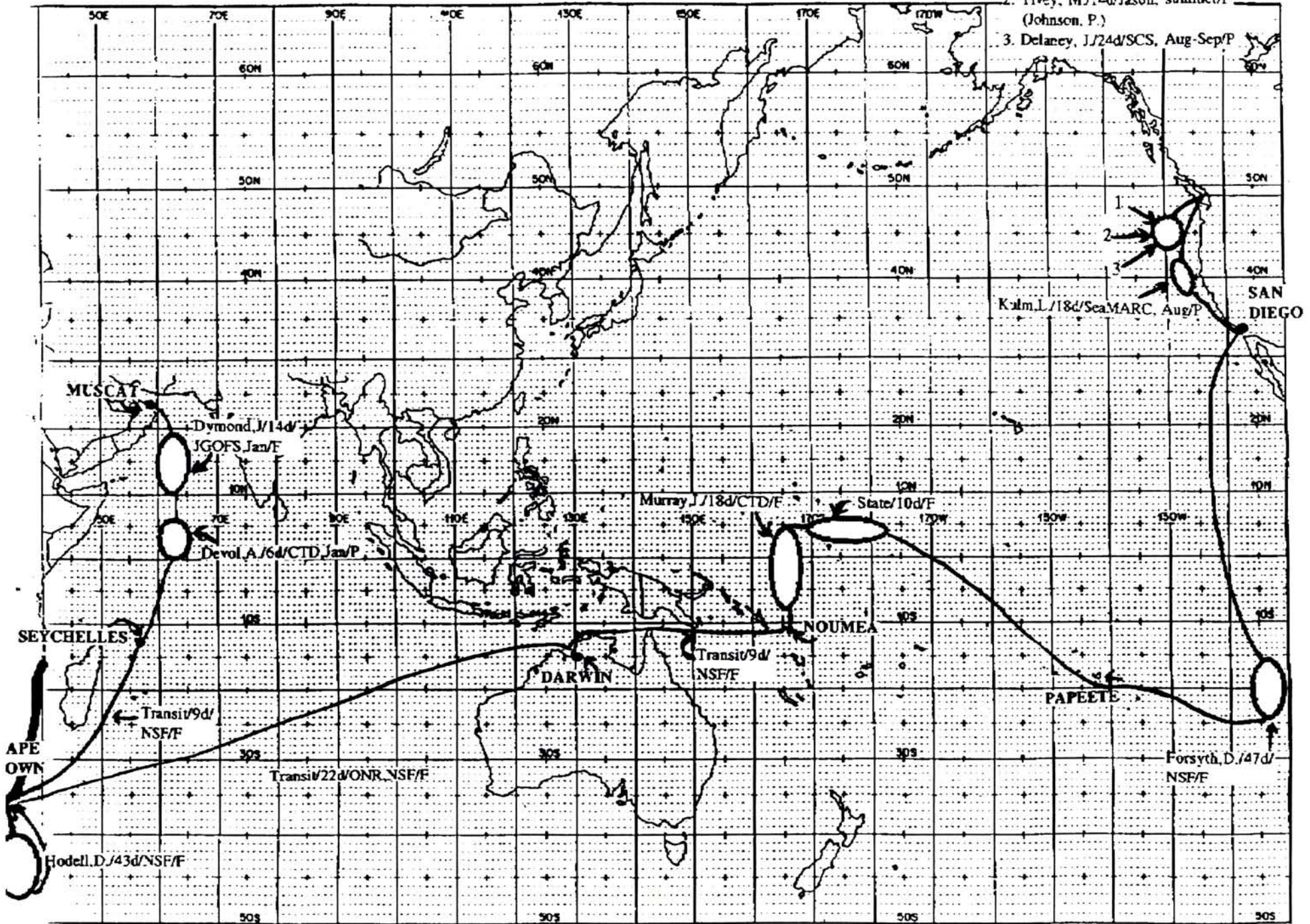
SHIP/CLASS	NSF		NAVY		OTHER		TOTAL		DAILY RATE			
	DAY	\$	DAY	\$	DAY	\$	DAY	\$				
MELVILLE	256	4,309	36	608	6	84	297	4,999	16,832			
KNORR	349	5,059	0	0	0	0	349	5,059	14,496			
ATLANTIS II	296	3,923	1	13	22	292	319	4,228	13,254			
EWING	284	4,279	0	0	25	377	309	4,856	15,068			
T.G. THOMPSON	219	3,073	112	1,572	0	0	331	4,645	14,033			
MOANA WAVE	182	2,129	0	0	28	328	210	2,457	11,700			
CLASS II	1,586	22,772	0	149	2,191	0	80	1,081	0	1,815	26,044	--
AVE: (6)	264	3,795	25	365	13	180	303	4,341	--	--		
EDWIN LINK	12	90	0	0	168	1,260	180	1,350	7,500			
ENDEAVOR	191	2,015	37	390	0	0	228	2,405	10,548			
OCEANUS	124	1,127	66	599	3	27	193	1,753	9,083			
GYRE	0	0	16	101	133	838	149	939	6,302			
ISELIN	0	0	0	0	0	0	0	0	NA			
NEW HORIZON	190	1,834	7	67	40	386	237	2,287	9,850			
SEWARD JOHNSON	116	986	48	409	66	561	230	1,955	8,500			
WECOMA	74	1,048	75	1,062	0	0	149	2,110	14,181			
CLASS III	707	7,100	0	249	2,627	0	410	3,072	0	1,366	12,799	--
AVE: (8)	88	888	0	31	328	0	51	384	0	171	1,600	--
PELICAN	0	0	0	0	158	711	158	711	4,500			
LONGHORN	43	172	8	32	21	84	72	288	4,000			
POINT SUR (a)	106	694	38	249	24	157	168	1,100	6,548			
CAPE HATTERAS	152	1,110	17	136	19	323	188	1,569	8,346			
ALPHA HELIX	89	862	19	194	50	501	158	1,547	9,789			
R. SPROUL	104	578	40	222	37	206	181	1,006	5,558			
CAPE HENLOPEN	173	955	25	138	0	0	198	1,093	6,520			
WEATHERBIRD II	156	1,160	1	7	2	15	159	1,182	7,435			
SEA DIVER	35	133	0	0	93	353	128	486	3,800			
CLASS IV - TOTAL	858	5,664	0	148	968	0	404	2,350	0	1,410	8,982	--
AVE: (9)	95	629	0	16	108	0	45	261	0	157	998	--
BLUE FIN	137	214	0	0	12	19	149	233	1,564			
LAURENTIAN	93	400	0	0	0	0	93	400	4,301			
BARNES	57	96	0	0	21	35	78	131	1,679			
CALANUS	65	192	5	15	15	44	85	251	2,950			
CLASS IV TOTAL	352	902	5	15	48	98	405	1,015	--			
AVE: (4)	88	225	1	4	12	25	101	254	--			
Fleet Total	3,503	36,438	0	551	5,801	0	942	6,601	0	4,996	48,840	--
AVE: (27)	130	1,350	0	20	215	0	35	244	0	185	1,809	--

