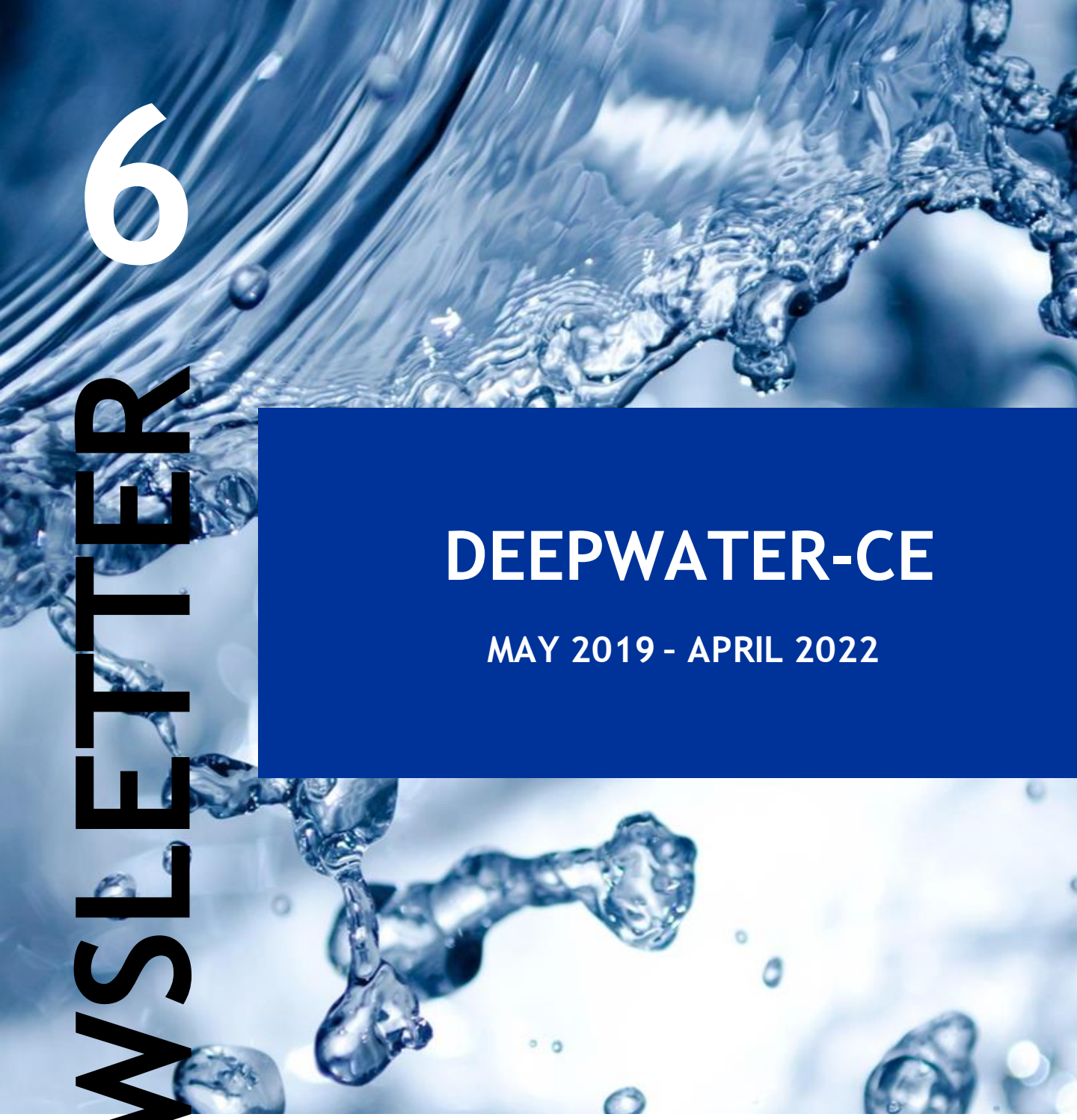


NEWSLETTER 6

DEEPWATER-CE

MAY 2019 - APRIL 2022

Interreg
CENTRAL EUROPE
DEEPWATER-CE

European Union
European Regional
Development Fund

YEAR 3/ APRIL 2022
Finale

Introduction

Seven **DEEPWATER-CE** partners have joined forces to develop the integrated environmental management capabilities of relevant public agents, with a view to developing a comprehensive, transnational approach to managing water resources.

