



# INTEGRATED HEAVY RAIN RISK MANAGEMENT

Newsletter #3  
April 2018 – August 2018



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Dear readers,

on 25<sup>th</sup> May 2018 the General Data Protection Regulation (GDPR) came into force. If you would not like to receive the newsletter any longer you can unsubscribe at any time: in that case, please send an e-mail to [rainman@iu-info.de](mailto:rainman@iu-info.de). If you are still happy to hear from us, we are looking forward to providing you with news of our project!

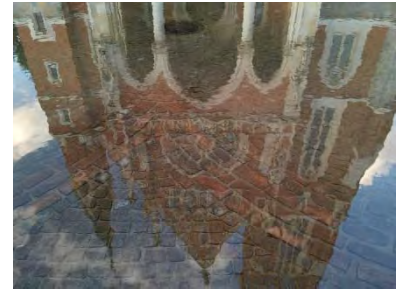
Your RAINMAN Team

## NEWSFLASH

16/04/2018

### Heavy rain event in the City of Graz

On 16th April 2018 a heavy rain event occurred, whereat 180 mm precipitation was recorded. This equates to 19 % of the total annual accumulated precipitation (835 mm). The consequences have been severe: e.g. a shopping center was flooded, people have been rescued out of a tramway that was stuck in a flooded underpass, and a house was evacuated due to danger of collapse. The fire brigade has received 534 emergency calls. This event has highlighted the importance of the RAINMAN project.



11/09/2018

### RAINMAN meets STRIMA II: practitioner workshop

During the second "STRIMA II - flood risk management forum" in Dresden on 11<sup>th</sup> September 2018, the first RAINMAN practitioner workshop will take place. During the workshop approaches for the documentation and mapping of heavy rain hazards and risks on the local level will be discussed. For this, municipalities and further local stakeholders from Saxony are welcome to participate on 11<sup>th</sup> September 2018 at 15:30.

Although translation from/to German and Czech language is provided for the Forum, the practitioner workshop will only be held in German.



12-13/11/2018

### 4th transnational partner meeting in Meißen

The next partner meeting will take place in Meißen on 12<sup>th</sup> - 13<sup>th</sup> November 2018: Additional to the presentation and discussion of intermediate and final results, a steering group meeting as well as the first advisory board meeting will be combined with the partner meeting.



20-22/03/2019

### SAVE THE DATE: RAINMAN Mid-term conference!

The project's mid-term conference will take place on 20<sup>th</sup> to 22<sup>nd</sup> March 2019 in Tiszakécske, Hungary. We are looking forward to present our first results and experiences and to exchange information on the various approaches and possibilities that deal with heavy rain risk in Central Europe!



## Scoping process concluded

During the past months, the project focused on gathering transferable information as input to the scoping process regarding

- a) methods of assessment and mapping of heavy rain risks in different European countries,
- b) heavy rain risk reduction measures and approaches in each of the project partners' countries in terms of legislation regarding pluvial floods that enable flood risk reduction.

The gathered information has been analysed and discussed by the partnership from the different countries' perspectives. In October 2017 and in February 2018, two scoping workshops introduced other experts' knowledge and advice. The results of this process are now put together in two scoping studies, which will be available on the RAINMAN website in autumn 2018.

Upon this knowledge base, an analytical framework for assessment and mapping methods is being developed. Furthermore, a joint catalogue of measures is gathered which will later on be integrated into the toolbox.

Both studies provide a good starting point for further content work not only regarding the development of the tools for the RAINMAN-Toolbox but also regarding the testing of the approaches in the pilot regions.

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## Results of the Online Survey

In the project RAINMAN, partners from six countries have joined to develop and test innovative methods and tools for the integrated management of heavy rain risks by local, regional & national public authorities. These will be included in the RAINMAN-Toolbox, a set of five transferable tools and methods for municipalities and regional stakeholders.

An online survey was jointly developed by the project partners and distributed to relevant stakeholders in all partner regions before developing the toolbox. With the survey information regarding two important inputs for the conception of the toolbox is gathered. On the one hand experiences with heavy rain in different regions are evaluated, on the other hand the stakeholders indicate their wishes and demands to improve heavy rain risk management. The results serve as a basis for the concept of the RAINMAN-Toolbox and its comprising methods and tools. The development and evaluation of the online survey was coordinated by the Saxon State Ministry of the Interior.

