



UNESCO CHAIR AND NETWORK INWEB

**THE INTERNATIONAL NETWORK OF WATER-ENVIRONMENT
CENTRES FOR THE BALKANS (INWEB)**

AT

**ARISTOTLE UNIVERSITY OF THESSALONIKI
(AUTH), GREECE**

for the Sustainable Management of Water
and Conflict Resolution

ACTIVITY REPORT

01 Jan 2014 – 31 Dec 2014

Prepared by

Prof. Jacques Ganoulis

UNESCO CHAIR AND NETWORK INWEB/Aristotle University of Thessaloniki, Greece

UNESCO CHAIR/UNITWIN NETWORK PROGRESS REPORT FORM

Title of the Chair/Network:	UNESCO CHAIR/INWEB (International Network of Water Environment Centres for the Balkans) for the Sustainable Management of Water and Conflict Resolution
Host Institution:	Aristotle University of Thessaloniki (AUTH), GREECE
Date of establishment of Chair/Network: (mm, yyyy)	07, 2003
Period of activity under report: (mm, yyyy - mm, yyyy)	01, 2014 – 12, 2014
Report established by: (name, position)	Jacques Ganoulis Chairholder and Coordinator

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<p>1. Executive Summary: <i>Major outcomes, results and impact of the Chair, including on national policies, in relation to its objectives as stated in Article 2 of the Chair Agreement (between the Institution and UNESCO)</i> (Not exceeding 300 words)</p>
<p>During 2014 the main outcome/result/impact of the UNESCO Chair/INWEB network, was threefold: (1) Collaboration with the EU Commission as invited expert and active partner in the Horizon 2020 Work Program 2014-2015, the EU-FP7-REGPOT and the WATER, EU 511095-TEMPUS projects (2) Developing research activities at AUTH and EU levels (3) Assisting UN Organisations like UNITAR, UNECE and UNESCO/IHP (International Hydrological Programme)/Paris for implementing various international programmes and other activities.</p> <p><u>Concerning the outcome (1)</u>, the principal results in 2014 were as follows:</p> <p>1.1 Evaluation remotely and in Brussels of proposals submitted to WIDESPREAD 1-2014, Teaming Project: http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-sewp_en.pdf</p> <p>1.2 External evaluator of the research quality in biodiversity and capability of the research developed by the Mammal Research Institute of the Polish Academy of Sciences (MRI/PAS, Bialowieza, Poland, May 2014. http://www.zbs.bialowieza.pl</p> <p>1.3 Active partner of the EU/TEMPUS educational project: <u>Water Related Advanced Training and Education for Regional Needs in Mahgreb</u> (WATER, EU 511095-TEMPUS)</p> <p><u>Concerning the outcome (2)</u>, the following main activities were developed during 2014:</p> <p>2.1 KLIMENESTOS research project, Aug 2012 – Feb 2015, funded by the Greek Ministry of Education on “river flow and hydropower production under climate change”. http://www.inweb.gr/index.php?option=com_content&view=article&id=384:klimenstos-project-aug-2012&catid=48:news&Itemid=101</p> <p>2.2 Phytoremediation: Experimental study of reclamation of sites affected by sewage sludge. PhD Thesis</p> <p>2.3 Water-Food-Energy Nexus: Integrated hydro-energy production and irrigated agriculture. PhD Thesis</p> <p>2.4 Contributing to FEMISE - Support to dialogues of the Euro-Med Partnership, Feb 2014 http://www.femise.org/</p> <p><u>Concerning the outcome (3)</u>, the following main activities were developed during 2014:</p> <p>3.1 Teaching 3 modules of the UNITAR e-course on Water Diplomacy, 17/11-14/12 2014</p> <p>3.2 Daegu/ Gyeongju preparatory meetings of the 7th World Water Forum, S. Korea, 21-24 Oct. 2014 http://www.nariwww.com/eng/index.php?q_page=intro&m_page=intro01</p> <p>3.3 UNECE Geneva “Counting our Gains”: Workshop on Benefits of Transboundary Water Cooperation Palais des Nations, Geneva, 22-23 May 2014 http://www.unece.org/env/water/workshop_benefits_cooperation_2014.html#</p> <p>3.4 UNESCO/G-WADI Network and IDI expert group meeting, Belgrade, Serbia, 17-18 Dec. 2014 http://www.jcermi.org/en/pr-centar/news/641-2012-10-13-17-48-44.html</p>

2) Activities:

Overview of activities undertaken by the Chair during the reporting period.

In 2014, the UNESCO Chair/INWEB at AUnT developed various education, training, capacity building and research activities; many of them are related to UN Organisations like UNITAR and UNESCO/IHP Programmes, such as the UNESCO/G-WADI, UNESCO-HELP, UNESCO/FAO/GROUNDWATER GOVERNANCE and the UNESCO/UNEP/MEDPARTNERSHIP programmes.

