

6th Edition of International Conference on GIS and Applied Computing for Water Resources-
WMAD21 (Online)

24th-25th September, 2021, ENSA Kenitra, Ibn Tofaïl University, Morocco

(Time zone in Morocco (GMT+1))

fGENERAL PROGRAM

(Time zone in Morocco (GMT+1))

(GMT+1)	
Day 1 - Friday 24 September 2021	
09:00 - 10:00	Reception
	Opening Ceremony : Link : https://meet.google.com/fnv-ugzd-khk Mr. Director of ENSA Kenitra Mr. Director of the Center for Doctoral Studies of Ibn Tofaïl University Mr. Director of Engineering Sciences Laboratory Mr. President of AIH Maroc Mr. President of SAWIS WMADS21 Chairs
10:00 - 13:00	WMAD21 : PLENARY SESSION 1 - OPENING KEYNOTES Link : https://meet.google.com/fnv-ugzd-khk Chairs : Pr. Bouabid EL MANSOURI (FS Kenitra), Pr. Hassane JARAR OULIDI (EHTP, Casablanca), Pr. Mohamed EL BOUHADDIOUI (ENSM Rabat), Pr. Aniss MOUMEN (ENSA Kenitra) Pr. Ali KHOSHNAZAR (IHE Delft Institute for Water Education, Netherlands), Pr. Gerald Augusto Corzo Perez (IHE Delft Institute for Water Education, Netherlands), "A New Framework for Spatiotemporal Drought Risk Assessment Considering Resilience and Heterogeneous Vulnerability Factors" Pr. Sunny Joseph KALAYATHANKAL (Jyothi Engineering College, India) "Modified Fuzzy Computing and Decision Making Applications" Pr. Bouabid EL MANSOURI (Ibn Tofaïl University, Morocco) "Numerical Modeling of Water Resources: Contributions and limits" Homage of Professor Ahmed SAYAD
13:00 - 14:30	Break
14:30 - 15:00	WMAD21 : PLENARY SESSION 2 - DISCUSSION Link : https://meet.google.com/fnv-ugzd-khk Chairs : Pr. Jamal CHAO (FS Kenitra), Pr. Mohamed EL BOUHADDIOUI (ENSM Rabat), Pr. Aniss MOUMEN (ENSA Kenitra) Pr. Abdelkader LARABI (Mohamed V University, Rabat) "Assessment and Mapping of the Vulnerability to Seawater Intrusion in Coastal Aquifers: a New Quantitative Approach for Groundwater Management and Risk Assessments"
15:00 - 19:00	WMAD21 : PARALLEL SESSIONS OF ORAL COMMUNICATIONS Session 1 : Big-data & Machine learning Link Session 1 : https://meet.google.com/xcg-qjmj-jpu Session 2 : Climate change & Natural hazard related to water Link Session 2 : https://meet.google.com/vuh-ebxp-cri Session 3 : Geomatics, Remote sensing and Modelling Link Session 3 : https://meet.google.com/xim-jfzv-whi Session 4 : Hydrology, hydrogeology and Hydro-geophysics Link Session 4 : https://meet.google.com/stu-vqtj-nbj Session 5 : Surface and Groundwater quality Link Session 5 : https://meet.google.com/nqp-zpff-xnf

