INFORMATION
PACKAGE

OCEAN
STARTUP
CHALLENGE

Turn your idea or tech into a wave of opportunity

INTRODUCTION

Problem-solvers wanted! The Ocean Startup Challenge is looking for innovative solutions to ocean-related challenges.

With the world's longest coastline, globally renowned research facilities and experts, government programs and supports, and a steady flow of talent, Canada is the right place to start or grow a successful ocean tech company.

We are looking for diverse entrepreneurs and innovators from rural, Indigenous and urban communities across Canada, and internationally, who have innovative technology or science-based solutions to ocean industry problems. Up to $1.4 million in funding and business support will go to winning startups and scaleups.

The Ocean Startup Project launched the Ocean Startup Challenge to support individuals and teams who are developing technologies that have large market potential.

About the Ocean Startup Project: The Ocean Startup Project, driven by Canada's Ocean Supercluster, is a pan-Atlantic collaboration between Creative Destruction Lab (CDL) – Atlantic, Genesis, Innovacorp, New Brunswick Innovation Foundation, PEI BioAlliance, and Springboard Atlantic to create and grow high-quality ocean technology companies.

About Canada's Ocean Supercluster: Canada's Ocean Supercluster is growing the ocean economy in a way that has never been done before, where leaders in fisheries, aquaculture, defense, offshore resources, marine renewables, bioresources, shipping, and ocean technology are coming together to develop and commercialize solutions to shared ocean challenges, while advancing Canada's position as a global leader in ocean.

CHALLENGE STATEMENTS

Industry and thought leaders have identified their top pain points across these areas:

- Fisheries and Aquaculture
- Shipping and Marine Transportation
- Marine Bioresources
- Offshore Energy
- Naval and Defence

For a full list of Challenge Statements, see Appendix 3 or visit https://oceanstartupproject.ca/challenge/#statements.

STREAMS AND SPECIAL AWARDS

The competition will have three streams: Idea, Growth, and Oceanshot. Applicants enter the stream which best describes their company stage. Stream descriptions are below.

IDEA	GROWTH	OCEANSHOT
Designed for entrepreneurs or teams early in their development. This stream is for Canada-based entrepreneurs with ideas or pre-revenue ocean tech companies. We're looking for applicants who: • Are pre-revenue, pre-institutional investment • Have no sales prior to application deadline • Are Canadian-based entity • Have a solution with a TRL 3 or lower	Designed for early stage companies with impressive milestones and some traction. This stream is for startups in Canada and around the world that would benefit from support and collaboration with Canadian ocean assets and facilities. We're looking for applicants who: • Have less than $300K in equity investment • Are the founder of the business venture and plan to work full-time in the business • Have a solution with a TRL 4 to TRL 7 • Are registered as a Canadian entity	Designed for applicants tackling uncharted problems with a large chance of failure, but if successful, will have a huge impact on ocean sustainability and create a massive market opportunity. We're looking for applicants who: • Have demonstrated a massive market opportunity • Are leveraging Canadian facilities or ocean assets • Have a solution with a TRL 7 or lower • Have at least one person dedicated to the project at full time capacity • Have clear intention and plan for commercialization upon success • Are registered as a Canadian entity

Special Awards

The competition will have three special awards: Women Ocean Entrepreneur, Impact, and Indigenous Ocean Entrepreneur. Entrants indicate on the application if they would also like to be considered for one of these awards. Descriptions are below.

Women Ocean Entrepreneur Award - $25,000
The Women Ocean Entrepreneur Award, presented by Cox & Palmer, will support a startup developing a technology or science-based solution to an ocean industry challenge. Up to one award will be dispersed.

In addition to the general eligibility for the Challenge streams, entrants must:

- Self-identify as a women and be based in a Canadian province or territory

Impact Award - $25,000
The Impact award, presented by BDO Canada, will support a startup developing a technology or science-based sustainable solution to help combat climate change, increase environmental monitoring capabilities, or restore ocean ecosystems. Up to one award will be dispersed.

In addition to the general eligibility for the Challenge streams, entrants must:

- Demonstrate how their solution to an ocean industry challenge will have a positive environmental impact

Indigenous Ocean Entrepreneur Award - $25,000
The Indigenous Ocean Entrepreneur Award will support an entrepreneur developing a technology or science-based solution for an ocean industry challenge. Up to one award will be dispersed.

