



## SCIENTIFIC PROGRAM

### **Monday 6<sup>th</sup>, November 2017**

- 08.30 – 09.30 Registration
- 09.30 – 10.15 Opening Ceremony
- 10.15 – 10.45 Inaugural lecture *Groundwater governance and Global Change in Mediterranean countries*  
Dr. Antonio Chambel. President of the International Association of Hydrogeologists
- 10.45 – 11.45 Coffee break

### Oral Presentations. Session 1: Impact of growing population and land use change on groundwater resources and wetlands

- 11.45 – 12.00 Aparicio J.O., Candela L., Alfranca O.  
Evaluación económica de la aplicación del agua subterránea desalobrada para agricultura en el Campo de Cartagena.
- 12.00 – 12.15 Berbel J., Expósito A., Mateos L.  
The importance of the groundwater governance in the global change context: A proposal for a Mediterranean aquifer (Llanos de la Puebla, Spain).
- 12.15 – 12.30 Custodio E.  
Concepts on groundwater resources.
- 12.30 – 12.45 El Hamdi A., Morarech M., Saadi M., Kacimi I., Bahaj T.  
Etude hydrogéologique du champ captant Tihli dans la plaine du Gharb (province de Sidi Kacem) pour une meilleure gestion du potentiel hydraulique (Maroc).
- 12.45 -13.00 Mansir I., Bouchaou L., Choukr-allah R., Chebli B., El Otmani M.  
Groundwater resources scarcity in Souss-Massa region and alternative solutions for sustainable agricultural development.
- 13.00 – 13.15 Ortuño A., Pérez C., Bueso S., Lupiani E., Corral C.  
Uso sostenible de los recursos subterráneos del acuífero aluvial del río Manilva (Málaga).
- 13.15 – 13.30 Schomburgk S., Leprond H.  
Technical fact sheets on the relevance of industrial groundwater monitoring network: a tool for priority actions and pollution management.
- 13.30 – 15.00 Lunch
- 15.00 – 15.30 Keynote lecture *Some impacts of climate change in Algeria*  
Dr. Redha Menani, University of Batna (Argilia)

### Oral Presentation. Session 2: Monitoring and modeling approaches for evaluating changes in groundwater quality and quantity

- 15.30 – 15.45 Alhama I., García G., Rodríguez T.  
Groundwater as an useful resource in the adaptation to the climate change: the case

- of the synclinal de Calasparra aquifer (Murcia, SE Spain).
- 15.45 – 16.00 Braca G., Ducci D.  
Development of a GIS based procedure (BIGBANG 1.0) for evaluating groundwater balances at National scale and comparison with groundwater resources evaluation at local scale.
- 16.00 – 16.15 Duque C., Thu Olsen J., Sanchez-Úbeda J.P., Calvache M.L.  
Paleohydrogeological model of the groundwater salinity in the Motril-Salobreña aquifer (Southeast Spain).
- 16.15 – 16.30 El Mouine Y., Saadi M., Morarech M., Bahaj T., Kacimi I.  
Apport de l'hydrodynamique, et de l'hydrogéologique à la caractérisation du fonctionnement du système aquifère de Taïcha (nappe de la Maâmora- Maroc).
- 16.30 – 16.45 González-Ramón A., Peinado-Parra T., Mejías-Moreno M., Jiménez de Cisneros-Vencelá C.  
Caracterización de descargas subterráneas ocultas en el borde oriental de Sierra Arana a partir de datos hidroquímicos e isotópicos (Granada, Sur de España).
- 16.45 -17.00 Hassen I., Hamzaoui-Azaza F., Bouhlila R.  
Hydrogeochemical and isotopic investigations for evaluation of the impact of climate change on groundwater quality, a case study of the Plaine of Kasserine (Central Tunisia).
- 17.00 – 17.15 Jiménez-Sánchez J., Martín-Montañés C., Sánchez-Úbeda J.P., Calvache M.L., López-Chicano M., Fernández-Chacón F.  
Flujos verticales en sondeos: relación entre testificaciones con flowmeter y perfiles de temperatura en el acuífero detrítico Motril-Salobreña (Granada, Sur de España).
- 17.15 – 17.30 Jódar Bermúdez J, Barrera García A., Almolda Cardona X., Batlle Pifarré F., Irizar M.  
Gestión sostenible y planificación de los recursos hídricos del acuífero de los Rodeos Tenerife) mediante el hospedaje del modelo numérico en una plataforma del *Cloud*.
- 17.30 – 17.45 Rodrigo-Illarri J., Rodrigo-Clavero M.E., Ballesteros-Almonacid L.  
Modeling soil transport of pesticides using different one-dimensional vadose zone numerical approximations.
- 17.45 – 18.00 N'Da B., Bouchaou L., Reichert B., Hanich L., Danni S., Ait Brahim Y., Chehbouni A., Beraaouz E., Michelot J.  
Chemical tracers and stable isotopes mixing models for the study of groundwater quality and recharge in the Moroccan high Atlas mountains
- 18.00 – 18.15 Slama F., Gargouri-Elouze E., Bouhlila R.  
Impact of rainfall structure on modelling solute leaching in soil and groundwater.
- 18.15 – 18.30 Wuilleumier A., Seguin J.J.  
Identifying trends in the water cycle of the "Gave de Pau" and "Gave d'Oloron" catchment areas in the northern Pyrenees.
- 18.30 – 18.45 Elmandour A., Elgettafi M., Karroum M., Himi M., Casas A.  
Investigation of the geochemical and geophysical evolution of groundwater under arid climate: A case study in Zima Lake, Bahira plain. Morocco.
- 20.00 Welcome cocktail

