

International Association of Hydrogeologists
COMMISSION ON MANAGED AQUIFER RECHARGE

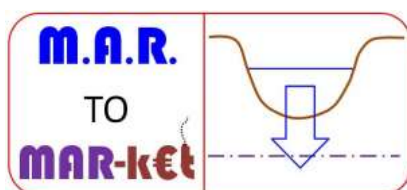
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Web sites: English: www.iah.org/recharge
Spanish: www.dina-mar.es/
Chinese: <http://china-mar.ujn.edu.cn/>

MAR to MAR-k€t WG
ANNUAL REPORT 2017

By Enrique Fernández Escalante
Tragsa Group



2017. MAR to MAR-k€t ACTIVITIES

This report summarizes most of the activities accomplished along 2017 with a direct or indirect intervention of MAR to MAR-k€t (=MtoM) WG, 5th group of the IAH MAR Commission.

It is worth to mention the close relation of this WG with MAR(solutions) EIP Water Action Group, MARSOL and DINA-MAR projects and ISMAR 10 conference organizers.

- **Activities and achievements in 2017**

LINKED-IN GROUP MANAGED AQUIFER RECHARGE, DINA-MAR



The Group keeps its usual activity, reporting the most important events and increasing slightly the number of participants: there are currently 279: <https://www.linkedin.com/groups/4690290>

MAR BOOKS REPOSITORY

This activity has continued along 2017 and there are more than 75 free books on MAR by December 2017. [http://www.dina-mar.es/post/2016/12/29/ACTUALIZACION-DIC-2016-Libros-sobre-la-tecnica-MAR-\(repositorio\)-MAR-books-repository.aspx](http://www.dina-mar.es/post/2016/12/29/ACTUALIZACION-DIC-2016-Libros-sobre-la-tecnica-MAR-(repositorio)-MAR-books-repository.aspx)

MARSOL. NEWSLETTERS

MARSOL project has finished in 2017 officially, with activities on dissemination and technology transfer. New videos (final statements...) and publications (MARSOL Policy Brief) have been released, described along this report. Accessible at: <http://www.marsol.eu/35-0-Results.html>

In Summary, the activity keeps going producing new video releases directed at the general public, publications and workshops. In the MtoM case to effort continues increasing the clientele, e.g. the irrigation community from Ica (Peru) or new institution from North Mexico. Activities hold a dissemination line rather “classic” and new efforts must be done to involve other branches from the industry apart from agro-industry (very well represented) and the whole community. Small companies at Los Arenales aquifer have also provided letters of support broadening the scope of the WG, where traditionally most of the partners where from the agroindustry, including a Hotel, a balneary...

- **Remaining targets, plans and support needs for 2018**

We keep working in the target to achieve a good environment in Europe for MAR technique to be more and more taken into account, by means of involving institutions and projects. The inputs on the new Directive for water reuse and MAR have been listened and considered by authors, anyway the new draft does not satisfy plenty of agents.

The next International Symposium on Managed Aquifer Recharge ([ISMAR 10](#)) to be hold in Madrid in May 2019 will contribute (hopefully) to set MAR in the first row of water management techniques and to disseminate better its advantages.

It is also worth to mention the incorporation of [AquaNES](#) project in the MAR Pan-European network which was created gathering ISMAR 10 supporters. This platform keeps sharing information and activities since 2015 July within a “no noise” policy.



MAR Pan-European Network created in 2015 with ISMAR 10 supporting projects

- **Still Existing barriers**

Regulation in Europe is still the most important barrier to overcome. Anyway, according to our indicators, MAR activity is increasing, there is a total volume calculated for the whole planet about 9.5 km³ of “MARed” water, what represents 1% of the total extractions of groundwater and 7 ‰ of the natural recharge (raw figures). Nevertheless, the pace is slower than expected, specially comparing the evolution between the European countries vs USA, India or Australia.

The indicators* we are tracking are:

- Annual MAR volume (Mm³/y)
- Annual GW use as % of total use (Mm³/y) (with Switzerland and Jordan in the first positions)
- MAR as % GW use (with Hungary and Slovakia heading the ranking)
- MAR as % global capacity (India and USA in the head)
- MAR as proportion of drinking water supply
- Indicative number of peer reviewed journal papers published in the field of MAR
- International growth in MAR by Installed capacity (Mm³/y) by decades

*Results are in press now (Dillon et al, 2017).

The detailed list of activities is presented next.