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(GMT+1)	WMAD21 : Day 2, Saturday 25 September 2021
09:00 - 10:00	Reception
10:00 - 11:00	<p>WMAD21 : PLENARY SESSION 3 - DISCUSSION Link : https://meet.google.com/fnv-ugzd-khk Chairs : Pr. Bouabid EL MANSOURI (FS Kenitra), Pr. Mohamed EL BOUHADDIOU (ENSM Rabat), Pr. Aniss MOUMEN (ENSA Kenitra)</p> <p>Pr. Mohamed WAHBA (International Commission on Irrigation and Drainage, India/Egypt) “Role of pilot Projects for Irrigation and Drainage technologies and lessons learned from some previous studies”</p> <p>Pr. Lahssen BENAABIDAT (FST, Fez)</p> <p>" PHEMAC: Participatory hub for effective mapping, acceleration and capitalization of EU-MPC NEXUS best practices"</p> <p>Pr. Aniss MOUMEN (Ibn Tofail University, Morocco) “Publication details about Springer Book Chapter & E3S Journal”</p>
11:00 - 13:30	<p>WMAD21 : PARALLEL SESSIONS OF ORAL COMMUNICATIONS Session 6 : Agriculture, Soil and Blue growth Link Session 6 : https://meet.google.com/ncd-fgar-fgi</p> <p>Session 7 : Integrated Water Resources Management Link Session 7 : https://meet.google.com/hfz-xiqw-xad</p> <p>Session 8 : Urban hydraulics, desalination and sanitation Link Session 8 : https://meet.google.com/avq-face-oxt</p>
13:30 - 14:30	Break
14:30 - 18:30	<p>Side Event "Hydroinformatic job market : Challenges and perspectives" 1st Meeting between Students and Laureats Link : https://meet.google.com/fnv-ugzd-khk</p>
18:30- 19:00	Closing of WMAD 21 conference

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SESSIONS PROGRAM

Date	Day 1 - Friday 24 September 2021		
Google meet	https://meet.google.com/xcg-qjmj-jpu		
Session/Topic	Session 1 : Big-data & Machine learning		
Chairs	Pr. Aniss MOUMEN (ENSA Kenitra), Pr. Abdelghani BOUDHAR (FST Beni-Mellal), Pr. Brahim ELBHIRI		
Hours	ID	Authors	Title
15:00 - 19:00	24	Rachid El Chaal and Moulay Othman Aboutafail	Development of stochastic mathematical models for the prediction of heavy metal content in surface waters using artificial neural network and multiple linear regression
	57	Sara Bouziane, Badraddine Aghoutane, Aniss Moumen, Ali Essahlaoui and Abdelhadi Elouali	Proposal of a Big data System for an Intelligent Management of Water Resources
	72	Ibrahim El Yaakoubi, Aicha Rochdi and Yassine Bouslihim	Spatial Prediction of Soil Organic matter with using machine learning: A case study in a semi-arid region, Morocco.
	80	Hicham Jamil, Bouabid Mansouri and Aniss Moumen	Big data analytics and water resources: Literature review & Fieldwork
	81	Youssef Rissouni, Aniss Moumen and Jamal Chao	UAV photogrammetry, deeplearning and structure from motion (SFM) to assess solar energy in urban areas
	97	Elhassan Jamal, Jamal Chao and Aniss Moumen	Big data analytic implementation to manage water resources: use case ABHB
	98	Bouchra Bargam and Abdelghani Boudhar	Support Vector Regression (SVR) approach for Daily Streamflow prediction in a mountain sub-basin in Morocco
	99	Karima Nifa, Abdelghani Boudhar, Hamza Ouatiki, Bouchra Bargam, Redouane Lguensat and Abdelghani Chehbouni	Performance of Deep learning Approach for Daily Runoff Prediction in a Poorly gauged basin in Morocco