A set of six **managed aquifer recharge (MAR)** solutions was chosen for detailed research to help resolve problems caused by climate change in Central European countries, including water scarcity or conflicts of use with other social and economic sectors. Partners have tackled a growing problem that affects more and more people, which is a lack of sufficient and, in places, good quality groundwater.

The MAR methods studied within our project make it possible to store additional quantities of good quality water in the aquifer, thus creating reserves for periods of prolonged drought or general water scarcity. This allows safe exstraction of groundwater for human consumption, agriculture or industry during crisis periods. As a result of the project, various MAR solutions are now better known to a larger audience thanks to trainings and co-operation with numerous international stakeholders.

Our team has developed a Transnational Decision Support Toolbox in the handbook form, in which a methodology designed to help stakeholders with selecting an appropriate location for a MAR facility is proposed. The handbook contains a set of selection criteria to assist in proper assessment of the suitability of a given region for the chosen MAR type implementation.

DEEPWATER-CE

01.05.2019

30.04.2022

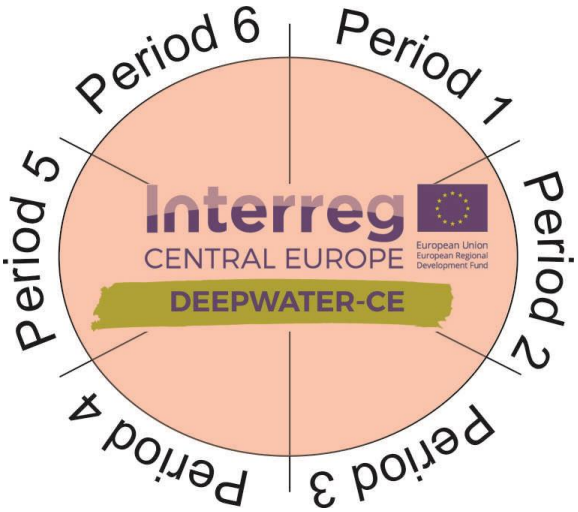
Developing an integrated implementation framework for **Managed Aquifer Recharge** solutions to facilitate the **protection of Central European water resources** endangered by climate change and user conflict

On the Global Groundwater Information System (GGIS) online platform of the International Groundwater Resources Assessment Centre, we published the MAR suitability maps, which were created on the basis of the methodology developed within the project.

Based on the results of the pilot actions, tools and recommendations for the implementation of MAR were developed, an overview of the relevant legislative acts was also carried out and the conclusions were presented to the decision-makers and stakeholders in the partner countries during our fruitful meetings, where we received a lot of interest and positive feedback.

In a broader, long-term perspective, this innovative project will certainly help to increase the security of our and future generations access to good quality water resources in the face of constantly changing climatic conditions in the Central Europe.

In this, the sixth and last issue of Newsletter, we are sharing a summary of information on our best efforts to successfully close the project and a collection of useful links giving access to the results we have achieved and products we have created within the project lifespan.



WORK PACKAGE 1

Trainings for knowledge transfer on MAR solutions and their environmental and economic benefits

TRAINING SESSIONS

All training sessions are intended for relevant stakeholders listed in national Cross-Sectoral Stakeholders' Groups (CSSG); they were carried out via sets of webinars or personal meetings in the local language and tailored to local requirements.
The main purpose of the training was to raise awareness of the basic principles of MAR schemes, practical information on their usage, reasons why they are necessary in the future due to climate change impact, technical information on their installation and benefits, followed by practical examples of installation. Additionally, specific information was presented on the national pilot site, including the planned investigation activities of a project partner.

- **MAR principles and collection of good practices and benchmark analysis (D.T1.3.2.)**

The training was focused on explanation of MAR principles, the conditions for their implementation, best practice examples in Europe and national case studies. The content was taken from a report dealing with collection of good practices and benchmark analysis of the existing MAR projects in Central Europe.