ACTIVITIES AND ACHIEVEMENTS IN 2017

CIS AD-HOC TASK GROUP ON WATER REUSE FOR THE EC, NEW DRAFT DOCUMENT DOR THE DIRECTIVE ON WATER REUSE AND AQUIFER RECHARGE

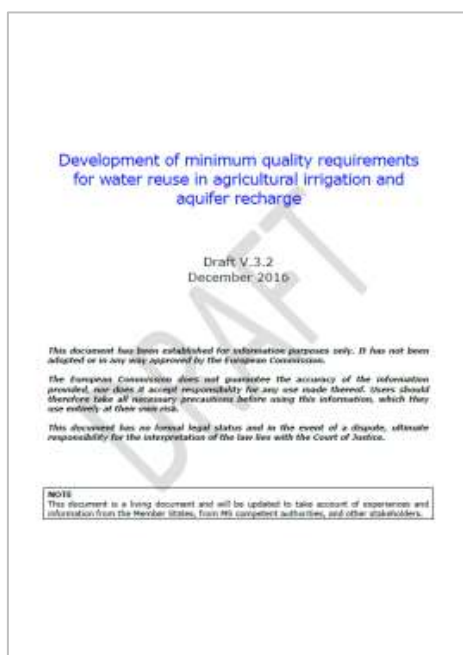
Last year we informed you about the public consultation on policy options to set minimum quality requirements for reused water in the European Union. This consultation WAS open until 27 January 2017 and is available in all official EU languages.

It aimed at collecting additional information and evidence and giving the possibility to a broad range of stakeholders to provide views, feedback and perceptions on how the minimum quality requirements for reused water in the European Union should be set.

From MtoM were sent more than 8 pages providing our opinion as it was double, urgent and important.

Access to the draft document: [JRC min qual req v.3.2 December 2016.pdf \(933,89 kb\)](#)

Direct links to the consultation webpage: [English](#)



Draft document for the water reuse and recharge of aquifers European Directive

MARSOL DELIVERABLE 13.4. BENCHMARKS EVOLUTION, POOLING AND PRACTICAL RESULTS

The main objective of this deliverable is to report the benchmarking results and to study and analyze the evolution of the diverse sets of benchmarks adopted for each demonstration site, in order to compare all of them so as to obtain some series of

settings and common circumstances willing to be applied in other Managed Aquifer Recharge (MAR) schemes as practical recommendations.

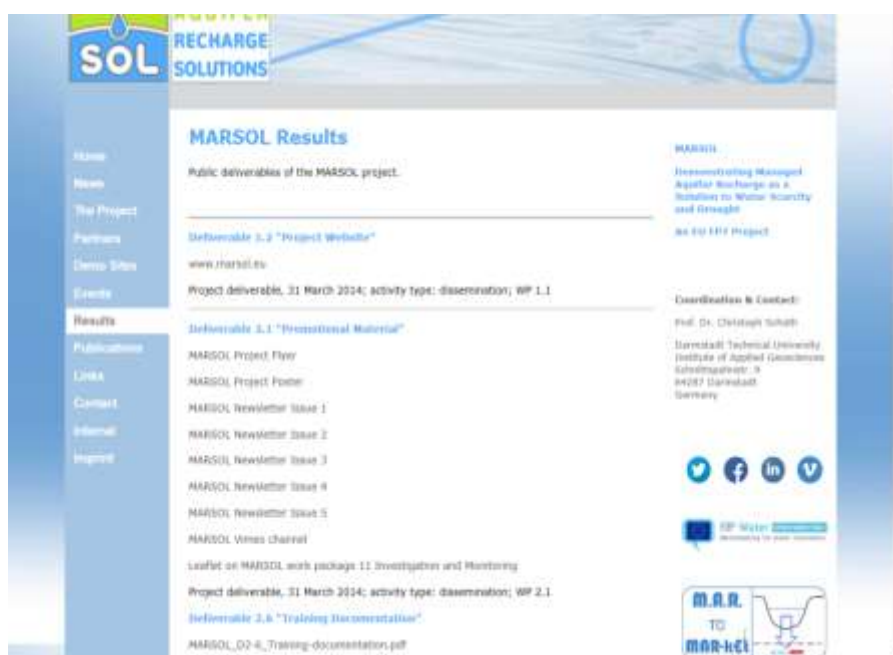
The deliverable includes all the different benches and indicators adopted and evaluated and their pooling, with specific trends obtained for the main groups of indicators and benchmarks evaluated during the project's development.

Regarding the envisaged objectives, the report presents how the different industry branches for some demonstration sites have been involved and mobilized and their degree of dependence on MAR technique in their water supply related schemes. The results demonstrate that MAR represents a strategic solution, in some cases unique, to combat water scarcity and extreme water related events adverse effects, paying special attention on droughts (the key is the storage).

