

**Interreg**



CENTRAL EUROPE

European Union  
European Regional  
Development Fund

**DEEPWATER-CE**

# DEEPWATER-CE

MAY 2019 - APRIL 2022

## NEWSLETTER / 2



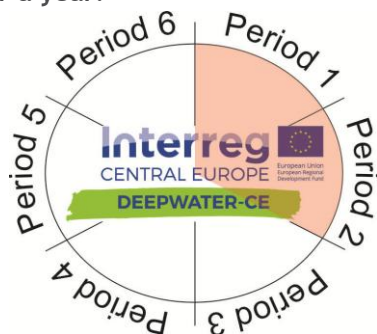
YEAR 1 / April 2020

<https://www.interreg-central.eu/Content.Node/DEEPWATER-CE.html>



## A brief look at the DEEPWATER-CE project.

We have been cooperating in achieving project goals for a year!



The major aim of DEEPWATER-CE project is to develop integrated environmental management capacities of responsible public actors for a comprehensive transnational approach to planning water resources and adoption of MANAGED AQUIFER RECHARGE (MAR) solutions in Central European (CE) countries, as a solution to climate change induced water scarcity and decreasing usage conflicts with other social and economic sectors.

**Main activities within DEEPWATER-CE project:**

- set of trainings and webinars for informing stakeholders about best MAR solutions,
- development of a transnational assessment methodology for decision-making on MAR locations in Central Europe,
- pilot feasibility studies on the application of different MAR types carried out in 4 countries: Hungary, Poland, Slovakia and Croatia,
- development of policy recommendations and national action plans regarding adoption of MAR into the river basin plans and water strategies.



**PROJECT PARTNERS**



**COUNTRIES: HUNGARY, GERMANY, POLAND, SLOVAKIA, CROATIA**



**BUDGET**



**TIMELINE**



## WORK PACKAGE 1

### We are working on!

In order to achieve WP T1 main goal - to develop a transnational knowledge base on the applicability of MAR in CE, several activities have been carried out to support this goal.

1. First step was the introduction of stakeholders in the project. By developing both national and transnational databases of cross-sectoral stakeholder groups (CSSG), further two-way cooperation is fostered, as well as dissemination of results, discussion & feedback. National CSSG participated in national kick-off meetings during last project period.
2. Further, an important overview paper has been developed: "Collection of good practices and benchmark analysis on MAR solutions in the EU". This paper contains core theoretical and practical elaboration of many topics within the term MAR. The paper addresses historical overview of MAR operation, objective and criteria, types of operation, source water implications, feasibility and performance as well as operational overview in Europe. Furthermore, this paper contains national experiences and existing project in MAR operation from DEEPWATER-CE participating countries (DE, HU, HR, PL and SK) as well as overview of key issues in water management in every country.
3. In Spring 2020, the first round of national training sessions will take place in DEEPWATER-CE countries. In total, three rounds will be held throughout the Project.

The aim of the first round of trainings is to present general MAR concept and terminology to stakeholders, such as:

- definition of Managed Aquifer Recharge
- types of MAR and objectives
- preconditions: natural settings (geology, hydrogeology), operational and economic factors
- good practices and benchmark analysis
- lessons learnt from past/existing MAR operations in Europe

National training sessions will be held in form of online webinars, to ensure broad participation. For stakeholders who cannot attend the webinar, offline recording of the session will be available on stakeholder's demand, either on DEEPWATER-CE Virtual Squares.

4. DEEPWATER-CE has established Virtual Squares - online network set up through LinkedIn in order to inform stakeholders of relevant news, results and outputs. Virtual Squares are set up on two levels: national and transnational. In national Virtual Squares, domestic stakeholders participate in their own national language, while in transnational Virtual Squares, cross-border stakeholders discuss in English. Through Virtual Squares, stakeholders can communicate, debate, ask questions and share information between themselves or Project Partners. By means of these both national and transnational cooperation will be strengthened which will enhance the quality of Project outputs and results and their dissemination.

Project Partners continue their work on WP T1 towards national training sessions and establishment of an efficient two-sided communication between cross-sectoral stakeholder groups on national and transnational level.



