



Northwest Association of Networked Ocean Observing System

27 October 2022

Mr. Dave Easter
U. S. Integrated Ocean Observing System 1315
East West Highway
Room 2623
Silver Spring, MD 20910

REF: NA21NOS0120093: “Sustaining NANOOS, the Pacific Northwest component of the US IOOS”

Dear Mr. Dave Easter,

This Cover Letter accompanies NANOOS’ response to your letter dated 5 August 2022 stating that NOAA IOOS recommended funding NANOOS at the level of \$3,907,251 for FY 2021 (with \$126,861 held back).

NANOOS greatly appreciates this funding for the continuation of our IOOS Regional Association and Coastal Ocean Observing System for the Pacific Northwest. On behalf of NANOOS’ Governing Council and principal investigators, I relay our sincere thanks for the continued support as we together execute this national and regional system.

As noted in the letter, this funding level is less than the funding amount requested of \$6M in our 31 December 2020 proposal to IOOS for FY21. Per your request, we include documents to detail how NANOOS will descope to meet the reduced funding level. In the text appended here, we present how our proposed objectives will or will not be met under the de-scoped budget and our revised Work Plan. Also attached is a revised SF424A, detailed statements of work, a summary budget, budget justifications, subcontractor packages, and rate agreements.

As noted in your letter, the FY22 NOAA funding level for NANOOS provides Core IOOS funding of \$2,914,275, for base operations, excluding the \$126,861 holdback. In addition to this amount, NANOOS FY21 funding includes several line-item amounts with specific tasks:

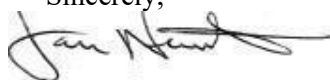
1. \$430,000 to further HABs understanding and prediction
2. \$29,073 for a one-time HFR system add-on (Kosro, OSU)
3. \$35,000 for a one-time increase for core needs
4. \$35,000 OAP funds for GOA-ON Co-Chair support (Newton, UW)
5. \$50,000 OAP funds for GOA-ON data portal and support (Newton/Tanner, UW)
6. \$271,455 OAP funds for NANOOS NOA-ON CB-06 observing (Hales, OSU)
7. \$102,948 OAP funds for NANOOS NOA-ON Cha’ba observing (Newton/Manalang, UW)
8. \$32,000 for MERHAB project activities (Mickett, UW)
9. \$7,500 for OceanHackWeek (Mayorga, UW)

Northwest Association of Networked Ocean Observing Systems

Applied Physics Laboratory, University of Washington; 1013 NE 40th Street; Seattle, WA 98105

Please let us know if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Jan Newton". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Dr. Jan Newton
NANOOS Executive Director

Encl.

NANOOS FY22 de-scope plan:

Revised objectives

De-scoped work plan

Statements of work, UW

SF424s

Budget Justification

Institutional documents

NANOOS Objectives for FY2022

Our objectives for the year (FY 2022 = Y2 of the new award = Y16 of NANOOS RCOOS) are listed below as originally proposed, and following directly underneath, as revised per our de-scope funding amount:

We retain our first objective without revision:

1) **Maintain NANOOS as the U.S. IOOS PNW Regional Association:** Sustain our proven role for regional coordination, administrative infrastructure, and stakeholder engagement, partnering with federal and non-federal (tribal, academic, state, local, industry, NGO, etc.) entities.

Our second objective:

2) **Maintain and enhance surface current and wave observations:** Maintain existing HF-radar and wave mapping capabilities and extend these to unserved and underserved areas in the region, providing critical national capacity along coasts and at critical ports. Utilize drifters to expand spatial coverage. Use observations to support wave forecasting capability.

is revised to:

Maintain surface current and wave observations: Maintain existing HF-radar and wave mapping capabilities, providing critical national capacity along coasts and at critical ports.

There are no funds for the extension to Strait of Juan de Fuca HFRs, drifters, or observations to support wave forecasting capability.

Our third objective:

3) **Sustain and enhance buoys and gliders in the PNW coastal ocean in coordination with national and regional programs and deploy new observing assets to expand spatial scope and increase our focus on biology:** Maintain, harden, enhance existing buoys and gliders, and engage new assets to provide broad regional observations, with focus on hypoxia, HABs, OA, and climate. Develop biological observations via tracking and acoustic networks, as part of West Coast wide efforts.

is revised to:

Sustain and enhance buoys and gliders in the PNW coastal ocean in coordination with national and regional programs: Maintain, harden, enhance existing buoys and gliders, with focus on hypoxia, HABs, OA, and climate.

There are no funds for new observing assets to expand the spatial scope (e.g., observations from fishing vessels of opportunity and crab pots, etc.) or to increase our focus on biology (e.g., tracking and acoustic networks).

Our fourth objective:

4) **Maintain and expand multidisciplinary observational capabilities in PNW estuaries and the nearshore, in coordination with local and regional programs:** Sustain and enhance observing ability including new investments in hypoxia, OA, and biological observations to aid sustainable resource management, water quality assessment, and sub-regional climate change evaluation.

is revised to:

Maintain multidisciplinary observational capabilities in PNW estuaries and the nearshore, in coordination with local and regional programs: Sustain observing ability to aid sustainable resource management, water quality assessment, and sub-regional climate change evaluation.

There is no ability to expand or enhance via new investments under this budget (e.g., add contaminant monitoring in Columbia River or support (calibration, sensor servicing) for a cabled observatory in the Salish Sea).

Our fifth objective:

5) **Maintain and enhance core elements of beach and shoreline observing:** Measure nearshore

bathymetry, topographic beach profiles, and shoreline morphodynamics along OR and WA, contributing to hazard mitigation by providing essential observations and better decision support tools for coastal managers, planners, and engineers.

is revised to:

Maintain core elements of beach and shoreline observing: Measure nearshore bathymetry, topographic beach profiles, and shoreline morphodynamics along OR and WA, contributing to hazard mitigation by providing essential observations and better decision support tools for coastal managers, planners, and engineers.

There is no ability to enhance under this budget (e.g., to account for change in coastal bluffs and expand beach monitoring to Puget Sound), thus we will provide information 'to the extent possible'.

Our sixth objective:

6) **Provide sustained support to a community of complementary regional numerical models:** Contribute to the operation of regional models, and the tools and products they support, covering the head of tide of estuaries to the outer edges of the Exclusive Economic Zone (EEZ) in both OR and WA, with strategic improvements to capabilities and scope, including new forecasts for waves.

is revised to:

Provide sustained support to a community of complementary regional numerical models: Contribute to the operation of regional models, and the tools and products they support, covering the head of tide of estuaries to the outer edges of the Exclusive Economic Zone (EEZ) in both OR and WA.

There is no ability to make strategic improvements in capabilities and scope, nor is there ability to invest in new forecasts for waves.

We retain our seventh objective without revision:

7) **Maintain, harden, and enhance NANOOS' Data Management and Cyberinfrastructure (DMAC) system for routine operational distribution of data and information:** Sustain and enhance the DMAC system, including the NANOOS Visualization System (NVS), for dynamic and distributed data access.

Noting that we will invest the FY22 increase of \$35,000 to focus on PI assistance for NANOOS DMAC recertification.

Our eighth objective:

8) **Continue to deliver existing and create innovative and transformative user-defined products and services for PNW stakeholders:** Continue our NVS innovation to succeed in this vital translation for meaningful and informative data products that address user needs and serve society.

is revised to:

Continue to deliver existing and, to the extent possible, create innovative and transformative user-defined products and services for PNW stakeholders: Continue our NVS innovation to succeed in this vital translation for meaningful and informative data products that address user needs and serve society.

Under flat funding, we will create new innovations 'to the extent possible'.

Our ninth objective:

9) **Sustain, diversify, and strengthen NANOOS engagement:** Continue ongoing engagement with diverse stakeholders and the public; to engage more audiences in observations, increasing ocean awareness and literacy; to expand and diversify the ocean and coastal workforce; to improve our ability to provide relevant ocean and coastal data and information to underserved or underrepresented communities; and to facilitate use of NANOOS products for societal objectives, the core task for which NANOOS exists.

is revised to:

Sustain and diversify NANOOS engagement to the extent possible: Continue ongoing engagement with

diverse stakeholders and the public, increasing ocean awareness and literacy; to diversify the ocean and coastal workforce; to improve our ability to provide relevant ocean and coastal data and information to underserved or underrepresented communities; and to facilitate use of NANOOS products for societal objectives, the core task for which NANOOS exists.

There is no ability to strengthen under a flat budget (e.g., new efforts to involve the community and students in making observations; nor to expand the ocean workforce via NANOOS internships; however, we will leverage existing programs to work to the extent possible toward this objective.

NANOOS Revised Work Plan for FY2022 Descope

The work plan described in our proposal for the \$3M funding level is similar to our FY22 award core funding amount of \$2,914,275. NANOOS thus will maintain all efforts to the current level which largely matches the work effort described in our proposal and highlighted below. Any deviations from that level of work effort are described below.

Governance and Management Subsystem:

1) Maintain NANOOS as the U.S. IOOS PNW Regional Association

Our work plan for this subsystem requires salaries and travel in FY22 for oversight, coordination, and evaluation. Under this funding level, we will maintain our current effort.

Lead PI: Newton, UW

Observing Subsystem:

2) Maintain surface current and wave observations

PNW Coast HF Surface Current Mapping: Our work plan for this objective element is to operate ten SeaSonde HF sites designated as Priority 1 sites by the national HF program; these are six long-range sites in OR, two in WA, and two standard-range sites in OR. As resources allow, three Priority 2 standard-range sites covering Heceta Bank, which is a source for HABs and of strong bathymetric flow perturbation, as well as the shelf portion of the OOI Endurance Array. Lead PI: Kosro, OSU

Wave Imaging at Critical PNW Ports: Our work plan for this objective element is to sustain the existing marine radar observing station at USCG Station Yaquina Bay, providing both real-time and historical wave information via NANOOS NVS. Mean and snapshot radar images are real-time viewable for use in environmental characterization. Lead PI: Haller, OSU

3) Sustain and enhance buoys and gliders in the PNW coastal ocean in coordination with national and regional programs.

Our work plan for this objective is to sustain the following coastal shelf assets:

WA shelf buoys: Effort will be maintained at existing levels for the Cha'ba buoy and the NEMO subsurface profiler. Lead PI: Manalang, UW

WA shelf HAB buoy: Funds will provide support for the HAB ESP deployment on NEMO mooring. Lead PI: Mickett, UW

WA shelf glider: Effort will be maintained at existing levels for the La Push line. Lead PI: Lee, UW

OR shelf buoy: Effort will be maintained at existing levels for the CB-06 buoy. Lead PI: Kosro, OSU

Columbia River shelf mooring: Effort will be maintained at existing levels for the CMOP buoy. Lead PI: Seaton, CRITFC

Columbia River shelf glider: Effort will be maintained at existing levels for the CMOP Columbia glider. PI: Barth, OSU

N. CA shelf glider: Effort will be maintained at existing levels for the Trinidad Head glider. Lead PI: Barth, OSU

4) Maintain multidisciplinary observational capabilities in PNW estuaries and the nearshore, in coordination with local and regional programs.

Our work plan for this objective is to sustain the following PNW estuarine assets:

Puget Sound, WA, profiling buoys: Effort will be maintained at existing levels for the six profiling buoys. Lead PI: Manalang, UW

Puget Sound, WA, US ferry-box: Effort will be at existing levels for the ferry-box, assuming COVID-19 does not preclude its operation. Lead PI: Krembs, WDOE

Columbia River, OR and WA: Effort will be at existing levels for the CMOP moorings. Lead PI: Seaton, CRITFC

South Slough/Coos Bay, OR: Effort will be at existing levels for the NERRS moorings. Lead PI: Helms, ODSL

5) Maintain core elements of beach and shoreline observing.

Our work plan is to sustain this bi-state network of beach, shoreline, and bathymetry monitoring efforts in collaboration with the WA and OR state agencies.

WA and OR beach, shoreline and bathymetry: Effort will be at existing levels, with no new assets or changes in work undertaken. WA beach monitoring, Lead PI: Kaminsky, WDOE; OR beach monitoring, Lead PI: Allan, DOGAMI; WA and OR nearshore bathymetric observations of beach and shoreline morphodynamics, Lead PI: Ruggerio, OSU

Modeling and Analysis Subsystem:

6) Provide sustained support to a community of complementary regional numerical models.

Our work plan for this objective is to support the continued operation of the NANOOS-supported models and maintain serving our partners' model outputs. As funds allow, we will continue to serve output from other partner's models.

NE Pacific and Salish Sea: Effort will be at the existing level to support the daily forecast model, LiveOcean, which simulates ocean circulation and bio-geochemistry in the Salish Sea and in coastal waters of the NE Pacific, including Oregon, Washington, and British Columbia. . Lead PI: MacCready, UW

Columbia River estuary and plume: Effort will be at the existing level to support the CRITFC circulation modeling system, which covers the Columbia River estuary and plume. Lead PI: Seaton, CRITFC

PNW Coastal Waters: Effort will be at the existing level to support the OSU real-time coastal ocean forecast model, which covers the coastal waters off OR and WA. Lead PI: Zaron, OSU

Data Management and Communications (DMAC) Subsystem:

Our strategic DMAC work plan is focused on sustaining the NANOOS DMAC Information System and user-facing Web and Products suite, including the integrated and thematically customized NANOOS Visualization System (NVS) framework.

7) Maintain, harden, and enhance NANOOS' Data Management and Cyberinfrastructure (DMAC) system for routine operational distribution of data and information.

Our strategic DMAC work plan, to be evaluated annually, focuses on sustaining work per our [Data Management Plan](#), as well as the user-facing web and products suite, including the integrated and thematically customized NVS framework. We will sustain our DMAC information system, and the Regional Data Assembly Center (DAC) that supports it. Effort will be at the existing level for the following areas. PIs: Tanner, UW; Seaton, CRITFC; Kosro, OSU

Mature Regional DAC Operations: NANOOS will continue its regular strategic assessment of current and future

needs for DAC operations, to sustain, refresh, and enhance a highly available, robust, distributed hardware and software environment; maintain appropriate staffing and team coordination; and maintain up- to-date operations and system documentation to ensure transparent and clear descriptions of DAC architecture.

NVS Support and Development: The user-friendly NVS data discovery, access, and visualization application framework serves a central and critical role in NANOOS' service to its stakeholders. The NANOOS DAC will maintain NVS support as one of its central roles, leveraging regional user needs, feedback, and data reviews to continually improve the relevance and quality of metadata for observing and modeling data assets integrated and served by NANOOS.

Engagement in National and Cross-regional DMAC Efforts: NANOOS will continue to actively participate in IOOS DMAC community development activities, including QARTOD, vocabulary management and semantic mapping, climatology data development and dissemination, unstructured model grids, and collaborative code development and testing via Github and other channels. NANOOS DMAC will sustain its collaborations with West Coast RA DMAC teams, via the West Coast Ocean Data Portal, IPACOA, and other efforts. We will proactively leverage and interact with marine-DMAC relevant efforts team members are engaged in, particularly the NSF-funded Ocean Observatories Initiative, estuarine and watershed monitoring initiatives, international ocean acidification monitoring activities and Canadian collaborations.

8) Continue to deliver existing and, to the extent possible, create innovative and transformative user-defined products and services for PNW stakeholders.

Our work plan for this objective will be evaluated and prioritized annually by the Tri-Com (= DMAC, User Products, and Engagement committees) based on user feedback, NANOOS Governing Council input, and outreach results for regional priorities. Effort will be at the existing level and confined to the following two tasks.
Lead PI: Tanner, UW

Web Site: Web content relevant to stakeholder issues, especially those related to Maritime Operations, Ecosystem Assessment, Fisheries & Biodiversity, Coastal Hazards, and Climate, will continue to be evaluated and updated as new information/issues become available.

Tailored Products Development: NANOOS will annually evaluate priorities for products at the Tri-Com meeting, based on outreach feedback, regional issues, and GC input, and will implement new tailored products to the extent possible.

9) Sustain and diversify NANOOS engagement to the extent possible.

NANOOS will leverage its history of effective stakeholder engagement gaining user input on NANOOS' vision and products through sustained and meaningful interaction to build from and strengthen our ongoing Engagement efforts. Our Engagement efforts will be at existing funding levels and will focus on three main areas. Lead PI: Newton, UW

Product Co-Development: The Engagement subsystem provides the link between users and DMAC, engaging users in product co-development through focus groups, targeted interviews, or surveys to garner feedback and input on products as they are developed.

Diversity, Equity, and Inclusion: NANOOS will work with the other IOOS regions and the Program Office on workforce development initiatives to expand and diversify the ocean, coastal, and Great Lake workforces and to improve our ability to provide relevant ocean and coastal data and information to underserved or underrepresented communities. On a more immediate and local scale, the NANOOS "Enabling Change" working group, made up of NANOOS staff and partners (currently federal, university, and state agency) will move forward with actions that match NANOOS' commitment ability.

Communication: We will continue to use existing methods for communication of NANOOS outputs on local, regional, and national levels, in collaboration with the IOOS Program Office and IOOS Association.

Line-item Work Plan elements

NANOOS assures the funding allotments outlined in our award letter, as tasks listed below, will be funded at the amounts indicated:

1. \$430,000 to further HABs understanding and prediction to be distributed to tribes, UW, WA Sea Grant, OSU, and for data services relevant to HABs in service of the PNW HAB Bulletin for WA and OR and other PNW HAB observing (Multiple PIs: MacCready, Callender, Bormann, Mordy, Newton/Tanner (all UW); Hunter (ODFW); Kavanaugh (OSU))
2. \$29,073 for one time system add ons (Kosro, OSU)
3. \$35,000 for a one-time increase (Newton, UW)
4. \$35,000 OAP funds for GOA-ON Co-Chair support for salary for Newton as GOA-ON co-chair (Newton, UW)
5. \$50,000 OAP funds for GOA-ON data portal and support; these funds sustain NANOOS' work to develop and maintain the GOA-ON data portal (Tanner, UW)
6. \$271,455 OAP funds for NANOOS NOA-ON CB-06 observing; these funds support OSU efforts for OA observing on CB-06 off the OR shelf (Hales, OSU)
7. \$102,948 OAP funds for NANOOS NOA-ON Cha'ba observing; these funds support UW efforts for OA observing on Cha'ba off the WA shelf (Manalang, UW)
8. \$32,000 for Monitoring and Event Response for Harmful Algal Blooms (MERHAB)/Pacific Northwest Environmental Sensor Processor ship time (Mickett, UW)
9. \$7,500 for OceanHackWeek; these funds are to support execution of OceanHackWeek (Mayorga, UW)

This completes our NANOOS Work Plan for FY22.

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2025

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. NANOOS Years 15-19 FY2021: Year 16 (U of Washington)	11.012	\$ <input type="text"/>	\$ <input type="text"/>	\$ 3,907,251.00	\$ <input type="text"/>	\$ 3,907,251.00
2. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5. Totals		\$ <input type="text"/>	\$ <input type="text"/>	\$ 3,907,251.00	\$ <input type="text"/>	\$ 3,907,251.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
	NANOOS Years 15-19 FY2021: Year 16 (U of Washington)				
a. Personnel	\$ 705,560.00	\$	\$	\$	\$ 705,560.00
b. Fringe Benefits	280,414.00				280,414.00
c. Travel	32,434.00				32,434.00
d. Equipment	20,175.00				20,175.00
e. Supplies	56,241.00				56,241.00
f. Contractual	2,020,528.00				2,020,528.00
g. Construction	0.00				0.00
h. Other	463,432.00				463,432.00
i. Total Direct Charges (sum of 6a-6h)	3,578,784.00				\$ 3,578,784.00
j. Indirect Charges	328,467.00				\$ 328,467.00
k. TOTALS (sum of 6i and 6j)	\$ 3,907,251.00	\$	\$	\$	\$ 3,907,251.00
7. Program Income	\$	\$	\$	\$	\$

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. NANOOS Years 15-19 FY2021: Year 16	\$	\$	\$	\$
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	\$	\$	\$	\$

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ 3,907,251.00	\$ 976,813.00	\$ 976,813.00	\$ 976,813.00	\$ 976,812.00
14. Non-Federal	\$ 0.00	0.00			
15. TOTAL (sum of lines 13 and 14)	\$ 3,907,251.00	\$ 976,813.00	\$ 976,813.00	\$ 976,813.00	\$ 976,812.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS)			
	(b)First	(c) Second	(d) Third	(e) Fourth
16. NANOOS Years 15-19 FY2021: Year 16	\$ 3,907,251.00	\$	\$	\$
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	\$ 3,907,251.00	\$	\$	\$

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: \$3,578,784	22. Indirect Charges: \$328,467 see remarks.
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23. Remarks: IDC is calculated with 3 UW F&A rates. APL-UW - \$264,060 = \$1,389,792 19% MTDC; UW On-Campus - \$36,406 = \$65,596 x 55.5% MTDC; UW Off-Campus - \$28,000 = \$107,694 x 26% MTDC. Contractual costs are subawards only

Statements of Work for UW-led activities for NANOOS in FY2021

The award is for the continued operation of the Northwest Association of Networked Ocean Observing Systems, NANOOS, for FY22. NANOOS is a complete observing system, composed of observing assets, data management, web display and visualization of data products, and education and outreach. NANOOS is implemented by UW-APL with several regional subcontractors that allow our system to address the diverse needs for coastal information in the Pacific Northwest. As a Regional Association of IOOS, NANOOS delivers data and information that allows the public and a variety of user groups to make decisions that involve the health, economy, and sustenance of uses of the marine coastal environment.

Statement of work for Newton for NANOOS Management

Newton will oversee and direct all elements of NANOOS RA and RCOOS. This includes travel to national and regional meetings, holding NANOOS meetings, assuring NANOOS governance is executed and involving NANOOS membership in the products and decisions of NANOOS. She will coordinate with Observation, DMAC, Education, and Product Development leads to assure the efficient and effective operation of NANOOS. She will provide oversight for all award letter tasks (*Award Letter Tasks 1, 2, 3, 9*), including those supported by NOAA OAP (*Award Letter Tasks 4, 5, 6, 7*) and NOAA NCCOS (*Award Letter Task 8*). All tasks are detailed below. This management work will include the assistance of Roxanne Carini, NANOOS associate, to liaise with NANOOS PIs to fulfill the requirements of NANOOS Recertification (*Award Letter Task 3*).

Statement of work for Newton for GOA-ON Chair support

Newton is a co-chair for the Global Ocean Acidification Observing Network (GOA-ON) (*Award Letter Task 4*). Included is salary support for her work to guide GOA-ON, lead meetings, and provide leadership.

Statement of work for Tanner for the GOA-ON Portal development

The Global Ocean Acidification Observing Network (GOA-ON) data portal, publicly released in September 2016, will continue development leveraging NANOOS capabilities (*Award Letter Task 5*). The GOA-ON Portal provides information about a broad range of GOA-ON activities, webinars, and policies. We will continue to update content as directed by GOA-ON personnel. Updates and new content include slideshow items, webinars, information pages, resources and manuals, and content for regional hubs. The GOA-ON Data Portal is a web-based interactive map that provides data and metadata about a wide range of platforms from GOA-ON members and partners. We will continue to manage and update the data portal as needed, primarily by working with GOA-ON personnel to add new platforms and data streams as they are available.

Statement of work for Tanner for UW contribution to NANOOS DMAC

A robust DMAC infrastructure is key to the success of NANOOS products and services. Much of our efforts over the next year will focus on continuing to improve current systems and making data available in formats standardized by IOOS. We have developed a new software framework for data harvesting called BlueHarvest, replacing nearly all of the old harvesting scripts. We will work to migrate the few remaining old harvesters to BlueHarvest and add additional new harvesters to BlueHarvest as the needs arise. As part of data harvesting, we will investigate and start to employ methods for acquiring and storing QARTOD flags for data. We will work with data providers to establish conventions for making such QARTOD flags available to BlueHarvest. We are in the process of converting model overlays to “dynamic overlays”, allowing users to specify color maps and ranges they prefer. We will work to add the dynamic capabilities to as many overlays as possible. As NANOOS DMAC has developed and grown over time, the challenge of monitoring system errors and outages has grown as well. We have started development of a monitoring app within NVS, and will continue to develop ways of interfacing DMAC tools and software with the monitoring app. Finally, we will continue to maintain NANOOS owned DMAC hardware, and apply updates and patches as necessary.

Statement of work for Tanner for UW NANOOS Website and Products

PI Troy Tanner will lead the implementation of the APL-UW portion of the web portal and products tasks. The

primary user-facing NANOOS interface is the web portal (site). The web portal provides access to recent items via a slideshow, archived news information, information about NANOOS and IOOS, education and outreach materials, current and archived documents, various related products, and more. We will continue to maintain and updated the current web portal framework and content as needed by our stakeholders. Working with our partners within and outside of the core NANOOS team, we will develop new content and web pages as needed. We will also continue to highlight important NANOOS related events and information via the slideshow feature on the home page.

NVS (NANOOS Visualization System) is a data and visualization portal that organizes information into various views for communities. These views are called “apps”. We will continue to develop apps for new communities as the needs are identified. We will add new platforms and model information to NVS as they become available. We will continue development of particle tracking capabilities and work to identify models compatible with web-service based interfaces to support such a feature. We are in the process of converting model overlays to “dynamic overlays”, allowing users to specify color maps and ranges they prefer. We will work to add the dynamic capabilities to as many overlays as possible.

NANOOS, via its web portal, develops additional products to serve specific needs. Two examples are the J-SCOPE ocean forecast for sardines product, and the HABs product pages which provide information, real-time monitoring, and forecasts for HABs events. We will continue to maintain, update, and create new content for such product pages as needs are identified. Working with our stakeholders, we will develop new product pages as appropriate.

Statement of work for Newton for NANOOS Engagement

Salaries are for part-time NANOOS Engagement staff, Rachel Wold, and for NANOOS Associate Carini for Engagement activities. Engagement staff will conduct networking, outreach, and user engagement to facilitate the use of NANOOS data and products. Their focus will be on keeping the NANOOS portal current and fresh, updating content to reflect NANOOS new products, and using NANOOS home page, social media platforms and regular newsletters to bring traffic to NANOOS portal. Carini will focus on content from NANOOS PI scientists and stakeholder engagement with new parties.

Engagement staff will provide outreach events for targeted groups including recreational boating and maritime operations communities. They will support the web development team’s efforts in refining the NANOOS web portal to meet the needs of data users via such activities as gathering feedback from targeted users, coordinating focus groups with targeted user groups, and creating training resources within the NVS Help App, such as FAQs and tutorial videos. Wold will continue to work with the IOOS Association and NOAA IOOS office to support IOOS education efforts on a national scale.

Statement of work for Manalang for UW contribution to NANOOS WA coastal buoy Observations

1. *Operation of WA Shelf Buoys:* The APL mooring team will staff two cruises to service environmental buoys at the NEMO site (Cha’ba, NEMO-Subsurface, a profiling mooring), coordinate instrument calibration with external vendors, perform minimal required routine maintenance on recovered mooring systems, and track real-time data (summer only) data flow from deployed moorings to the NVS site.

2. *Maintain Cha’ba as a real-time coastal pCO₂/ocean acidification mooring as part of NOAA OAP NOA-ON:* The funds will provide field support for, maintain, and assist with distributing data for a real-time pCO₂/OA monitoring mooring on the Washington shelf (Cha’ba) at La Push (***Award Letter Task 7***), with moorings deployed on a year-round basis. Leveraging includes 1) Much of the routine servicing, calibration and maintenance of the buoy is supported by NANOOS funding, and 2) NOAA-PMEL is responsible for calibration and maintenance of the OA sensors, which include pCO₂, pH, oxygen, temperature and salinity. Specific additional tasks necessary to be performed by APL/UW to support these sensors include 1) PI-level interfacing with NOAA/PMEL to ensure data quality and optimal sensor placement, 2) additional work each mooring

servicing mission (2x annually) associated with i) installation, maintenance and operation of mooring infrastructure (sea-lion exclusion fence and wells) necessary for the OA sensors, ii) packing, handling and installation/removal of the OA sensors, and 3) additional OA-specific QA/QC analysis of the other sensors on the mooring for proper contextualization of the data from the OA sensors (e.g. velocity, oxygen and temperature information during observed acidification periods).

Statement of work for Manalang for NANOOS Puget Sound Observations

The APL mooring team will conduct maintenance field visits to each of seven Puget Sound moorings (ORCA moorings and the Bellingham Bay Buoy, Se'lhaem) on approximately a quarterly basis (may be more frequent during periods of heavy fouling), oversee proper data flow from instruments to externally facing data reporting websites and repositories, coordinate instrument calibration with external vendors, and perform routine maintenance on recovered mooring components.

Statement of work for Lee on Glider operations

Funds requested for FY22 will support fabrication and limited testing of one SGX glider along with year-round operations. Savings resulting from reduced operational tempo during the COVID-19 pandemic allow us to carry some funding over from the previous year, while SGX fabrications undertaken for other programs provide economies of scale that will reduce unit cost during the coming year. These two factors allow us to continue NANOOS Washington Coast glider operations while also fabricating a second glider, which is critical to protecting the program's ability to conduct sustained observations along the La Push line.

Statement of work for Mickett on ESP Spring deployment

Funding will be used to design, build and implement a new subsurface controller module in support of near real-time ESP contextual observations including profile measurements of T, S, DO, nitrate and velocity. This fabrication will completely replace an aging (11 years old) buoy controller. Work will consist of:

1. Establishing design criteria for the new system;
2. Evaluating various existing controllers against design criteria;
3. Selecting and evaluating a candidate controller;
4. Writing firmware for system telemetry, instrument communication, and data logging;
5. Rebuilding power system;
6. Fabricating all new system cables for interfacing with instruments and powering/interfacing with the surface modem;
7. Selecting/design/purchase of new telemetry cable; and
8. Full system testing with instruments and telemetry system.

Instruments to integrate with this controller include a Teledyne RDI ADCP, a SeaBird SBE37 CTD and a McLane Moored Profiler. This work will be accelerated to be carried out over the fall/winter of 2021/2022 so that the NEMO-Subsurface mooring can be deployed on the regular schedule in the spring of 2023.

