



URBANFLOOD NEWSLETTER

December 2010

UrbanFlood is a project under the European Union 7th framework Programme* that develops and tests an internet based early warning system (EWS). The project started in December 2009. It is carried out by a consortium of Cyfronet (Poland), HR Wallingford (United Kingdom), OOO Siemens (Russia), STOWA, TNO and University of Amsterdam (The Netherlands).

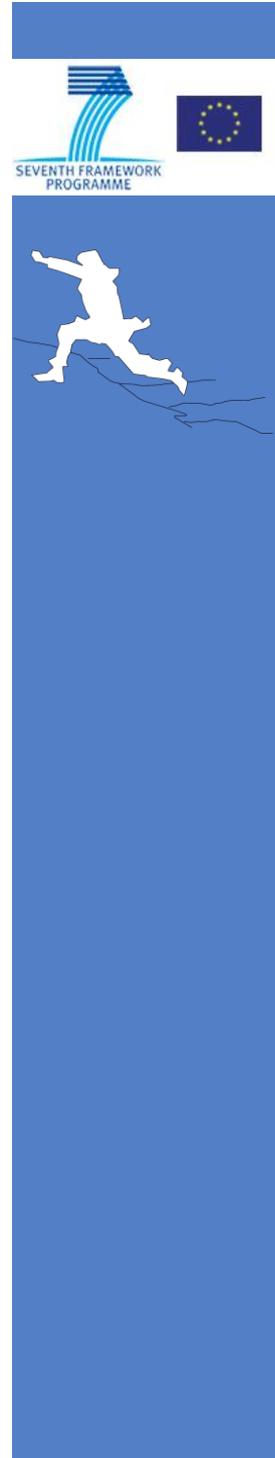
This newsletter informs about the progress and impact of the project.

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Rob Meijer, project co-ordinator: *"Looking back at the first year of the UrbanFlood project I think we can be satisfied with our achievements. These are the results of truly international cooperation of enthusiastic specialists, who worked hard and delivered what we promised. The workshop in Amsterdam was a showcase of the efforts up to now, and the feedback we received was very useful and overall also positive and encouraging."*

"I would like to invite owners of 'smart dikes' to contact me; UrbanFlood is offering a connection to our Online Early Warning System to monitor their dikes. In this way they experience a state of the art EWS and the project can work together with them to ensure that it fits in their ICT and operational work processes, with minimum adjustments and maximum benefits."
(Robert.Meijer@tno.nl)





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Collaboration with SSG4Env

In August 2010 an information exchange with the SSG4Env project showed that this project was complementary to UrbanFlood in flood forecasting technologies. The logical conclusion was to combine forces; And the first opportunity was organising a joint workshop on the use of sensors and ICT in the context of flood safety. Both projects are supported by the 7th framework program of the European Union.

SSG4Env, short for "Semantic Sensor Grids for Rapid Application Development for Environmental Management" is a project which is demonstrating its developments in the computer science using a coastal flood warning system. SSG4Env aims "to provide environmental management tools to key decision makers in a form that is simple, live and dynamic".

SSG4Env supports critical flood management decisions with information provided by a variety of sources including databases with historical data, real-time data from various instruments and sensors, mathematical models and simulations. SSG4Env also creates registries and ontologies for the users of environmental data. For more information see www.sensorgrid4env.eu

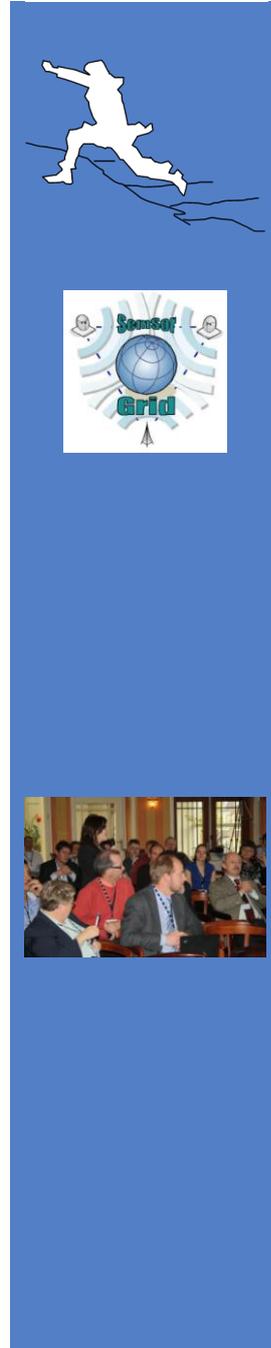
Joint UrbanFlood & SSG4Env Workshop Monitoring & Flood Safety Thursday 11 & Friday 12 November 2010 – Amsterdam, the Netherlands

Against a backdrop of storm and rain a truly international group of experts gathered in Amsterdam to look at how future flood safety can be improved by using modern sensor techniques, models, real-time monitoring and the Internet. Four themes were discussed: Sensing, ICT, Modelling and Application & Implementation.