In addition to the general eligibility for the Challenge streams, entrants must:

- Self-identify as Aboriginal or Indigenous (First Nation, Métis and Inuit)

GENERAL ELIGIBILITY

Winners must have an incorporated company in Canada before funds are released. See below for international company criteria.

Entrants are founders of the company.

Existing companies must have been in business for under five years and have 15 or few employees.

International Applicants

Entrants from around the world may apply for the Growth and Ocean Shot competition streams.

Any funds received from the Ocean Startup Challenge must be spent in Canada (e.g. equipment, materials, consultants).

International applicants must demonstrate how they will leverage Canada to advance their venture. The following are examples of how you can leverage Canadian assets:
- Have a letter of support from a Canadian incubator or accelerator
- Have a Memorandum of Understanding with a Canadian facility, organization, partner, or customer that can suppot the development of your technology in Canada

Entrants need to incorporate their company in one of the Canadian provinces, territories or Federally before funds will be released.

EVALUATION

In selecting the competition winners, the quality of the idea/technology, the strength of the management team, and impact of the funds all influence the judges' decisions.

Key criteria for evaluation include:

- **Pain & Solution:** Describes and quantifies the pain or problem, and proposes a feasible and scalable solution that provides a unique value to customers.
- **People:** Demonstrates the team is committed to the venture and has relevant experience and skills to execute, or identifies areas where there may be gaps.
- **Competition:** Clearly identifies sustainable competitive advantage, why there is a high barrier to competitive entry, and how to overcome the barrier and get market traction.
- **Market:** Identifies a large, growing international market and demonstrates understanding of potential customers
- **Impact of Funds:** Demonstrates how the funds will have a significant impact on helping reach key milestones.

The judging committee is comprised of representatives from the Ocean Startup Project and industry representatives. All submissions are treated confidentially and not made available to the public. Only those involved in managing or judging the competition and the Ocean Startup Project view submitted documents.

AWARDS

Up to $1.4 million in cash and business supports will be awarded to winning startups and scaleups. All funds are non-dilutive and non-repayable funding. The award amounts per category are below.

- **Idea stream:** Up to $25,000 per winner. Multiple winners in this category.
- **Growth stream:** Up to $100,000 per winner. Multiple winners in this category.
- **Oceanshot stream:** Up to $200,000 for one winner.
- **Women Ocean Entrepreneur Award:** $25,000 for one winner.
- **Impact Award:** $25,000 for one winner.
- **Indigenous Entrepreneur:** $25,000 for one winner.

The judging committee is comprised of representatives from the Ocean Startup Project and industry representatives. All submissions are treated confidentially and not made available to the public. Only those involved in managing or judging the competition and the Ocean Startup Project view submitted documents.

All competition entrants will receive feedback on their submission.

The amount awarded is determined by the judging committee. In addition to the cash award, winners will receive in-kind resources and services from the following partners: Cox & Palmer, BDO Canada, RBC, DeepSense, Emera ideaHub, Emergence, IGNITE, OceansAdvance, Genesis, Port of Halifax, Start-Up Yard at COVE, SEATAC, En Point, Enginuity and Startup Zone PEI.

Funding is provided to the winner as a reimbursement on expense claims. Claims must include receipts or invoices to support each item. Reimbursement is to be provided within 14-21 business days of submission of a complete claim. Missing items, ineligible expenses or other corrections may delay claim processing or result in claim rejection.

All expenses incurred must relate to achieving the milestones submitted in the approved application and proposed budget. We understand startups often pivot as they move forward, but any significant budget or milestone changes must be approved in advance by the Ocean Startup Project.

All expenses must be incurred by May 31, 2022.

The Ocean Startup Project reserves the right not to award any prizes.

TIMELINE

The following are key dates for the Ocean Startup Challenge:

- Information sessions: **Wednesday, April 14, 2021 & Tuesday, May 4, 2021**
- Application deadline: **Tuesday, June 1, 2021**
- Round 1 shortlist notified: **Tuesday, July 6, 2021**
- Round 1 interview: **July 26-August 10, 2021**
- Round 2 shortlist announced: **Wednesday, August 18, 2021**
- Round 2 presentation: **September 8-14, 2021**
- Winners announced: **Wednesday, September 22, 2021**
- Virtual awards gala: **Tuesday, September 28, 2021**

AWARDS

The competition will have two rounds. Below is the process for winner selection.

Round 1: Top applicants from the initial review will be invited to participate in round one. During this round, the focus will be on customer discovery. Interviews will be held with each company.