Statement of work for UW-led HAB-ON

The work for HAB understanding and prediction (*Award Letter Task 1*) is divided among several partners. Many UW partners will implement activity to support the PNW HAB Bulletin (Mordy, MacCready, Bormann/Osborne), others will support SoundToxins (Callender), ESP deployment (Mickett), and HABON oversight and data support (Newton/Tanner). OSU partner Kavanaugh's Oregon HAB activity is described in the OSU materials. ODFW (Hunter) HAB water sampling activity is described in the ODFW materials.

1. UW-ONRC UW ONRC (ORHAB) led by PI Bernard Bormann and ORHAB staff including ORHAB Research Analyst Anthony Odell, and ONRC Program Manager, Theresa Santman will: 1) Work with PI Jan Newton and other project leads to manage the ORHAB component of the project by coordinating the distribution of funds for field activities among the four Coastal Treaty Tribe members of ORHAB, and

serving as the host for equipment and supply purchasing and distribution. 2) ONRC staff have compiled equipment, supply and operation support needs in consultation with each tribe to support their capacity to collect, process, and analyze nearshore samples. This continues efforts undertaken with prior year's funding and includes nearshore vessel sampling transects, mooring data collection, and each tribe's shore-side laboratory processing and analysis. The current round of funds will also support a HAB tech training program initiated by the Hoh Tribe. NANOOS HAB-ON funds will be used to purchase supplies, equipment, and services in support of these objectives.

2. The UW-CICOES (Mordy) will use a TBN Professional Staff research scientist, in collaboration with PNW HAB Bulletin scientists at NOAA PMEL, UW Oceanography, and NOAA NWFSC, will continue production of the PNW HAB Bulletin for coastal shellfish managers and other project stakeholders. We expect to produce nominally 6 Bulletins. The PNW HAB Bulletin is considered to be a core service to coastal managers. Project scientists will continue to interface with coastal managers via monthly ORHAB phone calls. This enables project scientists to discuss progress made on the project along with any necessary modifications. Managers have already provided extensive input regarding PNW HAB Bulletin content and format, and we expect this to continue evolving throughout the project.
3. UW-Ocean work led by PI Parker MacCready will continue development and application of the daily forecast model, LiveOcean. The model simulates ocean circulation and biogeochemistry in the coastal waters of the NE Pacific, including Oregon, Washington, and British Columbia, and in the Salish Sea. The model is or has been used for research on river plumes, phytoplankton growth, Harmful Algal Blooms (HABs), hypoxia, Ocean Acidification, and the larval transport of invasive species. It has been extensively validated against a wide variety of observational data. In this year we propose to: 1.) Maintain ongoing LiveOcean daily forecasts, 2.) Continue producing daily particle tracking movies that are used by regional managers and by those responsible for production of the HAB Bulletin, and 3.) Explore extension of the forecast to longer than three days.
4. UW-APL HAB oversight and data support (Newton) APL PI Newton will provide oversight for all HAB ON projects and will assure technical analytical support of NANOOS for HAB data and products. Salary is included for Tanner, who will continue to maintain and update the HABs website as needed, and to develop new features in support of stakeholders and users.
5. UW-Washington Sea Grant (Callender) implements SoundToxins, a phytoplankton monitoring and research program, which is a diverse partnership of trained monitors from native tribes, shellfish producers, environmental learning centers, environmental groups, and Puget Sound volunteers designed to provide early warning of harmful algal bloom events in order to minimize both human health risks and economic losses to Puget Sound fisheries. With this funding we will be able to continue daily support of the SoundToxins monitors with overall communication and supplies, training, plankton identification, data recording, and alerting to State health officials about real-time concerning levels of harmful algae. We will also update the SoundToxins phytoplankton identification card. Activities include:
 - Provide daily support for SoundToxins monitors, field questions on data recording, phytoplankton identification and providing alerts to the Washington Department of Health and overall provide coordination and communication with all SoundToxins monitors. Alerts will be made to the Washington Department of Health when monitors observe levels of Pseudo-nitschia, Alexandrium and Dinophysis above established action levels.
 - Host regular SoundToxins office hours for monitors to virtually drop by to ask questions.
 - Communicate regularly with Principal Collaborators to achieve program goals; Prepare NOAA progress report, provide information about the project to interested stakeholders.

The UW-Atmospheric Science's Pacific Northwest Modeling group (Cliff Mass, PI) will provide APL-UW access to high-resolution numerical weather forecast data. These data are produced by the UW's Weather Research Forecast (WRF) model. The PNW WRF is run in a 24/7, semi-operational mode, and is available at a variety of resolutions. The WRF data will be used in the NANOOS modeling effort and support several sub-tasks. These include:

- The NANOOS Visualization System (NVS) that will show specific forecast parameters where there are observing assets in the water;
- Any applications run by the NVS that uses WRF model output;
- Provision of meteorological boundary conditions to support Parker MacCready's (UW School of Oceanography) LiveOcean model which will be served over NVS.

The UW Pacific Northwest Modeling group will allow access to the WRF data at least once every twelve hours. The resolution and data parameters are to be determined by mutual agreement. Access to the data will be for the period of the support, upon receipt of funds, and available for yearly renewal.

Statement of work for MacCready for UW contribution to NANOOS Modeling tasks: LiveOcean

We will continue development and application of our daily forecast model, LiveOcean. The model simulates ocean circulation and biogeochemistry in the Salish Sea and coastal waters of the NE Pacific, including Oregon, Washington, and British Columbia. The model has been used for research on river plumes, phytoplankton growth, Harmful Algal Blooms (HABs), hypoxia, and Ocean Acidification (OA), and has been extensively validated against a wide variety of observational data. URL: faculty.washington.edu/pmac/LO/LiveOcean.html.

Previous NANOOS support has allowed rapid development of the forecast system, and daily forecasts of biogeochemical properties including OA variables have been available online for the past four years through the NANOOS NVS portal. One model focus is on OA in coastal waters, an issue of great concern to shellfish growers. Another active use is for short-term forecasts of the advection of potential Harmful Algal Blooms (HABs) on the coast as part of a NOAA MERHAB project.

In the past year we maintained reliable daily forecasts, developed daily extractions of model fields for the NANOOS THREDDS server, and performed model-data comparisons of carbon variables relevant to OA, both within the Salish Sea and in coastal waters.

In the coming year we plan to:

- Perform hindcasts from 2013-present, allowing better understanding of interannual variability, e.g. the effects of the "Blob" marine heat wave of 2014-6 on the inland waters of the Salish Sea.
- Develop new nested forecast products for high-value regions such as Willapa Bay and South Puget Sound.
- Continue improving web access of the model output and data comparisons, developed in collaboration with stakeholders.

Statement of work for Mickett on MERHAB Ship Time

This activity will include R/V Jack Robertson vessel days or partial payment of a joint- NWEM-MERHAB charter vessel. It includes four full days aboard the R/V Jack Robertson or approximately three days on a chartered vessel. The use of these funds may be split between three different cruises—one in the spring (~May), one in mid-summer, and another in late September or October. Work on these cruises will consist of deployment and recovery of the Environmental Sample Processor Mooring, which is sited adjacent to UW/NANOOS/NOAA PMEL Cha'Ba mooring. The ESP mooring is jointly operated by UW/APL, NOAA NWFSC & CCEHBR, and MBARI. (*Award Letter Task 8*)

Statement of work for Mayorga on OceanHackWeek support

OceanHackWeek (<https://oceanhackweek.github.io>) is a 5-day learning hackathon aimed at exploring, creating and promoting effective computation and analysis workflows for large and complex oceanographic data. It brings together graduate students, postdoctoral associates and other scientists from different sectors including academia and government agencies. OceanHackWeek 2022 was held on August 15 – 19, 2022, as a global virtual event and six regional satellites to accommodate more diverse learning environment preferences, better address the demand for in-person engagement, and support a larger number of participants. A total of 104 participants gathered online and in coordinated satellite events around the globe: the US Northeast, Southwest and Northwest (UW) regions; Australia; Brazil (in Portuguese); a Spanish language virtual group; and the global event spanning time zones from Hawaii to Poland. The organization of OceanHackWeek 2022 has involved individuals at multiple institutions, with UW personnel playing a leading role in both planning, execution, and post-event coordination. ***(Award Letter Task 9)***

For other Award Letter tasks, see SOWs from NANOOS sub-contractors as follows:

Award Letter Task 1: Oregon HAB observations; Kavanaugh, OSU

Award Letter Task 1: HAB water sampling; Hunter, ODFW

Award Letter Task 3: One time HFR system add-ons; Kosro, OSU

Award Letter Task 6: NANOOS NOA-ON CB-06 observing; Hales; OSU

Statements of Work for subcontractor-led activities for NANOOS in FY2022

Oregon State University (OSU)

will be responsible for observing, DMAC, and modeling: Specific tasks include nearshore bathymetric surveying (Ruggerio); harbor wave observations for maritime ops (Haller); HF surface current mapping in OR and WA (Kosro); Oregon shelf mooring observations (Kosro); California Glider Procurement (Barth); N California glider observations (Barth); Central Washington shelf glider observations (Barth); PNW coastal modeling (Zaron); Oregon DMAC support (Kosro); OA observations off Oregon CB-06 buoy (Hales); Oregon HAB observations (Kavanaugh); and HFR one-time add-ons (Kosro).

Columbia River Inter Tribal Fish Commission (CRITFC)

will be responsible for Columbia River shelf and estuary observations, regional DMAC support, and modeling around the Columbia River estuary and plume (Seaton).

Oregon Department of Geology and Mineral Industries (DOGAMI)

will be responsible for Oregon shoreline observing (Allan) and for Allan to participate as User Products Committee Chair.

Oregon Department of State Lands (ODSL)

will be responsible for estuarine observations in South Slough/Coos Bay (Helms).

Washington Department of Ecology (Ecology)

will be responsible for the Salish Sea ferry-box observing (Krembs) and for Washington shoreline observing (Kaminsky).

Oregon Department of Fish and Wildlife (ODFW)

will be responsible for HAB water sampling in Oregon (Hunter).

BUDGET JUSTIFICATION

The budget will support the development, implementation, and operation of NANOOS, the Pacific Northwest regional coastal ocean observing system (RCOOS), as part of the U.S. Integrated Ocean Observing System (IOOS). The budget information below provides justification for University of Washington (UW) expenditures to support NANOOS according to NOAA cost categories. UW is the fiscal agent for NANOOS and additional budget details for subcontractors are included in the appendix. The total amount requested is \$3,907,251.

A. UW NANOOS PERSONNEL – YR2

Total: \$705,560

	Yearly Salary	% of Time	# of Months	Total Amount
<i>Management</i>				<i>\$117,512</i>
PI, Jan Newton, Management	\$202,272	41.67%	5.00	\$84,280
Oceanographer, Roxanne Carini	\$105,324	16.67%	2.00	\$17,554
Student Assistant (Work Study), Leilani Combs	\$14,389	37.50%	4.50	\$5,396
PI, Jan Newton, GOA-OA	\$202,272	5.08%	0.61	\$10,282
<i>Observing Subsystem</i>				<i>\$219,306</i>
<i>La Push Buoys</i>				
Co-PI, Dana Manalang	\$165,948	2.00%	0.24	\$3,319
Co-PI, John Mickett	\$140,748	2.00%	0.24	\$2,815
Field Eng., Chris Archer	\$83,160	10.00%	1.20	\$8,316
Field Eng., Robert Daniels	\$80,616	20.00%	2.40	\$16,123
Field Eng., Amy Larsen	\$78,552	12.50%	1.50	\$9,819
Field Eng., Keith Magness	\$103,860	6.00%	0.72	\$6,232
			<i>Subtotal</i>	<i>\$46,624</i>
<i>Puget Sound Buoys</i>				
Field Eng., Robert Daniels	\$80,616	12.50%	1.50	\$10,077
Field Eng., Amy Larsen	\$78,552	20.00%	2.40	\$15,710
Field Eng., Seth Travis	\$89,460	10.00%	1.20	\$8,946
Field Eng., Matthew Gimpelevich	\$58,752	10.00%	1.20	\$5,875
			<i>Subtotal</i>	<i>\$40,609</i>
<i>La Push Buoys, OA</i>				
Co-PI, John Mickett	\$140,748	2.50%	0.30	\$3,519
Field Eng., Chris Archer	\$83,160	5.00%	0.60	\$4,158
Field Eng., Robert Daniels	\$80,616	15.00%	1.80	\$12,092
Field Eng., Amy Larsen	\$78,552	10.00%	1.20	\$7,855
Data Manager., Seth Travis	\$89,460	15.00%	1.80	\$13,419
			<i>Subtotal</i>	<i>\$41,043</i>

<i>HAB Analysis</i>				
PI, Jan Newton	\$202,272	4.40%	0.53	\$8,905
Co-PI, Troy Tanner	\$146,796	12.50%	1.50	\$18,350
			<i>Subtotal</i>	\$27,254
<i>La Push Glider, O&M</i>				
Co-PI, Craig Lee	\$246,720	7.92%	0.95	\$19,532
Principal Eng., Geoff Shilling	\$176,976	25.00%	3.00	\$44,244
			<i>Subtotal</i>	\$63,776
<i>Modeling & Analysis Subsystem</i>				\$52,319
Co-PI, Parker MacCready (Live Ocean & HAB Modeling)	\$169,920	27.95%	3.35	\$47,484
Meteorologist, Dave Ovens (Co-PI Mass, Weather)	\$101,304	4.77%	0.57	\$4,835
<i>DMAC Subsystem</i>				\$202,064
<i>DMAC</i>				
Co-PI, Troy Tanner	\$146,796	4.17%	0.50	\$6,117
Software Eng., Alex Dioso	\$97,608	33.33%	4.00	\$32,536
Software Eng., Dan Stromecki	\$92,088	46.45%	5.57	\$42,777
			<i>Subtotal</i>	\$81,430
<i>GOA-ON</i>				
Co-PI, Troy Tanner	\$146,796	14.94%	1.79	\$21,933
			<i>Subtotal</i>	\$21,933
<i>Web Development</i>				
Co-PI, Troy Tanner	\$146,796	41.67%	5.00	\$61,165
Software Eng., Alex Dioso	\$97,608	14.86%	1.78	\$14,508
Software Eng., Dan Stromecki	\$92,088	8.33%	1.00	\$7,674
			<i>Subtotal</i>	\$83,347
<i>DMAC Recertification- here or under Management?</i>				
Oceanographer, Roxanne Carini	\$105,324	14.58%	1.75	\$15,353
			<i>Subtotal</i>	\$15,353
<i>Engagement Subsystem</i>				\$59,883
Oceanographer, Rachel Wold	\$62,052	41.67%	5.00	\$25,855
Oceanographer, Roxanne Carini	\$105,324	29.41%	3.53	\$30,978
Oceanographer, Emilio Mayorga (OceanHack)	\$121,956	2.50%	0.30	\$3,050
<i>HAB-ON</i>				\$54,477
Water Qual. Spec., Teri King (PI Callender)	\$102,168	8.33%	1.00	\$8,514
Water Qual. Spec., Michelle Lepori Bui (PI Callender)	\$74,880	28.84%	3.46	\$21,594
TBN – Pro Staff (PI McCabe)	\$97,476	25.00%	3.00	\$24,369

Principal Investigator – Jan Newton: As NANOOS Director, this position will oversee and direct all elements of NANOOS; Newton will also support to HAB-ON activities and to NOAA Ocean

Acidification Program (OAP) efforts and serve as GOA-ON Chair, as well as other related activities. Jan Newton will provide 6.14 months effort for a total of \$103,467.

Oceanographer – Roxanne Carini: This position will directly support the NANOOS Director, Jan Newton, while providing additional support under the engagement subsystem. Roxanne Carini will provide 7.28 months effort for a total of \$63,885.

Co-Principal Investigator – Troy Tanner: This position will oversee the DMAC subsystem, including technicians needed to maintain all data management and communications. It also includes data portal and web support for NANOOS, GOA-ON, and HAB analysis. Troy Tanner will provide 8.79 months effort for a total of \$107,564.

Co-Principal Investigator – Dana Manalang: This position will support the following observing subsystem projects: La Push Buoys, Puget Sound Buoys, and Ocean Acidification sampling at the La Push Cha'ba Buoy for NOAA OAP. It will oversee the field engineers and other key personnel to carry out the observing subsystem. Dana Manalang will provide 0.24 months effort for a total of \$3,319.

Co- Principal Investigator – John Mickett: This position will support the following observing subsystem projects: La Push Buoy, HAB buoy, and Ocean Acidification sampling for NOAA OAP. John Mickett will provide 0.54 months effort for a total of \$6,334.

Co- Principal Investigator – Craig Lee: This position will support the operation and maintenance of the La Push glider. Craig Lee will provide 0.95 months effort for a total of \$19,532.

Principal Engineer – Geoff Shilling: This position will support the operation and maintenance of the La Push glider. Geoff Shilling will provide 3.00 months effort for a total of \$44,244.

Co-Principal Investigator – Parker MacCready: This position will contribute to the Modeling and Analysis Subsystem, for lead modelers and technicians needed to maintain numerical models. Specifically, this position support maintenance of the LiveOcean and HAB models. Parker MacCready will provide 3.35 months effort for a total of \$47,848.

Meteorologist – Dave Ovens: This position will provide resources to support a technician for atmospheric input to modeling (Mass). Dave Ovens will provide 0.57 months effort for a total of \$4,835.

Oceanographer – Rachel Wold: This position will support the Engagement Subsystem. Specifically, it will execute engagement and outreach activities for NANOOS. Rachel Wold will provide 5 months effort for a total of \$25,855.

Field Engineer – Chris Archer: This position will provide resources to support a field engineer to support the following observing subsystem projects: La Push Buoys, and Ocean Acidification sampling for NOAA OAP. Chris Archer will provide 1.8 months effort for a total of \$12,474.

Field Engineer – Robert Daniels: This position will provide resources to support a field engineer to support the following observing subsystem projects: La Push Buoys, Puget Sound Buoys, Cha’ba Buoy enhancement, and Ocean Acidification sampling for NOAA OAP. Robert Daniels will provide 5.7 months effort for a total of \$38,293.

Field Engineer – Amy Larsen: This position will provide resources to support a field engineer to support the following observing subsystem projects: La Push Buoy, Puget Sound Buoys, Cha’ba Buoy, and Ocean Acidification sampling for NOAA OAP. Amy Larsen will provide 5.1 months effort for a total of \$33,385.

Field Engineer – Keith Magness: This position will provide resources to support a field engineer to support the following observing subsystem projects: La Push Buoys. Keith Magness will provide 0.72 months effort for a total of \$6,232.

Field Engineer – Matthew Gimpelevich: This position will provide resources to support a field engineer to support the following observing subsystem projects: Puget Sound Buoys. Matt Gimpelevich will provide 1.2 months effort for a total of \$5,875.

Data Manager – Seth Travis: This position will provide resources to support updates to data systems in support of: La Push Buoy, Puget Sound Buoys, and Ocean Acidification sampling for NOAA OAP. Seth Travis will provide 3.0 months effort for a total of \$22,365.

Software Engineer – Alex Dioso: This position will provide resources to support a software engineer for enhancing the DMAC Subsystem maintenance and development of the NANOOS portal, NVS web application suite, Data Explorer app, and Tsunami Evacuation app. Alex Dioso will provide 5.78 months effort for a total of \$47,044.

Software Engineer – Dan Stromecki: This position will provide resources to support a software engineer for enhancing the DMAC Subsystem maintenance and development of the NANOOS portal, NVS web application suite, Data Explorer app, and Tsunami Evacuation app. Dan Stromecki will provide 6.57 months effort for a total of \$50,451.

Oceanographer – Emilio Mayorga: This position will support OceanHack Week. Emilio Mayorga will provide 0.3 months effort for a total of \$3,050.

Water Quality Specialist – Terri King: This position will support the Harmful Algal Bloom Observing Network (HAB-ON). Terri King will provide 1.0 months effort for a total of \$8,514.

Water Quality Specialist – Michelle Lepori Bui: This position will support the Harmful Algal Bloom Observing Network (HAB-ON). Michelle Lepori Bui will provide 3.46 months effort for a total of \$21,594.

Student Assistant – Leilani Combs: This work study position will support the NANOOS Management team with data management and sample processing. Leilani Combs will provide 4.5 months effort for a total of \$5,396.

TBN Pro Staff: This position will support the Harmful Algal Bloom Observing Network (HAB-ON), specifically the HAB Bulletin. TBN Pro Staff will provide 3.0 months effort for a total of \$24,369.

B. UW NANOOS FRINGE BENEFITS - YR 2

Total: \$280,414

Personnel	Amount	Rate	Total
PI, Jan Newton	\$103,467	41.90%	\$43,352
Oceanographer, Roxanne Carini	\$63,885	41.90%	\$26,768
Co-PI, Troy Tanner	\$107,564	41.90%	\$45,069
Co-PI, Dana Manalang	\$3,319	41.90%	\$1,391
Co-PI, John Mickett	\$6,334	41.90%	\$2,654
Co-PI, Craig Lee	\$19,532	41.90%	\$8,184
Principal Eng., Geoff Shilling	\$44,244	41.90%	\$18,538
Co-PI, Parker MacCready (Live Ocean & HAB Modeling)	\$47,484	24.60%	\$11,681
Meteorologist, Dave Ovens (Co-PI Mass, Weather)	\$4,835	31.80%	\$1,537
Oceanographer, Rachel Wold	\$25,855	41.90%	\$10,833
Field Eng., Chris Archer	\$12,474	41.90%	\$5,227
Field Eng., Robert Daniels	\$38,293	41.90%	\$16,045
Field Eng., Amy Larsen	\$33,385	41.90%	\$13,988
Field Eng., Keith Magness	\$6,232	41.90%	\$2,611
Field Eng., Matthew Gimpelevich	\$5,875	41.90%	\$2,462
Field Eng., Seth Travis	\$22,365	41.90%	\$9,371
Software Eng., Alex Dioso	\$47,044	41.90%	\$19,711
Software Eng., Dan Stromecki	\$50,451	41.90%	\$21,139
Oceanographer, Emilio Mayorga (OceanHack)	\$3,050	41.90%	\$1,278
Water Qual. Spec., Teri King (PI Callender)	\$8,514	31.80%	\$2,707
Water Qual. Spec., Michelle Lepori Bui (PI Callender)	\$21,594	31.80%	\$6,867
Student Assistant (Work Study) - Leilani Combs	\$5,396	23.20%	\$1,252
TBN – Pro Staff (PI McCabe)	\$24,369	31.80%	\$7,749

The benefit and leave rates included in the budget are in accordance with UW’s negotiated

rates approved by the Department of Health and Human Services (DHHS) and UW policy on proposal budgets. The negotiated benefit rates differ between APL-UW and other departments at UW. Fringe rates are posted at <https://www.washington.edu/research/institutional-facts-and-rates/#benefit-rates> and are appended with other negotiated rate agreements in this document in the latter pages of this document. Current UW Benefits rates are: 41.9% for APL Professional staff, 23.2% for APL Hourly staff, 31.8% for Campus Professional staff, and 24.6% for Campus Research Faculty.

C. UW NANOOS TRAVEL – YR 2

\$32,434

- **Travel - Domestic: \$22,562**

Regional and national travel is requested NANOOS staff members (e.g., Director, Program Manager, support staff) for travel to meetings and workshops associated with NANOOS (including NANOOS Governing Council meeting/All-PI meeting, and regional Observing, DMAC, Modeling, and Outreach meetings), IOOS Association (including bi-annual Board meetings), IOOS (including bi-annual IOOS meetings and IOOS DMAC meetings) and to represent NANOOS at national meetings (e.g., Ocean Sciences, AGU). Outreach, Engagement and Education travel for NANOOS Outreach staff is for focused user group and education meetings. Local travel and ferry costs for Observing buoy PIs and technicians are associated with buoy support and maintenance of the observing subsystem.

NANOOS Management staff (PI Newton and two student notetakers) to attend regional NANOOS Outreach meeting in Newport, OR:

	Cost	Total
3 persons to Newport, OR		
1 x Ground Transport - UCAR + Mileage	1 \$375	\$375
3 ppl/3 nights @ \$131/night lodging	9 \$131	\$1,179
3 ppl/4 days @ \$69/day per diem	12 \$69	\$828
3 ppl/4 days @ \$50/day Miscellaneous (parking, tolls, ferry)	12 \$50	\$600
<i>Subtotal</i>		<i>\$2,982</i>

Management PI Newton and to attend bi-annual IOOS meetings at IOOS Program in Washington, DC:

	Cost	Total
1 pers. x 2 trips to Washington, DC		
2 x Contract RT Air from SEA	2 \$698	\$1,396
2 x 1 pers. /2 nights @ \$258/night lodging	4 \$258	\$1,032
2 x 1 pers. /3 days @ \$79/day per diem	6 \$79	\$474
2 x 1 pers./3 days @ \$50/day Miscellaneous (taxi, parking, tolls)	6 \$50	\$300
	<i>Subtotal</i>	<i>\$3,202</i>

NANOOS Management staff (PI Newton and two student notetakers) to attend regional NANOOS Outreach meeting in Neah Bay, WA.

	Cost	Total
3 persons to Neah Bay, WA		
1 x Ground Transport - UCAR + Mileage	1 \$277	\$277
3 ppl/3 nights @ \$113/night lodging	9 \$113	\$1,017
3 ppl/4 days @ \$74/day per diem	12 \$74	\$888
1 pers./4 days @ \$50/day Misc: taxi, parking, ferry, etc	4 \$50	\$200
	<i>Subtotal</i>	<i>\$2,382</i>

Management PI Newton to represent NANOOS at AGU Fall Meeting 2023 in San Francisco, CA:

	Cost	Total
1 person to San Francisco, CA		
1 x Contract RT Air from SEA	1 \$288	\$288
1 pers./5 nights @\$288/night lodging	5 \$288	\$1,440
1 pers./6 days @ \$79/day per diem	6 \$79	\$474
1 pers./6 days @ \$50/day Misc: ground transport, etc	6 \$50	\$300
	<i>Subtotal</i>	<i>\$2,502</i>

NANOOS Management PI Newton and 2 staff to attend NANOOS annual meeting at WSU, Vancouver, WA:

	Cost	Total
3 persons to Vancouver, WA		
1 x Ground Transport - UCAR + Mileage	1 \$226	\$226
3 ppl/2 nights @ \$182 night lodging	6 \$182	\$1,092
3 ppl/3 nights @ \$74/day per diem	9 \$74	\$666
3 ppl/3 days @ \$50/day Misc. (parking, tolls, ferry)	9 \$50	\$450
	<i>Subtotal</i>	<i>\$2,434</i>

NANOOS Engagement staff (Wold/Carini) to attend regional NANOOS Outreach meeting in Newport, OR:

	Cost	Total
2 persons to Newport, OR		
1 x Ground Transport - UCAR + Mileage	1 \$375	\$375
2 ppl/3 nights @\$131/night lodging	6 \$131	\$786
2 ppl/4 days # \$69/day per diem	8 \$69	\$552
2 ppl/4 days @\$50/day Miscellaneous (parking, tolls, ferry)	8 \$50	\$400
<i>Subtotal</i>		<i>\$2,113</i>

NANOOS Engagement staff (Wold/Carini) to attend regional NANOOS Outreach meeting in Neah Bay, WA:

	Cost	Total
2 persons to Neah Bay, WA		
1 x Ground Transport - UCAR + Mileage	1 \$277	\$277
2 ppl/3 nights @ \$113/night lodging	6 \$113	\$678
2 ppl/4 days @ \$74/day per diem	8 \$74	\$592
2 ppl/4 days @\$35.66/day Miscellaneous (parking, tolls, ferry)	8 \$50	\$400
<i>Subtotal</i>		<i>\$1,947</i>

Observing PI Manalang and three technical staff to service Cha'ba buoy offshore of La Push, WA:

	Cost	Total
4 persons to La Push, WA		
1 x Ground Transport - UCAR + Mileage	1 \$350	\$350
4 ppl/4 nights @ \$167.44/night lodging	16 \$167.44	\$2,679
4 ppl/5 nights @ \$79/day per diem	20 \$79	\$1,580
2 Staff/4 Days @ \$48.87/day Miscellaneous (parking, tolls, ferry)	8 \$48.87	\$391
<i>Subtotal</i>		<i>\$5,000</i>

- **Travel - Foreign: \$9,872**

Funds for international travel are included in this proposal as part of the NOAA OAP-supported GOA- ON Co-Chair duties for Newton. Additional permission for international travel may be requested. Should any additional international travel be required, e.g., for PI Newton for GOA-ON or NANOOS related work, funds from domestic travel may be used after consultation with the NOAA IOOS program manager.

PI Newton (GOA-OA) to 5th International Symposium on the Ocean in a High CO2 World in Lima, Peru

	Cost	Total
1 person to Lima, Peru		
1 x Refundable RT Air from SEA	1 \$1,500	\$1,500
1 pers./5 nights @ \$250/night lodging	5 \$250	\$1,250
1 pers./6 days @ \$76/day per diem	6 \$76	\$456
1 pers. / @\$200/trip Ground Transportation	1 \$200	\$200
<i>Subtotal</i>		<i>\$3,406</i>

PI Newton (GOA-OA) to 5th International Symposium on the Effects of Climate Change on the

World's Oceans in Bergen, Norway

		Cost	Total
1 person to Bergen, Norway			
1 x Refundable RT Air from SEA	1	\$1,562	\$1,562
1 pers./5 nights @ \$182/night lodging	5	\$182	\$910
1 pers./6 days @ \$76/day per diem	6	\$96	\$576
1 pers. / @\$143/trip Ground Transportation	1	\$143	\$143
<i>Subtotal</i>			<i>\$3,191</i>

PI Newton (Management) to ASLO Aquatic Sciences Meeting 2023 in Palma de Mallorca, Spain

		Cost	Total
1 person to Palma de Mallorca, Spain			
1 x Refundable RT Air from SEA	1	\$1,794	\$1,794
1 pers./6 nights @ \$133/night lodging	6	\$133	\$798
1 pers./7 days @ \$76/day per diem	7	\$76	\$483
1 pers. / @\$200/trip Ground Transportation	1	\$200	\$200
<i>Subtotal</i>			<i>\$3,275</i>

<i>Domestic</i>	<i>\$22,562</i>
Management	\$13,502
Engagement	\$4,060
WA Shelf Buoy	\$5,000

<i>International</i>	<i>\$9,872</i>
Management	\$3,275
GOA-OA	\$6,597

Travel costs are budgeted in accordance with University, State and Federal regulations and include refundable airfare, current per diem rates, and ground transportation. The travel costs proposed represent the best estimate of the off-site trips required to successfully complete this project. Lodging and per diem rates are set by the US General Services Administration. Full per diem days are assumed and therefore not prorated.

