

Report – Work Package 3

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RainGain Project Meeting, London, 16th April 2013



WP3: Urban pluvial flood modelling and prediction

General Objective of WP3:

To implement rainfall data (WP2) into improved urban storm water models to enhance short term pluvial flood modelling and prediction



Action WP3A10: Adoption, customisation and automatic linkage of rainfall forecasts to pluvial flood models.

Action WP3A11: Improvement and customisation of models for urban pluvial flood forecasting at fine scales in each of the pilot locations

Action WP3A12: Full-scale testing of the models for pluvial flood prediction in each of the pilot locations.

Action WP3A13: Development of guidelines and training material for capacity building and training of future end-users.

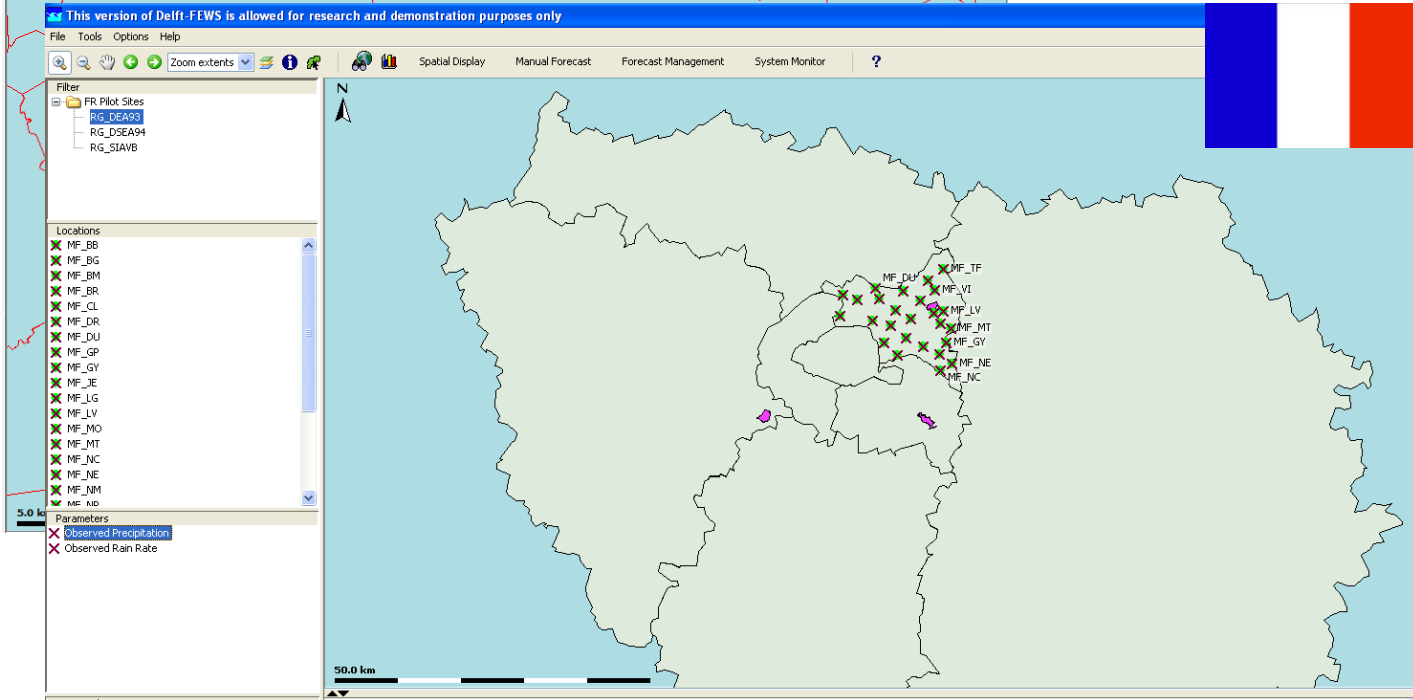
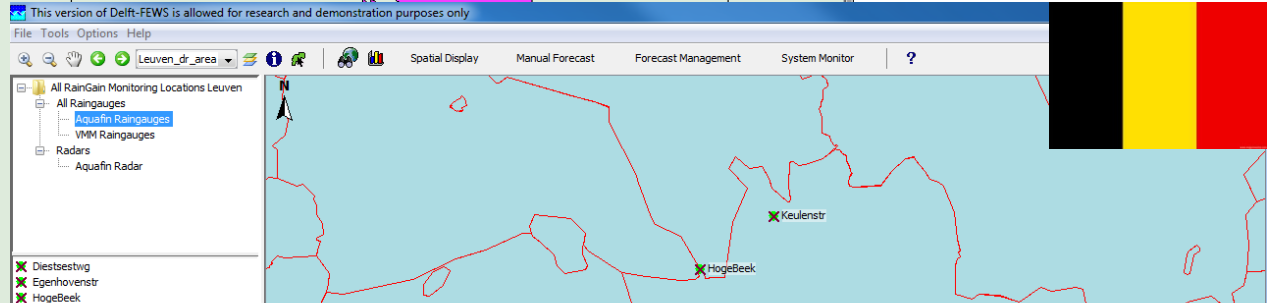
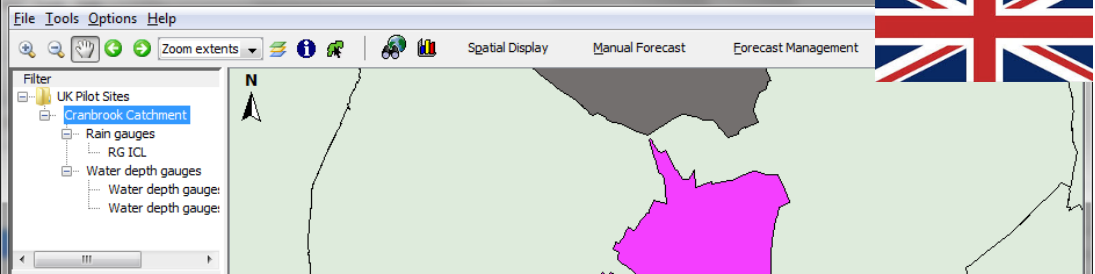