NOTES: a. NPS (CNOC) days only

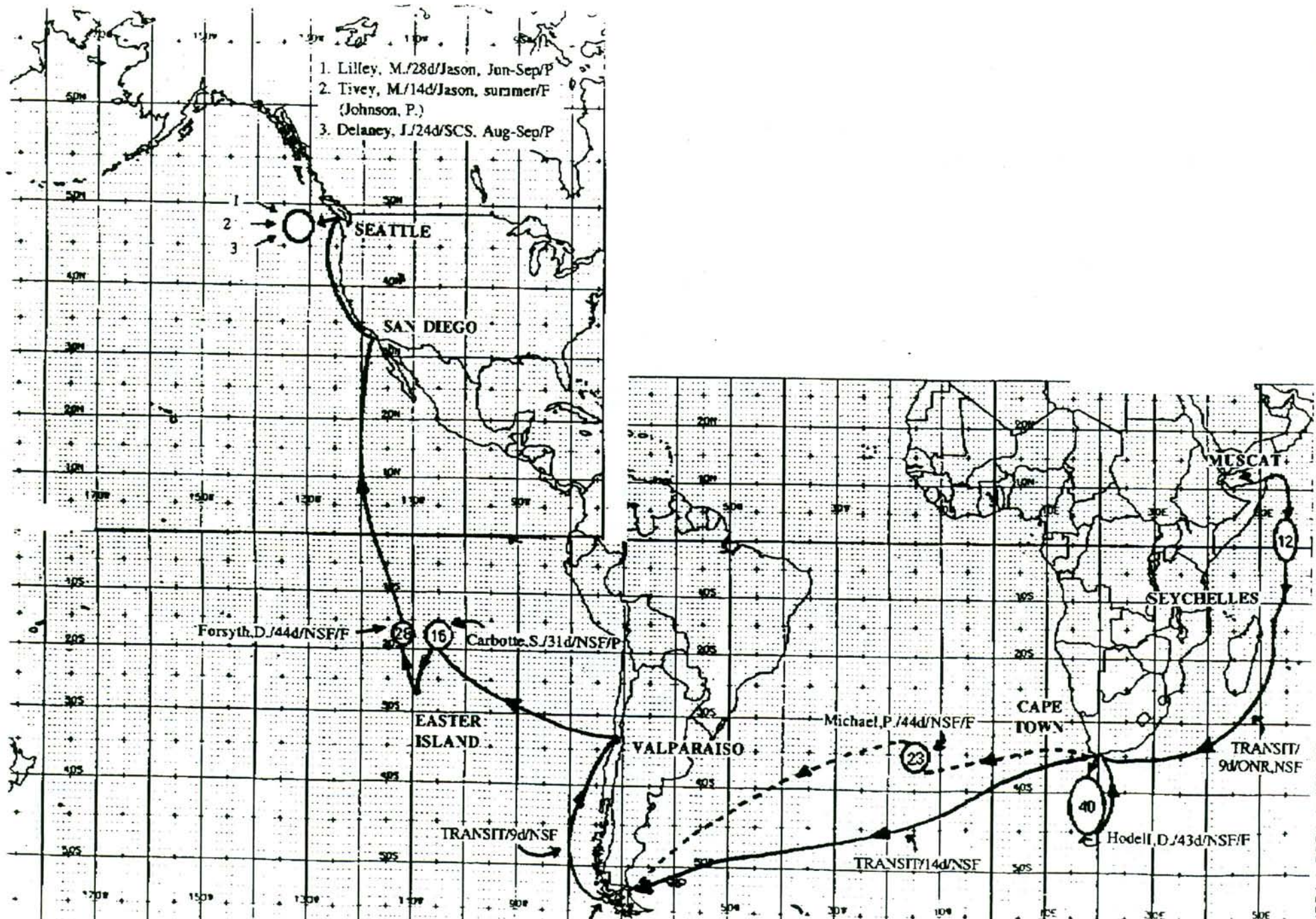
APPENDIX III



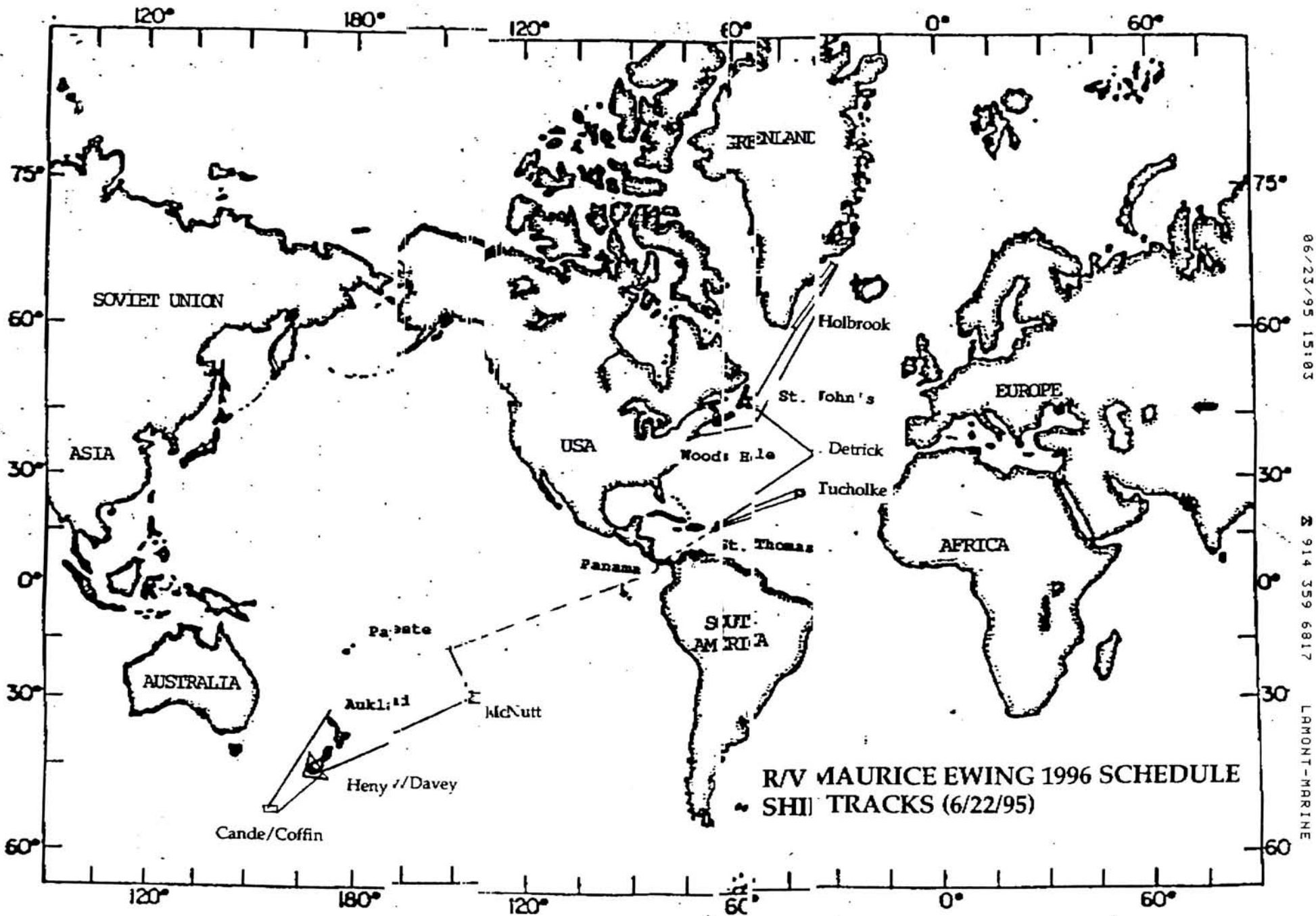
-1996- THOMPSON



-1996- THOMPSON (alternate)

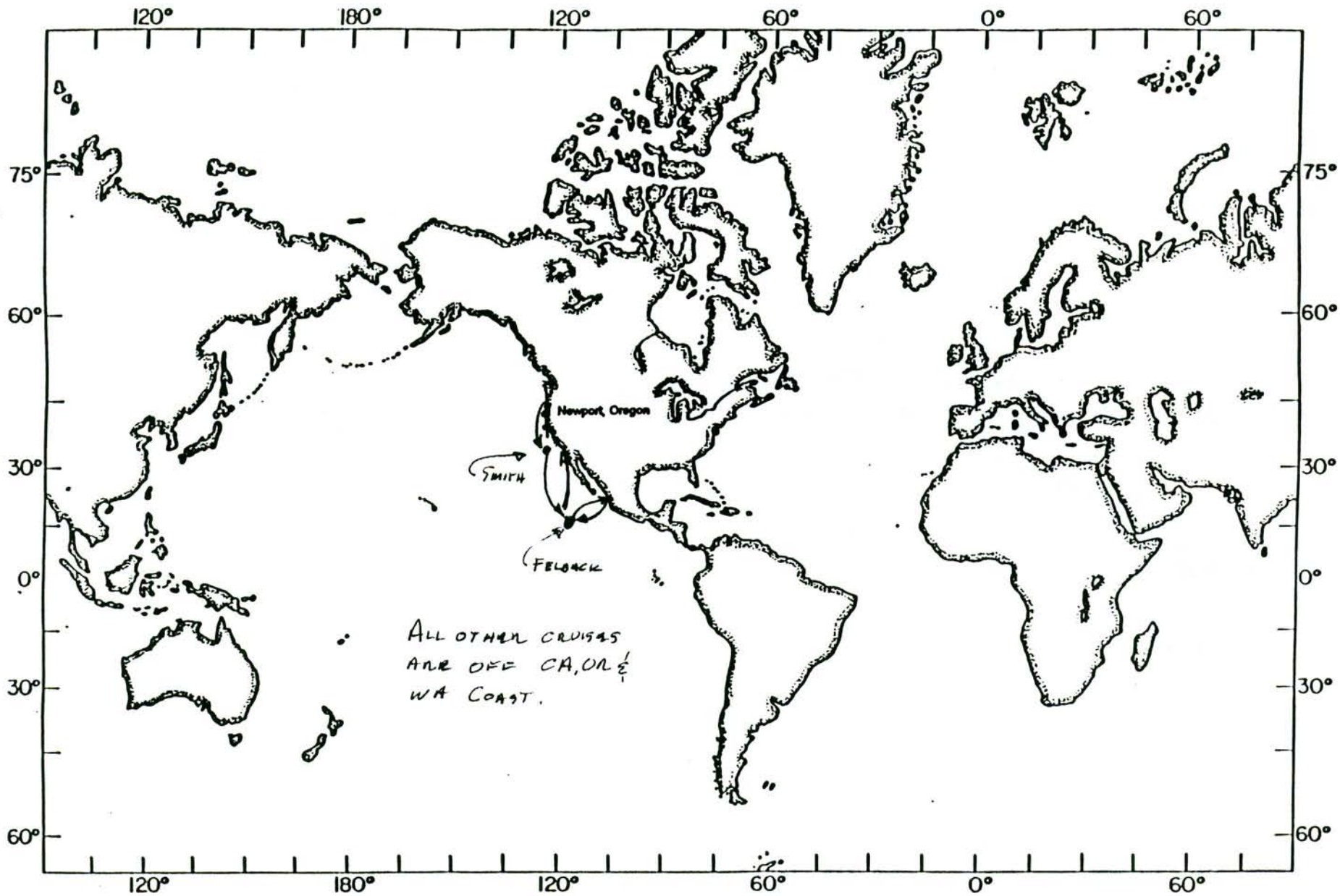


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R/V MAURICE EWING 1996 SCHEDULE
 SHI TRACKS (6/22/95)

