# Institute of Environmental Assessment and Water Research | 2017-2018

idæa

INSTITUT DE DIAGNOSI AMBIENTAL I ESTUDIS DE L'AIGUA

CSIC

CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

2019, Institute of Environmental Assessment and Water Research (Instituto de Diagnóstico Ambiental y Estudios del Agua, IDAEA)
Spanish Research Council (Consejo Superior de Investigaciones Científicas, CSIC)

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# Content


4 **From the Director**

6 **The Institute**
6 Welcome
6 Location
7 Organisation

8 **Who are we?**

10 **Research Groups**
10 Environmental Chemistry Department
30 Geosciences Department

46 **Research Supporting Services**

56 **Research Highlights**

74 **Creation of new committees**

75 **IDAEA in numbers**

80 **Scientific results**
80 SCI publications
121 Other publications
123 Edited Books
124 Book chapters
128 Oral presentations in conferences
145 Invited talks
157 Patents

158 **Research training**
158 Doctoral Thesis
162 Masters Thesis
165 Final Degree Projects

166 **Teaching activities**

174 **Communication**
174 Dissemination activities
175 Workshops
178 Media
178 Digital press
180 Digital videos
180 Radio
181 Television
182 Press

186 **Participation in committees and scientific representation**

190 **Organisation of Congresses**

194 **Awards**

# 1 From the Director

Teresa Moreno
Director of IDAEA

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Human society is expanding and globalising at an unprecedented, accelerating rate, pushing the limits of what our ecosystems can sustain. Realistic calculations by the UN predict 2.5 billion people being added to current urban populations by 2050, with megacities reaching sizes exceeding 100 million people, creating massive challenges relating to resource management and environmental pollution on a scale that is global and affects all of us.

In this context it is difficult to overemphasise the potential value of high quality research based on hard science and focused on the quality of the air we breathe and the water we drink and is used in the food we consume. This is our mission at IDAEA. We realize that the results of such research need to be shared on an international stage and brought to the people in the fight to help understand and resolve gigantic 21st century environmental problems such as hydrologic sustainability, urban air quality, and the ongoing Anthropocene great extinction event affecting so many species in our ecosystems. Recognition of the importance of such issues is becoming mainstream in society, with green parties and activist movements such as Extinction Rebellion driving forward the demand for radical change and new, better ways of seeing the world and interacting with our natural surroundings.

Increased water use and severe scarcity, especially in arid and semi-arid regions, have been highlighted by the World Economic Forum as a global risk. Water shortages result not from the global lack of water, but from the spatial and temporal mismatch between demand and supply, and things are going to worsen as our collective demand increases. Water engineers have traditionally overcome the problem using reservoirs, water transfers, desalination and groundwater, but all these sources and solutions are by now severely stressed, and the water is increasingly polluted with a wide range of emerging contaminants. Of particular global concern are emerging micropollutants (EMP's) and persistent organic pollutants (POPs) which can bio-magnify and bio-accumulate in ecosystems, inducing toxic effects that can be as poorly understood as they are potentially pernicious. New approaches are required. Our water resources must be better managed, recycled, and cleaned using less polluting more "natural" treatments.

As with water, so with air. All of us living in cities are increasingly aware of the fact that we breathe air contaminated with toxic particles and gases. In Europe the main problem today is road traffic, but in the developing world this combines with industrial and domestic emissions and poor infrastructure to create what is effectively an epidemic, a global insult to human health that results in millions of premature deaths. We need to develop more efficient and accurate methods of measuring and reducing our daily dosage of these pollutants, draw up legislative controls that really make a difference, tell people exactly what they are breathing and why, and find new solutions such as high-tech purifiers and low-emission transport in greener cities where clean air is a priority demanded by its citizens.

In this report for the period 2017-2018 we overview our research at IDAEA, emphasizing our achievements so far and our hopes for a better future. We demonstrate the enormous range and productivity of our research, involving subjects as diverse as emerging contaminants, flame retardants, toxicity and endocrine disruption, air quality in urban and indoor environments, geologic carbon storage, induced seismicity, soil and groundwater recharge, … but always focussed on air and water. Over the two years covered by this report IDAEA has continued to consolidate and develop itself as a reference research institute, obtaining 21 national projects and new 30 internationally funded projects (including winning an ERC Starting grant). We have increased our number of publications in SCI journals, and continue to be one of the most productive institutes in CSIC.

Last, but definitely not least, I want to give special thanks to all our administrative colleagues from CID, including library, informatics and maintenance personnel, who together work hard to make our daily research possible.

Enjoy the report!

# 2 The Institute

## 2.1 Welcome to the Institute of Environmental Assessment and Water Studies

IDAEA is an environmental science institute devoted to the study of the footprint of the chemical changes our species is imposing on the biosphere. Much of the research work at this institute is centred on two of the great environmental challenges of our time, namely the cleanliness and availability of the WATER we drink and the quality of the AIR we breathe, guided by the principle that our scientific understanding of current threats to global ecosystems is best approached from a holistic, systems-based viewpoint.

Founded in 2008, IDAEA was envisaged as a new multidisciplinary research institute bringing together a wide range of expertise in environmental science and organized under two broad Departments (Environmental Chemistry and Geosciences). The institute has demonstrated particular strengths in the analysis of organic pollutants and their impact on ecosystems, the study and management of water resources, the development of multivariate resolution algorithms in chemometrics, and in the study of inhalable particulate matter and toxic gases.

The international research profile of the various research groups working at IDAEA is firmly grounded upon a solid analytical base. To this end, the institute building houses large environmental geochemistry laboratories focussed on analysing atmospheric and aqueous pollutants. The Institute is also responsible for prestigious, state-of-the-art air monitoring “supersites” that include advanced on-line instrumentation for the study of air pollution. These supersites are integrated into international networks and have enabled the Institute to achieve research dominance in the field of source apportionment and transboundary migration of atmospheric pollutants.

## 2.2 Location

IDAEA is located at the
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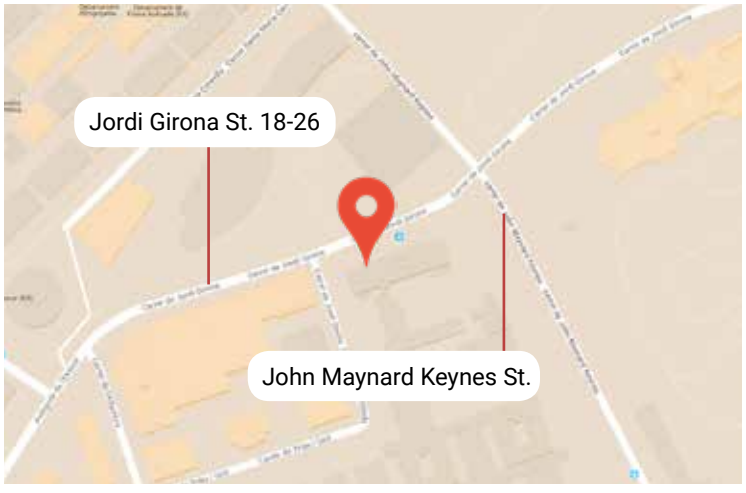
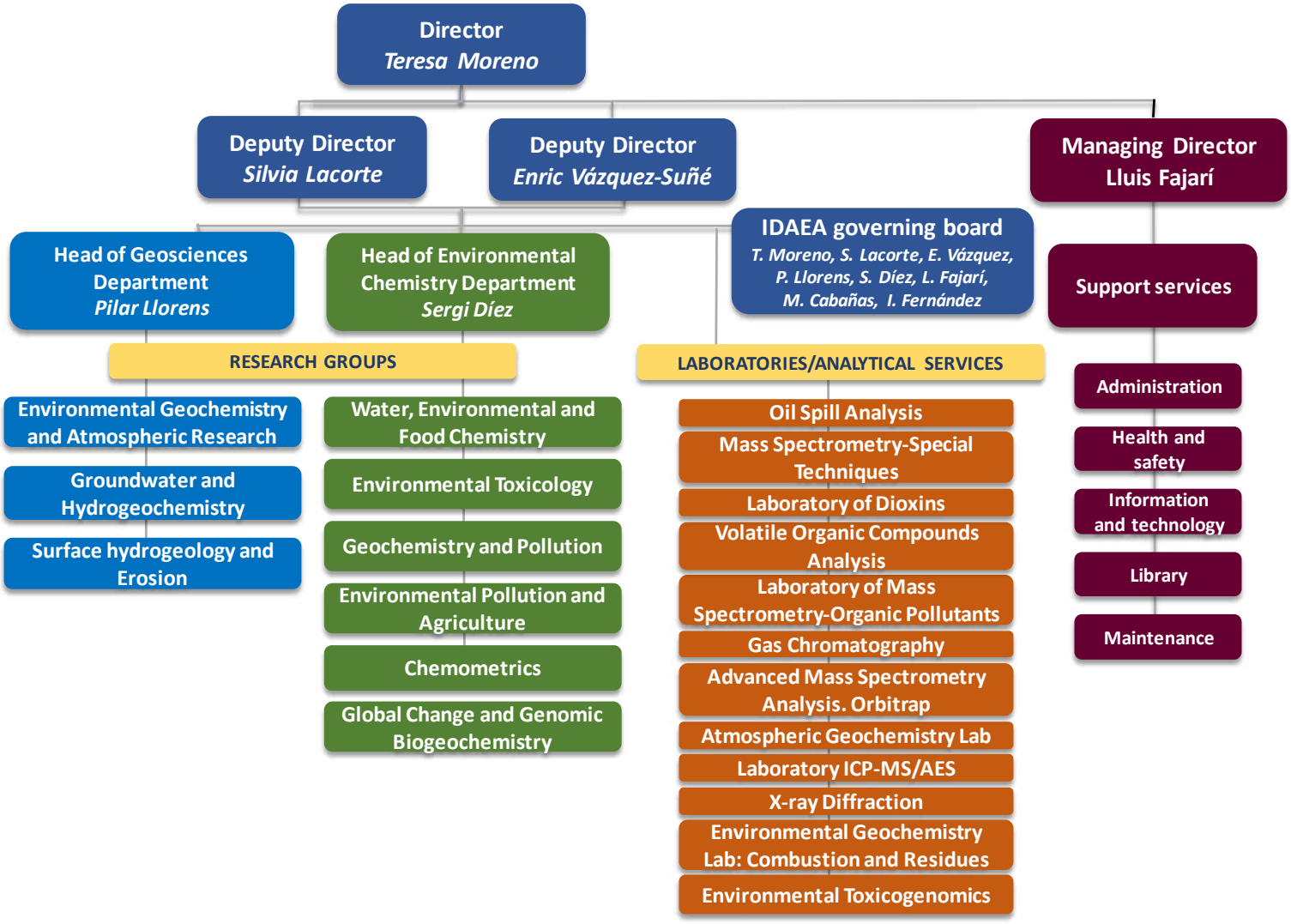


## 2.3 Organisation



# 3 Who are we?

IDAEA is proud of being a multidisciplinary research institute bringing together a wide range of expertise in environmental science and organized under two broad Departments (Environmental Chemistry and Geosciences).

## Environmental chemistry department

The **Environmental Chemistry Department** focusses on the assessment of origin, transport and evolution of natural and anthropogenic organic inputs to the environment, including the atmosphere, the water column, soils, sediments and organisms. The groups operating within the department have a world-class reputation for their research strength in the analysis, occurrence, fate and behaviour of organic pollutants, the development of chemometric methods of data analysis, the bioavailability and toxicity of emerging contaminants, and the interactions between organic pollutants and major biogeochemical cycles. Multiple methodologies have been developed for the analysis of polar and non-polar, volatile and non-volatile chemical compounds, based on different techniques such as gas and liquid chromatography, capillary electrophoresis and mass spectrometry. Other relevant topics involve the study of fossil molecular compounds as traces of climate change in the past and the toxicity of organic pollutants in organisms such as fish, shellfish and human beings.

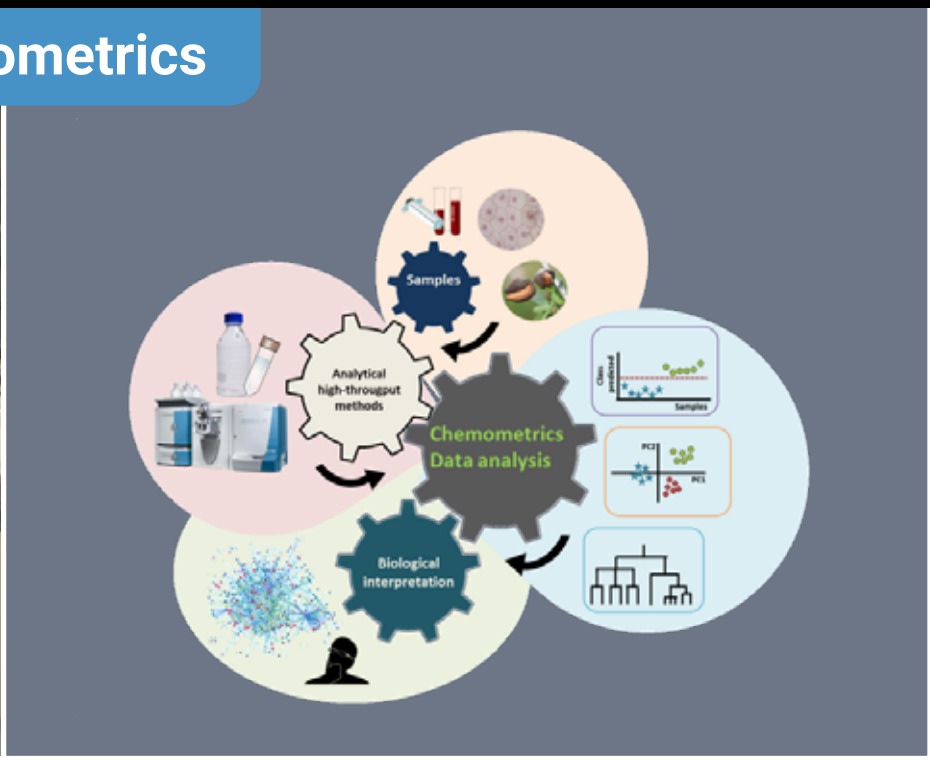
## Geosciences department

The **Geosciences Department** research interests focus on environmental issues related to air and water. Our atmospheric work includes study of the sources, transport and evolution of natural and anthropogenic inorganic compounds within the environment. The relevance of this research to human society lies in its direct links to important global environmental issues such as urban air quality, the abatement of industrial emissions, the transboundary movement of regional aerosol plumes, and the interaction of aerosols and climate.

Our hydrogeological expertise embraces the exploration of groundwater resources and pollutants, urban aquifer management, marine intrusion in coastal aquifers, and development of numerical models to assess suitable hydrogeological conditions for safe long-term waste storage and subsurface energy exploitation. Many aspects of our research involve applications in civil and mining engineering, and are again directly relevant to key environmental challenges facing modern society. Our surface hydrology approaches are multidisciplinary and include study of the role of vegetation on the hydrological cycle, rainfall-runoff dynamics, runoff generation processes and erosion and sediment transport processes.

## Environmental Chemistry Department

## Chemometrics

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Rubén Ballesteros Cano

## Chemometrics

The Chemometrics group focuses on the development and application of chemometric (data analysis) tools for the study of problems of environmental interest, such as the study of metabolomic effects of environmental stressors on target organisms or the evaluation of environmental data coming from monitoring campaigns. Main research lines include the development of chemometric approaches to analyse datasets coming from diverse analytical platforms, the application of these chemometric data analysis methods to evaluate the effects of chemical pollutants and global change stressors on environmentally relevant organisms and the analysis of environmental data sets (i.e. monitoring studies on air, surface waters, sediments and soils) to retrieve information regarding the identification, resolution, and apportionment of pollution sources and their environmental impact.

## Projects

- Chemometrics and high- throughput omics analytical methods for assessment of global change effects on environmental and biological systems (CHEMAGEB); ERC-AG 320737; European Research Council; Advanded Grants; R.Tauler Ferré; 04/2013 - 03/2018. 2.458.000€.
- Chemometrics: method development and application to analytical multidisciplinary problems; 2017SGR0753; Agència de Gestió d'Ajuts Universitaris i de Recerca, Generalitat de Catalunya; (SGR); R.Tauler Ferré; 01/2017 - 12/2019. 44.800€.
- Estrategias ómicas no dirigidas para la evaluación de sistemas ambientales multiestresados. CTQ2017-82598-P; CSIC; Ministerio de Economia, Industria y Competitividad; Proyectos I+D Excelencia 2017; J.Jaumot; 01/2018 - 12/2020. 64.000€.
- Gestión Integral de la calidad y cantidad de las aguas en los procesos de suministro y distribución (IMAQUA).Ris3CAT (Feder). COMRDI16-1-0063. 13 participantes. S.Lacorte. 2017-2020; 46.038,08€.
- Nuevos avances y propuestas para el análisis masivo de datos multi- y megavariantes. CTQ2015-66254-C02-01; Ministerio de Economia, Industria y Competitividad; Proyectos I+D Excelencia 2015; R.Tauler; CSIC; 01/2016 - 12/2019. 128.000€.
- Ozone dose on wastewater disinfection: toxicity assessment and microcontaminant removal. ICOOPB20361. CSIC and FAESP in Brazil. S.Lacorte. 01/01/2018 - 31/12/2019. 19.100€.

- Priorización de compuestos citostáticos para monitorización ambiental. Fuentes, comportamiento y estrategias de remediación. CTM2014-60199-P. Silvia Lacorte, Josep Caixach, C.Flores. 01/01/2015 - 31/12/2017. 72.600,00€.

- Quimiometría para ómica ambiental. Consejo Superior de Investigaciones Científicas; Intramural 2017 Nuevos Científicos Titulares; J.Jaumot; CSIC; 12/2017 - 11/2018. 5.000€.

- Residuos de fármacos en los efluentes de aguas residuales de centros para personas mayores (Establecimientos y residencias de ancianos): riesgos, nuevas herramientas de control y sistemas efectivos de tratamiento. SOE1/P1/F0173. S.Lacorte, C.Barata. 01/07/2016 - 30/06/2019. 153.007,00.

## Contracts

- Desarrollo y validación de modelos quimiométricos para el tratamiento de datos obtenidos con una sonda espectrofotométrica (UV); Institución: CETAQUA; 2017. 5.000€.

- Desarrollo y validación de modelos quimiométricos para el tratamiento de datos registrados en la estación de tratamiento de agua potable (ETAP) de Sant Joan Despí. CETAQUA; 10/07/2018 - 31/10/2019. 8.470,00€.

- Desarrollo y validación de modelos quimiométricos para la correlación de olores y compuestos detectados en distintos puntos de la EDAR del Besos. CETAQUA; 2017-2018. 5.000€.

- Desarrollo y validación de modelos quimiométricos para la correlación de olores y compuestos detectados en distintos puntos de la EDAR del Besós. CETAQUA. 01/11/2016 - 31/01/2017. 5.000€.

- Desarrollo, Aplicación y Validación de modelos quimiométricos que permitan el tratamiento y análisis de datos obtenidos en la captación de estaciones de estaciones de tratamiento de agua potable (ETAP) para la posible detección en EV; CETAQUA; 2016-2017. 15.000€.

- Detección de eventos y determinación del potencial de formación de trihalometanos en la ETAP SJD mediante espectrometría online-SpectroETAP. CETAQUA; 2018-2019. 7.000€.

- Determinación de las características (química y organoléptica) óptimas del agua de red para la mejora de la aceptación del servicio de abastecimiento al municipio de Roquetas; CETAQUA; 2017. 2.500€.

- Monitorización y control de bromatos en la etapa de ozonización en la producción de agua potable. CETAQUA; 2017-2018. 5.000€.

- Presencia, seguimiento e impacto de microplásticos en aguas naturales y de consumo. 15/02/2018 - 14/02/2019. 35.695,00€.

# Environmental Pollution and Agriculture (EPA)

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## Environmental Pollution and Agriculture (EPA)

The Environmental Pollution and Agriculture group is focused on the natural processes affecting the fate of contaminants in the environment to find nature based approaches to mitigate chemical pollution and the associated impact of human activity on the ecosystems. The research lines range from environmental chemistry to environmental forensics to identify the pollution sources and the key processes affecting to their fate in the environment, including sustainable wastewater treatment systems, biogeochemistry of Mercury in ecosystems and fate of contaminants in agroecosystems. Non target screening and metabolomic methods are developed to get further insight into the contaminant degradation pathways and their impacts into the downstream environment.

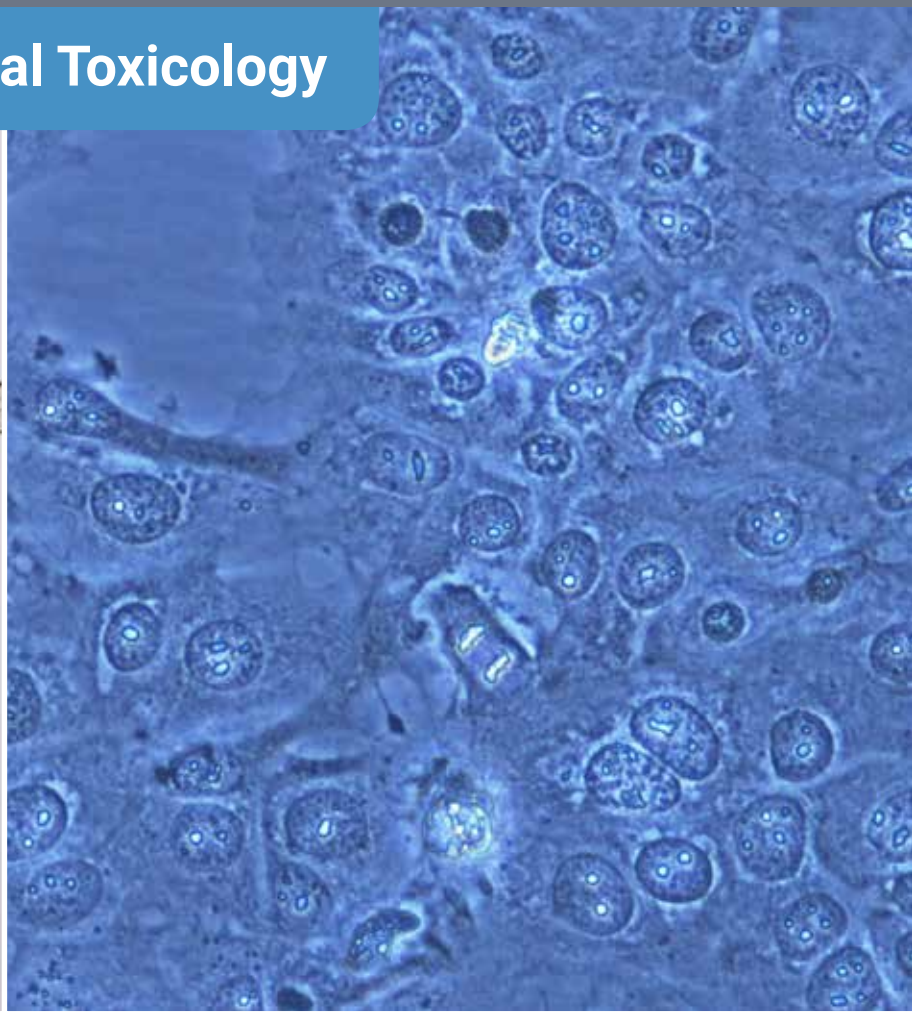
## Projects

- ANtibioticS and mobile resistance elements in WastEwater Reuse applications: risks and innovative solutions; H2020-MSCA-ITN-2015/675530; Marie Curie Foundation; Despo Fatta-Kassinos, JM.Bayona; 01/10/2015. 30/09/2019. 462.280€.
- Dinámica de la acumulación de antibióticos, metales y genes de resistencia bacteriana en cultivos agrícolas por fertilizacion orgánica. Implicaciones en la producción vegetal; DAMA; AGL2017-89518-R; JM.Bayona , V.Matamoros; 01/01/2018 - 31/12/2020. 163.350,00€.
- Explorando la química de la simbiosis en la atenuación de contaminantes emergentes. Avances en el tratamiento biológico de aguas residuales; CTM2017-91355-EXP; Ministerio de Ciencia, innovación y Universidades; V.Matamoros; 01/11/2018. 31/10/2020. 60.500,00.
- Identificación y prevención del riesgo químico en agricultura. Impacto holístico de la calidad ambiental en la incorporación de contaminantes en cultivos a escala real; AGL2014-59353-R; IDAEA; JM Bayona, V. Matamoros ; 01/01/2015 - 30/06/2018; 175.450€.
- Improvement and disclosure of efficient techniques for manure management towards a circular and sustainable agriculture (AGRICLOSE). ENV/ES/000439; LIFE; J.Boixaderas. IDAEA; 01/07/2018 - 30/06/2022. 283.792€.
- Los arrozales del Delta del Ebro como ecosistema clave para la especiación y biodisponibilidad del mercurio (EBRORICEHG);CGL2016-80963-R; C.Sanpera; MINECO, Plan Nacional I+D+I; UB, IDAEA; 01/01/2016 - 31/12/2019; 130.000€.
- Resolviendo la contaminacion de los acuiferos mediante nuevas configuraciones de microalgas. 201880I046; V. Matamoros. 22/11/2018 - 21/11/2019. 5.000,00€.

## Contracts

- Identificación de vertidos de hidrocarburos en el mar y resolver cuestiones que surjan en las fases de evaluación y respuesta en emergencias de contaminación de hidrocarburos; Salvamento Marítimo (SASEMAR). Ministerio de Fomento. 25/10/2007 - 31/12/2019. 934.637,73€.

# Environmental Toxicology



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## Environmental Toxicology

The Environmental Toxicology group studies and assesses the bioavailability and toxicity of existing and emerging contaminants and their mixtures. To this end, the group applies an array of lab toxicity tests (i.e. transgenic yeast, cell lines, zebra fish embryos and Daphnia magna models), and field assays conducted with feral fish and invertebrates from both marine and freshwater environments. Effects are assessed across different biological levels using transcriptomic, lipidomics, metabolomics, morphogenetic and specific cell response, including effects on whole organism and population. Some of the key achievements of the group involve the use of biomarkers and sentinel species to biomonitor contamination in marine and freshwater systems, the first evidence of endocrine disruption in fish (estrogenic effects in fish) and aquatic invertebrates (imposex in gastropods), the application of -omic technologies to monitor effects and mode of action (MoA) on model species, the determination of the 'obesogenic' effect of contaminants in fish, fish cell lines and invertebrates and the development of animal-free bioassays for endocrine disruption and related toxic effects.

## Projects

- Chemometric and High-throughput Omics Analytical Methods for Assessment of Global Change Effects on Enviromental and Biological Systems; 320737; R. Tauler, B. Piña. 01/04/2013 - 31/03/2018; 2.175.212,58€.
- Development of medium- and high-throughput methodologies for chemical risk assessment in aquatic ecosystems: neurobehavioural effects and pathophysiological mechanisms in zebrafish and Daphnia magna; NeuroAquaTox; CTM2017-83242-R; MICIN; IDAEA, IRI-UPC/CSIC; D.Raldúa, C.Barata, E.Prats, M.Faria. 01/01/2018 - 31/12/2020; 180.000€.
- EPIgenetic Signatures as biomarkers of ecoTOXicological effects (EPISTOX); H2020-MSCA-IF-2017; European Comission. Europaid. B.Piña; 01/01/2015 - 31/12/2019.
- Evaluación del riesgo ambiental basada en mecanismos de acción: hacia una solución ómica para una gestión eficaz de los riesgos químicos; CTM2014-51985-R; FEDER; IDAEA; C. Barata. 01/01/2015 - 31/12/2017; 211.750,00€.
- Grupo reconocido de la Generalitat de Catalunya. Toxicologia Ambiental; 2017SGR902; B.Piña; 01/01/2018 - 31/12/2020; 20.000,00€.
- Knowing the enemy: a mechanistic approach to fight against; OPIDN; NATO_2015; D.Raldúa; 21/04/2015 - 21/04/2018; 162.000,00€.

- Nuevas herramientas para la detección de disruptores lipídicos y obesógenos ambientales (LIPOTOX); CGL2014-52144-P; Ministerio de Economía y Competitividad. C.Porte.01/01/2015 - 31/12/2018; 165.770€.

- Ozone dose on wastewater disinfection: toxicity assessment and microcontaminant removal; COOPB20361; S. Lacorte. 01/01/2018 - 31/12/2019. 19.100,00€.

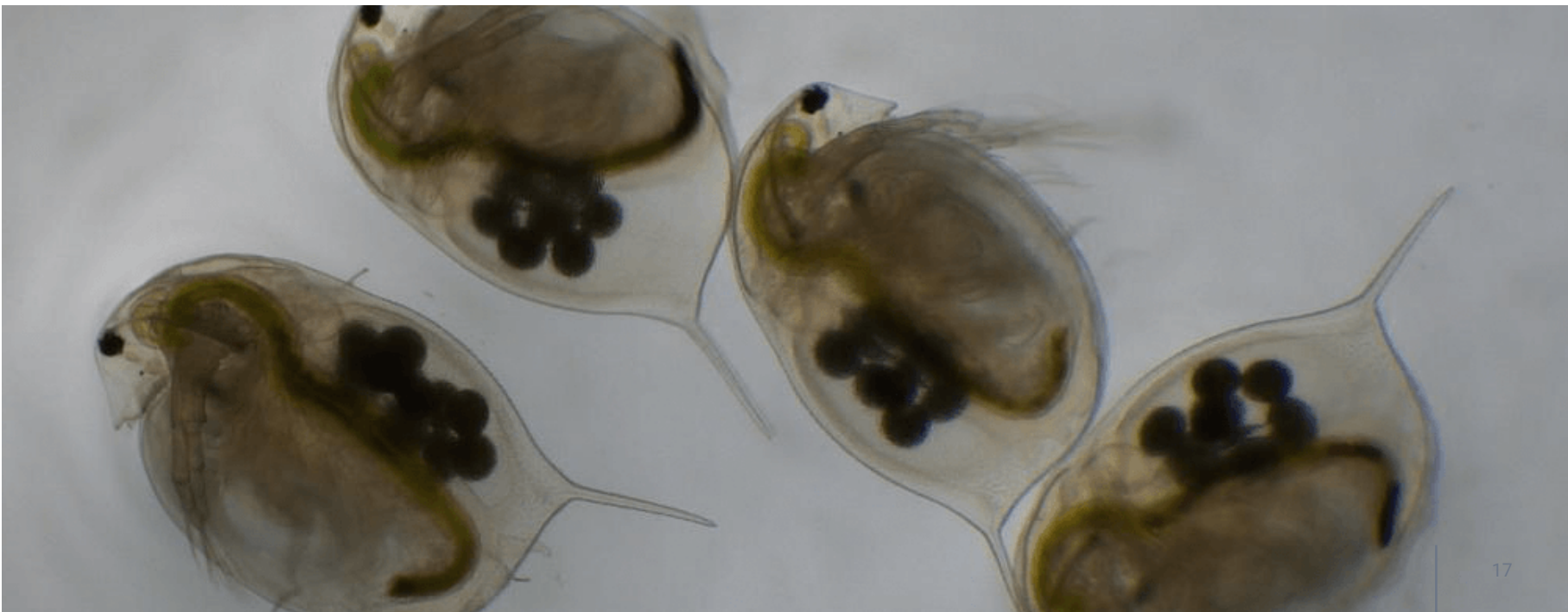
## Contracts

- Análisis de la calidad del agua de diferentes ecosistemas acuáticos del Delta del Ebro; I +D. IRTA, San Carles de la Ràpita; C.Barata; 17/11/2017 - 30/11/2017; 1500€.

- dCod 1.0:decoding systems toxicology of cod (Gadus morthua) environmental genomics for ecosystem quality monitoring and risk assessment; DLSI_2016; Universidad de Bergen - IDAEA -CSIC; C.Porte; 30/09/2016 - 30/03/2020; 50.000€.

- Determinación de biomarcadores de estrés oxidativo en mejillones expuestos a un producto molusquicida de fosfato férrico; I +D IRTA, San Carles de la Ràpita. IDAEA-CSIC; C.Barata; 10/07/2017 - 13/10/2017. 3.000€.

- iCod 2.0: Integrative environmental genomics of Atlantic cod (Gadus morhua); a holistic approach to characterize the biological effects of emerging contaminants and mixed exposure regimes; 244564/E40; Universidad de Bergen - IDAEA - CSIC. C.Porte. May 2015 - December 2018; 20.000€.



# Geochemistry and Pollution

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Óscar Rama Tejedor
Natalia Bravo Villarraso
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Carles Planas Pastor (Laboratory of Mass Spectrometry)
Jordi Sauló Dalmau (Laboratory of Dioxins)

## Geochemistry and Pollution

The Geochemistry and Pollution group studies natural organic matter and contaminants as a source of knowledge of the evolution of ecosystems, including climate change and transport processes, distribution, transformation and effects of organic pollution in organisms, including humans. This overall goal includes the development of analytical methods to study the concentrations of these compounds, their transfer flows between environmental compartments and their incorporation into organisms. It also covers the investigation of how organic molecules can provide geochemical information on past and present ecosystems and molecules that are useful to describe the health status of organisms.

## Projects

- ¿Cuán tóxica es la contaminación difusa?; CUANTOX; CTM2015-71832-P; Ministerio de Economía y Competitividad; J.Grimalt; 1/1/2016 - 31/12/2018. 225.302,00€.
- Exploring the Neurological Exposome (NEUROSOME). European Commission; H2020-MSCA-ITN-2017 SEP-210411486; Marie Skłodowska-Curie Actions; Innovative Training Networks (ITN); D.Sarigiannis. Aristotle University of Thessaloniki; 1/12/2017 - 30/11/2021; 247.872,96€.
- Health and Environment-wide Associations based on Large population Surveys (HEALS); FP7-ENV-2013- 603946; European Union; I. Annesi-Maesano. Université Pierre et Marie Curie. Paris V (France); 1/10/2013 - 31/06/2019. 450.437,40€.
- Herramientas web y redes sociales de carácter profesional y científico en la red consolidar; GRAC-CIE; CTM2014-59111-REDC; J.Grimalt; 01/12/2014 - 30/11/2017; 39.000,00€.
- Implementation of the MSED to the Deep Mediterranean Sea (IDEM); 11.0661/2017/750680/SUB/EN V.C2; European Commission IG Environment. R.Danovaro. Università Politecnica Delle Marche – UNIVPM, Ancona, Italia; 1/04/2017 - 31/03/2019. 50.818,00€.
- Microplasticos y microcontaminantes en la costa mediterranea. Toxicidad e impacto ambiental y en la salud humana; CTM2017-89701-C3-1-R; MINECO; M.Farré, E.Abad; 01/01/2018 - 31/12/2020; 177.870,00€.
- Priorización de compuestos citostáticos para monitorización ambiental. Fuentes, comportamiento y estrategias de remediación; CTM2014-60199-P; Ministerio de Educación, Ciencia e Innovación; S.Lacorte; 01/01/2015 - 31/12/2017; 72.600,00€.
- Project “GEF GMP2”GF4030-4F34; GEF_2016; E. Abad. 01/02/2016 - 30/04/2020; 827.436,14€.
- Transferencia de los nanomateriales de carbono en el medio acuático; Nano-Transfer; PCIN-2015-182-C02-01; M.Farré, E.Abad; 01/12/2015 - 30/11/2018; 135.000,00€.

## Contracts

- Análisi de seguiment de compostos orgànics prioritaris i metalls en aigües del Port de Barcelona. XMA-17021; 01/01/2017 - 31/12/2017; 21.296,00€.
- Análisis de Aguas y Muestras Sólidas del Embalse de Flix (AAMUSEF); 2016/0033; U.T.E. EBRE-FLIX (FCC CONSTRUCCION, SA); 25/10/2016 - 24/04/2017; 95.493,20€.
- Análisis de contaminantes atmosféricos; 02/05/2016 - 22/03/2017; 4.446,75€.
- Análisis de contaminantes orgánicos en agua; 25/06/2018 - 24/06/2020; 56.870,00€.
- Análisis de contaminantes para el cumplimiento de la DMA (Directiva Marco del Agua), en aguas y sedimientos portuarios; 01/03/2015 - 28/02/2017; 120.701,13€.
- Análisis de fármacos y tensioactivos en aguas residuales; 02/05/2016 - 01/03/2017; 19.360,00€.
- Análisis de substáncias prioritarias y nuevos contaminantes emergentes en las masas de agua de Catalunya; 01/12/2017 - 31/05/2018; 34.477,14€.