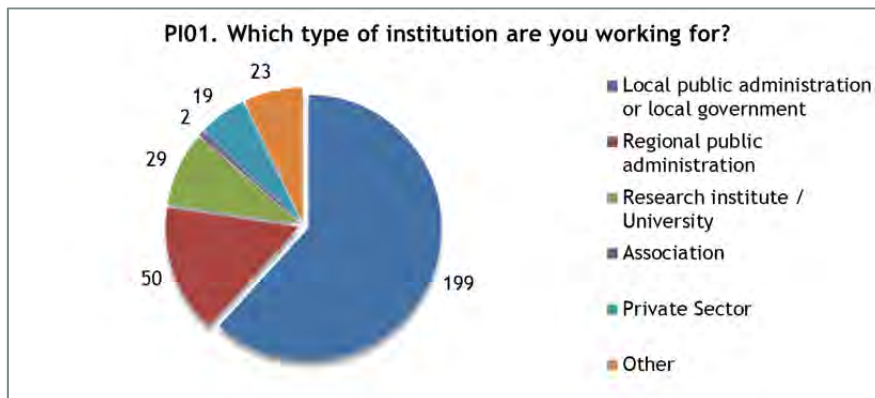
Besides personal information the online survey was structured into five topics. For each topic first results can already be presented on the following page.

The RAINMAN partnership will continue evaluating the results of the online survey. Conclusion for the different thematic RAINMAN work packages will be drawn. Furthermore, the survey complements the findings of the scoping studies. For each work package individual conclusions and country specific results of the online survey will be taken into account in the upcoming activities. The analysis of the survey results will be finalized until the end of 2018 and will be available on the RAINMAN website.

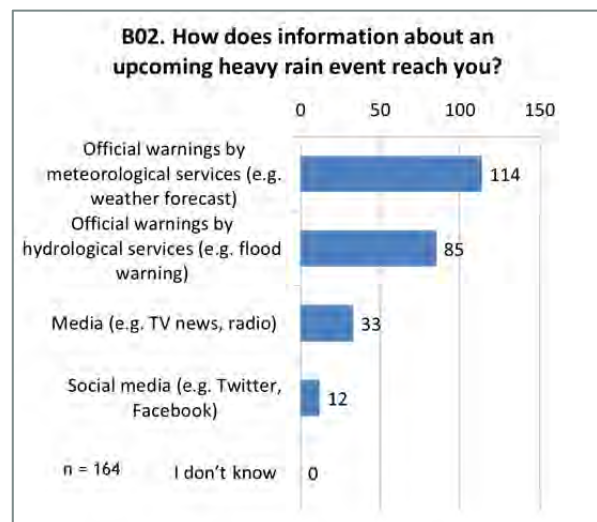
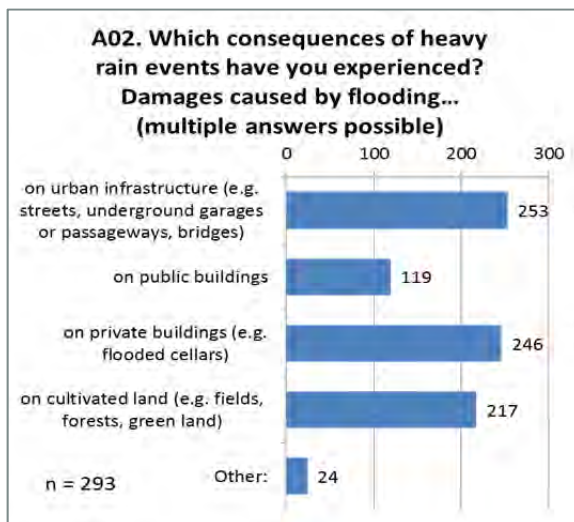




- Up to June 2018 the online survey was answered by 322 participants, mainly from the main target group local public administration, local government and regional public administration.