### ***Tuesday 7<sup>th</sup>, November 2017***

- 08.30 – 09.00 Keynote lecture *Groundwater contamination risk assessment and land use: examples at different scales in a Mediterranean country*  
Dr. Daniela Ducci, President of the IAHS Italian Chapter

### Oral Presentations. Session 3: Groundwater and climate change

- 09.00 – 09.15 Baena Ruiz L, Pulido-Velázquez D., Renau-Pruñonosa A., Morell I., Llopis-Albert C., Collados-Lara A.J., Senent-Aparicio J.  
An index-based method to assess impacts of global change on seawater intrusion problems.
- 09.15 – 09.30 Belalite H., Menani M.R.

- Influence des variations climatiques sur les réserves d'eau souterraine des plaines de Zana Chott Saboun et Gadaine (Nord-Est Algérien).  
09.30 – 09.45 Benabdallah S., Mairech H., Hummel F.M.  
Assessing the impacts of climatic change on groundwater recharge for the Chiba Basin in Tunisia.
- 09.45 -10.00 Bouderbala A.  
Effects of climate variability on groundwater resources in coastal aquifers (case of Mitidja Plain in the North Algeria).
- 10.00 – 10.15 Collados-Lara A.J., Pulido-Velázquez D., Pardo-Igúzquiza E.  
Escenarios futuros del cambio climático en el acuífero kárstico de la Sierra de las Nieves (Málaga) a partir de proyecciones de temperatura y precipitación generadas por modelos climáticos regionales.
- 10.15 – 10.30 Ducci D., Polemio M.  
Quantitative impact of climate variations on groundwater in southern Italy.
- 10.30 – 10.45 Lachaal F., Chargui S., Ben Messaoud R., Chekirbane A., Tsujimura M., Mlayah A., Massuel S., Leduc C.  
Impacts of global changes on groundwater resources in North-East Tunisia: The case of the Grombalia phreatic aquifer.
- 10.45 – 11.45 Coffee break – Posters sessions 1, 2 and 3

#### *Session 1*

- Hadri A., Aboufirass M., Ambri A., Berjamy B., Hearing M. IWRM Agreement: The case of El Haouz-Mejjat Basin, Morocco.
- Olías M., Macías F., Cánovas C.R., Moreno R. Características de algunas surgencias ácidas en acuíferos generados por la minería de sulfuros (SO España).

