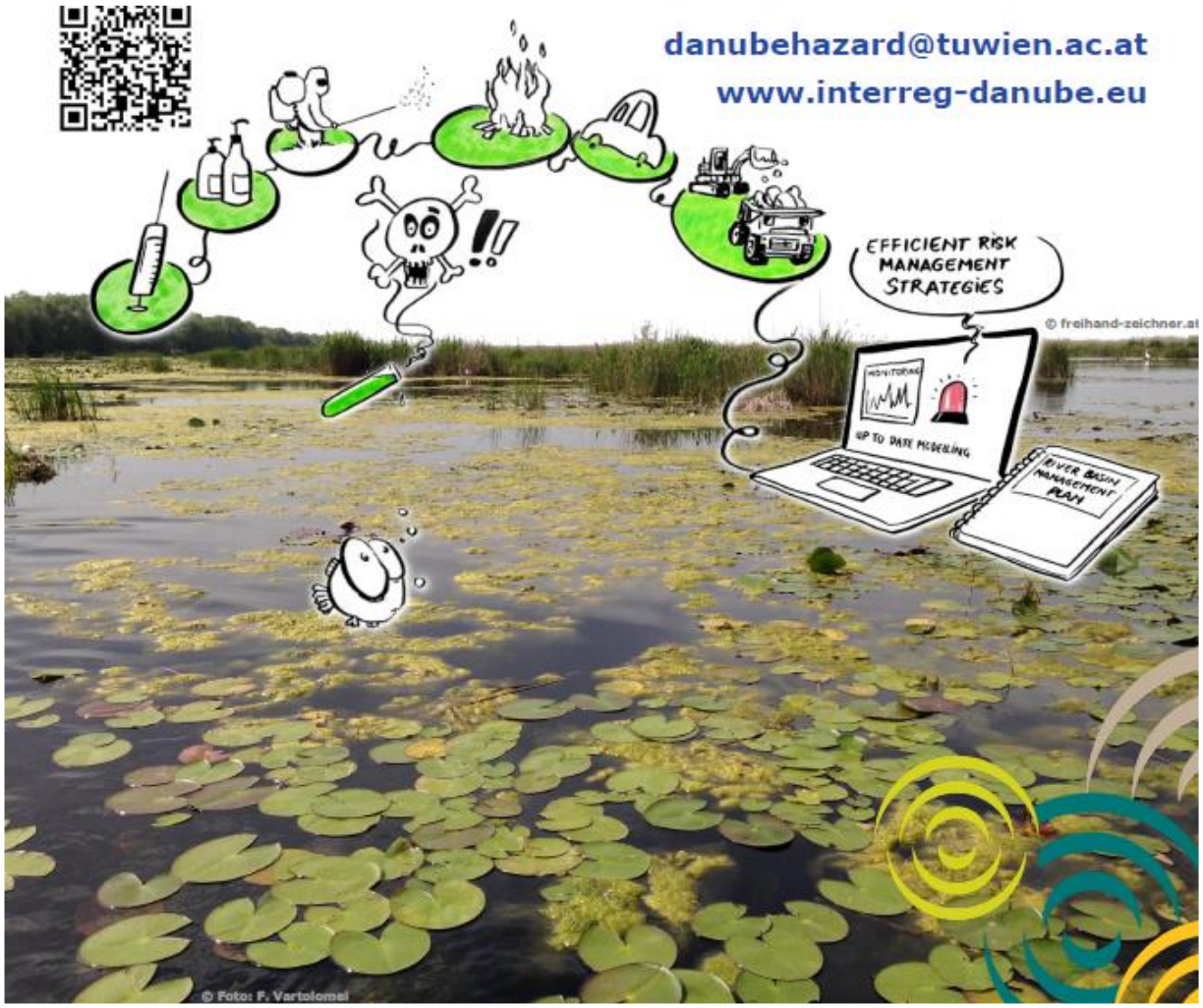

Output T4.3

SYNTHESIS REPORT ON TRANSNATIONAL TRAINING EVENTS ON MODELLING AND SCENARIO EVALUATION

November 2022

Project co-funded by European Union funds (ERDF, IPA, ENI) and National Funds of the participating countries

