**Turn your idea or tech into
a wave of opportunity**

**Fisheries &
Aquaculture**

OCEAN
STARTUP
CHALLENGE

oceanstartupchallenge.ca

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. Oceans are valuable sources of renewable and non-renewable 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 in the areas 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.

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

Challenge Statements

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.

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).
- Discover a novel therapeutic to prevent, treat or improve farm-raised fish, shellfish or bivalves' resistance to new or existing diseases.
- Develop sustainable, locally produced, feed ingredients, additives, stabilizers, preservatives, premixes or pre-/post-biotics for use in the aquaculture industry.
- 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.
- Cement biology first mindset into all designers of equipment that is in contact with the fish
- Discover a novel therapeutic to prevent, treat or improve farm-raised fish, shellfish or bivalves' resistance to new or existing diseases.
- Develop an innovative diagnostic tool for early detection and identification of diseases in fish and seafood.
- Develop sustainable, locally produced, feed ingredients, additives, stabilizers, preservatives, p remixes or pre-/post-biotics for use in the aquaculture industry.
- 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.