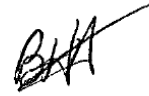



Date: 18 July 2018
From: NSF, ONR and the UNOLS Executive Secretary
To: Dr. Deborah Steinberg, UNOLS Council Chair

RTS  

Subj: 2019 U.S. Academic Research Fleet Operations Support Findings and Recommendations

Ref: UNOLS Non-Operators Subcommittee Procedures for Recommending Non-Operational Periods of Ships in the UNOLS Fleet (revised 8 June 2015)

Introduction

The National Science Foundation (NSF), the Office of Naval Research (ONR), and the UNOLS Executive Secretary provide the following letter to the UNOLS Council after having participated in initial 2019 ship scheduling meetings and conducted a review of the 2019 Letters of Intent for the U.S. Academic Research Fleet's (ARF) Global, Ocean/Intermediate, Regional, and Coastal/Local class ships. The ARF currently consists of 18 research oceanographic vessels, including the pending acceptance of R/V *Rachel Carson* (replacement vessel for R/V *Clifford A. Barnes*). We recognize additional science funding decisions will be made by all funding agencies in the coming weeks for the 2019-scheduling year but based on current projections the Cognizant Federal Agencies (NSF and ONR) present the following outlook for 2019 with supporting charts and data provided by the UNOLS Office, derived from the Ship Time Request System. We feel this early review and these findings enable a focus on weak or limited ship schedules, encourage the promotion of non-Federal work, and provide an outlook on surge capability for the approaching operating year. This annual letter is not meant to convey the final forecast for 2019, but rather provides a baseline for continued discussions within UNOLS on the projections for the ARF's operating year. The agencies consider past efforts and ongoing strategies achieved desired Fleet utilization rates within current and projected agency budgets with only a few exceptions. It should be noted that 2019 will present challenges due to scheduling availability on the Globals, due in-part to the mid-life refit shipyard of *Revelle*. While lessons learned from the *Thompson* mid-life shipyard experience are being incorporated into the planning for *Revelle* and *Atlantis* (in 2020), these projects do carry the risk of extension and post-shipyard warranty issues, thus upsetting planned science schedules. The need for flexibility and good communication should be anticipated for the next few years as these beneficial projects reach fruition.

The percentage increases from past June/July letters have been mainly a result of non-NSF work becoming known later in the scheduling process (see Table 1). The current balance between the number of ships in the ARF and available agencies' funding to support the infrastructure and science awards is projected to be sustainable, if day rates stay at or about current levels, and about the same number of science awards are made. The NSF and ONR will continue their efforts on modernizing the ARF. The Federal agencies will continue efforts to bring uniformity in the application of costing principles across the ARF.

Table 1: Comparison of Projected Utilization vs. Actual Utilization

Agency	ACOE	DOE	EPA	Inst/State	BOEM	NASA	NAVY	NOAA	NSF	USGS	Other	Total
Projected 2015 as of June 11, 2014: Total Funded and Pending	10	0	0	77	8	0	308	119	1291	57	90	1960
Actual/Final 2015 days by agency	13	24	6	195	12	26	506	423	1477	40	258	2980
Projected 2016 as of June 9, 2015: Total Funded and Pending	0	0	0	71	3	26	206	162	1281	29	259	2037
Actual/Final 2016 days by agency	14	0	0	168	0	31	534	284	1465	2	340	2838
Projected 2017 as of July 15, 2016: Total Funded and Pending	4	10	0	137	45	62	413	144	1484	1	105	2405
Actual/Final 2017 days by agency	9	13	12	230	3	70	643	276	1578	2	270	3106
Projected 2018 as of June 20, 2017: Total Funded and 30% Pending	0	3	0	61	3	64	326	141	1597	2	86	2282
Provisional 2018 days by agency	15	0	7	204	2	111	471	238	2027	29	247	3351
Projected 2019 as of June 30, 2018: Total Funded and 30% Pending	5	0	0	66	0	1	254	154	1660	4	117	2261

NSF anticipates a few ship days will be added to CY 19 schedules from the Spring 2018 OCE panels. However, NSF's 2018 support of several RAPIDS (Hurricanes Irma, Harvey, and Kilauea Volcano) plus an increase to fuel prices, will affect how much work can be supported.

Given the above, the NSF recommends proposals with ship time be considered at both panels, but with the caveat that Global/Ocean Class ship requests be contemplated 18 months or more from time of submission. The following link provides the 19 May 2017 announcement: https://www.nsf.gov/news/news_summ.jsp?cntn_id=191729&org=OCE.