- Analyses of organic trace compounds during aquifer recharge for indirect potable reuse; 10/10/2014 - 09/04/2017; 2.400,00€.
- Analysis of 100 puf samples for dl-POPs; 15/02/2017 - 30/06/2019; 50.000,00€.
- Apoyo tecnológico en el campo de los microcontaminantes emergentes; 27/07/2017 - 26/07/2018; 8.772,50€.
- Apoyo tecnológico referente a la vigilancia sobre compuestos emergentes, centrada en las actividades en investigación sobre nuevos compuestos y en la identificación de posible riesgos mediáticos en relación con el suministro de agua potable; 01/07/2015 - 30/06/2017; 17.545,00€.
- Apoyo tecnológico sobre las emisiones de dioxinas y furanos procedentes de fuentes estacionarias durante el proceso de producción de clinker, mediante sistemas de captación de gases en semicontinuo; 29/10/2014 - 28/12/2019; 14.520,00€.
- Assessment of the quality of water resources in the maltese islandès; 18/04/2016 - 17/04/2017; 39.000,00€.
- Chemical monitoring of watch list substances in the maltese islandès; 28/04/2017 - 21/07/2017; 4.070,48€.

- Control de contaminantes orgánicos emergentes en aguas subterráneas; 01/03/2014 - 29/02/2020; 12.705,00€.
- Conveni de col·laboració entre el CSIC, a través de l'IDAEA, i l'ASPB per a la realització de accions conjuntes i la seva aplicació en matèria de salut pública i seguretat alimentària; 11/03/2016 - 31/12/2017; 20.000,00€.
- Desarrollo de las metodologías analíticas para el análisis de compuestos contaminantes emergentes susceptibles de ser analizados por técnicas de GC/MS avanzadas; 26/06/2017 - 25/12/2017; 21.175,00€.
- Determinació dioxines i furans a punts de mesuraments; PTOP-2017-343; 01/01/2017 - 31/12/2017; 16.407,60€.
- Investigació de contaminants orgànics a la planta potabilitzadora de Blanes. Evolució durant els processos de tractament; 01/06/2016 - 30/05/2017. 7.986,00€.
- Determinación de contaminantes orgánicos en la planta potabilizadora de Blanes. Evolución durante los procesos de tratamiento; 20/07/2017 - 19/07/2018; 7.986,00€.
- Determinación de contaminantes orgánicos en la planta potabilizadora de Blanes. Evolución durante los procesos de tratamiento; 01/10/2018 - 30/09/2019; 8.167,50€.
- Determinación de dioxinas y furanos en materias primas para la alimentación animal y en alimentos para animales; AE CSIC, M.P. (IDAEA), Ministerio Agri. y Pesca, Alimentación y Medio Ambiente; 03/12/2018 - 30/10/2019; 43.200,00€.
- Determinación de dioxinas y furanos en muestras de medios de muestreo y partes del tren de muestreo de emisiones atmosféricas de fuentes estacionarias de captaciones en contínuo; 18/04/2017 - 30/06/2020; 14.520,00€.
- Determinación de dioxinas y furanos en muestras de suelo, vegetación y puntos de agua; 24/04/2017 - 31/12/2019; 77.440,00€.
- Determinación de dioxinas-furanos y PCBS similares a dioxinas en muestra biológica en el estudio epidemiológico en relación con la planta de valorización energética que forma parte del complejo medioambiental de Guipuzcoa; 01/12/2017 - 31/03/2019; 117.128,00€.
- Elaboración de procedimiento normalizado de trabajo en formato video para el muestreo de aire ambiente mediante captadores activos; 11/12/2017 - 10/06/2018; 11.823,00€.

- Estudi dels contaminants a l'aire de Barcelona a la zona limítrofa amb Sant Adrià; 01/09/2018 - 31/12/2018; 39.978,40€.
- Estudi en sóls de dioxines i furans al voltant de la planta de integral de valorització de residus de Sant Adrià de Besòs; 900556/2018; 15/03/2018 - 14/03/2019; 19.946,85€.
- Estudio de contaminantes orgánicos en matrices ambientales; 01/07/2017 - 31/01/2019; 16.232,15€.
- Estudio de la concentración de contaminantes atmosféricos debidos al tráfico (ECOTRAP); Agencia de Salud Pública de Barcelona;26/02/2018 - 26/08/2018; 19.989,20€.
- Estudio de nuevos compuestos de la "2 watch list" por cromatografía de líquidos/espectrometría de masas de alta resolución (HPLC/MS/MS); 09/04/2018 - 08/01/2019; 18.150,00€.
- Estudio relacionado con el análisis de compuestos orgánicos en matrices tales como agua de bebida envasada; 01/09/2012 - 31/08/2019; 164.923,00€.
- Investigación de contaminantes orgánicos en la planta potabilizadora de Montfulla. Evolución durante los procesos de tratamiento; 02/01/1999 - 05/03/2018; 146.140,99€.
- Mostreig amb carbó actiu granulat analític i determinació de contaminants orgànics en les ETAP d'Empuriabrava i de Tossa-Lloret; 08/06/2018 - 31/12/2018; 9.438,00€.
- Proyecto de apoyo tecnológico titulado: "OMXP120- DANONE"; 29/01/2018 - 28/11/2018; 3.811,50€.
- Screening de contaminantes orgánicos; 27/11/2017 - 26/11/2021; 17.424,00€.
- Soporte y asesoramiento tecnológico referente a "control de microcontaminantes en aguas"; 01/06/2015 - 31/05/2018; 57.172,50€.
- Stability monitoring of reference material BCR-607 (PCDD and PCDF in natural milk powder); 13/02/2017 - 31/03/2017; 8.700,00€.
- Study on pollutants in human serum from Chukotka peninsula, Russia; 01/07/2017 - 31/12/2017; 24.900,00€.

# Global Change and Genomic Biogeochemistry

Group

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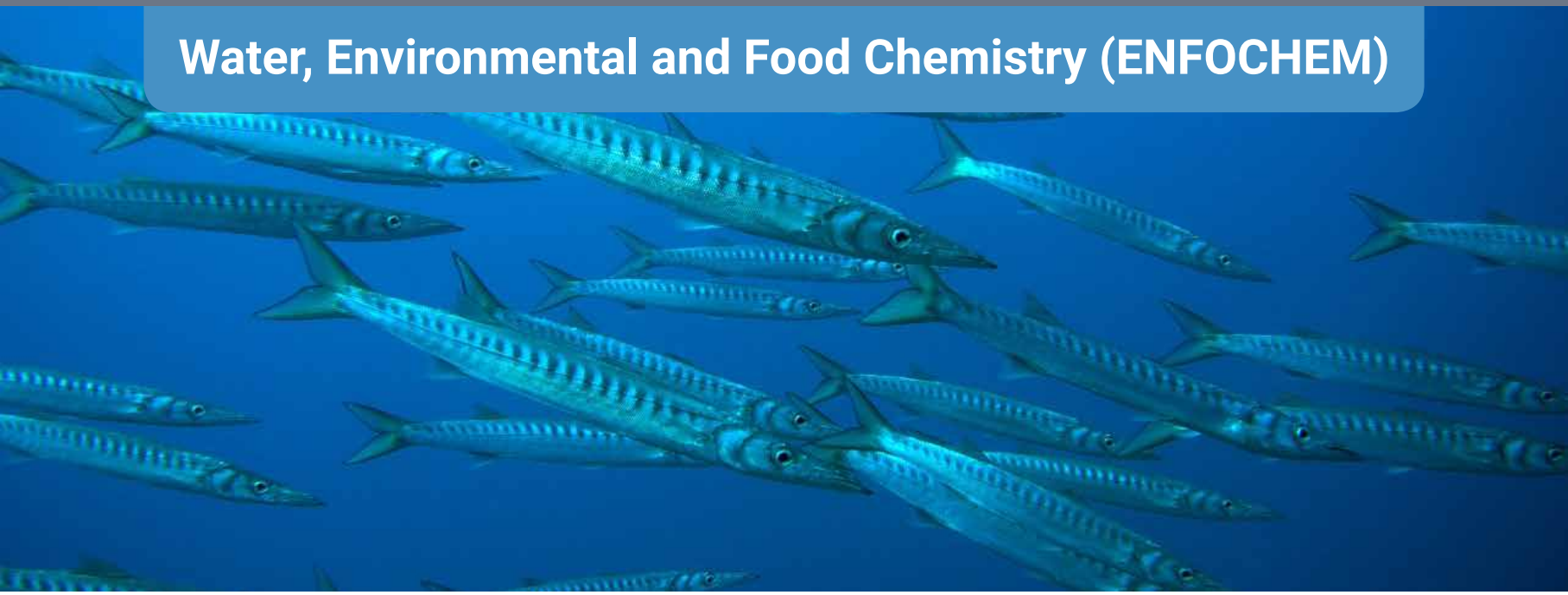
## Global Change and Genomic Biogeochemistry

The Global Change and Genomic Biogeochemistry group focuses its research on the anthropogenic organic component of the carbon and nutrient cycles at regional and global scale. Its approach combines the use of field work on atmospheric, seawater, and soil studies, the biogeochemistry of anthropogenic organic compounds, and the microbial-pollutant mutual interactions addressed through genomic and molecular approaches. Previous work by this research group has shown that organic pollutants with diverse sources are found ubiquitously in the oceanic atmosphere, seawater and biota (for all oceans). The research group has also made important contributions on the atmospheric deposition of organic compounds in the oceans and the polar regions (both Arctic and Antarctica). The research group combines scientists with expertise on environmental organic chemistry and on microbial biogeochemistry, and its evolution in recent years has involved the merging of chemical and genomic approaches to study the biogeochemistry of anthropogenic organic chemicals, and their effects on the major anthropogenic cycles of carbon and phosphorus.

## Projects

- Global change and genomic biogeochemistry; AGAUR; Grup de recerca preconsolidat, 2017SGR800; J.Dachs; 01/01/2018 - 31/12/2020; 15.000€.
- Impact of global change on the remobilization and bioaccumulation of organic pollutants in polar aquatic food webs; BIOPOLLAIR; 628303; Funded by European Commission (Marie Curie); J.Dachs; 16/06/2015 - 15/06/2018; 244.000€.
- Interacciones entre los contaminantes orgánicos sintéticos y las comunidades microbianas en aguas costeras; ISOMICS; CTM2015-65691-R; Funded by Spanish government; M.Vila-Costa; 01/01/2016 - 30/06/2019; 174.000€.
- The Antarctic as sentinel of global pollution; SENTINEL; Funded by Spanish Government (PN). J.Dachs; 01/01/2016 - 31/12/2018; 243.000€.

# Water, Environmental and Food Chemistry (ENFOCHEM)



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## Water, Environmental and Food Chemistry (ENFOCHEM)

The Water, Environmental and Food Chemistry (ENFOCHEM) Unit focuses its research on the presence, impact and fate of organic pollutants in the water cycle, terrestrial environment, biota, food and humans, including not only those that are already regulated by legislation (priority contaminants), such as pesticides, polycyclic aromatic hydrocarbons, alkylphenols, phthalates, and brominated flame retardants, but also contaminants of emerging concern such as pharmaceuticals, personal care products, chlorinated paraffins, organophosphate plasticizers, drugs of abuse and perfluorinated compounds for which environmental occurrence and ecotoxicity data are very scarce. This involves their monitoring in field samples and assessment of their degradation/metabolism in different types of water matrices, particulate matter, sediments, soils, sewage sludge, air, aquatic and terrestrial organisms, crops, food and biological samples from humans. It further deals with the bioaccesibility, bioaccumulation and biomagnification through the food web of contaminants in biota and humans. This research line has a long history of monitoring activities, which have been carried out in very diverse areas, ranging from local rivers to remote, pristine areas such as the Antarctic.

## Projects

- Accelerated water purification during artificial recharge of aquifers - a tool to restore drinking water re-sources; ACWAPUR; PCIN-2015-245; JPI-Waterworks 2014; J.Carrera and S.Díaz-Cruz; 01/7/2016 - 30/6/2019; 110.000€.
- Análisis del potencial de antibiosis de la biomasa de bofedales altoandinos en la Reserva Nacional de Salinas y Aguada Blanca, Arequipa, Peru; MHE-200050; ERANET-LAC; S. Díaz-Cruz; 01/01/2018 - 31/12/2020; 23.171€.
- Assessing the fate of pesticides and water-borne contaminants in agricultural crops and their environmental risks; AWARE; JPI-Water; Coordinator: D.Barceló. IP-CSIC: S. Pérez; 01/10/2017 - 30/09/2020; 227.770€.
- Contaminantes emergentes, nanomateriales y microplásticos en ríos, estuários y aguas costeras: Estudio integrado; INTEGRA-COAST; CGL2014-56530-C4-1-R; Ministerio de Economía y Competitividad; M.Farré and D.Barceló; 01/01/2015 - 31/12/2017; 152.000€.
- Desarrollo de metodologías analíticas para la determinación de plaguicidas en aguas y suelos y su aplicación en la evaluación de nuevos procesos de bioremediación ambiental; BECAS; CTM2016-75587-C2-2-R; MINECO; Coordinator: T. Vicent, Universitat Autònoma de Barcelona. IPs-CSIC: M. López de Alda and E. Eljarrat; 30/12/2016 - 29/12/2019; 121.000€.
- Enfoque innovador para la detección de sustancias citotóxicas y reprotóxicas en agua regenerada y potable; ENFOCAR; Fundación General del CSIC - ComFuturo; C.Postigo; 01/09/2018 - 31/08/2021; 124.800€.

- Estudio de la presencia e impacto de contaminantes emergentes en aguas residuales y superficiales de México; COOPA20095; 01/01/2016 - 31/12/2017; 12.680,00€.

- Evaluación de la presencia y del metabolismo de los contaminantes orgánicos persistentes y móviles presentes en el agua residual en cultivos agrícolas; 201780I071; S. Perez. 01/12/2017 - 30/11/2018; 5.000,00€.

- Evaluación del destino de plaguicidas y de los contaminantes orgánicos transmitidos por el riego con aguas risiduales a los cultivos agrícolas y sus riesgos ambientales; PCIN-2017-067; D. Barcelò. 01/10/2017 - 30/09/2020; 222.770,00€.

- Identificación de XENObioticos bioacumulables en mejillón siguiendo un enfoque METABOLOMICo: exposicion humana y ambiental; XENOMETABOLOMIC; CTM2015-73179-JIN; AEI/FEDER/UE; D.Álvarez; 01/01/2017 - 31/12/2019; 194.810€.

- Innovative tools enabling drinking WATER PROTECTion in rural and urban environments; WaterProtect; EU-H2020-727450; A.Ginebreda and M.López de Alda. 01/06/2017 - 31/05/2020. 214.186€.

- Managing the effects of multiple stressors on aquatic ecosystems under water scarcity; Globaqua; FP7- ENV.2013.6.2-1 603629; D.Barceló; 01/01/2014 - 31/01/2019; 7.590.588€ (IDAEA: 899.177€).

- Microplastics and microcontaminants in the Mediterranean coast: Toxicity and environmental and human health impacts; PLAS-MED; CTM2017-89701-C3-1-R; MINECO; M.Farré and E.Abad; 01/01/2018 - 31/12/2021; 177.870€.

- Natural Toxins and Drinking Water Quality - From Source to Tap; NaToxAq; H2020-MSCA-ITN-2016 - 722493; Coordinator: H. Chr. Bruun Hansen. University of Copenhagen. Denmark. IP-CSIC: M. Farré; 01/01/2017 - 31/12/2020; 460.000€.

- Nutritious, safe and sustainable seafood for consumers of tomorrow; SEAFOODTOMORROW ; H2020-Project 773400; Coordinator: A. Marques, IPMA, Portugal; IP-CSIC: E. Eljarrat; 01/11/2017 - 31/10/2020; 145.037€.

- Potential of river biofilms for the degradation of the herbicide glyphosate; BIGLY; ANR JCJC2016; Coordinator: J. Artigas, Université Clermont Auvergne, France. IP-CSIC: M. Farré; 01/01/2011 - 31/12/2018; 22.000€.

- Priority environmental contaminants in seafood: safety assessment, impact and public perception; ECsafeSEAFOOD; FP7-KBBE 2012.02.4-01;. Coordinator: A. Márques, Instituto português do Mar e da Atmosfera, Portugal. Participant researchers IDAEA: M. Farré and E. Eljarrat; 01/02/2013 - 31/01/2017.

- Real time monitoring of SEA contaminants by an autonomous lab-on-a-chip biosensor; SEA-on-a-CHIP; FP7-OCEAN-2013 614168; D.Barceló and M.Farré; 01/12/2013 - 30/06/2017. 5.753.740€ (IDAEA: 574.555€).

- Red consolider sobre los efectos de la escasez del agua y el cambio global en sistemas fluviales.; CTM2015-69780-REDC; D. Barcelò. 01/12/2015 - 30/11/2017; 51.500,00€.

- Riesgos emergentes de contaminacion quimica y microbiológica en la reutilización de aguas residuales para riego agrícola: estudio integrado; ROUSSEAU; CTM2017-89767-C3-1-R; MINECO; S. Díaz-Cruz, Co-IP D. Barceló; 01/01/2018 - 31/12/2020; 139.150€.

- Solutions for present and future emerging pollutants in land and water resources management SOLUTIONS. ENV-2010- 603437. Coordinator: W. Brack, UFZ, Leipzig, Germany. IP-CSIC: M. López de Alda. 1/10/2013 - 30/09/2018. 349.944€.

- Synergising International Research Studies into the environmental Fate and Behaviour of Toxic Organic Chemicals in the Waste Stream; INTERWASTE; Marie Skłodowska-Curie Research and Innovation Staff Exchange Project. Coordinator: S. Harrad, University of Birmingham, UK. IP-CSIC: E. Eljarrat; 01/01/2017 - 31/12/2020; 49.500€.

- Transfer of Nanomaterials in the aquatic environment; Nano-Trasfer; ERA_NET SIINN PCIN-2015-182-CO2-01; Coordinator: Dr. A. Schäffer, Institute for Environmental Research, RWTH Aachen. IPs-CSIC: E. Abad and M. Farré; 01/10/2013 - 30/09/2018. 135.000€.

## Contracts

- Agència Catalana de l'Aigua (ACA); 31/01/2018 - 31/01/2019; D.Barceló and A. Ginebreda; 14.375€.

- Análises de pesticidas e farmacêuticos no âmbito do projeto ALOP (ALentejo Observation and Prediction systems); ALT20-03-0145-FEDER-000004; Instituto Politécnico de Beja (Ajuste Direto n. 99/IPBeja/2017); M. López de Alda; 01/01/2018 - 31/12/2018; 21.138,21€.

- Anàlisi de metabolits de drogues en aigües residuals per fer estimacions de consums poblacionals; SA1404; Generalitat de Catalunya. Departament de Salut; Miren López de Alda Villaizán; 01/09/2016 - 31/05/2018; 13.552€.

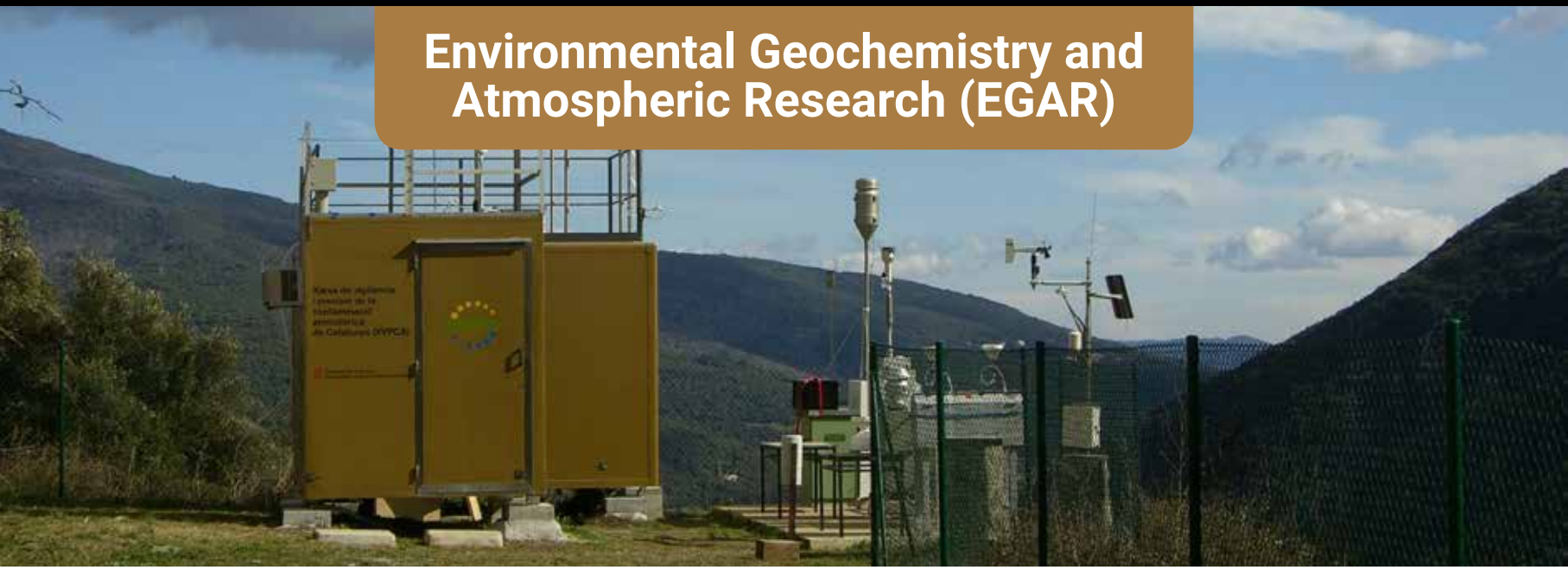
- Análisis de composición de microplásticos en peces marinos, en el marco del proyecto MEDSEALITTER; 1134; Facultad de Biología, Universidad de Barcelona; E.Eljarrat; 01/11/2018 - 31/08/2019; 6.000€.

- Análisis de insecticidas piretroides en el marco del Contrato CONICYT 21150103; Bibiana Jara Vergara - CONICYT; E.Eljarrat; 01/07/2018 - 31/12/2018; 2.000€.

- Control de compostos plaguicides a les xarxes de control de les aigües subterrànies; Agència Catalana de l'Aigua (ACA); 01/06/2017 - 01/05/2018; M.Farré; 18.000€.
- DBP-POFOREM-II ATLL Concessionaria de la Generalitat de Catalunya SA; 25/10/2017 - 25/06/2018; C.Postigo and D.Barceló; 30.430€.
- Determinación de la unión a proteína plasmática metobolismo microsomal de fase I y estabilidad plasmática de compuestos de Almirall; ALMIRALL, SA; S. Pérez; 15/02/2018 - 14/07/2018. 35.000€.
- Estudio técnico y biológico de un sistema mbbr con digestión bifásica en línea de fangos para la eliminación de contaminantes en aguas residuales urbanas; 2017-2018; S.Pérez; 25.410€.
- Evaluación del potencial de formación de diversos subproductos de desinfección (DBPs) emergentes en aguas de las diferentes plantas de tratamiento de ATLL CGC; ATLL; 01/10/2016 - 31/09/2017; 19.931,33€.
- Evaluación y análisis de piretroides en el ambiente marino; Laboratoire d'Océanographie Microbienne – CNRS, Francia ; E.Eljarrat; 01/11/2015 - 31/07/2017; 2.000€.
- Instituto Catalán de Investigación del Agua (ICRA). DMA; M.López de Alda, E.Eljarrat, M.Farré; 01/01/2017 - 31/12/2017; 71.464€.
- SA1404_Anàlisi de metabolits de drogues en aigües residuals per fer estimacions de consums poblacionals; Generalitat de Catalunya. Departament de Salut; M.López de Alda; 01/09/2018 - 31/12/2018; 4.235€.
- Study of the chemical quality of groundwater from Lima aquifers: Rímac, Chillón, Lurín and Chilca (Perú); Water and Environmental Services SAC Perú (WES) Registry No. 13289744. S. Díaz Cruz. 27/3/2018 - 27/7/2018. 2.500€.
- Sunscreen agents in waters from the tourism impacted Hanauma Bay, OAHU, Hawaii (USA); Haereticus Environmental Laboratory (HEL) USA Registry No. 03-0546145. S. Díaz Cruz. 18/12/2017 - 18/3/2018. 1.980€.
- Unidad de Calidad del Agua y Suelos; 214 SGR 418; 01/01/2014 - 30/04/2017. 27.000,00€.
- Unidad de calidad del agua y suelos; 2017 SGR 1404; 01/01/2018 - 31/12/2020; 44.480,00€.

Geosciences Department

# Environmental Geochemistry and Atmospheric Research (EGAR)



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## Environmental Geochemistry and Atmospheric Research (EGAR)

The Environmental Geochemistry and Atmospheric Research group investigates the chemical and physical processes responsible for the emission, transport, fate and removal of atmospheric pollutants that impact on human health and vegetation. A major objective is to investigate measures (technological and non-technological) to reduce emissions, concentrations or human exposure to poor quality air. Main research lines include aerosols and climate change (interpreting optical aerosol radiative effects as a function of their chemical and physical patterns and source contributions), human exposure to air pollutants (investigating the pathways of human exposure to air pollutants in both types of environments, and to understanding and quantifying the contribution of different sources to outdoor, commuting and indoor exposure), industrial emissions (characterising emissions of trace pollutants with a major environmental impact and devising and testing the efficiency of emission abatement controls) and industrial wastes (with special emphasis on coal combustion/gasification residues).

## Projects

- Aerosols, Clouds and Trace gases Preparatory Phase Project; ACTRIS PPP; 739530; H2020-INFRA/0274 CSA (COOR. & SUP. ACTION); ILMATIETEEN; A.Alastuey; 01/01/2017-31/12/2019; 24.535€.
- Aerosols, Clouds, and Trace gases Research Infrastructure; ACTRIS2; H2020-INFRA/0038 - 654619; European Commission. Research and Innovation action (RIA); Gelsomina Papalardo (CNR); Andrés Alastuey (CSIC); 01/04/2015 - 31/03/2019; 9.541.215,00€ (CSIC: 108.863,00€).
- Calidad del aire en el interior de autobuses de transporte público; BUSAIR; CGL2016-79132-R; Plan Nacional Retos; Teresa Moreno; 31/12/2016 - 31/12/2019; 128.000€.
- Chemical On-Line cOmpoSition and Source Apportionment of fine aerosoL (COLOSSAL); COST Action CA16109; MC. Minguillón; 03/03/2017 - 02/03/2021; 312.068,32€.
- Collective Awareness Platform for Tropospheric Ozone Pollution (CAPTOR); H2020 CAPS call 2015; Polytechnical University of Catalonia (Prof. Jorge García); M. Viana; 01/01/2016 - 31/12/2019; 1.960.293€ (CSIC: 180.398€).
- Efectos sobre la salud de la contaminación atmosférica por material particulado ultrafino en España (PI15/00515); Ministerio de Economía y Competitividad, Instituto de Salud Carlos III, Subprograma de Proyectos de Investigacion en Salud (AES 2015); A.Tobías; 01/01/2016 - 31/12/2018; 26.632,00€.
- Episodios de altos niveles de ozono, partículas ultrafinas y aerosoles secundarios en ambientes de fondo urbano y regional en el NE de España; CGL2016-78594-R; Ministerio de Ciencia e Innovación; X. Querol, A. Alastuey; 01/12/2016 - 31/12/2019; 322.000€.
- European topic centre on air pollution and climate change mitigation (ETC/ACM) 2014-2018; EEA/ACC/13/001-ETC/ACM; M. Viana; 01/01/2014 - 31/12/2018; 140.590,21€.

- Evaluation and improvement of the parameterization of aerosol hygroscopicity in global climate models using in-situ surface measurements; DE-SC0016541; US Department of Energy; DE-FOA-0001430; E. Andrews, G. Titos,P. Zieger; 01/11/2016 - 30/10/2019; 608.033US$ (CSIC: 43.267,89€).

- Exposición a compuestos orgánicos volátiles en el interior de autobuses de transporte público urbano; Proyecto intramural CSIC; F. Amato; 01/12/2017 - 31/11/2018; 5.000€.

- FRontiers in dust minerAloGical coMposition and its Effects upoN climaTe; 773051; X. Querol; 01/10/2018 - 30/09/2023. 503.256,00€.

- Geología Ambiental; 214 SGR 33; X. Querol; 01/01/2014 - 30/04/2017; 43.000,00€.

- Geoquímica Ambiental e Investigación Atmosférica (EGAR); 2017 SGR 00041; X. Querol; 01/01/2018 - 31/12/2020; 44.480,00€.

- Impacto en salud de la contaminación atmosférica en función de sus fuentes de emisión; CGL2017-82093-ERC; Convocatoria 2017 de Acciones de Dinamización "Proyectos Europa Excelencia, convocatoria programa estatal de I+D+I; M. Viana (CSIC); 01/01/2018 - 31/12/2018; 68.181€.

- Implementing methodologies and practices to reduce air pollution of the subway environment (IMPROVE); LIFE13 ENV/ES/000263; European Comission; IDAEA-CSIC and TMB; T.Moreno; 01/10/2014 - 31/03/2018. 814.433,00€.

- Measures to improve urban air quality; AXA Research Fund; F. Amato; 01/03/2017 - 28/02/2018; 40.000€.

- Nagoya IAR, Short-term Fellowship Program. Institute for Advanced Research, Nagoya University; Graduate School of Environmental Studies, Nagoya University (Michihiro Mochida); Nagoya University;M. Viana. 08/01/2018 - 03/02/2018; 988,000 JPY (7500 euro).

- Nuevas pastillas de frenos para un menor impacto en calidad del aire; ECO-BRAKE; Entidad que financia el Proyecto: Fundación BBVA; F.Amato; 30/09/2016 - 30/03/2018; 39.582€.

- Predicción de emisiones y exposición a partículas micro y nanométricas en ambientes industriales (PREDEXPIN); CGL2015-66777-C2-1-R; Convocatoria programa estatal de I+D+I orientada a los retos de la sociedad;  M.Viana; 01/01/2016 - 31/12/2018; 105.270€.

- Reducing risks from Occupational exposure to Coal Dust (ROCD); 754205; Research Fund for Coal and Steel; European Commission; T.Moreno. 01/07/2017 - 30/06/2020; 216.520€.

- Safe production and Use of Nanomaterials in the Ceramic Industry; CERASAFE; ERANET SIINN 2015, project ID: 16; M.Viana (IDAEA-CSIC). 01/12/2015 - 30/11/2018; 181.655€.
- Sistema de Espectrometría de Masas con Fuente de Plasma Acoplado Inductivamente; CSIC15-EE-3218; Dir. General de Investigación y Gestión Del Plan Nacional I+D, Ministerio de Ciencia e Innovación and CSIC; X. Querol; 01/01/2017 - 31/12/2019; 147.581€.
- Synergistic Understanding of Best Ways to improve Air qualitY in underground rail transport systems (SUBWAY); 01AXA0028; AXA Research Fund; F.Amato; 15/11/2013 - 15/12/2017; 120.000,00€.
- Validación y puesta a punto de un equipo de fluorescencia de rayos-x por dispersion de energias (EDXRF) para el analisis de muestras ambientales y su comparacion con el metodo de digestion acida y posterior analisis por ICP-AES y ICP-MS; 201830I035; N. Moreno; 22/11/2018 - 21/11/2019; 5.000,00€.

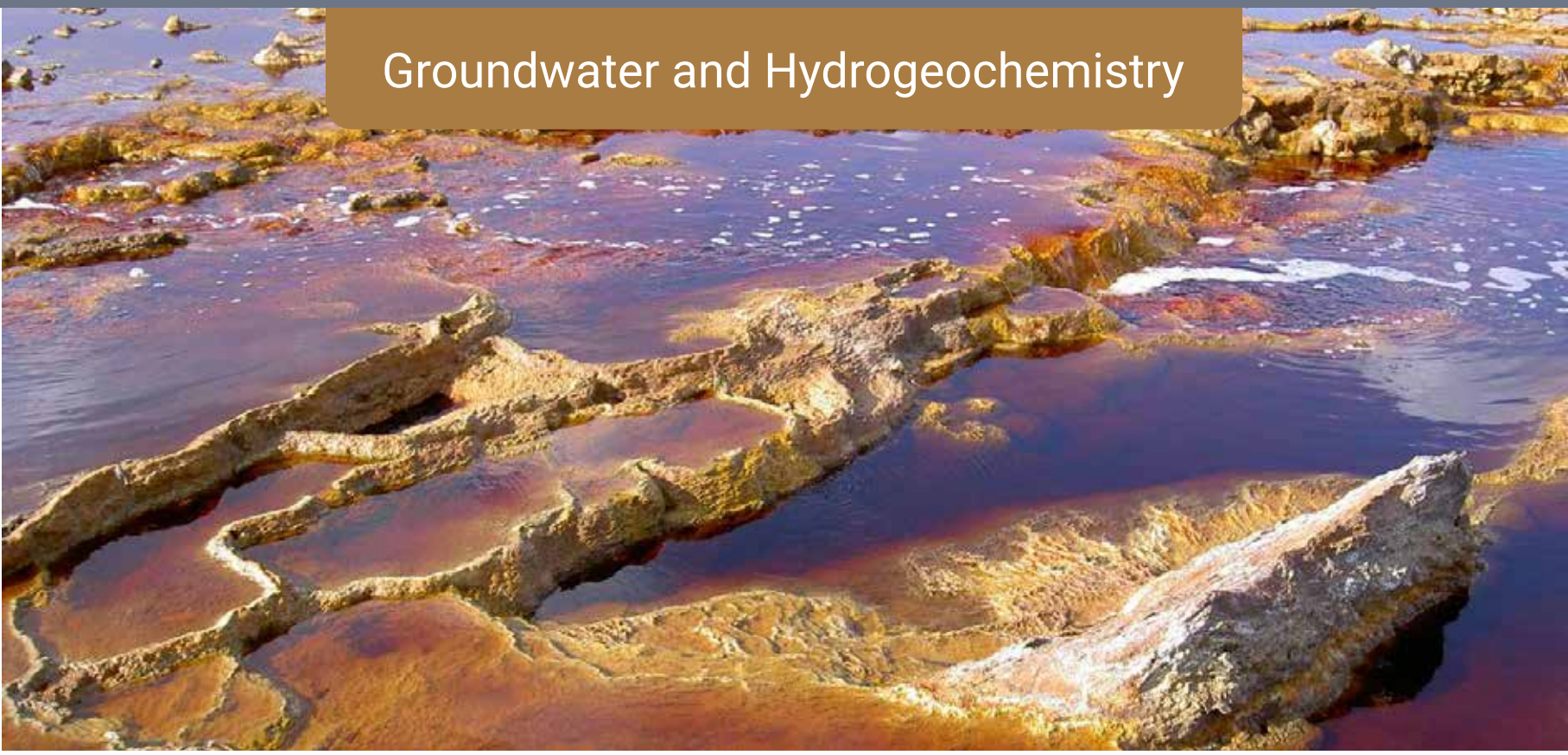
## Contracts

- Análisis de contaminantes traza en las unidades térmicas de Andorra-Teruel, As Pontes grupo 4 y litoral Almería grupo 1; 28/03/2017 - 31/12/2017; 70.180,00€.
- Análisis semanales de muestras sólidas y líquidas procedentes de la Desulfuración de la central térmica de Teruel; Endesa Generación SA; P.Córdoba; 13.650€.
- Analysis of aerosol particles obtained by using instruments provided by the Company; CSIC and AEROSOL D.O.O.; M.Pandolfi, A.Alastuey; 01/12/2018 - 30/06/2020; 83.853€.

