

Water challenges for a changing world

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EDITORIAL

"Water is taught by thirst" said the American poet Emily Dickinson meaning that we learn to appreciate things only when we are without them. Many people in the world suffer for water scarcity and drought. They are calculated 1.8 billion. Luckily research and innovation are focused to find solutions to make potable sea water and waste water. According to a study presented during the Stockholm World Water Week research and innovation investments in the water sector rise 9% each year, more than other sectors estimated at the lower rate of 4%. Filters for water depuration and desalination are the most studied subjects by applied research and innovation. Thanks to the inverse osmosis process which reduces costs plants of desalination have been duplicated all over the world and investments in this field will increase up to 17 billion USD in 2016.



PROGRESS ON WATER JPI ACTIVITIES

The 7th Governing Board

The meeting among the Water JPI partners will take place in Paris on 19-20 November 2015 and is organised around the three pillars of the activities within this initiative tackling present and future water challenges: the strategy, the implementation and the international cooperation. The outcomes of the second stakeholders workshop held in Orleans last October and the new version of the Strategic Research and Innovation Agenda will be presented. Implementation issues in the meeting agenda are related to the activities of the ERANET-Cofund Water Works 2014, in particular the results of the call on research and innovation for developing technological solutions and services and progress in the alignment of national agendas. Discussion on international cooperation will focus on the outcomes of the *ad hoc* task force and the development of the future coordination and support action whose [call](#) is open till 8 March 2016.

A second alignment workshop is scheduled for 19th November 2015 before the Governing Board and is meant to explore the ways in which water research and innovation is dealt with in the Water JPI countries in order to develop a realistic definitive plan of actions within the initiative.

Water JPI presented at the conference "Water for Health: EU-India STI Cooperation Days 2015"

The sixth edition of this annual event supported by the European Commission and jointly organized by the EU funded projects [INDIGO POLICY](#) and [INNO INDIGO](#) and the European Technology Platform for water (WssTP) was held in Rome on 15-16 October with the aim of creating new research and business networks on issues of priority interest for Europe and India.

The Rome EU-India event was focused on water for health and some new technological solutions for water treatment and wastewater management were shown as results of research projects promoted by the [Water Platform](#) established within the INNO INDIGO initiative. The networking café has been the occasion to meet with Indian researchers and enterprises interesting in research and innovation development.

As international cooperation to tackle the common challenge of improving water quality and water resources management was at the core of this conference, the Water JPI coordinator, Dominique Darmendrail, was invited to present the activities of this relevant initiative which aims to integrate cooperation in water research and innovation in Europe and outside Europe. The following debate focused on the research needs of the Gange rejuvenate plan and the possibilities of integrating Indian funding agencies in the Water JPI activities.

Water JPI presented at ECOMONDO 2015 conference

A Global Water Expo was organized at [ECOMONDO 2015](#), a technological platform for the Green and Circular Economy particularly focused on the innovative solutions for a sustainable management of waste and water. Two events were dedicated to international issues, the first on "Water management in emergency conditions: appropriate solutions towards development in resource-limited countries" with the involvement of UNESCO chair on "Water Resources Management and Culture" in Perugia and the second one on "Europe, environment and water treatment: the policies, the economy and the innovation Ready to Market" involving private and public entities, the Scientific and Technological Board of ECOMONDO and Water_2020 COST Action ES1202. "Water challenges and emerging issues in Europe" was the presentation on the Water JPI initiative inside this second international workshop.

The workshop aimed at illustrating the societal challenges and the emerging innovative techniques. Italian, European and extra-European water utilities presented the forthcoming large investments in wastewater treatment and discussed with the audience the gap for a widespread uptake of innovative efficient techniques. A number of techniques at pilot or demonstration scale, or implemented at full scale in few installations were illustrated demonstrating that energy efficiency, carbon footprint and resource recovery can be optimized while costs can be reduced compared to conventional activated sludge processes.

