Academic Fleet Review Meeting
June 8-10, 1998

UNOLS Sponsor History and Trends

Projections for UNOLS' Future - Substantial Financial Challenges (1995 - "Betzer" Report)

Estimated Cost, Funding and Shortfall for the UNOLS Fleet in ($M):

YEAR	Cost (4% Inc) for Optimal Utilization	Funding	Shortfall $M	Shortfall %
1992	49.7	46.8	2.9	6
1993	51.7	46.2	5.5	11
1994	53.8	47.1	6.7	12
1995	53.8	49.6	4.2	8
1996	57.1	47.3	9.8	17
1997	60.5	47.3	13.2	22
1998	60.5	47.3	13.2	22
1999	63.0	47.3	15.7	25
2000	65.5	47.3	18.2	28

Trends in Federal Support ($M) for UNOLS over the past 30 years

YEAR	NSF	ONR	OTHER	TOTAL
1968	6.8	4.1	1	11.9
1975	12.6	3.6	2.9	19.1
1985	25.9	4.1	5.8	35.8
1995	36	6.5	6	48.5
1997	32.8	4.4	13.6	50.8

UNOLS Ship Operating Days (by Agency), 1993-1998

AGENC	1993		1994		1995		1996		1997		1998	
	DAYS	%	DAYS	%	DAYS	%	DAYS	%	DAYS	%	DAYS	%
NSF	2,825	64%	2,870	67%	3,249	67%	2,739	63%	2,885	57%	2727	51%
ONR/N	721	16%	486	11%	632	13%	553	13%	572	11%	347	6%
NOAA	247	6%	251	6%	319	7%	145	3%	382	8%	613	11%
NAVO	---	---	---	---	---	---	---	---	393	8%	449	8%
OTHER*	651	15%	649	15%	666	14%	881	20%	851	17%	1238	23%
	4,444		4,256		4,866		4,318		5,083		5374	

UNOLS Operations Support
1993-1998 ($K)

	1993	1994	1995	1996	1997	1998
NSF	30,558	33,336	36,022	30,785	32,815	28,526
ONR/NRL	6,484	3,588	6,455	4,530	4,358	3,170
NOAA	1,981	1,956	2,209	1,143	3,509	5,407
OTHER	2,982	2,479	2,280	2,796	7,635	12,033
INST/STATE	3,074	2,591	1,563	3,112	2,536	4,554
Total	45,079	43,950	48,529	42,366	50,853	53,690

"Other Support"
UNOLS Operation Trends ($K)

	1993	1994	1995	1996	1997	1998
NAVO	---	---	---	---	4,655	5,337
INTERNATIONAL	815	191	687	494	1,849	517
INDUSTRY	467	119	614	652	551	2,549
DOE	401	641	36	950	---	---
NAVY POSTGRAD	322	338	202	86	294	113
NAVY LABS	521	281	8	136	---	1,153
ARPA	44	442	284	175	---	---
MMS	325	145	117	124	---	472
USGS	15	88	144	7	103	222
ALL OTHERS	72	234	188	172	183	1,650
	$2,982	$2,479	$2,280	$2,796	$7,635	$12,013

Notes:

- Data obtained from NSF Ship Operation Proposals. 1997 figures represent proposal requests.
- "NAVY LABS" -- NRAD, NOSC, ARL, NUSC, "NAVY," JHU/APL
- ALL OTHERS -- MBARI, JOI, EPA, NASA, ARMY, MUSEUMS, etc.

Trends in Science

- NSF OCE uses a much smaller fraction of its budget for field work than just 10 years ago.

- Science is more complicated and requires larger ships
  - The number of science berths has increased.
  - No shallow draft vessels in fleet that can accomodate large science parties.

- Global Science Programs
  - Climate change - e.g. El Nino studies, mandate global observations.

- Coastal Ocean Programs
  - Impacts in the coastal ocean will continue to increase.
  - Utilization of smallest ships in fleet increasing.

- Fisheries
  - Fisheries are under increasing stress and there are no modern fisheries research vessels in the US.