#### *Session 2*

- Athamena A., Mennani M. R., Athamena M., Belalit H. Risque de pollution des eaux souterraines de la plaine de Zana, Est Algérien.
- Azaiez H., Chabaane A., Khadhar S., Tayech M., Gabtni H.  
2D Electrical resistivity tomography survey for shallow environmental study: case study of oued Tahouna Grombalia, Tunisia.
- Cherkaoui Dekkaki H., Sahbi H. Developement of "Prk plus" multicriteria approach to evaluate the sensitivity of groundwater against pollution using GIS and remote sensing application to the Souss aquifer around a South area (South of Morocco).
- Duque C, Gómez-Fontalva J.M., Murillo J.M., Calvache M.L. Assessing the uncertainties in the water Budget of the Torrevieja aquifer (Southeast Spain).
- El Morabiti K., Benmakhlouf M., Pulido Bosch A., Stitou Messari J. Hydrogéochimie des sources thermales du couloir sud-rifain (Maroc).
- Elgettafi M., Chafouq D., Elmandour A., Himi M., Chouikri I., Casas A. Geochemical and geophysical characterization of groundwater salinization in the Ghis-Nekor plain; Nord of Morocco.
- Fethi A., Bensana A., Bouguettoucha A. Modeling of an amperometric biosensor response for the detection of pollutants in water samples.
- Heredia J., Gomes do Santos J. Martínez Santos P. El método de las imágenes: una herramienta necesaria en los modelos de flujo de campos de bombeo.
- Jiménez-Espinosa R., Hernández-Puentes P. Hydrogeochemical characterization of the Torreperogil and Sabiote active fault zone (province of Jaén, SE Spain): potential influence of earthquakes on aquifers.
- Moreno R., Olías M. Evolución de los niveles de inundación en dos cortas de las minas de Tharsis (Faja Pirítica Ibérica, España).

Naranjo-Fernández N., Guardiola-Albert C., Serrano-Hidalgo, C. Do we know all about Doñana aquifer model? Naturalizing the behavior of a mathematical model through hydrofacies.

### Session 3

Amraoui F. L'aquifère karstique du Lias du Saïs au Maroc à l'épreuve du changement climatique. Etat des lieux et adaptation.

Herrera C., Custodio E., Jódar J. Effect of past wetter periods on current conditions in arid zone aquifers

Juhlke T. R., Huneau F., Garel E., Barth J.A.C., van Geldern R.

The seasonal carbon dioxide budget from a Mediterranean mountain watershed in Corsica – (implications from ground and surface waters).

Luque-Espinar J.A., Pulido-Velázquez D., Pardo-Igúzquiza E., Fernández-Chacón F. Procesos climáticos que influyen en la recarga de acuíferos. Caso de la provincia de Granada.

Mas-Pla J., Menció A., Portell L. Qualitative evaluation of climate change effects on nitrate occurrence at several aquifers in the Catalonia Inner Basins.

Pardo-Igúzquiza E., Pulido-Bosch A., Luque-Espinar J.A., Heredia J., Durán J.J. Modelo matemático distribuido de un acuífero kárstico mediterráneo para el estudio de los efectos del cambio climático: el caso de la Sierra de las Nieves (Málaga, España).

Pardo-Igúzquiza E., Martos Rosillo S., Cabrera Arrabal J.A., Pedrera A., Ruiz Constan A., Durán Valsero J.J. Estimación preliminar de la recarga en las peridotitas de Sierra Bermeja (provincia de Málaga, España): sensibilidad al cambio climático.

Zeramdini A., Andreu J.M., Moutahir H., Ayanz J., Bellot J. Estimación del balance hídrico y la recarga en el acuífero de la Sierra de las Águilas bajo diferentes escenarios de cambio climático.

