NEWSLETTER

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PROGRESS ON WATER JPI

2017 JOINT CALL - STEP 1 RESULTS

The Water JPI 2017 Joint Call, funded by 12 countries, on "Water resource management in support of the United Nations Sustainable Development Goals" covers two topics:

• multiple pressure effects on ecosystems and ecosystem services as well as effective mitigation – adaptation tools and assessments for implementing the water related targets of the UN SDGs;

• developing accessible solutions for clean water management to address UN SDG6 targets and associated SDGs.

67 pre-proposals applied to this call for collaborative transnational research. After evaluation on the scientific excellence and impact criteria, 37 consortia are invited to submit a full proposal.

GOVERNING BOARD MEETING OUTPUTS

The Water JPI held its 12th Governing Board meeting in Larnaca (Cyprus) last May 9 2018. The meeting hosted by the Research Funding Agency of Cyprus (RPF), has been the occasion of reviewing the progress done within the JPI: the proposals of future calls for the European Framework Programme, the launch of the Knowledge Hub on Emerging Pollutants, the intermediate results of the 2017 and 2018 calls for proposals or the organisation of the second Water JPI conference.

The Governing Board (GB) approved the renewal 2018 of five scientific and technological board members, the creation of a task force on infrastructures, the proposed procedure for the revision of the vision document and of the Strategic Research and Innovation Agenda in 2019.

The presentation of PRIMA, by Diego Intriglio, Senior Advisor, launched discussion with the GB, highlighting the actions to be strengthened in the future by the two initiatives.

2015 JOINT CALL MID TERM REVIEW WORKSHOP

The 16 projects funded under the 2015 JPI call are met in Larnaca last May 8 for their mid-term review. An occasion to present their intermediate results and exchange with the follow-up group members in charge of the evaluation for the funding agencies involved in the call.

These projects addressed technological solutions and services for water systems:

1. for water treatment, reuse, recycling and desalination;
2. for water resources management; and
3. to mitigate impacts of extreme events (floods and droughts) at catchment scale.

The follow-up group composed by members of the evaluation panel and the Water JPI scientific and technological board monitored the progress of the cofunded call projects throughout their lifetime, providing advice where needed on project implementation and contractual requirements. The networking after each session of project presentations allowed to foster coordination and future cooperation among all the funded projects.

The presentation of WaterWorks2014 cofunded projects results are available on the Water JPI website.

AFRIALLIANCE ADVISORY BOARD MEETING

The AfriAlliance advisory board met in Paris at the International River Basins Organisation (INBO) offices the 24th of April 2018. The advisory board provides advices on directions to be followed during the implementation of the project, taking the perspective of complementary expertises of the stakeholders involved (Joint Research Center, Water JPI, Suez Environnement, African Ministerial Council on Water, NET WERC H20, EURAQUA / KIC Climate, UNDP / Cap-Net).

The main objective was to exchange on the main progress done during the 2nd year of the project and discuss the work plan for the upcoming months. Out of the main achievements:

• the development of the five action groups launched the first year of the project, four dealing with irrigation and harvesting, one on integrated water resources management and ethics;

• the policy brief entitled 'Strengthening the capacity of African stakeholders to achieve Sustainable Development Goal 6 amidst Climate Change', published after consultation of 35 citizens organisations;

• a synthesis of the constraints and opportunities for using/collocate monitoring technologies (from satellite observations to surface station observations and newly citizen water point observatories.

