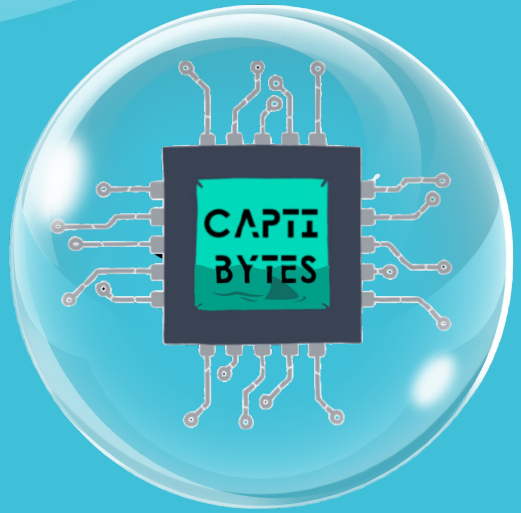
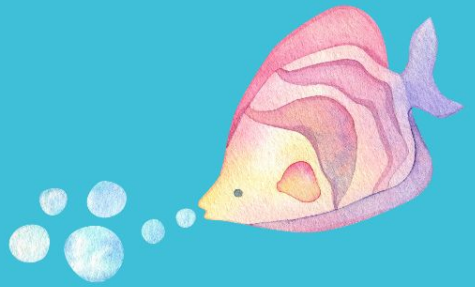
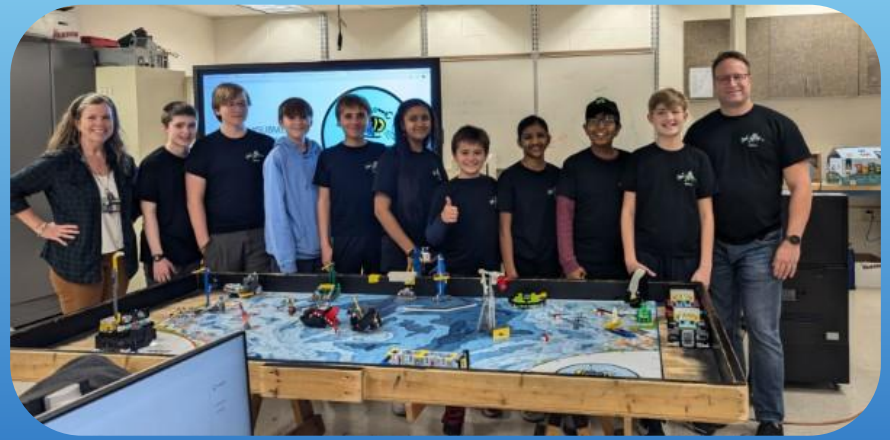
FLL Team #3249
CaptiBytes





Shenendehowa, Clifton Park, NY

THE TEAM



The Problem

In the Ocean there is a lot of trash from many different places, sometimes grouped together by the oceans currents. This garbage also makes it harder for ocean exploration and industry that relies on fish because:

- it makes fish sick,
- can further endanger protected fish, and
- makes it harder for scientist to do their job, and if they do, if it's ecologically dead, what can they look at? rocks?

Our Solution

The Ocean Tracking Craft (OTC) is an autonomous, solar powered ocean roaming machine that not only can clean up trash, like plastic floating on the ocean but also reports water conditions and potential problem such as algae blooms and when endangered fish are spotted.

Our model can also collect small amounts of trash that could target coastal or tourist areas.

Description Of Solution

Features: a latch at the front that is at water level to pick up any trash to sample and analyze, however it makes noise scaring fish away from the machine so they are not caught. The top is covered with solar panels for energy, along with some different instruments to measure things like temperature and salinity. It also uses GPS to navigate and VIAME to identify fish, trash, and anythings else that is specified, and also has pontoons to float and prevents it from flipping.
Extra info:
The OTC launch from bases (e.g. tourist/vacation spots, government ports), launching multiple as needed to cover an area , with if a cloudy day, two returning every hour, (otherwise they can be out for longer) where it will then relay any information it has found on it's journey that can hopefully be used for good, and then sent back out. If it encounters an algae bloom or a rare species and the robot can not see the robot signals back and collects a sample

- Hatch for collecting garbage samples
- Solar panels for power supply and battery storage
- Is able to relay information to different places.

