

# THE OCEAN CLEANUP MEGA EXPEDITION

## AUGUST 2015

### ABOUT THE OCEAN CLEANUP

- Founded in 2013 by (then 18-year-old) Boyan Slat
- Currently employs over 25 people and has 100+ operational volunteers
- Develops advanced technologies to rid the oceans of plastic
- According to computer modelling, a single 100 km-long Ocean Cleanup Array will be able to clean up half the Great Pacific Garbage Patch in 10 years' time
- \$2.2 million was raised during a crowd funding campaign in 2014
- The first pilot will likely be deployed in Japan in 2016
- This pilot will span 2000 meters, and will be operational for at least two years
- The cleanup of the Great Pacific Garbage Patch is scheduled to start by 2020
- More information on the technology and organisation can be found on [www.theoceancleanup.com](http://www.theoceancleanup.com)

### ABOUT THE MEGA EXPEDITION

- 37 vessels are participating. 35 of them are voluntary participants, and 2 (the mothership and support vessel) of them have been chartered
- Approximately 50 transects through the Great Pacific Garbage Patch will be performed.
- The vessels will jointly cover close to 100,000 nautical miles (180,000 km)
- The research area is approximately 3,500,000 km<sup>2</sup>. This equals to more than 1/3rd of the surface area of the United States
- Most of the vessels will embark from Honolulu
- The vessels will arrive either in San Francisco or Long Beach, California
- The largest vessel participating is the 171ft R/V Ocean Starr, serving as the mothership for the fleet
- The smallest vessels are around 40ft in length
- The scientific objective for the Mega Expedition is to determine the spatial distribution and size distribution of plastic pollution floating in the Pacific Ocean. This should allow The Ocean Cleanup to know how much plastic (by mass) is floating in the Pacific
- The Mega Expedition will be the largest ocean research expedition in history
- The Mega Expedition is the first-ever multi-vessel expedition to study plastic pollution.

- If successful, the Mega Expedition will collect more data in three weeks' time than was gathered in the last 40 years combined
- Each vessel will conduct 6 one-hour trawls per day using a 'manta trawl' to quantify the amount of small debris at a given location
- Twice a day, the crew will use a custom-built smartphone app to log the amount of large objects floating by
- The mothership has been fitted with two 6 meter-wide nets, allowing it to better quantify the large debris
- To quantify the largest and rarest debris, the mothership has also been fitted with an aerial camera system. A camera attached to a 32 m<sup>3</sup> helium-filled balloon will be raised to an altitude of 100 meters (300ft), allowing The Ocean Cleanup to cover a large area. It will capture about 60,000 images during its voyage

### AFTER THE EXPEDITION

- Following the Mega Expedition, samples will be sent to *The Ocean Cleanup's Ocean Plastic Lab* in Delft, The Netherlands
- It will take 5 full-time people about 5 months to analyse the samples. We estimate about 10 million pieces of plastic will be caught during the Mega Expedition
- The results will be published in a scientific journal
- The results of this study will be used to further develop our cleanup technology. It will allow us to determine the cleanup's economics. Furthermore, it will help us make sure the system will be able to handle the amount of plastic it will encounter

### THE PLASTIC POLLUTION PROBLEM

- 1/3rd of all of the world's ocean plastic pollution is concentrated between Hawaii and California
- According to the UN, ocean plastic causes at least 13 billion USD of direct damages to the global economy each year
- Over 100 species are currently endangered by plastic pollution
- 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