REVIEW - WP3 A10



- **ACTION:** Adoption, customisation and automatic linkage of rainfall forecasts to pluvial flood models.
- **OUTPUT:** Protocols and software for automatically feeding improved rainfall forecasts (WP2) into the urban pluvial flood models (WP3)
- **PROGRESS TO DATE:**
 - Agreement on adoption of Delft-FEWS platform as common ‘core’ (Jun 2012)
 - Pilot Delft-FEWS platform implemented for UK pilot location (Oct 2012)
 - Training course on use of the Delft-FEWS platform (Feb 2013)
 - First version of Delft-FEWS platform implemented for BE and FR pilot locations (Apr 2013)





- Locations
- ✘ Beal HS RG
 - ✘ Chadwell HS RG
 - ✘ Cranbrook Sewer
 - ✘ Roding River Outfall
 - ✘ Roding River Weir
 - ✘ Ursuline HS RG
 - ✘ Valentines Open Ch
 - ✘ Valentines Sewer
- Parameters
- ✘ Observed Water Levels
 - ✘ Simulated Water Levels
 - ✘ Observed Precipitation
 - ✘ Observed Rain Rate
- Activated Scenarios

- ✘ Observed Precipitation
- ✘ Observed Rain Rate

Activated Scenarios

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***** ERROR, PLEASE READ BELOW !!! *****
11-04-2013 09:31:00 INFO - Application.Startup.Finished: The application finished starting up. (17s)
11-04-2013 09:31:00 INFO - Gui.Initialized: Graphical user interface initialized.
11-04-2013 09:30:57 INFO - Session.Created: Stand-alone system
11-04-2013 09:30:57 ERROR - Location set id metgauges for icon meteo_site_data not found
System\ConfigFiles\LocationIcons 1.00 default.xml
11-04-2013 09:30:57 ERROR - Location set id hydgauges for icon fluvial_site_data not found
System\ConfigFiles\LocationIcons 1.00 default.xml
  