WE-NEED PROJECT

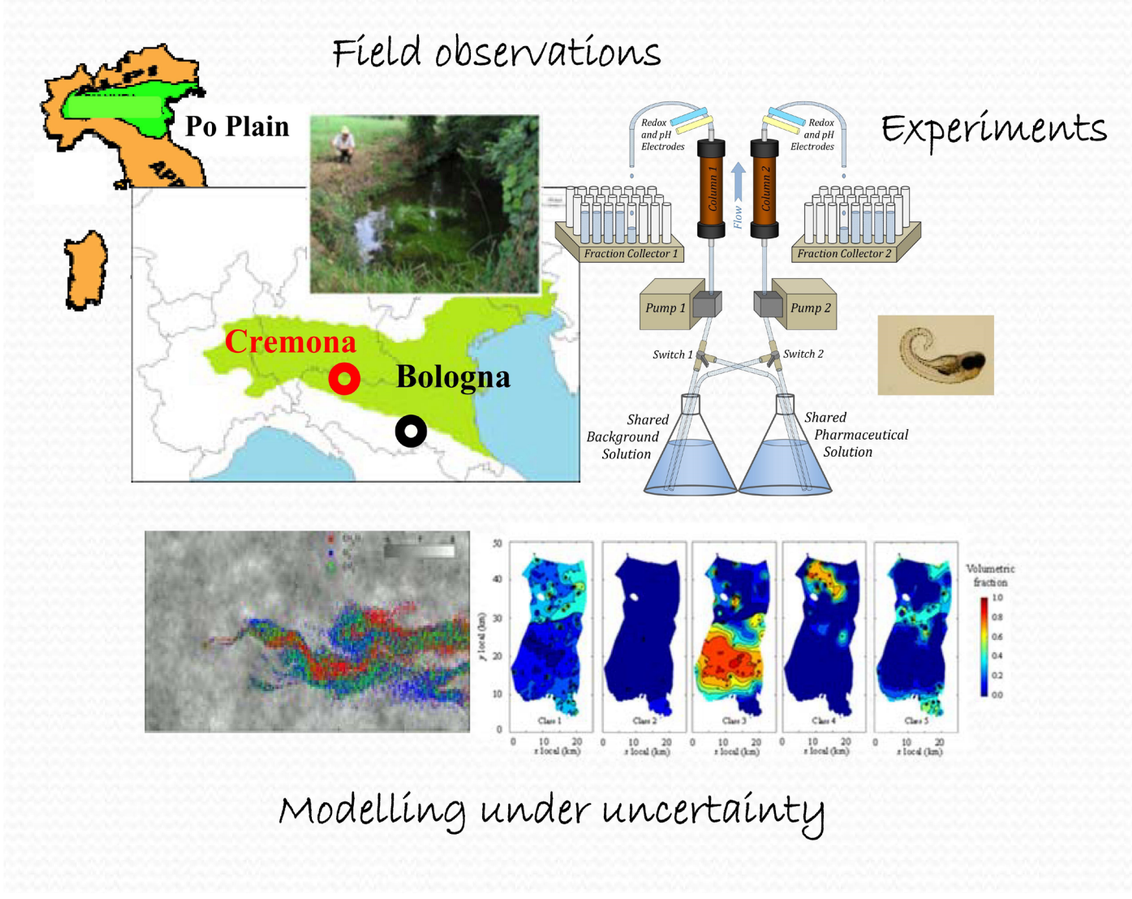
WE-NEED

Freshwater access is fundamental in key aspects of human life. Groundwater is a strategic resource for drinking water supply and is essential for ecosystem quality, energy and food security. This natural resource is endangered by several factors, including over-exploitation and contamination by anthropogenic activities. These elements severely affect the water-energy-food nexus, with critical environmental, sociological and economic consequences. WE-NEED (WatEr NEEDs, availability, quality and sustainability) is a 3-year project financed under the ERA-NET WaterWorks2014 Cofunded Call. The project started on 20th April 2016. It is co-ordinated by the Politecnico di Milano (Prof. Monica Riva, Dept. of Civil and Environmental Engineering) and includes as partners the Weizmann Institute of Science (PI: Prof. Brian Berkowitz, Dept. of Earth and Planetary Sciences), the Universitat Politecnica de Catalunya (PI: Prof. Daniel Fernandez Garcia, Dept. of Civil Engineering and Environmental) and the Universidade de Aveiro (PI: Prof. Susana Loureiro, Dept. Biology & Centre for Environmental and Marine Studies).

The goal of WE-NEED is to develop new management strategies to assist in the sustainable use of two key components of groundwater resources: pumping wells, used to obtain water for drinking purposes, and natural springs, typically employed for crop irrigation as well as for recreational use. We adopt a probabilistic risk assessment approach aimed at increasing confidence in decision making through quantification of risk. Activities are grounded on observations linked to two sites in Italy.

These sites are archetypal of two distinct realities and can be considered representative of diverse environmental settings and conditions of Europe-wide interest. During the first 18 months, the WE-NEED team has collected and analyzed available geological and hydrological data for the two field sites and developed flow models characterized by increasing complexity. The impact of uncertain parameters and boundary conditions on (i) aquifer characterization and (i) the uncertainty in predicting target variables has been assessed. A new statistical model for the interpretation of hydrological properties has been developed. The model allows one to estimate, accurately and efficiently, all relevant hydrogeological parameters by analyzing jointly sample moments of data and incremental series.

