IoT project will assess impact of climate change on forests, and inform UK policymaking

12 August, 2020

A trial is underway in forests in Surrey and Northumberland to assess the potential for Internet of Things (IoT) technology to monitor tree growth and the impacts of environmental change on the UK's forests.

Vodafone is funding the project, which is being conducted in partnership with Defra and the UK research organisation Forest Research. It will monitor tree growth and the impacts of environmental change on the UK's forests.

Specialist sensors have been attached to trees in two forests and are connected via Vodafone's Narrowband-IoT (NB-IoT) network. Data is collected and transmitted to Defra and Forest Research where advanced analytics will be used to assess the impact of temperature, humidity and soil moisture on tree growth and function.

Measuring tree growth is important in enabling scientists to estimate the contribution of trees to climate change mitigation as a result of their ability to absorb and store carbon from the atmosphere.

The three-month trial is now under way in Forestry England's Alice Holt forest, near Farnham in Surrey, and Harwood forest, near Rothbury in Northumberland. It is the first of its kind in the UK.

Defra and Forest Research will use the results to inform policy makers and the public of how the changing environment impacts tree growth and the huge benefits that trees can provide by storing carbon.

The trial follows Defra's 25-year Environment Plan, which outlined an ambition to increase woodland cover in England and the Government's commitment to increase tree planting across the UK to 30,000 hectares per year by 2025. To help reach these targets, the recently announced £640 million Nature for Climate Fund will invest in tree-planting alongside other environmental restoration over the next five years.

Anne Sheehan, Director, Vodafone Business UK, said: "Tackling climate change requires radical thinking and our forests will be vital to this.

"Our IoT technology enables us to connect trees and monitor performance, which is a perfect example of how technology can be used in new ways to help create a more sustainable future."

Malcolm McKee, Chief Technology Officer at Defra, said: "Trees are a unique natural resource that play a crucial role in combating the biodiversity and climate crises we face.

"This exciting partnership uses newly emerging IoT technologies to improve our understanding of the impacts of environmental change on our nation's forests, which will help inform our policymaking. The new technology provides better quality data and importantly, allows us to monitor places that current technologies cannot reach.

"We are always looking for ways to explore how using innovative new technologies can improve our data gathering. This initial focus is on the monitoring of forests, but the technologies will be applicable to monitoring 'anything' in the environment."

Matthew Wilkinson, Research Scientist at Forest Research, said the project had "the potential to transform the way we are able to collect and analyse data, and to reduce the need for frequent site visits, especially at remote rural locations." He added that it "will also help us to gather more data which is critical to targeting efforts to measure the contribution of individual trees to climate change.

"If the trial is successful, we hope it will expand to other areas of environmental monitoring and signify a step change in the amount of data we are able to collect and analyse."

Vodafone's sensors are attached to several trees within different areas of the two forests, and data is constantly gathered and transmitted back to a web portal accessible to both Defra and Forest Research.

Narrowband gives wide area coverage

NB-IoT operates within a very narrow radio band frequency, with wider coverage and deeper penetration than more traditional telemetry techniques. As a result, the technology is suitable for use across large areas, underground or within buildings. It also operates at low power so that specially designed batteries within devices, such as sensors, can last up to 10 years. This combination ensures that NB-IoT solutions are more sustainable, as well as being less expensive to install and run than current alternatives.

Source:https://envirotecmagazine.com/2020/08/12/iot-project-will-assess-impact-of-climate-change-on-forests-and-inform-uk-policymaking/