Infringement procedures and stringent standards for discharge have recently led to relevant investments in Italy and EU for municipal wastewater treatment. In addition, extra European fast growing economies are now making huge efforts to implement wastewater treatment. Such a scenario should second the speed up of innovations that contribute to solving societal challenges such as the water-energy-carbon nexus, which is also the mission of international initiatives such as the EIP Water, Water JPI or the Horizon 2020 program.

FOCUS ON WATER RESEARCH AND INNOVATION in Ireland



The [Environmental Protection Agency \(EPA\)](#) is an independent public body. Its mission is to promote and implement the highest practicable standards of environmental protection and management that embrace the principles of sustainable and balanced development. The main responsibilities of the EPA include: environmental licensing; enforcement of environmental law; environmental planning, education and guidance; monitoring, analysing and reporting on the environment; regulating Ireland's greenhouse gas emissions; environmental research development; strategic environmental

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assessment; waste management; and radiological protection. Through its research programmes, STRIVE Research Programme 2007-2013 and now [EPA Research Programme 2014-2020](#), the EPA is coordinating environmental research in Ireland and has provided approximately €100m funding for environmental research and development to colleges, research organisations and private companies over the period 2007-2015. Research is funded under three main areas: Climate Change, Water and Sustainability. The Water Research is mainly policy-driven. The EPA has participated in a number of EU-funded projects. These include: SKEP (FP6), ENVHEALTH ERA net (FP7), CIRCLE2 (FP7), CIRCLE (FP6), WatEUR CSA (FP7), WaterWorks2014, WaterWorks2015, JPI Climate CSA (FP7) & ERAnet on Climate Services. The EPA is co-chairing the Water JPI since November 2014. It is also involved in the JPI Connecting Climate Knowledge for Europe (Clik'EU). The EPA is the National Contact Point and National Delegate for Horizon 2020 Societal Challenge 5: Climate Action.

The [EPA Research's water research pillar](#) deals with groundwater, surface water, transitional and coastal water; as well as wastewater, drinking, bathing and shellfish waters. The overall aim of the water pillar is to support relevant water policy and to protect our water environment, contributing to achieving excellent water quality in Ireland. The thematic areas under EPA Research's Water Pillar for 2014-2020 include: theme 1: safe water; theme 2: ecosystem services and sustainability; theme 3: innovative water technologies; theme 4: understanding, managing and conserving our water resources; and theme 5: emerging and cross-cutting issues. It will support the emerging policy & implementation research needs in relation to the implementation of the Water Framework Directive (WFD), as well as marine research considerations to support to the formulation and implementation of policies. In addition, the EPA is coordinating a multi-agency trans - boundary [programme of research](#) on Environmental Impacts of Unconventional Gas Exploration & Extraction (UGEE), which has significant water elements, and is included under theme 5: emerging and cross-cutting issues. Multi- and inter-disciplinary research is required on these themes, with expected social, economic, technology, environment and policy impacts. These thematic areas also reflect EPA Research's effort to align, where relevant, its programme with the Water JPI [Strategic Research & Innovation Agenda](#). [DROPLET](#) (Database of Research Outputs: Projects, Literature and Environmental Technologies) is the EPA's new, easy-to-use interactive web application for exploring information about projects which have been funded in Ireland on Water Research. It has been developed by the EPA but includes projects from many other funders of environmental research in Ireland.

[Read more](#)

INTERVIEW WITH ANGELO SOLIMINI



Angelo Solimini is a researcher involved in the project TRACE (*Tracking and Assessing the Risk from Antibiotic Resistant Genes using Chip Technology in Surface Water Ecosystems*; website: <http://jpi-trace.eu/>) funded within the frame of the Water JPI Pilot Call. He is adjunct professor of hygiene and public health at the Department of Public Health and Infectious Diseases in the Sapienza University of Rome. Angelo was involved in the implementation process of the Water Frame Directive during his work experience at the European Commission Joint Research Centre of Ispra near Varese (Italy). He is author of more than 70 scientific papers.

Which is the novelty brought to water research by the TRACE project?