In 2014, the Chair holder spent much of his time in Paris, working with the UNESCO IHP/Groundwater Sector for implementing international programmes, such as the UNESCO/FAO Groundwater Governance Programme <http://www.groundwatergovernance.org/>.

In 2014, the Chair organized, contributed to and participated in many national and international meetings, workshops and conferences in cooperation with national and international partners. The Chairholder participated actively in launching the UNESCO South East European G-WADI Network.

He also contributed in the UNESCO related book: Global Water, prepared by the UNESCO Chair at the Australian National University.

More details on these activities and also references to publications produced by the Chair are given below and also on the INWEB's website www.inweb.gr, which is, for technical reasons, under update over the last 3 years period.

a) Education/Training/Research

(key education programmes and training delivered and research undertaken by the Chair during the reporting period, target group and geographical coverage)

a.i)**Education (leading to certificate)****a.i.1 UNITED NATIONS INSTITUTE FOR TRAINING & RESEARCH (UNITAR) e-Learning Course on Multilateral Diplomacy:**

Title: "Introduction to Water Diplomacy" October 21 to November 17, 2013

The Chairholder served as instructor and moderator for modules II, III and the final simulation exercise of the e-learning course that has been developed by UNITAR's Multilateral Diplomacy Programme, in partnership with the University of East Anglia, Water Security Research Centre and the UNESCO/IHP.

Prof. Ganoulis gave also a webinar to course's participants on recent challenges of water scarcity, climate change and water diplomacy.

The e-course aims to enhance participants' appreciation of how, through understanding water's conflict potential, we can promote and develop efficient cooperation tracks for sustainable water resources management, especially in internationally shared river basins and groundwater aquifers. <http://www.unitar.org/mdp/e-learning>

Duration: 4 weeks leading to certificate

Target groups: International UN staff, Diplomats, Master and PhD students

Geographical coverage for partners and participants: International

Expected results: Promoting cooperation for water related conflict resolution

**a.ii) Training
(short term)**

a.ii.1 Title: Tempus project EU 511095: Water Related Advanced Training and Education for Regional Needs in Mahgreb (WATER).

Intensive short course on

'Water Resources Assessment & Datas Reliability : Field measurements, Remote Sensing/GIS and Modeling'

Location: Mohammedia, Morocco

Duration: 5 days: 26-30 May 2014

Target groups: Engineers, MSc and PhD students in water related sciences

Geographical coverage: N. Africa and SE Europe

A field trip to Berrechid/Bouznika/Benslimane was organised on 27/05: Visit of ABH/ONEP, field measurements, sampling, hydrological gauging, artificial recharge (see photo 1).



Photo1: Field visit of the Settat dam, Morocco.

a.ii.2 Title: Tempus project EU 511095: Water Related Advanced Training and Education for Regional Needs in Mahgreb (WATER).

Intensive short course on "Aquifer Recharge"

Location: Hotel Holiday Village, Manar, Hammamet, Tunisia

Duration: 3 days: 1-3 September 2014 (Photo 2)

Target groups: Engineers, MSc and PhD students in water related sciences

Geographical coverage: N. Africa and SE Europe



Photo 2: Field trip during the TEMPUS course on "Aquifer Recharge" in Tunisia.

a.ii.3 Title: Tempus project EU 511095: Water Related Advanced Training and Education for Regional Needs in Mahgreb (WATER).

Intensive short course on Effective Governance of Water Resources Under Scarcity

Location: Hotel Holiday Village, Manar, Hammamet, Tunisia

Duration: 3 days: 4-6 September 2014 (Photo 3)

Target groups: Engineers, MSc and PhD students in water related sciences

Geographical coverage: N. Africa and SE Europe



Photo 3: Intensive TEMPUS Course on "Water Governance" in Tunisia.

a.ii.3 Title: Tempus project EU 511095: Water Related Advanced Training and Education for Regional Needs in Mahgreb (WATER).

Intensive short course on Management of Transboundary Water Resources in the Maghreb Region

Location: Annaba, Algeria

Duration: 5 days: 22-26 September 2014 (Photo 4)

Target groups: Engineers, MSc and PhD students in water related sciences

Geographical coverage: N. Africa and SE Europe



Photos 4, 5: Intensive TEMPUS Course on "Transboundary Waters" in Annaba, Algeria

**a.iii)
Research**

a.iii.1

EU-FP7-REGPOT “Conservation and Sustainable Management of Biodiversity (BIOCONSUS)”

The Chairholder was designated by the EU as external evaluator of the research quality in biodiversity and capability of research activities funded in the call FP7-REGPOT-2009-1. This evaluation was part of the project BIOCONSUS "Research Potential in Conservation and Sustainable Management of Biodiversity" (<http://www.bioconsus.pl/>) that has been developed during 2010-2014 by the Mammal Research Institute of the Polish Academy of Sciences (MRI/PAS, Bialowieza, Poland, <http://www.zbs.bialowieza.pl/>).