Direct download: <http://www.marsol.eu/35-0-Results.html>

MARSOL DELIVERABLE 17.5 "POLICY DOCUMENT FOR DECISION MAKERS"

The last official deliverable of the project MARSOL was released on 31 January 2017; activity type: report OTHER; WP 17. It is the thinner report from MARSOL project directed at politicians and decision makers. It can be downloaded from MARSOL website at [MARSOL D17-5 Policy-document-for-decision-makers 2017.pdf](#)



MARSOL Deliverables site for direct download

CONTRIBUTION TO THE WHITE BOOK ON MAR MODELING. CHAPTER.

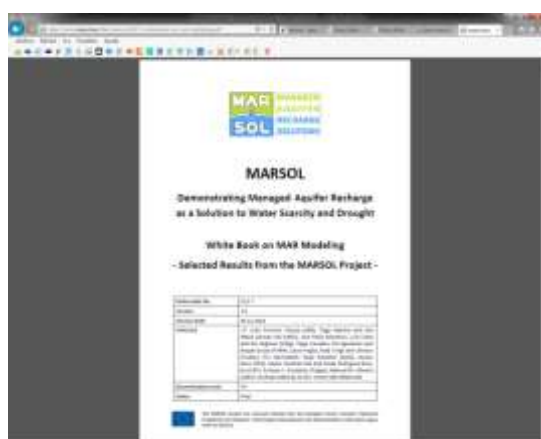
Deliverable 12.7 "White Book on MAR Modeling - Selected Results from the MARSOL Project"

In the context of Managed Aquifer Recharge (MAR) numerical modelling has been an important process in several applications, since the prediction of rise of groundwater

mounds, to determine where ground water must eventually be pumped, understand quality changes in infiltration water and aquifer water, predict the success of treatment induced by MAR methodologies or to calculate the necessary injected volumes to counter a saltwater intrusion problem.

It is essential as a state of the art overview, to compile several applications in different demo-sites and scales, where modelling was essential to refine MAR strategies.

Direct download: [MARSOL D12-7 White-Book-on-MAR-Modeling.pdf](#)



White book on MAR modeling. MARSOL deliverable 12.7 released in 2017

VIDEO OF MANAGED AQUIFER RECHARGE (MAR) AT THE MARSOL DEMONSTRATION SITES

Acceso al vídeo (enlace externo Vimeo) / Marsol demo-sites presentation: (external link): <https://vimeo.com/194059586>
[MARSOL Video Channel on VIMEO](#)



MARSOL demo-sites presentation video

Other MARSOL videos in Vimeo on demo-sites and Technical solutions:

<https://vimeo.com/search?q=marsol+demo+sites>

<https://vimeo.com/220270205>



MARSOL Technical Solutions applied at Los Arenales demo-site

WORKSHOP “MAR2FARM” ON MANAGED AQUIFER RECHARGE - A WORKSHOP DIRECTED AT END-USERS OF THE "LOS ARENALES" AQUIFER, CUÉLLAR (SEGOVIA, SPAIN), 28 MARCH 2017

Workshop directed at end-users of the "Los Arenales" Aquifer, Castilla y León, Spain, where are taking place the most extensive activities on MAR in Spain.

WORKSHOP "MAR2FARM", MARSOL Project, TRAGSA GROUP. 2017 March 28th. Sala cultural "Alfonsa de la Torre", Pza. Mayor 1, Cuéllar (Segovia, Spain).

Focused at regional level, the workshop exposed most of the outcomes achieved from MARSOL project regarding MAR as a technique for rural development, MAR to combat aquifer “overexploitation” caused by irrigation as well as to combat climate change adverse impacts.

The workshop was in Spanish in a language understandable for farmers and the general population, and the presentations were posted on dina-mar.es website.

PRESENTATIONS at: goo.gl/8v54Tc:

- Program of the Workshop "MAR2FARM" on Managed Aquifer Recharge: [programa-MAR2FARM-taller-CUELLAR.pdf](#)
- Los Arenales Aquifer, where are we? Video: [MARenales-Film v7.6.mp4](#)
- Los Arenales MAR constructions. what do we do? Part I. [Carracillo 2017 RFG.pdf](#)
- Alcazarén MAR building work, what do we do? Part II [Recarga del Acuífero JIA.pdf](#)
- MARSOL test with WWTP reclaim water combined with rain and run-off waters in Alcazarén-Pedrajas, how we do it? [Ensayo Alcazarén-Pedrajas MVL.pdf](#)
- Vegetation at MAR Canals and infiltration ponds, how does it work? [Marsol OMT.pdf](#)