Antibiotic resistance has become a major concern for public health. In hospitals, colonization and infections with bacteria often occur in patients after surgical practices and require treatment with antibiotics. This necessary clinical practice –along with improper antibiotics use- results in a selective pressure favouring pathogenic bacterial strains carrying antibiotic resistance genes (ARGs). To date, the study of antibiotic resistance has been carried out mainly in clinical settings and focussing on relevant human pathogens and related (and often life threatening) infections. In recent studies, ARGs have been identified in bacterial species living in natural aquatic environments, especially those that receive hospital and urban wastewater discharges. In such setting ARGs might be easily transferred to other ambient bacterial species, and spread in the environment.

The research carried by the TRACE consortium answers the JPI priority "Developing safe water systems for the citizens", can you explain in which way?

Given the serious public health threat posed by antibiotic resistant bacteria, it is important to investigate the potential role of surface water in amplifying the emergence and spread of antimicrobial resistance and to assess the potential associated risk to human health. This information is urgently needed for informed policy decisions.

More, in detail, which kind of studies is developing the project?

The project includes 6 WPs. WP1 includes field work to characterize chosen model sites. Sites selected for sample collection are the river Tiber and Ostia beach in Rome, the river Ter in Catalonia and Luetsche Lake in Central Germany. WP2 focuses on the identification of pathogenic bacteria carrying novel ARGs by means of whole genome sequencing. By analyzing metagenomic data, WP3 aims at developing new genetic primers for the quantification of ARGs. In WP4 we intend to set up and optimize a point-of-need assay, using nanotechnology-based biomolecular recognition approaches, to identify a pre-defined microbial pathogen marker. This technology will be validated against more traditional lab based methods in WP5. Finally WP6 deals with the probabilistic modelling that is used to quantify the human health risk, including uncertainties in estimates.

Are new methodologies or technologies envisaged?

TRACE will develop detection technologies based on multiplex DNA Chip-based analysis that allow for a simpler on-site detection of antibiotic resistance, thereby enabling the collection of larger amount of data in a shorter time. Future translation of this technology to the water monitoring realm may allow for an increasing number of measuring points, as well as a higher frequency of measurements.

Which outcomes are expected from TRACE?

The results of the study will be of interest, not only to policy makers, but also to regulatory authorities, public health specialists and the general public. Risk models will inform sanitary and regulatory authorities on potential intervention strategies to reduce human exposure to antibiotic resistant bacterial strains. The optimization of the point-of-need detection technology of pathogens at molecular level might have profound implications for future water monitoring.

Have you read the Water JPI Strategic Research and Innovation Agenda? Which is your opinion on the common goal to align national water research agendas at European level?

A common research strategy among member states in the field of water is an obvious need that can enhance the ambition and innovation contents of national projects and avoid the waste of funds in duplicating and jeopardize research questions. Additionally, research funding bodies may learn from each other on how to facilitate and speed up procedures of grants, avoiding bothersome and unnecessary delays as it is the case now for some countries. In my opinion, the practice of formulating policies and their implementation activities that are based on best scientific evidences are nowadays common practice in the health sector but are still at its infancy in the water sector.

RESEARCH HIGHLIGHTS

[E-flows linking to sediment dynamics](#)



A recent [European Commission guidance on environmental flows](#) (e-flows) identifies a series of overall key indications to tackle some critical aspects linked to the management and restoration of water bodies affected by hydrological pressures in order to reach the environmental objectives of the European Water Framework Directive 2000/60/EC (WFD). Considering sediment dynamics and river morphology with hydrology and hydraulics in order to determine e-flows is one of these key indications and it was discussed during a stakeholder workshop organized in September 2015 by ISPRA (IT) and DELTARES (NL) in the framework of the European project "[REFORM – Restoring rivers FOR effective catchment Management](#)". A panel of international experts, from relevant agencies and academia, investigated how to identify a common approach to specify efficient e-flow based measures that consider river sediment dynamics and morphological evolution, in order to supplement the EU guidance on e-flows. The discussion was drawn on the newly developed REFORM multi-scalar and process-oriented framework since it is ideally suited for tackling hydrology-sediment relationships. The outcomes of the discussion will be the topics of an ad-hoc comprehensive policy discussion paper that is currently under preparation.

