Institute of Environmental Science and Technology

ICTA-UAB

Annual Report 2022

ICTA Institut de Ciència i Tecnologia Ambientals - UAB

UAB Universitat Autònoma de Barcelona

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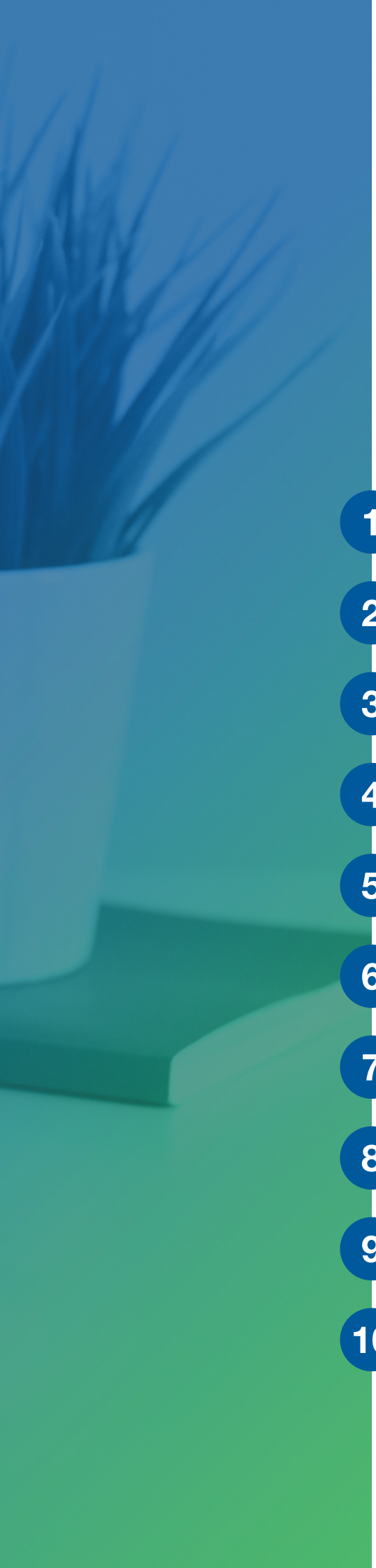
ICTA Institut de Ciència i Tecnologia Ambientals - UAB

UAB Universitat Autònoma de Barcelona

EXCELENCIA MARÍA DE MAEZTU



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Mission 1

The Institute of Environmental Science and Technology (ICTA-UAB) is a multidisciplinary centre that promotes academic research and postgraduate education in environmental sciences. We aim to improve our understanding of global environmental change, and the origin and changing nature of environmental problems. We also study policies, strategies and technologies to foster a transition to a sustainable economy.

Isabel Pont

Director

September 2022 - Present

"I am immensely proud to lead such a ground-breaking research center that works on the most challenging issues of our time. Spanning from the natural to the social sciences, our researchers are committed to finding solutions that are necessary, realistic, and above all, just."

About Us 2

The Institute of Environmental Science and Technology (ICTA-UAB) is a research institute of the Universitat Autònoma de Barcelona that hosts approximately 200 researchers trained in environmental sciences and related fields.

The UAB first established the institute in 2003 in the Faculty of Science. Since October 2014, we are hosted in a new, emblematic, highly energy-efficient building (certified as LEED GOLD by the US Green Building Council) on the UAB campus which reflects an open and collaborative working environment.

Since 2016, ICTA-UAB has received structural funding from the Spanish national program for scientific excellence known as María de Maeztu (Unidad de Excelencia «María de Maeztu» MDM-2015-0552, and CEX2019-000940-M), which has enabled us to develop more cross-cutting transdisciplinary research and training on global sustainability science and policy.

The institute's decision-making bodies include a Management Team, a Permanent Board and a Council. We also have an Academic Committee for Doctoral Studies in Environmental Science and Technology (as part of the PhD school of ICTA-UAB). There are two official Committees of the council: the Lab Committee (supervised by Dr. André Colonese), and the Alumni Commission (supervised by Prof. Xavier Gabarrell). There is also a voluntary "Equity, Diversity and Care" Committee.

During 2022 there has been a change in the management team of the Institute. From January until July 2022, the ICTA-UAB management team was led by Prof. Xavier Gabarrell i Durany as Director, Prof. Jordi Garcia Orellana† as Secretary, Prof. Adriana Artola Casacuberta as deputy Director of the Doctoral Studies, Dr. Esteve Corbera Elizalde as Scientific Director of the Maria de Maeztu Program, and Maica Nogales Malagón as the Institute General Manager.

In September 2022, ICTA-UAB welcomed a new management team led by Prof. Isabel Pont Castejón as Director, Dr. Laura Talens Peiró as Secretary, Prof. Adriana Artola Casacuberta as deputy Director of the Doctoral Studies, Dr. Esteve Corbera Elizalde as Scientific Director of the Maria de Maeztu Program, and Maica Nogales Malagón as the Institute General Manager.

To ensure the accomplishment of the objectives related to gender and diversity policies as well as a more efficient management of ICTA-UAB's resources, the new management board incorporated two new managers to the team: Prof. Isabelle Anguelovski as Gender, Diversity and Care manager and Dr. André Colonese as Offices and Laboratory manager.

Director
Isabel Pont Castejón

MdM Scientific Director
Esteve Corbera Elizalde

Secretary
Laura Talens Peiró

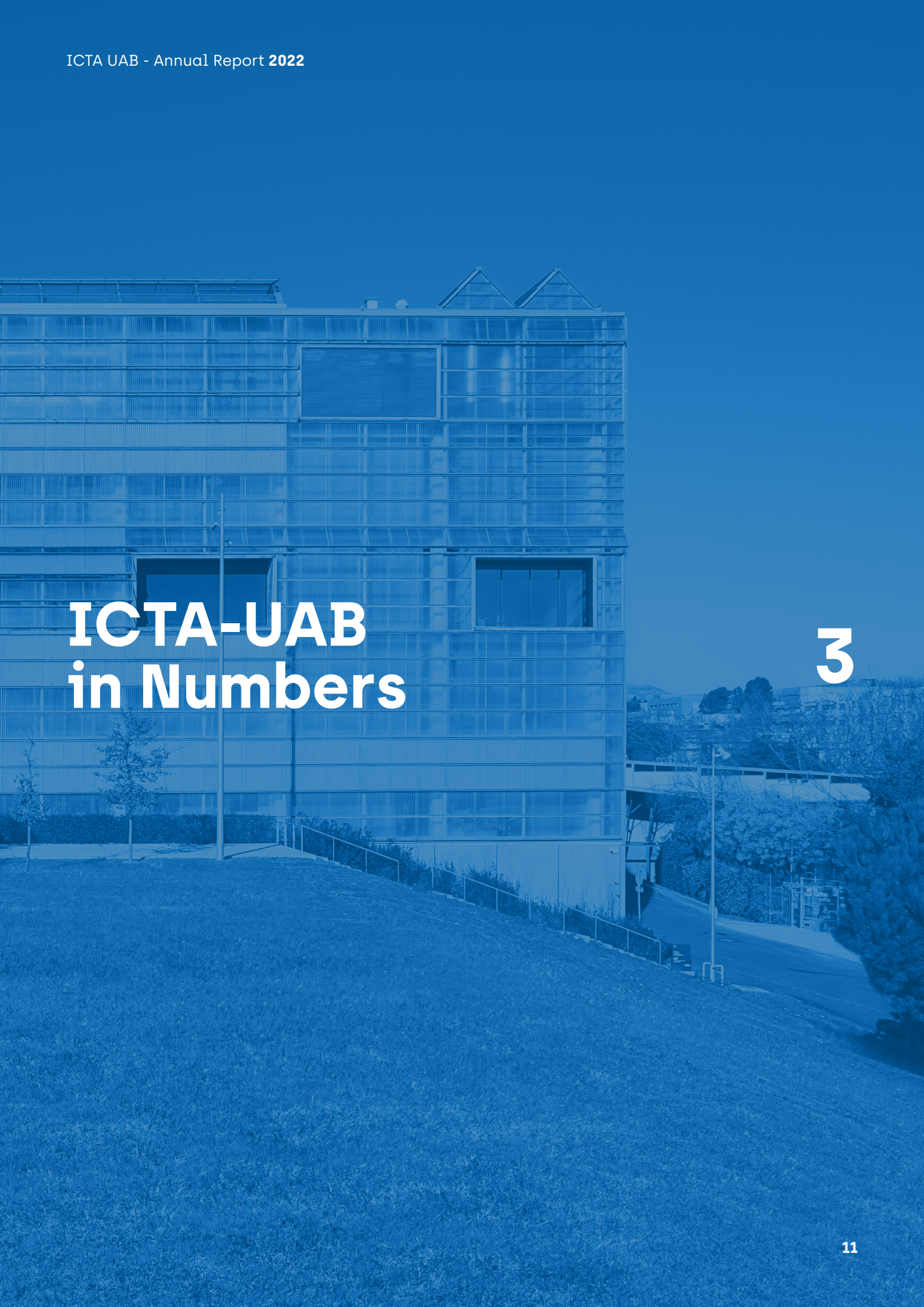
Gender, Diversity and Care Manager
Isabelle Anguelovski

Director of Doctoral Studies
Adriana Artola Casacuberta

Offices and Laboratory Manager
André Colonese

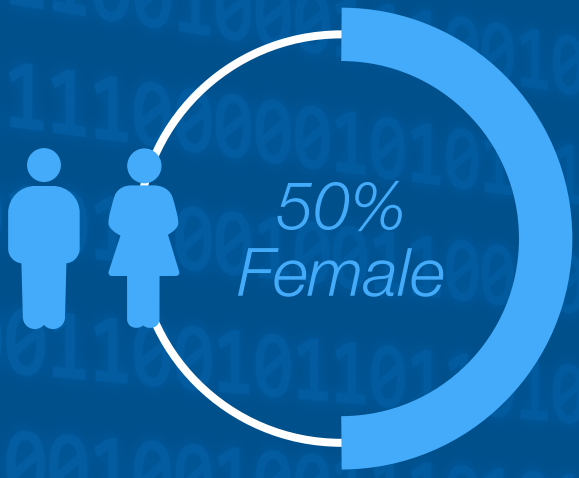
General Manager
Maica Nogales Malagón

2022 Executive Board



ICTA-UAB in Numbers

3



68
Researchers

42
Doctoral Candidates

47
Administration and Technical Research Staff
68% Female

32
Countries

6
ERC Grants

9.5 M€
Research Funding

7
Research Groups

20
Doctoral Theses Defended

288
Publications

Staff

4

Senior Researchers

Anguelovski, Isabelle
Apostolopoulou, Evangelia
Belmonte Soler, Jordina
Cole, Helen
Colonese, André Carlo
Corbera Elizalde, Esteve
Gabarrell i Durany, Xavier
Galbraith, Eric
Garcia Orellana, Jordi†
Giampietro, Mario
Hickel, Jason
Honey Rosés, Jordi
Kallis, Giorgos
Lombardo, Umberto
Marquet Sardà, Oriol
Morén Alegret, Ricard
Mortyn, Peter Graham
Pont Castejón, Isabel
Ramos Martín, Jesús
Reyes-García, Victoria
Rovira Val, María Rosa
Scheidel, Arnim
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van den Bergh, Jeroen
Villalba Méndez, Gara
Villamayor-Tomás, Sergio
Ziveri, Patrizia

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Davtian, Nina

Drews, Stefan*

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Gamboa Jiménez, Gonzalo

García del Amo, David

García-Lamarca Williams, Melissa

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Grelaud, Michael

Hanacek, Ksenija*

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Kotsila, Panagiota

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Rodellas Vila, Valentí

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Klein, Franziska*

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Macall, Diego

Mallo Costa, Miguel*

Martin, Nicholas*

Mastini, Riccardo*

Matheney, Austin Gage

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Music, Marta

Nawthiri, May Aye*

Nogué Algueró, Borja

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Porcher, Vincent

Porcuna Ferrer, Anna

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Romera Puga, María del Carmen*

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Sanz Sebastián, María Teresa
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Segura Barrero, Ricard
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Tonini, Pietro
Torren Peraire, Daniel
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Bukkens, Sandra
Calvet Mir, Laura*
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Daiyoub, Angham*
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Kokkorogiannis, Panagiotis
Limacher, Nina
Lomanto Perdomo, Valentina*
Manzano García, Adrián*
Marlès Magre, Jaume*
Mcgrath Michelle, Krista
Moraleda Cibrián, Núria
Muñoz Liesa, Joan
Navarro Gibert, David
Navas Obando, Grettel
Nistor, Brindusa Raluca
Osclowicz, Emilia*
Parada Molina, Felipe
Puigdemunt Puig, Rut
Renom Fernández, Silvia
Ricón Martínez, Cristian*
Ruiz Cayuela, Sergio
Sánchez Mateo, Sonia

Sierra Montoya, Miquel
Simón Mas, Gemma
Soleymani-Fard, Ramin
Subirana Iborra, Moisès*
Tofighi Niaki, Adrien

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Martínez Blanco, Júlia*
Oliver Solà, Jordi*
Ortega Cerdà, Miquel
Sarto Monteys, Víctor

Administration

Scientific Manager
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Technical Support of Research, International Projects Office (OPI)
Verónica Colombo

Communication Staff
Ana García Cañizares
Isabel Lopera Martínez

Technical Support of Research (National projects)
Silvia Martínez Sinibaldi

ERC Project Managers, and International Projects Office (OPI)
Vanesa del Pino Pérez
Laura Jiménez Fernández
Encarna Poncela Fernández
Marta Viana Díaz

IT and GIS Support
Oriol Baeza Martínez
Marta Borrós Vendrell

Academic Affairs

Cristina Durán Díez
(PhD Program)
Eduardo Martínez Martínez
(Masters Program)

María de Maeztu Financial Officer

Cristina Montero Blázquez
Alba Marcos López*

ICTA-UAB Logistical Support

Gloria Gutiérrez García

Economic Management Team

Maricarmen Charro Castro
Loli García Lucena
Maite Jiménez Batista
Cristina Martín Montemayor
Valentina Noyola Piña*
Angeles Peláez Expósito
Montse Puigdomènech Griño
Laura Sans Sobrino
Gemma Suades Méndez

Research Framework

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ICTA-UAB's research aims to better understand several environmental and societal challenges that need to be addressed to guarantee human progress in an ecologically sustainable Earth. We engage with a set of global, yet inter-related environmental challenges, including climate change, biodiversity loss, resource extraction, oceans' acidification and water pollution, environmental mobilization and conflicts, and their social and economic ramifications.

5 inter-related Environmen-tal and Social Challenges

In doing so, we also engage with important policy and social goals and debates, including for example the United Nations' Sustainable Development Goals (SDGs), the mitigation goals of the Paris Accord on Climate Change, or the Aichi Targets on Biodiversity Conservation. We expect to provide evidence on the best strategies to make progress on these global and regional sustainability goals, as well as to shed light on possible trade-offs across apparently desirable policy objectives.

Our research efforts are organized around five inter-related Environmental and Social Challenges, which structure our María de Maeztu Unit of Excellence strategic program (2020-2024).

Oceans 1

This challenge investigates the impacts of global change on oceanic and coastal systems and the potential of distinct policy pathways towards sustainable and equitable interactions with marine environments and their resources. It integrates social and natural science-based analyses which assess oceanic and coastal changes and propose transformative strategies for sustainable human-ocean interactions.

This challenge focuses on the analysis of the combined effects of climate and other drivers of global change on the sustainability of rural landscapes and livelihoods, across many and diverse geographical regions and peoples. It brings together theories and methods across the social sciences to understand how environmental impacts are perceived and managed, and how policies for rural development and environmental conservation perform.

This challenge explores how the production and consumption of goods and services relate to the use of raw materials and energy, the resulting environmental impacts during their lifespan, and how they affect to technological transitions and to human well-being. Novel product inventories which combine Life Cycle Analysis with Material Flow Analysis, and datasets of electronic goods to facilitate re-use and recycling are being developed.

This challenge aims to advance actions and projects for climate-responsive, equitable, and healthy cities and urban systems. It expects to generate new quantitative and qualitative evidence on the effectiveness of urban environmental actions and projects for meeting climate and sustainability goals; on their effect on the urban atmospheric or metabolism of resources; on their social and wellbeing impacts; and on the governance and planning frameworks that can maximize environmental and social goals in a changing climate.

This challenge aims to analyze and advocate for effective and equitable cross-scale policies, institutions, and social responses to address global environmental change. It aims to develop model- and case-based assessments of climate and other sustainability policy instruments, and to investigate how social mobilization or radical policy shifts (e.g., a-growth, or degrowth) can foster a transition towards a more sustainable planet.

Research Groups

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ICTA-UAB's research challenges are addressed by specific research groups (known as SGRs in the Catalan university and research context). These groups share an interest in the study of the causes, mechanisms and impacts of global environmental change, including climate change, the latest interactions with human societies and wellbeing, and the policy and institutional responses necessary for a transition to a sustainable future.

LASEG

Laboratory for the analysis of social-ecological systems in a globalized world

Research group Generalitat de Catalunya 2017-SGR-1588.
Principal investigator:
Victoria Reyes-García.

LASEG aims to better understand how local and indigenous knowledge can contribute to environmental sustainability, and how to better reconcile biodiversity conservation and the provision of ecosystem services with human wellbeing, in both rural and urban settings.

AEROBIOTAS

Aerobiology, atmospheric transport, and health

Research group Generalitat de Catalunya 2017SGR1692.
Principal investigator:
Jordina Belmonte Soler.

AEROBIOTAS focuses its activity on the study of the atmosphere's biological components: pollen and spores of fungi and their allergens and micro-arthropods, and the application of this knowledge to allergology, public health and animal and plant Health.

MERS

Marine and environmental biogeosciences research group

Research group Generalitat de Catalunya 2017-SGR-1588.
Principal investigator: Patrizia Ziveri.

MERS is addressing various environmental biological and geochemical processes regulating the marine and freshwater realms as well as interacting with climate change. Human-induced global and climate change affects society, natural resources and economy around the world and the awareness of their impact has increased considerably in the last decades.

SOSTENIPRA

Sustainability and environmental protection

Research group Generalitat de Catalunya 2017SGR1683.
Principal investigator: Xavier Gabarrell i Durany.

SOSTENIPRA aims to develop, adapt, and apply tools to promote sustainability and environmental protection with a systemic, life cycle approach. Our research focuses on resource management for a circular economy, sustainable food systems, and integrated analysis of urban nature-based solutions.

IMPACTANT

Dynamics of natural systems and the anthropic impacts

Research group Generalitat de Catalunya 2017SGR1320.
Principal investigator:
Joan Villanueva Ribes.

IMPACTANT studies the impact of human activities on the natural environment. The approach we adopt is highly interdisciplinary, combining tools from environmental chemistry, remote sensing, wildlife observation, and citizen science. We bridge the natural and social sciences to study the Earth System from an integrated perspective.

ECOLECON

Ecological Economics

Research group Generalitat de Catalunya 2017SGR1126.
Principal investigator:
Giorgos Kallis.

Ecological economics is the interdisciplinary science of the study of sustainability. Our mission is to develop, apply and disseminate critical knowledge necessary for understanding causes and solutions to environmental problems linking them to economic systems and policies that create or address these problems.

IASTE

Integrated assessment: sociology, technology and the environment

Research group Generalitat de Catalunya 2017SGR230.

Principal investigator: Mario Giampietro.

The overarching research objective of IASTE is to replace the technocratic approach of evidence-based policy with a more effective approach of co-production of knowledge claims to inform policy in the face of uncertainty.

ICTA-UAB's research challenges are addressed by specific research groups (known as SGRs in the Catalan university and research context)

Scientific Advances

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For a complete list of scientific advances, see Annexes

Oceans

This challenge investigates the impacts of global change on oceanic and coastal systems and the potential of distinct policy pathways towards sustainable and equitable interactions with marine environments and their resources. It integrates social and natural science-based analyses which assess oceanic and coastal changes and propose transformative strategies for sustainable human-ocean interactions.

SA.1

Groundwater discharge as a driver of methane emissions from Arctic lakes

Olid, C., Rodellas, V., Rocher-Ros, G., Garcia-Orellana†, J., Diego-Feliu, M., Alorda-Kleinglass, A., Bastviken, D. & Karlsson, J. (2022). Groundwater discharge as a driver of methane emissions from Arctic lakes. Nature communications 13(1), [3667].