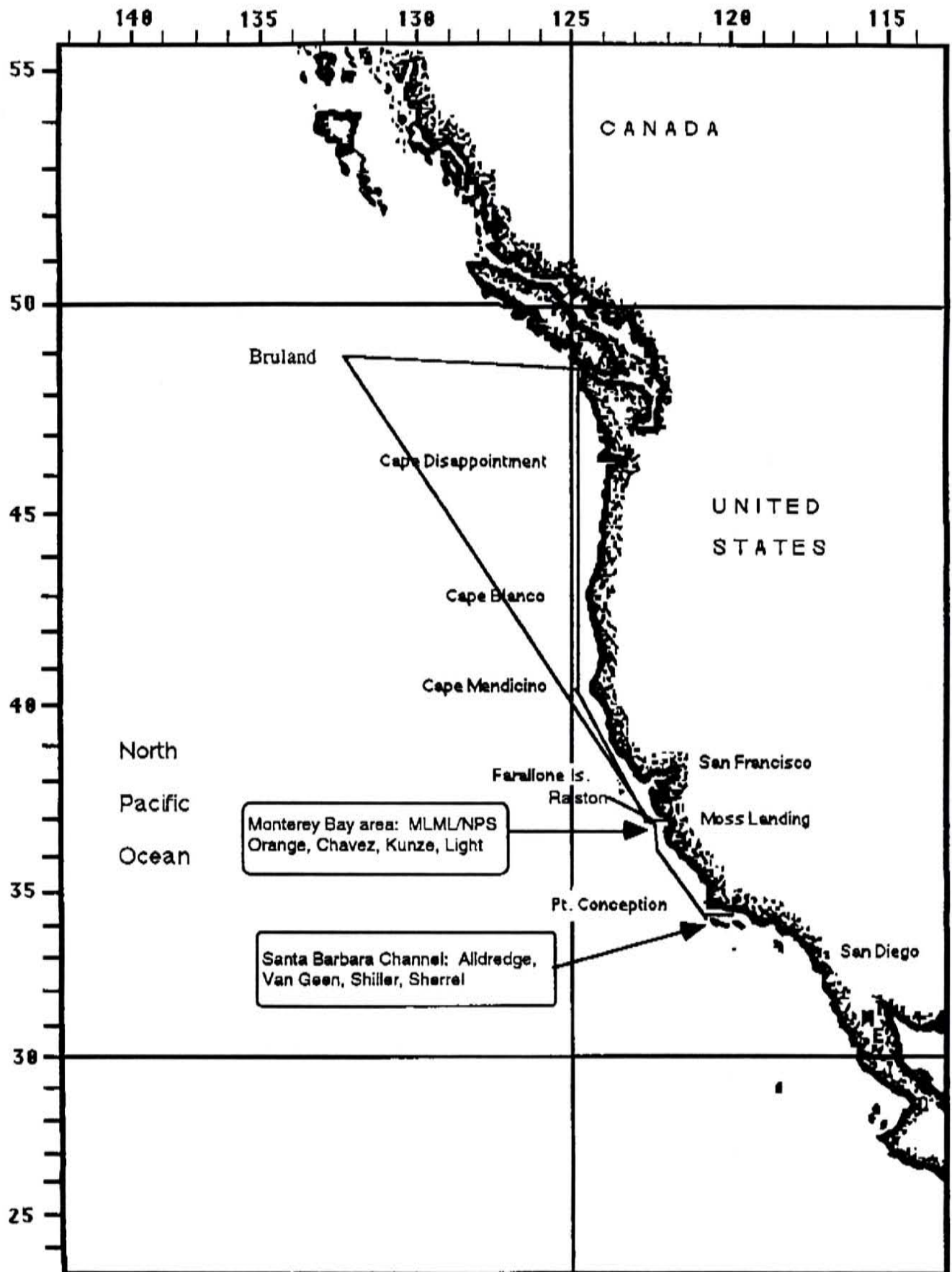
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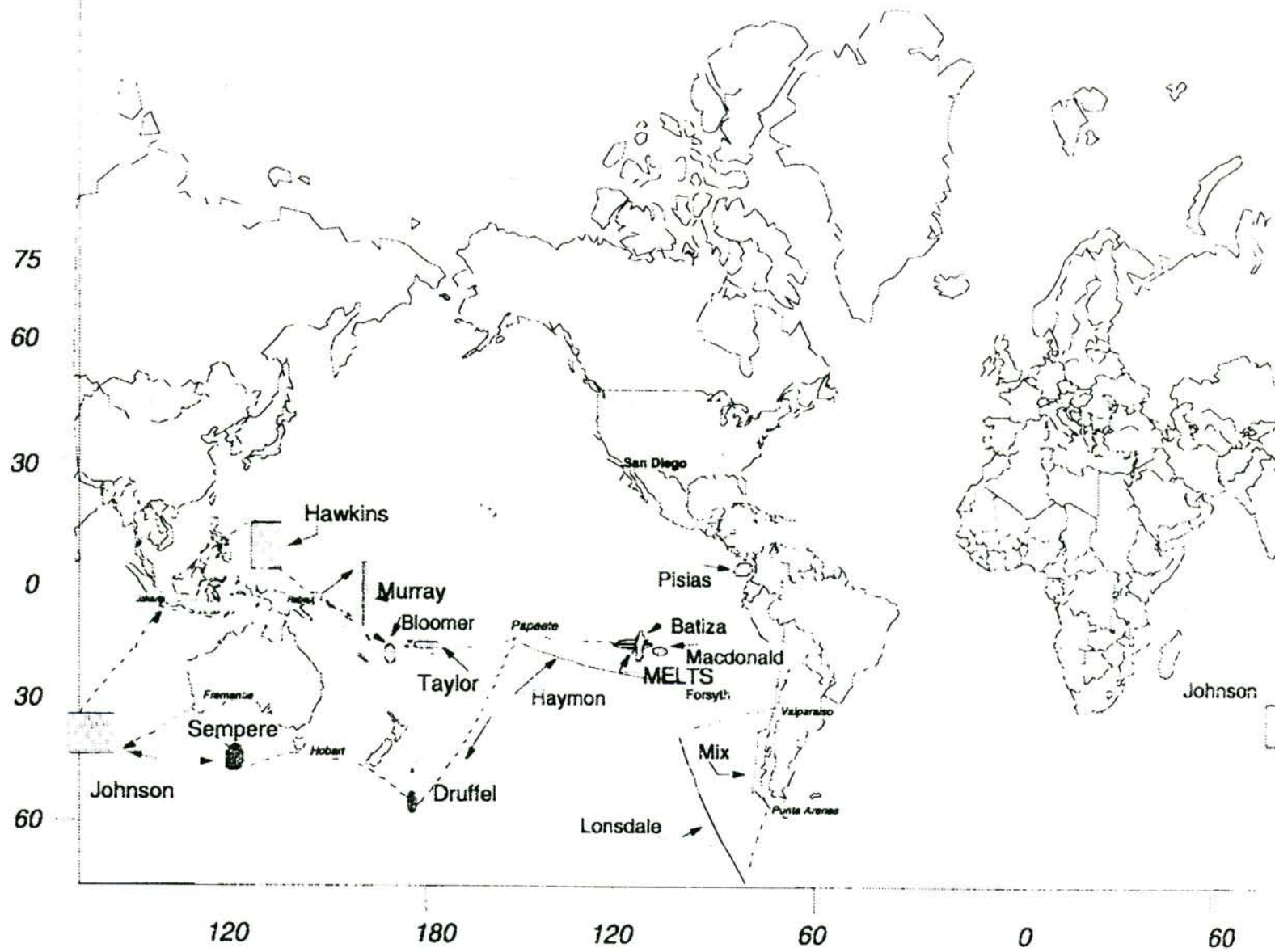