- Calidad del aire que respiramos en trayectos urbanos en taxi; Fundación ACS; T.Moreno; 01/01/2017-31/12/2017; 25.000€.
- Detección de episodios naturales de aportes transfronterizos de partículas y otras fuentes de contaminación de material particulado, y de formación de ozono troposférico; 17CAES010; Ministerio de Agricultura y Pesca, Alimentación y Medio Ambiente (MAPAMA); X.Querol, A.Alastuey;17/04/2018 - 16/11/2021. Cuantía de la subvención: 551.634,27€.
- Determinación y caracterización de material particulado atmosférico; CSIC - SEQUOPRO SL; A.Alastuey; 01/02/2017 - 30/11/2017; 47.740€.
- Elemental analysis of PM10 and PM2.5 filter samples by ICP-AES and ICP MS; CSIC and Federal Office for the Environment (FOEN); A.Alastuey; 01/06/2018 - 30/11/2019; 100.000€.

- Especificación técnica para establecer tratamientos de inmovilización y prevenir la lixiviación de elementos tales como níquel y molibdeno de las cenizas de combustión de carbón/coque; GYLLP-END-SID-EP-00001; 17/07/2017 - 16/07/2018; 51.382,65€.
- Estudio y evaluación de la contaminación atmosférica por material particulado y metales en España; Ministerio de Agricultura Alimentación y Medio Ambiente; X. Querol;2013-2017; 359.131€.
- Evaluación de la eficacia de un prototipo de depurador de aire para partículas y gases. Tautus Research and Development S.L.; F. Amato; 8.061€.
- Exposición a particulas de road dust en Bogotá; Universidad La Salle, Bogotá (Colombia); F. Amato; 01/03/2017 – 31/07/2017; 22.000€.
- Identificació de fonts contaminants atmosfèrics en diferents zones de Catalunya; 26/03/2018 - 26/03/2019; 195.778,00€.
- Identificación de fuentes de partículas atmosféricas antropogénicas a partir de la caracterización físico-química de aerosoles; Departament de Medi Ambient, Direcció General de Qualitat ambiental, Generalitat de Catalunya; X. Querol, Andrés Alastuey; 2017; 83.000€.
- Identificación de fuentes de partículas atmosféricas antropogénicas a partir de la caracterización físico-química de aerosoles; Departament de Medi Ambient, Direcció General de Qualitat ambiental, Generalitat de Catalunya; X. Querol, A.Alastuey; 2018; 83.000€.
- Impacto ambiental asociado a la logística de material pulverulento en puertos Comerciales; CSIC, AICE; A.Alastuey; 01/12/2016 - 31/07/2017; 10.854,75€.
- Interpretación de la monitorización de la calidad del aire en pistas de atletismo; M. Viana; 01/12/2018 - 30/09/2019; 14.520,00.
- Monitorización de la composición química de los aerosoles atmosféricos en el marco del programa de vigilancia atmosférica global (VAG) del Centro de Investigación atmosférica de Izaña; AEMET; X.Querol, A.Alastuey; 02/01/2015 - 31/12/2018; 222.222€.
- Suport tecnològic projecte estratègies per a la millora de la qualitat de l'aire a l'AMB; X. Querol. 11/12/2017 - 10/12/2018; 19.360,00€.
- Systematic Review of Health Effects of Desert Dust; WCCPRD5705326 2017/727884; World Health Organization (WHO); 01/06/2017 - 31/03/2018; X. Querol, A. Tobias, F. Amato, A. Karanasiou, 17.860US$.

# Groundwater and Hydrogeochemistry



Group

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**Technical Staff**
Jordi Bellés Felip

## Groundwater and Hydrogeochemistry

The Groundwater and Hydrogeochemistry group studies the hydraulic, chemical, thermal and mechanical processes that take place in permeable media. To do this, it uses laboratory, mathematical, numerical and, especially, field methods (using hydraulic, hydro-geo-chemical and environmental isotopic data taken directly or through specifically designed tests). The group is active in the development of numerical modelling techniques and the acquisition of field and laboratory data. In addition, a development line of geospatial data and information management, visualization and processing tools has been consolidated. Applications include the study of groundwater resources, the management of urban aquifers, the study of emerging pollutants in urban aquifers and artificial recharge facilities, the study of wetlands, marine intrusion in coastal aquifers, water management in mining, interaction with civil works and mining, storage of waste and/or its recovery, water decontamination methodologies, the study of the unsaturated zone and the study of the Hydro-Thermo-Mechanical and Chemical processes associated with the injection and extraction of fluids at great depth (storage of CO2, storage of nuclear waste, geothermal energy, shale gas, induced seismicity).

## Projects

- Aprovechamiento de residuos de la industria regional del piñón para la obtención de biocompuestos de alto valor agregado; Ref. VT12-UNCOMA4094; CONICET (Argentina); 01/01/2017 - 31/12/2018.
- El problema del cromo hexavalente en un sector de la cuenca del Matanza-Riachuelo: Evaluación de Estrategias de Remediación en las aguas subterráneas; MHE-200039; C. Ayora. 01/03/2017 - 31/12/2019; 25.500,00€.
- European training network for in situ imaging of dynamic processes in heterogeneous subsurface environments (ENIGMA); 722028; J.Carrera, M. Dentz. ; 01/01/2017 - 31/12/2020; 495.745,92€.
- Experiments with synchrotron radiation for modern environmental and industrial applications; CRP-G42005; IAEA-Internationat Atomic Energy Agency. Coordinated Research; I. Queralt. 2014-2017.
- Extracting REE from Acid Mine Drainage (AMDREY); PCIN-2015-256; ERAMIN; C. Ayora; 01/07/2016 - 30/06/2018; 71.000€.
- FREE and open source software tools for WATer resource management. (FREEWAT); 642224; H2020 UE; E.Vázquez; 01/01/2015 - 31/12/2018; 70.000€.
- Furthering the Knowledge Base For Reducing the Environmental Footprint of Shale Gas Development Fracrisk Consortium Agreement; FracRisk; 636811; European Union; J.Carrera; 01/06/2015 - 31/05/2017; 263.023,84€.

- Geoquímica de escandio, ytrio y tierras raras en drenajes ácidos de mina. Implicaciones económicas; CGL2016-78783-C2-2-R; Ministerio de Economia y Competitividad. Programa Estatal de Investigación, Desarrollo e Innovación orientada a los Retos de la Sociedad; C.Ayora, I.Queralt; 01/01/2017 - 31/12/2020; 102.000€.

- Hidrogeología Subterránea: Flujo y Transporte Reactivo en Medio Heterogéneo; Proyecto Intramural; 01/12/2017 - 30/11/2018; V.Vilarrasa; 5.000€.

- High resolution monitoring, real time visualization and reliable modeling of highly controlled, intermediate and up-scalable size pilot injection tests of underground storage of CO2 (TRUST); FP7-ENERGY-309067; European Commission; 01/11/2012 - 31/10/2017; J.Carrera; 683.487€.

- Interacción cemento Portland – roca en medios ácidos: secuestro geológico del CO2 y gestión de residuos de minas de sulfuros (PCROCKSS); CGL2017-82331-R; J.Cama, JM. Soler; 01/01/2018 - 31/12/2020; 108.900€.

- *Mechanisms of Mixing and Anomalous Transport: Pore Scale Simulation and Upscaling of Flow and Transport in Heterogeneous Media;* CGL2016-80022-R; Spanish Program for Research, Development and Innovation; M.Dentz; 30/12/2016 - 29/12/2018; 42.350,00€.

- MEzcla y DISpersión en el TRAnsporte de Energía y Solutos (MEDISTRAES); CGL2016-77122-C2-1-R (CSIC), CGL2016-77122-C2-2-R (UPC); Ministerio de Economía, Industria y Competitividad; Maarten Saaltink, J.Carrera; 30/12/2016 - 29/12/2019; 102.850,00€.

- Minería de tierras raras e itrio a partir del tratamiento de aguas ácidas de mina; CTM2014-61221-JIN; C. Ayora; 16/10/2015 - 15/10/2018; 196.211,00€.

- *Mixing in Heterogeneous Media Across Spatial and Temporal Scales: From Local Non-Equilibrium to Anomalous Chemical Transport and Dynamic Uncertainty* (MHetScale); 617511; Consolidator Grant, funded by the European Research Council; M.Dentz; 01/04/2014 - 31/03/2020; 1.904.186,00€.

- Proyección de la Evolución SOP-Salar de Atacama. Fase II; SQM; J. Carrera; 01/09/2016 - 31/08/2017.

- Purificación acelerada de agua mediante recarga artificial de acuíferos: Una herramienta para restaurar los recursos hídricos (ACWAPUR); PCIN-2015-245; H2020-JPI MICINN. Water JPI-WaterWorks 2014; J.Carrera; 01/01/2016 - 31/12/2018; 110.000,00€.

- Reactividad de las rocas almacén y sello en el secuestro geológico de CO2 (RESEC); CGL2014-54831-C3-1-R; 01/01/2015 - 31/12/2017; JM. Soler, J.Cama; 96.800€.

- Seguiment de l'impacte ambiental hidrogeològic de les obres del nou accés sud al port de Barcelona; Aigües del Prat; J.Carrera; 01/02/2016 - 01/02/2017; 10.611€.

- Study of silver nanoparticles uptake, translocation and biotransformation in lettuce and further in the food chain: Evidence for changes in Ag speciation; Experimental Project 2016091810; ALBA Synchrotron, beam line BL22 – CLAESS; 2017. I. Queralt.

## Contracts

- Anàlisi de la subsidència del terreny al barri del Poble Nou de Barcelona; 15/04/2017 -14/01/2018; 21.195,33€.

- Anàlisi de les causes dels moviments del terreny en l'entorn de la finca n.155 del C. Llull, Barcelona; Ajuntament de Barcelona / BCASA; E. Vázquez-Suñé; 01/02/2017 - 31/05/2017; CSIC:17.500€.

- Análisis de la documentación elaborada por CLC para la solicitud de ampliación de la planta metalúrgica; 03/08/2018 - 02/11/2018; 35.851,84€.

- Asesoramiento en el diseño e interpretación de ensayos de bombeo; 20/05/2016 - 19/05/2017; 5.000,00€.

- Avaluació i actualització del balanç de massa de les aigües subterrànies al Pla de Barcelona. aplicació del model hidrogeològic del Pla de Barcelona i Delta del Besòs (2012- 2016); Ajuntament de Barcelona / BCASA; E. Vázquez-Suñé;01/01/2017 - 31/12/2017; CSIC: 16.000€.

- Cuarta actualización del modelo de flujo de agua subterránea en el Salar de Atacama según RCA 226-2006; 15/04/2016 - 31/03/2017; 96.065,55€.

- Establecimiento de porcentajes de mezcla en las aguas de corta (CLC); 03/07/2017 - 02/07/2019; 66.005,50€.

- Estudi i seguiment de l'evolució del drenatge i dels nivells freàtics a l'entorn de la Plaça de la Vila de Sant Adrià del Besòs (2013-2016); Ajuntament de Sant Adrià del Besòs; E. Vázquez-Suñé; 09/01/2017 - 08/04/2017; CSIC:10.000€.

- Estudi i seguiment de l'evolució del drenatge i dels nivells freàtics a l'entorn de la Plaça de la Vila de Sant Adrià del Besòs (2013-2016); Ajuntament de Sant Adrià del Besòs; E. Vázquez-Suñé; 01/01/2018 - 31/12/2018; CSIC:10.000,00€.

- Evaluación de la variación en profundidad de la composición química de las aguas de drenaje del minado de clc, através del SDR y mina de interior; Cobre las Cruces; E. Vázquez-Suñé;01/09/2018 - 31/12/ 2018; 28.700,0€ / CSIC.

- Evaluation of the SKB Task Force on Modeling of Groundwater Flow and Transport of Solutes, Task 9, Increasing the realism in solute transport modeling – Modeling the field experiments of REPRO and LTDE-SD (2018); SKB (Sweden); JM. Soler; 03/05/2018 - 02/05/2019; 24.691,36€.

- Extension of "Modelling of the progress of the monopole-2 in situ diffusion experiment, 2016-2017 (Grimsel Test Site – Long-Term Diffusion project)"; Nagra (Switzerland); J.M. Soler; 01/04/2017 - 01/11/2017; 5.787,04€.

- GeoEnergie Suisse AG; 01/02/2017 - 31/01/2018; Víctor Vilarrasa; 25.000€.

- Identificación de las aguas extremo que caracterizan las mezclas existentes en el fondo de corta y cálculo evaluación proporciones de mezcla para el año hidrológico 2016_17; Cobre las Cruces; E. Vázquez-Suñé; 01/01/2017 - 31/12/2017; CSIC:27.275,00€.

- Identificación de las aguas extremo que caracterizan las mezclas existentes en el fondo de corta y cálculo evaluación proporciones de mezcla para el año hidrológico 2017_18; Cobre las Cruces; E. Vázquez-Suñé; 01/01/2018 - 31/12/2018; CSIC:27.275,00€.

- Modelling of the monopole-2 in situ diffusion experiment and predictive modelling of the Phase 4 in situ test (Grimsel Test Site – Long-Term Diffusion project); Nagra (Switzerland); Josep M. Soler; 12/04/2018 - 11/01/2019; 14.660,49€.

- Nagra (Switzerland); Josep M. Soler; 16/07/2018 - 15/01/2019; 10.246,91€.

- Plataforma SIG de gestió i anàlisi de dades geològiques e hidrogeològiques a la ciutat de Barcelona pel desenvolupament d'un projecte de doctorat industrial en la modalitat de cofinançament; Barcelona Cicle de l'aigua, S.A., UPC, CSIC; E. Vázquez-Suñé;01/10/2015 – 31/10/2018; Predoctoral fellowship 3 years + 37.855€ (CSIC-UPC: 12.600,00€ in 2017).

- Reactive Transport Modeling in the Framework of the GTS-LCS Project, 2016; Posiva Oy (Finland); JM. Soler; 01/02/2016 - 31/01/2017; 27.222,22€.

- Revisión cálculos hidrogeológicos y seguimiento de los efectos producidos por el agotamiento del freático en el ámbito de la ejecución del túnel de la Plaza de las Glorias; Ajuntament de Barcelona / BIMSA; E. Vázquez-Suñé; 01/05/2018 – 31/05/2020; CSIC: 39.200,00€.

- Revisión de los modelos numéricos del Salar de Llamara, Chile; SQM, Chile; E. Vázquez-Suñé; 01/02/2018 - 31/03/2018; 15.000,00€.

- Scientific and technical assistance related to modelling of poroelastic effects relevant for risk assessment of induced seismicity; 21/02/2018 - 28/02/2019; 25.000,00€.

- Scoping calculations for GTS-CIM (Grimsel Test Site – In Situ Migration of C-14 and I-129 in Cement); Nagra (Switzerland);01/10/2017 - 31/03/2018; JM. Soler; 10.246,91€.

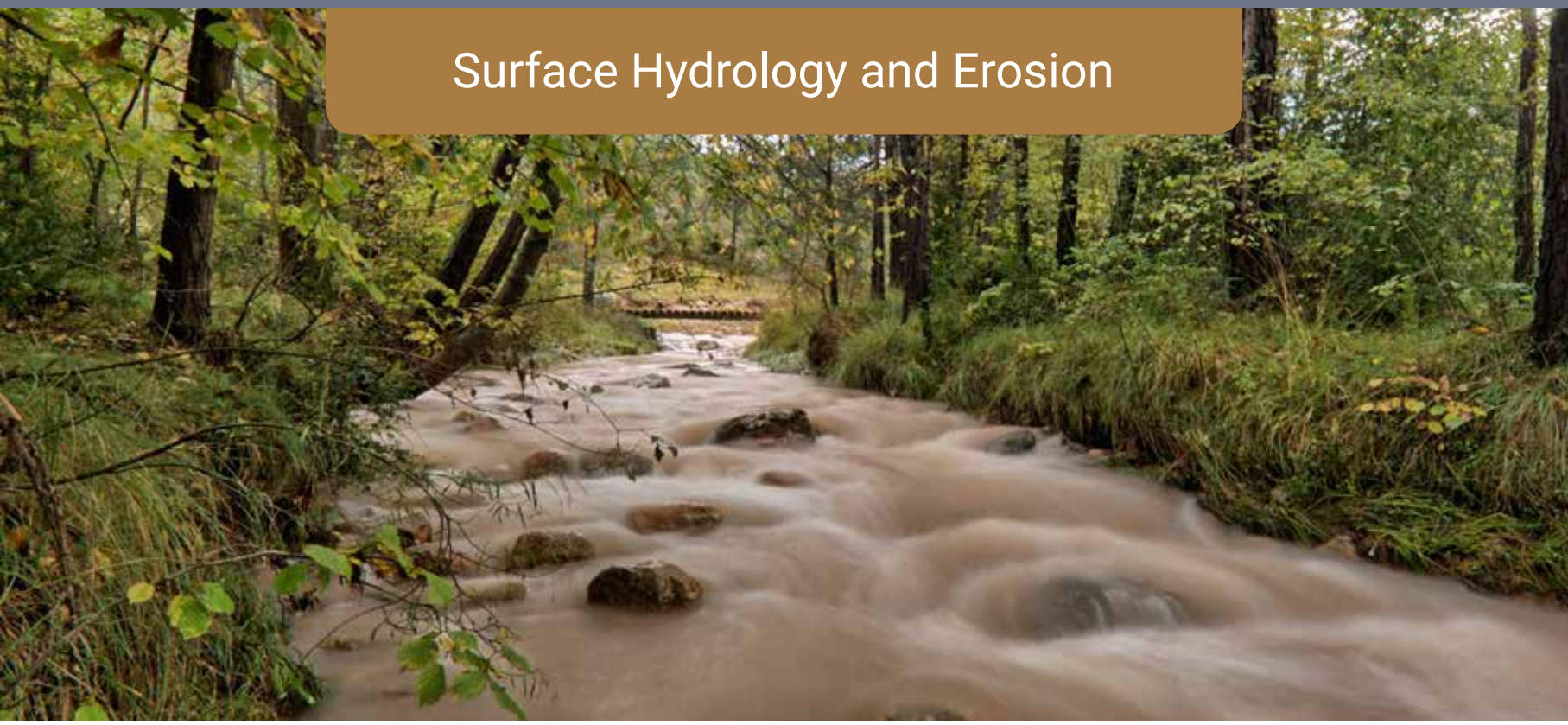
- To perform modelling calculations of the progress of the monopole-2 in situ diffusion experiment (Grimsel test site long-term diffusion experiment); Nagra (Switzerland); 01/09/2016 - 30/11/2017; 20.447,53€.

- Trabajos de modelación hidrogeológica relativos a la estrategia ambiental 2017 (Definición del PAT de Peine, Modificaciones al PAT del Sistema Aguas de Quelana, Soncor y Borde Este) - Fase II; SQM, Chile; E. Vázquez-Suñé;01/05/2017 – 31/01/2018; 99.254,00€.

- Trabajos de modelación hidrogeológica SQM-Salar; SQM, Chile; E. Vázquez-Suñé; 20/04/2018 - 19/04/2021; CSIC: 304.793,00€.

- Tratamiento pasivo de sulfato y metales pesados de las aguas de mina. Universidad de Huelva; C. Ayora; 23/10/2017 - 22/12/2017; 12.658€

# Surface Hydrology and Erosion



## Group

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**Technical Staff**
Gisel Bertran Creus
Elisenda Sánchez Costa
Maria Soria Extremera

## Surface Hydrology and Erosion

The Surface Hydrology and Erosion group is oriented towards the study of the hydrological dynamics of Mediterranean mountain areas using a multidisciplinary and multiple-scale approach. Several aspects of the hydrological cycle are investigated, utilising the Vallcebre Research Catchments (NE Spain) as a field laboratory to observe, quantify and model hydrological processes at the plot and catchment scale. The role of forests on hydrological processes and balances, the societal challenges induced by intense erosion processes and the regime of temporary rivers are among the main research subjects studied by this unit.

## Projects

- DYNAMIcs of abandoned TErrace Mediterranean landscapes under global change (MASCC DYNAMITE); PCIN-2017-061/AEI; Arimnet2 Call (2014)-ERA-NET European Commission's 7th Framework Programme - MINECO. Programa Estatal de I+D+I Retos; UMR LISAH (INRA-IRD-SupAgro), (France), IDAEA-CSIC (Spain), University of Catania (Italy), IAV-INRA-ENFI (Morocco), CESAM-University of Aveiro (Portugal), INRGREF (Tunisia); Damien Raclot UMR LISAH (INRA-IRD-SupAgro), Jérôme Latron (IDAEA); 01/01/2017 - 31/12/2019; CSIC: 48.600€.

- Hydrologic effects of human and climatic stresses in water-limited areas: role of coevolving runoff, vegetation and landforms for adaptive management; DP140104178; Australian Research Council (ARC). Discovery Projects Scheme; The University of Newcastle (Australia), Illinois University (USA), Durham University (UK), IDAEA-CSIC; Patricia M. Saco (The University of Newcastle, Australia); 01/01/2014 – 30/06/2019; 420,000 AUS$.

- Implementing the Water Framework Directive to temporary rivers: tools for the assessment of their ecological status (TRIVERS); LIFE13ENV/ES/000341; EU Commission, D.G. Environment, LIFE. LIFE+ call for proposals 2013; UB, IDAEA-CSIC, Agència Catalana de l'Aigua, Confederación Hidrográfica del Júcar; Francesc Gallart, Coordinator: Narcís Prat (UB); 01/06/2014 - 31/05/2018; CSIC: 542,346€.

- Indicadores de cambios funcionales bruscos para la priorización de áreas degradadas a restaurar en comunidades de plantas mediterráneas; CGL2013-42213-R; MINECO. Programa Estatal de I+D+I Retos; CIDE-CSIC, Universidad de Alcalá, Universidad de Zaragoza, IDAEA-CSIC, USDA (USA); Esther Bochet, Patricio Garcia-Fayós (CIDE-CSIC); 01/01/2014 - 31/12/2017; 73.000€.

- Investigación de los procesos hidrológicos en ambientes mediterráneos mediante la sintesis de datos hidrométricos, hidroquímicos e isotópicos (PROHIDLS). 201730I054; Jérôme Latron; 01/12/2017 - 30/11/2018. 5.000,00€.

- Patrones espacio-temporales de transferencia de agua en cuencas mediterráneas de cabecera. Conexiones entre vegetación y respuesta hidrológica; CGL2016-75957-R AEI/FEDER,UE; MINECO. Programa Estatal de I+D+I Retos; IDAEA-CSIC, University of Delaware (USA), Luxemburg Institute of Science and Technology (Luxemburg), GNS Science (New Zealand); Pilar Llorens (IDAEA); 01/12/2016 - 31/12/2019; 121.000€.

- Plant water use and drought resistance strategies across scales: from homeostatic mechanisms to regional vegetation dynamics; CGL2017-89149-C2-2-R AEI/FEDER, UE; MINECO. Programa Estatal de I+D+I Retos; CTFC, CREAF, CSIC; Miquel de Cáceres (CTFC); 01/01/2018 - 31/12/2021; 93.170.00€.

- Rol de la cobertura vegetal en el ciclo hidrológico en la Cuenca Alta del Río Napo; AECID-IKIAM; Universidad Amazónica IKIAM (Ecuador), IDAEA-CSIC; Byron Maza (IKIAM), Pilar Llorens (IDAEA); 01/11/2016 - 31/10/2018; 14.350€.

## Contracts

- Tractament de la informació hidrològica pre-actuació dins el marc del projecte Life+ CLIMARK; 20183167; Centre Tecnològic Forestal de Catalunya; Jérôme Latron, Pilar Llorens (IDAEA); 01/01/2018 - 31/12/2018; CSIC: 7.381,20€.

# International Scientific Cooperation and Communication activities

## Group

**Permanent Research Staff**
Rafael Rodríguez Clemente
(Group leader - Ad Honorem)

**Postdoctoral Research Staff**
Macarena Muñoz Ruiz

## International Scientific Cooperation and Communication activities

This group works on the set up, direction or participation in European research projects aiming at fostering political dialogue in science, technology and innovation between the European Union and several world regions, notably the Mediterranean Partners Countries and Latin America. A main focus is on the knowledge management and identification of best practices in the domains indicated above, making use of the previous experience of the group to promulgate the international dimension of IDAEA and its national leadership and influence on European environmental policies.

## Projects

- Ayuda a grupos de investigacion de calidad en el marco del plan de investigacion de Catalunya; 36.060,73; 2017-2018.
- Euro-Mediterranean cooperation through ERANET joint activities and beyond; ERANETMED, FP7-INCO.Net Grant 609475; 04/11/2013 – 08/03/2018; 104.325,00€.
- Mediterranean Science, Policy, Research & Innovation Gateway; MED-SPRING, FP7-INCO.Net Grant 311780; 01/02/2013 - 31/07/2017; 293.515,00€.
- Partnership for Research and Innovation in the Mediterranean Area; 724060; 01/05/2016 - 28/02/2018; 2.908,94€.
- Priorización de compuestos citostáticos para monitorización ambiental. Fuentes, comportamiento y estrategias de remediación; CTM2014-60199-P; PN2014 - PROY I+D - S. E. G. C. - P. EXCELENCIA; 01/01/2015 - 31/12/2017; 72.600,00€.
- Solutions Académiques pour le Territoire Euro-méditerranéen Leader d'Innovations et Transferts technologiques d'excellence; 574015-EPP-1-2016-1-FR-EPPKA2-; Erasmus+ SATELIT; Univ. de Aix-Marseille, Univ. Tethys; 15/10/2016 - 14/10/2019; 13.718,00€.

# 5 Research Supporting Services

IDAEA research is supported by 17 Scientific Equipment Services that provide shared access to specialized and interdisciplinary equipment, and expertise on environmental analytical assays. The services are also open to external uses from academia and industry.

## Gas Chromatography

This service has currently twelve gas chromatographs equipped with different detectors (FID, ECD, NPD, MS, Pyrolyser - CVAFS). Most of them have automated systems to introduce liquid samples or by SPME into Split / Splitless, On- Column or PTV inyectors. The service is available to users as self-service whom are supported by a technician assigned to the service. The greater part of applications that are carried out within this service are related to environmental pollution, for example Alkenone determination in paleoclimatic studies (GC -FID), Trihalomethane analysis (HS- SPME -GC -ECD), Priority organic pollutants (PCBs, pesticides, ...) in environmental and biological samples (GC –ECD), Mercury speciation by GC- Pyrolyser – CVAFS, Analysis of petroleum profiles (GC- MS), Monitoring organic synthesis reactions (GC-FID).

## High Resolution Mass Spectrometry

This service is suitable for analysis at trace levels and sub-traces and is currently used mainly for the analysis of persistent organic pollutants in environmental matrices and food. The service includes:

1. High resolution HRMS: High Resolution Mass Spectrometer, AutoSpec Ultima NT. (Waters), MS magnetic sector coupled to a high resolution gas chromatograph.

2. Low Resolution LRMS: Low resolution Mass Spectrometer ISQ, (Thermo Scientific) MS single quadrupole, coupled to a high resolution gas chromatograph.

## Advanced Mass Spectrometry Analysis: Orbitrap

This analysis service focuses primarily on organic compounds at trace levels in environmental and food matrices using liquid chromatography coupled to high resolution mass spectrometry and electrospray ionization (LC/ESI-HRMS). The high performance of our LC-HRMS system that differentiates it against other LC-MS systems is the accurate mass measurements of isolated organic compounds or food and environmental samples and their fragmentation products.

LC/ESI-HRMS System: Orbitrap-Exactive HCD (Thermo Fisher Scientific, Bremen, Germany) with ESI and heated H-ESI II sources coupled to a liquid chromatograph (Pmax 5800psi), a refrigerated autosampler, and with a high energy HCD collision cell (Resolution: 100000 (m/z 200, 1 scan/sec). Accuracy: external calibration <3ppm, internal calibration <1ppm. m/z range: 50 to 4000 (multicharge). Acquisition mode: Full Scan and all ion fragmentation (AIF).

## Mass Spectrometry-Special Techniques

This service comprises a large number of mass spectrometers linked to gas and liquid chromatographs and is devoted to trace organic analysis of a wide range of samples such as foodstuffs. These instruments are very powerful and allow the analysis of both pure compounds and complex mixtures. The service consists of two laboratories:

- GC-MS Lab., for volatile and semi-volatile compounds. The service encompasses priority pollutants such as pesticides, aromatic hydrocarbons PAHs, polychlorinated biphenyls PCBs, phthalates, and brominated flame retardants PBDEs, as well as emergent ones (e.g. pharmaceuticals, bisphenol). The laboratory includes 9 instruments with different provisions:
    - Instruments with electronic impact and/or chemical ionization sources;
    - Instruments with different analyzers: single quadrupole, triple quadrupole, time-of-flight of quick scanning, magnetic sector to isotopic relation analysis.
- LC-MS Lab., for non-volatile and polar compounds. The service encompasses analysis of priority pollutants (as pesticides), and also emergent ones (abuse drugs, pharmaceuticals, biocides). The laboratory includes 5 instruments with different provisions:
    - Instruments with electrospray, atmospheric pressure chemical ionization and/or atmospheric pressure photoionization probes;
    - Instruments with different analyzers: triple quadrupole, quadrupole- lineal ion trap, and quadrupole - cyclotronic resonance (orbitrap).

## Dioxin Laboratory

The IDAEA Dioxin Laboratory is mainly focused on the study of polychlorinated dibenzo-p-dioxins (PCDDs) dibenzofurans occurring in environmental settings such as animal feed and human food, fluids and tissues (including blood, serum, placenta and adipose tissue). The analysis is performed by high resolution gas chromatography coupled to high resolution mass spectrometry (HRGC-HRMS) and the isotopic dilution as quantization method. In addition, 'dioxin-like PCBs' or 'marker PCBs' are included within the compounds capable of being analyzed. Most importantly, the IDAEA Dioxin Laboratory is accredited by ENAC (Spanish National Acrediation Body) in accordance to the standard UNE-EN ISO/IEC 17025 (no. 159/LE1177).

## Oil Spill Analysis

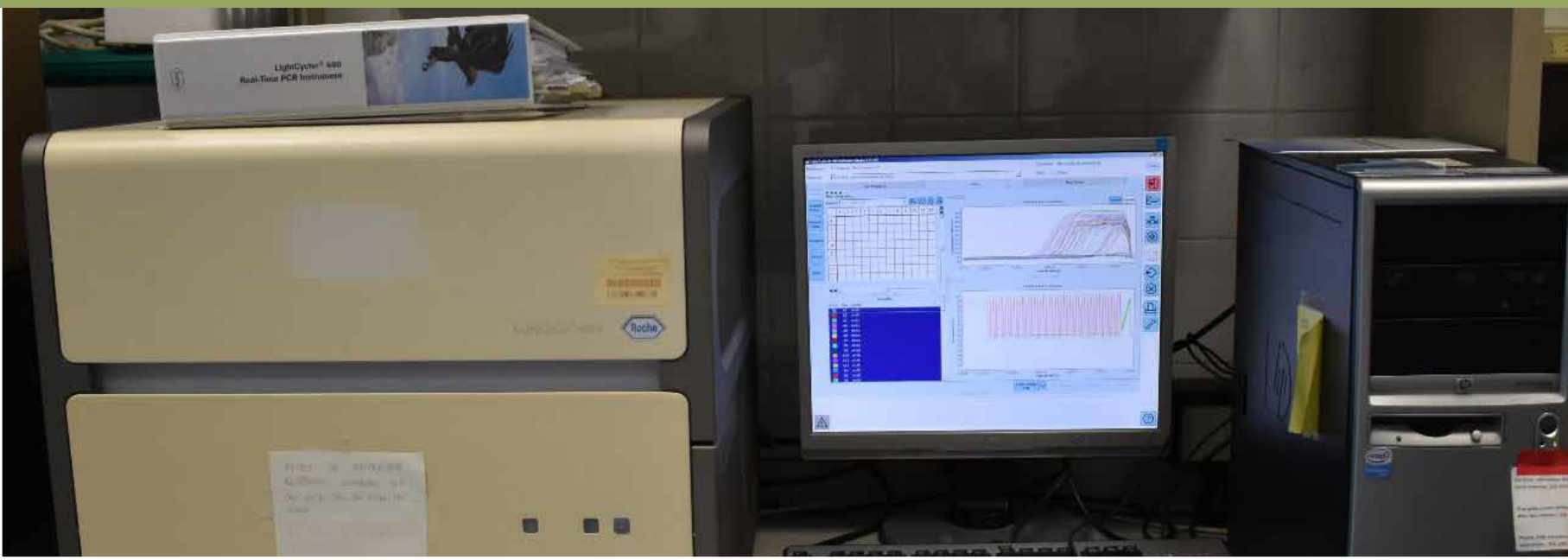
This service is another accredited IDAEA laboratory, in this case awarded the accreditation by ENAC (ISO 17025) and based on the chemical characterization of oil spills in the aquatic environment according to the CEN 15522-2 legal standard, which is based on the principles of environmental forensics. The products capable of being assayed include crude oil and its derivatives which contain a significant proportion of hydrocarbons with a boiling point higher than 200ºC. The method is based on a comparative study of ratios of molecular markers between the different candidate sources and the contaminated samples. Even though the laboratory has a great expertise in the determination of a wide range of environmental samples, the accreditation scope is specifically limited to seawater, sampling nets, emulsioned samples and tar balls. This IDAEA marine geochemistry laboratory is responsible for all the steps in the analytical process of the oil spills except sampling and transportation.

## Volatile Organic Compound Analysis

The service provides sampling, identification and quantification of VOCs emitted into the environment from anthropogenic and biogenic sources. Dynamic methods onto sorbent cartridges are used for atmospheric samples and BIO-VOC™ devices and sorbent cartridges for exhaled breath samples. These samples are analyzed by thermal desorption coupled to gas chromatography and mass spectrometry. Aldehydes are determined by high-performance liquid chromatography with ultraviolet detector. VOCs present in water samples are analyzed by purge and trap coupled to gas chromatography and mass spectrometry. The service also provides analysis of VOCs emitted by textile materials and present in pharmaceutical products by direct thermal desorption gas chromatography coupled to mass spectrometry.

## Mercury Analysis In Enviromental Samples

This laboratory has the capability of Mercury analysis performed on any kind of solid samples (eg sediment, soil, particulate material, biological material, food, etc) using the EPA 7473 method with a Leco AMA-254 device. The procedure is based on the thermal decomposition of the solid sample, gold trap amalgamation, thermal desorption and detection by atomic absorption spectrophotometry.




## Environmental Toxicogenomics Laboratory

The Environmental Toxicogenomics Service offers a suite of equipment and a highly specialized staff that allow the application of a range of several molecular biology techniques to environmental samples:

- RNA and DNA extraction and quantification
- RNA quality control
- Agarose gel electrophoresis
- Gene detection
- Gene expression analysis
- Genetic variation analysis

The facility is equipped with a Real Time q-PCR (LightCycler 480, Roche), a PCR termocycler (C1000 Touch, BioRad), a Nanodrop Spectrophotometer (NanoDrop 8000, Thermo Scientific), a Bioanalyzer (2100, Agilent Technologies) and a Gel Logic 200 Imaging System (Kodak). In addition, the Environmental Toxicogenomics Service offers the possibility of studying the toxicity of a compound, mixture or a sample following OECD guidelines such as Fish Embryo Acute Toxicity Test (OCDE 236), Daphnia Magna Reproduction Test (OCDE 211), Daphnia sp. Acute Inmobilization Test (OCDE 202) and Fresh Algae Growth Inhibition Test (OCDE 201).