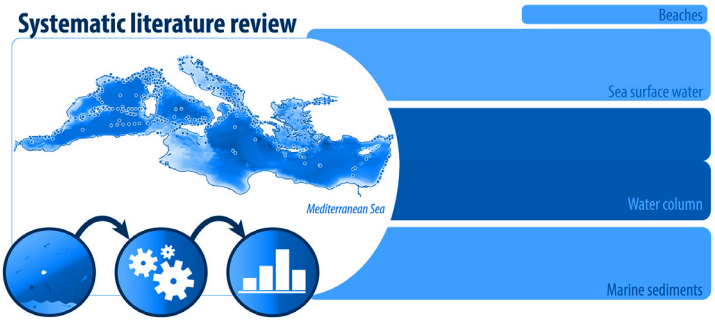
Groundwater that circulates through the subsurface as a consequence of melting permafrost can be a relevant source of methane (gas with a strong greenhouse effect) to Arctic lakes. The groundwater-driven transport of greenhouse gases to lakes culminates with their emission into the atmosphere. In our study, we unravel the important role and drivers of groundwater discharge for CH_4 emissions from Arctic lakes. We showed that the supply of CH_4 from groundwaters to different lakes is primarily related to lake depth and wetland cover. Groundwater CH_4 inputs to lakes are higher in summer than in autumn and are influenced by hydrological (groundwater recharge) and biological drivers (CH_4 production).

This information on the spatial and temporal patterns on groundwater discharge at high northern latitudes is critical for predicting lake greenhouse gas emissions in the warming Arctic, as rising temperatures, increasing precipitation, and permafrost thawing may further exacerbate groundwater CH_4 inputs to lakes.

https://doi.org/10.1038/s41467-022-31219-1

SA.2

Are research methods shaping our understanding of microplastic pollution? A literature review on the seawater and sediment bodies of the Mediterranean Sea



Simon-Sánchez, L., Grelaud, M., Franci, M., & Ziveri, P. (2022). Are research methods shaping our understanding of microplastic pollution? A literature review on the seawater and sediment bodies of the Mediterranean Sea. Environ-mental Pollution, 292, [118275].

The lack of standardization on the definition and methods in microplastic (MP) research has limited the overall interpretation and intercomparison of published data. In the Mediterranean Sea, huge efforts have been dedicated to defining the MP pollution levels.

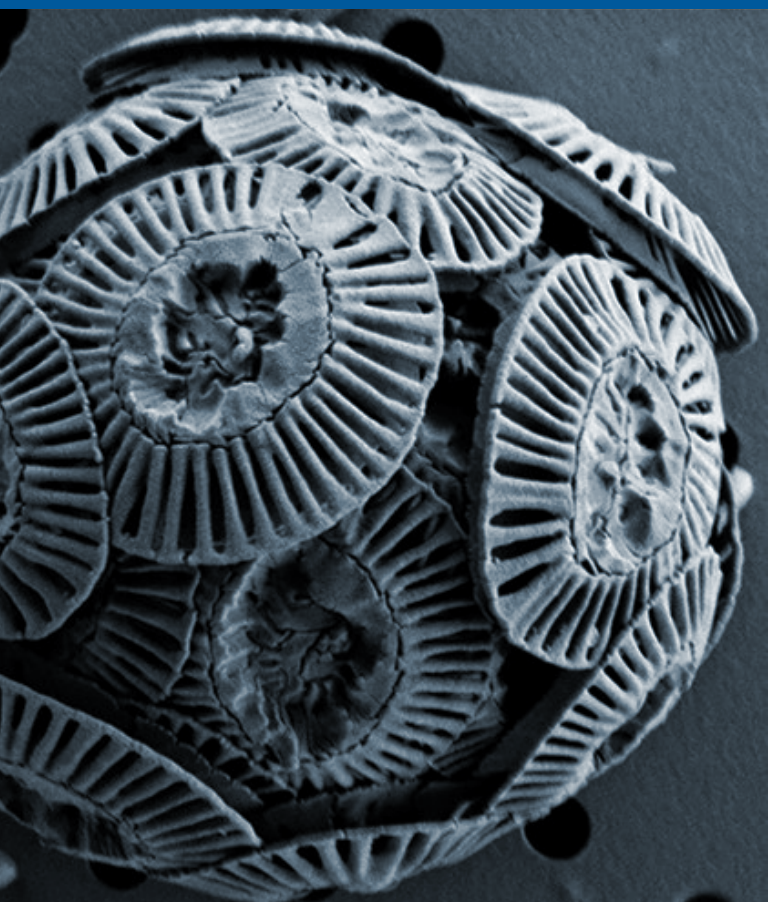
The reported MP concentrations are comparable to those found in the subtropical gyres, making this basin one of the world's greatest plastic accumulation areas.

However, we still know little about a few key questions: To what extent are the data produced limited by the methods? We present the results of a systematic review of MP research methods and occurrence targeting the seawater and sediment bodies of the Mediterranean Sea. We assess the discrepancies and similarities in the methods, analyze how these differences affect the reported concentrations, and identify the limitations of the data produced for the Mediterranean Sea. We reaffirm the pressing need of developing a common reporting terminology, and call for international collaboration, especially with North African countries.

https://doi.org/10.1016/j.envpol.2021.118275

SA.3

Nutritional value of key phytoplankton under climate change scenarios



Coccolithophores are a group of marine phytoplankton, covering themselves with a calcite-organic composite shell of extraordinary complexity (Fig A). Although small, coccolithophores are abundant in most oceans worldwide and contribute significantly to the global carbon cycle. They are also an essential part of the marine food web. It has been realized that climate change associated shifts in e.g. seawater pH and temperature will likely affect coccolithophores. But almost nothing is known about potential effects on grazers such as copepods. Therefore, we conducted a laboratory experiment subjecting the most abundant species E. huxleyi to elevated temperature and low pH, and determined parameters indicating food quantity and quality. Under this climate change scenario food quantity and digestibility increased but food quality decreased. Our results show that the marine food web is susceptible to climate change. The results of this work have been published in Limnology and Oceanography.

Johnson, R., Langer, G., Rossi, S.,Probert, I., Mammone, M. & Ziveri, P. (2022). Nutritional response of a coccolithophore to changing pH and temperature. Limnology and Oceanography, 67(10), 2309-2324.

https://doi.org/10.1002/lno.12204

SA.4

Elucidating historical fisheries' networks in the Iberian Peninsula using stable isotopes

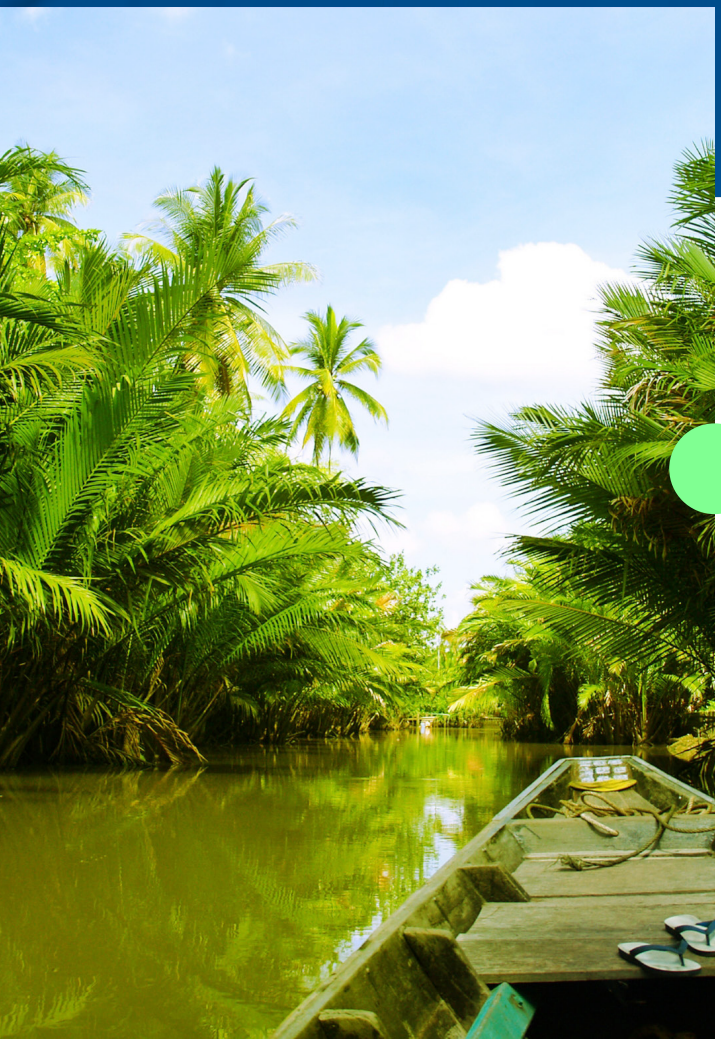
This study examines the supply of different fish in Southern Europe by analyzing archaeological European hake bones through a combined bone metrics and stable isotopic analysis approach. The findings shed light on historical fisheries production systems, regions exploited, and commercial routes, and reveal biological differences between archaeological and present-day hake populations in the North-east Atlantic and the Mediterranean Sea.

The research emphasizes the significance of studying fish remains and historical data to track the origin and development of historical fisheries in south-western Europe and their impact on modern fisheries. This study highlights the crucial role of archaeological and historical records in comprehending the lasting impact of humans on the ocean. The results of this work have been published in Fish and Fisheries.

Llorente-Rodríguez, L., Craig, O. E., Colonese, A. C., von Tersch, M., Roselló-Izquierdo, E., González Gómez de Agüero, E., Fernández-Rodríguez, C., Quirós-Castillo, J. A., López-Arias, B., Marlasca-Martín, R., Nottingham, J., & Morales Muñiz, A. (2022). Elucidating historical fisheries' networks in the Iberian Peninsula using stable isotopes. Fish and Fisheries, 23(4), 862– 873.

https://doi.org/10.1111/faf.12655

Land



This challenge focuses on the analysis of the combined effects of climate and other drivers of global change on the sustainability of rural landscapes and livelihoods, across many and diverse geographical regions and peoples. It brings together theories and methods across the social sciences to understand how environmental impacts are perceived and managed, and how policies for rural development and environmental conservation perform.

SA.1

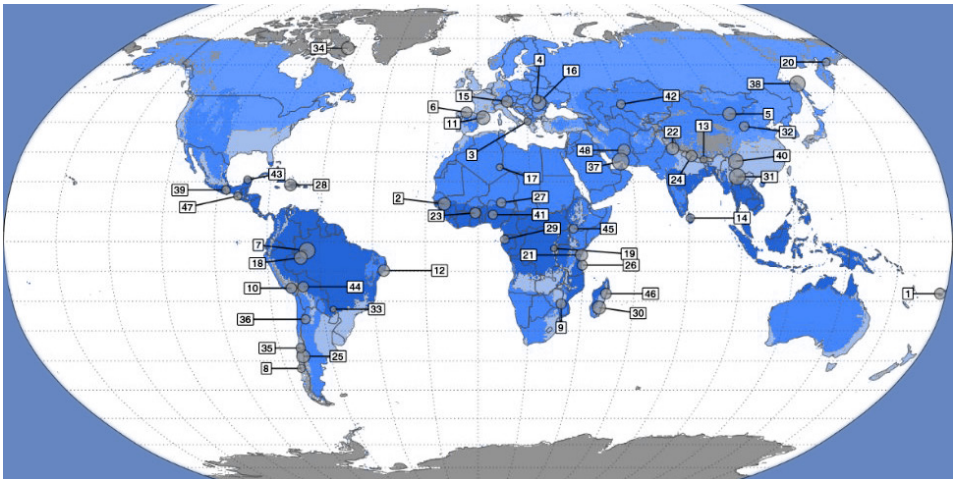
Indigenous Peoples and local communities worldwide report ongoing and widespread climate change impacts on local systems and livelihoods

Koppen-Geiger Climate Zones:

- *Tropical*
- *Arid*
- *Temperate*
- *Snow*
- *Polar*

Number of LICCIs:

- *10*
- *20*
- *40*
- *60*
- *80*

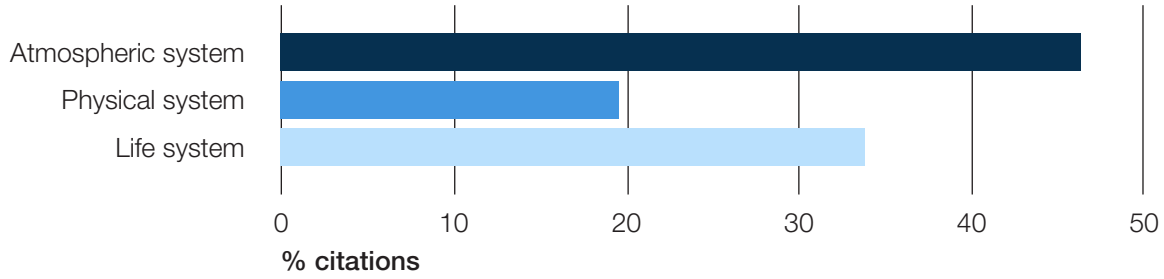


Images by Reyes-García et al., 2023, under review.

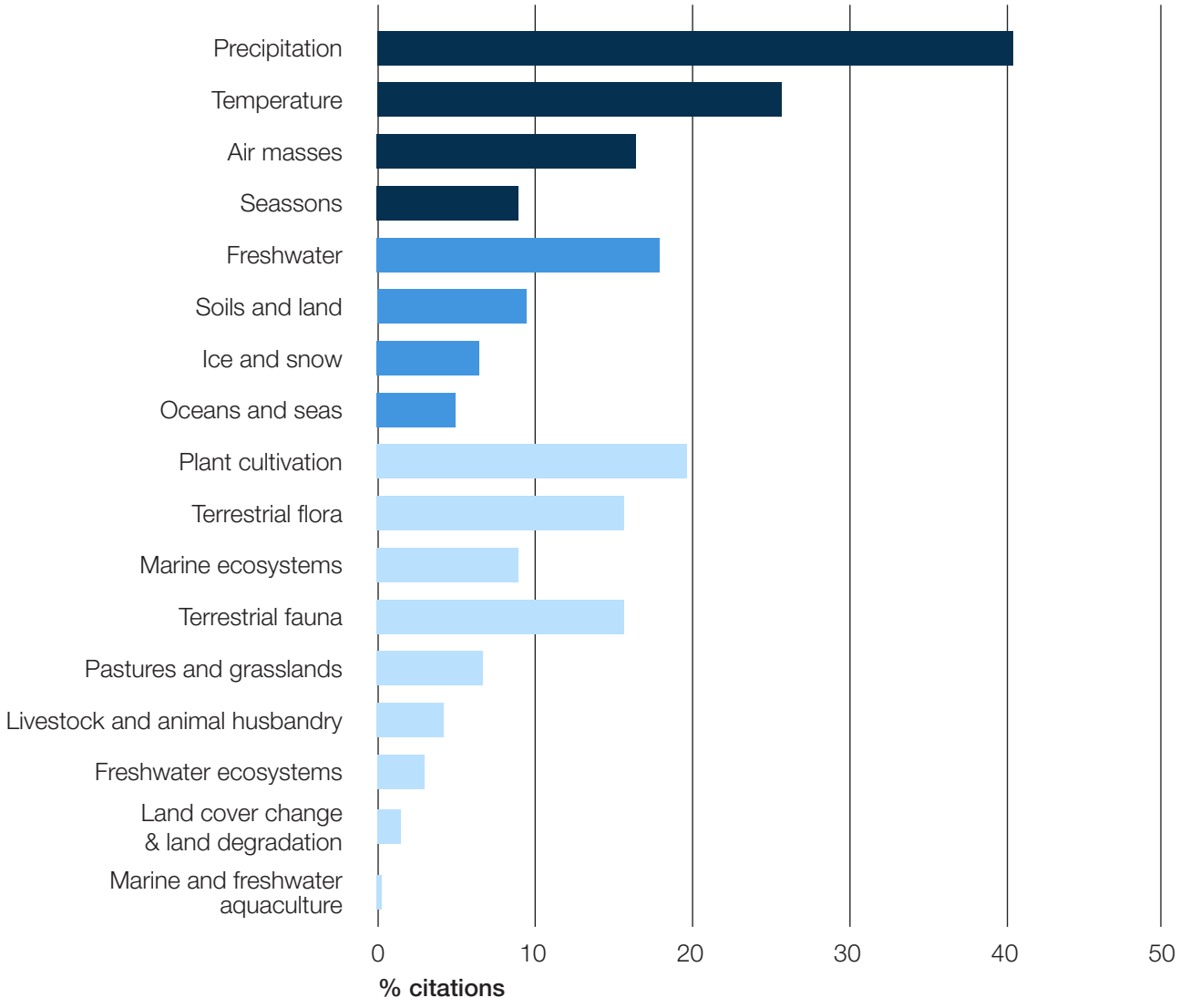
Primary information from 48 sites in all inhabited continents provide detailed evidence that climate change impacts on Indigenous Peoples and local communities are ongoing, tangible, widespread, and affect different elements of their local social-ecological systems. Reports of climate change impacts are dependent on the climate zone and the main livelihood strategy of the community reporting the impacts. Indigenous and local knowledge systems expand our global understanding of climate change impacts and can contribute to the framing of contextualized, as well as global, adaptation plans and interventions. The place-specific but cross-culturally comparable research protocol used in this work contributes to the identification of local economic and noneconomic impacts and losses.

These data could reframe current debates around climate change adaptation policies and strategies that better address localized loss and damage. The results of this work have been submitted for publication to Nature Climate Change.

System



Subsystem



Images by Reyes-García et al., 2023, under review.

SA.2

Climate change impacts cascade across Sierra Nevada social ecological system

Drawing on the knowledge of local communities of Sierra Nevada, a mountainous area of Spain, we identified triggering climate change impacts and their cascading effects. Results show that informants devoted to agricultural and livestock activities perceive more triggering and cascading impacts on their social-ecological system and more relations between them than informants not exclusively devoted to these activities. Changes in elements of the atmospheric and the physical systems trigger most cascading effects, that are primarily felt through changes in elements of the life systems. The results of this work will be published in the Routledge Handbook of Climate Change Impacts and Adaptation Strategies of Indigenous Peoples and Local Communities.

We identified triggering climate change impacts and their cascading effects

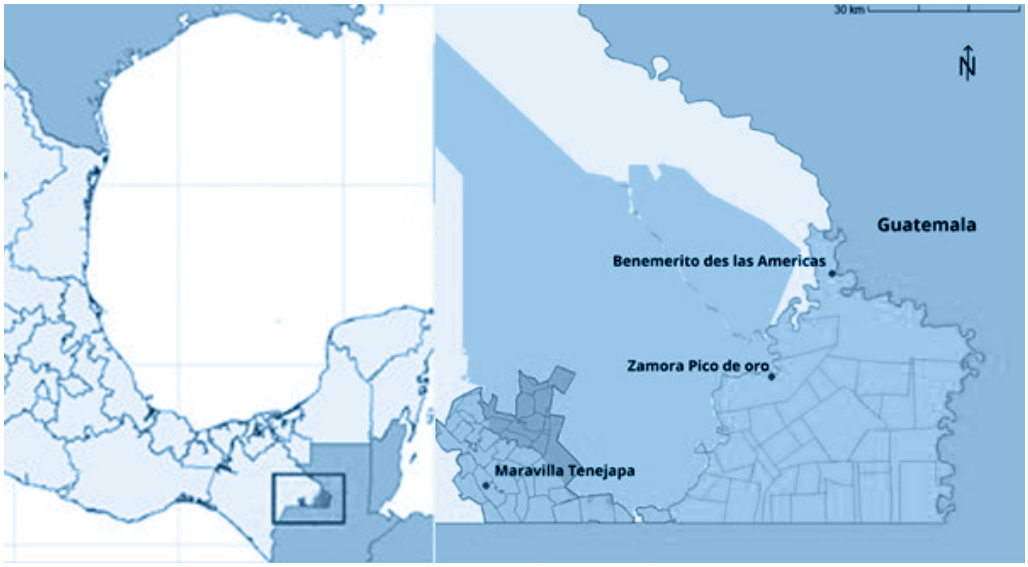
SA.3

Long-term economic incentives for conservation pay-off to avoid deforestation

Payments for Ecosystem Services (PES) have become a mainstream policy for biodiversity and forest conservation

Over the last few decades, Payments for Ecosystem Services (PES) have become a mainstream policy for biodiversity and forest conservation. In PES, stewards of natural resources and forests, including rural communities and landowners, receive economic payments in exchange of measurable conservation outcomes. The short-term effects of PES on deforestation are well documented, but we know less about program effectiveness when participation is sustained over time. In this study, we have assessed the impact of consecutive renewals of PES contracts on deforestation and forest degradation in three municipalities of Mexico's Selva Lacandona, the country's largest remaining patch of high-canopy tropical rainforest and one of its most biodiverse and threatened regions. We have found that PES reduced deforestation both after a single 5-year contract and after two consecutive contracts, but the impacts are only detectable in higher deforestation-risk parcels. Enrollment duration increases PES impact in these parcels, which suggests a positive cumulative effect over time. Payments, however, have not significantly reduced forest degradation, i.e., the slow removal of biomass in conserved forests. These findings suggest that improved spatial targeting and longer-term enrollment in PES are key enabling factors to improve forest conservation outcomes in agricultural frontiers and align with increasing calls for a conservation basic income. This work has been submitted for review in PLOS One.