We recommend watching the training materials used:

ENGLISH: 1 / recording
HUNGARIAN: 1/2/3/recording
POLISH: 1/2/3/4/ recording
SLOVAK: 1/2/3/4/ recording
CROATIAN: 1/ recording

- **Toolbox, selection criteria and checklist for MAR location (D.T1.3.3.)**

The training provided information on how a toolbox can assist in the decision making process for selecting the sites are appropriate for the location of MAR schemes in Central Europe. As part of the assessment process summarised in the toolbox, both general and specific criteria are considered, e.g. geological and hydrological conditions, climatic models and scenarios as well as the sensitivity of MAR schemes to extreme climates.

ENGLISH: 1 / recording
HUNGARIAN: 1/2/3 / recording
POLISH: 1/2/3/4 / recording
SLOVAK: 1/2/3/4 / recording
CROATIAN: recording

- **Pilot feasibility studies to prepare policy recommendations (D.T1.3.4.)**

This training presented the selection process for the specific pilot sites using a toolbox, related checklists and selection criteria for carrying out feasibility studies based on common methodology (specific guidelines for assessing water supply and demand, guidelines for risk management and technical solutions, guidelines for cost-benefit analysis, regulatory and legal framework). Policy recommendations for incorporating MAR solutions into water management will be prepared on the basis of the results of feasibility studies, while policy recommendations for incorporating MAR solutions into water management will be prepared.

POLISH recording
GERMAN: 1/2/3/recording
HUNGARIAN:recording
SLOVAK: 1/2A/2B/3/4/5/6/recording
CROATIAN: recording

RESULTS

D.T1.2.1

Collection of good practices and benchmark analysis on MAR solutions in the EU.

