Energy and Environmental Technology - 1TE623, Course of 2020
Oscar Jacobson, oscar.jacobson.9201@student.uu.se, 19990610-8619

The Ocean Cleanup Project: The end of the great pacific garbage patch?

The Great Pacific Garbage Patch is a large area of plastic pollution in the Pacific Ocean that has formed over the past few decades. It is estimated to be roughly twice the size of the American state of Texas, and is composed of millions of tons of plastic debris that have been carried into the patch by ocean currents.

The Great Pacific Garbage Patch has appeared in the near past as a result of the increasing amount of plastic that has been produced and used by humans in recent decades. Much of this plastic has ended up in the oceans, where it inevitably ends up in the garbage patch. The patch has grown over time as more and more plastic has been added to it.

The ocean clean up project is a vital initiative that aims to remove plastic and other forms of pollution from the world's oceans. The need for this project is driven by the fact that plastic pollution has become a major problem in the world's oceans, with millions of tons of plastic entering the oceans each year. This pollution not only harms marine life, but also has negative impacts on human health and the environment as a whole.

One of the main obstacles that the ocean clean up project has had to overcome is the sheer scale of the problem. The world's oceans are vast, and the amount of plastic pollution present in them is enormous. In addition, the plastic that is present in the oceans is often dispersed over large areas, making it difficult to locate and remove.

Despite these challenges, the ocean clean up project has made significant progress in recent years. In order to tackle the problem, the project has developed a number of innovative technologies that are designed to capture and remove plastic from the oceans. These technologies can mostly be categorized as floating barriers and booms, which are used to corral plastic pollution into areas where it can be collected and removed.

In addition to these technologies, the ocean clean up project has also made efforts to engage with communities around the world in order to raise awareness about the problem of plastic pollution and the importance of taking action to address it. This has included educational campaigns, as well as efforts to promote the use of alternatives to single-use plastics and to encourage the recycling of plastic products.

Figure 1: Interceptor drones at work with the system 002 pollution catcher

The so called interceptors are a key component of the ocean clean up project and make the main components in every pollution catching system. There are a multitude of interceptors and every one of them has been designed with a specific problem in mind. The most famous interceptors are autonomous boats, also known as drones or robots, that are used to collect plastic pollution from the oceans.

The drone interceptors operate by following a predetermined route through the oceans, using sensors and navigation systems to locate and collect plastic pollution along the way. Once the plastic has been collected, it is stored on board the interceptor until it can be transported back to shore for processing and disposal.

The use of autonomous boats for the purpose of collecting plastic pollution has several benefits. One of the main benefits is that it allows the project to cover large areas of the oceans in an efficient and cost-effective manner. This is due to the interceptors being able to operate for extended periods of time without the need for human intervention, and therefore collect large amounts of plastic during all hours of the day.

Another benefit of the drone interceptors is that they are able to operate in a variety of sea conditions, including rough seas. This is important because plastic pollution can be dispersed over large areas of the oceans and can be difficult to locate and collect. The use of autonomous boats allows the project to locate and

Figure 2: Different types of river barriers, left one is interceptor 007 in LA County and right one is interceptor 006 in Guatemala.

collect plastic pollution even in areas that are difficult to access or where sea conditions are challenging.

In Figure 1 two drone interceptors are seen with the plastic pollution catcher *system 002*. *System 002* is a key component of the ocean clean up project and is the current pollution catcher system in use behind the drone interceptors. The catcher system is a floating boom that is designed to funnel plastic pollution into a specific area, where it can be collected and removed from the oceans.

One of the main features of the plastic pollution catcher system 002 is its ability to capture and retain plastic pollution even in slightly rough sea conditions. This is achieved through the use of a series of floating barriers and anchors, which hold the boom in place and prevent it from being pushed around by waves and currents.

The other main type of interceptor is the river barrier, although not as flashy as the autonomous boats, the river barrier interceptors seen in Figure 2 are of utmost importance. According to the calculations of the ocean cleanup team 80% of all plastic that ends up in the ocean can be traced to about one thousand rivers.

Rivers also act as a final bottle neck that gathers up all the inland plastics at very concentrated points of interest before the problem reaches the ocean. Letting plastics flow freely in rivers would complicate the gathering process immensely. Controlling the outflow of one thousand rivers is a way smaller task than that of continuously cleaning up the ocean which is why the solution may be way closer than one might think.