## Air Quality Monitoring

This service uses an impressive range of both state-of-the-art and more routine equipment for the chemical and physical characterisation of aerosols and the subsequent identification of their sources and environmental impact. This substantial equipment resource includes manual and automatic high and low volume samplers for sampling suspended aerosol particles on filters for later gravimetric and chemical analysis, Optical Particle Counters for continuous automatic monitoring of PM10, PM2.5 and PM1 concentrations, Multi-Angle Absorption Photometer for real-time measurements of black carbon in ambient air, Aethalometers to determine the mass concentration of black carbon particles, Nephelometers for continuous measurements of aerosol scattering and backscattering coefficients, Aerosol Chemical Speciation Monitors for real-time measurements of the chemical composition and mass concentrations of non-refractory species in submicron aerosol particles, Condensation Particle Counters to monitor in real time the number concentration of particles and Nanoparticle Surface Area Monitor to measure human lung-deposited surface area of particles.

## Atmospheric Observation Network

This service presents a unique infrastructure for carrying out atmospheric research located in NE Spain. It is integrated within a mobile unit (equipped with various equipments for measuring concentration of gaseous precursors (SO2, NOX, O3) and aerosol physicochemical parameters) and by 3 fixed monitoring sites: Montseny (MSY, Regional background, 720 m a.s.l.), Montsec (MSA, Remote background, 1590 m a.s.l.) and Barcelona–Palau Reial (Urban background). It is particularly well-equipped for the in-situ characterization of aerosols (optical, physical, and chemical offline and online) and trace gases (NOx, SO2, O3, CO). Access to the network allows and encourages investigation of different environments connecting Air Quality and Climate Research. It is the only such scientific “supermultisite” in the Western Mediterranean Basin, a unique region for atmospheric research given the high insolation, the specific meteorology, the elevated emissions of anthropogenic and natural pollutants, and the frequent impact of dust outbreaks.

## Preparation Of Environmental Samples

In the context of environmental sample preparation (including filters and others such as impactor samples), this service provides a high quality service to CSIC research groups as well as other public and private organizations, offering:

- Acid digestion and subsequent ICP-AES and ICP-MS analyses
- Leaching test and subsequent chromatography and selective electrodes analyses
- Gravimetric analysis

- Particle-size distribution by laser method
- Aerosol Chemical Speciation Monitor (ACMS)
- Organic carbon and Elemental carbon (OC, EC)
- Potentiometry /Electrometric analysis (pH, conductivity, selective electrodes)

## Vallcebre Research Catchment

This service comprises of a network of long-term instrumented small hydrological basins located in the South-Eastern Pyrenees (1100-1700 m a.s.l.) with and mean annual precipitation around 880 mm. Five gauging stations at the outlets of catchments ranging from 0.025 to 4.17 km2 provide the main skeleton of the network, complemented by two experimental forest (pine and oak) plots. Two weather stations record every 5 min measurements of air T and RH, global and net radiation, as well as wind velocity and direction. A net of rain gauging and sampling stations records precipitation (4 points) at 5-min intervals and samples rain water (2 points) at both weekly and 5-mm rain depth intervals. The gauging stations record every 5-min measurements of discharge (5 points), T (3 points), optical water turbidity (3 points), ultra-sonic suspended solids concentration (2 points), and sample stream waters at rates depending on time and flow (3 points). The main hydrological setting is complemented by networks of soil water content recording (10 min, 8 points) and sampling (weekly, 2 points), as well as and groundwater level recording (10 min, 20 points) and sampling (weekly, 2 points). Ground water is also weekly sampled at one permanent spring. Finally, the forest experimental plots provide spatially dense recording (5 min) of throughfall, stemflow and soil water content.

## Hydrogeological And Geochemical Modeling

Modeling of water flow (hydrogeology) and reactive solute transport (geochemistry) at different scales, ranging from basin (km) to laboratory (cm), and the implications at the micrometer and nanometer scales (mechanisms).

## Hydrogeology Assessment

This service provides advice in the technical areas related to hydrogeology, including: water supply, contamination / decontamination of aquifers study water resources, public works, mining and geothermal.

## Physico Chemical Characterization Of Environmental Samples

The service consists of the following equipment:

- An HPLC chromatography equipment aimed at the determination of anions in liquid samples.
- A set of selective electrodes for determination of total Cl, total F and ammonium in liquid or solid sample leaching.
- An OCEC equipment for the determination of total C, OC and EC.
- A LECO AMA-254 for the determination of Hg.
- 2 X-ray Diffraction equipments for the crystalline determination of solid samples.
- An ICP-AES optical emission spectrometer for the multielement determination of major elements.
- A mass spectrometer with inductively coupled plasma source, ICP-MS for the multielement determination of trace elements.

## GIS And Geospatial Databases

A service for thematic cartography and databases development, management and visualization, and the development of hydrogeological studies including flow and solute transport modelling in groundwater.

# 6 Research Highlights

IDAEA is a high-impact research institute, being listed as fourth in the ranking in the Nature Index 2018 among the CSIC centers (after the Institute of Space Sciences (ICE), and the Institutes of Materials Science of Madrid (ICMM) and Barcelona (ICMAB)). CSIC (Spanish National Research Council) is Spain's largest public research institution, and ranks third among Europe's largest research organization. It is attached to the Spanish Ministry of Science, Innovation and Universities through the General Secretariat of Scientific Policies Coordination, and plays a key role in scientific and technological policy in Spain and worldwide.

A selection of the 531 SCI publications from all IDAEA research groups in 2017-2018 period is shown below, this corresponding to the papers with highest citations in 2017 and those published in the journals with highest impact factor in 2018.

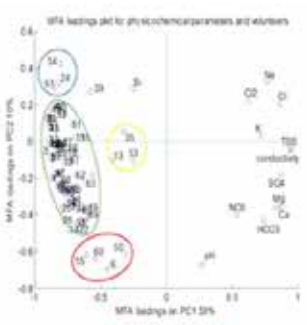
## ENVIRONMENTAL CHEMISTRY DEPARTMENT

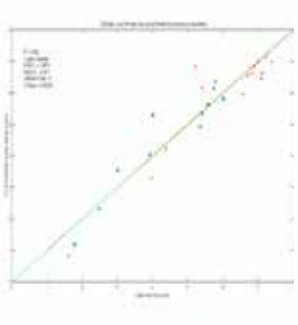
### Chemometrics

**2017: Predicting consumer preferences for mineral composition of bottled and tap water. Platikanov S., Hernández A., González S., Cortina J.L., Tauler R., Devesa R. *Talanta* 162, 1-9.**

It is well known that the taste of water (tap or bottled) depends on the chemical composition of the salt content, with both cations and anions contributing in different ways and interacting through synergism and antagonism. Traditionally, the water companies have tried to improve the taste of supplied water through sophisticated water treatment procedures such as membrane filtering and remineralization. However, there was a lack of knowledge about the effect of the mineral content on the water taste. A universal chemical formula of the water taste does not exist and thus its assessment (in tap and in bottled waters) required sensory experiments, in which water samples are systematically presented to trained or volunteer consumers, who have to test them blindly. In our study, sixty-nine untrained volunteers scored twenty-five different commercial bottled and tap waters from Spain and France. Water samples were physicochemically characterised by analysing conductivity, pH, total dissolved solids (TDS) and major anions and cations: $HCO_3^-$, $SO_4^{2-}$, $Cl^-$, $NO_3^-$, $Ca^{2+}$, $Mg^{2+}$, $Na^+$, and $K^+$. Residual chlorine levels were also analysed in the tap water samples. The volunteers overall liking for the taste of water was correlated with

25 commercial bottled and tap waters

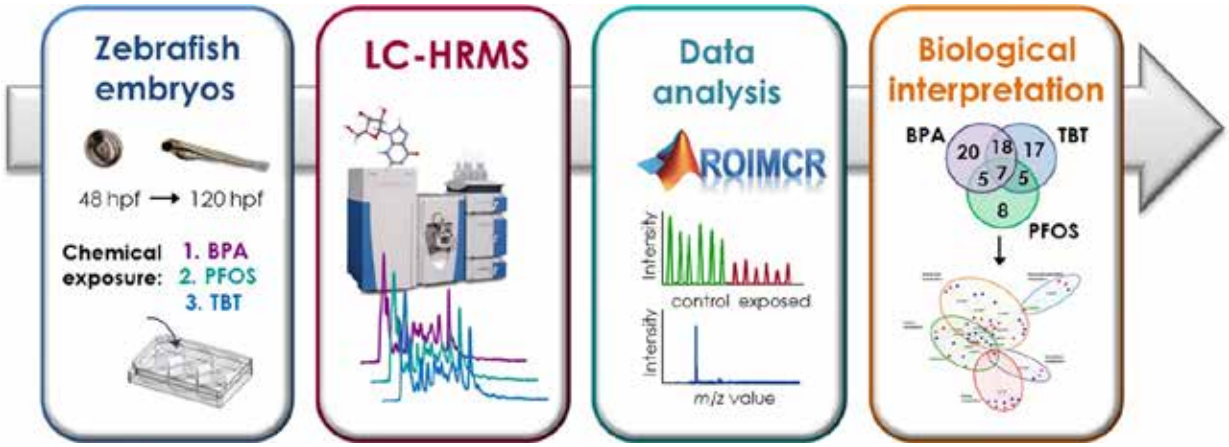

Multiple Factor Analysis


PLS taste prediction

the mineral composition of the selected bottled and tap waters. The chemometric analysis discovered that the volunteers preferred waters rich in calcium bicarbonate and sulphate, rather than in sodium chloride. This study also demonstrated that it was possible to accurately predict the overall liking applying a regression formula.

**2018: Assessment of endocrine disruptors effects on zebrafish (Danio rerio) embryos by untargeted LC-HRMS metabolomic analysis. Ortiz-Villanueva E., Jaumot J., Martínez R., Navarro-Martín L., Piña B., Tauler R. *Science of the Total Environment* 635, 156-166.**

Concern about endocrine disrupting chemicals (EDCs) effects on human and wildlife health is currently increasing. EDCs are exogenous compounds that initiate abnormal endocrine system processes by activating or inactivating endocrine target receptors or disturbing hormonal balances and metabolism, eventually disrupting homeostatic mechanisms, and finally affecting reproduction and development. Bisphenol A (BPA), perfluorooctane sulfonate (PFOS), and tributyltin (TBT) are emerging endocrine disruptors (EDCs) with still poorly defined mechanisms of toxicity and metabolic effects in aquatic organisms. We used an untargeted LC-HRMS metabolomic approach to study the effects of sub-lethal doses of these three EDCs on the metabolic profiles of zebrafish embryos exposed from 48 to 120 hpf (hours post fertilization). Advanced chemometric data analysis methods based on the ROIMCR approach were used for the MS data processing to reveal effects on the subjacent regulatory pathways. Around 50 potential biomarkers were identified for BPA and TBT treatments, whereas for PFOS only 25 biomarkers were identified. Pathway analysis of the corresponding metabolic changes suggested the presence of similar underlying zebrafish responses to BPA, TBT and PFOS affecting the metabolism of glycerophospholipids, amino acids, purines, carbon, and 2-oxocarboxylic acid. We related the changes in glycerophospholipid metabolism to alterations in the absorption of the yolk sack, the primary source of nutrients (including lipids) for the developing embryo, linking the molecular markers with adverse phenotypic effects. We propose that the interaction with the PPAR/RXR complex may be central to the observed metabolomic changes. Moreover, specific signaling pathways were detected for each EDC, which highlights particular modes of action on zebrafish embryos metabolism.

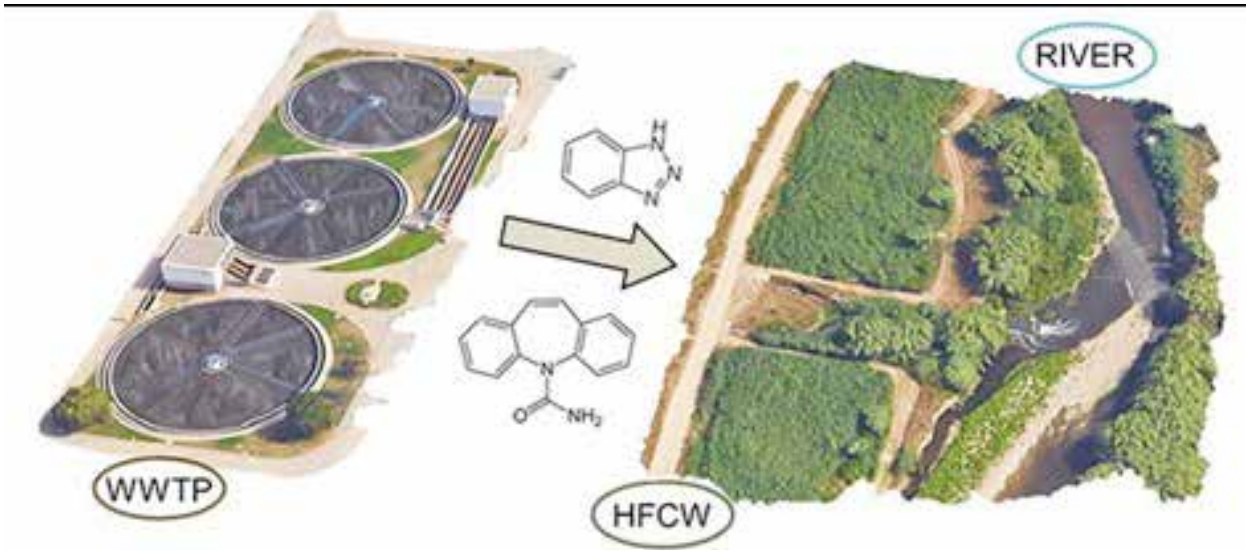


Environmental Pollution and Agriculture (EPA)

**2017: Mitigation of emerging contaminants by full-scale horizontal flow constructed wetlands fed with secondary treated wastewater. Matamoros V., Rodríguez Y., Bayona JM. *Ecological Engineering* 99, 222-227.**

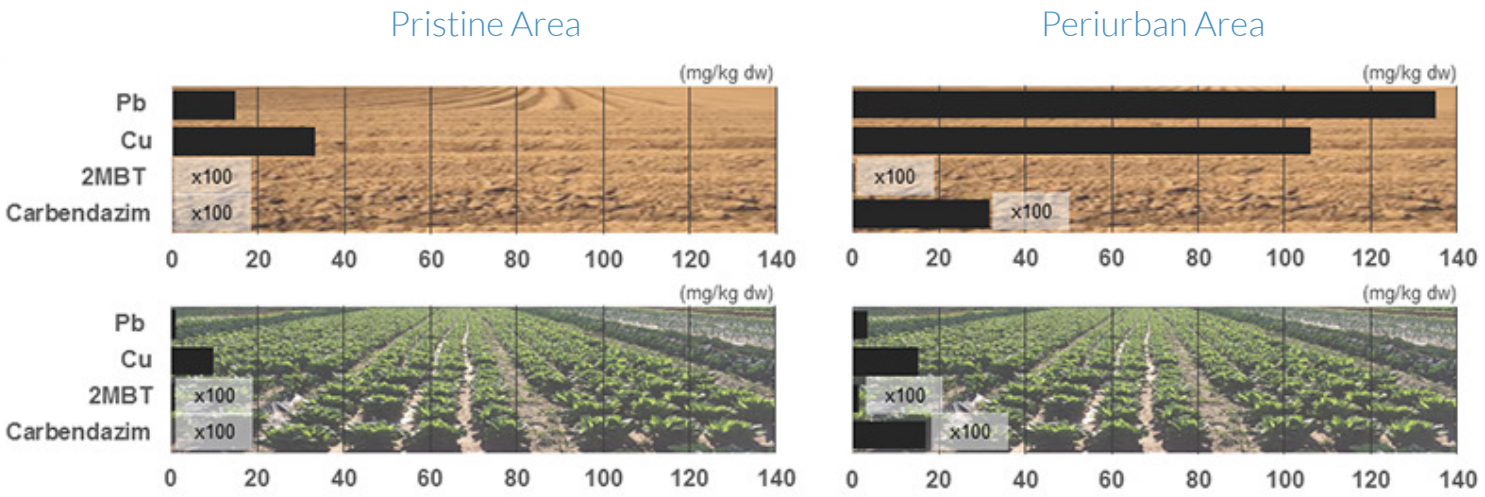
Conventional wastewater treatment plants do not (or only partially) remove the so called emerging contaminants (ECs) (i.e. contaminants not regulated belonging to different families). However, since many of these contaminants are bioactive, they can exert deleterious effects to the receiving aquatic ecosystems. The upgrade of conventional wastewater treatment plants (WWTPs) to advanced oxidation processes is hampered by high capital, operation and maintenance costs. Moreover, the implementation of the Water Framework Directive in the EU Member States pursues an improvement in the treated effluents to reach a good ecological and chemical status in the European rivers.

In this paper, the performance of 12 full-scale horizontal-flow constructed wetlands (HFCWs) (18,000 m2 in total) used as tertiary treatment to remove 16 ECs from secondary treated wastewater (423,500 PE) constructed in the low Besòs river basin (NE Spain) was evaluated. EC removal levels ranged from no removal up to 92%, with an average removal of 43%. The HFCWs were able to attenuate the predicted ecotoxicological effects of ECs on aquatic biota (Daphnia magna) by 66%. Accordingly, this study shows that HFCWs are a suitable ecofriendly technology for removing ECs from secondary effluents of urban wastewater plants and, as consequence to reduce the ecotoxicological effects associated with pollutant discharges in to small rivers with limited dilution capability such as the Besòs river.



**2018: Occurrence and bioaccumulation of chemical contaminants in lettuce grown in peri-urban horticulture. Margenat A., Matamoros V., Díez S., Cañameras N., Comas J., Bayona JM. *Science Total Environment* 637-638, 1166-1174.**

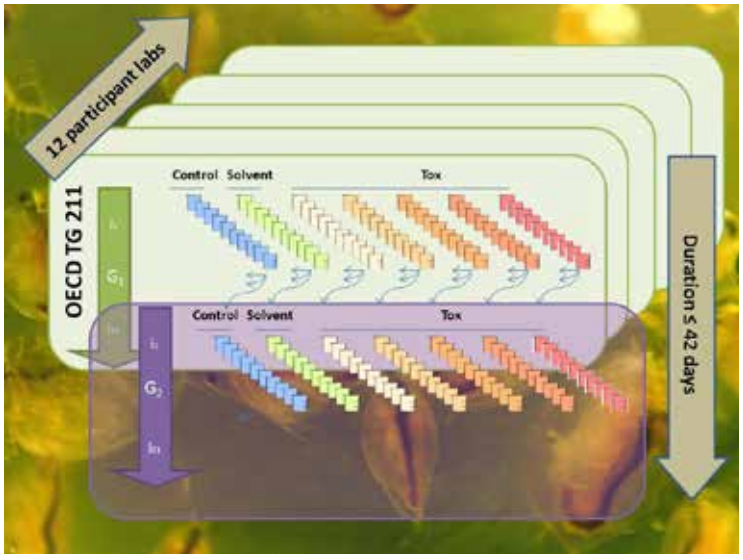
Peri-urban horticulture performs environmental and socio-economic functions and provides ecological services to nearby urban areas. Nevertheless, the pressure associated with industrialization and water pollution increase in the exposure of peri-urban vegetables to contaminants such as trace elements (TEs) and organic microcontaminants (OMCs). In this study, the occurrence of chemical contaminants (i.e., 15 TEs, 35 OMCs) in soil and the edible parts of lettuce from 4 plots in the peri-urban area of the city of Barcelona city (NE Spain) was assessed. A pristine site, outside the peri-urban area of influence, was selected for comparison. Although the concentration of Mo, Ni, Pb, and As in the soil of the peri-urban area exceeded the environmental quality guidelines, their occurrence in lettuce usually fulfilled with human food standards. Fungicides and chemicals released by plastic pipelines used in agriculture were prevalent in the soil and the edible parts of the lettuce. The occurrence of these chemical pollutants in the peri-urban area did not affect the chlorophyll, lipid, or carbohydrate content of the lettuce leaves. Principal Component Analysis showed that soil pollution, fungicide application, and irrigation water quality are the most relevant factors determining the occurrence of contaminants in lettuce.



## Environmental Toxicology

**2017: Validation of a two-generational reproduction test in *Daphnia magna*: An interlaboratory exercise. Barata C., Campos B., Rivetti C., LeBlanc GA., Eytcheson S., McKnight S., Tobor-Kaplon M., de Vries Buitenweg S., Choi S., Choi J., Sarapultsev, EI., Coutellec MA., Coke M., Pandard P., Chaumot A., Quéau H., Delorme N., Geffard O., Martínez-Jerónimo F., Watanabe H., Tatarazako N., Lopes I., Pestana JLT., Soare, AMVM., Pereira CM., De Schamphelaere K. *Science of Total Environment* 579, 1073-1083.**

Effects observed within one generation disregard potential detrimental effects that may appear across generations. Previously we have developed a two generation *Daphnia magna* reproduction test using the OECD TG 211 protocol with a few amendments, including initiating the second generation with third brood neonates produced from first generation individuals. Here we showed the results of an inter-laboratory calibration exercise among 12 partners that aimed to test the robustness and consistency of a two generation *Daphnia magna* reproduction test. Pyperonyl butoxide (PBO) was used as a test compound. Following experiments, PBO residues were determined by TQD-LC/MS/MS. Chemical analysis denoted minor deviations of measured PBO concentrations in freshly prepared and old test solutions and between real and nominal concentrations in all labs. Other test conditions (water, food, *D. magna* clone, type of test vessel) varied across partners as allowed in the OECD test guidelines. Cumulative fecundity and intrinsic population growth rates (*r*) were used to estimate "No observed effect concentrations "NOEC using the solvent control as the control treatment. $EC_{10}$ and $EC\text{-}_{50}$ values were obtained regression analyses. Eleven of the twelve labs succeeded in meeting the OECD criteria of producing more than 60 offspring per female in control treatments during 21 days in each of the two consecutive generations. Analysis of variance partitioning of cumulative fecundity indicated a relatively good performance of most labs with most of the variance accounted for by PBO (56.4%) and PBO by interlaboratory interactions (20.2%), with multigenerational effects within and across PBO



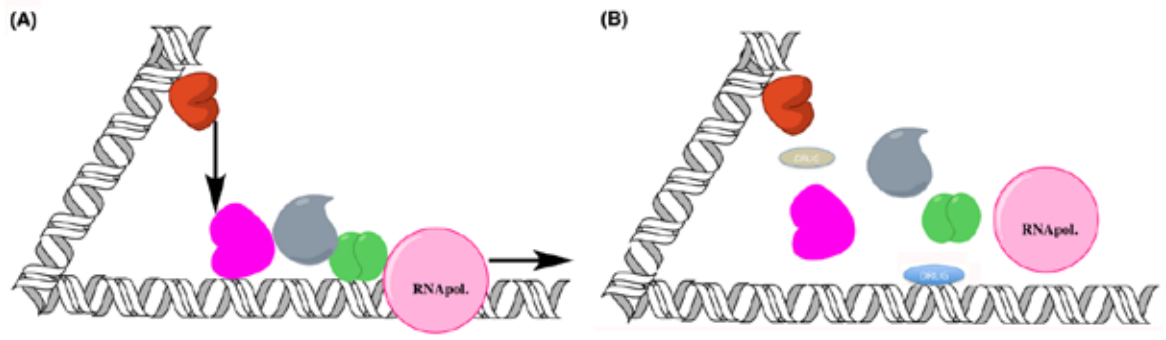
concentrations explaining about 6% of the variance. $EC_{50}$ values for reproduction and population growth rates were on average 16.6 and 20.8% lower among second generation individuals, respectively. In summary these results suggest that the proposed assay is reproducible but cumulative toxicity in the second generation cannot reliably be detected with this assay.

**2018: Challenging transcription by DNA-binding antitumor drugs. Portugal J. *Biochemical Pharmacology* 155, 336-345.**

Gene expression involves RNA polymerases and a variety of transcription factors and their highly-regulated interactions with gene promoters. Transcription factors bind to precise sequences of DNA in the gene promoter regions, thus activating or inhibiting the expression of nearby genes. In cancer, as well as in other pathologies, the incorrect behaviour of impaired cells can be determined by the pattern of genes they express.

Sometimes, transcription has been considered as clinically "undruggable", regardless that many DNA-binding drugs that have been in the first line of cancer therapy alter gene expression significantly. Many anticancer drugs in clinical use exert their activity by binding to DNA. DNA-binding compounds displaying sequence selectivity exhibit differential effects on the interactions between gene promoter regions and a variety of transcription factors.

Many "omic" tools have been developed to investigate the genome-wide changes in gene expression induced by DNA-binding compounds. The information available about the molecular structure and mechanisms of action of both transcription factors and DNA-binding drugs, together with the new prospects offered by functional genomics, should encourage the development of new more-selective DNA-binding antitumor drugs to target a single gene with little effect on others. Genome-wide signatures of gene interactions obtained from screens of DNA-binding compounds can be used to predict the clinical efficacy of targeted cancer therapy. Predicting the mechanisms of competition between transcription factors and DNA-binding ligands, together with the description of their actual effects on the transcriptome of treated patients, should contribute to upcoming progress in the development of more effective and less toxic therapeutic agents.



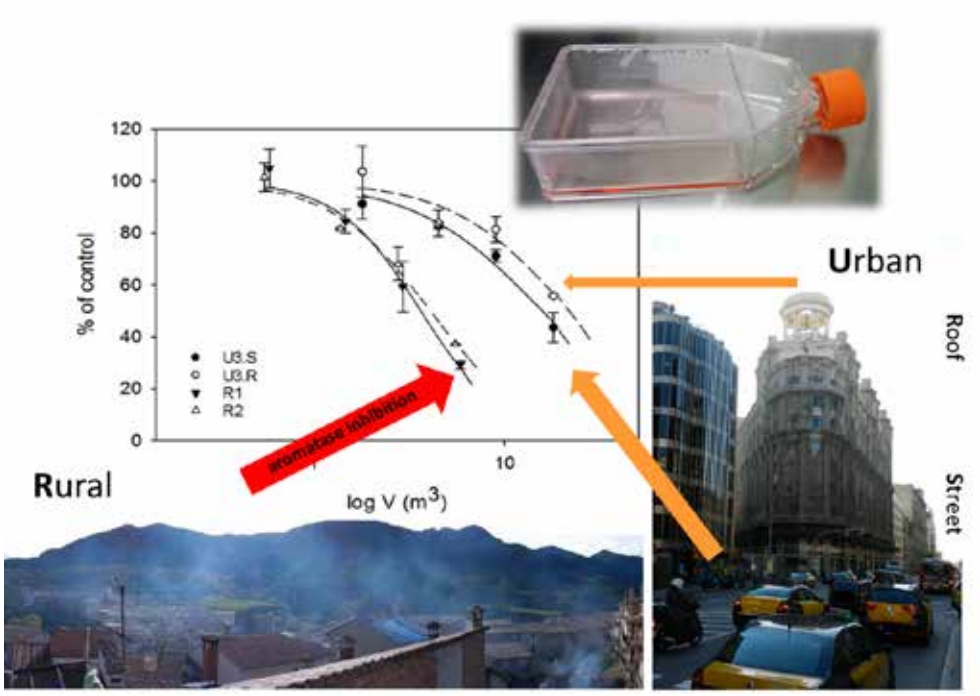
## Geochemistry and Pollution

**2017: Comparative toxicity and endocrine disruption potential of urban and rural atmospheric organic PM1 in JEG-3 human placental cells. van Drooge BL., Marqueño A., Grimalt JO., Fernández P., Porte C. *Environmental Pollution* 230, 378 – 386.**

Outdoor ambient air particulate matter and air pollution are related to adverse effects on human health. The present study assesses the cytotoxicity and ability to disrupt aromatase activity of organic PM1 extracts from rural and urban areas at equivalent air volumes from 2 to 30 m3, in human placental JEG-3 cells.

Samples were chemically analyzed by GC-MS for particle bounded organic compounds with endocrine disrupting potential, i.e. polycyclic aromatic hydrocarbons (PAH), O-PAH, phthalate esters, but also for organic molecular tracer compounds for the emission source identification.

Rural samples collected in winter were cytotoxic at the highest concentration tested and strongly inhibited aromatase activity in JEG-3 cells. No cytotoxicity was detected in summer samples from the rural site and the urban samples, while aromatase activity was moderately inhibited in these samples. In the urban area, the street site samples, collected close to intensive traffic, showed stronger inhibition of aromatase activity than the samples simultaneously collected at a roof site, 50 m above ground level. The cytotoxicity and endocrine disruption potential of the samples were linked to combustion products, i.e. PAH and O-PAH, especially from biomass burning in the rural site in winter.

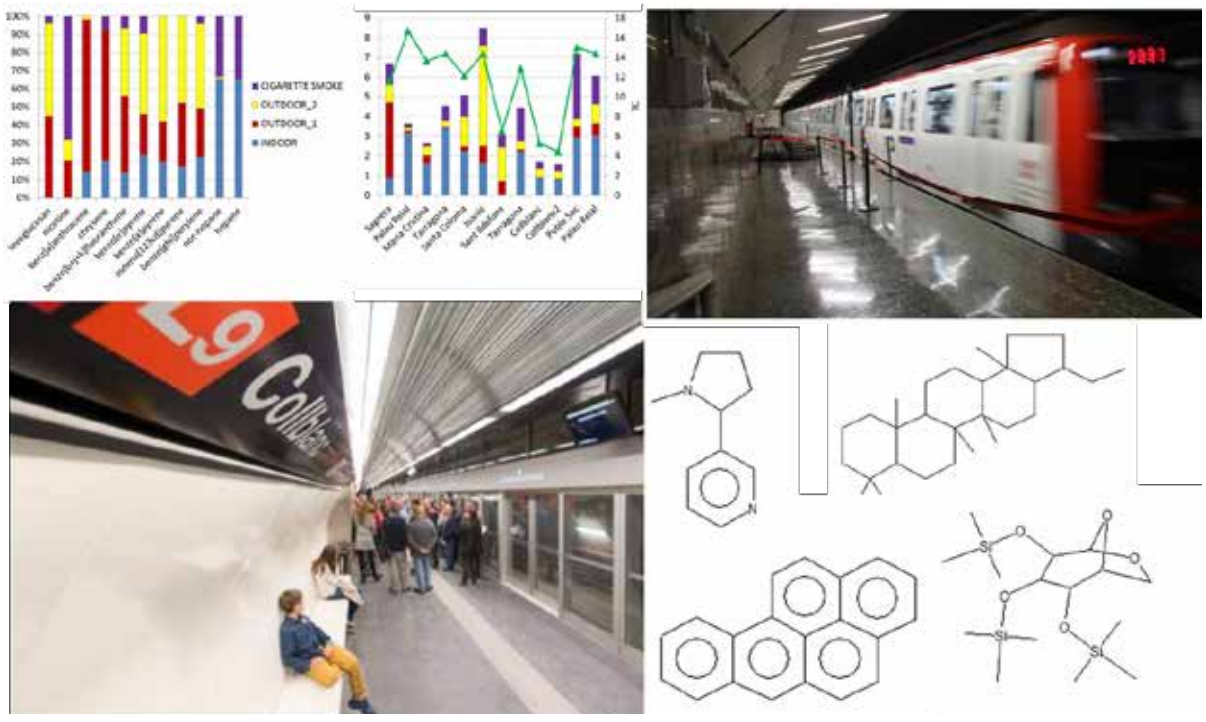


**2018: Origin of polycyclic aromatic hydrocarbons and other organic pollutants in the air particles of subway stations in Barcelona. van Drooge BL., Prats RM., Reche C., Minguillón MC., Querol X., Grimalt JO., Moreno T. *Science of the Total Environment* 642, 148-154.**

The air quality in subway stations is complex due to restricted ventilation conditions which may promote the concentration of air pollutants from both outdoor and indoor air. The paper deals with the air quality in platforms of nine subway stations in the metropolitan area of Barcelona.

PM2.5 samples were collected and analyzed on toxic polycyclic aromatic hydrocarbons and organic molecular tracer compounds for emission sources, i.e. levoglucosan, nicotine, and hopanes. The influence of ventilation conditions and nighttime maintenance activities on the concentrations of air pollutants has been studied. The organic compounds were used for source apportionment of the organic aerosol and PAH in the stations.

The results show that there is no influence of nighttime maintenance activities on the platform air quality during the next day. The source apportionment analysis showed that 75 % of the detected PAH at the platforms have an outdoor PM origin, and that at some platforms cigarette smoking is practiced. The modern subway stations, with advanced ventilation and platform screen doors that separate the subway system from the platform, showed best air quality.



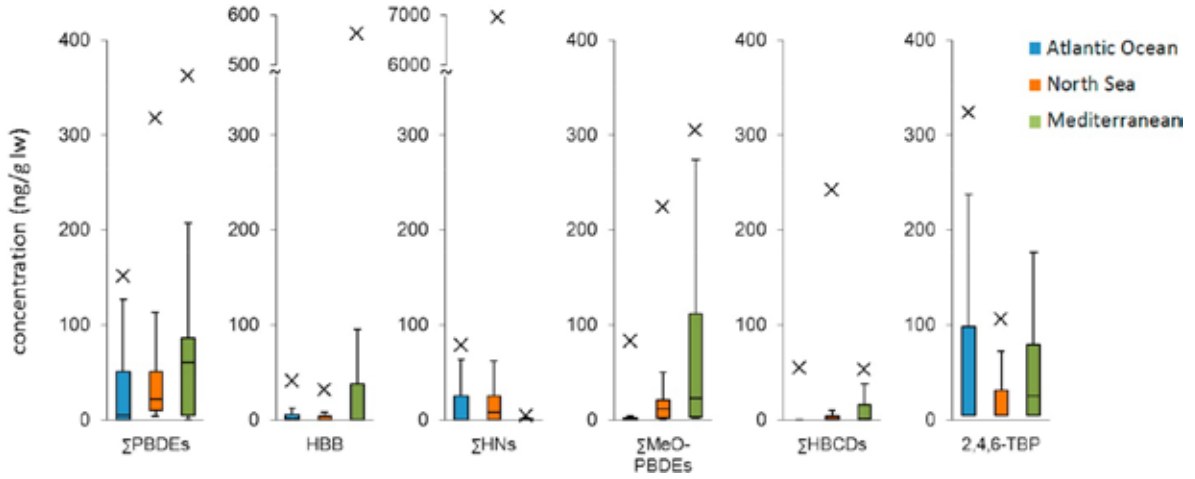
Water, Environmental and Food Chemistry (ENFOCHEM)

**2017: Occurrence of halogenated flame retardants in commercial seafood species available in European markets. Aznar-Alemany Ò., Trabalón L., Jacobs S., Barbosa V.L., Tejedor M.F., Granby K., Kwadijk C., Cunha S.C., Ferrari F., Vandermeersch G., Sioen I., Verbeke W., Vilavert L., Domingo J.L., Eljarrat E., Barceló D. *Food and Chemical Toxicology* 104, 35-47.**

We have studied the presence of classical (PBDEs and HBCD) and emerging (dechloranes) flame retardants (FRs) in commercial seafood from European countries, collected during 2014 and 2015. A total of 42 samples including 10 species (cod, mackerel, monkfish, mussel, Nile perch, plaice, salmon, seabream, shrimp and tuna) were selected corresponding to the most common species consumed in the study area. Samples corresponded to different geographical locations such as the Mediterranean Sea, the North Sea and the north-east Atlantic Ocean, with 3 samples imported from the Pacific Ocean and one from India. Moreover, 14 samples were analysed raw and cooked.

Contaminants were found in 90.5% of the seafood samples. Mussel and seabream were the most contaminated species and the Mediterranean Sea was the most contaminated location. Moreover, the cooking process concentrated PBDEs and HBB. Thus, these results indicate the importance of considering the effect of cooking in future risk assessment and risk management using cooked instead of raw samples.

