

Grant Application



Molly Dumas

Email : molly.dumas@aquarium.org

Application ID : A32DM83

Custom Ref. -

Application Start Date: 2022-08-12 00:04:44

Application Completed Date: 2022-08-12 21:57:59

1 Have you ever applied for an OWF grant before?

yes

1.1 What was the name of the project?

Dive Propulsion Vehicle (2021) and Video Camera (2019) for Dive Team research partnership

2 Have you ever been denied for an OWF grant before?

no

3 Project Title

Rebreather Units for Aquarium Research Dive Team

4 Name of my Organization

Oregon Coast Aquarium

5 If your organization is not a tax-exempt nonprofit, please list the name of your fiscal sponsor

-

If this does not apply to you, write N/A

n/a

6 Project Manager Full Name

Doug Batson, Aquarium Dive Team & Boat Safety Officer

7 Project Manager Mailing Address

-

Please enter full address with city, state & zip

2820 SE Ferry Slip Rd, Newport, OR 97365

| | |
|------|--|
| 8 | Project Manager Phone Number |
| | 541.283.1161 |
| 9 | Project Manager Email Address |
| | Doug.Batson@aquarium.org |
| 10 | Please provide a brief biographical statement about yourself |
| | Doug Batson has been on the Aquarium's Dive Research team since 2014. He trains and oversees dive volunteers for the Aquarium's exhibits. His team provides the boat and dive support on oceanic science research projects in collaborations with: OSU, UofO, ODFW, Partnership for Interdisciplinary Studies of Coastal Oceans, Marine Reserves and Oregon Kelp Alliance. |
| 11 | Provide any social media handles you use - Enter social handles or URLs such as instagram, facebook, twitter, youtube, etc. so that we can use to cross promote on our channels - if you do not have any, please place N/A |
| | facebook.com/OregonCoastAquarium/, youtube.com/user/OrCoastAquarium, https://www.instagram.com/oregoncoastaquarium/, https://twitter.com/orcoastaquarium |
| 12 | Please indicate if you are currently following Oregon Wildlife Foundation on our social media channels |
| | - Facebook - Twitter |
| 13 | Total estimated project cost |
| | 20173 |
| 14 | Funding that you are requesting from OWF - If you're request is for more than \$5,000, please contact Tim Greseth - tim@myowf.org before submitting your application. |
| | 9000 |
| 15 | What type of project are your proposing? |
| | Wildlife |
| 16 | Will your project address an Oregon Conservation Strategy habitat or species? |
| | yes |
| 16.1 | What habitat or species is addressed? |
| | Primarily near-shore species in Central Oregon Coast Marine reserves and Kelp Forests. |

| | |
|------|--|
| 17 | Start date of project- Day/Month/Year |
| | 01-02-2023 |
| 18 | End date of project |
| | 30-09-2023 |
| 19 | Location of project |
| | Central Oregon Coast Marine Reserves |
| 20 | Has a local, state or federal biologist reviewed this project? |
| | yes |
| 20.1 | What is their name and contact info? |
| | Lindsay Aylesworth (ODFW), Lindsay.X.AYLESWORTH@odfw.oregon.gov |
| 21 | Have you already or will you obtain necessary permits from all requisite agencies as applicable to proposed project? |
| | yes |
| 22 | What will the requested funds be used for? |
| | Purchase two Hollis Prism 2 Rebreather units and instructional training of 3 staff research divers for infield dive research |
| 23 | Provide a brief Project Summary |
| | Time at depth is a research diver's most precious and limited resource, and rebreathers provide an unsurpassed means of extending it. With rebreathers, the Aquarium research dive team can maximize its pursuit of two key habitat conservation initiatives: (1) Performing kelp forest habitat restoration research directly, and (2) Connecting the public to the Oregon Coast and inspiring ocean conservation through (a) collecting ambassador animals for exhibitry display and (b) collecting footage of local habitats to be shared to the wider public through social media. |
| 24 | Upload pre-project pictures or a video - By submitting these photos or video I warrant that I am the legal owner of this media and grant the Foundation permission to reproduce, exhibit, or publish them for all general purposes in relation to Oregon Wildlife Foundation's work. If you have questions about photo or video submissions please refer to myowf.org/grants for guidance. |
| | https://www.youtube.com/watch?v=bp-ysWntPbY&t=2s https://www.youtube.com/watch?v=qjwNNmQCI9Q https://www.youtube.com/watch?v=k6qR5V6qv-8&t=41s |
| 25 | Fill out the budget |

