

# Monitoring technology for flood protection

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Over one third of European cities are at risk of flooding. A key aspect in addressing this challenge is an early warning system that can predict the development of natural disasters before they happen. However, most existing early warning systems predict floods based on water levels in rivers and canals, without taking into account the stability and the danger of breakthrough of the protective dikes.

The European Union funded project UrbanFlood involving the Department of Corporate Technology of Siemens Russia proposes a different approach. Experiments conducted in the Netherlands, revealed that it is possible to have sensors placed in the dike to measure the likelihood of a breach. The main goal of the project is to create an Internet platform, which will be the link between the data from the sensors, early warning systems, as well as decision support systems, which will alert the general public. Another important aspect is its ability to maintain an early warning system, monitoring dikes from different countries and organizations, thereby ensuring monitoring of flood protection structures on a European scale.

For the early detection of abnormal behaviour of embankments Siemens in Russia is developing artificial intelligence components, which can detect potentially dangerous scenarios. In contrast to approaches based on modelling, such components are able to detect even situations which were not foreseen during the development of early warning systems, i.e. previously unknown types of abnormal behaviour. In critical situations such a decision support system is able to inform all stakeholders about the impending disaster, thanks to the information received from machine-learning components.

The company is also responsible for developing the platform and integration of components developed by other partners. In addition to Siemens, the project involves researchers from the Netherlands, Great Britain and Poland. In a joint workshop in Krakow in June 2010, a first prototype passed testing for virtual servers in Poland, the Netherlands and Russia. Experts are confident that the end results of the project will not only be a reliable early-warning system, but also new opportunities for business development. Further development of applications using the same the platform can be applied to prevent the occurrence of other natural disasters, such as volcano eruptions or earthquakes.