institute imdea water

just water

imdea **water** institute

annual report

2018

www.water.imdea.org

Eloy García Calvo
Director, IMDEA Water Institute
May 2019

annual report

2018

www.water.imdea.org

For IMDEA Agua, 2018 has been a year of generalised growth in the most relevant indicators: contracted personnel, number of related researchers, national and international projects underway (most European, of which the majority are H2020 projects), contracts with institutions and companies, patents, scientific articles, speeches at events and conferences, and participation in round tables, panels of experts and scientific committees.

Two of the H2020 projects in which IMDEA Agua participated ended as 2018 did, and we coordinated one of them. The iMetland project was chosen by the EU as one of the 10 innovation model projects in the water sector. This choice was based on contributions to ensure water security in Europe.

Research activity continues by very actively participating in two H2020 projects that started at the end of 2018. These projects aim to reduce energy use during treatment processes and to assess the risk of chemical substances being present in the environment.

Pilot studies have also been conducted by a spin-off partly owned by IMDEA Agua to treat effluents from the oil refining industry. The results of reducing pollution-indicating parameters (DQO, ammonium, total nitrogen and toxicity) are spectacular compared to those obtained by conventional treatments. The savings in operation costs of using new technology also stand out.

In our research centre, which works on a theme like water that is so closely linked to society, dissemination must take priority among our activities. Our activities are very diverse and have increased over the years. We take advantage of events like “the European Night of Researchers”, “Science Week” or “the International Day of Women and Girls in Science” to perform different dissemination activities. We also organise seminars and workshops on our premises and in other centres for Secondary Education students. Other important dissemination activities include publishing articles in print and online, interviews and reports about our researchers and our research, appearing in news in the media (299 times in 2018), and creating and managing websites (currently 10).

Training activities are still one of our main lines of work. In collaboration with the Universities of Alcalá and Rey Juan Carlos, we coordinate a PhD programme and a Master programme in two formats: face-to-face and semiface-to-face. In these programmes, three of every four students are foreign.

I wish to congratulate one of our researchers, Marco Vighi, for receiving from SETAC (the Society of Environmental Toxicology and Chemistry) the most important award of this relevant society: the Environmental Education Award.

Finally, I wish to thank, as I do each year, all the members of our institute, who are contracted and associated with us, for the efforts, commitment and enthusiasm they show in their daily activities that help make our institute slightly better every day.

words from the director...

annual report 2018

www.water.imdea.org

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IMDEA Water Institute

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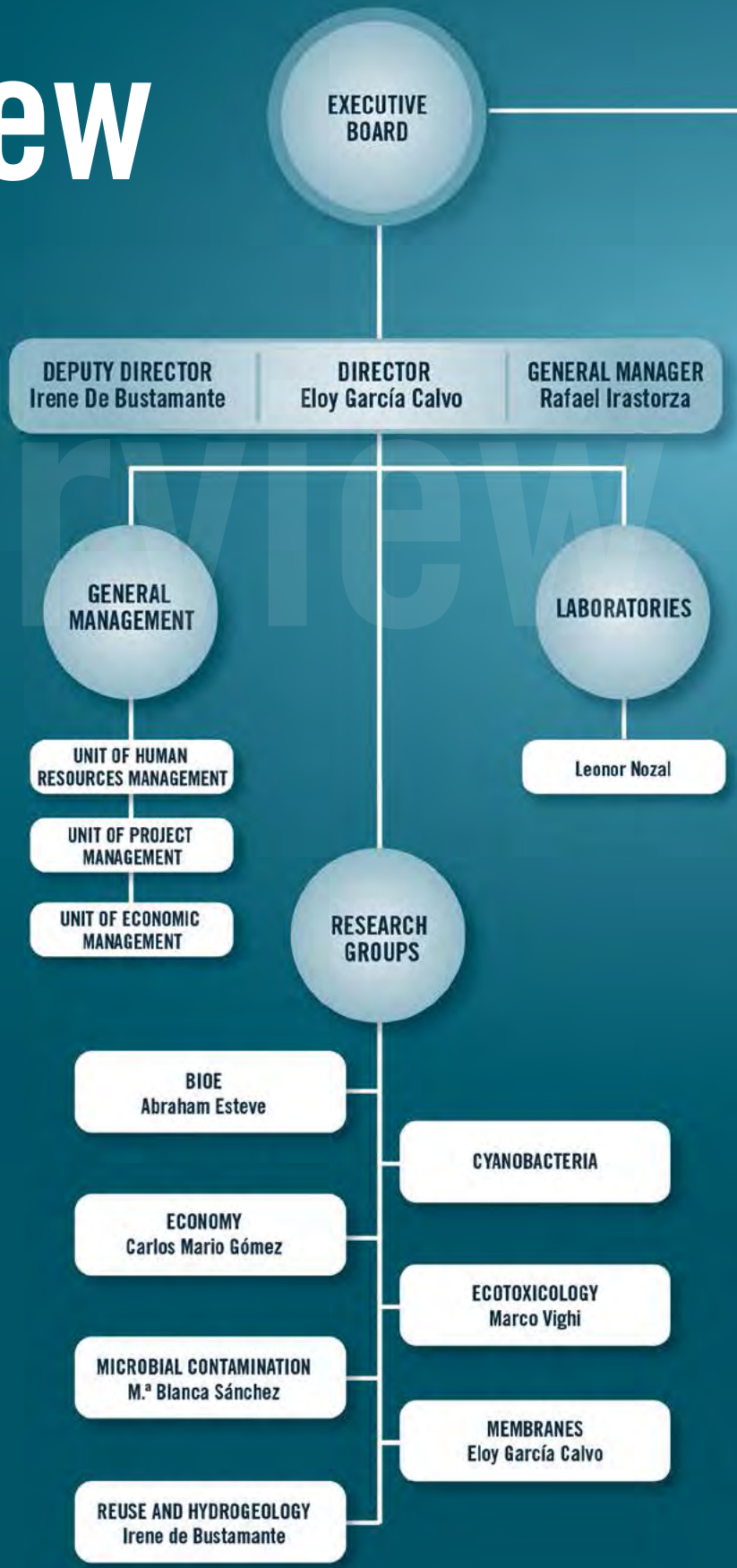
overview

IMDEA Water Institute is a public non-profit organisation promoted by the Madrid Regional Government, engaged in excellent research focused on contributing the innovative elements necessary in a strategic sector such as water, as well as providing highly competitive postgraduate lectures and courses. Training for scientists and professionals, primordial for IMDEA Water, is carried out through organising and collaborating in doctorate programmes, masters and other courses, thus helping to compensate society for the effort made in maintaining the Institute.

The institute's vision is to become an internationally acknowledged centre of excellence for research and innovation on water issues. Helping Madrid take pride of place among the regions generating knowledge and facilitating innovation, by providing solutions to problems and challenges in water management.

The mission is to foster multidisciplinary research and innovation on water issues, generating affordable and sustainable solutions for water-related issues and management. Likewise, to create an efficient development model for science and technology in collaboration with the production sector.



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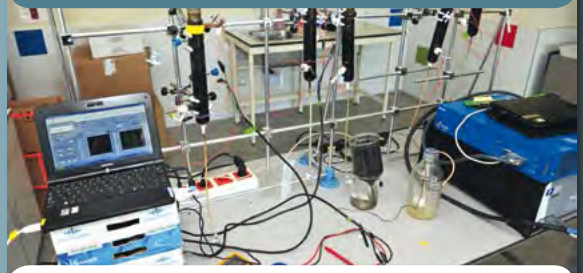
research areas

Microbial Electrochemical Technologies



Our research group is fully devoted to merge microbial, electrochemical and engineering tools to restore polluted environments (soil and water) by exploring the world behind the microbial electrochemical technologies (MET).

Our activities are divided into:

- Physiology and biochemistry of microbial electrogenesis
- Environmental microbial electrogenesis
- Microbial electrogenesis and bioengineering

Hydraulic heritage

Research on water heritage aims to resolve conflicts between the existence of such heritage structures and current social development and growth from a sustainable perspective.

- Inventory and evaluation of heritage systems using new technologies
- Development of putting in value and territorial management support structures
- Analysis of socio-economic values of water cultural heritage systems from an ecosystem services scope.
- Assessment of heritage and traditional landscapes impacts to be integrated in a holistic manner in complex landscape systems.

Economic and institutional analysis

Analytical studies as per the following issues:

- Sustainable water management in areas prone to extreme weather events
- Tools & methods for assessing climate change impacts, cost and benefits of climate-proof strategies, risk assessment, and evaluation of opportunities linked to climate change adaptation
- Hydro-economic modelling & analysis
- Prioritisation of water investments
- Economic analysis of aquatic ecosystem services delivery
- Integrated assessment of river basin management plans
- Economic assessment of water policies
- Economic policy instruments for sustainable water management (including pricing water security, drought insurance, and water trading schemes)
- Water governance
- Economic analysis of water and sanitation services (including for rural areas)
- Water conflict management

Active engagement in high-level fora aimed at raising the profile of water resources management and water services in global, national, regional, and local policy agendas

Membrane technology

The group is focused on studying the whole membrane process life cycle: from membrane preparation to their use in water treatment until their recycling.

- Development of new generation antifouling membranes by surface modification and the addition of functionalized groups and nanoparticles.
- Evaluation of different types of membranes (reverse osmosis, nanofiltration, ultrafiltration) in water treatment.
- Modification of recycled membranes and their implementation in urban wastewater treatment by membrane bioreactors (MBR) and desalination by electrodialysis (ED).

Ecotoxicology

Assessment of the risks for ecosystems determined by contaminants and their interactions with the environment, taking into account the vulnerability of individuals, populations and communities to chemical and non-chemical stressors

- Assessing exposure to contaminants through environmental monitoring and predictive exposure models
- Assessing effects trough toxicity tests with aquatic organisms at the individual, population and community level (using microcosms and mesocosms)
- Developing modelling approaches to predict effects at the individual, population and community level
- Assessing ecological quality trough monitoring of invertebrates and other biological indicators
- Characterising ecological risks combining effect and exposure assessments

Biological and Advanced oxidation technologies

Developing wastewater treatment focused on degradation of xenobiotic compunds by chemical or biological processes. This includes the development of methods for assessing the toxicity or emerging pollutants

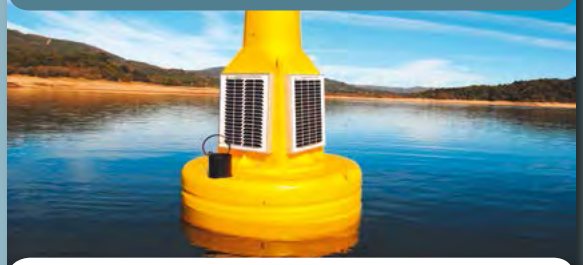
- Ozonization
- Fenton and Photo-Fenton processes
- Photocatalysis
- Biological (aerobic and anaerobic) processes in reactors of different configurations and biostimulation of microorganisms for in-situ biodegradation

Reclaimed water reuse

Land application systems for urban wastewater treatment of small built-up areas have several advantages:

- Managed without external energy input
- Reliable, robust and low maintenance technology
- Production of high quality biomass
- Capture of CO_2
- Use wastewater reclaimed in recharge of aquifers

Cyanobacterias and microbial contamination



The group focused their R&D activities to offer technology-based solutions to Water-based industries in relation to Cyanobacterial Harmful Algal Blooms.

- Designing monitoring programs for the development of toxic cyanobacteria blooms in reservoirs.
- Developing technology for the specific and sensitive detection of microcystins in water.
- Developing technology for the efficient and low-cost removal of microcystins during water treatment using biofilms.

On the other hand, impact of pollutants (pesticides, antibiotics and biocides) on microorganisms and antibiotic resistance in water environments is being studied.

- Potential effect of pollutants on bacterial populations
- Detection (finding and/or discovery) of antibiotic resistant bacteria (ARB) and resistance genes (ARG)
- Fitness cost linked to the acquisition of antibiotic resistance
- Resistance gene transfer and the role of pollutants

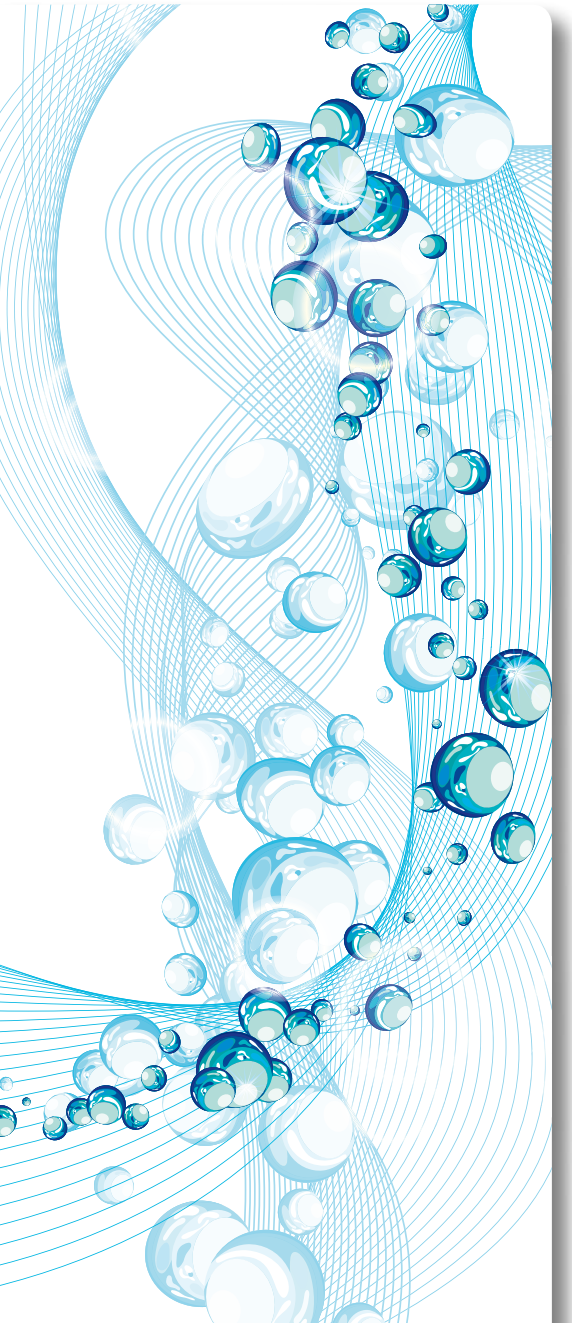
Water and energy

Exploring the potential of integrating solar photovoltaic technologies in water treatment processes to solve the problem of safe drinking water access and/or wastewater treatment.

- Photovoltaic-photochemical hybrid solar systems
- Clean water sensors for solar disinfection

On the other hand, a low cost system based on open source tools for the monitoring of photovoltaic systems, specifying in autonomous photovoltaic systems, with a reliability and accuracy that comply with existing regulations is being developing.

collaboration



collaboration

COLLABORATION WITH RESEARCH ORGANIZATIONS

Universidad de Alcalá
Universitat d'Alacant Universidad de Alicante
Universidad Rey Juan Carlos
Universidad de Jaén
ECOVIDA Centro de Investigaciones y Servicios Ambientales
IÑALES Parque Nacional
Universidad Complutense Madrid
CSIC Consejo Superior de Investigaciones Científicas
KISR
centa
FCIHS
Centro para el Conocimiento del Paisaje
UNIPAZ Instituto Universitario De La Paz.
JGI
CNAP
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PLATFORMS AND ASSOCIATIONS

RHC Renewable Heating & Cooling European Technology Platform
geoplat
iMED
AEDyR ASOCIACIÓN ESPAÑOLA DE DESALACIÓN y REUTILIZACIÓN
ΣH2O PLATAFORMA TECNOLÓGICA ESPAÑOLA DEL AGUA
water footprint network
ASERSA Asociación Española de Reutilización Sostenible del Agua
afre ASOCIACIÓN DE FABRICANTES PARA AGUA Y RIEGO ESPAÑOLES
IWA International Water Association
Medio Ambiente
netwerch2o
WssTP The European Water Platform
EUMED professionals & experts consortium
QWI WATER IS OUR CONCERN
Aeas Asociación Española de Abastecimientos de Agua y Saneamiento
RED ESPAÑOLA PARA EL DESARROLLO SOSTENIBLE
SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK

infrastructures and scientific equipment

IMDEA Water laboratories are part of the Network of Laboratories and Research Infrastructures of the Community of Madrid since 2009 with the reference number 267.

Water Laboratory
Basic Analysis Unit

In this unit we analyse several physical and chemical parameters laid down in the regulations on control of water quality and dumping.

Equipment

- Particle counter for water samples (0.2 microns and 2 microns). LS_200 model from Particle Measuring System Inc.
- Visible UV spectrophotometer (190-1.100 nm). UV-1800 model from Shimadzu.
- Total Organic Carbon (TOC) Analyzer. TOC-V CSH.

Applications

- Organoleptic assays: Colour and turbidity.
- Physical-chemical testing: Basic parameters such as pH, conductivity, temperatura, redox potential, Total Kjeldahl Nitrogen, total phosphorus, free and total chlorine, alkalinity, suspended solids (TSS), total organic carbon (TOC), DBO_5, DQO, total nitrogen, etc.

Water Laboratory
Organic and Inorganic Microcontaminants Unit

Liquid Chromatography coupled to Ultraviolet-Visible (HPLC-UV)

High resolution liquid chromatography (HPLC) is one of the most widely used separation techniques, due to its versatility and broad field of application.

Equipment

The HPLC Model 1200 (Agilent Technologies) apparatus includes a vacuum degasser, quaternary pump, automatic injector, thermostatted column compartment and diode detector (DAD).

Applications

The field of application for this technique is very wide-ranging. Some of the applications are listed here:

- Determination of organic pollutants (pesticides, herbicides, phenols, PCBs).
- Pharmaceutical products (antibiotics, sedatives, painkillers).
- Foodstuffs: artificial sweeteners, antioxidants, additives.
- Quantitative analysis of compounds of interest.

Ion Chromatography

Ion Chromatography is a variant of High Performance Liquid Chromatography (HPLC). Separation and determination of ions is carried out, based on the use of ion exchange resins. This type of chromatography is subdivided into cation and anion exchange chromatography, with the latter featuring most applications.

Equipment

- Dual channel Ion Chromatography system model 861 Advances compact IC (Metrohm), with sequential chemical suppression and samples ultrafiltration. Simultaneous determination of anions and cations with conductivity detector.

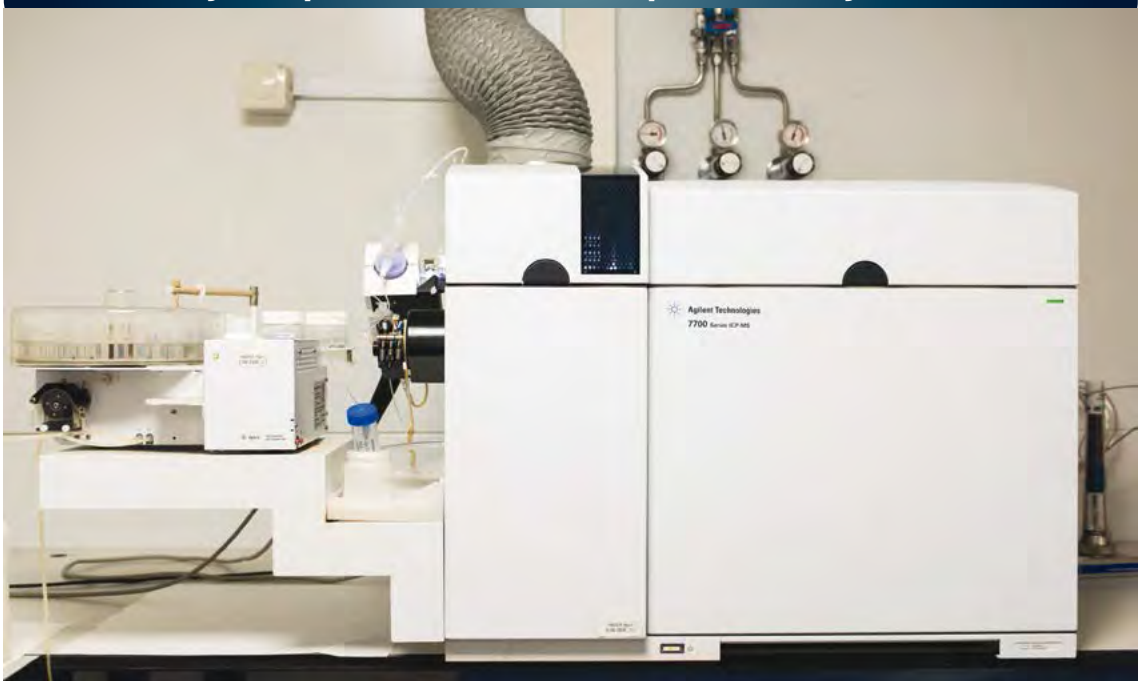
Applications

With detection by conductivity.

- Anion analysis (F^-, Cl^-, NO_2^-, Br^-, NO_3^-, PO_4^{3-}, SO_4^{2-}) in aqueous matrices.
- Cation analysis (Na^+, NH_4^+, K^+, Mg^{2+}, Ca^{2+}) in aqueous matrices.

Water Laboratory

Inductively Coupled Plasma Mass Spectrometry (ICP-MS) Unit



The analytical technique with the greatest potential for determination of trace level elements in all types of matrices. It is usually necessary to perform a sample digestion.

Equipment

Inductively coupled plasma - mass spectrometer (ICP-MS), model 7700 x (Agilent Technologies). High levels of performance, reliability and automation. Includes a collision cell system in helium mode; greater sensitivity, less background noise, increased removal of spectral interferences and 'no gas' mode. Option of coupling separation techniques such as high performance liquid chromatography (HPLC).

Applications

- The majority of elements in the periodic table can be analysed using this technique.
- Semi-quantitave multi-element analysis. To determine the major and minor elements in a sample. Allows semi-quantitative determinations of elements for which there is no comercial standard with an error lower than 15%.
- Quantitative analysis of elements of interest Linear dynamic range of 8 orders of magnitude (ng/L (ppt) – mg/L (ppm)) and low detection limits (ng/L (ppt)) for most elements
- Gauging the isotopic ratios of an element.
- Analysing solid biological, organic and inorganic samples by acid digestion and microwave treatments.
- Environmental applications (waters, soils, sediments and residues).
- Determination metals and contaminants in soils (fertilisers) and inland drinking waters (dumping).
- Speciation of metals in complex matrices.
- Quantification of inorganic nanoparticles.

Water Laboratory
Mass Spectrometry Unit

Mass Spectrometry (MS) is a highly sensitive instrumental analytical technique able to quali- and quantitatively assess all types of mixtures of substances. In addition, this technique also determines the molecular mass of a compound, as well at the different fragments resulting from controlled break-up of the same, providing highly valuable information on the molecular structure. The ions are separated according to their mass/charge (m/z) ratio and detected.

The great advantage of high-resolution mass spectrometry compared to low resolution is the greater precision and accuracy of the mass, due to the more high-performance features of the time of flight-quadrupole analysers (TOF and QTOF). These allow unequivocal identification of the exact mass of a compound.