Prof. J. Ganoulis, was one of the 4 members of the Institute's evaluation committee selected by the EU for the period 2012-2014. He contributed in writing and presenting the final evaluation report at the premises of the Polish Academy of Sciences in Warsaw, 20-22 May 2014.



a.iii.2

**Evaluation of proposals submitted to HORIZON 2020, EU-WIDESPREAD 1-2014, Teaming Project
Brussels, 3-15 November, 2014**

It was observed that the European Research and Innovation landscape presents a lot of structural disparities, with research and innovation excellence concentrated in a few geographical zones. These disparities are due to, among other reasons, the insufficient critical mass of science and centres with sufficient competence **Teaming** is addressing this challenge by creating or upgrading such centres of excellence, building on partnerships between leading scientific institutions and low performing partners that display the willingness to engage together on this purpose. **Teaming** is involving in principle, two (2) parties: (1) an institution of research and innovation excellence (public or private) or a consortium of such institutions and (2) the participant organisation from a low performing Member State. Both parties will be required to sign a grant agreement.

The evaluation team, based on different evaluation criteria, has selected and ranked a number of successful applications to be funded by the EU.

http://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/main/h2020-wp1415-sewp_en.pdf

During 2014, the Chair was also directly involved in the following 4 research projects:

- **KLIMENESTOS project, Aug 2012 – Feb 2015**

Investigation of climate change in Greece and the related impact on the sustainability of hydropower projects and the rural economy: Application in the Nestos river basin.

(Funded by the Greek Ministry of Education, Special Department for the Management and Enforcement of Actions in the Fields of Research and Development and Technological Innovation).

http://www.inweb.gr/index.php?option=com_content&view=article&id=384:klimenstos-project-aug-2012&catid=48:news&Itemid=101

- **WATER-FOOD-ENERGY Nexus, 2011-2014**

This research project focus on an integrated mathematical modelling of small hydro electrical plants that could operate in existing irrigation reservoirs (<15 m height and <1m³/s flow rate). The effective water use for an integrated energy production and irrigated agriculture is part of the recent problematic issue of water-energy-food nexus.

Main parts of the research are: hydrological modelling of small artificial reservoirs, cost-benefit evaluation of micro hydro-energy production, effective agricultural irrigation and measures for environmental protection (definition of an ecological flow rate downstream of the dam).

A PhD thesis under the supervision of the Chairholder was presented by Thomas Partialis, Rural Engineer at AUTh on 7/07/2014.

The PhD Thesis was evaluated by the University Committee with the highest honorary distinction.

- **PHYTOREMEDIATION Project, 2011-2014**

This is an experimental investigation of applying phytoremediation for the reclamation of sites affected by sewage sludge. Two experimental sites were selected, one within the area of the Thessaloniki Wastewater Treatment Plant, Greece, which receives sludge for temporary deposition, and the other within the area of the Bezludivka Wastewater Treatment Plant in Kharkiv, Ukraine, which is an area with dewatering sludge lagoons.

A PhD thesis under the supervision of the Chairholder was presented by Natalia Suschova, Environmental Engineer at AUTh, on 30/04/2014.

The PhD Thesis was evaluated by the University Committee with the highest honorary distinction.

- **NUMERICAL MODELING OF GROUNDWATER FLOW IN KARST, 2011-2014**

The project aims to analyse the hydrodynamic function of the karst spring of Almyros, located in the island of Crete, Greece. Different technical tools will be investigated and applied in order to increase the length of time the spring's water is fresh. In order to understand the hydrodynamic function of the Almyros spring, a simulation model was developed based on the commercially available ModFlow and Feflow software.

The hydrodynamic modelling was done in order to predict the state of flow in the greatest region during the operation of the pumping wells, to ascertain their interaction with the Almyros spring and to find an optimal solution for an efficient freshwater supply from the source. Different scenario of the aquifer functioning were created, and based on these simulations, future operating conditions of the source, as well as the expected flow rate output, were calculated, in order to be able to recommend effective management practices for the aquifer.

This project is under development and is the main PhD subject of Mr. Aristotelis Archontelis, Agronomist, AUTh.

b) Conferences/Meetings

(key conferences and meetings organized by the Chair or to which its Chairholder contributed)

b.i) Key meetings, conferences and workshops contributed by the Chair

Launching of South East European G-WADI Network and IDI expert group meeting 'Data tools and methodologies to address floods and droughts in the Member States' 17-18 December 2014, Belgrade, Serbia

The Chairholder, Prof. J. Ganoulis, attended the meeting and presented the UNESCO/INWEB's experience for addressing floods and droughts.

UNESCO IHP (International Hydrologic Programme), IDI (International Drought Initiative) and WSDAC organized this meeting from 17-18 December 2014 at WSDAC "Water for Sustainable Development and Adaptation to Climate Change" UNESCO category II centre hosted by the Institute for the Development of Water Resources "Jaroslav Černi" in Belgrade, Serbia.

The meeting, attended by representatives and experts from the region, launched the Southeast European secretariat for the G-WADI Programme (Global Network on Water and Development Information in Arid Lands), as well as the identification of gaps and needs of the member states.

