Organised by: INOWAS MAR Junior Research Group

Hosted by: TECHNISCHE UNIVERSITÄT DRESDEN

Funded by: Federal Ministry of Education and Research

2nd International INOWAS Summer School on Managed Aquifer Recharge
Dresden, Germany, 4-15 September 2017

INOWAS

MAR Junior Research Group

2nd International INOWAS

SUMMER SCHOOL

on Managed Aquifer Recharge

4-15 September 2017
Dresden, Germany

In collaboration with:

CIPSEM · cooperación alemana DEUTSCHE ZUSAMMENARBEIT · giz · igrac International Groundwater Resources Assessment Centre · GrupoTragsa Garantía Profesional. Servicio Público · KOMPETENZZENTRUM WasserBerlin · NATIONAL CENTRE FOR GROUNDWATER RESEARCH AND TRAINING · HTW Hochschule für Technik und Wirtschaft Dresden University of Applied Sciences · THE ENERGY & WATER AGENCY · MAR SOL MANAGED AQUIFER RECHARGE SOLUTIONS · DREWAG · Berliner Wasserbetriebe

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OUTLINE

What is managed aquifer recharge (MAR)?

The increasing population growth, high urbanisation rates and imminent climate change pose an immediate threat to water resources worldwide. As result, the society is confronted with serious challenges such as scarcity of water resources, inability to provide safe water supply, conflicting water uses, insufficient food security, as well as inadequate sanitation and risks for human health. Especially in arid or semi-arid regions the natural recharge is often not enough to meet the local water demand leading to over-exploitation of the groundwater resource and as a consequence to decreasing water tables and increasing salinization. The storage of water in surface reservoirs is widespread but it has several disadvantages such as high evaporation losses, high land area requirements, sediment accumulation, the possibility of structural failure and high vulnerability to contamination.

An alternative to surface storage is *managed aquifer recharge* (MAR), which implies storing excess water underground during periods of low demand or high availability to use it later in times of shortages. The main objective of MAR is to increase groundwater storage to overcome the temporal imbalance between local water demand and availability thus securing drinking or irrigation water supply at any time of the year. Other objectives include the reduction of saltwater intrusion in coastal aquifers, prevention of land subsidence, improvement of the source water quality through soil aquifer treatment (SAT) and avoidance of direct potable reuse of treated wastewater by an underground passage.

What are the main MAR-related challenges?

The wide range of available methods makes MAR a very attractive solution for regions governed by diverse climatic conditions. However, its success depends on selecting the most appropriate technologies and adjusting their operational parameters to match the site-specific conditions. Such decisions are not easy to take since they often require advanced multidisciplinary knowledge and a fast way to predict the expected response of the system to the proposed changes. The main challenges are found in planning an efficient system while assuring a smooth and effective operation. Specific issues to be regarded include the geospatial analysis of the area for the identification of most suitable sites for MAR application, characterization of geochemical processes that occur during water passage through soil, evaluation of recovery efficiency of abstracted water, assessment and monitoring of the quality of infiltration water, native groundwater and abstracted water, and in general the assessment of the impact of MAR on local water system and environment.

What can I learn from this summer school?

During the 2nd International INOWAS Summer School on MAR 2017, the participants will learn about the benefits of managed aquifer recharge as a component of sustainable water management strategies. Different MAR techniques will be presented from a practical perspective and the participants will be able to design, simulate and discuss different aspects of MAR implementation. Beside technical issues, an overview will be provided on the financial and economic aspects of MAR, as well as legal regulations and policies. The technical trips to MAR schemes in Pirna, Dresden and Berlin will round up the two-weeks summer school programme.

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PARTICIPANTS

The content of the summer school is designed for early career scientists, professionals and representatives of ministries, water service operators, academic and research institutions, with background in hydrogeology, hydrology, water management and environmental sciences. The summer school is especially relevant for participants that are already confronted in their work with overexploited aquifers, saltwater intrusion, and water reuse. Together with the application, a short description of your current work must be provided (max 1 page), in which you need to emphasize the main water-related challenges in your country or in your work (if possible, please try to already identify if managed aquifer recharge could be an option for you and explain why). Applications from developing countries will be given priority, previous experience with groundwater modeling and GIS will be considered advantage but is not a requirement.

COSTS

Participation to INOWAS Summer School 2017 is free of charge, including accommodation on TUD campus, lunch and coffee breaks, lectures' handouts, and technical trips. The participants must cover travel costs including visa and travel/health insurance (a limited number of travel scholarships will be provided).

LOCATION

The 2nd International INOWAS Summer School on MAR 2017 will be organised in the main campus of Technische Universität Dresden, one of the excellent universities in Germany. The venue address is: building CHE 2.BA, room 183, Bergstr. 66, 01069 Dresden, Germany. Free accommodation will be provided in the modern guesthouse of the university, just a few steps away from the summer school venue.

APPLICATION

Please send your application before 15 May 2017 by email in a single PDF file to: Claudia Schönekerl (claudia.schoenekerl@tu-dresden.de). The application shall include: a motivation letter (max. 1 page), the outline of your current work/research (max. 1 page), curriculum vitae, list of publications. Please note that applications sent after the deadline will not be taken into consideration.

