



UNIVERSITY OF WASHINGTON
SCHOOL OF OCEANOGRAPHY
BOX 357940
SEATTLE, WA 98195

Date: 26 July 2019

From: NSF, ONR and the UNOLS Executive Secretary

To: Dr. Craig Lee,
UNOLS Council Chair

for BH *ACS* ONR
[Signature]

Subj: CY 2020 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 annual agency letter to the UNOLS Council. This letter is based on participation in on-going CY 2020 ship scheduling meetings and conducting a review of the 2020 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 acceptance of R/V *Rachel Carson* and removal of R/V *Clifford A. Barnes*. All agencies will likely fund additional ship time as science funding decisions are made in the coming weeks for the CY 2020-scheduling year but based on current projections the Cognizant Federal Agencies (NSF and ONR) present the following outlook with supporting charts and data provided by the UNOLS Office, derived from the Ship Time Request System.

The Federal Agencies 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 CY 2020, but rather provides context for continued discussions within UNOLS on the projections for the ARF's operating year. CY 2020 scheduling presents challenges due to reduced availability on Global Class ships and NDSF vehicles, due in-part to the mid-life refits of R/Vs *Roger Revelle* and *Atlantis*. While lessons learned from the R/V *Thompson* mid-life shipyard experience are being incorporated these projects do carry the risk of extension and post-shipyard warranty issues, thus a potential for a disruption in the ability to execute the planned ships schedules may arise. R/V *Revelle's* post shipyard schedule will incorporate more time for shake-down cruises as well as remaining near the CONUS for the first set of cruises.

NSF has been operating in FY 2019 under several Continuing Resolutions, a partial government lapse in appropriations and associated shutdown/furlough, and a FY 2020 President's Budget Request with a potential decrease in the budget, which makes it important to find efficiencies and target some projects for potential deferrals. NSF attempted to minimize the stress to the operators in this Fiscal Year, however future operations will be impacted if this pattern of government shut-downs and timing of budgets continues. ONR FY2020 budget will be impacted by funds need to support additional costs of R/V *Roger Revelle* and *Atlantis* mid-life refits. The FY 2019 NSF Ship Operations budget was not sufficient to support all projected operational costs for CY 2019. NSF plans to provide funding for the period October through December 2019 from the FY 2020



appropriation. The total amount of funding available for the CY 2020 ship operations work will be dependent on the final FY 2020 budget, which may not be known until well into CY 2020. In addition, the Federal agencies will continue efforts to bring uniformity in the application of costing principles across the ARF and has phased-in several more equitable charging cost structures from the distributed costs, namely the division of transit liability and homeport loading/unloading days.

Table 1: Comparison of Projected Utilization vs. Actual Utilization

	Agency	ACOE	DOE	EPA	Inst/ State	BOEM	NASA	NAVY	NOAA	NSF	USGS	Other	Total
	<i>Date</i>												
Projected 2013: Total Funded & Pending	1-Jun-12	0	0	0	128	0	32	151	154	1682	20	239	2406
Final 2013 days by agency	11-Jun-14	8	0	0	200	4	14	594	227	1989	23	403	3462
Projected 2014: Total Funded & Pending	17-Jun-13	0	0	0	121	20	17	334	152	1700	40	175	2559
Final 2014 days by agency	19-Jun-15	0	7	6	227	18	20	370	343	1977	33	283	3284
Projected 2015: Total Funded & Pending	11-Jun-14	10	0	0	77	8	0	308	119	1291	57	90	1960
Final 2015 days by agency	15-Mar-16	13	24	6	195	12	26	506	423	1477	40	258	2980
Projected 2016: Total Funded & Pending	9-Jun-15	0	0	0	71	3	26	206	162	1281	29	259	2037
Final 2016 days by agency	28-Mar-17	14	0	0	168	0	31	534	284	1465	2	340	2838
Projected 2017: Total Funded & Pending	15-Jul-16	4	10	3	137	45	62	413	144	1484	1	105	2408
Final 2017 days by agency	13-Jun-18	9	13	12	230	3	70	643	276	1578	2	270	3106
Projected 2018: Total Funded & Pending	20-Jun-17	0	3	0	61	3	64	326	141	1597	22	86	2302
Final 2018 days by agency	18-Feb-19	14	0	4	192	2	111	422	232	1968	29	227	3201
Projected 2019: Total Funded & Pending	30-Jun-18	5	0	3	279	0	1	443	196	1867	9	234	3035
Provisional 2019 days by agency	1-Jul-19	14	0	15	346	0	11	457	219	1995	20	232	3309
Projected 2020: Total Funded & 30% Pending	1-Jul-19	11	0	0	143	0	127	246	92	1537	1	133	2289

