



**Proudly Present**  
***Hampton Roads “Open Seas 2020 Competition” as part of:  
“Something STEM-ulating over, under and on the Water”  
April 20, 2020 at Nauticus, Norfolk VA***  
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**Institute for Innovation & Entrepreneurship**

Open Seas is a partnership between the ODU, the Virginia Institute of Marine Science (VIMS) and the College of William & Mary. The program will be heavily focused on three industry clusters - maritime, shipping and logistics; aquaculture and fisheries; and flood mitigation and resilience. Although they cover over 70 percent of the surface of the planet, the oceans of the world are under serious threat.



**What is the HR Open Seas?**

**HR OPEN SEAS** is a marine science and maritime competition intended to promote the creation of marine technology businesses in Hampton Roads.

ODU's Institute for Innovation & Entrepreneurship is collaborating with the Hampton Roads Innovation Collaborative on an Open Seas effort to create maritime businesses to address ocean challenges.

**What are the Top 10 Ocean Challenges?**

Discover the ten biggest problems in the oceans right now.

**1. Plastics**

- The ocean is increasingly becoming a plastic soup that is killing hundreds of marine animals daily.
- Sooner or later, these millions of plastic pieces will end up in our stomachs.
- The size of the Great Pacific garbage patch ranges between 700,000 square kilometers (270,000 square miles) and 15,000,000 square kilometers (5,800,000 square miles).
- Plastic and debris: they are killing our oceans.

**2. Trash**

- The amount of litter left on the beaches or thrown into inland waterways, such as rivers and streams, will end up in the ocean.
- The situation is more serious when it comes to non-biodegradable waste, such as plastics, which break up into smaller particles, microplastics, and are mistaken for food by many marine species.
- The microplastics present in hygiene products and domestic and industrial cleanings products will also have the same destination.
- The islands of garbage are already a reality in some areas of the oceans.

### **3. Pollution**

- Many fertilizers and pesticides used systematically in agriculture end up falling into the ocean.
- Some of these products cause irreversible and fatal changes to the species; for example, they affect the reproduction process. Also, if ingested by humans, they can cause health issues.
- Water pollution: pollutants destroy marine life and affect humans.

### **4. Overexploitation of Fishing Resources**

- Studies indicate that there has been a considerable reduction in the populations of some species of fish. For example, overfishing of cod in Canadian waters has almost led to the extinction of the species.
- In addition to overfishing, there is also a serious lack of fishing activity management or non-compliance with the rules.
- The absence of a definition of the size of the animals or the time of capture, which allows the capture of juveniles or females with eggs, are some of the recurring problems.
- Overfishing of species with long life cycles at the top of food chains, like sharks and tuna, or species used for luxury cooking and alternative medicine also cause irreversible changes in the harmony of marine life.

### **5. Unsustainable Aquaculture**

- Intensive aquaculture at sea promotes the proliferation of pollutants in marine waters.
- The production of fish and bivalves involves the use of antibiotics and other chemicals, some of them toxic to the ecosystem.
- This situation is clearly visible in Asian waters due to the intensive production of Vietnamese clams.

### **6. Marine Engineering and Oil Drilling**

- All changes in the marine environment caused by construction, deep hole drilling, and many others human-related interventions cause acute changes in the habitat, various disturbances and generate pollutants.
- All these factors contribute to the destruction of the natural element and compromise the survival of marine species.
- Oil drilling: causing various disturbances in the marine environment.

### **7. Destruction of Habitats**

Some habitats provide and represent a unique shelter for reproduction. Marine forests are being destroyed for various reasons, including the use of aggressive fishing gear and methods like trawling.

### **8. Ocean Acidification and Coral Bleaching**

- Climate change has a profound impact on the oceans. The increased levels of CO<sub>2</sub> in the atmosphere cause changes in the pH of the oceans.
- This situation is particularly evident in tropical regions where marine ecosystems are extremely sensitive and rich in biodiversity, and where habitats are undergoing irreversible changes, most notably in coral reef areas.
- Ocean acidification: changes in pH kill coral reefs.

### **9. High Levels of Mercury**

- Excess mercury causes severe illness in marine life and humans. It is a pollutant that accumulates in the food chain and reaches humans through the ingestion of fish.
- High levels of mercury can cause serious diseases. As a result, the consumption of several fish species like the black scabbardfish and tuna should be regulated.

### **10. Sea Temperature Rise**

- Rising sea temperatures cause dramatic changes in marine ecosystems, with severe and lethal consequences.
- The phenomenon is also responsible for changing migratory routes, causing imbalances in food chains. For instance, raising the water temperature by just 0.5 °C causes the death of coral reefs.
- Healthy coral reefs work as "maternities" and shelter areas for a wide variety of species that provide food for humans, and on which many fishing communities depend.

## 11. Maritime Specific Challenges

- Ballast Water: What to do with water taken in from an overseas port that is NOT allowed to expel in USA ports due to chemicals or marine animal infestation.
- Undersea mapping: The undersea terrain changes all the time due to currents and shifts. How to obtain accurate mapping of the undersea world for navigation and other concerns?

## Open Seas 2020 Business Launch Competition

Open Seas 2020 is a competition to design a maritime business to address either a listed problem or even another which can be suggested.

## Open Seas 2020 Business Competition Process

1. **Open Seas Reverse Pitch Day.** Entrepreneurs are used to pitching their business idea to investors, partners and anyone they might meet in the local coffee shop. In this competition, the tables will turn. Instead, ODU's Open Seas Team will pitch to the attending audience to challenge and stimulate their thinking toward solving maritime problems.
2. The Open Seas Reverse Pitch Day will be held Monday April 20<sup>th</sup> at the Nauticus in Norfolk at 2pm, in their auditorium.
3. At that session attendees will learn more about marine and maritime challenges to ascertain what direction they may want to take a new technology business idea into.
4. Over the next 90 days (till July/Aug date TBD);
  - Attendees use info to develop ideas/proposals on innovation to solve issues.
  - Attendees apply for an Open Seas Cohort.
5. At the 90-day mark (from April 20, exact date TBD) companies get to present their business pitches to the Open Seas team for cash prizes to assist in business launch.
  - The Open Seas team selects a cohort and works with them to create and validate a business model and do the planning required to stand up MVPs.
  - \$4,500 of cash prizes are available to help launch selected cohorts.



## How to Register for Open Seas – 2 Step Process

Step 1: **Register at <https://somethingstemulating-techramp.eventbrite.com>**

Step 2: **Do Step 1, Then Select Open Seas registration option as an add-on**

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