CONTACT

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PROGRAMME

Monday, 4 September 2017 (Dresden)			
17:00-20:00	D-1	WELCOME RECEPTION Introduction to INOWAS project and summer school agenda, welcome buffet	Catalin Stefan Claudia Schönekerl TU Dresden (INOWAS)
Tuesday, 5 September 2017 (Dresden)			
09:00-12:00	E-1	SELF-INTRODUCTION Self-introduction of participants (short presentation of fields of activities)	Summer school participants
12:00-13:00		Lunch break	
13:00-16:00	E-2	SELF-INTRODUCTION Self-introduction of participants (cont.) (short presentation of fields of activities)	Summer school participants
17:00-20:00	D-2	NETWORKING Introduction CIPSEM Joint networking BBQ	Anna Görner Center for International Postgraduate Studies of Environmental Management (CIPSEM), Germany
Wednesday, 6 September 2017 (Dresden)			
09:00-11:00	A-1	LECTURE Introduction to managed aquifer recharge (MAR)	Catalin Stefan TU Dresden (INOWAS)
11:00-13:00	A-2 B-1	LECTURE and EXERCISE MAR techniques – detailed survey and selection process	Jana Sallwey TU Dresden (INOWAS)
13:00-14:00		Lunch break	
14:00-18:00	A-3 B-2	LECTURE and EXERCISE GIS-based selection of suitable sites for MAR application	Nienke Ansems International Groundwater Resources Assessment Center (IGRAC), The Netherlands
18:00-20:00		CITY TOUR Dresden	
Thursday, 7 September 2017 (Pirna)			
10:00-12:00	A-4	LECTURE MAR processes and parameters	Thomas Fichtner TU Dresden (INOWAS)
12:00-13:00		Lunch break	
13:00-17:00	C-1	TECHNICAL TRIP INOWAS MAR research facilities in Pirna	Thomas Fichtner Felix Barquero TU Dresden (INOWAS)
Friday, 8 September 2017 (Dresden)			
09:00-11:00	G-1	GUEST LECTURE Technical solutions for MAR systems	Enrique Fernández Escalante (TBC) (TRAGSA Group), Spain
11:00-13:00	G-2	GUEST LECTURE River bank filtration - challenges and ways forward	Thomas Grischek Dresden University of Applied Sciences (HTW), Germany
13:00-14:00		Lunch break	
14:00-16:00	G-3	GUEST LECTURE Regulating managed aquifer recharge	Manuel Sapiano The Energy & Water Agency Malta

With participation and contributions from:

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Monday, 11 September 2017 (Dresden)			
09:00-13:00	A-5	LECTURE MAR modeling (I)	Ralf Junghanns Jana Glass Aybulat Fatkhutdinov TU Dresden (INOWAS)
13:00-14:00		Lunch break	
14:00-17:00	B-3	EXERCISE MAR modeling using the web-based INOWAS-DSS modeling platform (II)	Ralf Junghanns Jana Glass TU Dresden (INOWAS)
Tuesday, 12 September 2017 (Dresden)			
09:00-13:00	B-4	EXERCISE and GROUP WORK MAR modeling – Preparation of presentations	Ralf Junghanns TU Dresden (INOWAS) Summer school participants
13:00-14:00		Lunch break	
14:00-17:00	B-5	EXERCISE and ROLE PLAY MAR modeling – Presentation of results	Ralf Junghanns Catalin Stefan TU Dresden (INOWAS) Summer school participants
Wednesday, 13 September 2017 (Berlin)			
08:00-20:00	C-2	TECHNICAL TRIP Infiltration basins for aquifer recharge in Berlin-Tegel	Christoph Sprenger Berlin Center of Competence for Water (KWB), Berlin Water Works (BWB), Germany
Thursday, 14 September 2017 (Dresden)			
09:00-12:00	G-4	GUEST LECTURE Financial and economic aspects of MAR	Andrew Ross (TBC) National Centre for Groundwater Research and Training (NCGRT), Australia
12:00-13:00		Lunch break	
13:00-18:00	C-3	TECHNICAL TRIP River bank filtration in Dresden-Hosterwitz and HTW research facility	Rico Bartak Dresden University of Applied Sciences (HTW), Dresden Water Works (DREWAG), Germany
Friday, 15 September 2017 (Dresden)			
09:00-12:00	G-4	GUEST LECTURE Technology transfer and applicability in developing countries	Harald Himsel Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Guatemala
12:00-13:00		Lunch break	
13:00-14:00	F-1	EVALUATION Summer school assignments	Catalin Stefan TU Dresden (INOWAS)
14:00-15:00		CLOSING CEREMONY Summer school wrap-up Certificates of attendance	Catalin Stefan Claudia Schönekerl TU Dresden (INOWAS)

A: Lecture, B: Exercise, C: Technical trip, D: Networking, E: Self-introduction, F: Evaluation, G: Guest lecture

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