Table data as of July 1, 2019

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

NSF and ONR will continue ongoing efforts towards modernizing the ARF, with NSF planning to select an operator for RCRV #3 in the RCRV Design, Construction and Delivery Project. As previously mentioned, ONR is continuing investment in service life extensions of their Global Class ships.

As of 1 July 2019, there are 1993 funded ARF ship days across all agencies for CY 2020, as shown in Table 21. There are 987 pending days of which an estimated 30% (296) will likely be funded resulting in an approximate total of 2289 days of ship time. Figures 1 through 4 illustrate the Fleet



utilization trends over the past ten years and the anticipated use in CY 2020, 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. In CY 2019 the operators began 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.* This variance will be most apparent on the Regional and Intermediate Class ships which have an operating tempo of mainly working out of home port.

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 to demonstrate the realities and limitations of operating and maintaining each 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 add these and thereby clearly identify the available surge capacity for the ARF. Surge capacity should represent any days “left over” after all of these activities have been documented.

Based on the early findings outlined below, some ships in the ARF may have a lower than optimal schedule in CY 2020. As agreed, the UNOLS Council, Non-Op Process, provides guidance on decisions regarding non-operational periods and calls for recommendations made by the Federal 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) NSF and ONR will not normally provide operators of agency-owned assets with lay-up funds and will not divert work from other ARF vessels 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. 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 in the short-term but reduces overall costs and is in line with Agency Position 2 above.
- 4) 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. Regarding "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) NSF announced the intention to retire (divest in) R/V *Marcus G. Langseth* in mid-2020. Consideration is currently being given for a potential one-year extension of the retirement date to September 2021. This extension would allow a focused effort on providing access to *Langseth's* capabilities for Early Career Scientists while also supporting a smooth transition to alternate sources.
- 7) Federal agencies encourage institutions that own and/or operate ARF vessels to employ their assets for institutional education and research. This type of shared-use lowers the day rate for all potential users and provides important funding for normal maintenance and/or emergent repairs. . . 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 operate safely and efficiently.

Agency Decisions and Recommendations

- 1) 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 that 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) 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, R/V *Roger Revelle* overhaul has started, and will be followed by R/V *Atlantis* mostly likely in Spring of CY 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) Projections of level or reduced budgets across the Federal agencies, escalating ship day rates and ship repairs, require that operators strive to strictly control operating costs. An institution's ability to maintain reasonable day rates will be considered when negotiating annual awards. In CY 2019, Global and Ocean Class ships accounted for approximately X 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 2019 the NSF/OCE funded 63 % (1157 days) of the total ship time (1847 days) for the ARF's Global and Ocean Class vessels, NSF-OOI funded 9 % (164 days), and ONR funded 18% (331 days). The remaining 10% was from NOAA, NASA, Army Corps of Engineers, 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) Funding agency science and ship program managers 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 and the science objectives are not compromised. Otherwise, larger programs will need to wait until the desired ship is available with minimal transit days.



9) Every effort is 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 and 2020 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, 2019.

The operational days for each ARF vessel for CY 20 are a “snap shot” of the 2020 LOIs that are posted as of 30 June 2019.