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REVIEW - WP3 A10



- **PROBLEMS / PARTICULAR ISSUES:**

- The Delft-FEWS platform is seen by pilot leaders as a useful tool mainly for exchanging the data and rainfall processing algorithms generated throughout the project. However, it may not be used operationally in all pilot locations. This is specially the case of Belgium and France, where separate forecasting systems are being implemented.
- In any case, it provides a common ‘core’ for exchange of data and algorithms

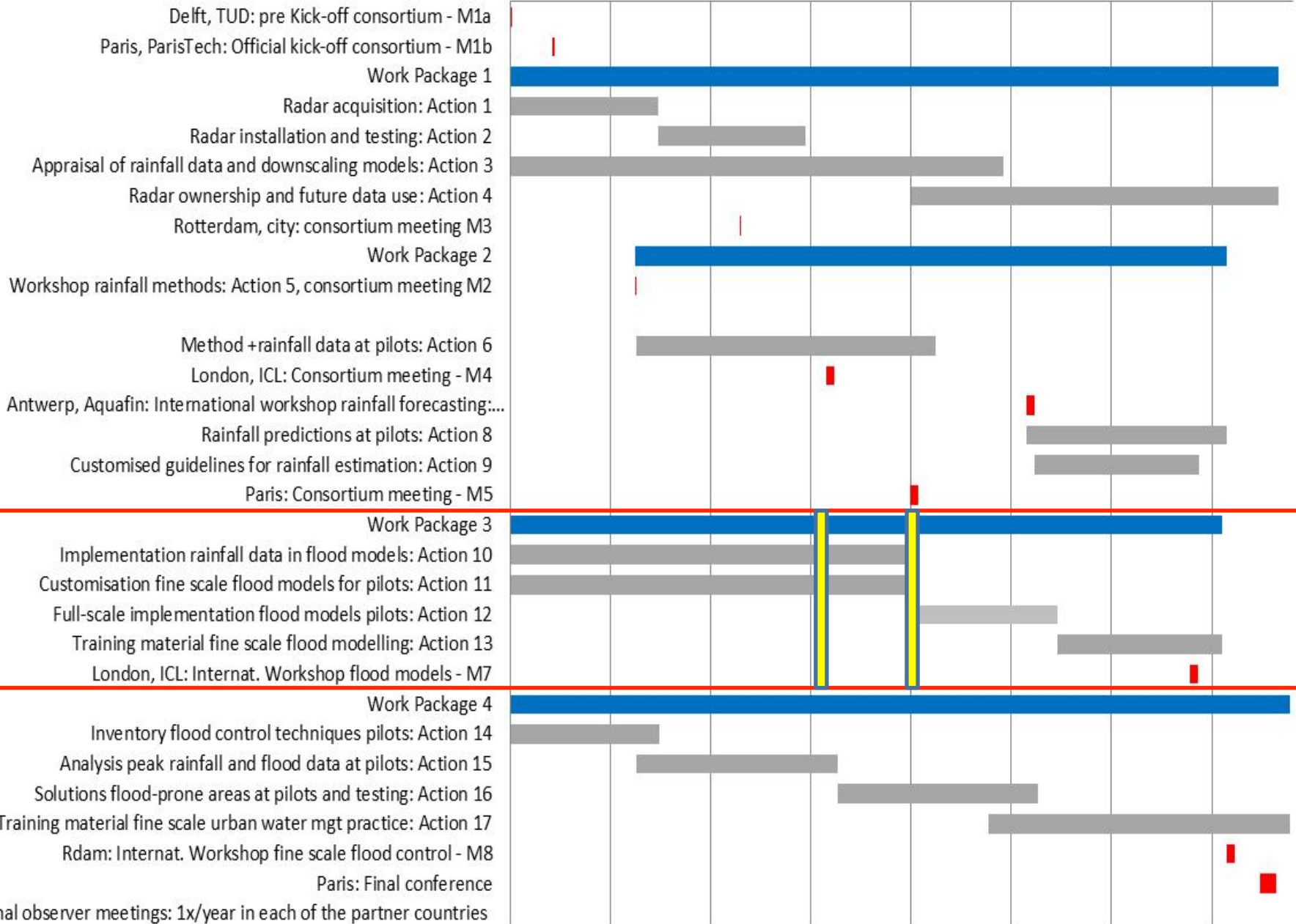
- **NEXT STEPS:**

- **JUN 2013 – WP3 Technical Meeting (UK):** training on import and visualisation of spatial data and linkage of external modules (e.g. hydraulic models / rainfall algorithms)
- **OCT 2013 – Project Meeting (FR):** Platforms customised for each pilot location
- **APR2014 – Project Meeting:** Tested platforms (depending on WP1 and WP2)