Numerous case studies from the Southeast European region, as well as worldwide, were presented to identify the gaps in data availability, tools and methodologies to address floods and droughts in member states. Furthermore, the need for a capacity building component was identified during the meeting. The meeting discussed products offered by the G-WADI network, linkages with the International Drought Initiatives (IDI) and possible joint activities

<http://www.icerni.org/en/pr-centar/news/641-2012-10-13-17-48-44.html>



International Water Forum (IWF), organised by WWF (World Water Forum)
20th-23rd October 2014, Daegu/Gyeongju, South Korea

The UNESCO Chair/INWEB at the Aristotle University of Thessaloniki (AUTH), Greece, participated in the International Water Forum, which took place from October 20th to 23rd in the South Korean cities of Daegu and Gyeongju City.

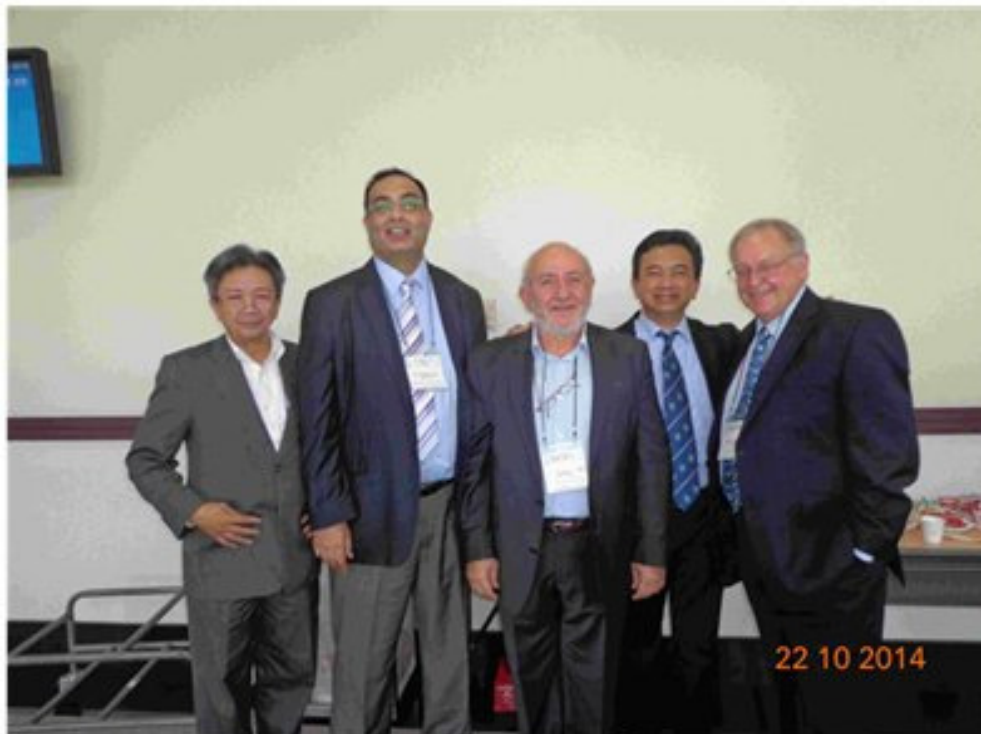
The Forum was a part of the 3rd Nakdong River International Water Week 2014 event.

A special part of the International Water Forum (IWF) meeting included lectures presented by special invited speakers. Mr Jacques Ganoulis, coordinator of the "UNESCO Chair/INWEB" and em.professor at AUTH, gave a lecture on "Effective Water Governance for Water Security and Sustainability: A Focus on Groundwater Resources".

The event was organised under the auspices of the World Water Council (WWC), as a part of the preparations for the 7th World Water Forum (WWF), which is to take place in April of 2015, in Daegu. More on IWF and WWF:

http://www.nariww.com/eng/index.php?q_page=intro&m_page=intro01

<http://eng.worldwaterforum7.org/main/>



2nd UNESCO-IHP Expert Meeting on "Management and protection of coastal wetlands"
12-13 June 2014, Paris, France

This workshop constituted the 2nd Meeting of the national groundwater experts contributing to UNESCO-IHP's activity on the "Management of Coastal Aquifers and Groundwater with emphases given to the management and protection of coastal wetlands". During this two day meeting, which was held at the UNESCO headquarters in Paris, the General Secretary of the Chair Dr. Ch. Skoulikaris participated in the workshop activities where the major activities for 2014-2015 were denoted. These UNESCO-IHP activities follow four main lines of action: coastal aquifer risk and uncertainty, regional actions for coastal aquifers, institutional and policy reforms for coastal aquifer management, and spatial technologies for coastal aquifer management. The particular contribution of the INWEB is related with the spatial technologies for the management of coastal aquifers, and is based on the relevant experience of developing a geo information system for the management of coastal aquifers which was implemented in 2012-2013.