1996
PROPOSED CRUISE TRACKS
R/V WECOMA
OREGON STATE UNIVERSITY

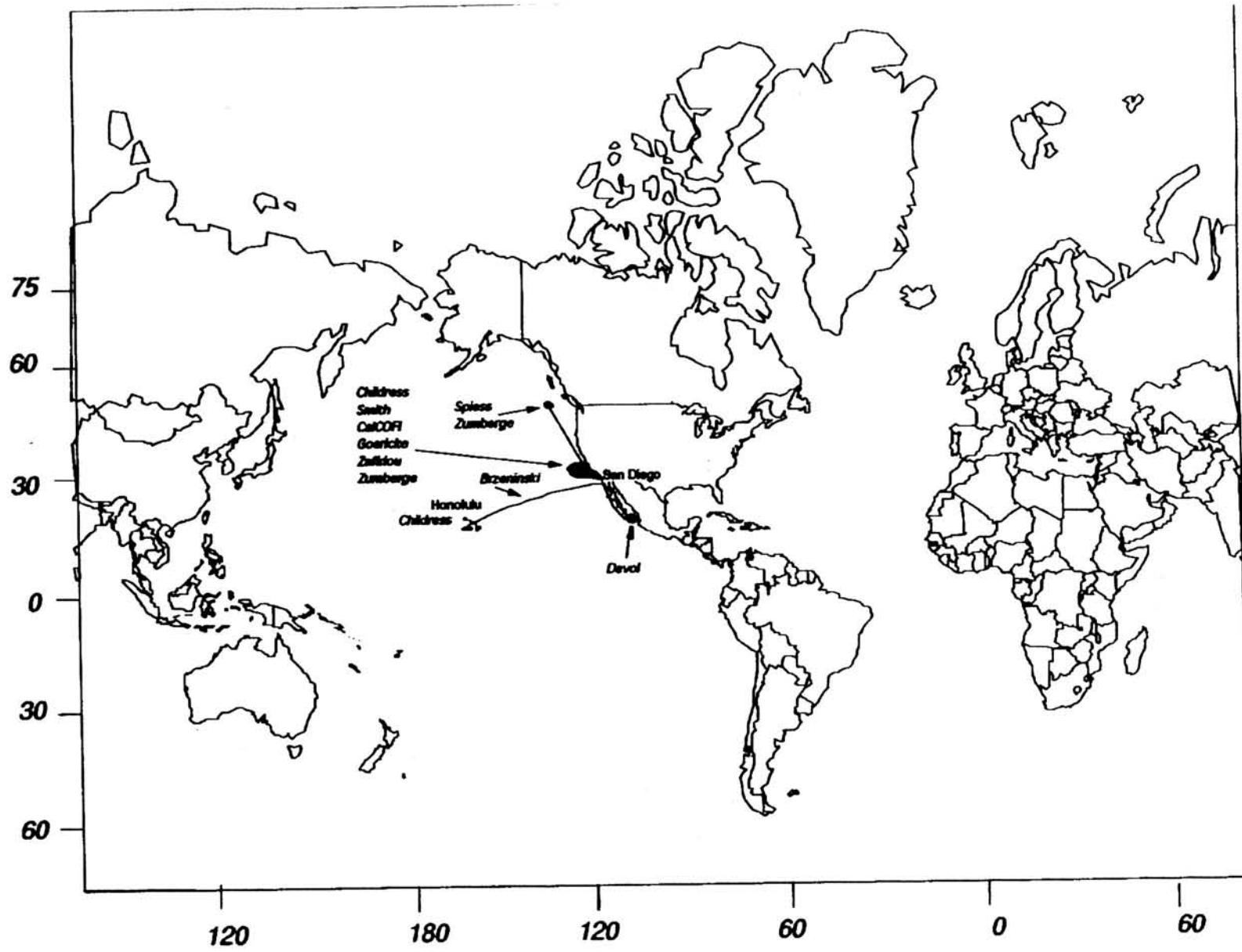
Moss Landing Marine Labs

1996 R/V POINT SUR Cruise Tracks



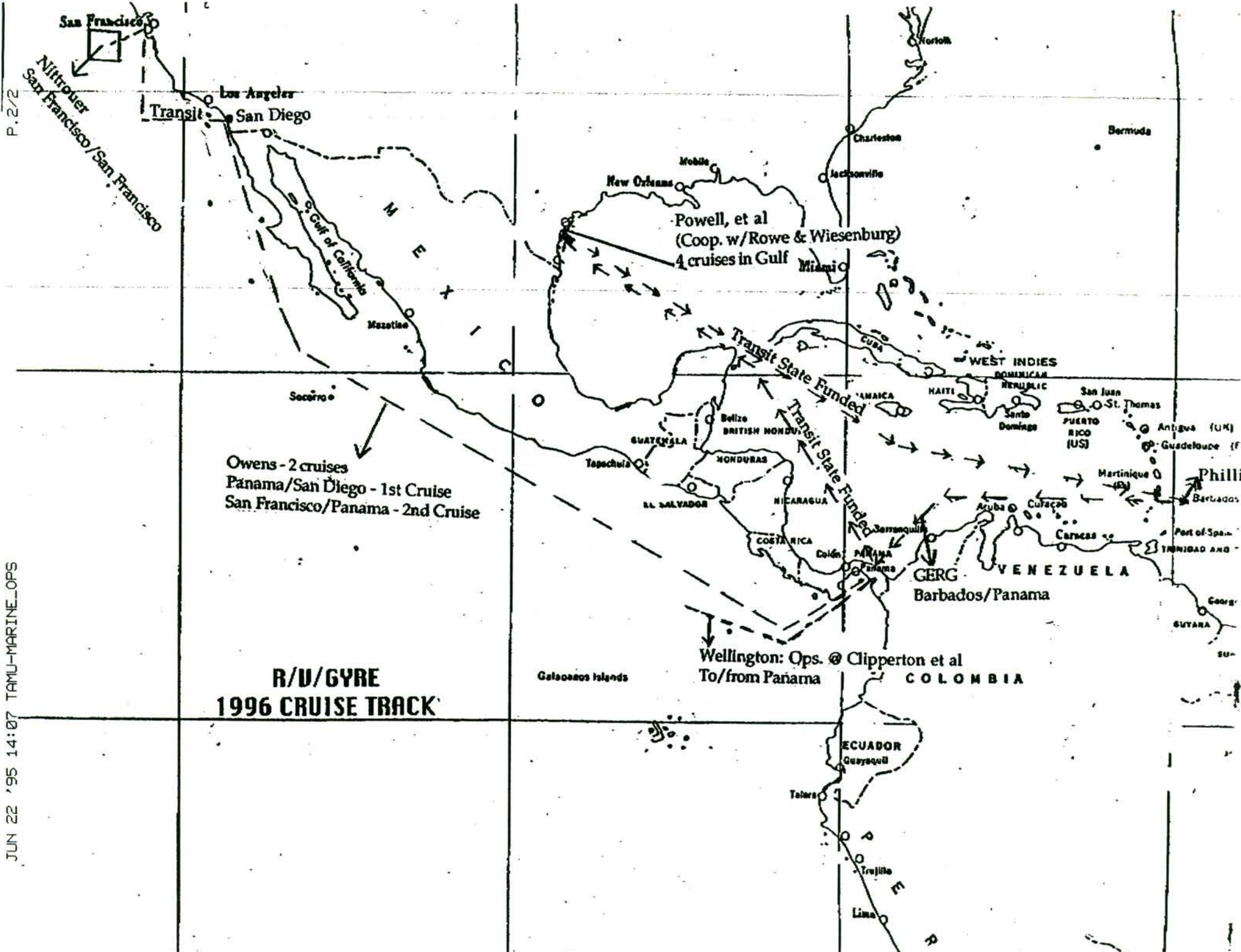