PROJECT TITLE: Tackling hazardous substances pollution in the Danube River Basin by Measuring, Modelling-based Management and Capacity building

ACRONYM: Danube Hazard m³c

DATE OF PREPARATION: November 2022

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Executive summary

According to the EU Water Framework Directive, hazardous substances (HS) pollution is a significant water quality issue to be tackled in the Danube River Basin. The Danube Hazard m³c project aims to achieve a durable and effective transnational control based on reduction of HS water pollution, by integrating and harmonizing available existing data of HS concentration levels and by modelling emissions at catchment scale in pilot regions. Emission modelling is fundamental to create inventories of HS emissions and thus to create the basis necessary to perform risk assessments and to develop river basin management plans. However, the know-how and level of implementation of such approaches in the Danube River Basin is still very limited.

Within the Danube Hazard m³c project, a training on emission modelling has been offered three times in three different locations, namely Vienna, Budapest and Bucharest in October 2022. Over 60 international participants from national and regional authorities, research and higher education institutions, technical agencies and private companies in the field of water quality management have taken part in them. Detailed agendas of all three training can be found in the Appendix: Agendas of the transnational trainings.

Summary of the main key points and lessons learned

The main objectives of the trainings were:

- to explain the goal and importance of emission modelling at catchment scale,

- to show which approaches and model types exist,

- to demonstrate how can scenarios be developed and properly interpreted,

- to explain what data are needed for models and which basic principles, approaches and assumptions are behind the calculations,

- to show practical examples based on the project results.

Participants in the workshops received information that helped them understand better what are the available approaches for modelling emissions of HS in waters and what is needed, in terms of skills, know-how, data and infrastructure, in order to use them in their work.

Some general lessons learnt from the training course are:

- all participants agreed that modelling issue is a new approach very modestly implemented in the countries participating in the training,
- extended and high-quality monitoring is needed to provide the necessary input data,
- efficient data management and accurate data processing are necessary as prior step to modelling,
- efforts should be made to obtain necessary information about sources and pathways,

- modelling can contribute significantly to better management (evaluating pressures and in impact assessment, as well as risk analysis) and can support policymakers in the selection of measures, e.g. through scenario analysis.

Introduction

The project main objective is to pave the path for a durable and effective transnational control and reduction of HS water pollution, considering the Danubian countries still lack, to a different extent, well defined plans, targeted strategies and adequate knowledge and instruments to tackle this very complex issue. The second specific objective is to achieve a harmonized and effective management of water pollution with HS at DRB level. This is pursued among others by performing modelling and scenario evaluation at DRB scale, by deriving concrete recommendations for the prioritization of transnational measures, integrating expertise on technical aspects but also in the field of policy and management.

In order to carry out modelling of water pollution it is key to identify the main pollution sources and pathways, which is a challenge, as the relevant knowledge base is poor.

In addition, there is lack of knowledge and institutional capacity regarding approaches to model emissions and carry out scenario analysis to select effective management measures.

Danube Hazard m³c aimed to address some of the previously mentioned challenges through three transnational training courses on HS emission modelling and scenario evaluation, which took place in Vienna (4-5 October 2022), Budapest (6-7 October 2022) and Bucharest (13-14 October 2022).

The scope and objective of the trainings can be summarized as follows:

- What is the goal and scope of emission modelling at catchment scale, which main approaches/model types exist
- How scenarios can be developed and properly interpreted
- What MoRE and DHSM models (the two approaches applied in the project) can deliver (and cannot deliver), at which spatial and temporal scale and how they can support river basin management
- Which input data is required for each of the two presented models
- Which basic principles, approaches and assumptions are behind the calculations for each of the two presented models
- What is needed to apply the MoRE and DHSM within a new institution (technical requirements, licenses, how to acquire further specific know-how).