- MAR practical recommendations, *how to manage it?* [Tech-Sols-MAR2FARM EFE.pdf](#)
- MAR and rural development, *how does it affect?* [marsol cuellar 2017 MA JSSS.pdf](#)
- Communities and Society, round table, *to whom?*. Future, final conclusions, and now... what? [resumen-coloquio.pdf](#)



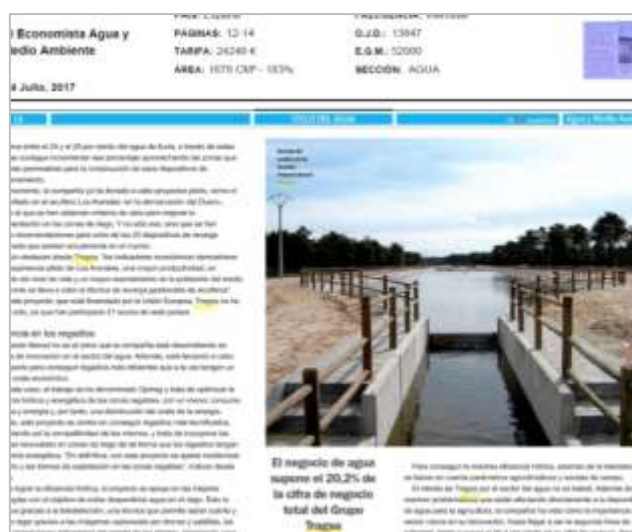
MAR2FARM workshop in Cuéllar, Segovia, Spain, 2017 March 28th. Roundtable and debate

EL ECONOMISTA AGUA Y MEDIO AMBIENTE 04/07/2017. DESCRIPCIÓN DEL PROYECTO MARSOL SOBRE RECARGA GESTIONADA

Under the title “Tragsa Group, 40 years fighting against drought”, the Magazine “El Economista Agua y Medio Ambiente” in their July 4th edition explained the main results from MARSOL Project.

The article enhances the technique and releases abundant figures, such as the water represents 20,2% of the total profit of Tragsa Group, etc. Special attention is paid to irrigation in it.

[Access to the publication](#)



The Economist... article

CEGAFEST CUÉLLAR, SEGOVIA, SPAIN. 2017, July 15th. DEBATE ON THE EFFECT OF EL CARRACILLO MAR EXPERIENCE ON CEGA RIVER

Under the title “Cega River, different sights” Cuéllar City Council (Segovia) and the political Party IU organized a 2nd Workshop during the CEGAFEST Festival that took place on July 15th.

The environmental effects from the diversion of water from Cega River to El Carracillo Mar facilities were debated, exposing different point of view, the advantages and disadvantages, the compatibility between both experiences and the final health of the River.

Program of the Workshop: [2 Charlas Cegafest 2 2017 50.jpg](#)

Tragsa exposed on behalf of MARSOL and MtoM the presentation: “La gestión de la recarga artificial de acuíferos en el marco del desarrollo sostenible. Comarca del Carracillo” (in Spanish). [CEGAFEST-CUELLAR-2017-EFE.pdf](#)



Program and presentation during CEGAFEST second edition Festival

The Regional Media published several articles of CEGAFEST 2nd edition:

- <http://www.elnortedecastilla.es/segovia/musica-debate-luchar-20170717125607-nt.html>
- <http://escuellar.es/index.php/opiniones-contrapuestas-sobre-la-situacion-del-rio-cega-en-la-jornada-de-cegafest/>
- <http://cuellar7.com/las-distintas-miradas-sobre-el-cega/60605/>

MARSOL. FINAL STATEMENTS VIDEO

The “final MARSOL Project statements” video (including the MtoM logo) contains the final message from seven of the first row project members after three years of R&D.

Final conclusions are underlined and some pendant issues for future are mentioned. The most remarkable are:

- MAR works, but needs more experts to do it
- MAR is now a proven technology
- MAR is key solution to ecosystems depending on groundwater
- MAR is a sound, safe, and sustainable strategy that can be used with great confidence
- MARSOL created a new generation of water managers that have an additional option now
- The awareness and the acceptance among stakeholders for MAR solutions is greatly increased
- MAR is one of the best techniques to face frontally climate change adverse impacts.

In summary, MAR is a sound, safe, and sustainable strategy for climate variability preparedness that can be used with great confidence, and through MARSOL and its demonstration sites the awareness and the acceptance among stakeholders for MAR solutions has been greatly increased.