Start date: 1 Sep 2011
End date: 31 July 2015

1.9.11 2.3.12 1.9.12 3.3.13 2.9.13 4.3.14 3.9.14 5.3.15



REVIEW - WP3 A11



- **ACTION:** Improvement and customisation of models for urban pluvial flood forecasting at fine scales in each of the pilot locations.
- **OUTPUT:** Tools, report and protocol for setting up and using advanced models for pluvial flood forecasting taking into account the particular characteristics of the location and the type of software used.
- **PROGRESS TO DATE:**
 - It has been agreed that at each pilot location the software package commonly used/readily available would continue to be used for the implementation of urban pluvial flood models in the RainGain project (Jun 2012)
 - Initial models implemented for all pilot locations
 - Review document on urban pluvial flood models produced by ICL (Feb 2013), this can serve as road map for implementation of models at pilot locations



COUNTRY	PILOT SITE	PILOT LEADER	DRAINAGE AREA (km ²)	MAIN CHARACTERISTICS	HYDRAULIC MODEL	RAINFALL DATA AVAILABLE	MAIN OBJECTIVES
NL	Spaanse Polder (Rotterdam District 12)	Guenda Bruni	1.9 km ²	Industrial area, highly impervious	Sewer system only, semi-distributed, Sobek-Urban	New polarimetric X-band radar, rain gauges	Mainly urban planning (analysis of water storage tank, water squares, further optimisation of real time control elements, green roofs)
NL	Kralinger – Crooswijk (Rotterdam District 10)	Guenda Bruni	8 km ²	Residential & industrial	Sewer system only, semi-distributed, Sobek-Urban	New polarimetric X-band radar, rain gauges	Mainly urban planning (analysis of water storage tank, water squares, further optimisation of real time control elements, green roofs)
NL	Rotterdam-Centre (Rotterdam District 9)	Guenda Bruni	3.7 km ²	Residential area with 2 urban parks	Sewer system only, semi-distributed, Sobek-Urban	New polarimetric X-band radar, rain gauges	Mainly urban planning (analysis of water storage tank, water squares, further optimisation of real time control elements, green roofs)
FR	Morée-Sausset, of which Kodak is a subcatchment (Seine-Saint-Denis, Paris)	Auguste Gires	Morée-Sausset: 34 km ² Kodak: 1.44 km ²	Highly urbanised, rather flat. Several retention basins for flood control.	Canoe model for whole catchment; Dual-drainage, fully distributed, Multi-Hydro for Kodak	Raingauges, C-band and new polarimetric X-band radar	Optimisation of real time control elements
FR	Jouy-en-Josas (Seine-Saint-Denis County, Paris)	Auguste Gires	2.5 km ²	Steep slopes, combination of land uses. Several storm water retention basins	Dual-drainage, fully distributed, Multi-Hydro	Raingauges, C-band and new polarimetric X-band radar	Optimisation of real time control elements
FR	Sucy-en-Brie (Val de Marne County, Paris)	Abdellah Ichiba	2.69 km ²	New retention basin (interest on RT control of it)	Currently CANOE model (only sewer system), Multi-Hydro is being implemented. Also, CALAMAR system for RT calibration	Raingauges, C-band and new polarimetric X-band radar	Optimisation of real time control elements