D. UW NANOOS EQUIPMENT – YR 2

\$20,175

Equipment for purchase by UW and its subcontractors is listed in the accompanying table showing task, amount, and justification. Equipment purchased will be owned by UW or its subcontractors but will be used for NANOOS as long as funding is provided. The cost of the equipment listed in the budget is based on quotes from the manufacturer or distributor.

In support of the La Push WA coastal buoys, we request \$15,000 to purchase an acoustic deckset with transducer. This is used to trigger acoustic releases that are used during mooring deployments and recoveries. To date, the NWEM team has borrowed decksets from other groups or laboratory equipment pools, but these units are in demand and not reliably available. Because this equipment is critical to mooring operations, the group will purchase an acoustic

deckset, including a dunkable transducer head.

In support of ORHAB, we request \$5,175 to purchase a Axiolab 5. epifluorescence phase-contrast microscope (total purchase price of \$13,337, with cost split between Years 1 and 2 of funding for Quinault tribal allocation). This microscope will greatly enhance the Quinault tribe's ability to detect and correctly identify HAB species using new methods which provide greater clarity of dinoflagellate structure and also allow for genetic information to be used in species ID.

Lease-versus-buy analysis: Lease of the equipment listed above is either not available or not cost-effective for sustained operations. Analysis of lease vs. purchase options for common oceanographic equipment such as current point-measurers or current-profilers, CTDs, wave-tide gauges, sonars, and water quality sensors (temperature, salinity, oxygen, chlorophyll, turbidity, optics) shows leasing rates are generally set to repay instrument purchase costs in 250 to 500 days. Because instruments purchased here will be used in a sustained observing program, beginning with the five-year program funded under this grant, and with the anticipation of future participation, the purchase option is the more cost effective for all of these applications.

EQUIPMENT TO BE PURCHASED BY UNIVERSITY OF WASHINGTON:

Task	Equipment	Amt per	Justification
La Push Buoys, Manalang	Seaglider Fabrication	\$15,000	Acoustic Deckset for triggering mooring releases - borrowed units are not reliably available
ORHAB, Borman	Axiolab 5. epifluorescence phase-contrast microscope	\$5,175 (partial)	To enhance the Quinault tribe's ability to detect and correctly identify HAB species

EQUIPMENT TO BE PURCHASED BY SUBCONTRACTORS:

Task	Equipment	Amt per	Justification
ODSL S. Slough Observations (Helms)	Sonde and Sensors	\$13,573 (total system cost)	To ensure program- wide uniformity
ODSL S. Slough Observations (Helms)	Xylem Storm 3 Turnkey Telemetry DCP system & Components	\$11,327 (total system cost)	To allow seamless and cost- free data stream telemetry
OSU Project 3 HF Radar (Kosro)	2 Computers	\$5,200	To support sustained observational programs
OSU Project 3 HF Radar (Kosro)	3 Antennas	\$11,000	To support sustained observational programs
OSU Project 4 OR Shelf Buoy (Kosro)	2 Instrument: 2 SBE37	\$7,530	To replace damaged equipment
OSU Project 4 OR Shelf Buoy (Kosro)	Computer	\$5,200	For Oregon Shelf Mooring data analysis
OSU Project 5 CA Glider Procurement (Barth)	Glider (50%)	\$100,000	Sampling/underwater observations
OSU Project 7 DMAC (Kosro)	Computer/data server	\$5,200	Funds to purchase a new computer server
OSU Project 8 OA (Hales)	2 Composite pressure cases	\$10,000	Replace damaged equipment

E. UW NANOOS SUPPLIES – YR 2**\$56,241**

- Management supplies (\$7,433, PI Newton) include laptops, webinar software, shipping costs, office supplies.
- NANOOS engagement and outreach supplies (\$2,389, PI Newton) include folders, postcards, decals, pens, etc.
- Observing supplies for WA shelf buoys (\$10,306, PI Manalang) are for buoy repair/replacement parts (e.g., cables and connectors (\$5,000), and mooring supplies and consumables (\$5,306) including shackles, chain, anchors, protective cages for instruments, and marine batteries for two buoys off WA shelf).
- Observing Supplies for OA support on WA shelf buoy (\$5,842, PI Manalang) are for analysis chemicals (\$3,000) and other expendables (\$2,842) to measure ocean acidification (OA).
- Observing supplies for Puget Sound buoys (\$15,165, PI Manalang) are for buoy repair/replacement parts (e.g., cables and connectors (\$1,278), marine batteries (\$500) for each of six buoys in Puget Sound), as well as general computing supplies and mooring consumables (\$4,500).
- WA Glider O&M (\$2,873, PI Lee) are for repair/replacement parts and other operational expendables.
- OceanHackWeek (\$40, PI Mayorga) supplies for both the virtual and the in-person satellite event at the University of Washington.
- HAB-ON supplies (\$12,193, PI Bormann) for non-capitalized lab equipment and supplies to process and analyze samples to be distributed by UW ONRC to ORHAB partners at four Treaty Tribes (Hoh, Makah, Quinault, Quileute) for assessing harmful algal blooms (HABs) as part of the HAB observing network, HAB-ON.

Management	\$7,433
Engagement	\$2,389
WA Shelf Buoys	\$10,306
OA Shelf	\$5,842
PS Buoys	\$15,165
Glider O&M	\$2,873
OceanHackWeek	\$40
HABs - ONRC	\$12,193

F. UW NANOOS CONTRACUAL – YR 2**\$2,020,528**

The strong academic-industry-government-NGO partnership of NANOOS requires that non-competitive subawards be established for certain sub-element tasks of NANOOS operations, to:

- Oregon State University (OSU): \$1,424,528
 - Method of selection: Sole source, OSU has been managing observations on and modeling of Oregon waters and providing supporting DMAC for NANOOS since its inception in 2004.

- Period of performance: 1 July 2021-30 June 2026
- Description of activities: OSU will conduct
 - Project 1 – Nearshore Bathymetry Observations (PI Ruggiero)
 - Project 2 – Marine Radar Observing Station (PI Haller)
 - Project 3 – HF Surface Current Mapping (PI Kosro)
 - Project 4 – Oregon Shelf Mooring (PI Kosro)
 - Project 5 – Underwater Glider Observations (PI Barth)
 - Project 6 – Oregon-Washington Coastal Ocean Data Assimilation and Forecast System (PI Barth)
 - Project 7 – Data Management and Communications (PI Kosro)
 - Project 8 – Ocean Acidification Monitoring (PI Hales)
 - Project 9 – Harmful Algal Bloom Observing Network (PI Kavanaugh)
- Method for Maintaining Performance Accountability: Semi-annual progress reports
- Itemized Budget: See attached subaward package
- Columbia River Inter Tribal Fish Commission (CRITFC): \$291,000
 - Method of selection: Sole source, CRITFC now manages “CMOP” the Coastal Margin Observation and Prediction center that has been making observations on and modeling of Columbia River estuary and shelf waters and providing supporting DMAC for NANOOS since its inception in 2004.
 - Period of performance: 1 July 2021-30 June 2026
 - Description of activities: CRITFC will conduct Columbia River shelf and estuary observations, regional DMAC support, and modeling around the Columbia River estuary and plume (Seaton).
 - Method for Maintaining Performance Accountability: Semi-annual progress reports
 - Itemized Budget: See attached subaward package
- Oregon Department of Geology and Mineral Industries (DOGAMI): \$60,000
 - Method of selection: Sole source, DOGAMI has been managing observations of Oregon shorelines for NANOOS since its inception in 2004.
 - Period of performance: 1 July 2021-30 June 2026
 - Description of activities: DOGAMI will provide observations of Oregon shorelines (Allan) and provide time for Allan to be the NANOOS User Products Committee Chair
 - Method for Maintaining Performance Accountability: Semi-annual progress reports
 - Itemized Budget: See attached subaward package
- Oregon Department of State Lands (ODSL): \$30,000
 - Method of selection: Sole source, ODSL has been managing observations in southern Oregon estuaries for NANOOS since its inception in 2004.
 - Period of performance: 1 July 2021-30 June 2026
 - Description of activities: ODSL will provide estuarine observations in South Slough/Coos Bay (Helms)
 - Method for Maintaining Performance Accountability: Semi-annual progress reports
 - Itemized Budget: See attached subaward package
- Washington Department of Ecology (Ecology): \$90,000

- Method of selection: Sole source, Ecology has been managing observations in Washington estuaries and of Washington shorelines for NANOOS since its inception in 2004.
- Period of performance: 1 July 2021-30 June 2026
- Description of activities: Ecology will provide Salish Sea ferry-box estuarine observations (Krembs) and Washington shoreline observations (Kaminsky)
- Method for Maintaining Performance Accountability: Semi-annual progress reports
- Itemized Budget: See attached subaward package.

For each subaward, budget justifications are provided in the subcontractor package, including their detailed budgets, SOWs, and other supporting documents.

- Oregon Department of Fish and Wildlife (ODFW): \$125,000
 - Method of selection: Sole source, funding will allow the continuation of the NOAA funded ODFW phytoplankton projection for an additional year.
 - Period of performance: 1 January 2023-31 December 2023
 - Description of activities: Funding will allow water samples to be collected from 5-sites on the north coast weekly, 2-sites on the central coast twice a month, and 2-sites on the southern coast twice a month. Samples include both whole water and net tow as well as one-liter samples to be used for particulate DA (pDA) analysis using ELISA techniques if cell counts reach or surpass existing thresholds. (Hunter)
 - Method for Maintaining Performance Accountability: Semi-annual progress reports
 - Itemized Budget: See attached subaward package.

For each subaward, budget justifications are provided in the subcontractor package, including their detailed budgets, SOWs, and other supporting documents.

OSU	\$1,424,528
CRITFC	\$291,000
DOGAMI	\$60,000
ODSL	\$30,000
Ecology	\$90,000
ODFW	\$125,000

G. UW NANOOS CONSTRUCTION – YR 2

\$0

None

H. UW NANOOS OTHER – YR 2

\$463,432

This category is composed of two items: services, and APL Prorated Direct Costs (PDC)

Services (\$103,116)

- For Management, PI Newton requests \$12,000 for annual IOOS Association dues. For Outreach, PI Newton allocates \$300 for a data plan coverage for an iPad tablet used in field or remote settings to connect users with NANOOS data streams, \$300 for project

telecomm and \$700 for printing brochures, posters, and other informational material and \$1,200 for costs for planned NANOOS workshops including meals, participant travel support, and event costs. NANOOS includes “participatory costs” to cover the participation of invitees (such as tribal members) to our workshops, funding their local travel and food. Per 2CFR 200.432, “costs may include local transportation, meals and refreshments, and other incidentals.” This is not a duplication with the travel requested in the travel category, which is for NANOOS staff.

- NANOOS Observing PI Manalang requests funds for the WA Shelf buoys instrument calibration services, which includes 3x Temperature and Salinity sensor calibrations at \$1,500 to Seabird Scientific (\$4,500). Cellular communications services for summer Cha’Ba and NEMO-Subsurface buoys (\$600), and satellite tracking for year-round continuous buoy position monitoring (\$581) are also requested.
- NANOOS Observing PI Manalang requests funds for the Puget Sound buoys instrument calibration services, which includes 7x Temperature and Salinity sensor calibrations at \$1,470 (\$10,290) and 6x Oxygen sensor calibrations at \$3,216 (\$19,297) to Seabird Scientific (total of \$29,587). Additional cellular internet services to allow communication with and data transmission from moorings at \$333.33 x 12 months (\$4,000). Additional costs include vessel-related services for fuel (\$2,000), insurance (\$1,250), and maintenance (\$2,420) for a vessel to conduct Puget Sound buoys maintenance.
- NANOOS MERHAB PI Mickett requests funds for APL-UW research vessel time. 4.3 days x \$4,624 per day (\$19,920).
- Two NANOOS projects allocate costs for printing brochures, posters and other informational materials: OceanHackWeek (PI Mayorga) for \$300; Modeling Weather (PI Mass) for \$58.
- NANOOS HAB-ON partner ONRC (PI Bormann) will receive services related to nearshore sampling, processing, analysis and reporting from the field activities among the four Coastal
- Treaty Tribe members of ORHAB. \$5,925 x 4 for a total of \$23,700.

Management/Outreach (PI Newton)	\$14,200
WA Shelf (PI Manalang)	\$5,681
PS Buoys (PI Manalang)	\$39,257
MERHAB R/V Time (PI Mickett)	\$19,920
OceanHackWeek (PI Mayorga)	\$300
Weather Modeling (PI Mass)	\$58
HAB-ONRC (PI Borman)	\$23,700

Prorated Direct Costs (\$360,316)

APL-UW’s purpose is Research and it is solely funded through Grant and Contract revenue. APL-UW’s operating expenses meet the definition of Direct Costs as defined by 2 CFR Part §200.413 and are directly charged to grants and contracts through the application of the Prorated Direct Costs rate (PDC). The PDC rate of 35.2% MTDC was approved by the Office of Naval Research on September 12, 2018 and became effective October 1, 2018. A PDC rate proposal was submitted to the Office of Naval Research on September 28, 2021 for the rate of 35%

MTDC to go into effect October 1, 2021. This rate is anticipated to continue through FY23. YR2 PDC costs is calculated on an APL-UW MTDC base of \$1,029,476.

A. Salary	\$598,764
B. Fringe Benefits	\$249,872
C. Travel	\$32,434
E. Supplies	\$44,048
G. Contractual	\$25,000
H. Other	\$79,358
MTDC Base for PDC	\$1,029,476

I. UW NANOOS TOTAL DIRECT CHARGES – YR 2

\$3,578,784

Total Direct Charges are composed of the following:

A. Personnel	\$705,560
B. Fringe	\$280,414
C. Travel	\$32,434
D. Equipment	\$20,175
E. Supplies	\$56,241
F. Contractual	\$2,020,528
G. Construction	\$0
H. Other	\$463,432
Total Direct Costs:	\$3,578,784

J. UW NANOOS INDIRECT CHARGES – YR 2

\$328,467

UW Facilities and Administrative costs are calculated as 55.5% of MTDC (total direct costs less equipment and graduate operating fees); the UW-Other rate is 26%, the UW-APL rate is 19.0%. Facilities and Administrative (Indirect) costs are calculated in accordance with the University’s DHHS rate agreement dated September 30, 2020. This agreement and a table of the rates are appended to this document and available at:

<https://www.washington.edu/research/institutional-facts-and-rates/#fa-rates>

Total Indirect Costs were calculated as follows from the base and rate.

	UW-APL	UW-Campus	UW-Other
Salary	\$598,764	\$52,319	\$54,477
Fringe Benefits	\$249,872	\$13,219	\$17,323
Travel	\$32,434	\$0	\$0
Supplies	\$44,048	\$0	\$12,193
Contractual	\$25,000	\$0	\$0
Other	\$439,674	\$58	\$23,700

Modified Total Direct Cost Base	\$1,389,792	\$65,596	\$107,695
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Multiplied by Indirect Cost Rates:

UW-APL	19%	\$264,060
UW-Campus	55.5%	\$36,406
UW-Other	26%	\$28,001
Total Indirect Costs		\$328,467

K. UW NANOOS TOTALS – DIRECT & INDIRECT CHARGES – YR 2 \$3,907,251

The total request is as follows:

Direct	\$3,578,784
Indirect	\$328,467
Total Request:	\$3,907,251

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN: 916001537

DATE:09/30/2020

ORGANIZATION:

FILING REF.: The preceding agreement was dated 07/21/2017

University of Washington
 Management Accounting and Analysis
 4300 Roosevelt Way NE, Suite 300
 Box 354966
 Seattle, WA 98195-4966

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

SECTION I: INDIRECT COST RATES

RATE TYPES: FIXED FINAL PROV. (PROVISIONAL) PRED. (PREDETERMINED)

EFFECTIVE PERIOD

<u>TYPE</u>	<u>FROM</u>	<u>TO</u>	<u>RATE(%)</u>	<u>LOCATION</u>	<u>APPLICABLE TO</u>
FINAL	07/01/2014	06/30/2015	54.50	(1) & (A)	Organized Research
PRED.	07/01/2015	06/30/2017	54.50	(1) & (A)	Organized Research
PRED.	07/01/2017	06/30/2018	55.00	(1) & (A)	Organized Research
PRED.	07/01/2018	06/30/2020	55.50	(1) & (A)	Organized Research
FINAL	07/01/2014	06/30/2015	26.00	(1) & (B)	Organized Research
PRED.	07/01/2015	06/30/2020	26.00	(1) & (B)	Organized Research
FINAL	07/01/2014	06/30/2015	53.00	(1) & (A)	Instruction
PRED.	07/01/2015	06/30/2020	53.00	(1) & (A)	Instruction
FINAL	07/01/2014	06/30/2015	26.00	(1) & (B)	Instruction
PRED.	07/01/2015	06/30/2020	26.00	(1) & (B)	Instruction
FINAL	07/01/2014	06/30/2015	33.80	(1) & (A)	Other Sponsored Activities
PRED.	07/01/2015	06/30/2016	33.80	(1) & (A)	Other Spon Act

ORGANIZATION: University of Washington Management Accounting and Analysis

AGREEMENT DATE: 9/30/2020

<u>TYPE</u>	<u>FROM</u>	<u>TO</u>	<u>RATE(%)</u>	<u>LOCATION</u>	<u>APPLICABLE TO</u>
PRED.	07/01/2016	06/30/2020	37.00	(1) & (A)	Other Sponsored Activities
FINAL	07/01/2014	06/30/2015	26.00	(1) & (B)	Other Spon Act
PRED.	07/01/2015	06/30/2016	26.00	(1) & (B)	Other Sponsored Activities
PRED.	07/01/2016	06/30/2020	25.00	(1) & (B)	Other Spon Act
FINAL	07/01/2014	06/30/2015	42.00	(1) & (C)	Core Grant
PRED.	07/01/2015	06/30/2016	42.00	(1) & (C)	Core Grant
PRED.	07/01/2016	06/30/2020	38.10	(1) & (C)	Core Grant
FINAL	07/01/2014	06/30/2015	78.00	(1) & (C)	Non-Core Fed
PRED.	07/01/2015	06/30/2016	78.00	(1) & (C)	Non-Core Fed
PRED.	07/01/2016	06/30/2020	83.10	(1) & (C)	Non-Core Fed
FINAL	07/01/2014	06/30/2015	17.00	(1) & (D)	
PRED.	07/01/2015	06/30/2016	17.00	(1) & (D)	
PRED.	07/01/2016	06/30/2020	19.00	(1) & (D)	
FINAL	07/01/2014	06/30/2015	25.00	(2) & (E)	
PRED.	07/01/2015	06/30/2020	25.00	(2) & (E)	
FINAL	07/01/2014	06/30/2015	74.00	(1) & (F)	Organized Research
PRED.	07/01/2015	06/30/2016	74.00	(1) & (F)	Organized Research
PRED.	07/01/2016	06/30/2017	75.00	(1) & (F)	Organized Research
PRED.	07/01/2017	06/30/2019	76.00	(1) & (F)	Organized Research
PRED.	07/01/2019	06/30/2020	76.50	(1) & (F)	Organized Research
PROV.	07/01/2020	Until Amended		(G)	

*BASE

ORGANIZATION: University of Washington Management Accounting and Analysis

AGREEMENT DATE: 9/30/2020

(1) Modified total direct costs, consisting of all direct salaries and wages, applicable fringe benefits, materials and supplies, services, travel and up to the first \$25,000 of each subaward (regardless of the period of performance of the subawards under the award). Modified total direct costs shall exclude equipment, capital expenditures, charges for patient care, rental costs, tuition remission, scholarships and fellowships, and the portion of each subaward in excess of \$25,000.

(2) Direct salaries and wages including vacation, holiday and sick pay and other paid absences but excluding other fringe benefits.

(A) On-Campus

(B) Off-Campus

(C) Washington National Primate Research Center - see Section II Special Remarks.

(D) Applied Physics Laboratory

(E) Vessel Operations

(F) Lake Union Campus

(G) Use same rates and conditions as those cited for fiscal year ending June 30, 2020.

ORGANIZATION: University of Washington Management Accounting and Analysis

AGREEMENT DATE: 9/30/2020

SECTION I: FRINGE BENEFIT RATES**

<u>TYPE</u>	<u>FROM</u>	<u>TO</u>	<u>RATE(%)</u>	<u>LOCATION</u>	<u>APPLICABLE TO</u>
FIXED	7/1/2018	6/30/2019	26.10	(1) & (B)	Faculty & Res. Assoc.
FIXED	7/1/2018	6/30/2019	32.50	(1) & (A)	Medical Residents & Senior Fellows
FIXED	7/1/2018	6/30/2019	17.30	(1) & (A)	Grad. Students
FIXED	7/1/2018	6/30/2019	17.00	(1) & (A)	Post Doc. Trainees
FIXED	7/1/2018	6/30/2019	40.50	(1) & (B)	Class. Staff
FIXED	7/1/2018	6/30/2019	34.10	(1) & (B)	Prof. Staff
FIXED	7/1/2018	6/30/2019	21.10	(1) & (B)	(D)
FIXED	7/1/2018	6/30/2019	21.60	(1) & (B)	(E)
FIXED	7/1/2018	6/30/2019	8.60	(1) & (B)	(F)
FIXED	7/1/2018	6/30/2019	20.90	(1) & (A)	Hourly
FIXED	7/1/2018	6/30/2019	27.80	(1) & (A)	Pre-Doctoral Trainees & Fellows
FIXED	7/1/2018	6/30/2019	60.70	(2) & (C)	Class. Staff
FIXED	7/1/2018	6/30/2019	56.50	(2) & (C)	Prof. Staff
FIXED	7/1/2018	6/30/2019	41.00	(2) & (C)	Faculty & Research Associates
FIXED	7/1/2019	6/30/2020	23.90	(1) & (B)	Faculty & Res. Assoc.
FIXED	7/1/2019	6/30/2020	31.00	(1) & (A)	Medical Residents & Senior Fellows
FIXED	7/1/2019	6/30/2020	21.20	(1) & (A)	Grad. Students
FIXED	7/1/2019	6/30/2020	22.70	(1) & (A)	Post Doc. Trainees
FIXED	7/1/2019	6/30/2020	41.20	(1) & (B)	Class. Staff
FIXED	7/1/2019	6/30/2020	32.10	(1) & (B)	Prof. Staff
FIXED	7/1/2019	6/30/2020	19.10	(1) & (B)	(D)
FIXED	7/1/2019	6/30/2020	21.90	(1) & (B)	(E)
FIXED	7/1/2019	6/30/2020	8.90	(1) & (B)	(F)

ORGANIZATION: University of Washington Management Accounting and Analysis

AGREEMENT DATE: 9/30/2020

FIXED	7/1/2019	6/30/2020	20.90 (1) & (A)	Hourly
FIXED	7/1/2019	6/30/2020	27.10 (1) & (A)	Pre-Doctoral Trainees & Fellows
FIXED	7/1/2019	6/30/2020	64.20 (2) & (C)	Class. Staff
FIXED	7/1/2019	6/30/2020	53.90 (2) & (C)	Prof. Staff
FIXED	7/1/2019	6/30/2020	34.50 (2) & (C)	Faculty & Research Associates

** DESCRIPTION OF FRINGE BENEFITS RATE BASE:

(1) Direct salaries and wages including vacation, holiday, and sick pay but excluding other fringe benefits.

(2) Direct salaries and wages excluding vacation, sick leave, holidays, other paid absences and all other fringe benefits.

- (A) Entire University
- (B) All except Applied Physics Laboratory
- (C) Applied Physics Laboratory
- (D) Professional Staff - Global (No Health)
- (E) Professional Staff - Global (No Retirement)
- (F) Professional Staff - Global (No Health or Retirement)

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SECTION II: SPECIAL REMARKS

TREATMENT OF FRINGE BENEFITS:

The fringe benefits are charged using the rate(s) listed in the Fringe Benefits Section of this Agreement. The following fringe benefits are included in the fringe benefit rate(s):

HEALTH INSURANCE, SOCIAL SECURITY & MEDICARE TAXES, WORKERS COMPENSATION, MEDICAL AID & INDUSTRIAL INSURANCE, UWRP, STATE RETIREMENT, UNEMPLOYMENT COMPENSATION, SEPARATION LEAVE PAYMENTS FOR CLASSIFIED & PROFESSIONAL STAFF, AND PAID FAMILY AND MEDICAL LEAVE.

TREATMENT OF PAID ABSENCES

Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims are not made for the cost of these paid absences. Beginning July 1, 2011, unused leave payments made upon separation of Classified and Professional Staff are included in the fringe benefit rates.

Beginning October 1, 1996 the Applied Physics Laboratory (APL) has separate fringe benefit rates from the remainder of the University of Washington. These rates include paid absences. Therefore, charges for direct salaries and wages from APL must exclude charges for paid absences, including vacation, sick leave, holidays, and other paid absences.

DEFINITION OF EQUIPMENT

Prior to 07/01/2016, equipment means tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds \$2,000. Effective 07/01/2016, equipment means tangible personal property (including information technology systems) having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds \$5,000.

DEFINITION OF ON-CAMPUS, OFF-CAMPUS AND SPECIAL RATES:

DEFINITION OF OFF-CAMPUS RATE

a. An off-campus program is one that is conducted (1) in leased facilities where space related costs (e.g. rent, utilities and maintenance) are charged directly to the program, or (2) in facilities made available (at no cost) to the program by a non-University organization, or (3) away from the University over an uninterrupted period of time in excess of 30 days for field work. The Off-Campus rate is not to be used as a substitute for the Vessel Operations rate or the Applied Physics Laboratory rate. Even though Pack Forest, Big Beef Creek, and Olympic Natural Resource Center are owned and operated by the University, these facilities are considered to be off campus.

b. Projects conducted at two or more locations:

There are instances where a project supported by a single grant or contract

ORGANIZATION: University of Washington Management Accounting and Analysis

AGREEMENT DATE: 9/30/2020

is conducted at two or more locations, thus requiring special consideration in determining the appropriate indirect cost provision. The following should be observed in such circumstances:

(1) Where the total annual amount of the grant or contract direct costs is less than \$250,000, a single indirect cost rate will be applied. This rate will be the one currently applicable to the location where the preponderance of project salaries is located.

(2) Where the total annual amount of the grant or contract direct costs is \$250,000 or more, the appropriate rate for each location will be applied to the modified total direct costs specifically assigned to the respective location. In the absence of the institution's ability to specifically identify and assign costs to each location, the appropriate rate for each location will be applied to total project costs in the same ratio as direct salary costs incurred at each location during the period covered by the project billing or accounting.

PRIMATE CENTER RATES:

The Washington National Primate Research Center (WNPRC) has two Federally recognized rates for each time period. The NIH Office of the Director Primate Research Center (P51) Core Grant rate is 42.0% for 07/01/14 - 06/30/16. The NIH Office of the Director Primate Research Center (P51) Core Grant rate is 38.1% for 07/01/16 - 06/30/20. The Non-Core Federal Rate of 78.0% for 07/01/14 - 06/30/16 is the sum of the Core Grant (42.0%) and the WNPRC specific F&A expenditures (36.0%). The Non-Core Federal Rate of 83.1% for 07/01/16 - 06/30/20 is the sum of the Core Grant (38.1%) and the WNPRC specific F&A expenditures (45.0%).

This rate agreement updates the fringe benefits only.

NEXT PROPOSAL DUE DATE

A fringe benefit rates proposal based on actual costs for fiscal year ending June 30, 2019 has been received and is under review.

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SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted: such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

The rates in this Agreement were approved in accordance with the authority in Title 2 of the Code of Federal Regulations, Part 200 (2 CFR 200), and should be applied to grants, contracts and other agreements covered by 2 CFR 200, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

E. OTHER:

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

University of Washington Management Accounting and Analysis

(INSTITUTION)

Brian McCartan

(SIGNATURE)

Brian McCartan

(NAME)

VP Finance

(TITLE)

9/30/20

(DATE)

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

Arif M. Karim - S Digitally signed by Arif M. Karim - S Date: 2020.09.30 15:27:21 -05'00'

(SIGNATURE)

Arif Karim

(NAME)

Director, Cost Allocation Services

(TITLE)

9/30/2020

(DATE) 7194

HHS REPRESENTATIVE:

Janet Turner

Telephone:

(415) 437-7820



DEPARTMENT OF THE NAVY
 OFFICE OF NAVAL RESEARCH
 SEATTLE REGIONAL OFFICE
 300 FIFTH AVENUE, SUITE 710
 SEATTLE, WA 98104

IN REPLY REFER TO

ONR 247
 September 12, 2018

Dr. Lisa M. Zurk
 Director, Applied Physics Laboratory
 University of Washington
 909 NE Boat Street
 Seattle, WA 98105

Reference: Applied Physics Laboratory Prorated Direct Cost Rate submitted August 21, 2018, for the period October 1, 2018 through September 30, 2019.

Dear Dr. Zurk:

Based on my preliminary review, the below Applied Physics Laboratory (APL) Prorated Direct Cost (PDC) rate is provisionally approved for pricing and billing purposes, effective October 1, 2018.

<u>Rate Category</u>	<u>Rate</u>	<u>Application Base</u>
Prorated Direct Cost	35.20%	(a)

- (a) APL Modified Total Direct Costs (MTDC) consisting of salaries and wages, applicable fringe benefits, materials and supplies, services, travel, and up to the first \$25,000 of each subaward (regardless of the period of performance of the subawards). MTDC excludes equipment, capital expenditures, charges for patient care, rental costs, tuition remission, scholarships and fellowships, participant support costs and the portion of each subaward in excess of \$25,000.

