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READING :

What happened to The Ocean Cleanup — the system that would rid the oceans of plastic? Australian Broadcasting Corporation (ABC) - Science

By environment reporter Nick Kilvert – Posted Thu 16 Mar 2023

Remember The Ocean Cleanup? It was the ambitious plan hatched by a young Dutch entrepreneur to “rid the world’s oceans of plastic”. If not, here’s a quick refresher:

5 In 2013, 18-year-old Boyan Slat dropped out of an aerospace engineering degree after a TEDx talk he presented the previous year went viral. In his talk, Mr Slat laid out his belief that a well-designed, floating system of nets could clean up the Great Pacific Garbage Patch — a concentrated gyre of plastic in the Pacific Ocean — “within five years”.

10 Riding the huge wave of publicity after his presentation made its way to YouTube, Mr Slat launched a crowdfunding campaign, then a feasibility study, and eventually began working on prototypes for a system to remove from the world’s oceans “90 per cent of floating plastic by 2040”. While few could question the principle, or Mr Slat’s belief in the project, many questioned its feasibility.

In the years since The Ocean Cleanup was launched, designs have been tested, failed, refined, and tested again. Mr Slat has jokingly referred to the failures as “unscheduled learning opportunities”.

In the meantime, the plastic problem in the world’s oceans has grown much worse.

15 So it’s worth checking back in on The Ocean Cleanup, and whether Mr Slat’s dream is any closer to becoming reality.

Timeline of ‘unscheduled learning opportunities’

2018: Wind- and wave-powered System 001 — “Wilson”

20 In 2018, after several years of testing, the System 001 prototype was launched — a 600-metre-long free-floating pipe with a net 3m deep suspended under it. Early results in the Pacific Ocean weren’t too promising: The net was being pushed in the current along with the plastic it was supposed to be collecting. Then, rough seas broke an 80m section of the net free, and the apparatus was towed back to port to be patched up.

25 Critics including physical oceanographer Kim Martini, who spoke to the ABC at the time, were worried the design had the potential to trap sea life, and become a floating piece of garbage itself.

2019: System 001B

30 After months of repairs, the same system was sent out with a sea anchor — similar to a parachute in the water — to slow it down and increase its plastic yield. But again, it didn’t hold onto much of the plastic. After a minor tweak, Mr Slat reported in October 2019 they had managed to recover a relatively small amount of plastic from the Great Pacific Garbage Patch for the first time. The idea with this free-floating system, which was fitted with GPS transmitters, was that a ship would visit every few months or longer to pick up plastic gathered in the nets. From the outset, Mr Slat pitched the idea of a passive system that would harness the currents of the ocean to move it around. That design was mainly about keeping down costs, Mr Slat explained at a press conference in

35 Rotterdam in 2019.

“If you were to simply trawl for plastic, it would take [an] untold amount of time and be really expensive.”

2021: System 002 — “Jenny”

40 Given that pre-requisite, there was an interesting addition to the design launched in 2021.

Dubbed “Jenny”, System 002 had not one but two ships towing its 800m-long net through the water to give it “active propulsion”. The problem with the earlier passive design was that it just wasn’t gathering enough plastic. According to The Ocean Cleanup, to be effective at scale, it would have needed to deploy hundreds of passive systems, which was “unfeasible”. System 002 also had a long pocket added in the middle of the net where trash could be funnelled and accumulate. Speaking on the addition of ship power, Mr Slat said cleaning the oceans was

45 the priority, rather than the method used. In late 2021, and again in 2022, The Ocean Cleanup announced several large hauls of plastic had successfully been brought aboard the mother ship. Sceptics pointed out that the trash was too clean and well-preserved to have been floating in the Pacific for years. But The Ocean Cleanup countered that low nutrients and exposure to UV in the garbage patch explained the lack of growth or biofouling.

50 According to The Ocean Cleanup, it collected more than 153 tonnes of plastic from the Pacific in 2022.

2023: System 002B and 03?

Which brings us to now.

55 The Ocean Cleanup is currently testing System 002B, which includes, among other things, an onboard plastic compactor. And it says it’s in the process of scaling up to System 03, which will be three times the size of the 800m 002 prototype, and will likely be the model it rolls out at scale.

According to The Ocean Cleanup website, a system the size of 002 could theoretically clean up the garbage patch, but that it would be “impossibly expensive”. As well as refining the design of System 03, The Ocean Cleanup says it’s working on its “key performance indicator” — cost-to-cleaning ratio.

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Will it work?

In earlier iterations of the project, Mr Slat himself said that ship-driven nets would be prohibitively expensive — hence the attempts at a passive system.

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According to Alistair McIlgorm from the Australian National Centre for Ocean Resources and Security, the cost to run the vessels in the new system would be enormous.

“The fundamental problem would be that ... the two vessels that he has, those fishing vessels, cost \$15-\$20,000 a day. For low-value plastic to recycle, that’s not sustainable,” Professor McIlgorm of the University of Wollongong said.

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With 10 of those systems operating, day in, day out, the bills would stack up very fast.

But if Mr Slat’s viral TEDx talk showed anything, it was that he is very good at selling an idea.