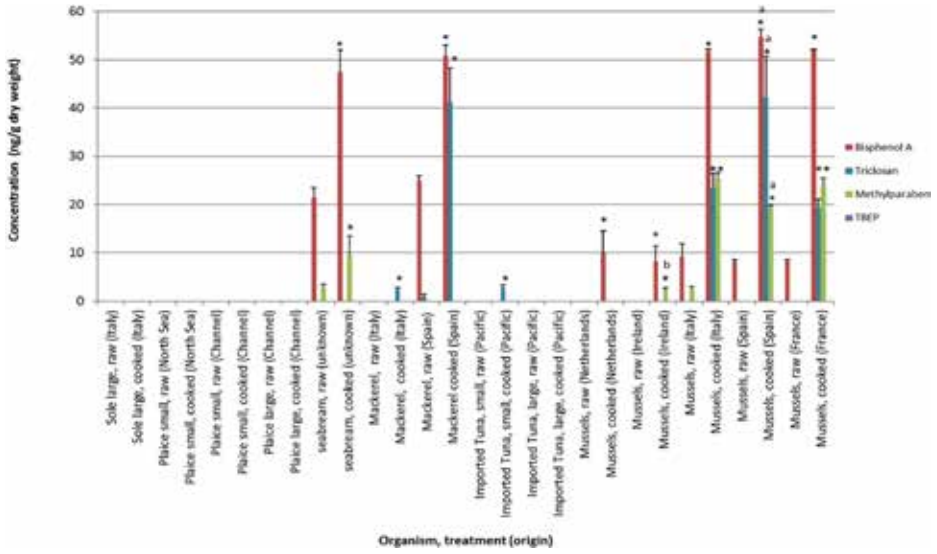
The possible health risk from exposure to FRs in seafood was assessed using the concentrations of the raw samples and based on the overall seafood consumption pattern of adults from Belgium, Ireland, Italy, Portugal and Spain. The risk assessment revealed that there was no health risk related to the exposure to brominated FRs via seafood consumption. However, a refined risk assessment for BDE-99 is of interest in the future, since data for BDE-99 are approximating the threshold value. Moreover, the risk could increase due to other relevant sources of exposure, such as meat products, animal and vegetable fats and oils, dairy products, egg products, etc.



**2018: Pharmaceuticals and endocrine disruptors in raw and cooked seafood from European market: Concentrations and human exposure levels. Álvarez-Muñoz D., Rodríguez-Mozaz S., Jacobs S., Serra-Compte A., Cáceres N., Sioen I., Verbeke W., Barbosa V., Ferrari F., Fernández-Tejedor M., Cunha S., Granby K., Robbens J., Kotterman M., Marques A., Barceló D. *Environment International* 119, 570 - 581.**

Pharmaceuticals (PhACs) and endocrine disrupting compounds (EDCs) are considered contaminants of emerging concern. They have large volumes of production and can find their way to the marine environment through different paths. Therefore, they can accumulate in aquatic organisms such as seafood that later on end up on the food chain. These compounds may represent a risk to consumers through effects on the human reproductive system, metabolic disorders, pathogenesis of breast cancer or the development of microbial resistance. Measuring their levels in highly consumed seafood is important to assess the potential risks to human health. Besides, the effect of cooking on contaminant levels is relevant to investigate since their concentrations may change, thus affecting humans' dietary exposure. This is the first work published that researches the presence and levels of relevant PhACs and EDCs in commercially available seafood, on a large geographical scale, for assessing their potential risk to human health through the diet and the effect of cooking on their levels. For this purpose, a sampling survey of seafood from 11 European countries was undertaken. Twelve highly consumed seafood types were analysed raw and cooked with 3 analytical methods (65 samples, 195 analysis).

In the majority of the commercial seafood analysed, PhACs were not detected or were below quantification limits, discarding a potential human risk through seafood consumption. However, EDCs were detected in almost all analysed samples, which point them as a relevant group of contaminants present in European seafood. EDCs such as bisphenol A (BPA), methylparaben and triclosan were frequently detected in raw seafood with concentrations reaching up to 184 ng/g dry weight (dw) of triclosan in plaice, 69 ng/g dw of BPA in canned tuna, and 9 ng/g dw in mackerel. Cooking by steaming had no effect on PhACs levels, but significantly increased the levels of EDCs in 62% of the samples analysed, reaching 46-fold increase and 55 ng/g dw of BPA in cooked mussels from Spain.



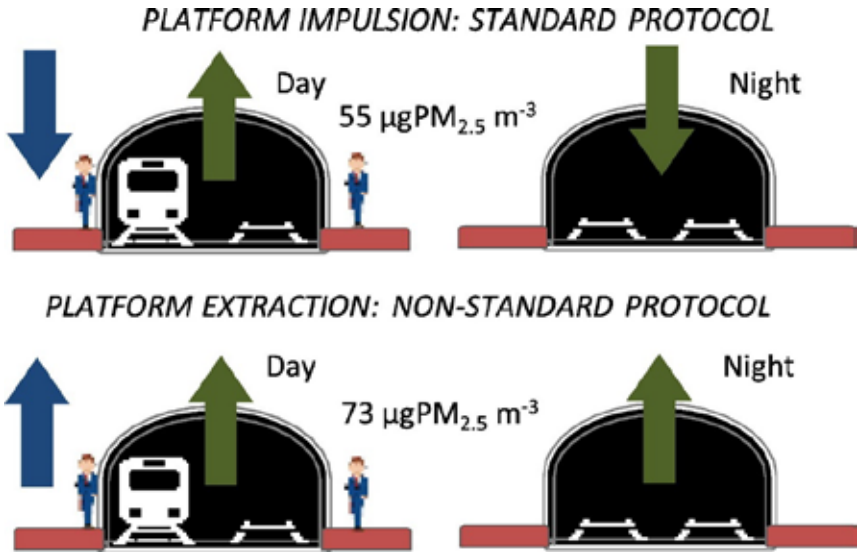
GEOSCIENCES DEPARTMENT

Environmental Geochemistry and Atmospheric Research (EGAR)

**2017: The effect of ventilation protocols on airborne particulate matter in subway systems. Moreno T., Reche C., Minguillón M.C., Capdevila M., de Miguel E., Querol X. *Science Total Environment* 584-585, 1317-1323.**

In the context of air quality, commuting by underground rail is one of the high-exposure periods among various daily activities, because inhalable airborne particulate matter (PM) levels in the subway environment are typically higher than those both above ground and in other indoor environments. Aerosol emissions specific to the subway include mechanical abrasion of rails, wheels, brakes and catenary, resuspension of material by air turbulence in the stations and tunnels, and PM emitted during nighttime maintenance works.

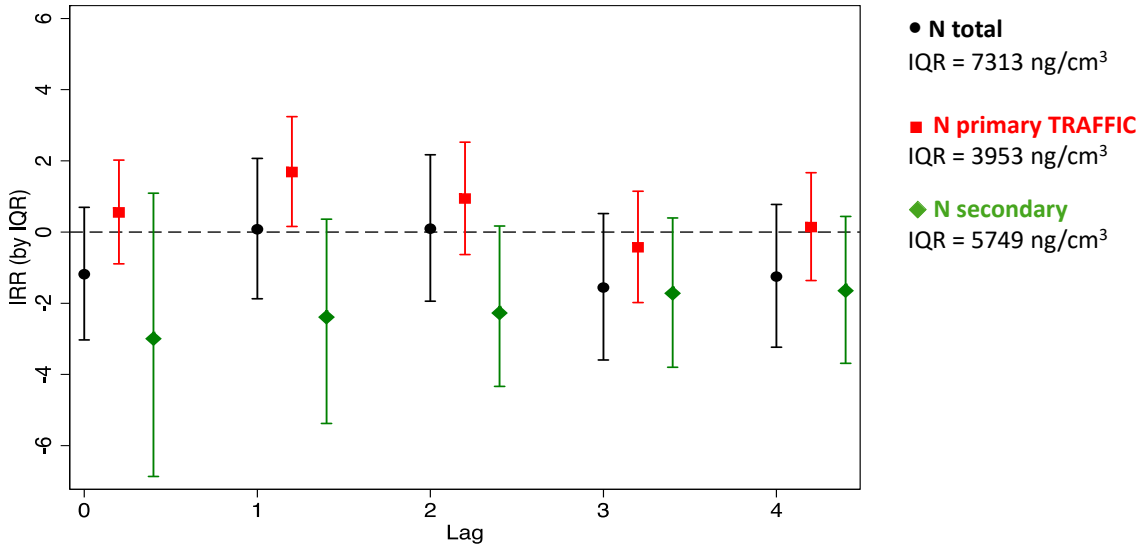
As part of the European-funded IMPROVE LIFE project work programme experiments in the Barcelona Metro system demonstrate that tunnel ventilation plays an extremely important role in maintaining cleaner air by reducing both inhalable PM mass and particle number concentration on platforms by over 50%, even in the presence of full-length platform screen doors. Another key influence on platform air quality is the chosen combination of fan power and forced air flow direction (impulsion of outdoor ambient air or extraction of subway indoor air): cleaner platform air was achieved using platform impulsion at higher power settings designed to ameliorate high summer temperatures underground. Reversing platform air flow from impulsion to extraction produced an immediate deterioration in PM air quality, most notably if the higher power setting was maintained, when an especially marked increase in numbers of very fine particles was observed and attributed to tunnel air being drawn into the platform. Inside the air conditioned Barcelona Metro trains air quality is markedly better than on the platform, and unchanged A/C filters were observed capable of maintaining a similar reduction in inside train PM for at least three months.



**2018: Short-term effects of ultrafine particles on daily mortality by primary vehicle exhaust versus secondary origin in three Spanish cities. Tobías A., Rivas I., Reche C., Alastuey A., Rodríguez S., Fernández-Camacho R., Sánchez de la Campa A.M., de la Rosa J., Sunyer J., Querol X. *Environment International* 111, 144-151.**

This is one of the few studies on the evaluation of the potential health effect of urban ultrafine particles (UFP, those particles with a size finer than 100 nm). In the study we used long time series of levels of number concentration of total particles (N, with around 80% falling in the range of UFP) from Barcelona, Huelva and Santa Cruz de Tenerife. We did not find a cause –effect relationship with daily mortality and levles of N in any of the cities, but the relationship was clear and statisticaly significant when we considered N1 (primary road traffic UFP) for Barcelona and N2 (secondary new particle formation fom gaseous precursors) in the industrial city of Huelva. The relative risk of mortality increase in these cities as UFP from these sources increased. The results are very relevant because the behaviour of fine particles (PM2.5 or particle mass concentration of particles with diameters <2.5 µm) is completely different from that of UFP, and our results indicate that the latter need to be considered also in evaluating air quality impairment and resulting health effects.

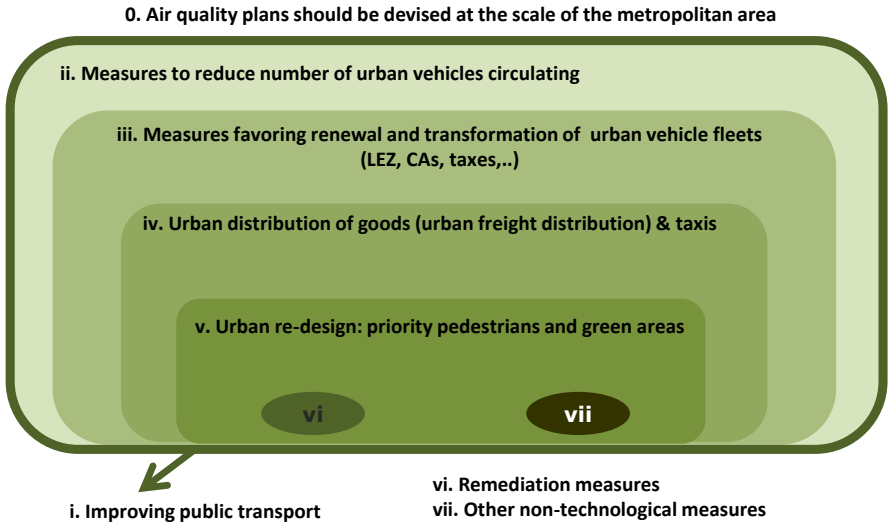
**Short-term health effects of total, primary and secondary UFP in Barcelona 2009-2011 series total mortality**



## Projects: AIRUSE AWARD 2018

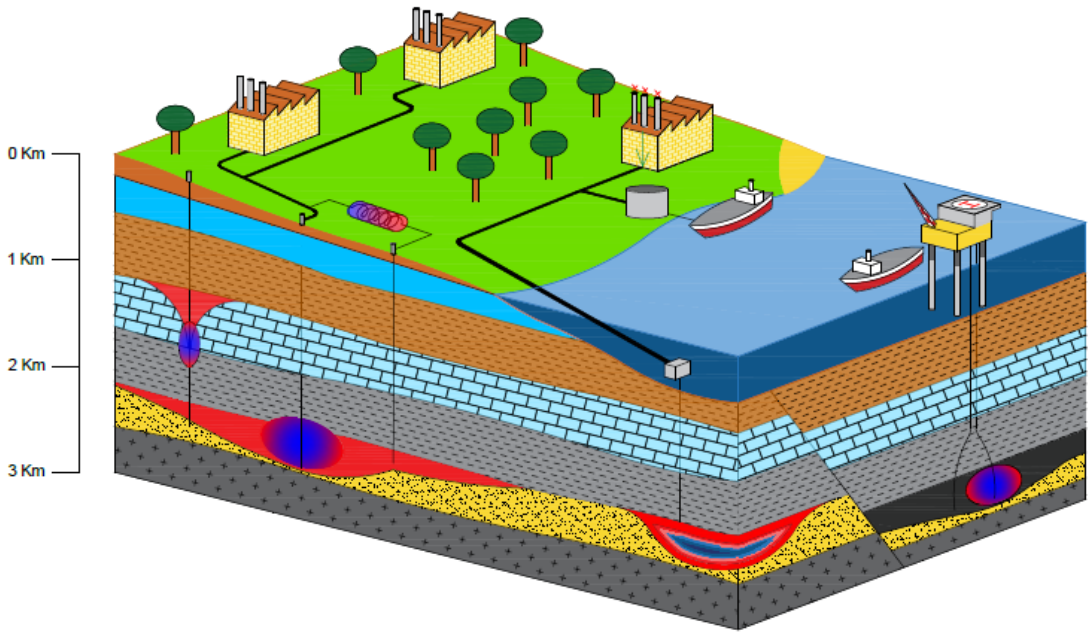
AIRUSE LIFE+ (European Commission) provides National Authorities of Southern European countries with appropriate measures to reduce urban atmospheric pollution. A combination of diverse emission sources with a complex climatology and a high urban density significantly enhances urban pollution in South European and Mediterranean countries. The Project assessed the source contributions of pollutants in 5 major cities, namely Athens, Barcelona, Florence, Milan and Porto; reviewed effectiveness of air quality measures in different regions of Europe, tested in situ the effectiveness of specific measures, and proposed a series of air quality urban and industrial measures with high efficiency for Southern European cities.

The project, led by IDAEA-CSIC, was selected in 2018 as one of the Best Life Projects, by LFE+ and DG Environment of the EC. AIRUSE was also nominated as one of the six Green City projects, from which AIRUSE won by public voting. The People's Choice Award was presented to AIRUSE by the EC Commissioner for Environment, Maritime Affairs and Fisheries Mr Karmenu Vella, during the LIFE Award Ceremony in the 2018 EU Green Week, on Wednesday 23 May 2018 at the Bluepoint Conference Centre in Brussels.



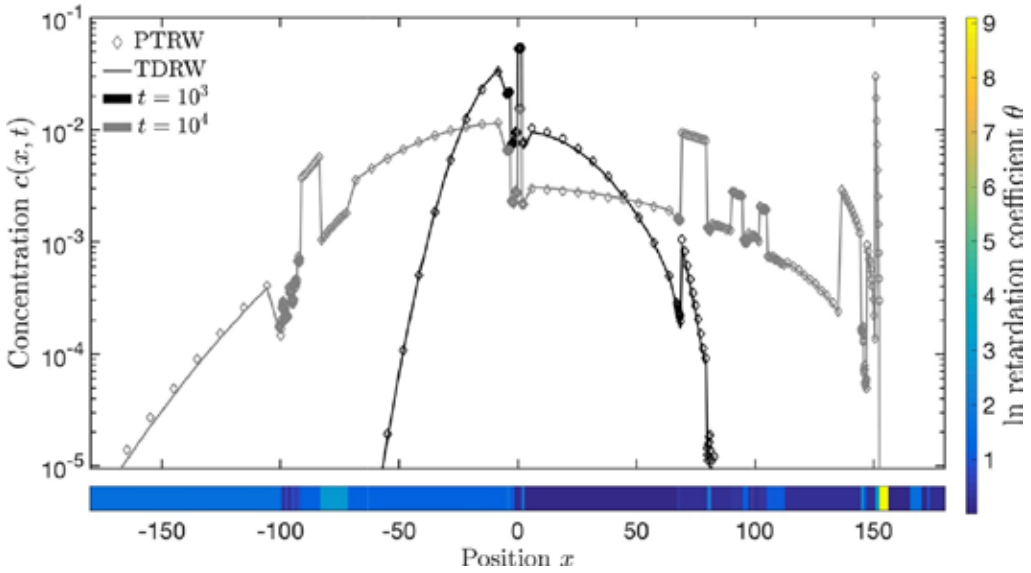
**2017: Thermal effects on geologic carbon storage. Vilarrasa, V., Rutqvist, J. *Earth-Science Reviews* 165, 245-256.**

One of the most promising ways to significantly reduce greenhouse gases emissions, while carbon-free energy sources are developed, is Carbon Capture and Storage (CCS). Non-isothermal effects play a major role in all stages of CCS, so their comprehension is crucial for a successful deployment of CCS projects. In this paper, we review the literature on thermal effects related to CCS. The optimal conditions for CO2 transport between the regions where CO2 is captured and suitable geostorage sites, both onshore (through pipelines) and offshore (through pipelines or ships), are such that CO2 stays in liquid state. To minimize costs, CO2 should ideally be injected at the wellhead in similar pressure and temperature conditions as it is delivered by transport. To optimize injection conditions, coupled wellbore and reservoir simulators that solve the strongly non-linear problem of CO2 pressure, temperature and density within the wellbore and non-isothermal two-phase flow within the storage formation have been developed. CO2 generally reaches the storage formation at a lower temperature than that of the rock, inducing non-trivial thermo-hydro-mechanical-chemical coupled processes. Thermal effects are also relevant in "Utilization" options that may provide an added value to the injected CO2, such as Enhanced Oil Recovery (EOR), Enhanced Coal Bed Methane (ECBM) and geothermal energy extraction combined with CO2 storage. If the injected CO2 leaks through faults, the caprock or wellbores, strong cooling will occur due to the expansion of CO2 as pressure decreases with depth. Finally, we conclude by identifying research gaps and challenges of thermal effects related to CCS.



**2018: A Coupled Time Domain Random Walk Approach for Transport in Media Characterized by Broadly-distributed Heterogeneity Length Scales. Aquino T., Dentz M. *Advances in Water Resources* 119, 60-69.**

Physical and chemical heterogeneity, which often spans multiple scales, has important consequences for solute transport in natural and engineered media. Upscaling transport dynamics is essential for understanding and providing efficient methods for predicting, large-scale solute transport. We consider a one-dimensional medium characterized by a broad distribution of heterogeneity length scales and transport properties. Specifically, we consider spatially variable advection and dispersion as a result of heterogeneous retardation and analyze dispersive trapping and regular dispersion as the small-scale transport mechanisms. We develop a time domain random walk (TDRW) approach for conservative solute transport in heterogeneous media where medium properties vary over a distribution of length scales. The spatial transition lengths are equal to the heterogeneity length scales, and thus determined by medium geometry. This approach determines the coarse-grained solute concentration at the interfaces between regions, from which we reconstruct the fine-scale concentration for single-medium transport realizations using the propagator of the subscale transport mechanism. The performance of this approach is demonstrated for diffusion under random retardation in power-law media characterized by heavy-tailed lengthscale and retardation distributions.

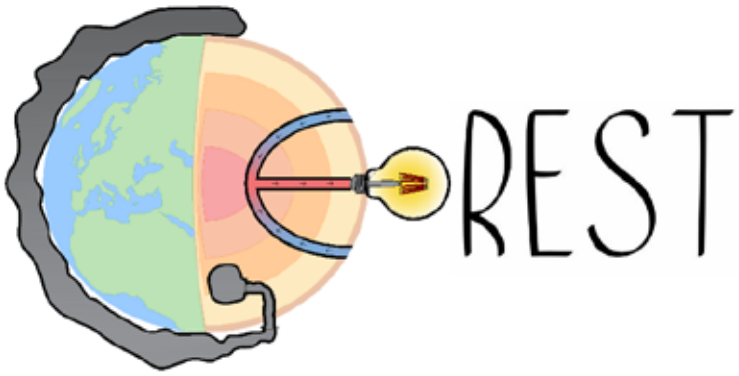



Comparison between concentrations at two different times computed from our TDRW approach and fine-scale simulations using a particle tracking random walk (PTRW). Results are for a single medium realization with segment lengths and retardation coefficients as shown by the color bar.

**Projects: ERC Starting Grant GEoREST (predictinG EaRthquakES induced by fluid injecTion).**

GEoREST aims at developing a novel methodology to predict and mitigate induced seismicity. Fluid injection related to underground resources has become widespread, causing numerous cases of induced seismicity. If felt, induced seismicity has a negative effect on public perception and may jeopardise wellbore stability and infrastructure, which has led to the cancellation of several projects. Therefore, forecasting injection-induced earthquakes is a big challenge that must be overcome to deploy geo-energies to significantly reduce $CO_2$ emissions and thus mitigate climate change and reduce related health issues.

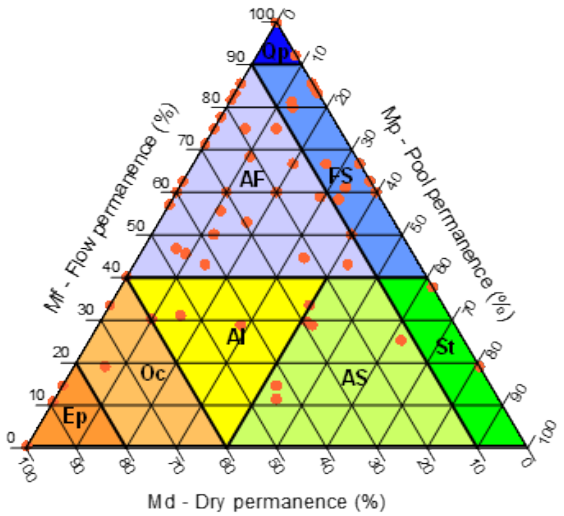
We propose an interdisciplinary approach that integrates coupled thermo-hydro-mechanical-seismic processes that occur in the subsurface as a result of fluid injection. The methodology, based on new analytical and numerical solutions, will concentrate on (1) understanding the processes that lead to induced seismicity by model testing of specific conjectures, (2) improving and extending subsurface characterization by using industrial fluid injection operations as a long-term continuous characterization technique, so as to reduce prediction uncertainty, and (3) using the resulting understanding and site specific knowledge to predict and mitigate induced seismicity. Project developments will be tested and verified against fluid-induced seismicity at field sites that present diverse characteristics. Arguably, the successful development of this project will provide operators with concepts and tools to perform pressure management to reduce the risk of inducing seismicity to acceptable levels and thus, reverse public perception on fluid injection activities.



## Surface Hydrology and Erosion

**2017: TREHS: An open-access software tool for investigating and evaluating temporary river regimes as a first step for their ecological status assessment. Gallart F., Cid N., Latron J., Llorens P., Bonada N., Jeuffroy J., Jiménez-Argudo SM., Vega RM., Solà C., Soria M., Bardina M., Hernández-Casahuga AJ., Fidalgo A., Estrela T., Munné A., Prat N. *Science Total Environment* 607-608, 519-540.**

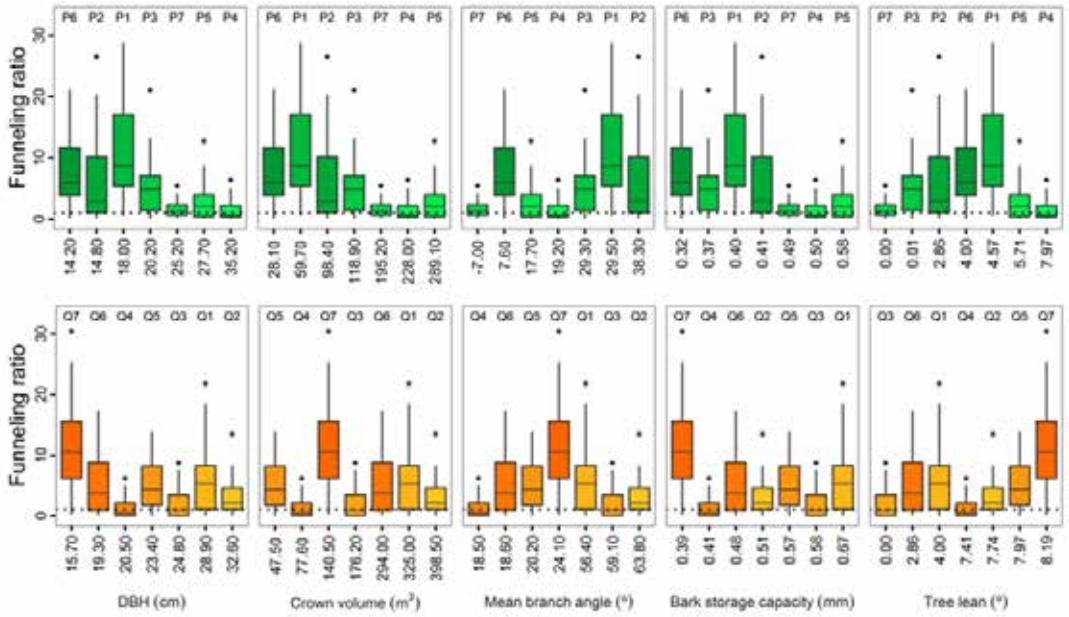
When the regime of a river is not perennial, there are four main difficulties with the use of hydrographs for assessing hydrological alteration: i) the main hydrological features relevant for biological communities are not quantitative (discharges) but qualitative (phases such as flowing water, stagnant pools or lack of surface water), ii) stream flow records do not inform on the temporal occurrence of stagnant pools, iii) as most of the temporary streams are ungauged, their regime has to be evaluated by alternative methods such as remote sensing or citizen science, and iv) the biological quality assessment of the ecological status of a temporary stream must follow a sampling schedule and references adapted to the flow-pool-dry regime. To overcome these challenges within an operational approach, the freely available software tool TREHS has been developed within the EU LIFE TRIVERS project. This software permits the input of information from flow simulations obtained with any rainfall-runoff model (to set an unimpacted reference stream regime) and compares this with the information obtained from flow gauging records (if available) and interviews with local people, as well as instantaneous observations by individuals and interpretation of ground-level or aerial photographs. Up to six metrics defining the permanence of water flow, the presence of stagnant pools and their temporal patterns of occurrence are used to determine natural and observed river regimes and to assess the degree of hydrological alteration. A new regime classification specifically designed for temporary rivers was developed using the metrics that measure the relative permanence of the three main phases: flow, disconnected pools and dry stream bed. Finally, the software characterizes the differences between the natural and actual regimes, diagnoses the hydrological status (degree of hydrological alteration), assesses the significance and robustness of the diagnosis and recommends the best periods for biological quality samplings.




Distribution of the TREHS aquatic phases regimes in the FPD plot. Qp: Quasi-perennial; AF: Alternate-Fluent; FS: Fluent-Stagnant; St: Stagnant; AS: Alternate-Stagnant; Al: Alternate; Oc: Occasional; EP: Episodic. Mf: flow permanence; Mp: pool permanence; Md: dry channel permanence. The orange dots represent river stations were the metrics were obtained from in situ or photographic observations (73 points).

**2018: Effect of biotic and abiotic factors on inter-and intra-event variability in stemflow rates in oak and pine stands in a Mediterranean mountain area. Cayuela C., Llorens P., Sánchez-Costa E., Levia DF., Latron J. *Journal of hydrology* 560, 396-406.**

Stemflow, despite being a small proportion of gross rainfall, is an important and understudied flux of water in forested areas. Recent studies have highlighted its complexity and relative importance for understanding soil and groundwater recharge. Stemflow dynamics offer an insight into how rain water is stored and released from the stems of trees to the soil. Past attempts have been made to understand the variability of stemflow under different types of vegetation, but rather few studies have focused on the combined influence of biotic and abiotic factors on inter and intra-storm stemflow variability, and none in Mediterranean climates. This study presents stemflow data collected at high temporal resolution for two species with contrasting canopies and bark characteristics: *Quercus pubescens Willd*. (downy oak) and *Pinus sylvestris L.* (Scots pine) in the Vallcebre research catchments (NE of Spain, 42º 12'N, 1º 49'E). The main objective was to understand how the interaction of biotic and abiotic factors affected stemflow dynamics. Mean stemflow production was low for both species (~1% of incident rainfall) and increased with rainfall amount. However, the magnitude of the response depended on the combination of multiple biotic and abiotic factors. Both species produced similar stemflow volumes and the largest differences were found among trees of the same species. The combined analysis of biotic and abiotic factors showed that funneling ratios and stemflow dynamics were highly influenced by the interaction of rainfall intensity and tree size.




Box-plots of funneling ratios in relation to biotic factors for Scots pine (P, top) and downy oak (Q, bottom). The horizontal black line indicates the median, boxes correspond to the first and third quartiles (the 25th and 75th percentiles), whiskers represent values that fall within 1.5 times the interquartile range and circles represent outliers.

# 7 Creation of new committees

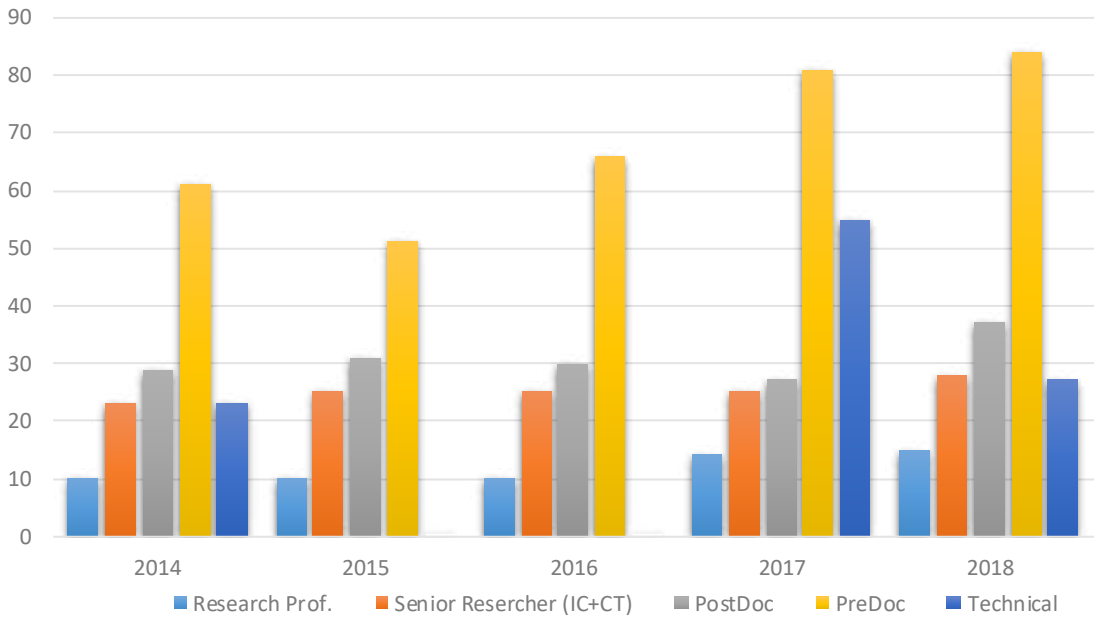
In 2018 three new committees have been created for:

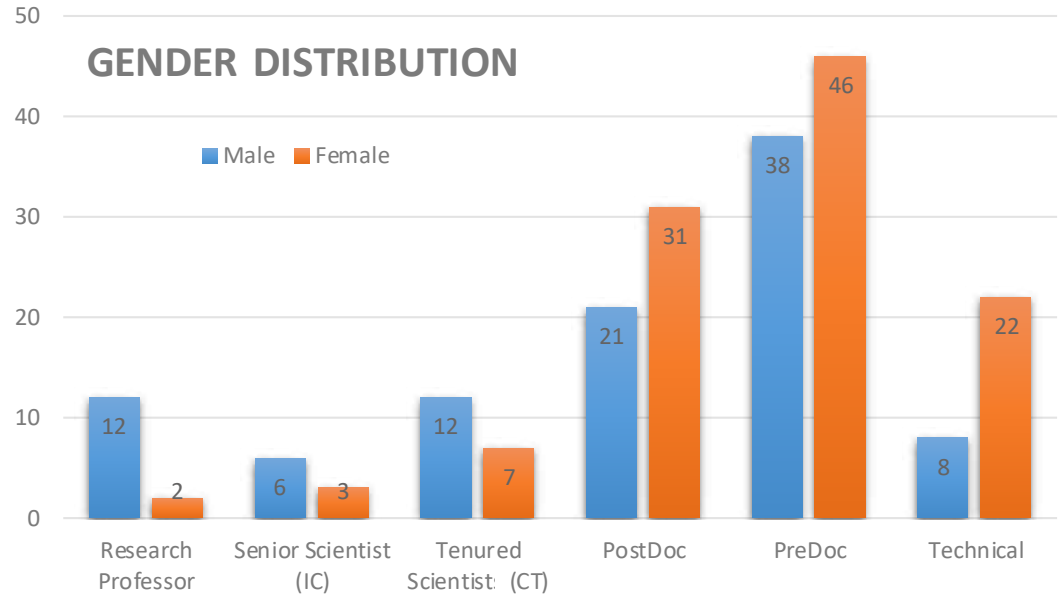
Internal Seminars for PhD and Postdoctoral researchers in IDAEA. These seminars are in English and are held every Wednesday. The committee is formed by Alejandra Gilabert, María Cruz Minguillón, Pedro Trechera and Bozo Zonja, all active members within IDAEA research groups.

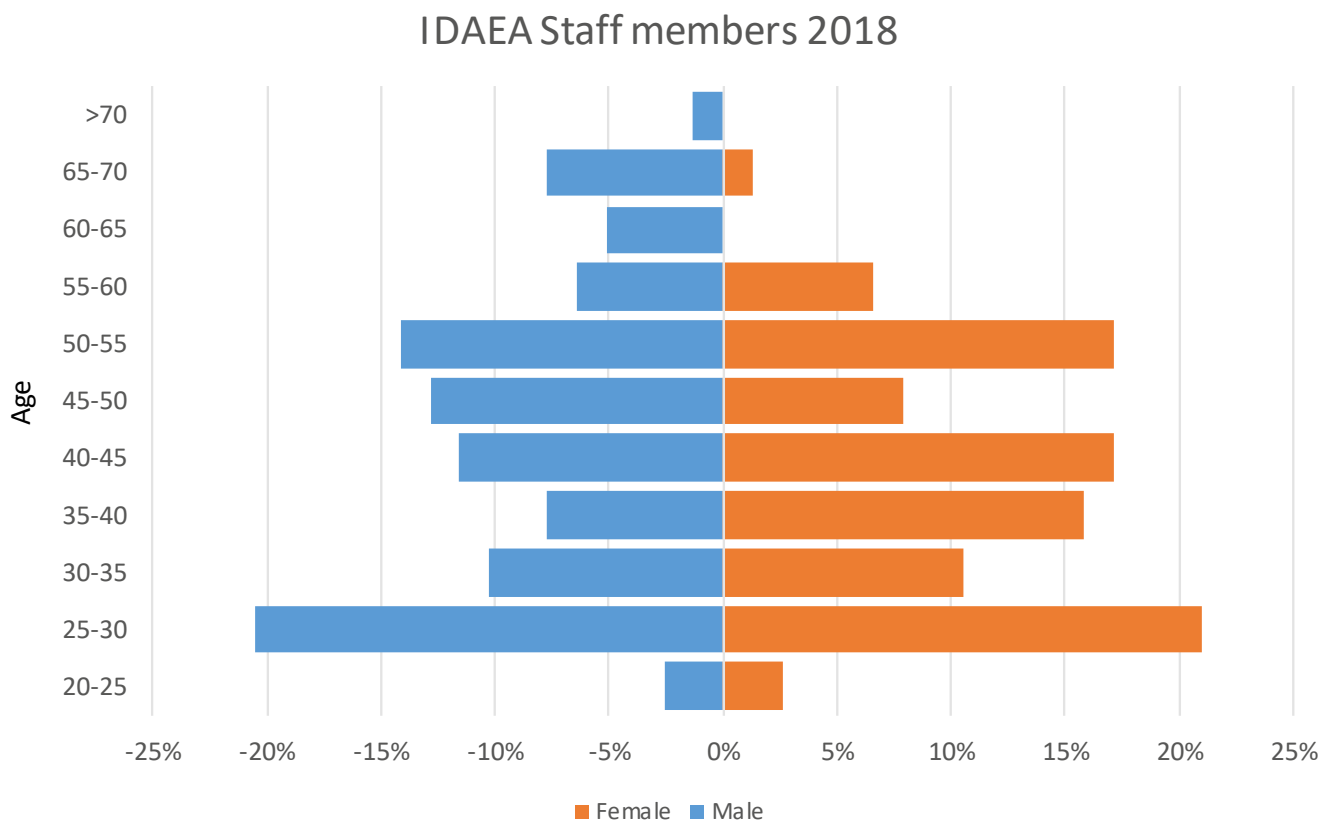
Waste Management. The IDAEA is an environmental institute and wants to maximize the recycling activities in their activities. The committee is formed by Roser Marin, Laura Martinez and Inmaculada Claparols.