## WORK PACKAGE 2

**We are working on!**

### OUR ACTIVITIES IN THIS PACKAGE

This work package is about **development of a transnational assessment methodology for decision-making on MAR locations in Central Europe.**

Within it methodologies for the collection of climatological, hydrogeological and geological information relevant for MAR site implementation in Central Europe is developed. Base on this information, a methodology for a sensitivity analysis for MAR sites is developed.

For the sensitivity analysis several climatological extreme events (e.g. floods and droughts) impacting MAR sites are chosen. With this methodology the sensitivity of the MAR system to these extreme events can be evaluated.

In the next step a decision support toolbox for MAR site selection in Central Europe (CE) from the collected information in the methodology is derived.

As the requirements for every MAR type are different the paramteres defining the hydrogeological suitability, the climate exposure and the sensitivity of the MAR system will be selected for 6 chosen MAR types, which include the most common MAR types in CE (infiltration ponds , induced river/lake bank infiltration, ASR) and the ones that will be further investigated at the pilot sites in the DEEPWATER-CE project (recharge dam, underground dam and ditches).

Two different scales are implemented in the decision support toolbox. First a screening on national level will be carried out to select the suitable target areas for MAR locations. On a second scale, it is possible to investigate the suitability of the target areas on a regional level with more detailed and specific selection criteria.

### WHAT WE'VE DONE SO FAR?

So far the methodologies for MAR site selection for climatological, hydrogeological and sensitivity analysis information have been successfully completed.

During one physical and one virtual work meetings in February 2020 in Budapest and March 2020 via Skype, the methodologies of the thematic activities were discussed and are now being finalized until the end of May 2020 in weekly meeting groups.

After that, methodologies and selection criteria from climatology, hydrogeology and geology as well as sensitivity analysis will be collected in a joint final document until the beginning of June 2020 in a form of a handbook.

Based on this document a video tutorial on the use of the toolbox-will be shot and distributed over the various channels of communication.



## WORK PACKAGE 3

### We've already started the fieldwork!

This work package is about pilot feasibility studies on the application of different MAR types that will be carried out in 4 countries: Hungary, Poland, Slovakia and Croatia. Related field works have already been started in Poland and Croatia.

The work on the pilot feasibility study on karst semiarid hydrogeologic conditions is being deployed in Croatia. Started work is carried out by Croatian Geological Survey, Split Water and Sewerage Company Ltd and Croatian Waters

### LOOK AT OUR WORK!



Coastal spring Pizdica and intake structure  
(M. Filipović)



Well sampling (M. Patekar)

## CROATIA

### CURRENT PROGRESS OF WORK

Experts from Croatian Geological Survey started field and laboratory investigations on the island of Vis in September 2019. In order to provide an answer whether it is possible to deploy a MAR operation on this remote karstic island with semiarid climate, a detailed hydrogeological, structural and geophysical investigation is required. As groundwater conditions in karstic environment are characterized by quick and sudden changes in quality and quantity, it is necessary to perform detailed monthly sampling and measurements.

Conducted field and laboratory investigation on the island of Vis include:

- sampling of springs and groundwater from wells for *in-situ* and laboratory measurements of: electrical conductivity, temperature, pH, cation and anion composition, O<sub>2</sub> content

- analysis of stable isotopes <sup>16</sup>O, <sup>18</sup>O and <sup>2</sup>H
- analysis of precipitation data on four meteorological stations
- monitoring of groundwater levels, temperature and electrical conductivity with automatic loggers installed in 7 wells
- investigation of new prospective zones by electrical tomography.

Field investigations will continue in upcoming months as we further investigate highly complex and heterogenic karst system. In order to enhance the quality and applicability of these investigations, a strong cooperation is fostered between Croatian Geological Survey and stakeholders from the island of Vis, namely Water supply company, City administration, Communal services, local researchers and population.



## WORK PACKAGE 3

We've already started the fieldwork!

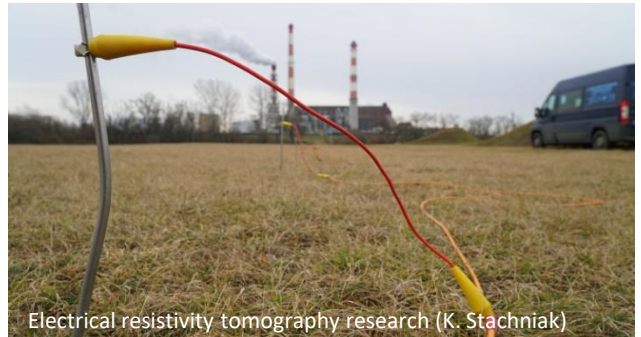
The work on the pilot feasibility study of MAR in Poland is focused on the porous aquifers which are located near industrial sites that pose a serious threat for the quality of water in shallow aquifers.