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Date	Day 1 - Friday 24 September 2021		
Google meet	https://meet.google.com/vuh-ebxp-cri		
Session/Topic	Session 2 : Climate change & Natural hazard related to water		
Chairs	Dr. Narjiss SATOUR (FS Rabat), Dr. Badr EL MAHRAD (CIMA, Portugal)		
Hours	ID	Authors	Title
15:00 - 19:00	5	Youssef Jaouhari, Laila Stour and Ali Agoumi	Adaptation to climate change of Moroccan companies: towards an appropriate climate risk anticipation tool
	21	Yousra El Baki, Khalid Boutoia and Abdelouahid Medaghri-Alaoui	Impact of climate change on surface water in the beni mellal-khenifra region
	63	Meriem BOUSSEBA, Loubna FERRAJ, Sara OUAHB, Mohammed DROUSSI and Mustapha HASNAOUI	Study of the mortality and exploitation parameters of Sander lucioperca (Linnaeus, 1758) in the Al Massira Dam Lake (Morocco)
	76	Zineb Moumen, Ismail Elhassnaoui and Fatima Daid	Statistical Descriptive Analysis of Three Climate Variables; Precipitation, Temperature and Relative Humidity. Study Cases (Innaouene Watershed; Morocco)
	87	Narjiss SATOUR, Badreddine Benyacoub, Badr EL MAHRAD, Ilias Kacimi	KPCA over PCA to assess urban resilience to floods
	89	Ouassila Salhi, Mohammed Diouri, Mohammed Amine Moussaoui, Ibtissam Marsli and Rajae Meziane	Estimation of absorptivity of Earth-atmosphere system over the MENA areas
	93	Rajae Meziane, Mohammed Diouri, Abdelmoula Ben-Tayeb, Hanae Steli and Ouassila Salhi	Effect of the main active volcanoes on aerosol optical properties
	101	Hind Azidane, Aïcha Benmohammadi, Michel Boko and Mohamed El Bouhaddioui	Equilibrium beach profile on sandy beach of the Mehdyia coast of Morocco
106	Marouane Laaraj, Lahcen Benaabidate and Valérie Mesnage	Assessment and mapping of water erosion by the integration of the Gavrilovic "EPM" model in the Inaouene watershed, Morocco	

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Date	Day 1 - Friday 24 September 2021		
Google meet	https://meet.google.com/xim-jfzv-whi		
Session/Topic	Session 3 : Geomatics, Remote sensing and Modelling		
Chairs	Dr. Lhoussaine EL MEZOUARY (FS Kenitra)		
Hours	ID	Authors	Title
15:00 - 19:00	17	Manal El Garouani, Mhamed Amyay, Abderrahim Lahrach and Hassane Jarar Oulidi	Exploring the Relationship between LST, LULC and NDVI in Saïss Plain using Geospatial Techniques
	18	Bakali Hosny, Aouiche Ismail and Serhir Najat	Problem of determining the threshold for statistical analysis by the POT method Application to wave data on the Moroccan Atlantic coast
	26	Sara Moutia, Mohamed Sinan and Brahim Lekhlif	Agricultural Drought Monitoring Based on satellite derived indicator VHI and the SPEI over MOROCCO in a changing climate
	32	Nabil Aouichaty, Yassine Bouslihim, Said Hilali, Abdjalil Zouhri and Yahya Koulali	Influence of DEM resolution on the RUSLE model: Case of abandoned quarries in Settat province (Morocco)
	44	Msaddek Mohamed, Abdelkader El Garouani, Kimbowa George and Fatima Daide	Remote sensing approach and HEC-HMS Model to simulate Impacts of Land Use/Cover Change on Streamflows in the Oum Er-Rbia watershed (Morocco)
	47	Elyasse El Mrabet, Lhoussaine El Mezouary and Bouabid El Mansouri	A study of water infiltration basin and clogging using column experiments
	56	Meryem El Amraoui and Lahcen Kabiri	Etude diachronique par télédétection spatiale des Changements du couvert végétal dans l'Oasis de Ferkla: « Etude de cas: Bour El Khourbat, Tinjdad, Maroc »
	70	Lama Ouali and Kabiri Lahcen	Evaluation of remotely-sensed precipitation (GPM_3IMERGM v06) products over the Guir, Ziz, Rheris and Maider watersheds
	85	Ghizlane Benezzine, Abdeljalil Zouhri and Yahya Koulali	Combining AHP with GIS for landfill site selection: Ben Ahmed circle
	106	Lhoussaine El Mezouary, Bouâbid El MANSOURI	Groundwater flow equation, overview, derivation and solution
36	Soumaya Nabih and Lahcen Benaabidate	Evaluation of Satellite-based Precipitation Products over UpperSebou watershed (Morocco)	