Social Network. To improve the impact of IDAEA in social networking. The committee is formed by Patricia Córdoba, Marc Marín, Cristina Postigo, Claudia Sanz.

# 8 IDAEA in numbers

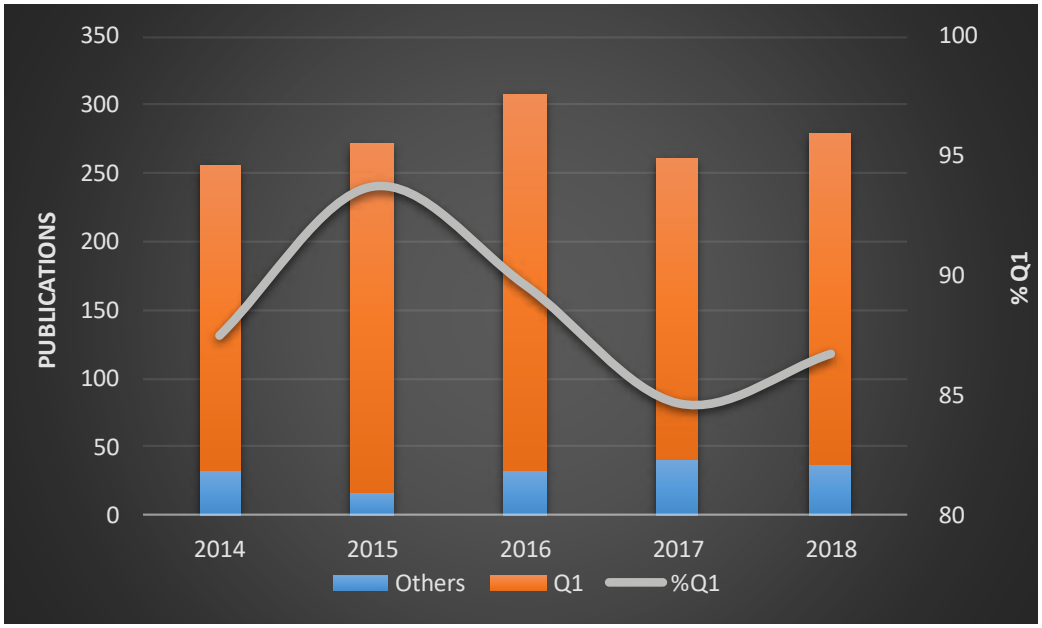


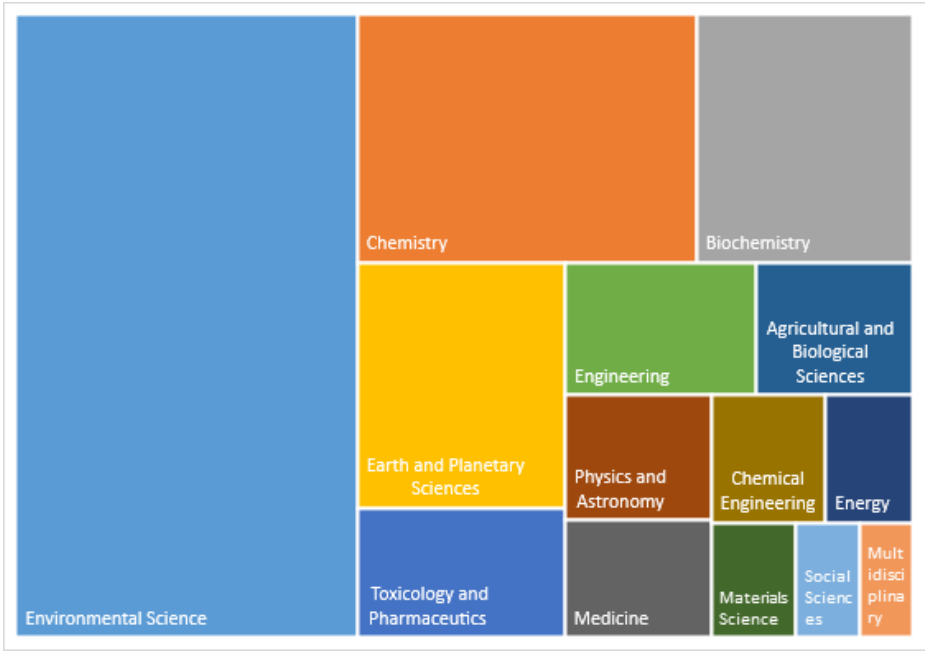

IDAEA Staff members 2018
Age
>70
65-70
60-65
55-60
50-55
45-50
40-45
35-40
30-35
25-30
20-25
-25%
-20%
-15%
-10%
-5%
0%
5%
10%
15%
20%
25%
Female
Male

World visitors
to IDAEA

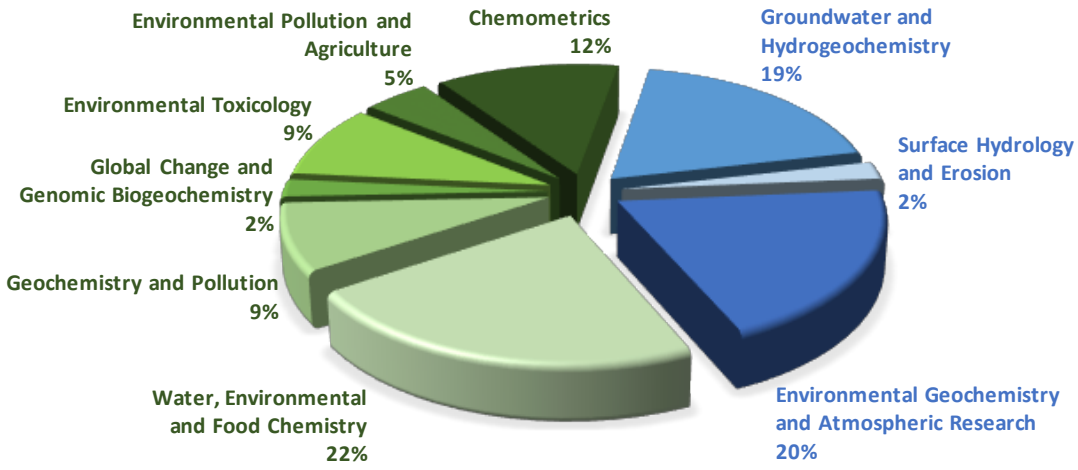
NUMBER OF PUBLICATIONS



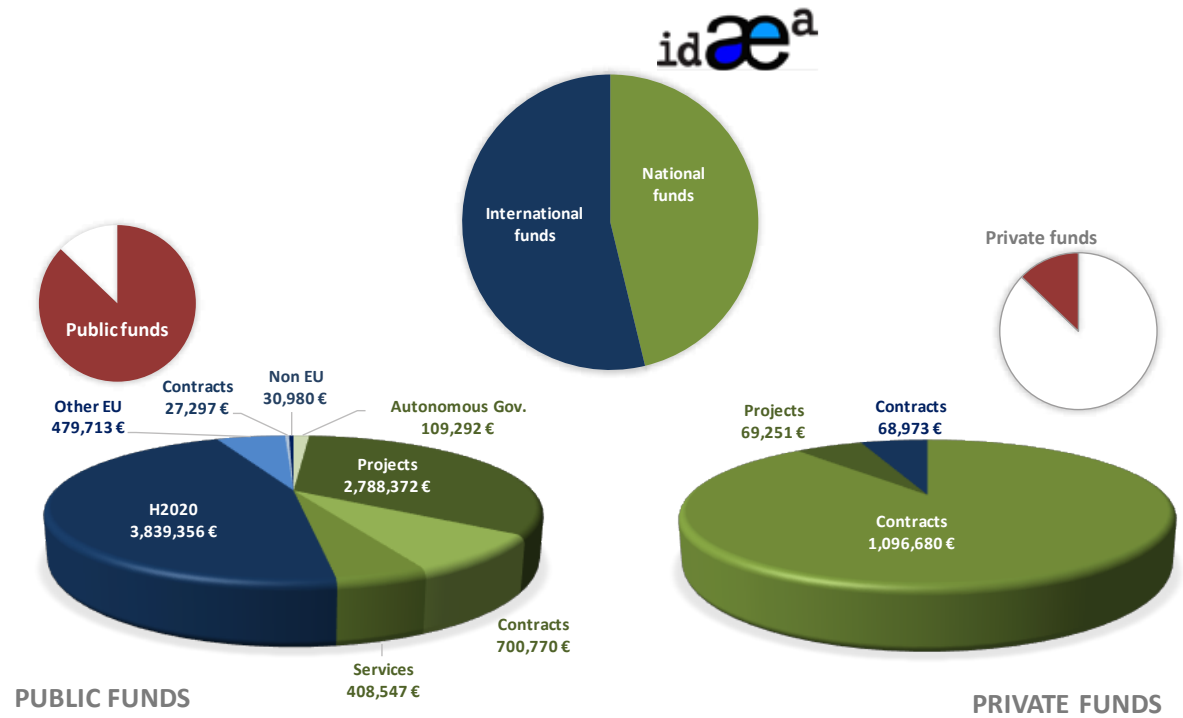

SUBJECT AREA OF IDAEA PUBLICATIONS



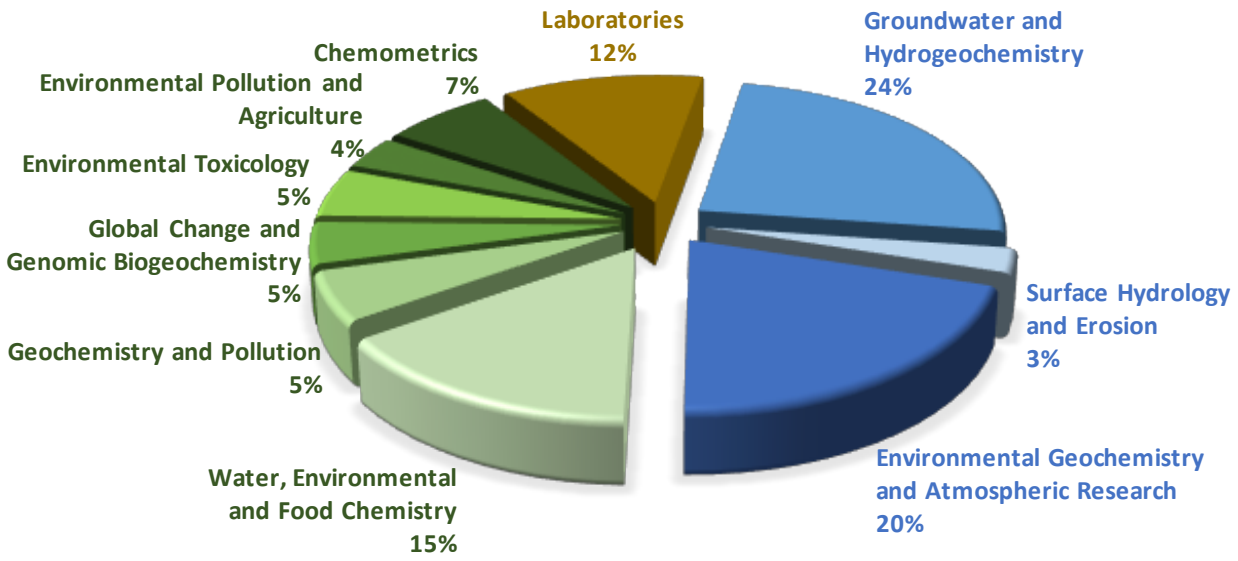
## PUBLICATIONS PER RESEARCH GROUP 2017-2018




## IDAEA 2017-2018 FUNDING



FUNDING PER RESEARCH GROUP 2017-2018




SUMMARY 2017-2018

| | *2017* | *2018* |
|---|---|---|
| *Active international projects* | 48 | 54 |
| *Active national projects* | 38 | 42 |
| *Active contracts* | 53 | 76 |
| *SCI publications* | 257 | 274 |
| *Books edited* | 1 | 3 |
| *Book chapters* | 10 | 27 |
| *Oral presentations in conferences* | 157 | 219 |
| *Patents* | - | 1 |
| *Doctoral Thesis* | 26 | 14 |
| *Master Thesis* | 5 | 25 |

# 9 Scientific Results

## SCI Publications

- Abad, E., Moyano, E.; **"V Reunión Nacional de Dioxinas, Furanos y Compuestos Orgánicos Persistentes Relacionados & VIII Reunión de la Sociedad Española de Espectrometría de Masas"**; Science of the Total Environment; 2018; 10.1016/j.scitotenv.2018.05.242.

- Abdelhafidh, K., Ali, M., Hassen, K., Badreddine, S., Jaume, A., Sandra, P., Ethel, E., Damià, B., Hamouda, B., Ezzeddine, M.; **Uptake and metabolism of carbamazepine (CBZ) by clam Ruditapes decussatus and its effects in biochemical responses**; Xenobiotica; 2018; 10.1080/00498254.2017.1354268.

- Aceña, J., Pérez, S., Eichhorn, P., Solé, M., Barceló, D.; **Metabolite profiling of carbamazepine and ibuprofen in Solea senegalensis bile using high-resolution mass spectrometry**; Analytical and Bioanalytical Chemistry; 2017; 10.1007/s00216-017-0467-7.

- Àgueda, A., Grossi, C., Pastor, E., Rioja, E., Sánchez-García, L., Batet, Ò., Curcoll, R., Ealo, M., Nofuentes, M., Occhipinti, P., Rodó, X., Morguí, J.-A.; **Temporal and spatial variability of ground level atmospheric methane concentrations in the Ebro River Delta**; Atmospheric Pollution Research; 2017; 10.1016/j.apr.2017.01.009.

- Ahmadvand, M., Parastar, H., Sereshti, H., Olivieri, A., Tauler, R.; **A systematic study on the effect of noise and shift on multivariate figures of merit of second-order calibration algorithms**; Analytica Chimica Acta; 2017; 10.1016/j.aca.2016.11.070.

- Alcaraz, M., Vázquez-Suñé, E., Velasco, V., Criollo, R.; **A loosely coupled GIS and hydrogeological modeling framework**; Environmental Earth Sciences; 2017; 10.1007/s12665-017-6709-3.

- Alcaraz, M., Vives, L., Vázquez-Suñé, E.; The T-I-GERmethod: **A graphical alternative to support the design and management of shallow geothermal energy exploitations at the metropolitan scale**; Renewable Energy; 2017; 10.1016/j.renene.2017.03.022.

- Alemany, S., Vilor-Tejedor, N., Bustamante, M., Álvarez-Pedrerol, M., Rivas, I., Forns, J., Querol, X., Pujol, J., Sunyer, J.; **Interaction between airborne copper exposure and ATP7B polymorphisms on inattentiveness in scholar children**; International Journal of Hygiene and Environmental Health; 2017; 10.1016/j.ijheh.2016.10.010.

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- Vilarrasa, V., Carrera, J., Olivella, S., Rutqvist, J., Laloui, L. 2018, Induced seismicity in geo-energies. European Geosciences Union General Assembly 2018, 8-13 April, 2018, Viena (Austria).

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- Zareidarmiyan, A., Salarirad, H., Vilarrasa, V. and Olivella, S., 2018. Themo-hydro-mechanical simulation of gas injection into fractured media. Proceedings of 10th Workshop of CODE_BRIGHT Users, UPC, Barcelona, Spain, 3 May 2018.

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- Zonja, B.; López de Alda, M.; Barceló D.; Data-dependent fragment ion search for detection of sartans and related compounds in wastewater and surface water. Conference. SETAC Europe 28th Annual Meeting. Rome, Italy. 13-17 May 2018.

## Invited talks

- Alastuey, A. Contaminación atmosférica y sus negativas consecuencias en la calidad del aire y la salud de los ciudadanos. Situación en nuestro país: principales problemas y posibles soluciones. Tribunal de Cuentas. Introducción a la Auditoría Medioambiental: Nueva perspectiva fiscalizadora en el Tribunal de Cuentas. 18/06/2018. Madrid.

- Alastuey, A. La contaminación urbana procedente del transporte. La situación actual en España. Ponencia invitada. Fundación Naturgy. Jornada: Etiquetaje ambiental de vehículos y gestión de la contaminación urbana. Fecha: 10/10/2018. Lugar celebración: Barcelona.

- Alastuey, A. Medi Atmosfèric: perquè mesurem la contaminació atmosfèrica? Tipo de participacion: Ponencia invitada. Generalitat de Catalunya, Departamente de territorio i Sostenibilitat. Jornada: Informe sobre l'estat del medi ambient a Catalunya, 20 anys d'accés a la informació ambiental. Fecha: 26/06/2018. Barcelona.

- Alastuey, A. Panorama Internacional. Problemática y acciones. Fundación Española del Corazón. Jornada: Impacto de la calidad del aire en la salud cardiovascular. Madrid Fecha: 26/11/2018.

- Amato, Fulvio; Padoan, Elio. Road Dust Emissions: Impact On Air Quality And Health And Possible Mitigation. DUST 2018 conference. City of event: Bari, Italy Date of event: 30/05/2018 https://www.dust2018.org/programme/.

- Barata, Carlos. ESCPB •31st Congress of the New European Society for Comparative Physiology and Biochemistry. Obesogens beyond vertebrates. Disruption of storage lipids in the crustacean. Oporto (Portugal) 9-12th September 2018.

- Bayona, Josep M.; IV Conferencia Panamericana de Sistemas de Humedales. Oral plenaria: Aplicación de humedales construidos en la remoción de contaminantes emergentes en aguas residuales urbanas para su reutilización en agricultura. Lima- Perú. 15-18 May 2018.

- Bayona, Josep M.; Sample prep in the omics era and beyond. Is it still needed? ExTech2017, Santiago de Compostela. 27-30 June 2017.

- Cama J.; Garcia-Rios M.; Davila G.; Soler J. M. 2017. Characterization of fracture changes under high PCO2. X-ray computed microtomography (XCMT) and SEM images. GSA Annual Meeting.

- Carnerero C., Querol X., Massegué J. Phenomenology of ground-level ozone episodes in Spain. Clean Air Dialogue between Spain and the European Commission. Ministry for the Ecological Transition, Spain, 8-9 October 2018. https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/atmosfera-y-calidad-del-aire/agenda_tcm30-483837.pdf.

- Carrera, Jesús. "Caracterización de yacimientos fracturados y acuíferos asociados" Instituto de Investigaciones en Matemáticas Aplicadas y en Sistemas (IIMAS) Universidad de Méjico – March 25 - April 1, 2017.

- Carrera, Jesús. "Challenges and Opportunities in Groundwater under Cities" and "Urban Groundwater: the Barcelona case"- Action TU1206 Meeting-Sub-Urban Conference, March 12-16, Technical University of Civil Engenieering, Bucharest.

- Carrera, Jesús. "Foro Internacional: Hablemos del agua: manejo y conservación" Auditorio Mayor 'Carlos Gómez Albarracín' de la Universidad Autónoma de Bucaramanga, UNAB - October 4, 2018.

- Carrera, Jesús. "Hidrogeología y Obra Civil", AIH-Grupo chileno- December 6, 2017.

- Carrera, Jesús. "Quo Vadis Hidrogeología (y el IHLLA)", Instituto de Hidrología de Llanuras de Azul, UNCPBA- June 1, 2017.

- Carrera, Jesús. "Reactive transport: basic concepts and challenges" Eawag Seminar, Switzerland - 6-8 December 2018.

- Carrera, Jesús. "Seawater Intrusion, the seventh egipt plague: the argentona pilot site.", IDAEA, CSIC, Barcelona, 50 aniversario del CID – December 2017.

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- Dentz, Marco; Veronica Morales; Alexandre Puyguiraud; Philippe Gouze; Matthias Willmann; Markus Holzner. 2017. The stochastic dynamics of in- termittent porescale particle motion; EGU General Assembly 2017.

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- Farré, Marinella. Developments of autonomous biosensors for seawater monitoring. Invited by INL. Mission 10000 International Nanogateway Conference. 17 October. Braga, Portugal. 2018.

- Farré, Marinella. Key Enabling Technologies for the 2030 Oceans. Invited by INL. Transfer of Key Enabling Technologies (KETs) to the Maritime Industries. 14 November. Porto, Portugal. 2018.

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- Grimalt, Joan. Acumulación de COPs en niños de la Isla de Menorca y su relación con la ingesta de alimentos. Ministerio de transición ecológica. Madrid. 18 April 2018.

- Grimalt, Joan. Associations between fetal exposures to chemical pollutants and developmental disorders in the early childhood. Case studies from the European cohorts. INCHES. Seul. South Korea. 27 June 2018.

- Grimalt, Joan. Cambios ambientales en las ciudades. Laudatio Si y grandes ciudades. Universidad Internacional Menendez y Pelayo. Santander. 23 July 2018.

- Grimalt, Joan. Compuestos orgánicos volátiles generados en el vapeo: humo, aire exhalado y atmósferas internes. Fira Mostres, Barcelona. 14 October 2017.

- Grimalt, Joan. Contaminación ambiental global. Seminario Pensamiento y Ciencia contemporáneos. Madrid. 23 February 2017.

- Grimalt, Joan. Desarrollos analíticos para conocer la calidad de las atmosferas interiores. caso práctico: la influencia de los cigarrillos Electrónicos. Agilentt, Barcelona. 7 March 2017.

- Grimalt, Joan. Drivers of the accumulation of mercury and organochlorine pollutants in Mediterranean lean fish and dietary significance. PPTOX. Forde Island. Dinamarca. 28 May 2018.

- Grimalt, Joan. Efectes de la contaminació ambiental sobre la salut humana. Universitat Politècnica de Catalunya. Barcelona. 8 November 2018.

- Grimalt, Joan. El cambio climático. Congreso de Diputados. Madrid. 12 March 2018.

- Grimalt, Joan. El canvi climatic. Institut Pere Borrell. Puigcerdà. 7 November 2018.

- Grimalt, Joan. Environmental benefits and threats of life in the cities. Instituto Cervantes. Manchester. 20 April 2018.

- Grimalt, Joan. Glacial-Interglacial high resolution alkenone SST record between MIS 23 and MIS 46 in the Iberian Margin. Molyvos. Lesvos, Greece. 29 August 2017.

- Grimalt, Joan. How human energy uses have influenced on climate and global change?. Arab Emirates. 5 April 2017.
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- Grimalt, Joan. Impacte de l'activitat humana en el canvi climàtic. Institut Químic de Sarrià. 6 February 2018.
- Grimalt, Joan. L'antropocè i el canvi climàtic. Residència d'Investigadors. Barcelona. 23 January 2017.
- Grimalt, Joan. L'impacte de l'activitat humana en el canvi climatic. Institut Químic de Sarrià. Barcelona. 21 September 2017.
- Grimalt, Joan. La recerca en química ambiental de l'IDAEA. Departament de Territori i Sostenibilitat. Generalitat de Catalunya. Barcelona. 17 October 2017.
- Grimalt, Joan. Malalties generades per contaminants. Universitat Pompeu Fabra. Barcelona. 27 November 2017.
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- Grimalt, Joan. Mercury concentrations in lean fish from the Western Mediterranean Sea: Dietary exposure and risk assessment in the population of the Balearic Islands. IDEM. Malta. 6 September 2018.
- Grimalt, Joan. Mesures per mitigar el canvi climatic. Institut d'Estudis Catalans. Barcelona. 19 May 2018.
- Grimalt, Joan. New assessment of the C37 alkenone performance for the measurement of sea Surface temperatures. Fall Meeting of the American Geophysical Union. 10 December 2018.
- Grimalt, Joan. Propietats de l'Aigua. Residència d'Investigadors. Barcelona. 18 April 2018.
- Grimalt, Joan. Què podem fer els científics per conservar el Mediterrani?. Ètica i investigació. Centre Cultural La Caixa. Palma. Mallorca. 9 February 2017.
- Grimalt, Joan. Quines contribucions ja fet la química als coneixements del canvi climàtic?. Desena trobada de Joves Investigadors dels Països Catalans. Barcelona. 29 January 2018.
- Grimalt, Joan. Transfer of lipid molecules and polycyclic aromatic hydrocarbons to open marine waters by dense water cascading events. IDEM. Malta. 7 September 2018.
- Grimalt, Joan. Tres dècades de recerca. Ajuntament de Flix. Flix, Tarragona. 18 June 2017.
- Grimalt, Joan. Tres dècades de recerca. Institut d'Estudis Catalans. Barcelona. 6 June 2018.
- Grimalt, Joan. Ventajas y problemas ambientales de la vida en las ciudades. Instituto Cervantes. Cairo. Egypt. 16 July 2018.
- Grimalt, Joan. Water Quality and water treatment. Rio de Janeiro, Brasil. 13 July 2017.
- Grimalt, Joan; Abad, Esteban. Metodologia de l'estudi de la contaminació sobre la salut del districte de Sant Martí. Museu Blau. Barcelona. 30 January 2018.
- Hidalgo, Juan J.; Dentz, Marco. 2018. Effect of heterogeneity on the mixing of fluids under convective instabilities; Computational Models in Water Resources; Internacional.
- Jaumot, Joaquim. 41st Symposium Chromatographic Methods of Investigating Organic Compounds; Szczyrk, Polonia. MCR-based analysis of metabolomic data: from LC-MS to MS imaging. June 2018.

- Jaumot, Joaquim. Chemometrics in Analytical Chemistry 2018; Halifax, Canada. Chemometric strategies for MS-based omics data analysis: from chromatograms to images. June 2018.

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- Llorens, Pilar. VIII Congreso Ibérico de las Ciencias del Suelo. 20-22 June 2018. Donostia. "Los isótopos del agua como trazadores del almacenamiento y transferencia del agua en el suelo. Experiencias a diferentes escalas espacio-temporales".

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- Minguillón, M.C.; Chemical fingerprint of aerosol sources within subway environment. IMPROVE Life Workshop. Barcelona, Spain, 3 July 2017.

- Minguillón, M.C.; Viana, M.; Reche, C.; Amato, F.; Querol, X.; Assessment of low-cost sensors for air quality in real-world conditions. Status of Air Quality Sensors and their use in (official) monitoring strategies meeting. National Institute for Public Health and the Environment, Ministry of Health, Welfare and Sport, RIVM. Bilthoven, the Netherlands, 13 February 2017.

- Montemurro, Nicola; Barceló, Damià; Përez, Sandra; Screening and quantitation of emerging contaminants in wastewater effluents using X500R QTOF System with SWATH Acquisition. Invited by ABSciex. LC/MS/MS workshop on environmental application and food safety. 26-27 June. Barcelona. 2018.

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- Moreno T. "Air quality mitigation measures in the subway environment". 3 July 2017. Workshop on Air Quality in Subway Systems. CSIC, Barcelona.

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- Moreno, T. Calidad del aire urbano y movilidad. Foro sobre: calidad del aire, salud y sostenibilidad urbana. Organized by Capítulo Español del Club de Roma and Asociación para

la Sostenibilidad y el Progreso de las Sociedades (ASYPS) with support of Obra Social "la Caixa" and colaboration of CaixaForum Madrid. 15 March 2018.

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- Pandolfi M. Some remarks on EBAS aerosol particles scattering data. ACTRIS WP3 Meeting. Madrid, Spain, 17-19 October 2017.

- Perez N. Resultados de la campaña de medidas de ozono y partículas ultrafinas, Madrid Julio 2016. Centro de Educación Ambiental El Huerto del Retiro, Madrid, 25 May 2017.

- Pérez N., Alastuey A., M. Pandolfi, X. Querol, I. Moreno, F. Velarde, J.L. Jaffrezo, G. Uzu, J.L. Besombes, P. Laj, M. Andrade. Air quality and source apportionment in La Paz. Laboratorio de Física de la Atmósfera, Universidad Mayor de San Andrés (LFA-UMSA). La Paz, Bolivia, 4th june 2018.

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- Piña, Benjamí. XII Jornadas Técnicas de Saneamiento y Depuración. Bioensayos para determinación de los efectos de los contaminantes emergentes. Murcia, 16-17 November 2017.

- Porte, Cinta. MAPMAS. International Workshop on Marine Pollution and Maritime Safety. Use of in-vitro bioassays to characterize the environmental quality of benthic ecosystems. Barcelona (Spain). 3-6th October 2017.

- Postigo, Cristina. Regulated and Emerging Disinfection Byproducts in Drinking Water: Occurrence in a Large Network Supply . Out of the Lab - Into the Field International Alumni Workshop, : Karls Eberhard Universität, Department of Geosciences, Tübingen, Stuttgart, Alemania. Invited. 02-04/08/2018.

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- Querol X. La transferencia de la población y la contaminación. Ciclo de Conferencias del CSIC sobre ANTROPOCENO. Delegación del CSIC en Catalunya. 19 April 2017.

- Querol X. Mesures efectives per la millora de qualitat de l'aire Urbà. Taula Temàtica. Metalbolisme Urbà. Área Metropolitana de Barcelona, 5 April 2017.

- Querol X. Mobilitat i qualitat de l'aire a (l'Àrea Metropolitana de) Barcelona. Ciencia Regional. Ateneu de Barcelona, 2 May 2017.

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- Vázquez-Suñé, E.; Jornada de Geologia Urbana. Il•lustre Col•legi Oficial de Geòlegs. La gestió de l'aigua subterrània a Barcelona i el seu entorn. Vázquez-Suñé, E. Barcelona, 7 June 2017.

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- Viana, M. 2017. Impact of maritime transport emissions on coastal air quality in Europe. Shipping And The Environment, From Regional to Global Perspectives. Gothemburg, Sweden, October 24th, 2017.

- Viana, M. 2018. El tráfico como fuente de contaminación atmosférica en nuestras ciudades: situación actual y estrategias de mejora. Instituto Cervantes, Hamburgo, June 12 2018.

- Viana, M. 2018. Geographical variability of pollutant source contributions and their impacts on health. ERS Research Seminar "The impact of air pollution on respiratory health - a focus on persistent problems and new emerging areas", Berlin, Germany; 19 – 20 November 2018.

- Viana, M. 2018. Health benefits of air quality mitigation strategies in Europe: case studies ISES-ISEE BenMAP User Symposium. Conference of the International Society for Environmental Epidemiology (ISEE2018), Ottawa, Canada, August 27th 2018.

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- Viana, M. 2018. The impact of traffic as a major emission source in European cities. Medi ambient i societat: pautes per a la gestió ambiental. Institut d'Estudis Catalans, Barcelona, June 5th 2018.

- Viana, M. et al. 2017. Occupational exposure to nanoparticles: monitoring and management in industrial settings. 8th Nanotechnology, Occupational and Environmental Health conference, May 29th to June 1st 2017, Elsinore, Denmark.

- Vilarrasa, V., 2017. Breaking the Wall of geo-energies. Falling Walls Lab Barcelona, Pompeu Fabra University (UPF), Barcelona, Spain, 12 September 2017.

- Vilarrasa, V., Carrera, J., Olivella, S. and Rutqvist, J., 2018. Long-term modeling of thermo-hydro-mechanical processes of geologic carbon storage. International Symposium on Energy Geotechnics SEG-2018, Lausanne, Switzerland, 26-28 September 2018.

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- Vilarrasa, Victor. 'Hydrogeology: Flow and reactive transport in heterogeneous media', 50th Anniversary of the CID, Spanish National Research Council (CSIC), Barcelona, Spain, 17 March 2017.

- Vilarrasa, Victor. 'Induced seismicity in geoenergy applications', Geotechnical Engineering Seminar at University of Illinois at Urbana-Champaign (UIUC), Urbana-Champaign, Illinois, USA, 16 February, 2018.

- Vilarrasa, Victor. 'Minimizing the risk of inducing felt seismicity in geologic carbon storage', UPC-CSIC Hydrogeology Group Seminar, Technical University of Catalonia (UPC), Barcelona, Spain, 1 June, 2017.

## Patents

- Lacorte Bruguera, Silvia; Franquet Griell, Helena; Orera Clemente, Victor Manuel; Silva Treviño, Jorge. 2017. Muestreador cerámico pasivo para la medida de contaminación en aguas. / 16813780. licenciada: null.

# 10 Research training

## Doctoral Thesis

- Aceña Sánchez, Jaume. Transformació i metabolisme de fàrmacs al medi aquàtic mitjançant l'espectrometria de masses d'alta resolución. UB. Director: Barceló i Cullerés, Damià; Pérez, Sandra. 2017, 17 July, Sobresaliente "Cum Laude".

- Aznar Alemany, Òscar. Contaminants orgànics persistents i pseudopersistents en medi marí. Estudi en biota i en consum humà. UPC. Director: Eljarrat Esebag, Ethel; Barceló i Cullerés, Damià. 2017, 20 November, Sobresaliente "Cum Laude".

- Blanco Rubio, Maria. Nuevas aproximaciones toxicológicas para la detección de disruptores endocrinos y lipídicos en ecosistemas Mediterráneos y sistemas celulares. Dra. Cinta Porte Visa. Universitat Politècnica de Catalunya. Ciencias del Mar. 20 March 2018. Sobresaliente Cum laude.

- Casal Rodríguez, Paulo. Remobilització dels contaminants orgànics persistents en els ecosistemes polars costaners. Doctor en Ciències del Mar. Universitat Politècnica de Catalunya. Jordi Dachs. 7 November 2018.

- Comolli, Alessandro. Mechanism and stochastic dynamics of transport in Darcy-scale heterogeneous porous media. Technical University of Catalonia (UPC), Department of Civil Engineering, excelente cum laude, 14 June 2018. Marco Dentz.

- Corcellas i Carramiñana, Cayo Eduard. Estudi dels insecticides piretroides en mostres biològiques i humanes. UB. Director: Eljarrat Esebag, Ethel; Barceló i Cullerés, Damià. 2017, 28 September, Sobresaliente "Cum Laude".

- Dandar, Enkhbayar. Water resources of the upper Tuul River basin, Mongolia. Universitat Politècnica de Catalunya (UPC). Hidrología Subterránea. Director: Jesus Carrera, Maarten Saaltink, Buyankhishig Nemer. June, 2017.

- De Simone, Silvia. Induced Seismicity in Enhanced Geothermal Systems: Assessment of Thermo-Hydro-Mechanical Effects.Hidrología Subterránea.Direc tor: Jesus Carrera, Enric Váquez Suñé. March 2017.

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- Franquet Griell, Helena. Comportament de Citostàtics a l'ambient: Presència, Degradabilitat i Avaluació de Riscos. Universitat de Barcelona (UB). Director Dra. Sílvia Lacorte. 25 July 2017.

- Gallardo Hernández, Helena. Estudios en la zona crítica en campos agrícolas regados con aguas depuradas: Experiencias de laboratorio y de campo en el Parc Agrari del Baix Llobregat. Institut de Recerca de l'Aigua. Universidad de Barcelona. Facultad de Farmacia y Ciencias de la Alimentación. Director: Tapias Pantebre, Josefina Carlota; Marguí Grabulosa, Eva; Queralt i Mitjans, Ignasi. 15 September 2017. Sobresaliente "Cum Laude".