Rough weather is currently the main issue that the open ocean pollutant catcher is facing. The system being disturbed and pushed around is a problem in two ways.

Firstly, disturbances cause a lot more wear and tear on the large collection systems. Even though the nets used to gather and capture plastics are professionally made using the latest technology from the fishing industry, there is no guarantee that the pollutant catcher won't break. Setting standards such as allowing for fish to be able to move unhindered through, or around, the nets also limit the construction of the catchers where marine life safety might be prioritised over system durability.

Secondly, disturbances cause plastics to move in unpredictable ways, often pushing plastics out of desired areas in the collection process. A lot of plastics are, for example, shoved over the catcher by the waves in rough sea making the collection process more inefficient. In terms of what is to be expected from the next generation of plastic pollution catcher systems, it is likely that they will continue to be designed with the goal of capturing and retaining plastic pollution even in rough sea conditions.

There have been concerns raised about the potential for autonomous boats used in the ocean clean up project to contribute to carbon pollution. Carbon pollution, also known as carbon dioxide (CO2) emissions, is the release of CO2 into the atmosphere, which is a major contributor to climate change.

One issue with the use of autonomous boats in the ocean clean up project is that they rely on fossil fuels, such as gasoline or diesel, to power their engines. The burning of fossil fuels releases CO2 into the atmosphere, which contributes to climate change. The manufacturing and transportation of these boats as well as the processing and disposal of the collected plastic contribute to CO2 emissions.

Another issue is that the use of autonomous boats may lead to an increase in shipping traffic, as these boats are used to transport the collected plastic back to shore. The shipping industry is a major contributor to carbon pollution, as the burning of fossil fuels to power ships releases large amounts of CO2 into the atmosphere.

As a side note, most plastics today are not recycled, in America only roughly 9% of all plastics used are ever recycled. The market for recycled plastics is very small and continuous resistance from various political and corporate interests have historically slowed down the progress towards a market making use of renewable or recycled plastics. For the project to succeed in removing all plastic pollution there also has to be steps taken in society, both politically and industrially to reduce

and reuse plastics wherever possible.

Poor regions of the world tend to be affected more harshly by pollution and environmental issues in general. A very famous example of this is Coca-Cola importing one-use plastics to poor countries without making sure that these areas have an adequate way of handling the extra waste. Large corporations often take advantage of countries with lacking infrastructure and less strict regulation to cut the cost of distribution and production. Increasing profits when doing so, but leaving the already poor communities to deal with an insurmountable problem.

The ocean clean up project has generated a significant amount of exposure on social media, with many people expressing excitement and support for the initiative. This recent gain in publicity has been fueled by the project's focus on addressing a pressing environmental problem with the use of innovative technologies and strategies.

One of the key factors that has contributed to the hype around the ocean clean up project is the high level of public interest in environmental issues. As people become more aware of the impact that humans are having on the planet, there is a growing desire to take action to protect the environment and to address pressing environmental problems. The ocean clean up project has captured this public interest by focusing on an issue that is both visible and tangible.

In addition to its focus on a pressing environmental issue, the use of autonomous boats, or drones, to collect plastic pollution has captured the public imagination, as has the development of new technologies to capture and remove plastic from the oceans. The fact that the project is using cutting-edge technologies and approaches has made it more appealing to social media users and has helped to generate buzz around the initiative.

The hype created around the ocean clean up project on social media has had a number of positive impacts. It has helped to raise awareness about the problem of plastic pollution in the oceans and has encouraged people to think about their own environmental impact. It has also helped to generate support for the project and to draw attention to the flaws of the current use of plastics worldwide.

There is still a long way to go before the Pacific Ocean is plastic-free. The ocean clean up project has made significant progress in addressing the problem of plastic pollution in the Pacific Ocean. However, the great pacific garbage patch is vast and the amount of plastic present in it is enormous, so it will likely take many more years of cleanup efforts to fully address the problem.

In terms of how far we have come with respect to the previous state of the Great Pacific Garbage Patch, it is difficult to say with certainty as there has been limited data available on the patch in the past. However, it is clear that the problem of plastic pollution in the Pacific Ocean has been growing in recent decades and that the patch has become increasingly large and dense over time.

The ocean clean up project is an important initiative that is addressing a major environmental problem and is making a positive impact on society. By engaging with the general public and raising awareness about the problem of plastic pollution, the project is helping to build support for the important work that it is doing and hopefully inspiring future changes in industry, politics as well as in everyday life.

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