### Oral Presentations. Session 3: Groundwater and climate change (continuation)

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| 11.45 – 12.15 | KINDRA Project: Making Groundwater Visible<br>Mercedes García Padilla, Environment and Water Agency of Andalusia  |
| 12.15 – 12.30 | Martín-Arias J., Martínez-Santos P., Andreo B.<br>Hydrogeological model of Mijas mountain aquifers under different climate conditions (Malaga, Spain).  |
| 12.30 – 12.45 | Sinan M., Outbourahte Y., Ouyahia K., Lekhlif B., Jarar H.O.<br>Développement d'une nouvelle méthodologie de caractérisation de l'aptitude des nappes à la recharge artificielle des nappes. Application à la nappe du Haouz de Marrakech. Maroc. |
| 12.45 – 13.00 | Ouhamdouchs, Bahir M., Carreira P.M., Zouari K.<br>Groundwater responses to climate change in a coastal semi-arid area from Morocco; case of Essaouira Basin.   |
| 13.00– 13.150 | Pardo-Igúzquiza E., Collados Lara A.J., Pulido Velázquez D.<br>Future effects of climate change on the dynamics of the Sierra Nevada snowpack: conclusions from cellular automata models.   |
| 13.15 – 13.30 | Rodrigo-Clavero, M. E., Rodrigo-Illarri, J.<br>Impact of climate change on the leachate production of a bioreactor landfill.  |
| 13.30 -13.45  | Sánchez-Martos F., Molina Sánchez L., López-Martos J.M., Navarro-Martínez F.<br>Consideraciones sobre la evolución temporal de dos humedales dependientes de las aguas subterráneas en el Campo de Dalías (Almería).                              |
| 13.45 – 15.30 | Lunch   |
| 15.30 – 16.00 | Keynote lecture <i>As the land so the water – can we govern the linkages</i><br>Speaker: Stephen Foster, D Sc (London) C Eng CIWEM c Geol FGS   |
| 16.00 – 18.00 | Round table: The importance of groundwater in adapting to global change   |

Moderator: Dr. Marco Petitta, Vice President of IAH - Europe (West and Central)

Participants:

Dr. David Pulido, IGME

Dr. Bouabid El Mansouri, President of Moroccan IAH Chapter

Dr. Faten Jarraya Horriche, President of Tunisian IAH Chapter

Dr. Jesús García Martínez, Chief of Water Planning, Segura Basin Government

18.00 – 19.30 Homage to Prof. Antonio Pulido-Bosch

21.00 Gala Dinner

### **Wednesday 8<sup>th</sup>, November 2017**

8.30 – 9.00 Keynote lecture *Anthropization of groundwater resources in the Mediterranean region: forms and issues*  
Speaker: Christian Leduc, Institute of Research for Development, France

#### Oral Presentations. Session 4: Protection and sustainable use of groundwater

- 09.00 – 09.15 Abahous H., Ronchail J., Sifeddine A., Kenny L., Bouchaou L.  
Impacts of the water resources variability on cereal yields in the region of Souss-Massa, Southern Morocco.
- 09.15 – 09.30 Carreira P.M., Marques J.M.  
Groundwater salinity and environmental change over the last 20,000 years: Isotopic evidences in the Lower Sado aquifer recharge, Portugal.
- 09.30 – 09.45 Erostate M., Garel E., Huneau F., Pasqualini V.  
Delineating the aquifer role in the anthropogenic fingerprint on the groundwater-dependent ecosystem of the Biguglia Lagoon (Corsica, France).
- 09.45 - 10.00 Nieto-López J.M., Andreo-Navarro B., Barbera Fornell J.A., Ramirez Gonzalez J.M., Rendon Martos M.  
Preliminary study of the impact of Guadalhorce river mouth channeling (Malaga, Spain) on groundwater related wetlands.
- 10.00 – 10.15 Leduc C., Massuel S., Riaux J., Calvez R., Ogilvie A., Benaïssa N., Lachaal F., Jenhaoui Z.  
Changement global et ressources en eau souterraines dans la region de Kairouan (Tunisie centrale): evolutions rapides et a long terme.
- 10.15 – 10.30 Mejías M., Benítez de Lugo L.  
The first hydraulic culture in Europe: the Bronze Age Motillas of la Mancha (Spain).
- 10.30 – 10.45 Oumarou Danni S., Bouchaou L., Elmouden A., N'da B., Malki M.  
Isotopic and chemical tracers for the sustainable management of water resources in a semi-arid area: Case of Massa catchment, Morocco.
- 10.45 - 11.00 Vernoux J.F., Horriche F., Ghoudi R., Abdedaiem S., Hamza M.  
Modalités de gestion des aquifères de la Jeffara de Gabès en lien avec les écosystèmes oasiens.
- 11.00 – 11.30 Coffee break – Posters sessions 4, 5 and 6