- García Cardona, Júlia. Removal of phosphorus from sewage using basaluminite, a residue from acid mine drainage treatment. Universitat de Barcelona (UB). Supervisors: Ester Torres Sánchez/Mercè Granados Juan. June 2017.

- García Álvarez, María Isabel. Origin of Atmospheric Aerosols transported across the North Atlantic Free Troposphere. Universidad de La Laguna. Facultad de Ciencias, Departamento de Química. 20 July 2017. Excelente Cum Laude. Director: Sergio Rodríquez, Barend van Drooge, Andrés Alastuey.

- Giulivo, Monica. Impact assessment of flame retardants in European river basins. Supervisor: Ethel Eljarrat. Università Cattolica del Sacro Cuore. Tutor: Ettore Capri; Ethel Eljarrat. 31 May 2017. Excellent.

- Gorrochategui Matas, Eva; Assessment of the lipidomic effects of environmental pollutants on exposed organisms using chemometric and analytical methods; Dr. Romà Tauler y Dra. Sílvia Lacorte; April 2018.

- Hurtado Cervera, Carlos.Tesis. Fate and effects of waterborne contaminants of emerging concern in the soil-plant system. Impact of biochar soil amendment to mitigate their plant uptake. Universitat Politécnica de Catalunya. Mención internacional. Excel.lent. Cum laude. Bayona i Termens, Josep Maria. July 2017.

- Kuzmanovic, Maja. Ecotoxicological Risk of Pollutants in Iberian Rivers. UPC. Dr Antoni Ginebreda Martí; Dr Damià Barceló. 23 June 2017. Sobresaliente "Cum Laude".

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- Margenat Mas, Anna. Tesis. Dynamics of chemical contaminants in peri-urban agriculture and evaluation of their potential impact on crops and human health. Universitat Politècnica de Catalunya. 27 November 2018. Director: J.M. Bayona. Co-director: V. Matamoros.

- Mastroianni, Nicola. Drugs of abuse in the aquatic and atmospheric compartments analysis, occurrence, and assessment of human consumption in Spain. UB. Director: Barceló i Cullerés, Damià; López de Alda, Miren. 2017, 18 September, Sobresaliente "Cum Laude".

- Molins Delgado, Daniel. Productos de cuidado personal en el medio ambiente: presencia, destino y efectos. UPC. Director: Díaz Cruz, Silvia; Barceló i Cullerés, Damià. 2017, 1 December, Sobresaliente "Cum Laude".

- Navarro Reig, Meritxell; Aplicación de herramientas quimiométricas de análisis de datos para el estudio de los efectos del cambio global sobre el metaboloma de especies vegetales; Dr. Romà Tauler y Dr. Joaquim Jaumot; May 2018.

- Obiso, Vincenzo. Assessment of Dynamic Aerosol-Radiation Interaction in Atmospheric Models, Universitat Politècnica de Catalunya, Supervisors: Oriol Jorba, Marco Pandolfi, 07/03/2018.

- Olmos Peñarroja, Víctor; Disseny de protocols metodològics per a estudis d'òmica ambiental basats en l'ús d'imatges hiperespectrals i mètodes quimiomètrics; Dr. Romà Tauler y Dra. Anna de Juan; October 2018.

- Ortiz Villanueva, Elena; Evaluación de los efectos ómicos en organos modelo mediante la aplicación de herramientas de análisis de datos megavariantes; Dr. Romà Tauler y Dr. Joaquim Jaumot; September 2018.

- Padoan, Elio. Partitioning and mobility of heavy metals in particle size fractions of road dust and urban soils". University of Turin (Italy) Supervisors: F. Ajmone Marsan, F. Amato 28/02/2018.

- Pemberthy Mendoza, Diana. Thesi. 2017. Análisis de dibenzo-p-dioxinas y dibenzofuranos policlorados (PCDD/Fs) en muestras de alimentos, por espectrometría de masas con analizador de trampa de iones, triple cuadrupolo y de alta resolución. Universidad de Antioquía (UdA).

- Pepe, Nicola. Development of a multi-scale modeling system for urban air quality assessment: case study over the Milan area. Politecnico di Milano (Italy). Supervisors: M. Bedogni, G. Lonati, F. Amato. 20/03/2018.

- Pérez Albaladejo, Elisabet. Uso de líneas celulares como modelos in vitro para la evaluación de toxicidad y mecanismos de acción de contaminantes ambientales. Dr Cinta Porte Visa. Universitat de Barcelona, UB; Biodiversidad. 18 September 2017. Sobresaliente Cum laude.

- Puig Castellví, Francesc; Development and applications of nuclear magnetic resonance spectroscopy and chemometric methods for the analysis of the metabolome of Saccharomyces cerevisar under different growing conditions; Dr. Romà Tauler y Dr. Ignacio Alfonso; July 2018.

- Rama Corredor, Óscar. Biomarcadors paleoclimàtics a la conca de la Guaiana (Atlantic tropical occidental). Technical University of Catalonia. High School of Engineering. Department of Hydraulic, Marine and Environmental Engineering. Grimalt Obrador, Joan; Martrat Sotil, Belén. 6 November 2017.

- Rivas Becerra, Daniel. Aplicación de MALDI-TOF Imaging y HPLC-MS/MS al estudio de la degradación del polímero policaprolactonadiol en diferentes medios acuáticos. UPC. Director: Ginebreda, Antoni; Barceló i Cullerés, Damià. 2017, 20 November.

- Rivera Jaimes, José Abraham. Estudio de la presencia e impacto de contaminantes emergentes en aguas residuales y superficiales de México. Rosa María Melgoza Alemán, M. López de Alda. Univ. Autónoma del Estado de Morelos. Fac. de Ciencias Químicas e Ingeniería. 31 August 2018.

- Rivetti, Claudia. The use of integrated approaches to characterize new mechanismn of toxicity of pollutants in the aquatic environment. Director Barata Martí, Carlos. Universitat Politècnica de Catalunya. Departament d'Enginyeria Civil i Ambiental. 19 May 2017.

- Rodrigues, Andreia C.M. Insecticides, DEtritivores and ALiens: Combined effects of invasive species and insecticide exposure along detritus based stream food webs. FCT, Co-directors João L T Pestana; Carlos Barata Marti; Amadeu M V M Soares. Aveiro University, IDAEA-CSIC. 2017.

- Scheiber Pagès, Laura. Groundwater management in the proximity of a mine site. IDAEA / Deptartament d'Enginyeria del Terreny. ETSECCPB. Director: Enric Vàzquez Suñé / Carlos Ayora. Awared with Best Early Career Hydrogeologists. 9 June 2017.

- Soldevilla Bacardit, Núria. Efectes de la contaminació atmosfèrica sobre la presió arterial ambulatòria. Universitat Autònoma de Barcelona. Facultat de Medicina, Programa de Doctorat en Medicina. 20 November 2017. Excelente Cum Laude. Director: Ernest Vinyoles, Aurelio Tobías.

- Valhondo González, Cristina. A reactive barrier to enhance the removal of emerging organic compounds during artificial recharge of aquifers through infiltration basins. Director: Jesús Carrera, Carlos Ayora. University: Universitat Politècnica de Catalunya. Dept. de Ingeniería Civil y Ambiental. 3 February 2017.

- Zonja, Bozo. Identification and fate of known and unknown transformation products of pharmaceuticals in the aquatic System; supervisor: Sandra Pérez; Universitat de Barcelona (UB); Director: Dra. Sandra Pérez Solsona i Dra. Mira Petrovic. 1 February 2017.

## Master Thesis

- Acuña Barrantes, Ana Julia. Evaluacion de la calidad del agua residual regenerada para la recarga artificial de acuíferos. UPC-IDAEA. Director: M. Silvia Díaz-Cruz. 14 July 2017.
- Alcaide Martín, Laura; Analysis of biological tissues through mass spectrometry imaging and infrared hyperspectral imaging; Química Analítica (Universitat de Barcelona); Dr. Romà Tauler y Dra. Carmen Bedia; July 2018.
- Casellas Masana, Enric. Characteristics and intra-event scale variability of rainfall isotopic signature in a Mediterranean mountain catchment (Vallcebre, eastern Pyrenees). Master of Meteorology, Universitat de Barcelona. Director: J. Latron (IDAEA) and P. Llorens (IDAEA). July 2017.
- Celdrán Domínguez, Yurima. Estudio de series temporales (2006-2016) de ozono (O3) troposférico en el N, NE y centro de Catalunya, Màster de Meteorologia, Universitat de Barcelona. Supervisor: Xavier Querol and Maria Rosa Soler. 2017.
- Celis Díaz, Betty Elena. Modelación y cálculo de rebajamiento para una unidad minera en zona de los andes de Perú. IDAEA/FCIHS/Deptartament d'Enginyeria del Terreny. ETSECCPB. Máster Profesional en Hidrología Subterránea.Director: Enric Vázquez-Suñé. July 2018.
- Climent Climent, Esther. Efecto de las drogas psiuiátricas y otros fármacos en los neurotransmisores de Daphnia magna. Determinaciones analíticas por LC-MS-MS. Universitat de Barcelona, Química y Física, Dep Química Ambiental. July 2017.
- Diviu Franco, Marc. Modelo hidrogeológico 3D en una zona minera de alta montaña. IDAEA/FCIHS/Deptartament d'Enginyeria del Terreny. ETSECCPB. Máster Profesional en Hidrología Subterránea. Director: Enric Vázquez-Suñé. July 2017.
- Galisteo García, Gemma. Modelación de flujo y transporte de calor con densidad variable en la depresión del Vallès (Barcelona). IDAEA/FCIHS/Deptartament d'Enginyeria del Terreny. ETSECCPB. Máster Profesional en Hidrología Subterránea. Director: Enric Vázquez-Suñé and Miguel Angel Marazuela. July 2017.
- Garcia Salcedo, Sergi. Estudi de l'exposició prenatal a compostos organoclorats en una cohort de Tarragona. Master in Laboratory of Clinical Analysis. Pompeu Fabra University. Grimalt Obrador, Joan. June 2018.
- Hassanzadeh, Ashkan. A decision making algorithm using Python programming language in ArcGIS to automate creating the three dimensional geological cross-sections. IDAEA/Departments of Mathematics, Physics and DACSO (UAB). Master's in modeling for science and engineering. Director: Enric Vázquez-Suñé. September 2018.

- Juan Polo, Adriana. Uso de la cromatografia liquida acoplada a la espectrometria de masas de alta resolución para la determinación de la distribución y metabolismo de fármacos en lechugas cultivadas en invernadero. Universidad de Barcelona – IDAEA. Facultad de Químicas. 2017-2018.

- Lainez Díaz, Celia. Toxicity of the plasticizers di (2- ethylhexyl) terephthalate, diisononyl and diisodecyl phthalate in human placental cells. Master in Molecular Biotechnology. Dr. Elisabet Pérez Albaladejo and Dr Cinta Porte Visa. Facultad de Farmacia. Universitat de Barcelona. 25 July 2018.

- Lindenberger, Florian. Mediterranean terraced landscapes: exploration of hydrological and geomorphological vulnerabilities and effects. Master. Director: M. Moreno de las Heras (IDAEA), F. Gallart (IDAEA) and Jochen Seidel (Stuttgart University). Stuttgart University (Germany). May 2017.

- López Fernández, Laia; Untargeted lipidomics study of carrot plants exposed to glyphosate; Máster: Química Analítica (Universitat de Barcelona); Dr. Joaquim Jaumot y Dra. Carmen Bedia; July 2018.

- López Mella, Daniel. Estimación del flujo de evaporación desde las aguas subterráneas En el Salar de Atacama, Chile. IDAEA / FCIHS / Deptartament d'Enginyeria del Terreny. ETSECCPB. Máster Profesional en Hidrología Subterránea. Director: Enric Vázquez-Suñé, July 2018.

- Martínez Jiménez, Pablo. Estudi de la degradació del polímer policaprolactonadiol aen aigua residual mitjançant tècniques avançades d'espectrometria de masses.Director: Antoni Ginebreda Martí. Universitat de Barcelona. Màster universitari de Ciència i Gestió dIntegral de l'Aigua. 2018.

- Massegué Obradors, Jordi. Phenomenology of 2005–2017 high ozone pollution episodes over northern Barcelona Metropolitan Area. Master de Ingeniería Ambiental, Universitat Politàcnica de Catalunya. Supervisor: Xavier Querol and José María Baldasano. 2018.

- Mayta Rodas, Ronald. Modelación hidrogeológica de la zona el Ayro - Tacna (Perú). IDAEA/FCIHS/Deptartament d'Enginyeria del Terreny. ETSECCPB. Máster Profesional en Hidrología Subterránea. Director: Enric Vázquez-Suñé and Jose Bolzicco. July 2017.

- Montolio Llenas, Joan. Inferring boundary layer time series from ceilometer data and its influence on air quality over Barcelona, Facultat de Física, Universitat de Barcelona. Master Meteorología. Supervisor: Yolanda Sola, Marco Pandolfi, 2018.

- Moreira Fernandes, Célia Carolina; Hallimonium portulacoides and Juncus maritimus in a mercury contaminated salt marsh: metal accumulation, biochemical and lipidomic patterns; Biología Molecular y Celular (Universidad de Aveiro); Dra. Carmen Bedia; July 2017.

- Moreno Sanabria, Luis. Reducció del potencial de lixiviació de Molibdè y Níquel en cendres volants procedents d'una unitat de producció tèrmica (UPT). Universitat de Barcelona, Facuiltad de Quimica. Màster en Química de Materials Aplicada. Supervisor: Patricia Córdoba and Ana María de Juan. 2018.

- Muela Malla, Silvia. Análisis espectral del régimen de explotación de sistemas geotérmicos someros y su relación con la respuesta térmica producida en el medio acuífero. Universidad de Zaragoza. Máster en Geologia: Técnicas y Aplicaciones.Director: A. García-Gil and E. Vázquez-Suñé. December 2017.

- Nieto Melgarejo, Herminio. Modelación de flujo de dren horizontal. IDAEA/FCIHS/Deptartament d'Enginyeria del Terreny. ETSECCPB. Máster Profesional en Hidrología Subterránea.Director: Enric Vázquez-Suñé. July 2018.

- Ordoñez Parrini, Rodolfo. Modelo Hidrológico para la estimación de la recarga subterranea en el Salar de Atacama, Chile. IDAEA/FCIHS/Deptartament d'Enginyeria del Terreny. ETSECCPB. Máster Profesional en Hidrología Subterránea. Director: Enric Vázquez-Suñé. July 2018.

- Penalva Arias, Nuria. Master. 2018. Determinación de contaminantes orgánicos en lagos de alta montaña del Pirineo catalán. Universidad de Barcelona (UB). Barend van Drooge and Pilar Fernández.

- Peralta Garzón, Soraya. Análisis de pesticidas organofosforados y piretroides en orinas maternas de la cohorte Tarragona. Master in Laboratory of Clinical Analysis. Pompeu Fabra University. Grimalt Obrador, Joan. June 2018.

- Peris Domes, Andrea. Estudio de la biodegradación de pesticidas apolares mediante los hongos Trametes versicolor.Director: E.Eljarrat. Universidad de Barcelona, Facultad de Ciencias Químicas, Departamento de Química Analítica. July 2018.

- Piña Iglesias, Jordi. Estudio Hidrogeológico para evaluar la idoneidad de un emplazamiento para la ubicación de un cementerio. IDAEA/FCIHS/Deptartament d'Enginyeria del Terreny. ETSECCPB. Máster Profesional en Hidrología Subterránea. Director: Enric Vázquez-Suñé. July 2018.

- Rojas Villar, Natalia. Trabajo fin de master. Determinación de fitoquelatinas como indicador de contaminación por metales pesados en lechuga maravilla (Lactuca sativa L.). Facultat de Química, Universitat de Barcelona, UB. Cristina Ariño y Sergi Díez. July 2017. Máster universitario en Química Analítica, UB.

- Rovira Garcia, Xavier. Determination of neurotransmitters and related metabolites affected by neuro-active pharmaceuticals in Daphnia magna and zebrafish larvae. Universitat de Barcelona, Química y Física, Dep Química Ambiental. July 2018.

- Sala Solà, Berta. Análisis de contaminantes orgánicos clásicos y emergentes en delfines del oceáno Índico y del mar Mediterráneo.Director: E.Eljarrat. Universidad Politécnica de Cataluña, Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos, Departamento de Ingeniería Química. October 2017.

- Sierra Sánchez, Clara. Temporalitat dels rius de les conques internes de Catalunya i alteració del règim hidrològic de la Tordera. Director: Jérôme Iatron (IDAEA) and Joan Gomà (UB). Universidad de Barcelona, Màster en Ciència i Gestió Integral de l'Aigua. 25 September 2018.

- Singla Just, Berta. Efecte de la coberta forestal en la mida de gota i la composició isotòpica del trascol en una parcel•la de pi roig (Conques d'investigació de Vallcebre, Pirineus Orientals, Catalunya). Master. Directors: Pilar Llorens (IDAEA) and Jérôme Iatron (IDAEA). Universitat de Lleida. 29 October 2018.

- Sunyer Caldú, Adrià. Filtres solars i productes de transformació en el medi ambient: Estudi mitjançant tècniques electroquímiques i cromatografia de líquids acoblada a espectrometria de masses.UB – IDAEA. Directors: M. Silvia Díaz-Cruz and José Manuel Díaz-Cruz. 13 July 2018.

- Valdivielso Mijangos, Sonia. Composición isotópica de las precipitaciones y aguas superficiales y subterráneas: gestión de datos. IDAEA/FCIHS/Deptartament d'Enginyeria del Terreny. ETSECCPB. Máster Profesional en Hidrología Subterránea. Director: Enric Vázquez-Suñé. July 2018.

- Valiente Merino, María. Young water fraction in a Mediterranean mountain catchment: Application of a new methodology for dating surface waters (Vallcebre Research Catchments, southeastern Pyrenees). Director: F. Gallart (IDAEA), Jérôme Iatron (IDAEA) and Pilar Llorens (IDAEA). Universidad de Málaga, Máster de Recursos Hídricos y Medio Ambiente. 16 October 2018.

- Varello, Roberta. An exploratory analysis of bromine compound and pyrethroids in stranded sperm whales.Director: E.Eljarrat. Department of Veterinary Public Health and Animal Pathology, University of Bologna, Italy.

- Vilà Cano, Judit. Estudio de la removilización de contaminantes orgánicos persistentes en episodios de crecidas fluviales.Director: E.Eljarrat. Universidad de Barcelona, Facultad de Ciencias Químicas, Departamento de Química Analítica. July 2017.

## Final Degree Projects

- Alcaide Martín, Laura; Study of photodegradation processes of environmental organic pollutants by spectrofluorimetry and chemometric methods. Química (Universitat de Barcelona); Supervisors: Dr Romà Tauler Ferré and Dr Anna de Juan Capdevila. June 2017.

- Buxó Escapa, Guillem. Interpretation of tracer test in granite. Escuela Técnica Superior de Ingeniería de Caminos, Canales y Puertos - Universidad Politécnica de Cataluña (ETSICCP - UPC). Director:Saaltink, Maarten Willem. IDAEA. 16 June 2017.

- Fernández Navas, Nora; Mass spectrometry imaging: optimization of sample preparation and metabolite identification through MS/MS. Química (Universitat de Barcelona); Dr Anna de Juan Capdevila and Dr Carmen Bedia Girbes. June 2017.

- González Romero, Adolfo. Deposició atmosfèrica de partícules en suspensió a Barcelona. Geoquímica per avaluar l'efecte del trànsit a la contaminació de sorrals i parcs. Universitat de Barcelona, Facuiltad de Ciencias de la Tierra. Grado Geología/Ciencias de la Tierra. Supervisor: Xavier Querol and Maite García Vallés. 2018.

- Palomares Moliner, Adriana; Arsenic exposure effects on rice crops grown: phenotypic and metabolomic characterization. Química (Universitat de Barcelona); Dr. Ana Maria de Juan Capdevila and Dr. Joaquim Jaumot Soler. June 2017.

- Sicart Ollé, Marc. Sorption of Perfluoroalkyl substances on environmental degraded microplastics. Universidad de Barcelona-IDAEA. Facultad de Químicas. Supervisors: Mònica Martínez López(UB, Marta Llorca-Casamayor and Marinel·la Farré Urgell (IDAEA-CSIC). 2017-2018.

# 11 Teaching activities

## Teaching activities

- Alastuey, A., Pérez, N. Air pollution and air quality management. Course of Astronomy and Meteorology. University of Barcelona. Faculty of Physical Sciences, Department of Meteorology. 2 h. Barcelona. 2 May 2017.
- Alastuey, A., Pérez, N. Air pollution and air quality management. Course of Astronomy and Meteorology. University of Barcelona. Facultat de CC Physics, Departament de Meteorologia. 2 h. Barcelona. 5 December 2017.
- Amato F., Basagaña X., Hopke P, Minguillón M.C. Pandolfi M., Querol X. II PMF (Positive Matrix Factorization) training course. 14-16 June 2017. IDAEA-CSIC.
- Barceló, Damià. Instructor of advanced courses in different universities and conferences internationals as PITTCON and SETAC.
- Barceló, Damià. Teacher of Master in Environmental Engineering. Universitat Politècnica de Catalunya. Organic pollutants in the continental aquatic environment.
- Barceló, Damià. Teacher of Master in Analytical Chemistry. University of Barcelona. Study of organic contaminants in environmental samples and their effects.
- Bayona, Josep Maria. Participation in the magister course. Environmental Sciences. SUE Caribbean Program. University of Córboba, Monteria (Colombia). 2017.
- Bayona, Josep Maria. Participation in the PhD Program. Ciencia y Tecnología Agroalimentaria. University of Vigo. 2017.
- Bayona, Josep Maria. IMTA-CONACYT Postgraduate course. Conference: Incorporation of organic micropollutants into crops in the context of water reuse. Jiutepec. Morelos. Mexico. October 2018.
- Bayona, Josep Maria. Participation as a teacher. 1st Training on Oil Splill sampling. EMSA. Gijón 19-20 September 2018.
- Bayona, Josep Maria. Participation as a teacher. Introduction to emerging pollutants: “Categories, origin, environmental distribution and adverse effects on human health and ecosystems”. Thematic Network Management of Water Quality and Availability. CONACYT. 24 October 2018.

- Carrera, Jesus. International Association of Hydrogeologists. Spanish Group (AIG-GE). Madrid. II Hydrogeological Modeling Course. 10-13 July 2017.

- Carrera, Jesus. International Underground Hydrology Center Foundation. (FCIHS) Endorsed by the Polytechnic University of Catalonia (U.P.C.). Flow in variable density and multiphase. Quality, Contamination and Recovery of Aquifers. 2016-2017.

- Carrera, Jesus. Institute of Investigations in Applied Mathematics and in System. Department of Systems Engineering. (IIMAS). Mexico. Characterization of fractured reservoirs and associated aquifers. 13-21 October 2017.

- Carrera, Jesús. TRUST Consortium. Training Course on CO2. Israel (Haifa). State of WP10: Extrapolation ; State of WP5 : Strategies for storage management. 8 Jaunary 2017.

- Carrera, Jesus. Master's Degree in Land Engineering and Seismic Engineering. Polytechnic University of Catalonia (U.P.C.). Aquifer mechanics. 2012-2013, 2013-2014, 2014-2015, 2015-2016, 2016-2017, 2017-2018.

- Díez, Sergi. Participation in Master's degree in Analytical Chemistry. University of Barcelona (UB). 2017.

- Díez, Sergi. Participation in the magister course. Environmental Sciences of the SUE Caribbean Program. University of Córboba, Monteria (Colombia). 2018.

- Díez, Sergi. Participation in the PhD Program. Ciencia y Tecnología Agroalimentaria, University of Vigo. 2018.

- Eljarrat, Ethel. Member of the Academic Committee of the PhD Program "Analytical Chemistry and Environment ". 2017-2018.

- Eljarrat, Ethel. Contaminants orgànics persistents (POPs). (3 h). Course "Contaminants orgànics en el medi aquàtic continental". Master in Environmental Engineering. Escola Tècnica Superior d'Enginyers de camins, Canals i Ports, UPC, Barcelona. 2017.

- Eljarrat, Ethel. Contaminants orgànics persistents (POPs). (3 h). Course "Contaminants orgànics en el medi aquàtic continental". Master in Environmental Engineering. Escola Tècnica Superior d'Enginyers de camins, Canals i Ports, UPC, Barcelona. 2018.

- Eljarrat, Ethel. Contaminants orgànics persistents. (1.5 h). Course "Estudi dels contaminants orgànics i inorgànics em plusres ambientals i els seus efectes". Master in Analytical Chemistry. Faculty of Chemical Sciences, UB, Barcelona. 2017.

- Eljarrat, Ethel. Contaminants orgànics persistents. (1.5 h). Course "Estudi dels contaminants orgànics i inorgànics em plusres ambientals i els seus efectes". Master in Analytical Chemistry. Faculty of Chemical Sciences, UB, Barcelona. 2018.

- Farré, Marinella. Coordination and teaching of "Organic pollutants in the continental aquatic environment" Code 31141 (5 credits) in the Master's Degree in Environmental Engineering of the Polytechnic University of Catalonia (UPC), taught at the Higher Technical School of Civil Engineers, Channels and Ports. From 2011-present.

- Farré, Marinella. Course and training on Analysis of Persistent Organic Pollutants. Organized by UNEP under the GEF Project GMP 2 "GF4030-4F34 Title: Continuing Regional Supporting for the POPs Global Monitoring Plan under the Stockholm Convention. UN-Environment 19-28 January 2018 Pesticide Research Laboratory, Department of Chemistry, University of the West Indies, Mona. Kingston, Jamaica (40 h).

- Farré, Marinella. Course and training on Analysis of Persistent Organic Pollutants. Organized by UNEP under the GEF Project GMP 2 "GF4030-4F34 Title: Continuing Regional Supporting for the POPs Global Monitoring Plan under the Stockholm Convention. UN-Environment 24 May 2018 to 04 June 2018. Environmental Protection Department, University of the West Indies, St. Michael. Barbados (40 h).

- Farré, Marinella. Teaching of "Study of organic pollutants in environmental samples and their effects" in the Master's Degree in Chemistry of the University of Barcelona (UB), taught at the Faculty of Chemical Sciences. 2013 -present.

- Farré, Marinella. Member of the Academic Committee of the Doctoral Program "Water Science and Technology". University of Girona (UdG). From 2012 to 2017.

- Farré, Marinella. Member of the Academic Committee of the Doctoral Program "Environmental Engineering". Universitat Politècnica de Catalunya (UPC). From 2018 -present.

- Farré, Marinella. President of the Doctorate Commission of the Institute of Environmental Diagnostics and Water Studies of the CSIC (IDAEA-CSIC). From 2012-present.

- Farré, Marinella. Professor of the International Course: Analytical Chemistry for the determination of natural toxins and metabolites. NaToxAq summer school in Helsingoer. Denmark. 26-27 September 2017 (8 h lectures).

- Farré, Marinella. Professor of Module 4 of the Master's Degree in Environmental Toxicology and Risk Assessment Universidad Rey Juan Carlos Course 2016-2017 / 2017-2018 / 2018-2019. https://online.urjc.es/es/para-futuros-estudiantes/titulos-propios/master-en-toxicologia-ambiental-yevaluacion-de-riesgos-para-la-salud-y-el-medio-ambiente# team-teacher.

- Farré, Marinella. Teacher of "Study of organic pollutants in environmental samples and their effects". Master's degree in Chemistry. University of Barcelona (UB). In the Facultat de Ciències Químicas. From 2013 -present.

- Gallart, Francesc. Official Master's Degree in Water Resources and the Environment. Malaga University. Topic 2. Surface water - generation of runoff 6-7 November 2017 (10 h). Malaga.

- Izquierdo, Maria. 2018. Deficit of nutrients and associated diseases. I Specialization Course in Medical Geology.

- Izquierdo, Maria. Deficit of micronutrients and associated diseases. 1st Edition monographic course of specialization in Medical Geology. Trace elements: Geology, health and social impact. Salamanca, 11 November 2018. http://www.geologiamedica.org/.

- Lacorte, Sílvia. Master's degree in Basic and Applied Research in Hunting Resources. University of Castilla-La Mancha. 2016-2017. Students: 15 Lacorte, Sílvia. Master's degree in Analytical Chemistry and the Environment. Dept. Analytical Chemistry. University of Barcelona Students: 30. 2016-2017.

- Lacorte, Sílvia. Coordinator of the subject "Study of organic and inorganic pollutants in environmental samples and their effects". Departament de Química Analytica of the Universitat de Barcelona. 2018.

- López de Alda, Miren. Analysis and water quality (1.5 h). "Studying organic and inorganic pollutants in environmental matters and their effects" within the Master in Analytical Chemistry. Faculty of Chemical Sciences, UB, Barcelona. 2017-2018.

- Matamoros, Víctor. Participation as a teacher. Phytosudoe Summer Course. New trends in restoration of degraded soils III: trace elements, organic pollutants and constructed wetlands. "The use of constructed wetlands for pollution removal. Cases from Denmark and Catalunya ". 9-10 October 2018. Vitoria. Spain.

- Minguillón, M.C., Querol, X. Master of Meteorology. University of Barcelona. 19 and 24 April 2018. 3 h. Molina, Antonio. Grau in Agroenvironmental and Landscape Engineering (3rd curs). Universitat Politècnica de Catalunya (ESAB-UPC). Assignment "Medi i Impacte Ambiental". November 2017 (16 h).

- Molina, Antonio. Grau in Agroenvironmental and Landscape Engineering (3rd curs). Universitat Politècnica de Catalunya (ESAB-UPC). "Medi i Impacte Ambiental". November 2018 (16 h).

- Moreno de las Heras, Mariano. Grau in Agroenvironmental and Landscape Engineering (3rd curs). Universitat Politècnica de Catalunya (ESAB-UPC). Seminari "Restoration of degraded spaces by mining activities: relief design". "Medi i Impacte Ambiental". November 2017 (2 h).

- Moreno de las Heras, Mariano. Grau in Agroenvironmental and Landscape Engineering (3rd curs). Universitat Politècnica de Catalunya (ESAB-UPC). Seminari "Eco-geomorphological considerations for the restoration of mining environments". "Medi i Impacte Ambiental". November 2018 (2 h).

- Pandolfi, M. Course on "Environmental Data Handling", School of Atmospheric Measurements in Latin America and the Caribbean: Atmospheric Particles and Reactive Gases (SAMLAC), Organizer: Global Atmospheric Chemistry Project Americas Working Group (IGAC-AWG), Puerto Rico, 12-16 November 2018.

- Pérez, Sandra. Distributed i transformació dels contaminants al medi aquàtic (6 h). Program of Master Universitat de Barcelona. Professor at the Polytechnic University of Catalonia. 2017 and 2018.

- Piña, Benjamí. "Organic and Inorganic Pollutants in the Environment: Analysis and Effects". Post-graduate Course. University of Barcelona, Barcelona, Spain. Courses 2016/2017, 2017/2018.

- Piña, Benjamí. "Biotechnological Applications", Master in Biotechnology. University of Barcelona, Barcelona, Spain. Courses 2016/2017, 2017/2018.

- Piña, Benjamí. Master's / Doctoral Program in Life Science Innovation. Tsukuba University (Japan). Coordinators: Yukuno Watanabe (U. Tsukuba), Colin Godwin (U. Oxford, UK). 2017 .

- Postigo, Cristina. Contaminants orgànics in ecosystems aquàtics i el seu risc ambiental - Disinfection of water and formation of disinfection byproducts (1 h). Master's Program in Environmental Engineering. Professor at the Polytechnic University of Catalonia.2017.

- Queralt, Ignacio. The metal coin: analysis using X-ray techniques. The ancient coin. XXIX Documentation Course 2018. National Museum of Art of Catalonia.

- Queralt, Ignacio. Interdisciplinary Seminar on Archaeometry and Epigraphy: Metals. Interuniversity Master of Classical Archeology 2017. Institut Catala D'archeology Clàssica (ICAC), Universitat Rovira i Virgili (URV).

- Queralt, Ignasi. Non-destructive analysis for the study and characterization of metal alloys and their corrosion processes. XXIX Documentation Course, The Ancient Currency. MNAC, Museu Nacional d'Art de Catalunya. 13 March 2018. 4 h.

- Queralt, Ignasi. Regional Training Course on Chemical and Structural Characterization of Cultural Heritage Objects by X-ray Diffraction and X-ray Fluorescence spectroscopies. National Institute of Nuclear Research (ININ). Mexico. Sponsored by the International Atomic Energy Agency. TALNAPC20160115-001. 11-15 December 2017. 40 h.

- Queralt, Ignasi. Non-destructive analysis techniques for the study and characterization of metal alloys and their corrosion processes. XXVIII Documentation Course, The Ancient Currency. MNAC, Museu Nacional d'Art de Catalunya.18 April 2017. 4 h.

- Queralt, Ignasi. Universitat Autónoma de Barcelona- Universitat Rovira I Virgili. Master's Degree in Classical Archeology. Anàlisi química de materials metal.lics antics per espectrometria de raigs X. Institut Català d'Arqueologia Clàssica. 15 May 2017. 6 h.

- Queralt, Ignasi. Workshop on Non-destructive techniques for Cultural Heritage. Instituto Italiano de Cultura, Buenos Aires, Argentina. 11-12 October 2018. 16h.

- Querol, X ., Amato, F ., Minguillón, M.C ., Pandolfi, M. Third PMF Training Course (Positive Matrix Factorization for source apportionment studies) of the AIRUSE Life Project ENV / ES / 584. Barcelona. 24-26 October 2018.

- Querol, Xavier. Master Environmental and fundamental chemistry, A Coruña University, 7 h. 7 March 2018. http://estudos.udc.es/es/study/detail/4500v01#mobility.

- Querol, Xavier. Environmental Health and Edaphology of the Faculty of Pharmacy and Food Sciences, subject Health and Environmental Management of the Pharmacy Degree, 1 h, 31 October 2017. Urban air quality: Diagnosis, effects and measurements.

- Querol, Xavier. Environmental Health and Edaphology of the Faculty of Pharmacy and Food Sciences, subject Health and Environmental Management of the Pharmacy Degree, 1 h. December 4, 2018: Urban air quality: Diagnosis, effects and measurements.

- Querol, Xavier. Mineralogy and geochemistry applied to atmospheric sciences. Environmental Mineralogy. 1 h. Degree in Geology University of Barcelona. 8 March 2018.

- Querol, Xavier. International University of Andalusia and University of Huelva. Interuniversity Master of Environmental Technology. 10 h. 1-2 February 2018. Huelva.

- Querol, Xavier. Abating human exposure to air pollutants in cities. Course Pre-conference. RICTA-2017: Iberian Science and Technology Network of Aerosols (Spain-Portugal). Barcelona. 4 July 2017.

- Querol, Xavier. Environmental and Fundamental Chemistry Master, A Coruña University., 7 h, 6 March 2017.

- Querol, X. International University of Andalusia and University of Huelva. Interuniversity Master of Environmental Technology. 10 hours 30-31 January 2017. Huelva.

- Querol X., Amato F., Karanasiou A. ,Tobias A. Course for teachers - The air we breathe: pollutants, health and city. 7-8 February 2017. IDAEA-CSIC. Barcelona. Departament d'Ensenyament Generalitat de Catalunya.

- Querol, X., Amato F., Minguillón M.C., Pandolfi M., Hopke F. Training course on air quality for officials of the Xunta de Galicia. 2 h. Official Training Center, Santiago de Compostela, 24 April 2017.

- Querol, Xavier. Climate change and air pollution, 2 h. Training Course in Climate Services. Universitat Politècnica de València. 20 July 2018.

- Querol, X . Application of Geochemistry to environmental studies on power generation and urban atmosphere. 3 h, 9 October 2018. China University of Geosciences, Wuhan, China.