Started work is carried out by University of Silesia in Katowice and Tarnów Waterworks with cooperation with Technical University of Munich - a lead partner of the WP T3.

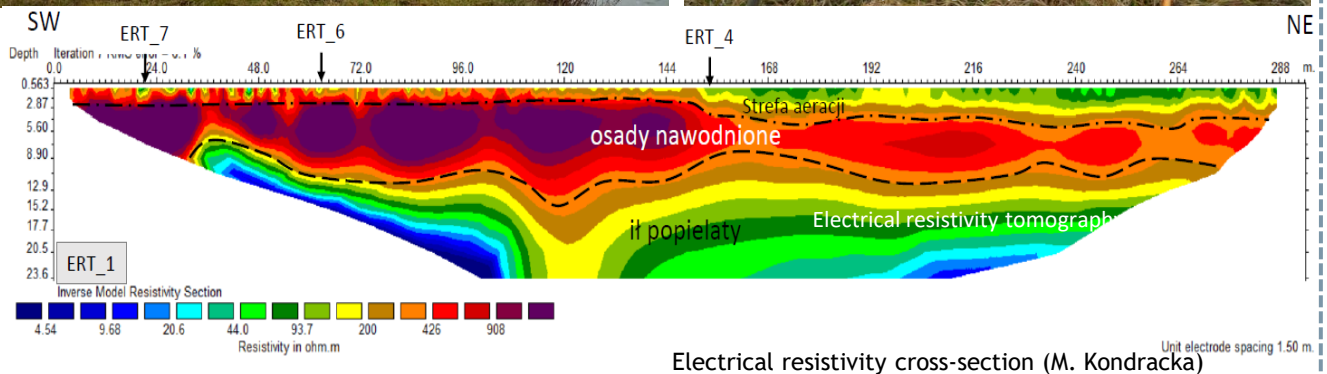
### LOOK AT OUR WORK!



Example of MAR spreading methods (S. Sitek)



Electrical resistivity tomography research (K. Stachniak)



Electrical resistivity cross-section (M. Kondracka)

## POLAND

### CURRENT PROGRESS OF WORK

The knowledge of geological and hydrogeological conditions is crucial for the location of an appropriate type of Managed Aquifer Recharge (MAR). For this reason, one of the non-invasive methods of investigation of soil and water environment was applied. Electrical resistivity tomography (ERT) is one of the geophysical methods, consisting in automatic measurement of electrical resistance between individual electrodes along the measuring line. The interpretation is based on the calculation of the electrical resistivity values and the depth from the input data using Jacoby matrix and forward modelling procedures. In the area of research, 10 cross sections with a total length of less than 2 km were carried out.

Currently, work is being continued on the interpretation of the results, which will allow to determine the thickness of the aquifer and other hydrogeological parameters that will help to determine the usefulness of the analyzed area for various MAR types.



## First Project Coordination Meeting

20-21  
NOVEMBER  
2019

The meeting was organized by the University of Silesia in Katowice in cooperation with the project Lead Partner.

Firstly, the results and future activities of ongoing work under WPT1 were discussed such as:

- PPs country reports on the CSSG kick-off meetings;
- setting up and operation of the national and transnational virtual squares;
- good practices and benchmark analysis on MAR solutions - summary report
- a draft methodology for training on good practices on MAR in the EU.

Secondly, the results and future activities of the work under WPT2 were discussed.

The main issue was the development of a transnational assessment methodology for decision-making on MAR location in CE, report on activities carried out in three thematic fields:

- hydrogeological conditions,
- climatic models,
- sensitivity analysis of extreme situations.