Table 2: Fleet Utilization by Agency (2015-2020)

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 Days	14	0	4	192	2	111	422	232	1968	29	227	3201
2019 Funded & Pending Days*	14	0	15	346	0	11	457	219	1995	20	232	3309
2020 Funded Days**	10	0	0	103	0	125	239	71	1347	0	98	1993
2020 Pending Days**	3	0	0	133	0	8	23	69	634	2	115	987
2020 Funded & 30% of Pending Days***	11	0	0	143	0	127	246	92	1537	1	133	2289

Notes about the table:

* The 2019 Funded and Pending days are based on posted ship schedules as of 7/01/2019.

** The 2020 Funded and Pending days are based on the latest LOIs and draft schedules posted as of 7/01/2019.

*** A 30% success factor rate has been applied to the pending days

Table data as of 1July2019



- There are currently 3309 operating/charge days (funded and pending) on the 2019 published schedules as of July 1, 2019. The NSF will provide support for 2185 or 60 % of the total days, and ONR/NRL will support 457 or 14 %, and NOAA 219 or 7%. The balance accounts for 19 % of days.
- For CY 19, Globals/Ocean Class vessels *Atlantis*, *Langseth*, *Revelle*, *Sikuliaq*, *Thompson*, *Armstrong*, *Ride* and *Kilo Moana* have schedules with 1847 provisional operating days (funded and all pending), accounting for 56% of total days (1847 days of the 3309).
- R/V *Atlantis* will operate in calendar year 2019 (CY 19) 284 days of which 266 are funded by NSF (OCE and OOI) with the remaining 18 days supported by institutional days, ONR, NASA, and "other". *Atlantis* started the year on the U.S. west coast conducting *Alvin* operations, OOI cabled array operations, the annual CCE-LTER cruise, and *Sentry* and *Jason* work at the Cascadia Subduction Zone. The latter half of the year *Atlantis*, along with *Alvin* and *Sentry*, will carry out operations in the Santa Barbara basin and deploy OBSs at the GoFar Transform Fault at EPR. The end of 2019 is being revised in order to accomplish newly funded work in light of *Atlantis'* (and *Alvin*) mid-life refit(s), slated to start in early June 2020. The current CY 20 LOI has 118 days primarily funded by NSF and NASA. *Atlantis* will transit through the Panama Canal to support work off the Cayman Islands and the Gulf of Mexico, concluding CY 20 with the NASA EXPORTS project in the North Atlantic.
- In CY 19 R/V *Roger Revelle* had 72 days scheduled for NSF programs out of New Zealand, before heading into the year-long service life extension. In CY 20 *Revelle* will continue the mid-life period through April 2020. R/V *Revelle* plans to transit to homeport San Diego in order to conduct several shake-down cruises and accommodate an NSF Ship Inspection before returning to science operations. The current LOI has 168 days which 160 days are to support NSF (OCE & OOI) programs, 8 days for NOAA, NASA, ONR, and "other". *Revelle's* first post-shipyard science operations will be for the OOI cabled array, then *Sentry* and *JASON* operations at the Axial Seamount, *JASON* operations at the East Pacific Rise and repositioning to Papeete for early CY 21 work off North Australia.
- In CY 19 *Marcus Langseth* will carry out 144 NSF days. *Langseth* is currently conducting 2D seismic and OBS work across the Hawaii and Emperor seamount chains out of Honolulu, then the ship will transit to and from the Alaska Peninsula subduction zone and Axial Seamount to support 3D seismic and OBS work, ending the year in Seattle for a regulatory overhaul. The CY 20 LOI has 90 days scheduled with another pending OBS project likely to be added (logistics and a two-ship coordination is being considered).
- R/V *Sikuliaq* plans to execute 271 days in CY 19, of which 240 are funded by NSF (OCE and OPP). The remaining days are funded by NOAA, the State of Alaska and "other". *Sikuliaq* will conduct OOI operations in the spring and fall with summer operations supporting CCE-LTER, NGA-LTER, and programs in the Gulf of Alaska and around the Alaskan Peninsula. The current CY 20 LOI has 232 days which 116 are funded and 116 are pending. NSF (OCE and OPP) plans to fund 224 days with the State of Alaska adding the remaining days. *Sikuliaq's* LOI has OOI operations scheduled in the spring and early fall, with summer operations for NGA-LTER and programs in the eastern North Pacific up to northern edge of the Chuckchi Borderland.
- In CY 19 *Thomas G. Thompson* is scheduled with 295 days and nearly all days are associated with NSF projects. *Thompson* began operations in the Southwest Indian Ridge and then supported the repeat hydrography IO 6S line (transect across the Antarctic Circumpolar Current between South African and Antarctic continental shelf). *Thompson* was repositioned to Woods Hole for dock-side maintenance and