As of 30 June 2018, there are 2014 funded ARF ship days across all agencies for CY 19, as shown in Table 2¹. There are 824 pending days of which an estimated 30% (247) will likely be funded resulting in an approximate total of 2261 days of ship time. Figures 1 through 4

¹ These funding totals do not include NSF/OCE ship support outside the ARF. In 2019, NSF/OCE will use R/V *Nathaniel B. Palmer* and R/V *Ron Brown*.

illustrate the Fleet utilization trends over the past ten years and the anticipated use in 2019, and Figures 2 and 3 in particular, demonstrate the changing demand of each ship class. Raw utilization numbers alone do not adequately reflect the usage among classes of ships, so it is important to distinguish the causes of trends within ship classes. Also, the utilization numbers depicted in the graphic do not account for the homeport operational days during which the ship, crew and science team are working pre- and post-cruise. Starting in 2019 the operators will begin to charge for homeport loading and unloading days, which will keep the ARF compliant with §200.468_ b) (1) *[the day rate] Does not discriminate between activities under Federal awards and other activities of the non-Federal entity.*

UNOLS/Ship Scheduling Committee (SSC) and FIC are requested to continue to finalize a methodology for defining a Full Optimal Year (FOY) for each vessel to reflect annual targets. Additionally, UNOLS is requested to better define the available surge capacity in the FOY, in order to adequately demonstrate the realities and limitations of operating and maintaining a research vessel. The current FOY “window” for each vessel, which includes all the activities that had not been represented in the utilization numbers, (e.g. home port turn-arounds for loading/unloading, maintenance, inspections, home port outreach activities) should be updated to clearly identify the available surge capacity for the ARF, to include these. Surge capacity should represent any days “left over” after all these activities have been accounted for.

Based on the early findings outlined below, some ships in the ARF may have a lower than optimal schedule in 2019. As agreed to by the UNOLS Council, the Non-Op Process provides guidance for making decisions regarding non-operational periods, and calls for recommendations to be made by the agencies. This letter provides those recommendations. The link to the reference document is:

https://www.unols.org/sites/default/files/NonOp_Process_Recmd.pdf.

Agency Positions

1) Vessel owners have sole discretion on whether or not to retain their vessel(s) in service. Agencies have final say on where their respective federal work will be carried-out. UNOLS can withdraw ships from the ARF, if utilization declines over a period of time and owner-operators continue to retain their ship in service, as outlined in the UNOLS Guidelines for *Requesting/Becoming a UNOLS Vessel*, (dated 9/30/2004). <https://www.unols.org/document/guidelines-becoming-unols-vessel>

2) The NSF and ONR will not normally provide operators of agency-owned assets with lay-up funds and will not divert work from other UNOLS ships as an artificial means to reduce day rates. Lay-up funds for a specific ship will be carefully reviewed on a case-by-case basis and will be considered within the context of the overall ARF usage and budgetary projections. The NSF and ONR believe this is in compliance with the UNOLS Charter (ANNEX I, Ship Scheduling Committee).

- 3) Federal agencies prioritize decisions based on schedule efficiency, scientific effectiveness, and budget comparisons among ship options, to maximize science support while making every effort to reduce overall costs. This may require a long-term view beyond a 12-month forecast. It may be the case that consolidation of underutilized schedules adds transit days but reduces overall costs and is in line with Agency Position 2 above.
- 4) The NSF and ONR agree an appropriate level of surge capacity is needed; in particular for rapid response-type cruises, and to allow for potential future increases in science utilization.
- 5) Given the current and projected Federal funding limitations and the need to modernize the ARF, it has become apparent fleet size is an important factor in overall planning and budgeting resources for maximum attainment of science objectives and requires continued evaluation. With regard to "right sizing" of the ARF, consideration will be given to geographic distribution of the ships, mission capabilities, and overall projected science utilization by Class, as all are important factors in ensuring efficient and effective investments in science operations at sea.
- 6) The NSF has made the determination that it's in the Foundation's best interest to fulfill the *Sea Change* recommendation to retire (divest in) R/V *Marcus G. Langseth* in mid-2020. The NSF/OCE Marine Geology and Geophysics Program plans to continue to support science needs using a regional planning approach.
- 7) Federal agencies encourage institutions that own and/or operate ARF vessels to employ their assets for institutional education and research. This initiative shares the burden with the Federal agencies and lowers the day rate for all potential users. The use of institutional days must conform to requirements set forth in Charter Party and Cooperative Agreements.
- 8) Going forward, the new methodology of establishing a homeport load/unload day rate, a separate MOSA rate, and an operational rate, will provide more transparency to the ship's overall day rate calculation, and is in-line with industry practice. This will also change the way the utilization of ships is presented, where traditionally the utilization count was solely based on "charge days". The Federal agencies feel that this will represent a more accurate projection of usage and give the regionally based ships parity to those ships that mostly work abroad in terms of the displaying the level of effort needed to maintain ships at their FOY (Full Optimal Year).