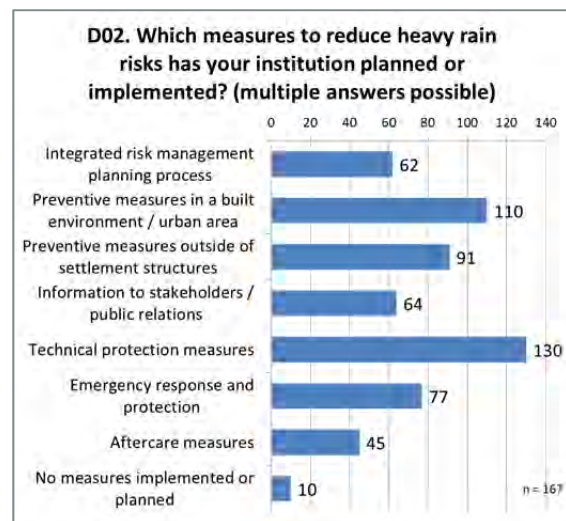
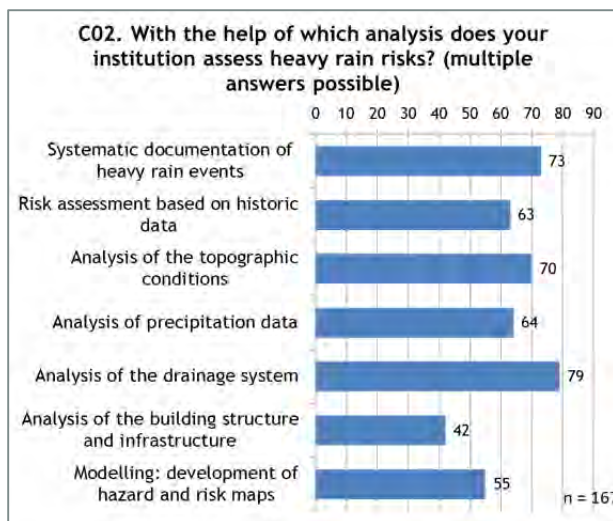
- More than 90 % of the respondents have experiences with heavy rain risks (section A of the survey). They experienced especially damages on urban infrastructure, on private buildings and on cultivated land caused by flooding and mass movements (damages caused by flooding: see figure below). Most participants are concerned about consequences of climate change and think that heavy rain events will increase in the future. Most respondents agree that more activities by public authorities are needed for risk prevention which is the main target group for the RAINMAN-Toolbox.
- Practical use of early warning systems (section B): Information about heavy rain events are mostly provided by public meteorological services (see figure below). Only 60 % of the participants state that warnings reach them in time, 25 % state the warnings turn out to be correct. In the perceptions of the respondents from different countries and communities warning for heavy rain events are hardly predictable.



- For the assessment and mapping of heavy rain risks (section C) a variety of methods is available and applied, a clear distinction between important / non important methods is not possible (see figure below). Although most participants are aware of heavy rain risks more than 40 % have not conducted any heavy rain risk assessment yet.



- A high share of the respondents have already planned or implemented measures to mitigate heavy rain risks (section D). The focus of planned / implemented measures is on technical protection measures as well as on preventive measures in a built environment and outside of settlement structures (see figure below). According to the participants these are also the most effective areas of activity.
- In the last section (section E) of the survey participants were asked which kind of support and materials would help to improve heavy rain risk management. The identified demands and wishes will be reflected in the development of the toolbox. The intended structure of the toolbox already includes large parts of these demands and wishes, e.g. the expressed need for information and guidance. Nevertheless, the survey also revealed blind spots in the scope of the toolbox that need to be reflected in the further development of the toolbox (e.g. information on financing or funding options for the implementation of measures).