Equipment

- Bidimensional Gas Chromatography/ MS (GC x GC/ TOF). Pegasus (LECO) and GC model 7890A from Agilent Technologies.
- Gas Chromatography / Triple Quadrupole (GC-MS/MS). GC model 7890A and triple quadrupole detector model 7000 (Agilent Technologies). This system is coupled to a Gerstel twister brand Autosampler.
- Liquid Chromatography (LC-QTOF) equipment. Triple TOF 5600 model (AB sciex).
- Liquid Chromatography /MS (LC-TOF) equipment (model G6280B, Agilent Technologies).
- Liquid Chromatography /Triple Quadrupole (LC-MS/MS) (model 6495A, Agilent Technologies).

Applications

- Analysis of organic micropollutants in waters by GC-MS/MS (organochlorine and organophosphorus pesticides, trihalomethanes, polyaromatic hydrocarbons) by means of LC-MS (TOF) y LC-MS/MS (QTOF) (drug and multi-residue)
- Determination of impurities in pesticide products.
- Assays to determine exact mass and fragmentation studies.
- Identifying compounds, or fragments of the same, by their mass spectrum in comparison with GC-MS libraries. New analytical, methods are constantly being developed to adapt to the new requirements laid down in current legislation on monitoring water quality and control parameters

Soil Laboratory

IMDEA-Water has a laboratory dedicated to analysis of soils, sediments and similar solid matrices, such as humus or reactive materials. Activities mainly focus on determining physical-chemical properties for characterisation from an agronomic standpoint. The study of these solid matrixes is of prime importance, as characterising the soil-water system is crucial when assessing the use of water in activities such as irrigation or artificial recharge of aquifers. The impact on soil of water reuse for environmental purposes is highlighted, as it depends on the quality of the water utilised, which will vary depending on its source. This procedure thus helps define the efficacy of treatments whose effluents may be used in one of the environmental uses, or to analyse water quality according to source. In short, soil monitoring is a necessary tool when assessing the management of water resources.

Equipment

- Area for pre-treatment of samples.
- Richards plates to calculate moisture retention.
- Microwave/Oven for digestion and extraction.

Applications

- Texture.
- Moisture, pH and electrical conductivity.
- Organic Matter.
- Total nitrogen, assimilable phosphorus, nitrates.
- Total calcium carbonate.
- Cation exchange capacity and exchangeable bases (Na^+, K^+, Ca^{2+}, Mg^{2+}).
- Exchangeable aluminium.
- Metals.
- Phosphates retention.
- Assimilable boron.
- Calcium carbonate equivalent content.
- Amorphous content (Si, Al, Fe).
- Total organic carbon content.
- Moisture retention curve.

Biology and Microbiology Laboratory

IMDEA Water hosts a biological laboratory providing analysis on surface and groundwater to:

- Support monitoring programs of water quality by means of national and international standardized methods and in agreement with WFD 2000/60/CE y GWD 2006/118/CE.
- Technological solutions for controlling cyanobacteria and cyanotoxin removal.
- Monitor invertebrate communities from surface and groundwater ecosystems to provide an integrated ecological status assessment.

Equipment

Ecohydrology unit: the microbiological unit is equipped with fully high-quality optical microscopes systems available with high-resolution photo-montage systems for microorganism and plankton identification:

- Light microscope.
- Stereo microscopes.
- Digital photo camera.
- Culturing facilities for algae and invertebrates.
- Microcosms and aquaria.

Cyanobacteria and cyanotoxins unit:

- Incubator for cyanobacteria and bacteria cultures.
- Rotary evaporator with a cooling system, Buchi, for extraction of cyanotoxins.
- Solid Phase extraction equipment, for concentrating toxin extracts.

Molecular biology unit:

- Gel Documentation System, AlphaImager, for documentation of gel electropheresis.
- Real Time PCR machine, AB7300, for quantitative and qualitative gene studies.
- Nano-photometer, Epoch, for measuring DNA concentration in as low as 2 µl volume.
- Gel Electrophoresis Equipment, Biorad, for electrophoresis of DNA and RNA.
- PCR Thermocycler, to perform PCR reaction.
- Homogenizer for DNA extraction, Precellys, to extract DNA from bacterial cells.

Applications

- Surface and groundwater monitoring (rivers, lakes, aquifers) based on biological indicators.
- Specimens identification of cyanobacteria green-algae, zooplankton, macroinvertebrates and aquatic plants to the lowest taxonomic resolution.
- Toxicity test (single and multiple species tests, acute and chronic) for ecotoxicologial risk characterization.
- Biodegradation of cyanotoxins and diversity of biodegrading bacterial populations using classic gene markers and metagenomics studies.
- Developing technological solution for biological monitoring and elimination of cyanotoxins during water treatment.

Pilot Plants

Membrane technology

Membrane technology is a generic term used for any separation process in which membranes are employed. A membrane can be defined as a physical barrier separating two phases and allowing a selective transportation of compounds from one phase to the other. Membrane technology can be used for different applications such as water purification and desalination, fruit juice concentration, milk fractionation in dairy industry, etc.

In the laboratory of membrane technology the following equipment can be found:

- Two laboratory-scale cross-flow stainless steel test units for flat-sheet membranes. The systems can be used as a microfiltration, ultrafiltration, nanofiltration or reverse osmosis.
- A spiral wound ultrafiltration and reverse osmosis membrane pilot plants that can be coupled and used in serie.
- Three stirred cell (lab scale) for ultrafiltration and nanofiltration membranes.
- A membrane bioreactor for wastewater treatment.
- A electrodialysis cell.
- A direct osmosis system
- Automatic membrane coating device with different coating speeds and different coating thicknesses to prepare membranes for different applications.

Microbial electrochemical technologies

The Microbial Electrochemical Technologies pilot plant provides an ideal space for companies in the sector that want to perform pre-industrial tests based on the interaction microorganism-electrode. Currently, different designs and configurations for the treatment of urban and industrial wastewater are operated under controlled conditions before passing to the real scale. The plant is also the site of testing activities funded by prestigious innovation programs such as H2020.

Outdoor mesocosm facilities

The mesocosm facility run by the Ecotoxicology group of the IMDEA Water Institute consists of 9 independent stream channels, 24 lotic model ecosystems of 1 m^3, and a biodiversity lagoon equipped with a macrophyte-based filter. The mesocosm facility allows the design and performance of experiments with several controls and treatments, and is perfectly suited to:

- Assess the dissipation and fate of contaminants in environmental matrices (e.g. water, sediment, biota)
- Assess the direct and indirect effects of contaminants on several biological endpoints in order to calculate safe environmental concentrations
- Evaluate the interaction between multiple stressors (chemical and non-chemical) on aquatic ecosystems

A wide range of measuring and sampling devices are available, which allow the evaluation of the following endpoints:

- Water physico-chemical parameters (DO, T, pH, EC, Alkalinity, etc.)
- Nutrient concentrations
- Biological responses at the population and community level: phytoplankton, macrophytes, zooplankton, macroinvertebrates, etc.
- Our mesocosm facility is located few meters away to our analytical chemistry lab, and can be used to represent scenarios such as those used for the regulatory risk assessment of chemicals in southern Europe.

Land application systems

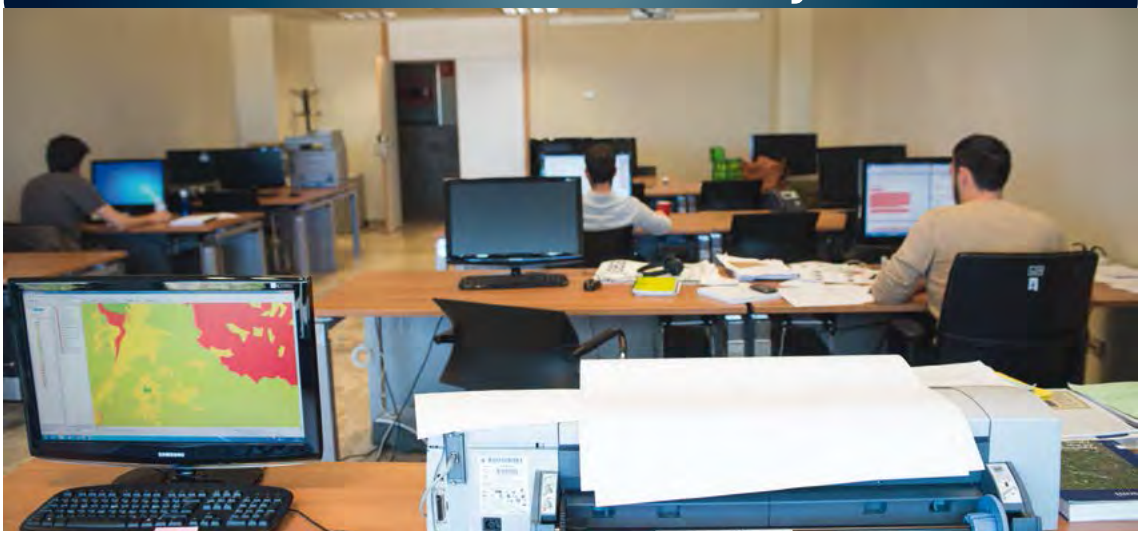
A vegetation filter (VF), as part of land application systems, is an agroforestry system, in which pretreated wastewater is applied to a soil surface with arboreal and herbaceous vegetation. The purification is done through the joint action of the soil, the microorganisms present in it and the plants, through a series of physical, chemical and biological processes.

The installed VF has an area of 60 m^2 and has planted poplars (clone I-214) with a density of 10,000 trees/ha. This is a fast growing plant species and, therefore, has high water and nutrient requirements. This allows to maximize the performance and debugging capacity of the system. In addition, the plantation undergoes short shifts (2-3 years).

The wastewater from the institute is taken to an imhoff tank to perform the pretreatment. The pretreated water is distributed under pressure to a first VF and distributed to another different pilot of wastewater treatment and that works in a complementary way. The effluent of this last pilot is used to irrigate a second VF, of characteristics homologous to the first, and which works as a tertiary treatment. To this second VF, and since the organic matter load it is going to receive is much lower, organic amendments of plant origin have been added in such a way that the organic carbon content is increased and the elimination of contaminants is enhanced through microbial stimulation and the increase of sorption processes.

These systems make it possible to carry out the integral treatment of wastewater from IMDEA Water, as well as to know and compare the response of both filters to the treatment of different water qualities.

Geomatic Laboratory



There is a need of development of tools to support the management of the water resource, through the correct assessment of the present state of the resource and its possible evolution in different scenarios. IMDEA Water works on the methodological development and application of different tools for management support, including remote sensing, spatial databases or geodatabase construction and design, and geological and hydrological modelling.

The Geomatics Unit is a resource that provides an infrastructure dedicated to solutions based on new technologies. The Lab has a complete framework consisting of a set of hardware, software, and databases, with which a wide range of needs are covered, such as:

- Modelling.
- Development of specific maps using remote sensing techniques, GPS and conventional documentary sources.
- Automation of data collection.
- Application of simulation models.

Applications research and services

- Irrigation.
- Water planning.
- Water footprint.
- Pollution control.
- Quality control.
- Floods and droughts.
- Hydraulic heritage.
- Ecological status of water bodies.
- Reuse.

Equipment

- ARCGIS.
- GIS IDRISI.
- GIS ILWIS.
- GIS GVSIG.
- SAGA GIS.
- QUANTUM GIS.
- ERDAS IMAGINE.
- ER-MAPPER.
- OPTICKS.
- Geostatistics SURFER.
- Spatial Metric Analysis -FRAGSTAT.
- Estimation of Soil Parameters, Hydrologic Modelling - HEC and SWMM family.
- Automated water data collection systems.
- Water Erosion Models - WEAP.
- Hydrogeological models: Hydrus 1D, CXTFIT, PHREEQC-2.
- Statistical analysis programs: Tanagra, R.
- Terminals under a central server.
- Peripherals of different sizes, including printers, plotters and a medium format scanner.
- Support materials that aid data collection and its inclusion in drive systems (laptops, pagers, GPS and SLR cameras).

Water and Energy Laboratory

Manufacturing

Soldering station, vacuum pumps and chambers for cell encapsulation with silicone.

Electronic testing

- DC power supply.
- Oscilloscope.
- Function generator.
- Bench multimeter.
- Datalogger.
- Basic sun simulator (artificial lamp).

Outdoors monitoring

- Pyranometer.
- UV radiometer.
- Portable spectroradiometer.
- Temperature sensor, wind speed, wind direction.
- Portable datalogger.
- Calibrated solar cells.
- Pumps.
- Shunt resistors for PV modules testing.
- Flowmeters.
- Hand multimeters.
- Waterproof temperature sensors.
- RTD sensors for modules temperatures.
- Adjustable mounting structure.

projects and contracts

projects and contracts

1. Projects

1.1. Urban and Industrial Wastewater Treatment

1.1.1. A new generation of Microbial Electrochemical Wetland for effective decentralized wastewater treatment (iMETland)

http://www.imetland.eu

iMETland project aims at unleashing the small community economies potential through innovative wastewater treatments technologies, creating a virtuous circle connecting water, energy, ICT, land resources and safeguarding the environment. The project maximises the innovation potential of the following technical features, to be tested and validated at four different geographical locations: Mediterranean (Spain), North-Europe (Denmark), South-America (Argentina) and North-America (Mexico). iMETland innovation stands in the balanced integration of technologies, which are wisely amalgamated in the environment. Exploiting the combination of water sector, energy, ICT and land resources, the project paves the way to solve small communities wastewater treatment needs in a cost effective, energy efficient and environmental friendly manner. This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 642190.

1.1.2. Microbial Desalination for Low Energy Drinking Water (MIDES)

http://midesh2020.eu/

Shortage of fresh water has become one of the major challenges for societies all over the world. Water desalination offers an opportunity to significantly increase the freshwater supply for drinking, industrial use and irrigation. All current desalination technologies require significant electrical or thermal energy, with today's Reverse Osmosis (RO) desalination units consuming electric energy of at least 3 kWh/m^3 – in extensive tests about ten years ago, the Affordable Desalination Collaboration (ADC) in California measured 1.6 kWh/m^3 for RO power consumption on the best commercially available membranes, and total plant energy about twice as high.

To overcome thermodynamical limitations of RO, which point to 1,09 kwh/m^3 for seawater at 50 % recovery, Microbial Desalination Cells (MDC) concurrently treat wastewater and generate energy to achieve desalination. MDCs can produce around 1.8 kWh of bioelectricity from the handling of 1 m^3 of wastewater. Such energy can be directly used to i) totally remove the salt content in seawater without external energy input, or ii) partially reduce the salinity to lower substantially the amount of energy for a subsequent desalination treatment. MIDES aims to develop the World's largest demonstrator of an innovative and low-energy technology for drinking water production, using MDC technology either as stand-alone or as pre-treatment step for RO.

The project focuses on overcoming the current limitations of MDC technology such as low desalination rate, high manufacturing cost, biofouling and scaling problems on membranes, optimization of the microbial electrochemical process, system scaling up and economic feasibility of the technology. This will be achieved via innovation in nanostructured electrodes, antifouling membranes (using nanoparticles with biocide activity), electrochemical reactor design and optimization, microbial electrochemistry and physiology expertise, and process engineering and control.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 685793.

1.1.3. Advanced Nutrient Solutions With Electrochemical Recovery (LIFE ANSWER)

http://life-answer.eu/es/

The purpose of this project is to demonstrate the technical and economic feasibility of electrocoagulation and bioelectrogenic microbial treatments in medium to small indus-

try wastewater treatment plants for zero effluent discharge. These treatments can solve the environmental problem from that kind of industries, one of the main wastewater generators right now.

The project will be developed in one of the most important beer production plant of Europe (Alovera, property of MAHOU) at a demonstration scale treating real wastewater effluent in such a way that the feasibility of a solution reproducible to other areas will be shown, involving the main stakeholders (food and drink industries, local entities, and water public bodies) during the project implementation.

1.1.4. Microbial electrochemical strategies oriented to a sustainable and decentralized urban waste water reuse (MET4HOME)

MET4HOME aims to take advantage of the metabolism of these microorganisms to change the paradigm of decentralized water purification through the design, construction and validation of a compact prototype designed to purify and disinfect the water generated by an isolated dwelling (up to 8 eq/inhab) Allowing its reuse for irrigation, sanitary tanks, etc. Taking advantage of the use of electrochemical instrumentation, we will install an electrodisinfection system for the elimination of pathogens.

1.1.5. Madrid Advanced Wastewater Treatment Network with Non-Biodegradable Pollutants (REMTAVARES 3)

http://www.remtavares.com/

REMTAVARES 3 is the reference point in terms of advanced technologies in wastewater management to ensure sustainable development for the Community of Madrid.

The lines of research that support these technologies are: treatment advanced technologies (physical, membrane, advanced oxidation and chemical processes) and testing the ecotoxicological effects of pharmaceutical compounds on surface and groundwater crustaceans.

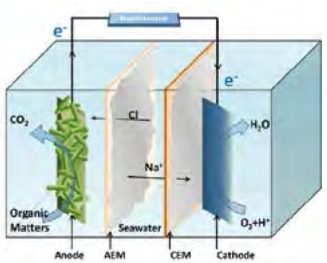
1.1.6. Low-energy technology for drinking water: microbial desalination (BioDES)

Shortage of fresh water has become one of the major challenges for societies all over the world. Water desalination offers an opportunity to significantly increase the freshwater supply for drinking, industrial use and irrigation. All current desalination technologies require significant electrical or thermal energy, with today's Reverse Osmosis (RO) desalination units consuming electric energy of at least 3 kWh/m^3 in extensive tests about ten years ago, the Affordable Desalination Collaboration (ADC) in California measured 1.6 kWh m-3 for RO power consumption on the best commercially available membranes, and total plant energy about twice as high, once pre-treatment and pumping is factored.

To overcome thermodynamical limitations of RO, which point to 1.09 kWh m-3 for seawater at 50 % recovery, Microbial Desalination Cells (MDC) concurrently treat wastewater and generate energy to achieve desalination. MDCs can produce around 1.8 kWh of bioelectricity from the handling of 1 m^3 of wastewater. Such energy can be directly used to i) totally remove the salt content in seawater without external energy input, or ii) partially reduce the salinity to lower substantially the amount of energy for a subsequent desalination treatment. BioDES aims to develop an innovative and low-energy technology for drinking water production, using MDC technology either as standalone or as pre-treatment step for RO.

The project will focus on overcoming the current limitations of MDC technology such as low desalination rate, high manufacturing cost, biofouling and scaling problems on membranes, and optimization of the microbial-electrochemical process. This will be achieved via innovation in nanostructured electrodes, antifouling membranes (using nanoparticles with biocide activity), electrochemical reactor design and optimization, microbial electrochemistry and physiology expertise. The project envisages the following main advancements over the current state of the art:

- Salt removal rate in MDC of 75-90% before RO system.
- Integrated wastewater treatment (WWT): removal of 90 % Chemical Oxygen Demand (COD).
- Desalination of seawater with energy consumption below 0.5 kWh m-3, about half of the thermodynamic energy limit of RO.
- 85% reduction in energy cost compared with current desalination plants through efficient operation and energy management.
- At least 75% reduction of the cost of desalinated water.



- Innovation in MDC design, increasing 20-fold current desalination production achieved at the moment in the largest MDC system: from 2.4 kg TDS m-3 day-1 to 40 kg TDS m-3 day-1 (referred to desalination chamber).
- Meetings with water companies at the end of the project to collaborate in market uptake of the BioDES technology.

It is important to note that IMDEA is founding members of the EIP Action Group MEET-ME4WATER. The Action Group is focused on overcoming the barriers to scale-up and demonstration of microbial electrochemical technologies (METs) and to bring them faster to market. Thus, the development of BioDES Project will provide a technological breakthrough by demonstrating the energy efficiency and the environmental benefits of such technologies for the production of drinking water, and allow fast dissemination of the advances and facilitate market uptake.

1.2. Reclaimed Water Reuse

1.2.1. Water reclamation by using a new concept of land application systems (FILVER+)

With the reference CTM2016-79211-C2 (AEI/FEDER, EU), is funded by the State Research Agency (AEI) and the European Regional Development Fund ERDF), and is part of the 2016 call for R+D+i projects of the Ministry of Economy, Industry and Competitiveness.

FILVER+ project considers the development of an Amended Land Application System (ALAS) as a technology of secondary and tertiary treatments, to maximizing removal of nutrients, microparasites/pathogens and emerging pollutants, by application of low cost and easy acquisition amendments. That will give as result a reduction of the required surface for the IVF installation and an increase of the quality of the infiltrated water, thus diminishing the impact on the underlying aquifer. The project is oriented to the search of solutions to fulfil the environmental objectives required by the Water Framework Directive, as it is recorded in the Actions Program included in the Hydrological Plans of River Basins for the Second Cycle (2015-2021), for which an investment of more than seven thousand millions of euros is planned.

1.2.2. Irrigation of crops with surface water contaminated with pharmaceuticals and trace metals: natural attenuation or health risk? (FatePharM)

Surface water is the main receptor of wastewater treatment plant (WWTP) effluents from large cities. The use of this resource for crop irrigation raises the urgent need to study the contaminant transfer encompassing the global "Source-Propagation-Receptor" system.

Through a multidisciplinary and multiscale approach, FatePharM addresses the concerns raised in the scientific-technical, social and economic spheres by the presence of pharmaceuticals and trace metals (TMs) in the context of Chemical Mixtures (CMs). In this sense, the challenge of FatePharM relies in the identification of the risk for food safety (human health) and the environment associated with the indirect reuse of contaminated surface water for crop irrigation. The two areas of action are: 1) The evaluation of the transfer of pharmaceuticals, transformation products (TPs) and TMs in CMs; and 2) The identification and quantification of the chemical and ecotoxicological impact of the pharmaceutical-TM interaction. For these reasons, the Jarama river basin has been selected as the study area.

The study area supposes an unbeatable scenario since it consists of an alluvial aquifer located downstream of the city of Madrid whose soils use is almost totally designated for intensive agricultural practices. These lands are irrigated by flooding with surface waters of the Presa del Rey and the Real Acequia del Jarama, receptors of effluents from the main EDARs of Madrid. This context can be extrapolated to the entire Mediterranean area, considered a vulnerable scenario in the climate change forecasts. According to the area of action, the project has been structured in two working scales that will be addressed in a complementary way: 1) The source of contamination (WWTP), the propagation (Presa del Rey and Real Acequia del Jarama) and the receptor (agricultural soils and crops) of pharmaceuticals, TPs and TMs in the study area will be evaluated at the field scale during 1 year; 2) the impact of pharmaceutical-TM interactions in CMs during infiltration through the soil will be evaluated at laboratory scale by means of infiltration reactors specifically designed for monitoring of contaminants (transport, microbiological activity and bioassays with crops). The synergy of the professional trajectory of the two PIs, Dras. Ana de Santiago and Raffaella Meffe, is pivotal for developing FatePharM. The multidisciplinarity of the team components represents an excellent combination for carrying out the project, since it gathers their experience with CMs, (pharmaceuticals and TMs), different approaches (physicochemical, ecotoxicological), environmental compartments (water, soil, biota) and working scales (field, laboratory). The impact of FatePharM reaches different aims. From the social point of view, it helps to determine the risk for human health by the studied contaminants. This also economically impacts on the selection of those minimizing this risk when prioritizing their use against others. Finally, the limited literature in this respect implies a clear scientific and technical impact.

