Very large scale cloud computing

Internet attached, on-demand sensors

Internet connected, on-demand data centers

Dike / Levee / Dam / Embankment / Infrastructure monitoring

UrbanFlood: automatically create early warning systems that watch internet data streams

Common Information Spaces, 4D visualisation, decision support, automatic capacity scaling

Application: world wide monitoring of dikes that protect urban areas

UrbanFlood: ICT to mitigate the effects of climate change in urban environments

UrbanFlood technology allows to generate internet based EWSs. Each EWS contains a common information space (CIS) containing facilities for data storage and workflow. These workflow connect computer programs within and between EWSs, command and control centres and web applications. Internet attached sensors are used to collect, forecast, collect, alert and disseminate information, as well as to adapt the processing capacity of running on to the needs of a situation. To increase capacity, for example, parts of an EWS, being an application, artificial intelligence or software or another EWS, are disconnected from the workflow, exploited multiple times on other cloud computers and reconnected to the workflow.

World wide monitoring of 10000’s km of dikes

Dikes in the United Kingdom, US, Netherlands and Russia will be monitored by the UrbanFlood technology. Artificial intelligence and system identification technologies are applied to monitor the dikes. Dikes can be connected to any monitoring system which can be adapted to the needs of a situation. Decision makers research “what if” scenario, multi-party actions that ensure the safety calculations and flooding simulations on clouds.

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Experiments with dikes (picture left): www.urbanflood.eu and long term monitoring of dikes (picture center). www.urbanflood.eu: UrbanFlood to deal with generation 1 and 2 of sensor measurements. Generation 1 sensors typically yield information that experts can survey plug in their models and calculate the probability of breaching: water height in sea and channels, water pressure and humidity in a dike. Generation 2 sensors equal to detecting directly the onset of breaching, e.g. flow optics measurements, however, current dike and passing ships cause temporal movements of dikes. UrbanFlood operates between the two, if the dike reacts as expected – basis of past information, AI and system theory as well as 4D evaluation of dike movement.