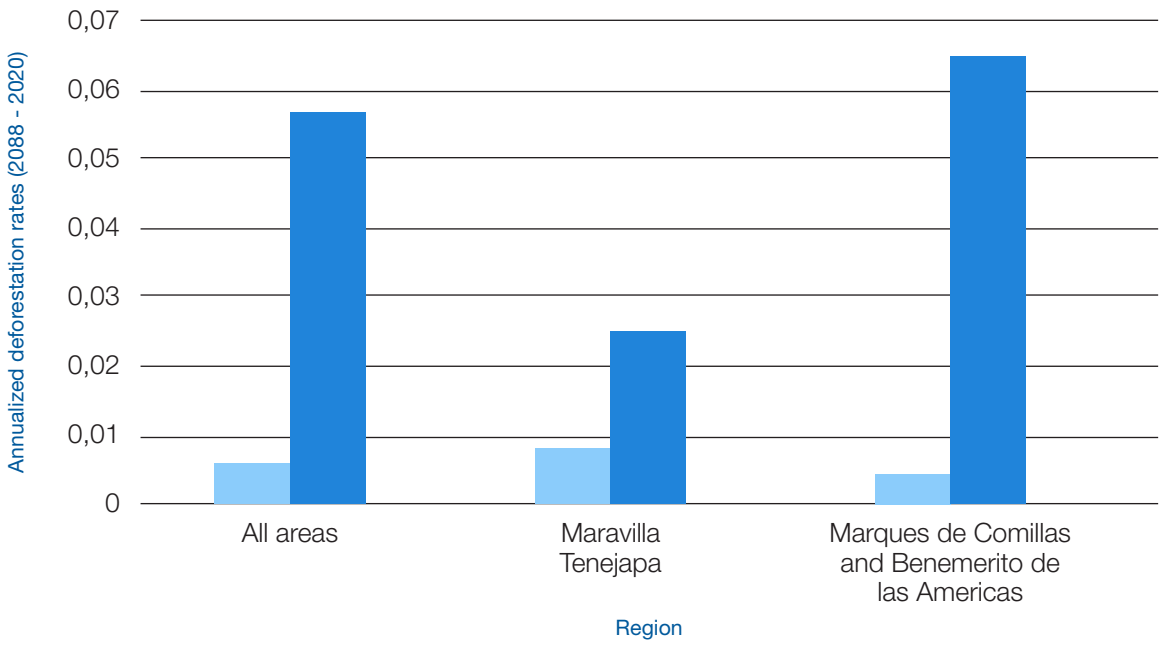
The three municipalities studied in the Selva Lacandona, Mexico



Study Site:

- *Maravilla Tenejada*
- *Marques de Comillas and Benemerito des las Americas*
- *Protected area*
- *Main population center of each municipality*

Annualized deforestation rates in the three regions between 2008 and 2020 in treated and untreated areas



Zone:

- *Treated*
- *Untreated*

Images by Hugo Charoud et al. (under review).

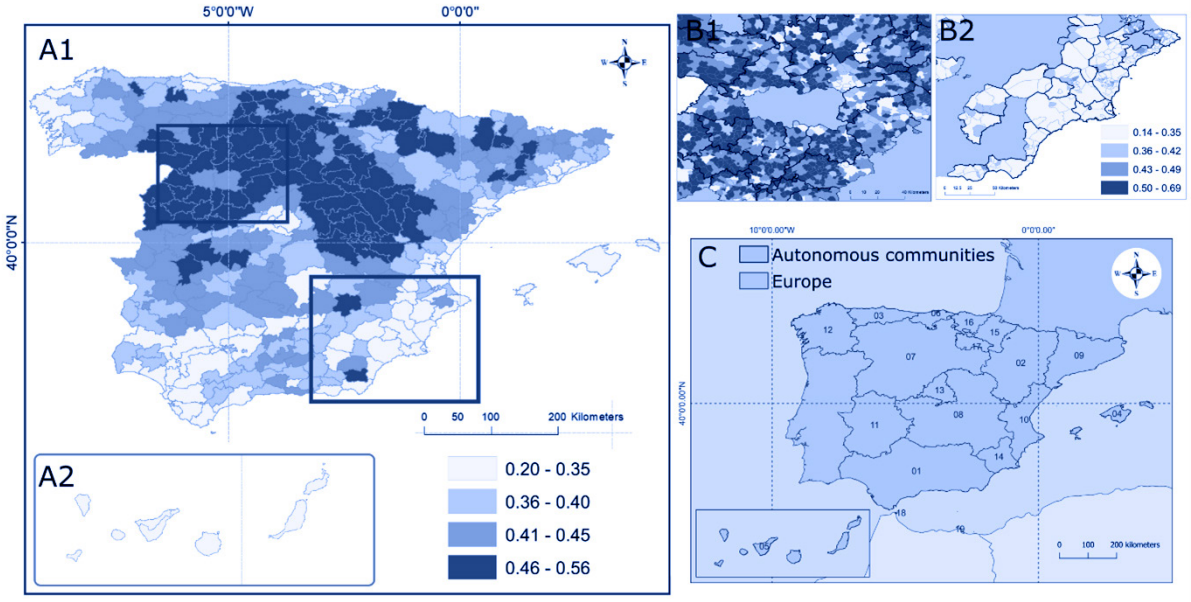
Caption: During PES contracts deforestation remained low in enrolled areas but was very important in unenrolled parcels.

SA.4

Vulnerability to climate change, depopulation and globalization in rural Spain

Rural areas in Spain are experiencing unprecedented environmental and social changes. Three of the main stressors that rural regions in Spain are facing include depopulation, climate change and biodiversity loss. Qualitative, local accounts of their compounded effects exist, but these are not sufficient if the goal is to promote social and policy learning across local contexts. The ICTA-UAB SEVERAS project (Villamayor-Tomas, Corbera, Gaitán-Cremaschi Pierri-Daunt, Lima) moves beyond qualitative accounts of vulnerability by developing a quantitative Socio-environmental vulnerability index. The index currently integrates data on 27 variables, which were selected based on a thorough literature review and a Spanish-wide survey to 173 rural development practitioners and academics.

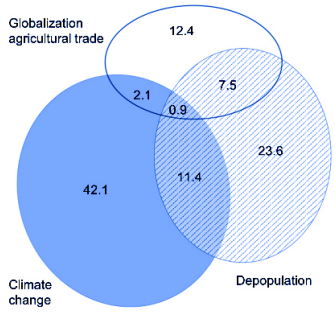
Distribution of vulnerability index across Spanish countries (A1) and municipalities (B1 and B2)



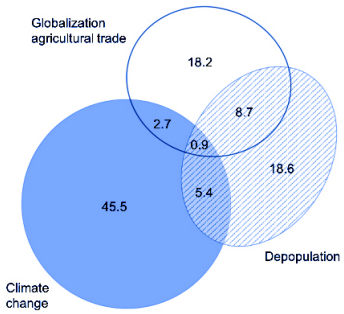
Although the counties within Castilla y León, Castilla la Mancha and Navarra have the highest vulnerability scores, there is large heterogeneity when vulnerability is looked at the municipal level. Even within the highest vulnerability counties in those regions we find municipalities with both very low and very high vulnerability.

Share (%) of the rural, rural remote and rural accessible areas that are most impacted (top quartile) by different stressors and their combinations.

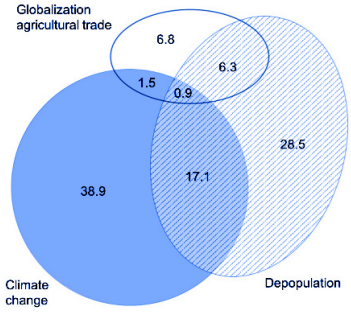
RURAL (%)



ACCESSIBLE RURAL (%)



REMOTE RURAL (%)



Note

Rural remote: dominated by agricultural/forest land use, low population density and low density of transport infrastructure.

Rural accessible: similar to remote but with denser transport infrastructure.

SA.5

Moving towards more integrative rural development policies

Rural development policies have notably evolved in the last decades from a narrow understanding of rural development in economic terms (e.g. productivity and efficiency) to a broader attention to both economic as well as social inclusiveness and environmental matters (e.g. ecological sustainability and social equity). In the European context, such progressive shift has been partly facilitated by the LEADER program, which has been the main source of rural development funding over the last 25 years. However, concerns have been raised about the ability of the LEADER program to spark more sustainable development alternatives.

The SEVERAS project and the also ICTA-UAB led SUSTAIN project (Villamayor-Tomas, Corbera) address this issue with an eye on the coupled challenge of dealing with climate change, depopulation and the globalization of agricultural markets. Results from 4 participatory scenario workshops with local stakeholders in two highly vulnerable counties in Spain (Boedo-Ojeda, in Castilla León; and Segarra, in Cataluña) point to a diversity of short-term recommendations that could address several of the abovementioned threats. Those include promoting and diversify housing models through, e.g., housing cooperatives or use concessions; promoting local energy communities; implement a national food plan that aims to produce food to be consumed in short circuits; promote environmental education in regular courses at school; or create general and sectorial regional forums to encourage collaboration and the exchange of visions and innovations. Longer term recommendations include promoting rural schools and knowledge; social housing; small scale food transformation facilities; and observatory of rural development; or specific legislation for rural areas.

Participatory scenario workshop session (Boedo-Ojeda, Castilla León).

Consumption

This challenge explores how the production and consumption of goods and services relate to the use of raw materials and energy, the resulting environmental impacts during their lifespan, and how they affect to technological transitions and to human well-being. Novel product inventories which combine Life Cycle Analysis with Material Flow Analysis, and datasets of electronic goods to facilitate re-use and recycling are being developed.

SA.1

Quantitative Storytelling: Unveiling uncomfortable knowledge and implausible socio-technical imaginaries

Quantitative storytelling is a novel approach developed within the Post-Normal Science paradigm. Rather than compiling 'evidence' in support of a 'best course of action', quantitative storytelling operates 'via negativa'; it tests various non-equivalent problem framings on their congruence with quantitative analytical checks. In this way, it considers different concerns, hopes, and scales and dimensions of analysis. More than 20 papers advancing and applying quantitative storytelling have been published over the past three years, most of them using a dedicated analytical toolkit, Multi-Scale Integrated Analysis of Societal and Ecosystem Metabolism (MuSIASEM), also developed within this research line. A recent paper summarizing the findings of quantitative storytelling in the policy domain of energy and climate change concludes that the idea of a smooth and painless transition to a zero-carbon economy can only persist by virtue of banishing uncomfortable knowledge and the creation of implausible socio-technical imaginaries.

Giampietro, M., & Bukkens, S. G. F. (2022). Knowledge claims in European Union energy policies: Unknown knowns and uncomfortable awareness. Energy Research and Social Science, 91, [102739].

https://doi.org/10.1038/s41467-022-31219-1

SA.2

Multi-Scale Integrated Analysis of Societal and Ecosystem Metabolism (MuSIASEM): An analytical framework characterizing the metabolic pattern of social-ecological systems

Recent advances in MuSIASEM permit to characterize the desirability of social practices, their technical and economic viability, their ecological compatibility, and their dependence on imports. To this purpose it proposes the use of non-equivalent quantitative representations, adopting different 'lenses':

(i) FEELINGSCOPE: indicators referring to the perceptions of the affective interactions associated with the social practices expressed in society;

(ii) MACROSCOPE: indicators of the technical and economic viability of actual or proposed policies;

(iii) MESOSCOPE: indicators reflecting the openness of the metabolic pattern (dependency of local consumption on imports);

(iv) MICROSCOPE: looking at the requirements of both inputs under human control and environmental services from embedding ecosystems;

(v) VIRTUALSCOPE: estimating the stress externalized to other social-ecological systems (through imports). Recent results show that the EU economy is heavily dependent on imported labor and energy and could not possibly internalize the production of the agricultural commodities that it is currently importing.

SA.3

FoodE App to mobilize and interconnect users and stakeholders in sustainable City-Region Food Systems

The FoodE App is a major outcome of the Foode project, aimed at easing citizen active engagement in identifying, monitoring and assessing City-Region Food Systems (CRFS) initiatives. This tool provides a Map of CRFS initiatives, Users feedback, Reward consumers or users, and a Scoring of its sustainability. Each CRFS is scored and ranked based on two different parameters: the Simplified Sustainability Score and the Customer's Score.

Sustainability performance includes the social, economic and environmental dimensions calculated from previous information.

ICTA-UAB researcher and PI of the FoodE App, Xavier Gabarrell, has noted that 'now the community of local food is growing, and this application will be the floor to meet them'.

The "FoodE App" is available for Android and iOS devices by searching "FoodE App" in the Play Store (Android devices) and the App Store (iOS devices) or through the landing page at

https://foode.sostenipra.cat/

Cities

This challenge aims to advance actions and projects for climate-responsive, equitable, and healthy cities and urban systems. It expects to generate new quantitative and qualitative evidence on the effectiveness of urban environmental actions and projects for meeting climate and sustainability goals; on their effect on the urban atmospheric or metabolism of resources; on their social and wellbeing impacts; and on the governance and planning frameworks that can maximize environmental and social goals in a changing climate.

SA.1

Greenhouse Gas Monitoring Network of the Metropolitan Area of Barcelona

We are currently in the process of implementing a GHG monitoring network of the Metropolitan Area of Barcelona

We are currently in the process of implementing a GHG monitoring network of the Metropolitan Area of Barcelona, which so far consists of four online-gas analyzers (CO_2/CH_4/H_2O PICARRO analyzer G-2301) in four different locations chosen to capture the heterogeneity of the AMB and various forms of land-use:

- urban forest (Observatori Fabra),
- the coastline for land-sea interaction (ICM),
- an urban park amidst highly built area (IDAEA at the UPC campus),
- and densely-used highway in outskirts of the city (ICTA at UAB campus).

We will soon be implementing one more station to capture agriculture land use, close to the delta of the Llobregat river as well as several CO_2 sensors to complement the online gas analyzers.

The data is already of public access and will soon be able to be downloaded directly from an online platform.

SA.1

Telecommuting improves air quality

The main conclusion of this study:

Implementing the telework system two, three and four days per week would reduce NO_2 dioxide levels

We investigate how effective various strategies are in improving air quality, such as green infrastructure, teleworking or low emission areas. Mobility restrictions due to the COVID pandemic forced many people to work from home, which increased telecommuting and improved air quality in cities. Based on this exceptional situation, we carried out a large-scale pilot study that allows us to reflect on the lessons learned during confinement in terms of reducing air pollution. The main conclusion of this study, published in the NPJ Urban Sustainability (Badia et al., 2021), is that implementing the telework system two, three and four days per week would reduce NO_2 dioxide levels, the main related pollutant with traffic emissions, of 4%, 8% and 10%.

SEVERE LOCK-DOWN	MEDIUM CONFINEMENT	LOW CONFINEMENT
75%	50%	25%

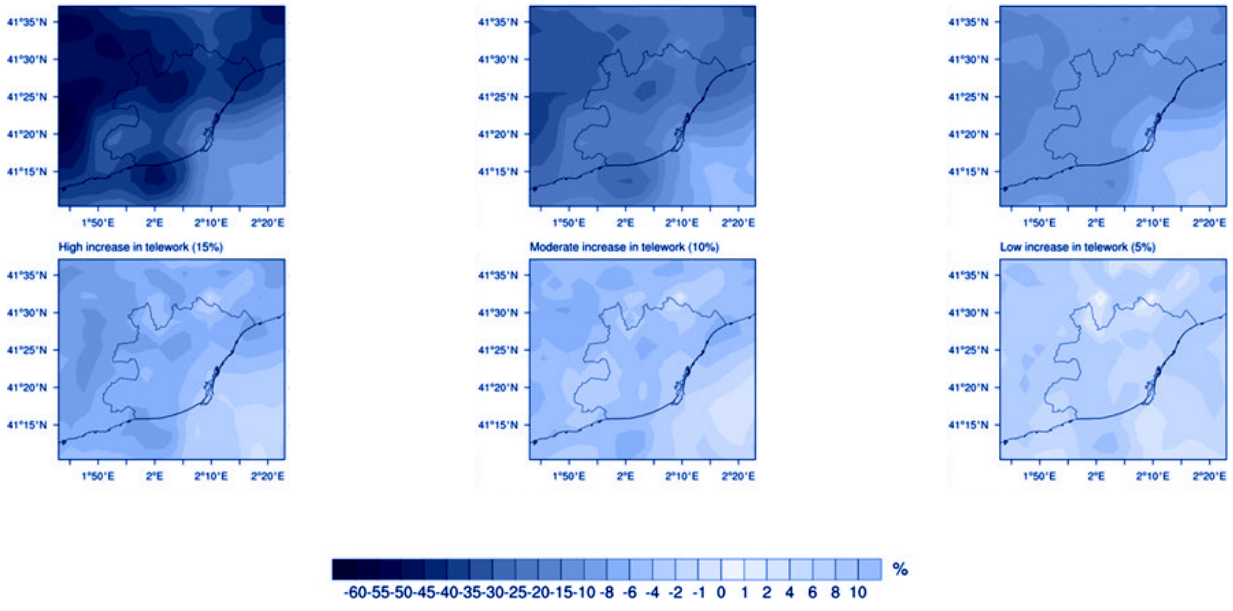


Figure: Difference (in %) in NO_2 concentrations between the base case and each scenario during typical morning high pollution peak hours (7–9 h) in the Metropolitan Area of Barcelona for March 2016 (only weekdays days Monday–Friday) from Badia et al., 2021.Badia, A., Langemeyer, J., Codina, X., Gilabert, J., Guilera, N., Vidal, V., Segura, R., Vives, M. & Villalba, G. (2021). A take-home message from COVID-19 on urban air pollution reduction through mobility limitations and teleworking. NPJ Urban Sustainability 1, 35.

https://doi.org/10.1038/s42949-021-00037-7

SA.3

Agricultural perspectives in the Metropolitan Area of Barcelona: results from co-creating desired scenarios and the pathways to achieve them

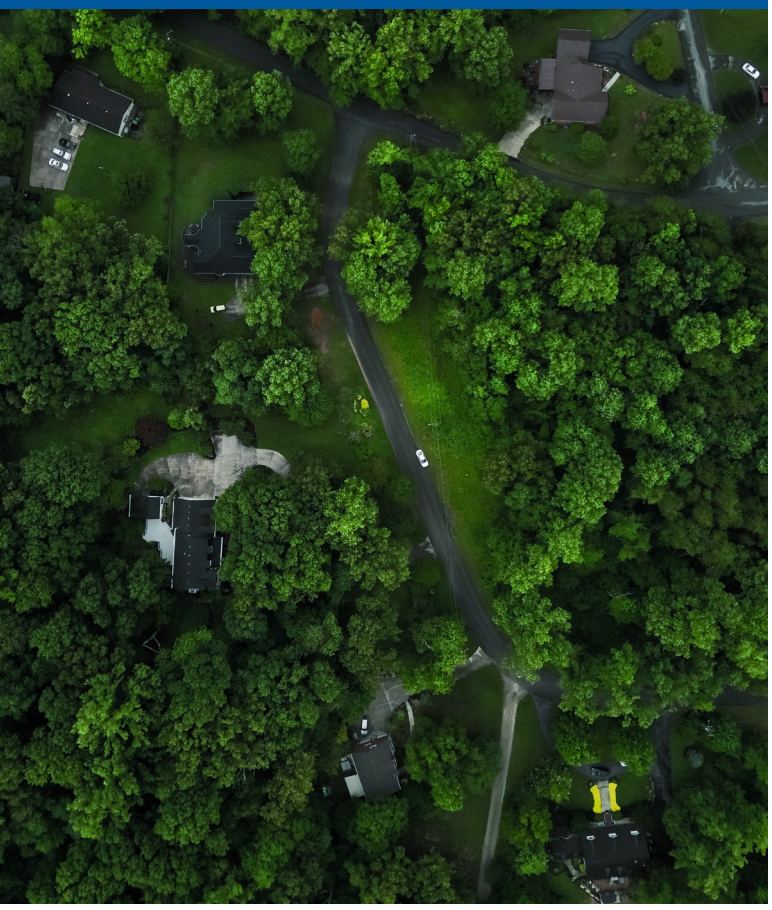
The agricultural land of the Metropolitan Area of Barcelona

has been reduced from 20% to 8-9% over the past decades

The agricultural land of the Metropolitan Area of Barcelona has been reduced from 20% to 8-9% over the past decades, despite urban gardening being supported by municipal actions. Urban agriculture constitutes a nature-based solution to several societal challenges, not least in the context of global climate change, related heat events, and enhanced food security. To better understand the limitations and obstacles that urban agriculture has been facing, and the way to move forward to successfully alter the decline of agricultural lands, a co-creation workshop was organized by ICTA-UAB for its discussion between a variety of stakeholders related to the field (public, academic, private). Obstacles to urban agriculture were described in four categories: sociopolitical (e.g., globalization, lack of knowledge of agricultural benefits and lack of agricultural labor), normative (e.g., lack of knowledge of local geography and territoriality and outdated legal framework that does not prioritize agricultural benefits), economic (e.g., economic uncertainty of the agricultural activity, high level of competition with agricultural products from other localities) and infrastructure/ technology (e.g., little land available for farming, few public services for farmers and outdated technologies).