1.3. Economic and Institutional Analysis

1.3.1. Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services Across EU Policies. AQUACROSS

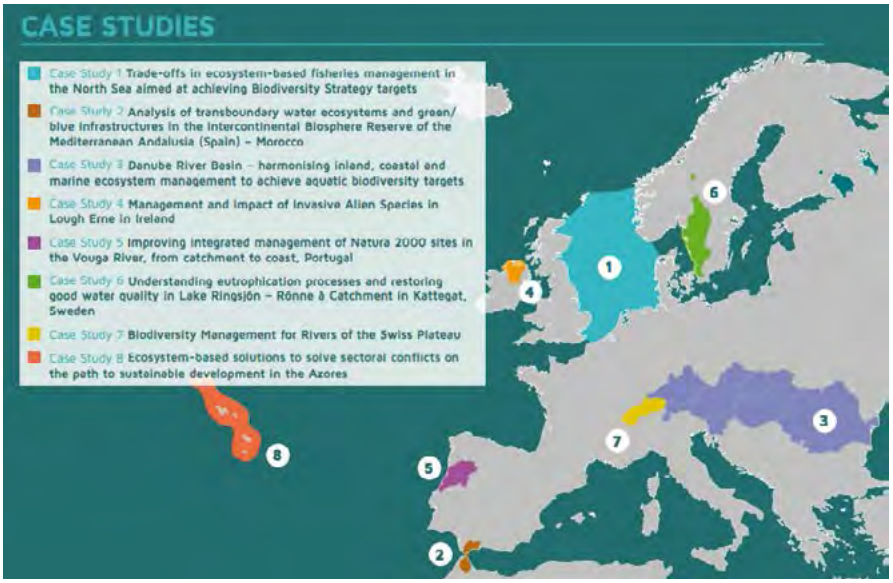
http://aquacross.eu/

This project aims to support EU efforts to protect aquatic biodiversity and ensure the provision of aquatic ecosystem services. Funded by Europe's Horizon 2020 research programme under Grant Agreement no. 642317, AQUACROSS seeks to advance knowledge and application of ecosystem-based management (EBM) for aquatic ecosystems to support the timely achievement of the EU 2020 Biodiversity Strategy targets.

To do this, AQUACROSS considers the EU policy framework for aquatic ecosystems and builds on knowledge stemming from different sources to develop innovative management tools, concepts and business models for aquatic ecosystems.

The AQUACROSS approach is built around four pillars of work and eight case studies:

- Pillar 1: Real-world testing—the project will ensure stakeholder engagement, knowledge exchange and social learning to achieve practical policy solutions and end-user uptake.
- Pillar 2: Giving direction—it is important to understand the current political setting in order to facilitate policy coordination across aquatic ecosystems.
- Pillar 3: Increasing scientific knowledge—work under this pillar will develop and test protocols and guidance materials for testing the AQUACROSS AF in the case studies.
- Pillar 4: Improving management— building on the work undertaken in the previous pillars, this pillar aims to develop concepts, practices and tools for better implementation of EBM.



EIP Water Action Group
Pooling resources - Innovating water

River~Res
RiverRestorationBenefits

1.3.2. "River Restoration Benefits" (RiverRes)

http://www.eip-water.eu/RiverRes

The vision and mission of the RiverRes Action Group is to provide a Roadmap to address current policy challenges as opportunities for innovation through river restoration, as an example of nature based solutions. In particular, how river restoration can increase the effectiveness of EU directives and policy implementation. The current challenge -as identified in a number of documents like the EU Blueprint, the Biodiversity Strategy 2020, Climate Change Adaptation Strategy, Water Scarcity & Drought Policy, etc. is implementation and innovation.

Some of the policy challenges that can be tackled in an integrated manner include for example:

- Improving water quality: so that the positive ecosystem services from more natural river system are internalised in relation to water quality;
- Prevention against extreme events: river restoration actions to recover the lateral connectivity and floodplain are an effective Green infrastructure solution to contribute to flood control and to groundwater recharge;
- Protection of biodiversity: rehabilitating river systems contributes to restore the natural habitat of aquatic biodiversity.

RiverRes mainly targets projects that aim to reduce hydro-morphological pressures and facilitate the processes of "re-naturalization" of which allows -not only to improve their ecological status - but also to enhance the delivery of potential ecosystem services, under an integrated approach in the implementation of several EU Directives.

1.4. Membrane Technology

1.4.1. Transformation of disposed reverse osmosis membranes into recycled ultra-and nanofiltration membranes

http://www.life-transfomem.eu/

TRANSFOMEM is an European Community co-funding LIFE project with contract number LIFE13 ENV/ES/000751 coordinated by IMDEA WATER. It aims to develop an innovative recycling process for reverse-osmosis membranes disposed in landfills. End-of-life reverse osmosis membranes are transformed to lower pressure ultra-nanofiltration membranes in order to use them for wastewater treatment. LIFE TRANSFOMEM is framed in the "LIFE+ Environment Policy & Governance" component: pilot projects that contribute to the development of innovative policy ideas, technologies, methods and instruments.

1.4.2. Preparation, modification and characterization of pressure-driven membranes

The IMDEA Water membrane research group is focused on studying the whole membrane process life cycle: from membrane preparation, to their use in water treatment until their recycling. The group is developing new generation antifouling membranes by surface modification and the addition of nanoparticles. Further, water treatment by different types of membranes such as reverse osmosis (RO), nanofiltration (NF), ultrafiltration (UF) and microfiltration (MF) is carried and their process performance is evaluated. After recycling the membranes (project LIFE-TRANSFOMEM), the group studies the modification of recycled membranes in order to find new applications in wastewater treatments. As an example, there is an active collaboration with the REMTAVARES 3 project, where the membrane technology group is focused on the modification of recycled membranes for the removal of emerging compounds from hospital wastewater.

The group is also developing research on the characterization, fouling (membrane autopsy) and effectiveness of different cleaning treatments of commercial membranes.

The IMDEA Water membrane research group by its associated researcher from Complutense Univesity of Madrid, works also on the fabrication, modification and characterization of different types of new-generation membranes for a wide variety of separation processes such as membrane distillation (MD), forward osmosis (FO) and pervaporation (PV) that are implemented at different environmental applications.

1.4.3. Innovation and recycling of membranes for water treatment (INREMEM) http://inremem.simplesite.com/

The main objective of the coordinated project INREMEM is to recycle disposed reverse osmosis membranes (at laboratory scale) and to transform them into membranes that will be used in the the treatment of waters from different sources: wastewater, surface water and osmotic solutions. For this reason, INREMEM studies 5 different techniques where the recycled membranes will be implemented: i) biomembranes (BM) for the treatment of surface water, ii) membrane bioreactors (MBR) for wastewater treatment, iii) forward osmosis for wastewater treatment, iv) electrodialysis (ED) for the regeneration of osmotic solutions and v) membrane distillation (MD) for the regeneration of osmotic solutions.

INREMEM studies an alternative membrane management route to the disposal in landfills once the membranes are not capable of achieving the objectives set in the water treatment processes. In this way, INREMEM will contribute to the effort of the European Union to become a "recycling society", as it is set in the Waste Framework Directive (Directive 2008/98/CE).

1.4.4. Immobilized Laccases for the degradation of aromatic compounds from wastewaters (LIDA)

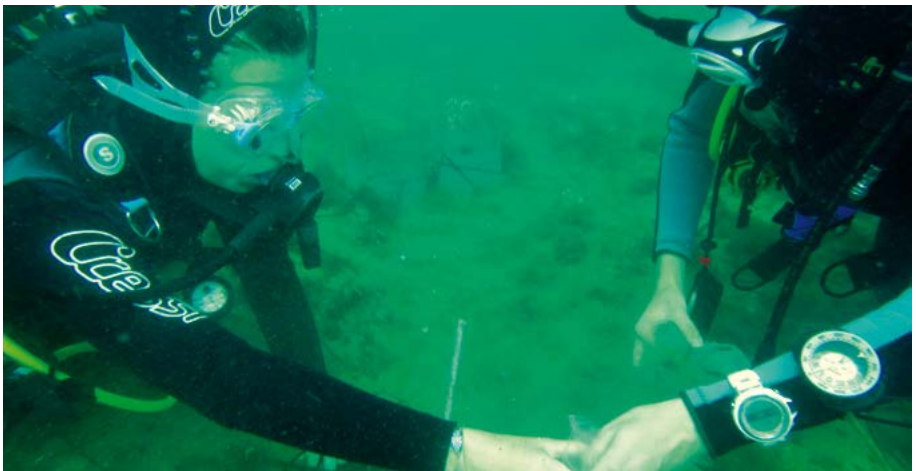
The main objective of LIDA network is to develop sustainable strategies for the degradation of phenolic and aromatic compounds from different industrial wastewaters such as manufacturing industry and agriculture using immobilized novel laccase enzymes. LIDA network is composed by 15 research groups and more than 100 researchers coming from 7 Ibero-American countries (Argentina, Colombia, Costa Rica, Cuba, Ecuador, Spain and Mexico). In this way, the network will promote the exchange of professors and PhD students between the research groups. In addition, the network will boost the cooperation between research institutes and industries, creating new consortiums and research projects related to the research line of the LIDA network.

1.5. Ecotoxicology

1.5.1. Tools for Assessment and Planning of Aquaculture Sustainability (TAPAS) http://tapas-h2020.eu/

Aquaculture is one of five sectors in the EU's Blue Growth Strategy, aimed at harnessing untapped potential for food production and jobs whilst focusing on environmental sustainability. The H2020 TAPAS project led by the University of Stirling (UK) and formed by 15 partners from 10 European countries addresses this challenge by supporting member states to establish a coherent and efficient regulatory framework aimed at sustainable growth. TAPAS uses a requirements analysis to evaluate existing regulatory and licensing frameworks across the EU, taking account of the range of production environments and specificities and emerging approaches such as offshore technologies, integrated multi-trophic aquaculture, and integration with other sectors. TAPAS will propose new, flexible approaches to open methods of coordination, working to unified, common standards. TAPAS will also evaluate existing tools for economic assessment of aquaculture sustainability affecting sectoral growth. TAPAS will critically evaluate the capabilities and verification level of existing ecosystem planning tools and will develop new approaches for evaluation of carrying capacities, environmental impact and future risk. TAPAS will improve existing and develop new models for far- and near-field environmental assessment providing better monitoring, observation, forecasting and early warning technologies. The innovative methodologies and components emerging from TAPAS will be integrated in an Aquaculture Sustainability Toolbox complemented by a decision support system to support the development and implementation of coastal and marine spatial planning enabling less costly, more transparent and more efficient licensing. Within the TAPAS project, the Ecotoxicology group of the IMDEA Water Institute is particularly involved in the ecotoxicological risk assessment of potentially toxic chemicals. The main research tasks are:

- Improvement of environmental modelling tools.
- Development of appropriate environmental quality standards.
- Ecotoxicological risk assessment of chemicals in several freshwater and marine aquaculture production scenarios.



1.5.2. Impacts of MicroPlastics in Agro-Systems and Stream Environments (IMPASSE)

http://www.waterjpi.eu/joint-calls/joint-call-2016-waterworks-2015/impasse

There is evidence to suggest that each year in North America, farmed soils are exposed to up to 300,000 tonnes of MPs, which are less than 5mm in size. It is unknown whether these MPs have any direct or indirect effects on agrosystems or the freshwater environment. A primary source of MPs to agrosystems is thought to be biosolids, grey water, or sludge, which are an important source of fertiliser. It is important to foster a better understanding of any potential effects of MPs, and to develop shared management solutions. The aim of this project is to find resolutions which will safeguard agricultural sustainability, economic goals, and human and animal health. The project will be overseen by the Norwegian Institute for Water Research and is run in collaboration with three additional institutions across Europe (the Swedish University of Agriculture, the Vrije University of Amsterdam, and IMDEA-Water in Spain) and one Canadian (Trent University, Toronto). It consists of 5 inter-connected work packages which look at exposure (WP1), impacts (WP2), decision support tools (WP3), stakeholder engagement (WP4) and scenario assessment (WP5).

WP 1: Exposure

The movement of MPs at the field scale will be quantified and tracked. We will take samples of the biosolids before they are applied to the land, as well as sampling soil and runoff samples. Our project partners will be developing mechanisms to remove MPs from sewage sludge, with the aim of being able to provide MP-free materials for future farming activities. We will be conducting sampling in the Simcoe watershed during a few key events (heavy rainfall, drought) over the course of one year.

WP2: Impacts

Project partners will be assessing the uptake and responses of soil and freshwater organisms to exposure of MPs and associated chemicals through laboratory experiments. Chemicals investigated will include those which are constituent of the original plastics, and those which may become adsorbed to the plastics in the environment.

WP3: Decision support tools

A new model of the transport, distribution and fate of MPs in soil and stream systems will be developed using data from the field study sites.

The model will be used to support conclusions when analysing the implications of different agricultural or waste-water treatment management practices developed.

WP4: Stakeholder engagement

We aim to involve stakeholders from different interested parties (local farmers, waste water treatment managers, the research community, local municipalities and Ministries). The stakeholders would be involved in the definition of the monitoring plans (WP1), informed of the results of the monitoring, and the impacts (WP2), and will be encouraged to provide inputs for defining possible management scenarios for mitigating MP exposure and impacts (WP5). Enabling the local farming community to help shape the monitoring and development of feasible management strategies is an integral part of this program, and we aim to maintain open channels of communication throughout the project.

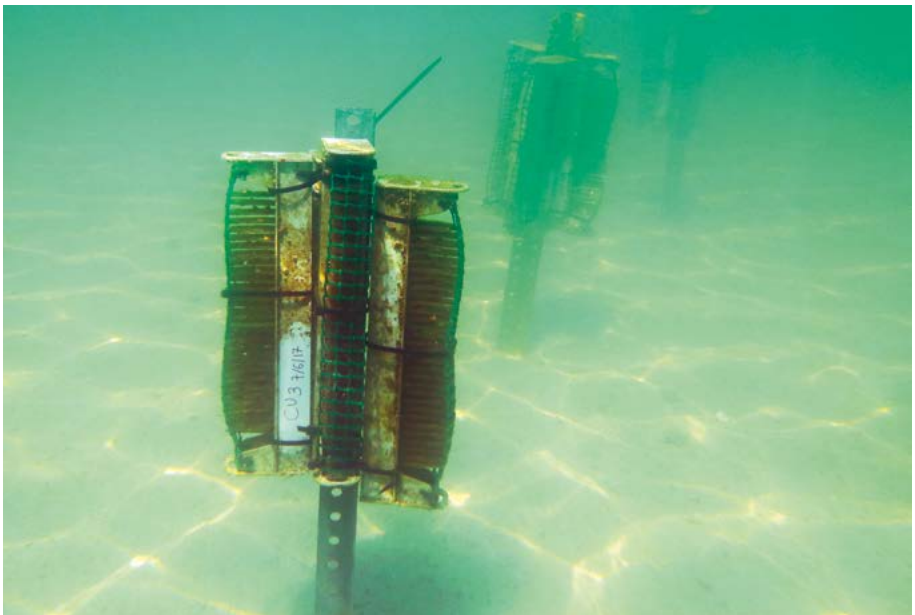
WP5: Scenario Assessment:

We will evaluate the resilience of management scenarios (under climate change) to control MP mobility, and to limit downstream transport. The implications of new technology for effluent/sludge processing will be assessed. Importantly, a comprehensive cost-benefit assessment will be performed to assess the economy of the management scenarios. Results will be communicated to stakeholders.

1.5.3. Effects of global change on the emission, fate, effects and risks of chemicals in aquatic ecosystems (ECORISK2050)

https://ecorisk2050.sites.uu.nl/

ECORISK2050 is a Europe wide project that analyses and addresses risks of chemicals of emerging concern focusing on scenarios up to 2050.



By 2050, the world population will reach nine billion people and three quarters of the global population will live in cities. The development path to 2050 will be marked by shifts in land-use and weather patterns, and by changes in the way water and food resources are obtained and managed all over the world. These global changes (GCs) will affect the emissions, environmental transport pathways and fate of chemicals, and thus affect the exposure of the natural environment to chemicals. Future changes may also alter the sensitivity of ecosystems to chemical exposure. Therefore, the ECORISK2050 project brings together a world leading and interdisciplinary consortium of universities, research institutes, industry and regulatory and governmental authorities to deliver a cohort of Early Stage Researchers (ESRs). The coupled training goals and research objectives of the project are: (1) to assess how the inputs of chemicals from agriculture and urban environments and their fate and transport are affected by different environmental conditions, including those of specific EU regions, and how this will change under GC scenarios in order to assess the likely increase in chemical risks to human and ecosystem health; (2) to identify potential adaptation and mitigation strategies that can be implemented in the short and medium term, to abate unacceptable changes in risks, and use the GC scenarios to propose robust implementation pathways, and (3) to develop a set of tools for use by industry and policy makers, that allow the impacts of a range of GC related drivers on chemicals risks to be assessed and managed.

The project will deliver the next generation of scientists, consultants and industry and governmental decision-makers who have the knowledge and skill sets required to address the changing pressures that chemicals emitted by agricultural and urban activities pose to aquatic systems on the path to 2050.

1.6. Water and Mining

1.6.1. Water and Mining Industry

Water resources are especially sensitive to mining activity, due to the intense environmental impact it causes, which in many cases includes generation of acid waters, pollution by heavy metals, modification of the hydrogeological conditions of auriferous, etc. These effects are compounded by the demand for water, especially in areas with scant resources, which often gives rise to competition with the demand from other productive sectors such as agriculture.

IMDEA Water has initiated two lines of work in the field of water and the mining industry: one in relation with the characterisation of the direct environmental impacts caused by the mining industry, and another concerning water reuse and recycling for mining purposes.

1.7. Cyanobacteria and Cyanotoxins

1.7.1. Smart alert against harmful cyanobacterial blooms for the water industry (CIANOALERT)

The objective of the CianoAlert project is to develop a real-time intelligent monitoring and alerting system to warn of the development of cyanobacteria blooms in the bodies of water destined for consumption and aquaculture facilities. The solution proposed by CianoAlert, which will allow monitoring of large areas, will combine wireless sensor network technology (sensors placed in the water) with telecommunication technologies and intelligent user interface, and the incorporation of technology controlled aircraft systems (RPAS) as remote sensing devices to obtain information relevant to the degree of affectation and the distribution and density of cyanobacteria for the implementation of a specific and sensitive system in real time, easy to handle and understand.

1.8. Climate Change

1.8.1. Towards multifunctional agricultural landscapes in Europe: Assessing and governing synergies between biodiversity and ecosystem services (TALE) http://www.ufz.de/tale/

TALE is an interdisciplinary research project funded within the framework of BiodivERsA/FACCE-JPI (duration April 2015 - March 2018). The project supports choices at the spatial scale to be considered, strategies to decide on optimal land uses and a changing environment (e.g. climate change), the appropriate mix of policy instruments to be implemented and the required monitoring and evaluation schemes. The design is accompanied by stakeholder processes at local, regional and national level to achieve a high level of policy coherence. iMDEA Water Institute contributes to the creation of a hydrological model that can reflect as accurately as possible the performance of the water resources of the Cega, Eresma and Adaja watersheds as part of the Douro River basin. Assessing both qualities an quantity of watershed resources, it will be possible to predict different effects of water management strategies, land use and impacts that could affect water resources by the climate change effects. Contact: David Rivas.

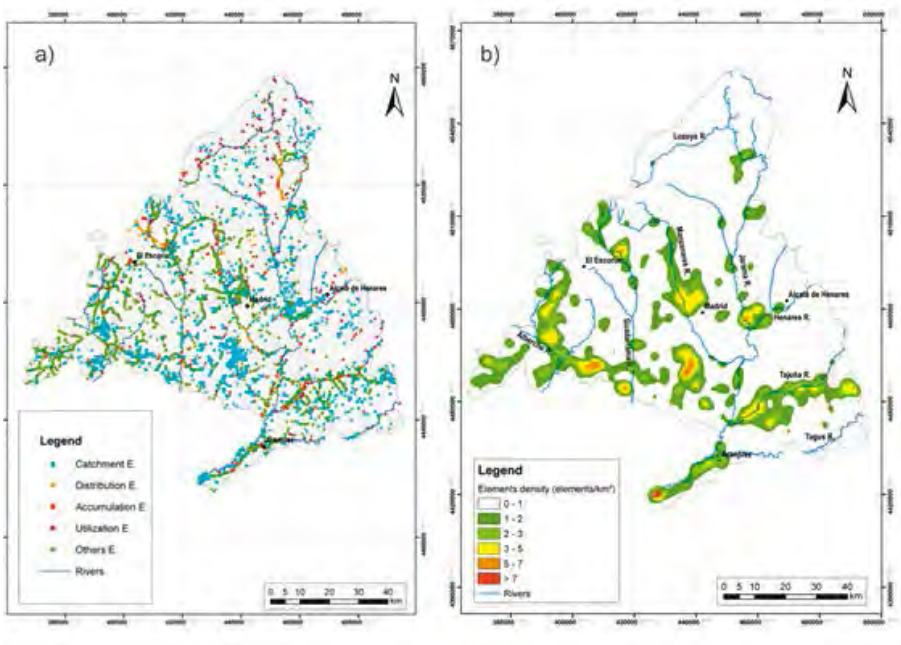
1.9. Tool Development for Water Resource Management

There is a need to develop tools to support the management of water resources, through the correct assessment of the present state of the resource and its possible evolution in different scenarios.

IMDEA Water is working on the methodological development and application of different management support tools, including remote sensing, geodatabase construction and design, and geological and hydrological modelling. Remote sensing techniques enables the location and estimation with the required precision of some important terrain features such as crop evapotranspiration, land uses, vegetation index, etc. The geodatabase records and arranges all this information, giving as result a GIS able to analyse the topological and quantitative relations of different variables. The knowledge of those variables and their relations is materialised in the implementation of a Hydrological Information System. This will allow construction of the hydrological model and will be the basis for decision-making in managing the resources.

1.10. Hydraulic Heritage

Research into water heritage aims to resolve conflicts between the existence of heritage structures and the current social need for development and growth. To this end, four main lines of action have been created:



1. Inventory and valuation of heritage systems using new technology as an integrator of different sources of data and information processing.
2. Development of valuation and territorial management support structures as useful tools for decision making.
3. Analysis of socio-economic values of water cultural heritage systems, from a sustainable strategy of traditional systems that allow their survival and constitute forms of support for endogenous economic development.
4. Assessment of heritage and traditional landscape impacts (positive and/or negative) to be integrated in a holistic manner in complex landscape systems, in which water flows are common elements.

1.11. Water and Energy

1.11.1. Solar Photovoltaics

IMDEA Water is exploring the potential of integrating solar photovoltaic technologies in water treatment processes to solve the problem of safe drinking water access and/or wastewater treatment, by developing clean and sustainable solutions for both industrial and rural applications, increasing the systems efficiencies, reducing costs, saving energy, making water treatment systems accessible to communities with limited resources and infrastructures (especially in developing countries and/or rural or isolated areas in Europe with limited access), or improving water-drinking access in emergency situations. Current research lines include:

a) photovoltaic-photochemical hybrid solar systems for the simultaneous production of drinking water and electricity with high efficiency;

b) low cost clean water sensors for solar disinfection, measuring solar global irradiance, UV irradiance and temperature, and integrating these sensors with low-cost monitoring systems based in open-hardware; and

c) water & solar energy nexus in developing countries to provide basic services and reduce environmental impact.

1.11.2. Attracting Talented Researchers within the Spanish Campus of International Excellence 'Smart Energy' and the region of Madrid (GOT ENERGY TALENT)

http://gotenergytalent.uah.es/

GOT ENERGY TALENT is a highly competitive, merit-based fellowship programme aimed at incorporating postdoctoral talent on the area of SMART ENERGY to enable them to conduct their own excellent research project and bringing it closer to the society, in order to produce a positive effect not only in terms of excellent science and talent attraction but also by strengthening the regional economy and promoting international networking.