COUNTRY	PILOT SITE	PILOT LEADER	DRAINAGE AREA (km ²)	MAIN CHARACTERISTICS	HYDRAULIC MODEL	RAINFALL DATA AVAILABLE	MAIN OBJECTIVES
BE	Northern part of Leuven (Herent)	Johan Van Assel	30 km ²	Occasional pluvial flooding in centre of Herent	Currently 1D InfoWorks. Both full 2D and dual system (1D/2D) foreseen to be implemented	Previously acquired X-band radar and 8 operational raingauges	Flood modelling, RT flood forecasting and warning. General optimisation of pumping stations and CSOs Identify and solve problems of rural overland inflow to sewer system
BE	Full Leuven area	Johan Van Assel	120 km ²	Highly urbanised city centre with risk of coincidental fluvial and pluvial flooding (although nothing serious has happened in recent years). Occasional pluvial flooding in low areas near WWTP.	Currently 1D InfoWorks, to be extended for flood modelling. Full 2D implementation unlikely to be feasible within project.	Previously acquired X-band radar and 8 operational raingauges	Same as above. Use RTC for realtime flood and storage control near WWTP.
BE	Ghent: area Oostakker - Sint-Amandsberg	Patrick Willems		Regular flooding	Dual-drainage, semi-distributed, Infoworks	Rain gauge data to be collected; additional gauges will be installed by TMVW (sewer system manager)	Climate adaptation planning Flood nowcasting system (RainGain & PLURISK projects)
UK	Cranbrook catchment, London Borough of Redbridge	Susana Ochoa	9 km ²	Highly urbanised, coincidental fluvial and pluvial flooding	Dual-drainage (1D/1D and 1D/2D), semi-distributed, InfoWorks	Upgraded C-band radar, raingauges and possibly X-band radar	Urban planning and RT forecasting and warning
UK	Torquay Town Centre, Devon Borough of Torbay	Susana Ochoa	14.6 km ²	Coastal city, steep slopes drain to natural depression, flooding exacerbated by high tides	Dual-drainage, semi-distributed, Infoworks	Upgraded C-band radar, raingauges and possibly X-band radar	Optimisation of real time control elements
UK	Purley Area, London Borough of Croydon	Susana Ochoa	6.5 km ²	Highly urbanised, great density of receptors, slopes drain to natural depression	Sewer system only, semi-distributed InfoWorks	Upgraded C-band radar and raingauges	Urban planning and RT forecasting and warning

REVIEW - WP3 A11



- **PROBLEMS / PARTICULAR ISSUES:**

- BE partners are interested in setting up a 1D model of the surface using the AOFD tool developed at ICL. This tool needs to be improved and its current version is hard to be used by partners – an upgrade is planned in Jul/Aug 2013.