R/V Melville Late 95/96
 Scripps Institution of Oceanography

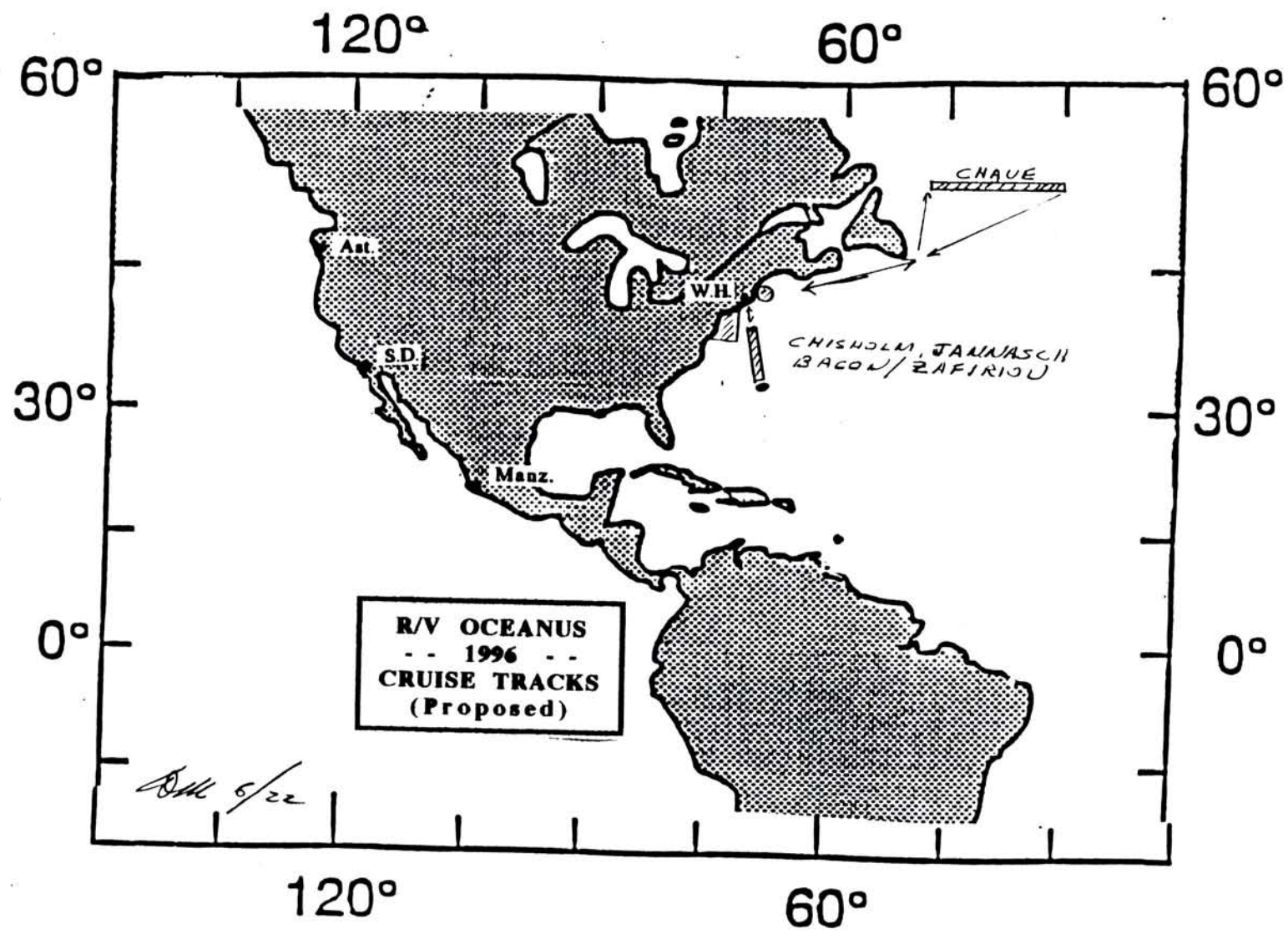


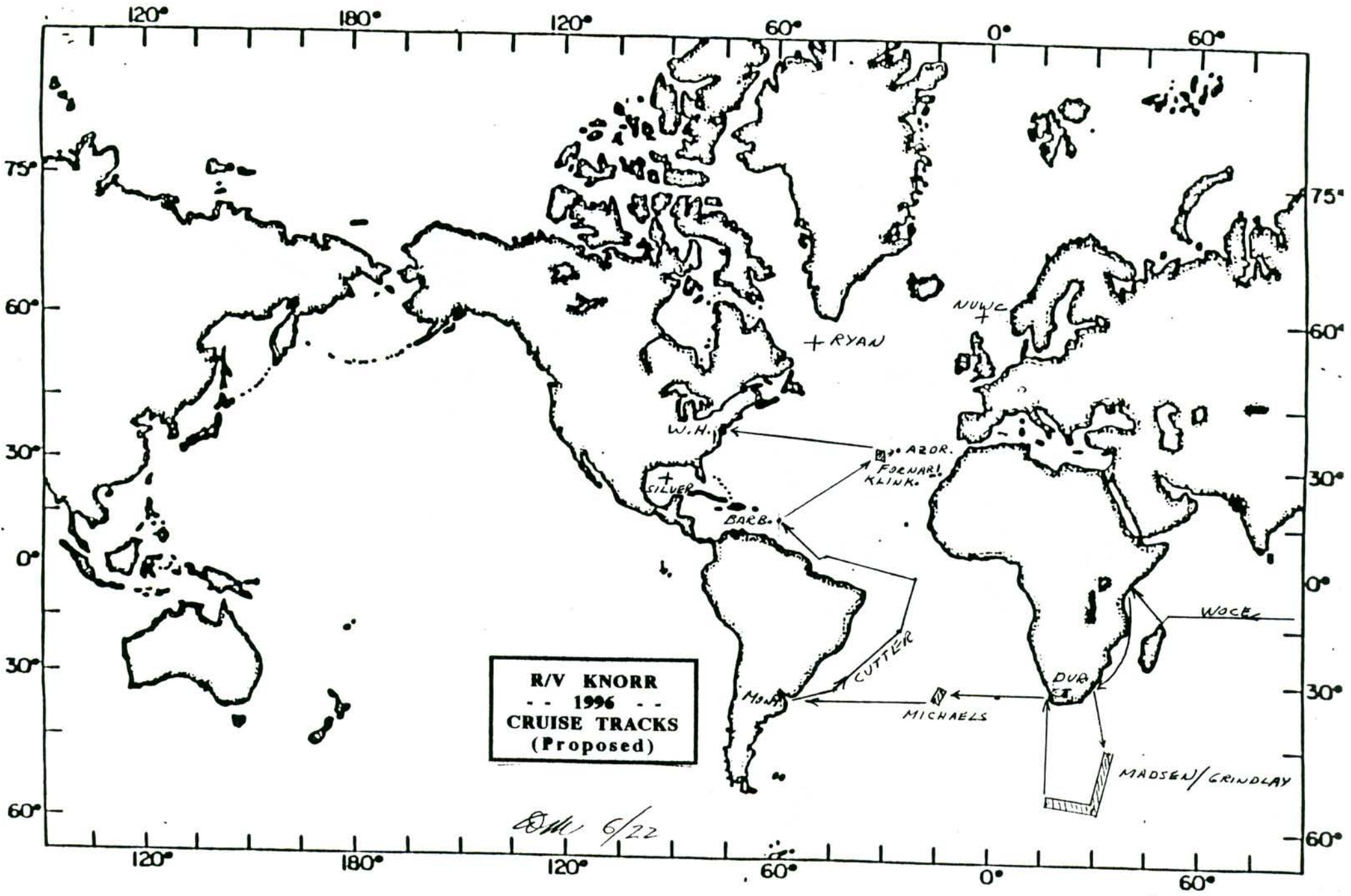
R/V New Horizon 96
Scripps Institution of Oceanography