It should be noted that subsequent audits may result in necessary adjustments to the approved rate. The approved rate is subject to unilateral amendment by the government or bilateral amendment by the contracting parties at any time.

Please contact me if you have any questions or concerns at (206) 548-7243 or robert.rice@navy.mil.

Sincerely,

RICE.ROBERT.J. 1229596760
Digitally signed by RICE.ROBERT.J.1229596760
 DN: c=US, o=U.S. Government, ou=DoD,
 ou=PKI, ou=USN,
 cn=RICE.ROBERT.J.1229596760
 Date: 2018.09.12 14:16:11 -0700

Robert J. Rice
 Administrative Contracting Officer

UW Campus & APL Fringe Benefits 07-01-2022 through 06-30-2023

Employee Fringe Benefit Rates

For each dollar paid as salary or wage to an employee, the UW incurs associated costs for fringe benefits. These benefits include F.I.C.A., worker's compensation, unemployment compensation, retirement, and health insurance.

These rates change and are updated on an annual basis. [GIM 3: Fringe Benefit Rates and Sponsored Projects](#)

Review the current [Benefit Rates](#) from UW Financial Reporting.

<https://www.washington.edu/research/institutional-facts-and-rates/#benefit-rates>

Campus Benefit Rates

Salary Titles	Object Codes	Current Rates	Preliminary Rates
Instruction and Research Faculty	01-10	24.1%	
Medical Residents	01-20	31.2%	
Residents and Chief Residents	01-20E	31.2%	
Graduate student appointments	01-30, 01-40	21.3%	
Post-Doctoral Trainees	01-50	14.7%	
Classified staff	01-60	39.5%	
Professional staff	01-70	31.8%	
Professional staff (retirement exempt)	01-70ER	23.1%	
Professional staff (healthcare exempt)	01-70EH	17.5%	
Professional staff (retirement and healthcare exempt)	01-70EB	8.8%	
Hourly, Visiting Scientists, and O.T.	01-80	21.5%	
Pre-doctoral Fellows and Trainees	01-90	28.8%	

Applied Physics Laboratory (APL) Benefit Rates

Certain Applied Physics Laboratory (APL) rates include staff leave accruals and differ from campus rates.

Salary Titles	Object Codes	Current Rates			Preliminary Rates		
		Benefits	Leave	Total	Benefits	Leave	Total
Instruction and Research Faculty	01-10	24.1	1.2	25.3			
Medical Residents	01-20	31.2	0	31.2			
Residents and Chief Residents	01-20E	0%	0%	0%			
Graduate student appointments	01-30, 01-40	21.3	0	21.3			
Post-Doctoral Trainees	01-50	14.7	0	14.7			
Classified staff	01-60	39.5	20	59.5			
Professional staff	01-70	26.9	15	41.9			
Professional staff (retirement exempt)	01-70ER	0%	0%	0%			
Professional staff (healthcare exempt)	01-70EH	0%	0%	0%			
Professional staff (retirement and healthcare exempt)	01-70EB	0%	0%	0%			
Hourly, Visiting Scientists, and O.T.	01-80	21.5	1.7	23.2			
Pre-doctoral Fellows and Trainees	01-90	28.8	0	28.8			

SERVICE CENTER RATES

Fiscal Year 2023

APL MACHINE SHOP

Effective: 7/1/2022 – 6/30/2023

Debit Object Code: 03-99

Approved Services	Internal User Rate ⁶	External User Rate ⁷	Unit
Machine Shop Labor Hour	\$86	\$147	Per Hour

APL RESEARCH VESSELS

Effective 7/1/2022 – 6/30/2023

Debit Object Code: 03-49

Robertson - Underway ⁸

Approved Services	Internal User Rate ⁶	External User Rate ⁷	Unit
Base: Minimum Four-Hours Use (0-4 hours)	\$1,088	\$1,868	Per Use
Between Four- to Twelve-Hours Use	\$272	\$467	Per Hour
Full-Day Use (Between 12-24 Hours) ⁹	\$4,624	\$7,939	Per Day
Overnight Dockside – No Operator ¹⁰	\$816	\$1,401	Per Night
Overnight Dockside – Operator Required	\$1,418	\$2,435	Per Night

Acoustic Test Facility (ATF) on RDL – Dockside

Approved Services	Internal User Rate ⁶	External User Rate ⁷	Unit
Base: Minimum Four-Hours Use (0-4 hours)	\$1,404	\$2,412	Per Use
Between Four- to Twelve-Hours Use	\$351	\$603	Per Hour

Light Vessel – Underway ⁸

Approved Services	Internal User Rate ⁶	External User Rate ⁷	Unit
Base: Minimum Four-Hours Use (0-4 hours)	\$1,664	\$2,856	Per Use
Between Four- to Twelve-Hours Use	\$416	\$714	Per Hour
Full-Day Use (Between 12-24 Hours) ⁹	\$7,072	\$12,138	Per Day
Overnight Dockside – No Operator ¹⁰	\$1,248	\$2,142	Per Night
Overnight Dockside – Operator Required	\$1,850	\$3,176	Per Night

⁶ Internal user rates are the unburdened rates charged to UW/APL sponsored or non-sponsored funds; these rates do not include PDC, F&A, or Fixed Fee

⁷ External user rates are for use with non-UW, external agencies when engaging in a service contract; a differential of 71.7% total cost is applied to the Internal user rate to offset APL operating costs and institutional overhead assessments

⁸ Labor costs of the primary operator are included in the internal and external user rates

⁹ Underway usage for 24-hour operations includes two operators (advance notification needed for operations lasting longer than 12-hours)

¹⁰ Provided the vessel is parked at a dock or moored at a buoy in a designated moorage area and none of its fixed research support equipment or other vessel capabilities are being used for research activities. Any berthing or moorage fees shall be charged directly to the project requiring the layover

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2025

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. NANOOS Years 15-19 FY2021: Year 16 (OSU)	11.012	\$ <input type="text"/>	\$ <input type="text"/>	\$ 1,424,530.00	\$ <input type="text"/>	\$ 1,424,530.00
2. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5. Totals		\$ <input type="text"/>	\$ <input type="text"/>	\$ 1,424,530.00	\$ <input type="text"/>	\$ 1,424,530.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
	NANOOS Years 15-19 FY2021: Year 16 (OSU)				
a. Personnel	\$ 393,097.00	\$	\$	\$	\$ 393,097.00
b. Fringe Benefits	224,217.00				224,217.00
c. Travel	37,306.00				37,306.00
d. Equipment	188,860.00				188,860.00
e. Supplies	85,808.00				85,808.00
f. Contractual	0.00				0.00
g. Construction	0.00				0.00
h. Other	92,568.00				92,568.00
i. Total Direct Charges (sum of 6a-6h)	1,021,856.00				\$ 1,021,856.00
j. Indirect Charges	402,674.00				\$ 402,674.00
k. TOTALS (sum of 6i and 6j)	\$ 1,424,530.00	\$	\$	\$	\$ 1,424,530.00
7. Program Income	\$	\$	\$	\$	\$

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. NANOOS Years 15-19 FY2021: Year 16	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
9. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
10. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
11. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
12. TOTAL (sum of lines 8-11)	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ <input type="text" value="1,424,530.00"/>	\$ <input type="text" value="356,133.00"/>	\$ <input type="text" value="356,133.00"/>	\$ <input type="text" value="356,132.00"/>	\$ <input type="text" value="356,132.00"/>
14. Non-Federal	\$ <input type="text" value="0.00"/>	<input type="text" value="0.00"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
15. TOTAL (sum of lines 13 and 14)	\$ <input type="text" value="1,424,530.00"/>	\$ <input type="text" value="356,133.00"/>	\$ <input type="text" value="356,133.00"/>	\$ <input type="text" value="356,132.00"/>	\$ <input type="text" value="356,132.00"/>

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS)			
	(b)First	(c) Second	(d) Third	(e) Fourth
16. NANOOS Years 15-19 FY2021: Year 16	\$ <input type="text" value="1,424,530.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>
17. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
18. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
19. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
20. TOTAL (sum of lines 16 - 19)	\$ <input type="text" value="1,424,530.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: <input type="text" value="\$1,021,856"/>	22. Indirect Charges: <input type="text" value="\$402,674 = \$830,256 x 48.5% MTDC"/>
23. Remarks: <input type="text"/>	



Office for Sponsored Research and Award Administration
A312 Kerr Administration Building, Corvallis, Oregon 97331-2140
Tel 541-737-4933 | Fax 541-737-3093 | sponsored.programs@oregonstate.edu

September 15, 2022

To Whom It May Concern,

Oregon State University is pleased to submit the proposal "OSU Contribution to NANOOS 2021-2026."

The appropriate programmatic and institutional officials have reviewed this proposal in the amount of \$1,424,530 for the project duration of July 1, 2022 -June 30, 2023.

The authorized institutional official's signature below indicates institutional approval for the proposed project.

Oregon State University has a Conflict of Interest policy that is compliant with the PHS Financial Conflict of Interest Regulations (42 CFR Part 50 Subpart F).

Oregon State University is prepared to perform the work as outlined in the proposal. Dr. P Kosro will serve as Oregon State University's Principal Investigator.

Legal Name: Oregon State University

Authorized Signing Official: Jennifer Creighton, Jennifer Creighton, Assoc VP for Research, Finance & Operations

UEI: MZ4DYXE1SL98

EIN Number: 61-1730890

Payee Name: Oregon State University

Remittance Address: Office for Sponsored Research and Award Administration, 312 Kerr Administration Building, Corvallis, OR 97331-2140

Financial Representative: Aedra McCarthy, osraa.finance@oregonstate.edu

Contractual Representative: Irem Tumer, sponsored.programs@oregonstate.edu

Approved:

Lisa Hall

Acting for:

Jennifer Creighton

Institutional Authorizing Official

Subawardee: Oregon State University (OSU)

Amount: \$1,424,530

Project Title: Oregon State University (OSU) Support for the Northwest Association of Networked Ocean Observing Systems (NANOOS)

Scope of Work

Project 1: Peter Ruggiero: Nearshore Bathymetry Observations

Description of proposed five-year effort: The objective of this component of the RCOOS will remain focused on maintaining the nearshore bathymetric component of both the Washington and Oregon beach and shoreline monitoring efforts in cooperation with Jonathan Allan of DOGAMI and George Kaminsky of WA DOE. The purpose of our efforts is to document the seasonal-interannual-decadal changes in beach and shoreline morphodynamics and for identifying coastal hazards, information that is critical to state and federal coastal resource managers, geotechnical consultants, and the public-at-large.

Observations: This task consists of annual nearshore bathymetric surveys, measured using a PWC-based Coastal Profiling System at selected sites in Oregon and Washington. During each summer, Peter Ruggiero's group at Oregon State University proposes to collect nearshore bathymetry data along the four sub-cells of the Columbia River littoral cell (CRLC). Over 220 individual cross-shore profiles will be collected during extending from the lower inter-tidal to ~12 m of water depth (~2000 m from the shoreline). Approximately 400 kilometers of nearshore mapping will take place with approximately 8-10 days of field data collection. The data will be processed from their raw format into deliverable text files after having passed a rigorous quality assurance process. In all cases these nearshore bathymetry measurements will be combined with topographic measurement collected by PI Kaminsky's group at Ecology developing complete maps of the nearshore planform. During each summer, Ruggiero's group will also collect nearshore bathymetric data along one or more littoral cells (e.g., Newport) within the north-central Oregon coast. Approximately 50 individual cross-shore beach profiles will be collected from the lower intertidal to ~25 m of water depth (~1500 m from the shoreline). These data will be combined with topographic data collected synoptically and will be processed from their raw format into deliverable text files after having passed a rigorous quality assurance process.

These data continue to provide a critical source of information for improving coastal hazard mitigation along the coastlines of the CRLC and portions of the Oregon coast and for understanding the morphodynamics of high energy beaches. The data continues to be used in many scientific studies including student theses and peer reviewed publications. In collaboration with the US Geological Survey and the Washington Department of Ecology the nearshore bathymetry and topographic data being collected via NANOOS at the mouth of the Columbia River is being used to inform regional sediment management practices.

Deliverables: Nearshore bathymetric data are essential for any modeling of coastal change including shoreline and dune evolution modeling. Cross-shore profiles and gridded products (e.g., volume change) will therefore be made available to any modelers working in the region. As described above, volume change calculations from these data are essential for the US Army Corps of Engineers to implement their Regional Sediment management programs at the MCR. The time series of nearshore, beach, and dune evolution that NANOOS has funded for many years is now over 20 years old. This makes this one of the most robust and continuous time series in the world and a veritable gold mine for studies exploring the influence of climate change and variability on coastal morphodynamics. Further, these data are critical for municipalities, counties, and state agencies who are planning for and developing a range of adaptation

measures for addressing increasing coastal flood and erosion risk in the region.

Budget justification: This work requires part time support of a researcher (Ruggiero), a technical person (Jeff Wood), and three hourly student workers to perform most of the field work. Budget provides for survey design and data collection, processing, and archiving. The proposed budget provides for survey preparation and data collection (domestic travel), processing, archiving, and initial change analyses.

Domestic travel of \$5,075 is requested in year 1, with a 3% increase in each year, based on 6 days along the Oregon and Washington coast for the team of 5. Support is also requested for minor equipment and supplies (protection suits, pfd, helmets, batteries, cables, pelican cases, etc.) required to maintain and operate a 4th generation PWC-based Coastal Profiling System (designed and built by OSU). Summer tuition for two GRAs is requested as well. To accommodate the descoped budget, FRA support was decreased by 0.5 months, and costs for supplies were reduced.

Project 2: Merrick Haller, Marine radar observing station @USCG Yaquina Bay Station

Statement of Work

Our objectives are to provide both real-time and historical wave and bathymetry data that is of use to the USCG, the Newport marine industry, and recreational boaters out of Yaquina Bay. Our ongoing work involves producing wave directional spectra over three sub-regions near the inlet (Yaquina Bay, OR) and supplying mean and snapshot radar images. All of these data are updated every 15 minutes through NVS Explorer. In addition, the system can estimate bathymetry (not in real-time) and these data are supplied as overlays in a Google Earth image.

In the past year we have successfully deployed our new data acquisition system (developed in house), which is more robust and which allows the USCG personnel to view the radar display in their watchtower. After discussions with NOAA personnel (Brian Zelenke) we have agreed to add time series plots for our wave parameters. Specifically, we will generate time series of dominant wavelength, peak period, and direction. These data will be added to the JSON file for ingestion into NVS (alternately, we will generate our own plots and feed those into NVS).

Finally, we are expecting to have new bathymetric analysis to perform. Ruggiero's group is expected to collect new comprehensive Newport bathymetry (via PWC) this month (Sept 2022) that we can compare to our radar-derived bathymetry this fall.

Budget Justification

Support for this effort is primarily for technician time (Faculty Research Assistant, Randy Pittman), with minor amounts of materials and supplies (hard drives, radar parts, routine radar servicing) and travel costs to the Newport field site for service and maintenance. To accommodate the descoped budget, FRA support was reduced from 4 months to 3.2 and the travel budget was reduced.

Project 3: HF Surface Current Mapping, P. Michael Kosro

This project continues the measurement program of surface current mapping which has been part of NANOOS for many years. We propose to continue operation of the suite of land-based remote-sensing current mapping systems along the Pacific Northwest coast, from northern California to central Washington, and expansion on the Washington coast. Long-range instruments (150km range, 4-5

MHz operational frequency) are separated by approximately 80 km alongshore. Where signals from two or more instruments overlap, the eastward and northward components of the near-surface currents can be mapped at hourly intervals, on an ocean grid of order 6km spacing. These maps provide a unique view of the spatial variation in the surface currents, and their time changes at a wide range of frequencies (semidiurnal and diurnal tidal; wind-driven; frontal; advective; spring-neap; inertial currents; coastal- trapped wave; seasonal, including horizontal fields in the upwelling/downwelling seasons; interannual, including El Niño/La Niña; and unexpected (e.g. delayed upwelling season of 2005 [Kosro et al., 2006]). The measurements have been used to test the hypothesis that a particular Harmful Algal Bloom event measured off the Washington coast could have originated on Heceta Bank off Oregon (Hickey et al, 2013). The real-time measurements are collected electronically from the coastal sites, transferred to OSU for processing, and passed along to national users including the IOOS HF radar center and the National Data Buoy Center, the National Centers for Environmental Information which provides archival and public access, the U.S. Coast Guard for use in Search and Rescue, the NOAA Office Response and Restoration for use in spill-response. The data are used by ocean circulation modelers for data assimilation, to guide their models and keep them “on track”.

In the past funding cycles, measurements from this array of eleven sites cover the region from Crescent City, CA to the southern Long Beach peninsula, WA, including the full length of the Oregon coast. These include six (6) long-range (150km) sites: LOO1 (46° 26'N, 124° 04'W), MAN1 (45° 38'N, 123° 57'W), YHL1 (44° 41'N, 124° 05'W), WIN1 (43° 40'N, 124° 12'W), CBL1 (42° 50'N, 124° 34'W), and PSG1 (41° 47'N, 124° 15'W), and two (2) standard-range (50km) higher-resolution sites (STV2 (46° 11'N, 123° 59'W), and SEA1 (45° 59'N, 123° 57'W), all designated Priority 1 by the national HF program. As resources allow, we hope to also continue operations at our three Priority 2 standard-range sites, YHS2 (44° 40'N, 124° 05'W), WLD2 (44° 23'N, 124° 05'W) and WSH1 (44° 10'N, 124° 07'W) covering Heceta Bank, which is a source for HABs and of strong bathymetric flow perturbation, as well as the shelf portion of the OOI Endurance Array.

In addition, we have added a 12th long-range site farther north, near Westport, WA, and are negotiating to add a 13th site near Kalaloch, WA, extending coverage northward; the funding of instruments for these two new sites was acquired by a successful competitive “Filling the Gaps” proposal to IOOS.

The data are collected in near-real time via internet from the measurement sites and returned to OSU for processing, evaluation, display, and further dissemination via the national IOOS-funded HF-Radar Network, and via the NANOOS Visualization System (NVS, nvs.nanoos.org).

The data are made available to the public and agencies in near-real time for use in marine navigation (sailors, fishermen), search and rescue (USCG), spill-tracking (NOAA ORR), Harmful Algal Bloom tracking, tracking interannual variability (e.g. ENSO, marine heat waves), data assimilation modelling, as well as science investigation (e.g. inertial currents, upwelling response, seasonal variability, tidal currents including coastal hotspots, and many others). The data were used in more than 35 papers since 2002 with Kosro as co-author.

Mapping of large- and mesoscale response to forcing in a range of space and time scales, including inertial oscillations (forced by changes in winds, contributors to vertical mixing; papers by S.Y.Kim and P.M.Kosro (2013) and several follow-on studies; tidal currents and their spatial variation (strong

local enhancement of tidal currents; Erofeeva et al., 2003; Kurapov et al., 2003); Osborne et al (2011; 2014); El Niño (Kosro, 2002; Durski et al, 2015); regional currents (Coos Bay shelf; Columbia River outflow; Heceta Bank); shelf currents driven by fresh river outflows (Mazzini et al, 2015).

These measurements also improve ocean circulation model predictions by providing data for assimilation: (Oke et al, 2002; Kurapov et al., 2003; Liu et al., 2009; Osborne et al., 2011; Yu et al, 2012; Pasmans et al, 2019).

Studies of biological invasive species (Yamada and Kosro, 2010; Yamada et al., 2015) have used the long time series data of surface currents.

We will continue to produce data sets of near-raw data (“Range Series” and “Cross-Spectra”) which will allow reprocessing after collection. We will produce hourly radial-current data files (one-dimensional current at each grid point directed toward or away from the measurement site), transferred to OSU and then placed for distribution to national archives hourly in near-real time. We will combine and map the radial currents into total (2-dimensional) surface currents hourly.

We will post daily-averaged maps of total currents at our web site, and provide a text listing of the plotted data, once per day. The national site will also compute total currents and make hourly files available.

Our DMAC team will provide interactive maps on NVS for exploration of the mapped currents.

User groups have included US Coast Guard search and rescue; sailors for navigation aid, glider teams to predict drift by their glider before recovery; ocean modelers using our currents for data assimilation; biologists studying invasive green crabs; shelf and slope oceanographers (please see previous section).

Budget Justification

Funds are budgeted for scientific and management participation (Kosro), field repairs, installations, calibration, networking (Sroufe), data processing, archiving, and quality control (FRA to be named).

Funds for permanent equipment are budgeted. We are operating 11 field sites with equipment that is typically 20 years old, antennas that are outside in all weather. To minimize equipment failures and to update old technology, we had budgeted each year to replace half of the electronics at one site; this would give us a full suite of new electronics equipment at one site every 2 years (\$65k/yr), allowing a 20yr replacement cycle. However, to accommodate descope cuts, purchases of electronics have been deferred for years 1&2. We have budgeted for 3 HF antennas, at \$11,000 each, to replace aging ones. Two computers, one for processing the high-volume data and another for data archival, are budgeted as permanent equipment.

Funds for travel are included for monthly trips to our field sites for physical exchange of data drives, to carry back to OSU; this is in addition to the hourly electronic download of radial data from our sites to produce up-to-date maps. Travel funds are also budgeted for as-needed trips to our sites for repair and inspection, as well as instrument calibration. Travel to regional meetings (e.g. NANOOS PI and Governing Council meetings; NANOOS Data Management meetings) and national science meetings (e.g. Ocean Sciences or Radiowave Oceanography Workshop).

Funds for on-site (far from OSU campus) electricity, internet connectivity (e.g. cell phone/modem/ISP service) are budgeted under Other Direct Costs. Materials for antenna cables, computer data storage, project-related data acquisition, site air-conditioners and de-humidifiers, processing computers, and expendables are also included in Materials and Supplies.

To accommodate the descope budget, support for techs was reduced substantially, equipment scheduled to be purchased (transmitters, receiver) were deferred, and other direct costs (communications, materials/supplies) also were reduced significantly. This is partly justified by savings from deferrals in spending due to delay in installing the Kalaloch site in Washington state.

Project 4: Oregon Shelf Mooring, P. Michael Kosro

A shelf mooring will be maintained during the five-year program to collect time-series of ocean parameters at subsurface depths, and to obtain meteorological measurements. This program will operate in cooperation with Burke Hales' biogeochemistry measurement program on the same mooring, which focuses on CO₂ and ocean pH, for the OA program.

Since the start of NANOOS, a physical-meteorological mooring has been maintained in the open ocean on the Oregon shelf, measuring time-series of water temperature at about 10 depths, water salinity at 3-4 depths, dissolved oxygen in the lower water column, and vertical profiles of horizontal currents using an Acoustic Doppler Current Profiler. On the surface float, meteorological data are collected. There is cell-phone communication between the buoy and shore, with real-time reporting of ocean data (T, S, currents) and meteorological data (wind speed and direction, insolation, air temperature, etc) and buoy diagnostics (GPS location, battery voltage, etc). An Argos satellite-based monitoring system provides alerts should the buoy's location (determined independently of the GPS) depart from its expected position by more than a fixed amount. Wind and wave measurements are of considerable interest to the fishing fleet out of nearby Coos Bay and Charleston, Oregon.

As it has been over the past 14 years, the preferred plan will be to recover the mooring and re-deploy it twice per year, to balance costs vs. risk of data loss.

Measurements are reported in near-real time from CB-06 primarily via cell-modem telemetry, and the most recent 60-days are displayed on the web by the NANOOS visualization system (NVS, nvs.nanoos.org/Explorer), which also provides an interface to view maps of model output from weather, wave, and ocean models, making this an important resource for mariners planning at-sea work. NVS has tools for comparing present conditions with climatological values, and with anomalies from climatological values, and for putting this information into spatial context.

Long-timeseries of variables at fixed depths will be estimated from the raw measurements, so that the strength of variations at different frequencies can be determined, and compared to variations at other depths, or in other fields, or in time series of different forcing mechanisms; this will require post-processing to flag and reduce data glitches, primarily from biofouling on near-surface salinity sensors, but also to estimate and reduce effects of vertical motion of instruments (several instruments have pressure sensors to aid in this).

Budget Justification

Salary plus Benefits: PI for management and NANOOS participation; Mooring Technician (Sroufe) for engineering, preparation, deployment, recovery of mooring twice/year. Costs for connection of required computers to the CEOAS network (Research Computing System RCS) have been budgeted. Travel for mooring cruises from OSU to Coos Bay, OR, is included, as is sea-pay.

Materials and supplies: funds are allocated for instrument calibrations, mooring rigging, cell phone charges, ARGOS satellite beacon charges, batteries, replacing worn and damaged sensors, anchors, and mooring hardware.

Permanent Equipment: Funds to replace damaged equipment are included in year 2 for two SeaBird 37 37-SM CTDs. Funds (\$5200) are also budgeted for a new computer for the project.

Other Direct Costs: Costs to connect to the CEOAS computer network are included, as are phone charges for download of buoy data and other communications.

To accommodate descope budgets, the funding for the data analyst has been cut to 1 month, no funds are budgeted for travel to meetings, and boat costs have been removed from the Other Direct Costs, and we will rely upon the Hales program to fund the boat costs for the turnaround cruises, which we have agreed to.

Project 5: Underwater Glider Observations off Trinidad Head, CA, and over the Central Washington Shelf

John (Jack) Barth and R. Kipp Shearman, Oregon State University

Trinidad Head, CA, Glider Line

We will continue year-round sampling along the Trinidad Head (TH), CA, line (41 3.5'N) using an underwater glider. The TH glider line provides much-needed subsurface data for physical, chemical, and biological ocean parameters from a region of the California Current that is under sampled. This glider line provides key measurements of upper-ocean heat content, along-coast flow, and subsurface dissolved oxygen and chlorophyll fluorescence. The upper-ocean heat content is critical for tracking interannual variability like El Nino/La Nina and marine heat waves. Variations in the properties of deep source water for upwelling influence productivity and hypoxia on the continental shelf.

We use a 1000-m capable Seaglider equipped with the following sensors: CTD, dissolved oxygen (Aanderaa 4831 optode), light backscatter (700 nm), chlorophyll fluorescence and Colored Dissolved Organic Matter (CDOM) fluorescence (WET Labs Ecopuck). The gliders also measure depth-averaged velocity that can be combined with geostrophic estimates of relative velocity to get absolute velocity and hence transport. The glider flies from approximately the 100-m isobath (~10km offshore) to 129W (~500 km offshore), repeating the line every 25 days. Data are returned to shore after every dive and then submitted to NANOOS, CeNCOOS and to the IOOS glider DAC. In addition, plots of the data and some value-added products are displayed by NANOOS and CeNCOOS.

In addition to the OSU glider group members, we work with CeNCOOS's Dr. Eric Bjorkstedt (NOAA SWFSC, Humboldt State University) and his colleagues who are presently making CTD and

zooplankton measurements along the TH line. We work with Eric to make use of the R/V Coral Sea to conduct glider fieldwork.

During this 5-year period, we will align our data delivery and value-added data products with those from the other west-coast glider groups. We will also collaborate with NANOOS and CeNCOOS modelers to make sure our glider data is readily available for their data-assimilating circulation models of the California Current. We will work to make our glider data and glider-derived data products even more useful to the ocean community. We will pursue this with the help of NANOOS and CeNCOOS through interactions with ocean users, managers, public officials, and concerned citizens.

Central Washington Shelf Glider Operations

We will operate an underwater glider on the central Washington shelf in collaboration with the Columbia River Inter-Tribal Fish Commission (CRITFC) and the Quinault Indian Nation. The primary mission for the glider is to map subsurface ocean properties including dissolved oxygen in a region off the central Washington coast, near Grays Harbor and extending south toward the Columbia River. There is interest in monitoring the evolution and extent of possible hypoxic waters in this region, especially for the Quinault Indian Nation who has traditional fishing rights in this region. Glider operations will occur during the upwelling season from April to September.

Through arrangement with CRITFC, the OSU glider research group is borrowing two Teledyne Marine Slocum 200-m gliders. The 200-m capable Slocum gliders are equipped with the following sensors: CTD, dissolved oxygen (Aanderaa optode), light backscatter (700 nm), chlorophyll fluorescence and Colored Dissolved Organic Matter (CDOM) fluorescence (WET Labs Ecopuck). The gliders also measure depth-averaged velocity that can be combined with geostrophic estimates of relative velocity to get absolute velocity and hence transport. We will use funds in years 1-2 to upgrade these two gliders to make sure that the hardware and software are up to date, and that both have Teledyne Marine's thruster package for help in overcoming the strong horizontal currents and fresh surface water found on the central WA shelf.

We will fly the glider in two modes on the Washington shelf. The glider sampling plans will be coordinated with CRITFC and the Quinault Indian Nation. The first sampling mode will be a cross-margin transect off central Washington (exact latitude to be decided) in early spring (target April) to measure the properties of upwelling source water at the beginning of the upwelling season. The second sampling mode will be a mapping pattern to measure shelf properties in the region of the Quinault Indian treaty fishing grounds and continuing south toward the Columbia River mouth. We propose to make 3-week mapping deployments approximately every other month from May to September.

We will coordinate with CRITFC and the Quinault Indian Nation on mission planning. Modelers at CRITFC will make use of the glider data to verify and improve their numerical models of the region. Both the Quinault Indian Nation and the member tribes of CRITFC have interest in better understanding ocean conditions as they affect tribal fisheries.

During year 2 we will visit the Quinault Indian Nation in Taholah, WA, to share with tribal youth

about how the underwater glider operates and how to interpret the data it collects.

Data are returned to shore several times per day and are submitted to the IOOS glider data center. Sensor data are QA/QC'd with factory calibrations and with lab calibration of the dissolved oxygen sensor between deployments. The data are also automatically sent to NANOOS for use by other PIs, for plotting and for creation of value-added products. We propose to work with NANOOS and relevant stakeholders, especially the Quinault Indian Nation and CRITFC to make the glider data and derived products as useful as possible. We will make monthly maps of near-bottom dissolved oxygen, as well as making maps of surface and near-bottom temperature and salinity. The in-water data can also be combined with and used to verify numerical ocean circulation and biogeochemical model output.