Agency Decisions and Recommendations

- 1) The NSF and ONR recommend the operators of all ships continue to identify ways to reduce costs and seek appropriate opportunities to support research and education programs from other funding sources, including institutional funds. The Federal agencies encourage leveraging activities in order to maximize scheduling opportunities. It is important operators not over-estimate yearly costs, which tend to result in large residual carry-forward funds, and the

resulting consequence of reducing opportunities to schedule additional operational days in the current year.

2) The NSF and ONR recommend the science community consider how to best integrate their research strategies with the enhanced capabilities, yet smaller berthing capacities of the R/Vs *Sikuliaq*, *Armstrong*, and *Ride*. With the major overhaul of R/V *Thompson* completed, the focus is now on R/V *Revelle*, which will begin her nominally one-year overhaul period in April 2019, to be followed by R/V *Atlantis* mostly likely in April 2020. In the Global Class vessels' place, our new, capable Ocean Class vessels will take on some of the larger ships' projects, and the science community should plan for reduced berthing capacities, particularly when requesting the support of NDSF assets.

Guidelines

The guidelines and principals used by ONR and the NSF to develop the recommendations noted above, as well as budgetary investments in ship operations, are outlined below:

- 1) Budgetary constraints across the Federal agencies, escalating ship day rates and ship repairs, require that operators strive to maintain operating costs within inflation. An institution's ability to maintain reasonable day rates will be considered when negotiating annual awards. In CY 18, Global and Ocean Class ships accounted for approximately 64 percent of the NSF budget for ship operations and technical support, and the impact to the Fleet should be especially considered, as stated in the Agency Decisions and Recommendations #2. In CY 18 the NSF/OCE funded 61% (1591 days) of the total ship time (2580 days) for the ARF's Global and Ocean Class vessels, NSF-OOI funded 10% (186 days), and ONR funded 13% (352 days). The remaining 16% was from NOAA, NASA, Institutional, and non-Federal funding.
- 2) Federal agencies will continue to evaluate weak schedules of institution-owned ships, and the additional impact to an agency's costs. Recognizing that shore-side support is one area where costs are distributed across the ships, these costs will continue to be reviewed on an annual basis. Base costs should be used in evaluating comparisons.
- 3) When possible, scheduled maintenance periods should be carried out in a vessel's homeport, both as a cost saving measure as well as an opportunity to conduct substantive preventative maintenance. Unless an exemption is granted, U.S. shipyards must be used for regulatory dry-docking.
- 4) Ship schedules should be developed to meet the science program requirements while adhering to budgetary constraints.

- 5) Science program requirements should match the oceanographic outfitting capabilities of the ship on which the program is scheduled.
- 6) The size/class of vessel should be considered when selecting ships appropriate for the science mission.
- 7) The Funding Agency Program Manager and the Principal Investigator (PI) will be consulted when information beyond that listed on the UNOLS Ship Time Request Form is required. PIs and operators should avoid changing the scope and purpose of the funded project unless approved by the Federal agency.
- 8) Programs may be scheduled as a two-ship operation instead of a single Global Class ship, if it will be more efficient and cost effective.
- 9) Every effort should be made to schedule each year's funded programs within the budgetary constraints of each Federal agency. Deferrals will be considered if a particular cruise cannot be accommodated effectively and efficiently. All cruises requiring significant transit costs will be specifically reviewed and evaluated to determine if it can be accommodated within the available funding.
- 10) Science missions requiring Federal assets, such as NDSF ROVs, need special consideration when scheduling. It may necessitate substitution of assets, which requires approval by the funding agencies to either give flexibility for scheduling the missions or for cost savings.

Supporting Information and Findings

The following findings regarding ARF vessel operations for 2019 are based on the submitted ship time requests, posted Letters of Intent (LOI) or a preliminary schedule, and cost estimates provided by the vessel operators as of June 30, 2018, which does reflect NSF's decision to discontinue support for the OOI Southern Ocean Sites at Argentine Basin and 55 South.

The operational days for each ARF vessel for CY 19 are a "snap shot" of the 2019 LOIs that are posted as of 30 June 2018.

Table 2: Fleet Utilization by Agency (2015 - 2019)

Agency	ACOE	DOE	EPA	Inst/State	BOEM	NASA	NAVY	NOAA	NSF	USGS	Other	Total
2015 Funded Days	13	24	6	195	12	26	506	423	1477	40	258	2980
2016 Funded Days	14	0	0	168	0	31	534	284	1465	2	340	2838
2017 Funded Days	9	13	12	230	3	70	643	276	1578	2	270	3106
2018 Funded & Pending Days*	15	0	7	204	2	111	471	238	2027	29	247	3351
2019 Funded Days**	0	0	0	42	0	0	223	129	1535	4	81	2014
2019 Pending Days**	15	0	0	81	0	3	104	83	417	0	121	824
2019 Funded & 30% of Pending Days***	5	0	0	66	0	1	254	154	1660	4	117	2261

Notes about the table:

- * The 2018 Funded and Pending days are based on posted ship schedules as of 6/30/2018.
- ** The 2019 Funded and Pending days are based on the latest LOIs and draft schedules posted as of 6/30/2018.
- *** A 30% success factor rate has been applied to the pending days

- Based on the total of directly chargeable days, the NSF accounted for ~51% of total funding or 1578 days within the ARF in 2017; and in addition, NSF/OCE support of 95 days on *Ka'imikai-O-Kanaloa (KOK)*, 157 days on *Nathaniel B. Palmer*, and 56 days on NATO R/V *Alliance*. ONR & NRL funded 602 days in the ARF and 58 days on USCG *Healy*, and 81 on R/P FLIP.
- There are currently 3351 operating/charge days (funded and pending) on the 2018 published schedules as of June 30, 2018. The NSF will provide support for 2027 or 60 % of the total days, and ONR/NRL will support 471 or 14 %.
- For CY 18, Globals/Ocean Class vessels *Atlantis*, *Langseth*, *Revelle*, *Sikuliaq*, *Thompson*, *Armstrong*, *Ride* and *Kilo Moana* have schedules with between 136 and 328 operating days (funded and all pending), accounting for 60% of total days (2027 days of the 3351). There are specific homeport maintenance periods planned.
- In CY 18 *Atlantis* will operate 305 days starting the year in the Argentine Basin for NSF/OOI, then north to the North Atlantic Ocean, then transit through the Panama Canal to work off Costa Rica, Guaymas Basin, East Pacific Rise and finishing the year with a shipyard period on the U.S. west coast. In CY 19, the *Atlantis* has 286 days of which 220 are funded and 66 days are pending. *Atlantis* will be working off San Diego, the Pacific Northwest, and the Gulf of Mexico in CY 19.

- In CY 18 *Roger Revelle* has 262 days in support of NSF programs off San Diego to the west coast of Mexico, then to the Pacific Northwest in support of NSF/OOI, followed by NASA EXPORTS off Alaska then GEOTRACES south to Hilo and Tahiti. *Revelle* will then transit to New Zealand to finish the year.

In CY 19, the current LOI for *Roger Revelle* has 78 days funded and 8 days pending to support two programs out of New Zealand. The ship will then return to San Diego in March 2019 to prepare to enter the mid-life refit period in April 2019.

- In CY 18 *Marcus Langseth* will support 126 days, with funding from NSF, and 10 funded days for the Imperial College of London. During CY 19 *Marcus Langseth* will operate in the Pacific Northwest and the Gulf of Alaska in support of four funded projects, totaling 105 days.
- In CY 18 *Sikuliaq's* schedule has 243 chargeable days from NSF, NSF-OOI, ONR, North Pacific Research Board, and the State of Alaska. Development of *Sikuliaq's* schedules will require continued flexibility in order to accommodate coordination with Native Alaskan Communities. During CY19 the *Sikuliaq* schedule is projected to support 209 funded days of work and 74 pending days.
- *Thomas Thompson* completed the mid-life refit in January 2018, then sailed to New Zealand to support the Humphris mission, then up to Kaohsiung and Indian Ocean for four ONR programs. The ship will end the year in Australia. In CY 19, the *Thompson* will support three programs at the beginning of the year off Cape Town, South Africa, then transit to Woods Hole to support an NSF program, a maintenance period, then to the Southeast Atlantic Ocean, and the Argentine Margin.
- In CY 18 *Kilo Moana's* schedule is projected to support 257 days, 117 funded by NSF, the remaining a combination of NOAA, ONR, 2 cruises of non-federally funded work, and institutional days. During CY 19, *Kilo Moana* has 153 days funded by the NSF with 86 days of pending work for NOAA, NSF and non-federal groups.
- *Neil Armstrong* began CY 18 working off Woods Hole in support of OOI Pioneer, then will work off Iceland for two ONR programs, and the NSF/OOI Irminger Sea projects as well as NSF OSNAP programs. They will finish the year at NSF/OOI Pioneer and an INSURV inspection in December. During CY 19 *Neil Armstrong* is scheduled for 233 days of science, primarily in the North Atlantic, with 10 days pending.
- In CY 18 *Sally Ride* is working off San Diego, the Pacific Northwest and the Gulf of Alaska in support of NSF. ONR, NOAA, BOEM, NASA and institutional days totaling 176 days funded and 70 days pending. During CY 19 *Sally Ride's* LOI indicates 248 total days, with 152 funded days and 96 days in support of NSF, ONR, NOAA. The operating region will be San Diego, Japan, Sri Lanka, Taiwan, and Guam.