Protocols for synthesis, characterization and detection of several emerging contaminants have been developed and ecotoxicity tests have been performed. Planned future activities of WE-NEED include the quantification of the effect of multiple sources of uncertainty on sustainable management and protection of groundwater. These will lead to (i) assessment of the contaminant-specific vulnerability of aquifer systems, and (ii) improved, physically-based risk assessment and water management protocols, and (iii) assess the environmental effects of complex chemical mixtures.



IMDROFLOOD PROJECT

Between 1998 and 2009, Europe suffered over 213 major damaging floods causing more than 1100 casualties, the displacement of about half a million people and at least €52 billion in insured economic losses. Conversely, droughts cause annual economic losses of 6.2 billion €/year on average, with losses increasing in recent decades. Unfortunately, climate change is intensifying climate extremes such as floods and droughts, which are expected to increase even more in the future. In this context is essential to improve the scientific knowledge and strengthening drought and flood forecasting and early warning to improve adaptation to climate change.

To help this effort, we create the IMDROFLOOD (Improving Drought and Flood Early Warning, Forecasting and Mitigation using real-time hydroclimatic indicators) project (financed by WaterWorks 2014) with the main objective of enhance flood and drought risk management at the catchment level through the development of novel flood and drought information tools.

IMDROFLOOD includes research institutes, universities and companies from six countries (Spain, Portugal, Estonia, Romania, Moldova and South Africa) and it is focused on five river basins which have contrasting environmental conditions and specific problems (Tagus, Ebro Prut, Emajõgi and Limpopo).

IMDROFLOOD activities during the first half of the project have achieved some project millstones. One of the most important has been the effective engagement of stakeholders. The constant communication and three stakeholders meeting have allowed understanding stakeholders and end-users needs. During the first months of the project a complete collection of data sources in each basin has been collected and implemented in a Spatial Data Infrastructure, to share data among the project partners (private side) and to disseminate the products of the project. We have developed climatic drought indices at the most detailed spatial resolution and the longest temporal possible perspective in all studied basins (see monitordesequia for Spanish results). Furthermore we have computed remote sensing indices and land cover information to monitor drought. These indices have been used to improve our understanding of crop yield management under dry conditions. Another task has been the calibration of the Regional Hydro-Ecologic Simulation System (RHESSys), this model is especially sensitive to vegetation process. Currently we are simulating droughts and floods under different vegetation scenarios to understand its impact on the river flow.
On the other hand we have developed a new probabilistic forecasting strategy, coupling dynamic and statistical models, seeking the improvement of weather forecasts for the next 15 days. We are working in the incorporation of the forecasting of Atmospheric Rivers for predicting high amounts of precipitation.

The next steps of the IMDROFLOOD project are oriented to integrate the weather forecasting with the hydrological models, and to create drought and flood monitoring and early warning systems. In this line we have conceptualized the first version of the early warning systems including the recommendations of stakeholders and end-users to improve the potential usefulness of the systems.

DROPLETS

STRENGTHENING CHINA EUROPE WATER INNOVATION COOPERATION

PIANO is a H2020 strategic cooperation partnership for water research and innovation between Europe and China to create social and economic cooperation opportunities in the European and Chinese water sectors. Among its objectives are strengthening the existing network of the CEWP, identification of European technological water innovations that have a potential for implementation in China, identification of drivers and barriers related to implementation and replication of water innovations in China, and promotion of knowledge exchange. Further, a strategic research and innovation agenda (SRIA) for China Europe water cooperation has been elaborated.

During the event, which was held in Brussels last 15 May, the project results and recommendations were presented, gaining feedback and exploring options and synergies to utilize the project results through and beyond the work of the China Europe Water Platform and the other international water-related networks and initiatives. Video and presentations of the event will be uploaded on the PIANO website in the next weeks.

ENGINEERED POLYMER MEMBRANES COULD BE NEW OPTION FOR WATER TREATMENT

Chemical and biomolecular engineers at the University of Notre Dame and Purdue University studied self-assembled block polymer membranes, which allow for both customizable and uniform pore sizes, as a platform for water treatment systems.