inspections. Summer operations include the North Atlantic and a New Jersey continental shelf projects. In the fall, *Thompson* heads to the South Atlantic for two seismic projects before returning into the Indian Ocean. The current CY 20 LOI has 298 days of which 286 will be funded by NSF. The remaining days are pending through the University of Washington. *Thompson* will operate off South Africa and the western Pacific before returning to the U.S. west coast to support Sentry operations and undergo overhaul and repair in Seattle.

- In CY 19 *Kilo Moana* will carry out 290 sea-going days. NSF will fund 210 days with ONR, University of Hawaii and other non-federal groups (71 days) supporting the remaining days. Most operations will be done out of Honolulu. *Kilo Moana* will work off the west coast of Mexico and the southwest Pacific. The current CY 20 LOI has 246 days of which 199 are funded and 47 still pending, with NSF accounting for 188 days and the remaining days for non-federal users.
- In CY 19 *Neil Armstrong* has 215 days, 122 days for NSF, 84 for ONR, and 9 for institutional days. *Armstrong* will support OOI operations in the spring and fall. During summer operations *Armstrong* will transit to Reykjavik to support work near Greenland and Iceland. *Armstrong* will support fall and winter operations along the Atlantic outer continental shelf (Virginia to Florida) and in the Sargasso Sea. The current CY 20 LOI has 258 days of which 253 are funded. NSF will support 132 days, Navy 75, NASA (EXPORTS) 44 and WHOI 7. *Armstrong* will again support OOI operations in the spring and fall. Summer operations support mooring work in the North Atlantic and sub-polar North Atlantic. Winter operations will be along the Atlantic continental shelf.
- R/V *Sally Ride* has scheduled 282 operational days in CY 19. ONR funded 246 days, University of California – San Diego 22 days and NSF 14 days, for work off the California coast and the Western Pacific for several ONR programs. The current CY 20 LOI has 293 days of which 226 are funded and 67 are pending.
- In CY 19 *Endeavor* will support 199 days. NSF has funded 151 days, ONR 9 days and the University of Rhode Island 39 days. Most operations are out of *Endeavor's* homeport except for NSF funded programs out of Bermuda, including BATs, off the coast of Brazil and Gulf of Mexico. The current CY 20 LOI has 147 days of which 53 are funded and 94 are pending. NSF will support up to 117 days, ONR 10 days, NOPP 7 days and the University of Rhode Island 13 days.
- In CY 19 *Oceanus's* schedule has 189 days, with NSF funding 99 days, ONR 35 days, NOAA 25 days, OSU 16 days and the remaining days to be funded by ACOE. Seagoing operations are mainly along the U.S. west coast. *Oceanus* will support CCE-LTER, CalCOFI and a HOT cruise, as well as a variety of work off Oregon. The current CY 20 LOI has 215 days of which 112 are funded and 103 are pending, and with seagoing operations off the U.S. west coast and Baja California. The funding sources are varied, with NSF potentially funding 120 days, NASA 28 days, ONR 13 days, OSU 36 days, and the remaining pending days by ACOE. *Oceanus* will retire at the end of CY 20, and R/V *Taani* is expected in the Fleet in CY 2021.
- *Atlantic Explorer's* CY 19 schedule has 194 days of which 181 days are funded by NSF, mostly for the BATs and one transect cruise between Bermuda and Woods Hole for an OCE Chemical Oceanographic project. The current CY 20 LOI has 197 days of which 160 are funded and 37 pending. NSF is funding 154 days, NOPP has 30 pending days, and BIOS is funding 6 days with 7 more pending.



