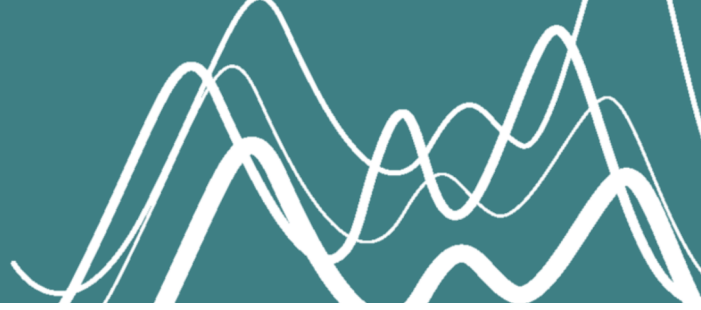


# Northumbrian Water

## Interruption to Supply Risk Mapping using Spatial R Package



### The Challenge

The client was looking for innovative solutions to help reduce interruptions to supply and to provide a better customer experience. The key challenge was how to identify customers most at risk of experiencing long interruptions to water supply when an incident took place. Once these “at-risk” customers had been identified, the results needed to be communicated to non-technical staff in a visual, informative manner.

MODERN  
MACHINE  
LEARNING

### The Solution

Jumping Rivers utilised modern machine learning techniques to predict when an interruption event would last beyond the threshold for a customer area. Understanding that the impact was important for both NWL and the customer, Jumping Rivers built a custom simulation model for the potential impact that a specific interruption would cause. This allowed the client to not only gain insight into the probability that customers would suffer a long period without water supply but to also understand the number of customers that may be affected. The combination of models aids decision making in prioritisation of response to events, thus significantly reducing the risk of customers suffering lengthy interruptions.

IDENTIFY  
RISKS

The model can be used standalone or as an API available to other software. In this instance Jumping Rivers also built a user-friendly visualisation web application allowing non-technical users access to the underlying predictive and simulation models. When an event occurs, engineers now have an easy way to inspect the affected geographic areas, and simulate the potential impact to the neighbouring regions.

INFORMATIVE  
VISUALISATIONS

The client also consulted Jumping Rivers about how the tool might best be deployed within their existing systems architecture, on which a range of options were presented and discussed.

Using a variety  
of tools

### The Results

The bespoke simulation model helped reduce the severity of impact to homes throughout the region with more accurate risk modelling. Additional insight found during the exploration stage of the modelling also provided some unexpected added value.

The development of a user-friendly interface allowed non-technical staff to engage and interact with the simulations, to be able to make rapid decisions, leading to quicker response times and better customer service.

Northumbrian Water and other utility providers face fines for breaks in the water supply that are over 24 hours. By better understanding the customers most at risk of long interruptions, this creates financial savings for the client as well as providing better customer service.