The study, published in Nature Partner Journals - Clean Water, determined the platform has the potential to advance water treatment technologies. Until this research, polymer membranes, which act as a filter to desalinate and selectively remove contaminants from various water sources, have aided water treatment, but their selectivity remains a significant challenge when it comes to filtering chemical properties - a potential risk to the environment and human health. The research team focused on block polymer membranes because of their well-defined nanostructures and functionality. They were able to molecularly engineer the chemical properties of the polymer to create large areas of high-performance membrane, reduce pore size and design multifunctional pore wall chemistries for solute-specific separation. The membranes could essentially be customized depending on the water source and treatment needed.

Membranes that are more selective and more resilient to certain exposures such as chlorine or boric acid and less prone to collecting unwanted properties - or fouling - than current state-of-the-art options could improve treatment in a number of ways. They could reduce the number of filtration passes required for irrigation, control concentrations of chlorine into the system to help forestall effects of biofouling and reduce chemical demands for membrane cleaning - reducing operating costs and environmental impact.

Transitioning the technology from the laboratory setting to practice presents its own set of challenges that will need to be addressed in the

coming years. However, the researchers are hopeful the transition can be made since several of the techniques used to generate self-assembled block polymers are consistent with current membrane fabrication practices.

INTEGRATED DROUGHT MANAGEMENT IN CENTRAL AND EASTERN EUROPE

By Sabina Bokal and Richard Müller, of the Global Water Partnership Central and Eastern Europe.

Water scarcity and droughts are not just matters of concern for water managers. They have direct impacts on the citizens and economic sectors that use and depend on water, such as agriculture, tourism, industry, energy and transport. Water scarcity and droughts also have broader impacts on natural resources at large such as through biodiversity, water quality, increased risks of forest fires and soil impoverishment. But how can such a complex natural phenomena be managed?

Drought management is currently reactive, dealing mainly with losses and damages. Cooperation among key actors is missing, and formal legislation mostly does not exist. In 2013, at the High-Level Meeting on Drought Policies, the Global Water Partnership (GWP) and WMO launched a joint Integrated Drought Management Programme (IDMP).

Its main mission is to move from reactive to proactive drought management, focusing on drought prevention, mitigation, vulnerability reduction, planning and preparedness. Shortly after, in February 2013, the GWP Central and Eastern Europe (CEE) office launched a regional implementation of the IDMP.

The IDMP CEE[3] supports the Governments of Bulgaria, Czechia, Hungary, Lithuania, Poland, Republic of Moldova, Romania, Slovakia, Slovenia and Ukraine in the development of drought management policies and plans. It is structured to provide both policy advice and practical solutions in drought management, and focuses on an integrated approach rather than fragmented solutions. Over 40 organizations from the 10 countries are involved. This article highlights the main achievements of the first phase (2015–2017) of the regional implementation and shows the direction of the second phase (2017–2019).

Here the full article.

ZJU SCIENTISTS PRODUCE POLYAMIDE MEMBRANES WITH NANOSCALE TURING STRUCTURES

A research program led by professor Zhang Lin with the Zhejiang University developed the membrane formed by nanoscale bubbles and tubes. The material allows water to permeate three to four times faster than traditional membrane for water purification.

Zhang likened the function of the membranes to the interior of the mammalian intestine as it absorbs water and nutrition. Zhang expects the membranes to have a variety of applications in home water purification, industrial waste water treatment and desalination. The research is ready for commercialization. Here the full article.

OPPORTUNITIES

WATER JPI PHOTO COMPETITION

The registration to the Water JPI Photo Competition, organized in the framework of Water JPI International Conference Helsinki 6-7 June 2018, is still open. The deadline to submitted the photographs illustrating the Water JPI Strategic Research & Innovation Agenda thematic areas is next 28 May 2018 and all information are available here.

THE EUROPEAN JUNIOR WATER PROGRAMME

The European Junior Water Programme aims to build a community of talented young water management professionals who share a deep commitment to addressing today's and future water and climate change issues in Europe. It is designed to provide participants with the knowledge, the skills, the tools and the appropriate co-creation and cooperation network to find new solutions and share knowledge for the purpose of creating and maintaining a sustainable and safe water management system in Europe.

The water programme is based on three pillars:

1. cooperation on local European water systems and challenging projects addressing pressing issues through practical assignments,

2. masterclasses providing knowledge of European policies, water governance, financial instruments, water footprint, and the main water challenges,

3. professional skills and personal development in an extensive training programme for the purpose of working together in transnational teams and developing cultural awareness.