Statements Video Accesses:

DINA-MAR: http://www.dina-mar.es/videos/MARSOL_Tragsa8_x264_001.mp4
<http://www.dina-mar.es/post/2017/07/20/Final-MARSOL-statements-Video.aspx>

Vimeo: <https://vimeo.com/226268269>

You Tube: <https://youtu.be/nnSlwCzrim0>

Subtitled in Spanish:

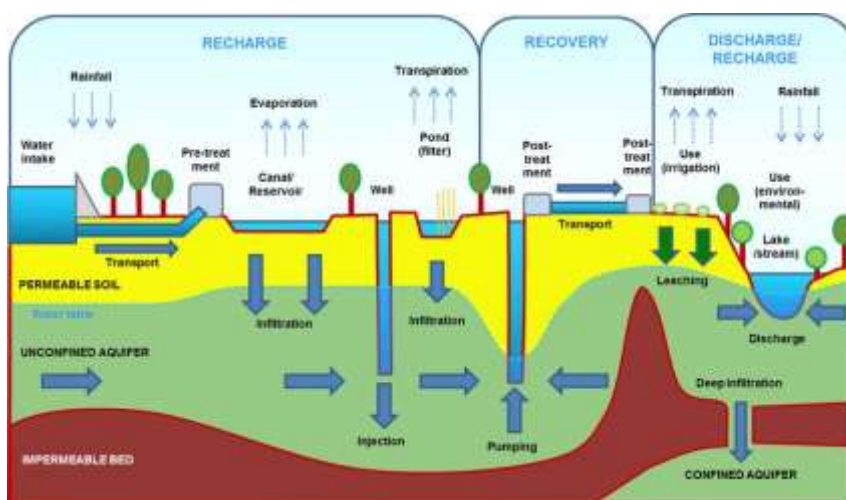
<https://youtu.be/hBmzFy12cm8>

<https://vimeo.com/227872076>

Subtitled in English:

<https://youtu.be/81DSpHcy28c>

Full text for final MARSOL Statements (pdf): [MARSOL_SG_STATEMENTS_I.pdf](#)



MARSOL final MARSOL Statements video screenshot

INTEGRATED MANAGEMENT OF RAINWATER IN BUILT ENVIRONMENT. BOOK

The project GIAE, related to DINA-MAR since the beginning, has a publication available on the internet since 2017.

The publication, written in English and Spanish, responds to a complex problem: managing rainwater in built environments. Offering a set of effective measures to prevent and take advantage of this resource, most of them directly related to urban hydrogeology and artificial recharge in urban areas. The main aim is to improve urban route and regain their natural behavior before any intervention activities.

[Download the book: The Comprehensive Management of Rainwater in Built-up Areas.](#)



New GIAE-DINA-MAR book on SUDS and MAR in urban areas

MARSOL FINAL POLICY BRIEF DOCUMENT

Results of the demonstration sites will be used to develop guidelines for MAR site selection, technical realization, monitoring strategies, and modelling approaches, to offer stakeholders a comprehensive state of the art and proven toolbox for MAR implementation.



MARSOL Policy Brief Document

Also, the economic and legal aspects of MAR has been analysed to enable and accelerate market penetration.

Download the Policy Brief document. [MARSOL Policy Brief final.pdf](#)

COURSE ON HYDROGEOLOGY AND MANAGED AQUIFER RECHARGE IN MANAGUA, NICARAGUA

On 2017 August 31th and September 1st, organized and financed by the World Bank has taken place a capacitation course on groundwater in the new Water Resources Plan of Nicaragua (PNRH) and MAR.

The activity had the support of several Nicaraguan institutions, such as ENACAL, ANA, INETER, FISE, etc.

The first day was exposed the methodology used for the groundwater component in the PNRH, and the second was pure technology Transfer of MAR activities.

The course had 35 assistants either civil servants or from the Academia. The final outcomes state that Nicaragua includes several areas in which MAR is a first row option within the new stages for water management and planning, e.g. at “Corredor Seco”.

Programs Access:

August 31th: [PNRH-programa-capacitacion-GW-BM-v2.pdf](#)

September 1st: [PNRH-programa-curso-IWRM-MAR-BM-V3_s.pdf](#)



Course on Hydrogeology and MAR in Managua (Nicaragua)

PARTICIPATION IN THE INOWAS SUMMER SCHOOL ON MAR. DRESDEN (GERMANY)

The second edition of the Inowas International Summer School on MAR was hold last September 4-15 organized by INOWAS Research Group from Dresden Polytechnic University, financed by the German Government (BMBF).

On September 8th were exposed two presentations from MARSOL-MtoM components on MAR Technical Solutions (Tragsa Group) and Legislation (Sewcu, Malta).

The Summer School, organized by Dr. Catalin Estefan, counted on the presence of several members from the [IAH MAR Commission](#).

[Program access](#)

[More Info \(external link\)](#)



2nd INOWAS MAR summer School announcement

MANAGED AQUIFER RECHARGE AT OPORTO EIP WATER CONFERENCE 2017, PORTUGAL

Between September 25- 29th took place in Oporto the third EIP (Environmental Innovation Partnership) meeting of the European Commission, with three presentations on MAR and an advance of the ISMAR 10 conference to transform opportunities into actions.