DROPLETS



Water balance at basin level

The project "[PAWA – Pilot Arno Water Accounts](#)" presented to the European Commission DG Environment (DG ENV) and to Member States its final results and outcomes during the [6th Meeting of the EU WFD CIS Working Group on Programme of Measures](#) held in Brussels on 15 October 2015. The presentation focused, in particular, on the project contribution to the Arno River Basin Management Plan (RBMP), developed according to the requirements of the EU Water Framework Directive 2000/60/EC (WFD), and the related programme of measures (PoM). In addition it was showed how climate change considerations can take into account when calculating water balance using the "[SEEA-Water–System of Environmental-Economic Accounting for Water](#)" methodology developed by the United Nations Statistics Division. PAWA, together other six pilot projects, was funded by DG ENV in the framework of a preparatory action on development of prevention activities to halt desertification in Europe. Details and final technical reports of these projects are available in the DG ENV website dedicated to "[Water balances and water resources management targets](#)".



Investing in natural infrastructure to address water, food, energy nexus

There is an increasing awareness of how water infrastructure impacts other sectors and provide essential services. A [report](#) published by the International Union for Conservation of Nature and the International Water Association offers concrete examples of success stories focused on green solutions to solve the challenges related to the water, food, energy nexus.

Austria's best practices for organising research landscape for grand challenges

On 13 October 2015, a conference on strategic research networking in the context of Grand Societal Challenges took place in Vienna. The conference was organised by the Federal Ministry of Science, Research and Economy (BMWFV) and the Austrian Research Promotion Agency (FFG). The aim of the event was to exchange good practices for organising the national research landscape in terms of tackling Grand Challenges and to discuss how industry, policy and society should be involved. Presentations by the European Commission and by CCCA (Climate Change Centre Austria, a coordination platform for strengthening climate research in Austria) were followed by four parallel workshops establishing platforms on specific topics: 1) personalised medicine, 2) demographic change, 3) smart cities and 4) sustainable water systems. The objectives of the platform on sustainable water systems are to harmonise national and European research agenda and also to foster the Austrian involvement within the JPI Water.

How to advance global change research in Europe

Future Earth, a major international research platform for global sustainability, organized a workshop which took place in Innsbruck, Austria on 5-6 November 2015. European Future Earth operators and European research funders met to discuss how to advance Future Earth activities in Europe by exploring synergies, gaps, and resource efficiency. The workshop also highlighted the need for a communication platform to share best practices and to create ideas for joint proposals. [To know more](#)

New EU rules to improve monitoring of drinking water

The European Commission has recently adopted new rules for a more efficient monitoring of drinking water across Europe. This amendment to Annexes II and III to Council Directive 98/83/EC on the quality of water intended for human consumption, allows Member States to decide on the basis of a risk assessment, which parameter to monitor given that some drinking water supply zones do not pose any risk for finding hazardous substances. According to these new rules Member States can also choose to increase or reduce the frequency of sampling in water supply zones, as well as to extend the list of substances to monitor in case of public health concerns. [To know more](#)

Emerging water contaminants Report by JRC

This report produced by JRC, represents the Development of the first Watch List under the Environmental Quality Standards Directive with the aim of supporting European environmental legislation for the protection of the quality of European waters. The [report](#) describes the procedure to identify a short-list of substances, based on the suspected risk to or via the aquatic environment. This mechanism concerns emerging pollutants and other substances for which the available monitoring data are either insufficient or of insufficient quality for an EU-wide risk assessment. From the short-list, seven additional substances are proposed for inclusion in the first Watch List.

OPPORTUNITIES

Framework Partnership Agreement

In the recently published Horizon 2020 work programmes 2016-2017 Framework Partnership Agreements supporting Joint actions on specific challenges are included. FPA is an administrative arrangement that needs to be in place in order to issue specific ERANET Grant Agreements without the usual call procedure. FPA is designed to implement a long term action plan addressing the specific challenge with a consistent set of resulting ERA-Net Cofund actions supported by many countries and their different programme owners and managers joint in a consortium. FPAs provides the advantage of a simplified proposal submission and grant preparation shortening the time needed to launch cofunded calls in order to improve the cooperation between the European Commission and the national/regional programme managers and owners in Member States and outside Europe.

