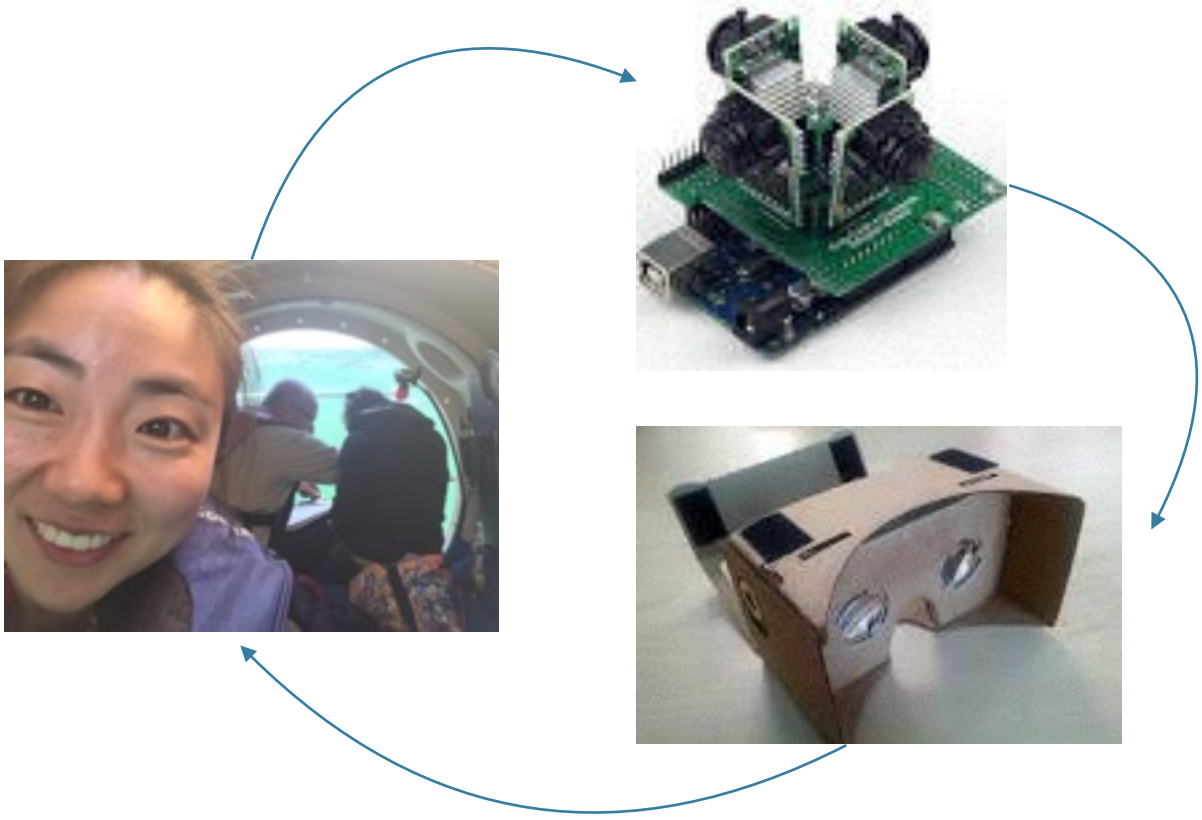
Open The Oceans Challenge #3



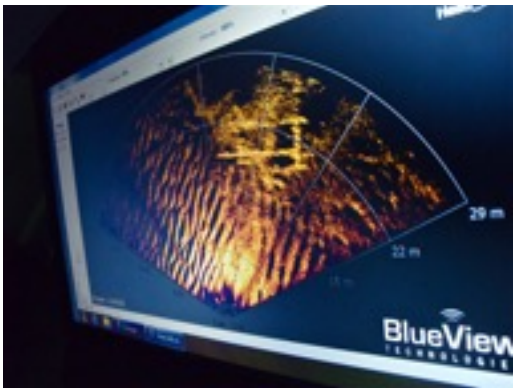
Bringing the Ocean to you using VR

February 5, 2016

Request for Proposal number: 2016-003

Open The Oceans is a program of OceanGate Foundation (OGF). Our mission is ignite curiosity, passion, and lifelong learning through the exploration of Earth's final frontier, the ocean. We create *Inspiration Through Exploration®*.