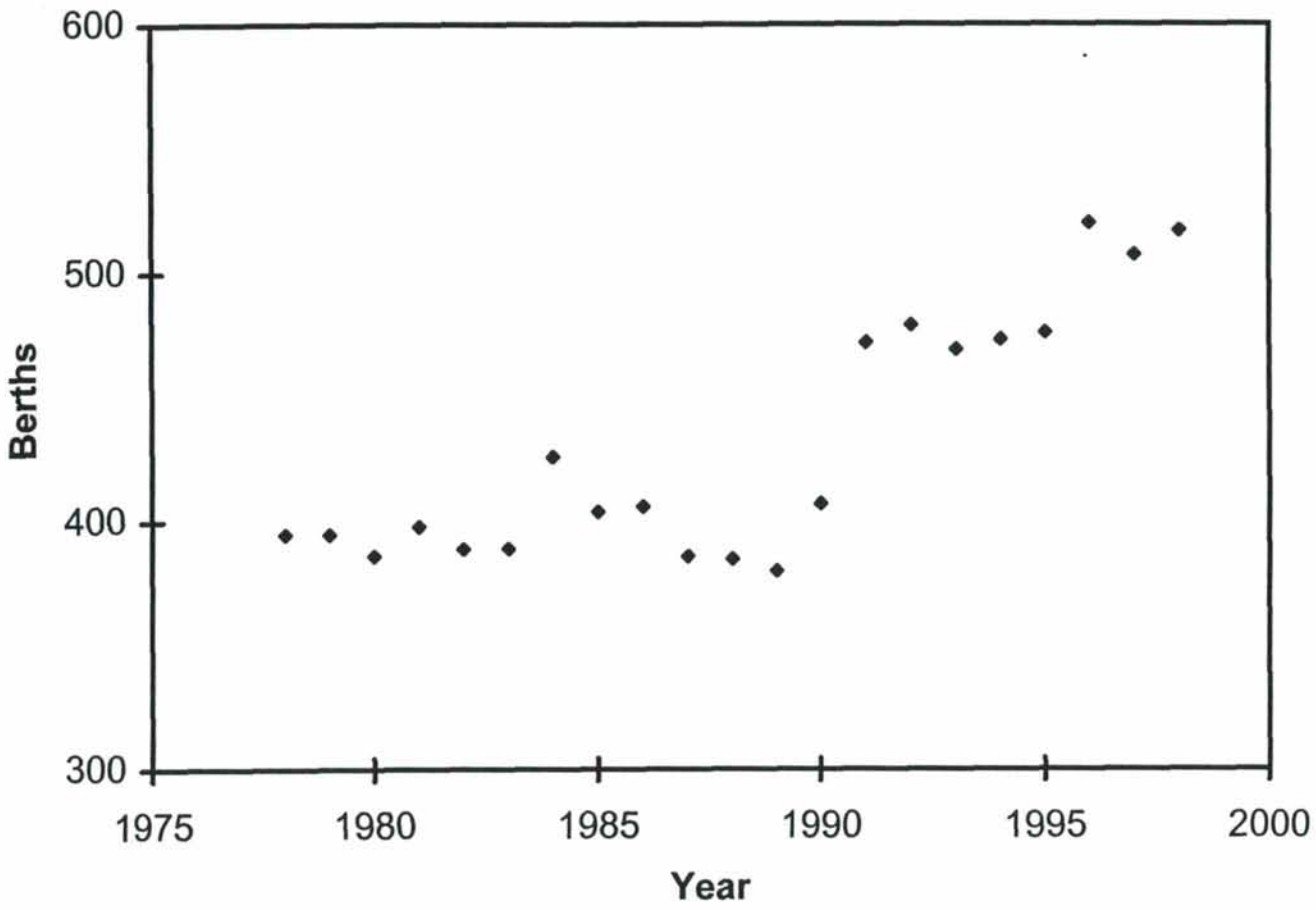
Recent trends in ship support at NSF

NSF Budget	1987	1996	% Change (87 to 96)
Ship Operations	$ 26.0M	$ 31.1M	20
Ocean Science Research	$ 66.4M	$104.9 M	58
Operational Days	3444	2745	-20
Ship Ops/Research x 100	39.2	29.6	

