

## BACKGROUND

Millions of tons of plastic are polluting our oceans, killing over one million seabirds and one-hundred thousand marine mammals each year. Impacting human health and causing billions of dollars of economic damage. However, a cleanup of our oceans has always been deemed impossible, costing billions of dollars and thousands of years.

19-year old Boyan Slat disagrees. His solution is a concept to passively clean the oceans of plastic in just several years' time. The concept would utilize the natural currents to let the oceans clean themselves, in what would become the largest cleanup in history.

## THE OCEAN CLEANUP TEAM

The Ocean Cleanup foundation was founded by **Boyan Slat** (Dutch, 27-07-1994), and now has over 100 volunteers, whom are mainly scientists and engineers. Thanks to the support of more than 15 institutions and companies and 3000 funders The Ocean Cleanup has been able to perform a large amount of research.

## THE PROBLEM

### Great Pacific Garbage Patch

- ❖ Is one of the 5 areas called 'gyres' where ocean currents converge, concentrating plastic pollution
- ❖ Every square km of gyre contains hundreds of thousands – and up to millions - of pieces of plastic
- ❖ Concentration of plastic is extremely high, and spread over millions of square km
- ❖ In total an estimated 500.000.000 kg of plastic float in the oceans

### Sea life

- ❖ Over one hundred thousand mammals and a million seabirds die each year because of this plastic, either through ingestion or entanglement
- ❖ The survival of many species, including the Hawaiian Monk Seal and Loggerhead Turtle, could be jeopardized by plastic debris
- ❖ Toxic chemicals (including PCBs and DDTs) are absorbed by the plastic, increasing the concentration a million times
- ❖ After being ingested by fish, these persistent organic pollutants bio-accumulate in our food chain

## THE SOLUTION

### Conventional cleanup methods

- ❖ Conventional cleanup methods have been based on vessels with nets
- ❖ This would take billions of dollars and thousands of years
- ❖ Bycatch and emissions would likely cancel out the good work

### The Ocean Cleanup Concept

- ❖ Basic principle: "Why move through the oceans, if the oceans can move through you?"
- ❖ The Concept consists of an array of floating barriers that passively catches and concentrates the debris, and a 'collection' platform that efficiently extracts the debris. The ocean current passes underneath the barriers, taking all neutrally-buoyant sea life with it, preventing bycatch
- ❖ To prove The Ocean Cleanup Concept can be executed, an extensive feasibility study was conducted
- ❖ The feasibility study took 400 days to finish, the report is 530 pages
- ❖ The feasibility study concluded the concept 'likely is a feasible and viable method for large-scale, passive and efficient removal of floating plastic from the North Pacific Garbage Patch'

# FACTSHEET

THE OCEAN  
CLEANUP®

June 2014

## BOARD

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Founder & President

**Frans Ratelband**  
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**Femke Hoes**  
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## MANAGEMENT

**Boyan Slat**  
Founder & President

**Florian Dirkse**  
General manager

**Jan de Sonnevile**  
Lead engineer

June 2014

**Why The Ocean Cleanup Concept works**

- ❖ Most of the plastics can be found in the top 3 meters, and will be gathered by the barriers
- ❖ The plastic travels along the barriers, proven by both computer simulations, and a 40 m long barrier test setup in the Atlantic
- ❖ The environmental impact of the concept is negligible
- ❖ No major legal hurdles have been identified
- ❖ Ocean plastic is just as suitable as normal waste plastic to be turned into oil (using pyrolysis)
- ❖ Almost half of the plastic within the North Pacific Gyre (about 70.000.000 kg) can be removed within 10 years

**How The Ocean Cleanup Concept works**

- ❖ The largest structure ever deployed on the oceans, by two orders of magnitude
- ❖ The structure consists of a single 100 km array: two arms of over 50 km in a V-shaped configuration concentrate the plastic, with a collection platform placed in the center
- ❖ The platform has a 10,000 m<sup>3</sup> buffer size, and will be emptied every 1.5 months
- ❖ A passive structure with 162 solar panels acting as the primary power supplier

**Costs of The Ocean Cleanup Concept**

- ❖ The Ocean Cleanup estimates the cost of removing 1 kg of plastic at € 4.53
- ❖ This is 33 times cheaper than conventional ocean cleanup methods, while also being an estimate 7900 times faster

**THE NEXT PHASE****Next phase of The Ocean Cleanup Concept**

- ❖ Goal: Large-scale and fully operational pilot in 3 to 4 years' time
- ❖ A series of up-scaled tests, oceanographic field research and in-depth engineering to eliminate uncertainties and optimize technical design
- ❖ To help fund this major next step, a crowd funding campaign has been started, see: [www.theoceancleanup.com](http://www.theoceancleanup.com)

**TIMELINE**

<b>Summer '11</b>	Boyan Slat, then 16 years old, was diving in Greece and was coming across more plastic bags than fish...
<b>Sept '11</b>	Together with a high school friend, Boyan started investigating the plastic pollution problem, and why it was so difficult to clean it up
<b>April '12</b>	The high school science project was awarded Best Technical Design at Delft University of Technology
<b>Sept '12</b>	Boyan started studying Aerospace Engineering at the Delft University of Technology
<b>Oct '12</b>	Boyan presented: "How the Oceans can Clean Themselves" at TEDxDelft
<b>Feb '13</b>	Boyan paused his study to fully focus on developing The Ocean Cleanup Concept
<b>March '13</b>	The Ocean Cleanup story went viral on social media
<b>April '13</b>	Crowd funding campaign was started, 80.000 dollars collected in 15 days
<b>May '13</b>	Boyan recognized as one of 20 Most Promising Young Entrepreneurs Worldwide
<b>Nov '13</b>	1st expedition to the North Pacific Garbage Patch at the North Atlantic Gyre
<b>March '14</b>	Large scale test near Azores Islands
<b>June '14</b>	The Ocean Cleanup Release Event in NY (USA) and Delft (the Netherlands)