Benefits

The O.T.C has many benefits. First, it helps people locate where trash is, which makes it easier for projects like the Ocean Cleanup to find polluted areas. Second, it is easier for us to study and explore different areas, allows sea creatures to live in a nice clean, trash free ecosystem, and so tourists or vacationers and can also enjoy the water. Cleaner oceans make it easier for exploration of our oceans for scientists and those working to save sea life, (which includes reefs), and the fishing industry.

And lastly, it is more popular to go to clean beaches to snorkel/dive/swim in healthy reefs and clean, pristine water, rather than dead, gray reefs and disgusting brown water that you can't even see because of the trash. Our solution can actually clean the reefs and shores of tourist spots.

Expert: Cerulean and Kitware

Our team has contacted two experts,

1) Kristen Moreau, a manager from the non-profit organization Cerulean (their project is called Sky Truth), which aims to provide organizations who clean up garbage in the ocean information to locate areas that require cleaning using satellite imagery. The project Sky Truth is mainly focused on locating oil spills in bodies of water.
   skytruth.org/Cerulean/
2) Matt Dawkins, an engineer from Kitware, which is a program that uses AI to identify different types of things that are bad for the ocean. www.kitware.com

Who Would Use It?

Governments to clean harbors or garbage near their city or country.

Resorts or hotels on beaches because they make money because of their blue, beautiful ocean, so if it's gross, less money.

Non-profit organizations like The Ocean Cleanup might use it to further their goals of cleaning the ocean.

Research Resources

- ❑ National Geographic article on the Pacific Garbage Patch
- ❑ **International Finance Corporation**
- ❑ National Oceanic and Atmospheric Association (NOAA)
- ❑ Ted Talk - The Great Pacific Garbage Patch
- ❑ Team Seas fundraising project, Mark Rober
- ❑ Natural Resources Defense Council
- ❑ The Marine Mammal Center
- ❑ Center for Biological Diversity

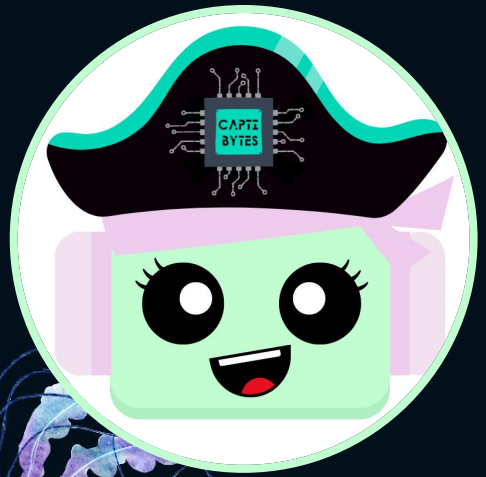
There are about 2 million cigarette butts, the largest of any trash item in the ocean. Don't smoke or vape!

It has been estimated that it would take 67 ships one year to clean under 1% of the oceans trash! That's a lot!

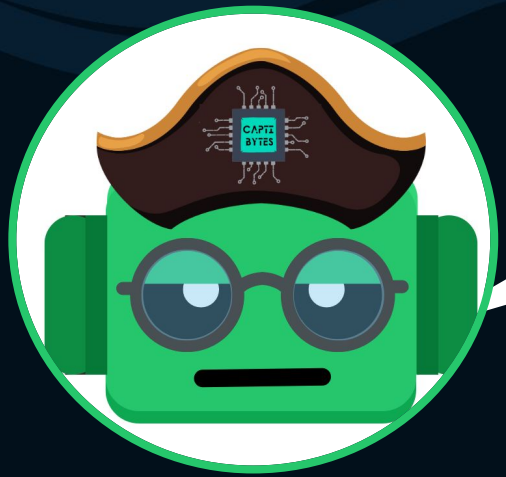
The garbage patches have 250 pieces of trash for every one human.