| Project Revenue | Cash | In-Kind | Committed / Pending |
|--|-----------------|-------------------------------|----------------------------|
| Oregon Wildlife Foundation Request | 9000.00 | | Pending |
| Charles Engelhard Foundation | 5000.00 | | Pending |
| Aquarium Admissions Revenue | 1173.00 | | Committed |
| Shannon Nill Fund of OCF | 5000.00 | | Committed |
| | | | |
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| REVENUE | 20173.00 | 0.00 | |
| | | TOTAL PROJECT SUPPORT | 0.00 |
| Project Expenses | Cash | In-Kind | Total |
| Two Hollis Prism II Rebreathers | 13040.00 | | 13040.00 |
| Two FABER 3L 3442 diluent gas cylinders | 462.00 | | 462.00 |
| Two FABER 3L 3442 oxygen gas cylinders | 462.00 | | 462.00 |
| Two Diluent gas cylinder valves | 149.00 | | 149.00 |
| Two Oxygen gas cylinder valves | 149.00 | | 149.00 |
| Two Bailout Valves | 607.00 | | 607.00 |
| Two Prism II Spares Kit | 94.00 | | 94.00 |
| Nine O2 cells | 720.00 | | 720.00 |
| One Shearwater Perdix Dive Computer | 800.00 | | 800.00 |
| Two CCR Crossover Training Course | 2000.00 | | 2000.00 |
| Full CCR Training Course | 1200.00 | | 1200.00 |
| TDI Online Cose and Card Processing for three | 450.00 | | 450.00 |
| Advanced Nitrox card processing for one | 40.00 | | 40.00 |
| | | | 0.00 |
| | | TOTAL PROJECT EXPENSES | 0.00 |
| | | | |
| Balanced budget? This cell should read "0" ----> | | NET | 0.00 |

26 Upload your Project Narrative -
Please make sure your narrative is no more than 7 pages long, single spaced, 12 pt. font (Calibri preferred).

1 Document Uploaded

27 Upload letters of support

1 Document Uploaded

28 I understand that I am required to submit a Project Completion Report, copies of any publications or social media posts crediting the Foundation's support, and post-project pictures at the completion of my project

yes

Powered by **Submit.com**



PROJECT NAME: Rebreather Units and Training for Aquarium Research Dive Team

CONTACTS:

Grant writer - Molly Dumas, Dir. of Development, 541.283.1106, c.801.943.2492, molly.dumas@aquarium.org

Project Manager - Doug Batson, Dive and Boat Safety Officer, 541.283.1161

Department Supervisor - Jim Burke, Dir. of Animal Husbandry, 541.283.1160, jim.burke@aquarium.org

MISSION STATEMENT: Our mission is to create unique and engaging experiences that connect you to the Oregon coast and inspire ocean conservation.

SUMMARY: The Oregon Coast Aquarium (OCAq) seeks an Oregon Wildlife Foundation (OWF) \$9k/\$11k matching-grant for the purchase of two Hollis Prism 2 Rebreather units and for instructional training of 3 staff research divers in their operation. The Oregon coast weather and ocean conditions severely limit the opportunities to safely navigate by boat and dive to do collections and research. Time at depth is a research diver’s most precious and limited resource, and rebreathers provide an unsurpassed means of extending it. With rebreathers, the OCAq research dive team can maximize its pursuit of two key habitat conservation initiatives: (1) Performing kelp forest habitat restoration research directly; and (2) Connecting the public to the Oregon Coast and inspiring ocean conservation through (a) collecting ambassador animals for exhibitry display and (b) collecting footage of local habitats to be shared to the wider public through social media. A rebreather gives a diver more time at depth by extending the duration of the breathing gas supply, the amount of time a diver may stay at depth without risking decompression sickness (the bends); and the diver’s thermal tolerance of hypothermic conditons.