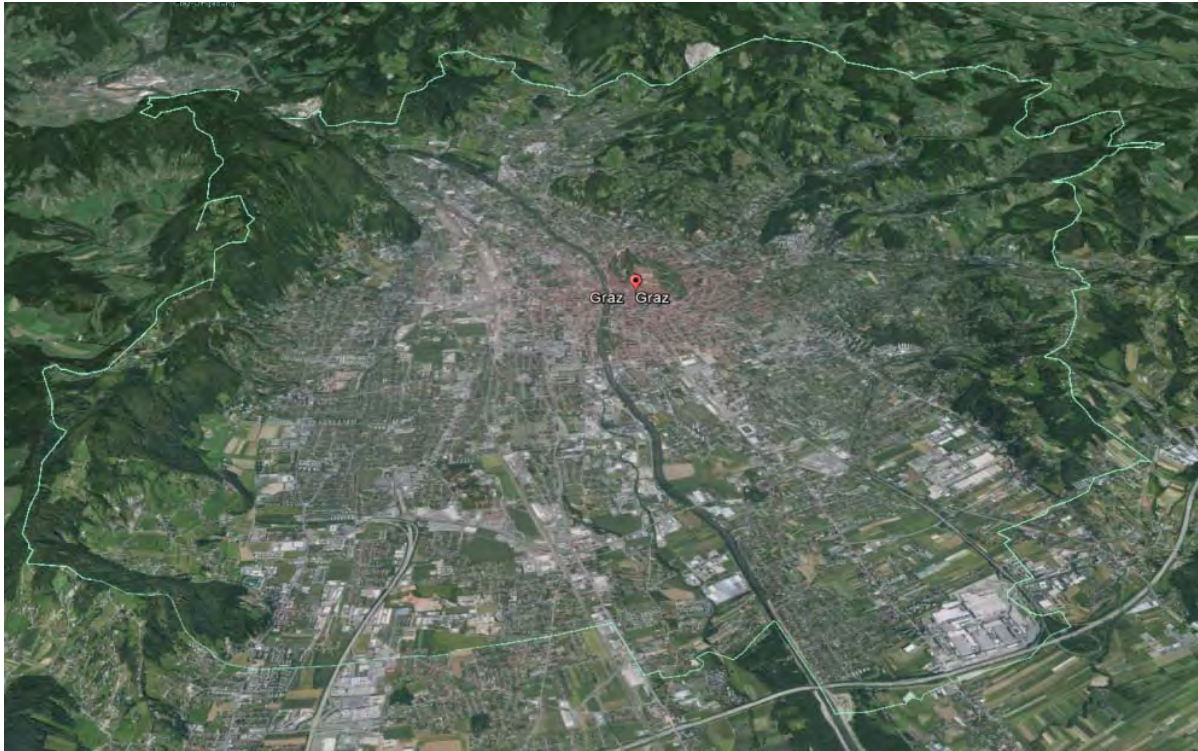
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## Pilot activities in the City of Graz

### Location

Graz is the 2<sup>nd</sup> largest city of Austria with about 287,000 inhabitants, situated at the Southern border of the Alps. A chain of hills in the West, North and East surrounds the city. The City of Graz covers about 13,000 hectares, of which somewhat more than half are building land and roads. Besides a multitude of smaller watercourses, the Graz urban area contains more than 40 streams, plus 10 torrents.



Natural Environment Side, Source: Google Maps

### Problem description

Under the pressure of demographic, infrastructural and spatial problems the issue of flood risk has often been dodged in urban areas; therefore the damage potential in settlement areas has risen enormously. Watercourses were straightened, narrowed or forced into canals and the urgently needed retention spaces were sacrificed for the sake of other uses. Sealing and new settlement developments, especially in the hilly terrain, favour the probability of occurrence of pluvial floods. Innumerable historic flood disasters have been recorded in the urban area of Graz (e.g. 2005, 2009, 2013). A very recent example of a dramatic heavy rain event took place at 16<sup>th</sup> April 2018, for details see Newsflash (page 2). Every time the source of flooding has been fluvial as well as pluvial floods and slope water. In 2006 the so called "The Streams of Graz - Programme of Measures" was initiated with the goals to implement structural and non-structural flood protection, to improve the ecological status and to create nearby recreational areas. A large number of measures have been implemented so far. Until now, the focus was mainly on fluvial flooding. Regarding pluvial floods, indicative flow path maps are available.







Flow Path Map Graz, [https://www.graz.at/cms/beitrag/10295894/8115447/Online\\_Karte\\_Fliesspfadkarte.html](https://www.graz.at/cms/beitrag/10295894/8115447/Online_Karte_Fliesspfadkarte.html)

## What is planned within the project?

- To define heavy rain risk scenarios
- To generate heavy rain risk maps for endangered hot spots
- To develop an emergency management plan with a catalogue of measures
- To improve the existing “alarm tool” regarding heavy rain risks
- To hold trainings and workshops with representatives of the City of Graz

## Heavy rain risk check:

### “How well is the City of Graz prepared for pluvial flood events?”

A highlight took place in June 2018. External experts (Reinhard Vogt, Marc Scheibel) from Germany conducted a “heavy rain risk check” in order to answer the question: “How well is the City of Graz prepared for pluvial flood events?” In the course of a 2-day workshop 28 participants from all affected fields have analysed in total 35 indicators regarding the status of land use, building, information, behaviour and many more. Beyond that, political representatives have held a press conference to inform the public about the project activities. The results are currently being evaluated.