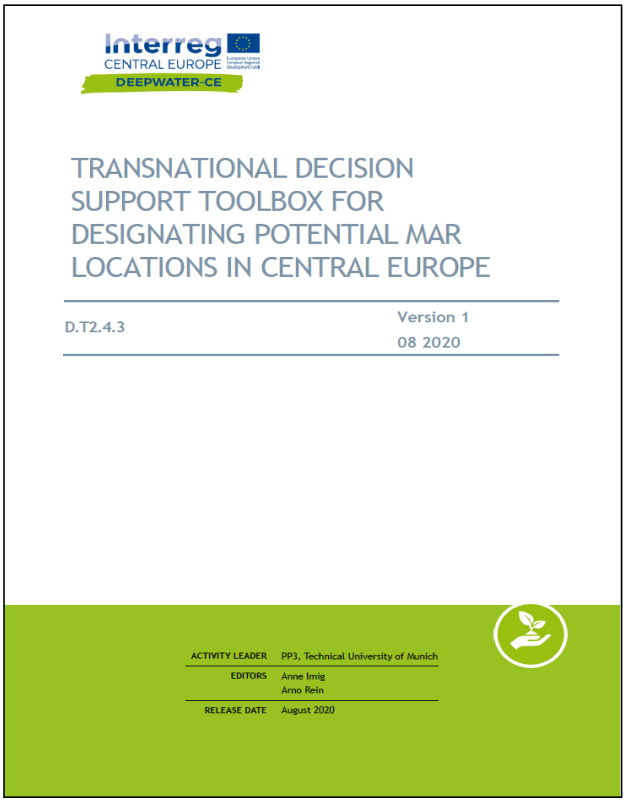
WORK PACKAGE 2

Development of a transnational knowledge base on the applicability of MAR in CE

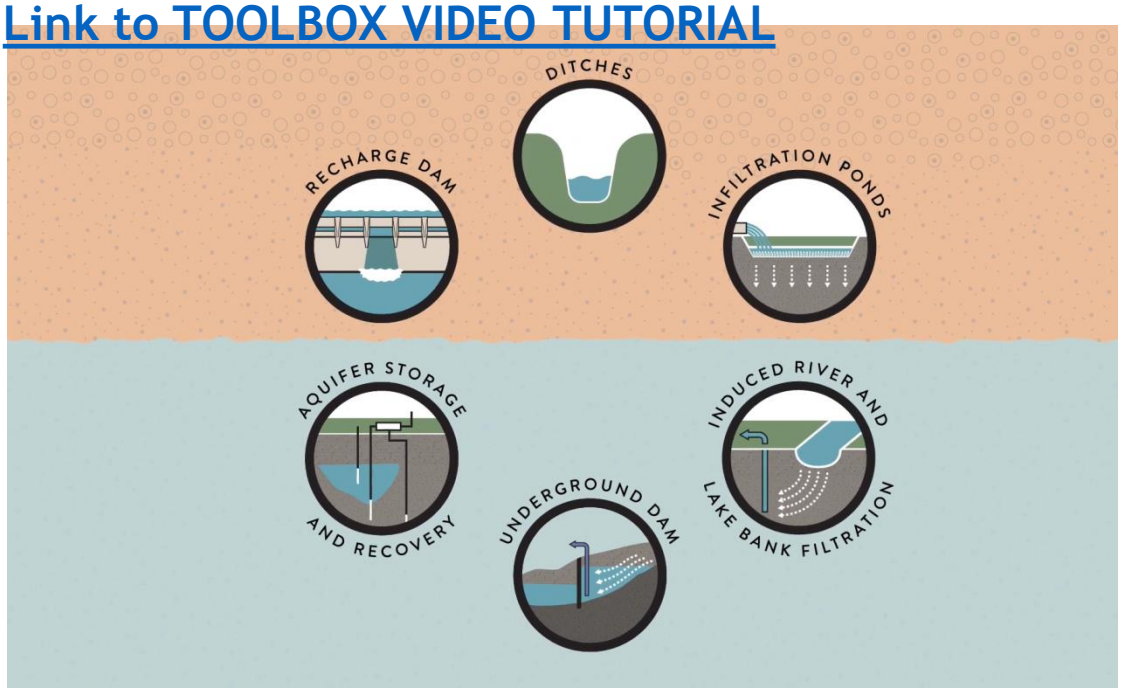
WP T2 OUTPUT - TOOLBOX

The main output of Work Package 2 was a handbook presenting a decision-support toolbox for the evaluation of manage aquifer recharge suitability. Three major components were investigated: climatological selection criteria, geological and hydrogeological selection criteria as well as the sensitivity of MAR schemes for cliamte extremes.
These selection criteria, aimed at identifying potential MAR sites, are presented in the form of checklists within a toolbox.

TOOLBOX in PDF handbook



Link to TOOLBOX VIDEO TUTORIAL



WORK PACKAGE 3

Pilot Feasibility Study of MAR schemes with an integrated environmental approach

In the Work Package 3, we developed a common methodological guidance for DEEPWATER-CE MAR pilot feasibility studies in order to assess the actual feasibility of MAR sitesidentified as potentially suitable for a particular MAR type.
At the chosen pilot sites, different hydrological, hydrogeological and geophysical measurements were carried out.

The data collected were used to identify the technical and economical feasibility of the MAR scheme.
The results of the pilot feasibility studies were used to prepare policy recommendations with a view to channeling MAR solutions into national river basin management plans and water management strategies in work package 4.

The main objectives of these outputs are to indicate the environmental, social and economic effects of MAR, with particular emphasis on six methods and to present the results and conclusions of the work carried out in our 4 pilot areas.

OUTPUTS

(in PDF)

O.T3.1

Maros alluvial fan, Hungary

Studies in this region revealed porous geological conditions in the alluvial floodplain systems. The area of interest was the covered paleo-channels of the Ancient Maros River.

O.T3.2

Tarnów Waterworks, Poland

The research focused on a working infiltration well field exploiting the shallow porous aquifer near the industrial zone, which poses a serious threat to groundwater quality.

O.T3.3

The Žitný ostrov, Slovakia

Study on porous aquifers in agriculturaly used area. The pilot site area is demarcated by canals providing technical possibilities for water flow control, i.e. creating a Recharge Dam MAR type.

O.T3.4

Island of Vis, Croatia

The study took place in a region with complex karst hydrogeological conditions, in the Mediterranean coastal area on the island of Vis.

Pilot sites

Poland	Slovakia	Hungary	Croatia
Świerczków well field	Žitný ostrov	Vicinity of Medgyesbodzás and Csanádapáca	Vis Island

MORE RESULTS
Work Package 3

WORK PACKAGE 4

National Action Plans for adopting MAR solutions in national water resource management schemes

The Work Package 4 of the DEEPWATER-CE project is about to collect and analyse current legislation in Central Europe (CE) relevant to the legislation of MAR, frame and present policy recommendations supported by the scientific outcomes of the project, in order to mitigate the implementation of MAR schemes throughout the CE region. Through the actions of WP4, the project aims to develop concrete ready-to-implement measures and define a path to adopting them for the benefit of the whole CE region.