GOT ENERGY TALENT will bring in 34 experienced researchers to develop a 24-month stay through 2 open calls at international level (17 fellowships per call), over its 60 months of implementation. The postdoctoral fellows will have a full trans-national mobility experience and access to the research facilities of the organisations partnering the programme from and outside academia. The fellows will freely decide whether to carry out a 24-month advanced research project or a 12-month advanced research combined with a 12-month period devoted to applied research, in one of the hosting institutions within the network of internationally recognised organisations on this core area.

GOT ENERGY TALENT will strengthen a favourable environment in order to attract talented and experienced researchers by offering an attractive ecosystem, composed of academic and industrial organisations focused on ENERGY AREA with a strong potential. The selection of the area is based on the objectives posed by the Research and Innovation Strategies for Smart Specialisation (RIS3) of the region of Madrid, which encompasses Energy, amongst other prioritised areas, along with the long-term vision of the Universidad de Alcalá and the Universidad Rey Juan Carlos, as it is clear from their involvement in the CIE 'Smart Energy' focusing on Bioenergy and Smart Cities. Furthermore, GOT ENERGY TALENT is a demand-driven research programme addressing the significant challenges faces Europe in the field of Energy. IMDEA Water participates as non-academic partner host institution.

2. Contracts

- WASH global: Capitalization of the SABA+ experience and conceptualization for the global up-scaling. **Swiss Agency for Development and Cooperation** (REF-1006-22600 Contract number: E-81051893).

- Framework Contract to provide services to support to Commission policy activities on the Bathing Water, Drinking Water and Urban Waste Water Treatment Directives. Water for citizens. **DG ENVIRONMENT, European Commission.**

- **EUROPEAN PARLIAMENT. Multiple framework service contract in five lots for provision of external expertise on regulatory and policy issues in the fields of environmental policies, climate change, sustainable development, public health and food safety: Lot II.**

  Evaluation support (through reports, studies, seminars...) of costs and benefits of actions and politics related with climate change.

- Framework Contract on evaluation, review and development of EU water policy. **DG ENVIRONMENT, European Commission:**

  - Integrated Assessment (IA) of the 2nd planning cycle of River Management Plans (RBMPs)

- Lake Chad Basin Groundwater Information **(World Bank).**

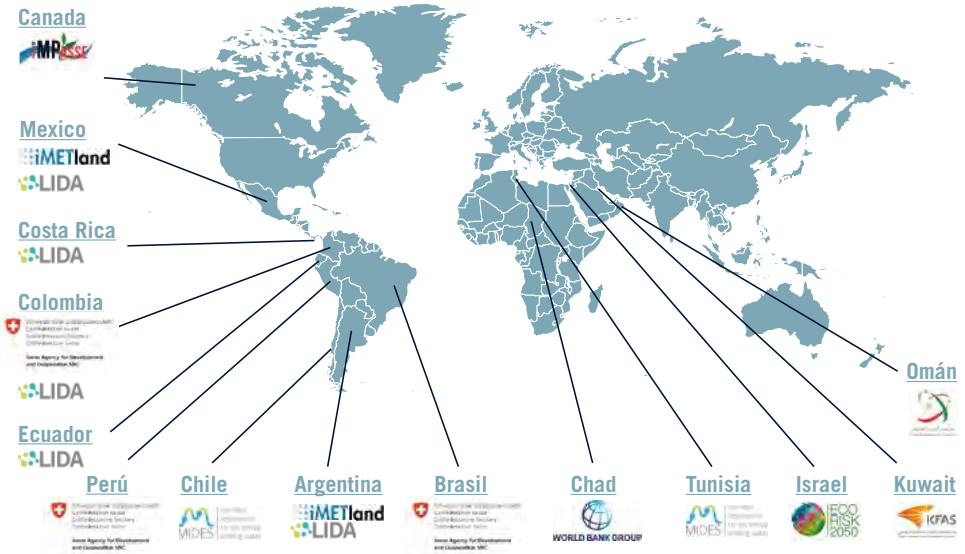
- Redacció d'informe "Revisió crítica de disseny".
  Ajuntament de Biar (Alacant)

- Study of water regeneration through land application systems: removal of nutrients and emerging pollutants. **Laboratorios tecnológicos de Levante S.L.**

- Use of end-of-life reverse osmosis membranes to treat wastewater for industrial and agricultural use. **Research Council (TRC) of Oman**

- Sustainable Desert Ecosystem Management with Use of Treated Wastewater for Forage Irrigation in Kuwati. **Kuwait Foundation for Advancement in Science (KFAS)**

International collaboration in projects and contracts



human resources

research groups

Membrane Technology

Ecotoxicology

Reclaimed water reuse

Hydraulic heritage

Microbial Electrochemical Technologies

Cyanobacterias and microbial contamination

Biological and Advanced oxidation technologies

Economic and institutional analysis

Water and energy

Membrane Technology

Dr. Eloy García Calvo

Director

He received his Ph.D. in Industrial Chemistry from the Complutense University of Madrid in 1980. Since 1992 he is professor of Chemical Engineering at the University of Alcalá (UAH). He directs a project of the first call Consolider-Ingenio 2010, www.consolider-tragua.com, involving 180 researchers from 24 research groups in Spain. He also coordinates the CNR COP (National Reference Centre for Persistent Organic Pollutants) www.cnrcop.es, MARM Ministry and collaboration between INIA and UAH. As a researcher in the areas of biotechnology and, especially, environment he has led 31 research projects at European, national and regional level. He has also been responsible of 14 projects in collaboration with companies and private funding. Other results include 7 patents, and about a hundred of scientific papers, mostly in the most relevant journals in the area, and 13 PhD directed.

Currently, he is the research coordinator of the project LIFE TRANSFOMEM, and he also coordinates a spanish project: INREMEM. Since 2017 he leads the WATER JPI IMPASSE project. He has been part of the evaluation panel of Environmental and Climate Programme in the 3FP and 4FP of the EU, the International Geosphere-Biosphere Programme (ICSU), Expert Panel on Technology and Technology Transfer at the UN and the Working Party on Biotechnology-Electronic Discussion Group of the OECD on the issue of safe drinking water. He has previously been Vice Chancellor for Research at the UAH, Manager of RTD Environmental programme within the National RTD, a member of the CNEAI (National Evaluation of Research Activity) (board nº6 of architecture and engineering), Coordinator of Technology Programme for the Environment of the Madrid Region and evaluator of scientific projects in the European Union, Hungary, Argentina and Spain (Galicia, Aragon, Basque Country). He has also published opinion articles in environmental and science newspapers.

Among the awards, special mention of the UAH, 2007, in transfer of knowledge and the Prize of the IWA (International Water Association) in the category of "Sustainability: practical implementation" received during world congress of the association held in November 2010 in Montreal.

Furthermore, during the Science Gala 2012, Consolider Tragua was acknowledged by the Directorate General of Technical and Scientific Research as one of the five projects that represent the quality of the Spanish science.

Dr. Mohamed Khayet Souhaimi

Associated Researcher

PhD in Physics. He is Full Professor at the Faculty of Physics of the Complutense University of Madrid. He is an expert on membrane science and technology (membrane design and fabrication, membrane processes including nanofiltration, emerging technologies) and water treatment (desalination, wastewater treatment, etc.). He has contributed a substantial number of articles (over 120 papers since 2000) on the subject of membrane science and technology to various international refereed journals, including among others, Journal of Membrane Science and Desalination. He has filed 5 International Patents on the fabrication of polymeric membranes for water treatment. Recently, he has published 3 books: "Membrane Distillation: Principles and Applications", Elsevier (2011)", "Membrane Modification: Technology and Applications", CRC Press, Taylor & Francis Group (2012) and "Pervaporation, Vapour Permeation and Membrane Distillation", Elsevier (Woodhead Publishing Ltd) (2015); and edited 5 special issues in international journals. He has coordinated various national and international projects funded by different institutions (European Union, Spanish Ministry of External Affaires, Spanish Ministry of Science and Innovation, Middle East Desalination Research Center (MEDRC), Abengoa Water, etc.).

He has supervised several research studies (9 Ph.D. thesis, 25 master thesis and undergraduate students). He is currently member of the European Desalination Society (EDS), the European Membrane Society (EMS) and the North American Membrane Society (NAMS). He has delivered over 60 oral presentations at national and international conferences on membranes and membrane processes and presented more than 45 posters. He is actually associate editor of the journals "Desalination" and "Water and Desalination Research Journal", and member of the editorial board of the Journals: "Applied Membrane Science & Technology", "Membrane Water Treatment (MWT)", "Membranes", "Polymers", "Applied Sciences", "Journal of Materials Science and Nanotechnology", "SAJ Nanoscience and Nanotechnology" and "Journal of Membrane Science and Research". He has recently received the prestigious "Prince Sultan Bin Abdulaziz International Prize for Water" (PSIPW, 5th edition, 2012) on Alternative Water Resources (Saudi Arabia) for his novel and creative work in membrane distillation (MD) technology that he has studied and promoted in all its theoretical and experimental aspects (from membrane synthesis to implementation).

Dr. Serena Molina Martínez

Researcher

She obtained her PhD by the Complutense University of Madrid in 2012. Her knowledge about material science has been complemented with the Master Degree in Advanced Specialization in Plastics and Rubber at Menéndez Pelayo International University (UIMP) and Spanish National Research Council (CSIC).

During 4 years she worked at Institute of Polymer Science and Technology (ICTP-CSIC). She has wide experience in the evaluation, modification and characterization of polymeric membranes (reverse osmosis, nanofiltration, ultrafiltration and electrodialysis).

She has participated in 8 research projects about development and testing of polymeric membranes for different water treatments. She has taught laboratory practices in the Master of Advanced Specialization in Plastics and Rubber. She has presented 22 communications at several national and international conferences. She has 16 scientific articles published in international scientific journals, a patent and a book chapter. She joined IMDEA Water in July 2014. Currently; she is involved in different projects related to desalination and wastewater treatment.

Dr. Junkal Landaburu Aguirre

Researcher

Dr. Junkal Landaburu Aguirre obtained the degree of M.Sc (Chemistry) in 2004 from the University of Basque Country, Spain. She started her PhD studies in 2006 in the Environmental and Chemical Engineering group of the University of Oulu, Finland. Her PhD thesis was focused on the removal of heavy metals from phosphorous rich wastewaters using membrane technology (Micellar-Enhanced Ultrafiltration). After defending her thesis she continued working at the University of Oulu as a postdoctoral researcher. During this period, she made a one year research stay (01/01/2014 - 31/12/2014) in the Chemical and Environmental Engineering group of the University Rey Juan Carlos, Spain, where she focused on the preparation of thin film composite membranes with nanoparticles.

She joined IMDEA Water in January 2015 with a Marie Skłodowska-Curie AMAROUT fellowship.

In addition, she has participated in 14 national and international projects, being most of the projects focused on industrial waste water treatment with a wide international and industrial collaboration. She has 20 scientific articles, 1 book chapter, 1 patent and 25 communications in international conferences.

Dr. Raquel García Pacheco

Researcher

She worked at IMDEA Water for 8 years (2010-2018). In that time, she developed her PhD within Hydrology and Water Resource Management Program and managed the European project LIFE-TRANSFOMEM. She was also actively involved in 8 diverse projects at national, regional and international level; related to water treatment and dissemination activities. As a result of her research activity she reached: 1 Patent, 1 Intellectual Registration Protection, 1 Thesis, 7 scientific papers (6 of them are in Q1), 5 book chapters, 6 dissemination papers and 20 congresses (most of them oral presentation).

Her interest on water topic is not only academic but also social. She is volunteer member of the emergency response units (ERU) of Spanish Red Cross (ERU Water and Sanitation and ERU Mass Sanitation) and has been deployed in 4 international emergencies.

Since June 2018 she is an associate researcher of IMDEA Water and a Post-doctoral researcher TECNIOSPRING+MARIE SKLODOWSKA CURIE at LEQUIA group of University of Girona. She spent one year at UNSW (Australia) to conduct the first year of Mem 2.0 project (Integration of second hand membranes in water process, 2018-2020).

Dr. Nataraj Sanna Kotrappanavar

Researcher

He received his PhD on Membrane Based Separation Processes Science from Centre of Excellence in Polymer Science, Karnatak Univeristy, India (2008). He worked as Postdoctoral Associate at Alan G McDiarmid Energy Research Institute, Chonnam National University, South Korea (2007-09) and at Institute of Atomic Molecular Sciences, Academia Sinica, Taiwan (2009-10). Further, he worked as Qatar University visiting fellow (2010-11) and full time Postdoctoral Research Associate (2011-13) at Cavendish Laboratory, University Cambridge, UK. Later he worked as DST-INSPIRE Faculty Fellow (2013-15) at CSIR-CSMCRI (India) where his main areas of research was to develop Sustainable Materials and Processes for Energy and Environmental applications.

Since 2015 he is Associate Professor at Centre for Nano and Material Sciences, Jain University, India.

In October 2018 he joined IMDEA Water as researcher under the Talent Attraction Programme funded by the Community of Madrid (ref. 2017-T1/AMB5610), developping the project “Functionalized Nanocomposite Membranes for Water Treatment Applications”.

He has 50 Research Articles, 9 US/PCT Patents (6-granted, 3-filed) and 2 Book Chapters to his credit.

Dr. Manuel Enrique López Sepúlveda

Research Support

BSc in Chemical
MSc on Integral Water Management by the University of Cadiz
Research: European project LIFE13 ENV/ES/000751 TRANSFOMEM (Transformation of disposed reverse osmosis membranes into recycled ultrafiltration and nanofiltration membranes).

Laura Rodríguez Saez

Research Support

Degree in Environmental Sciences from Autonoma University of Madrid
MSc in Environmental Management, Quality and Audit
Research: European project LIFE13 ENV/ES/000751 TRANSFOMEM (Transformation of disposed reverse osmosis membranes into recycled ultrafiltration and nanofiltration membranes).

Amaia Ortiz de Lejarazu Larrañaga

Predoctoral Researcher

Degree in Environmental Sciences from the University of the Basque Country
Research: Membrane technology.

Jorge Senán Salinas

Research Support

Degree Environmental Science at the University of Barcelona
MSc in Hydrology and Water Resources Management at University of Alcalá & University Rey Juan Carlos
Research: **INREMEM** project - CTM2015-65348-C2-1-R (MINECO/FEDER). Innovation and recycling of membranes for water treatment.

Reclaimed water reuse

Dr. Irene de Bustamante Gutiérrez

Deputy Director

Ph.D. in Geological Sciences from the Complutense University of Madrid.

Since 1990 is Professor in the Department of Geology at the University of Alcalá. She is currently Director of the Master's Degree in Hydrology and Water Resource Management.

Since 2007 she is the Deputy Director of IMDEA Water Institute. Among her current research may include: hydrogeology, water quality and pollution, reuse of reclaimed water for irrigation and aquiefers recharge and environmental cartography.

She has participated in 60 projects and research contracts, in 35 of them being the principal investigator. The results are reflected in more than 200 papers in journals, books and papers, three patents and a software.

She has also directed 8 doctoral theses, licentiate 4 PhD and 35 master's projects.

Also noteworthy is her work as Director of the Master in Hydrology and Water Resources Management, besides being part of the Educational Commission of the PhD in Hydrology and Water Resources Management.

She recently won several research awards, 3 of them related to Consolider Tragua "Treatment and reuse of wastewater for sustainable management", granted by the Board of the University of Alcalá in 2007; by the International Water Association in 2012 within of the category "Grand prize in the practical realization" and by the Directorate General of Technical and Scientific Research in 2012 as one of five representative projects funded scientific quality recently by the Spanish National Research Plan. She also won a second prize in 2012 during the XIV edition of the 3M Foundation Awards for innovation for her work "Evolution of traces of drugs in the treatment of urban waste water."

Dr. Francisco Javier Lillo Ramos

Associated Researcher

He graduated in Geology in 1985 from the Complutense University of Madrid and got the Diploma in Geological Engineering in 1985. He obtained a Ph.D in Earth Sciences from the University of Leeds (Britain). Afterwards, he spent ten years working in the industry, mainly as field geologist. In 1999, he joined the academic staff of the University Rey Juan Carlos, where is teaching geology and hydrology and is the Head of the Group of Geology since then. He obtained the academic tenure in 2003. Dr. Lillo is the co-director of the Master of Hydrology and Water Resources Management (University of Alcalá-URJC) since 2005. He has published over 60 research papers, including 47 articles in peer-reviewed journals and 6 books and metodologic guides. He has been participant in 22 research projects (Spain, Chile and European Union), in 8 of them being the principal investigator. Dr. Lillo has also collaborated in several projects with industry. His research is currently focused on studies about regeneration and water quality; hydrochemical characterisation of groundwater and surface water: environmental impacts assessment of mining in air, soils and water and studies of abiotic environment in ante glacier ecosystem.

Dr. Francisco Carreño Conde

Associated Researcher

Graduated in Geological Sciences from the Complutense University of Madrid and obtained a Ph.D. for the Rey Juan Carlos University. He worked for four years in a private sector environmental company and three years on a research grant in remote sensing (Complutense University of Madrid).

He has been Professor of Biology and Geology Department at Rey Juan Carlos University since 2002. He is a co-author of six papers in international peer-reviewed journals, one scientific book and four chapters of scientific books, and more than 40 marine geology and geomorphology maps. His research is currently focused on remote sensing and GIS techniques applied to prospecting, management and conservation of water, geology, detection of submarine groundwater discharges. He has also experience in 3D geological surfaces for groundwater modelling.

Dr. Raffaella Meffe

Researcher

Graduated in Geological Science with specialization in hydrogeology at the University of Rome "La Sapienza" in 2007. During her master thesis, she carried out the characterization of a carbonatic aquifer to quantify the natural groundwater resource for a suitable drinking water management.

She obtained her PhD at the Free University of Berlin in 2011. The PhD research was mainly focused on organic contamination of groundwater used for drinking water production.

She published papers in international peer-reviewed journals and attended international conferences.

Dr. María del Carmen Cabrera Santana

Associated Researcher

Ph.D. in Geology from the University of Salamanca. She has developed his professional work in the Geological and Mining Institute of Spain, in the Hydraulic Service in Las Palmas (Directorate General of Water. Canary Islands Government) and the University of Las Palmas de Gran Canaria, as Professor since 2003. Her research focuses mainly in the field of Hydrogeology of volcanic terrains, but she has also conducted studies on the stratigraphy and sedimentology of the Las Palmas detritic Formation. She is the author of numerous national and international publications.

Dr. María del Pino Palacios Díaz

Associated Researcher

PhD in Agricultural Engineering (1993), Polytechnic University of Valencia. Additionally, she holds a Master's Degree in Environmental Engineering by the University of Las Palmas de Gran Canaria (ULPGC). She is an expert in Techniques for Agricultural Business Management and a Specialist in Pruning. Since 1999, she is Professor in the ULPGC. Her current research lines, among others, are: agricultural reuse of reclaimed water from municipal origin; water monitoring, optimization of its management and of agronomic and health issues involved in its reuse; soil and subscriber; production of forage and biofuels; maintenance of irrigation systems; water quality (studies on the presence and movement of emerging contaminants in soil and water). She has participated in 11 research projects (2 international, 6 national and 3 regional projects) and 9 research contracts. (4 funded by public entities and 5 funded by private entitites). In 11 of them she has been the principal investigator. She is author of 25 papers in international journals, 5 in national journals, 4 books, 4 book sections and 75 International and National Conferences monographs. She has also published several dissemination articles, receiving the Canary Islands Award to the best dissemination work. She has conducted three PhD thesis. Currently she leads the research team of the ULPGC in the ADAPTaRES Project (Interreg-MAC 2014-2020).

Dr. Lucila Candela
Associated Researcher

PhD in groundwater hydrology. Professor at the Technical University of Catalonia. Specialist in water resources, groundwater and vadose zone. As a researcher he has lead and participated in more than 50 research projects at national and international level funded by different institutions (MICIN, EU, UNESCO, OIEA, WB, Kuwait).

She is co-author of more than 230 publications including books and book chapters and 85 journal papers most in relevant jouranls. Advisser of more than 10 PhD and a number of MsD. Thesis.

She has being Manager of two ERANET's Programmes and R&TD Manager of Water Resources Programme Ministry of Science and Innovation- Spain and evaluator of research projects for Holland, Israel, Jordania, Qatar and Flanders Seconded Expert at International Hydrological Programme IHP-UNESCO-Paris. She has participated as expert in International Pannels for the EU-External Advisory Group; GEF-UNEP; Edinburgh Research Partnership's, University of Edinburgh; Ministere de l'Ecologie, France; GRAPHIC/UNESCO and Transboundary Aquifers Programme (UNESCO).

Dr. María de las Virtudes Martínez Hernández
Researcher

PhD in Hydrology and Water Resources Management at University of Alcala (2015), MSc in the same programme (2008) and BSc in Environmental Sciences at University of Alcala (2007). During her career she has worked with environmental contamination problems and water quality. Her research is mainly focused on contaminant reactive transport through porous media, environmental water reuse, and water resources management and quality. She deals particularly with emerging contaminants such as pharmaceuticals, and their natural attenuation during infiltration. In addition, she collaborates with the master programme "Hydrology and Water Resources Management". She also participates in scientific dissemination events such as Week of Science and European Researcher's night.

Dr. Ana de Santiago Martín
Researcher

She obtained an European PhD in Pharmacy in 2013 in the Soil Science Department at Complutense University of Madrid where she worked as Assistant for 5 years. She specialized on the role played by soil reactive fractions and other environmental variables on metal (bio)availability in agricultural soils and its implication for the food chain.

She worked for 3 years in Quebec (Canada) at Laval University on the fate of metals, deicing salts, phosphorus, and hydrocarbons in diverse pressure scenarios (spills, peri-urban, sedimentation) as well as on eco-remediation (filter beds and constructed wetlands).

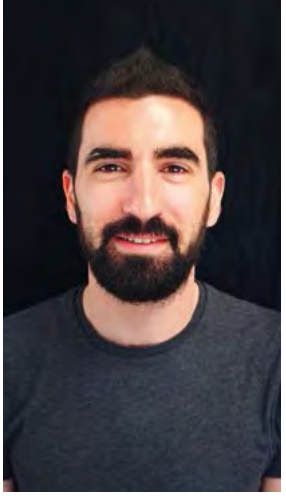
He joined IMDEA Water in 2017 within the Talent Attraction Program. Her research is currently based on the wastewater treatment (WWT) by vegetation filters for aquifer recharge and on the identification of the risk for food safety associated with the indirect reuse of surface water impacted by WWT effluents (metals and emerging contaminants) for crop irrigation.

David Mostaza Colado
Research Support

Degree in Environmental Sciences at University Rey Juan Carlos.
MSc in Hydrology and Water Resources Management at University of Alcalá & University Rey Juan Carlos.
Research: Intelligent system to optimize the use of water in agriculture.

Jorge Antonio Hernández Martín
Research Support

Degree in Geological Engineering at University of Alicante.
MSc in Hydrogeology at Fundación Centro Internacional de Hidrología Subterránea
Research: Hidrogeology



Guillermo Vaquero Quintana
Research Support

Degree in Geological Engineering at Universidad Politécnica de Madrid.
MSc in Mining Engineering at the same university
Research: Hydrogeology

Gloria Teijón Ávila
Research Support

Degree in Geological Sciences at University of Salamanca.
MSc in Hydrogeology at FCIHS-Technical University of Cataluña
Research: Irrigation of crops with surface water contaminated with pharmaceuticals and trace metals.

