



ABOUT RAINGAIN
Partners
Objectives and Actions
Pilot sites
FAQs
INTERREG IVB North-West Europe Programme

Installation and testing of rainfall radars

Objective

The objective of WP1 is the acquisition, installation and testing of radars at pilot locations in Rotterdam and Paris (new polarimetric X-band radars), Leuven (enhance previously acquired X-band radar and acquisition of 4 additional rain gauges) and Greater London (upgraded C-band radar, testing and implementation of superresolution protocol). Weather radars are the only measuring devices that provide space-time estimates of rainfall. However, the present resulting rainfall products do not meet the relevant scales of urban hydrology. The objective of WP1 is therefore to enable testing of the recent technology of X-band radars (i.e. emission frequency close to 10 GHz) for urban water management. Their higher frequency with respect to classical S-band and C-band radars allows to increase the effective spatial scale resolution by a factor of about ten (from kilometre to hectometre scale), i.e. to increase the number of precipitation data pixels by a factor of a hundred.

Furthermore, these radars are lighter and less expensive, and would be manageable and affordable to local water authorities. Paris and Rotterdam will acquire new polarimetric X-band radars (respectively with pulsed continuous emissions), whereas Leuven will test a non polarimetric X-band radar. Therefore three different versions of the X-band technology will be tested along with a C-band radar with superresolution protocol (in the UK).

An important part of these tests, will be the careful comparison of the obtained data with those of raingauge networks and existing local classical weather radars, including downscaling rainfall models. Partners will learn from each other's application experiences under different physical conditions (climatology, topography including that of high buildings), which they will exchange in two international meetings in year 2 and year 4 of the project period. The X-band radars will be installed and tested for further use in WP2 and inputs for WP3.

Actions and investments

Action Wp1A1 : Acquisition of X-band radars: preparation and realisation of public tender procedures, detailed studies on location and installation, design of infrastructures (e.g. power and internet connections), getting the necessary authorisations for emission and infrastructures and selection of the best offer.

Action Wp1A2 : Installation and testing of the radars, set up of internet platform for data transmission, validation of the obtained data set up operational data flow monitoring

Action Wp1A3 : Appraisal of rainfall data and downscaling models: investigation of all possible rainfall data sources, collection of rainfall data and quality assurance, review and appraisal of the existing rainfall downscaling models. Comparison of test site results.

Action Wp1A4 : Future data use and resolving ownership of acquired radars: the radars will continue to function and deliver rainfall data after the end of the project period. During the project, a platform and agreements will be set up for future dissemination of rainfall data, after the project has ended.

Investments WP1 I1 and I2 (1 investment shared by 2 partners) of one radar to be acquired in the Netherlands.

This comprises:

- the radar hardware
- installation and infrastructure expenses for installation of the radar on top of high building in the center of Rotterdam (opposite Rotterdam train station), including power supply and internet connection.
- experimental costs; mainly staff costs for radar testing by specialized technician (from TU Delft)

Print

DOWNLOADS



All Downloads

Investment WP1 I3 of one radar to be acquired in France.

This comprises:

- the radar hardware
- the related softwares, in particular the rainrate retrieval algorithm based on polarimetry
- an internet platform to monitor the data flows
- spare parts for level 2 maintenance over the project period
- infrastructures expenses: reinforcement of the roof of Ecole des Ponts, installation of a 5 meter pylon, secured power suppl

Transnational added value

The Belgian partners in the project acquired their X-band radar in 2008 and will bring their knowledge and experience with installation and validation of the equipment to the benefit of the partners that are to acquire radars in this project. The validation results of the X-band radars are to be intercompared and compared with the super-resolution data from the UK pilot to evaluate the quality of the respective results. The harmonisation of basic pilot locations characteristics descriptions will allow for intercomparison and knowledge exchange.

The implementation of this new radar technology, needs to consider the local, national and EU policy and societal practice if there is to be substantial benefit and impact. The acceptance and active use of the radar technology requires capacity building with stakeholders. To promote this, national observer groups are set up for each of the pilot locations as part of WP4. The acquired knowledge from installation and testing of the four different types of radars at the pilot locations, in combination with other rainfall data especially from rain gauges, will be disseminated to the observer groups during national observer group meetings. Thus, all partners and observers will acquire knowledge of the advantages and drawbacks of the different radar rainfall technologies, which will support them in future decisions on acquisition of fine-scale rainfall technology for other cities than the pilot locations.

Who is doing what ?

Action Wp1A1: Ecole des Ponts ParisTech in France and Rotterdam and province of Zuid-Holland in the Netherlands will acquire radar equipment; K.U. Leuven in Belgium and ICL and MetOffice in the UK will upgrade their radar technologies

Action Wp1A2: Partners in France and the NL will install the newly acquired radars and K.U. Leuven, Ecole des Ponts ParisTech, ICL and TU Delft will test the radars and validate the data for application in WP2

Action Wp1A3: ICL, Ecole des Ponts ParisTech, K.U. Leuven and TU Delft will appraise local rainfall data and national radar downscaling models in cooperation with the respective national weather agencies (MetOffice, MétéoFrance, KMI and KNMI)

Action Wp1A4: Rotterdam, KMI and TU Delft will find a solution for future dissemination of the X-band data, which for Paris will be ensured by Ecole des Ponts ParisTech. The latter will develop the International Network for Education & Training, INET-RadX, with Education & Training programs RAINGAIN@INET-RadX and a communication centre for General Public & Youth, GPY-RadX, in particular with the help of the RainGain communication officer (hosted by Ecole des Ponts ParisTech)

Outputs

WP1A1 (principal deliverable of WP1): delivery of two newly acquired, functional, validated X-band radars in two pilot locations and additional rain gauges pilot locations

WP1A2: installed, tested and validated radars at pilot locations in Paris and Rotterdam; internet platform for data transmission, operational data flow monitoring, including data quality and availability for other packages.

Pilot locations report including agreed organisational scheme of radar site operation with local and national stakeholders network and international links

WP1A3: Rainfall data collected from rain gauges and national C- or S-band radars through downscaling models. Comparison and assessment of test site results during international project meetings and additional technical meetings (2 for WP1).

Presentations at national project event, for national observer groups, on pilot locations available data, tools, strategies, experiences and challenges

WP1A4: Platform for future dissemination of radar rainfall data, after end of project period, for acquired radars in Paris and Rotterdam. The radar in Paris will be owned and continue to be owned by ParisTech and ParisTech will assume responsibility for future data dissemination. The city of Rotterdam will assume ownership of the radar for the duration of the project period. After the end of the project, ownership of the radar will be taken over by a specialized institution (KNMI or TU Delft) or a platform will be set up including specialized institutions and data users. The structure for future ownership of the Rotterdam radar will be

set up during the project; the future owner will also assume responsibility for future dissemination of the radar data. The International Network for Education & Training, INET-RadX, with Education & Training programs RAINGAIN@INET-RadX and a communication centre for General Public & Youth, GPY-RadX will ensure continued capacity building.