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Date	Day 1 - Friday 24 September 2021		
Google meet	https://meet.google.com/stu-vqtj-nbj		
Session/Topic	Session 4 : Hydrology, hydrogeology and Hydro-geophysics		
Chairs	Pr. Bouâbid EI MANSOURI (FS Kenitra), Pr. Mohamed EL BOUHADDIOUI (ENSM)		
Hours	ID	Authors	Title
15:00 - 19:00	11	Mohamed Aghad, Lhoussaine El Mezouary, Mohamed Sadiki and Jamal Alkarkouri	Hydrological modelling for flood forecasting in Kénitra catchments, Western of Morocco
	12	Lhoussaine El Mezouary, Bouâbid El MANSOURI	Applied Latin Hypercube stochastic method to quantify the uncertainty in groundwater equation model simulations
	15	Oussama Laassilia, Driss Ouazar, Ahmed Bouziane and Moulay Driss Hasnaoui	Continuous modelling of the Bouregreg watershed (Morocco) using HEC-HMS model
	45	Hasna Mourni, Karima Sebari, Laila Stour and Abdellatif Ahbari	Estimation of the HEC-HMS model parameters in data-scarce regions. Application to the Ouergha watershed (Sebou, Morocco)
	54	Lhoussaine Tarik and Ahmed Benamara	Geophysical study of a fractured and karstified aquifer by the methods of electrical resistivity and very low-frequency electromagnetism VLF-EM (Middle Atlasic Causse of El-Hajeb)
	60	Soukaina Benkou, Abdelkader Larabi, Mohamed Faouzi and Oussama Ait Raoui	Caractérisation Hydrogéologique et Evaluation des Ressources en Eau Souterraines de la Nappe Côtière de Chtouka (Sud-Ouest ; Morocco)
	69	Samir Ait M'barek, Aicha Rochdi, Yassine Bouslihim and Abdelhalim Miftah	Simulation of the global hydrological cycle in the el grou watershed using gis and swat model.
	90	Fatima Daide, Rachida Afgane, Abderrahim Lahrach, Abdel-Ali Chaouni, Mohamed Msaddek and Ismail Elhassnaoui	Rainfall-runoff modeling of Beht watershed using the hydrological model (HEC-HMS)
	95	Soumia Slimani, Mohamed Farhloul, Ibtissam Medarhri, Khalid Najib and Abdelmalek Zine	A new mixed formulation of a nonstationary seawater intrusion problem in a confined aquifer
	96	Ayoub Benmhammed, Nezha Mejjad, Adil Elyahyaoui, Abdelmourhit Laissaoui, El Mahjoub Chakir, Nadia Ziad and Hamid Marah	Assessment of groundwater quality using Physico-chemical analyzes of Sahel-Doukkala region
104	Ouchbani Ali, Larabi Abdelkader, Aarab Abdellatif	Apport de la prospection par tomographie électrique pour le choix de l'implantation d'un forage hydrogéologique : Cas de l'alimentation d'une station de dessalement dans la région de Cap Ghir (région d'Agadir)	
37	Rihem Mejdoub El Fehri, Noamen Rebai and Aniss Moumen	Combination of the methodical approach and statistical analysis for the study of vulnerability to seawater intrusion	