As Graz faces the challenge of inundations due to fluvial, pluvial and sewer flooding, Graz University of Technology, Institute of Urban Water Management and Landscape Water Engineering, is developing a new combined methodology to identify areas at risk. It will be applied for hot spots in the city.



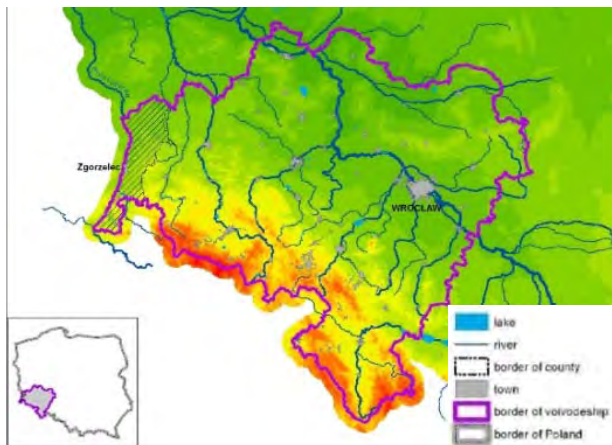


Press Conference “Heavy Rain Risk Check”: Rudolf Hornich (Coordinator for Flood Risk Management, Office of the Styrian Government), Hans Seitinger (Regional Minister for Water Management, Styrian Government), Reinhard Vogt (Former Head of the Flood Control Centre Cologne), Heimo Krajnc (Fire Brigade - City of Graz)

Picture: © Styrian Government, Lebensressort

<b>Further information:</b>	Office of the Styrian Government Department Water Management, Resources and Sustainability Rudolf Hornich, Cornelia Jöbstl, Brigitte Skoriansz <a href="mailto:rudolf.hornich@stmk.gv.at">rudolf.hornich@stmk.gv.at</a>
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## Pilot activities in Lower Silesia



Lower Silesia Province (Voivodeship) is located in south-west Poland with its capital in the City of Wrocław.

The northern part of the area are lowlands (75 % of region), while in the south of the area there are Sudety Foreland and the Sudety Mountains with the highest peak Śnieżka (1,603 m a.s.l.). Almost the entire region is located within the Odra river basin. Physio-graphical, climatic and hydrological factors make Lower Silesia often affected by precipitation-related floods.

In Lower Silesia Province, the **Zgorzelec County** - a predominantly rural area with a population density below 300 inhabitants/km<sup>2</sup> and located mostly within the Nysa Łużycka catchment - was considered in the analysis due to heavy rain events affecting this area.

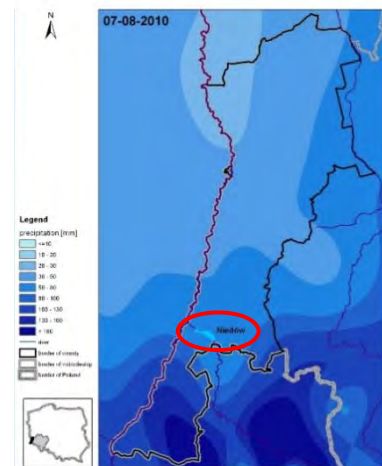




## Flash flood event in 2010

The most serious event of heavy rainfall, that caused a flash flood in the Nysa Łużycka catchment, occurred in August 2010.

- The most intensive rain occurred at night on 6<sup>th</sup>/7<sup>th</sup> August and in the morning on 7<sup>th</sup> August.
- The highest intensity of rainfall reached almost 60 mm/hour.
- Daily precipitation totals reached up to 180 mm.
- The dam of the Niedów reservoir on the Witka river (tributary of Nysa Łużycka) was destroyed.
- 4 people lost their lives.
- The material losses exceeded 225 Mio PLN (ca. 55 Mio €) in Bogatynia community.