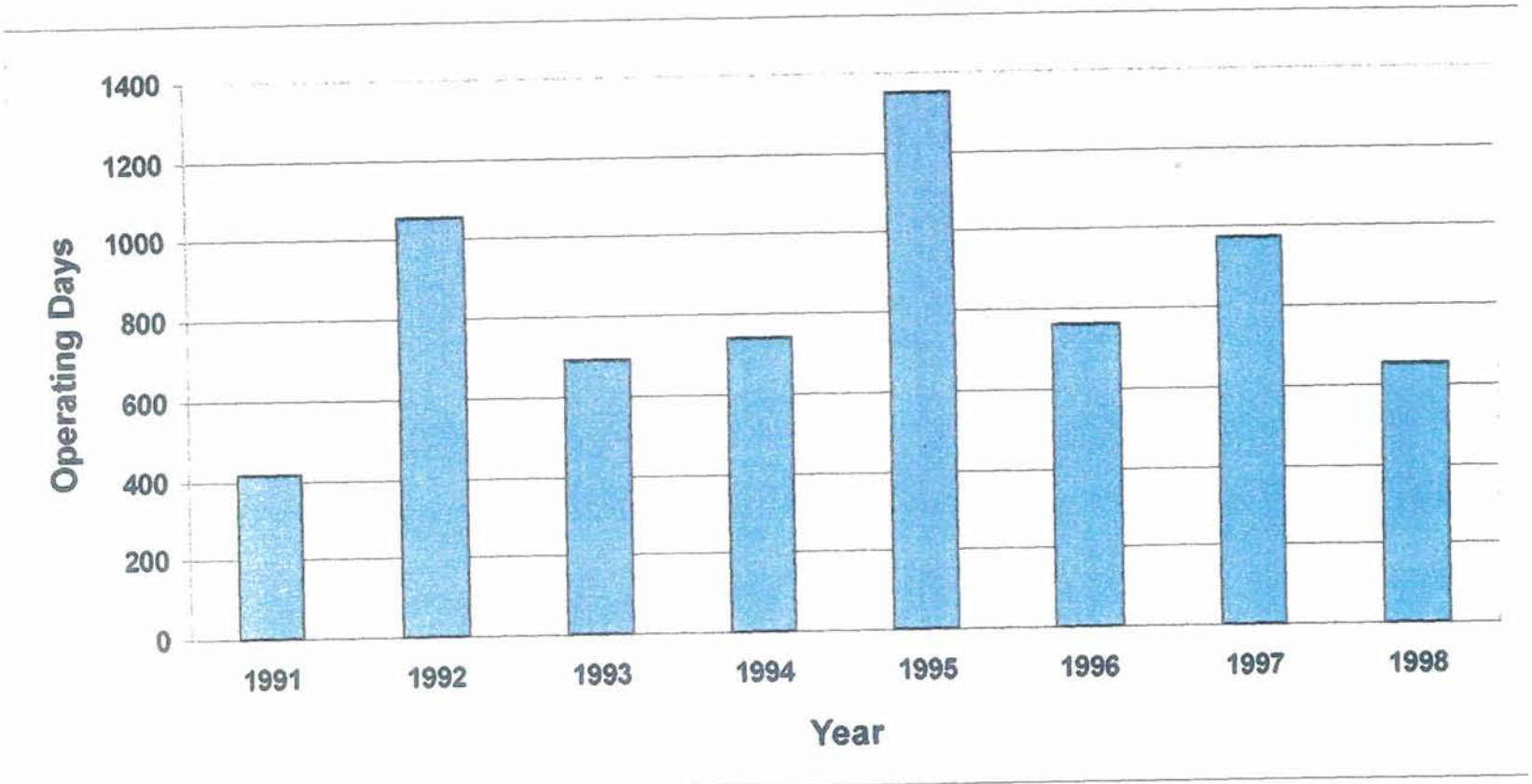
1) Ship operational costs have grown at a somewhat smaller rate than have science costs.