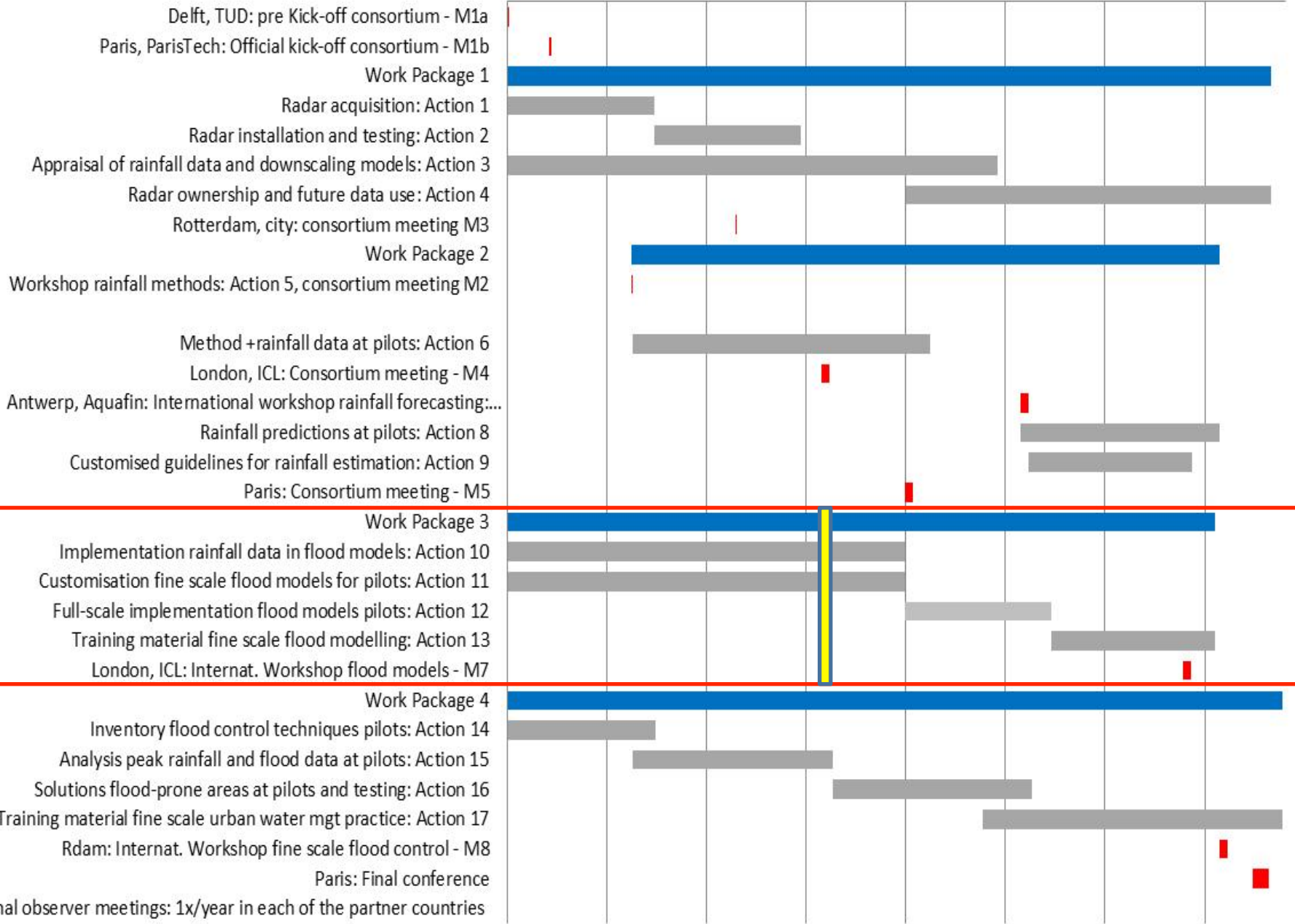
- **NEXT STEPS:**

- Partners will provide comments and inputs for review document – this document will continue to be updated as the project progresses and conclusions are reached regarding the suitability of the different software packages and modelling approaches (Deadline for inputs will be defined in technical meeting on Wed)
- Upgrade of AOFD tool: Jul/Aug 2013
- Models of all pilot locations will continue to be improved as the project progresses and monitoring data becomes available.
- Throughout the project the different software packages and modelling approaches will be discussed and compared, partners will share experiences and expertise, and recommendations regarding the suitability of the different models will be made.



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REVIEW - WP3 A12



- **ACTION:** Full-scale testing of the models for pluvial flood prediction in each of the pilot locations (with historical data and in RT)
- **OUTPUT:** Core technology for urban pluvial flood prediction, tested models, reports
- **PROGRESS TO DATE:**
 - Data for testing of models are being collected
 - The datasets to be used for testing of models have been agreed upon (Feb 2013) – these will come from WP2
- **PROBLEMS / PARTICULAR ISSUES:**
 - Collection of data for model testing is delayed as a result of delays in WP1
- **NEXT STEPS:**
 - Testing of models will start at the end of 2013 (dates will be continuously revised)