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Google meet	https://meet.google.com/nqp-zpff-xnf		
Session/Topic	Session 5 : Surface and Groundwater quality		
Chairs	Dr. Gabriela MOROȘANU (University of Bucharest, Romania), Dr. Ismail ELHASSNAOUI (EMI Rabat)		
Hours	ID	Authors	Title
15:00 - 19:00	28	Ghizlane Azizi, Mostapha Akodad, Mostafa Layachi, Mourad Baghour, Ali Skalli, Hanane Ait Hmeid, Hicham Gueddari and Abdelmajid Moumen	Biomonitoring study of trace metals (Al, As, Li) in mussels from the Al Hoceïma Coasts of Moroccan Mediterranean Sea
	33	El Fakir Rabia, Mili El Mostafa, Essahlaoui Ali, Ammari Zakaria and Elhafyani Mohammed	Physico-chemical characterization of the free water table of the Fes-Meknes basin.
	55	Nouhaila Hadoudi, Hassan Amhamdi and M'hamed Ahari	Sorption of bisphenol A from aqueous solutions using natural adsorbents: Isotherm, Kinetic and Effect of temperature
	64	Sara El Ghizi, Nezha El Aadel, Mohamed Sadik, Mohammed El Bouch and Mustapha Hasnaoui	Contribution to the study of the hydro-chemical characteristics of the lake ecosystem Dayet Er-Roumi, Morocco
	75	Sara Ghazali and Abdelghani Laamyem	Treatment of the leachate from the uncontrolled landfill of casablanca city by of the infiltration-percolation
	83	El Mustapha Azzirque, Farida Salmoun, El Khalil Cherif and Nezha Mejjad	Determination of the Joaamaa groundwater quality using physico-chemical water analysis and Geographic Information System (GIS)
	92	Asmae Charki, Hossain El Ouarghi and M'Hamed Ahari	Treatability tests of synthetic leachate from the Al-Hoceïma city controlled landfill.

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Date	Day 2 - Saturday 25 September 2021		
Google meet	https://meet.google.com/ncd-fgar-fgi		
Session/Topic	Session 6 : Agriculture, Soil and Blue growth		
Chairs	Dr. Nezha MEJJAD (FS Casablanca), Dr. Ismail ELHASSNAOUI (EMI Rabat), Dr. Yassine BOUSLIHIM (FST SETTAT)		
Hours	ID	Authors	Title
11:00 - 13:30	10	Said Mohafid, Laila Stour, Ali Agoumi and Manar Ouassil	Guide for valuing mud extracted from dam reservoirs in Morocco
	20	Saif Serag and Adil Echchelh	Economic technical study for electricity production by using (Tidal-Hydrogen) in Socotra Island, Yemen
	34	Ouassila Riouchi, Faid El Madani, Eric Abadie, Mourad Baghour and Ali Skalli	Pseudo-Nitzschia sp (Bacillariophyceae), seasonal distribution in the lagoon of Nador (Morocco).
	51	Samira El Aouidi, Ayoub Benmhammed, Azouz Benkdad, Nezha Mejjad, Edit Tóth-Bodrogi, El Mahjoub Chakir, Tibor Kovács and Abdelmourhit Laissaoui	Transfer of 40K, 226Ra and 210Pb from soil to plants in various locations of El-Jadida agricultural area (north-western Morocco)
	103	Sanae Chakir, Adil Bekraoui, Hassan Majdoubi and Mhamed Mouqallid	Numerical simulation of the microclimate of an olive cuttings greenhouse
	10	Said Mohafid, Laila Stour, Ali Agoumi and Manar Ouassil	Guide for valuing mud extracted from dam reservoirs in Morocco
	62	Sara Ouahb, Meriem Bousseba, Loubna Ferraj, Aziz El Moujtahid and Mustapha Hasnaoui	Weight-length relationship and relative condition factor of <i>Micropterus salmoides</i> (Lacépède, 1802), <i>Cyprinus carpio</i> (Linnaeus, 1758) and <i>Oreochromis niloticus</i> (Linnaeus, 1758) caught in the Al-Massira Dam Lake
100	Youness Ouassanouan, Younes Fakir, Vincent Simonneaux and Mohamed Hakim Kharrou	Water resources and agricultural land use changes across the High-Atlas piedmont area, Morocco	

