Travis Anderson
3140 MW2

The Ocean Cleanup is a non-profit organization that develops advanced technology to rid the world's oceans of plastic. Their team consists of more than 80 engineers, researchers, scientists, and computational modelers working daily to accomplish this goal. Founded in 2013 by inventor Boyan Slat, The Ocean Cleanup aims to tackle one of the biggest environmental issues of our time.


The Ocean Cleanup's ultimate goal is to remove 90% of the oceans' plastic by 2040. They are accomplishing this goal by taking estimates of global plastic emissions from rivers into the ocean, and developing global models for plastic waste generation. Their data shows that 1,000 of the most polluted rivers in the world are responsible for 80% of the ocean plastic pollution. In these rivers, they plan to deploy proprietary technology that captures plastic particles and places them into containers to be transported to proper disposal sites. The Ocean Cleanup has already deployed two of these machines, called Interceptors, in Indonesia and Malaysia. The Interceptor is an autonomous and scalable solution to prevent debris from entering the ocean, which they plan to deploy to the most polluted rivers over the next five years. Each one of these machines is equipped with off-grid power generation via solar panels & batteries, a 4G data uplink, measurement systems for extracted debris & local weather conditions, a remote monitoring dashboard, and an automated extraction control system. The Ocean Cleanup Claims that fully operational Interceptors can extract up to 50,000 kg of debris a day; at optimal efficiency, this capacity can theoretically be as high as 100,000 kg a day.

The Ocean Cleanup and their Interceptors have been successful due to their hardworking team of researchers, engineers, and data scientists. They are a relatively small team, with only about 80 employees, however their progress has been extremely significant. Current job postings for The Ocean Cleanup include positions for Computational Modeler and River Data Scientist.

Travis Anderson
3140 MW2

The Computational Modeler is responsible for performing advanced data analyses and dynamic modeling in order to understand the ocean system's behavior and the behavior of the plastic. Some of the Computational Modeler's responsibilities include creating computational fluid dynamics simulations, oceanographic and sea-surface current and wave models, and developing Ocean Cleanup system concepts. For this position, it is imperative to understand CFD software, such as ANSYS / Star CCM+ / XFlow, as well as being proficient in Matlab, Python, and database management such as SQL.

*"We are currently designing a completely new type of structure which will operate in the open ocean. This comes with many challenges; understanding the exact conditions to design for and the effects of certain design changes are key to success. I am looking forward to expanding our team of outstanding computational modelers with another bright thinker and modeler, such that we can bring our system design to the next level."*

***– Arjen Tjallema, Technology Manager***

The River Data Scientist is a part of the Data & Monitoring Team, the team that was responsible for identifying the 1,000 most polluted rivers in the world. Data from their research campaign, the Interceptors, and online databases needs to be processed, organized, and visualized in order to support their Engineering, Operational, and Business Development teams as well as to understand the plastic pollution in rivers. The River Data Scientist structures incoming data and makes sure that the data is presentable and accessible. The Data Scientist must be capable of handling, structuring, and organizing large data streams from various sources, which requires experience with database systems such as SQL. Other skills include geographic information system mapping with ArcGIS, standard statistical techniques and modelling, and proven programming skills in Python.

*"The Data & Monitoring Team supports the development and deployment of Interceptors by researching the spatial and temporal behavior of plastic in rivers and providing all relevant data on rivers where deployments are planned. We collect data, create models, and collaborate with universities across the globe to obtain an accurate knowledge of plastic-emitting rivers. If you are a structured person who combines data science skills with an affinity for hydrology, then this is the opportunity you are looking for."*

***– Lourens Meijer, Team Lead Data & Monitoring***

Travis Anderson
3140 MW2

***Notes & Resources***

The information used  in this write up came from the organization directly via their website, theoceancleanup.com. The Ocean Cleanup is very transparent about their progress and technological developments. They provide PDFs containing the specifications of their Interceptor machines as well as data presentations on their findings and achievements.

Some useful links:

https://theoceancleanup.com

https://phys.org/news/2020-01-solar-powered-barge-key-interceptor-plastic.html

https://www.usnews.com/news/business/articles/2019-10-27/dutch-inventor-unveils-device-to-scoop-plastic-out-of-rivers