

John Sargent Lecture

Tuesday 5th March 2019 at 18:30hrs
(following CEDA AGM at 18:00hrs)

Institution of Civil Engineers, One Great George Street, London, SW1P 3AA
 (Refreshments available from 17:30hrs)

THE PLASTIC PROBLEM

Presented by

Lonneke Holierhoek - The Ocean Cleanup



(©The Ocean Cleanup)

Every year, millions of tonnes of plastic enter the ocean. Ocean plastic pollution impacts the environment, the economy and humans.

A significant percentage of the plastic that enters the world's oceans drifts into large systems of circulating ocean currents, also known as gyres. There are five gyres in the world's oceans and the largest of these is known as the Great Pacific Garbage Patch, halfway between Hawaii and California. Once trapped in a gyre, the plastic will break down into micro plastics and become increasingly easier to mistake for food by sea life - and so it enters the food chain. Plastic pollution is conservatively estimated to have a yearly financial damage of 13 billion USD.

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TECHNOLOGY-BASED SOLUTION

The Great Pacific Garbage Patch is stretching over an area twice the size of Texas and contains 80,000 metric tonnes of floating plastic. Since the plastic is so dispersed, going after it with vessels and nets would not be feasible. This is why The Ocean Cleanup has developed a passive cleanup technology, to first concentrate the plastic, so it can be scooped up and brought back to shore for recycling. The Ocean Cleanup's passive technology is designed to work with the natural forces of the ocean to collect plastic debris. The system's two main components are 1) its buoyant u-shaped floater; and 2) a screen attached, hanging 3 meters below the surface.

The system is pushed forward by the wind, currents and waves, whilst the plastic is predominately pushed forward by the currents only, as it sits just below the surface. The system is therefore moving faster relative to the plastic, and thus captures it.

On September 8, 2018, The Ocean Cleanup launched their first ocean cleanup system from San Francisco out into the North Pacific, en route to the Great Pacific Garbage Patch. This deployment gives The Ocean Cleanup an opportunity to test the technology at full scale. The system will be monitored closely, and the lessons learned will be implemented in the design of the next following system, before starting the scale-up to full fleet. The Ocean Cleanup aims to launch 60 cleanup systems in the Great Pacific Garbage Patch, and in doing so, be able to remove 50 % of the patch every 5 years.

LONNEKE HOLIERHOEK

Lonneke Holierhoek, has a Master's degree in Technical Mathematics from Delft University of Technology (1993) and graduated as a Civil Engineering Surveyor / Quantity Surveyor with the Chartered Institution of Civil Engineering Surveyors (2002). Lonneke has over 20 years of experience in the maritime and offshore construction industry, from companies such as the Dutch dredging and offshore contractor Van Oord, its predecessors Ballast Nedam Dredging, HAM/Hollandsche Beton Groep as well as Offshore Independents. Lonneke started her career in the marine offshore industry as a risk analyst after which she transitioned into increasingly more managerial roles. She joined The Ocean Cleanup as COO in 2017, when the team transitioned from inventing to execution of its ambitious plans.

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