SA.4

Green gentrification in European and American cities



Although urban greening is universally recognized as an essential part of sustainable and climate-responsive cities, a growing literature on green gentrification argues that new green infrastructure, and greenspace in particular, can contribute to gentrification, thus creating social and racial inequalities in access to the benefits of greenspace and further environmental and climate injustice.

In response to limited quantitative evidence documenting the temporal relationship between new greenspaces and gentrification across entire cities, let alone across various international contexts, we employ a spatially weighted Bayesian model to test the green gentrification hypothesis across 28 cities in 9 countries in North America and Europe. Here we show a strong positive and relevant relationship for at least one decade between greening in the 1990s-2000s and gentrification that occurred between 2000-2016 in 17 of the 28 cities.

Our results also determine whether greening plays a “lead”, “integrated”, or “subsidiary” role in explaining gentrification

Anguelovski, I., Connolly, J. J., H, C., Garcia Lamarca, M., Triguero-Mas, M., Baró, F., Martin, N., Conesa, D., Shokry, G., Pérez del Pulgar, C., Arguelles Ramos, L., Matheney, A., Gallez, E., Oscilowicz, E., López Máñez, J., Sarzo, B., Beltrán, M. A., & Martínez Minaya, J. (2022). Green gentrification in European and North American Cities. Nature Communications, 13(1), [3816].

https://doi.org/10.1038/s41467-022-31572-1

Policies

This challenge aims to advance actions and projects for climate-responsive, equitable, and healthy cities and urban systems. It expects to generate new quantitative and qualitative evidence on the effectiveness of urban environmental actions and projects for meeting climate and sustainability goals; on their effect on the urban atmospheric or metabolism of resources; on their social and wellbeing impacts; and on the governance and planning frameworks that can maximize environmental and social goals in a changing climate.

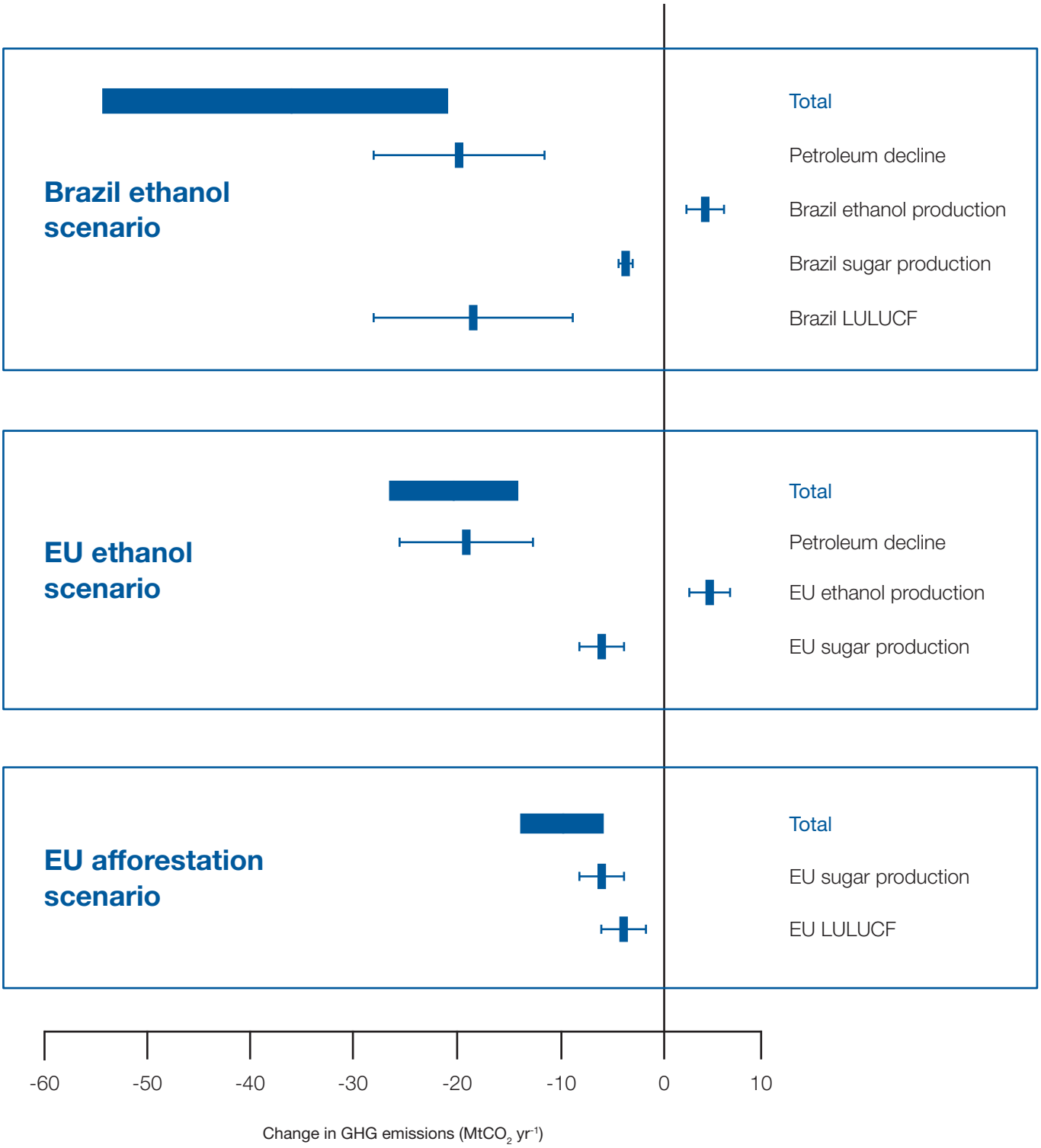
SA.1

Sugar taxation to simultaneously combat climate change, deforestation and health risks

The study highlights that sugar taxation has the potential to meet apparently competing objectives. The reason is that sugar is one of the worst foods to eat from a health perspective while especially sugarcane has great potential for biofuel production.

The starting point is that the EU implements a sugar tax to reduce EU-wide sugar use, both in consumption and production, such as of beverages. Three scenarios are then explored, namely the EU reforesting its existing sugar cropland, the EU switching its sugar beet crops to ethanol production, and the EU exporting its excess sugar production to meet worldwide demand while another main exporter, namely Brazil, switches its sugarcane crops from sugar to ethanol production.

As visualized in the figure, calculations indicate that emissions could fall by 20.9–54.3 $MtCO_2e$ per year under the latter scenario. These savings would be double to four times those from the other scenarios. In line with these findings, the study recommends that the EU and Brazil strike an agreement in which the EU concentrates on sugar production from sugar beet for the global sugar market while Brazil focuses on producing ethanol from sugarcane. This would provide the greatest environmental benefits to society. Sugarcane ethanol production has already proved to be an economically viable alternative to sugar in Brazil and is more efficient than ethanol production from sugar beet. An additional advantage is that the economic impact on farmers in both the EU and Brazil would be minimal, limiting potential social resistance against the plan.



King, L.C. & van den Bergh, J. (2022). Sugar taxation for climate and sustainability goals. Nature Sustainability, 5.

https://doi.org/10.1038/s41893-022-00934-4

SA.2

A low-carbon energy transition may result in substantial emissions

This study shows that the process of transitioning to a low-carbon energy system could lead to significant global emissions, consuming much of the remaining carbon budget, and thus leaving less emissions for socio-economic processes and activities than widely thought.

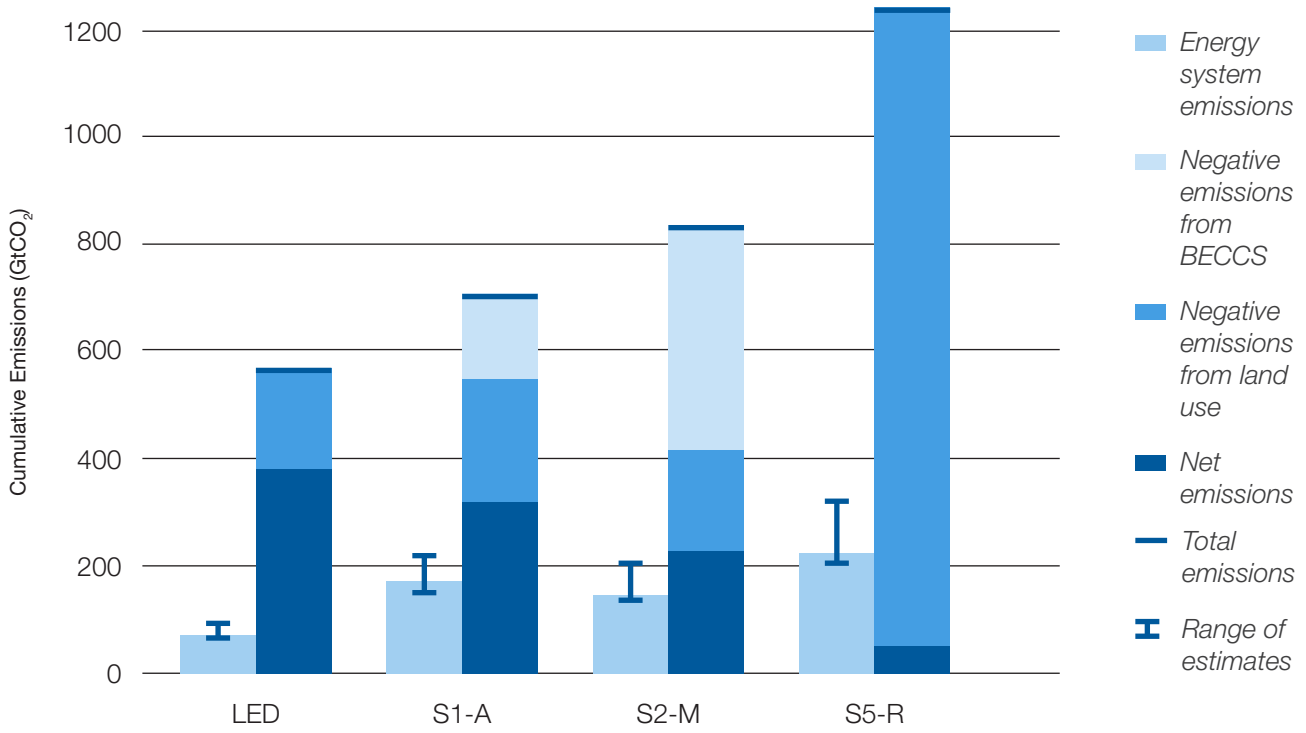
The researchers calculate that the emissions associated with the transition range from 70 $GtCO_2$ to 395 $GtCO_2$, which roughly corresponds to 2-11 times of the world's total emissions in 2021.

The average emissions associated with a low-carbon energy transition amount to 195 gigatonnes of CO_2, which equals approximately 0.1 °C of additional global warming.

Interestingly, the study finds that while the energy emissions associated with decarbonization are significant, the benefits of decarbonization still far outweigh the costs. The faster economies can decarbonize and reduce energy use, the better. As the study shows also, not all scenarios of a low-carbon energy transition are alike. Scenarios with low energy use and lots of renewable energy have much lower emissions associated with the transition. Other scenarios, however, that continue relying on fossil fuels, in the hope of sucking carbon out of the atmosphere later in this century, have a lot of emissions linked to the transition. In contrast to what has been argued in previous studies, the authors find that a low-carbon energy transition would not necessarily reduce the efficiency of energy provisioning.

Energy system emissions for each of the four 1.50 °C illustrative pathways.

https://www.nature.com/articles/s41467-022-33976-5



Energy system efficiency declines in scenarios that rely on biofuels and fossil fuels with carbon capture and storage but remains stable or even increases in scenarios that push for renewable energy. Overall, this study marks a major contribution as it shows that any viable pathway for avoiding dangerous climate change requires a decrease in energy use during the initial push for the transition. Continued growth in energy consumption is simply incompatible with the goal of a safe climate.

Any viable pathway for avoiding dangerous climate change requires a decrease in energy use during the initial push for the transition

SA.3

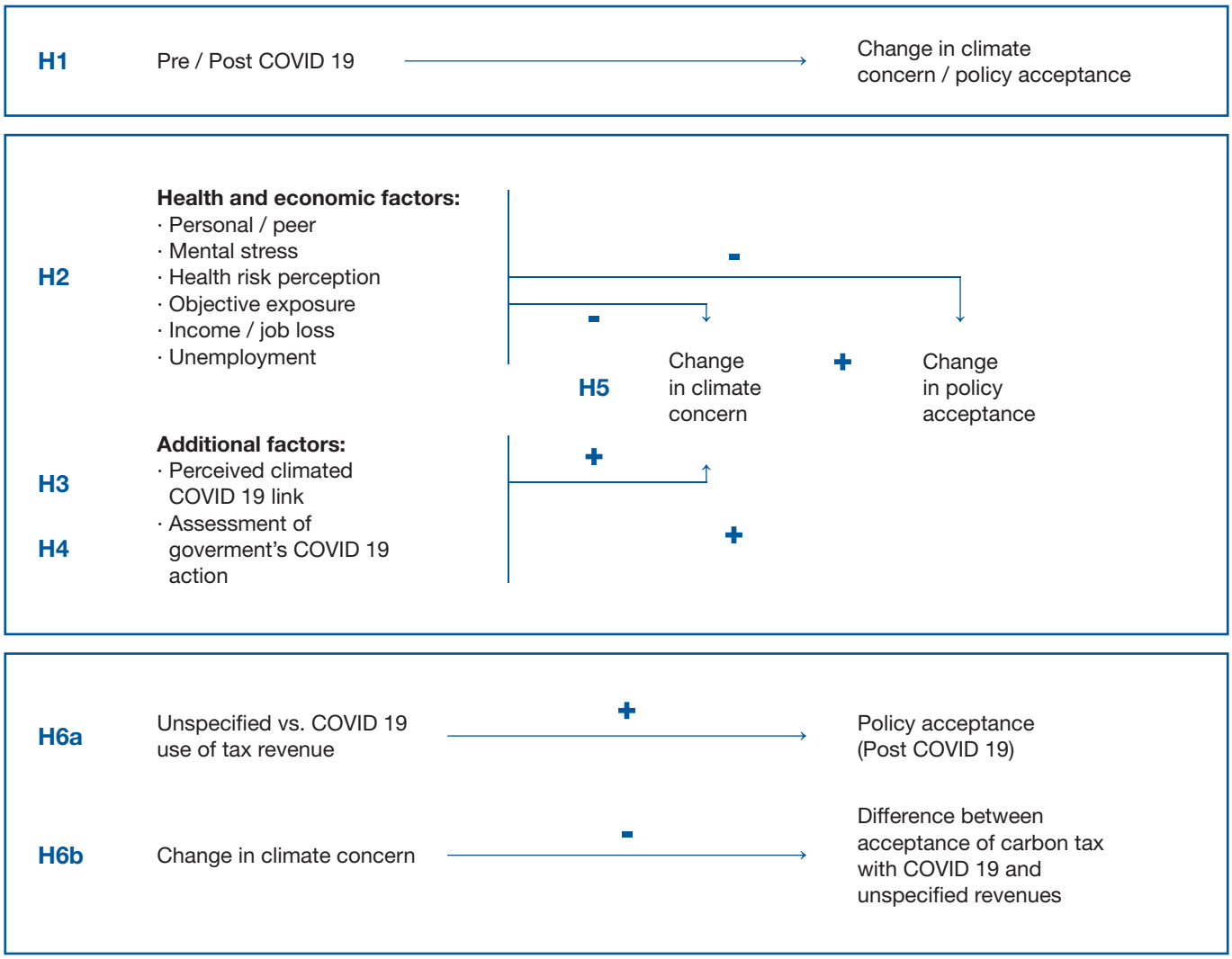
Climate concern and policy acceptance before and after COVID-19

During pandemic the climate concern decreased, and acceptance of climate policy increased

Just before the outbreak of COVID-19, we undertook a survey about public acceptability of climate policy in Spain. We decided to repeat this with additional questions about the pandemic. We find (N=1172) that climate concern decreased, and acceptance of climate policy increased. While adverse health experiences are unrelated, unemployment reduced acceptance. Moreover, higher policy acceptance is associated with a positive opinion about how the government addressed the COVID-19 crisis.

A related study used computational linguistics to derive patterns in the responses to open-ended questions. It finds more optimism about future climate action by citizens than by the government.

Positive views express opportunities to increase pro-environmental behavior, common among younger, higher educated and male respondents and those who positively assessed COVID-19 confinement. Negative views express that financial resources for climate action will be limited due to a focus on healthcare and economic recovery, and that government mismanagement impedes effective climate action.



Drews, S., Savin, I.,van den Bergh, J. & Villamayor, S. (2022). Climate concern and policy acceptance before and after COVID-19. Ecological Economics, 199, [107507].

https://doi.org/10.1016/j.ecolecon.2022.107507

Savin, I., Drews, S.,van den Bergh, J. & Villamayor, S. (2022). Public expectations about the impact of COVID-19 on climate action by citizens and government. PLOS One, 17(6), e0266979.

https://doi.org/10.1371/journal.pone.0266979

New Projects in 2022

8

Our funding comes from a variety of sources. Most of our projects are funded by EU collaborative or European-Council grants, with a substantial part of our research budget also coming from competitive calls launched by Spanish, Catalan, and Barcelona public funding agencies.

Projects awarded during 2022
(chronological order by awarded date)

Maintenance of the sampling stations of Camp de Tarragona and Terres de l'Ebre of the Xarxa Aerobiològica de Catalunya (XAC) and the necessary personnel to perform the measurements of pollen and atmospheric spores in 2022.

Jordina Belmonte Soler

Diputació de Tarragona: 15.000,00 €

1/01/22 → 31/12/22

NICHES: Nature's Integration in Cities' Hydrologies, Ecologies and Societies.

Johannes Langemeyer

Ministerio de Ciencia e Innovación: 201.202,81 €

1/04/22 → 31/03/25

Effects of temperature and air pollution on mental health in Barcelona and its metropolitan area considering sociodemographic and geographical inequalities.

Isabelle Anguelovski

Ajuntament de Barcelona, Fundació "La Caixa", Fundació Institut per a la recerca a l'Atenció Primària Jordi Gol i Gurina (IDIAPJGol): 14.634,14 €

19/05/22 → 18/11/23

BICIZEN: Empowering urban cyclists through citizen science.