- In CY 19 *Pelican* has 202 days on their schedule with a diverse funding source. NSF is funding 86 days, with NOAA supporting 32 days, and "other" non-federal funding at 80 days. The current CY 20 LOI has 151 days of which 126 are funded and 25 pending. Other non-federal groups will support up to 60 days, NSF 56 days, and ONR 20 days, with remaining days coming from institution, the state and USGS support. It should be noted that the GOMRI funding has ended, in which LUMCON was able to secure significant ship funding under this initiative.
- In CY 19 *Hugh R. Sharp* will support 114 days. Navy has 47 days scheduled, NOAA 53 days, NSF 11 days and 3 non-federal days. All operations are out of homeport except three cruises in and out of WHOI. The current CY 20 LOI has 118 days of which 35 are funded and 83 are pending. NSF has 79 days on the LOI (35 funded and 44 pending) and 39 days pending for NOAA. Operations will be based out of homeport and the east coast except for an NSF funded program that will move Sharp into the Gulf of Mexico.
- In CY 19 *Walton Smith* will support 133 days of which 114 are funded and 19 are pending. NOAA has 56 days scheduled, NSF 40 days, DARPA 16 days, GOMRI 15 days, and the University of Miami 5 days. All operations are out of homeport except an NSF funded program off the U.S. Virgin Islands. The current CY 20 LOI has 115 days of which 81 are funded and 34 pending. NSF may have up to 70 days (34 pending), NOAA 42 days and the University of Miami 3 days. All operations are out of homeport except an NSF funded program off the northern coast of South America.
- In CY 19 *Savannah* will carry out 88 days to support 37 NOAA days, 15 NSF days, 15 EPA days, 10 days for the state of Georgia and the University of Georgia, with the remaining days from other non-federal groups. The current CY 20 LOI has 123 days with only 18 days funded and 105 pending. NSF has 75 pending days, NOAA up to 37 (30 pending) and the University of Georgia 11. All operations will be in and out of homeport in CY 19 and CY 20 except an EPA cruise in CY 19.
- In CY 19 *Blue Heron* will carry out 88 "sea" days. NSF funded 60 days, with the University of Minnesota – Duluth scheduling 10 days, the state of Minnesota 7 days and NOAA 2 days. The current CY 20 LOI has 41 days with 29 NSF funded days and 12 pending days for University of Minnesota – Duluth and the state of Minnesota. *Blue Heron* will work in Lake Superior, Lake Michigan and adjacent waters in both years.
- In CY 19 *Robert G. Sproul* will support 121 days. Most of *Sproul's* funding comes from the University of California – San Diego with 54 days scheduled this year, 23 for ONR, 14 for DARPA, and NASA 8 days. The current CY 20 LOI has 80 days of which 19 days are funded and 61 pending. The University of California – San Diego, Navy, DARPA, NOPP and NSF will support the funded and pending operations.
- In CY 19 R/V *Rachel Carson*, the newest addition to the ARF, will carry out 112 days. The University of Washington will support 72 days, USGS 18 days, NSF 16 days and other non-federal groups 6 days. The current CY 20 LOI has 60 days pending. The University of Washington plans schedule approximately 44 days, NSF 11 days and other non-federal groups 5 days. All operations for CY 19 and CY 20 will be supported out of *Carson's* homeport. It is anticipated that *Carson* will continue to add days.