Seasonal meeting, Klimenestos project**30 Jan - 01Feb 2015, Athens, Greece**

The General Secretary of the UNESCO Chair, Dr. Ch. Skoulikaris, met in May 2014 with other partners in Athens, Greece, in order to overview the progress of the project and define the future workload of the Klimenestos research project entitled "Investigation of climate change in Greece and the impact on sustainability and rural economy of hydropower projects: Application in the Nestos river basin".

(Greek Ministry of Education, Special Department for the Management and Enforcement of Actions in the Fields of Research and Development and Technological Innovation)."

<http://www.gsrt.gr/central.aspx?sid=119I428I1089I323I488743>

New IT tools for agricultural irrigation**26th-27th March 2014, Thessaloniki, Greece**

The Chairholder, Prof. J. Ganoulis, and the Secretary General Dr. Ch. Skoulikaris organized and attended a TEMPUS project meeting held in Thessaloniki, Greece, from 26-27 March 2014.

The project aimed to assess, develop and upgrade curricula that will provide engineers, post-graduate students and professionals with in-depth knowledge and follow up of new regional water resources policies and master plans of the Maghreb governments, and achieve a holistic approach to sustainable development of water resources in Maghreb.

The project also established in Morocco, Algeria and Tunisia, 3 national training and teaching centres in water technologies and water resources management.

In particular, this meeting focused on:

- 1: State of the art of the project, planning of activities and responsibilities
- 2: Planning of training courses and visits to European partners
- 3: Introduction to Maghreb participants of new IT tools for agricultural irrigation.

Water Resources Assessment and Data Reliability: Field Measurements, Remote Sensing/GIS and Modeling**26th-30th May 2014, Mohammedia, Morocco**

The Chairholder, Prof. J. Ganoulis, and the Secretary General Dr. Ch. Skoulikaris attended the TEMPUS project meeting held in Mohammedia, Morocco, from 26-30 May 2014. This project analysed also the establishment of a Regional WATER centre at EMI-UM5A, Rabat, Morocco.

In particular, the meeting focused on:

Presentation of the WATER project and the workshop's programme**Topic 1: Field Measurements in Water Resources**

Field measurements for hydrogeological studies and parameter estimations.

Topic 2: Remote Sensing and Geographical Information Systems

Global Earth Observation, SIG, IDS and sustainable development

Field work: Visit of the Bouregreg Basin Agency Benslimane-Berrechid-Mohammedia

Meteorological and hydrological stations, piezometric network, dam reservoirs, well field, artificial recharge sites, pollution control, laboratory measurements

Topic 3: Geographical Information Systems and Models

Geographical Information System (GIS) in Water Resources Management.

Coupling GIS with hydrological models: The case of the HEC-HMS hydrologic model,

Integrated Strategic Approaches for Exploitation and Management of Water Resources: Adaptive Management and Water Scarcity**1st-6th September 2014, Hammamet, Tunisia**

The Chairholder, Prof. J. Ganoulis, and the Secretary General Dr. Ch. Skoulikaris attended the TEMPUS project meetings held in Hammamet, Tunisia, from 1-6 September 2014.

The project included the upgrading of curricula and the organisation of a series of short time intensive courses that will provide engineers, post-graduate students and local professionals with the state-of-the-art holistic approaches to sustainable management of water resources in the Maghreb.

In particular, the meeting focused on:

- 1: Overview of the project, planning of future activities and responsibilities
- 2: Planning of specific training courses on adaptive water resources management under water scarcity conditions
- 3: Evaluation of climate change impacts in the Mediterranean basin in terms of expected future water scarcity and extreme flooding.

UNECE Workshop on Benefits of Transboundary Water Cooperation
22-23 May 2014, Palais des Nations, Geneva, Switzerland

This workshop was organized by the United Nations Economic Commission for Europe (UNECE) in cooperation with UNESCO/IHP in the framework of the Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Water Convention).

The workshop aimed to bring together professionals from all over the world working on transboundary water cooperation to discuss the wide variety of potential benefits of transboundary water cooperation as well as the opportunities for further engaging into cooperation by broadening its scope.

Prof. Ganoulis presented *the case study of the Mesta/Nestos River catchment, shared between Bulgaria and Greece in Session 7 Chaired by Alice Aureli, UNESCO IHP –ISARM: Communicating benefits of transboundary water cooperation*. He focused on good practices, challenges faced and lessons learned on the identification, assessment and communication of the wide range of benefits that can be generated by transboundary water cooperation.

http://www.unece.org/env/water/workshop_benefits_cooperation_2014.html#/

UNESCO-FRIEND-Water2014: 7th Global FRIEND-Water Conference
07-10 October 2014, Montpellier, France

During this UNESCO Conference, the Chairholder, Prof. J. Ganoulis, presented two papers entitled:

(1) "Cooperative WebGIS interactive information systems for water resources data management"

By Skoulikaris, Ch., Ganoulis, J., Karapetsas, N., Katsogiannos, F. & Zalidis, G.

and

(2) "Ecological flow for integrated planning of small hydropower plants. A case study from Greece"

By Patsialis, T., Skoulikaris, Ch. & Ganoulis J.