Blanca Huidobro López
Predoctoral Research

Degree in Chemical Engineering from Complutense University of Madrid.
MSc in Chemical Engineering from Polytechnic University of Madrid.
Research: Water reclamation by using a new concept of land application systems.

Microbial Electrochemical Technologies (MET)

Dr. Abraham Esteve Núñez

Associated Researcher

Principal investigator of the Bioe Group, he develops his work in the field of environmental biotechnology, specifically in Microbial Electrochemical Technologies (MET), and its application, among others, to wastewater treatment.

Graduated in Biochemistry from the University of Murcia (1995), he carried out his doctoral research on the microbial biodegradation of explosives at the Zaidín Experimental Station (CSIC) and obtained a PhD in Biochemistry from the University of Granada with an Extraordinary Prize (2000). He completed postdoctoral studies at the Environmental Biotechnology Center of the University of Massachusetts (USA) from 2001 to 2005, and at the Astrobiology Center (INTA / CSIC, Madrid) from 2005 to 2008.

In 2009 he joined the Universidad de Alcalá as a researcher hired through the Ramón y Cajal programme. In 2013 he obtained his position as Associate Professor in the area of Chemical Engineering. He lectures in various degree courses as well as in the Master of Hydrology and Management of Water Resources of the UAH. To date, he has conducted six doctoral theses, more than 15 master's degrees and has been a member of some 20 national and international theses committees.

He is the author of 50 scientific publications and 7 national and international patents, one of them a PCT awarded by Madrid + d (2015). He has participated and coordinated diverse national and European projects, among them iMETland (awarded by Madrid + d in 2016) and MIDES, both of Horizonte2020 programme. Secretary of the European section of ISMET (International Society for Microbial Electrochemistry and Technology), in 2013 he was editor of ISMET news, the society's quarterly newsletter. In addition, he was responsible for EU-ISMET 2014, the European Congress.

Since 2014 he has been responsible for MEET-ME4WATER, an action group in the EIP Water.

He is also coordinator of IBERIMET, the National Network of Microbial Electrochemical Technologies, which gathers the main Spanish groups in the field.

In 2016 he received the First Prize of the Campus of International Excellence 'Intelligent Energy' for the work *Electrosynthesis of bio-products of high added value and bioenergy from wastewater through mixed cultures of photobacteria illuminated with infrared light.*

Dr. Karina Boltes Espínola

Associated Researcher

Chemical Engineering. PhD in Chemistry (2000). Associate Professor in Chemical Engineering Department at the university of Alcalá. Her research is focused on optimisation of biological processes for degradation of xenobiotics using reactors of different configurations. Toxicological evaluation of mixed pollutants in wastewater and biostimulation of microorganisms for in-situ biodegradation are other research areas. She has participated in 20 research projects sponsored by the Spanish government and private enterprises. She has also been the director of 3 PhD thesis, and many post-graduate research projects in Master Degree on Hydrology and Water Management and Master Degree in Industrial Engineering, both in University of Alcala. Her main scientific interest is the application of bioelectrochemical process for micropollutants removal and detoxification of wastewater.

Dr. Juan Manuel Ortiz Díaz-Guerra

Researcher

Chemical Engineer (2002) and PhD on Electrochemistry (2009) at University of Alicante. His thesis was entitled "Desalination of brackish water by electrodialysis powered directly by solar photovoltaic energy: feasibility study and modelling".

Researcher of "Applied Electrochemistry and Electrocatalysis" Group, University Institute of Electrochemistry, University of Alicante (2002-12), being his interests the electrochemical processes for environmental protection, waste water treatment using electrochemical technology, energy production an storage, microbial electrochemistry (microbial fuel cells), and electrochemical systems powered by renewable energy.

From 2010 to 2012, he was involved as researcher in BacWire Project (project co-financed by the FP-7 of the European Union), developing a new concept of microbial fuel cell using nanomaterials and functionalized electrodes.

From 2013, his scientific research is focused on development of waste water treatment processes using microbial electrochemical technology, formerly in FCC Aqualia S.A. as "Project Manager" at Innovation and Technology Department, and currently at IMDEA Water. He is author of various scientific papers and more than 20 communications in international conferences and workshops, and co-author of 2 patents related to water technologies.

Dr. Antonio Berná Galiano

Researcher

Dr. Antonio Berná Galiano obtained a degree in Chemical Engineering from the University of Alicante in 2000 and a PhD in Materials Science (2014). His PhD studies were focused on spectroelectrochemical studies for characterization of interfacial electrochemical processes such as the specific adsorption of anions and applications such as electrocatalytic processes and bacteria/electrode interaction.

Since 2010 until March 2015, he was contracted as researcher at the Department of Analytical Chemistry, Physical Chemistry and Chemical Engineering in the University of Alcalá. Currently, as researcher at IMDEA Water, Dr. Berná has focused its research on the study of the electrochemical engineering aspects for the application of Microbial Electrochemistry and Electrochemical Technologies in such a fields as wastewater treatment, environmental engineering and bioelectrochemical sensors for pollution assessment.

Dr. Alessandro A. Carmona Martínez

Researcher

He has a degree on B.Sc. Environmental Engineering from the National Polytechnic Institute of Mexico (2001-2005). His thesis was entitled: "Batch bio-H2 production with inhibited methanogenic consortia from organic solid waste".

Later he obtained a M.Sc. degree on Environmental Biotechnology (2005-2008) at CINVESTAV-IPN, Mexico during which he worked on the topic "Electricity production in microbial fuel cells fed with spent organic extracts from hydrogenogenic fermentation of organic solid wastes".

From 2008 to 2012 he moved to Germany to do a Ph.D. (magna cum laude) at TU Braunschweig. There he conducted research on "Electron transfer mechanisms in electrochemically active microbial biofilms".

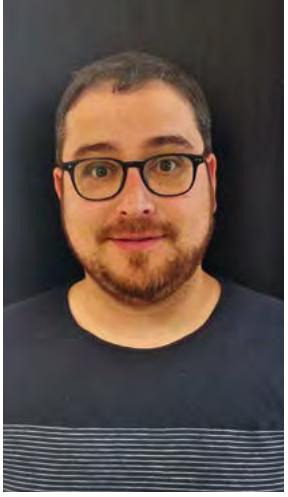
In 2012 he spent 3 months at the VU Amsterdam, The Netherlands as a scientific visitor where he studied "Outer membrane cytochromes of microbial biofilms by a combination of surface-enhanced resonance Raman scattering spectroscopy and electrochemistry".

From 2012 to 2015 he moved to France where he worked as Postdoctoral Researcher at INRA-Narbonne. There he worked mainly on three topics: (i) "Coupling H2 production by dark fermentation and microbial electrolysis", (ii) "Electron transfer mechanisms of novel electrochemically active bacteria" and (iii) "Microbial electrosynthesis of acetate".

Dr. Sara Tejedor Sanz

Researcher

Degree in Chemical Engineering at the Complutense University of Madrid and Master in Hydrology and Water Resources Management at the UAH/URJ. Last year studied at the Technical University of Denmark (DTU, Copenhagen) and 6-month internship the Department of Environmental Engineering in the area of bioenergy. In the last 5 years she has worked as a researcher at IMDEA Water, FCC Aqualia and the University of Alcalá, being linked to projects of public-private partnerships related to microbial electrochemical technologies as Aquaelectra, ITHACA, BioSO4 and EM4EM.
From April 2016 to May 2018 she worked for IMDEA Water as predoctoral and postdoctoral researcher in collaboration with the group Bioelectrogénesis in the line of wastewater treatment by microbial electrogenesis.



Dr. Pau Ródenas Motos

Researcher

BSc in Chemistry (2007) by the University Jaume I of Castellón. In 2012 he obteinen his MSc on Nanoscience and Nanotechnology from University of Valencia, Jaume I University, University of Alicante, University of Castilla-La Mancha, Autonomous University of Madrid and University of Valladolid. He graduated with the final Master Thesis with the title: Photoelectrolysis of water using nanostructured semiconductors.

In 2012 he visited Bar-Ilan University (Israel) for one month where he participated in the modification of hematite structures using microwave and electrodeposition doping techniques.

From 2012 to 2016, he studied Ph.D. and worked as a Researcher at WETSUS (Netherlands) for the European BioElectroMET project. He received his doctorate from the University of Wageningen on April 21, 2017, with the thesis entitled "Bioelectrochemical metal recovery with Microbial Fuel Cells."

In May 2017 IMDEA Agua contracts Pau Rodenas as a researcher for the European project MIDES in Microbial Desalination.

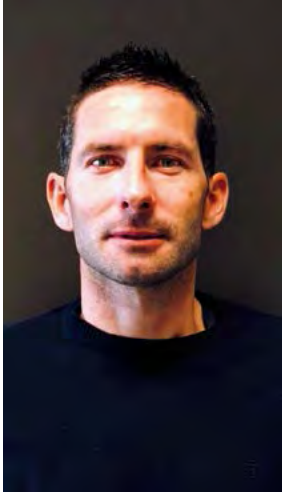
Dr. Arantxa Aguirre Sierra

Researcher

Degree in Environmental Sciences at the University of Alcalá, graduated with honors. Master's Degree in Hydrology and Water Resources Management (UAH/URJC).

For five years she worked at the University of Alcalá in the Bioelectrogenesis research group, focusing her work on the application of microbial electrochemical technologies to constructed wetlands for the treatment of wastewater in small populations. He defended his doctoral thesis (cum laude and international mention) in September 2017. It was entitled "Integrating Microbial Electrochemical Technologies in Constructed Wetlands, a new Paradigm for Treating Wastewater in Small Communities". During her doctorate she made a research stay in the Biosciences Department of Aarhus University (Denmark), as well as long stays at the CENTA Foundation, where she carried out a large part of her research, linked to projects of public-private partnership as Aquaelectra and Smart Wetland.

During 2018, she worked at IMDEA Water, for the H2020 project iMETland. This project investigates the application of the technology in bioelectrogenic wetlands (METlands) for the treatment of wastewater in small populations.



Dr. Raúl Berenguer Betrián

Researcher

BSc in Chemistry (2004) and a PhD in Materials Science (2010) at the University of Alicante. In his thesis in the "Group of Electrocatalysis and Polymer Electrochemistry", he studied the application of the electrochemical technology for the regeneration of spent carbon adsorbents and the abatement of pollutants in wastewater treatment.

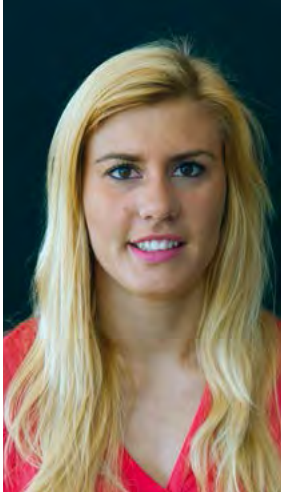
Funded by Nissan Motor Co., he was Associate Researcher at the "Institute of Multidisciplinary Research for Advanced Materials", Tohoku University in Japan (2010-12). There, he studied the electrochemical behavior and modification of carbon materials for electrochemical devices (SCs, LiBs and FCs).

With a "Juan de la Cierva" contract at the University of Málaga, (2012-15), he developed innovative synthetic routes by electrospinning and electrospraying for the design of advanced materials.

He consolidated his main research line on "electrodes and electrochemical technologies for wastewater treatment" at University of Alicante (2015-17, "Juan de la Cierva-Incorporación" contract).

In 2018, he joined IMDEA Water to participate in the H2020 project "iMETland", being his research focused on the biofilter materials.

Dr. Berenguer is author of more than 40 scientific papers and more than 80 communications in conferences, and co-inventor of 5 patents. Young Research Prize (2011) by the Spanish Carbon Group.



Amanda Prado de Nicolás

Associated Predoctoral Researcher

Degree in Biology at University Rey Juan Carlos.
MSc in Biotechnology at University Autónoma of Madrid.
Research: Wastewater treatment through the use of electrogenic wetlands with electroactive biochar as a biofilter substrate.

Colin Wardman

Predoctoral Researcher

Degree in Science in Marine Biology from Humboldt State University in California.
MSc in Science in Microbiology from the University of Massachusetts.
Research: Microbial electrochemical technologies.

Marina Ramírez Moreno

Research Support

Degree in Chemistry from University of Alcalá.
MSc in Fine Chemicals.
Research: European H2020 research project MIDES "Microbial Desalination for Low Energy Drinking Water".

Belén Barroeta García

Research Support

Degree in Journalism at Complutense University of Madrid
Specialist in Socioeconomic Journalism, UCM
Diplome of Advanced Studies in Journalism, UCM
Research: Representation of hydraulic fracturing (fracking) in the Spanish newspapers; science communication.

Eduardo Noriega Primo

Predoctoral Researcher

Degree in Industrial Technical Engineering in Industrial Chemistry and Chemical Engineering.
Research: Microbial electrochemical technologies for treating hydrocarbon polluted wastewaters.

Carlos Manchón Vállegas

Research Support

Bachelor in Molecular Biology from University of Alcalá.
MSC in Research in Functional Biology and Biotechnology.
Research: Microbial electrochemical technologies.

Biological and Advanced oxidation technologies

Dr. Pedro Letón García

Associated Researcher

Graduated in Chemistry in 1985 from University of Alcalá, with a Ph.D. in Chemistry from the Engineering Department of Alcalá University in 1992. Professor at the University of Alcalá, he is co-author of more than thirty papers in international peer-reviewed journals, and several technical reports for industry.

Nowadays he works on wastewater treatment focused on degradation of xenobiotic compounds by chemical (ozone) or biological (aerobic and anaerobic) processes. Xenobiotics of interest are pharmaceutical and personal care products detected in wastewater plant effluent which must be removed in order to reuse the water.

Toxicity aspects such as synergisms and antagonisms in mixtures between compounds and metabolites, as well as their evolution during treatment, are also of interest.

Dr. Roberto Rosal García

Associated Researcher

Master degree with honours in Chemistry and in Business Administration and Ph.D. degree in Chemistry from the University of Oviedo with distinguished dissertation award. Professor of Chemical Engineering University of Oviedo (1992-2003) and currently at the Department of Analytical Chemistry and Chemical Engineering of the University of Alcalá. His scientific interests are focused on water treatment with emphasis on aqueous micropollutants and the processes for their removal. He is also working on the bio-nano interaction of engineered materials and the production of fouling resistant membranes. He participated in more than thirty financed research projects and R&D contracts and published over eighty scientific articles and book chapters. He is currently leading several projects with national and international funding.

Dr. José Antonio Perdigón Melón

Associated Researcher

PhD in Chemistry from the University of Alcalá. Associate Professor at the University of Alcalá since 2011, assigned to the area of Chemical Engineering. He has taught Chemistry and Environmental Engineering at various degrees and Master. Author of over 30 articles based on synthesis and characterization of catalysts and wastewater treatment, he has participated in over 18 projects of national and international research. He has directed more than 10 undergraduate, graduate and Master Thesis projects. The research developed in recent years have focused on the treatment processes of wastewater and associated toxicity, and the study of water conditioning processes (fit-to-use) both by processes of ozonation and electrooxidation.

Dr. Alice Luminita Petre

Associated Researcher

BSc in Chemistry and a MSc in Physical Chemistry and Applied Radiochemistry from the University of Bucharest (Romania). PhD with European PhD Mention in Catalysis from the Université Claude Bernard Lyon I (France). PhD fellowships in Institut de Recherches sur la Catalyse, Villeurbanne (France) and postdoctoral stays at the RWTH Aachen (Germany) and the Institute of Catalysis and Petrochemistry (CSIC, Madrid).

Since 2007 she was a researcher from the National Science Program Ramón y Cajal in the Department of Analytical Chemistry and Chemical Engineering of the University of Alcalá. Associate Professor at the University of Alcalá since 2012 assigned to the area of Chemical Engineering.

She has participated in more than twenty financed research projects and R&D contracts and she has published over thirty five articles in peer-reviewed journals.

Ecotoxicology

Prof. Marco Vighi

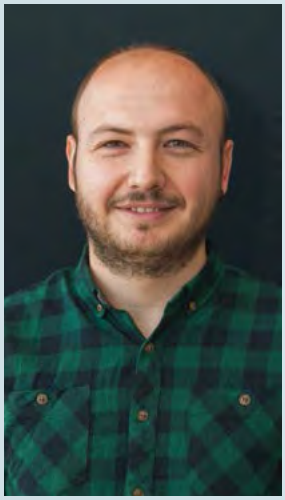
Researcher

Marco Vighi tooks the degree in Biology at the University of Milano, in 1969. He operated in the field of environmental pollution since 1969, working at the Water Research Institute of the National Research Council in Italy. In 1983 he got a chair at the University of Milano where he was professor of Agricultural Ecotoxicology. In 1998, he moved to the Department of Earth and Environmental Sciences of the University of Milano-Bicocca, where he was professor of Ecology and Applied Ecology and responsible of the Research Group on Ecotoxicology up to November 2015, when he retired.

Up to the early 1980s, his scientific activity was mainly addressed to applied hydrobiology and eutrophication of marine and fresh waters. In the last three decades, the research activity moved toward ecotoxicology. Main research fields are: ecotoxicology of organic pollutants on aquatic and terrestrial ecosystems at different levels of organization; Quantitative Structure-Activity Relationships (QSAR); distribution and fate of contaminants (monitoring and modeling); long range transport of persistent organic pollutants; effects and environmental fate of complex mixtures; environmental risk assessment; bridging ecotoxicology with environmental economy. He published more than 160 scientific papers and books on applied ecology and ecotoxicology.

From 1991 to 2013 Marco was member of Scientific Advisory Committees on Toxicology and Ecotoxicology of the European Commission, DG SANCO (CSTE, CSTEE, SCHER). Since April 2016 he is member of Scientific Committee on Health, Environmental and Emerging Risk (SCHEER) of the European Commission. In several occasions he was consultant on environmental issues for the FAO/UNEP, for the World Health Organisation and for the UNEP/POPRC (Persistent Organic Pollutants Review Committee) on issues related to the Stockholm Convention. From 2002 to 2005 he was Senior Consultant of the Project "Phase-out of pesticidal POPs in China", developed by the UNPD (United Nations Development Programme) in collaboration with the Chinese government, with the aim of the implemetation of the Stockholm Convention in China.

Marco is incorporated at IMDEA Water since December 2015 with the objective of developing a new research line on Aquatic Ecotoxicology and Ecological Risk Assessment.



Dr. Andreu Rico Artero

Researcher

Andreu Rico holds a BSc in Agricultural Engineering (graduated with honours) and a high-education degree (Licenciatura) on Environmental Sciences from the Polytechnic University of Valencia, Spain. In 2009, he obtained his MSc on Aquatic Ecology and Water Quality Management from Wageningen University, the Netherlands. During his master studies he focused on assessing the fate and toxicological effects of pesticides in tropical freshwater ecosystems and collaborated with two international projects, in Brazil and Costa Rica. In May 2014, he obtained his PhD on Ecotoxicology and Chemical Risk Assessment from Wageningen University. As part of his PhD he investigated the environmental risks posed by the use of veterinary medicines in Asian aquaculture. After his PhD he worked for a year and a half in Wageningen Environmental Research (formerly Alterra, The Netherlands) where he specialized on the ecological risk assessment of pesticides and other emerging contaminants (pharmaceuticals, home-care products).

Andreu Rico joined the IMDEA Water Institute in December 2015, under the framework of the Marie Skłodowska-Curie AMAROUT II Program, and subsequently received a Juan de la Cierva grant.

Andreu Rico has participated in 9 international projects and has a strong background on the design of experiments and predictive models for the ecological risk assessment of contaminants. He is an active member of the Society of Environmental Toxicology and Chemistry and is co-author of more than 40 papers, 50 conference proceedings, and several reports for the chemical industry. During the last few years he has participated has supervisor and lecturer in the Mater on Environmental Toxicology and Risk Assessment of the University Rey Juan Carlos and on the Master on Hydrology and Water Resource Management of the University of Alcalá.

One of his main interests is to identify key stress factors that affect aquatic populations and communities under Mediterranean conditions, as well as to evaluate their interactive effects with urban, agricultural and industrial pollution. His investigations aim to develop new modeling tools that are able to integrate the multiple stress factors related to global climate change into a more sophisticated and environmentally relevant risk assessment framework for contaminants.

Dr. Belén González Gaya

Researcher

BSc in Environmental Science at Autonomous University of Madrid (2007). MsC in Aquatic Ecology and Water Quality at Wageningen University (The Netherlands) (2009). During her master studies she developed practical stages in the Benthic Ecology Laboratory of Ischia, Stazione Zoologica Anton Dorhn (Naples), and at the Coastal Ecosystems Laboratory of the Museo Argentino de Ciencias Naturales in Buenos Aires.

In October 2015, she obtains her PhD on Marine Sciences by the University of Barcelona. Her PhD thesis was developed inside the Malaspina 2010 Project.

She enjoyed one year of postdoctoral experience on the Institute of Organic Chemistry in Madrid.

In April 2017, she joined the IMDEA Water Institute to work on the H2020 European Project TAPAS, studying the effects of organic pollutants from fisheries on coastal areas of the Mediterranean Sea. After a successful presentation of her research in IMDEA Water in two international conferences and a publication in Science of the Total Environment in 2018, she leaves the centre in April to enjoy a Juan de la Cierva postdoctoral grant at the Marine Station of Plentzia (Basque Country University).

Alba Arenas Sánchez

Predoctoral Researcher

Degree in Environmental Science at Autonomous University of Madrid.
MSc in Aquatic Ecology and Water Quality at Wageningen University and Research Centre, Holland.
Research: Vulnerability assessment of aquatic ecosystems to multiple stressors in the Mediterranean área.

Theresa Schell

Predoctoral Researcher

Bachelor in Environmental Science at University of Koblenz-Landay (Germany)
MSc in Ecotoxicology at the same university.
Research: Impacts of microplastics in agrosystems and stream environments.

Raquel Dafouz Ramírez

Research Support

Degree in Environmental Science at Rey Juan Carlos University.
MSc in Agro-Environmental and Agrifood Sciences at Autonomous University of Madrid.
Research: Aquatic ecotoxicology and ecological risk assessment.

Cyanobacterias and microbial contamination

Dr. Rehab El-Shehawy

Researcher

She has obtained her PhD. degree in Microbiology from the University of Bayreuth Germany in 2001. She authored and co-authored more than twenty one articles. She collaborates and welcomes collaboration on both national and international levels.

Working at the interface between research and product development, Dr. El-Shehawy is currently leading the group of Cyanobacteria and Cyanotoxins dedicated to offer technology-based solutions to tackle the problems caused by over-growth (blooms) of cyanobacteria in water bodies and their toxins.

Dr. María Blanca Sánchez

Researcher

Dr. Sánchez obtained her M.Sc. in Biochemistry from Universidad Autónoma de Madrid (UAM). In 2005, she obtained her PhD in Molecular Biology from UAM, studying antibiotic biosynthesis regulation and resistance mechanisms of antibiotics by antibiotic producing microorganisms. In 2006 she joined the Biotecnología Microbiana department in Centro Nacional de Biotecnología (CNB-CSIC). Her research has been focused on antimicrobial resistance mechanisms by opportunistic pathogens.