For each of the themes several thought-provoking presentations were given. The Dutch [LiveDijk](#) and [Geobeads](#) were presented, but also examples and experiences from the [USA](#), the [UK](#), [France](#), [Russia](#), [Poland](#) and the [Czech Republic](#). The (concept) Early Warning System of UrbanFlood was demonstrated to a very interested public.

The presentations are available on video, see below.

Available workshop documents: [programme](#) (pdf); [detailed programme and abstracts](#) (pdf) and [list of participants](#) (pdf).





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Interactive flood simulation and visualisation on a multitouch table during the UrbanFlood Workshop in Amsterdam

The goal of a Decision Support System (DSS) is to help decision-makers in making informed decisions in case of emergencies. In a demonstration UrbanFlood experts presented their prototype DSS for flood disasters. The system includes several simulation modules and visualization components that are integrated into an interactive graphical environment. An interactive flood simulator for inundation dynamics in the case of dike failure is one of the most intriguing results. The simulator is based on software developed by HR Wallingford and incorporated by UvA as a part of an interactive application running on a so called "multitouch table"

The flood simulator uses a digital terrain model (DTM) that describes the elevation of the topography at the area selected for simulation, in this case the Amsterdam Watergraafsmeer area. Small corrections have been made to the DTM to correct for data acquisition errors and to add missing structures (tunnels, buildings). The DTM is pre-processed into a simulation grid consisting of Inundation Zones (IZ). The dynamics of water discharge through the breached dike (the "hydrograph") is calculated by a breaching model. The output of an inundation simulation contains the time series of water level and discharge velocities in all IZ. The simulation output data is visualised on a Microsoft Surface multi-touch table.

The flood simulator is encapsulated in a so called "virtual machine". Virtual machine software mimics computer hardware, and modern data centres offer customers to run, via the internet, their virtual machines on their hardware. Data centres with this service are called "clouds" in ICT jargon; e.g. the SARA Clouds in Amsterdam. In such clouds, virtual machines can be easily copied or moved. UrbanFlood uses this ability to generate new early warning systems.

Recently, a dike has been equipped with sensors located in the Amsterdam Gaasperplas area. Flood simulations of this area, as well as the Eemshaven LiveDike area, are being prepared for simulation. However, as the flood simulator is also encapsulated in a virtual machine, it is rather straightforward to create many other simulations of flooding events. We will show, for example, simulations of floods in various parts of Amsterdam, including the Science Park.

As the fancy flood simulations on the multitouch table are typically suited for use in command and control rooms and for public display in museums, UrbanFlood also develops a web-based interface to the flood simulators. The web support provides an additional capacity to reach persons that have access to a web browser only - e.g. professionals in the field with a smart phone or iPad, or an interested student behind a computer.





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UrbanFlood results

Since our last newsletter several reports and other 'deliverables' have been completed. Some of them are for internal use (Demonstration Plan); others however are freely available on the website:

The design and prototyping of a decision support system for flood control – see also below in this newsletter;

Specification of the architecture and interfaces of the Common Information Space – Presents the design of the UrbanFlood Common Information Space (CIS), a framework for creating and hosting Early Warning Systems for environmental threats;

Orchestrating the information flow in a Common Information Space (prototype description);

Basic Remote Dike Monitor (short description);

Operational DSS Viewer – describes the functionalities of the control room and gives access to a demonstrator on the internet;

Specification of Plug-in Technology for EWS Components – describes the design of UrbanFlood EWS hosting platform and plug- in technology for UrbanFlood EWS components;

Monitoring, rich browsers and cloud service technologies for an online EWS hosting platform - describes technologies which form the base for the UrbanFlood online hosting platform: virtualization and cloud computing;

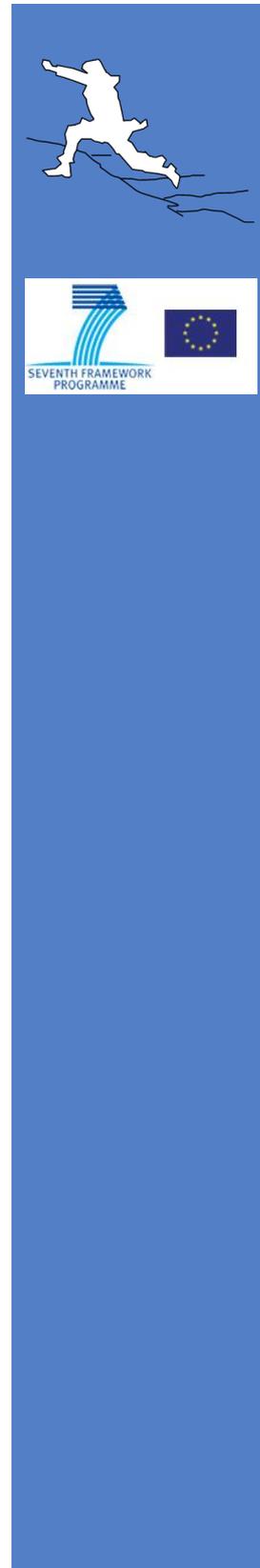
Acceptance of Internet Services to Combat Climate Change Induced Disasters – workshop statement

[pdf for downloads](#) at the website.