USE OF FUNDS: The budget for this grant includes equipment and training. The OCAq’s selection of the Hollis Prism 2 rebreather is based foremost upon servicing, technical support, and the long-term ability of the OCAq to continue financially supporting and maintaining equipment for years to come. Below is a detailed overview of rationale for this request:

Equipment: Hollis has agreed to make the OCAq a Hollis dealer and sell units and supplies to our facility at discounted dealer pricing. The OCAq already owns some of the most expensive essential support equipment necessary to mount rebreather dive operations, as well as to sustain the equipment long-term. The Prism 2 is purpose-built with as few serviceable components and connections as possible, reducing failure points. In addition to being less likely to need a constant trickle of new parts, they have relatively inexpensive service kits. Unlike other models of rebreathers that require nearly a



dozen different and expensive service kits per unit per year, the Prism 2 requires only one. Because Hollis will make the OCAq a dealer, we would obtain this kit at discounted dealer pricing of \$170/unit/year.

Training: The OCAq seeks to train three full-time staff on the Prism 2: the Director of Animal Husbandry, Doug Batson (Dive Safety Officer) and the Assistant Dive Safety Officer. The OCAq will contract a Prism 2 Instructor utilized in the past for technician courses. He provided the cost breakdown below for training. He can provide a trainer rebreather unit to make up for the difference in the Aquarium seeking training for three divers but only purchasing two rebreather units. Outsourcing rebreather servicing can cost over \$1000 per rebreather per year. By performing rebreather servicing in-house, the OCAq need only pay for service kits and parts, not skilled labor. Since the units do not need to be mailed offsite to a technician and shipped back, they are available more days out of the year, and do not spend weeks waiting in the queue for servicing. Any minor repairs or tweaks needed between regular service intervals, or in the field, can be handled in minutes. OCAq is absorbing logistical costs of training (lodging, meals, gas) and equipment consumables (batteries, air fills, oxygen fills, scrubber absorbent material) in our operating budget. Therefore, these expenses are not listed in the project budget.

PURPOSE: The Oregon Coast Aquarium respectfully requests the Oregon Wildlife Foundation continue its strong support of our mission. In 2019, OWF funded an underwater camera that afforded us the means to capture footage of our research and field work. In 2021, we asked the OWF to assist with purchasing Diver Propulsion Vehicles to expand our dive team's geographic range. In this grant application, we ask the OWF to assist with purchasing rebreathers, to extend our dive time. Below are two examples of ways this equipment and training can be used in the field to achieve our mission.

I. Conserving Kelp Forests

Oregon's rich kelp forest ecosystems are under immediate threat from urchin population booms. Urchins, once controlled in population size by seastar predation, prey on kelp. When seastar-wasting disease decimated seastar populations off the Oregon coast, this check on urchins sharply diminished. A dramatic increase in urchin populations has in turn eradicated much of Oregon's kelp forest ecosystems, which form the richest and most biodiverse habitats on the coast. With the eradication of kelp, much of the life which depended on it for shelter or food also disappeared. These clear-cut areas are now urchin barrens, stretches of reef once rich and biodiverse now stripped to bare rock. This phenomenon is moving from south to north along the Pacific coast, in real time. From preliminary reconnaissance dives, Newport arguably sits at the present-day dividing line between decimated kelp forests to the south and healthy kelp forests to the north.