Key dates:
- Round 1 shortlist notified: Tuesday, July 6, 2021
- Invite-only information session: Tuesday, July 13, 2021
- Customer-focused workshop: Tuesday, July 13, 2021
- Pitch workshop: Tuesday, July 20, 2021
- Company interviews: July 26-August 10, 2021

Round 2: The top 30-40 applicants will participate in this round. Each company will give a pitch presentation to a judging panel.

Key dates:
- Round 2 shortlist announced: Wednesday, August 18, 2021
- Shortlist information session: Thursday, August 19, 2021
- One-on-one support: August 19-September 7, 2021
- Pitch presentation: September 8-14, 2021
- Winners announced: Wednesday, September 22, 2021
- Virtual Gala Awards: Tuesday, September 28, 2021

Note: Selection of the Round 1 applicants will be based on the application provided and feedback from reviewers.

APPLICATION

Interested parties that meet the eligibility criteria outlined above must ensure all submissions follow competition guidelines. Complete the online application at https://oceanstartupproject.ca/challenge-application and **submit by Tuesday, June 1 at 11:59 pm ADT**. Refer to Appendix 1 for an overview of information requested in the online application.

Round 1 interviews: Round 1 shortlist participants will meet with reviewers virtually for 20 minutes to discuss their submission, talk about customer discovery, business opportunity, team and other aspects of their business/concept.

Round 2 shortlist presentations: Shortlisted participants will each have 5-10 minutes to present their business overview, followed by a 10-minute question and answer session. All sessions will be conducted virtually.

Companies selected for shortlist presentations will have pitch presentations between September 8-14 and will receive one-on-one support from the Ocean Startup Project prior to their presentation to prepare and practice.

The interviews and presentations are closed to the public.

SUPPORT FOR ENTRANTS

Information Sessions

Online information sessions will be held on Wednesday, April 14 and Tuesday, May 4. For more information and to register for an upcoming info session, visit https://ocean-startup-challenge-info-session.eventbrite.ca.

Shortlist Candidates

One-on-one advice will be provided to shortlist candidates.

CONFIDENTIALITY

All applications will be treated confidentially and will not be made available to the public. Only those directly involved in managing or judging the competition and the Ocean Startup Project will view submitted documents. While summary details will not be disclosed, the competition organizers reserve the right to announce those who advance to subsequent competition phases. Applicants will retain ownership of any intellectual property associated with their application.

Entrants agree to receive emails from the Ocean Startup Project and its partners.

Questions? Visit our frequently asked questions (FAQ) or reach out to us at challenge@oceanstartupproject.ca.

Complete the online application at https://oceanstartupproject.ca/challenge-application. Please note that most questions have a word limit. Below is an overview of the information requested in the online application.

Name (first name, last name)
Email
Phone
Full address (city, province/state, country)
Website
Business Name
Business Overview (50 words)
What is the challenge area you are addressing (drop down menu)

Pain
· Please describe the problem your potential customers are experiencing.

Solution
· What is your idea or solution?
· Describe your product or service.
· Describe how your product or service works.
· Describe the science/technology behind your product.
· Is there any intellectual property (IP) being developed? If so, please describe the IP and explain who has ownership.
· How does your idea or solution solve the problem outlined above?
· What is the current status of your technology/venture? (TRL level drop down)

Market
· Who are your customers? (e.g. category, specific companies)
· Describe the value proposition for this customer in one sentence (how does this save time or money or increase your customers' revenue).
· How big is the market pain? (e.g. how big is the market size) Include sources if applicable.

People
· Team: Co-founder 1, Co-founder 2
    · Name
    · Email
    · LinkedIn (other) profile
    · Roles and responsibilities
    · Background and experience
    · Skills
    · Anticipated time commitment (drop down: occasional, less than 50%, more than 50%, full-time)
· Please list the names, roles and emails of any additional co-founders or key members of your executive team.

Solving ocean challenges requires diverse perspectives. Answers to the following questions will only be used to evaluate applications for the Women Ocean Entrepreneur and Indigenous Ocean Entrepreneur Awards. Self-identifying is completely voluntary.