## Hazard and risk maps

Our pilot activities with regard to hazard and risk mapping focus on rural areas and small cities by applying the method developed by T. Bryndal (2014) „Identification of small catchments prone to flash flood generation in the Polish Carpathians“.

The applied method involves the following steps:

- Identification of catchments in Lower Silesia where pluvial flash flood events occurred,
- Calculation of the physiographic, land use and hydrological parameters for the catchments affected by pluvial flash flood events,
- Creation of a GIS database of the parameters for each identified catchment,
- Statistical analysis and evaluation of the types (models) of the catchments more prone to flash flood generation,
- Identification of catchments more than others prone to pluvial flash flood within Nysa Łużycka river basin.

## Non-technical measures

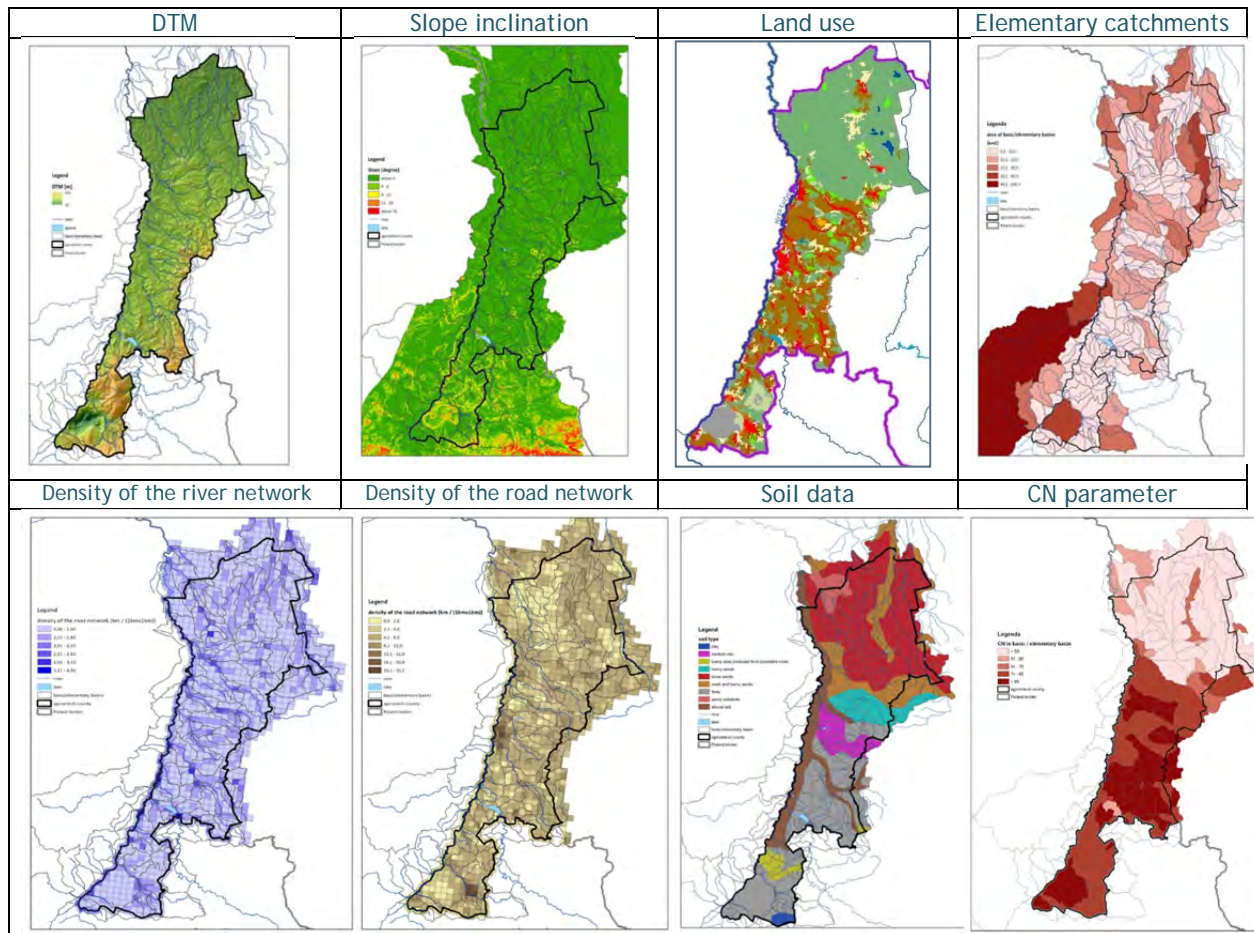
Our pilot activities within non-technical mitigation measures in order to reduce heavy rain risk focus on the following activities:

1. Recommendations for spatial planners & end users for prioritizations of actions and strategies for pluvial flood protection,
2. Catalogue of good practise of the tested measures.