The specific objective is the development of a policy framework for MAR with the object of facilitating the long-term sustainability of water supply within the region. The project is expected to bring benefits such as improvements to the integrated environmental management capacity of competent bodies for protection and sustainable use of water resources in Central Europe through transnational cooperation.

This is to be achieved by providing better knowledge on technical solutions and legal requirements as well as the social, ecological and economic impact of what MAR scheme implementations would bring to the targeted territories.

RESULTS

(in PDF)

Reports D.T4.2.2

Set of policy recommendations to include MAR solutions into the legislation

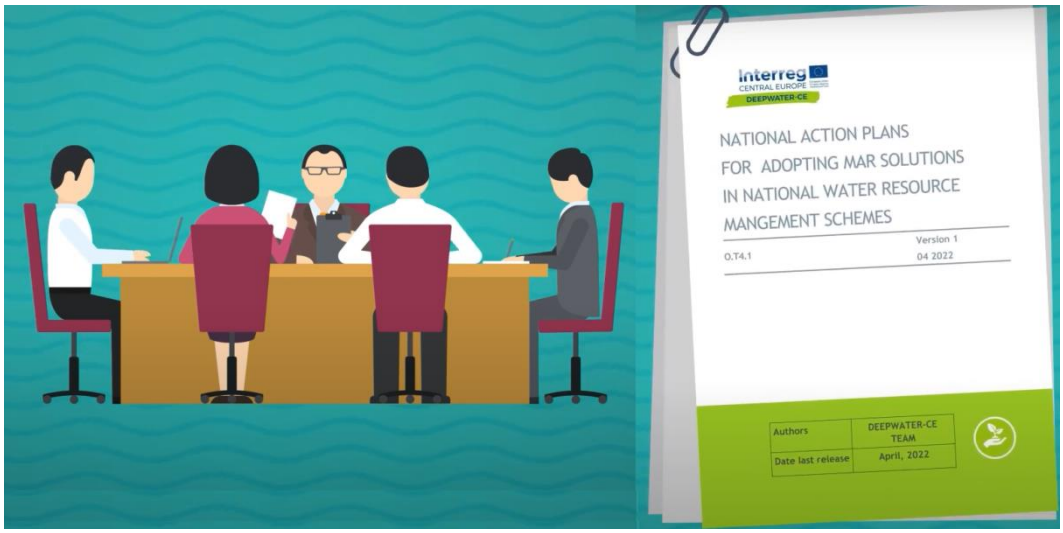
Report D.T4.2.3

Guidelines for integrating MAR into the national river basin plans and strategies

MORE RESULTS

Work Package 4

National Action Plans for adopting MAR solutions in national Water Resource Management Schemes



PROJECT ACTIVITIES

SEMINARS TO PRESENT PROJECT OUTPUTS

HUNGARY

7 PARTICIPANTS

During our seminar with representatives of the Ministry of Innovation and Technology on 9th December 2021, we had the chance to present in person the completed deliverables. Our guests gave positive feedback, and they also offered their help with the upcoming educational programs, which can help raise awareness and increase the knowledge of MAR technologies.

POLAND

67 PARTICIPANTS

This seminar was held online by the Teams platform on February 28th. 67 participants attended the event, which was organised by the PP4, Tarnów Waterworks and the Polish National Chapter of the International Association of Hydrogeologists. During the meeting, the finalised and current work on project outputs was presented (mainly O.T3.2 and briefly about O.T4.1 progress). At the end of the meeting, there was time for a discussion.

SLOVAKIA

11 PARTICIPANTS

This seminar aimed at presenting project outputs O.T3: a Toolbox and Feasibility study took place online on 24.2.2022. Representatives of two ministries (Environment and Agriculture and Rural Development), their sectoral institutions, the Association of Water Companies and the Slovak Agrarian Chamber actively discussed the scope for MAR in Slovakia.