Jordi Honey Rosés

European Commission: 100.000,00 €

1/06/22 → 31/05/23

RIDaGoP: Research on Indigenous Data Governance Protocols: A toolkit for working with Indigenous Knowledge.

Victoria Reyes-García

European Commission: 150.000,00 €

1/07/22 → 31/12/23

CLIMATEWEALTH: Young people's perceptions of carbon inequality and demand for policy interventions.

Stefan Drews

Fundació "La Caixa": 3.630,00 €

12/07/22 → 30/09/22

MOVE4EDU: Modular ventilation system integrated with urban food production in educational buildings: Exploring the indoor CO2 generation from respiration for sustainable food production.

Xavier Gabarrell i Durany

Ministerio de Ciencia e Innovación: 145.200,00 €

1/09/22 → 31/08/25

PACHAMAMA: Paleodietary analyses of the first Andean cities: high-resolution assessment to macronutrients using a multiproxy approach.

André Colonese

European Commission: 181.152,95 €

1/10/22 → 30/09/24

JustWind4All: Just and effective governance for accelerating wind energy.

Cristina Madrid López

European Commission: 2.786.907,80 €

1/11/22 → 31/10/25

CONDJUST: Conservation Data Justice.

Dan Brockington

European Commission: 2.491.924,00 €

1/12/22 → 31/10/27

CRONUS: Capture and Reuse Of biogenic gases for Negative-emission - sustainable biofUelS.

Gonzalo Gamboa Jiménez

European Commission: 4.390.894,50 €

1/12/22 → 31/08/26

STEPP: Social Transport Equity by Planning for Proximity.

Oriol Marquet Sardà

Fundació "La Caixa": 97.470,00 €

1/12/22 → 30/11/24

BINAFET: Building Integrated Agriculture for an effective ecological transition. Local resources use.

Xavier Gabarrell i Durany

Ministerio de Ciencia e Innovación: 172.500,00 €

1/12/22 → 30/11/24

ETOS: Assessing the environmental externalization of the sustainable energy transition in Open Source.

Cristina Madrid López

Ministerio de Ciencia e Innovación: 155.250,00 €

1/12/22 → 30/11/24

SUSTAIN: Leading Sustainability Transitions in Rural Spain.

Sergio Villamayor Tomás

Ministerio de Ciencia e Innovación: 194.120,00 €

1/12/22 → 30/11/24

Individual fellowships and mobility grants

ICTA-UAB Researchers at different career stages are funded by international, Spanish and Catalan research agencies.

Senior

TALENT 2021
Laura Talens Peiró

Universitat Autònoma de Barcelona (UAB): 76.263 €
1/04/22 → 31/03/25

TALENT 2021
Helen Cole

Universitat Autònoma de Barcelona (UAB): 76.263 €
23/05/22 → 22/05/25

ICREA SENIOR 2022
Dan Brockington

Institució Catalana de Recerca i Estudis Avançats
1/12/22 → 31/12/30

Postdoc

MARGARITA SALAS 2022
Giulia Mattalia

Ministerio de Universidades: 79.100,00 €
30/12/22 → 29/12/24

Predoc

FI. Stéphanie Birnstiel

Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR): 69.508,40 €
1/05/22 → 30/04/25

FI. Ana Villán Delgado

Agència de Gestió d'Ajuts Universitaris i de Recerca (AGAUR): 69.508,40 €
1/05/22 → 30/04/25

Predoc

CONTRATO PARA FORMACIÓN DE DOCTORES FPI

James Morrison

Ministerio de Ciencia e Innovación: 99.260,00 €

1/10/22 → 30/09/26

CONTRATO PARA FORMACIÓN DE DOCTORES FPI

Anh-Thu Nguyen

Ministerio de Ciencia e Innovación: 99.260,00 €

1/11/22 → 31/10/26

CONTRATO PARA FORMACIÓN DE DOCTORES FPI

Arturo Lucas Forcadell

Ministerio de Ciencia e Innovación: 99.260,00 €

1/12/22 → 30/11/26

Mobility grants

ECIU RESEARCHERS MOBILITY FUND

Oriol Marquet Sardà

European Commission: 2.232,00 €

24/08/22 → 31/08/22

JOSÉ CASTILLEJO 2021

Helen Cole

Secretaría General de Universidades: 11.015,00 €

1/10/22 → 31/12/22

Research contracts

ICTA-UAB researchers have also received support from a variety of private and public agencies as well as foundations.

Collaboration agreement between the Fundación Mujeres por Africa and UAB to participate in the project "Ellas investigan".

Xavier Gabarrell i Durany

Fundación Mujeres Por África

28/01/22 → 27/01/24

AHRC-FAPESP MoU Human-Environment Relationships in pre-Columbian Amazonia (HERCA).

Umberto Lombardo

University of Reading

1/02/22 → 4/12/23

City Makers for Sustainable and Just Cities: From Theory to Action.

Panagiota Kotsila
Melissa García-Lamarca

ICLEI - Local Governments for Sustainability, European Secretariat

1/02/22 → 31/05/23

Research study on environmental justice, conflict and movements for the defence of rights in Syria within the framework of the project of the Jordanian and Catalan host communities in the construction of peace and the consolidation of democracy and human rights in the Middle East.

Daniela del Bene
Roberto Cantoni

Fundació Autònoma Solidària

15/02/22 → 14/08/23

Collaboration agreement between the Institut les Garberes and the UAB as part of the Pandemies Project.

Xavier Gabarrell i Durany

10/03/22 → 13/11/22

Technical, Social and Environmental Consulting for the Application and Development of Rooftop Greenhouses in South Korea based on Recent Research Trends.

Xavier Gabarrell i Durany

Korea Institute of Machinery and Materials

18/04/22 → 31/12/23

Plasticker: the microplastics hunter.

Michael Grelaud

Universitat Autònoma de Barcelona (UAB)

1/06/22 → 31/05/23

Impact Acceleration Award program.

Sergio Villamayor-Tomás

University of Leeds

1/09/22 → 31/03/23

Installation of a measuring device based on optical sensors developed by the company.

Jordina Belmonte Soler

Bettair Cities, S.L.

15/09/22 → 14/09/23

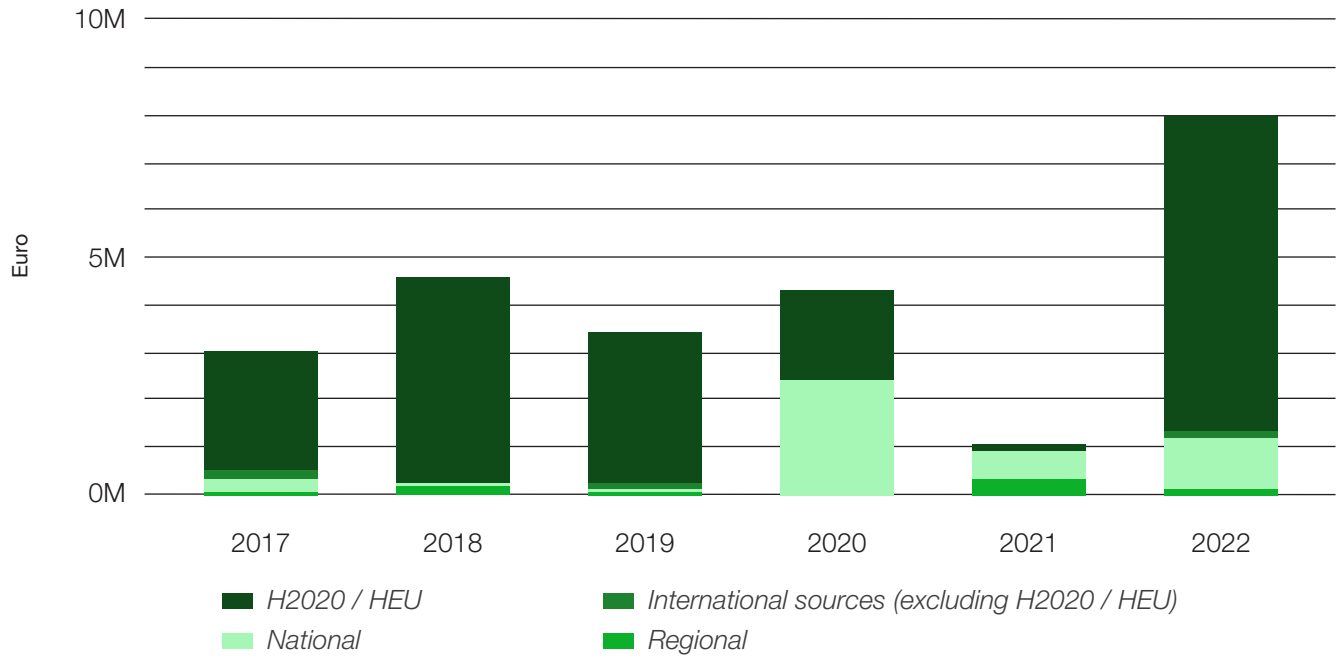
A methodology for the analysis of the thermal comfort of climatic shelters.

Gara Villalba Méndez

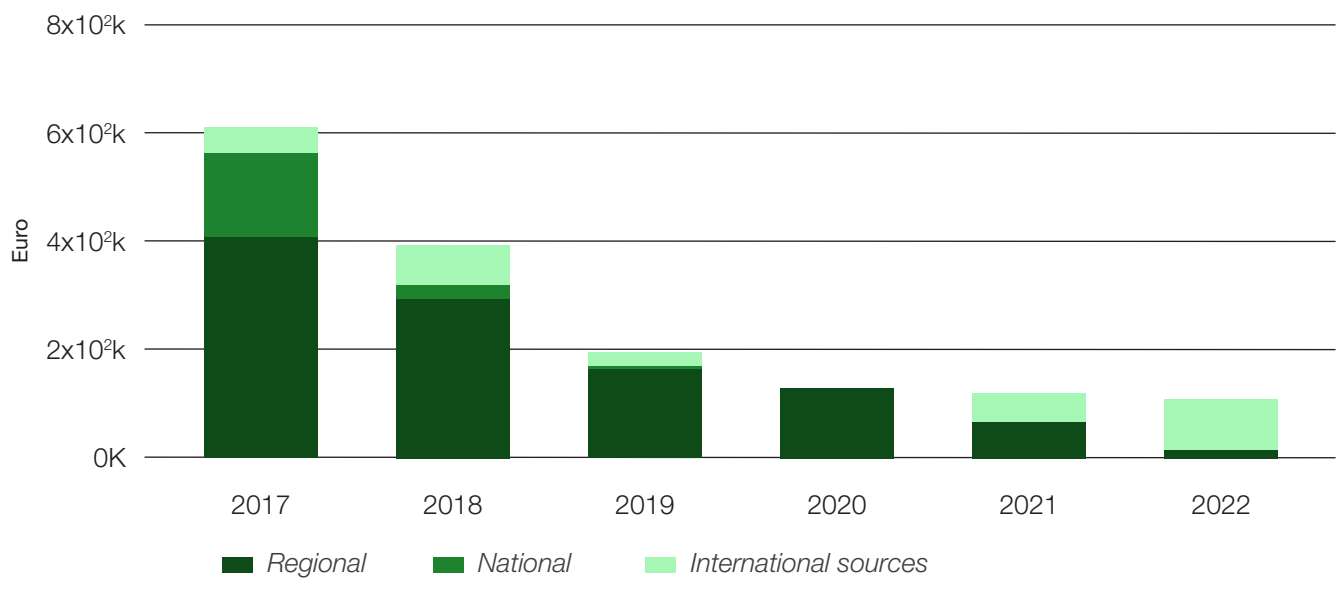
Consorci Àrea Metropolitana de Barcelona (CAMB)

1/11/22 → 31/10/23

PUBLIC FUNDING
Competitive sources



PUBLIC FUNDING
Non-competitive sources



Publications 9

For a complete list of publications, see Annexes.

Articles

Our research is published in leading, high impact factor journals. 21 articles were published in Nature and Science-related journals, as well as in the Proceedings of the National Academy of Sciences, USA (PNAS) among others.

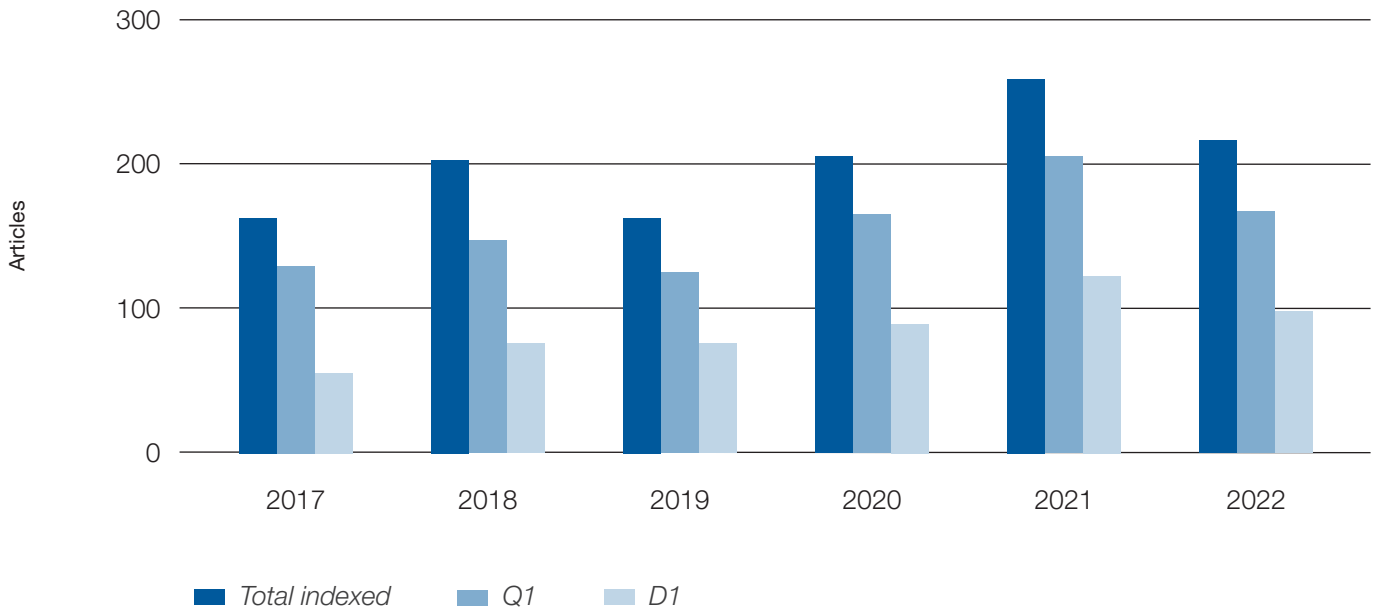
Overall, about 200 scientific articles were published in peer-reviewed journals in 2022, across more than 130 different scientific journals. Over 76% of the articles appeared in journals with an impact factor of four or higher.

219 Indexed Articles

171 Articles Published in 1st Quartile

100 In 1st Decile

PEER-REVIEWED PUBLICATIONS



Selected publications in indexed journals

Lombardo, U., Arroyo-Kalin, M., Schmidt, M., et al. (2022)

Evidence confirms an anthropic origin of Amazonian Dark Earths.

Nature Communications, 13(1), 3444

https://doi.org/10.1038/s41467-022-31064-2

Busck-Lumholt, L. M., Corbera, E., & Mertz, O. (2022)

How are institutions included in Integrated Conservation and Development Projects? Developing and testing a diagnostic approach on the World Bank's Forest and Community project in Salta, Argentina.

World development, 157, [105956]

https://doi.org/10.1016/j.worlddev.2022.105956

Alarcón, M., Periago, C., Pino, D., Mazón, J., Casas-Castillo, M. D. C., Ho-Zhang, J. J., De Linares, C., Rodríguez-Solà, R., & Belmonte, J. (2022)

Potential contribution of distant sources to airborne Betula pollen levels in Northeastern Iberian Peninsula.

Science of the total environment, 818, [151827]

https://doi.org/10.1016/j.scitotenv.2021.151827

Arcas-Pilz, V., Parada, F., Rufí-Salis, M., Stringari, G., González, R., Villalba, G., & Gabarrell, X. (2022)

Extended use and optimization of struvite in hydroponic cultivation systems.

Resources, Conservation and Recycling, 179, [106130]

https://doi.org/10.1016/j.resconrec.2021.106130

Salvatteci, R., Schneider, R. R., Galbraith, E., Field, D., Blanz, T., Bauersachs, T., Crosta, X., Martinez, P., Echevin, V., Scholz, F., & Bertrand, A. (2022)

Smaller fish species in a warm and oxygen-poor.

Humboldt Current system. Science, 375(6576)

https://doi.org/10.1126/science.abj0270

Slameršak, A., Kallis, G., & Neill, D. W. O. (2022)

Energy requirements and carbon emissions for a low-carbon energy transition.

Nature Communications, 13(1), [6932]

https://doi.org/10.1038/s41467-022-33976-5

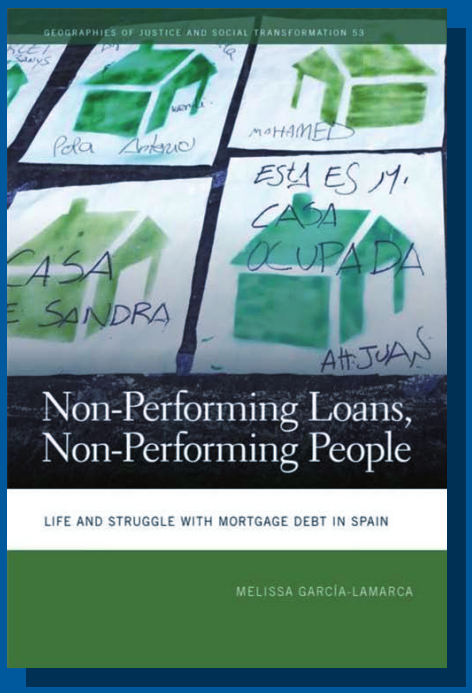
Pérez-Sánchez, L., Velasco Fernandez, R., & Giampietro, M. (2022)

Factors and actions for the sustainability of the residential sector. The nexus of energy, materials, space, and time use.

Renewable and Sustainable Energy Reviews, 161, [112388]

https://doi.org/10.1016/j.rser.2022.112388

Books



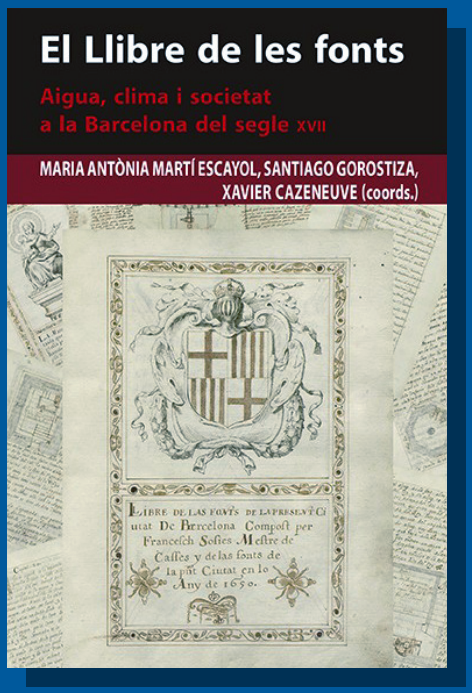
Non-Performing Loans, Non-Performing People

Life and Struggle with Mortgage Debt in Spain

University of Georgia Press, 2022.

Author: Melissa García-Lamarca.

Non-Performing Loans, Non-Performing People tells the previously untold stories of those living with mortgage debt in times of precarity and explores how individualized indebtedness can unite collective resistance in the struggle toward housing justice and more sustainable urban futures.



El Llibre de les fonts

Aigua, clima i societat a la Barcelona del segle XVII

Editorial Afers and Ajuntament de Barcelona, 2022.

Editors and authors: M. Antonia Martí, Santiago Gorostiza and Xavier Cazeneuve.