Budget justification: Salary is to support the co-PIs, Barth and Shearman, and two Research Associates, Erofeev and Pierce, to participate in this glider project. Sea pay is requested for days at sea for glider deployment and recovery. Other Payroll Expenses/Benefits are charged at OSU rates. Permanent Equipment costs are requested to upgrade two existing underwater gliders in years 1-2 and to purchase a complete glider in year 3. Travel funds support OSU personnel costs for traveling to Trinidad Head, CA, and Grays Harbor, WA, to join research cruises and for the co-PIs to attend the NANOOS annual meeting. We also request international travel funds to support the lead PI in attending an international meeting to coordinate glider observations and/or present scientific results. Materials and Supplies include computer supplies, sensor calibration, glider repair, batteries for the gliders, and Iridium cell phone charges for glider operations and data return to shore. Computer Services are for partial support of the co-PI's connection of their computers to the CEOAS network. The Other category includes costs for shipping gliders to the manufacturers for servicing and for OSU's Over-the-Side insurance costs. Indirect costs are on total costs minus permanent equipment.

Project 6: Ed Zaron, The Oregon-Washington coastal ocean data assimilation and forecast system.

The OSU coastal ocean forecast system, including its data assimilation component, has been in operation since 2011, providing information on surface currents, SST front locations and other oceanic variables of interest to NANOOS users. An important product of the forecast system is the "Tuna Forecast Application", which is one of the most popular applications in NVS. In the next year, we propose to maintain the existing system by updating the data sources used for forecast initialization (altimetry and SST), and by comparing the forecasts with those from the NOAA West Coast Operational Forecast System (WCOFS), which is expected to soon become operational. We have developed a new frontal location metric, based on the finite-time Lyapunov exponent of the Lagrangian surface currents, and we propose to explore the usefulness of this metric as adjunct to the existing products provided to the NVS.

Budget Justification

Dr. Ed Zaron has taken leadership of the data assimilating coastal modeling effort at OSU; Dr. Alex Kurapov, now at NOAA, will continue to contribute intellectually. Funds are budgeted for partial salary for Dr. Zaron for scientific and administrative leadership (0.5months/yr). Funding for Dr. Lana Erofeeva's salary (3 months/yr) is budgeted so she can oversee the routine model operation and updating, and production of operational forecasts. Fringe benefits (OPE) are budgeted at the university-recommended rates.

Funds in year 2 are also allocated to pay for use of the CEOAS Research Computing Services. Materials and supplies (primarily computer storage disks and peripherals) are also budgeted.

Project 7: OSU Data Management and Communications, P. Michael Kosro

This project will provide expertise to the NANOOS team on data management and communication and contribute to the generation of data and models into user products, especially for data generated by OSU. OSU has a strong concentration of ocean observing and modeling activities for NANOOS. To facilitate the transition of those observations and model outputs into data products conforming to national standards in an efficient and responsive way, NANOOS invests in DMAC expertise local to OSU.

The OSU DMAC representative since the start of NANOOS, Craig Risien, has changed focus and a new person will be hired to take on his responsibilities.

Budget Justification

Salary support for the faculty research assistant is budgeted. Funds to purchase a new computer server (permanent equipment) are included in the budget. Travel to a domestic meeting on DMAC issues is allocated. Funds for materials and supplies (computer related), computer networking services, and communications (phone) are budgeted.

Project 8: Hales: Ocean Acidification Monitoring in US Pacific Coastal Waters at NOAA-ON Station CB06 (Formerly NH10)

Project goals and objectives: The project goals are to maintain a persistent, year-round NOAA-ON moored observation node at a mid-shelf location on the Oregon coast south of Heceta Bank. The system will be supported by OSU-CEOAS personnel, and two duplicate mooring systems developed there. Instrumentation for in-water pCO₂, pH, O₂ and CTD will be provided by collaborators at NOAA-PMEL. Validation samples and their analyses will be managed by CEOAS personnel, and to develop statistical metrics of frequency-of-occurrence of harmful OA threshold-crossings at NH10 and CB06, and to place these metrics in the context of seasonal to interannual natural climate variability, with the long-term objective of identifying emerging climate-change driven signals in evolving OA conditions. A long-term persistent continuous monitoring system (Burke-o-Lator) was unable to be deployed at the Oregon Institute of Marine Biology during the previous period due to personnel changes at OIMB and the travel restrictions of the pandemic.

Technical approach and methodology: The surface measurement plan is based primarily on the NOAA-PMEL-provided M_{Ap}CO₂ system, which makes measurements of gas-phase CO₂ content of either atmospheric or surface-water equilibrated air using an onboard LI820 NDIR unit calibrated with a soda-lime zero gas and a known span gas. The M_{Ap}CO₂ measurements are supported by a PMEL-provided CTD (SBE16) instrument interfaced with Chl/turbidity and O₂ optical sensors. A stand-alone pH sensor (Satlantic SeaFET or SAMI-pH), also provided by PMEL, is interfaced directly with the M_{Ap}CO₂ unit. Ancillary measurements of meteorological variables (air temperature, barometric pressure, windspeed and direction, surface solar irradiance) are part of the CEOAS-developed mooring

system.

Validation samples are collected during deployment and recovery operations for CO₂ chemistry and O₂, and for CO₂ chemistry by opportunistic sampling in intervening times, as well as on dedicated vessel hires. O₂ samples are sampled and ‘pickled’ in the field and returned to the laboratory for analysis by Winkler titration with a few days of their return. CO₂ samples are collected in 350-mL bottles, preserved with 40μL of a saturated HgCl₂ solution and sealed with urethane-lined metal crimp-seal caps. These samples are analyzed for pCO₂ and TCO₂ in Hales’ lab using established procedures, with CRM analyses for accuracy assurance. Other carbonate system parameters (T_{Alk}, pH, Ω) are calculated from these measurements for in situ conditions. The combined pCO₂/TCO₂ system (aka the Burke-o-Lator) is by now a well-established measurement system that is now deployed at several locations along the US Pacific coast.

The systems are deployed on a mooring system designed by Hales and colleagues under this work (the Fixed-Location Ocean Acidification Tracker, or FLOATer), consisting of a custom surface buoy constructed of syntactic foam and stainless steel structure, incorporating stable and energy-dense lithium- iron-phosphate batteries and solar charger/controllers, and an embedment-style anchor with a hybrid chain/spectra tether. Previous designs, both from OSU and PMEL, showed challenges in withstanding winter conditions. Since the FLOATER inception, only an apparent container-ship strike has led to mooring system failure.

General plan of work

The moorings will be deployed/recovered on a ~6-month interval, weather and ship availability permitting. Deployment and recovery are each ~2-hour operations, and if a vessel is available from Charleston Harbor, the operation can be done in as little as one day. If a vessel from Newport is required, the at-sea transit time adds an additional three days to the operation. Nominal operations windows are May and November, covering the upwelling and downwelling seasons and the fall and spring transitions, but ocean conditions will dictate the actual timing. When possible, opportunistic research vessel availability will be pursued.

Hales was able to reach agreement with a local tow-boat operator, Pacific Tug, for Coos Bay-based operations. These vessels are equipped with heavy-lift winches, a-frame, and have added crane capacity for our work. Estimates of rates are \$8500 + fuel for a day of work, and we have budgeted \$10,000 for each day of work. Each mooring turnaround operation will require the participation of Hales and techs Hubbard and Freiberg, and the staging and travel associated with this work requires these to be two-day trips. Basically, OSU will deliver the mooring and personnel will travel and load-up the day before the at-sea operations, stay overnight in Coos Bay, carry out the work the following day, and return to Corvallis.

Hales manages OSU’s Routine Chemistry Lab, where discrete sample pCO₂ and TCO₂ analyses are run. The cost of samples (\$29 per pCO₂/TCO₂ analysis pair) is covered in the personnel and supplies budgets included here. We anticipate a few dozen analyses per year.

Budget Justification and Narrative

The budget is driven by the direct expense of salaries of PI Hales (PI, 2 month/yr) and technicians Hubbard (Senior Faculty Research Assistant, 3 months/yr) and Freiburg (Faculty Research Assistant, 3 months per year) and their associated university-specified fringe benefits. Hubbard oversees the MApCO₂ installation in the mooring, and the overall direction of the mooring assembly, pre-deployment testing, and deployment logistics, management and maintenance of the OIMB measurement system, and direction of the dedicated and opportunistic check sampling program and subsequent analyses, with Freiburg as support for all these operations. Hales will oversee the overall project, direct the planning of at-sea operations, troubleshooting and data management. Previous support levels (0.25 month/yr for Hales, 2 months per year for Hubbard) were insufficient for maintaining the mooring operations, particularly as Hales's group has taken on more of the responsibility for the deployment and recovery activities.

We anticipate replacing stainless steel pressure housings on both moorings (electronics/cpu case, charge-controller case, two battery cases) with new composite housings developed and tested at the CEOAS Machine and Technical Development Facility. These cases reduce the weight of the surface expression by ~50 kg in air, and eliminate some of the corrosion issues we saw on previous deployments that we suspect were due to material-composition imperfections related to supply-chain issues during the pandemic. Each set of cases, including the waterproof bulkhead connectors and composite materials is expected to cost \$10,000.

Significant additional expenses lie in costs for vessel-hires, which are estimated at \$10k/day of ship time for deployment-compatible vessels. Three days per year of mooring-capable vessel services is budgeted (\$30,000 for the duration of the project), assuming two mooring turnaround operations and a day in reserve if ocean conditions dictate.

Additional expenses include materials and supplies (\$24,910) covering expendable mooring hardware and sensors for the surface buoy if needed (e.g. weather stations, data loggers, solar panels, batteries, charge controllers), standard gases and CRMs, electronic components and computers/supplies, machine shop and lab analysis fees, and use of the CEOAS flatbed truck. Travel between Corvallis and Coos Bay is included (\$9000/yr), assuming three 2-day trips per year for 3 people including personal vehicle mileage, lodging, and per diem. Computer-network fees (\$3000) are included.

Overhead is charged at 48.5% of direct costs less permanent equipment, tuition, and participant fees.

Project 9: Maria Kavanaugh - Harmful Algal Bloom (HAB) Observing Network (-ON)

This project seeks to engage the Oregon and Washington fishing fleet in the coproduction of an offshore plankton observatory. Plankton samples will be collected by fisherman partners and samples will be run on an imaging flow cytometer which will indicate the abundance and diversity of phytoplankton and microzooplankton, and whether potentially harmful species are present. A dashboard will be built to house fisherman-collected data, with the goal to provide an early warning for fisheries and additional data for the West Coast HAB Bulletin. Kavanaugh will work with the Science and Fisherman Exchange and Marine Resource Management (MRM) programs at OSU (Lead, Karen McLeod) to connect with fishermen. This work will synergize with efforts to develop more

widespread, accessible tools to observe marine ecosystem responses changing conditions off the Oregon and Washington coast.

Budget Justification:

Senior Personnel: Dr. Maria Kavanaugh be responsible for overseeing development and refinement of the automated image classification system. Kavanaugh will develop benchmarks, advise post-baccalaureate researcher and graduate students, and communicate with NWFSC, ODFW, and fleet collaborators on all aspects of the project. Kavanaugh requests 0.25 months salary.

Other Personnel: We request 1.75 months of funding for Kelly George, a post baccalaureate researcher working on image annotation in Kavanaugh's lab. George will assist the graduate student and act as continuity between graduate students. A graduate student with interests spanning environmental data science will be supported for the summer quarter (3 months) to assist with coordination of fleet and running of samples. Kavanaugh collaborates and mentors students through the Marine Resource Management Program and Ocean Ecology and Biogeochemistry. In the event that no student is interested in incorporating this effort into their thesis, Kelly George will take over the role of summer coordinator.

Fringe Benefits are payroll and personnel assessment expenditures such as Federal Insurance Contributions Act (FICA), Public Employees' Retirement System (PERS); State Accident Insurance Fund (SAIF); Medical, Dental, and Life Insurance; and assessments from the Personnel Division Workers' Compensation Board and Employee Relations Board. Fringe benefits are assessed at recommended rates but will be adjusted to actual rates upon award of funds.

Equipment: No major equipment is requested.

Travel: No Travel

Participant Support: None requested

Other Direct Costs:

Materials and supplies: Replacement parts including pump, tubes, and filters for IFCB and costs to replace lost bottles are included and are estimated at \$1594.

Publication/Dissemination: Publication costs are requested in the amount of \$3000 in Year2.

Computer Services: Funds are requested \$656 for OSU PI employee contribution to the connection of computers to the College network.

Subaward (no cost): No subawards

Indirect Costs: Oregon State University's federally negotiated indirect rate will be 48.5% of modified total direct costs (MTDC).

Grad Research Assistants	-	-	-	-
Summer GRAs (no tuition) (months)	\$31,680	16.67%	5.00	\$13,572
Undergrads (hourly rate)	\$33,488	32.25%	470	\$7,500
Total				\$258,608
GRAND TOTAL	\$393,097			

Principal Investigator - P. M. Kosro: This position will support two projects: HF Surface Current Mapping and Oregon Shelf Mooring; with additional oversight for OSU Data Management and Communications. Mike Kosro also serves as the NANOOS Governing Council Vice Chair and works directly with NANOOS core staff to implement the system and provide strategic guidance. Mike Kosro will provide 7.0 months effort for a total of \$88,186.

Professor - Peter Ruggiero: This position will maintain the nearshore bathymetric component of both the Washington and Oregon beach and shoreline monitoring efforts. Peter Ruggiero will provide in-kind oversight to the project.

Professor - Merrick Haller: This position will support the provision of both real-time and historical wave and bathymetry data. Merrick Haller will provide 0.20 months support for a total of \$3,362.

Professor - John A. Barth: This position will support year-round sampling along the Trinidad Head (TH), CA, line (41 3.5'N) using an underwater glider. Salary is to support the co-PIs, including Jack Barth to participate in this glider project. Sea pay is requested for days at sea for glider deployment and recovery. Jack Barth will provide 0.50 months of support for a total of \$6,920.

Professor - R. Kipp Shearman: This position will continue year-round sampling along the Trinidad Head (TH), CA, line (41 3.5'N) using an underwater glider. Kipp Shearman will provide in-kind oversight to the project.

Associate Professor - Edward D. Zaron: This position will support the Oregon-Washington coastal ocean data assimilation and forecast system. Ed Zaron will take leadership of the data assimilating coastal modeling effort at OSU. Ed Zaron will provide 0.50 months of support for a total of \$5,354.

Professor - Burke M. Hales: This position will maintain a persistent, year-round NOA-ON moored observation node at a mid-shelf location on the Oregon coast south of Heceta Bank. Burke Hales will oversee the overall project, direct the planning of at-sea operations, troubleshooting and data management. Burke Hales will provide 2.00 months of support for a total of \$28,500.

Assistant Professor - Maria Kavanaugh: This position will provide support to engage the Oregon and Washington fishing fleet in the coproduction of an offshore plankton observatory. Maria Kavanaugh .25 month of support at a total of \$2,167.

B. Fringe (\$224,217)

OSU-NANOOS Fringe Year 1			
Senior Personnel	Amount	% Rate	Total
Peter Ruggiero	-	-	\$0

Merrick Haller	\$3,362	54.00%	\$1,815
P. M. Kosro	\$75,588	54.00%	\$40,818
P. M. Kosro	\$12,598	54.00%	\$6,803
John A. Barth	\$6,920	50.00%	\$3,460
R. Kipp Shearman	-	-	\$0
Edward D. Zaron	\$5,354	42.00%	\$2,249
P. M. Kosro	\$0	54.00%	\$0
Burke M. Hales	\$27,860	52.00%	\$14,820
Maria Kavanaugh	\$2,167	57.00%	\$1,235
Total			\$71,200
<u>Other Personnel</u>			
Postdocs (scholar or RA)	-	-	\$0
Faculty Res Assistant			\$150,857
Sea pay	\$1,500	34.00%	\$510
Grad Research Assistants	-	-	\$0
Summer GRAs (no tuition)	\$5,280	10.00%	\$1,274
Undergrads (hourly rate)	\$7,500	5.00%	\$376
Total			\$153,017
GRAND TOTAL			\$224,217

The fringe rate for OSU during the period of performance depends on salary and varies between 42%-57% for senior staff and between 5%-60.75% for other personnel. The total cost for Fringe in Year 2 is \$224,217.

C. Travel (37,306)

TRAVEL DOMESTIC

Project 1 – Field Work Travel	\$5,075
Project 2 – Newport, OR	\$478
Project 3 – Regional and National Meetings, Travel to HF Sites	\$15,253
Project 4 – Regional and National Meetings, Travel to Deployments	\$2,000
Project 5 – Grays Harbor, WA; Eureka, CA; Vancouver WA	\$3,500
Project 6 – Regional NANOOS Meeting; Coastal Modeling Workshop; Science Conference	\$0
Project 7 – Regional and National Meetings	\$2,000
Project 8 – OA Support	\$9,000
Project 9 – HAB-ON	\$0
Total	\$37,306

TRAVEL DOMESTIC

Project 1 – The proposed budget provides for survey preparation and data collection (domestic travel), processing, archiving, and initial change analyses. Domestic travel of \$5,075 is requested in year 1, based on 7 days along the Oregon and Washington coast for the team of 5.

Field Work (OR and WA) 5 persons @ (per person) \$94.50/night lodging (x6), \$64 MI&E (x7)	\$5,075
Total	\$5,075

Project 2 - Travel costs to the Newport field site for service and maintenance.

Field Work (Newport, OR) 1 person @ \$135.50/night lodging (x2), \$69 MI&E (x3)	\$478
Total	\$478

Project 3 - Funds for travel are included for monthly trips to our field sites for physical exchange of data drives, to carry back to OSU; this is in addition to the hourly electronic download of radial data from our sites to produce up-to-date maps. Travel funds are also budgeted for as-needed trips to our sites for repair and inspection, as well as instrument calibration. Travel to regional meetings (e.g. NANOOS PI and Governing Council meetings; NANOOS Data Management meetings) and national science meetings (e.g. Ocean Sciences or Radiowave Oceanography Workshop).

Field Work (OR various) 14 trips, 2 persons @ \$135.50/night lodging (x2), \$69 MI&E (x2)	\$11,452
NANOOS Meetings, 1 person @ \$218/night lodging (x4), \$79 MI&E (x5)	\$1,267
Other Meetings, 2 persons @ \$218/night lodging (x4), \$79 MI&E (x5)	\$2,534
Total	\$15,253

Project 4 - Travel for mooring cruises is included and funds are budgeted for travel to planning meetings and to science meetings (e.g. Fall AGU).

Field Work (Coos Bay, OR) 1 person @ \$97/night lodging (x4), \$69 MI&E (x5)	\$733
Other Meetings, 1 person @ \$218/night lodging (x4), \$79 MI&E (x5)	\$1,267
Total	\$2,000

Project 5 - Travel funds support OSU personnel costs for traveling to Trinidad Head, CA, and Grays Harbor, WA, to join research cruises and for the co-PIs to attend the NANOOS annual meeting.

Field Work (CA, OR, WA) 5 persons @ \$100/night lodging (x4), \$60 MI&E (x5)	\$3,500
Total	\$3,500

Project 6 – No travel budgeted.

Project 7 - Travel to a domestic meeting on DMAC issues is allocated.

Other Meetings, 2 persons @ \$201/night lodging (x3), \$79 MI&E (x6), airfare \$320	\$2,000
Total	\$2,000

Project 8 - Travel between Corvallis and Coos Bay is included, assuming four 2-day trips per year for 3 people, and 12 one-day trips for one person, at \$250/person/day, including personal vehicle mileage (~\$125 per RT), lodging, and per diem.

Field Work (OR) 4 trips for 3 persons @ \$250/day (x2)	\$6,000
Field Work (OR) 12 trips for 1 person @ \$250/day (x1)	\$3,000
Total	\$9,000

Project 9 – no travel budgeted.

The total combined travel requests are \$37,306.

D. Equipment (\$188,860)

Project 3 – Computers (2@\$5200 each)	\$10,400
Project 3 – Replacement antennas (3@\$11,000 each)	\$33,000
Project 4 – Instrument: 2 SBE37 (2@\$7530 each)	\$15,060
Project 4 – Computer (\$5,200)	\$5,200
Project 5 - New CA Glider (50% from NANOOS)	\$100,000
Project 7 – Computer/data server	\$5,200
Project 8 – Replacement composite pressure cases (2@\$10K each)	\$20,000
Total	\$188,860

Equipment costs of \$188,860 are requested for new computers (\$10,400) and 3 new antennas (\$33,000) for HF Surface Current Mapping; 2 SeaBird 37 CTD (\$15,060) to replace damaged equipment for the Oregon shelf mooring; a new glider for sampling in CA (\$100,000, with NANOOS providing half of the \$200K cost); an additional computer/data server (\$5200) for OSU Data Management and Communications, and 2 replacement composite pressure cases (\$10K each). All equipment purchases are for Year 2.

Lease of the equipment listed above is either not available or not cost-effective for sustained operations. Analysis of lease vs. purchase options for common oceanographic equipment such as current point- measurers or current-profilers, CTDs, wave- tide gauges, sonars, and water quality sensors (temperature, salinity, oxygen, chlorophyll, turbidity, optics) shows leasing rates are generally set to repay instrument purchase costs in 250 to 500 days. Because instruments purchased here will be used in a sustained observing program, beginning with the five-year program funded under this grant, and with the anticipation of future participation, the purchase option is the more cost effective for all of these applications.

E. Supplies (\$85,808)

Project 1 – Nearshore Bathymetry Observations	\$2,310
Project 2 – Marine Radar Observing Station	\$1488
Project 3 – HF Surface Current Mapping	\$10,808
Project 4 – Oregon Shelf Mooring	\$16,045
Project 5 – Underwater Glider Observations	\$25,646
Project 6 – Coastal Ocean Data Assimilation and Forecast System	\$1,782
Project 7 – Data Management and Communications	\$1,225
Project 8 – Ocean Acidification Monitoring	\$24,910
Project 9 – HAB Observing Network	\$1,594
Total	\$85,808

Project 1 – Nearshore Bathymetry Observations (\$2,310): Supplies include protection suits, personal floatation devices, helmets, batteries, cables, pelican cases, etc. required to maintain and operate a 4th generation PWC-based Coastal Profiling System (designed and built by OSU).

Project 2 – Marine Radar Observing Station (\$1488): Materials and supplies include hard drives, radar parts, routine radar servicing.

Project 3 – HF Surface Current Mapping (\$10,808): Materials for antenna cables, computer data storage, project-related data acquisition, site air-conditioners and de-humidifiers, processing computers, and expendables. Includes equipment repairs of all costs, and replacements costing up to \$5,000.

Project 4 – Oregon Shelf Mooring (\$16,045): Funds are allocated for instrument calibrations, mooring rigging, cell phone data charges, ARGOS satellite beacon charges, batteries, replacing worn and damaged sensors costing up to \$5,000, anchors, mooring hardware, etc.

Project 5 – Trinidad Head Glider Line (\$25,646): Includes computer supplies, sensor calibration, glider repair, batteries for the gliders, and Iridium cell phone charges for glider operations and data return to shore.

Project 6 – Coastal Ocean Data Assimilation and Forecast System (\$1782): Supplies primarily include computer storage disks and peripherals.

Project 7 – Data Management and Communications (\$1,225): Funds for materials and supplies (computer related), computer networking services, and communications (phone) are budgeted.

Project 8 – Ocean Acidification Monitoring (\$24,910): Includes expendable mooring hardware and tethers (Amsteel Blue), replacement anchors and supplies for the surface buoy if needed (e.g. weather stations, data loggers, solar panels, batteries, charge controllers), standard gases and CRMs, electronic components and computers/supplies, machine shop and lab analysis fees, and use of the CEOAS flatbed truck

Project 9 – HAB Observing Network (\$1,594): Includes minor equipment such as pumps, sample bottles, and chemical fixatives.

The total budget for supplies is \$85,808.

F. Contractual

None.

G. Construction

None.

H. Other (\$92,568)

Categories included under other costs are: Publication Costs (\$3500), Consultant Services (\$2,400), Computer Services (\$15,281), Other Miscellaneous (\$68,647), and Tuition (\$2740).

- Publication Costs: General publication costs to submit journal articles based on research are included under Projects 5 and 9. Total publication costs are \$3500.
- Consultant Services: A local first-response technician for the distant site at Point St. George is included for Project 3 (a 5 hour drive each way), at a cost of \$2,400/yr.
- Computer Services: Research Computing Services (RCS) are required to connect OSU's CEOAS computer network. Activities that require RCS support include Project 3 (\$4,020), Project 4 (\$3,000), Project 5 (\$1,950), Project 6 (\$927), Project 7 (\$1,728), Project 8 (\$3,000), and Project 9 (\$656). Total costs for computing services are \$15,281.
- Other Miscellaneous: These costs include communications, maintenance, and repairs for remote on-site locations to provide electricity and internet connectivity (e.g. cell phone/modem/ISP service) on Project 3 (\$5,647). Costs for cell-modem data transfer and small-boat mooring repairs are budgeted on Project 4 (\$2,000). Costs for shipping gliders to the manufacturers for servicing at \$1,000 and for OSU's Over-the-Side insurance costs (private carrier insurance for untended in-water equipment against loss) at \$30,000 are included for Project 5 (\$31,000). Other costs for Project 8 include three days per year of mooring-capable vessel services is budgeted, assuming two mooring turnaround operations and a day in reserve if ocean conditions dictate (\$30,000). The total costs for Other Miscellaneous is \$68,647.
- Tuition: Programs that use summer GRAs for research assistance now pay summer tuition, prorated to the number of months worked (\$2740).

I. Total Direct Charges (\$1,021,856)

A. Personnel	\$393,097
B. Fringe	\$224,217
C. Travel	\$37,306
D. Equipment	\$188,860
E. Supplies	\$85,808
F. Contractual	\$0
G. Construction	\$0
H. Other	\$92,568
Total	\$1,021,856

Total direct costs are estimated at \$1,021,856.

J. Indirect Charges (\$402,674)

The rate is 48.5% and is computed on the following direct cost base of \$830,256, which is total costs (\$1,021,856) but with equipment and tuition excluded.

Personnel	\$393,097
Fringe	\$224,217
Travel	\$37,306
Supplies	\$85,808
<u>Other</u>	<u>\$89,828</u>
Total	\$830,256

Multiplied by Indirect Cost Rate of 48.5%

Total Indirect Costs: \$402,674

K. Totals (\$1,424,530)

Total funding requested for OSU NANOOS support in year 2 is \$1,424,530.



DEPARTMENT OF HEALTH & HUMAN SERVICES

Program Support Center
Financial Management Portfolio
Cost Allocation Services

90 7th Street, Suite 4-600
San Francisco, CA 94103-6705
PHONE: (415) 437-7820
FAX: (415) 437-7823
EMAIL: CAS-SF@psc.hhs.gov

June 29, 2022

Michael J. Green
VP for Finance and Administration / CFO
Oregon State University
640 Kerr Administration
Corvallis, OR 97331-2156

Dear Mr. Green:

A copy the facilities and administrative (F&A) cost rate agreement for the Oregon State University is being sent to you for signature. This agreement reflects an understanding reached between your organization and a member of my staff concerning the rate(s) that may be used in support of your claim for F&A costs on grants and contracts with the Federal Government.

The Office of Management and Budget (OMB) has requested that we reach an agreement with each major institution on the components of published F&A rates. The enclosed forms are provided for that purpose.

Please have the agreement signed by an authorized representative of your organization and return within ten business days of receipt. The signed agreement should be sent to me by email, while retaining the copy for your files. Only when the signed agreement is returned, will we then reproduce and distribute the agreement to the appropriate awarding organizations of the Federal Government for their use.

An F&A cost proposal, together with the supporting information, are required to substantiate your claim for indirect costs under grants and contracts awarded by the Federal Government. Therefore, your next proposal based on actual costs for the fiscal year ending 06/30/2023 is due in our office by 12/31/2023. Please submit your next proposal electronically via email to CAS-SF@psc.hhs.gov.

Sincerely,

Arif Karim, Director
Cost Allocation Services

Enclosure

PLEASE SIGN AND RETURN THE NEGOTIATION AGREEMENT BY EMAIL

COLLEGES AND UNIVERSITIES RATE AGREEMENT

EIN: 61-1730890

DATE: 06/29/2022

ORGANIZATION:

Oregon State University
 Finance And Administration
 640 Kerr Administration
 Corvallis, OR 97331-2156

FILING REF.: The preceding
 agreement was dated
 01/08/2019

The rates approved in this agreement are for use on grants, contracts and other agreements with the Federal Government, subject to the conditions in Section III.

SECTION I: Facilities And Administrative Cost Rates

RATE TYPES: FIXED FINAL PROV. (PROVISIONAL) PRED. (PREDETERMINED)

EFFECTIVE PERIOD

<u>TYPE</u>	<u>FROM</u>	<u>TO</u>	<u>RATE(%)</u>	<u>LOCATION</u>	<u>APPLICABLE TO</u>
PRED.	07/01/2020	06/30/2024	48.50	(1) On-Campus	Organized Research
PRED.	07/01/2020	06/30/2024	26.00	(1) Off-Camp.	Organized Research
PRED.	07/01/2020	06/30/2024	36.00	(1) On-Campus	Other Sponsored Activities
PRED.	07/01/2020	06/30/2024	32.00	(2) On-Campus	Vessel Operations
PRED.	07/01/2020	06/30/2024	49.20	(1) On-Campus	Org. Res. (3)
PRED.	07/01/2020	06/30/2024	26.70	(1) Off-Camp.	Org. Res. (3)
PRED.	07/01/2020	06/30/2024	7.00	(1) Off-Camp.	IPA (4)
PRED.	07/01/2020	06/30/2024	26.00	(1) Off-Campus	Other Sponsored Activities
PROV.	07/01/2024	Until Amended	0.00	(5)	

*BASE

ORGANIZATION: Oregon State University

AGREEMENT DATE: 6/29/2022

(1) Modified total direct costs, consisting of all salaries and wages, fringe benefits, materials and supplies, services, travel, and subgrants and subcontracts up to the first \$25,000 of each subgrant or subcontract (regardless of the period covered by the subgrant or subcontract). Equipment, capital expenditures, charges for patient care and tuition remission, rental costs, scholarships, and fellowships as well as the portion of each subgrant and subcontract in excess of \$25,000 shall be excluded from modified total direct costs.