EVENTS

6-7 JUNE 2018, VANCOUVER, CANADA BLUETECH FORUM

BlueTech Forum is focused on water innovation and enables its attendees to stay one step ahead of the market. This year's sessions illustrate how the future of the water sector is being shaped by the trend of Circular Economy and how we should adapt our strategy to thrive in this new environment.

8-12 JULY 2018, SINGAPORE, SINGAPORE INTERNATIONAL WATER WEEK

The Singapore International Water Week (SIWW) is the global platform to share and co-create innovative water solutions. The biennial event gathers stakeholders from the global water industry to share best practices showcase the latest technologies and tap business opportunities. SIWW is part of the strategic programme of the Singapore Government to grow the water industry and develop water technologies. Singapore International Water Week 2018 will be held in conjunction with the 6th World Cities Summit and the 4th Clean Enviro Summit Singapore, from 8 -12 July 2018 at the Sands Expo and Convention Centre, Marina Bay Sands in Singapore.

26-31 AUGUST 2018 WORLD WATER WEEK 2018

World Water Week is the annual focal point for the globe's water issues. It is organized by SIWI. In 2018, World Water Week will address the theme "Water, ecosystems and human development". At the following link the event programme.

5-7 SEPTEMBER 2018, UNIVERSITY OF AVEIRO, PORTUGAL, WATEFCON 2018 - FUTURE OF WATER IN EUROPE: LOCAL, REGIONAL AND GLOBAL BEST PRACTICE

The increased necessity for efficiency in the use of water in the urban environment, particularly in the building water cycle is becoming more imperative in Europe. Where cities are facing a range of pressures resulting from population growth, climate change and deterioration of urban infrastructure systems. Some water efficiency measures can contribute not only to savings in drinking water consumption but also to energy efficiency and flood/drought control. This makes it imperative to reflect on current solutions, explore blue-sky ideas to support best practices in urban water management, based on greater efficiency in water use. All information at the following link.

20-21 SEPTEMBER 2018, VIENNA, AUSTRIA, EU WATER CONFERENCE

The 5th European Water Conference aims to present and discuss progress in the implementation of EU water legislation. The event is jointly organised by the European Commission's Directorate-General for the Environment and the forthcoming Austrian EU Presidency.

The Commission's implementation report on the second River Basin Management Plans and the first Flood Risk Management Plans, and the European Environment Agency's State of Water Report are due to be published during the second quarter of 2018, and will serve as a basis for the discussions at the Water Conference. The Conference will also include a session dedicated to the forthcoming evaluation of EU water policy.

The Conference will serve as a platform for consultation and debate between Member States, stakeholders, the European Commission, the European Environment Agency and other EU institutions about the findings of the different water-related reports. It will also provide a valuable opportunity to learn from each other's experiences in view of the next water planning cycles. You can register here.

8-12 OCTOBER 2018, BERLIN, GERMANY, TERENO INTERNATIONAL CONFERENCE WATER LEADERS SUMMIT

Global change has triggered a number of environmental changes, such as alterations in climate, land productivity, water resources, atmospheric chemistry, and ecological systems. Finding solutions to the impact of global change is one of the most important challenges of the 21st century. TERENO is embarking on new paths with an interdisciplinary and long-term research programme involving six Helmholtz Association Centers. TERENO spans an Earth observation network across Germany that extends from the North German lowlands to the Bavarian Alps. This unique large-scale project aims to catalogue the longterm ecological, social and economic impact of global change at regional level. Scientists and researchers want to use their findings to show how humankind can best respond to these changes.

The conference will give researchers from around the world the opportunity to discuss the latest developments in the field of the environmental research and monitoring.

27-30 NOVEMBER 2018, VENICE, ITALY, COWM2018

The Conference Citizen Observatories for natural hazards and Water Management 2018 will focus on the potential of Citizen Science in the European (and beyond) innovation landscape, and in particular in the fields of Environmental Monitoring, Natural Risks management, Land use monitoring and management. The Conference will investigate the role and opportunities for active citizen participation in policy making and the new technologies, methods and advanced modelling to support Citizen Observatories.

COWM2018 will bring together social scientists, surveyors, engineers, scientists, and other professionals from many countries involved in research and development activities in a wide range of technical and management topics related to citizen observatories and their impacts on society. It will be an opportunity to discover how to maximize the benefit of data emerging from citizen observatories.