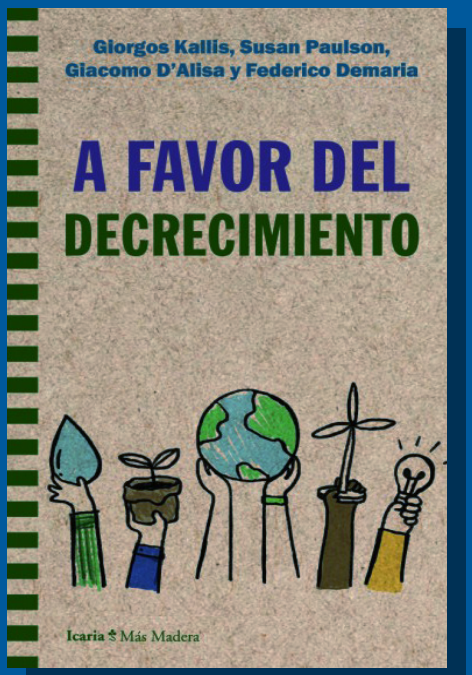
This book describes the hydraulic network of drinking water in the city, formed by water mines, pipes (underground and external), vents and fountains and it allows us to understand how water was managed in a Mediterranean city in modern times. It is an essential document for the knowledge of the history of Barcelona and an exceptional document in the European context.

Social struggles for public space, nature and the commons in the post-crisis era. A geographical approach

Nisos Publications, 2022.

Author: Elia Apostolopoulou.

This book has brought together more than ten years of research focusing on different social conflicts and struggles for access to space, nature and the commons in different countries.

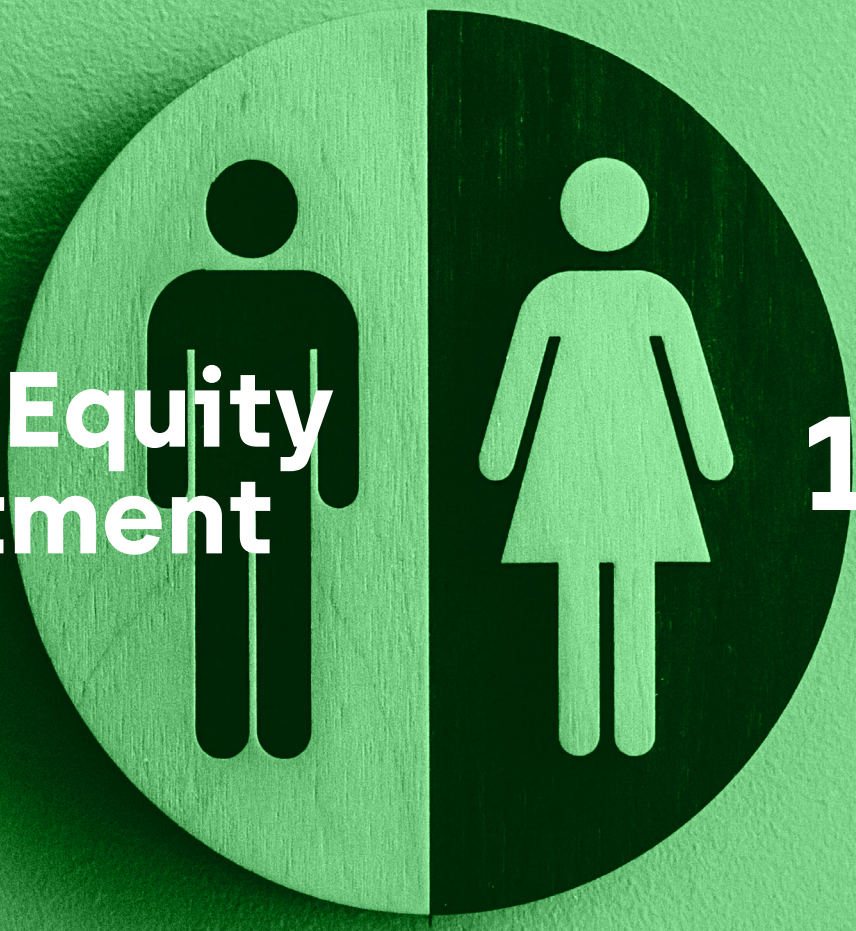


A favor del decrecimiento

Icaria Editorial, 2022.

Authors: Giorgos Kallis, Susan Paulson, Giacomo D'Alisa and Federico Demaria.

In this compelling book, published in its English version by Polity Press and translated into three languages during this year, leading experts Kallis, Paulson, D'Alisa and Demaria make the case for degrowth - living well with less, by living differently, prioritizing wellbeing, equity and sustainability.



Gender Equity Commitment

10

In July 2022, ICTA-UAB approved its first Gender Equity Policy, framed within the institute's commitment to advancing gender equity at all levels through actions that strengthen the presence and the role of female and non-binary scientists at the institution, make visible their research contributions, and enable the development and implementation of protocols to address gender-based discrimination and sexual harassment.

GENDER EQUITY POLICY

ICTA-UAB's new Gender Equity Policy reflects its commitment to advancing gender equity at all levels.

1. **Representation of female and non-binary scientists**
2. **Working conditions and work-life balance**
3. **Gender awareness**
4. **Non-sexist and inclusive language**
5. **Prevention of gender-based discrimination and harrassment**

This initiative forms part of the policies being developed by the UAB, specifically the "IV Action Plan for Gender Equity at the Universitat Autònoma de Barcelona 2019-2023", and the María de Maeztu program of Excellence 2020-2023 at ICTA-UAB.

Prior to this policy, a series of activities had been developed to address gender equity challenges at the institution.

A few years ago, a survey led by two postdoctoral researchers gathered data on gender issues and a series of workshops were facilitated to analyze human relations, power relations, conflicts between different groups, and the areas that needed to improve gender equity within ICTA-UAB.

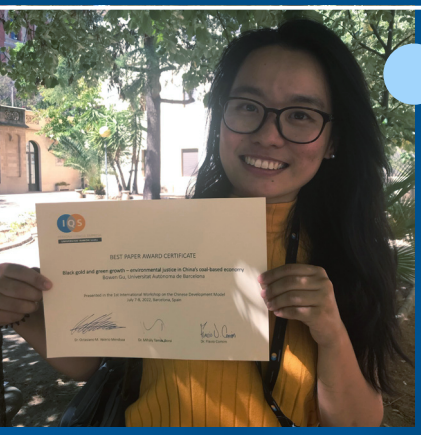
Following these initiatives, other activities had continued to foster debate and reflection on these issues, such as the creation in 2021 of a working group composed of PhD and Postdoctoral fellows specifically dedicated to gender equity and power relations.

In September 2021, 65 members of the ICTA-UAB community participated in an introductory workshop on gender equity and social justice, which fed into a Gender Audit conducted by an external organization, Col·lectiu Punt6, in late 2021. This audit was then the base of the Gender Equity Policy prepared, discussed, and approved in July 2022.

In July 2022, ICTA-UAB approved its first Gender Equity Policy

Awards and Recognitions

11



Bowen Gu

The Best Paper Award at the 1st International Workshop on the Chinese Development Model

Bowen Gu won the Best Paper Award at the 1st International Workshop on the Chinese Development Model, held 7-8 July 2022 in Barcelona under the heading “Defying mainstream economic theories to achieve unprecedented progress”.

Lucas Barrero García

Honorable mention in the 1st “Ezequiel Martínez”

Lucas Barrero García has been awarded an honorable mention in the 1st “Ezequiel Martínez” Prize for young Andalusians on the Environment and Climate Change, organized by the Federación Andaluza de Ateneos.

Théo Konc

Honorable mention as part of the EAERE Award

Théo Konc got an honorable mention as part of the EAERE Award for Best Doctoral Dissertation in Environmental and Resource Economics.

Dalena Tran

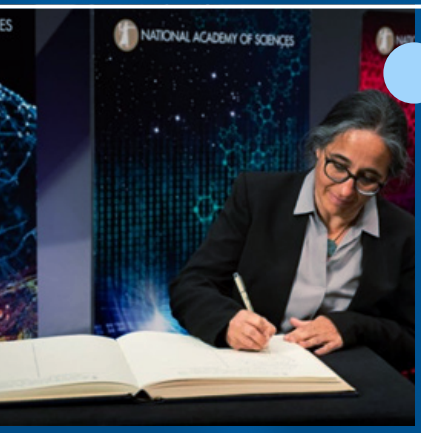
Student prize for the best student contribution at the XIV ESEE

Dalena Tran has been awarded one student prize for the best student contribution at the XIV International Conference of the European Society for Ecological Economics (ESEE 2022), held 14-17 June 2022 in Pisa (Italy) under the theme “Will Achiles catch up with the Tortoise?”.

Ivan Savin

Top five nominees worldwide for the USERN

Ivan Savin has been named among top five nominees worldwide for the Universal Scientific Education and Research Network (USERN) prize in Social Sciences.



Victoria Reyes-García

Was elected to the National Academy of Sciences in 2021

Victoria Reyes-García was presented to their colleagues in the U.S. National Academy of Sciences, on Wednesday 4 May. She was elected to the Academy in 2021 in recognition of her distinguished and continued achievements in original research.

Dan Brockington

Was awarded an ERC Advanced grant to work on Conservation Data Justice

Dan Brockington, who integrated ICTA-UAB in 2022, was awarded an ERC Advanced grant to work on Conservation Data Justice, an emerging scientific field that explores the justice implications of data used in conservation decision-making.

Laura Talens Peiró and Helen Cole

Awarded a Talent UAB 2021 - Santander

Laura Talens Peiró and Helen Cole are two of the five researchers awarded a Talent UAB 2021 - Santander research grants whose research contracts started in 2022.

Umberto Lombardo

Was awarded an ERC Consolidator

Umberto Lombardo was awarded an ERC Consolidator grant for the development of a project aimed at reconstructing the human demography of the southwestern Amazonia during the Holocene and to reveal the role of environmental and cultural changes in shaping it.

Cristina Madrid-López

Was elected Board member of the International Society for Industrial Ecology

Cristina Madrid-López was elected Board member of the International Society for Industrial Ecology, that promotes the use of industrial ecology in research, education, policy, community development, and industrial practices.

"ICTA-UAB in 100 words"

On the occasion of the celebration of Sant Jordi's Day, 23 April 2022, ICTA-UAB awarded the prizes of the 1st Micro-stories Competition "ICTA-UAB in 100 words". The winning works were "ICTA = CAT & I" by Annie James, "Poema de cien palabras" by Esteve Corbera Elizalde, "Sancho told me about it, in the columns", by Felipe Parada Molina and "She began her PhD" by Jordi Honey Rosés.

The ENABLE project

The ENABLE project, Enabling Green and Blue Infrastructure Potential in Complex Social-Ecological Regions: A System Approach for Assessing Local Solutions Context Green and blue infrastructure (GBI), which ICTA-UAB is part of, has won the 5th edition of the BiodivERsa Prize for Excellence and Impact.

ICTA-UAB researchers awarded the PhD Extraordinary Award

Thirteen ICTA-UAB researchers of the PhD programme in Environmental Science and Technology coordinated by ICTA-UAB received the PhD Extraordinary Award for their doctoral thesis developed during 2016-2018. The students who were awarded the distinction are ICTA-UAB researchers Amaia Albizua Aguinaco, Diego Andreucci, Francesc Baró Porras, Maxi Castrillejo Iridoy, Ana Nadal Fuentes, Anna Petit Boix, Viena Puigcorbé Lacueva, David Sanjuan Delmás, Qinglong Shao, Jorge Sierra Pérez and researchers from the Department of Chemical, Biological and Environmental Engineering Pedro Jiménez Peñalver, Josep Anton Mir Tutusáus and Clara Reino Sánchez.

Policy and Societal Impact

12

This section highlights some of the most important outreach and societal impact articles or activities developed under each of our research challenges (see section 5).

Oceans

Marine mollusc shells reveal how prehistoric humans adapted to intense climate change

García-Escárzaga, A., Gutiérrez-Zugasti, I., Marín-Arroyo, A.B., Fernandes, R., Núñez de la Fuente, S., Cuenca-Solana, D., Iriarte, E., Simões, C., Martín-Chivelet, J., González-Morales, M. R., & Roberts, P. (2022). Human forager response to abrupt climate change at 8.2 ka on the Atlantic coast of Europe. Scientific Reports, 12(1), [6481].

A new multidisciplinary study involving ICTA-UAB researcher Asier García-Escárzaga reveals the impact and consequences of the '8.2 ka event', the largest abrupt climate change of the Holocene, for prehistoric foragers and marine ecology in Atlantic Europe.

https://doi.org/10.1038/s41598-022-10135-w

Microplastics deposited on the seafloor triple in 20 years

Simon-Sánchez, L., Grelaud, M., Lorenz, C., Garcia-Orellana†, J., Vianello, A., Liu, F., Vollertsen, J. & Ziveri, P. (2022). Can a Sediment Core Reveal the Plastic Age? Microplastic Preservation in a Coastal Sedimentary Record. Environmental Science and Technology, 56(23).

The total amount of microplastics deposited on the bottom of oceans has tripled in the past two decades with a progression that corresponds to the type and volume of consumption of plastic products by society.

https://doi.org/10.1021/acs.est.2c04264

Land

International scientists call for more sustainable and equitable land use to tackle climate change

Meyfroidt, P., de Bremond, A., Ryan, C. M., Archer, E., Aspinall, R., Chhabra, A., Camara, G., Corbera, E. et al. (2022). Ten facts about land systems for sustainability. PNAS, 119(7).

A new international scientific report in which ICTA-UAB has participated identifies “10 facts” about global land use and urges policymakers around the world to adopt new approaches to addressing climate change, biodiversity and other global crises in a more sustainable and equitable way.

https://doi.org/10.1073/pnas.2109217118

17% of rural land exposed simultaneously to high degrees of depopulation and aridity

Villamayor-Tomas, S., Pocull, G., Facchini, F., Maeztu, C. & Corbera, E. (2022). Desertified Spain. Notes on rural Spain’s exposure to depopulation and climate change.

A total of 28% of rural land in Spain is exposed to high levels of depopulation, while 45% has problems with aridity, and 17.5% suffers from both problems according to ”la Caixa” Foundation’s Social Observatory and ICTA-UAB.

https://elobservatoriosocial.fundacionlacaixa.org/en/-/l-espanya-desertificada

Consumption

Farm shops and agricultural cooperatives waste up to 80% less fruit and vegetables than supermarkets

Tonini, P., Muñoz Odina, P., Orsini, F., & Gabarrell Durany, X. (2022). Economic benefit and social impact derived by a food loss prevention strategy in the vegetable sector: A spatial and temporal analysis at the regional level. Frontiers in Sustainable Food Systems, 6, [1043591].

Food wastage in farm shops, agricultural cooperatives, and farmers' stalls is between 1% and 2%, a much lower percentage than in supermarkets, where 5% to 10% of fruits and vegetables end up in the rubbish bin.

https://doi.org/10.3389/fsufs.2022.1043591

Reducing sugar consumption to achieve climate and sustainability goals

King, L.C. & van den Bergh, J. (2022). Sugar taxation for climate and sustainability goals. Nature Sustainability, 5.

New ICTA-UAB study published in Nature Sustainability says that sugar taxation policies have the potential to meet environmental, social, and economic objectives.

https://doi.org/10.1038/s41893-022-00934-4

Cities

Exposure to urban greenness has unequal effects on men's and women's mental health

Fernández Núñez, M-B., Campos Suzman, L., Maneja, R., Bach, A., Marquet, O., Anguelovski, I. &, Knobel, P. (2022). Gender and sex differences in urban greenness' mental health benefits: A systematic review. Health & Place, 76, [102864].

Exposure to urban greenness leads to greater mental health benefits for women, although they are less likely to use these green spaces as frequently for reasons mainly related to safety concerns.

https://doi.org/10.1016/j.healthplace.2022.102864

New project to empower urban cyclists through citizen science

The project Empowering urban cyclists through citizen science, led by ICTA-UAB researcher Jordi Honey Rosés in the framework of the ECIUSMART-ER University, kick-started the 2nd week of May with the celebration of its initial meeting at ICTA-UAB.

Policies

The United States and the European Union are responsible for the majority of ecological damage caused by excess use of raw materials

Hickel, J., O'Neill, D. W., Fanning, A.L. & Zoomkawala, H., (2022). National responsibility for ecological breakdown: a fair-shares assessment of resource use, 1970–2017. Lancet Planetary Health 6(4).

High-income nations are responsible for 74% of the global excess in resource extraction over the 1970-2017 period, driven primarily by the USA and the countries of the European Union. This is demonstrated in an international study led by Jason Hickel, researcher at ICTA-UAB, which determines national responsibility for ecological breakdown by calculating the extent to which each nation has overshot their fair share of sustainable resource use thresholds.

https://doi.org/10.1016/S2542-5196(22)00044-4

European project to explore pathways towards post-growth economics

Giorgos Kallis and Jason Hickel, together with Julia Steinberger, won a 10M euros ERC-SYNERGY project that will study how to escape from a growth economy and ensure social welfare and planetary sustainability.

Knowledge transfer – scientific dissemination

Educational programs

Isabelle Anguelovski participates in the program **CientifiKs en Joc.**

Course 2021-2022

Oriol Marquet Sardà, Laura Talens Peiró, and Margarita Triguero-Mas participate in the **Ajuntament de Barcelona initative Joves per l'Emergència Climàtica.**

March-May 2022

ICTA-UAB participates in the **UAB Barcelona Summer School.**

8 June 2022

PROECA, the educational program of the RIVUS Observatory, coordinated by Sonia Sánchez-Mateo, welcomes nearly 400 students.

July 2022

ICTA-UAB joins the program **Science by Women led by the Women for Africa Foundation.**

28 July 2022

Cristina Madrid-López becomes the mentor of the program **Women in Energy led by the Global Women's Network for the Energy Transition.**

16 September 2022

ICTA-UAB teaches the Sustainability course within the **Mad for Science program hosted by Catalunya La Pedrera Foundation.**

31 October 2022

Laura Talens Peiró participates in the program **CientifiKs en Joc.**

October-December 2022

Laura Talens Peiró and Oriol Marquet Sardà participate in the **Ajuntament de Barcelona initative Joves per l'Emergència Climàtica.**

October-December 2022

Exhibitions and fairs

LICCI team collaborates in the exhibition **The weather is in disarray at the Valencian Museum of Ethnology.**

27 January 2022

Victoria Reyes-García gives several **talks at Caixaforums.**

March 2022

Isabelle Anguelovski gives a **TEDx talk at TEDxVitoria Gasteiz.**

7 May 2022

ICTA-UAB participates in the **Ciutat i Ciencia science festival.**

23 May 2022

ICTA-UAB researchers meet with **European science journalists.**

24 May 2022

ICTA-UAB participate in the **Maker Faire Barcelona.**

29 June 2022

Victoria-Reyes-García participates in the **TV3 Docuseries Xplorers.**

September 2022

The BCNUEJ team releases the **online webdocumentary The Green Divide.**

September 2022

ICTA-UAB is part of the **Smart City Expo World Congress.**

9 November 2022

Companies

ICTA-UAB Aerobiological Network of Catalonia (XAC) and the UAB Department of Animal Biology, Plant Biology and Ecology (BABVE), led by researcher Jordina Belmonte, in the framework of an agreement with **Qualitas 4 Health and Swisens, are collaborating in the development of an automatic observation model of pollen and other aerosols in real time based on artificial intelligence.**

March 2022

The company Tectum, created by ICTA-UAB, **designs a prototype of an urban garden for offices.**

17 June 2022

ICTA-UAB collaborates in the **drafting of a sustainability roadmap for the DOQ Priorat.**

7 September 2022

Policy-making

Victoria Reyes-García joined the first ever **UNESCO-IPCC-ICOMOS meeting to strengthen synergies between culture and climate change science.**

19 January 2022

SOSTENIPRA participates in a **FAO event on Urban Agriculture.**

24 January 2022

Xavier Gabarrell i Durany participates in the **World Engineering Summit in Costa Rica.**

March 2022

Joan Rieradevall Pons advises the **Parliament on policies for sustainable and resilient cities.**

4 March 2022

Isabelle Anguelovski asks **Parliament for criteria of justice and equity in the neighborhood upgrading law.**

28 March 2022

Patrizia Ziveri participates as a **Jury in the National Research Awards.**

5 May 2022

Jordi Honey-Rosés takes part in the **CADS session on decarbonization.**

6 May 2022

Raúl Velasco-Fernández and Juan Cadillo-Benalcázar are the authors of the study **A critical approach to the EU-MERCOSUR Agreement: Analysis of the structural dynamics and the water-land-labor nexus of key agricultural products.**

6 May 2022

Victoria Reyes-García offers an expert opinion at the **IPBES Transformative Change Assessment.**

17 May 2022

Xavier Gabarrell i Durany elected **Management Board member of the European Food Safety Authority (EFSA).**

15 June 2022

ICTA-UAB calls for a **new Intergovernmental Panel for Ocean Sustainability in Lisbon.**

18 July 2022

Keynote Speakers and Visitors

13

Keynote speakers

Daniel Pauly (University of British Columbia) and Jennifer Dunne (Santa Fe Institute).