(2) Direct salaries and wages including vacation, holiday, and sick pay but excluding other fringe benefits.

(3) Facilities and Administrative Cost Rates - DOD Contracts only.

(4) Intergovernmental Personnel Act Agreements.

(5) Use same rates and conditions as those cited for fiscal year ending June 30, 2024.

ORGANIZATION: Oregon State University

AGREEMENT DATE: 6/29/2022

SECTION II: SPECIAL REMARKS

TREATMENT OF FRINGE BENEFITS:

The fringe benefits are specifically identified to each employee and are charged individually as direct costs. The directly claimed fringe benefits are listed below.

TREATMENT OF PAID ABSENCES

Vacation, holiday, sick leave pay and other paid absences are included in salaries and wages and are claimed on grants, contracts and other agreements as part of the normal cost for salaries and wages. Separate claims are not made for the cost of these paid absences.

DEFINITION OF OFF-CAMPUS

The off-campus rate will apply to sponsored projects performed in facilities which are not owned or leased by OSU; or where rent of facilities is directly allocated to the project as an approved direct cost. Where a project occurs at both on-campus and off-campus locations, the off-campus component must consist of an activity period a minimum of 90 consecutive days away from the institution. The appropriate rate will be applied to each portion.

DEFINITION OF EQUIPMENT

Equipment is defined as tangible nonexpendable personal property (including information technology systems) having a useful life of more than one year and an acquisition cost of \$5,000 or more per unit.

The following fringe benefits are treated as direct costs:

FICA, PERS, MEDICAL/DENTAL/LIFE INSURANCE, LIABILITY INSURANCE, UNEMPLOYMENT & LONG-TERM DISABILITY INSURANCE, STATE ACCIDENT INSURANCE FUND, EXECUTIVE DEPARTMENT PERSONNEL DIVISION AND EMPLOYEE RELATIONS BOARD ASSESSMENT.

The two year extension of the indirect cost rate was granted in accordance with 2 CFR 200.414(g).

NEXT PROPOSAL DUE DATE

A proposal based on actual costs for fiscal year ending 06/30/23, will be due no later than 12/31/23.

ORGANIZATION: Oregon State University

AGREEMENT DATE: 6/29/2022

SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted; such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. ACCOUNTING CHANGES:

This Agreement is based on the accounting system purported by the organization to be in effect during the Agreement period. Changes to the method of accounting for costs which affect the amount of reimbursement resulting from the use of this Agreement require prior approval of the authorized representative of the cognizant agency. Such changes include, but are not limited to, changes in the charging of a particular type of cost from facilities and administrative to direct. Failure to obtain approval may result in cost disallowances.

C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

The rates in this Agreement were approved in accordance with the authority in Title 2 of the Code of Federal Regulations, Part 200 (2 CFR 200), and should be applied to grants, contracts and other agreements covered by 2 CFR 200, subject to any limitations in A above. The organization may provide copies of the Agreement to other Federal Agencies to give them early notification of the Agreement.

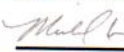
E. OTHER:

If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

Oregon State University

(INSTITUTION)
DocuSigned by:



Michael J. Green

(NAME)

(NAME)

Vice President for Finance and Administration

(TITLE)

7/1/2022 | 05:27:12 PDT

(DATE)

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

(SIGNATURE)

Arif Karim

(NAME)

Director, Cost Allocation Services

(TITLE)

4/1/2022

(DATE) 5280

HHS REPRESENTATIVE: Jeanette Lu

Telephone: (415) 437-7820

ORGANIZATION: Oregon State University

AGREEMENT DATE: 6/29/2022

SECTION III: GENERAL

A. LIMITATIONS:

The rates in this Agreement are subject to any statutory or administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the organization were included in its facilities and administrative cost pools as finally accepted; such costs are legal obligations of the organization and are allowable under the governing cost principles; (2) The same costs that have been treated as facilities and administrative costs are not claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the organization which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

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C. FIXED RATES:

If a fixed rate is in this Agreement, it is based on an estimate of the costs for the period covered by the rate. When the actual costs for this period are determined, an adjustment will be made to a rate of a future year(s) to compensate for the difference between the costs used to establish the fixed rate and actual costs.

D. USE BY OTHER FEDERAL AGENCIES:

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If any Federal contract, grant or other agreement is reimbursing facilities and administrative costs by a means other than the approved rate(s) in this Agreement, the organization should (1) credit such costs to the affected programs, and (2) apply the approved rate(s) to the appropriate base to identify the proper amount of facilities and administrative costs allocable to these programs.

BY THE INSTITUTION:

Oregon State University

(INSTITUTION)

(SIGNATURE)

(NAME)

(TITLE)

(DATE)

ON BEHALF OF THE FEDERAL GOVERNMENT:

DEPARTMENT OF HEALTH AND HUMAN SERVICES

(AGENCY)

Arif M. Karim -S Digitally signed by Arif M. Karim -S
Date: 2022.06.30 10:59:35 -05'00'

(SIGNATURE)

Arif Karim

(NAME)

Director, Cost Allocation Services

(TITLE)

4/1/2022

(DATE) 5280

HHS REPRESENTATIVE: Jeanette Lu

Telephone: (415) 437-7820

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2025

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. NANOOS Years 15-19 FY2021: Year 16 (CRITFC)	11.012	\$ <input type="text"/>	\$ <input type="text"/>	\$ 291,000.00	\$ <input type="text"/>	\$ 291,000.00
2.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5. Totals		\$ <input type="text"/>	\$ <input type="text"/>	\$ 291,000.00	\$ <input type="text"/>	\$ 291,000.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
	NANOOS Years 15-19 FY2021: Year 16 (CRITFC)				
a. Personnel	\$ 110,491.00	\$	\$	\$	\$ 110,491.00
b. Fringe Benefits	31,304.00				31,304.00
c. Travel	2,000.00				2,000.00
d. Equipment	0.00				0.00
e. Supplies	10,196.00				10,196.00
f. Contractual	77,045.00				77,045.00
g. Construction	0.00				0.00
h. Other	1,000.00				1,000.00
i. Total Direct Charges (sum of 6a-6h)	232,036.00				\$ 232,036.00
j. Indirect Charges	58,964.00				\$ 58,964.00
k. TOTALS (sum of 6i and 6j)	\$ 291,000.00	\$	\$	\$	\$ 291,000.00
7. Program Income	\$	\$	\$	\$	\$

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. NANOOS Years 15-19 FY2021: Year 16	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
9. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
10. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
11. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
12. TOTAL (sum of lines 8-11)	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ <input type="text" value="291,000.00"/>	\$ <input type="text" value="72,750.00"/>	\$ <input type="text" value="72,750.00"/>	\$ <input type="text" value="72,750.00"/>	\$ <input type="text" value="72,750.00"/>
14. Non-Federal	\$ <input type="text" value="0.00"/>	<input type="text" value="0.00"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
15. TOTAL (sum of lines 13 and 14)	\$ <input type="text" value="291,000.00"/>	\$ <input type="text" value="72,750.00"/>	\$ <input type="text" value="72,750.00"/>	\$ <input type="text" value="72,750.00"/>	\$ <input type="text" value="72,750.00"/>

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS)			
	(b)First	(c) Second	(d) Third	(e) Fourth
16. NANOOS Years 15-19 FY2021: Year 16	\$ <input type="text" value="291,000.00"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
17. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
18. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
19. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
20. TOTAL (sum of lines 16 - 19)	\$ <input type="text" value="291,000.00"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: <input type="text" value="\$232,036"/>	22. Indirect Charges: <input type="text" value="\$58,964 = \$163,321 x 27.92% + \$68,715 x 19.45%"/>
23. Remarks: <input type="text" value="Contractual costs are service contracts only"/>	



COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

700 NE Multnomah Street, Suite 1200
Portland, Oregon 97232

(503) 238-0667
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September 29, 2022

Jan A. Newton, Ph.D.
NANOOS Executive Director
Principle Oceanographer
Applied Physics Laboratory
University of Washington
1013 NE 40th St.
Seattle WA 98105-6698

Re: Letter of Intent to Collaborate

Dear Dr. Newton:

Columbia River Inter-Tribal Fish Commission (CRITFC) submits this letter of intent to collaborate for the following sponsored project.

Title: Sustaining NANOOS, the Pacific Northwest component of the US IOOS
Principal Investigator: Dr. Jan A. Newton, Applied Physics Laboratory
Subaward P.I. Charles Seaton, CRITFC
Sponsor: NOAA/NOS Coastal Services Center
Period of Performance: 7/1/2022 – 6/30/2023

CRITFC is willing to establish a Subaward for this project. CRITFC is aware of the Sponsor's grant and contract policies and agrees to administer the subaward in accordance with them.

CRITFC's proposed Statements of Work are attached. CRITFC's requested funding is \$291,000; detailed budgets are also attached.

Please contact the following individuals for additional information regarding this proposal.

Technical Contact:	Administrative Contract
Charles Seaton Phone: (503) 238-0667 Fax: (503) 235-4228 Email: cseaton@critfc.org	Chris Roe Phone: 503-238-0667 Fax: (503) 235-4228 Email: chris.roe@critfc.org

Sincerely,

Aja K. DeCoteau
Executive Director

Subawardee: Columbia River Inter-Tribal Fish Commission (CRITFC)

Amount: \$291,000

Project Title: Columbia River observation and prediction system, including estuary and plume modeling and estuary and shelf buoys

STATEMENT OF WORK

Scope for Year 2

STATEMENT OF WORK

Proposed effort: We propose to maintain an established observation and prediction infrastructure for science and societal applications in the Columbia River estuary (SATURN [*Baptista et al.*, 2015]). Support is requested for observations, modeling, data management, and product maintenance, as follows:

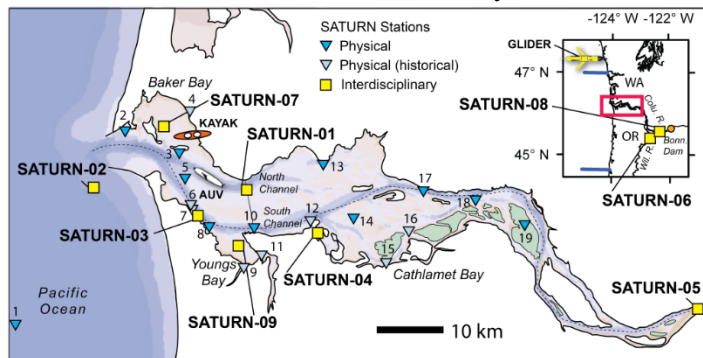
Rationale and Justification for continuation of effort

SATURN (including predecessor CORIE) is among the earliest estuarine observation and prediction systems in the world, and one of the pioneer subsystems of NANOOS and IOOS. Focused on the Columbia River estuary (broadly defined to include riverine and ocean interactions), SATURN has been developed as a “collaboratory” to support both science and science translation to society. Sample accomplishments:

- Physical observations extend back to 1996 and biogeochemical observations to 2008. These long-term time series are powerful and distinctive witnesses to PNW processes and their variability and change.
- SATURN observations, simulations and products have directly supported multiple multi-institutional science projects, including but not limited to NSF-LMER, NSF-RISE, NSF-CMOP, NOAA-Plume and NOAA-Estuary. NSF-CMOP alone produced over 150 peer-reviewed publications and theses.
- SATURN has helped bridge across stakeholder communities (federal and state agencies, tribes, others) and has provided direct support to major regional decisions, including the Columbia River Channel Improvement Project (CRCIP), the Columbia River Treaty Review, and the Bradwood Landing LNG terminal application. CRCIP exemplifies the multiple ways SATURN serves the region: simulations were used to generate topic-specific consensus among stakeholders during the Re-consultation phase of CRCIP (2001); observations were used to monitor post-construction impacts for almost a decade; and a new generation of simulations were eventually used to generate post-construction consensus about the extent of the impact.

Scope

Task 1a: Observations in the lower estuary and shelf source waters (PI: C.M. Seaton)



- Maintain the network of interdisciplinary endurance stations in the lower estuary and near-plume (SATURN-02, 03, 04, 07 and 09; some of these stations are maintained on a seasonal basis). Additional seasonal station(s) may also be deployed in support of regional studies (e.g., North Head, in 2019-2020). Upgrading the existing physical station, Eliot, to an interdisciplinary station is planned for 2022.
- Collaborate with OSU on running a glider line on the continental shelf, to fill nationally recognized observational gaps. The line extends West and/or North relative to the mouth of the Columbia River. CRITFC will collaborate on mission design, science goals, and development of a tribally-focused internship pathway.

Task 1c: Modeling (PI: C.M. Seaton)

- Maintain the daily forecasts of river-to-shelf circulation in the Columbia River
- Maintain the multi-year climatology of river-to-shelf circulation in the Columbia River (aka Climatological Atlas)

Task 1d: Data management and products (PI: C.M. Seaton)

- Maintain the SATURN observational database
- Maintain web products of value for Columbia River stakeholders
- Export sensor and model data to NANOOS
- Contribute to the central NANOOS DMAC cyber-team

Reference

Baptista, A. M., C. Seaton, M. Wilkin, S. Riseman, J. A. Needoba, D. Maier, P. J. Turner, T. Kärnä, J. E. Lopez, L. Herfort, V. M. Megler, C. McNeil, B. C. Crump, T. D. Peterson, Y. Spitz & H. M. Simon (2015). Infrastructure for collaborative science and societal applications in the Columbia River estuary. *Frontiers of Earth Science*, 9(4), 659-682.

Subawardee: Columbia River Inter-Tribal Fish Commission (CRITFC)

Amount: \$291,000

Project Title: Columbia River observation and prediction system, including estuary and plume modeling and estuary and shelf buoys

Budget Narrative

As indicated in Standard Form 424-A, the proposed budget contains funding requested by the Columbia River Inter-Tribal Fish Commission (CRITFC). CRITFC proposes to maintain an established observation and prediction infrastructure for science and societal applications in the Columbia River estuary. Support is requested for observations, modeling, data management, and product maintenance. CRITFC Principal Investigator, Charles Seaton also serves as a participant in NANOOS central DMAC activities. The total cost for this cooperative agreement is \$291,000 in Year 2.

A. Personnel (\$110,491)

CRITFC-NANOOS Personnel Year 1 – Observations and Prediction				
Position Title & Name	Salary	% Time	# Months	Amount
Principal Investigator - Charles Seaton	\$99,028	10%	1.2	\$9,903
Data Quality Analyst - Sarah Riseman	\$58,557	66%	8	\$38,634
Ocean Modeler - Mike Swirsky	\$83,381	10%	1.2	\$8,234
Oceanographer - Mary Rose Gradoville	\$85,882	20%	2.4	\$11,165
Field Technician -TBD	51,106	83%	10	\$42,555
GRAND TOTAL				\$110,491

Principal Investigator - Charles Seaton: This position will support observations, DMAC, and modeling activities for the Columbia River and coastal ocean. Charles Seaton will provide 1.2 months effort for a total of \$9,903.

Data Quality Analyst - Sarah Riseman: This position will support observations and DMAC for the Columbia River and coastal ocean. Sarah Riseman will provide 8 months effort for a total of \$38,634.

Modeling programmer – Mike Swirsky: This position will support DMAC and modeling activities for the Columbia River and coastal ocean. Mike Swirsky will provide 1.2 months effort for a total of \$8,234.

Oceanographer – Mary Rose Gradoville: This position will support observations activities for the Columbia River and coastal ocean. Dr. Gradoville will provide 2.4 months effort for a total of \$11,165.

Field Technician - TBD: This position will support observations activities for the Columbia River and coastal ocean. This position will provide 10 months effort for a total of \$42,555. This position is expected to be filled in Feb, 2023. This position will be based in Astoria and will incur indirect costs at the Astoria rate.

B. Fringe (\$)

CRITFC-NANOOS Fringe Year 1 – Observations and Prediction			
Position & Title	Amount	% Rate	Amount

Principal Investigator – Charles Seaton	\$9,903	35.5%	\$3,516
Data Quality Analyst – Sarah Riseman	\$38,634	15.0%	\$5,795
Modeling programmer – Mike Swirsky	\$8,234	35.5%	\$2,923
Oceanographer – Rosie Gradoville	\$11,165	35.5%	\$3,963
Astoria Field Technician – TBD	\$42,555	35.5%	\$15,107
GRAND TOTAL			\$31,304

The fringe rate for CRITFC during the period of performance is 15% for Sarah Riseman and 35.5% for all other staff. The total cost for Fringe in Year 2 is \$31,304.

C. Travel (\$2000)

TRAVEL DOMESTIC

NANOOS Tri-Com meeting, 1 person @ \$182/night lodging (x2), \$63 perDiem (x3)	\$553	The
Train travel, Portland to Seattle	\$81	
Oregon State of the Coast, 1 person @ 182/night lodging (x1), \$69 perDiem (x1)	\$251	
Rental vehicle and gas, Portland to Newport	\$115	
Mileage for GSA vehicle 500 miles/month for 8 months @ \$0.25/mile	\$1000	
Total	\$2000	

budget includes domestic travel to allow CRITFC staff, based in Portland, OR, to attend NANOOS and IOOS meetings in the Pacific Northwest, as well as other regional meetings, based on travel from Portland to Seattle for annual 2-day Tri-Com meeting, and on travel from Portland to Newport, OR for 1 day State of the Coast conference, for a total of \$1000.

Mileage is included for a GSA Federal Vehicle (class 46C, 4X4 Pickup, full size, extended cab, \$0.25/mile), for 8 months at 500 miles per month (estimate based on average miles per month required for CMOP station maintenance), for a total of \$1000. The vehicle will be used for transporting materials, including buoys and for daily travel to CMOP stations for station maintenance. The GSA vehicle will be based in Astoria and charged indirect costs at the Astoria rate.

The total cost for travel is \$2000.

D. Equipment

None.

E. Supplies and Minor Equipment (\$10,196)

These Materials and Supplies are primarily for operating and maintaining the Center’s observation network on the Oregon coast, including fabrication, instrument calibration and vessel operation, and secondarily for operating and maintaining computer resources, including maintenance services for hardware and software. We have estimated these expenses based on recent experience in the Coastal Margin Observation & Prediction program. The budget includes a total of \$385 for supplies. An additional \$12,000 for supplies and materials for the field program are included as expenses in Michael Wilkin’s contract, and are therefore not included in this category.

In addition to supplies, this category also includes minor equipment, specifically one AIS transceiver beacon (\$4,310) for station to shore communications, and one laptop for the new field technician (\$1,800).

General field supplies (not included in Michael Wilkin contract): 7 months x \$55/month = \$385

Minor equipment: \$4310

Minor computer: \$1800

Software licenses (Matlab, SMS): \$3701

Field supplies and minor equipment purchases will originate in Astoria and be charged the Astoria indirect rate.

F. Contractual (\$77,045)

Michael Wilkin - Total \$69,327

Method of Selection: Sole source, contractor has over 20 years' experience developing and managing this observation network, formerly staff at OHSU before the transition to CRITFC

Period of Performance: contract currently extends to Jun 30, 2023

Description of Activities: Contracted management of the observation network and vessel staffing, in support of field operations.

Ring Central – Total \$360

Method of selection: CRITFC institution-wide RFP

Period of performance: 1 year

Description of activities: Phone line for Astoria field office

OSU Nutrient Lab – Total \$2,000

Method of Selection: Sole source, contractor is a regional expert in nutrient analysis, and this contractor has been used by CMOP for nutrient analysis for ~10 years, providing methodological consistency. Annual nutrient analysis is performed once per year on ~80 samples collected since previous year @ \$25/sample for a total cost of \$2,000.

GSA light truck – Total \$1,472

Ford F-150 or equivalent for materials transport and station maintenance: 8 months at \$184/month

Instrument maintenance - Total \$3,886

Intermittent service of field instruments, including DO sensors, CTs, and Turner Cyclops instruments. Amount estimated based on prior experience with annual maintenance costs.

Instrument maintenance will originate in Astoria, and the GSA light truck will be based in Astoria, so both will be charged the Astoria indirect rate.

The total for all contracted services is \$77,045.

G. Construction

None.

H. Other

Education/ Seminar & Conference Reg. fees: \$1000

Conference attendance by Charles Seaton or Dr. Rosie Gradoville. Specific conferences not yet selected. Cost is estimate based on prior experience.

I. Total Direct Charges (\$232,036)

Category	Portland	Astoria	Total
A. Personnel	\$67,936	\$42,555	\$110,491
B. Fringe	\$16,197	\$15,107	\$31,304
C. Travel	\$1,000	\$1,000	\$2,000
D. Equipment	\$0	\$0	\$0
E. Supplies	\$5,501	\$4,695	\$10,196
F. Contractual	\$71,687	\$5,358	\$77,045
G. Construction	\$0	\$0	\$0
H. Other	\$1000	\$0	\$1000
Total	\$163,321	\$68,715	\$232,036

Total direct costs based in Portland are estimated at \$163,321. Total direct costs based in Astoria are estimated at \$68,715. Total direct costs are estimated at \$232,036.

J. Indirect Charges (\$58,964)

The U.S. Department of the Interior, National Business Center, acting as the cognizant agency of the federal government, approved a Negotiated Indirect Cost Agreement with the Columbia River Inter-Tribal Fish Commission (CRITFC) for CY2022. The U.S. DOI, National Business Center Representative to this agreement is Marilyn P. Elgar, phone (916)930-3811.

The Direct Cost Base used for calculating indirect cost recovery includes all project expenditures except capital equipment (>\$5,000), and pass through funds, which are normally defined as payments to participants, stipends to eligible recipients, or subawards, all of which normally require minimal administrative effort. CRITFC follows 2 CFR 200 (Uniform Guidance).

CRITFC’s approved CY2022 Indirect Rate is 27.92% for costs incurred at the Portland location, and 19.45% for costs incurred at the Astoria location.

CRITFC is a subdivision of the tribal governments of the Confederated Tribes of the Umatilla Reservation; the Confederated Tribes of the Warm Springs Reservation; the Confederated Tribes and Bands of the Yakama Nation; and the Nez Perce Tribe.

Indirect costs in Astoria are \$13,365. Indirect costs in Portland are \$45,599. Indirect charges requested for this project amount to \$58,964.

K. Totals (\$291,000)

CRITFC is requesting \$291,000 total.

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2025

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. NANOOS Years 15-19 FY2021: Year 16 (DOGAMI)	11.012	\$ <input type="text"/>	\$ <input type="text"/>	\$ 60,000.00	\$ <input type="text"/>	\$ 60,000.00
2.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5. Totals		\$ <input type="text"/>	\$ <input type="text"/>	\$ 60,000.00	\$ <input type="text"/>	\$ 60,000.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
	NANOOS Years 15-19 FY2021: Year 16 (DOGAMI)				
a. Personnel	\$ 23,999.00	\$	\$	\$	\$ 23,999.00
b. Fringe Benefits	14,067.00				14,067.00
c. Travel	5,774.00				5,774.00
d. Equipment	0.00				0.00
e. Supplies	440.00				440.00
f. Contractual	0.00				0.00
g. Construction	0.00				0.00
h. Other	0.00				0.00
i. Total Direct Charges (sum of 6a-6h)	44,280.00				\$ 44,280.00
j. Indirect Charges	15,720.00				\$ 15,720.00
k. TOTALS (sum of 6i and 6j)	\$ 60,000.00	\$	\$	\$	\$ 60,000.00
7. Program Income	\$	\$	\$	\$	\$

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. NANOOS Years 15-19 FY2021: Year 16	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
9. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
10. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
11. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
12. TOTAL (sum of lines 8-11)	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ <input type="text" value="60,000.00"/>	\$ <input type="text" value="15,000.00"/>	\$ <input type="text" value="15,000.00"/>	\$ <input type="text" value="15,000.00"/>	\$ <input type="text" value="15,000.00"/>
14. Non-Federal	\$ <input type="text" value="0.00"/>	<input type="text" value="0.00"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
15. TOTAL (sum of lines 13 and 14)	\$ <input type="text" value="60,000.00"/>	\$ <input type="text" value="15,000.00"/>	\$ <input type="text" value="15,000.00"/>	\$ <input type="text" value="15,000.00"/>	\$ <input type="text" value="15,000.00"/>

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS)			
	(b)First	(c) Second	(d) Third	(e) Fourth
16. NANOOS Years 15-19 FY2021: Year 16	\$ <input type="text" value="60,000.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>
17. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
18. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
19. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
20. TOTAL (sum of lines 16 - 19)	\$ <input type="text" value="60,000.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>	\$ <input type="text" value="0.00"/>

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: <input type="text" value="\$44,280"/>	22. Indirect Charges: <input type="text" value="\$15,720 = \$44,280 x 35.5%"/>
23. Remarks: <input type="text"/>	



Oregon

Kate Brown, Governor

Department of Geology and Mineral Industries

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Dr. Jan Newton
Applied Physics Laboratory
University of Washington
1013 NE 40th St
Seattle WA 98105-6698

September 30, 2022

Dear Dr. Newton:

We are excited to hear that Northwest Association of Networked Ocean Observing Systems (NANOOS) will be funded by NOAA IOOS over the next five years (2021-2026) and that the Oregon Department of Geology and Mineral Industries (DOGAMI) will remain a core partner of the Regional Coastal Observing System. This letter confirms that for FY2022/23 (yr 2 of the next 5-year study) DOGAMI will continue to participate in the project titled "Enhancing the Regional Coastal Ocean Observing Systems (RCOOS) of the Northwest Association of Networked Ocean Observing Systems (NANOOS)". Specifically, DOGAMI will assist with the following:

1. Undertake late summer (~Aug/Sep), winter (~Dec/Jan), and spring (~Mar/Apr/May) surveys of the Neskowin (15 sites), Rockaway (25 sites), and Clatsop (6 sites) beach monitoring network. Time/funding permitting, undertake annual late winter/spring surveys (~April) of the Netarts (24 sites) and Gold Beach monitoring networks; additional annual surveys may take place in the following areas if funding is remaining and include Beverly Beach (15 sites) and Newport (58 sites) beach monitoring network. Undertake Mean Higher High Water (MHHW) tidal based shoreline surveys on the same days as the beach profile measurements are carried out. Budget estimate of \$45,000;
2. Disseminate beach state/change data and products among coastal managers and regulatory authorities in appropriate formats through the NANOOS Beaches and shorelines portal (<http://nvs.nanoos.org/BeachMapping>); and,
3. Coordinate, organize and chair meetings of the NANOOS User Products committee (UPC). Work with core Data Management and Communications (DMAC) committee members to facilitate the development and implementation of products identified by coastal and ocean stakeholders (e.g., continued development of Pacific Northwest climatology products, enhancements to the maritime operations and boater web applications, and to the tsunami evacuation portal, etc.). Participate in NANOOS Governing Council, Principal Investigator, and stakeholder meetings. Budget estimate of \$15,000.

Sincerely,

Dr. Ruarri Day-Stirrat
Director and State Geologist

Cc: Jonathan Allan, PhD, Coastal Geomorphologist, DOGAMI

Subawardee: Oregon Department of Geology and Mineral Industries (DOGAMI)

Amount: \$60,000

Project Title: Oregon Beach Shoreline Mapping and Analysis Program: Quantifying the short and long-term response of Oregon beaches for Coastal Managers

Scope of Work

The Oregon Department of Geology and Mineral Industries (DOGAMI), remains a committed partner in the ongoing development of the regional NANOOS RCOOS. The primary objective of our component of the RCOOS will remain focused on maintaining an Oregon beach and shoreline monitoring program (Allan and Hart, 2007a, 2008, Allan and Stimely, 2013), the purpose of which is to document variability in beach and shoreline morphodynamics, information that is important to coastal resource managers. The specific objectives of our study include:

- To provide quantitative information on the morphological response of Oregon beaches at various time scales, including seasonal (due to changes in waves and tides), interannual (e.g. storm-induced, El Niños), and long-term changes (e.g. sea level rise, changes in storm frequency/magnitude, and interdecadal climate shifts such as the Pacific Decadal Oscillation);
- To provide improved knowledge of coastal hazards, particularly the effects of such processes on the patterns and trends of coastal erosion, as well as flooding and inundation effects to properties and infrastructure located adjacent to the coast (e.g. Barnard et al., 2017).
- To contribute to an overall improved understanding of the role of climate variability in controlling the morphodynamics response of beaches along the Oregon coast, to assist coastal resource managers with important decisions related to management of the coast (e.g. Barnard et al., 2017; Anderson et al., 2018).

Established in 2004, the Oregon Beach Shoreline Mapping and Analysis Program (OBSMAP) presently consists of 674 beach and shoreline monitoring sites established along the length of the Oregon coast. Of these, 178 sites are supported through NANOOS, while the remaining sites were established for the purposes of FEMA coastal flood hazard inundation mapping (e.g. Allan et al., 2015), Snowy Plover dune restoration (USFWS), landslide changes (ODOT/FHWA), erosion control and engineering design at the mouth of the Columbia River (USACE) and at the Hatfield Marine Science Center in Newport (OSU). None of these monitoring sites would have been made possible without the initial implementation of an RCOOS in the NANOOS region. Monitoring of the beach sites is accomplished using Real-Time Kinematic Differential Global Positioning System (RTK-DGPS), with a precision of $\sim\pm 2$ cm and survey mapping accuracies of $\sim\pm 4-6$ cm (Allan and Stimely, 2013). RTK-DGPS allows DOGAMI scientists to mount the GPS on a backpack worn by a mapper, locate it atop of an ATV vehicle in order to undertake detailed topographic measurements, or on a personal watercraft to collect bathymetric data offshore the coast. These data, served through the NANOOS Visualization System beach mapping portal (<http://nvs.nanoos.org/BeachMapping>), are of considerable interest to state and federal agencies to assist with coastal resource management (e.g. the Oregon Department of Land Conservation and Development (planning), the Oregon Parks and Recreation Department (permitting of coastal engineering structures/snowy plover restoration sites), the City of Cannon Beach (dune management), coastal geotechnical consultants (e.g. Ashcreek & Associates, HG Schlicker for site-specific geologic investigations), county planning offices (e.g. Tillamook County), federal agencies such as the Federal Emergency Management Association (FEMA) for coastal flood inundation and erosion mapping, and the public at large (e.g. erosion responses in the communities of Neskowin and Rockaway have led to a greater demand for information about what is happening).