REVIEW - WP3 A12



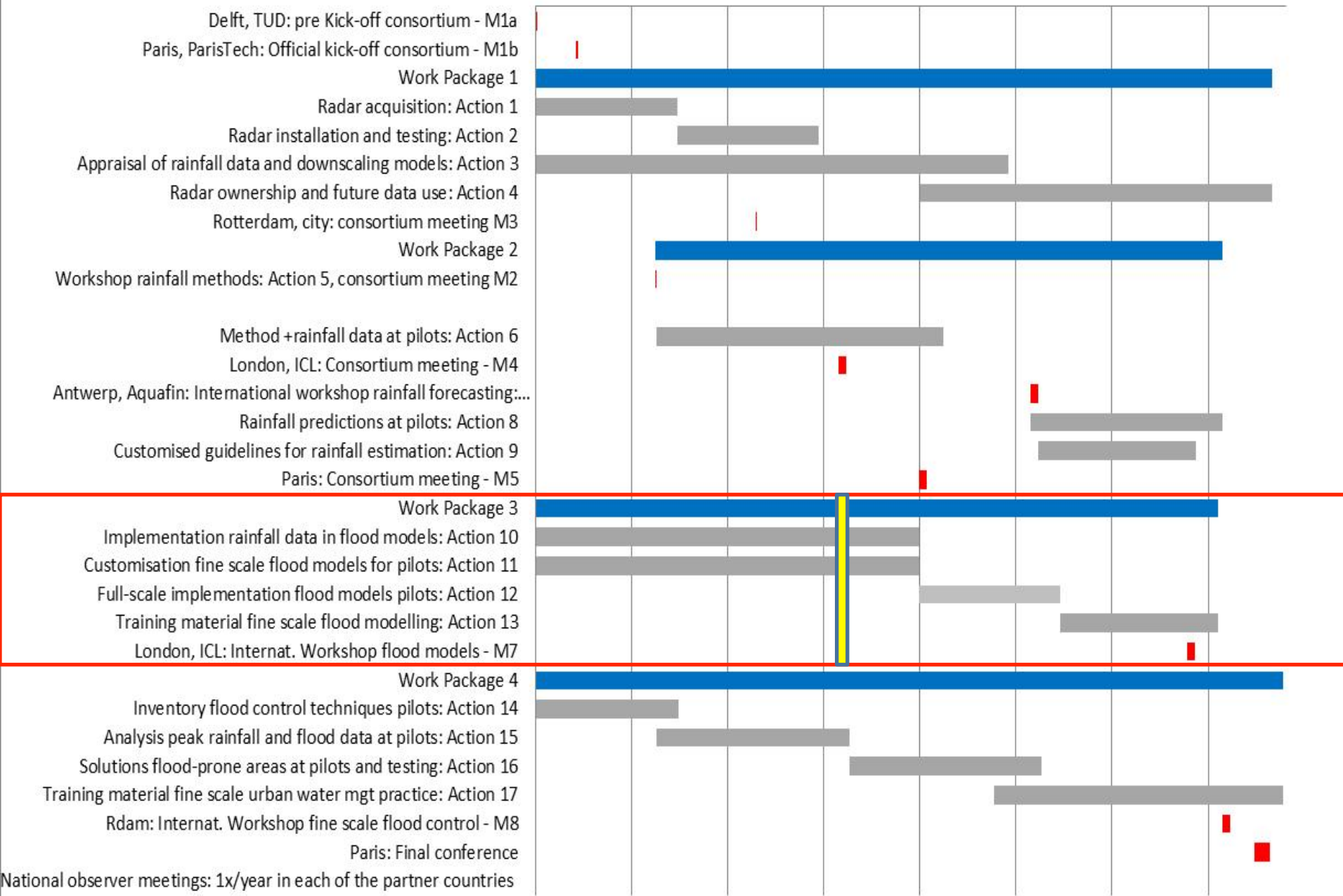
Datasets to be used for model testing:

- One common rainfall dataset will be applied to models of all pilot locations. This dataset will include: C-band and/or X-band radar data, raingauge data, merged radar-raingauge data, downscaled radar data. This would enable drawing conclusions regarding the effect of different rainfall inputs on different models.
- Complete dataset specific to each pilot location, comprising rainfall as well as water depth/flow measurements. This would enable assessing the performance of the model.