An invitation to apply

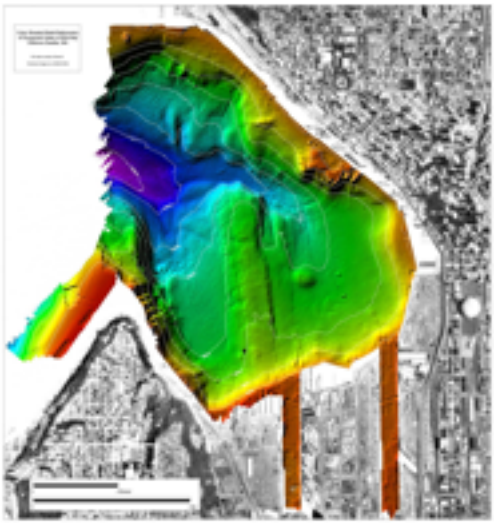


OceanGate Foundation invites students interested in learning technology development to participate in a 1-day hardware hack-a-thon, with a focus on creating a panoramic or stereographic time-lapse camera, suitable for creating "StreetView" style content of a submersible dive. The team that submits the winning design will have the opportunity to send their prototype into the real world on a submersible expedition. We envision continued work on the prototype after the hack-a-thon in Spring Quarter 2016, with a target of deployment on submersible dives in Summer 2016.

Students interested in hardware and software hacking, Internet of Things tech, videography and short form story telling using technology are encouraged to attend.

Overview

The ocean plays a significant role in our everyday lives, from controlling climate and large scale weather patterns to helping feed the planet; understanding the ocean is critical for understanding our future. The human drive to explore has been intertwined with ocean exploration for thousands of years, and as our use of technology has progressed, so too has our ability to explore and understand the ocean. So far we have only explored a very small fraction of the ocean using direct measurement and most often rely on remote sensing platforms (for example acoustic, gravity and satellite measurements) to gain understanding for large areas of the ocean. For example, the image below shows the bathymetry of Elliott Bay, WA, and was created using sonar measurements. While data analysis and creative presentation can go a long way towards improving our understanding, exploring the ocean directly via submersible expeditions captures the imagination in a way that data feeds and their resultant visualizations cannot.



Pursuing a career in science, technology, engineering and math (STEM) suffers from some of the same challenges as understanding the ocean. In the everyday experience of many we live in a world completely dependent upon technology even if we don't understand the way in which it was developed. No matter how complex a piece of technology, chances are good that it was developed using the basic scientific method of 1) forming a hypothesis, 2) making observations, 3) analyzing the results and 4) drawing conclusions. Submersibles offer an excellent platform for learning how to do technology development — for any given mission there are many different problems that can be solved with technology; all are made more interesting by the challenge of working at depth with a submersible.

PROJECT AREAS

Panoramic video and time-lapse photography

The mission of Open The Oceans is to ignite curiosity, passion and excitement about the ocean. One of the fundamental challenges we face in exciting humans about the ocean is that it is difficult for us to visit and see the wonders of the ocean "with our own eyes". Studies have shown that communicating a message online has significantly higher engagement if you use images instead of text alone; with video the engagement is even higher. GoPro and other "action cam" companies have used this fact to build very interesting products and a whole new way of story telling.

It is challenging, however, to give people the experience of diving in a submersible — it is not quite indescribable, but photographs and simple video fall short of the full experience. Recently the New York Times took an additional step in using visual story telling by developing VR content. Using your smartphone and a small cardboard "viewer", we are able to be virtually transported to different parts of the world. It is a powerful medium only now beginning to be used to tell stories. Our goal is to create a system that will allow us to create a "DiveView" experience much like Google's StreetView. Such DiveView videos can then be used to document our dive activities and increase engagement for our stakeholders.

There products that solve this problem now, most notably Google and GoPro's "Jump" system of 16 GoPro cameras. In addition to being expensive, this solution is too large to mount in the submersible for typical operations and would be extremely difficult to put into a pressure vessel (our goal for the next iteration). We hope to use inexpensive Arduino components to build something that can be used in our dive ops.

HELP US HACK TOGETHER A SYSTEM TO SOLVE THIS PROBLEM!

- https://www.google.com/get/cardboard/jump/
- http://www.nytimes.com/newsgraphics/2015/nytvr/
- http://www.arducam.com/tag/360-view-camera/

Team Eligibility

To be eligible for Open The Oceans Contest #2, all team members must be currently enrolled as a student at the following institutions:

- Seattle Colleges (North, Central or South)
- University of Washington, Freshman and Sophomores.
- ORCA Program at Everett CC.
- Mentors eligible from UW Oceanography Ocean Technology program.

Students not enrolled in programs listed above may be eligible but will need to get permission to apply in advance. Any questions regarding eligibility or administrative questions should be directed by email to Christian Sarason <cpsarason@oceangatefoundation.org>.

TIMELINE AND IMPORTANT DATES

Week of March 21st, 2016: Tour of OceanGate Inc. Submersibles, Port of Everett

Tour and Field Trip to OceanGate Inc. headquarters (Everett, WA). Kickoff meeting will introduce students to the problem definition and give teams an opportunity to visit a submersible in person.