- For the East Coast Intermediate *Endeavor* in CY 18, the schedule has 193 funded days. For CY 19, *Endeavor's* LOI has 158 funded days and 7 pending days split between NSF, ONR, and other.
- In CY 18 *Atlantic Explorer's* schedule has 179 NSF days, along with 5 days institutionally funded. The CY 19 LOI shows 102 funded NSF days and 4 funded institutional days. There are also 4 pending NSF days and 7 pending institutional days.
- In CY 18 R/V *Pelican* in the Gulf of Mexico has a near fully subscribed schedule of 171 days (15 of these are pending days). Historically, *Pelican* has had a broad base of support from many agencies and this trend continued in CY 18. The CY19 LOI shows 102 funded days, 50 of which are NSF days, and 46 pending days.
- In CY 18 R/V *Hugh Sharp* has a schedule with 139 funded operating days. For 2019, *Sharp's* LOI has 43 funded and 56 pending.
- In CY 18 R/V *Walton Smith* has a strong schedule, with 215 days of which 67 days are pending. The 2019 LOI currently has 84 days funded and 43 days pending.
- In CY 18 R/V *Savannah* has 88 days of which 7 days are pending. The 2019 LOI for R/V *Savannah* has 35 funded days and 65 pending.
- R/V *Blue Heron* has 46 funded days in CY 18, with 2 days still pending. *Blue Heron's* CY 19 LOI has 43 funded days, and 21 pending days.
- For the West Coast Intermediate, *Oceanus* has 146 funded days and 30 pending scheduled in CY 18. *Oceanus'* CY 19 LOI has 110 funded and 79 pending days.
- In CY 18 *Robert G. Sproul* is scheduled for 52 funded and 17 days pending. In CY 19 there are 3 funded days, and 44 pending days shown on the Letter of Intent.
- In CY 18 *Clifford A. Barnes'* schedule has a mix of users comprising 35 funded and 6 pending days. In CY 18 the *Clifford Barnes* was taken out of service and the Univ. of Washington is bringing the new vessel, R/V *Rachel Carson* into service. Upon successful completion of the UNOLS process, (including NSF Ship Inspection) the *Rachel Carson* will become a UNOLS vessel. The CY 19 letter of intent for the *Rachel Carson* has not been posted yet.

Figure 1: UNOLS Fleet Utilization (2010 – 2019)