The OCAq is a partner of the Oregon Kelp Alliance (ORKA), a consortium of universities, non-profits, government agencies, and citizen science groups. The ORKA has received \$990,000 in federal funding to be used in (1) Creating an inventory of kelp coverage on the Oregon coast, and (2) Developing and implementing restoration strategies. This consortium operates through each member group performing these tasks in their own "backyard." The OCAq operates in the central Oregon coast. The OCAq, in collaboration with ORKA, is integrating its technological advantages into ORKA surveys in order to punch above its weight and do what other dive teams cannot. We have already

demonstrated proof-of-concept long-range video transects using the DPV (Diver Propulsion Vehicle) and camera-mount system that OWF supported through previous grants. Combining the extended distance DPVs offer with the extended time limits rebreathers offer, our team could cover kilometers during a dive, not just meters. With the goal of creating an inventory of the Oregon coast's kelp coverage, the ability to cover vast swaths of ground by staying down long durations and travelling quickly is a game-changer.

II. Inspiring Ocean Conservation

Beneath Oregon's crashing waves lie ecosystems every bit as spectacular as a Yellowstone National Park, yet completely invisible to the everyday person. The vast majority of Oregonians, let alone Americans, will never personally visit these exotic habitats. Many go their entire lives without setting eyes on the ocean. Very few get the opportunity to travel the surface on a boat. Only a miniscule number will ever venture beneath the waves. This creates unique challenges for inspiring conservation. People inherently struggle to value the preservation, management, and restoration of habitats they cannot visit or see. In order to inspire ocean conservation, it is essential to connect the public to the Oregon coast by creating unique and engaging experiences. Our dive program accomplishes this in three ways. First, by collecting ambassador specimens to display in exhibits that recreate natural habitats; second, by creating and sharing stories from footage gathered offshore using onsite monitors and on our social media; and third, this content becomes a resource for schools that facilitates creating a more ocean literate world.

Onsite Public Awareness: Aquarium exhibits bring the public face-to-face with wildlife they could never otherwise see. We educate our 260 volunteers to interpret these exhibits, and provide additional content on our website. These encounters forge memories, experiences, and connections. They foster an interest in learning more about wildlife and their ecosystems, and a passion for conserving them. The purpose of collection dives is to obtain species not accessible from the intertidal. This means descending to depths far enough from the surface that species assemblages completely change. A rebreather offers divers dramatically more time at depth to search for and collect animals. Collecting invertebrates is not as simple as picking them up and putting them in a bag; each one must be carefully scraped and leveraged from the substrate. Collecting a single anemone may take 5 minutes or more, and means that an entire dive team of 4 divers comes home for the day with less than a dozen. Some of the most fascinating and alien species like basket stars or Puget Sound king crab have depth ranges that even at their shallowest parameter only just barely overlap a diver's deepest. These are not rare or endangered species, but at the depths we can reach, they are few and far between. Having double or triple the time to search for them means the difference between coming home with a single token specimen, or enough to populate an exhibit.

Sharing Wildlife Stories Online: The offshore Oregon environment is arguably the least visually-documented of any diveable region in the United States. Underwater video collected by the OCAq scientific dive team can bring the wild, dynamic ecosystems of our coastal waters to Aquarium guests, membership, and the wider public. Using rebreathers, the OCAq dive team proposes launching a concerted effort to visually document the diversity of Oregon's offshore environment. Footage taken with state-of-the-art underwater video equipment will

connect Oregonians to the spectacular ecosystems in their own backyard, promoting engagement and fostering a conservation mindset. Combining this technology with rebreathers provides our dive team more time underwater to gather footage, to frame and coordinate shots, and to spend more time at the least explored deep regions to document life. Rebreathers offer benefits over conventional scuba for videography: because they emit no bubbles, divers are transformed from noisy intruders to silent observers of wildlife. They can approach closer without disturbing wildlife, and do not have to worry about bubbles getting in the way of the shot.

The OCAq is currently developing the installation of a high-definition video monitor to be placed just prior to our Orford Reef tunnel exhibit, which would display the best of this footage in a loop-reel. But the footage is most valuable for those unable to visit the OCAq at all. For those members of the public with physical, financial, or logistical hurdles which encumber them from visiting the Aquarium in person, we can post footage on social media, use it to tell short stories about wildlife and our research, and create educational videos on the ecosystems of the Oregon coast. This project will help foster outreach, as well as provide teachers resources for their curriculum.