She has participated in ten national and four international projects. Dr. Sánchez has been author and co-author of twenty-nine scientific articles, twenty-two of them has been published in the first quartile indexed journals, as first or last author in twelve of them. Her research has been presented in national and international conferences, 6 oral communications. She has also supervised three Master´s degree work and two doctoral theses and collaborates with two master programs: Master of Biotechnology of Universidad Autónoma de Madrid and Hydrology and Water Resources Management of University of Alcala.

She joined IMDEA Water in September 2017 to study the effect of micropollutants on water microorganisms and antibiotic resistance genes..

Jesús Morón López
Research Support

Degree in Biology from University of Seville, Sevilla, Spain.
MSc: Molecular Genetics and Biotechnology.
Research: Toxic Cianobacteria in fresh water reservoirs

Lucía Nieto Reyes
Research Support

Degree in Biology from University of Seville.
Research: Toxic Cianobacteria in freshwater.

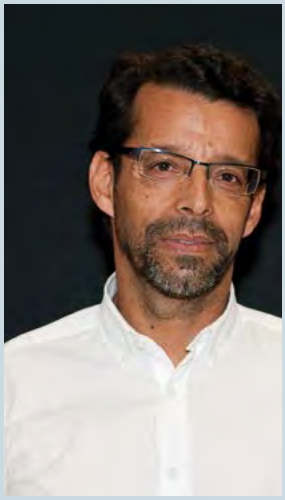
Ángel G. Pompa Pernía
Research Support

Degree in Biomedical Engineering from Polytechnic University of Havana, Cuba.
MSc: Electronic Systems Engineering from University Carlos III of Madrid.
Research: Smart alert against harmful cyanobacteria blooms for the water industry.

Borja Fernández Retuerto
Predoctoral Researcher

Bachelor in Biology, speciality in Biotechnology from Complutense University of Madrid.
MSc: Virology at the same University.
Research: Effect of microcontaminants (antibiotics and biocides) on water microorganisms and antibiotic resistance genes.

Economic and institutional analysis



Dr. Carlos Mario Gómez Gómez

Associated Researcher

Carlos Mario Gómez is Professor of Economics at the University of Alcalá since 1996. Graduated in Political Science (in Colombia) and Economics (in Spain), Master's in Agricultural Economics and Development at the University of London in 1992. He received his Ph.D. degree in Economics at the University of Alcalá (Madrid). He was appointed as a Research Associate at the Institute of Business and Economic Research of the University of California Berkeley in 1994, and as a Visiting Scholar for a sabbatical leave in 2000.

He has done extensive research on environmental economics with emphasis on water economics which was published in different peer reviewed national and international journals. Since 2000 he has led a sequence of competitive national projects and has been involved in the national and European economic analysis groups formed to support the implementation of the Water Framework Directive.

At IMDEA he is currently leading the research team of the EPI Water project approved in 2010 under the Seventh Framework Program of the European Union.

Gonzalo Delacámara Andrés

Researcher

Senior academic and water resources management and water economics specialist. He is currently a Research Fellow and Coordinator of the Department of Economic and Institutional Analysis of Water at IMDEA Water Institute and Faculty Member of the Belpasso International Summer School in Environmental and Natural Resource Economics.

He has recently worked on decision-making techniques for the Environment Agency (2015), as part of the support of that regulator to water utilities in England and Wales. His current roles include water policy advisor to the European Commission (EC DG ENV) as part of the Water Framework Directive (WFD) Common Implementation Strategy (CIS) Working Group on Economics and to the the European Parliament (2014-2018).

He is also water policy advisor for the World Bank as part of the 2030 Water Resources Group (WB, IFC, WEF – 2013-2016) framework contracts in which he has led the hydroeconomic analysis of water investments in the Pacific coastal catchments of Peru and is currently leading the work stream on the economic valuation of water resources and the use of economic incentives for water management in Mongolia, as well as the hydroeconomic analysis in two mining regions and the capital city (Ulaanbaatar).

He is an international consultant on water and energy economics for UN agencies such as ECLAC, FAO, WHO-PAHO, UNDP and UNESCO, and international development banks (WB; IFC, IDB). Within a wide range of economic analysis assignments, he has worked on different studies to link water policy and macroeconomic performance in the EU (2013-2015), as part of the so-called European Semester. He has also coordinated the research team for the EU FP7 EPI-Water project (2011-2013) on economic policy instruments for sustainable water management, in which an economic assessment of environmental outcomes of EPIs was a key outcome.

Gonzalo also coordinates IMDEA's contribution to the EIP-Water Action Group RiverRes and to the study for DG environment on maximising water reuse in the EU. Within the newly H2020 granted project AQUACROSS (2015-2018), Gonzalo leads the development of a common framework for the assessment of aquatic ecosystems.

Dr. Alberto del Villar García

Associated Researcher

Professor in the Department of Applied Economics at University of Alcalá. Bachelor of Economics and Business Administration (UNED), Master in Public Finance and Taxation (IEF) and PhD in Economics (University of Alcalá). He has teach in numerous courses and seminars on different aspects related with Water Economy and Pricing, and since 1998 he teaches at the University of Alcalá.

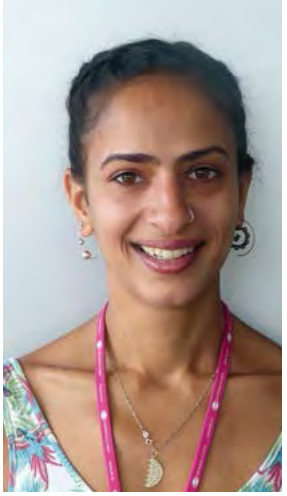
His research is focused on analyzing the pricing mechanism, pricing and costs of water services, which have led to participate in multiple research projects and contracts, both as a partner and as principal researcher. The result of this activity has resulted in participation in conferences and publications of books and magazines nationally and internationally. Since 2002 he has participated as an expert in several focus groups related to water and in the water planning process resulting from the implementation of the Water Framework Directive in Spain.

His activity in IMDEA Water Instituted is related to the participation and collaboration in various research projects and activities related to water economy.

Marta Rodríguez Gómez

Research Support

Degree in Environmental Sciences from Autonomous University of Madrid. Spain.
MSc in Hidrology and Water Resources Management at Alcalá University and Rey Juan Carlos University, Madrid. Spain
Research: Drivers affecting the industrial structure of water and sanitation services.



Asya Amran Marhubi

Research Support

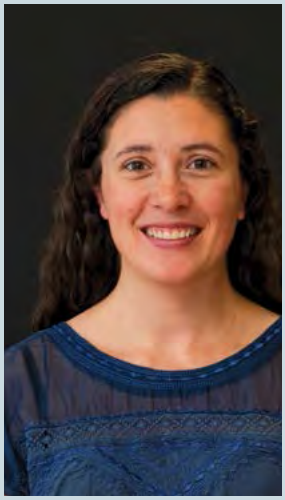
Degree in International Development Studies and Spanish & Latin American Studies.
MSc in Corporate Social Responsibility & Sustainable Development from the EOI.
Research: H2020 research project AQUACROSS: "Knowledge, Assessment, and Management for AQUAtic Biodiversity and Ecosystem Services aCROSS EU policies".

Marta Arenas Romasanta

Research Support

Degree in Biology from Complutense University of Madrid.
MSc in Sustainable Development and CSR – EOI Business School.
Research: Ecological, social and economic approaches for water management.

Water and energy



Dr. Marta Vivar García

Associated Researcher

Telecommunication Engineering degree by the Polytechnic University of Madrid (UPM) and PhD on Photovoltaic Solar Energy studies by the Institute of Solar Energy within the same university (IES-UPM) in 2009. MSc on Hydrology and Water Resources Management by the University of Alcalá in 2013. She worked at the Australian National University (ANU, Australia) for three years as postdoctoral researcher, combining both research and lecturing activities. She has also worked at Tianjin University (China) for a year under Chinese public funding.

Her main research lines include the design and development of hybrid solar photovoltaic / thermal / photochemical devices that use the solar spectrum more efficiently, for the production of electricity, purified water and/or heat; and the development of low-cost clean water photovoltaic systems for solar disinfection in developing countries.

She has participated in 14 research projects, being PI in some of them. Results include 20 international journal articles, 12 national scientific journal articles, 41 communications to international conferences, 5 invited talks and 1 patent. She has supervised 18 honours and/ or master students projects and completed several research stays at ANU (Australia), ZSW (Germany), University of Ferrara (Italy), Anna University (India) and Tianjin University (China).

Dr. Natalia Pichel Mira

Research support

Degree in Environmental Science at the University of León.
MSc in Water Quality Science and Technology at the University of Granada.
Research: PV-photochemical systems for water treatment.

Dr. Manuel Fuentes Conde

Associated Researcher

He is an Industrial Engineer (U.N.E.D) and PhD in Photovoltaic Solar Energy (University of Jaén, 2009). He worked as designer in automobile industry during two years (Valeo S.L.) and then, he worked as lecturer at University of Jaén (2000), Nowadays he is Tenured Associate Professor in Electronics and Automation Engineering Department at University of Jaén.

His first research line was focused in Photovoltaic Systems, specifically, in Grid Connected Photovoltaic Systems (GCPVS), developing measurement devices for PV modules and PV systems quality controls. After his postdoctoral stays in ANU (Canberra, Australia, 6 months) and Tianjin University (Tianjin, China, 4 months) he opened a new research line focused on water purification thanks to hybrid photovoltaic-photocatalytic systems and hybrid autonomous systems (renewable energies-fuel) based on low cost design for its monitoring and management.

He has participated in 23 research projects, contracts and agreements, being the leader and principal researcher in some of them. The research results include 34 papers in international journals (JRC), 11 papers in national journals, more than 40 publications in international conferences, 9 invited talks and one patent. He is reviewer of 13 journals gathered in the ISI Science JCR and belongs to the editorial board of International Journal o Photoenergy. He is supervisor of more than 45 honour student projects og Technical Degrees and Masters.

Ascensión López Vargas

Research support

Degree in Telecommunications Engineering at the University of Alcala.
MSc in Communications and Information Technologies at the University of Alcalá.
MSc in Aerospace Research at the University of Alcala.
Research: Solar photovoltaic-photochemical-thermal hybrid systems, clean water photovoltaic sensors for solar disinfection.

Hydraulic heritage

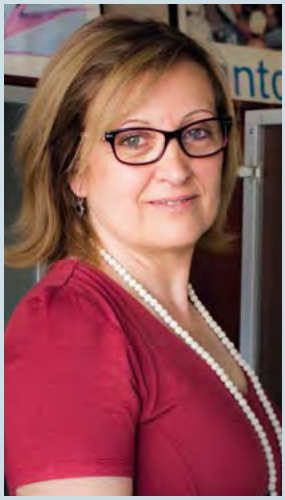
Dr. Juan Antonio Pascual Aguilar

Associated Researcher

Graduated in Geography in 1991 from the University of Valencia where he later obtained his PhD in Geography. He is researcher at the Desertification Research Centre (CIDE). He has taken part in 9 Spanish and European competitive projects and more than 30 non competitive projects through academic and private contracts.

He has published more than 40 papers between book chapters and journals, apart from other literature presented at scientific meetings. He has participated as lecturer in 2 MsC programmes and given several guest talks at national and international meetings.

His research centres on the spatial analysis and temporal study of environmental land use and water processes using the application of models and Geographical Information Systems. He has also developed his expertise in landscape assessment, particularly on issues related with the preservation of traditional agricultural patterns and water use.



Dr. Irene de Bustamante Gutiérrez

Deputy Director

Ph.D. in Geological Sciences from the Complutense University of Madrid.

Since 1990 is Professor in the Department of Geology at the University of Alcalá. She is currently Director of the Master's Degree in Hydrology and Water Resource Management.

Since 2007 she is the Deputy Director of IMDEA Water Institute. Among her current research may include: hydrogeology, water quality and pollution, reuse of reclaimed water for irrigation and aquifers recharge and environmental cartography.

She has participated in 60 projects and research contracts, in 35 of them being the principal investigator. The results are reflected in more than 200 papers in journals, books and papers, three patents and a software.

She has also directed 8 doctoral theses, licentiate 4 PhD and 35 master's projects.

Also noteworthy is her work as Director of the Master in Hydrology and Water Resources Management, besides being part of the Educational Commission of the PhD in Hydrology and Water Resources Management.

She recently won several research awards, 3 of them related to Consolider Tragua "Treatment and reuse of wastewater for sustainable management", granted by the Board of the University of Alcalá in 2007; by the International Water Association in 2012 within of the category "Grand prize in the practical realization" and by the Directorate General of Technical and Scientific Research in 2012 as one of five representative projects funded scientific quality recently by the Spanish National Research Plan. She also won a second prize in 2012 during the XIV edition of the 3M Foundation Awards for innovation for her work "Evolution of traces of drugs in the treatment of urban waste water."

laboratory staff

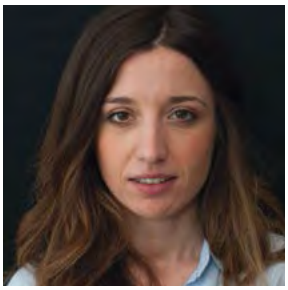
Dr. Leonor Nozal Martínez
Quality and Laboratories Management / Laboratory responsible
PhD in Chemical Sciences.

Francisco Martínez Serrano
Laboratory Technician
IVT: Environmental Chemistry.

Carolina Guillén Fuentes
Laboratory Technician
IVT: Control and Analysis.
IVT: Environmental Chemistry.

Amaya Romero Salas
Laboratory Technician
IVT: Control and Analysis.

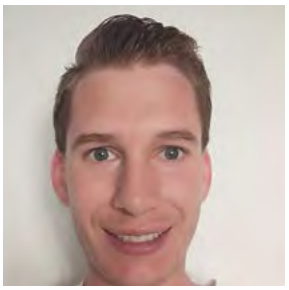
Covadonga Alonso Alonso
Laboratory Technician
Degree in Chemistry by the Autonomous University of Madrid, Spain.



Dr. María Isabel López a
Laboratory Technician
PhD in Analytical Chemistry by Complutense University of Madrid, Spain.

Dr. Laura Cherta Cucala
Laboratory Technician
PhD in Analytical Chemistry by the Institute for Pesticides and Water of the University Jaume I.

Patricia García Doncel
Research support
Degree in Chemistry at the University of Alcala.



Manuel Mínguez Calzada
Laboratory Technician
IVT: Electronic Product Development.

Dr. Alberto Blanco González
Research support
PhD in Hydrology and Water Resources Management.

Diego Parra Robles
Laboratory Technician
IVT: Environmental Chemistry.

Beatriz Peinado Rodríguez
Laboratory Technician
IVT: Environmental Health.
IVT: Clinical Diagnostic.

Noelia C. Peral Romero
Research support
Degree in Chemistry at Autonomous University of Madrid.

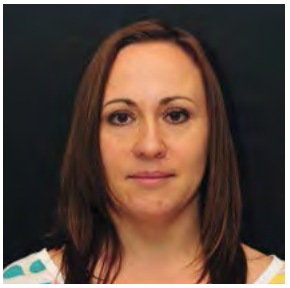
management area and administration

Rafael Irastorza Vaca
General Manager

Degree in Economics and Business Administration Sciences.

Dr. Juana Sanz García
R&D Management

PhD in Environmental Sciences.



Mari Luz Barquilla Crespo
Economic Management

Degree in Economics Sciences.

José Ángel Gómez Martín
Technology transfer technician

Degree in Environmental Sciences.

Gloria Rubio Sánchez
R&D Technical support

Degree in Environmental Science.

Angélica Manguán García
R&D Technical support

Degree in Environmental Sciences.

Celia Barral Nieto
Technician in Economic and Administration
Superior Technician in Administration and Finance

Carolina Merino Ajenjo
Technician in Economic and Administration
Superior Technician in Administration and Finance

Josefa Simón Recio
Secretary

Research results and knowledge dissemination

Research results

1.12. Scientific Papers

1.12.1. Articles in journals

1. **Abu-Serie, M.M., Nasser, N., Abd El-Wahab, A., El-Shehawy, R., Pienaar, H., Baddour, N. and Amer, R. (2018)**
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Toxicon, 143. pp. 81-89. ISSN 00410101.

2. **Carmona, A., Lacroix, R., Trably, E., Da Silva, S. and Bernet, N. (2018)**
On the actual anode area that contributes to the current density produced by electroactive biofilms.
Electrochimica Acta, 259. pp. 395-401. ISSN 00134686.

3. **Castaño, A., Valencia, L., Serrano, J.M. and Delgado, J.A. (2018)**
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Journal of Freshwater Ecology, 33 (1). pp. 347-360. ISSN 0270-5060.

4. **Catalán, N., Casas-Ruiz, J. P., Arce, M. I., Abril, M., Bravo, A. G., del Campo, R., Estévez, E., Freixa, A., Giménez-Grau, P., González-Ferreras, A. M., Gómez-Gener, Ll., Lupon, A., Martínez, A., Palacin-Lizarbe, C., Poblador, S., Rasines-Ladero, R., Reyes, M., Rodríguez-Castillo, T., Rodríguez-Lozano, P., Sanpera-Calbet, I., Tornero, I. and Pastor, A. (2018)**
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5. **Daam, M.A. and Rico, A. (2018)**
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Environmental Science and Pollution Research, 25 (14). pp. 13235-13243. ISSN 0944-1344.

6. **Domínguez-Garay, A. and Esteve-Núñez, A. (2018)**
Designing strategies for operating Microbial Electrochemical Systems to clean up polluted soils under non-flooded conditions.
Bioelectrochemistry, 124. pp. 142-148. ISSN 1567-5394.

7. **Domínguez-Garay, A., Rodrigo, J.F., Dörfler, U., Schroll, R. and Esteve-Núñez, A. (2018)**
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8. **Estévez-Canales, M., Pinto, D., Coradin, T., Laberty-Rober,C. and Esteve-Núñez, A. (2018)**
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9. **Focks, A., Grisoni, F., Barsi, A. and Vighi, M. (2018)**
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Integrated Environmental Assessment and Management, 14 (5). pp. 601-603. ISSN 15513777.

10. **García-Pacheco, R., Landaburu, J., Terrero, P., Campos, E., Molina-Serrano, F., Rabadan, J., Zarzo, D. and García-Calvo, E. (2018)**
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Desalination, 433. pp. 199-208. ISSN 0011-9164.

11. **Ginebreda, A., Sabater-Liesa, L., Rico, A., Focks, A. and Barceló, D. (2018)**
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Science of The Total Environment, 618. pp. 323-335. ISSN 00489697.

12. **González-Gaya, B., Cherta, L., Nozal, L. and Rico, A. (2018)**
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Science of The Total Environment, 643. pp. 994-1004. ISSN 00489697.

13. **Grisoni, F., Consonni, V. and Vighi, M. (2018)**
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14. **Henriksson, P.J.G., Belton, B., Jahan, K.M. and Rico, A. (2018)**
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19. **Larrea-Murrell, J. A., Rojas-Badia, M. M., García-Soto, I., Romeu-Alvarez, B., Bacchetti, T., Gillis, A., Boltes, K., Heydrich-Perez, M., Lugo-Moya, D. and Mahillon, J. (2018)**
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21. **Martín-Crespo, T., Gómez-Ortiz, D., Martín-Velázquez, S., Martínez-Pagán, P., De Ignacio, C., Lillo, J. and Faz, Á. (2018)**
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22. **Martín-Sanz, J.P., Valverde, I., De Santiago-Martín, A., Quintana, J.R., González-Huecas, C., López-Lafuente, A.L. and Dieguéz, A. (2018)**
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27. **Pichel, N. and Vivar, M. (2018)**
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28. **Pichel, N., Vivar, M. and Fuentes, M. (2018)**
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1.12.2. Other articles

1. **Ali, H., Rahman, M.M., Rico, A., Jaman, A., Basak, S.K., Islam, M.M., Khan, N., Keus, H.J. and Mohan, C.V. (2018)**
An assessment of health management practices and occupational health hazards in tiger shrimp (Penaeus monodon) and freshwater prawn (Macrobrachium rosenbergii) aquaculture in Bangladesh.
Veterinary and Animal Science, 5. pp. 10-19. ISSN 2451943X.

2. **Arenas, M. and Delacámara, G. (2018)**
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3. **Delacámara, G. (2018)**
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6. **López-Heras, I., Cherta, L., Alonso-Alonso, C. and Nozal, L. (2018)**
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7. **López-Lafuente, A., Valverde, I., Quintana, J.R., Martín-Sanz, J.P., De Santiago-Martín, A. and González, C. (2018)**
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1.12.3. Books

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2. **Berreteaga, A., Campos, E., De Bustamante, I., Iglesias, J.A., Lillo, J. and Zarzo, D. (2018)**
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3. **Blanco, A. and Pascual, J.A. (2018)**
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4. **Del Castillo, M., Condori, E., Herrero, E., Llorente, M., Maita, J., Sousa, D., Uribe, J., Vélez, W.A. and Vicente, M.C. (2018)**
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1.12.4. Books Chapters

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2. **Blanco, A., Pascual, J.A. and De Bustamante, I. (2018)**
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3. **Pascual Aguilar, J.A., Belda Carrasco, R. and Iranzo García, E. (2018)**
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1.12.5. Scientific-Technical Reports

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European Union's Horizon 2020 Framework Programme for Research and Innovation Grant Agreement No. 642317. Technical Report. European Union (H2020 FP Grant Agreement)-AQUACROSS.

2. **Bertollini, R., Borges, T., Duarte Davidson, R., de Voogt, P., Hoet, P., Scott, M., Slama, R. and Vighi, M. (2018)**
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3. **Lillebø, A., Teixeira, H., Morgado, M., Genua-Olmedo, A., Nogueira, A., Delacámara, G., Marhubi, A., Gómez, C.M., Martínez-López, J. and Strosser, P. (2018)**
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4. **Mattheiß, V., Strosser, P., Krautkraemer, A., McDonald, H., Röschel, L., Hoffmann, H., Lago, M., Delacámara, G., Gómez, C.M. and Piet, G. (2018)**
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5. **Proykova, A., Kraetke, R., Bertollini, R., Borges, T., Duarte-Davidson, R., Panagiotakos , D., Slama, R., Scott, M., Testai, E., Vermeire, T. and Vighi, M. (2018)**
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7. **Van den Brink, P.J., Deneer, J., van Smeden, J., Rico, A., González-Gaya, B., Sánchez, M.B., Ács, A., Ferincz, A., Marin, A., García-Bueno, N., Telfer, T. (2018)**
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1.13. IT platform

1. Web Mapping of alternatives to end-of-life membranes management. Created by IMDEA Water Geomatics Unit and Membrane Technology Group, together with LEQUIA (University of Girona). 29/06/2018.

1.14. Lectures

1. **Aguirre-Sierra, A.**
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2. **Barroeta, B.**
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3. **Blanco, A.**
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4. **Cherta, L.**
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5. **Delacámara, G.**
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7. **Delacámara, G.**
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9. Delacámara, G.

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10. Delacámara, G.

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12. Delacámara, G.

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13. Delacámara, G.

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14. Esteve-Nuñez, A.

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15. Esteve-Nuñez, A.

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16. Esteve-Nuñez, A.

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17. Esteve-Nuñez, A.

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18. Esteve-Nuñez, A.

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19. **Galvez, R.**
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I Jornada de Clases Magistrales. Acciona Agua. Universidad de Alcalá. Alcalá de Henares. 15/02/2018.