· Do you consider yourself to be an Aboriginal/Indigenous (First Nation, Métis and Inuit) person? (yes/no/prefer not to answer drop down)

- Do you self-identify as a member of the following visible minority or underrepresented groups? (multiple select)
  - Not a member of a visible minority
  - Prefer not to answer
  - Person of African heritage
  - East Asian (Chinese, Japanese, Korean, etc.)
  - South East Asian (Cambodian, Filipino, Thai, Vietnamese, etc.)
  - West Asian or Arab (Iranian, Lebanese, Afghan, etc.)
  - Latin, South or Central American
  - Women
  - Persons with disabilities
- Do you have any advisors or mentors?
- What gaps exist on the team?

Competition
- Who are your potential competitors? What are your competitors' strengths and weaknesses?
- What is your product's core sustainable competitive advantage over your competitors? (i.e. how will you remain competitive over time)

Execution
- What milestones have you achieved to date? This could include market research, customer discovery, product concept development, competitor analysis, etc.
- How would funding help you achieve future milestones? Please provide a detailed plan on how you will achieve future milestones.
- What is the long-term vision of your company? Describe what you would like your company to be in 10 years.
- Have you raised any money for the venture? If so, how much? (equity investment)
- How much time have you spent developing your idea or solution?

Oceanshot Questions (only applicable if applying to the Oceanshot stream):
- Describe the technical risk you face and how you are considering to overcome the challenge.
- Describe how a successful project will lead to a contribution to ocean sustainability and access a massive commercial market opportunity.
- Describe how you will use the funding to test, validate and commercialize your solution.

Other
- Is there anything else you would like to share?
- Do you have a pitch deck or supporting documents you would like to share? (Maximum 100 MB)

APPENDIX 2: TECHNOLOGY READINESS LEVELS

These are the nine technology readiness levels, with 1 being the least ready and 9 being already used in real-life conditions. Source: https://www.ic.gc.ca/eic/site/080.nsf/eng/00002.html

Level 1: Basic principles of concept are observed and reported
Scientific research begins to be translated into applied research and development. Activities might include paper studies of a technology's basic properties.

Level 2: Technology concept and/or application formulated
Invention begins. Once basic principles are observed, practical applications can be invented. Activities are limited to analytic studies.

Level 3: Analytical and experimental critical function and/or proof of concept
Active research and development is initiated. This includes analytical studies and/or laboratory studies. Activities might include components that are not yet integrated or representative.

Level 4: Component and/or validation in a laboratory environment
Basic technological components are integrated to establish that they will work together. Activities include integration of "ad hoc" hardware in the laboratory.

Level 5: Component and/or validation in a simulated environment
The basic technological components are integrated for testing in a simulated environment. Activities include laboratory integration of components.

Level 6: System/subsystem model or prototype demonstration in a simulated environment
A model or prototype that represents a near desired configuration. Activities include testing in a simulated operational environment or laboratory.

Level 7: Prototype ready for demonstration in an appropriate operational environment
Prototype at planned operational level and is ready for demonstration in an operational environment. Activities include prototype field testing.

Level 8: Actual technology completed and qualified through tests and demonstrations
Technology has been proven to work in its final form and under expected conditions. Activities include developmental testing and evaluation of whether it will meet operational requirements.

Level 9: Actual technology proven through successful deployment in an operational setting
Actual application of the technology in its final form and under real-life conditions, such as those encountered in operational tests and evaluations. Activities include using the innovation under operational conditions.

APPENDIX 3: CHALLENGE STATEMENTS

Now is the time for you to take advantage of rapid growth in the ocean economy, projected to reach $3 trillion by 2030.

Oceans are the foundation for much of the world's economy. More than 3 billion people rely on oceans to provide jobs and livelihoods. Oceans feed us, regulate our climate, and generate 50% of the oxygen we breathe. They are valuable sources of renewable and nonrenewable resources and you can make a big impact.

Curious what ocean sectors present big opportunities to innovate? We have you covered.

We sought input from industry and thought leaders who shared their top pain points across the following areas: aquaculture, fisheries, biosciences, healthy oceans and ecosystem services, transportation, energy, and enabling technologies and data analytics. Common themes that run across those areas are the need for data, information, knowledge, decision-making tools, and enabling technologies.

Be innovative. Desirable attributes of solutions might include being: low cost, easily deployable, easily maintained, rugged for harsh environments, accurate, low power, real-time, remote, and safer for human operators.

We need diverse entrepreneurs and innovators from rural, Indigenous and urban communities across Canada, and internationally. Step up to make a positive impact by solving one or more of the ocean industry priorities listed below.