The GPGP (Great Pacific Garbage Patch) is nearly twice the size of Texas. That's huge!

Some of the trash dates back to 1960. That's super old!



With all the trash, it makes it hard for things like algae and plankton to grow, which can disrupt the food web.



Different animals like albatrosses might mistake trash for food and feed it to their young. It's not very healthy.

Ghost fishing is when abandoned fishing nets still catch and suffocate different sea animals like dolphins or fish.

The garbage islands looks like a lot of cloudy soup because of all the microplastics in it

Other Solutions	How it's similar to our solution	How it's different from our solution
Team Seas	Team Seas used the Interceptor to collect trash in rivers as part of their partnership with The Ocean Cleanup project.	It is not a 2 pronged solution…can collect samples of garbage along beaches but can also roam the ocean collecting data to assist with ocean exploration by using VIAMEthat includes tracking and reporting water conditions and garbage.
The Ocean Cleanup	Created the Interceptor for rivers and System 002 and 003 for the ocean.It's sole purpose is to remove garbage from the ocean	It is not a 2 pronged solution…can collect garbage along beaches but can also roam the ocean collecting data to assist with ocean exploration that includes tracking and reporting water conditions and garbage.

Model Of OTC

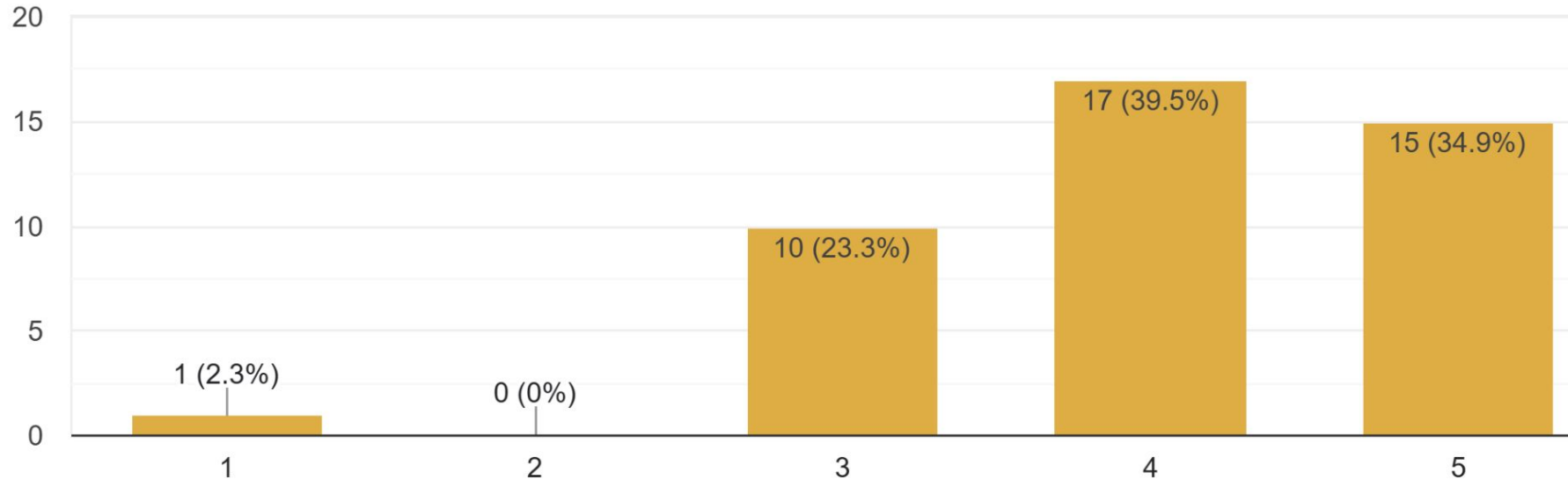
Generated by Ai

OTC

Survey Feedback

How impactful do you think our solution is?

43 responses



Survey Feedback - Problems caused by pollution in the ocean

Innovation Solution - OTC

GitHub