Ocean Literacy: Following the pandemic's shutdowns, the OCAq Education Department was able to resume our partnership with Lincoln County School District, Sea Grant, Oregon State Parks, Oregon Coast STEM Hub, Marine Discovery Tours, Hatfield Marine Science Center and Oregon Fish & Wildlife to develop the Ocean Literacy Initiative (OLI) for the school district. OLI was formed in 2017 to integrate ocean science and stewardship into the curriculum across all grades and subjects to create meaningful and lasting ocean literacy. The OLI coalition used the Ocean Literacy Guide (http://oceanliteracy.wp2.coexploration.org/?page_id=47) distributed by the Global Ocean Literacy Network to define goals and objectives, and build a localized framework for ocean education. The Ocean Literacy Guide, published internationally in 2013, was a collaboration between NOAA, Sea Grant, National Geographic, Centers for Ocean Sciences Education Excellence, National Marine Sanctuaries, and multiple universities.

The OLI group agreed that engaging learners in place-based, hands-on experiences helps them build personal connections to the ocean and its inhabitants that motivate them to act on behalf of these fragile ecosystems. The OCAq supports this initiative by managing the Ocean Literacy Initiative website developed by the OLI group <https://sites.google.com/site/k12oceanliteracy/home>, posting age-specific curriculum resources and links to trusted websites. OCAq also updates comprehensive field trip planning guides for teachers (https://aquarium.org/wp-content/uploads/2022/05/22_Field-Trip-Guide.pdf) with pre-/post trip activities, tips on crafting learning goals, and worksheets for student completion. We can include links to our dive team video footage on both the OLI and OCAq resource webpages.

EXAMPLES OF EXPERIENCE: The OCAq scientific dive team can do a lot with the few minutes of bottom time available to them — and even more with the help of tools provided through previous grants from the Oregon Wildlife Foundation. In June 2022, a two-day weather-window presented at Port Orford in southern Oregon. This remote location has fewer calm-weather days than the rest of Oregon, and our team capitalized on the opportunity. In two-days of diving, we: (1) deployed a great white shark acoustic receiver instrument for Oregon State University; (2) collected footage of the reef by mounting the OWF-camera to the OWF-Diver Propulsion Vehicles (DPVs); (3) performed long-

range kelp forest video transect surveys for the Oregon Kelp Alliance; and (4) collected ambassador specimens for exhibit display.

For each of the four tasks listed above, equipment provided with previous grants from OWF has proved essential. With the DPVs, our team was able to reach the designated sites. The OWF camera was used to collect high quality footage incomparably superior to the GoPro alternative. Footage of staff performing kelp conservation research was turned into a brief educational video, and posted on the Aquarium's social media (see <https://www.youtube.com/watch?v=qjwNNmQCI9Q>.) The long-range kelp transects are the first of their kind in Oregon. These immediately attracted the attention of the Oregon Kelp Alliance, which is now integrating them as a high-efficiency method of documenting large swaths of Oregon's coastline and creating an inventory of the state's kelp forests, a federally-funded and state-mandated initiative. The ambassador species collected for exhibitry could not have been detected without covering a large swath of ground, as made possible by the DPVs. These included species that we are very rarely able to showcase, since they reside at depths divers may only visit briefly. Not only did we collect our target species, but also ones we did not expect to find and have never before displayed.

To display footage of the reef itself, our facility is installing a high-definition monitor screen adjacent to the Aquarium's Orford Reef exhibit, which 400,000 annual visitors will see as they enter *Passages of the Deep*. A separate video was created for the great white shark research performed (see <https://youtu.be/bp-ysWntPbY>.) These are examples of the expansive use of information and video footage garnered by our dive team. With rebreathers to extend dive time, we believe we can double or triple the amount of data and footage, as well as procure species that visitors would never see.