Both papers have been reviewed and accepted for publication in: *IAHS Publ 363, Hydrology in a Changing World: Environmental and Human Dimensions (ed. by T. Daniell et al.), IAHS, Wallingford, UK, 2014.*

The Conference was organised by FRIEND-Water (Flow Regime from International Experimental and Network Data), which is an international collaborative network of experts, aiming to generate new understanding about regional hydrology and multi-scale water cycle processes.

FRIEND-Water is investigating long-term variations and changes in hydrological variables to better understand the climate, river basin and human controls on the spatial and temporal distribution of water. The science and training supported by the FRIEND-Water programme are critical for: water resources management, socio- economic development, safeguard the environment, and assessing the impact of global change, including climate change and human impact.

As a cross-cutting theme of UNESCO's, International Hydrology Program (IHP), FRIEND-Water contributes to research on: regional water resources, droughts, global change and the water cycle, and water education and capacity building. The FRIEND-Water programme complements and interacts with many national projects and international initiatives.

<http://www.im2e.org/>

5th International Symposium on Karst
14th-16th October 2014, Malaga, Spain

Prof. Ganoulis attended this Conference and presented a paper entitled:

"Comparison between hydrodynamic simulation and available data in a karst coastal aquifer: the case of Almyros spring, Crete Island, Greece " By A. Archontelis and J. Ganoulis

The paper was reviewed and published in the book: *B.Andreo et al. (eds.) Hydrogeological and Environmental Investigations in Karst Systems, Environmental Earth Sciences 1, 301-311, Springer, 2015.*

The Conference as very successful and provided the opportunity to review recent advances on karst hydrogeology. Karst is the result of climatic and hydrological evolution of soluble rocks (carbonates, evaporates, conglomerates) particularly during the recent geological history of the Earth. The action of water has generated a great range of karstic features that are part of our natural heritage and which on occasion form major tourist attractions. Karst areas often serve as crop land or as substrates for other human activity. One quarter of the world's population uses water of karst aquifers. Karst is highly fragile and the exploitation of its resources or inappropriate land uses gives rise to environmental problems such as water pollution, subsidence, flooding and changes in the subterranean environment.

<http://www.cehiuma.uma.es/en/index.asp>

**OECD Global Forum on Environment: New Perspectives on the Water-Energy-Food Nexus
27-28 November 2014, OECD Conference Centre, Paris**

The Chairholder, Prof. J. Ganoulis, attended the Global Forum on the Water-Energy-Food Nexus, organised by OECD in Paris. He actively participated in the general discussion.

In the run-up to Rio+20, the Bonn 2011 Nexus Conference contributed to a better understanding of the interdependencies between the water, food, and energy security and highlighted the need for more systemic thinking to identify synergies and trade-offs between different sectors, interest groups and development goals.

During this meeting, high-level government and private sector representatives discussed current and future risks associated with the nexus across the economy, as part of the Global Dialogue on Water Security and Sustainable Growth. The forum started with a presentation of new findings related to the nexus from the Expert Task Force on Water Security and Sustainable Growth. The panel will then discuss how trade-offs between water, energy and food may affect economic growth, and how they could be addressed.

<http://www.oecd.org/environment/nexus.htm>

**PROJET SASS III: Atelier régional de restitution des résultats et de présentation des
recommandations pour un développement durable**
**ROUND TABLE: Projet GICRESAIT de « gestion intégrée et concertée des ressources en eau
des systèmes aquifères d'Iullemeden et de Taoudéni/Tanezrouft et du fleuve Niger »,
16-19 June 2014, Tunis, Tunisia**

Prof. J. Ganoulis participated on behalf of A. Aureli, UNESCO/IHP, Groundwater Resources and Aquifer systems Section in the following two joint events.

(1) The workshop on the SASS III project, was organised by the "Observatoire du Sahara et du Sahel" (OSS) in order to show the main results of the project to high rank officials and Ministerial delegations of the 3 countries: Tunisia, Algeria and Libya.

(2) OSS, jointly with the African Water facility (AWF), organized on June 18th 2014 a round table for development partners within the framework of the GICRESAIT project (Joint and Integrated Water Resources Management of the Iullemeden-Taoudeni/Tanezrouft Aquifer Systems and the Niger River). A number of representatives of North and South countries and institutions took part in the discussion which focused particularly on the GICRESAIT project and generally on the effort made by the OSS Water program to improve the knowledge of transboundary aquifers in the Sahara-Sahel region.



<http://www.oss-online.org/en/bulletin%20d%E2%80%99information>

GWP Med Regional Consultation Workshop on strengthening transboundary water management institutions in North Africa

11 september 2014, Tunis, Tunisia

The Chairholder, Prof. J. Ganoulis attended the meeting as a UNESCO expert. The aim of the workshop, organised by the Global Water Partnership-Mediterranean (GWP_Med), was to provide the necessary elements to elaborate ANBO's (African Network for Basin Organisations) ten-year strategy (2015-2025) as well as a five-year action plan (2015-2020). The discussions aimed to identify the pillars to establish basin organisations for shared water resources in Northern Africa, that currently lack cooperation mechanisms. Another objective was to provide strategies orientation in order to strengthen existing institutions and harmonise national policies on Integrated Water Resources Management (IWRM).