The programme of the trainings included seven blocks dedicated to the following topics:

1. Emission modelling on catchment scale as a tool to support HS management (Overview of existing approaches for modelling and scenario analysis (management, climate, ...): scope, potential, limitations and data)

2. MoRE model (Technical introduction: scope, temporal and spatial scales; data requirements; calculation approaches; technical requirements, conditions and documentation for its use)
3. Danube Hazard Substance model (DHSM, based on the SOLUTIONS model) (Technical introduction: scope, temporal and spatial scales; data requirements; calculation approaches; technical requirements, conditions and documentation for its use);
4. DHSM model: Hands-on workshop (Interactive and practical exercise session):
5. Workshop (1): Processing of input data
6. Workshop (2): Development and implementation of programmes of measures for scenario analysis
7. Results of MoRE and DHSM models, MoRE vs. DHSM or MoRE and DHSM? (Examples of the results in the pilot regions of the Danube Hazard m3c project and for the whole Danube River Basin for different types of hazardous substances. Critical comparison of the two models and discussion of complementary aspects. Lessons learned in the Danube Hazard m³c project.)

During each training, the approach taken and the intermediate results obtained in the Danube Hazard m³c project were presented to and discussed with the participating national experts.

The joint language of all three events was English as the participants came from different countries.

The transnational training courses served improving understanding of concepts and enhancing skills in modelling of HS emissions with the objective to use them also in the development and evaluation of management scenarios.

Another goal of the transnational training events was to improve knowledge related to the analysis of significant pollution sources and pathways to help authorities in more effective management of the relevant HS.

Last but not least, enhancing of competencies among relevant target groups in these specific areas in the Danube region countries was targeted.

The synthesis of these transnational training courses can be found below.

1. Transnational training in Vienna

The first transnational training on HS emission modelling and scenario evaluation took place on October 4th and 5th in Vienna. The event was organized by Environment Agency Austria, with support of TU Wien. It took place at the premises of TU Wien, which guaranteed optimal conditions and facilities.

The invitation was sent out to several international institutions and working groups with a background in modelling. Among others the central and provincial water administrations were addressed, the ICPDR PM EG were invited, provincial water management administrations, universities and research institutions, waterworks, and consulting companies – representing the targeted target groups of the Danube Hazard m³c project.

Finally, 26 participants attended the training, representing seven Danube countries and the Netherlands. From the institutional point of view, the participants strongly represented the potential end users of the model results. The exact composition of the participants group was as follows:

Organisation	**Type of organisation**	**Country**	**No of participants**
Austrian Environmental Agency	Sectoral agency	Austria	2
Budapest University of Technology and Economics	Research and higher education	Hungary	1
DELTARES	Consultancy	The Netherlands	2
German Environmental Agency	Sectoral agency	Germany	1
Institute of Hydrometeorology and Seismology	Research institution	Montenegro	1
Karlsruhe Institute of Technology	Research and higher education	Germany	2
Slovak Hydrometeorological Institute SHMÚ	Sectoral agency	Slovakia	2
TU Wien	Research and higher education	Austria	6
Ukrainian Hydrometeorological Institute	Research institution	Ukraine	2
University Babes-Bolyai Cluj	Research and higher education	Romania	2
University of Natural Resources and Life Sciences	Research and higher education	Austria	1
Water Research Institute	Research institution	Slovakia	4

The one and half-day program started with the welcome of the participants. Oliver Gabriel, the WP T2 work package leader of the Danube Hazard m³c project team introduced the framework and the scope of the training. This was followed by a round table introduction of all participants.

The event program followed the uniformly defined structure developed by the partnership. The 1st speaker, Ottavia Zoboli gave a comprehensive presentation about emission modelling. After this, the two model approaches were introduced by the project representatives: Oliver Gabriel presented the MoRE model, and Sibren Loos introduced the concept of the DHSM model.