More than Euro 340 million to Public-Public Partnerships

Horizon 2020 Work Programme 2016/17 will fund Public-Public Partnerships (P2Ps) with a planned Union contribution of more than Euro 340 million, expected to leverage public funds from Participating States for transnational research in excess of 1 Billion €. All call topics related to P2Ps are presented on the ERA-LEARN 2020 portal. A partnering tool assisting you in building or joining consortia is available on the portal. [To know more](#)

The new European Neighbourhood Instrument

For the period 2014-2020, the ENPI is succeeded by a new European Neighbourhood Instrument (ENI) which has a budget of € 15.4 billion to support strengthening of relations with neighbourhood countries and bring tangible benefits to both the EU and its partners (Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Israel, Jordan, Lebanon, Libya, the Republic of Moldova, Morocco, Palestine, Syria, Tunisia and Ukraine). More information is provided [here](#).



COST Action proposal

The Cost Call is opened in all fields of Science and Technology including Humanities and Social Sciences. COST invites proposals for Actions contributing to the scientific, technological, economic, cultural or societal knowledge advancement and development of Europe. Multi- and interdisciplinary proposals are encouraged, you can submit your cost Action Call for Proposal through the new e-COST online [submission tool](#). The next collection date is 9 February 2016.



ERA-Can+ Twinning Programme

ERA-Can+ project, promoting cooperation between the European Union and Canada in science, technology and innovation, has recently launched its first call for proposals. The Twinning Programme will support the combination of EU-funded projects and Canadian-funded projects with the aim of new networking and research collaborations. Each twinning project should consist of at least one EU-funded project consortium (FP7 or Horizon 2020), and one Canadian project funded either at the federal or provincial level. Proposal submission deadline is January 4, 2016. [To Know more](#)



Survey on user needs in designing the support for P2P networks

ERA-LEARN 2020 mission is to expand and update guidance and learning material as well as to facilitate the exchange knowledge and good practice among the Public-Public Partnerships (P2P) community. A list of potential future topics that could be addressed and supported by ERA-LEARN 2020 have been assembled in this survey. If you want to cover the needs of your organization and to provide material which is relevant for your P2P activities take the opportunity to participate in this [online survey on user needs](#).



Partner search of NCPs CARE is available

The Partner search of NCPs CARE is now available to support potential applicants for the Horizon 2020 Work programme of Societal Challenge 5 "Climate action, environment, resource efficiency and raw materials", to find partners and to build a consortium for a project proposals. Through [the portal](#) you can find information or post a partner offer or partner search within the open topics of the Societal Challenge 5.

UPCOMING EVENTS



UN Climate Change Conference- COP 21 (Paris, 30 November – 11 December 2015)

The twenty-first session of the Conference of the Parties (COP) to the UNFCCC also known as the 2015 Paris Climate Conference, has the objective to achieve a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C. At COP 21 beyond the formal negotiations, over 200 events focused on major issues in the Convention process and exhibits covering a wide variety of topics, will be organized serving as a platform for observer organizations. Official delegates from government, intergovernmental organisations, UN agencies, NGOs and civil society will participate to 2015 Paris Climate Conference. [To Know more](#)



Financing the Circular Economy Workshop (Luxembourg, 10 December 2015)

"Financing the Circular Economy to further engage Europe's financial sector in the circular economy" is a workshop organized by the European Commission in cooperation with the European Investment Bank (EIB) within the framework of the Luxembourg Presidency of the Council. The main objective of the conference is to further engage Europe's financial sector into an innovative process aimed to the know-how required to finance the transition to the circular economy in Europe. [To Know more](#)



Climate Change Adaptation Plans Conference (London, 1 December 2015)

After the recent submission of adaptation plans to Defra by water companies, CIWEM (Chartered Institution of Water and Environmental Management) organizes this conference in cooperation with Water UK (the network of water and wastewater service supply organizations in England). The main objective of the event is to evaluate progress made by the water sector in the last five years, the various approaches to manage climate risks used and new learning emerged, trying to identify key themes for the Government Climate Change Risk Assessment due to be published in 2017. [To know more](#)