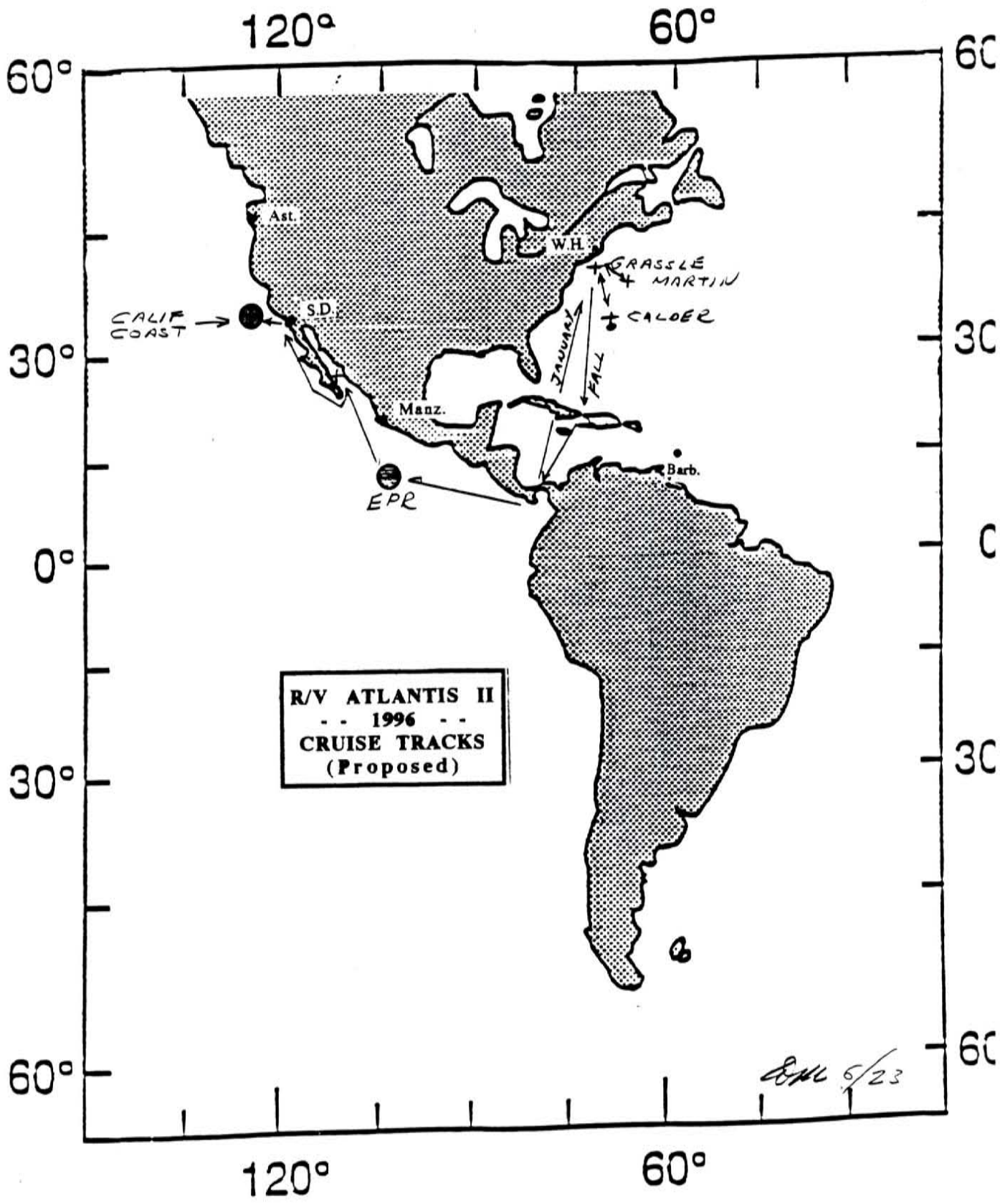
updated June 19, 1995



**R/V/GYRE
1996 CRUISE TRACK**







APPENDIX IV

PI	INSTITUTION	AREA	SHIP REQUESTED	OPTIMUM	SOURCE/ FUNDING	DAYS
				1996 DATES		
Aller, R*	STONY BROOK	NA10	SEWARD JOHNSON	FEB-MAR	NSF/CHEM	14
Allredde, A*	UCSB	NP13	POINT SUR	JUN-JUL	NSF/CHEM	10
Allison, M	WHOI	NA10	CAPE HATTERAS	FEB	NSF/MGG	14
Allison, M	TAMU	NP6	BARNES	NOV95/JAN96	NSF/MGG	4
Amerman, J	TAMU	NA6	CAPE HATTERAS	FEB	NSF/CHEM	10
Amerman, J	TAMU	NA6	CAPE HATTERAS	AUG	NSF/CHEM	7
Amerman, J*	TAMU	NA6	WEATHERBIRD II	AUG	NSF/BIO	10
Bacon/Francisa*	WHOI	NA6	OCEANUS	JUL/AUG	NSF/CHEM	10
Badley, M*	DEL	NA6	CAPE HENLOPEN	TBD	ONR	16
Bailey, T	HBOI	NA9	JOHNSON/LINK	MAY	NSF/BIO	12
Banse, K*	UM	NP9	WECOMA	SEP/OCT	NSF/BIO	20
Banse, K	UM	NP9	MEDIUM	JUL	NSF/BIO	9
Barth, J*	OSU	NA6	ENDEAVOR	AUG-SEP	ONR	21
Barth, J*	OSU	NP9	WECOMA	MAY	ONR	3
Beardsley, R**	WHOI	NA6	ENDEAVOR/OCE	SEP	ONR	22
Becker, K	MIAMI	NA6	ATLANTIS II	SPR/SUM	NSF/ODP	3
Behrens, W	UT	NA9	GYRE	MAY/JUN	NSF/MGG	20
Behrens, W	UT	NA9	GYRE	SEP	NSF/MGG	12
Benfield, M	WHOI	NA6	CAPE HATTERAS	MAR/JUN	NSF/BIO	28
Bernhard, J*	WADSWORTH	NP9	SPROUL	OCT	NSF/BIO	2
Biesiot, P	U OF S M	NA6	CAPE HATTERAS	SEP	NSF/BIO	2
Blough, N**	U MD	NA6	CAPE HENLOPEN	JUN&AUG	ONR	10
Boucot, A*	OSU	NA4	EWING	JUL/AUG	NSF/MGG	18
Boynton, W*	U MD	NA6	CAPE HENLOPEN	MAR-OCT	NSF/LMER	39
Brown, K	SCRIPPS	NP13	MELVILLE	SUMMER/FALL	NSF/MGG	12
Brown, K	SCRIPPS	NP9	SPROUL	SPRING/SUM	NSF/MGG	2
Brown, W	UNH	NA6	OCEANUS/END	DEC95	NSF/PHY	4
Brown, W	UNH	NA6	OCEANUS/END	FEB & SEP	NSF/PHY	8
Bruland, K*	UCSC	NP9	POINT SUR	JUN-JUL	NSF/CHEM	28
Burdick, D*	ODU	NA6	CAPE HENLOPEN	APR	NSF/CHEM	4
Buskey, E*	UT	NA9	LONGHORN	MAY	NSF/BIO	7
Butler, R	???	NP9	MELVILLE	JUL	NSF/OTECH	18
Cai/Sayles	WHOI	NA6	MEDIUM	MAR/APR	NSF/CHEM	10
Cai/Sayles	WHOI	NA6	MEDIUM	AUG	NSF/CHEM	10
Capone, D*	U MD	NA9/10	SEWARD JOHNSON	AUG-OCT	NSF/BIO	20
Carbotte, S	LDEO	SP3	EWING	APR ON	NSF/MGG	29
Cary/Stein	DEL	NP13	ATLANTIS II	APR ON	NSF/BIO	5
Catibovic, J	WHOI	NP6	ATLANTIS II	JUN/SEP	NSF	4
Chave, A*	WHOI	NP9	WECOMA	SEP-OCT	NSF/MGG	5
Chave, A*	WHOI	NA4	OCEANUS	OCT	NSF/PHY	33
Chilress, J*	UCSB	NP9	NEW HORIZON	WINTER&JUN	NSF/BIO	24
Chisholm, S*	MIT	NA6	OCEANUS	JUN(FROM94)	NSF/BIO	10
Chisholm, S	MIT	NA6	OCEANUS	JAN	NSF/BIO	10
Christensen, *	BIGELOW	NA6	OCEANUS	AUG-OCT	NSF/CHEM	14
Christensen, J	BIGELOW	NA6	ISELIN/ENDEAVR	JUN	NSF/CHEM	30
Christensen, J	BIGELOW	NA6	ISELIN/ENDEAVR	DEC	NSF/CHEM	30
Church, T*	DEL	NA6	CAPE HENLOPEN	SUM/SPR/FAL	NSF/CHEM	21
Cifuentes, L	TAMU	NA9	GYRE	JAN	NSF/BIO	10

Coats, D **	SMITHSONIAN	NA6	CAPE HENLOPEN	MAY/OCT	NSF/BIO	30
Cochran, K	STONY BROOK	NP11	MOANA WAVE	MONTHLY	NSF/CHEM	6
Cochran, J	LDEO	NP13	EWING	ANY	NSF/RIDGE	41
Coffin, M*	UT	SP2/NP12	EWING	APR/MAY	NSF/ODP	37
Collins, C*	NPS	NP9	POINT SUR	SEP	QMR	4
Conte, M	WHOI	NA6	WEATHERBIRD II	THRU-OUT	NSF/CHEM	18
Cook, S	HBIO	NA9	SEWARD JOHNSON	JUL	???	3
Corliss, B	DUKE	NA6	CAPE HATTERAS	SEP	NSF/MGG	10
Corliss, B	DUKE	NA6	MEDIUM/LARGE	FEB/MAY/NOV	NSF/MGG	19
Cowen, R*	STONY BROOK	NA9	SEWARD JOHNSON	APR/MAY	NSF/BIO/PH	30
Cutter, G*	ODU	SA1/2NA10/9	KNORR	MAY	NSF/CHEM	39
Cutter, G*	ODU	NA6	CAPE HATTERAS	AUG	NSF/CHEM	7
Dacey, J	WHOI	NA9	WEATHERBIRD II	SEP/NOV	NSF/CHEM	20
Dacey, J	WHOI	NA6	OCEANUS	AUG	NSF/CHEM	26
Dago, M*	LUMCON	NA9	PELICAN	JUL	NSF/BIO	10
DeGrandpre, M	WHOI	NA4	ENDEAVOR	MAR/APR/OCT	NSF/CHEM	4
DeLaney, J*	UM	NP9	THOMPSON	SUMMER	NSF/RIDGE	22
de Moustier*	SCRIPPS	NA2/AR2	NEW HORIZON	AUG	NSF/MGG	31
Detrick, R*	WHOI	NP13	EWING	ANY	NSF/MGG	35
Detrick, R*	WHOI	NA6/7	EWING	APR-JUN	NSF/RIDGE	39
Deuser, M*	WHOI	NA6	WEATHERBIRD II	MAR-NOV	NSF/CHEM	6
Devol, A*	UM	NP13	BARNES	TBA	NSF/CHEM	14
Devol, A*	UM	NP9	NEW HORIZON	FEB	NSF/CHEM	30
Devol, A*	UM	IN1	THOMPSON	JAN	NSF/CHEM	3
Dick, H	WHOI	IN4	KNORR	JAN-FEB	NSF/ODP	35
Diebold, J	LDEO	SP4	EWING	JAN-FEB	NSF/CONT D	27
Driscoll, M	LDEO	IN1	EWING	SPR/FALL95?	NSF/ODP	30
Druffel, E	UCI	IN9	MELVILLE	FEB	NSF/CHEM	33
Duodale, R	USC	NP9	POINT SUR	APR/MAY/JUN	NSF/BIO	15
Eckelbaroer, K	U OF MAINE	NA6	WEATHERBIRD II	FEB-DEC	NSF/BIO	24
Eckman, J*	SKIDAWAY	NA6	BLUE FIN	APR/JUL/SEP	NSF/BIO	60
Eckman, J*	SKIDAWAY	NA6	BLUE FIN	JUN/AUG	NSF/BIO	4
Felback, H**	SCRIPPS	NP13	NEW HORIZON/WE	TBD	NSF/BIO	56
Fenical, M*	SCRIPPS	NA9	SEWARD JOHNSON	SUMMER	NSF/CHEM	21
Fornari, D*	WHOI	NA7	KNORR	AUG-SEP	NSF/RIDGE	33
Forsyth, D*	BROWN	SP3	THOMPSON	MAY/JUN	NSF/RIDGE	48
France/Mullin	UNH/WHOI	NP8/11	X-0-X	JUL	NSF/BIO	8
Frank, T*	HBIO	NA6/9/13	SEA DIVER	FEB/OCT	NSF/BIO	7
Frank, T*	HBIO	NA6/9/13	SEWARD JOHNSON	JUN	NSF/BIO	11
Friedrichs, C*	VIMS	NA6	CAPE HATTERAS	FEB/APR/OCT	NSF/MGG	30
Gallager, S	WHOI	NA6	ENDEAVOR/OCEA	MAR	NSF/BIO	4
Gallager, S	WHOI	NA6	ENDEAVOR/OCEA	MAR	NSF/BIO	4
Garvine, R*	DEL	NA6	CAPE HENLOPEN	TBD	NSF/PHY	22
Glynn, P	MIAMI	NP13	URRZCZ	JUL	NSF/BIO	12
Goad, L*	U MICH	GL4	LAURENTIAN	JUL	NSF/TEP	9
Goericke, R*	SCRIPPS	NP9	NEW HORIZON	ANY?	NSF/BIO	2
Green, T	MUSKEGOM	GL4	LAURENTIAN	AUG	NSF/TE	3
Grego, M	UM-APL	NP9	BARNES	MAY	??	15
Grindlay, M*	U OF P R	NA9	EWING	JAN-MAY	NSF/MGG	20
Halfman, J	NOTRE DAME	GL4	LAURENTIAN	AUG	NSF/MGG	2
Hall, J*	MEMORIAL U	NA8	EWING	AUG/SEP	??	22
Hansell, D	BBS	NA6	WEATHERBIRD II	FEB-OCT	NSF/CHEM	12
Hardino, A	SCRIPPS	SP1	EWING	NOV95?	NSF/MGG	12
Henvey, T*	USC	SP5	EWING	FEB/MAR	NSF/EAR	29