At the end of the day, in the frame of a hands-on workshop, the participants could test the application of the model by solving a practical example. This exercise was held by Jos van Gils from Deltares. The hands-on exercise complemented the lectures, and the participants enjoyed the practical experience.

On the 2nd day, two consecutive workshops targeting the important issues of the models were implemented. Zsolt Jolánkai from the BME team discussed data processing, which is an essential requirement for the application of models. Oliver Gabriel together with Marianne Bertine Broer from Environment Agency Austria presented the methods and gave examples for the use of the MoRE model results in the WFD management cycle and in the scenario development, which is the most important target of the model simulations. In the second part of the presentation, the workflow of MoRE was demonstrated.

Finally, the models were compared in the framework of an impressive presentation in an open, interactive way, with the active involvement of the two model developers, a moderator and the audience arranged by Matthias Zessner (TU Wien), Jos van Gils (Deltares) and Marianne Bertine Broer (Environment Agency Austria).

The participants had the opportunity to ask questions at the end of each block as well as during the presentations. Their activity was continuous. There were comments on many topics, among others, input data and the wither applicability of the results.

The participants experienced in model applications raised questions about the technical details, e.g. the assumptions used in the models, considering different processes, dealing with the stocks and accumulation, time and spatial scaling issues and also had an interest in the coding of the programs.

Before the end of the transnational training event, session participants were asked to fill in a questionnaire about the training by scoring and the possibility of sharing their impressions and suggestions.

Based on the evaluation of the questionnaires, the event was successful, and the participants were satisfied with the organization, the work program, the presentations and the trainers, too. The majority of the participants wrote that the training was useful and gave positive feedback. In general, the opinion was clear, that Emission Modelling is a useful tool to overcome and support several requirements from the WFD management cycle. Several participants did not (or only partly) used the presented methods before, they got information and they will be able to utilize the training material in their work.

Participants of the training in Vienna

2. Transnational training in Budapest

The second transnational training took place on October 6th and 7th in Budapest. The event was hosted by the Budapest University of Technology and Economics.

The invitation was sent to several institutions - among others, central water administration, regional directorates, universities and research institutions, waterworks, and consulting companies – representing the targeted stakeholders of the Danube Hazard m³c project.

Finally, 21 participants attended the training. They were delegated from 5 governmental institutions: General Directorate of Water Management, three regional (Middle-Tisza, Middle-Danube Valley and Mid-Transdanubian) Regional Water Directorates, 1 local governmental office (Budavár Municipality), 4 universities (BME, MATE, University of Pannonia

and TU Wien), 1 research institution (LLC Center for Ecotoxicological Research), 1 Environmental Agency (Environment Agency Austria), 2 engineering companies (DHI-Hungary and DELTARES) and 1 environmental consulting company (Aqua-Terra Lab Ltd.). From the institutional point of view, the participants strongly represented the potential end users of the models. The exact composition of the participants group was as follows:

Organisation	**Type of organization**	**Country**	**No of participants**
General Directorate of Water Management	National Administration	Hungary	1
Middle-Tisza Water Directorate	National Administration	Hungary	1
Middle-Danube Valley Water Directorate	National Administration	Hungary	2
Mid-Transdanubian Water Directorate	National Administration	Hungary	1
Budavár Municipality	National Administration	Hungary	1
Austrian Environmental Agency	Sectoral agency	Austria	1
TU Wien	Research and higher education	Austria	1
Budapest University of Technology and Economics	Research and higher education	Hungary	6
Hungarian University of Agriculture and Life Sciences	Research and higher education	Hungary	1
University of Pannonia	Research and higher education	Hungary	1
LLC Center for Ecotoxicological Research	Research and higher education	Montenegro	1
DHI-Hungary	Consultany	Hungary	2
Aqua-Terra Lab Ltd.	Consultancy	Hungary	1
DELTARES	Consultancy	The Netherlands	1

The one and half-day program started with the welcome of the participants. Adrienne Clement, the manager of the Danube Hazard project hosting team introduced the framework and the scope of the training. This was followed by a round table introduction of the participants. The event program followed the uniformly defined structure developed by the partnership. The first speaker, Ottavia Zoboli gave a comprehensive presentation about emission model-

ling. After it, the two model approaches were introduced by the project representatives: Oliver Gabriel presented the MoRE model, and Sibren Jos introduced the concept of the DHSM model.