KATOWICE  
POLAND

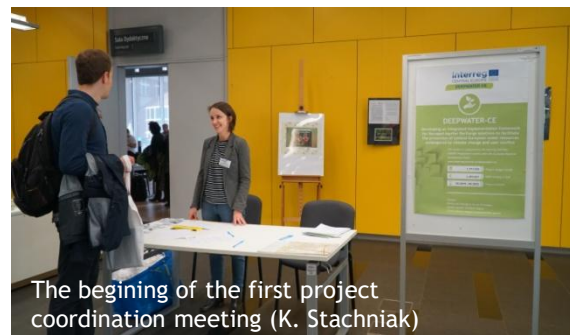
We have discussed results and ongoing activities connected with the development of a transnational knowledge base on the applicability of MAR in CE (reports, trainings, webinars), the development of a transnational decision support toolbox for designating MAR locations in CE (hydrogeological conditions, climatic models, sensitivity analysis of extreme situations), communication issues and also actual tasks of project management.



DEEPWATER-CE Partners (K. Stachniak)



We are working (K. Stachniak)



The beginning of the first project coordination meeting (K. Stachniak)



## First Project Coordination Meeting - **PRESS CONFERENCE**

**20  
NOVEMBER  
2019**

**KATOWICE  
POLAND**

A press conference was held before the partners' meeting.

The theme of the DEEPWATER-CE project deals with important issues related to mitigating the effects of climate change and securing access to water for the societies of Central Europe therefore met with wide media attention.

During the press conference the following persons spoke:

- dr hab. Tomasz Pietrzykowski (Vice-Rector of the University of Silesia in Katowice)
- dr Sławomir Sitek (DEEPWATER -CE, Polish project coordinator; University of Silesia in Katowice)
- Elisabeth Magyar (project leader; Mining and Geological Survey of Hungary)



Press conference (K. Stachniak)



Camerman's eye (K. Stachniak)

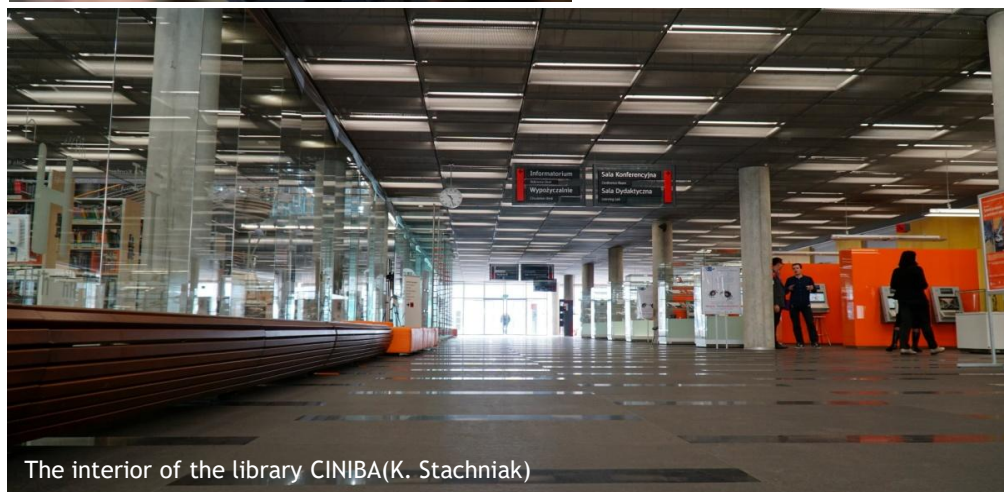
The conference was attended by such local (Poland) media as:

Radio eM, TOK FM, Radio Katowice, Super Express, UŚ TV, RMF MAXX, Polish Press Agency

Video record from the conference was posted on the project's YouTube channel.

We invite you to watch it!

[https://www.youtube.com/channel/UCh3Iw3sFH\\_lpSw\\_YSzZ4mXg](https://www.youtube.com/channel/UCh3Iw3sFH_lpSw_YSzZ4mXg)



The interior of the library CINIBA(K. Stachniak)





## First Thematic Coordination Meeting

25-26  
FEBRUARY  
2020

BUDAPEST  
HUNGARY

During a 2-days-long thematic meeting organized by the LP, Mining and Geological Survey (HU) and Geogold Kárpátia Ltd. (HU), project partners reviewed the current status of preparation for the first national trainings for stakeholders in PL, SK, HU, CRO and DE on good practices of managed aquifer recharge (MAR), as well as the components of the decision support toolbox aiming the designation of potential MAR locations.

Focal point of the meeting was to discuss and determine the structure and methodology of the DEEPWATER-CE toolbox.

