

Drone expert is developing drone technology to measure the size of small, underwater sediments

July 16 2019, by Megan Cox



Credit: Loughborough University

A Loughborough University academic is developing drone technology to measure the size of small, underwater sediments in a bid to understand how rivers are responding to environmental drivers such as climate change.

Physical Geographer Dr. Amy Woodget, of the School of Social Sciences, is hoping her research using drone imagery and [machine](#)

[learning](#) will allow sediments as small as 0.5cm to be measured accurately, providing valuable scientific data that will reveal how rivers are behaving.

Monitoring how river habitat [sediment](#) (matter that settles at the bottom of the water) is changing is important for several reasons.

Sediment sizes can have different and drastic effects on rivers. Large sediment accumulations can cause upstream flooding or deflect the flow to adjacent land, streams or critical habitats, and increased fine sediment can affect the penetration of light into the water and result in algal blooms.

By studying patterns of sediment size, experts can understand changes that are occurring in rivers as a result of environmental factors.

These patterns can also reveal how the shape and size of river channels are changing, which is important as it means the amount of water a channel can hold can be calculated and then experts can assess how susceptible a river is to flooding.

Sediment size is also important to ecologists as it gives an indication of what kind of habitats are available in a river.

Dr. Woodget says drones allow environments to be studied in much more detail than previously possible and this is likely to become very important for helping make the right decisions to manage environments effectively.

She explained: "This research project aims to measure the size of underwater river sediments using a novel technological approach using drone imagery and machine learning.

"We need to know how to accurately measure underwater sediment sizes in fine detail in order to improve our understanding of how rivers and their resident animal and plant life are changing and responding to big environmental drivers like climate change.

"Using drones is a bit like the difference between driving with your glasses on instead of off, if you're short-sighted. The detail revealed by wearing the glasses—or in this case from the detailed [drone](#) imagery—helps us make better decisions to ensure our safety and that of others.

"So this means that if we care about our economies, homes, industries, agriculture, transport networks, recreational and environmental spaces and how they might be threatened by [climate change](#), then we need to be able to measure and monitor physical parameters like sediment size accurately and with our glasses 'on.'"

Dr. Woodget will undertake fieldwork at two river sites—in the Lake District and along the England-Wales border—which both experienced serious flooding in 2015 as a result of Storm Desmond.

Provided by Loughborough University

Citation: Drone expert is developing drone technology to measure the size of small, underwater sediments (2019, July 16) retrieved 9 April 2024 from <https://techxplore.com/news/2019-07-drone-expert-technology-size-small.html>

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