Drones used in fight against plastic pollution on UK beaches

On a beach in Kent, Peter Kohler and Ellie Mackay are teaching a drone how to see.

Their project, Plastic Tide, aims to create software that will automatically pick out the pieces of plastic that wash up here on the shingle[1].

"One of the major challenges we face is that we can only account for 1% of those millions and millions of tonnes [of plastic] that are coming into our oceans every year," Mr Kohler told Sky News.

"So the question is, where is that 99% going?"

He added: "We just don't know. It could be in the water, it could be in wildlife, or it could be on beaches.

"And so what the Plastic Tide is doing, it's using drone technology to image beaches in a way that's never been done before, on a scientific scale. So that you can build up a picture of how much of that missing 99% is washing up on our beaches."

Mr Kohler and Ms Mackay use an off-the-shelf drone. They select the area of beach they want to film and a free app comes up with a survey pattern flight path - the drone moves systematically up and down the beach as if it were ploughing it.

The images taken are then uploaded to a scientific crowd-sourcing platform called Zooniverse.

Anyone can log on, look at the images and tag bits of plastic in them.

That will build up a huge amount of data, which will be used to train a machine-learning algorithm to spot plastic by itself - no humans required.

The hope is that, eventually, anyone will be able to fly a drone, take images, then computers will automatically scan the images and determine the levels of plastic pollution on a beach.

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This summer, Mr Kohler and Ms Mackay will travel all 3,200 miles of the UK coastline, surveying beaches.

Plastic Tide is also collaborating with two researchers at Imperial College.

In an underground laboratory, Jose Alsina and Erik van Sebille tend to a huge wave tank.

Controlled with a smartphone app, they can programme the tank to simulate any sort of coastline.

Then they throw in ping pong balls - a useful substitute for plastic pollution - and track how they end on the artificial beach.

Mr van Sebille uses that data to build models on how plastic moves around coasts.

"In the end it's going to be for the whole world," he told Sky News.

"But we're focussing now on the UK. And our question is: whose plastic ends up where? So how does whatever happens near our coastline determine where the plastic ends up?

"Does plastic from the Thames end up in Norway or Norfolk? We really don't know that now."

Plastic Tide will combine their drone surveys of real life beaches with Mr Alsina and Mr van Sebille's simulated version.

Mr Van Sebille told Sky News that, over the next five years, we'll dump more plastics into our ocean than during the entire 20th Century.

There's no new, groundbreaking piece of technology here. Just off-the-shelf components, smart thinking and a desire to put a small dent in a huge problem.

You can find out more about Sky Ocean Rescue and get involved by visiting the campaign's website and you can also watch our documentary, A Plastic Tide.

Reading Comprehension Tasks / Questions

1. What problem is the project *Plastic Tide* trying to solve?

2. How long is the coastline of the UK?

3. What happens to most of the plastic that gets dumped into the oceans?

4. What kind of drones do the researchers use?

5. How do they do the actual surveying and data analysis?

6. Explain what the wave tank is for.

7. What is the connection between the two groups of researchers?