At the end of the day, in the frame of a hands-on workshop, the training participants could test the application of the model by solving a practical example. This exercise complemented the lectures, and the participants really enjoyed it.

On the 2nd day, two consecutive workshops targeting the important issues of the models were carried out. Máté Kardos and Zsolt Jolánkai from the BME team discussed data processing, which is an essential requirement for the application of models. Oliver Gabriel from the Environment Agency Austria presented the methods and examples for scenario development, which is the most important target of the model simulations.

Finally, the models were compared in the framework of an interactive presentation moderated by Ottavia Zoboli, with the active involvement of the two model developers and the audience.

The training participants had the opportunity to ask questions at the end of each block and the discussion and exchange were lively during the whole time. There were comments on many topics, among others, input data supply and the wider applicability of the results.

As in the previous transnational training event, the participants experienced in model applications raised questions about the technical details, e.g. the assumptions used in the models, considering different processes, dealing with the stocks and accumulation, time scaling issues, and also had an interest in the coding of the programs.

The participants were asked to fill in a questionnaire about the training by scoring and the possibility of sharing their impressions and suggestions, giving very good feedback.

The participants found the training useful, they got new information and they will be able to utilize the training material in their work.

Participants on the 2nd day in Budapest

Hands-on workshop at the training in Budapest

3. Transnational training in Bucharest

The third transnational training on HS emission modelling and scenario evaluation was organized in Bucharest, Romania on 13-14.10.2022. The event was hosted by the National Administration" Romanian Waters" (NARW) at Capsa Hotel.

The course was attended by experts from Water Basin Administrations and National Administration Romanian Waters, specialists from Universities and Research Institutions (University of Bucharest, Institute of Geology, Institute of Geography, Research Institute for Pedology and Agrochemistry, National Institute of Hydrology and Water Management) and also, experts from Bulgaria. In total 25 participants attended the transnational course.

The exact composition of the participants group was as follows:

Organisation	**Type of organisation**	**Country**	**No of participants**
Institute of Soil Science, Agrotechnologies and plant protection "Nikola Poushkarov"	Research Institute	Bulgaria	1
Bulgarian Water Association	Sectoral agency	Bulgaria	1
DELTARES	Consultancy	The Netherlands	1
Budapest University of Technology and Economics	Research and higher education	Hungary	1
TU Wien	Research and higher education	Austria	1
Austrian Environmental Agency	Sectoral agency	Austria	1
National Institute of Hydrology and Water Management	Research Institute	Romania	1
University of Bucharest	Research and higher education	Romania	1
Institute of Geography	Research and higher education	Romania	2
Research Institute for Pedology and Agrochemistry	Research Institute	Romania	2
Water Basin Administrations	Basin Administration	Romania	6
National Administration Romanian Waters	National Administration	Romania	7

The training was moderated by Ioana Nedelea project manager from NARW, and the courses were held by Matthias Zessner (TU Wien), Marianne Broer (Environment Agency Austria), Máté Kardos (BME) and Jos van Gils (Deltares).

The first day of the transnational training started with a brief introduction on the project topics, some words related to the purpose of the training, followed by a tour de table for the participants to introduce themselves.

The first presentation *Emission modelling on catchment scale as a tool to support HS management,* presented by Matthias Zessner, was a starting point to get familiar with modelling of HS emission on the catchment scale and it was focused on the following aspects: monitoring versus modelling, exposure models, emission modelling and emission inventories. The presentation was concluded with brief introduction to predictions and scenario analysis. Having in mind that future developments will happen with a certain probability, scenarios will be developed in line with: "what would happen if". Expected or potential changes in the system in the future and scenarios can only consider changes that are implemented in the scope of the model. Discussions about the approaches appropriate to use in the case of historical pollution were carried out and clarified by Matthias.