20. **García Calvo, E.**
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21. **García Calvo, E.**
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I Jornada Técnica sobre Gas Natural Renovable (GNR) y Movilidad Sostenible. ETSI Minas y Energía. Madrid. 12/06/2018.

22. **García-Pacheco, R.**
Second hand membrane systems in Water Industry: Reality or fiction?
University of New South Wales. Sidney, Australia. 18/06/2018.

23. **García-Pacheco, R., Terrero, P.**
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24. **Gómez, C.M.**
La innovación en gobernanza y en el diseño de incentivos para garantizar la equidad en el acceso al agua.
VIII Foro de la Economía del Agua. Madrid. 27/09/2018.

25. **González-Gaya, B.**
Genes de resistencia a antibióticos en el medio acuático.
Jornada Técnica Informativa sobre el Acceso y la Utilización de Recursos Genéticos en el Sector de la Investigación. MAPAMA. Madrid. 01/03/2018.

26. **López-Heras, I.**
Screening y cuantificación de contaminantes emergentes en aguas de río mediante LC-MS/MS.
Jornada "Innovaciones en espectrometría de masas de agua". IMDEA Water y Agilent Technologies. IMDEA Water. Alcalá de Henares. 24/01/2018.

27. **Ortiz, J.M.**
Biotecnología y membranas de intercambio iónico: De la desalinización microbiana de baja energía a procesos innovadores para la producción sostenible de agua.
XII Congreso Internacional de AEDyR. Toledo. 23 - 25/10/2018.

28. **Senán, J.**
Análisis de ciclo de vida en el reciclaje de membranas de ósmosis inversa.
Workshop "Gestión de membranas al final de su vida útil. Hacia una economía circular". IMDEA Water and Life-Transfomem Consortium. IMDEA Water. Alcalá de Henares. 16/05/2018.

1.15. Round tables

1. Barroeta, B.
Workshop: Communicating Science in a Complex World. Experiences, Controversies and Future Strategies.
Wissenschaft im Dialog. Brussels, Belgium. 17/10/2018.

2. De Bustamante, I.
Miembro del jurado de los V Premios al Talento Joven para la Gestión Sostenible del Agua de la Fundación Botín. Madrid. 26/09/2018.

3. De Bustamante, I.
Enseignement novateur del sciences de la terre et de l›environnement.
Encuentro internacional Educación Científica: Métodos y Prácticas Innovadoras. L›Ecole Normale Supérieure de Rabat. Rabat, Morocco. 13 - 15/11/2018.

4. Delacámara, G.
Pricing Water Security and Enhancing Practical Financing Tools for Reclaimed Wastewater Reuse.
IDA International Water Reuse and Recycling Conference. Valencia. 24 - 27/06/2018.

5. Delacámara, G.
Diálogos del agua.
II Premios Cátedra FACSA de Innovación en el Ciclo Integral del Agua de la Universitat Jaume I. Castellón de la Plana. 12/04/2018.

6. Delacámara, G.
Globalmente responsables. ODS#Objetivo 6: Cada gota cuenta.
Coca Cola and Servimedia. Madrid. 19/03/2018.

7. Delacámara, G.
I Jornada Agua y Futuro: Retos en la gestión del ciclo integral del agua.
FACSA and Levante-EMV. Valencia. 21/06/2018.

8. Delacámara, G.
Debate entre Gonzalo Delacámara y David Saurí.
Jornada "La gestión del agua y el medio ambiente". Asociación de Amigos de la UAB. Barcelona. 05/04/2018.

9. Delacámara, G.
Keynote speaker: *Com será el sector de l'aigua?*
X Aniversario del Catalan Water Partnership - W10YFN (Water 10 Years From Now). Barcelona. 27/04/2018.

10. Delacámara, G.
Keynote speaker: *Economic analysis of reclaimed wastewater reuse – pricing long-term water security.*
IWARESA 2018 - IWA Regional Conference on Water Reuse and Salinity Management. Murcia. 11 - 15/06/2018.

11. Delacámara, G.
Debate sobre la planificación hidrológica.
Sesión Técnica 19 - Política nacional del agua y planificación hidrológica. CONAMA 2018 (Congreso Nacional del Medio Ambiente) - Rumbo 20.30. Madrid. 26 - 29/11/2018.

12. Delacámara, G.
Observatorio sobre "El déficit en las infraestructuras del agua, fórmulas para la gestión del agua en España".
El Economista and Acciona. Madrid. 05/11/2018.

13. Delacámara, G.
Claves para un nuevo modelo de gestión del agua eficiente y sostenible. Jornada "La gestión del agua en España: Análisis y retos del ciclo urbano del agua".
Diario Expansión and Acciona Agua. Madrid. 04/10/2018.

14. Delacámara, G.
Connecting SDGs: Water, energy and food nexus.
AMWAJ Forum 2018: A Mediterranean Water and Journalism forum for sustainable development. Barcelona. 20 - 30/10/2018.

15. Delacámara, G.
El valor del agua y de la seguridad hídrica.
IX Foro de la Economía del Agua. Barcelona. 15/11/2018.

16. Delacámara, G.
The future of the cities.
Ciclo Arquitectura en corto. 3ª edición. Technal & Roca Gallery. Madrid. 13/11/2018.

17. Delacámara, G.
La agenda del sector del agua (II): Reflexión y Diálogo.
Smart Water Summit 2018. Fundación Botín. Madrid. 25/09/2018.

18. Delacámara, G.
La necesidad de reescribir el Contrato Social en torno al agua.
VIII Foro de la Economía del Agua. Madrid. 27/09/2018.

19. Delacámara, G.
La sequía en España. Impactos jurídicos, económicos y sociales.
XXII Jornadas de Derecho de Aguas - Sequía e Inundaciones como Fenómenos Hidrológicos Extremos. Universidad de Zaragoza and Confederación Hidrográfica del Ebro. Zaragoza. 26/04/2018.

20. Delacámara, G.
Gobernanza del agua en América Latina y España.
II Foro Futuro en Español (FEE 2018) en Murcia: Recursos hídricos: Innovación y desafíos. Diario La Verdad. Murcia. 10/05/2018.

21. Delacámara, G.
Gobernanza del agua y regulación del sector de los servicios públicos.
H2Orizon. I Salón de innovación y tecnología del agua. Gestión eficiente del agua en el mundo digital. Sevilla. 19 - 21/09/2017

22. Delacámara, G.
Pricing Water Security and Enhancing Practical Financing Tools for Reclaimed Wastewater Reuse.
IDA International Conference on Water Reuse and Recycling: *Making Every Drop* Count. Valencia. 24 - 27/06/2018.

23. Delacámara, G.
Releasing the Floodgates: Blockchain for Water Managemen.
Session *Blockchain for Inclusiveness*. OECD Block Chain Policy Forum. Distributed Ledgers: Opportunities and Challenges. Paris, France. 04 - 05/09/ 2018.

24. Delacámara, G.
Modelo SABA (Saneamiento Básico) de la Cooperación Suiza para el Desarrollo (COSUDE).
VIII Foro Mundial del Agua. Brasilia 2018. Compartiendo el Agua. Brasilia, Brazil. 18 - 23/03/2018.

25. Delacámara, G.
Research and Innovation needs for the future.
Workshop on Projects for Policy (P4P) for Urban Water Management. Comisión Europea, D.G. Research and Innovation. Brussels, Belgium. 11 - 12/09/2018.

26. Delacámara, G.
El futuro de los recursos hídricos.
AQUAFORUM Murcia. 24/04/2018.

27. Delacámara, G.
Water Crisis.
Water Innovation Europe 2018: The road towards a Water-Smart Society: Overcoming the water challenges of the future. WssTP. Brussels, Belgium. 14/06/2018.

28. Delacamára, G.
Presentación del Libro Blanco de la Economía del Agua. Barcelona. 27/02/2018.

29. Delacamára, G.
Presentación del Libro Blanco de la Economía del Agua. Madrid. 26/03/2018.

30. Delacamára, G.
Presentación del Libro Blanco de la Economía del Agua. Murcia. 27/06/2018.

31. Delacámara, G.
Financiación de Servicios y Recuperación de Costes.
Ciclo de talleres de participación temática y territorial sobre "El reglamento del Ciclo Integral del Agua de Uso Urbano en Andalucía". Málaga. 20/09/2018

32. Esteve-Núñez, A., Barroeta, B.
Ciencia, periodismo y sociedad.
Asociación de Comunicadores de Biotecnología. Centro Nacional de Biotecnología (CNB-CSIC). Madrid. 09/05/2018.

33. Esteve-Núñez, A., Barroeta, B.
Investor Café - EASME, Brussels, Belgium. 12/06/2018.

34. Esteve-Núñez, A.
XIX Foro iAgua Magazine: El agua en la economía circular.
Roca Madrid Gallery. Madrid. 23/04/2018.

35. García Calvo, E.
Perspectivas para el agua en situaciones de sequía.
Rotary Club Elche, AEDyR and Fundación Caja Mediterráneo. Elche, Alicante. 05/06/2018

36. García Calvo, E.
Agua, Energía y Reutilización.
Madrid AquaEnergy Forum: De la huella del carbono a la huella hídrica. Fundación Ingeniero Jorge Juan. Madrid. 20 - 21/11/2018.

37. García Calvo, E.
Regeneración y Reutilización. Parte 1.
XII Congreso Internacional de AEDyR. Toledo. 23 - 25/10/2018.

38. Gómez, C.M.
La innovación en gobernanza y en el diseño de incentivos para garantizar la equidad en el acceso al agua.
VIII Foro de la Economía del Agua. Madrid. 27/09/2018.

39. Nozal, L.
Empleabilidad en Nuestros Grados. Presente, Pasado y Futuro.
UAH. Madrid. 25/05/2018.

1.16. Participation in Scientific Committees

1. AQUAFORUM Murcia. 24/04. Director of the Technical committee: **Delacámara, G.**

2. Cluster for the "Value of Water" of the WssTP platform (Water supply and sanitation Technology Platform). Leader: **Delacámara, G.**

3. Committee AEN/CTN318 "Riegos": Working groups 7 (Obras de riego) and 8 (Zonas verdes). **De Bustamante, I. and Martínez-Hernández, V.**

4. Commission Decision C(2015)5383, Directorate General for Health and Food Safety, European Commission. Scientific Committee "Health, Environmental and Emerging Risk". **Vighi, M.**

5. ENMRI-Alexandria, Egypt (Environmental and Natural Materials Research Institute). Advisory Board: **El-Shehawy, R.**

6. Newsletter and Website Committees of the ISMET- International Society for Microbial Electrochemistry and Technology. Editorial Coordinator of the ISMET news (newsletter). **Barroeta, B.**

7. OCDE Water Governance Initiative. **Delacámara, G.**

8. Organization Committee of AQUACROSS Final Conference "Ecosystem-Based Management for the Protection of Aquatic Biodiversity – Practice and Lessons Learnt". Brussels, Belgium. 10 - 11/10/2018. **Delacámara, G.**

9. Water Economics Forum (VIII and IX edition). Academic Director and spokesman: Delacámara, G. Member of the Academic Committee: **Gómez, C.M.**

10. Working group "Emerging Compounds". EU Water Supply & Sanitation Technology Platform (WssTP). **Martínez-Hernández, V.**

1.17. Oral Communications

1. **Aguirre-Sierra, A., Salas, J.J., Aragón, C., Esteve-Núñez, A.**
Integrating Microbial Electrochemical Technologies (MET) To Constructed Wetlands To Treat Urban Wastewater From Small Communities: the METland Concept.
16th IWA International Conference on Wetland Systems for Water Pollution Control. Valencia. 30/09/2018 - 04/10/2018.

2. **Arenas-Sánchez, A., Nozal, L., Alonso, C., López-Heras, I., Rivas, D., Rico, A., Vighi, M.**
Presence of organic contaminants in rivers from the Upper Tagus watershed (Central Spain).
11º Congreso Ibérico y 8º Iberoamericano de Contaminación y Toxicología Ambiental. Madrid. 11 - 13/07/2018.

3. **Arenas-Sánchez, A., López-Heras, I., Nozal, L., Vighi, M., Rico, A.**
Combined effects of high temperatures, drought and an insecticide on freshwater zooplankton communities: a microcosm study.
XIX Congreso de la Asociación Ibérica de Limnología (AIL). Coimbra, Portugal. 24 - 29/06/2018.

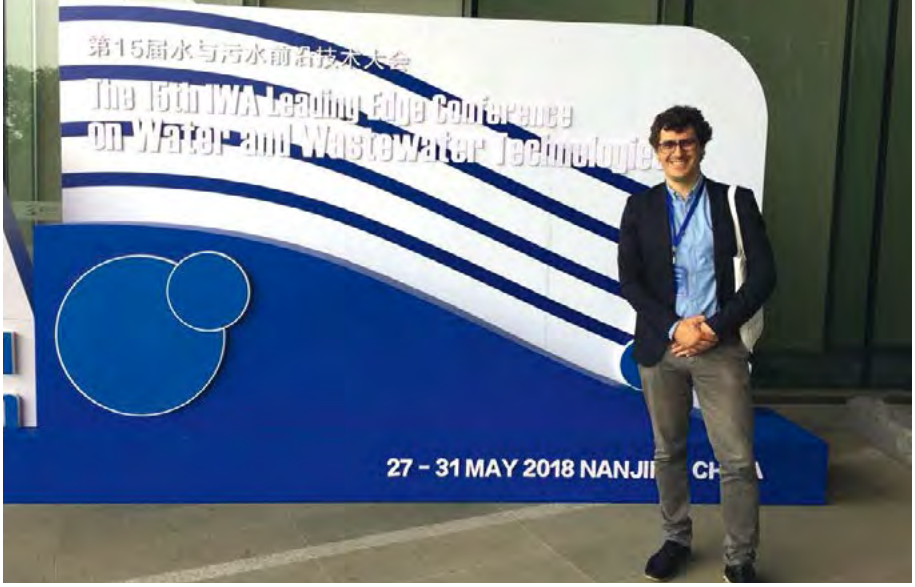
4. **Berná, A., Aragón, C., Aguirre-Sierra, A., Salas, J.J., Solís,G., Esteve-Núñez, A.**
Microbial Electrochemical Technologies and constructed wetlands for the removal of emerging contaminants in SUDOE regions.
16th IWA International Conference on Wetland Systems for Water Pollution Control. Valencia. 30/09/2018 - 04/10/2018.

5. **De Bustamante, I., Lillo, J., Hernández, J., Leal, M., Meffe, R., De Santiago-Martín, A., Martínez-Hernández, V.**
El chopo como materia prima e instrumento medioambiental.
II Simposio del Chopo. Valladolid. 17/10/2018

6. **Garcia-Pacheco, R., López-Sepúlveda, M., Terrero, P., Campos, E., Molina, F., Karela, A., Zarzo, D., García-Calvo. E.**
LIFE13 TRANSFOMEM: Reclaiming wastewater using recycled ultrafiltration membranes.
IDA International Water Reuse and Recycling Conference. Valencia. 24 - 27/06/2018.

7. **González-Gaya, B., García-Bueno, N., Gomez, I., Martinez-Lopez, B., Franco, P., Buelow, E., Marin, A., Rico, A.**
Effects of medicated fish feeds in the marine environment.
SETAC Europe 28th Annual Meeting, Rome, Italy. 13-17/05/2018.

8. **Martínez-Hernández, V., Meffe, R., Kohfahl, C., De Bustamante, I.**



Modelling infiltration reactor experiments to investigate natural attenuation of selected pharmaceuticals.
6th International Conference on Emerging Contaminants (EmCon2018). NIVA. Oslo, Norway. 25 - 28/06/2018.

9. **Meffe, R., Martínez-Hernández, V., De Miguel, Á., Leal, M., Hernández, J., De Santiago, A., López-Heras, I., Alonso, C., De Bustamante, I., Lillo, J., Martín, I., Salas, J.J.**
The fate of emerging organic contaminants during non-conventional wastewater treatment with a vegetation filter and a potential improvement of the system.
6th International Conference on Emerging Contaminants (EmCon2018). NIVA. Oslo, Norway. 25 - 28/06/2018.

10. **Monsalvo, V., Arévalo, J., Salinas, S., Kennedy, M., Esteve-Núñez, A., Rogalla, F.**
Microbial desalination (MIDES) cells: an innovative solution for low energy drinking water production.
Conference on Desalination for the Environment: Clean Water and Energy Science. Research, Innovation, Industry, Business. European Desalination Society. Athens, Greece. 03 - 06/09/2018.

11. **Ortiz, J.M., Esteve-Núñez, A.**
Microbial Electrochemical Technology for Environmental Applications: Bioelectrogenic Wetlands.
Intercontinental Landfill Research Symposium. Luleå University. Sweden. 26 - 28/06/2018.

12. **Prado, A., Berenguer, R., Esteve-Núñez, A.**
Towards a more sustainable treatment of urban wastewaters with biomass-derived carbon biofilters.
EU-ISMET 2018. International Society for Microbial Electrochemistry and Technology, 4th European Meeting. Newcastle upon Tyne, U.K. 12 - 14/09/2018.

13. **Pun, Á., Boltes, K., Letón, P., Nozal, L., Esteve-Núñez, A.**
METfilters detoxification capabilities.
16th IWA International Conference on Wetland Systems for Water Pollution Control. Valencia. 30/09/2018 - 04/10/2018.

14. **Ramírez, M., Berenguer, R., Ortiz, J.M., Esteve-Núñez, A.**
Influence of Inaccessible Porosity of Activated Expanded Graphite Electrodes on the Electroactivity of Geobacter sulfurreducens.
EU-ISMET 2018. International Society for Microbial Electrochemistry and Technology, 4th European Meeting. Newcastle upon Tyne, U.K. 12 - 14/09/2018.

15. **Ramírez, M., Ródenas, P., Ortiz, J.M., Esteve-Núñez, A., Borràs, E, Alanguilla, M., Bosch, P., Zamora, P., Arévalo, J., Monsalvo, V., Rogalla, F.**

Microbial desalination cell: the golden MIDES low energy desalination technology.
Conference on Desalination for the Environment: Clean Water and Energy Science. Research, Innovation, Industry, Business. European Desalination Society. Athens, Greece. 03 - 06/09/2018.

16. **Ramírez-Vargas, C.A., Peñacoba-Antona, L., Esteve-Núñez, A., Brix, H., Arias, C.A.**
Electric potential and correlation with treatment performance of electroactive constructed wetland.
16th IWA International Conference on Wetland Systems for Water Pollution Control. Valencia. 30/09/2018 - 04/10/2018.

17. **Rico, A., Arenas-Sánchez, A., Pasqualini, J,. García-Astillero, A., Cherta, L., Nozal, L., Vighi, M.**
Effects of imidacloprid and a neonicotinoid mixture on aquatic invertebrate communities under Mediterranean conditions.
11º Congreso Ibérico y 8º Iberoamericano de Contaminación y Toxicología Ambiental. Madrid. 11 - 13/07/2018.

18. **Rico, A., Schell, T., Hurley, R.**
Effects of microplastics in freshwater and soil ecosystems.
International Water Association (IWA) World Water Congress & Exhibition 2018. Tokyo, Japan. 16 - 21/09/2018.

19. **Schell, T., Hurley, R., Rico, A., Nizzetto, L., Vighi, M.**
Environmental loads and fate of microplastics in the Henares watershed, Central Spain.
International Water Association (IWA) World Water Congress & Exhibition 2018. Tokyo, Japan. 16 - 21/09/2018.

20. **Senán-Salinas, J., Contreras, J., Landaburu-Aguirre, J., García-Calvo, E.**
Life cycle assessment challenges in innovative recycling research. From reverse osmosis to forward osmosis.
SETAC Europe 24th LCA Symposium. Vienna, Austria. 24-27/09/2018

21. **Tejedor-Sanz, S., Asensio, Y., Fernandez-Labrador, P., Ortiz, J.M., Tolón, J., Monsalvo, V., Ciriza, J.F., Esteve-Núñez, A.**
Combining Bioelectrochemical Fluidized Beds Reactors And Electrocoagulation Cells: A New Paradigm On Industrial Wastewater Treatment. ANSWER Project.
EcoSTP18 Conference - Ecotechnologies for Wastewater Treatment. Western University. Ontario, Canada. 25 - 27/06/2018.

22. **Terrero, P., García-Pacheco, R., Campos, E., Molina, F., Pomata, D., Senán, J., López-Sepúlveda, M., Calzada, M., Martínez, D., Landaburu-Aguirre, J., Zarzo, D., García-Calvo, E.**
LIFE+13 TRANSFOMEM: Validación de membranas recicladas en procesos de filtración a media y baja presión.
XII Congreso Internacional de AEDyR. Toledo. 23 - 25/10/2018.

23. **Van den Brink, P.J., Lillicrap, A.D., Macken, A., Rico, A., Telfer, T.C.**
Tools for Assessment and Planning of Aquaculture Sustainability (TAPAS).
SETAC Europe 28th Annual Meeting, Rome, Italy. 13-17/05/2018.

24. **Zamora, P., Asensio, Y., Tejedor, S., Fernández, P., Ortiz, J.M., Monsalvo, V., Ciriza, J.F., Rogalla, F., Esteve-Núñez, A.**
Combination of bio-electrochemical and electrochemical technologies as a ready-to-use solution for food industry wastewater treatment.
XXXIX Meeting of the Electrochemistry Group of the Spanish Royal Society of Chemistry and 3rd E3 Mediterranean Symposium: Electrochemistry for Environment and Energy. Universidad Complutense. Madrid. 02 - 05/07/2018.

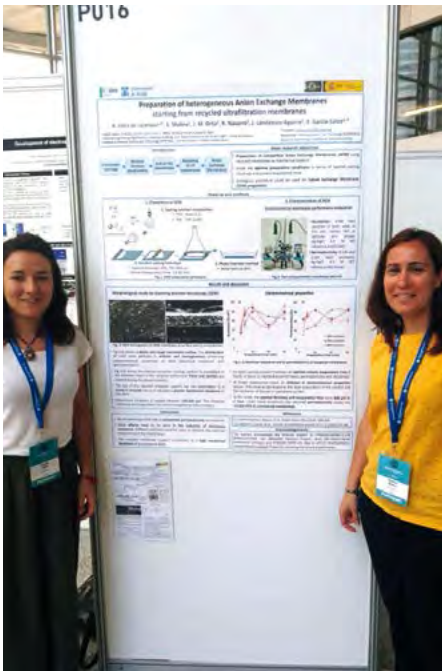
25. **Zamora, P., Ramírez, M., Ortiz, J.M., Monsalvo, V., Rogalla, F., Esteve-Núñez, A.**
Merging membrane technology and bioelectrochemical systems for low-cost desalination and wastewater treatment.
EU-ISMET 2018. International Society for Microbial Electrochemistry and Technology, 4th European Meeting. Newcastle upon Tyne, U.K. 12 - 14/09/2018.

1.18. Posters

1. **Arenas-Sánchez, A., Alonso, C., García-Doncel, P., Romero, A., Castaño, A., Nozal, L., Vighi, M., Rico A.**
Chemical stress on aquatic communities under semi-arid conditions: towards an improved multimetric approach.
28th Society of Environmental Toxicology and Chemistry (SETAC) Europe meeting. Rome, Italy. 13-17/05/2018.