"Climate and pre-industrial human impacts on marine ecosystems: Crossing disciplinary boundaries"

7 January 2022

Robert Ayres, Emeritus Professor of Economics and Political Science and Technology Management at INSEAD.

"Economics as an Island of order far from Equilibrium"

1 February 2022

Fander Falconí, Professor at Facultad Latinoamericana de Ciencias Sociales (FLACSO).

"Right-wing nationalisms and the climate crisis: the Trump case"

17 February 2022

Jane Mbolle Chah, Senior Lecturer at University of Nigeria.

"Gender analysis of Climate Smart Agriculture investment among small-scale farmers in Northern Benin"

3 March 2022

Jonas Ostergaard Nielsen, Professor at Humboldt-Universität zu Berlin.

"Global lives and integrative geography"

24 March 2022

Jeroen Guinée, Associate Professor at Leiden University.

"Life Cycle (Sustainability) Assessment: where are we and where are we going? Dónde estamos, y hacia dónde vamos"

4 April 2022

James Bendle, from University of Birmingham.

"New tools for reconstructing terrestrial and marine climate" and Erin McClymont, from Durham University UK. "Quantifying and understanding past climate changes". Tribute to Antoni Rosell-Melé †

5 April 2022

Jorge Riechmann, Professor at Universidad Autónoma de Madrid.

"For a symbioethics in the Century of the Great Trial"

25 April 2022

Brendan Fisher, Professor at The Gund Institute for Environment, University of Vermont.

"Biodiversity conservation and natural resource economics"

7 June 2022

Daniel Pauly, UBC Killam Professor at Institute for the Oceans and Fisheries & Department of Zoology, University of British Columbia.

"Fish must breathe: An Introduction to the Gill-Oxygen Limitation Theory (GOLT)"

29 June 2022

Gustavo Moura, Professor of Ethnodevelopment at Universidade Federal do Pará.

"Social Oceanography: Propositions from the Global South"

9 September 2022

Emma McKinley, Researcher at Cardiff University.

"Sustainable Ocean Futures: The Role of Marine Social Sciences"

9 September 2022

Tatiana Filatova, Professor of Computational Economics at Delft University of Technology.

"Changing climate - changing behavior: Empirical agent based computational models for climate change economics"

20 October 2022

Rutgerd Boelens, Professor of Political Ecology of Water at the University of Amsterdam & Professor of Water Governance and Social Justice at the Wageningen University.

"Rivers, Territories and Power. Conceptualizing Transdisciplinary Movements for Water Justice"

24 October 2022

Prof. Dirk Philipsen, Associate Research Professor of Economic History at the Sanford School of Public Policy, and Senior Fellow at the Kenan Institute for Ethics at Duke University.

"The Tragedy of the Commons, Revisited"

2 November 2022

Visitors

Renata Rapisarda, Visiting postgraduate.

8/1/2022-9/7/2022, University of Catania

Akwe Epse Chah Jane Mbolle, Guest researcher.

1/2/2022-30/4/2022, Fundación Mujeres por Africa

Falilu Adekunbi, Guest researcher.

22/2/2022-20/2/2022, University of Lagos

Jeroen Bartholomeus Guinée, Guest researcher.

1/3/2022-31/5/2022, Institute of Environmental Sciences (CML), Leiden University

Luciana Staiano, Visiting postgraduate.

22/4/2022-5/6/2022, Universidad de Buenos Aires

Giulia Benati, Visiting postgraduate.

1/5/2022-31/12/2022, Università di Roma La Sapienza

Maria Soledad Castro Vargas, PIF-FENIX.

1/5/2022-31/7/2023, Phd - Scholarship Costa Rica

Marli Roberts, Visiting postgraduate.

6/6/2022-31/12/2022, UIC-Universitat Internacional de Catalunya

Jampel Dell Angelo, Guest researcher.

10/6/2022-10/10/2022, Institute for Environmental Studies (IVM), Vrije Universiteit Amsterdam

Maria Teresa de Jesús Sánchez Orozco, Visiting undergraduate.

16/6/2022-5/8/2022, Universidad Nacional Autónoma de México

Elouise Ann Filas, Visiting postgraduate.

26/6/2022-1/8/2022, University of Toledo

Ethan Andrew Eidt, Visiting undergraduate.

26/6/2022-1/8/2022, University of Toledo

Kelsey Duffey, Visiting undergraduate.

26/6/2022-1/8/2022, University of Toledo

Lauren Hower, Visiting undergraduate.

26/6/2022-1/8/2022, University of Toledo

Lucas Dale Finke, Visiting undergraduate.

26/6/2022-1/8/2022, University of Toledo

Shiloh ReAnn Walz, Visiting undergraduate.

26/6/2022-1/8/2022, University of Toledo

Elena Luongo, Visiting postgraduate.

1/7/2022-31/12/2022, UIC-Universitat Internacional de Catalunya

Alesandro Busá, Guest researcher.

1/9/2022-30/11/2022, University of Leicester/ Marie Sklodowska-Curie MSCA Global Fellowship

Alessandro Perrone, Visiting postgraduate.

1/9/2022-30/11/2022, Alma Mater Studiorum Università di Bologna

Athina-Nikolitsa Kekelou, Visiting postgraduate.

1/9/2022-28/2/2023, Erasmus +

Carlos René Green Ruiz, Guest researcher.

1/9/2022-31/8/2023, Instituto de Ciencias del Mar y Limnología, Universidad Nacional Autónoma de México

Enrico Bergamini, Visiting postgraduate.

1/9/2022-31/7/2023, University of Turin

Rosario Carmona Yost, Visiting postgraduate.

5/9/2022-31/10/2022, University of Bonn

Jakob Mayer, Guest researcher.

24/9/2022-25/10/2022, University of Graz

Isabela Jayne Vera, PIF-FENIX.

3/10/2022-3/10/2025, Phd-Scholarship Panamà

Juan David Arosamena Polo, PIF-FENIX.

3/10/2022-19/10/2025, PhD-Scholarship SENACYT

Lorenzo Filippo Velott, Visiting postgraduate.

3/10/2022-30/4/2023, Scuola Normale Superiore-Social and Political Sciences

Paula Rodríguez Delgado, work placements.

10/10/2022-30/4/2023, Institut La Romànica

Joan Vázquez Dueñas, work placements.

14/11/2022-31/5/2023, IES Terrassa

Ulises Rodrigo Magdalena, Visiting postgraduate.

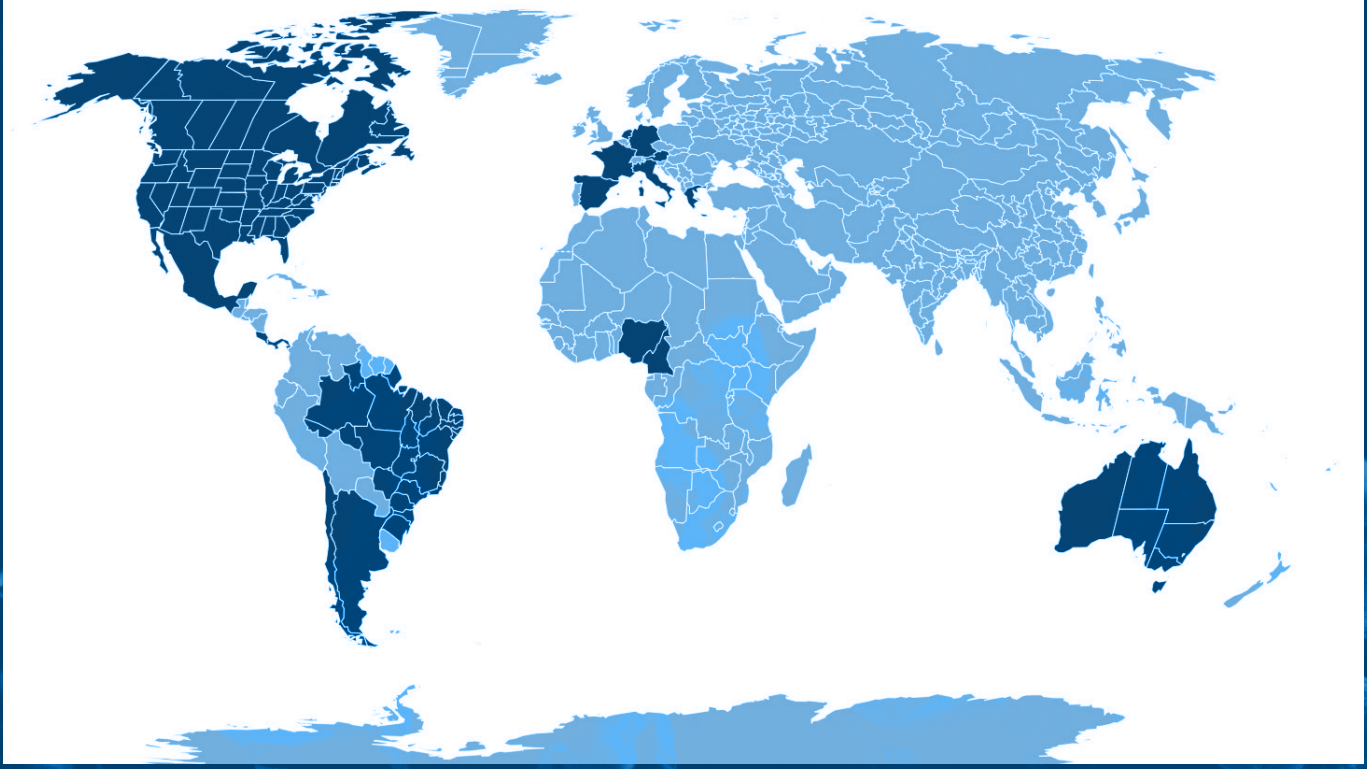
28/11/2022-16/12/2022, University of Campinas

Jessica Bosseaux, Guest researcher.

1/12/2022-3/3/2023, University of Reading

Martina Maglicic, PIF – FENIX.

20/12/2022-30/9/2023, University of Amsterdam



ICTA-UAB has received visitors from over a dozen countries including the US, Australia and from South America, Europe and Africa.

Training 14

PhD Program

PhD in Environmental Science and Technology

The PhD in Environmental Science and Technology is a UAB program adapted to the European Higher Education Area (EHEA) and is governed by Royal Decree 99/2011 of January 28, 2011 of the Government of Spain.

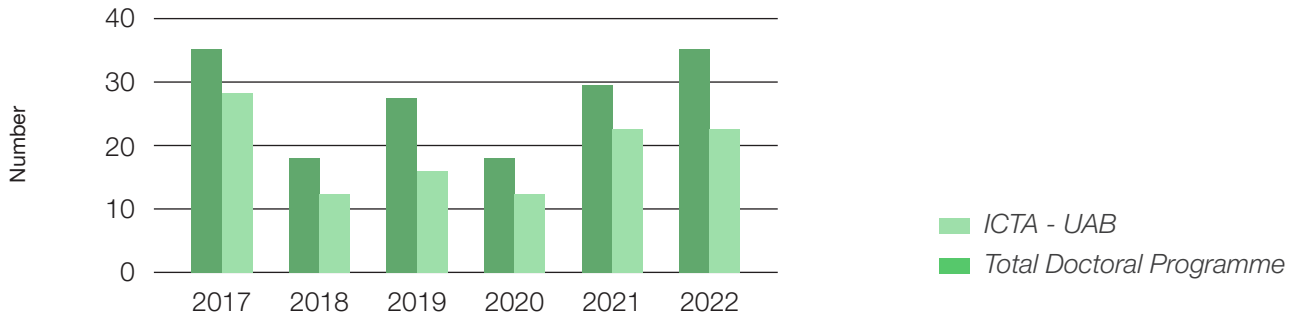
AQU CATALUNYA

The PhD Program in Environmental Science and Technology received in 2022 the AQU Catalunya's preliminary report corresponding to the evaluation of the program, awarding it the highest overall assessment: Accredited in progress towards excellence.

Coordinator: Prof. Adriana Artola Casacuberta.

Academic board: Dr Sergio Villamayor-Tomás, Prof Graham Mortyn, Prof Xavier Gabarrell i Durany, and Dr Laura Talens Peiró.

Doctoral Theses



Masters

Master's Degree in Interdisciplinary Studies in Environmental, Economic and Social Sustainability

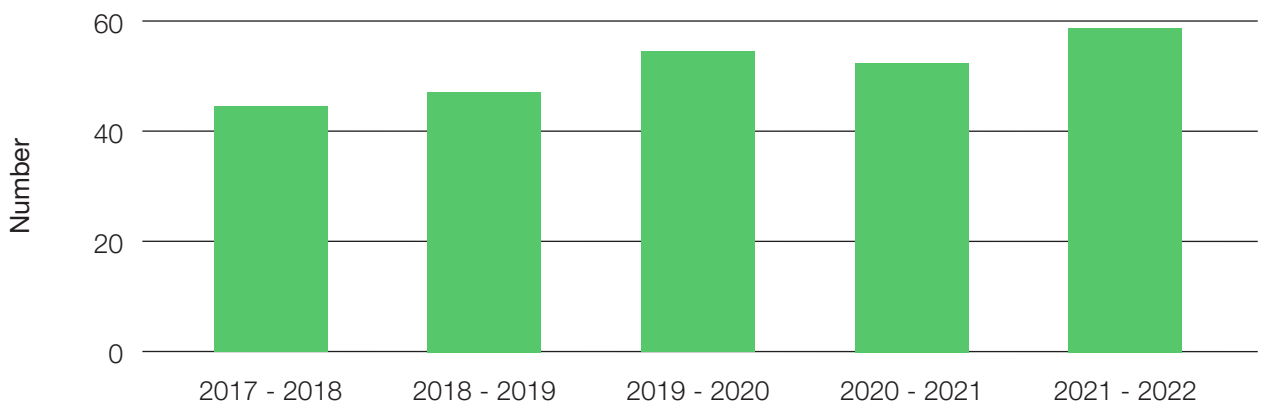
The master's degree offers a mixed approach. On the one hand, it includes advanced course components for graduates of Environmental Sciences. On the other, it meets the needs of other graduates interested in incorporating environmental knowledge and skills into their academic training, based on fields such as Ecological Economics and Environmental Management, Analysis of the Natural Environment, Environmental Technology, Industrial Ecology or Global Change, all of which are considered specialisations in this master's degree.

Of the 60 credits, 30 belong to compulsory core subjects and the rest form part of each specialisation

This master's degree has been offered since the 1997/98 academic year.

Coordinator: Eduard Ariza Sole.

Master Theses



Master's Degree in Political Ecology. Degrowth and Environmental Justice

This is the first master of its kind within the flourishing fields of Political Ecology, Degrowth and Environmental Justice, now in its 4th edition with 32 enrolled students.

The master is co-organized by ICTA-UAB and Research & Degrowth (R&D), an academic association dedicated to research, awareness-raising, and events organization around the topic of degrowth, bringing together the scholarly excellence of ICTA-UAB researchers with hands-on experience in activism and policy-making of R&D.

Coordinator: Claudio Cattaneo.

This is the first master of its kind within the flourishing fields of Political Ecology, Degrowth and Environmental Justice

Online Master on Degrowth: Ecology, Economics and Policy

The ICTA-UAB and Research & Degrowth have launched the first online master´s on “Degrowth: Ecology, Economics and Policy”, an international master’s fully dedicated on research and policy for degrowth.

The course is ideal for those who want to learn more about degrowth, either after their bachelor’s degree, or after they got a master’s degree on a different topic or even started a PhD and want to give a degrowth direction to their research and work. This master is explicitly research-focused and oriented towards policy-making in the Global North.

Coordinator: Claudio Cattaneo.

This master is explicitly research-focused and oriented towards policy-making in the Global North

Additional Training Courses

The MOOC "Sustainability of Social-Ecological Systems"

Researcher: Mario Giampietro.

The MOOC "Sustainability of Social-Ecological Systems" led by our researcher Mario Giampietro has been included in the recommended list of Open Education Resources (OERs) and Massive Open Online Courses (MOOCs) launched by the project Faculty for a Future.

We offer general and specific training activities through the María de Maeztu program, on an annual basis and at the start of each academic year (i.e. September-October).

- Good practices in research.
- Systematic literature and case study reviews.
- Research design.
- Scientific publishing and open access.
- Becoming a scientific writer.
- The road to competitive funding.
- How to defeat the boss "Mr Stress".
- How to lead 21st century organizations.
- Mentoring and coaching.

Some of our research staff also participated in UAB Barcelona Summer School courses:

- Ecological Economics and Degrowth Principles.
- Geography of Global Change.

Laboratory Facilities 15

ICTA-UAB is equipped with world-class laboratory and analytical facilities for inorganic and organic chemistry, with applications in a range of scientific fields and temporal scales. Our infrastructure is used by research groups working at the forefront of current knowledge on modern and past socio-ecological systems, from ocean acidification, microplastic pollution and urban agriculture, to past climate and human societies. In 2022 we provided commercial analytical services and consultancy to dozens of Spanish and international institutions, notably on the fields of climate, ecology and archaeology.

Organic and inorganic chemistry

Microplastic extraction laboratory

Organic geochemistry and environmental laboratory

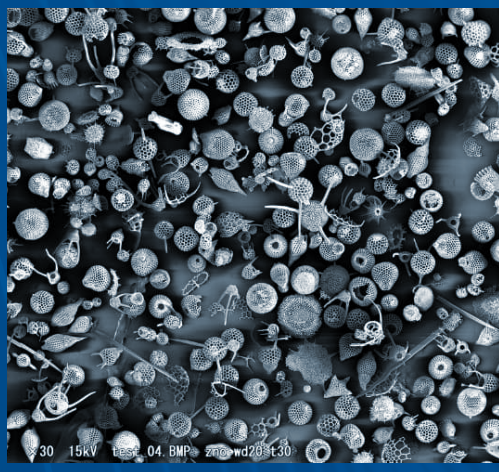
Agro-urban lab: i-RTG integrated rooftop greenhouse

Biomolecular archaeology and palaeoecology

GHG monitoring network of the metropolitan area of Barcelona

Stable isotope analysis

Sedimentology



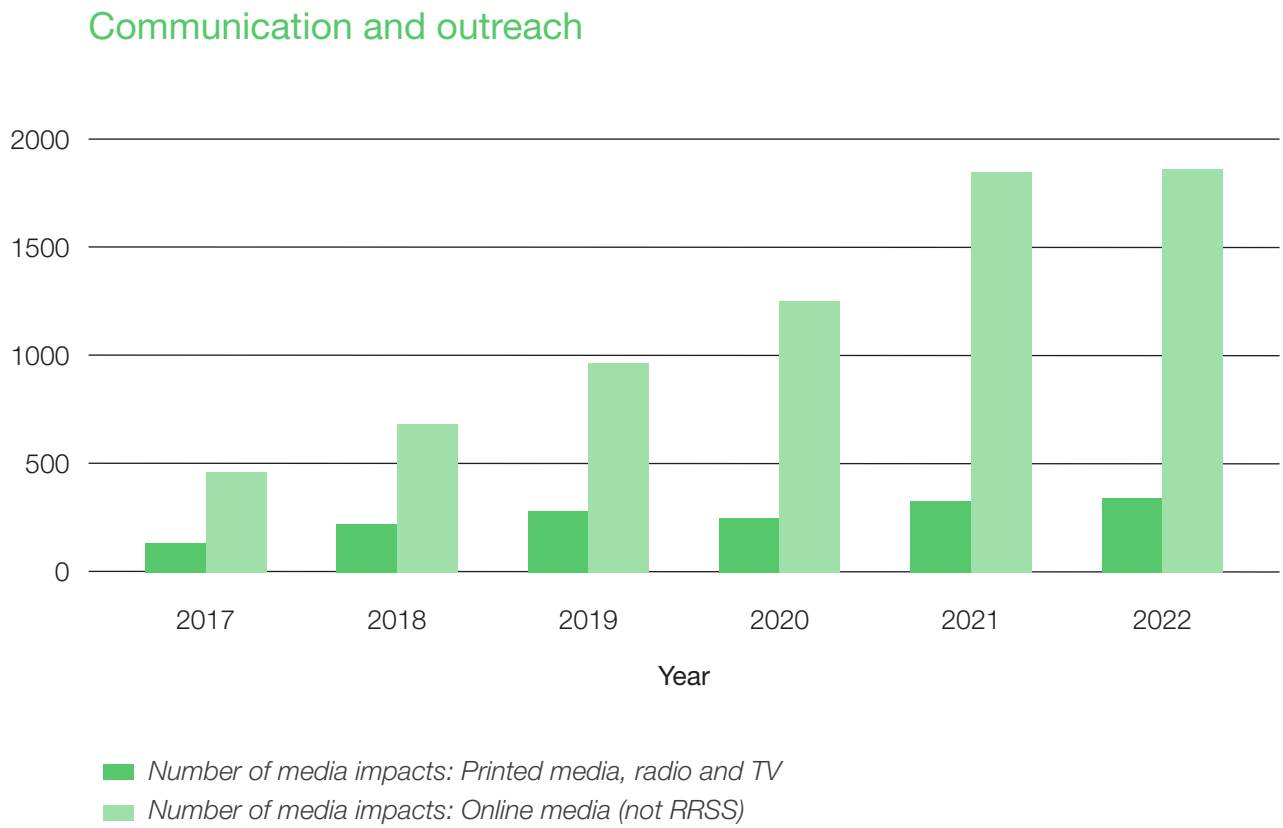
Micropalaeontology

Dissemination Activities

16

In 2022, ICTA-UAB hosted 107 seminars, workshops and events.