International Conference on Civil, Agricultural & Environmental Engineering (CAEE-15)

The International Association of Civil, Agricultural & Environmental Engineering Researchers organizes a conference on Nov. 30-Dec. 1, 2015 at Istanbul (Turkey), with the aim of bringing together researchers, scientists, engineers, scholars and students in the various areas of civil, agricultural & environmental engineering. This event provides a forum for the dissemination of original research results, new ideas, research and development, practical experiments, and best practices, for the benefit of society. Delegates will have also the opportunity to find partners for future collaborations. [To know more](#)



JPI- Climate Symposium - Taking stock and inspiring the future (17-18 November 2015, Madrid Spain)

JPI Climate organizes this event back to back with the meeting of the Governing Board. The main objective is to present and discuss with key stakeholders and strategic partners the new JPI Climate strategy through a review of past or on-going achievements towards a prioritized implementation. The stock taking will be important for planning the next phase of JPI Climate with new elements of a JPI Climate Vision. [More information](#)

JPI-Climate Workshop "Climate Impact and Loss data for Europe"(16-17 December 2015)

This international workshop will be held immediately after COP21 negotiations in Paris involving scientists from various disciplines as well as practitioners from insurances, infrastructure and political institutions. Given the frequency and intensity of economic disaster losses due to climate change there is urgent need to improve the knowledge, understanding and data on climate impacts for an appropriate disaster risk management as part of climate change adaptation. Discussions will focus on existing datasets and their quality, collection, use and requirements. [To Know more](#)



Wastewater & Sanitation Egypt (Cairo, 8-9 December 2015)

Wastewater and sanitation development are essential for Egypt's water security where population growing and rapid urbanization is putting a strain on the already stressed water resources. A master plan has been drawn up in Egypt to provide and develop a comprehensive wastewater infrastructure to treat the countries sewerage and also to provide high quality wastewater for reuse to alleviate the pressure on the fresh water supplies. This workshop is organized with the aim of showing the international best practices and latest water treatment technologies in order to provide high quality effluent and plans for the development of new water facilities. [To Know more](#)

Water Security 2015 (9-11 December 2015, Oxford)



The University of Oxford organizes this conference looking for new approaches to sustainably deliver water security for millions of poor people in Africa and South Asia. Discussions will focus on how a risk-based framework charts pathways to sustainable growth and reduce poverty. The workshop will be structured around several interesting sessions where leading global thinkers and practitioners from government, enterprise, civil society and academia will advance and debate risk-based analysis of water security. [To know more](#)

CALL FOR PAPERS



Exploring Permafrost in a Future Earth

The [Call for abstracts](#) of the 11th International Conference on Permafrost (ICOP 2016) that will be held in Potsdam, Germany, 20-24 June 2016 is opened. All relevant aspects of permafrost research, engineering and outreach on a global and regional level will be the conference topics. A list of sessions and their descriptions are available under 'Program - [session overview](#)'. A maximum of two abstracts can be submitted per first author. One of them only can be submitted as an oral presentation. Abstracts should be submitted online until 1 December 2015.



ICWRER2016 (Kyoto, Japan, June 5-9, 2016)

[Abstract submission](#) for the 7th International Conference on Water Resources and Environment Research (ICWRER2016) is opened. This symposium is a series of conferences dealing with hydrology and water resources. The main theme of ICWRER 2016 is 'Water Security in Geo, Eco and Socio Systems'. Your [participation to the call](#) is highly encouraged for valuable knowledge exchanges. Submission deadline is November 30th.



Citizen Observatories for Water Management – COWM 2016 (Venice, Italy 7-9 June 2016)

This conference will focus on the potential of Citizen Science in the European water innovation landscape. Social scientists, surveyors, engineers, scientists, and other professionals involved in research and development activities in the following topics are invited to present their abstract : environmental monitoring and modeling; technologies at the service of citizens; the social dimensions of citizen observatories; citizens observatories and decision making. Deadline for [Abstract Submission](#) is February 2016.