Hildebrand, J	SCRIPPS	NP9	MEDIUM/LARGE	JUL	NSF/MGG	6
Hodell, D*	UFL	SA4/6	EWING/LARGE	JAN-MAR	NSF/ODP	40
Holbrook, S	WHOI	NA6	CAPE HATTERAS	OCT95?	NSF/ODP	8
Holbrook, S*	WHOI	NA1/4	EWING	SEP95?	NSF/MGG	42
Honjo, S	WHOI	IN1	THOMPSON	OCT	NSF/JGOFs	ANC
Houghton, R*	LDEO	NA6	ENDEAVOR	MAY	NSF/	6
Huaphris, S**	WHOI	NP9	THOMPSON/REV	MAY/JUN	NSF/ODP	28
Huyer, A*	OSU	NP9	WECOMA	JUL	ONR	12
Inoall, E*	UT	NA9	LONGHORN	AUG	NSF/CHEM	10
Inoall, E	UT	NP9	SMALL	MAY	NSF/CHEM	12
Jacobs, D	SCRIPPS	SA1	MEDIUM	MAR	NSF/	5
Jannasch, H	WHOI	NP13	KNORR/ALVIN/JA	DEC95/AP96	NSF/BIO	10
Johnson, K*	HAWAII	IN3/4/7	MELVILLE	DEC95/JAN96	NSF/RIDGE	50
Johnson, P	UM	NP9	BARNES	FEB/MAR	NSF/MGG	5
Johnson, P*	UM	NP8/11/12	THOMPSON	FEB/MAR	NSF/MGG	40
Johnson, P	UM	NP9	THOMPSON/JAS	SUMMER	NSF	12
Jumars, P*	UM	NP6	BARNES	EA QTR	NSF/BIO	16
Karl, D*	HAWAII	NP12/9	MOANA WAVE	MAY&JUN	NSF/BIO	56
Keil, R*	UM	NP6	BARNES	3 DAY/MO	NSF/CHEM	36
Kent, G	WHOI	NA6/7	EWING	FALL95?	NSF/RIDGE	5
Kidwell, S	U CHICAGO	NA9	URACCA	MAY	NSF/PALEO	25
Kidwell, S	U CHICAGO	NA9	URACCA	AUG/SEP	NSF/PALEO	30
Kirchman, D*	U DEL	NA6	CAPE HENLOPEN	APR/AUG	NSF/BIO	8
Klinkhammer, J	OSU	SP3	KNORR	??	NSF/CHEM	4
Knab, A*	BBS	NA6	WEATHERBIRD II	MONTHLY	NSF/CHEM	110
Kulm, V*	OSU	NP9	THOMPSON	AUG	NSF/MGG	19
Kunze, E	UM	NP9	POINT SUR	SEP/OCT	NSF/PHY	7
Lanoueir, C	LDEO	NP13	MELVILLE	ANY	NSF/MGG	35
Lasker, H	SUNY BUFFALO	NA9	URACCA	JUL	NSF/BIO	12
Latz, M*	SCRIPPS	NP9	SPROUL	MONTHLY	NSF/BIO	15
Ledwell, J*	WHOI	SA1	SEWARD JOHNSON	MAR	NSF/PHY	31
Ledwell, J*	WHOI	NA6	OCEANUS	SEP	ONR	15
Lehman, J*	U MICH	GL4	LAURENTIAN	JUN/JUL/AUG	NSF/BIO	24
Lentz, S*	WHOI	NA6	OCEANUS	JUL-AUG	ONR	15
Levine, M*	OSU	NA6	OCEANUS	JUL	ONR	6
Levine, M	OSU	NA6	OCEANUS	SEP	ONR	8
Lilley, M*	UM	NP9	THOMPSON	ANY	NSF/ODP	15
Lilley, M	UM	SP3	ATLANTIS II	JAN/FEB	NSF/RIDGE	36
Lonsdale, P*	SCRIPPS	SP9	MELVILLE	JAN	NSF/MGG	35
Luther, G*	U DEL	NA6	CAPE HENLOPEN	AUG	NSF/CHEM	8
Luyendyk, B	UCSB	SP4	EWING	APR	NSF/MGG	28
MacDonald, I*	TAMU	NA9	SEWARD JOHNSON	JUL	NSF/MGG	9
MacDonald, K*	UCSB	SP3	MELVILLE	NOV	NSF/MGG	43
Martin, W	WHOI	NA6	KNORR/ALVIN	JUL	NSF/CHEM	14
Martin, W*	WHOI	NA6	OCEANUS	JUN-OCT	NSF/CHEM	7
McCleave, J	MAINE	NA6/9	CAPE HATTERAS	FEB	NSF/BIO	30
McNutt, M*	MIT	SP2	EWING	AUSTRAL SM	NSF/MGG	46
Michael, P*	TULSA	SA1-4	KNORR	WINTER	NSF/RIDGE	41
Michaels, A	BBS	NA6	WEATHERBIRD II	MAR/APR/JUN	NSF/CHEM	20
Michaels, A	BBS	NA6	WEATHERBIRD II	MAR/MAY	NSF/CHEM	14
Mied/Marmorino	NRL	NA6	CAPE HENLOPEN	SEP	NRL	17
Miller, C*	OSU	NP9	WECOMA	MAY	NSF/TECH	1
Mitchell, G	SCRIPPS	NP9	NEW HORIZON	ANY	ONR	2