CROATIA

17 PARTICIPANTS

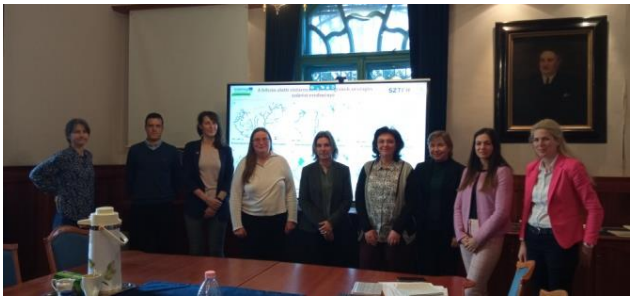
This seminar was organised in the headquarters of the ViK Split and was attended by 17 participants of various professional backgrounds, including representatives of the Croatian Waters, the City of Split, the Split-Dalmatia County, several NGOs, and hydrology professors from the University of Split. The seminar lasted 4 hours in total, covering the most important aspects of MAR implementation and challenges facing it in Croatia.

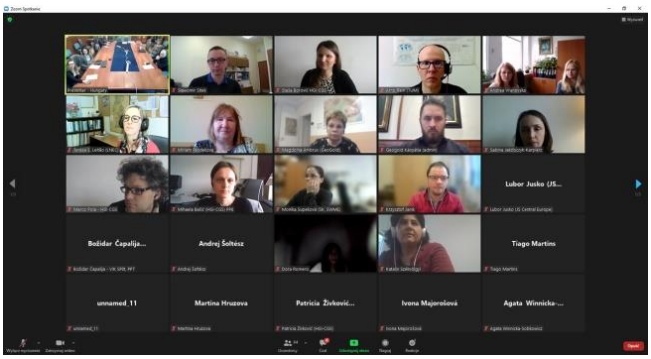
PERSONAL MEETINGS

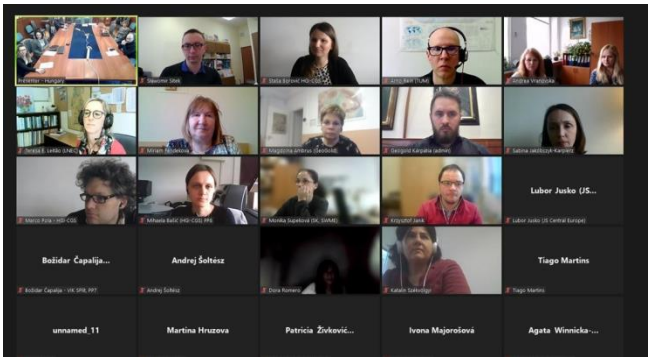
Bilateral meetings with representatives from Institutions responsible for implementing the Action Plans in water management in partner counties. The four meetings have been undertaken in: Hungary, Poland, Slovakia and Croatia.

PROJECT ACTIVITIES

We operated offline as well as online!