2) A much smaller proportion of the science budget is allocated for field research as more effort is devoted to computer modeling and remote sensing. However, we need more data to constrain models and satellite remote sensing, not less!

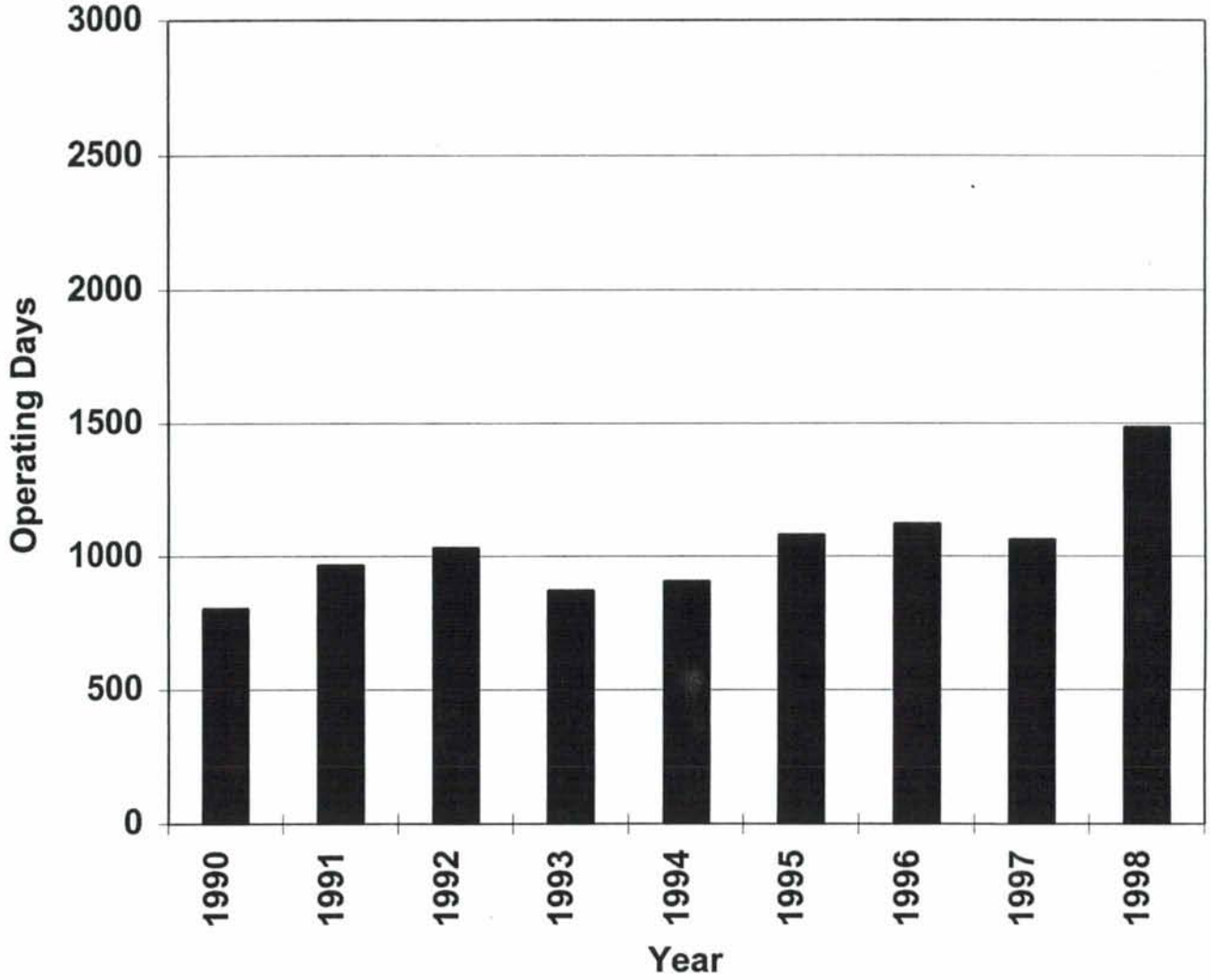
TOTAL SCIENCE BERTHS IN UNOLS FLEET



Major Oceanographic Programs
UNOLS Ship Utilization



LOCAL NEAR-SHORE SHIP UTILIZATION
Operating Days (1990-1998)