Fisheries

Capture fisheries provide the world's growing population with a crucial source of food.[1] Fish accounts for 17% of all animal protein and 7% of all protein consumed in the world. With capture fisheries production relatively static since the late 1980s, large opportunities exist to optimize and sustain fishery resources, reduce waste and environmental impact, and improve fishing practices.

Industry has identified the following priorities for technology innovation and development:

- Develop a novel use for fish and shellfish waste to create new value-added products that maximize the economic impact of fisheries.
- Develop an alternative, cost-effective bait that uses sustainably sourced ingredients for the fishing industry.
- Create an environmental scanning system for real-time monitoring and mapping of the seabed and habitats. And/or to avoid impacts with marine life like whales.
- Through technology, create improvements in processing technologies, harvest yield, product quality and product packaging, shipping, tracking.
- Develop improved safety systems for the commercial fishing industry.

Aquaculture

Aquaculture is among the fastest growing food sectors in the world, accounting for more than 50% of the world's total seafood production. Aquaculture includes farming of fish, shellfish and aquatic plants. The sector has a history of innovation, sustainability and responsibility. The workforce is located in both rural and coastal communities. Primary goals of the aquaculture sector are to enhance its financial sustainability by reducing operating costs per unit of production, and increase its environmental sustainability by mitigating negative impacts on local coastal communities.

Areas where innovation and technology advances are required for aquaculture include: water quality, fish health, waste management, pathogen recognition, remote sensing, data collection, autonomous control, inspection, and maintenance, and merging streams of information to advise or forecast.

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[1] https://www.seafoodsource.com/news/supply-trade/rising-incomes-increased-urbanization-to-underpin-seafood-consumption-growth

Industry has identified the following priorities for technology innovation and development:

- Develop a data analytics platform to support management decisions related to rearing and production, and to respond to the environmental challenges in the aquaculture industry.
- Develop an Internet of Things (IoT) and artificial intelligence (AI)-enabled, real-time, environmental sensor and forecast system for the autonomous monitoring of aquaculture farms, and surroundings, to support:
  - Nutrient monitoring that may be a precursor to harmful algae blooms and tunicates.
  - Observations of invasive plant or fish species
  - Using fish behaviour as a precursor to changing environments, change in appetite or health status
  - Collection of data for more efficient and safe offshore operations
- Design cost-effective water treatment and management systems for aquaculture farms that support responsible and viable growth of the sector, particularly as it relates to coastal, land-based and recirculating aquaculture systems (RAS).

Shipping and Marine Transportation

Nearly 90% of global trade is done through international shipping. The shipping industry is targeting zero emissions and support of the green economy in a sustainable manner. The industry is seeking new technology and innovation to enable increased energy efficiency, enhanced marine security, optimized maritime traffic management and development of maritime infrastructure to improve sustainability and increase profitability.[2]

Ports are working to optimize operations to improve productivity, reduce costs, improve yard operations, optimize truck turnaround times, and reduce environmental impact on local communities.[3]

The shipping industry has identified the following priorities for technology innovation and development:

- Develop a low-cost, remote, real-time monitoring platform to improve security, decision-making, and the operational efficiency of ports.
- Design a solution that would monitor marine assets to help keep them out of drydock (e.g., corrosion, hull failure, and hull penetration).
- Design a system that integrates IOT-enabled sensors, data analytics and AI to provide for the real-time analysis, reporting and predictive maintenance of key port and maritime assets.
- Improve the efficiency of long-distance shipping by reducing friction, reducing fuel consumption/emissions, and optimizing routing forecasts.
- Integrate advanced onboard autonomous systems to improve efficiency and safety, and reduce the number of people required to operate commercial vessels.
- Improve fuel, propulsion, and bunkering technology to make ships more efficient and safer for the environment.
- Develop a solution for maritime transportation that helps lower emissions and uses existing technology that is being implemented in other areas of transportation.