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Date	Day 2 - Saturday 25 September 2021		
Google meet	https://meet.google.com/hfz-xiqw-xad		
Session/Topic	Session 7 : Integrated Water Resources Management		
Chairs	Dr. Mohamed BEN-DAOUD (FS Meknes), Dr. Gabriela MOROȘANU (University of Bucharest, Romania), Pr. Aniss MOUMEN (ENSA Kenitra)		
Hours	ID	Authors	Title
11:00 - 13:30	3	Oussama Laassilia, Driss Ouazar, Ahmed Bouziane and Moulay Driss Hasnaoui	Justification criteria for Inter-Basin Water Transfer Projects
	66	Loubna Ferraj, Meriem Bousseba, Sara Ouahb, Aziz El Moujtahid and Mustapha Hasnaoui	Bio-ecology and growth of commercial interest species <i>Micropterus salmoides</i> (Lacépède, 1802), <i>Cyprinus carpio</i> (Linnaeus, 1758) and <i>Oreochromis niloticus</i> (Linnaeus, 1758) in Moroccan continental waters
	73	Mohamed Ben-Daoud, Badr El Mahrad, Gabriela Adina Moroșanu and Ismail Elhassnaoui	Stakeholder's involvement in water management system: The analysis of actors' game in the R'Dom sub-basin.
	78	Aniss Moumen, Hajar Slimani	Adoption of Big data technology by water stakeholders in Morocco: challenges and perspectives
	82	Nezha Mejjad , Ahmed Fekri, Ouafa El Hammoumi, Samira El Aouidi, Jauad El Kharraz, Savas Kaya, and Aniss Moumen	Application of DPSIR framework to analyze the groundwater pollution threats of municipal solid waste: Case study Médiouna Landfill, Morocco.
	105	Gabriela Adina Moroșanu, Marta Cristina Jurchescu, Liliana Zaharia, Gabriela Ioana-Toroimac, Mohamed Ben-Daoud and Aniss Moumen	Sediment connectivity within riverside - morphological processes coupling framework for identifying fine sediment sources within Jiu River Basin (Romania)

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Date	Day 2 - Saturday 25 September 2021		
Google meet	https://meet.google.com/avq-face-oxt		
Session/Topic	Session 8 : Urban hydraulics, desalination and sanitation		
Chairs	Pr. Bouâbid EI MANSOURI (FS Kenitra), Pr. Mohamed EL BOUHADDIOUI (ENSM Rabat), Dr. Lhoussaine EL MEZOUARY (FS Kenitra)		
Hours	ID	Authors	Title
11:00 - 13:30	4	Faycal Taghlabi, Laila Stour and Ali Agoumi	Prelocalization and Leak detection in drinking water distribution network using modeling-based algorithms: Case study: The city of Casablanca (Morocco)
	7	Abdelkbir Errougui, Asmaa Benbiyi and Mohamed El Guendouzi	Evaluation of energy consumption during the seawater desalination process simulated with a ternary mixture of {NaCl + KCl}(aq)
	35	Hanane Ait Hmeid, Mustapha Akodad, Mourad Baghour, Abdelmajid Moumen, Ali Skalli, Ghizlane Azizi and Hicham Gueddari	Simultaneous adsorption behavior of heavy metals from Oil Mill Wastewater onto natural clay
	65	Abderrahmane Ben-Daoud, Souad M'Rabet and Mohamed Ben-Daoud	Modelling Pluvial Flooding in Urban Area using PC-SWMM: Settat City as a case
	77	Naif Al-Jadabi, Mohamed Laaouan, Jamal Mabrouki, Ghizlane Fattah and Souad El Hajjaji	Comparative study of the coagulation efficacy of Moringa Oleifera seeds extract to Alum for domestic wastewater treatment of Ain Aouda City, Morocco.
	86	Ibrahym Dachraoui and Abdelghani Laamyem	Study by ICP of the leachate from the landfill uncontrolled of Sidi Bennour city by filtration percolation through a purifying matrix