Figure 1: UNOLS Fleet Utilization (2010-2020)
 As of July 1, 2019

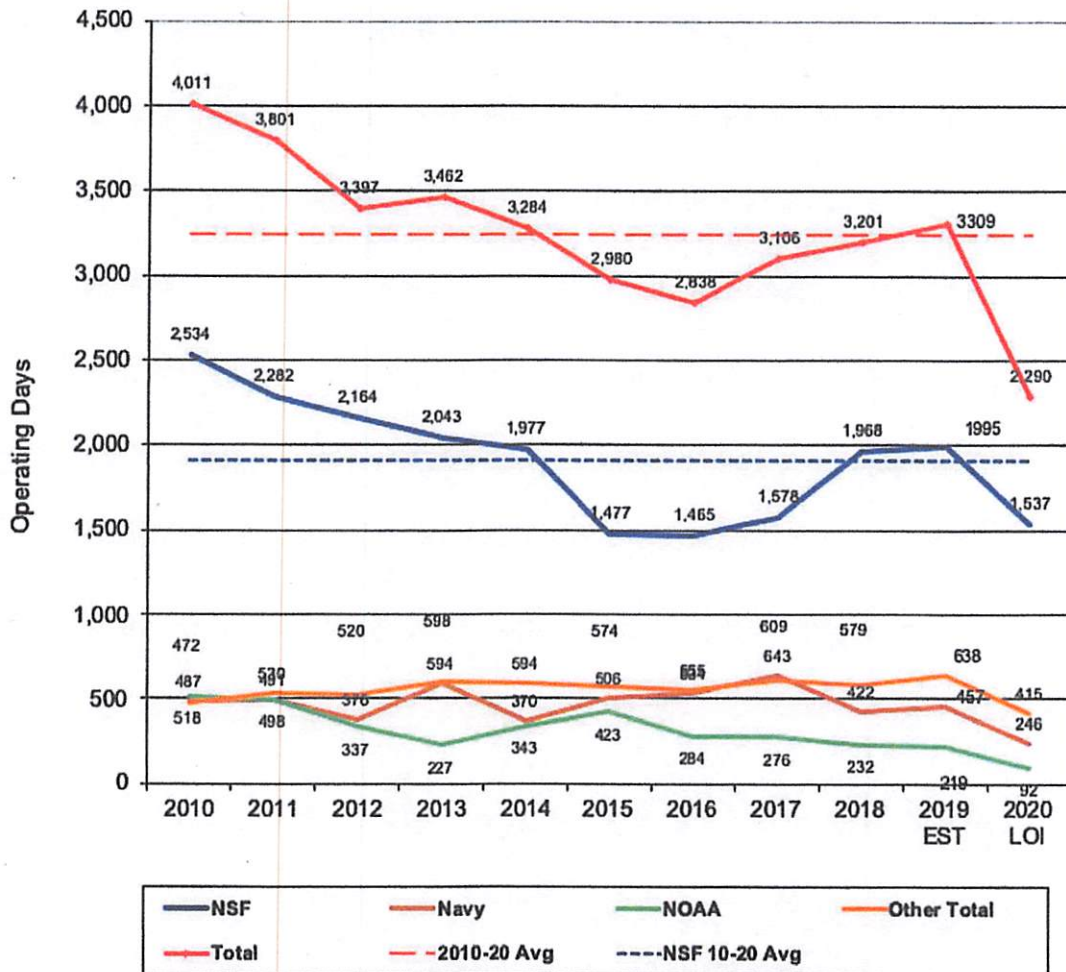




Figure 2: Ship Utilization 2010-2020: Global and Ocean/Intermediate Classes
 As of July 1, 2019

