

CASE STUDY

Flood Defence

Slaithwaite, Kirklees Council

Protecting a village: delivering a local early flood warning and monitoring system to keep people, homes and businesses safe



Slaithwaite suffered extensive flood damage in 2015 after a blocked debris screen caused Crimble Clough Stream to back up, demolishing the wall at the end of Clough Road, flooding the area and causing extensive damage to local homes and businesses.

Slaithwaite is a village within the Metropolitan Borough of Kirklees in West Yorkshire, situated in the Colne Valley five miles south west of Huddersfield.



The devastating flood of 2015 in Slaithwaite

The 2012 Kirklees Flood Risk Management Strategy identified that around 2,000 properties were at high risk of flooding with a potential £70 million of damage.

When we started our conversation with Kirklees Council, they clearly expressed an interest in a local flood warning and monitoring system to proactively respond to future flood risk.

Kirklees Local Flood Authority

Kirklees Council in West Yorkshire is the third largest metropolitan council in the region. As the lead local flood authority for the district, Kirklees manages local flood risk from surface water, groundwater and smaller watercourses and ensures cooperation between local risk management authorities.

As part of a smart monitoring project for flood risk areas, funded by Chester University, Anadel worked with the Kirklees Council flood risk team to design a local flood alert and monitoring solution for Crimble Clough, enabling the Kirklees Council to better manage the risk of flooding in Slaithwaite.

Working with Chester University and Kirklees Council

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The challenge

The project is designed to monitor high water levels at Crimble Clough caused by debris washed down from the upper wooded catchment and blocking the debris screen. The sensor-based system monitors the difference between water levels, before and after the debris screen, automatically sending alerts for pre-set trigger points.

No real-time information: in 2015 the Crimble Clough debris screen became blocked by debris washed down from the upper wooded catchment, with no warning system in place to alert the screen contractors.

No strategic information: in 2015, there were many flood hotspots that needed attention but with limited council resources. Because there was no remote monitoring system in place, it was difficult to choose where best to deploy support.

Extensive damage: In 2015, due to the stream backing up and demolishing the wall, homes and businesses downstream from Clough Road were flooded and severely damaged.

Disruption: following the flood, the clear-up and restoration process for the affected area meant residents had to leave their homes and businesses were closed for months. The economic damage from the 2015 flood was significant with many hours of Kirklees Council labour invested into the recovery. With a monitoring and alert system in place, all of this could have been prevented.



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The solution – Andel FloodAlert

Andel FloodAlert provides 24/7 local monitoring and alerts for areas at risk from flooding.

FloodAlert provides real-time information on rising water levels and automatically sends out early flood warnings. The robust and reliable system is easy to install and set up and tracks water levels in watercourses and other parameters for up to 15km from a gateway.

From a single water-level sensor to a catchment sensor network monitoring water levels, soil moisture, rainfall data and water quality, FloodAlert provides real-time local flood monitoring and alerts for projects of any size.

Crimble Clough at Slaithwaite showing FloodAlert catchment network monitoring



- LoWaRAN® gateway connects to all devices and communicates all data to a central network server
- Soil moisture sensors
- Water level sensors
- Rain gauge



Andel FloodAlert system merges collected data with other risk variables such as 3-year historical and 36-hour forecast rainfall data



FloodAlert sensors and LoWaRAN® network gateway installation at Crimble Clough, Slaithwaite

Installing Andel's FloodAlert system now means that Kirklees Council has:

- A cost-effective, real-time local flood monitoring and alert system.
- A water level monitoring system at the debris screen that sends out SMS and email alerts when water levels reach critical.
- A system that recognises that the debris screen is

blocked by monitoring water levels before and after the screen, sending out SMS and email alerts when the difference is too much.

- A dataset with detailed catchment data including rainfall, water levels at strategic points and soil moisture in the surrounding farmland – all helping to develop future flood risk models and flood alerts.
- Live monitoring of sensor data via a cloud-based portal with easy-to-use visualisation accessible from any device with internet connectivity.
- A system that can communicate with an unlimited number of designated users.
- Communication via a low-power, low-impact LoRaWAN® network.

The results

An effective early warning system: Kirklees Council now receives real-time alerts, allowing for timely response to blockages of the debris screen at Clough Road that has historically caused flooding during periods of heavy rain.

Data collection: Kirklees Council can now collect detailed data about how the Crimble Clough catchment responds to rainfall and can develop models to predict future response.

Impact measurement: Kirklees Council is developing a baseline to measure the effectiveness of natural flood management interventions at critical locations within the catchment.

What our client said

“Working together on the ‘buildbacktogether’ project was a pleasurable experience, it was essential to have the complimentary skills that made the outcome of the project much more effective. The support from team Andel was very useful and Gerbren Haaksma especially was extremely supportive and efficient with his quick response and stimulating input through the term of the project. I am keen to continue our collaboration and work with the local communities on more engagements like the Slaithwaite project.”

Namrata Bhattacharya-Mis, Programme Leader, Natural Hazard Management (BA/BSc), Chester University

The results of the project will also inform a wider strategy for IoT integration within the council for real-time information of flood risk areas.

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