March 25th, 2016, All Day: UW Ocean Technology Center

Hack-a-Thon at UW Ocean Technology center. Student teams of 4-5 will create solutions to address the challenge as listed in the Product Requirements doc (see below). Anyone who participates in the Hack-A-Thon will be eligible to be placed on the OceanGate, Inc. submersible dive training list. *One lucky individual will be selected to accompany OceanGate, Inc on a training dive expedition (time, place and details to be determined.)*

Stage 2 Pre-Proposals DUE: April 8th, 2016, 23:59 PDT

Students wishing to turn their prototype into a real product can compete in Stage 2 by submitting a pre-proposal that describes their idea, approach and likelihood of success. Teams are strongly encouraged to entrain a Mentor from the UW Ocean Tech program as part of their work.

Pre-Proposals due by email to cpsarason@oceangatefoundation.org and rebecca.hartzler@seattlecolleges.edu. Pre-proposals should be no more than 1 page (letter sized, PDF format) and include 1) a 250 word summary of the idea and 2) names and contact information for each team member.

April 11-15, 2016: UW Ocean Technology Center

Christian Sarason will hold 30 minute consultations with each team that submits a pre-proposal. The intent of this meeting is to highlight any technical issues that might arise and help the team focus the full proposal for best effect. Although the full team is not required to attend, having multiple members get feedback will improve the chances of a good full proposal.

Stage 2 Final Proposals DUE: April 30th, 2015, 23:59 PDT

Final proposals due by email to cpsarason@oceangatefoundation.org and rebecca.hartzler@seattlecolleges.edu. To be considered, proposals must be no longer than 5 pages (letter sized, PDF format). Proposals will be scored according to the rubric in this RFP.

May 1st, 2016

Winning proposal announced. Winning team will have a budget of $500 of materials to complete their design. All designs, software and content produced will be shared as Creative Commons CC-BY (thus allowing others to adopt and improve on the design.)

May-June 2016: UW Ocean Technology Center (or other suitable location)

Design iteration and project build-out. Students will have access to the UW Ocean Technology center for "hacker hours" once per week for 3-4 hours to continue to improve their design.

PROJECT SCORING RUBRIC

Proposal Selection Criteria

Much of modern scientific research today is accomplished by teams of scientists that respond to a **R**equest **f**or **P**roposal (RFP) from various funding agencies, both governmental and private. Our challenge will be structured in a similar manner, with proposals judged by a review panel. The panel will rank proposals according to a scoring rubric. Teams will have 10 minutes at the end to present what they accomplished, and must address the following 4 questions specifically.

- **What are you proposing to do? (25%)**

  This section should be a concise description of your design idea. It should be clearly written and address the basic idea of what you hope to achieve.

- **How does your approach solve a problem addressed in the RFP? (25%)**

  This section should state clearly how your proposed solution will address one of the areas in the RFP.

- **How will your team accomplish the plan (what skills are on your team)? (25%)**

  This section should address the makeup of your team and how you plan to accomplish your project if selected.

- **Once your experiment is complete, how will you share what you have done with your peers and wider community? (25%)**

  The best science and technology is useless if no one ever knows about it; your project should delineate clearly how the work you do will be shared. Short online videos, a social media campaign or a beautifully designed info-graphic are all possibilities here — use your creativity but keep it something that is achievable.

You will find an example rubric at the end of this RFP. The winning design proposal will get the opportunity to have their project accompany one of our dives; depending upon logistics the winning team may be able to accompany OGF on the dive day as well.

Score	What are you proposing to do?	Why does your approach solve the problem?	How will your team accomplish your plan?	How will you share what you have learned?
Sophisticated (5)	All relevant information was obtained and information sources were valid. Analysis and design considerations were well supported by the information and pragmatic given the limitations of diving in a submersible.	All requirements and objectives for the design are clearly identified and evaluated. The proposed design offers a new approach to the problem addressed.	Skills of team members are clearly communicated and well balanced. There is a mix of technical, project management and creative skills on the team. Roles for each member are clearly identified.	The project has a clear plan for presenting their work and causing the wider world to be inspired. Planned communications cover social and web channels and offer a compelling reason for others to learn more about their work.
Competent (3)	Sufficient relevant information was obtained and information sources were valid. Analysis and design considerations were mostly supported by the information and reasonable given the limitations of diving in a submersible.	Most requirements and objectives for the design are clearly identified and evaluated. The proposed design offers a small improvement in approach to the problem addressed.	Skills of team members are strong but not communicated clearly. There is a mix of technical, project management and creative skills on the team, but some duplication of skills. Roles for each member are clearly identified.	The project has a reasonable plan for presenting their work and causing the wider world to be inspired. Planned communications cover social and web channels but do not offer a compelling reason for others to learn more about their work.
Not Yet Complete (1)	Insufficient relevant information was obtained and information sources were not valid. Analysis and design considerations were not well supported by the information. Proposed design was impractical given basic limitations of diving in a submersible.	Many requirements and objectives for the design are missing. The proposed design offers no improvement over a current method to solve the problem addressed.	Skills of team members are not strong and not communicated clearly. There are many team members with the same set of skills. Roles for each member not are clearly identified.	The project has a limited plan for presenting their work to the wider world. Planned communications do not cover social and web channels and offer no reason for others to learn more about their work.