2017 EIP Water Conference Programme: [2017 EIP Water Conference Programme.pdf](#)

The Hub_Schedule: [The Hub_Schedule.pdf](#)

[More Info](#)

PRESENTATIONS:

Uniting universities, research labs, local government and the private sector in the MAR network in Italy. Rudy Rossetto, SSSUP, Italy / “MAR” EIP Water Action Group

Novel water supply solutions for agriculture: Managed aquifer recharge and subsurface storage. João Paulo Lobo Ferreira, LNEC.



Lobo Ferreira exposing Novel water supply solutions for agriculture

Managed Aquifer Recharge (MAR) to overthrow adverse climate change impacts. How ISMAR 10 can transform opportunities into actions. Enrique Fernández Escalante TRAGSA-PTEA.

Presentations access: <http://www.dina-mar.es/post/2017/09/20/Managed-Aquifer-Recharge-en-la-EIP-Conference-2017-en-Oporto-Portugal.aspx>



Summary and conclusions of the MtoM presentation at The Hub

Within the meeting was hosted the workshop: MARtoMARKet side event on "MARsolutions, TWIs and Modelling.

PROGRAM:

- Introduction to the MAR side event session and
- The White Book on MAR modelling: Selected results from MARSOL Project – JP Lobo Ferreira (LNEC, PT)
- MAR&LEX: Guidelines for M.A.R. Water Quality. International overview and lessons learnt – Enrique F. Escalante (TRAGSA, ES)

- The EU LIFE REWAT MAR plant at Suvereto (Italy): law requirements and monitoring needs for environmental and health safety – Rudy Rossetto (SSSUP, Santannapisa, IT)
- AquaNES Project overview: combined natural and engineered processes for water treatment systems - Rita Hochstrat (FHNW School of Life Sciences, CH)
- Advanced monitoring and modelling to control and optimise operation of MAR systems: the Agon-Coutainville case - Marie Pettenati (BRGM, FR)
- Improving water quality via MAR: the examples of LNEC physical model and S. Bartolomeu de Messines WWTP – Teresa Leitão (LNEC, PT)
- The PIANO Project WP 2 Task 1a Water and Agriculture; Technical Support Service for Irrigation management (SATR) – Gonalo Rodrigues (COTR, PT)



POWERED BY



IAH MAR COMMISSION IN CROATIA IAH 2017 CONFERENCE

The Croatian National Chapter of the International Association of Hydrogeologists hosted the 44th Annual Congress “Groundwater Heritage and Sustainability” in the Dubrovnik Palace hotel, Dubrovnik, Croatia, from 25th to 29th September 2017.

MtoM was present in the IAH-MAR Commission Plenary (Monday 25 September from 17:00-18.30 in the Dubrava 2 room) where Dr. Peter Dillon exposed some slides on detention-infiltration mechanisms developed by a Peruvian MtoM partner (JUASVI).



MtoM presentation in the IAH MAR Commission Plenary at Croatia IAH 2017 Conference

CONTRIBUTION IN THE NEW PUBLICATION “MANEJO DE LA RECARGA DE ACUÍFEROS: UN ENFOQUE HACIA LATINOAMÉRICA”

The Instituto Mexicano de Tecnología del Agua (IMTA) released on October 3rd a new multi-author book on MAR: *Manejo de la recarga de acuíferos: un enfoque hacia Latinoamérica* (in Spanish).

Tragsa-MtoM has collaborated with 211 pages of this magisterial thick book on MAR.



Download the book, 977 pg, 270 Mb (External link): goo.gl/38r1fJ

More Info (IMTA Website): goo.gl/AA4vvs



New publication on MAR

WORKSHOP ON SAT-MAR IN MADRID. RECLAIM WATER MANAGEMENT BY MEANS OF INDUCED AND ARTIFICIAL RECHARGE. ENVIRONMENTAL, SOCIOECONOMIC AND LEGAL ASPECTS

The “Groundwater Club” (Club del Agua Subterránea or CAS) promoted a workshop on MAR and water reuse last October 18-19th in Madrid, Fundación Gómez-Pardo, cause of the release of the draft for the future Directive on water reuse and aquifers recharge.

The workshop counted with the cooperation of several institutions, including Tragsa, the Spanish water Technological Platform, IGME, etc. and counted on 100 attendants.

