

19-Year Old, Boyan Slat, masterminds Ocean Cleanup

By [Georgina Hill](#), Science Editor (2015/16)

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Every year about 8 million tons of plastic enter the ocean. Most of it degrades into tiny fractions that poison aquatic organisms: turtles are suffocated by plastic bags, lighters and toothbrushes are found in the stomach of ocean birds. Furthermore, plastics act as sponges, absorbing toxic chemicals such as DDT (*dichlorodiphenyltrichloroethane*) that bio-accumulate in the food chain. Not only does aquatic plastic pollution harm the health of organisms, it harms the economy – tourism is lost and the cost of clean up amounts to approximately 8 billion pounds per year.

Ecosystem analysis shows that plastic concentrations are highest in the five major subtropical gyres as debris is trapped in these slowly circulating bodies of water. However small plastic fragments are suspended in the water column throughout the world. As most debris is “microplastic”, the size and impact of these “garbage patches” is hard to visualize, therefore the problem is often neglected. However, precocious teenage student and entrepreneur Boyan Slat offers a solution in the form of the Ocean Cleanup Array. He presented his idea at the TEDx in Delft University of Technology and it won a prize for “Best Technical Design”. It’s hard to not be impressed.



Boyan at the TEDx event that brought his idea into the spotlight Image: TEDxDelft/_43P0704

So, how will the Ocean Cleanup Array work to save the sea? It consists of a series of long, stationary floating barriers that take advantage of natural ocean currents thus saving massive amount of energy. Most plastic is found in the top three meters of water therefore the barriers catch plastic, concentrate debris and force it in the direction of attached processing platform. Phase one of Slat’s project has proven that the system does work. A 40meter proof-of-concept boom was stationed in the Atlantic, successfully capturing plastic and moving it along the barriers for processing.

At these stations small plastic is filtered from water by slurry pump and centrifuge, whilst a mesh conveyer scoops larger pieces up. This is a similar system to those used by existing technologies. Solar panels are the stations primary energy supplier making it a very green technology. The design is highly efficient, an estimated 7900 times faster; cost effective at 33 times cheaper than conventional methods and storm resistant.

Will the system disturb aquatic life? No! Ocean currents flow under the barriers and no nets are involved preventing by-catch and environmental disturbance. Due to its size microscopic plankton is not caught up

in the processing of seawater. Nevertheless research into plankton biomass reduction showed that even if all plankton encountering the boom are damaged, biomass would be restored in less than 7 seconds per year!

In the next 3-4 years Slat aims to deploy a full-scale pilot. This major next step needs funding for up-scaling tests and further research from companies, institutes and individuals, but if the array is built, it would become the largest ocean clean up technology ever deployed!



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