Marianne Broer presented the MoRE model (Modelling of Regionalized Emissions), in terms of scope, temporal and spatial scales; data requirements; calculation approaches; technical requirements, conditions and documentation for its use. The presentation generated a lot of discussions. The audience was very interested to understand the model development, and the types of input data, having in mind that Austria used this model in their RBMP (River Basin Management Plan).

Jos van Gils presented the DHSM model (based on the SOLUTIONS model) that was developed within the Danube Hazard m³c project. This session was a great opportunity for the audience to ask questions on technical details and to find out more about this model. The event was considered a win-win experience for the trainer and for the participants, who were invited by Jos to join an interactive and practical exercise session.

The second day started with the first Workshop on the *Processing of input data*, moderated by Máté Kardos. He presented all needed data to be fed into the model: temporal and spatial data, emission pathways and other special information. The participants were very interested in the topic and ask some clarifications related to the load calculation and the data uncertainty.

The second Workshop - *Development and implementation of programs of measures for scenario analysis* was presented by Marianne Broer. This block was particularly useful to discuss how to apply pathway and source-oriented modelling approaches as necessary steps for establishing a complete inventory of HS emissions as required by the Water Framework Directive and as fundamental basis to develop river basin management plans.

The transnational training course was finalized with an interesting exercise led by Matthias Zessner, Jos van Gils and Martine Broer: A comparison of results from MoRE and DHSM models, MoRE vs. DHSM or MoRE and DHSM? During this section, a critical comparison was made between the MoRE and DHSM models. It is clear that both models depend on the quality of the data and that technical skills are required. Also, some lessons learned in the Danube Hazard m³c project were shared with the audience.

During the event, NARW distributed the Danube Hazard m³c project link to the participants and everyone was encouraged to access it to find out the results of the project. The leaflets of the Danube Hazard m³c project and additional information were also disseminated to the participants.

The training on modelling was a great opportunity to share valuable information, knowledge, experiences on approaches related to modelling topics on HS emissions.

First day training in Bucharest

Second day training in Bucharest

Practical exercise at the training in Bucharest

4. Overall training evaluation

At the end of the training courses the participants were asked to fill in an evaluation questionnaire. Based on the responses given, the events can be considered a success and the participants were satisfied with the organization, the presentations and the trainers, too. The general opinion was that the trainings were useful, new information was learned and the participants will be able to use the training material in their work.

Conclusions

1. Developing and using modelling as well as scenario analysis are important to aid transnational and national HS management;
2. The interest of researchers and water professionals in modelling of HS is strong on the one hand and on the other hand the authorities that are beneficiary of the models are very interested to use models as a support in the frame of developing their River Basin Management Plans and not only;
3. Modelling is a new approach very modestly implemented in the countries participating in the trainings. Support was given to the introduction of modelling, especially since these tools can best assist the implementation of a combined approach to EQS and emission limit values, which is in line with the WFD;
4. The performance of the models depends on the quality of input data;
5. The collection, processing and management of large input datasets is seen by most participants as one of the major tasks and challenges, due to lack of data or to lack of statistical skills and of database-related know-how.
5. The purpose of this series of courses was to provide a better understanding of HS pollution and to discuss how modelling can be used in impact assessment, either to help identify the most appropriate measures;
6. There is further need to consolidate the technical skills and professional capacities of institutions and their staff through additional specific trainings, in order to put into practice these tools and to improve their basin-wide application.