<http://www.gwp.org/en/GWP-Mediterranean/gwp-in-action1/News-List-Page/Regional-Consultation-Workshop-Strengthening-Institutions-For-Transboundary-Water-Management-In-North-Africa/>

Project Preparation Workshop on Groundwater Management in the Transboundary Syr Darya Basin: Kazakhstan – Kyrgyzstan – Tajikistan

3-4 February 2014, UNESCO HQ, Paris, France

The aim of the meeting was to discuss and prepare activities following three preliminary national level consultations in the project countries (September 2013). Its objective was to reach, through a series of presentations and group discussions, a full understanding among all participants of the project rationale, expected outcomes and activities, and of the Project Preparation Grant (PPG) preparation process, execution modalities and roles.

Prof. Ganoulis presented on behalf of the UNESCO Chair/INWEB a paper entitled "Dynamic Downscaling for Studying Climate Change Impacts on River Catchment Hydrology" and offered to contribute INWEB's expertise for elaborating the Full Size Project.



<http://www.groundwatercop.iwlearn.net/gefgwportfolio/syrdarya>

iii) A selection of conference presentations by the Chairholder and other colleagues

All conference presentations are available and may be sent on request.

Most of the above activities were developed in cooperation with the core INWEB's partners and other UN related institutions.

The Chair also contributed by a paper published in the book "Global Water", edited by Paul Wyrwoll, UNESCO Chair in Water Economics and Transboundary Water Governance, The Australian National University. (www.globalwaterforum.org)

d) Publications/Multimedia Materials

(major publications and teaching/learning materials)

Please tick relevant fields of output and indicate volume of output:

	[tick]	[no.]
Books	<input type="checkbox"/>	
Books (edited)	<input type="checkbox"/>	
Books (chapters)	<input checked="" type="checkbox"/>	1
Monographs	<input type="checkbox"/>	
Research Reports	<input checked="" type="checkbox"/>	2
Journal Articles (refereed)	<input checked="" type="checkbox"/>	2
Conference Proceedings	<input checked="" type="checkbox"/>	3
Occasional Papers	<input type="checkbox"/>	
Teaching/Learning Materials	<input checked="" type="checkbox"/>	2
Multimedia Materials (CD-Rom)	<input type="checkbox"/>	
Multimedia Materials (Video)	<input type="checkbox"/>	
Multimedia Materials (Other)		

Give details of major publications and materials including full citations.

i) Theses

- 2 PhD theses were completed in 2014 by Thomas Partialis and Natalia Suschova
- 1 PhD thesis is under preparation.

ii) Publications

Scientific Journals

Skoulikaris, Ch., Kontos, Y., and Krestenitis Y. (2014) " Integration of EU environmental and energy directives for the short term forecasting of dams' releases and river outflows to the coastal zone". (Submitted for Review in: Journal of Water Resources Management)

Alexandridis, T. K., Monachou, S., Skoulikaris, C., Kalopesa, E., and Zalidis G.C. (2014). "Investigation of the temporal relation of remotely sensed coastal water quality with GIS modeled upstream soil erosion " J. of Hydrological Processes, (accepted for publication) doi:10.1002/hyp.10373

Book contributions

Ganoulis, J., Quartano, K., & Skoulikaris, C. (2014) "Promoting Cooperation for Transboundary Water Security: The Experience of the UNESCO Chair/INWEB." In: Global water: issues and insights, R. Q. Grafton, Wyrwoll, P., White, C., & Allendes, D., ed., ANU Press, Canberra, 203-214.

Papers reviewed and presented in International Conferences

Skoulikaris, Ch., Ganoulis, J., Karapetsas, N., Katsogiannos, F. & Zalidis, G. (2014)
Cooperative WebGIS interactive information systems for water resources data management. In:
Hydrology in a Changing World: Environmental and Human Dimensions (ed. by T. Daniell et al.).
IAHS Publ 363, 342–347. IAHS, Wallingford, UK.

Patsialis, T., Skoulikaris, Ch. & Ganoulis J. (2014)
Ecological flow for integrated planning of small hydropower plants. A case study from Greece, In:
Hydrology in a Changing World: Environmental and Human Dimensions (ed. by T. Daniell et al.).
IAHS Publ 363, 469-474. IAHS, Wallingford, UK.