Offshore Energy

Offshore resources such as oil, gas and renewable sources can help meet energy demands. More than a quarter of today's oil and gas supply is produced offshore.[4] Ocean energy, also known as marine energy, encompasses engineering technologies, such as tidal and wave power, that harness the movements of the ocean to create electricity.[5] It is critical to develop new products and services to enable and accelerate the transition from extractive energy production to renewable energy production. Challenges include surveillance of marine life and habitat, site characterization, remote operations, testing and modelling, advanced materials and corrosion protection, installation and logistics, and power generation and power grid.[6]

2 International Maritime Organization. http://www.imo.org/en/About/Pages/Default.aspx

3 Port Technology. https://www.porttechnology.org/news/top_three_biggest_challenges_for_global_terminal

4 https://www.iea.org/reports/offshore-energy-outlook-2018

5 https://ourworld.unu.edu/en/ocean-energy-making-waves

6 https://webgate.ec.europa.eu/maritimeforum/sites/maritimeforum/files/OceanEnergyForum_Roadmap_Online_Version_08Nov2016.pdf

The offshore energy industry has identified the following priorities for technology innovation and development:

- Develop a marine life monitoring system for the offshore renewable energy industry to monitor disruptions to marine habitats, to enable aquaculture farming around offshore wind platforms, and to decrease fish and marine life mortality by employing predictive analytics.
- Design a data analytics and AI-enhanced platform that optimizes the performance of marine renewable energy systems.
- Develop an embeddable sensor to monitor the performance of offshore renewable energy assets.
- Improve site characterization efficiency, accuracy, and resolution, increase speed at collecting the data, and reduce mission costs.
- Improve material and coating technology to reduce corrosion and biofouling, reduce vibration and fatigue, and protect against ice and suspended sediment.
- Improve operational efficiency, preventative maintenance, and decommissioning using digital twin and AI technologies.
- Develop new autonomous and robotic systems to reduce costs and increase personnel safety in offshore operations.

Marine Bioresources

Marine bioresource companies create new value from resources within the marine environment and support additional value creation for operators in fisheries and aquaculture. Businesses and consumers are quickly realizing that there are many valuable products that can be derived or manufactured from marine resources, such as high-quality additives for food, cosmetics, pharmaceuticals, coatings, and even pet treats. There are additional opportunities to create a circular economy by utilizing the byproducts of fisheries and aquaculture processing (fish and shellfish waste) to create higher-value products. Sustainable aquaculture of fish and seafood can help feed the world's growing population. For that to happen, new, safe and effective tools and technologies are needed to address animal health, nutrition and pro-duction. More effective prevention and treatment methods as well as diagnostics and monitoring tools are required to detect, prevent or treat bacterial, viral and parasitic diseases. Increased aquaculture production also equates to a growing demand for raw material feedstocks and a desire for novel, sustainable, and locally sourced feed ingredients.

The marine bioresource industry has identified the following priorities for technology innovation and development:

By-products / Bioconversion
- Develop new, value-added products, using invasive species, underutilized species and problem species such as green crab, tunicates, sea lettuce, and sea lice, which could become separate bio-resources for new businesses.
- Develop an alternative, commercial scale use for fish and shellfish waste.

Marine Bioresources
- Develop an efficient screening mechanism to identify bio-active compounds in marine life.
- Develop a novel methodology for the comprehensive characterization of biodiversity in marine environments.
- Develop a natural, effective and safe sea lice repellant or exterminator.
- Discover a new therapeutic that incorporates natural marine and marine life products, with selective activity against virus strains, for example COVID-19, and that is non-toxic to mammalian cell lines.
- Discover a new therapeutic that can enhance the microbiome in common fish species with the intent of improving fish health and performance.

Naval and Defence

Canada and allied nation's blue water navies consist of submarines, surface combatants, support and patrol ships, and autonomous assets. Surveillance, security, and situational awareness of the seas are becoming increasingly important and complex. The need for required awareness and operational capabilities are being stretched into remote areas, polar regions and the deep sea. With better awareness and understanding, Canada's Royal Canadian Navy can adapt and respond to the everchanging marine environment.

The defence industry has identified the following priorities for technology innovation and development:

- Develop improved components of a real-time, autonomous, ocean monitoring system that integrates sensors, autonomous vehicles, IOT, data analytics and AI.
- Develop charging, communications and data telemetry systems for remote monitoring or autonomous platforms.
- Develop the architecture for a modular, easy-to-deploy, autonomous platform to enable more applications that requires fewer people and less attention.
- Develop improved components of a real-time ocean observation system that uses acoustic and non-acoustic sensors, autonomous surface vehicles (ASVs), autonomous underwater vehicles (AUVs), and IOT to monitor for underwater noise and target detection.
- Improve cybersecurity platforms/tools for marine assets and data.
- Develop monitoring and marine surveillance tools for high latitude and under-ice environments.
- Develop low-cost, wide-area, low-logistics underwater measurement and surveillance platforms to inform hydrographic models and detect threats.