Appendix: Agendas of the transnational trainings

a. Vienna

Danube Hazard m³c

Tackling hazardous substances pollution in the Danube River Basin by Measuring, Modelling-based Management and Capacity building

Training on hazardous substances emission modelling and scenario evaluation

04.10.2022 – 05.10.2022 in Vienna

Programme

Day 1		
09:15	**09:30**	**Welcome** *(Martine Broer and Oliver Gabriel, UBA)*
09:30	**10:15**	**Emission modelling on catchment scale as tool to support hazardous substances management** *(Ottavia Zoboli, TU Wien)* Overview of existing approaches for modelling and scenario analysis (management, climate, ...): scope, potential, limitations and data
10:15	**10:40**	**Questions and answers**
10:40	**11:00**	***Coffee break***
11:00	**11:45**	**MoRE model** *(Martine Broer and Oliver Gabriel, UBA)* Technical introduction: scope, temporal and spatial scales; data requirements; calculation approaches; technical requirements, conditions and documentation for its use
11:45	**12:05**	**Questions and answers**
12:05	**13:15**	***Lunch break***
13:15	**14:00**	**DHSM model (based on the SOLUTIONS model)** *(Jos van Gils and Sibren Loos, Deltares)* Technical introduction: scope, temporal and spatial scales; data requirements; calculation approaches; technical requirements, conditions and documentation for its use
14:00	**14:20**	**Questions and answers**
14:20	**14:40**	***Coffee break***

14:40	**17:00**	**DHSM model: Hands-on workshop** *(Jos van Gils and Sibren Loos, Deltares)* Interactive and practical exercise session
Day 2		
9:00	**10:30**	**Workshop (1): Processing of input data** *Zsolt Jolankai (BME)*
10:30	**10:50**	***Coffee break***
10:50	**12:10**	**Workshop (2): Development and implementation of programmes of measures for scenario analysis** *Martine Broer and Oliver Gabriel (UBA)*
12:10	**13:10**	***Lunch break***
13:10	**14:00**	**Results of MoRE and DHSM models, MoRE vs. DHSM or MoRE and DHSM?** *Matthias Zessner (TU Wien), Jos van Gils and Sibren Loos (Deltares), Martine Broer and Oliver Gabriel (UBA)* Examples of the results in the pilot regions of the Danube Hazard m3c project and for the whole Danube River Basin for different types of hazardous substances. Critical comparison of the two models and discussion of complementary aspects. Lessons learned in the Danube Hazard m³c project.
14:00	**14:15**	**Questions and answers** *(Martine Broer and Oliver Gabriel, UBA)*
14:15	**14:30**	**Conclusions and feedback of the participants, including filling in the questionnaire** *(Martine Broer and Oliver Gabriel, UBA)*
14:30		**End of the training**

Location:

TU Wien

Karlsplatz 13

1040 Vienna

Seminar room (Sitzungszimmer AD EG 19 – in German) on the ground floor

b. Budapest

Danube Hazard m³c

Tackling hazardous substances pollution in the Danube River Basin by Measuring, Modelling-based Management and Capacity building

Training on hazardous substances emission modelling and scenario evaluation

Date: 06.10.2022 – 07.10.2022 Budapest

Programme

Day 1:		
09:15	**09:30**	**Welcome** ***Adrienne Clement (BME)***
09:30	**10:15**	**Emission modelling on catchment scale as tool to support hazardous substances management** ***Ottavia Zoboli (TU Wien)*** Overview of existing approaches for modelling and scenario analysis (management, climate, ...): scope, potential, limitations and data
10:15	**10:40**	**Questions and answers**
10:40	**11:00**	***Coffee break***
11:00	**11:45**	**MoRE model** Technical introduction: scope, temporal and spatial scales; data requirements; calculation approaches; technical requirements, conditions and documentation for its use
11:45	**12:05**	**Questions and answers**
12:05	**13:15**	***Lunch break***
13:15	**14:00**	**DHSM model (based on the SOLUTIONS model)** ***Sibren Loos (DELTARES)*** Technical introduction: scope, temporal and spatial scales; data requirements; calculation approaches; technical requirements, conditions and documentation for its use
14:00	**14:20**	**Questions and answers**
14:20	**14:40**	***Coffee break***

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14:40	**17:00**	**DHSM model: Hands-on workshop** ***Sibren Loos (DELTARES)*** Interactive and practical exercise session