Partners agreed that the toolbox should support decision-making and planning processes on two levels: on national and (sub-)regional level, thus definition of the 3 sets of selection criteria has to fit to this 2-tier concept.

Therefore, the toolbox will be composed to enable

1. a sequential country and regional level screening of hydrogeological suitability of areas for installing specific MAR techniques,
2. assessing the expected territorial climate change trends which can outline those CE regions that might be most in need of underground water storage in the 21th century,
3. performing regional level climate sensitivity analysis with assessing the potential impacts of extreme events such as droughts or floods on aquifers with a good potential of nesting MAR systems.



During the meeting (Beata Ferenczi)



Project Partners (Beata Ferenczi)



## Second Thematic Coordination Meeting

23<sup>rd</sup>  
MARCH  
2020

Skype  
meeting

During the meeting the prepared draft about organized webinars was discussed. Webinars are planned as part of the project. These are trainings for knowledge transfer about MAR solutions and their environmental and economic benefits.

The main purpose of webinars is providing participants with key information and skills, exchanging experience and ideas linked to the specific thematic area. The participants should easily understand the basic principles of the MAR schemes, obtain practical information for usage and get benefits from participation in the training session for their future work.

Within the project the following trainings will be performed for the relevant stakeholders in their own country who are involved in Cross-Sectoral Stakeholders Groups (CSSG):

- MAR topic and collection of good practices and benchmarking analysis,
- Toolbox, selection criteria and checklist for MAR location,
- Pilot feasibility studies to prepare policy recommendations.

Secondly, the Toolbox methodology for selection criteria and checklist for MAR location was discussed. The checklists are based on the selection criteria per each of the qualifiers defined in the different activities:

- climatic scenarios - where MARis needed,
- hydrogeological conditions- where MAR is possible,
- extreme situation cases.

There was a division of work and responsibilities in relation to the preparation of hydrogeological conditions and climate database and the collection of possible national or regional spatial data availability, enabling the determination of selection criteria for MAR locations.

Also the moderate discussion took place on data availability and data process, to assess the potential for harmonized mapping, and optional mapping of regional selection criteria.

Preparations for the creation of maps of partner countries or regions, enabling the selection of MAR locations have started.



Spring is coming (K. Stachniak)



## VIRTUAL SQUARE

### ABOUT

A Virtual Square (VS) is an internet platform that is established within the service LinkedIn, aiming at facilitating cooperation within cross-sectoral stakeholders groups (CSSG).

A stakeholder is a person, group of persons or representative of an institution being interested in the DEEPWATER-CE thematic and obtained results.

VS is a place where discussions will be held on the various topics of the project, especially in relation to the main outputs of the project priority:

Discussions in LinkedIn groups take place in the form of thematic posts and their comments.

### Cooperation with stakeholders via national and transnational virtual squares facilitates:

- to identify their expectations and needs from the project
- to provide thematic expertise to the project
- to assist with the implementation of project activities
- to take part in designing and finalizing draft project outputs and deliverables, primarily on a regional and national level (e.g. country reports, training material, pilot feasibility study)
- to participate in project events such as thematic workshops, virtual meetings and forums, thematic round-tables, national training sessions, and capacity building activities.

### THE NATIONAL VIRTUAL SQUARES (NVS)

Five separate LinkedIn groups as a national platforms for each PPs country: Croatia, Hungary, Poland, Slovakia in national languages and Germany as a exception in English, to facilitate communication in the partner countries and to discuss issues related to the national area in the first instance.

#### National Virtual Squares (NVS)

POLAND

<https://www.linkedin.com/groups/13847309/>

SLOVAKIA

<https://www.linkedin.com/groups/13837018/>

HUNGARY

<https://www.linkedin.com/groups/8913723/>

GERMANY

<https://www.linkedin.com/groups/8914391/>

CROATIA

<https://www.linkedin.com/in/deepwater-ce-hr-9b13791a7/>

### THE TRANSNATIONAL VIRTUAL SQUARES (TNVS)

Transnational Virtual Square (TNVS) - additional LinkedIn group as an international platform in English. To discuss the issue in a wider audience, in a broader context, in an international group.

#### Transnational Virtual Square (TNVS)

<https://www.linkedin.com/groups/13760882/>

MAIN WEBSITE LinkedIn

<https://www.linkedin.com/company/36126184/>



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**DEEPWATER-CE**



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## PARTNERS



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