UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM
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DATE: July 18, 2014

TO: Bauke Houtman, Head
NSF/OCE, Integrative Programs Section

SUBJECT: Number of Regional Class Research Vessels (RCRV)

A subcommittee of the UNOLS Fleet Improvement Committee (FIC) was formed to review NSF's letter regarding the "Number of Regional Class Research Vessels (RCRV)" and prepare a response. The subcommittee membership includes Dr. David Bradley, Chair; Dr. Joan Bernhard; Dr. Greg Cutter; and Dr. Alexander Shor. The subcommittee drafted this response document and circulated it to all the non-conflicted FIC members for comment. FIC Chair, Dr. Clare Reimers, is conflicted with this issue in her role as PI of the Regional Vessel acquisition project and was not involved with preparing or commenting on the response.

The UNOLS Fleet Improvement Committee (FIC) agrees with NSF OCE management and UNOLS Council that building three Regional Class Research Vessels is the appropriate number, and that this supports the best estimate of the affordable research requirements from NSF and other federal agencies for the next 10-20 years. FIC absolutely agrees that getting three new, capable, technologically advanced research vessels into the fleet, one on each of the three coasts, is essential to support US ocean research. That said, the financial estimates given by NSF to justify their five scenarios to reduce UNOLS fleet size from 17 to 16 vessels to meet budget projections cannot be duplicated using the information we have, and therefore we do not specifically endorse any particular plan to remove one ship from the fleet. Instead, we note that the technological advances provided by introducing the three new, capable RCRVs will result in much better support for ocean researchers than are provided by some of the older intermediate-class vessels currently operating, and at similar cost. Replacement or layup of ships therefore must be based on actual needs and distribution of assets at the time of decision, and not on 2014 budget projections alone.

UNOLS FIC recognizes that the mix of research that is supported by NSF OCE has changed significantly in the past 20 years, as shown in Figure 1 illustrating the programmatic support of the four primary OCE research programs. Relatively rapid growth of Biological Oceanography and Chemical Oceanography compares to slower growth of Physical Oceanography and Marine Geology and Geophysics over the same period. We interpret this change to represent a qualitative shift from world-circling blue-water oceanography towards more process-focused, interdisciplinary and often coastal studies, many within the EEZ of the US and its territories. While both blue water and regional research are still well represented in the NSF portfolio, the shift toward research bearing on anthropogenic processes and impacts, and the heavy emphasis on cost-effectiveness of projects and limiting wasteful ship transits have all resulted in more coastal work and fewer lengthy expeditions to the blue ocean. We do not see this reversing in coming years, and thus we feel that getting new, capable regional research vessels into the fleet is the most important replacement we can envision at present.

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The capabilities of these new vessels, as seen in Figure 2 that compares all ship capabilities, are the essential qualifications for their addition to the fleet – laboratories with modern research-grade equipment and layout, capabilities to support remotely-operated and autonomous vehicles, sensors to acquire high quality underway measurements, winches and instrumentation to collect precisely-located samples of water and/or sediments and to have those samples be uncontaminated by either the ship or the wire used to deploy the instruments, among other capabilities. Retrofitting the older ships in UNOLS is expensive and often not fully successful, and the continuous introduction of new environmental regulations that impact the types of fuel that can be used, the types of motors and generators that can be operated, and the systems aboard for managing waste make retrofitting ships very expensive, and sometimes impossible. Getting new, efficient ships that meet the modern regulations is therefore an important factor to manage the maintenance and repair costs, and keep the ships operating efficiently.

Finally, it is essential to address the fact that the ships being built are not only to support NSF-funded research, but for all federal agency research. Without the benefit of ONR providing most of the large ships in the UNOLS fleet for more than 40 years, NSF would have very limited capability to support field research. NSF needs to take a broad view of their responsibility to the community, and address the fact that the overwhelming majority of use of the UNOLS fleet by non-NSF funding agencies uses the smaller research vessels. Having at minimum one new, capable vessel for research on each of the three US coasts is essential to support the needs of the nation.

Sincerely,

RCRV Subcommittee of the Fleet Improvement Committee:
Dr. David Bradley, Chair
Dr. Joan Bernhard
Dr. Greg Cutter
Dr. Alexander Shor

Figure 1. NSF Ocean Research Program Budgets by Science Discipline (1995 – 2014) [*Chart provided by NSF*]