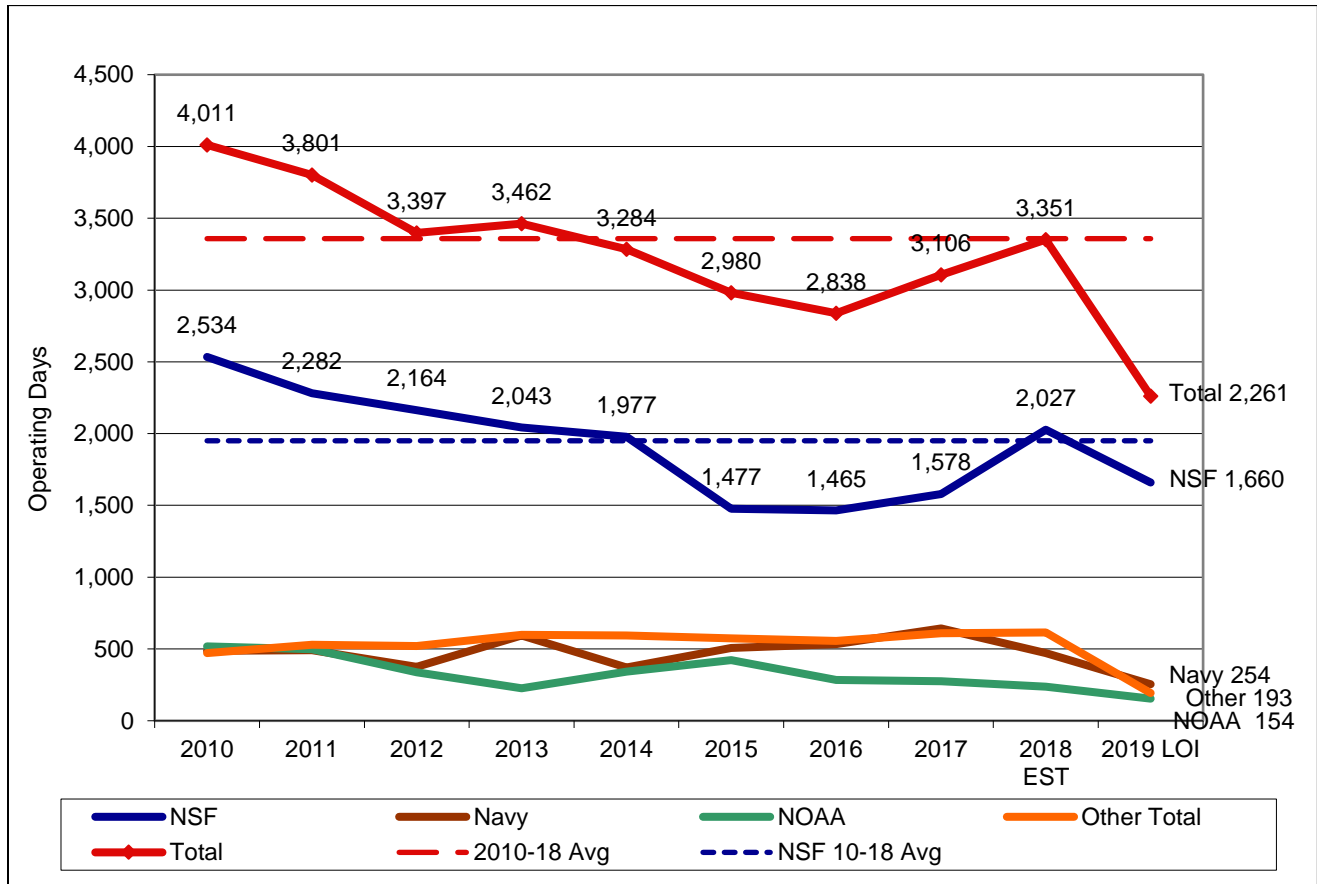


Figure 2: Ship Utilization by Class: 2010 – 2019: Global and Ocean Intermediate Class

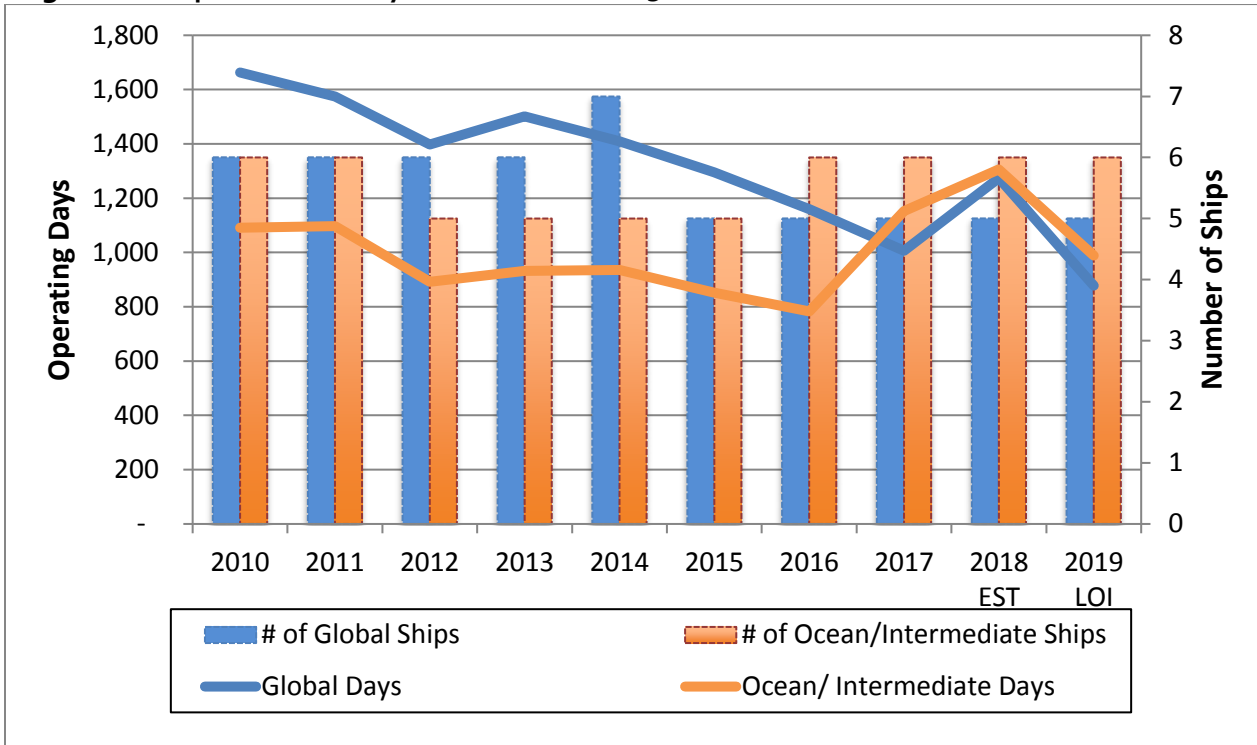


Figure 3: Ship Utilization by Class: 2010 – 2019: Regional and Coastal/Local Class