With support from NANOOS, DOGAMI has been tasked with two roles:

1. DOGAMI will continue to maintain the OBSMAP program. Our overall approach will remain unchanged and will reflect the following:
 - a. Undertake late summer (\sim Aug/Sep), winter (\sim Dec/Jan), and spring (\sim Mar/Apr/May) surveys of core sentinel beach observation stations located in the Neskowin (15 sites), Rockaway (25 sites), and Clatsop (6

- sites) littoral cells. Time and funding permitting, undertake an annual survey, late winter (~April) of the Netarts (24 sites) and Gold Beach beach monitoring networks, and potentially late summer (~Aug/Sep) surveys of the Beverly Beach (15 sites) and Newport (58 sites). Undertake Mean Higher High Water (MHHW) tidal based shoreline surveys on the same days as the beach profile measurements are carried out.
- b. Disseminate beach state/change data and products among coastal managers and regulatory authorities in appropriate formats through the NANOOS Beaches and shorelines portal (<http://nvs.nanoos.org/BeachMapping>); and,
2. As chair of NANOOS User Products, PI Allan will coordinate, organize and chair meetings of the NANOOS User Products committee (UPC). Work with core Data Management and Communications (DMAC) committee members to facilitate the development and implementation of products identified by coastal and ocean stakeholders (e.g. continued development of PNW climatology products, enhancements to the maritime operations and boater web applications, and to the tsunami evacuation portal, etc.). Participate in NANOOS Governing Council, Principal Investigator, and stakeholder meetings.

References

- Allan, J.C. and Hart, R., 2007. Assessing the temporal and spatial variability of coastal change in the Neskowin littoral cell: Developing a comprehensive monitoring program for Oregon beaches Portland, Oregon: Oregon Department of Geology and Mineral Industries Open-file-report O-07-01, 27p.
- Allan, J.C. and Hart, R., 2008. Oregon beach and shoreline mapping and analysis program: 2007-2008 beach monitoring report. Portland: Oregon Department of Geology and Mineral Industries Open file report O-08-15, 60p.
- Allan, J.C. and Stimely, L., 2013. Oregon Beach Shoreline Mapping and Analysis Program: Quantifying Short to Long-term Beach and Shoreline Changes in the Gold Beach, Nesika, and Netarts Littoral Cells. Portland, Oregon: Oregon Department of Geology and Mineral Industries O-13-07, 46p.
- Allan, J. C., Ruggiero, P., Garcia, G., O'Brien, F., Stimely, L., and Roberts, J. T., 2015. Coastal Flood Hazard Study, Tillamook County, Oregon. Oregon Department of Geology and Mineral Industries, Portland, Oregon. Special Paper 47, 283 pp.
- Barnard, P. L., Hoover, D., Hubbard, D. M., Snyder, A., Ludka, B. C., Allan, J., Kaminsky, G. M., Ruggiero, P., Gallien, T. W., Gabel, L., McCandless, D., Weiner, H. M., Cohn, N., Anderson, D. L., and Serafin, K. A.: Extreme oceanographic forcing and coastal response due to the 2015-16 El Niño, *Nature Communications*, 8, 2017.
- Anderson, D., Ruggiero, P., Antolinez, J.A., Mendez, F.J., and Allan, J., 2018, A climate index optimized for longshore sediment transport reveals interannual and multi - decadal littoral cell rotations: *Journal of Geophysical Research: Earth Surface*.

Subawardee: Oregon Department of Geology and Mineral Industries (DOGAMI)

Amount: \$60,000

Project Title: Oregon Beach Shoreline Mapping and Analysis Program: Quantifying the short and long-term response of Oregon beaches for Coastal Managers

Budget Narrative

As indicated in Standard Form 424-A, the proposed budget contains funding requested by the Oregon Department of Geology and Mineral Industries (DOGAMI). DOGAMI remains a committed partner in the ongoing development of the Northwest Association of Networked Ocean Observing Systems (NANOOS). The primary objective of our component of the NANOOS will remain focused on maintaining an Oregon beach and shoreline monitoring program (Allan and Hart, 2007a, 2008, Allan and Stimely, 2013), the purpose of which is to document variability in beach and shoreline morphodynamics, information that is important to coastal resource managers. DOGAMI Principal Investigator, Jonathan Allan also serves as the NANOOS User Products Committee Chair. The total cost for this cooperative agreement is \$60,000 in Year 2.

A. Personnel (\$23,999)

DOGAMI-NANOOS Personnel Year 2				
Position Title & Name	Salary	% Time	# Months	Amount
J. Allan – Task 1	\$105,061	12%	1.44	\$12,597
J. Allan – Task 2 (UPC Chair)	\$105,061	5%	0.6	\$5,273
F. O’Brien	\$78,499	7.8%	0.94	\$6,129
Total Personnel				\$23,999

Principal Investigator – Jonathan Allan: This position has two tasks. For Task 1, this position will undertake project management, GPS surveys of the beach monitoring sites, data reduction and analyses, and reporting. For Task 2, this position will support as NANOOS User Products chair in order to facilitate meetings, data analyses (e.g., climatology products), and product development and testing. Jonathan Allan will provide 2.04 months effort for a total of \$17,870.

Field Assistant – F. O’Brien: This position works directly with the Principal Investigator to assist DOGAMI staff members with field surveys. Staff will provide 0.94 months effort for a total of \$6,129.

B. Fringe (\$14,067)

DOGAMI-NANOOS Fringe Year 2			
Position & Title	Amount	% Rate	Amount
J. Allan – Task 1	\$12,728	59%	\$7,510
J. Allan – Task 2 (UPC Chair)	\$5,328	59%	\$3,143
F. O’Brien	\$6,322	54%	\$3,414
Total Fringe			\$14,067

The fringe rate for DOGAMI during the period of performance is 59%, which includes components for employee benefits, provisions for applicable cost of living increases, and range adjustments in accordance with Oregon Department of Geology and Mineral Industries policy. The total cost for Fringe in Year 2 is \$14,067.

C. Travel (\$5,774)

TRAVEL DOMESTIC

Fieldwork per diem. 2 people @ \$96/night lodging, \$59 food	\$4,812
NANOOS PI/GC meeting, 1 person @ \$152/night lodging (2 nights), \$74 food	\$452
NANOOS Tri-com meeting, 1 person @ \$176/night lodging (2 nights), \$79 food	\$510
Total	\$5,774

Considerable time will be spent in the field travelling to coastal field sites. For Task 1, we are requesting in-state travel support for 2 people for multiple days. Travel costs are based on the following: \$96/night lodging, \$59/day food. Travel supported requested for Task 1 is \$4,812. Additional travel support is requested for PI Allan to attend the NANOOS PI-GC annual meeting, which is calculated at \$152/night lodging, \$74/day food for two days; total for NANOOS PI-GC meeting is \$452. For Task 2, we are requesting travel support to enable PI Allan to participate in the NANOOS Tri-com meeting in Seattle, WA, which is calculated at \$176/night lodging, \$79 food for two days; total for NANOOS Tri-com meeting is \$510. The combined travel requests totals \$5,774.

D. Equipment

None.

E. Supplies (\$440.00)

DOGAMI is requesting funding to support field operations. This includes general field supplies and ATV fuel. The total funding requested to support field operations is \$440.00.

F. Contractual

None.

G. Construction

None.

H. Other

None.

I. Total Direct Charges (\$44,280)

A. Personnel	\$23,999
B. Fringe	\$14,067
C. Travel	\$5,774
D. Equipment	\$0
E. Supplies	\$440
F. Contractual	\$0
G. Construction	\$0
H. Other	\$0
Total	\$44,280

Total direct costs are estimated at \$44,280.

J. Indirect Charges (\$15,720)

A fixed carry forward rate is negotiated with the United States Department of the Interior annually. The current rate is 35.5% and is applied to all direct costs. Indirect charges requested for this project amount to \$15,720.

K. Totals (\$60,000)

DOGAMI is requesting \$60,000 in funding support for Tasks 1 and 2.



United States Department of the Interior

OFFICE OF THE SECRETARY

Washington, DC 20240

State and Local Governments Indirect Cost Negotiation Agreement

EIN: 93-6001955

Date: 03/11/2022

Organization:

Oregon Department of Geology and Mineral Industries
800 NE Oregon Street, Suite 965
Portland, OR 97232

Report Number: 2022-0256

Filing Ref.:

Last Negotiation Agreement
dated: 09/29/2020

The indirect cost rate contained herein is for use on grants, contracts, and other agreements with the Federal Government to which 2 CFR Part 200 applies subject to the limitations in Section II.A. of this agreement. The rate was negotiated by the U.S. Department of the Interior, Interior Business Center, and the subject organization in accordance with the authority contained in applicable regulations.

Section I: Rate

Start Date	End Date	Rate Type	Rate				
			Name	Rate	Base	Location	Applicable To
07/01/2021	06/30/2022	Fixed Carryforward	Indirect	35.50 %	(A)	All	1/
			Indirect	15.00 %	(A)	All	2/

1/ Geologic Survey and Services (GS&S).

2/ Light Detection and Ranging (LIDAR).

(A) Base: Total direct costs, less capital expenditures and passthrough funds. Passthrough funds are normally defined as payments to participants, stipends to eligible recipients, or subawards, all of which normally require minimal administrative effort.

Treatment of fringe benefits: Fringe benefits applicable to direct salaries and wages are treated as direct costs; fringe benefits applicable to indirect salaries and wages are treated as indirect costs.

Section II: General

- A. **Limitations:** Use of the rate(s) contained in this agreement is subject to any applicable statutory limitations. Acceptance of the rate(s) agreed to herein is predicated upon these conditions: (1) no costs other than those incurred by the subject organization were included in its indirect cost rate proposal, (2) all such costs are the legal obligations of the grantee/contractor, (3) similar types of costs have been accorded consistent treatment, and (4) the same costs that have been treated as indirect costs have not been claimed as direct costs (for example, supplies can be charged directly to a program or activity as long as these costs are not part of the supply costs included in the indirect cost pool for central administration).
- B. **Audit:** All costs (direct and indirect, federal and non-federal) are subject to audit. Adjustments to amounts resulting from audit of the cost allocation plan or indirect cost rate proposal upon which the negotiation of this agreement was based will be compensated for in a subsequent negotiation.
- C. **Changes:** The rate(s) contained in this agreement are based on the accounting system in effect at the time the proposal was submitted. Changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rate(s) in this agreement may require the prior approval of the cognizant agency. Failure to obtain such approval may result in subsequent audit disallowance.
- D. **Rate Type:**
1. **Fixed Carryforward Rate:** The fixed carryforward rate is based on an estimate of the costs that will be incurred during the period for which the rate applies. When the actual costs for such period have been determined, an adjustment will be made to the rate for a future period, if necessary, to compensate for the difference between the costs used to establish the fixed rate and the actual costs.
 2. **Provisional/Final Rate:** Within six (6) months after year end, a final indirect cost rate proposal must be submitted based on actual costs. Billings and charges to contracts and grants must be adjusted if the final rate varies from the provisional rate. If the final rate is greater than the provisional rate and there are no funds available to cover the additional indirect costs, the organization may not recover all indirect costs. Conversely, if the final rate is less than the provisional rate, the organization will be required to pay back the difference to the funding agency.
 3. **Predetermined Rate:** A predetermined rate is an indirect cost rate applicable to a specified current or future period, usually the organization's fiscal year. The rate is based on an estimate of the costs to be incurred during the period. A predetermined rate is not subject to adjustment.
- E. **Rate Extension:** Only final and predetermined rates may be eligible for consideration of rate extensions. Requests for rate extensions of a current rate will be reviewed on a case-by-case basis. If an extension is granted, the non-Federal entity may not request a rate review until the extension period ends. In the last year of a rate extension period, the non-Federal entity must submit a new rate proposal for the next fiscal period.
- F. **Agency Notification:** Copies of this document may be provided to other federal offices as a means of notifying them of the agreement contained herein.
- G. **Record Keeping:** Organizations must maintain accounting records that demonstrate that each type of cost has been treated consistently either as a direct cost or an indirect cost. Records pertaining to the costs of program administration, such as salaries, travel, and related costs, should be kept on an annual basis.
- H. **Reimbursement Ceilings:** Grantee/contractor program agreements providing for ceilings on indirect cost rates or reimbursement amounts are subject to the ceilings stipulated in the contract or grant agreements. If the ceiling rate is higher than the negotiated rate in Section I of this agreement, the negotiated rate will be used to determine the maximum allowable indirect cost.

Section II: General (continued)

- I. **Use of Other Rates:** If any federal programs are reimbursing indirect costs to this grantee/contractor by a measure other than the approved rate(s) in this agreement, the grantee/contractor should credit such costs to the affected programs, and the approved rate(s) should be used to identify the maximum amount of indirect cost allocable to these programs.

- J. **Central Service Costs:** If the proposed central service cost allocation plan for the same period has not been approved by that time, the indirect cost proposal may be prepared including an amount for central services that is based on the latest federally-approved central service cost allocation plan. The difference between these central service amounts and the amounts ultimately approved will be compensated for by an adjustment in a subsequent period.

- K. **Other:**
 - 1. The purpose of an indirect cost rate is to facilitate the allocation and billing of indirect costs. Approval of the indirect cost rate does not mean that an organization can recover more than the actual costs of a particular program or activity.

 - 2. Programs received or initiated by the organization subsequent to the negotiation of this agreement are subject to the approved indirect cost rate(s) if the programs receive administrative support from the indirect cost pool. It should be noted that this could result in an adjustment to a future rate.


 - 3. Indirect cost proposals must be developed (and, when required, submitted) within six (6) months after the close of the governmental unit's fiscal year, unless an exception is approved by the cognizant agency for indirect costs

Section III: Acceptance

Listed below are the signatures of acceptance for this agreement:

By the State and Local Governments

Oregon Department of Geology and Mineral
Industries

DocuSigned by:

8316BAAE8092425...

Signature

Steve Dahlberg

Name:

Chief Financial Officer

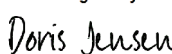
Title:

3/15/2022

Date

By the Cognizant Federal Government Agency

US Department of the Interior - USGS

DocuSigned by:

5F809670612D483...

Signature

Craig Wills

Name:

Division Chief
Indirect Cost & Contract Audit Division
Interior Business Center

Title:

3/14/2022

Date

Negotiated by: Omar Sheyyab
Telephone: (916) 930-3806

Next Proposal Due Date: 12/31/2021

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2025

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. NANOOS Years 15-19 FY2021: Year 16 (ODSL)	11.012	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text" value="30,000.00"/>	\$ <input type="text"/>	\$ <input type="text" value="30,000.00"/>
2.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4.	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5. Totals		\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text" value="30,000.00"/>	\$ <input type="text"/>	\$ <input type="text" value="30,000.00"/>

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
	NANOOS Years 15-19 FY2021: Year 16 (ODSL)				
a. Personnel	\$ 0.00	\$	\$	\$	\$ 0.00
b. Fringe Benefits	0.00				0.00
c. Travel	300.00				300.00
d. Equipment	24,900.00				24,900.00
e. Supplies	0.00				0.00
f. Contractual	0.00				0.00
g. Construction	0.00				0.00
h. Other	4,800.00				4,800.00
i. Total Direct Charges (sum of 6a-6h)	30,000.00				\$ 30,000.00
j. Indirect Charges	0.00				\$ 0.00
k. TOTALS (sum of 6i and 6j)	\$ 30,000.00	\$	\$	\$	\$ 30,000.00
7. Program Income	\$	\$	\$	\$	\$

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. NANOOS Years 15-19 FY2021: Year 16	\$	\$	\$	\$
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	\$	\$	\$	\$

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ 30,000.00	\$ 24,000.00	\$ 2,000.00	\$ 2,000.00	\$ 2,000.00
14. Non-Federal	\$ 0.00	0.00			
15. TOTAL (sum of lines 13 and 14)	\$ 30,000.00	\$ 24,000.00	\$ 2,000.00	\$ 2,000.00	\$ 2,000.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS)			
	(b)First	(c) Second	(d) Third	(e) Fourth
16. NANOOS Years 15-19 FY2021: Year 16	\$ 30,000.00	\$ 0.00	\$ 0.00	\$ 0.00
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	\$ 30,000.00	\$ 0.00	\$ 0.00	\$ 0.00

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: \$30,000	22. Indirect Charges: \$0
23. Remarks:	



Oregon

Kate Brown, Governor

Department of State Lands

South Slough National Estuarine Research Reserve

P.O. Box 5417 | 61907 Seven Devils Road

Charleston, Oregon 97420

(541) 888-5558

FAX (541) 888-5559

www.oregon.gov/dsl/ss

September 30, 2022

Dr. Jan A. Newton, NANOOS Director
Applied Physics Laboratory
University of Washington
1013 NE 40th Street
Seattle, WA 98105-6698

State Land Board

Kate Brown
Governor

Shemia Fagan
Secretary of State

Dear Dr. Newton:

The Oregon Department of State Lands/South Slough National Estuarine Research Reserve (SSNERR) is pleased to contribute to the collaborative partnership of the Northwest Association of Networked Ocean Observing Systems through estuarine observing in Oregon.

Tobias Read
State Treasurer

The South Slough Reserve will continue operation of the network of four water quality monitoring stations along with a meteorological station located within the South Slough estuary, and collaborate with the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians (CTCLUSI) to co-manage a fifth water quality station in the Coos estuary.

Four of the water quality stations (Charleston Bridge, Valino Island, Winchester Creek, Elliot Creek) and the meteorological station (Tom's Creek) are managed in cooperation between NANOOS and the National Estuarine Research Reserve System (NERRS), with the North Spit, Coos estuary station collectively managed by CTCLUSI, SSNERR, and NANOOS. The water quality stations utilize multiparameter data sondes that measure a standard suite of variables, including water temperature, salinity, dissolved oxygen, pH, turbidity, and depth. The weather station has a Campbell Scientific datalogger and collects air temperature, relative humidity, barometric pressure, wind speed/direction, and solar radiation data. All monitoring stations are equipped with telemetry systems, with data transmitted through the Geostationary Observational Environmental Satellite System (GOES) and accessible through the NANOOS Visualization System and the NERRS Centralized Data Management Office. The GOES telemetry capabilities are available to SSNERR in partnership with NOAA's Office for Coastal Management.

New funds provided by NANOOS in 2022 (\$30,000) will enable the Reserve to 1) access, maintain, and repair the network of monitoring stations, 2) purchase sensors, telemetry equipment, and monitoring accessories to collect continuous water quality data and provide near real-time data access to stakeholders, and 3) provide support to students seeking experience in the natural sciences through the water quality internship.

We look forward to the opportunity to continue our participation as a member of the NANOOS team; provide high quality, standardized environmental datasets; and deliver data products to our coastal stakeholders.

With best regards,

Bree K. Yednock
Reserve Manager

Subawardee: Oregon Department of State Lands / South Slough National Estuarine Research Reserve
Amount: \$30,000
Project Title: South Slough Estuarine Observations

Statement of Work

As a participant in the collaborative Northwest Association of Networked Ocean Observing Systems (NANOOS) program, the Oregon Department of State Lands / South Slough National Estuarine Research Reserve (ODSL/SSNERR) shall operate and maintain a network of six stations that includes five water quality monitoring stations and one meteorological station. This network currently includes five South Slough SWMP stations (four water quality and one meteorological) and one Coos estuary water quality station. We are partnering with one of our local tribes to install and maintain telemetry equipment on one of their established water quality stations in the Coos estuary.

Four water quality stations and one meteorological station are located within the South Slough estuary (Charleston Bridge, soschwq; Valino Island, sosvawq; Winchester Creek, soswiwq, Elliot Creek, sosecwq, Tom's Creek marsh, sostcmet); the fifth water quality station (North Spit, sosnswq) is operated in collaboration with the Confederated Tribes of the Coos Lower Umpqua, and Siuslaw Indians) and is located in the lower Coos estuary. Each moored station is equipped with a Yellow Springs Instrument multi parameter EXO2 data logger that measures seven water quality parameters, and there are telemetry systems at all five of the stations. Measurements are recorded every 15 minutes for the following parameters: water temperature, specific conductivity, salinity, dissolved oxygen, pH, turbidity, and water depth. Three stations are located near commercial Pacific oyster grow out operations or oyster growing areas in the South Slough estuary (Charleston Bridge, Valino Island, Elliot Creek).

New funds provided by NANOOS (\$30,000) will enable the South Slough NERR to 1) maintain operation of the existing network of five estuarine water quality monitoring stations and one meteorological station over the period of the project, 2) partner with the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians (CTCLUSI) to maintain telemetry equipment on their existing North Spit BLM water quality station, 3) install and maintain a Storm 3 telemetry system at one water quality station, 4) install and maintain a water level sensor at Winchester Creek tide gauge and 5) provide experience to undergraduate students through the part-time water quality internship.

Specific expenses associated with operation of the monitoring stations include purchase of replacement and new water quality sondes and water quality and weather sensors, telemetry systems and components, and calibration solutions for the sensors. Funding provided by NANOOS will enable the South Slough NERR to continue to provide near real-time measurements of the ambient estuarine water parameters to several web-based data access portals including the NANOOS Visualization System (NVS), the NERRS Centralized Data Management Office (CDMO), and the NOAA Hydrometeorological Automated Data System (HADS). Funds for travel will allow one South Slough staff member to attend the Annual Governing Council and Primary Investigator meetings in Vancouver, WA. Funds for a part-time

water quality internship managed through the Reserve Internship program will allow a quarterly stipend to support a student internship to assist the System-Wide Monitoring Program.

The SSNERR water quality stations provide real-time data access for shellfish growers in the Coos estuary, including North Bend and Coos Bay Oyster Companies, Clausen Oysters, Qualman Oyster Farms and Younker Point Oysters. The South Slough Reserve and partner CTCLUSI stations provide environmental data for research, monitoring and education programs conducted at the Reserve and CTCLUSI tribal programs. Data from SWMP/NANOOS stations are incorporated into research projects at the Reserve funded through the Office of Coastal Management.

Subawardee: Oregon Department of State Lands / South Slough National Estuarine Research Reserve
Amount: \$30,000
Project Title: South Slough Estuarine Observations

Budget Narrative

As indicated in Standard Form 424-A, the proposed budget contains funding requested by the Oregon Department of State Lands / South Slough National Estuarine Research Reserve (ODSL/SSNERR). As a participant in the collaborative Northwest Association of Networked Ocean Observing Systems (NANOOS) program, the Oregon Department of State Lands / South Slough National Estuarine Research Reserve (ODSL/SSNERR) shall operate and maintain a network of six monitoring stations, five water quality and one meteorological station. This network currently includes five South Slough SWMP stations and one Coos estuary partner water quality station. We are collaborating with the Confederated Tribes of the Coos, Lower Umpqua, and Siuslaw Indians to install and maintain telemetry equipment on their established North Spit-BLM water quality station in the Coos estuary. The total cost for this cooperative agreement is \$30,000 in Year 2.

A. Personnel

None.

B. Fringe

None.

1.5

C. Travel (\$300)

TRAVEL DOMESTIC

NANOOS PI meeting, 1 person @ \$182/night lodging, \$74 M&IE (1.5 days), parking	\$300
Total	\$300

Includes funds to cover lodging and meals and incidentals for attending the annual NANOOS Principal Investigator meeting. Travel request totals \$300.

D. Equipment (\$24,900)

Equipment	Item Description	Year 2
Sonde/Sensors	EXO2 sonde	\$6,500
	Cond/Temp sensor	\$1,700
	Dissolved Oxygen sensor	\$2,000
	Turbidity sensor	\$1,850
	pH sensor	\$575
	Wiper with AF brush	\$1,250
	Replacement DO cap	(12) \$2,160
	Replacement pH module	(12) \$1,944
	Replacement wiper brush	(12) \$708
	Sonde guard	\$809
	Copper Tape	\$82
	Replacement sensor tool/magnet kit	\$68
	O-ring replacement kit	\$45
	Batteries, D cell	(12) \$382
Subtotal		\$13,573

Telemetry	Xylem Storm 3 Turnkey Telemetry DCP system	\$6,500
	Mooring supplies	\$700
Subtotal		\$7,200
Calibration Solutions	Conductivity standard	(6) \$838
	pH 7 standard	(6) \$535
	pH 10 standard	(6) \$535
	Turbidity standard	(6) \$2,219
Subtotal		\$4,127
Totals		\$24,900

Equipment over \$5,000: The Yellow Springs Instruments, Inc. (YSI) EXO2 multiparameter sonde (\$6,500) is the version of the water quality instrument that is approved for the National Estuarine Research Reserve System (NERRS) as a component of their participation in the System-Wide Monitoring Program (SWMP). YSI supplies the existing water quality instruments used by SWMP to ensure program-wide uniformity in equipment, data parameter specifications, and data file format for the network of coastal estuary sites in the NERR system.

The YSI EXO2 series data loggers are equipped with an array of water quality sensors to measure water temperature, specific conductivity/salinity, dissolved oxygen, pH, turbidity, and water depth at each station. Instruments have centrally located anti-fouling wiper brush sensors. Funds requested here will allow the Reserve to continue using equipment that accommodates optical sensor arrays (dissolved oxygen, turbidity), purchase calibration standard solutions for each of the sensors for monthly calibrations, directly interchange equipment during monthly deployment and retrievals, complete field verification quality assurance/quality control protocols with a handheld instrument and replace malfunctioning equipment. The dissolved oxygen, pH, and wiper sensors have replaceable modules, caps, or brushes that are exchanged approximately annually or during malfunction of the sensor, instead of replacing the entire sensor body itself. Additional items include sonde guards that protect the sensors during field deployment, copper tape for anti-fouling protection of the sensors, and internal D-cell batteries that power the sonde instruments.

The telemetry system components allow seamless and cost-free data stream telemetry via the GOES satellite system. Telemetry system components specifically requested here are for replacing older equipment and standardizing Data Collection Platform infrastructure across stations. The Xylem Storm 3 Turnkey telemetry system (\$6500) is approved for the NERR System to standardize telemetry platforms across the Reserves for improved integration of all components for data transmission, management, and access. The Turnkey system includes a Storm 3 datalogger, enclosure, 12 V battery, solar power supply, panel mount, and solar regulator. The platform hardware and supplies include Acrylonitrile Butadiene Styrene pipe, stainless steel fittings, locks, mounts, nylon straps, and strapping tools.

South Slough will maintain a tide gauge in Winchester Creek near the Hidden Creek primary sentinel site location, as part of the National Estuarine Research Reserve Sentinel Site program to understand the effects of changing water levels/sea-level rise on wetland communities. The tide gauge has a NOAA approved microwave radar sensor that collects water level data every 6 minutes to match NOAA's Center for Operational Oceanographic Products and Services, National Water Level Observation Network. NANOOS funds will allow the Reserve to maintain the tide gauge, and to eventually incorporate Hidden Creek water level into the NVS assets.

The total equipment requested is \$24,900.

E. Supplies

None.

F. Contractual

None.

G. Construction

None.

H. Other (\$4,800)

Part-time water quality intern (\$20/hour stipend for 120 hours per 2 quarters). The total Other request is \$4,800.

I. Total Direct Charges (\$30,000)

A. Personnel	\$0
B. Fringe	\$0
C. Travel	\$300
D. Equipment	\$24,900
E. Supplies	\$0
F. Contractual	\$0
G. Construction	\$0
H. Other	\$4,800
Total	\$30,000

Total direct costs are estimated at \$30,000.

J. Indirect Charges

None.

K. Totals (\$30,000)

ODSL is requesting \$30,000 in funding support.

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2022

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. NANOOS Years 15-19 FY2022:Year 16 (WA State Ecology)	11.012	\$ 90,000.00	\$	\$	\$	\$ 90,000.00
2.						
3.						
4.						
5. Totals		\$ 90,000.00	\$	\$	\$	\$ 90,000.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
	NANOOS Years 15-19 FY2022:Year 16 (WA State Ecology)				
a. Personnel	\$ 31,579.00	\$	\$	\$	\$ 31,579.00
b. Fringe Benefits	6,783.00				6,783.00
c. Travel	7,945.00				7,945.00
d. Equipment	4,500.00				4,500.00
e. Supplies	2,664.00				2,664.00
f. Contractual	25,500.00				25,500.00
g. Construction					
h. Other					
i. Total Direct Charges (sum of 6a-6h)	78,971.00				\$ 78,971.00
j. Indirect Charges	11,029.00				\$ 11,029.00
k. TOTALS (sum of 6i and 6j)	\$ 90,000.00	\$	\$	\$	\$ 90,000.00
7. Program Income	\$	\$	\$	\$	\$

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. NANOOS Years 15-19 FY2022:Year 16 (WA State Ecology)	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
9. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
10. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
11. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
12. TOTAL (sum of lines 8-11)	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ <input type="text" value="90,000.00"/>	\$ <input type="text" value="90,000.00"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>
14. Non-Federal	\$ <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
15. TOTAL (sum of lines 13 and 14)	\$ <input type="text" value="90,000.00"/>	\$ <input type="text" value="90,000.00"/>	\$ <input type="text"/>	\$ <input type="text"/>	\$ <input type="text"/>

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS)			
	(b)First	(c) Second	(d) Third	(e) Fourth
16. NANOOS Years 15-19;FY2022:Year 16 (WA State Ecology) Future years 17-19 & for this award	\$ <input type="text" value="168,000.00"/>	\$ <input type="text" value="168,000.00"/>	\$ <input type="text" value="168,000.00"/>	\$ <input type="text"/>
17. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
18. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
19. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
20. TOTAL (sum of lines 16 - 19)	\$ <input type="text" value="168,000.00"/>	\$ <input type="text" value="168,000.00"/>	\$ <input type="text" value="168,000.00"/>	\$ <input type="text"/>

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: <input type="text" value="\$78,971"/>	22. Indirect Charges: <input type="text" value="\$11,029"/>
23. Remarks: <input type="text" value="Indirect rate is 28.75% of salaries & benefits"/>	



STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

September 29, 2022

Dr. Jan Newton
NANOOS Executive Director
Applied Physics Laboratory
University of Washington
1013 NE 40th Street
Seattle, WA 98105-6698

Dear Dr. Newton:

This letter is to provide our statement of work and corresponding budget for participation during the period June 1, 2022 to May 31, 2023 of the Northwest Association of Networked Ocean Observing Systems (NANOOS) Regional Coastal Ocean Observing Systems (RCOOS).