Day 2:		
9:00	**10:30**	**Workshop (1): Processing of input data** ***Máté Kardos and Zsolt Jolánkai (BME)***
10:30	**10:50**	***Coffee break***
10:50	**12:10**	**Workshop (2): Development and implementation of programmes of measures for scenario analysis** ***Oliver Gabriel (UBA)***
12:10	**13:10**	***Lunch break***
13:10	**14:00**	**Results of MoRE and DHSM models, MoRE vs. DHSM or MoRE and DHSM?** ***Ottavia Zoboli (TU Wien)*** Examples of the results in the pilot regions of the Danube Hazard m3c project and for the whole Danube River Basin for different types of hazardous substances. Critical comparison of the two models and discussion of complementary aspects. Lessons learned in the Danube Hazard m³c project.
14:00	**14:15**	**Questions and answers**
14:15	**14:30**	**Conclusions and feedback of the participants, including filling in the questionnaire**
14:30		**End of the training**

Location:

Budapest University of Technology and Economics,

1111 Budapest, Műegyetem rkp. 3., Building K, mezzanine floor 30.

c. Bucharest

Danube Hazard m³c

Tackling hazardous substances pollution in the Danube River Basin by Measuring, Modelling-based Management and Capacity building

Training on hazardous substances emission modelling and scenario evaluation

Date: 13.10.2022 – 14.10.2022, Bucharest

Programme

Day 1: 13.10.2022		
09:15	**09:30**	**Welcome – *(Elena Țuchiu/Ioana Nedelea, NARW)***
09:30	**10:15**	**Emission modelling on catchment scale as tool to support hazardous substances management** *(Matthias Zessner, TU Wien)* Overview of existing approaches for modelling and scenario analysis (management, climate, ...): scope, potential, limitations and data
10:15	**10:40**	**Questions and answers**
10:40	**11:00**	***Coffee break***
11:00	**11:45**	**MoRE model** *(Martine Broer, UBA)* Technical introduction: scope, temporal and spatial scales; data requirements; calculation approaches; technical requirements, conditions and documentation for its use
11:45	**12:05**	**Questions and answers**
12:05	**13:15**	***Lunch break***
13:15	**14:00**	**DHSM model (based on the SOLUTIONS model)** *(Jos van Gils, Deltares)* Technical introduction: scope, temporal and spatial scales; data requirements; calculation approaches; technical requirements, conditions and documentation for its use
14:00	**14:20**	**Questions and answers**
14:20	**14:40**	***Coffee break***
14:40	**17:00**	**DHSM model: Hands-on workshop** *(Jos van Gils, Deltares)*

Project co-funded by European Union funds (ERDF, IPA, ENI) and National Funds of the participating countries

		Interactive and practical exercise session
Day 2: 14.10.2022		
9:00	**10:30**	**Workshop (1): Processing of input data** *Máté Kardos (BME)*
10:30	**10:50**	***Coffee break***
10:50	**12:10**	**Workshop (2): Development and implementation of programmes of measures for scenario analysis** *Martine Broer (UBA)*
12:10	**13:10**	***Lunch break***
13:10	**14:00**	**Results of MoRE and DHSM models, MoRE vs. DHSM or MoRE amd DHSM?** *Matthias Zessner (TU Wien), Jos van Gils (Deltares), Martine Broer (UBA)* Examples of the results in the pilot regions of the Danube Hazard m3c project and for the whole Danube River Basin for different types of hazardous substances. Critical comparison of the two models and disscusion of complementary aspects. Lessons learned in the Danube Hazard m3c project.
14:00	**14:15**	**Questions and answers**
14:15	**14:30**	**Conclusions and feedback of the participants, including filling in the questionnaire**
14:30		**End of the training** *(Mugurel Sidau/Ioana Nedelea, NARW)*

Location:

BUCHAREST, CAPȘA HOTEL

36 Calea Victoriei, 010082 Bucharest