Report: The design and prototyping of a decision support system for flood control

This report describes a prototype of the Decision Support System (DSS) developed in the first year of the Project. It details the UrbanFlood DSS architecture and the workflow that connects an interactive user-friendly interface with sensor data streams and with a cascade of models developed for scenario-based predictions of dike failure, breaching and inundation.

The prototype DSS was demonstrated at the Joint UrbanFlood & SSG4Env Workshop on Monitoring and Flood Safety. Participants of the Workshop actively experimented with the system and discussed its functionality and usability during the eight "Demo & Info Market" sessions. Their feedback and the suggestions of the UrbanFlood Advisory Board indicated that the system has great potential for dike management authorities; it also pointed at areas for improvement. In addition to the initially planned activities for the development of a more mature DSS with rich functionality and wide access for the targeted groups of users we intend to incorporate all these new suggestions as well.





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First UrbanFlood Advisory Board Meeting

On Wednesday November 10 the first UrbanFlood Advisory Board Meeting was held in, to quote one of the members, "a very civilized way": combined with dinner. The Advisory Board Members were invited to take note of the results and plans of the UrbanFlood project and to comment on these. However, the main task of the board is to advise UrbanFlood on how to maximise impact and assist through the board's network of contacts. Representing organisations involved in modern dike monitoring techniques in the UK, the USA, Germany and the Netherlands, the members are well positioned to act as linking pins between the UrbanFlood project and flood prevention activities in these countries. As UrbanFlood can generate a dike monitoring system automatically – whether for a small test, a larger pilot or for operational inspection of tens of kilometres of dikes – UrbanFlood is able to support dike monitoring initiatives as well as R&D – wherever there is internet.

Test locations for 'smart dikes': Amsterdam

At this moment one test location has been realised in the Amsterdam area, at the Stammerdijk location, in close co-operation with Waternet, the regional water management organisation. Waternet is very interested in the concept of digital monitoring of dikes, not only for early warning but also to facilitate regular monitoring of dike strength and even for the official 6-yearly safety audit. Waternet intends to carry out more test installations at several sites, and will conduct dike strength experiments. UrbanFlood will work closely with Waternet, financing part of the trials, and looking into ways how the planned UrbanFlood EWS can be used at Waternet.

'Smart dikes' in the UK and Saint Petersburg, Russia

Unfortunately, UrbanFlood, in close cooperation with the UK ministry of Environment, could not find a suitable location in the London area. London is mostly protected by stone walls against floods, whereas UrbanFlood concentrates its developments on earthen embankment-dikes. However, dikes in the historical town of Boston, to the North-West of London, are not only scientifically very interesting – tide differences up to four metres are regularly observed, but are also doing their protective job more frequently as other UK dikes. Site inspections are ongoing, and the UrbanFlood project hopes to be able to install a sensor network sometime during the first half of 2011.

For St. Petersburg the discussions have only recently started, and actual installation of a sensor network may not begin until 2012.





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Invitation to dike managers

The UrbanFlood project invites regional water managers that have installed sensor systems in dikes, or that have plans to do so, to contact the project co-ordinator Prof. Rob Meijer. UrbanFlood is offering to install the Online Early Warning System to monitor these dikes, and process and interpret the signals. UrbanFlood wants to work closely together with the end users, and installing the state of the art UrbanFlood EWS in a real-life situation will enable both the user and the UrbanFlood team to gain experience and to jointly improve the system.

Mike Clark and his thoughts on cooperation

And finally, we would like to share a thought with you, something expressed rather eloquently during our workshop by Professor Mike Clark (director of the GeoData Institute, University of Southampton, UK)

"Isolation does not work. Competition is an extremely successful strategy, both in the commercial and research worlds. We need to convince the managers that we have to abandon competition and embrace cooperation. Competition leads to evolution, but it is a slow process."

1. *"Moral case: we are spending public money – we have to maximize the result to benefit the community, and you can't do this in competition, so we need to cooperate;"*
2. *"Cooperation will highly accelerate this evolution, adaptation, avoiding duplication;"*
3. *"Cooperation maximizes innovation, building innovation through teamwork;"*
4. *"Cooperation creates continuity – now often lacking in many EU projects. Don't keep your results to yourself for further elaboration in the next phase of your project – share the results and work together to really make an impact."*

A clear call for cooperation and a perfect conclusion of the workshop!

Events

January 21, 2011: UrbanFlood European Commission Review Meeting
Brussels, Belgium

UrbanFlood Newsletter

For inquiries regarding this newsletter you can contact the UrbanFlood webmaster, Jacqueline Bredius at newsletter@urbanflood.eu. If you would like to receive this newsletter please send her an e-mail with your contact details: name, organisation and e-mail address. To unsubscribe you can send an email with the title or text 'unsubscribe'.





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UrbanFlood is a European project under the EU 7th framework Programme*. For more details please visit the UrbanFlood website www.urbanflood.eu or contact the project coordinator: robert.meijer@tno.nl



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Eemsgolaan 3
PO Box 1416
9701 BK Groningen
The Netherlands
www.urbanflood.eu
info@urbanflood.eu