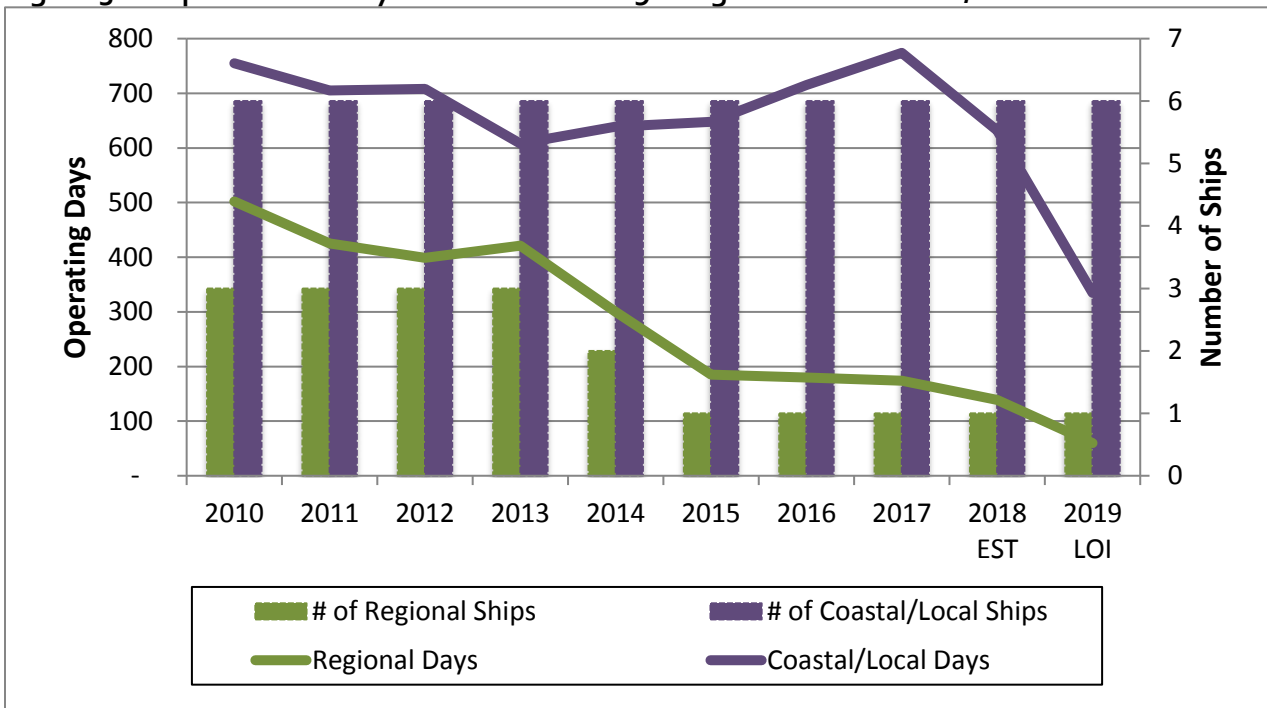
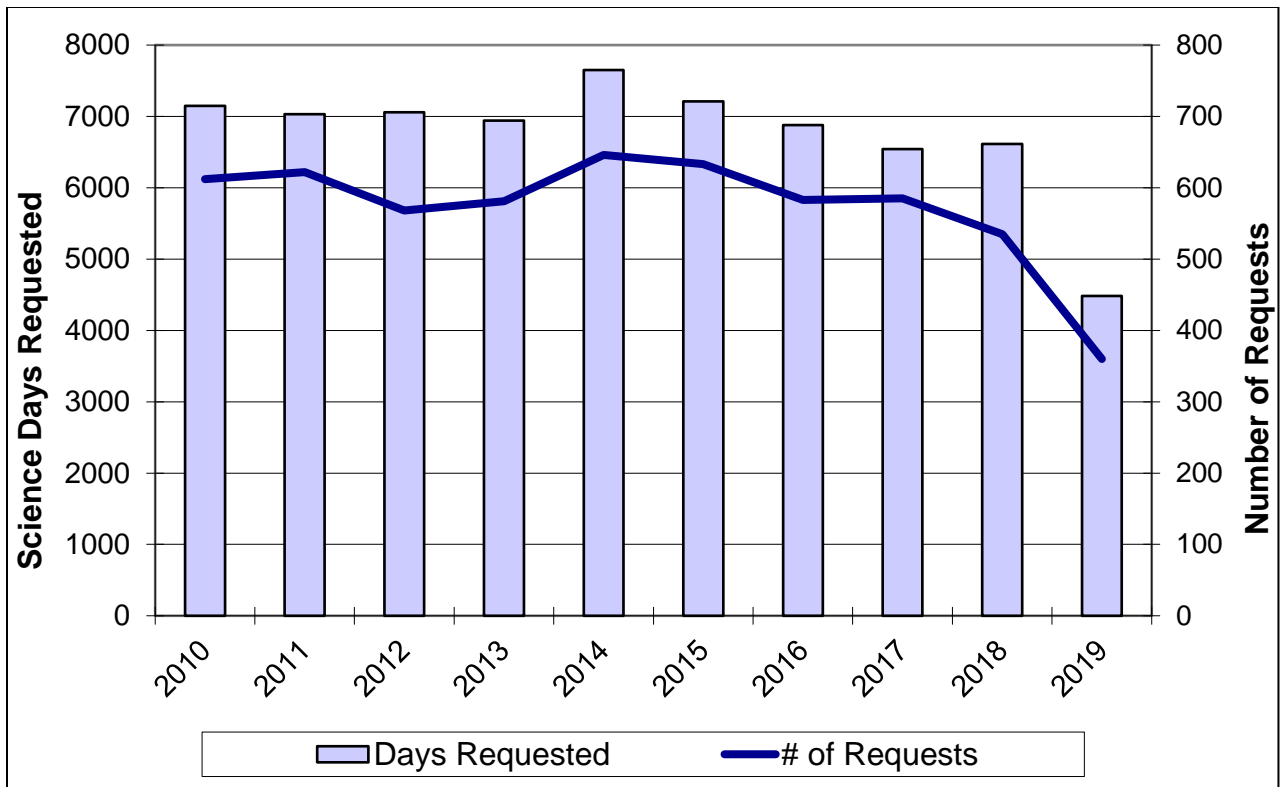