The non-technical measures which are currently implemented in the Zgorzelec county will be summarized and the legal regulations and strategic documents in spatial planning will be collected and analysed. Next, in order to reduce heavy rain risks, the work will focus on small retention and land use changes with the option of using a run off model and GIS analyses.

The work will be accompanied by consultations listed as associated partners within the project (Regional Water Management Board in Wrocław and Institute of Territorial Development) as well as other stakeholders.





Physiographic, land use and hydrological data for identification of small catchments in Nysa Łużycka river basin

<p><b>Further information:</b></p>	<p>Institute of Meteorology and Water Management - National Research Institute                  Dr. Mariusz Adynkiewicz-Piragas, Iwona Zdralewicz, Irena Otop  <a href="mailto:mariusz.adynkiewicz@imgw.pl">mariusz.adynkiewicz@imgw.pl</a></p>
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## 3rd Partner meeting in Zagreb

The RAINMAN partnership met for the 3rd partner meeting in the Croatian capital Zagreb. The meeting took place on 13<sup>th</sup> and 14<sup>th</sup> June 2018. The importance of the RAINMAN project was extremely visible as heavy rain events were observed in almost every country of the partnership in the weeks before the meeting. During the two days meeting the partners presented their ongoing activities, had fruitful discussions and decided on the next steps.

The Director of Development of our host Croatian Waters, Danko Biondić, warmly welcomed the participants on the first day of the meeting. Additionally, Croatian experts gave an insight into flood risk management and hydrological aspects of heavy precipitations analyses in Croatia.

In the following presentations and discussions the partnership focused on assessment and mapping of heavy rain risks. Based on a scoping study on assessment and mapping of heavy rain risks, drafted by the Environmental Agency (AT), the partnership discussed interlinkages to other RAINMAN activities. For the finalization of this scoping study the RAINMAN partners agreed on minor improvements of the scoping study, as for example to address the intention of hazard maps more detailed. The scoping study will be reflected from the pilot activities to confirm or reject related findings. Additionally, an analytical framework was presented by the Leibniz Institute of Ecological Urban and Regional Development (DE). The aim of the framework is to structure different methods of assessment and mapping in a clear and concise manner, e.g. related to geographical conditions or by different steps (e.g. hazard analysis, vulnerability analysis, risk analysis and map generation). All these activities form the basis for the development of tool 1 for the RAINMAN-Toolbox which aims to provide guidance on methods for assessment and mapping of heavy rain risks.



On the second day the partners set a focus on risk reduction measures to reduce damages of heavy rain risks. Here again a scoping study provides an overview on existing information and instruments, i.e. on existing catalogues about risk reduction measures, in the different partner regions. It becomes clear that the partner regions build upon different classifications and no standard catalogue of risk reduction measures has been implemented so far. This was again confirmed by the presentation about implemented or planned risk reduction measures in the pilot activities.





For the toolbox, RAINMAN will differentiate measures in four categories which are

- “early warning and emergency response”,
- “risk reduction by urban and regional planning”,
- “prevention for urban areas and private structures” and
- “retention concepts and optimization for storage management”.

These four topics were discussed in parallel working sessions and will be covered by tool 2 in the RAINMAN-Toolbox.

During both days the participants also got to know first results of the online survey that covered all relevant topics of the RAINMAN project. Also interlinkages to the RAINMAN-Toolbox were addressed during both days.

The next partner meeting will take place in Meißen in November 2018.



## RAINMAN Key Facts

Project duration: 07.2017 – 06.2020  
Project budget: 3,045,287 €  
ERDF funding: 2,488,510 €

RAINMAN website &  
newsletter registration: [www.interreg-central.eu/rainman](http://www.interreg-central.eu/rainman)



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## Project Partner

