

Volume 23 | May 2013

Port Betaald  
Port Payé  
Pays-Bas



# Druppel

The Water Prof. and the Water Prince

**RAINGAIN**  
Marie-claire ten Veldhuis

Flood protection Vietnam  
Mark de Weerd

 **DISPUUT  
WATERMANAGEMENT**

# Table of contents

Anthonie Hogendoorn	4	From the board
	5	Cover contest & Graduates
Remko Nijzink	7	International water news
Frans Willem Hamer about the new King	9	A new historical water figure
Water Prof. Huub Savenije about	10	The Water Prince
Wouter Berghuijs is getting in touch with	12	The Young Hydrologic Society
Remko Nijzink wondering about	13	Tenang?! Sangat tenang!
Mark de Weerd's adventures during a	14	Flood protection project Vietnam
Gerard Pijcke telling his	15	Internship story
Luciano Raso thinks about	17	Water under uncertainty
Marie-claire ten Veldhuis knows about	20	<b>RAINGAIN</b>
Tim van Emmerik works on	23	The dielectric constant
David Ginting and Pradeep Rathore getting to know	24	Theo Olsthoorn
Joris de Vos tells about	27	The Active Members Day
David Ginting got a souvenir from the	28	UN World Water Day
Prof. Dhruvajyoti Sen explaining	29	Kosi River floods
Fei Cui is reporting a Chinese	30	Pig incident
Jose M. Torcal is	31	Living the Dutch experience
Laura Sterna and her new job	33	You say Water, I say Railway!
Remko Nijzink	34	Dispuut Puzzles



# RAINGAIN: Rainfall radars to get accurate estimates of urban rainfall

Marie-claire ten Veldhuis

A specialised rainfall radar will be installed on the roof of the Nationale Nederlanden building in Rotterdam in autumn of this year. The radar aims to accurately measure rainfall patterns above the city, which will help to prevent flood damage.



## Urban rainfall

The radar that is now under construction for future installation in Rotterdam, is specialised in local rainfall estimation. Rainfall patterns in the city can be measured a lot more accurate by this radar compared to conventional radars such as those currently operated by KNMI. Cities are highly vulnerable to localised, intense rainfall, because urban hydrological systems react very rapidly to rainfall. More accurate, detailed rainfall data will help water managers to improve operational control of their water and sewer systems and to plan investments in water infrastructure in a more efficient way. For instance, detailed rainfall data can help to improve operational control of pumping stations, use of water storage in underground water tanks and on water squares. Local rainfall data will also help to develop more reliable local weather forecasts.

## Special radar features

The radar in Rotterdam is to be delivered by SSBV Aerospace & Technology Group in Noordwijk. Installation is planned to take place in November 2013. The radar has several special features that make it especially suitable for application in cities. First, it is an X-band radar, with a higher frequency

compared to the national radars that are of the C-band type. This means that smaller antennas are needed and a lighter radar structure can be built which can be supported by a normal building roof: the radar that is to be installed in Rotterdam weighs only about 250kg. The radar will be equipped with dual polarimetry and Doppler capabilities, so it can measure both the size of rain droplets and their velocities. This also makes the radar less sensitive to attenuation, which can be a problem with higher frequency signals. Another advantage is that it will be installed at lower altitude compared to the national KNMI radars, so it measures rainfall closer to the ground.

## Radar installation

The rainfall radar needs to be installed on a very high location in the city in order to prevent obstruction of the radar beam by buildings. The Nationale Nederlanden building, officially called Delftse Poort Gebouw, has been selected for installation, because it is one of the tallest buildings in Rotterdam, it is located in the city centre and because the building owner and Nationale Nederlanden both offered their support.

A visit to the 150 m high building roof was organised on 7 March, with representatives of Nationale Nederlanden, SSBV and TU Delft to sort out technical and practical details for radar installation. First, the exact location needs to be decided, taking into account other roof installations, such as ventilators of the building climatisation system, window cleaning equipments, communication antennas. Connections for power supply and internet access need to be provided from inside the building. And a solution needs to be found to transport the radar to the building roof. This is not straightforward, because access to the roof consists of an extremely narrow staircase. A creative solution will need to be found here, because hoisting the radar up with a large crane is impossible due to limited space in the vicinity of the building which is located right next to the central station.





### RainGain European cooperation

The installation of the rainfall radar in Rotterdam is part of RainGain, a European cooperation project. Apart from Rotterdam three other pilot cities are partners: Leuven (BE), London (UK) and Paris (FR). The pilots serve as test sites to demonstrate the capabilities of radar technology for urban rainfall estimation and forecasting. The pilots represent a variety of urban characteristics, where different types of radar technologies will be tested. In Paris a new radar, very similar to the one in Rotterdam, has recently been acquired and will be installed on the campus of ENPC-ParisTech, likewise in autumn 2013. In Leuven a radar of an older type has been operational for several years and the experiences gained here will be beneficial for the other pilots. And they will help to show the added value of the newer and more expensive radars. Radar technology for the London pilot is based on the existing national radar network, but will be improved by upgrading the radars and smarter signal processing techniques.

The project comprises 13 partners in total, including



A part of the RainGain team checking out possible radar locations on the roof

research institutions, meteorological agencies, cities and water management organisations. Radar data will be used in detailed urban flood models to simulate and predict urban flooding down to the level of individual households. This information will help water managers in the cities to react adequately to heavy precipitation and to develop effective solutions for improved flood protection, such as warning systems and optimisation of storage capacity. Water managers from the four pilot cities are actively involved in the RainGain project to make sure the developed rainfall and flood data products are made fit for use in water management practice. Project partners in the Netherlands include Stadsbeheer Rotterdam, province Zuid-Holland and TU Delft. Hoogheemraadschap Delfland, Schieland en de Krimpenerwaard en Waterschap Hollandse Delta actively support the project. Rotterdam and Provincie Zuid-Holland receive EUR230,000 EU funding which is largely spent on radar acquisition.

### Get involved

National Observer Groups have been set up in each of the partner countries to disseminate project information and receive input from local organisations. More details of project activities can be found on the website [www.raingain.eu](http://www.raingain.eu).

If the information in this article has triggered you to become more closely involved in RainGain, you are cordially invited to attend one of the annual National Observer Group meetings in Belgium, France, the Netherlands or the UK or one of the international project events. For more information you can also contact: Marie-claire ten Veldhuis ([j.a.e.tenVeldhuis@tudelft.nl](mailto:j.a.e.tenVeldhuis@tudelft.nl)).

