

**Team Number:** ATC-2

**School Name:** Academy for Technology and the Classics

**Area of Science:** Environmental

**Project Title:** Cleaning Oil Spills

**Problem Definition:**

Oil spill effects are fast acting and they affect many organisms in the process. We want to find a way to quickly clean up the oil with the least damage to the environment. We also want to find a method that doesn't affect the ecosystem or the atmosphere. Theoretically we can only have the natural clean up. But the time that it takes to clean up the oil spills is slower in natural decomposition. We need to find a mix of both natural resources and robotic variables to clean effectively and efficiently in the shortest amount of time. If we find the quickest route to clean a natural shaped oil spill we need to see which method would work best.

**Problem Solution:** Our solution is to simulate how sea cleaning drones that work on a bio cleaning system effectively and efficiently clean up the oil spills, with the least amount of damage to the ecosystem, in the least amount of time. Our simulation would represent different patterns the drones could execute to find the most effective system of disposing of the oil. This would be after the spill had occurred, recognizing that containment with the drones would be nearly impossible if they were to be sent out while the spill was occurring.

**Progress to Date:** Currently we have been working on the basic research of the project. We have found various sources containing to the Deepwater Horizon oil spill, how long it generally takes to clean up oil spills, what effects the oil has on the environment, past simulations done about oil spills. We also researched how micro-organisms could be used to clean up oil spills. Following our original idea of a safe and clean way to dispose of crude oil. We have also began research into robots that could be used to suck up and dispose of the oil with the use of gps to operate entirely without human interaction. One example is the Bio Cleaning System that has an acoustic warning mechanism to ensure that fish avoid the robots and the area of the spill. The basic design pumps water into it the robot were bacteria eats up the oil, and then the cleaned water is pumped back into the ocean. The whole drone runs on a hydroelectric system, and is able to track the spread of oil to effectively clean up the oil.

**Expected Results:** We plan to use Scratch to create our simulation of various pathways of cleanup performed by the sea cleaning drones. We expect that the most effective pattern would include setting up the robots along the outer edge of the odd shaped spill and have them work towards the center, with slight overlap between the robots. This will ensure maximum clean up coverage.

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**Sponsoring Teacher:** Jenifer Hooten

**Mentor:** Phil Jones

**Sources:**

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<http://www.govtech.com/fs/perspectives/Can-We-Harness-Bacteria-to-Help-Clean-Up-Future-Oil-Spills.html>