2. **Arenas-Sánchez, A., López-Heras, I., Nozal, L., Vighi, M., Rico, A.**
Combined effects of high temperatures, drought and an insecticide on freshwater zooplankton communities: a microcosm study.
28th Society of Environmental Toxicology and Chemistry (SETAC) Europe meeting. Rome, Italy. 13-17/05/2018

3. **Blanco, A., Pascual-Aguilar, J.A., De Bustamante, I.**
De la cartografía antigua a los mapas *online colaborativos. Caso de estudio del Patrimonio Hidráulico de la Comunidad de Madrid.*
XVIII Congreso Nacional de Tecnologías de la Información Geográfica (TIG). Dpto. de Geografía (UV) and Grupo de Tecnologías de la Información Geográfica (AGE). Valencia. 20 - 22/06/2018.



4. **Cirés, S., González-Pleiter, M., Pulido-Reyes, G., Martín-Betancor, K., Rico, A., Leganés, F., Quesada, A., Fernández-Piñas, F.**
Ecotoxicity assessment of microcystins in freshwater samples using a recombinant bioluminescent cyanobacterium.
11º Congreso Ibérico y 8º Iberoamericano de Contaminación y Toxicología Ambiental, Madrid.11-13/06/2018.

5. **Daam, M., Rico, A., Brock, T.C.M.**
Is the EFSA effect assessment approach for fungicides sufficiently protective for aquatic ecosystems?
SETAC Europe 28th Annual Meeting, Rome, Italy. 13-17/05/2018.

6. **Fuentes, M., Vivar. M., López-Vargas, A., Pichel, N.**
Photovoltaic toy cars racing circuits as hands-on learning solar energy: Results from a Problem Based Learning (PBL) experience for undergraduates.
World Conference on Photovoltaic Energy Conversion (WCPEC-7). Waikoloa, Hawaii, U.S.A. 10 - 15/06/2018.

7. **García-Bueno, N., Gonzalez-Gaya, B., Marin, C., Marin, A., Rico, A.**
Shifts in the diatom assemblage structure and biological traits of marine biofilms exposed to antibiotics used in aquaculture.
SETAC Europe 28th Annual Meeting, Rome, Italy. 13-17/05/2018.

8. **García-Pacheco, R., Ortiz de Lejarazu, A., Landaburu-Aguirre, J., Molina, S., Ransome, T., García-Calvo, E.**
Usage of ppm·h concept for membrane aging. Polyamide tolerance to free chlorine.
Euromembrane 2018. ISIRYM (UPV) y EMS. Valencia. 09 - 13/07/2018.

9. **Gonzalez-Gaya, B., García-Bueno, N., Gomez, I., Martinez-Lopez, B., Martinez, J.M., Marin, C., Marin, A., Rico A.**
Effects of aquaculture antibiotics on marine biofilms and on the amphipod *Gammarus aequicauda.*
SETAC Europe 28th Annual Meeting, 13-17 May 2018, Rome, Italy.

10. **Hurley, R., Schell, T., Rico, A., Vighi, M., Nizzetto, L.**
Runoff of microplastics from agricultural soil.
28th Society of Environmental Toxicology and Chemistry (SETAC) Europe meeting. Rome, Italy. 13-17/05/2018.

11. **López-Vargas, A., Fuentes, M., Vivar. M.**
On the application of IoT for real-time monitoring of small stand-alone PV systems: Results from a new smart datalogger.
World Conference on Photovoltaic Energy Conversion (WCPEC-7). Waikoloa, Hawaii, U.S.A. 10 - 15/06/2018.

12. **López-Vargas, A., Fuentes, M., Vivar. M.**
Open source technologies and IoT as a tool for meeting the challenge of mass-scale Solar Home Systems monitoring in developing countries.
World Conference on Photovoltaic Energy Conversion (WCPEC-7). Waikoloa, Hawaii, U.S.A. 10 - 15/06/2018.

13. **Martín-Sanz, J.P., Valverde-Asenjo, I., De Santiago-Martín, A., Quintana-Nieto, J.R., González-Huecas, C., López-Lafuente, A., Diéguez-Antón, A.**
Relationships between a mixture of trace elements and enzyme activities are better explained by potentially available fraction.
Global Symposium on Soil Pollution. FAO. Rome, Italy. 3 - 4/05/2018.

14. **Martín-Sanz, J.P., Valverde-Asenjo, I., De Santiago-Martín, A., Quintana-Nieto, J.R., González-Huecas, C., López-Lafuente, A., Diéguez-Antón, A.**
Stoichiometry of enzymatic activities in calcareous soils under different agricultural uses.
11º Congreso Ibérico y 8º Iberoamericano de Contaminación y Toxicología Ambiental. Madrid. 11 - 13/07/2018.

15. **Ortiz de Lejarazu, A., Molina, S., Ortiz, J.M., Navarro, R., Landaburu-Aguirre J., García-Calvo, E.**
Preparation of heterogeneous Anion Exchange Membranes starting from recycled ultrafiltration membranes.
Euromembrane 2018. ISIRYM (UPV) y EMS. Valencia. 09 - 13/07/2018.

16. **Ortiz, J.M., Ramirez-Moreno, M. Rodenas, P., Esteve-Núñez, A.**
Microbial Electrochemical Technology and ion exchange membranes: low-energy desalination for sustainable water production.
XXXIX Meeting of the Electrochemistry Group of the Spanish Royal Society of Chemistry and 3rd E3 Mediterranean Symposium: Electrochemistry for Environment and Energy. Universidad Complutense. Madrid. 02 - 05/07/2018.

17. **Ortiz, J.M., Ramirez-Moreno, M., Zamora, P., Arévalo, J., Monsalvo, V., Rogalla, F., Esteve-Núñez, A.**
Microbial Desalination Cell for Brackish Water Desalination Powered by Energy Contained in Wastewater.
LET 2018 – The 15th IWA Leading Edge Conference on Water and Wastewater Technologies. Nanking, China. 27 - 31/05/2018.

18. **Pascual Aguilar, J.A., Belda Carrasco, R. and Iranzo García, E.**
Diseño de itinerarios de paisaje en la Sierra de Espadán-Río Mijares: puesta en valor y difusión de los recursos paisajísticos locales mediante cartografía web.
Congreso Nacional de Tecnologías de la Información Geográfica (TIG). Dpto. de Geografía (UV) and Grupo de Tecnologías de la Información Geográfica (AGE). Valencia. 20-22/06/2018

19. **Pichel, N., Vivar. M., Fuentes, M., Eugenio-Cruz, K., Sánchez-Pérez, A.**
A hybrid photovoltaic-photochemical prototype for simultaneous energy generation and water purification in rural areas of Mexico.
World Conference on Photovoltaic Energy Conversion (WCPEC-7). Waikoloa, Hawaii, U.S.A. 10 - 15/06/2018.

20. **Pichel, N., Vivar. M., Fuentes, M.**
Optimization study of a photovoltaic-photochemical hybrid system (SOLWAT) for meeting the needs of electricity and clean water.
World Conference on Photovoltaic Energy Conversion (WCPEC-7). Waikoloa, Hawaii, U.S.A. 10 - 15/06/2018.

21. **Rico, A., Alonso, C., García, P., Romero, A., Castaño, A., Nozal, L., Vighi, M., Arenas-Sánchez, A.**
Temporal variability and effects of multiple stressors on the aquatic invertebrate community under semi-arid conditions.
International Water Association (IWA) World Water Congress & Exhibition 2018. Tokyo, Japan. 16 - 21/09/2018.

22. **Rico, A., Arenas-Sánchez, A., Pasqualini, J., García-Astillero, A., Cherta, L., Nozal, L., Vighi, M.**
Effects of imidacloprid and a neonicotinoid mixture on aquatic invertebrate communities under Mediterranean conditions.
SETAC Europe 28th Annual Meeting, Rome, Italy. 13-17/05/2018.

23. **Rico, A., Arenas-Sánchez, A., Pasqualini, J., García-Astillero, A., Cherta, L., Nozal, L., Vighi, M.**
Effects of imidacloprid and a neonicotinoid mixture on aquatic invertebrate communities under Mediterranean conditions.
International Water Association (IWA) World Water Congress & Exhibition 2018. Tokyo, Japan. 16 - 21/09/2018.

24. **Rico, A., Brock, T.C.M., Daam, M.**
Relative tolerance of aquatic organisms to fungicides.
SETAC Europe 28th Annual Meeting, Rome, Italy. 13-17/05/2018.

25. **Rico, A., Vighi, M., Van den Brink, P.J., ter Horst, M., Tsapakis, M., Kalantzi, I., Macken, A., Lillicrap, A., García-Bueno, N., Marin, A., Teixeira, T., Torres, R., Falconer, L., Telfer, T.**
State-of-the-art on the use of models for the ERA of chemicals used in aquaculture.
SETAC Europe 28th Annual Meeting, Rome, Italy. 13-17/05/2018.

26. **Rodríguez-Sáez, L., Landaburu-Aguirre, J., Molina, S., García-Calvo. E.**
Antibiofouling surface modification of recycled ultrafiltration membranes for membrane bioreactors. Euromembrane 2018. ISIRYM (UPV) y EMS. Valencia. 09 - 13/07/2018.

27. **Salehi, N., Vaquero, V. Elorza, F.J., Candela, L., Serrat, A.**
Remote sensing application for investigating groundwater recharge at Lake Chad Basin (EGU2018-17433).
European Geosciences Union (EGU) General Assembly 2018. Vienna, Austria. 8 -13/04/2018.

28. **Schell, T., Hurley R, Rico A, Vighi M.**
Microplastics in wastewater and freshwaters: a case-study in the Henares river watershed (Central Spain).
28th Society of Environmental Toxicology and Chemistry (SETAC) Europe meeting. Rome, Italy. 13-17/05/2018.

29. **Senán-Salinas J., García-Pacheco R., Landaburu-Aguirre J., Molina, S., Terrero, P., García-Calvo, E.**
Environmental and economic assessment of reverse osmosis recycling to nanofiltration and ultrafiltration at pilot scale.
Euromembrane 2018. ISIRYM (UPV) y EMS. Valencia. 09 - 13/07/2018.

30. **Vivar. M., Fuentes, M., Pichel, N., López-Vargas, A.**
Solar energy outreach activities for schoolchildren: Hands-on experiments on photovoltaics, solar thermal and solar water disinfection.
World Conference on Photovoltaic Energy Conversion (WCPEC-7). Waikoloa, Hawaii, U.S.A. 10 - 15/06/2018.

31. **Zamora, P., Asensio, Y., Esteve-Núñez, A., Arévalo, J., Rogalla, F. Monsalvo, V.**
Anaerobic Wastewater Pretreatment as Fuel Production Stage for Microbial Desalination Cells.
LET 2018 – The 15th IWA Leading Edge Conference on Water and Wastewater Technologies. Nanking, China. 27 - 31/05/2018.

1.19. Fellowships

Alberto Blanco González
Category: Research support
Fund: Spanish Ministry of Economy, Industry and Competitiveness

Juan Manuel Ortiz Díaz-Guerra
Category: Researcher form National Science Programme "Young Researchers"
Fund: Spanish Ministry of Economy, Industry and Competitiveness

Manuel Mínguez Calzada
Category: Laboratory technician
Fund: Community of Madrid

Ana de Santiago Martín
Category: Researcher from Regional Science Programme "Talent atraction"
Fund: Community of Madrid

Lucía Nieto Reyes
Category: Researcher support
Fund: Community of Madrid

Amaia Ortiz de Lejarazu Larrañaga
Category: Predoctoral researcher
Fund: Spanish Ministry of Economy and Competitiveness

Raquel Dafouz Ramírez
Category: Research support
Fund: Community of Madrid

Noelia C. Peral Romero
Category: Laboratory technician
Fund: Community of Madrid

Borja Fernández Retuerto
Category: Predoctoral researcher
Fund: Community of Madrid

Eduardo Noriega Primo
Category: Predoctoral researcher
Fund: Community of Madrid

Nataraj Sanna Kotrappanavar
Category: Researcher from Regional Science Programme "Talent atraction"
Fund: Community of Madrid

Blanca Huidobro López
Category: Predoctoral researcher from National Science Programme "Funds for the training of doctors" FPI
Fund: Spanish Ministry of Science, Innovation and Universities

1.20. PhD Thesis

PhD thesis defended

1. **Natalia Pichel Mira.** Sistemas fotovoltaicos-fotoquímicos para el tratamiento del agua. Directora: Marta Vivar García. 02/02/2018.

Thesis in progress

2. **Alba Arenas Sánchez.** Evaluación de la vulnerabilidad de los ecosistemas acuáticos a múltiples factores de estrés en el área mediterránea. Directores: Andreu Rico Artero y Marco Vighi.

3. **Álvaro Pun García.** Efecto de contaminantes emergentes en lechos bioelectroquímicos. Directores: Abraham Esteve Núñez y Karina Boltes Espínola.

4. **Amaia Ortiz de Lejarazu Larrañaga**. Innovación en el reciclaje de membranas para el tratamiento del agua. Directores: Serena Molina Martínez y Juan Manuel Ortiz Díaz-Guerra.

5. **Amanda Prado Nicolás.** Depuración de aguas residuales mediante el uso de humedales bioeletrogénicos con biochar electroactivo como sustrato biofiltrante. Director: Abraham Esteve Núñez.

6. **Ana María Fernández Santamarina.** Análisis de las necesidades hídricas en diversas componentes del ecosistema fluvial para la definición de regímenes de caudales ecológicos. Directores: Ángel Luis Udias Moinelo y Fernando Magdaleno Mas.

7. **Andrés de Deus Villagra.** Estrategias 3D de "cableado" redox en bacterias electroactivas para recuperar ambientes contaminados. Director: Abraham Esteve Núñez

8. **Antonio de Lucas Sepúlveda**. Concepto, análisis histórico y determinación de excedentes de la cuenca del Tajo: aplicación al trasvase Tajo-Segura. Directores: Irene de Bustamante Gutiérrez y Bernardo López Camacho.

9. **Ascensión López Vargas.** Desarrollo de equipos de bajo coste para monitorización de sistemas fotovoltaicos basados en herramientas de open-hardware y código abierto. Directores: Manuel Fuentes Conde y Marta Vivar García.

10. **Berta Díez Odriozola.** Fouling and biofouling resistant membranes for water treatment processes. Director: Roberto Rosal García.

11. **Blanca Huidobro López.** Desarrollo de un filtro verde enmendado que actúe como tratamiento secundario y terciario. Director: Irene de Bustamante Gutiérrez y Leonor Nozal Martínez.

12. **Carlos Edo Cuesta.** Environmental distribution and fate of microplastics: ageing and effect on the freshwater biota. Directores: Roberto Rosal García y Francisca Fernández Piñas.

13. **Colin Wardman.** Tecnologías electroquímicas microbianas aplicadas a la depuración de aguas residuales. Director: Abraham Esteve Núñez.

14. **Cristina Villar Martín.** Biosensores electroactivos. Director: Abraham Esteve Núñez.

15. **David Mostaza Colado.** Estudio de las relaciones entre aguas superficiales y aguas subterráneas de la Masa de Agua Subterránea (MAS) Aluviales: Jarama-Tajuña (030.007). Director: Francisco Carreño Conde.

16. **Felicia Mabel Díaz Cubilla**. Efecto de contaminantes emergentes sobre procesos anaerobios de tratamiento de agua residual. Directores: Pedro Letón y Karina Boltes Espínola.

17. **Fluquer Peña Laureano.** El agua subterránea en los sistemas kársticos de la reserva Nor Yauyos Cochas. Directores: Irene de Bustamante Gutiérrez y Javier Lillo Ramos.

18. **Georgiana Amariei.** Materiales funcionales nanoestructurados para aplicaciones tecnológicas y biomédicas. Directores: Roberto Rosal García y Pedro Letón García.

19. **Idoia Martín de Lucía Ramos.** Physical and toxicological interactions between anthropogenic pollutants and engineered nanoparticles. Directores: Roberto Rosal García y Francisca Fernández Piñas.

20. **Jacquelyne del Rosio Chagua Flores.** Estudio hidrogeológico, disponibilidad y calidad del agua subterránea en la cuenca Sama, Tacna, Perú. Directora: Irene de Bustamante Gutiérrez.

21. **Jesús Morón López**. Desarrollo de tecnologías biológicas de control de cyano-HABs y eliminación de cianotoxinas. Directora: Serena Molina Martínez.

22. **Jorge Carlos Delgado García**. Análisis de las implicaciones de la viabilidad de reutilización del agua en la edificación. Director: Eloy García Calvo.

23. **Jorge Senán Salinas**. Análisis de Ciclo de Vida en la transición a la Economía Circular. Caso de estudio: El reciclaje en la tecnología de membrana. Directores: Eloy García Calvo y Junkal Landaburu Aguirre.

24. **Juan José Castro Ríos.** Ingeniería hidráulica aplicada a la minería romana, estudio del sistema ruina montium. Directores: Irene de Bustamante Gutiérrez y Javier Lillo Ramos.

25. **Juan Pedro Martín Sanz**. Aplicación de índices de calidad a la afección de nitrógeno y metales pesados en el suelo bajo diferentes usos en el área periurbana de Madrid. Directores: Ana de Santiago Martin e Inmaculada Valverde Asenjo.

26. **Laura Rodríguez Sáez**. Uso de membranas recicladas de ultrafiltración en biorreactores de membrana para tratamiento de aguas residuales. Directoras: Junkal Landaburu Aguirre y Serena Molina Martínez.

27. **Lorena Peñacoba Antona**. Diseño y construcción de humedales electrogénicos para la eliminación de contaminantes emergentes en aguas residuales urbanas. Directores: Eloy García Calvo y Abraham Esteve Núñez.

28. **Mercedes Echegaray Giménez**. La gobernanza del agua en España. Directores: Irene de Bustamante y Bernardo López-Camacho.

29. **Sara Pelegrin Mc Carthy**. Planificación hidrológica comparada: España y Reino Unido. Herramienta para cumplir los ODS y cambio climático. Directores: Irene de Bustamante y Bernardo López-Camacho.

30. **Sergio Martínez-Campos Gutiérrez**. Plastic as vectors of microorganism in the aquatic environment. Director: Roberto Rosal.

31. **Theresa Schell**. Sources, pathways and risk of microplastics in freshwater ecosystems. Director: Andreu Rico Artero.

1.21. Internships

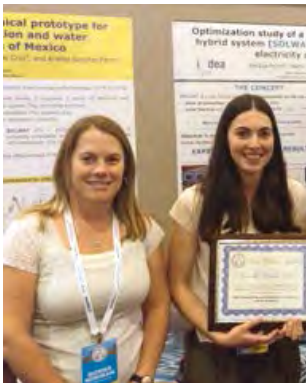
Student: Gerardo Ricardelli
Research: Characterization of recycled membranes for different applications (ion exchange and ultrafiltration membrane)
Centre: Università degli studi di Cassino e del Lazio Meriodionale (Italy)
Date: 02/2018-07/2018

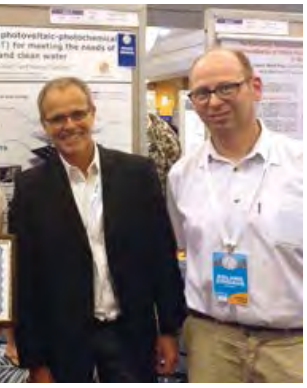
Student: Anastasia Karela
Research: Use of recycled membranes for household water treatment
Centre: University of Patras (Greece)
Date: 03/2018-05/2018

Student: José Luis Corvea Porras
Research: Geomatics applied to the management of water resources in protected areas
Centre: Inversiones Gamma, S.A. (Cuba)
Date: 05/2018-07/2018

Student: Olga Titica
Research: Analitycal methods to measure parameters in water and soil samples
Centre: University of Calgary (Canada)
Date: 05/2018-06/2018

Student: Michael Peter Füeg
Research: Microbial Electrochemical Technologies
Centre: University of Alcalá
Date: 02/2018-actually





Student: María Fernanda Jaramillo Llorente
Research: Management of groundwater resources for a sustainable agriculture and environmental protection
Centre: Instituto Cinara, Universidad del Valle (Colombia)
Date: 08/2018-12/2018

Student: Jacquelyne del Rosio Chagua Flores
Research: Groundwater quality
Centre: University of Alcalá
Date: 09/2018-11/2018

Student: Savannah Fox Vajgrt
Research: Characterize the biofilms developed on different electrode materials used for Microbial Electrochemical Technologies (MET)
Centre: University of Wisconsin - Madison (U.S.A.)
Date: 09/2018-12/2018

Student: Ángeles Mendoza Sammet
Research: Life cycle analysis of pilot plant of MIDES
Centre: UNESCO IHE Delft, Institute for Water Education (Netherlads)
Date: 11/2018-12/2018

Student: Sonam Jamtsho
Research: Life cycle analysis of pilot plant of MIDES
Centre: UNESCO IHE Delft, Institute for Water Education (Netherlads)
Date: 11/2018-12/2018

1.22. RTD activities organization

1. Annual meeting of the IMPASSE (Impacts of microplastics in agrosystems and stream environments) project. 29-30/01/2018.

2. Workshop "Helping Nature. Additional resources: desalination and reuse". IUACA, CAMPUSHABITAT5U, AEDyR, UA and IMDEA Water. In the framework of World Water Day. Alicante. 22/03/2018.

3. Technical visit to the pilot plant of the Life+ TRANSFOMEM project located at the wastewater treatment plant of Guadalajara. 09/05/2018.

4. Workshop "Management of end-of-life desalination membranes. Towards a circular economy system". IMDEA Water and Life+TRANSFOMEM Consortium. Alcalá de Henares. 16/05/2018.

5. Workshop "Introduction of renewable energies". IMDEA Water, Telur Geotermia y Agua S.A. and CETYS University of Tijuana (Mexico). IMDEA Water, Alcalá de Henares. 03/07/2018.

6. Workshop "Strategies for the abatement of priority and emerging contaminants in wastewater. Current progress and future challenges". IMDEA Water and REMTAVARES Consortium. Madrid. 10 - 11/12/2018.

1.23. Institutional Activities

12.1. Awards and Merits

1. González-Gaya, B. Prize "Somos Científicas, ¡en directo!". CaixaForum, Madrid. 10/02/2018.

2. IMDEA Water. XIV Premio Carlos Ruiz Celaá a la Trayectoria Institucional. Grupo Especializado del Agua, Asociación Nacional de Ingenieros de Minas. Sevilla. 13/04/2018.

3. Vighi, M. Environmental Education Award 2018, SETAC (Society of Environmental Toxicology and Chemistry). SETAC Europe 28th Annual Meeting. Rome, Italy. 14/05/2018.

4. Pichel, N. Prize for the best poster *Optimization study of a photovoltaic-photochemical hybrid system (SOLWAT) for meeting the needs of electricity and clean water* (Pichel, N., Vivar. M., Fuentes, M.) in the World Conference on Photovoltaic Energy Conversion (WCPEC-7). Waikoloa, Hawaii. 10 - 15/06/2018.

5. Fernández Rubio, R. (President of the Board of Trustees of IMDEA Water) Doctor Honoris Causa by the National University of Engineering in Lima, Peru. 05/2018. Bestowal ceremony: Lima, Peru, 11/10/2018.

6. Water Economics Forum, (Delacámara, G. Academic Director). Award for Best Event, iAgua. Roca Madrid Gallery. 19/12/2018.

12.2 Other institutional activities

- Member of Research Laboratories Network (REDLAB).
  http://www.madrimasd.org/Laboratorios/default.asp

- Participation. XVIII Science Week. Madrid, Spain. 2018

- Member of Euraxess Service Network. Local Contact Point

- Participation. Blog el agua. Madri+d. REMTAVARES Project.
  http://www.madrimasd.org/blogs/remtavares/

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