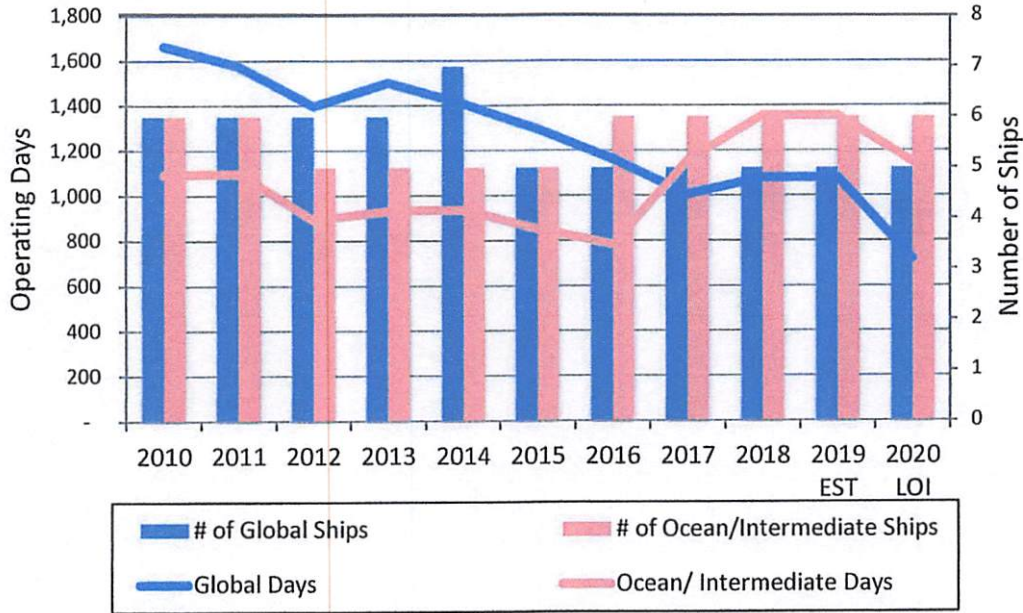


Figure 3: Ship Utilization 2010-2020: Regional and Coastal/Local Classes
 As of July 1, 2019

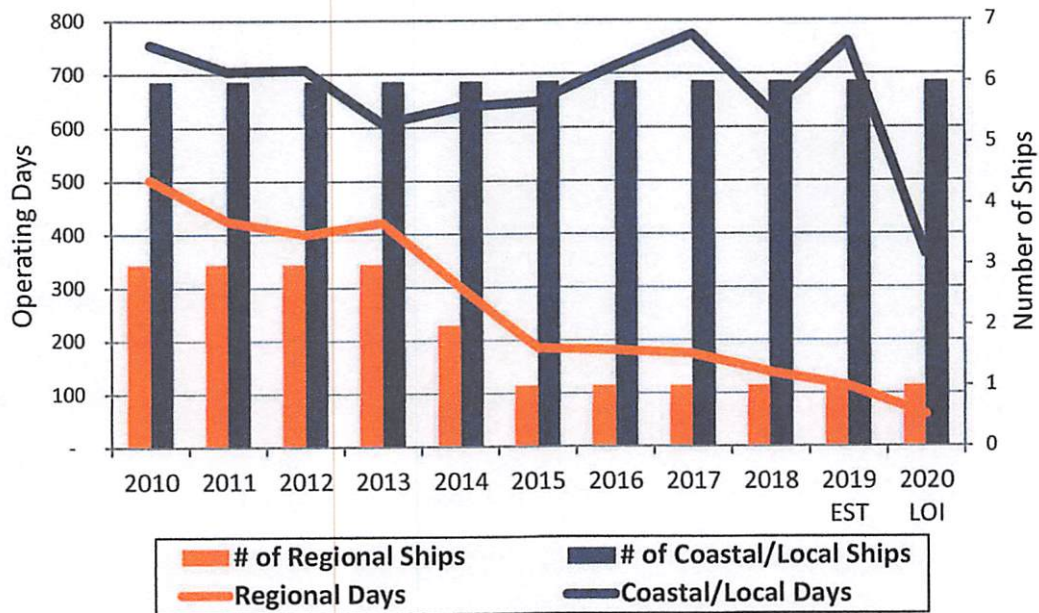




Figure 4: Ship Time Request Demand
As of July 1, 2019