COLLABORATING PARTNERS: The Oregon Coast Aquarium occupies a unique and unrivalled position in its ability to fulfill these objectives. The home location of Newport is by luck positioned at the geographical nexus-point of some of Oregon's richest subtidal habitats, and its research vessel the *Gracie Lynn* is purpose-built to bring divers to the most challenging sites. From Newport on the central Oregon coast, staff may trailer the vessel from the northernmost point of Oregon to the southernmost with less than a week's notice. Alone among local aquariums, zoos, universities, government agencies, and citizen science groups, the OCAq is reliably able to take advantage of the Oregon coast's fleeting windows of calm weather, and to make rapid deployments to conduct nearshore research. Our partnerships with and support of such organizations above (Oregon State University, University of Oregon, Oregon Department of Fish & Wildlife, Partnership for Interdisciplinary Studies of Coastal Oceans, and Oregon Kelp Alliance) frequently mean the difference between those groups being able to deploy oceanographic instruments and conduct scientific surveys, or staying in.

The OCAq is an organizational member of the American Academy of Underwater Sciences (AAUS). This organization provides a liability framework within which scientific diving institutions — predominately, aquariums, universities, and government agencies — may easily collaborate. Members may share divers, equipment, and research vessels to complete scientific research. By creating our own rebreather field diving team, we open the door to collaborating at a higher level with other facilities that share the same technology and operate on the cutting edge of modern-day dive research and discovery.



Oregon

Kate Brown, Governor

Department of Fish and Wildlife
Marine Resources Program
2040 SE Marine Science Drive
Newport, OR 97365
(541) 867-4741
FAX (541) 867-0311
www.dfw.state.or.us/mrp/

January 29, 2019



To Whom It May Concern,

I am the Research Project Leader for the Oregon Department of Fish and Wildlife's (ODFW's) Marine Reserve Program, and the Oregon Coast Aquarium is a key collaborator and contributor to science and education in our community. ODFW is the lead agency responsible for overseeing the scientific monitoring and management of Oregon's five marine reserve sites that have been designated within the state's nearshore waters. The Oregon Coast Aquarium has played a critical role in supporting the development of our long-term scientific monitoring program since the inception of our program in 2010. Together we have successfully developed a scientifically rigorous, volunteer dive program to gather monitoring data on underwater habitats, invertebrates, and fish communities. To date the dive program led by the Oregon Coast Aquarium has trained 29 divers, conducting over 600 monitoring dives in the first eight years of our program. Without the efforts of the Oregon Coast Aquarium, we would be unable to have a dive program contributing such valuable data to the long-term monitoring of Oregon's Marine Reserves. The commitment and contribution of the Oregon Coast Aquarium to our project is exemplary of their commitment and dedication to collaborating in cutting-edge science in the Pacific Northwest.

Furthermore, the Oregon Coast Aquarium is a master at turning science and fieldwork efforts into educational opportunities. As a partner with the ODFW Marine Reserves program, the Oregon Coast Aquarium has an educational kiosk about the marine reserves in their local sandy shores exhibit. Furthermore, their educational programs and communication staff broaden the reach of our program to share key messages about the science and creatures found in Oregon's waters. We are grateful to have them as a scientific and educational partner and support their capital campaign and project priorities for 2019 and beyond.

Sincerely,

Lindsay Aylesworth, Ph.D
Project Leader
Marine Reserves Program
Oregon Department of Fish and Wildlife
lindsay.x.aylesworth@state.or.us

Oregon Coast Aquarium
Rebreather Application
Provided YouTube links:

Acoustic Receiver Deployment

<https://www.youtube.com/watch?v=bp-ysWntPbY&t=12s>

Kelp Survey with OCA

<https://www.youtube.com/watch?v=qjwNNmQCI9Q>

Beneath the Surface: Diving for the Oregon Marine Reserves

<https://www.youtube.com/watch?v=k6qR5V6qv-8&t=41s>