A. Archontelis and J. Ganoulis (2014)
Comparison between hydrodynamic simulation and available data in a karst coastal aquifer: the case
of Almyros spring, Crete Island, Greece In: B.Andreo et al. (eds.) Hydrogeological and Environmental
Investigations in Karst Systems, Environmental Earth Sciences 1, Springer, 2015

e) Cooperation with UNESCO-IHP

During 2014 the Chairholder spent much of his time with UNESCO/IHP Paris and among other
activities, he contributed to implement the following International Programmes:

GEF/FAO/UNESCO “Groundwater Governance: A Global Framework for Country Action”

<http://www.groundwatergovernance.org/>

UNEP-MAP/GEF/UNESCO “Medpartnership Programme”

The Chairholder was responsible for the regional activity 1.1.1 “Assessment of Risk and Uncertainty
of Coastal Aquifers in the Mediterranean”. Coordinator of 12 national experts from the following core
members in the MedPartnership project: Morocco, Algeria, Tunisia, Libya, Egypt, Palestine, Lebanon,
Turkey, Albania, Montenegro, Bosnia and Herzegovina and Croatia. Responsible for writing the
regional report on: Risk and Uncertainty of Coastal Aquifers in the Mediterranean.

<http://www.themedpartnership.org/>

Developing an Interactive Information System for the Arab States and SubSahara

The Chairholder in cooperation with the Chair’s General Secretary Dr Charalambos Skoulikaris were
committed by the UNESCO/RCSARM (Regional Centre for Shared Aquifer Resources Management),
Tripoli, Libya for developing in cooperation with UNESCO-INWEB a geo-referenced information
system for transboundary aquifers in Africa (<http://www.inweb.gr/fusion/4.html>). The system
contains 71 transboundary aquifers, based on the IGRAC’s map of transboundary aquifers of the
world. The number of countries sharing a transboundary aquifer ranges from 2 to 6, and the number
of aquifers in a country shared with neighbouring countries, varies from 1 to 7. The system (a)
enables national experts responsible for each country to update in real time information on
transboundary aquifers and (b) supports public participation by allowing users to provide comments
on the aquifers that appear on the base map.

f) Other

(any other activities to report)

N/A

3. Future Plans and Development Prospects:

*Outline of action plan for the next biennium and short/medium and long-term development prospects.
Please do not hesitate to refer to difficulties that the Chair has experienced
(Not exceeding 300 words)*

Plan for the next biennium:

Provide expertise and assist UNESCO-IHP in the following specific programmes:

- UNESCO/ISARM
- UNESCO/G-WADI
- MEDPARTNERSHIP (GEF, UNEP)
- UNESCO/UNDP/SYR DARYA

Plan in short/medium term:

- Strengthen the links and cooperation between INWEB's core partners
- Capacity building in the fields of groundwater management and climate change
- Regional applications and modelling techniques for sustainable water resources management
- Water governance with emphasis to groundwater resources
- Information and communication systems for water cooperation

Plan in medium/long term:

- Promoting and planning the creation of international river management commissions and transboundary groundwater governance institutions in order to overcome the economic crisis and contribute to socio-economic development in the Balkans.

Appendix:**1) Human Resources**

Provided by Host Institution Aristotle University of Thessaloniki (AUTH):

- 1 full time Em. Prof., 2 part time Profs, 1 general secretary/researcher, 1 part time technical assistant
- 3 PhD students
- A variable number of visiting staff (1-2)
- All 10 core members of INWEB

2) Financial Resources	
<p><i>Please tick sources of financial contribution and specify the amount in U.S. dollars</i></p>	<p style="text-align: right;">[tick] Amount (\$) for the biennium 2014-2015)</p> <p>Host Institution <input checked="" type="checkbox"/> 10.000 (partially in kind)</p> <p>Partner Institution <input type="checkbox"/></p> <p>Government Body <input type="checkbox"/></p> <p>Other Public Institution/Body <input checked="" type="checkbox"/> 90.000 (research projects)</p> <p>(incl. Research Councils)</p> <p>UNESCO <input type="checkbox"/></p> <p>Other UN Agency <input type="checkbox"/></p> <p>IGO <input type="checkbox"/></p> <p>NGO <input type="checkbox"/></p> <p>Industry <input type="checkbox"/></p> <p>Other Private <input type="checkbox"/></p>
<p><i>Give details of financial contributions, material resources and space.</i></p> <ul style="list-style-type: none"> • <u>Financial contributions</u> <ul style="list-style-type: none"> - Amount is variable, depending on specific research projects - Research projects have specific objectives related to UNESCO Chair activities - For the time period 2014-2015 research was funded by the Greek Secretariat for Research, Ministry of Education (KLIMENESTOS project). • <u>Material resources</u> <p>Provided by AUTh:</p> <ul style="list-style-type: none"> • Telephone, fax, stationery, heating, lighting, electricity • Internet connection, office equipment. <p>All used for running the UNESCO Chair and Network INWEB.</p> • <u>Space placed at the disposal of the Chair and Network</u> <p>Provided by AUTh:</p> <ul style="list-style-type: none"> • Office space (approx 20 m²) • Meeting room (up to 150 persons) • Reception area (approx 50 m²). <p>All shared with other functions of the Aristotle University of Thessaloniki.</p> 	

End of the Form