Trends in Science

- Deep submergence science
  - National Deep Submergence Facility vehicles are all operating a near maximum rates.
  - No US science vehicles with 6000 m capability.

- Computer simulations of ocean processes
  - More sophisticated models need more, not less data

- Satellite remote sensing
  - Opens a new vista, but the range of applications is narrow. For example, chemical remote sensing is not feasible.

- Partnerships
  - Utilization of fleet by Navy and NOAA increasing

UNOLS Partnerships

- UNOLS has signed an MOU with NOAA to bring the new NOAA ship RONALD BROWN into the UNOLS scheduling process. It will be available to academic scientists as are other UNOLS vessels. BROWN brings specialized meteorological capabilities (e.g., Doppler Radar) not available on other UNOLS ships. Access to the UNOLS fleet will minimize NOAA transit costs. NOAA will support a full year of Class I ship time, but much of it may be conducted on UNOLS vessels operating in oceans far from BROWN. In addition, NOAA will use approximately one half year of time on other UNOLS ships.

- UNOLS has also established the Arctic Icebreaker Coordinating Committee to act as the lead for scientists working from US ships in the Arctic Ocean. They have made remarkable strides in working with the US Coast Guard on their new research icebreaker, MICHAEL HEALY and on broadening academic access to the POLAR Class ships. We anticipate that the academic community will have access to HEALY by the year 2000 in much the same way that we request other specialized facilities, such as ALVIN.

UNOLS Partnerships

- Via the National Ocean Partnership Act, the Naval Oceanographic Office has available $7.5 million to use UNOLS ships for Navy surveys. The NAVO funding helps build a bridge between NAVO, which is one of the largest oceanographic institutions in the world, and the academic community. The Navy benefits from access to a geographically distributed fleet for collection of data for model development and training exercises.

  This work improves our flexibility in scheduling science operations because more ships can operate. It lowers the day rates of research vessels by spreading fixed annual costs over a greater number of sea days. It helps ensure that all funded academic science cruises, particularly those in remote areas, are able to find a platform for their work.

Why scientists choose UNOLS ships

- Science support
  - UNOLS ships receive kudo's for support of complex science operations that range from atmospheric chemical measurements to sampling deep-sea hydrothermal systems.

- Access
  - Institutions may choose not to operate ships - their scientists can access the sea.

- Success rate
  - <5% of days lost.