Figure 4: Ship Time Request Demand



October 24, 2018

From: UNOLS Council Non-Operator Subcommittee (Tammi Richardson, Chair; Rhian Waller, Anna-Louise Reysenbach)

To: NSF and ONR (hereafter ‘the Agencies’)

Subj: Response to document “2019 U.S. Academic Research Fleet Operations Support Findings and Recommendations”

Ref: The above document (submitted to Dr. Deborah Steinberg-UNOLS Chair, 18 July 2018)

The following comments from the UNOLS Council Non-operator Subcommittee are in response to the Agencies’ positions, guidelines, and recommendations as detailed in the “2019 U.S. Academic Research Fleet Operations Support Findings and Recommendations.”

Overall, we are encouraged to see that the Agencies are satisfied with efforts towards achieving desired Fleet utilization rates and we note the possible challenges with scheduling the Global class vessels due to the *Revelle*’s mid-life refit. We concur that a clear definition of the fleet’s surge potential is critical, especially considering recent needs for rapid response research in the wake of major hurricanes and the Kilauea volcano eruption, for example. We are encouraged that the NSF will accept proposals with ship time requests at both panels, and feel that the recommended 18-month-from-submission time window is a reasonable timeframe for the more complex Global/Ocean class ship requests.

Our comments focus on the Agency Positions, Decisions and Recommendations, and Guidelines.

Agency Positions

Most agency positions are identical to those in the past and have been commented on in previous Non-Operator responses. In response to position 4 and as mentioned above, we agree that some level of surge capacity is needed for rapid-response type cruises. We are in favor of this assuming that rapid response cruises do not displace already-scheduled ship operations, and thus truly increase science utilization. In response to position 6, we concur with the NSF decision to follow the Sea Change recommendation of retiring the *R/V Marcus G. Langseth* in mid-2020. While this is disappointing, we understand the factors that underlie this decision.

Agency Decisions and Recommendations

Recommendation 1 (identification of cost reduction strategies, leveraging of institutional resources) is a recurring theme and a continuing activity for ship operators.

Similarly, re: Recommendation 2, the science community is embracing the enhanced capabilities of the newest members of the ARF and we believe will plan for reduced berthing capacities as needed.

Guidelines

Agency Guidelines are identical to those in previous documents.

Agency Guidelines

Most of the guidelines listed are identical to those in previous years, but we note that the concept of using a two-ship operation instead of one Global is problematic given that most cruises share samples and sampling systems (i.e., most cruises for Globals are interdisciplinary) so the applicability of this approach would be very limited and potentially more costly as a result. We also note that past two-ship operations have fully utilized the space afforded by two global class vessels (e.g., SoFex; R/V *Melville* and R/V *Revelle*) or one global and one ocean/intermediate class vessel (e.g., 2018 NASA EXPORTS; R/V *Revelle* and R/V *Ride*).

Supporting Information and Findings

Given the sinusoidal variations in ship requests (Figure 4) we have to be careful in interpreting trends, but clearly the fleet utilization (Figure 1) is declining steadily; this appears to be driven primarily by overall funding, not by a lack of scientific initiative (i.e., requests). The decline in Global utilization (Figure 2) since 2012-2013 is probably due to the cycle of OOI, Repeat Hydrography/CLIVAR, and GEOTRACES cruises (e.g., RH and GEOTRACES were on *USCGC Healy* in 2015). It is anticipated that these programs (e.g., planned GEOTRACES Pacific in 2018; OOI global array servicing) and other newly developed ones (e.g., NASA/NSF-funded EXPORTS) will increase Global demand and should shift this trend upward. Moreover, given the ages of the Global class vessels, notwithstanding SLEP, and the long lead-time for new ship funding and construction, the FIC has started writing new Science Mission Requirements for replacement Global vessel(s).

Sincerely,



Dr. Deborah Steinberg/UNOLS Chair