- Soler, Josep Maria. 2017. Reactive transport "5 ECTS credits" Univ. Politècnica de Catalunya, Dep. Of Civil and Environmental Engineering (master's program), 2017-2018, Barcelona, Universitat Politècnica de Catalunya (UPC).

- Tauler, Romà. Master's degree in Environmental Engineering. Contaminants orgànics in ecosystems aquàtics i el seu risc ambiental. 2 ECTS. Universitat Politècnica de Catalunya. 4h 2017, 2018.

- Tauler, Romà. Jornades Doctorals UAB; Chemometrics: a powerful tool for the research of high throughput omics

environmental analytical data. Facultat de Ciències, Autonomous University of Barcelona. June 2017.

- Tauler, Romà. Master's degree Integrative approaches to perceive responses of organisms to environmental challenges. 3 ECTS. University of Aveiro (Aveiro, Portugal). 2017 and 2018.

- Titos, Gloria. Subject: Atmospheric Radiation. Master in Geophysics and Meteorology (University of Granada). 1 ECTS. November 2017.

- Tobias, Aureli. 30th Residential summer course of the European Educational Program in Epidemiology. World Health Organization and International Epidemiology Association, Florence, Italy. 26-30 June 2017.

- Tobias, Aureli. 31st Residential Summer Course in Epidemiology, European Educational Program in Epidemiology, June 25-29, Florence, Italy.

- Tobias, Aureli. Meta-analysis with R. XII Summer School, Universitat Politècnica de Catalunya, Barcelona. 18-21 June 2018. Tobias, Aureli. Meta-analysis with Stata, Summer Courses of the Autonomous University of Mexico, 6-10 August 2018, Mexico City, Mexico.

- Tobias, Aureli. Regression of time series. Consortium Center for Biomedical Research in the Epidemiology and Public Health Network (CIBERESP), 14-15 June 2018. Barcelona.

- Vázquez, Enric. Collaborator University of Antioquia Engineering School (Medellín, Colombia). Task: Support and evaluation of postgraduate courses. 2018.

- Váquez, Enric. International Course on Underground Hydrology, remote version. Edition 16. (CIHS_D). International Center for Underground Hydrology Foundation and ETSECCPB - Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports de Barcelona. Member of the Teaching Commission.

- Vázquez, Enric. International Course on Underground Hydrology, remote version. Edition 17. (CIHS_D). Teaching Commission. International Center for Underground Hydrology Foundation. Teaching: 70 h. ETSECCPB - Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports de Barcelona. 2017-2018.

- Vázquez, Enric. International Course on Underground Hydrology, remote version. Edition 18. (CIHS_D). Teaching Commission. International Center for Underground Hydrology Foundation. Teaching: 70h. ETSECCPB - Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports de Barcelona.

- Váquez, Enric. International Course on Underground Hydrology. Edition 50. (CIHS). International Center for Underground Hydrology Foundation and ETSECCPB - Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports de Barcelona. Member of the Teaching Commission.

- Vázquez, Enric. International Course on Underground Hydrology. Edition 51 CIHS. Teaching Commission. International Center for Underground Hydrology Foundation. Teaching: 70 h, 2018. ETSECCPB - Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports de Barcelona.

- Vázquez, E. International Course on Underground Hydrology. Edition 52 CIHS. Teaching Commission. International Center for Underground Hydrology Foundation. Teaching: 70 h, 2018. ETSECCPB - Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports de Barcelona.

- Vázquez, Enric. Master in Geology and Environmental Management of Mineral Resources. Subject / Module: Hydrology and hydrogeology applied to mining. Seat Santa María de La Rábida. University of Huelva Interuniversity Program / International University of Andalusia. 25 h. May 2018.

- Vázquez, Enric. Professional Master of Underground Hydrology. Director of the Master. Master's own Fundació Politècnica de Catalunya. ETSECCPB - Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports de Barcelona. September 2017-July 2018. 45 h and direction of 4 Master Thesis.

- Vázquez, Enric. Professional Master of Underground Hydrology. Director of the Master. Master's own Fundació Politècnica de Catalunya. ETSECCPB - Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports de Barcelona. September 2018-July 2019. 45 h and address of 6 Master Thesis.

- Vázquez, Enric. Official Master's Degree in Paisatgisme. Subject / Module: Hydrology and geology (8 h, 1st Quarter 2017-2018). Escola Tecnica Superior d'Arquitectura de Barcelona of the UPC.

- Vázquez, Enric. X Hispanic American Course on Underground Hydrology (CHHS). Subjects: 1) Module: Transport of solutes and tracers. (25 h, 4-8 Nov. 2018). 2) Module: Groundwater pollution. (25 h, 11 - 15 Nov. 2018). Faculty of Engineering. University of the Republic - Montevideo, Uruguay.

- Váquez, Enric. Direction of the Professional Master of Underground Hydrology. Master's Fundació Politècnica de Catalunya. ETSECCPB - Escola Tècnica Superior d'Enginyeria de Camins, Canals i Ports de Barcelona.

- Váquez, Enric. Master in Sustainable River Management and Integrated Water Management. VIII Edition. Master University of Zaragoza. Teaching Commission Member.

- Vilarrasa, Víctor. 'Hydro-mechanical processes' lecture in the training course '3rd Advanced Course on CO2 Storage in Deep Saline Formations', Spanish National Research Council (CSIC), Barcelona, Spain, 13-14 September 2017.

## Dissemination Activities

- Lacorte, S. Talk in *Escuela Thau* in Barcelona. February 2018.
- Martínez, R; Casado, M; Fuertes, I; Sanz, C; Faria, M; Marqueño, A; "¡Atención! Cuidado con los contaminantes". Programa de Actividades Escolares (PAE), aimed at primary and secondary school students, 3 November 2017 in Kensington School (3° ESO), 8 June 2018 in La Pineda de Badalona Institute (I and 2 High School), 25 October 2018 in the Narcís Monturiol Institute (High Grade), 12 November 2018 in the Torras i Bages Institute from l'Hospitalet (1 and 2 High School). Escolab, aimed at secondary and high school students, 17 January 2018 for Moisés Broggi Institute (2 High School) in the IDAEA-CSIC, 13 February 2018 for Castell d'Estela Institute (I and 2 High School) in the IDAEA-CSIC, 11 April 2018 for XXV Olimpiada Institute (4 ESO) in the IDAEA-CSIC, 5 December 2018 for the Mare de Déu del Àngels Institute(1 and 2 High School) in the IDAEA-CSIC. PAE and Escolab belongs to Ajuntament de Barcelona.
- Minguillón, M.C.; Alastuey, A.; Programa de divulgación "El CSIC en el aula": Taller "Calidad del aire" secondary school students (IES Emperador Carles de Barcelona), IES. 5 March 2018.
- Minguillón, M.C.; Alastuey, A.; Programa de divulgación "El CSIC en el aula": Taller "Calidad del aire" secondary school students (Institut Bernat Metge de Barcelona), IDAEA-CSIC. 31 May 2018.
- Minguillón, M.C.; Alastuey, A.; Programa de divulgación "Escolab" del Ayuntamiento de Barcelona: Taller "Calidad del aire" secondary school students (IES Consell de Cent de Barcelona), IDAEA-CSIC. 29 January 2018.
- Minguillón, M.C.; Alastuey, A.; Programa de divulgación "Escolab" del Ayuntamiento de Barcelona: Taller "Calidad del aire" secondary school students (IES Jaume Balmes de L'Hospitalet de Llobregat), IDAEA-CSIC. 19 February 2018.
- Minguillón, M.C. Scientific advisor for #CienciaenelParlamento, independent citizen initiative that aims to put science at the service of the legislative branch (https://www.cienciaenelparlamento.org), has the support of the Congress Bureau and all parliamentary groups. 25 selected from more than 200 candidates.
- Querol, X. La Calidad del Aire. Un Reto Actual. Comisario exposición itinerante. Naturgy Fundation: 2018. http://www.fundacionnaturgy.org/ca/blog/la-fundacio-naturgy-presenta-a-barcelona-una-exposicio-sobre-la-contaminacio-atmosferica-i-com-afecta-la-salut-de-les-persones-i-del-medi-ambient/.
- Vilarrasa, V. Informational talk on "Ways to mitigate climate change", at the 1st Open Day of the Official Language School, Inca, Spain, 7 April 2017.
- IDAEA has also actively participated in the *Espai Ciència - Saló Ensenyament* 2017 and 2018 and the *Setmana de la Ciència* 2018 - Activity organized by the Generalitat de Catalunya and the FCRi.

## Workshops

- Amato, Fulvio. La qualitat de l'aire al Vallès Oriental: diagnòstic i mesures de millora, Centre d'Estudis de Granollers, Granollers (Barcelona) 11 October 2018. http://acgranollers.cat/events/la-qualitat-de-laire-al-valles-oriental-diagnostic-i-mesures-de-millora.

- Bayona, Josep Maria. Removal of emerging contaminants through constructed wetlands. National Laboratory of Science and Technology and Integrated Water Management. México. October 2018.

- Bedía, Carmen. General aspects in basic research of breast cancer; Metabolomics and lipidomics applications in biomedicine research and clinical diagnosis. Facultad de Medicina, Universidad Autónoma de Barcelona. February 2018.

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Quo CIENCIA NATURALEZA TECNOLOGÍA SER HUMANO SALUD

## SELECCIÓN ESPAÑOLA DE LA CIENCIA 2017: XAVIER QUEROL

Es profesor e investigador del Instituto de Diagnóstico Ambiental del CSIC, uno de los principales expertos españoles en investigación atmosférica y uno de los nuevos miembros de la Selección Española de la Ciencia 2017. Hablamos con él para saber hasta qué punto estamos dañando al planeta y cómo afecta la contaminación a nuestra salud.

somGranollers

Societat Política Economia Esports Cultura Opinió

## Contra la contaminació, restricions de trànsit al nucli urbà

L'expert mediambiental Fulvio Amato oferirà avui (20 h), al Museu de Granollers, una ponència sobre la qualitat de l'aire al Vallès Oriental i com millorar-la

Societat

Dissa, 11 d'octubre de 2018 | 08:47h

EL DIARIO VASCO

Gipuzkoa Alto Urola Alto Deba Bajo Deba Bidasoa Buruntzaldea Costa Urola

## Jordi Dachs: «Todos los humanos tenemos sustancias tóxicas en el cuerpo, se depositan en los tejidos»

Jordi Dachs, ayer en las puertas de Tabakalera. | USOZ

**Jordi Dachs: Doctor en Ciencias del Mar e investigador**

«Debemos reglamentar las sustancias sintéticas que se transportan por el mar y por el aire para que se pueda prohibir el uso de algunas de ellas»

TENDENCIAS

Q

QUIÉN

SILVIA DÍAZ CRUZ

*Los estudios sobre contaminación de esta química han servido para que Hawái y Palaos prohíban cremas cosméticas dañinas para el medio ambiente*

## La mujer que ensombreció los filtros solares

**La experta ya mostró que la placenta de las embarazadas puede transmitir al feto estas sustancias dañinas**

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- Eljarrat, Ethel. EL PERIÓDICO, 10 October 2017, p.30: Un contaminante prohibido hace 10 años sigue presente en los ríos europeos.

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3
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- Tobías, Aurelio. Faro de Vigo. 01 August 2018. https://www.farodevigo.es/sociedad/2018/08/01/cambio-climatico-aumentara-muertes-olas/1937867.html.
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- Tobías, Aurelio. Revista la Marea. 14 September 2018. https://www.lamarea.com/2018/09/14/el-calor-que-mata/.

# 13 Participation in committees and scientific representation

## Participation in committees and scientific representation

- Alastuey, Andrés. Evaluator of the Area of Evaluation of R + D + I of the General direction of Evaluation and Accreditation (DEVA) of the Andalusian Agency of the Knowledge. 30 March 2016 - 30 March 2019.
- Amato, Fulvio. Evaluator Projects of the French National Plan. Agence Nationale de la Recherche (ANR) France.
- Amato, Fulvio. Evaluator PIR Projects of the Italian National Plan. Ministero dell'istruzione, dell'università e della ricerca (MIUR) Italy.
- Amato, Fulvio. Member of Validation Group for H2020 EIT- Raw Materials: ECOPADS (Eliminating Copper from brake PADS and recycling).
- Barata, Carlos. Project Evaluation Committee Agence Nationale de la Recherche (ANR). Ecotoxicology France 2017; 2018.
- Barata, Carlos. Session organization 'Cost effective and ecological relevant testing using invertebrate species: new insights for environmental risk assessment. SETAC Europe 27th Annual Meeting. Brussels (Belgium). 7-11 May 2017.
- Barceló, Damià. Associate editor of the scientific journal. Detritus-A journal from International Wzste Working Group (IWWG) 2018-present.
- Barceló, Damià. Associate editor of the scientific journal. Methods X (Elsevier, Amsterdam, NL) 2014-present.
- Barceló, Damià. Associate editor of the scientific journal. Process Safety and Environmental Protection (Elsevier, Amsterdam, L) 2015-present.
- Barceló, Damià. Associate editor of the scientific journal. Trends in Analytical Chemistry (Elsevier, Amsterdam, NL) 1993-present.
- Barceló, Damià. Co-EDITOR of the Handbook of Environmental Chemistry Book Series, (Springer-Verlag, brlin, Germany, NL). 2007- present.
- Barceló, Damià. Co-Editor in Chief. Current Opinion on Environmental Science and Health (Elsevier) Since 1 January 2017.

- Barceló, Damià. Co-Editor in Chief. Science of the total Environment (Elsevier). Since 1 January 2012.
- Barceló, Damià. Editor. Series of Books Wilson & Wilson Comprehensive Analytical Chemistry, (Elsevier, Amsterdam, NL). 1997- present.
- Barceló, Damià. Member of the Editorial Advisory Board. Analytical and Bionalytical Chemistry (Springer Verlag, Germany) 2002-present.
- Barceló, Damià. Member of the scientific society ACS (American Chemical Society).
- Barceló, Damià. Member of the scientific society ASMS (American Society for Mass Spectrometry).
- Barceló, Damià. Member of the scientific society CWP (Catalan Water Partnership).
- Barceló, Damià. Member of the scientific society IEC (Institut dEstudis Catalans).
- Barceló, Damià. Member of the scientific society SCQ (Societat Catalana de Quimica).
- Barceló, Damià. Member of the scientific society SECyTA (Spanish Society of Chromatography and Related Techniques).
- Barceló, Damià. Member of the scientific society SEEM (Spanish Society of Mass Spectrometry).
- Barceló, Damià. Member of the scientific society SEQA (Spanish Society of Analytical Chemistry).
- Barceló, Damià. Member of the scientific society SETAC (Society of Environmental Toxicology and Chemistry).
- Barceló, Damià. Member of the External Advisory Board of LEPABE - Laboratory for Process Engineering, Environment, Biotechnology and Energy, of the Faculty of Engineering of the University of Porto, Portugal, 2017-2018.
- Bedía, Carmen. Correlated Multimodal Imaging in Life Sciences. COST Action CA17121. Task leader 2: Applications for the new correlated multimodal imaging. October 2018; 4 years.
- Dachs, Jordi. Associate Editor. Archives of environmental contamination and toxicology (Springer).
- Dachs, Jordi. Evaluation Committee of the “Mediterranean Institute of Oceanography MIO”, CNRS-Univerité de Marseille, France, January 2017.
- Dachs, Jordi. Editorial Advisory Board. Environmental Science & Technology (American Chemical Society).
- Diaz, Silvia. Member of the International Advisory Committee on Water, Soil and Food Contamination of the International Conference on Environmental Pollution, Risk Assessment and Remediation (ICEPRAR 2018), Mahdia, Tunisia, April 2018.
- Diez, Sergi. Member of the Academic Committee of the Doctoral Program “Analytical Chemistry and Environment” of the University of Barcelona (UB). 2017-2018.
- Diez, Sergi. Member of the Academic Committee of the PhD Program “Water Science and Technology” of the University of Girona (UdG). 2017-2018.
- Eljarrat, Ethel. EXPERT in the topic “Pollution by plastics” in the debate table of the Science in Parliament event, 6-7 November 2018, Madrid.

- Gallart, Francesc. Secretary of the Hydrology Section of the Spanish Commission of Geodesy and Geophysics.
- Ginebreda, Antoni. Member of the Water Reuse Commission of the Prat de Llobregat WWTP. 2018-present.
- Ginebreda, Antoni. Vice-president of the Scientific-Technical Council of CETAQUA. 2018-present.
- Grimalt, Joan. Association of Chemists and Engineers of the Chemical Institute of Sarriá. AIQS. vocal, 2014-present.
- Grimalt, Joan. International Panel on Chemical Pollution. IPCP. Vocal 2015-present.
- Izquierdo, Maria. Responsible for the scientific program of the 1st Edition monographic course of specialization in Medical Geology. Trace elements: Geology, health and social impact. Salamanca, 11 November 2018. Organized by the Spanish Chapter of the International Medical Geology Association. http://www.geologiamedica.org/.
- Lacorte, Sílvia. Coordinator of the Erasmus program between IDAEA-CSIC and the University of Naples.
- Lacorte, Sílvia. Member of the academic committee of the Department of Analytical Chemistry of the University of Barcelona.
- Lacorte, Sílvia. Member of the Division of Chemistry and the Environment, EuCheMS (http://www.euchems.eu/divisions/chemistry-and-the-environment.html).
- Lacorte, Sílvia. Member of the Rovaltain Foundation in France (http://fcsrovaltain.org/la-fondation.html).
- Lacorte, Sílvia. Member of the Coordination of the Area of Sciences and Chemical Technologies of the CSIC. May 2012-April 2018.
- Latron, Jérôme. Member of the Editorial Board of Catena journal.
- Latron, Jérôme. National Representative for Spain in the ERB (Euromediterranean Network of Experimental and Representative Basins) and member of the steering committee.
- Llorens, Pilar. Collaborator State Research Agency. Area: Environmental Sciences and Technologies. Sub-area: Earth and Water Sciences. August 2017-present.
- Llorens, Pilar; Latron, Jérôme; Gallart, Francesc. Comitè Assessor d'Hidròlegs pel PNRB del Montseny.
- López de Alda, Miren. Proposal evaluation committee 2017 Marie Skłodowska-Curie - Individual Fellowships (MSCA-IF-2017). EU Human Resources Mobility November 2017.
- López de Alda, Miren. Proposal evaluation committee submitted to EMPIR Call 2018 (https://www.euramet.org/?news=40:736). EURAMET - The European Association of National Metrology Institutes. Metrology November 2018.
- López de Alda, Miren. Editorial board of the Journal Applied Sciences (ISSN 2076-3417). MDPI. Applied Natural Sciences. 04 December 2017 - present.
- López de Alda, Miren. Expert scientific advisor. General Intervention of the State Administration (IGAE). Treasury. 2015-present.
- López de Alda, Miren. Member International Program on the State of the Ocean (IPSO). IPSO Working Group. Principal Investigator in the area of Environmental Assessment and Water Research. 2015-present.
- López de Alda, Miren. Rapporteur of proposals submitted to H2020-WIDESPREAD-2018-03. EU H2020 Spreading Excellence and Widening Participation - 2018 Twinning. December 2018-February 2019.
- Moreno de las Heras, Mariano. Member of the Expert Panel. Evaluation of research project proposals for the call H2020-

SFS-47-2017 (Expert ID EX2013D150869) of the European Commission.

- Moreno de las Heras, Mariano. Member of the Editorial Board of the international scientific journal Hydrology and Earth System Sciences.

- Moreno, Teresa. Evaluator of the Evaluation and Accreditation Department of the Andalusian Agency of Knowledge (DEVA-AAC). 2017-2020.

- Moreno, Teresa. Evaluator of the German Academic Exchange Service (DAAD). For scholarship applications in Spain for the years 2017-2022.

- Moreno, Teresa. Member of the evaluation committee Juan de la Cierva State Program 2017.

- Moreno, Teresa. Deputy Director of the Research and Development Center (CID) of the CSIC. 2018-present.

- Pandolfi, Marco. Evaluator of the requests of the ACTRIS Central Facility (ACTRIS PPP Data Center) for ACTRIS (Aerosols, Clouds and Trace Gas Research InfraStructure) Preparatory Phase Project (PPP, EU-H2020).

- Pérez, Sandra. Associate editor TREAC. Elsevier Since 2016.

- Pérez, Sandra. Board member SEEM Mass Spectrometry Society. 2014-2017.

- Pérez, Sandra. Secretary of the board. SEEM Mass Spectrometry Society. Since 2017.

- Postigo, Cristina. Member of the evaluation panel of the second phase of the European call. Reviewer of research proposals. 2017 Water JPI Joint Call. Oslo, Norway 12 September 2018 - 13 September 2018.

- Querol, Xavier. Evaluator Sexenios ANECA: Natural Resources. 2018.

- Querol, Xavier. Scientific Adviser WHO. First WHO Global Conference on Air Pollution and Health: Improving air quality, fighting climate change - saving lives, WHO-Geneva, 30 October- 1 November 2018. http://www.who.int/airpollution/events/conference/CAPH1_SciAdv_bios3_28Aug18. pdf.

- Querol, Xavier. Vice-Chair Cost Action INDAIRPOLLNET. CA17136 - Indoor Air Pollution Network. Since July 2018. https://www.cost.eu/actions/CA17136#tabs|Name:overview.

- Rodríguez, Rafael. Delegate of the Presidency of the CSIC for the RIS3-FEDER.

- Viana, Mar. Evaluator PIR Projects of the Italian National Plan. Ministero dell'istruzione, dell'università e della ricerca (MIUR) Italy.

- Viana, Mar. Expert reviewer for the Czech Science Foundation, the main public funding agency in the Czech Republic supporting all areas of basic research.

- Viana, Mar. Expert reviewer for the European Science Foundation (ESF). Membership for a three-year period (starting September 2018).

- Viana, Mar. Scientific Committee. Emissions of particulate matter from ship's exhausts: transport, toxicology and mitigation strategies. 2017.

- Vila-Costa, Maria. Reviewer Editor. Frontiers in Environmental Microbiology (springer-nature).

## Organisation of Congresses

- Amato, Fulvio. Scientific Committee 9th International Workshop on Sand / Dust storm and Associated Dustfall.
- Barata, Carlos. Scientific Committee, Chairman session Endocrine disrupters and obesogens. 11º Congreso Ibérico y 8º Iberoamericano de Contaminación y Toxicología Ambiental. CICTA. Madrid (Spain). 11-13th July 2018.
- Barata, Carlos. Organizer 'The added value of using invertebrate species in ecotoxicology: new insights for environmental risk assessment". SETAC Europe 28th Annual Meeting. Responsible and Innovative Research for Environmental Quality. Rome (Italy). 13-17 May 2018.
- Barceló, Damià. Organizer and Chairman. International workshops series on "Liquid chromatography-tandem mass spectrometry for screening and trace level quantitation of environmental and food samples", Barcelona, Spain 2018.
- Barceló, Damià. Organizer and co-chair. SETAC-Europe Rome 2018. "Analysis, fate and risk of emerging contaminants in water, soil, plants and biota under water scarcity". Rome. 14 May 2018 - 17 May 2018.
- Barceló, Damià. Scientific Committee. SETAC NA, 38th Annual Meeting - "Chemical, biological and instrumental methods for detecting harmful algae and their natural toxins". Minneapolis MNl,USA, November 2017.
- Barceló, Damià. Chairman in the V Reunión Nacional de Dioxinas, Furanos y otros compuestos orgánicos persistentes. Barcelona. 15-16 June 2017.
- Barceló, Damià. Chairman of the Round-table Integrating GLOBAQUA/MARS/SOLUTIONS outcomes into EC water policy; water and citizens in the GLOBAQUA Final Conference: Water river management under water scarcity and multiple stressors. 17-19 December 2018. Barcelona.
- Barceló, Damià. Chairman of the Session "Water, Air, Soil and Food contamination" del International Conference on Environmental Pollution, Risk Assessment and Remediation (ICEPRAR 2018), Mahdia, Tunisia. April 2018.
- Barceló, Damià. Member of the International Advisory Committee on Water, Soil and Food Contamination del International Conference on Environmental Pollution, Risk Assessment and Remediation (ICEPRAR 2018), Mahdia, Tunisia. April 2018.

- Barceló, Damià. Member of the Scientific Committee of the GLOBAQUA Final Conference: Water river management under water scarcity and multiple stressors.17-19 December 2018. Barcelona.

- Barceló, Damià. Member of the Scientific Committee of the SEA-on-a-CHIP Final Open Technical Meeting and Workshop. 16-17 May 2017. Olhao, Portugal.

- Barceló, Damià. Member of the Scientific Committee of the VIII Reunión de la Sociedad Española de Espectrometría de Masas (SEEM) and V Reunión Nacional de Dioxinas, Furanos y otros compuestos orgánicos persistentes. Barcelona. 15-16 June 2017.

- Bayona, J.M. (Organizing Committee). XENOWAC II. Challenges and solutions related to xenobiotics and antimicrobial resistance in the framework of water reuse. 10-12 October 2018. Limassol. Chipre.

- Carrera, Jesús. Convener. EGU. 23-29 April 2017. Viena (Austria).

- Dachs, Jordi. Els contaminants orgànics com a vector de canvi global durant l'antropocè. Dilluns de Ciència - L'antropocè. 2017.

- Dachs, Jordi. Coordinación y Presentación. Dilluns de Ciència-Com els humans estem transformant la Terra- L'Era de l'Antropocè-II. 2017.

- Dentz, Marco. Organizer. Mixing Day 2018 workshop at IDAEA on May 20, 2018.

- Dentz, Marco. 9th International Conference on Porous Media & Annual Meeting (Interpore), New Orleans, USA, 14-17 May 2018. Organizer of the session (MS 1.04) Upscaling of mixing, dispersion and reaction processes from pore to continuum scale.

- Dentz, Marco. Computational Methods in Water Resources Conference 2018 (Saint Malo, France, 3-7 June, 2018). Organizer of the session: Mixing and Reaction Across Scales in Subsurface Environments.

- Dentz, Marco. European Geosciences Union General Assembly 2018, Vienna, Austria. Co-organizer of the session HS8.1.4 Subsurface flow and solute transport: Concepts, modelling, observations and applications of dispersion, mixing and reactive transport in heterogeneous media.

- Gallart, Francesc. Convener. Hydrological extremes: from droughts to floods Session (HS2.1.1) European Geosciences Union, General Assembly 2018, Vienna, 8-13 April 2018.

- Grimalt, Joan; Giron Sierra, Alvaro; Arrizabalaga Valbuena, Juan; Mengod los Arcos, Guadalupe; Vila Mitja, M.Asunción, Calvo Calvo, Luis; Sardá Amills, Francisco. 2018. Coordinación. Ciencia Editada.

- Grimalt, Joan; Rull del Castillo, Valentin; Calvo Calvo, Luis; Piña Capo, Benjamí. 2017. Coordinación y presentación. Lunes de Ciencia. January 2017. Cómo los humanos estamos transformando la Tierra: la era del Antropoceno.

- Grimalt, Joan. Scientific Committee Member. 15as Jornadas de Análisis Instrumental. Barcelona. 3 - 5 October 2017.

- Jaumot, Joaquim. International Committee. 41st Symposium Chromatographic Methods of Investigating Organic Compounds. Szczyrk (Polonia). Participants: 80; June 2018.

- Latron, Jérôme. Scientific Committee. 17th Biennial Conference ERB "Innovative monitoring techniques and modelling approaches for analysing hydrological processes in small basins", September 2018, Germany.

- Latron, Jérôme. Scientific Committee. International Conference on the Vulnerability of the Mediterranean Soils to Water Erosion. Institut Agronomique et Vétérinaire Hassan II, Rabat (Morocco), 19-20 November 2018.

- Llorens, Pilar. Convener. General Ecohydrology Session (HS10.3). European Geosciences Union, General Assembly 2018, Vienna, 8-13 April 2018.

- Llorens, Pilar. Convener. General Ecohydrology Session (HS10.3/BG9.4/SSS9.34). European Geosciences Union General Assembly. Vienna (Austria). 23–28 April 2017.

- Llorens, Pilar. Convener. Stable isotopes to study water dynamics in the soil-plant-atmosphere continuum (co-organized) Session (HS10.5/BG2.1/SSS13.40). European Geosciences Union, General Assembly 2018, Vienna, 8-13 April 2018.

- López de Alda, Miren. Member of the Scientific Committee of the ISEAC-40. International Conference on Environmental & Food Monitoring. 19-22 June 2018. Santiago de Compostela, Spain.

- Matamoros, Victor. Chairman Scientific Committee. IWA Specialist Conference on Wetland Systems for Water Pollution Control. International Congress Valencia, IWA. 7 October 2018 - 11 October 2018.

- Moreno de las Heras, Mariano. Convener. Coevolution of soils, landforms and vegetation: patterns, feedbacks and ecosystem stability thresholds (co-organized) Session (SSS9.8/BG2.44/GM5.6/HS11.53). European Geosciences Union, General Assembly 2018, Vienna, 8-13 April 2018.

- Moreno, Teresa; Querol, Xavier. Chairs. RICTA 2017. 5th Iberian Meeting on Aerosol Science and Technology, 3-6 July 2017, Barcelona, Spain. http://www.ricta2017.org/.

- Moreno, Teresa. 2017. Air quality mitigation measures in the subway environment. Workshop on public transport. Barcelona, 2017.

- Moreno, Teresa. 2018. Member Scientific Committee of the 6th Iberian Meeting on Aerosol Science and Technology (RICTA 2018).

- Pérez, Sandra. Chairman of GLOBAQUA final conference: Water river management under water scarcity and multiple stressors. 17-19 December 2018. Barcelona, Spain.

- Pérez, Sandra. Member of the Scientific Committee of the 15as Jornadas de Análisis Instrumental. 3-5 October 2017. Barcelona.

- Pérez, Sandra. Member of the Scientific Committee of the VIII SEEM meeting. 12-16 June 2017. Barcelona.

- Porte, Cinta; Barata, Carlos. Organizers. 'Obesogens and Lipid Disrupters'. SETAC Europe 28th Annual Meeting. Responsible and Innovative Research for Environmental Quality. Rome (Italy).13-17th May 2018.

- Postigo, Cristina. Organizer and co-chair of the session "Environmental fate of emerging contaminants in the water cycle: analytical challenges and engineered solutions" SETAC Europe 28th Annual Meeting, Rome, Italy. 14 - 17 May 2018.

- Queralt, Ignasi (Organizing Committee). CHEMFORS 2018: Cultural Heritage Materials and Forensic Sciences: From authentication to crime evidences through non-destructive analytical tools. Universidad de la Frontera, Pucón, Chile, 8-9 November 2018. https://sarx-jfmf-2018.ufro.cl/es/preregistro-chemfors-2018/.

- Queralt, Ignasi. Organizing Committee. EXPOMINER 2017. Fira Barcelona. 10-12 November 2017. http://www.expominer.com.

- Queralt, Ignasi. Organizing Committee. EXPOMINER 2018, Fira Barcelona, 8-10 November 2018. http://www.expominer.com.

- Queralt, Ignasi. Organizing Committee. THEOPRAX 2018: Theoretical and practical X-ray fluorescence spectroscopy International Workshop: Instrumentation and Applications, University of Girona, Spain, 4-6 September 2018. http://iqcc.udg.edu/theoprax2018/.

- Querol, Xavier. 2017. Coordinator. Dilluns de Ciència III. March-April 2017 - Cómo los humanos estamos transformando la Tierra: la era del Antropoceno.

- Querol, Xavier. Scientific Chairman. PSF/TAIEX Workshop on Air Pollution, Industrial Emissions, Sand and Dust Storms. DG. Environment (European Commission and Iranian Department of Environment). Tehran 21-22 November 2017.

- Querol, Xavier; Moreno, Teresa. Scientific Chairmans. Abating exposure to Air Pollutants in Cities. LIFE+ Programe-EC, Platform Meeting on Air. 26-27 september2017, Barcelona. http://www.lifeprepair.eu/wp-content/uploads/2017/09/AIR-Platform-2017.pdf.

- Querol, Xavier. Co-organizer. HYSPLIT-NOAA. IDAEA-CSIC, 15-17 May 2018. NOAA-UHU-CSIC, Barcelona. https://www.arl.noaa.gov/outreach/news-photos/latest-hysplit-workshop-continues-the-trend-of-increasing-international-collaboration/.

- Querol, Xavier. Co-organizer. IDAEA-CSIC-MAPAMA. Jornada sobre estado de desarrollo actual y aplicaciones de sensores de bajo coste en calidad del aire. MAPAMA, Salón de actos Plaza S. Juan de la Cruz S/N, 5 June 2018. http://www.femp.es/sites/default/files/programa_9.pdf.

- Tauler, Romà; Jaumot, Joaquim. International Committee. XVII Chemometrics in Analytical Chemistry. Halifax (Canada). Participants: 200; June 2018.

- Tauler, Romà. Congress Organization. International Workshop Environmental Omics, Integration & Modelling. Barcelona. Participants: 100; October 2017.

- Tobías, Aureli. Organizing Committee Member. RICTA 2017. 5th Iberian Meeting on Aerosol Science and Technology, 3-6 July 2017, Barcelona, Spain. http://www.ricta2017.org/.

- Tobias, Aureli. Pre-conference workshop Evaluating the short-term health effects of desert and anthropogenic dust. First WHO Global Conference on Air Pollution and Health: Improving air quality, combatting climate change – saving lives, WHO-Geneva, 30 October- 1 November 2018, Geneva, Switzerland.

- Vázquez Suñé, Enric (Organizer). 1st FREEWAT USER AND DEVELOPERS INTERNATIONAL WORKSHOP. IDAEA-CSIC. Barcelona. 21 September 2017.

- Vázquez Suñé, Enric. Organizer. FREEWAT 3rd GENERAL CONSORTIUM MEETING. IDAEA-CSIC. Barcelona. 20 September 2017.

- Vázquez Suñé, Enric. Organizer. Workshop: "Jornada aguas freáticas urbanas como recurso hídrico alternativo. El caso de Sant Adrià de Besòs". Ajuntament Sant Adrià-EUSAB-IDAEA-FCIHS Barcelona. 24 May 2018.

- Vázquez Suñé, Enric. Organizer. Workshop: "ICT tools for innovating Groundwater Management in a changing world". IDAEA-CSIC. Barcelona. 22 September 2017.

- Vilarrasa, Víctor. Organizing Committee Member. Conference on Coupled processes in Fractured geological media: Observation, modeling, and application (CouFrac), Wuhan, China, 12-14 November 2018.

- Vilarrasa, Víctor. Convener of the session. "Evaluation of coupled thermo-hydro-mechanical-chemical (THMC) processes related to geo-energy applications: from laboratory to reservoir scale", EGU General Assembly 2018, Vienna, 8-13 April 2018.

# 15 Awards

## Awards

- Barceló, Damià. 2018. Associació Catalana d'Amics de l'Aigua. For his professional career.
- Dentz, Marco. Outstanding Referee of the Physical Review journals of the American Physical Society.
- Joaquim Jaumot. International Prize "Chemometrics and Intelligent Laboratory Systems Award" for Chemometrics researchers less than 40 years old. June 2018.
- Querol, Xavier. 2018. Best LIFE Project 2018 on Peoples Choice on Green Cities. DG. AIRUSE-LIFE+. Project leader X. Querol. EU awards best LIFE projects for nature, environment and climate action.
- Querol, Xavier. Selected 2017 in the Spanish Selection of Science 2017. Quo-CSIC Magazine.
- Querol, Xavier. 2017. Academic of the 4th section, as an expert in Atmospheric Geochemistry. Elected academic from the Royal Academy of Sciences and Arts of Barcelona.
- Soldevila N, Vinyoles E, Tobías A, Muñoz MA, del Val JL, Real J, Verdú JM, Domingo M, Mundet X, de la Sierra A. Efectes de les particules aèries en suspensió sobre la pressió arterial ambulatòria. Best Oral Presentation in the XXIV Reunió de la Societat Catalana d'Hipertensió Arterial, Barcelona, 12-13 December 2017.

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