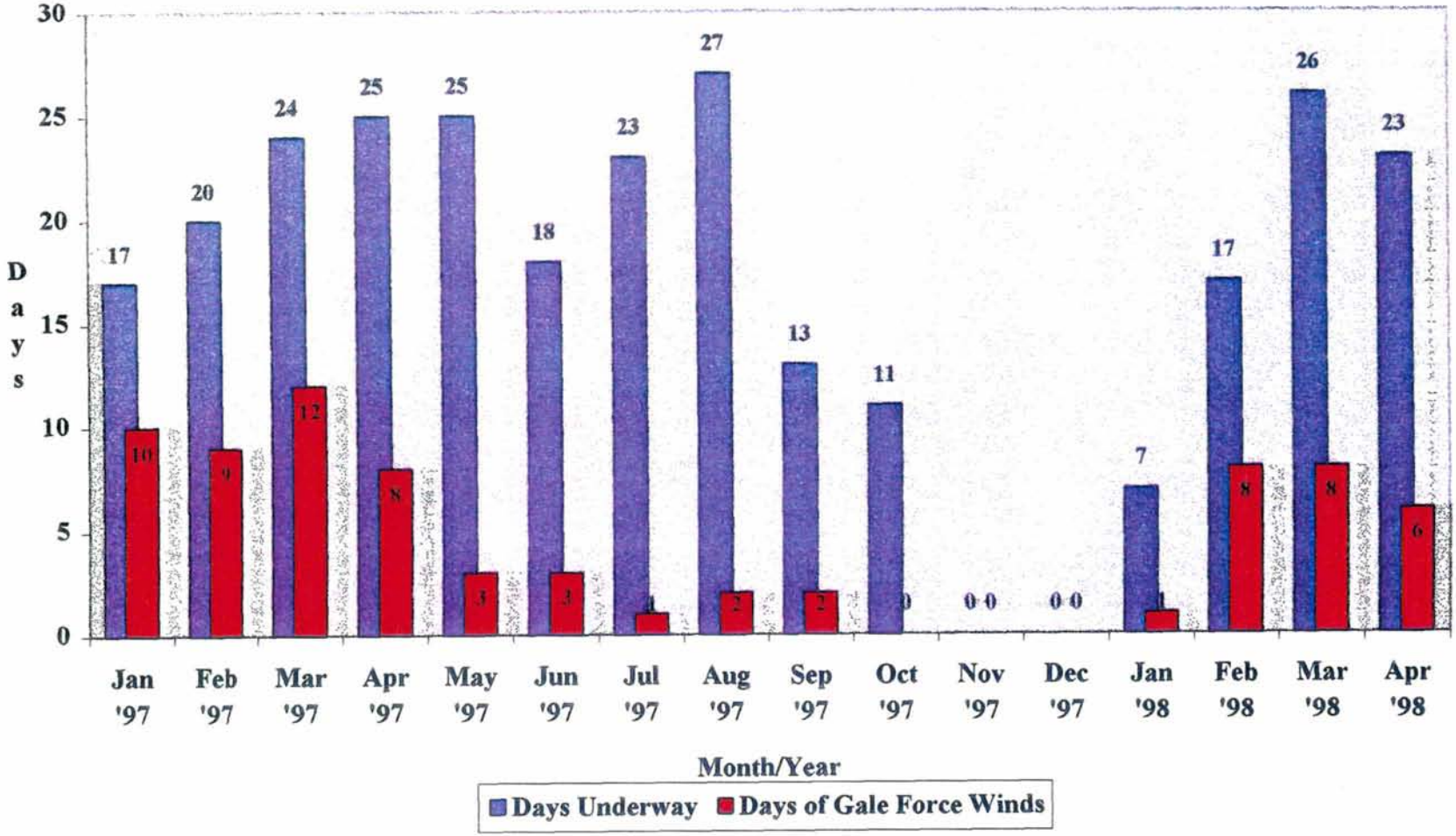
- Safety
  - Operations at sea are extremely hazardous. For example, nearly 200 large freighters have been lost in the past two decades. UNOLS ships are designed to accommodate the unique safety problems of conducting complex experiments at sea.

- Cost
  - Management by seagoing scientists is an effective mechanism to control the cost of marine operations while still maintaining an efficient science platform.

Reported Fleet Reliability

Year	Operating Days	Cruises	Lost Time Due to Weather	Lost Time Due to Ship	Lost Time Due to Science	Total % Lost
1991	4574	512	1.30%	0.53%	0.64%	2.47%
1992	4912	547	1.84%	1.21%	0.48%	3.53%
1993	4444	526	1.82%	1.36%	0.49%	3.67%
1994	4256	544	2.29%	0.69%	0.32%	3.30%
1995	4866	533	2.50%	0.80%	0.80%	4.10%
1996	4319	509	2.17%	0.31%	0.63%	3.11%

R/V OCEANUS - Gale Force Winds



Total Days Underway in 1997/98	**276**
Total Days of Gale Force Winds	**73**
Percentage Days of Gale Force Winds	**26.4%**

Data Courtesy of
Diego Mello
Chief Mate, *R/V Oceanus*