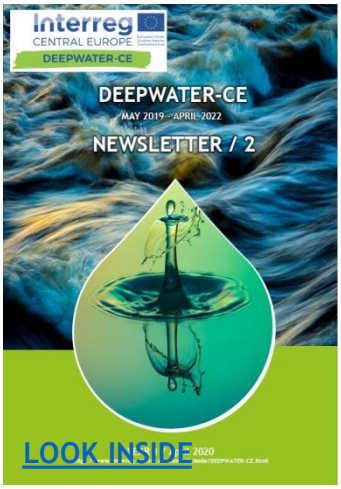


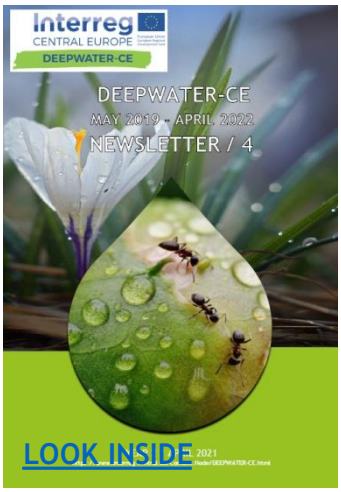
COMUNICATION ACTIVITIES

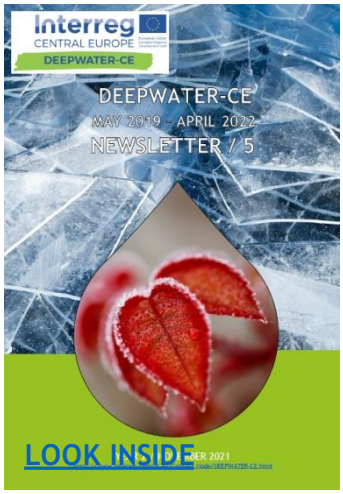
NEWSLETTERS

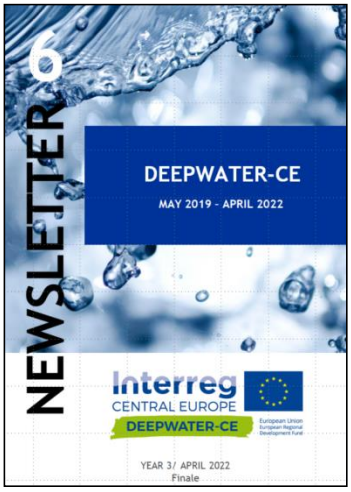
FINAL VIDEOS subtitles versions:

[Hungarian]
[German]
[Polish]
[Slovak]
[Croatian]

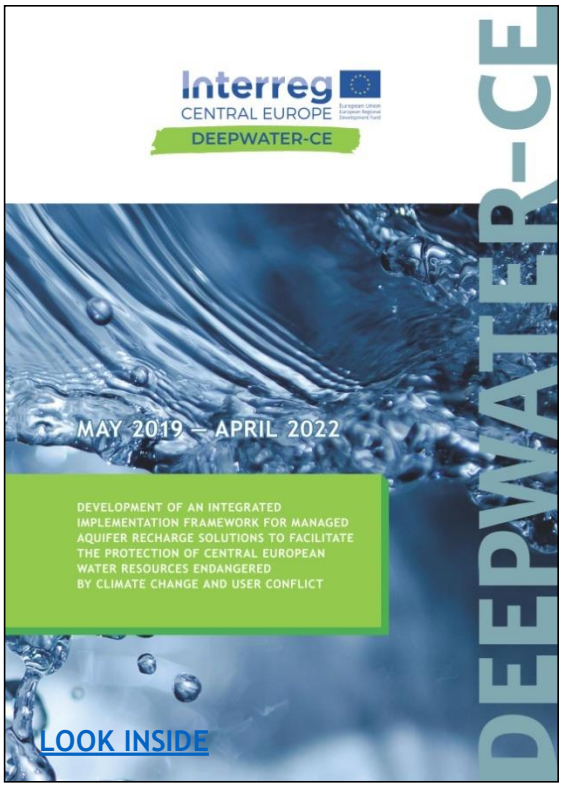


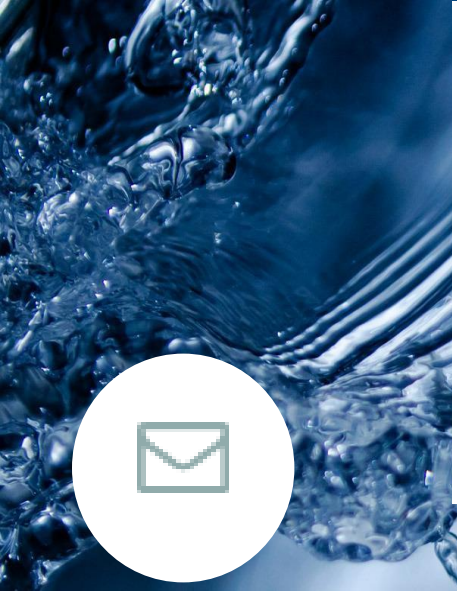






FINAL BROCHURE





European Union

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CENTRAL EUROPE

DEEPWATER-CE

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Lead Partner

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Deepwater-ce

At our official webpage you can find more information about the aims of the project, the partners involved, project news and events, and our outputs.

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

Also on ResearchGate platform includes our main reports and results:
https://www.researchgate.net/project/DEEPWATER-CE

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GEOGOLD KÁRPÁTIA

Technical University of Munich

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W KATOWICACH

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CROATIAN GEOLOGICAL SURVEY

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PHOTOS: DEEPWATER-CE partners
COVER GRAPHICS for free use from PIXABAY

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