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REVIEW - WP3 A13

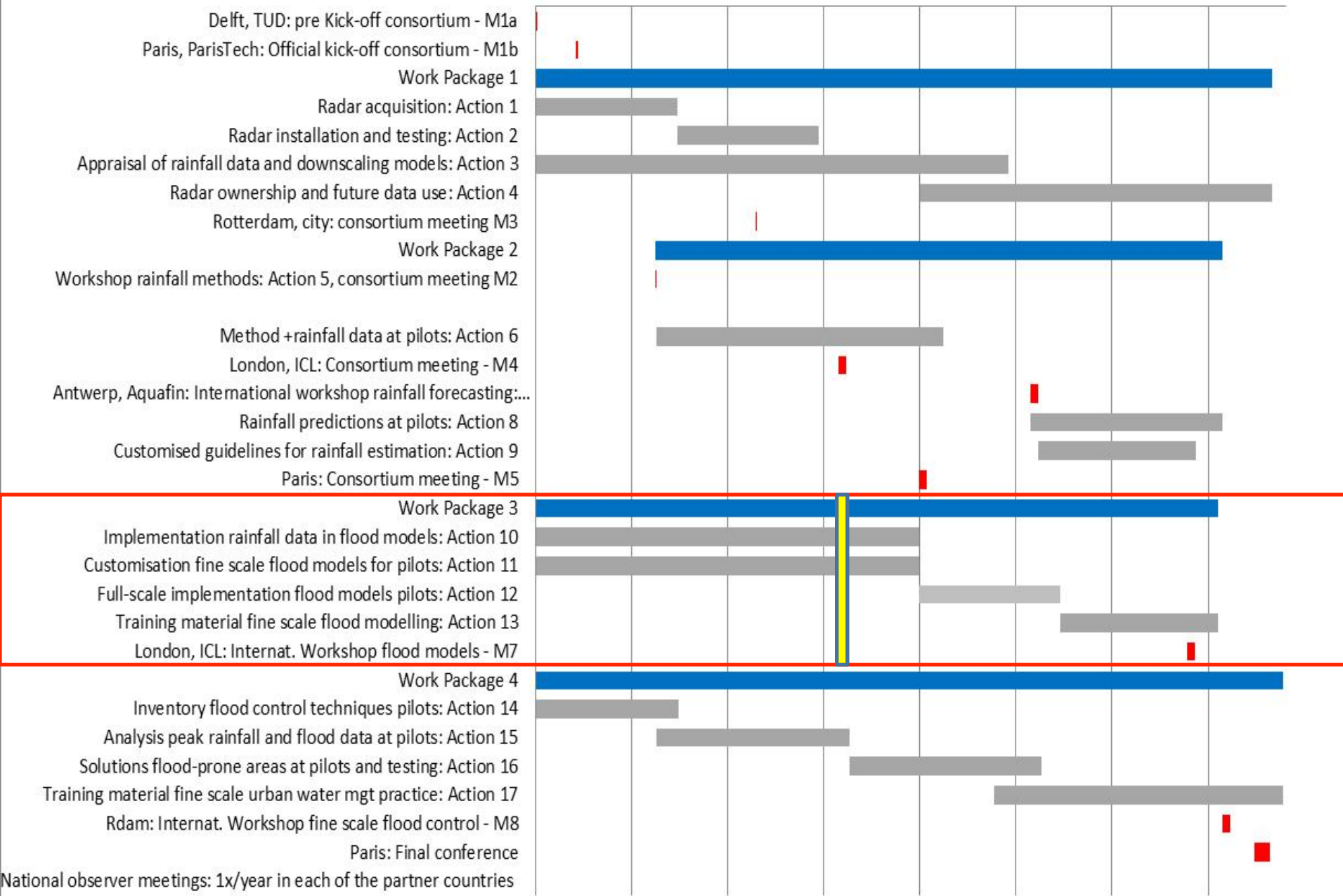


- **ACTION:** Development of guidelines and training material for capacity building and training of future end-users.
- **OUTPUT:** Country customised guidelines for pluvial flood forecasting at fine scales. Material for engaging local community members in flood risk management
- **PROGRESS TO DATE:**
 - Initial version of review document on urban pluvial flood models - this will be one of the deliverables of WP3 A13
 - ICL developed a workshop pack for engagement of stakeholders in local flood risk management. This document was distributed amongst WP leaders and can be freely used at the different pilot locations of the RainGain project.
- **NEXT STEPS:**
 - Review document will be continuously updated



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OVERALL PROGRESS



- Progress according to proposed timeline
- Permanent (and very useful) consultation and discussion with partners on forecasting platform and urban pluvial flood modelling approaches