#### Session 4

Chabour N. Vulnérabilité et évolution des hydrosystèmes côtiers de l'est algérien: l'aquifère de Teleza, NE Algérie.

Fekri A. The impact of drought on groundwater quality: case of Essaouira syncline, Morocco.

Fernández-Ayuso A., Rodríguez-Rodríguez M., Benavente J. Change in the hydrological functioning of sand dune ponds in Doñana National Park (Southern Andalusia, Spain).

Jamaa H., El Achheb A., Ibno Namr K., Echelfi Y., Hamdouni T. Impact des changements climatiques et des activités anthropiques sur les eaux souterraines dans les périmètres irrigués des Doukkala, Maroc.

Mansouri Z., Menani R. Assessment of water requirements of olive and apricots trees in Tinibaouine region (North-Eastern of Algeria).

Romero A., Moreno L., Rodríguez S., de la Losa A., Jiménez E., Heredia J. Calidad del agua subterránea y su relación con la actividad humana. Montánchez, un caso de estudio.

#### Session 5

Espinosa Martínez S., Díaz M.A., Antonaya Avi J., Calero Díaz G. Evaluación del origen de la salinidad en el acuífero plioceno Aloha en Marbella (Málaga).

Martínez-Martos M., Galindo-Zaldívar J., Ruano P., Pedrera A., López-Chicano M., Marínez-Moreno F.J. Electrical resistivity tomography of freshwater-saltwater mixing zone applied to the study of a highly anthropized detrital coastal aquifer (Carchuna-Calahonda, Betic Cordillera, Spain).

Re V., El Amrani Paaza N. Approche multi-traceurs des eaux souterraines pour une meilleure gestion de la ressource dans les zones côtières: cas de l'aquifère de Bou-Areg (Nador, Maroc).

Sánchez-Úbeda J.P., López-Chicano M., Calvache M.L., Purtschert R., Engesgaard P., Martín-Montañés C., Sültenfuß J., Duque C. Groundwater age dating in Motril-Salobreña coastal aquifer with environmental tracers ( $\delta^{18}\text{O}/\delta^2\text{H}$ ,  $^3\text{H}/^3\text{He}$ ,  $^4\text{He}$ ,  $^{85}\text{Kr}$ , and  $^{39}\text{Ar}$ ).

#### Session 6

Argamasilla M., Camprovín P., Massana J, Martín J. Multivariate statistical techniques and binary mixing models to infer the impact of injecting pre-potable water in a Mediterranean coastal aquifer. Demonstration at Llobregat Lower Valley (Barcelona).

Ben Brahim H., Horriche F.J., Slama F. Multicriteria decision aid for choosing groundwater artificial recharge sites with treated wastewater: case study of Mornag aquifer.

Garrido Schneider E., García-Gil A., Arrazola Martínez C., Escayola Calvo O., Sánchez Navarro J. A. Usefulness of a groundwater temperature baseline monitoring network for the identification of thermal interferences among shallow geothermal exploitation systems in urban environments.

Heredia J., Martos-Rosillo S., González-Ramón A., Pedrera A., Rodríguez-Rodríguez M. El consumo responsable y la adecuación en la satisfacción de la demanda: elementos básicos en la adaptación al cambio global. El caso de la Sierra de Humilladero (Málaga, España)

Montesinos S., Fernández L., Mateo B., González M. Cuantificación mediante teledetección de las extracciones de agua subterránea en el acuífero de Aguascalientes (México).

#### Oral Presentations. Session 5: Water management challenges and case studies in Mediterranean coastal aquifers

11.30 – 11.45 Martínez-Moreno F.J., Monteiro-Santos F.A., Bernardo I., Farzamian M., Nascimento C. Fernandes J., Casal B., Ribeiro J.A.