Mix, A	OSU	SP3/SP6/SP9	MEL/EWING/THOM	JAN-APR	NSF/ODP	43
Moffett, J	WHOI	NA6	OCEANUS	JAN	NSF/CHEM	7
Moffett/Busler	WHOI	NA6	WEATHERBIRD II	APR	NSF/CHEM	5
Moore, G	HAWAII	NP12	EWING	MAY-AUG	NSF/MGG	21
Morgan, J P**	SCRIPPS	NP12	M.W./N.H.	???	NSF/GEO	25
Moun, J*	OSU	NP9	WECOMA	AUG&NOV	NSF/PHY	8
Muramoto, J	WHOI	[M]	THOMPSON	JAN/FEB	NSF/JGDFS	??
Murray, J	UM	NP9	BARNES	AUG	NSF/CHEM	7
Murray, J*	UM	SP2/MP11	THOMPSON/MEL	MAR	NSF/CHEM	22
Murray, J	UM	NP9	BARNES	TBA	NSF/CHEM	25
Mutter, C	LDEO	NP10	EWING	APR	NSF/MGG	46
Mutter, C	LDEO	SP3	EWING	MAY-SEP	NSF/MGG	29
Nelson, J	SKIDAWAY	NA6	BLUE FIN	JAN/MAR	NSF/BIO	20
Nelson, N	BBRS	NA6	WEATHERBIRD II	MAY & SEP	NSF/BIO	14
Nicholson, C	UCSB	NP13	EWING	SPRING	NSF/MGG	14
Nicholson, C	UCSB	NP13	SPROUL OR NH	SPRING	NSF/MGG	11
Nittrower, C	STONY BROOK	NA6	CAPE HATTERAS	JUL-DEC	NSF/MGG	49
Nittrower, C**	STONY BROOK	NP9	WECOMA/GYRE	AUG/SEP	ONR	40
Norris, R	WHOI	[M]	THOMPSON	JAN/FEB	NSF/JGDFS	??
Olson, R	WHOI	NA6	OCEANUS	MAR	NSF/BIO	14
Orcutt/Vernon	SCRIPPS	NP11	MELVILLE	SPRING/SUM	NSF/ODP	15
Owens, D*	TAMU	NP13	GYRE	JUL & AUG	NSF/PH BEH	10
Paffenhoffer*	SKIDAWAY	NA6	BLUE FIN	ALL	NSF/BIO	48
Paul, A	ALASKA	NP6	ALPHA HELIX	AUG/SEP	NSF	21
Paul, J*	U OF SF	NA9	PELICAN	JUL	NSF	8
Pickart, R*	WHOI	NA6	ENDEAVOR	MAY & JUN	ONR	29
Pickart/Beard	WHOI	NA6	OCEANUS	MAY & JUN	ONR	29
Pilkey, D	DUKE	NA6	CAPE HATTERAS	FEB/MAR/JUN	NSF/MGG	18
Pisias, N	OSU	NP13/9	MELVILLE/THOM	ANY	NSF/ESH	30
Pratson, L	LDEO	NA9	EWING	MAR95?	NSF/MGG	20
Purdy, G	WHOI	NA10	EWING	FALL	NSF/MGG	36
Purdy, G*	WHOI	NP12	REVELLE	OCT	NSF/ODP	32
Ravizza, G	WHOI	NP9	KNORR/ALVIN	SUMMER	NSF/MGG	2
Richardson, M*	NRL	NP9	WECOMA	JUN/JUL	ONR	38
Richardson, P	WHOI	SA2	MEDIUM/LARGE	MAY/JUN	NSF/PHY	19
Riggs, S*	EAST CAR U	NA6	CAPE HATTERAS	JUL/AUG	NSF/MGG	22
Riser, S*	UM	[M]	THOMPSON	MAR	NSF/PHY	25
Rosentrantz, E	UT	NA9	EWING	NOV	NSF/MGG	30
Rosby/Prater	URI	NA4	ENDEAVOR	JUL/AUG	ONR	28
Rowe, G	TAMU	NA9	GYRE	MAY-AUG	NSF/BIO	10
Rowe, G	TAMU	NA9	LONGHORN	QUARTERLY	??	20
Royer, T*	ALASKA	NP6	ALPHA HELIX	APR/AUG/DEC	NSF/PHY	15
Salmun, H*	JOHNS HOP	NA6	CAPE HEMLOPEN	MAY/JUN	NSF/	6
Sambrolto, R	LDEO	NA6	CAPE HATTERAS	APR/MAY	NSF/BIO	21
Santschi, P	TAMU	NA9	GYRE	MAR&OCT	NSF/CHEM	20
Sawyer, D*	RICE	NA7	EWING	MAY-AUG	NSF/MGG	28
Sayles, F*	WHOI	NA6	WEATHERBIRD II	ALL	NSF/CHEM	50
Schneider, D	WHOI	NP13	ATLANTIS II	ANY	NSF/MGG	20
Sempere, J C*	UM	NA6/10	MELVILLE	ANY	NSF/RIDGE	35
Sharp, J*	DEL	NA6	CAPE HEMLOPEN	JUL	NSF/REU	3
Sharp, J*	DEL	NA6	CAPE HEMLOPEN	APR/JUL	NSF/CHEM	6
Sherrell, R	RUTGERS	NP9	POINT SUR	MAY	NSF/CHEM	2
Sherrell, R	RUTGERS	NA6	WEATHERBIRD II	AUG	NSF/CHEM	2
Shiller, P	U OF S M	NA9	PELICAN	JUN	NSF/CHEM	15

Shiller, A	U OF S M	NP9	POINT SUR	MAY	NSF/CHEM	1
Siebel, D	UCSB	NA6	WEATHERBIRD II	MAR/AUG	NSF/	12
Siebenaller, M	LSU	NP9	WECOMA	MAY	NSF/BIO	10
Sieracki, M	BIGELOW	NA6	CAPE HATTERAS	JUL	NSF	12
Silva, A	URI	NA9	LARGE/KNORR	JUL/AUG	NSF/ENG	21
Silver, E	UCSC	NP13	EWING/LARGE	APR/JUN	NSF/ODP	20
Simenstad, C*	UM	NP9	BARNES	JUL	NSF/LMER	30
Smith, C	HAWAII	NP13	ATLANTIS II	JUL-DEC	NSF/BIO	12
Smith, C	HAWAII	NP9	ATLANTIS II	JAN-AUG	NSF/BIO	2
Smith, K**	SCRIPPS	NP13	NEW H/REVILLE	FEB/JUN/OCT	NSF/	42
Soless/Hildbdt*	SCRIPPS	NP9	MELVILLE/M H	SUMMER	???	14
Stannes, K	UA	NP6	ALPHA HELIX	SUMMER	NSF/POLAR	5
Stanic, S*	NRL	NA6	OCEANUS	AUG	ONR	14
Stanton, T	WHOI	NA6	OCEANUS	MAY	NSF/BIO	12
Stephen, R	WHOI	NP13	REVELLE	OCT	NSF/ODP	30
Strom, S	WUJ	NP9/13	POINT SUR	JUN/JUL	NSF/BIO	30
Suttle, C*	UT	NA9	LONGHORN	AUG	NSF/BIO	10
Szwant, A*	MIAMI	NA9	SEA DIVER/CAL	APR/AUG	NSF/BIO	12
Tebbens, S	U OF SO FL	SP6	MELVILLE	NOV95/MAR96	NSF/MGG	40
Toole, J	WHOI	IN7	FRANKLIN	FALL	NSF/PHY	21
Toole, J	WHOI	NA6	WEATHERBIRD	OCT	NSF	3
Toomey, D*	U OF OR	NA7	EWING	JUN	NSF/RIDGE	6
Toomey, D	U OF OR	NA7	OCEANUS	DEC	NSF/RIDGE	6
Torres, J*	U OF SO FL	NA9	CALANUS	JUN-AUG	NSF?	28
Townsend, D	MAINE	NA6	ENDEAVOR	APR&MAY	NSF/BIO	20
Trehu, A*	OSU	NP9	WECOMA	AUG/SEP	NSF/MGG	6
Tucholke, B*	WHOI	NA10	EWING	JUL	NSF/RIDGE	35
Turner, R	LSU	NA9	PELICAN	JAN-OCT	NSF/LMER	96
Van Dover, C	ALASKA	NA6	ATLANTIS II	JAN/FEB	NSF/RIDGE	8
van Green, A*	LDED	NP9	POINT SUR	NOV	NSF/MGG	4
Vrijenhoek/Ltz	RUTGERS	NP9	KNORR/ALVIN	EARLY/LATE	NSF/RIDGE	19
Walsh, J	U OF S FL	NA9	ISELIN/PELICAN	FEB/MAR/APR	NSF/LMER	30
Washburn, L	UCSB	NA6	ENDEAVOR	JUN	NSF	19
Waterbury, J*	WHOI	NA6/9	OCEANUS	AUG/SEP	??	14
Webb, S*	SCRIPPS	NP9	REVILLE	AUG	NSF/ODP	7
Webb, S*	SCRIPPS	NP9	WECOMA	DEC	NSF/ODP	10
Whitledge, T*	UT	NA9	LONGHORN	JUL	NSF/REU	6
Whitworth, T	TAMU	AM2/3/4/IN	PALMER	JAN	NSF/MOCE	53
Wiebe, W*	U OF GA	NA6	BLUE FIN	MAR/JUL	NSF/BIO	10
Wimbush, M*	URI	GL4	LAURENTIAN	AUG	NSF/PHY	14
Wimbush, M*	URI	NA6	ENDEAVOR	JUN	NSF/UFE	1
Window, H*	SKIDAWAY	NA6	BLUE FIN	JUL/AUG	NSF/CHEM	5
Wirick, C*	BROOKHAVEN	NA6	ENDEAVOR	FEB	DOE	10
Wirick, C*	BROOKHAVEN	NA6	ENDEAVOR	MAY	DOE	10
Wirick, C*	BROOKHAVEN	NA6	ENDEAVOR	JUN	DOE	10
Wirick, C*	BROOKHAVEN	NA6	ENDEAVOR	OCT	DOE	10
Wirick, C*	BROOKHAVEN	NA6	ENDEAVOR	NOV	DOE	10
Wirick, C*	BROOKHAVEN	NA6	OCEANUS	MAR	DOE	9
Wirick, C*	BROOKHAVEN	NA6	OCEANUS	JUL	DOE	5
Wirick, C*	BROOKHAVEN	NA6	SEWARD JOHNSON	MAR	DOE	15
Wirick, C*	BROOKHAVEN	NA6	SEWARD JOHNSON	APR	DOE	15
Wirick, C*	BROOKHAVEN	NA6	SEWARD JOHNSON	JUN	DOE	15
Wirick, C*	BROOKHAVEN	NA6	SEWARD JOHNSON	SEP	DOE	14
Wirick, C*	BROOKHAVEN	NA6	SEWARD JOHNSON	SEP	DOE	15

Worcester, P*	SCRIPPS	NA4	OCEANUS	LATE SUM	NSF	15
Yamamoto, T*	MIAMI	NA6/7	SEWARD JOHNSON	ANY	NSF?	7
Young, C*	HBOI	NA9	EDWIN LINK	JAN/MAY/JUN	???	26
Young, C	HBOI	NA5	SEWARD JOHNSON	SUMMER	NSF?	20
Zafirou, D*	WHOI	NA6	NEW HORIZON	AUG	NSF/CHEM	3
Zafirou, D*	WHOI	NA6	WEATHR/OCEANUS	JUN	NSF/ChEM	3
Zaneveid, J R	OSU	NA6	SEWARD JOHNSON	AUG-SEP	ONR	21
Zelt, G*	RICE	NA4	EWING	AUG	NSF/MGG	30
Zumberge, M**	SCRIPPS	NP9	NEW H/REVELLE	SUMMER	ONR/MGG	5