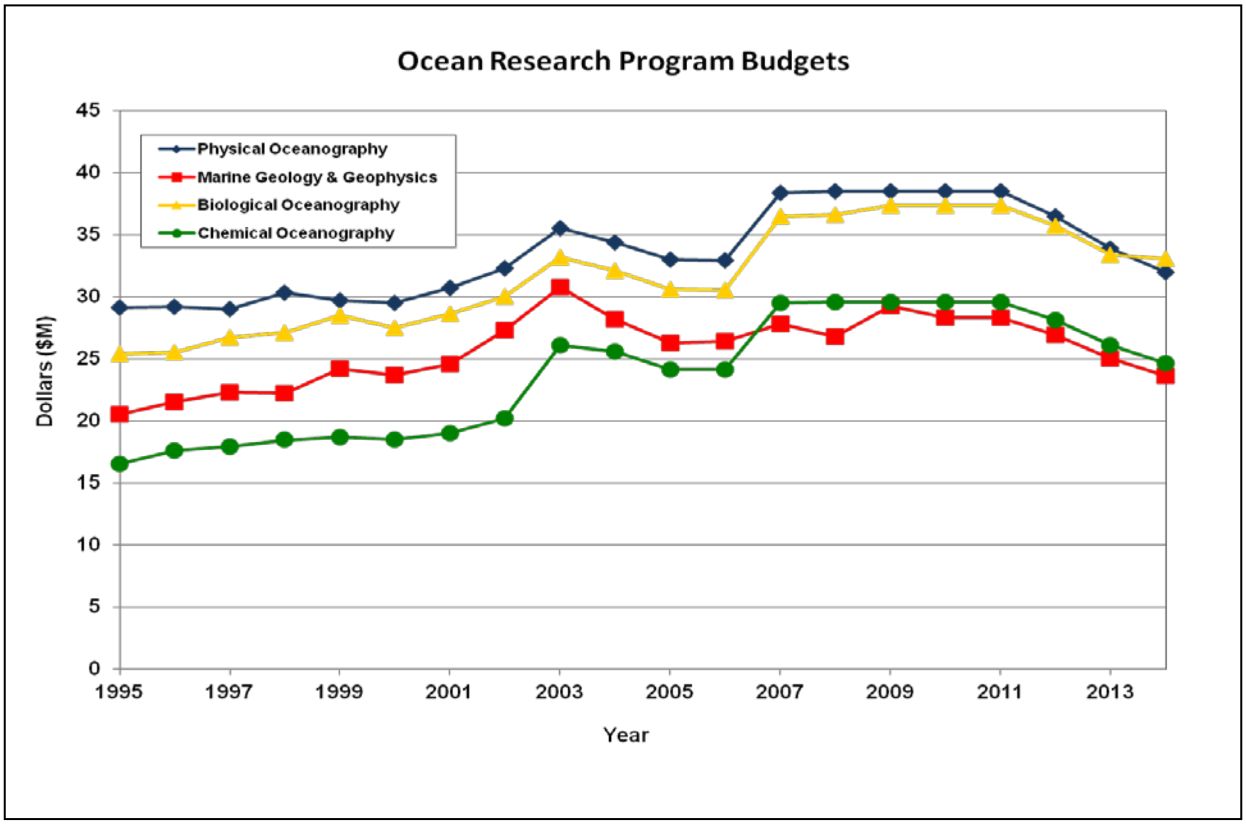

Figure 2: UNOLS Vessel Capability Chart (sheet 1 of 2)

FIGURE 2. UNOLS Vessel Capability Chart	Vessel:	Thompson	Revelle	Atlantis	Sikuliaq	Langseth	OCRV	Kilo Moana	Oceanus	Endeavor	New Horizon	Atlantic Explor
		Global Class					Ocean/Intermediate Class					
Dimensions												
Length (overall)	ft	273	274	274	261	237.4	238	186	177	185	170	170
Beam	ft	52.5	52.5	52.5	52	56	50	88	166		36	38
Draft @ amidships	ft	17	17	19	18'9"	19'4"	15	25	17' 6"	18' 6"	12	11'3"
Regulatory Tonnage	GT ITC[1]	3,058	3,180	3,304		3,834	TBD	3,060	260	298	297	861
Displacement (Full Load)	LT	3,528	3,512	3,512	3,665	3906	2,916	2,542	960	756	1,007	1,297
Lab and Science Spaces												
Main Lab	ft^2	1,700	1,745	1,676	1,000	2,345	1,023	500	595	696	914	380
Wet Lab	ft^2	225	330	234	510	613	398	320	240	390	84	-
Additional Labs	ft^2	1,770	1,774	2,085	570	1,724	311	1,264	530	578	176	670
Science Storage	ft^2	1,400	965	500	750	in labs	589	144	150	150	48	in labs
Deck												
Aft Deck Areas (incl staging bays)	ft^2	4,350	4,070	3,732	4,360		1,870	2,200	2,150	2,100	1,730	2,220[AE1]
Side Rail	ft	112	104	104	100		80			3	123	
Freeboard	ft	10	9	9	9'5"	5'7"	7	12	3	3	3.5	3.25
20ft Van Locations	number	6	7	6	3	4	3	3	2	2		3
Berths												
Science + Mar Techs	number	38	37	38	26	35	24	28	15	18	12	22
Mobility impaired accessible (within Science berths)	number	-	-	-	2	-	1	-	-	-	-	-
Crew	number	21	22	22	20	20	20	20	12	12	19	12
Berthing Van Option	number	-	-	-	yes	-	-	-	-	-	-	-
Total	number	59	59	60	46	55	45	48	27	30	31	34
Performance												
Cruise Speed	knots	12	11.7	11	11	11	11	11	11	10	9	10
Max Speed	knots	15	15	15	14	13	12	14	14	14		11
Range	nm	12,000 @ 15kts	15,000 @ 12kts	17,280	9700 @ 11kts	13,500	11,500	10,000 @12Kts	7,000	8,000	9,600	5,500
Endurance	days	60	52	60	45	60	40	50	30	30	40	30
Fuel Capacity	gallons	280,000	227,500	267,540	185,000	270,000	147,066	130,000	48,000	56,100	40,000	56,000
Bow Thruster	hp	1,100	1,180	1,180	920	800	920	919	350	320	250	350
Main Propulsion	hp	2x3,000	2x3,000	2x3,000	2x2,875	2x3550	2x1,162	4020	3000	3050	2x850	2x940
Dynamic Positioning Capabilities	yes/no	yes	yes	yes	yes	yes	yes	yes	no	no	no	no
Science Equipment												
Multibeam sonar	KHz	30 (1°x1° Array)	12 (1°x1° Array)	12 (1°x1° Array)	30, 70 (.5°x1° Array)	12 (1°x1° Array)	12 (1°x2°), 700 (.5°x1°)	12, 70	-	-	-	-
Communications Equipment and Network												
Satellite Band		C/Ku (HSN), L (FBB-1ea)	C (HSN), L (FBB-2ea)	C (HSN), L (FBB-2ea)	C/Ku (HSN), L (FBB-1ea), Iridium	C (HSN), L (FBB-2ea)	C/Ku (HSN), L (2ea FBB)	C (HSN), L (FBB)	Ku (HSN), L (FBB)	Ku (HSN), L (FBB)	Ku (HSN), L (FBB)	Ku (HSN), L (FBB)