1d and quasi-2d joint inversion of TDEM and DCR data to evaluate seawater intrusion in coastal areas: a case of study in Algarve (South of Portugal).

11.45 – 12.00 Sánchez-Úbeda J.P., Calvache M.L., Engesgaard P., Duque C., López-Chicano M., Purtschert R.

Numerical modeling of age distribution in Motril-Salobreña coastal aquifer (SE Spain).

12.00 – 12.15 Custodio E.

Consequences of seawater intrusion in Mediterranean Spain. Project SASMIE

12.15 – 12.30 Echelfi Y., El Achheb A., El Mansouri B., El Maliki S., Echcharef A., Younsi A.

The estimation of aquifer hydrodynamic parameters using piezometric continuous measurement and tidal effect in Sidi Moussa coastal aquifer, Morocco.

12.30– 12.45 El Kanti S.M., El Mansouri B., Arjidal Y., Larabi A.

Numerical groundwater modelling as an effective tool for management of the Deep groundwater at the Dakhla Bay (South Morocco).

- 12.45 – 13.00 García-Aróstegui J.L., Baudron P., Taddei D., Fernández-Molina P., Leduc C., Gomariz-Castillo F., Blondet I.  
Caracterización de la recarga en un episodio de precipitación excepcional e implicaciones sobre un lagoón costero asociado (Campo de Cartagena-Mar Menor, SE España).
- 13.00 -13.15 Kouz T., Cherkaoui Dekkaki H., Mansour S., Hassani Zerrouk M., Mourabite T.  
Application of GALDIT index to assess the intrinsic vulnerability of coastal aquifer to seawater intrusion: Case of the Ghiss-Nekor aquifer (North East of Morocco).
- 13.15 -13.30 Pulido-Bosch A., Vallejos Á., Sola F.  
Métodos de suministro de agua de mar para desaladoras y su problemática.
- 13.30 – 13.45 Santoni S., Garel E., Huneau F.  
Multi-tracers strategy to define a conceptual model for the coastal aquifers of Mediterranean islands, case study of the Bonifacio aquifer (Corsica, France).
- 13.45 –15.30 Lunch
- 15.30 – 16.00 Keynote lecture *Soil and groundwater salinisation risks, approaches and modeling*  
Speaker: Dr. Rachida Bouhlila, Ecole National de'Ingenieurs, Tunisia

Oral presentations. Session 6: Technical and innovative solutions and groundwater management for adaptation to global change

- 16.00 – 16.15 Carvalho R.C., Carvalho T., Sousa F.R., Gil S., Agostinho R.  
Sowing water in Monchique mountain: A multidisciplinary MAR project for climate change adaptation.
- 16.15 – 16.30 García-Gil A, Garrido Schneider E.A., Sánchez Navarro J.A., Vázquez-Suñé E., Marazuela Calvo M.A., Muela Maya S.  
Reactive transport modelling for the study of geochemical impacts induced by shallow geothermal exploitation.
- 16.30 – 16.45 Horriche F.J., Mgaidi N., Ghouili N., Zammouri M.  
Groundwater recharge assessment using Wetpass: Case study of the Sidi Marzoug-Sbiba aquifer (Tunisia).
- 16.45 – 17.00 Molano Leno L., Kohfahl C., Martínez Suarez J., Ruiz Bermudo F., Martínez Sanchez de la Nieta A.N., Mediavilla C., Engelhardt S., Vanderlinden K., Giraldez J.V.  
Investigating the impact of climate change on groundwater recharge using a high precision meteorolysimeter in a dune belt of the Doñana National Park.
- 17.00 – 17.30 Closing Ceremony
- 17.30 IAH- Spanish Chapter Meeting

**Thursday 9<sup>th</sup>, November 2017**

- 08.30 Departure for Congress Technical Field Trip
- 15.30 Return from Option 1 Technical Field Trip
- 18.00 Return from Option 2 Technical Field Trip