More Info (external link): <http://www.clubdelaguasubterranea.org/>

Program: [JornadasRecarga-final.pdf](#)

TRAGSA PRESENTATIONS:

- “Resultados y contribuciones del proyecto MARSOL en materia de reutilización, SAT-MAR y sugerencias para la normativa europea”, por Enrique Fernández Escalante, TRAGSA-PTEA. Coautor: Manuel Sapiano (Malta). [MARSOL-SAT-MAR-CAS-EFE NOV2017-v9.pdf](#)
- “Influencia del regadío con aguas regeneradas en suelos, acuíferos y cultivos. Recomendaciones prácticas. Resultados del proyecto de I+D+i EARSAC”, por Sergi Mulet Aloras, TRAGSA-Baleares. [earsac-Presentación Jornadas Club Agua v1b.pdf](#)
- “Avances del Grupo de Trabajo MAR to MAR-kēt para acercar la recarga gestionada a la agroindustria. Ejemplo real de la Comarca del Carracillo, Segovia, España”, por Jon San Sebastián Sauto, TRAGSATEC-PTEA. [LA RECARGA ARTIFICIAL Y EL DESARROLLO SOSTENIBLE EN EL CARRACILLO.pdf](#)

The rest of the presentations can be accessed in the link:
<http://www.clubdelaguasubterranea.org/infoint.htm#top>

As a final conclusion, the workshop stated the necessity of water reuse on the Mediterranean coast, where it has become a necessity rather than an option.



Tragsa Group/ MtoM presentation on MAR and water reuse in the CAS conference

ORGANIZATION OF THE WORKSHOP ON MAR IN MADRID: MANAGED AQUIFER RECHARGE, AN ALTERNATIVE ON ADAPTATION TO CLIMATE CHANGE

Last 2017 November 27-28 and organized by Cátedra Rafael Dal-Ré (ETSIAAB-TRAGSA) took place in Madrid, ETSIAAB Escuela Técnica Superior de Ingeniería Agronómica, Alimentaria y de Biosistemas (Polytechnic University of Madrid, UPM), the workshop “Managed Aquifer Recharge, an alternative on adaptation to climate change”.



Cátedra Dal-Ré inauguration and final workshop debate

Caused inauguration of the Cátedra Rafael Dal-Ré (UPM-Tragsa) the workshop providing some new knowledge and capacities on MAR and directed at Civil servants in the Public Administration, interested Institutions and Students.

LA RECARGA GESTIONADA DE ACUÍFEROS: UNA ALTERNATIVA DE ADAPTACIÓN AL CAMBIO CLIMÁTICO
27-28 de noviembre de 2017
Cátedra Rafael Dal-Ré/TRAGSA
Escuela Técnica Superior de Ingeniería Agronómica, Alimentaria y de Biosistemas (UPM), Salón de Actos, Ciudad Universitaria, Madrid

INTRODUCCIÓN
En la última década se han discutido intensamente contribuciones al estado del arte en materia de técnicas alternativas de gestión hídrica, y en especial, en la técnica "MAR" (Managed Aquifer Recharge), entendiendo esta técnica "recarga gestionada". Esta parte de la obra busca una comprensión técnica más profunda y práctica de esta técnica, para la implementación práctica en España, a través de un taller de trabajo práctico y teórico, con la participación de expertos en el tema.

PROGRAMA
El programa de la jornada se divide en dos partes: una de mañana y otra de tarde. La mañana estará dedicada a la presentación de la técnica "MAR" y a la discusión de los casos de estudio. La tarde estará dedicada a la presentación de los resultados de la encuesta y a la discusión de los casos de estudio.

TEMAS DE LA JORNADA
1. Introducción a la técnica "MAR".
2. Caso de estudio: Recarga gestionada de acuíferos en España.
3. Caso de estudio: Recarga gestionada de acuíferos en España.
4. Caso de estudio: Recarga gestionada de acuíferos en España.
5. Caso de estudio: Recarga gestionada de acuíferos en España.

LOCOS DE LA JORNADA
1. ETSIAAB (UPM).
2. ETSIAAB (UPM).
3. ETSIAAB (UPM).
4. ETSIAAB (UPM).
5. ETSIAAB (UPM).

INSCRIPCIONES
Las inscripciones se realizan a través del siguiente enlace: <http://www.etsiaab.upm.es/mar>. El plazo de inscripción es hasta el 20 de noviembre de 2017.

NOTA
Las inscripciones están gratuitas y de carácter obligatorio. Para acceder a la jornada es necesario inscribirse y participar en la encuesta. Se requiere contar con acceso a internet y correo electrónico.