Though many of the predictions from his original pitch have failed to materialise, The Ocean Cleanup has been incredibly successful at raising money.

In a single fundraising drive during the six months to May 2017, for example, it raised over \$32 million.

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The group also has a legion of partnerships with global companies — among them banks, shipping companies and major soft-drink labels. It’s also the beneficiary of philanthropists and government sponsors.

So presuming it can find a way to overcome the hurdle of funding the operation, can it succeed?

One major problem it’s going to face, according to Professor McIlgorm, is that the garbage patch isn’t a uniform island of plastic.

Some places have lots of plastic while other areas are sparse.

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“[But] if the plastic density was a tenth of what it is in those [Ocean Cleanup] videos, they’ll just be sailing around at sea wasting fuel and everything else.”

For their part, The Ocean Cleanup say they’re using computer modelling and sophisticated ship navigation technology to concentrate their efforts on the denser accumulations.

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But the same issue arises the more they clean up. In other words, the more you clean, the less rubbish you’re going to be retrieving while burning through loads of fuel to do it.

Which leads to the third issue. If you stop, the patch will eventually fill up again.

The UN estimates at least 14 million tonnes of plastic enter the oceans every year.

“The trouble is, and the old saying is, if you depend on clean-up, you’ll be cleaning for the rest of your life. You have to get into prevention,” Professor McIlgorm said.

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Amanda Reichelt-Brushett, a marine ecotoxicologist at Southern Cross University, said the work The Ocean Cleanup is doing in the Pacific can help get the ball rolling on the necessary prevention that is needed.

“Those type of images [of the clean up of the Great Pacific Garbage Patch] send messages to help change people’s behaviour,” Professor Reichelt-Brushett said.

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“They’re really important visual messages that go towards awareness raising and dealing with the problem at its source.”

In turn, she said, the community can put pressure on industry and industry regulators.

“It’s important that [industry] take responsibility for that whole life cycle assessment process — cradle to cradle rather than cradle to grave.”

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What does prevention look like?

Although The Ocean Cleanup’s netting project in the Pacific gets the lion’s share of attention, its own statistics suggest it’s had far more success closer to shore.

It’s rolled out 10 “interceptors”, including trial versions, to collect rubbish in rivers in the US, Jamaica, Central America and Asia.

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In 2022, The Ocean Cleanup collected more than 153 tonnes of garbage from the ocean. But its interceptors gathered nearly 840 tonnes from river systems.

Mr Slat has said that the interceptors are about “[turning off] the tap” and that The Ocean Cleanup aimed to “tackle” pollution in the world’s 1,000 most polluted rivers.

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Professor McIlgorm said focusing its funding on its onshore projects would have a bigger impact at this stage than trying to clean up the Great Pacific Garbage Patch.

“I’ve done projects up in Jakarta, in Indonesia, holding workshops and trying to work out why the marine debris is there.

“The main problem was just a lack of a domestic bin system. People put plastic bags out, basically the dogs got them, the rain got them, the wind got them.

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“The best estimate was that only about 50 per cent of domestic trash got to any form of organised dump. But then at the dump, it didn’t have good fences. So the wind was blowing it all over the place.

The Cocos (Keeling) Islands consist of two small coral atolls around 2,000 kilometres off the coast of northern Western Australia.

Despite a population of around 600 people, they’re drowning in trash from just a couple of Indonesian rivers.

120 Charitha Pattiaratchi, a multidisciplinary researcher from the University of Western Australia, said the plastic situation on Cocos (Keeling) Islands clearly demonstrated the importance of cutting off waste at the source. “The Cocos Islands get 27 tonnes of plastics a year [washing up],” Professor Pattiaratchi said. “Now we’ve found out that three rivers in Indonesia provide 80 per cent of the plastics to the Cocos.” He said better infrastructure along with education were the best preventative measures for stopping plastics entering the oceans.

125 “The ideal place is stopping it at the land. Failing that, then target the rivers. “[Oceanic] garbage patches are the end of the pathway.” But once the plastic was in the middle of the ocean, the method used by The Ocean Cleanup was about the best we’ve got, Professor Pattiaratchi said.

130 “That’s about the only way you can do it, unfortunately.”

The Ocean Cleanup’s self-defined benchmark of success is whether it can reduce ocean plastic by 90 per cent by 2040. Whether its efforts in the Pacific can ever fulfil its promise remains to be seen.

135 Given its track record of adapting to “unscheduled learning opportunities”, it may be that it turns its focus more to onshore solutions like interceptors in future. But given the massive and growing problem that plastic pollution is, Professor Reichelt-Brushett said, at this stage, anything was better than nothing.

140 “I definitely think it’s a piece of the puzzle,” she said. “I think everyone that invests time and effort is making a small difference.”
(The Ocean Cleanup was contacted for this story, but did not respond by deadline.)

Document 4:

LISTENING

The Other Source: Where does plastic in the Great Pacific Garbage Patch really come from?

The Ocean Cleanup

<https://youtu.be/CqnMjYlmNyQ>

Watch this video and find out where ocean plastic comes from.