Notes:

1. ITC is "International Tonnage Convention"

AE1 - includes 01 aft deck

Figure 2: UNOLS Vessel Capability Chart (sheet 2 of 2)

FIGURE 2. UNOLS Vessel Capability Chart	Vessel:	RCRV	Sharp	Sproul	Pelican	Walton Smith	Savannah	Blue Heron	Barnes
		Regional Class		Coastal/Local Class					
Dimensions									
Length (overall)	ft	191	146	125	116	96	92	86' 03"	65' 5.5"
Beam	ft	41	32	32	26'6"	40	27	23'04"	
Draft @ amidships	ft	12.5	9.5	9'6"	9'6"	7	8' 6"	11' 09"	
Regulatory Tonnage	GT ITC[1]	TBD	496	85	261	325	265	<200	
Displacement (Full Load)	LT	~1,488	598	696	514	156	351.29	275	86
Lab and Science Spaces									
Main Lab	ft^2	525	340	220	124	480	308	575	
Wet Lab	ft^2	285	260	130	273	200	158	240	
Additional Labs	ft^2	420	400 (vans)	400	156	-	-		
Science Storage	ft^2	220	in labs	in labs	in labs	in labs	60	labs	
Deck									
Aft Deck Areas (incl staging bays)	ft^2	2,350	1,500	1854	1000	960	606	800	
Side Rail	ft	77	53	90	4	4'	50	3' 4"	
Freeboard	ft	6	5	2	4' 6"	5'8"	5	3'	
20ft Van Locations	number	2 mated + 1 stand alone	2	3	2	-	-	10' van	
Berths									
Science + Mar Techs	number	18	16	12	15	13	16	7	2
Mobility impaired accessible (within Science berths)	number	1	1	-	-	-	-	-	-
Crew	number	12	6	5	6	7	5	4	6
Berthing Van Option	number	4	4	-	-	-	-	-	-
Total	number	30(34)	22(26)	17	21	20	21	11	8
Performance									
Cruise Speed	knots	~12	10-11	8.5	9.2	9-10	9.5	9	10
Max Speed	knots	~12.5	11		9.2	10		10	10
Range	nm	6,300@ 12kts	3,500	4,300	3490	1800	2400	2000	1000
Endurance	days	21	14	14	18	12	10	21	7
Fuel Capacity	gallons	≥69,209	15,000	25,000	15,000	10,000	10,500	5200	1920
Bow Thruster	hp	1085	325	155	125	25	65	-	
Main Propulsion	hp	1600	750	2x675	2x450	2x760	2x450	775	400HP
Dynamic Positioning Capabilities	yes/no	DP-1	Unrated	no	no	no	no	no	no
Science Equipment									
Multibeam sonar	KHz	200, 400 (1°x1°)	200, 400	-	-	-	-	240	-
Communications Equipment and Network									
Satellite Band		C/Ku (HSN), L (FBB-2ea)	L (FBB), Fleet 55	L (FBB)	Ku (HSN), L (FBB)	Ku (HSN), L (FBB), Iridium, cellular	L (FBB), cellular	L (FBB), cellular	L (FBB), cellular
Notes:									
1. ITC is "International Tonnage Convention"									
AE1 - includes 01 aft deck									