Madrid workshop on MAR program

Program: [SEMINARIO-TRAGSA-agronomos-MAR-V19.pdf \(533,26 kb\)](#)

Poster: [Cartel Jornadas Recarga Gestionada de Acuíferos.pdf \(434,51 kb\)](#)

PRESENTATIONS:

1- La recarga gestionada de acuíferos. Su estado del Arte. D. José Antonio de la Orden Gómez (IGME) [1-Catedra Dal-Re. 27nov2017. JAOG.pdf](#)

- 2- I+D+i en recarga gestionada de acuíferos. Resultados del proyecto europeo *Managed Aquifer Recharge Solutions* (MARSOL). D. Enrique Fernández Escalante (Tragsa) [2-MARSOL-DAL-RE EFE.pdf](#)
- 2B- El proyecto europeo MARSOL [8-tecMARSOLp.pdf](#)
- 3- La planificación hidrológica y nuevos planes de cuenca. D. Luis Martínez Cortina (Dirección General del Agua, MAPAMA) [3-LMC-Presentación Recarga gestionada.pdf](#)
- 4- Recarga artificial de acuíferos con destino al riego. D. Manuel Navarro Comalrena de Sobregrau (Subdirección General de Regadíos y Economía del Agua, MAPAMA) [4-PRESENTACION-SANTIUSTE.pdf](#)
- 5- Recarga gestionada y medio ambiente. Técnicas de evaluación y seguimiento. D. Jon San Sebastián Sauto (Tragsatec) [5-MARSOL 27 Nov 2017 Cátedra Dal Re JSSS.pdf](#)
- 6-Criterios constructivos y componentes específicos en obras de recarga artificial. Ejemplos del acuífero de Los Arenales. Descripción de la visita técnica. D. Roberto Fernández García (Tragsa, Segovia) [6-Presentación Carracillo 2017 RFG.pdf](#)
- 7- Preliminares del Congreso Internacional ISMAR 10, Mayo de 2019, organizado por el Grupo Tragsa. D. Enrique Fernández Escalante (Tragsa) y D. José Antonio de la Orden Gómez (IGME) [7-ISMAR 10-TRAGSA-2019.pdf](#)
- 8-Visita técnica al acuífero de Los Arenales (Valladolid-Segovia). Explicación *in situ* de los distintos dispositivos de recarga gestionada y su aplicación al regadío y al desarrollo rural.

FIELD TRIP GUIDE: [GUIA CAMPO-28-nov-17.pdf](#)



Field trip. Pedrajas-Alcazarén SAT-MAR and Santiuste Basin MAR site

[More Info \(Grupo Tragsa\)](#)

[More info \(DINA-MAR\)](#)

[Cátedra Dal-Ré access \(Technical University of Madrid\)](#)

PARTICIPATION IN THE FINAL “DESSIN PROJECT” ORGANIZED BY CETAQUA: “TOWARDS A MORE SUSTAINABLE MANAGEMENT OF AQUIFERS”

CETAQUA, Water Technological Center, organized the workshop “Towards a more sustainable management of aquifers” in Barcelona, December 12th, as an activity to close officially the European projects DESSIN and SASMIE. The workshop counted on over 100 attendants.



E. Custodio during his exposition in the DESSIN-SASMIE final workshop

TRAGSA has participated invited by organizers exposing some Technical solutions for detention-infiltration related to MAR, after Professor Emilio Custodio, Catedrático of hydrogeology of the Universitat Politècnica de Catalunya (UPC).

Presentation of E.F. Escalante, TRAGSA: *“La recarga gestionada de acuíferos como componente de la gestión hídrica integrada. Experiencias de detención-infiltración”*
dessin-dic-17-efe.pdf



Presentation on DESSIN-SASMIE workshop with MtoM logo

More Info (external links):

<http://www.cetaqua.com/es/sala-de-prensa/noticia/512/una-gestion-sostenible-de-los-acuiferos-contra-la-escasez-de-agua>

<https://www.tecnoaqua.es/eventos/cetaqua-jornada-gestion-sostenible-acuiferos>

ISMAR 10 MADRID IS SHAPING UP. “MAR TO SOLVE THE GLOBAL WATER CRISIS”

Some advances during 2017 have been.

- Themes and topics are clarified: There will be 20 sessions
- Committees are almost defined, including reviewers and 40 chair-men
- First official announce and final dates expected for 2018 January

Info: ismar10@tragsa.es; info@ismar10.com

Web site (draft): www.ismar10.net

Twitter: @ismar10

Google +: ismar10madrid / ISMAR 10 Group

Linked-In: Ismar ten



New ISMAR 10 leaflet

NEXT ACTIVITIES

It is expected to pay a great effort for ISMAR 10 Conference temporarily, what could bring a decrease in the other lines of action activity.

Many more opportunities have been detected and they will be duly informed.

Dr. Enrique Fernández Escalante