The Washington State Department of Ecology (Ecology) has conducted shoreline and beach monitoring by Ecology's Shorelands and Environmental Assistance (SEA) Program and made estuarine observations directed by Ecology's Environmental Assessment Program (EAP) under the NANOOS Pilot and the past ten years of grants. Work under this grant will be conducted separately by these two programs and they are combined in this letter of commitment related to Fiscal Year 22 of NANOOS funding. The scope of work, budget, and budget justification follows.

Scope of Work

Shoreline and Beach Monitoring (Shorelands and Environmental Assistance Program)

With funding of \$60,000, Ecology will maintain a reduced-level beach and shoreline monitoring effort in the Columbia River littoral cell and at South Beach near Kalaloch. The beach monitoring program requires the support of a two field project scientists. NANOOS funds only support approximately 22% of scientist and an intern plus a portion of operations and expenses. Thus, other project grants are required to fund the remainder of the salaries and indirect costs plus additional operating expenses in order to implement the monitoring program. With leveraging of additional funds, the NANOOS budget enables implementation of data collection, processing, and archiving.

With base-level NANOOS funding, we have reduced our beach surface mapping from 16 sites during both summer and winter and three sites during fall and spring, to only 15 sites during summer and five sites during winter. This allows us to maintain an annual time series, but does not provide the previous capability to assess regional gradients in beach response to winter conditions, particularly El Niño signatures that have accentuated asymmetric seasonal forcing.

Products to be developed and delivered include: digital data, time-series of cross-shore beach profiles, beach surface and contour change, and operational support of the Coastal Profiling System (CPS) through collaboration with Oregon State University.

Although NANOOS funding has remained essentially flat since over the past thirteen years while operating costs have increased, we have been fortunate to leverage support from other organizations that benefit from our beach monitoring program. We have been able to monitor in Puget Sound (e.g., Elwha River mouth), and have been able to increase our surveying capabilities using our 28' twin-hull vessel (beach-landing craft) designed for hydrographic and topographic surveying. We previously collaborated with Washington Sea Grant, National Park Service, Quinault Indian Nation, the Quileute Tribe, and Makah Tribe on establishing monuments and collecting initial beach profiles along the Olympic Peninsula. These efforts demonstrate the potential to expand the beach monitoring program beyond the southwest Washington coast to serve the needs of more communities throughout the state. Unfortunately, opportunities to acquire funds for sustained monitoring from other sources are extremely limited.

Estuarine Observations (Environmental Assessment Program)

EAP will focus our NANOOS support on helping to maintain our collaborative ferry monitoring project with Clipper Navigations, Inc. and Washington Department of Transportation (DOT) ferries. Ecology will support a newly reinstalled package of several sensors, a data logging /telemetry system and a water and atmospheric CO₂ access port to support scientifically focused collaborative work on the larger new Victoria Clipper ferry. Funding for the upcoming period (\$30,000) will cover IT support for data flow, operating expenses, equipment calibration and maintenance, installation hardware, annual maintenance, and troubleshooting related to data flow from the Victoria clipper ferry and the DOT ferry.

Despite COVID restriction this public/private partnership continues to be very successful and is extremely cost- effective, saving the cost of expensive ship time while covering an extensive transect across a less frequently monitored domain of the Salish Sea. We collect continuous surface data as the ferry makes its twice daily runs between Seattle, WA and Victoria, BC, Canada and now offer collaborative opportunities with access to a georeferenced water stream for collaborative work across NANOOS partners.

Surface data along the 80 mile transect has been valuable in determining at the timing and spatial extent of blooms in Puget Sound and Straits, the movement of water masses and river plumes, and the dynamic of surface water exchange between Puget Sound and the Straits. With the addition of the water and atmospheric CO₂ access port we will expand the capabilities to biological and chemical data collection, while providing the infrastructure of contextual physical data and telemetry.

Ecology is currently in the process to installing a pCO₂ sensor for surface water and atmospheric measurements in collaboration with Dr. Micah Horwith. Likewise continue to work in collaboration with Dr. Jim Thomson at APL to maintain two ADCP on two DOT ferries capturing the dynamic of exchange flow between Port Townsend and Whidbey Island.

This streamlined and improved near in-real time en route ferry system and format of data sharing (ERDAP) can be easily incorporate into NANOOS NVS reporting matrix and shared with NANOOS partners across the US Canadian border.

Subawardee: Washington State Department of Ecology (Ecology)
Amount: \$90,000
Project Title: Shoreline and Beach Monitoring (Shorelands and Environmental Assistance Program) & Estuarine Observations (Environmental Assessment Program)

Budget Narrative

As indicated in Standard Form 424-A, the proposed budget contains funding requested by the Washington State Department of Ecology. Ecology has conducted shoreline and beach monitoring by Ecology’s Shorelands and Environmental Assistance (SEA) Program and made estuarine observations directed by Ecology’s Environmental Assessment Program (EAP) under the NANOOS Pilot and the past eleven years of grants. Work under this grant will be conducted separately by these two programs and they are combined in this letter of commitment related to Fiscal Year 22 of NANOOS funding. This includes \$60,000 for WA Beach Monitoring [Shorelands and Environmental Assistance (SEA) Program] and the Coastal Monitoring & Analysis Program (CMAP) for Shoreline and Beach Monitoring, as well as \$30,000 for WA Estuarine Observations [Environmental Assessment Program (EAP)]. The total cost for this agreement is \$90,000 in Year 2.

A. Personnel (31,579)

Ecology-NANOOS Personnel Year 1				
Position Title & Name	Salary	% Time	# Months	Amount
PI, Senior Coastal Engineer, George Kaminsky	-	-	-	-
Senior Oceanographer, Christopher Krembs	-	-	-	-
Environmental Specialist 3, Diana McCandless	\$64,788	4.17%	0.5	\$2,700
Natural Resource Scientist 2, Hannah Drummond	\$57,324	8.33%	1.0	\$4,777
Environmental Specialist 2, Gabrielle Alampay	\$43,800	10.83%	1.3	\$4,745
Intern, Casey Madill	\$19,357	100%	11.0	\$19,357
Total Personnel				\$31,579

Senior Coastal Engineer – George Kaminsky: This position serves as the Principal Investigator (PI) and will provide overall leadership on the beach and shoreline observation program. Dr. Kaminsky will oversee all phases of the beach monitoring and assisting with field data collection, analyses, product generation an, and incorporation into local decision-making. Dr. Kaminsky will also coordinate and collaborate with other NANOOS partners and beneficiaries. Dr. Kaminsky will contribute approximately two months to this project as in-kind service.

Senior Oceanographer – Christopher Krembs: This position will provide overall leadership on the Victoria Clipper ferry monitoring project. Dr. Krembs will oversee all phases of the ferry monitoring project and assisting with data QC, analysis, data assimilation, product generation. Dr. Krembs will also coordinate and collaborate with other NANOOS partners and beneficiaries. Dr. Krembs will contribute approximately one month to this project as in-kind service.

Other Personnel: Other SEA Program staff will provide field data collection, processing, analysis, and product generation support. Diana McCandless (Environmental Specialist 3), Hannah Drummond (Natural Resource

Scientist 2), and Gabrielle Alampay (Environmental Specialist 2) will charge approximately 0.5, 1.0, and 1.3 months, respectively to the project associated with collecting and processing topographic data.

Salaries are paid in accordance with Washington State Employee Salary Schedule (McCandless-\$5,399/month, Drummond - \$4,777/month, Alampay - \$3,650/month). Our Intern, Casey Madill, is paid a monthly stipend of \$2,506, but the total is cost shared such that the monthly salary charge is \$1,760. Total other personnel will provide 13.8 months effort for a total of \$31,579.

B. Fringe (\$6,783)

Ecology-NANOOS Fringe Year 1			
Position & Title	Amount	% Rate	Total
PI, Senior Coastal Engineer, George Kaminsky	-	-	-
Senior Oceanographer, Christopher Krembs	-	-	-
Environmental Specialist 3, Diana McCandless	\$2,700	42.2%	\$1,139
Natural Resource Scientist 2, Hannah Drummond	\$4,777	41%	\$1,959
Environmental Specialist 2, Gabrielle Alampay	\$4,745	43%	\$2,040
Intern, Casey Madill	\$19,357	8.5%	\$1,645
Total Fringe			\$6,783

The Washington State Department of Ecology benefit rate is dependent on salary level and is approximately 33-45% for the FTE positions. Intern benefit rate is approximately 8.5%.The total cost for Fringe in Year 1 is \$6,783.

C. Travel (\$7,945)

TRAVEL DOMESTIC

Fieldwork per diem. 2 people @ \$116.50/night lodging for 22 nights, meals \$61/day, 23 days	\$7,945
Total	\$7,945

Travel costs include 22 days of lodging @ \$116.50 per day for 2 staff and 23 days of per diem expenses @ \$61.29 per day for 2 staff. The travel request totals \$7,945.

D. Equipment

Funds for equipment (\$4,500) will be used to purchase installation hardware and electric hardware.

E. Supplies (\$7,164)

Costs for consumables, replacement field surveying supplies, installation hardware and electric hardware are estimated at \$7,164 based projected maintenance costs. The total funding requested for supplies to support field operations is \$7,164.

F. Contractual (\$25,500)

Costs include \$25,500 for equipment installation and IT support for data flow, operating expenses, maintenance, and troubleshooting related to data flow from the Victoria clipper ferry and the DOT ferry. These costs covered by the following contractors:

Jim Thomson (Applied Physics Laboratory at the University of Washington) - Total \$13,653

Method of Selection: Sole source, State ferries are a compartmentalized high-security environment monitored by federal agents. Working on board WA state ferries requires a good working relationship, the trust of ship engineers, and detailed knowledge of the existing instrument that were installed into the hull of the 2 ships under the guidance of Jim Thomson. His longstanding working relationship makes him and his group uniquely qualified.

Period of Performance: July 1, 2022 - Jun 30, 2023

Brandon Sackmann (GSI Environmental Inc.) - Total \$11,847

Method of Selection: Sole source. The Victoria Clipper ferry monitoring was designed, implemented, and upgraded several times over the course of 12 years by Dr. Sackmann. A unique detailed knowledge of the sensor and electronic system makes Dr. Sackmann, now employed by at GIS, uniquely qualified.

Period of Performance: July 1, 2022 - Jun 30, 2023

G. Construction

None.

H. Other

None.

I. Total Direct Charges (\$78,971)

A. Personnel	\$31,579
B. Fringe	\$6,783
C. Travel	\$7,945
D. Equipment	\$4,500
E. Supplies	\$2,664
F. Contractual	\$25,500
G. Construction	\$0
H. Other	\$0
Total	\$78,971

Total direct costs are estimated at \$78,971.

J. Indirect Charges (\$11,029)

Washington Department of Ecology negotiated indirect rate is set for each fiscal year. The rate for Fiscal Year 22 is 28.75% of Salaries and Benefits. Indirect charges requested for this project amount to \$11,029.

K. Totals (\$90,000)

Ecology is requesting \$90,000.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

COGNIZANT AGENCY
NEGOTIATION AGREEMENT

State of Washington
Department of Ecology
Olympia, Washington

Date: April 26, 2022

Filing Ref: May 10, 2021

The indirect cost rates contained herein are for use on grants and contracts with the Federal Government to which 2 CFR Part 200 applies, subject to the limitations contained in the guidance and in Section II, A below.

SECTION I: RATES

<u>Type</u>	<u>Effective Period</u>		<u>Rate</u>	<u>Base</u>	<u>Applicable to:</u>
	<u>From</u>	<u>To</u>			
Fixed	7/1/2022	6/30/2023	28.75%	(a)	All Programs

Basis for Application

(a) Direct salaries and wages, including fringe benefits.

Treatment of Fringe Benefits: Fringe benefits applicable to direct salaries and wages are treated as direct costs and are not included in the rates identified above.

SECTION II: GENERAL

A. LIMITATIONS: The rate in this Agreement is subject to any statutory and administrative limitations and apply to a given grant, contract or other agreement only to the extent that funds are available. Acceptance of the rates is subject to the following conditions: (1) Only costs incurred by the department/agency or allocated to the department/agency by an approved cost allocation plan were included in the indirect cost pool as finally accepted; such costs are legal obligations of the department/agency and are allowable under governing cost principles; (2) The same costs that have been treated as indirect costs have not been claimed as direct costs; (3) Similar types of costs have been accorded consistent accounting treatment; and (4) The information provided by the department/agency which was used to establish the rates is not later found to be materially incomplete or inaccurate by the Federal Government. In such situations the rate(s) would be subject to renegotiation at the discretion of the Federal Government.

B. CHANGES. The fixed rate contained in this agreement is based on the organizational structure and the accounting system in effect at the time the proposal was submitted. Changes in the organizational structure or changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rate in this agreement,

require the prior approval of the authorized representative of the responsible negotiation agency. Failure to obtain such approval may result in subsequent audit disallowances.

C. THE FIXED RATE contained in this agreement is based on an estimate of the cost which will be incurred during the period for which the rate applies. When the actual costs for such a period have been determined, an adjustment will be made in the negotiation following such determination to compensate for the difference between the cost used to establish the fixed rate and that which would have been used were the actual costs known at the time.

D. NOTIFICATION TO FEDERAL AGENCIES: Copies of this document may be provided to other Federal agencies as a means of notifying them of the agreement contained herein.

E. SPECIAL REMARKS: Please confirm your acceptance of the terms of the indirect cost rate agreement by signing and returning this letter to me. Please retain a copy for your records.

ACCEPTANCE

The undersigned official warrants that he/she has the proper authority to execute this agreement on the behalf of the State Agency:

By the Federal Agency:



Digitally signed by Erik Fairchild
Date: 2022.04.27 07:57:41 -07'00'

(Signature)

Erik Fairchild

(Name)

Chief Financial Officer

(Title)

Washington State Department of Ecology

(Agency)

April 27, 2022

(Date)

JACQUELINE
SMITH

Digitally signed by JACQUELINE
SMITH
Date: 2022.04.26 15:59:44 -04'00'

(Signature)

Jacqueline Smith, Rate Negotiator
National Policy, Training and Compliance
Division
U.S. Environmental Protection Agency

Negotiated by: Jacqueline Smith
Telephone: (202) 564-5055

BUDGET INFORMATION - Non-Construction Programs

OMB Number: 4040-0006
Expiration Date: 02/28/2025

SECTION A - BUDGET SUMMARY

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. NANOOS Years 15-19 FY2021: Year 16 (ODFW)	11.012	\$ <input type="text"/>	\$ <input type="text"/>	\$ 125,000.00	\$ <input type="text"/>	\$ 125,000.00
2. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
3. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
4. <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
5. Totals		\$ <input type="text"/>	\$ <input type="text"/>	\$ 125,000.00	\$ <input type="text"/>	\$ 125,000.00

SECTION B - BUDGET CATEGORIES

6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
	NANOOS Years 15-19 FY2021: Year 16 (ODFW)				
a. Personnel	\$ 54,660.00	\$	\$	\$	\$ 54,660.00
b. Fringe Benefits	27,018.00				27,018.00
c. Travel	4,500.00				4,500.00
d. Equipment	0.00				0.00
e. Supplies	6,476.00				6,476.00
f. Contractual	0.00				0.00
g. Construction	0.00				0.00
h. Other	3,500.00				3,500.00
i. Total Direct Charges (sum of 6a-6h)	96,154.00				\$ 96,154.00
j. Indirect Charges	28,846.00				\$ 28,846.00
k. TOTALS (sum of 6i and 6j)	\$ 125,000.00	\$	\$	\$	\$ 125,000.00
7. Program Income	\$	\$	\$	\$	\$

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e)TOTALS
8. NANOOS Years 15-19 FY2021: Year 16	\$	\$	\$	\$
9.				
10.				
11.				
12. TOTAL (sum of lines 8-11)	\$	\$	\$	\$

SECTION D - FORECASTED CASH NEEDS

	Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$ 125,000.00	\$ 31,250.00	\$ 31,250.00	\$ 31,250.00	\$ 31,250.00
14. Non-Federal	\$ 0.00	0.00			
15. TOTAL (sum of lines 13 and 14)	\$ 125,000.00	\$ 31,250.00	\$ 31,250.00	\$ 31,250.00	\$ 31,250.00

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT

(a) Grant Program	FUTURE FUNDING PERIODS (YEARS)			
	(b)First	(c) Second	(d) Third	(e) Fourth
16. NANOOS Years 15-19 FY2021: Year 16	\$ 125,000.00	\$ 0.00	\$ 0.00	\$ 0.00
17.				
18.				
19.				
20. TOTAL (sum of lines 16 - 19)	\$ 125,000.00	\$ 0.00	\$ 0.00	\$ 0.00

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges: 96,154	22. Indirect Charges: \$28,846 = \$96,154 x 30%
23. Remarks:	



Oregon

Kate Brown, Governor

Department of Fish and Wildlife

Contract Services Section
4034 Fairview Industrial Dr SE
Salem, OR 97302-1142
503-947-6133
Fax: 503-947-6156
www.dfw.state.or.us



Date: September 19, 2022

Dr. Jan Newton
Applied Physics Laboratory
University of Washington
1013 NE 40th St
Seattle, WA 98105-6698

RE: Letter of Commitment- Oregon Department of Fish and Wildlife, Monitoring Oregon Coast Harmful Algae 2023 (MOCHA23) of the Pacific Northwest Harmful Algal Bloom (PNW HAB) Bulletin.

Dear Dr. Newton:

We are pleased to learn that the Northwest Association of Networked Ocean Observing Systems (NANOOS) will be providing funding for the ODFW MOCHA23 project for 2023. This letter confirms ODFW's commitment to continue the phytoplankton sampling project in Oregon for the 2023 calendar year that supplies important data to the regional PNW HAB Bulletin. Specifically, ODFW use the \$125,000 funds for the following:

1. Continue the ODFW NRS1 Phytoplankton specialist position from January 2023 thru December 2023. This position collects samples from five northern Oregon sites, coordinates volunteer samples from three central and southern Oregon sites, establishes schedules and provides all necessary gear for sampling. This position also analyzes all samples for the presence of HAB species, conducts ELISA analysis and provides weekly updates to shellfish managers and other interested parties;
2. Provide detailed updates to the PNW HAB Bulletining coordinator on HAB species abundance as well as any particulate toxin data;
3. Coordinate sampling during HAB events with other phytoplankton monitoring programs along the PNW to ensure tracking of bloom movement; and,
4. Provide assistance with other Oregon HAB programs, including but not limited to the Newport offshore sampling line. Assistance to include technical input/instruction and sample analysis.

Sincerely,

Shannon Hurn
ODFW Deputy Director for Administration

Cc. Matthew Hunter, ODFW Shellfish Biologist

ODFW 2023 NANOOS Funding

Budget Justification

Overview

The NANOOS (Northwest Association of Networked Ocean Observing Systems) funding will enable ODFW to support one year-round position for monitoring phytoplankton from 1/1/23 to 12/31/2023. This Statement of Work describes the activities that will be conducted with the funding from NANOOS.

Funding will allow water samples to be collected from 5-sites on the north coast weekly, 2-sites on the central coast twice a month, and 2-sites on the southern coast twice a month. Samples include both whole water and net tow as well as one liter samples to be used for particulate DA (pDA) analysis using ELISA techniques if cell counts reach or surpass existing thresholds.

This NANOOS funding will allow the continuation of the existing ODFW phytoplankton project as current funding through NOAA will expire 12/31/22.

Budget

Personnel

Position Title	Monthly Salary	% of Time	Total Amount
NRS1 Phyto Specialist	\$4,555	100	\$54,660
Total Salary=			\$54,660

ODFW intends for the NRS1 phytoplankton sampling specialist position to be a 12-month position from 1/1/2023 to 12/31/2023 period. The position will be a Natural Resource Specialist-1 (NRS-1) that will be funded for 12 months per year. Please note that annual raise takes place as per union contract and service dates of the employee. Duties of this position includes all phytoplankton analysis, all ELISA analysis, summarization of analysis, weekly updates to project principle investigators, interested constituents and parties of interest, annual status report writing, meeting presentations of results, collecting samples, coordinating samples from other sites, participation on cruises, inventory of current supplies and re-supplying sample sites as needed.

ODFW Supervising shellfish project leader, Matthew Hunter will direct the work of this position. The position will work jointly with the Oregon Department of Agriculture and with other shellfish managers associated with this project.

Fringe Benefits

NRS1 Phyto Specialist	Rate	Monthly	Annual
Annual Salary	\$4,555	\$4,555	\$54,660
Retirement & Bond	23.44%	\$1,067.46	\$12,809.57
FICA	7.65%	\$348.46	\$4,181.49
Health Benefits	\$832	\$832	\$9,984
W/C & ERB Assessment	\$3.61	\$3.61	\$43.32
TOTAL		\$2,251.53	\$27,018

Travel

	TOTAL
VEHICLE (\$375 a month)	\$4,500
TOTAL	\$4,500

Travel costs will include one Oregon Department of Administrative Services (ODAS) motor pool vehicles for 12 total months (1/1/2023-12/31/2023) at \$375 a monthly fee. These vehicles are necessary to access the remote sampling sites.

Supplies

ITEM	TOTAL
Sample Jars and lids. -125ml jars and lids \$2@ -1 liter containers \$5@	\$250.00
Electronics; YSI temp/salinity meters in YR2 and field temp and salinity meters in YR3	\$150.00
Shipping supplies; this includes - insulated shipping boxes -cold packs -labels -tags -tape -Styrofoam dividers	\$200.00
Chemicals (DA kits)	\$5,800.00
Fieldwork supplies	\$76.00
TOTAL	\$6,476.00

The majority of sampling equipment already exists and will not need to be purchased. Replacement costs will vary and as needed. The purchase of ELISA DA kits for pDA analysis will be most of the costs.

Other

ITEM	YR1	TOTAL
Other; shipping costs -Ground @ \$20 each -Overnight @ \$50 each	30 Ground= \$600 58 Overnight=\$9,900	\$600 \$2,900
TOTAL		\$3,500.00

Annually, it is anticipated that there will be over 80 shipments of water samples and re-supplied packers to and from Astoria and the sample sites from as far away as Gold Beach to as close as Newport. Samples will be shipped to Astoria via ground or overnight shipping dependent upon distance and time sensitivity of sample integrity. Re-supplied packers will be shipped back to the sample sites via ground shipping. Overnight shipping averages \$50 and ground shipping averages \$20 this includes anticipated inflation of shipping costs of 1% per year.

Total Direct Charges

Total = **\$96,153**

A.	Personnel	\$54,660
B.	Fringe	\$27,018
C.	Travel	\$4,500
D.	Equipment	\$0
E.	Supplies	\$6,476
F.	Contractual	\$0
G.	Construction	\$0
H.	Other	\$3,500
Total		\$96,154

Indirect Charges

Total= **\$28,846**

ODAS has an indirect cost of all grants to ODFW at a rate of 30% for the time of this NANOOS funding. This rate is revisited annually by the audit branch of the Department, National Business Center (NBC).

A.	Personnel	\$54,660
B.	Fringe	\$27,018
C.	Travel	\$4,500
E.	Supplies	\$6,476
H.	Other	\$3,500
Total		\$96,154

Totals – Direct and Indirect Charges

	Direct	Indirect	Total
FUNDING	\$96,154	\$28,846	\$125,000



United States Department of the Interior

OFFICE OF THE SECRETARY

Washington, DC 20240

State and Local Governments Indirect Cost Negotiation Agreement

EIN: 93-0655103

Date: 03/24/2022

Organization:

Oregon Department of Fish and Wildlife
4034 Fairview Industrial Drive SE
Salem, OR 97302

Report Number: 2022-0112

Filing Ref.:

Last Negotiation Agreement
dated: 02/23/2021

The indirect cost rate contained herein is for use on grants, contracts, and other agreements with the Federal Government to which 2 CFR Part 200 applies subject to the limitations in Section II.A. of this agreement. The rate was negotiated by the U.S. Department of the Interior, Interior Business Center, and the subject organization in accordance with the authority contained in applicable regulations.

Section I: Rate

Start Date	End Date	Rate Type	Name	Rate	Base	Location	Applicable To
07/01/2022	06/30/2023	Fixed Carryforward	Indirect	30.00 %	(A)	All	All Programs

(A) Base: Total direct costs, less capital expenditures and passthrough funds. Passthrough funds are normally defined as payments to participants, stipends to eligible recipients, or subawards, all of which normally require minimal administrative effort.

Treatment of fringe benefits: Fringe benefits applicable to direct salaries and wages are treated as direct costs; fringe benefits applicable to indirect salaries and wages are treated as indirect costs.

Section II: General

- A. **Limitations:** Use of the rate(s) contained in this agreement is subject to any applicable statutory limitations. Acceptance of the rate(s) agreed to herein is predicated upon these conditions: (1) no costs other than those incurred by the subject organization were included in its indirect cost rate proposal, (2) all such costs are the legal obligations of the grantee/contractor, (3) similar types of costs have been accorded consistent treatment, and (4) the same costs that have been treated as indirect costs have not been claimed as direct costs (for example, supplies can be charged directly to a program or activity as long as these costs are not part of the supply costs included in the indirect cost pool for central administration).
- B. **Audit:** All costs (direct and indirect, federal and non-federal) are subject to audit. Adjustments to amounts resulting from audit of the cost allocation plan or indirect cost rate proposal upon which the negotiation of this agreement was based will be compensated for in a subsequent negotiation.
- C. **Changes:** The rate(s) contained in this agreement are based on the accounting system in effect at the time the proposal was submitted. Changes in the method of accounting for costs which affect the amount of reimbursement resulting from use of the rate(s) in this agreement may require the prior approval of the cognizant agency. Failure to obtain such approval may result in subsequent audit disallowance.
- D. **Rate Type:**
1. **Fixed Carryforward Rate:** The fixed carryforward rate is based on an estimate of the costs that will be incurred during the period for which the rate applies. When the actual costs for such period have been determined, an adjustment will be made to the rate for a future period, if necessary, to compensate for the difference between the costs used to establish the fixed rate and the actual costs.
 2. **Provisional/Final Rate:** Within six (6) months after year end, a final indirect cost rate proposal must be submitted based on actual costs. Billings and charges to contracts and grants must be adjusted if the final rate varies from the provisional rate. If the final rate is greater than the provisional rate and there are no funds available to cover the additional indirect costs, the organization may not recover all indirect costs. Conversely, if the final rate is less than the provisional rate, the organization will be required to pay back the difference to the funding agency.
 3. **Predetermined Rate:** A predetermined rate is an indirect cost rate applicable to a specified current or future period, usually the organization's fiscal year. The rate is based on an estimate of the costs to be incurred during the period. A predetermined rate is not subject to adjustment.
- E. **Rate Extension:** Only final and predetermined rates may be eligible for consideration of rate extensions. Requests for rate extensions of a current rate will be reviewed on a case-by-case basis. If an extension is granted, the non-Federal entity may not request a rate review until the extension period ends. In the last year of a rate extension period, the non-Federal entity must submit a new rate proposal for the next fiscal period.
- F. **Agency Notification:** Copies of this document may be provided to other federal offices as a means of notifying them of the agreement contained herein.
- G. **Record Keeping:** Organizations must maintain accounting records that demonstrate that each type of cost has been treated consistently either as a direct cost or an indirect cost. Records pertaining to the costs of program administration, such as salaries, travel, and related costs, should be kept on an annual basis.
- H. **Reimbursement Ceilings:** Grantee/contractor program agreements providing for ceilings on indirect cost rates or reimbursement amounts are subject to the ceilings stipulated in the contract or grant agreements. If the ceiling rate is higher than the negotiated rate in Section I of this agreement, the negotiated rate will be used to determine the maximum allowable indirect cost.
- I. **Use of Other Rates:** If any federal programs are reimbursing indirect costs to this grantee/contractor by a measure other than the approved rate(s) in this agreement, the grantee/contractor should credit such costs to the

Section II: General (continued)

affected programs, and the approved rate(s) should be used to identify the maximum amount of indirect cost allocable to these programs.

- J. **Central Service Costs:** If the proposed central service cost allocation plan for the same period has not been approved by that time, the indirect cost proposal may be prepared including an amount for central services that is based on the latest federally-approved central service cost allocation plan. The difference between these central service amounts and the amounts ultimately approved will be compensated for by an adjustment in a subsequent period.
- K. **Other:**
1. The purpose of an indirect cost rate is to facilitate the allocation and billing of indirect costs. Approval of the indirect cost rate does not mean that an organization can recover more than the actual costs of a particular program or activity.
 2. Programs received or initiated by the organization subsequent to the negotiation of this agreement are subject to the approved indirect cost rate(s) if the programs receive administrative support from the indirect cost pool. It should be noted that this could result in an adjustment to a future rate.
 3. Indirect cost proposals must be developed (and, when required, submitted) within six (6) months after the close of the governmental unit's fiscal year, unless an exception is approved by the cognizant agency for indirect costs

Section III: Acceptance

Listed below are the signatures of acceptance for this agreement:

By the State and Local Governments

By the Cognizant Federal Government Agency

Oregon Department of Fish and Wildlife

US Department of the Interior - FWS

DocuSigned by:
Ken Loffink
2233C5790CCA431...

DocuSigned by:
Craig Wills
B47DB1F4A5DB4BF...

Signature

Signature

Ken Loffink

Craig Wills

Name:

Name:

Division Chief

Indirect Cost & Contract Audit Division

Interior Business Center

Administrator, Administrative Services Division

Title:

Title:

3/25/2022

3/25/2022

Date

Date

Negotiated by: Elena Chan
Telephone: (916) 930-3824

Next Proposal Due Date: 12/31/2022