

Vulnerability to flooding of critical infrastructure in Cork



Flooding in Cork in 2009

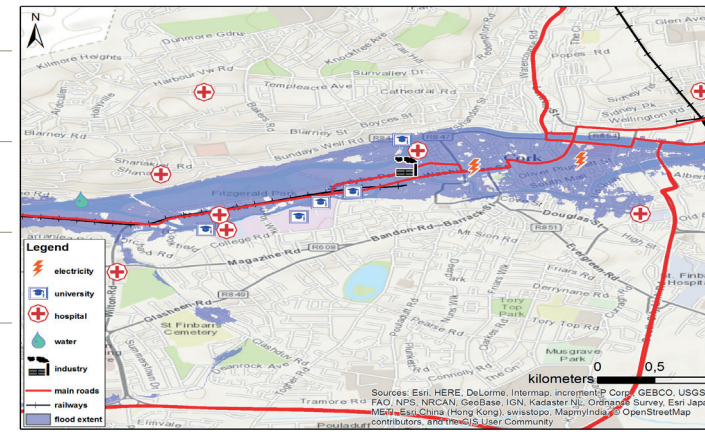


Hospital personnel transported by boat to their hospital

Recent floods in Cork (Ireland) have disrupted health services and the water supply, affecting the lives of many citizens. These events clearly demonstrated the vulnerability of this critical infrastructure to flooding. To make Cork more resilient, Deltares and partners analysed the flood vulnerability of critical infrastructure and adaptation measures. The research was part of the EU FP7 project INTACT which looks at the vulnerability of critical infrastructure to extreme weather events. The project included five case studies, one of which was Cork.

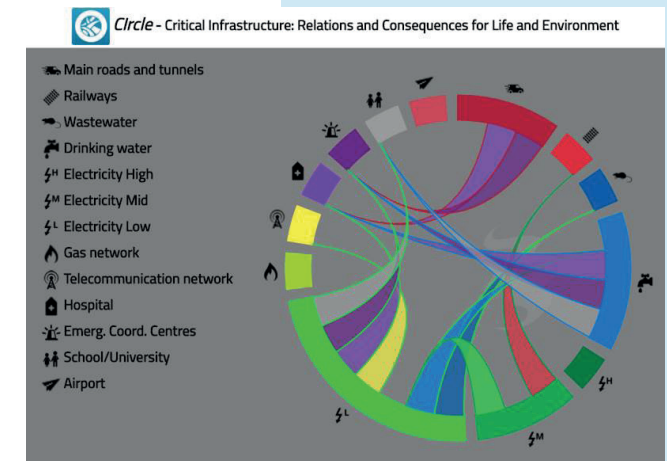
Cork is the largest city in the southwest of Ireland. It suffered severe flooding in 2009. The flood lasted less than 24 hours but there was substantial damage: the closure of main transportation routes, the temporary closure of the roads to and from the hospital, severe damage to the university and a two-week interruption in the supply of fresh water to residents. Approximately 87,000 persons were affected by a lack of drinking water in their homes, the majority in the north of the city. Some urgent flood protection measures have already been implemented to prevent a repeat of similar events. Additional measures have been proposed for the areas in and around Cork.

Information about flood risks is crucial to evaluate the past, current and future vulnerability of critical infrastructure (CI) to flooding. Whereas general flood impact and risk analysis methods focus on direct damage due to the force of water on objects, damage related to critical infrastructure is generally associated with interruptions in services. The impact depends mainly on the network structure and the dependence of society and other networks on the services, and less on the nature of the actual flood.



Overview of the flood-prone area and critical infrastructure in Cork City centre

Deltares and its partners used the storyline approach and the Circle tool to obtain information about the vulnerability of critical infrastructure and to study cascade effects. This approach does not require data transfer; it structures the input of key stakeholders and experts from workshops and interviews to obtain a picture of what may happen during a flood event, of the responsibilities of actors and of interrelations between different critical infrastructure networks. These insights contribute to the development of shared, consistent and comprehensive strategies, and adaptation measures.



A result of the Circle tool: Critical infrastructure and the links between the networks

The outcomes of this research help Irish stakeholders and others to arrange flood defence and mitigation measures, including emergency management plans. In Cork a comprehensive set of measures was proposed and it has already been partly implemented: flood forecasting, the management of reservoirs, and emergency management have been improved to respond more effectively. Additionally, quays and embankments have been strengthened to make flooding less likely. The potential impact of flooding has been reduced by protecting transformer stations from flood depths of one metre. Furthermore, the drinking water production plant is now protected better and is better prepared for floods.

Further reading:

De Bruijn et al. (2016). Flood vulnerability of critical infrastructure in Cork, Ireland. E3S Web Conf., 7 07005. DOI: <http://dx.doi.org/10.1051/e3sconf/20160707005>