40 press releases related to our research findings were published by newspapers, radio and TV, (local, national and internationally). These have resulted in 2.010 impacts in newspapers, TV channels and radios.



In social media, we published about 1.315 tweets, which had 995.300 visualizations; the twitter account achieved 9.679 followers by the end of the years. Our website had 37.519 users who visited 106.065 pages.

ICTA-UABs scientific findings and activities were also publicized through a monthly online newsletter, which has 1.545 subscribers from all over the world.

In 2022, ICTA-UAB hosted 107 seminars, workshops and events

Selected news coverage

Telenotícies TV3

870 bicycles were reported stolen in the city of Barcelona in 2021, averaging more than 2 bicycles per day and thus contributing to cycling disincentives.

Castilla La Mancha Media

17% of rural land is simultaneously exposed to high rates of depopulation and aridity, which worsens the socio-ecological vulnerability of farming territories.

Agencia EFE

International scientists call for more sustainable and equitable land use to tackle climate change.

Phys Org

Farm shops and agricultural cooperatives waste of up to 80% less fruit and vegetables than supermarkets.

Sky News

Greener and more walkable urban areas promote physical activity.

Ministerio de Consumo

Dialogues on degrowth and sustainable consumption.

Phys Org

Spanish citizens are more supportive of climate action after COVID-19, but more pessimistic in their expectations.

The Guardian

US and Europe behind majority of ecological damage, says study.

Deia

Mollusc shells reveal how prehistoric humans adapted to intense climate change.

El Punt Avui

Report calls for Indigenous Peoples' knowledge to be included in climate policy.

Al Jazeera

All Hail the Planet: There's a mega climate problem with our megacities.

Telenotícies TV3

Urban rooftop gardens to combat food dependency thousands of miles away.

El Economista

The Mediterranean Sea is the sea with most microplastics in the world.

El Crític

Laura Talens Peiró: "There is no capacity to deal with the waste expected in 10 years from now".

Annexes 17

Annex I

Doctoral Theses (in alphabetical order)

Arcas Pilz, Verónica. 2022. Alternative fertilizers for urban agriculture within the circular economy framework. Co-directors: Xavier Gabarrell, Gara Villalba. Supervisor: Xavier Gabarrell.

Calcagni, Fulvia. 2022. A web of values - Leveraging social media data for social-ecological sustainability science. Co-directors: Johannes Langemeyer, James Connolly, Victoria Reyes García. Supervisor: Victoria Reyes García.

Castro Santa, Juana. 2022. Green Advertising in a Climate-Change Context: Experimental Studies. Co-directors: Jeroen van den Bergh, Stefan Drews. Supervisor: Jeroen van den Bergh.

Diego Feliu, Marc. 2022. Improving the Use of Radium Isotopes and Radon as Tracers of Submarine Groundwater Discharge. Co-directors: Valentí Rodellas, Jordi García Orellana†. Supervisor: Jordi García Orellana†.

Dunlop, Teresa Eleanor. 2022. All that glitters is not gold: Energy efficiency from a critical policy perspective. Co-directors: Thomas Voelker, Mario Giampietro, Angela Guimaraes. Supervisor: Mario Giampietro.

García Casañas, Cristina. 2022. Imaginaries of innovation and science: critical analysis and sustainability concerns. Co-directors: Louis Lemkow, Roger Strand. Supervisor: Mario Giampietro.

Klein, Franziska. 2022. Who has time to be green? The 'double dividend' under bounded rationality and time constraints. Director and supervisor: Jeroen van den Bergh.

Lumholt, Louise Marie Busck. 2022. Causality and Institutional Distance in International Conservation and Development: A Telecoupling Approach. Co-directors: Esteve Corbera, Mertz Ole. Supervisor: Esteve Corbera.

Mallo Costa, Miguel. 2022. Mediterranean coastal marine biodiversity trends: an ecological and social assessment in the NW region. Co-directors: Victoria Reyes-García, Sergio Rossi, Patrizia Ziveri. Supervisor: Victoria Reyes García.

Mastini, Riccardo. 2022. A Green New Deal without growth? Theoretical reflections and empirical studies. Co-directors: Giorgos Kallis, Christos Zografos, Jason Hickel. Supervisor: Giorgos Kallis.

Mattalia, Giulia. 2022. Divergent trajectories of local ecological knowledge among divided communities: insights from Hutsuls and Romanians of Bukovina (Romania and Ukraine). Co-directors: Victoria Reyes-García, Renata Soukand. Supervisor: Victoria Reyes-García.

Mempel, Finn. 2022. Disentangling the Global Soybean Complex: land use change in the era of reflexive modernity. Co-directors: Esteve Corbera, Beatriz Rodriguez Labajos. Supervisor: Esteve Corbera.

Moya Calderón, Michael. 2022. Tourist overcrowding in protected areas and its influence zones: a case study in Costa Rica. Co-directors: Carlos Barriocanal, Eduardo Carrillo. Supervisor: Jordina Belmonte.

Parada Molina, Felipe Agustín. 2022. Reducing the Environmental Impact of Food Production in Urban Agriculture by Optimizing Irrigation. Co-directors: Xavier Gabarrell, Gara Villalba, Pedro Muñoz. Supervisor: Xavier Gabarrell.

Pena, Alexandra Mario. 2022. Agro-urban sustainability through rooftop greenhouses, improving cites' sustainability. Economic viability and sustainable business models. Co-directors: Maria Rosa Rovira, Joan Manuel Fernández. Supervisor: Maria Rosa Rovira.

Romera Puga, Maria del Carmen. 2022. Towards an inclusive environmental governance model. Analysing the interface between the arganeraie biosphere reserve (Morocco) and two local communities. Co-directors: Pablo Dominguez, Roser Maneja, Said Boujrouf. Supervisor: Esteve Corbera.

Simon Sanchez, Laura. 2022. Microplastic pollution in transitional environments. Methods, occurrence, and fate of microplastics in the Mediterranean Sea. Co-directors: Michael Grelaud, Patrizia Ziveri. Supervisor: Patrizia Ziveri.

Watts, Matthew John. 2022. The Combined effects of climate, environment, and socio-demographic factors on Human Health via the spread of emerging infectious diseases: Using big data methods to investigate macro-level determinants of disease transmission. Co-directors: Victor Sarto, Panagiota Kotsila, Graham Mortyn. Supervisor: Graham Mortyn.

Weber, Lena Hutchinson. 2022. (Re)Searching for Transformation: Collective Nurturing of Knowledge for Environmental Justice. Director: Leah Temper. Supervisor: Sergio Villamayor.

Zaldo Aubanell, Quim. 2022. Disentangling the role of Land Use and Land Cover data in the relationship between the environment and human health. Co-directors: Roser Maneja, Isabel Serra. Supervisor: Esteve Corbera.

Annex II

Publications
(in alphabetical order by journal)

Articles

Frišták, V., Pipíška, M., Koperová, D., Jagerhofer, R., Soja, G., Bell, S.M.(2022). Utilization of Sewage Sludge-Derived Pyrogenic Material as a Promising Soil Amendment. *Agriculture (Switzerland) 12(3). doi: 10.3390/agriculture12030360*

Blanch-Ramirez, J., Calvet-Mir, L., Aceituno-Mata, L., Benyei, P. (2022). Climate change in the Catalan Pyrenees intersects with socioeconomic factors to shape crop diversity and management. *Agronomy for Sustainable Development 42(5). doi: 10.1007/s13593-022-00806-3*

Garmendia, E., Aldezabal, A., Galan, E., Andonegi, A., del Prado, A., Gamboa, G., Garcia, O., Pardo, G., Aldai, N., Barron, L.J.R. (2022). Mountain sheep grazing systems provide multiple ecological, socio-economic, and food quality benefits. *Agronomy for Sustainable Development 42. doi: 10.1007/s13593-021-00751-7*

Chapin, F.S., Weber, E.U., Bennett, E.M., Biggs, R., Van Den Bergh, J., Adger, W. N., Crépin, A., Polasky, S., Folke, C., Scheffer, M., Segerson, K., Anderies, J. M., Barrett, S., Cardenas, J., Carpenter, S. R., Fischer, J., Kautsky, N., Levin, S. A., Sho. (2022). Earth stewardship: Shaping a sustainable future through interacting policy and norm shifts. *Ambio 851. doi: 10.1007/s13280-022-01721-3*

Miñarro, S., Selim, S., Galbraith, E.D. (2022). Does catching more fish increase the subjective well-being of fishers? Insights from Bangladesh. *Ambio 51. doi: 10.1007/s13280-021-01698-5*

Reyes-García, V., Fernández-Llamazares, Á., Aumeeruddy-Thomas, Y., Benyei, P., Bussmann, R. W., Diamond, S. K., García-del-Amo, D., Guadilla-Sáez, S., Hanazaki, N., Kosoy, N., Lavides, M., Luz, A. C., McElwee, P., Meretsky, V. J., Newberry, T., Molnár, Z., Ruiz-Mallén, I., Salpeteur, M. et al. (2022). Recognizing Indigenous peoples' and local communities' rights and agency in the post-2020 Biodiversity Agenda. *Ambio 51. doi: 10.1007/s13280-021-01561-7*

Savin, I., van den Bergh, J. (2022). Tired of climate targets? Shift focus of IPCC scenarios from emission and growth targets to policies. *Annals of the New York Academy of Sciences 1517. doi: 10.1111/nyas.14900*

Calderón, M.M., Ávila, E.B., Chaves, A.L., Jiménez, E.C., Lozano, C.B. (2022). Anthropization in buffer zones of protected areas. *Annals of Tourism Research Empirical Insights 3(2). doi: 10.1016/j.annale.2022.100072*

Talens Peiró, L., Martin, N., Villalba Méndez, G., Madrid-López, C. (2022). Integration of raw materials indicators of energy technologies into energy system models. *Applied Energy 307. doi: 10.1016/j.apenergy.2021.118150.*

Tu, Q., Hase, F., Schneider, M., Garciá, O., Blumenstock, T., Borsdorff, T., Frey, M., Khosrawi, F., Lorente, A., Alberti, C., Bustos, J. J., Butz, A., Carreño, V., Cuevas, E., Curcoll, R., Diekmann, C. J., Dubravica, D., Ertl, B., Estruch, C., León-Luis, S. F., Marrero, C., Morgui, J-A., Ramos, R., Scharun, C., Schneider, C., Sepúlveda, E., Toledano, C., Torres, C. (2022). Quantification of CH4 emissions from waste disposal sites near the city of Madrid using ground- and space-based observations of COCCON, TROPOMI and IASI. *Atmospheric Chemistry and Physics 22. doi: 10.5194/acp-22-295-2022*

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Pascual, U., Mcelwee, P. D., Diamond, S. E., Ngo, H. T., Bai, X., Cheung, W. W. L., Lim, M., Steiner, N., Agard, J., Donatti, C. I., Duarte, C. M., Leemans, R., Managi, S., Pires, A. P. F., Reyes-garcía, V., Trisos, C., Scholes, R. J., Pörtner, H. (2022). Governing for Transformative Change across the Biodiversity–Climate–Society Nexus. *Bioscience 72(7). doi: 10.1093/biosci/biac031*

Reyes-Garciá, V., Tofighi-Niaki, A., Austin, B.J., Benyei, P., Danielsen, F., Fernández-Llamazares, Á., Sharma, A., Soleymani-Fard, R., Tengö, M. (2022). Data Sovereignty in Community-Based Environmental Monitoring: Toward Equitable Environmental Data Governance. *BioScience 72. doi: 10.1093/biosci/biac048*

Akinci, Z.S., Delclòs-Alió, X., Vich, G., Salvo, D., Ibarluzea, J., Miralles-Guasch, C. (2022). How different are objective operationalizations of walkability for older adults compared to the general population? A systematic review. *BMC Geriatrics 22(1). doi: 10.1186/s12877-022-03233-x*

Soueid, L., Triguero-Mas, M., Dalmau, A., Barrera-Gómez, J., Alonso, L., Basagaña, X., Thieden, E., Wulf, H.C., Diffey, B., Young, A.R., Nieuwenhuijsen, M., Dadvand, P. (2022). Estimating personal solar ultraviolet radiation exposure through time spent outdoors, ambient levels and modelling approaches. *British Journal of Dermatology 186. doi: 10.1111/bjd.20703*

Muñoz-Liesa, J., Royapoor, M., Cuerva, E., Gassó-Domingo, S., Gabarrell, X., Josa, A. (2022). Building-integrated greenhouses raise energy co-benefits through active ventilation Systems. *Building and Environment 208. doi: 10.1016/j.buildenv.2021.108585*

Zhong, Q., Puigcorbé, V., Chen, X., Rodellas, V., Wang, X., Yu, T., Du, J. (2022). Unexpectedly high dissolved210Pb in coastal groundwaters: Is submarine groundwater discharge important in coastal sea? *Chemical Geology 614. doi: 10.1016/j.chemgeo.2022.121165*

Neidig, J., Anguelovski, I., Albaina, A., Pascual, U. (2022). "We are the Green Capital": Navigating the political and sustainability fix narratives of urban greening. *Cities 131. doi: 10.1016/j.cities.2022.103999*

Oscilowicz, E., Anguelovski, I., Triguero-mas, M., García-lamarca, M., Baró, F., Cole, H. V. S. (2022). Green justice through policy and practice: a call for further research into tools that foster healthy green cities for all. *Cities & Health 6. doi: 10.1080/23748834.2022.2072057*

Sigler, L., Gilabert, J., Villalba, G. (2022). Exploring Methods for Developing Local Climate Zones to Support Climate Research. *Climate 10 (7). doi: 10.3390/cli10070109*

Diaz-Serrano, L., Kallis, G. (2022). Political leaders with professional background in business and climate outcomes. *Climatic Change 172. doi: 10.1007/s10584-022-03363-6*

Marino, A., Blanco, J., Cortes-Vazquez, J., Lopez-Bao, J., Bosch, A., Durant, S. (2022). Environmentalities of Coexistence with Wolves in the Cantabrian Mountains of Spain. *Conservation and Society 20. doi: 10.4103/cs.cs_66_21*

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Moya Calderón, M., Chavarría Esquivel, K., Arrieta García, M.M., Lozano, C.B. (2022). Tourist behaviour and dynamics of domestic tourism in times of COVID-19. *Current Issues in Tourism 25. doi: 10.1080/13683500.2021.1947993*

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van den Bergh, J.C.J.M. (2022). A procedure for globally institutionalizing a 'beyond-GDP' mètric. *Ecological Economics 192. doi: 10.1016/j.ecolecon.2021.107257*

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Savin, I., Mundt, P. (2022). Drivers of productivity change in global value chains: Reallocation vs. Innovation. *Economics Letters 220. doi: 10.1016/j.econlet.2022.110878*

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Zapata-Caldas, E., Calcagni, F., Baró, F., Langemeyer, J. (2022). Using crowdsourced imagery to assess cultural ecosystem services in data-scarce urban contexts: The case of the metropolitan area of Cali, Colombia. *Ecosystem Services 56. doi: 10.1016/j.ecoser.2022.101445*

Levin, S.A., Anderies, J.M., Adger, N., Barrett, S., Bennett, E.M., Cardenas, J.C., Carpenter, S.R., Crépin, A.-S., Ehrlich, P., Fischer, J., Folke, C., Kautsky, N., Kling, C., Nyborg, K., Polasky, S., Scheffer, M., Segerson, K., Shogren, J., van den Bergh, J., Walker, Brian, Weber, E.U., Wilen, J. (2022). Governance in the Face of Extreme Events: Lessons from Evolutionary Processes for Structuring Interventions, and the Need to Go Beyond. *Ecosystems 25. doi: 10.1007/s10021-021-00680-2*

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Annex IV

Gender Equity and Responsible Travel Strategy

ICTA-UAB Gender Equity Audit and Policy

True to its commitment to advancing gender equality at all levels, the ICTA-UAB has developed its Gender Equality Policy, through which it aims to implement actions that strengthen the presence and role of women and non-binary scientists at the institution, make their research contributions visible and enable the development and implementation of protocols to address gender-based discrimination and sexual harassment.

The initiative forms part of the policies being developed by the UAB, specifically the "IV Action Plan for Gender Equality at the Universitat Autònoma de Barcelona 2019-2023", and the María de Maeztu Excellence Programme 2020-2023 at ICTA-UAB.

After years in which several activities had been developed to foster debate and reflection on power relations and conflicts between groups, in 2021 it was created a working group composed of predoctoral, and postdoctoral researchers specifically dedicated to gender equity and power relations. During 2022, an internal gender audit was carried out, which has enabled the objectives and actions of the Gender Equality Policy to be defined.

ICTA-UAB Responsible Travel Strategy

ICTA-UAB has designed a responsible travel strategy with the aim of helping researchers at the centre, as well as researchers from the rest of the UAB, to reduce the environmental impact of their research-related travels.

Annex V

Press Releases (in chronological order)

Victoria Reyes-García joined the first ever UNESCO-IPCC-ICOMOS meeting to strengthen synergies between culture and climate change science 19_01_2022

Dinosaurs and amber: a site in Teruel opens a unique window to the Cretaceous world from 110 million years ago 21_01_2022

Ocean microplastic pollution may be greater than estimated 25_01_2022

Agriculture and sustainable mobility in cities after the pandemic 28_01_2022

International scientists call for more sustainable and equitable land use to tackle climate change 08_02_2022

New project to analyze marine biodiversity loss through the study of marine calcifying plankton 10_02_2022

Local communities around the globe claim the disappearance of wild edible plants 22_02_2022

High pollen levels expected in spring, with normal values returning in summer 16_03_2022

"Advanced" countries' wealth depends on the appropriation of resources and labour from the global South 22_03_2022

The United States and the European Union are responsible for the majority of ecological damage caused by excess use of raw materials 08_04_2022

Marine mollusc shells reveal how prehistoric humans adapted to intense climate change 22_04_2022

Investigadors de l'ICTA-UAB, autors de l'estudi crític amb l'Acord UE-MERCOSUR 06_05_2022

Victoria Reyes-García presented in the National Academy of Sciences 10_05_2022

New project to empower urban cyclists through citizen science 12_05_2022

An oceanographic campaign analysed soot from tropical fires deposited in the Atlantic Ocean 22_05_2022

Scientists call for decision-making to be transformed to tackle the climate and biodiversity crises together 01_06_2022

Farm shops and agricultural cooperatives waste up to 80% less fruit and vegetables than supermarkets 02_06_2022

Mountain sheep grazing systems provide multiple socio-ecological benefits 08_06_2022

New project on the ethical analysis of wildlife regeneration 14_06_2022

Reduction of global inequalities in energy use necessary to stop climate change 07_07_2022

Understanding the Calcium Carbonate Cycle in the North Pacific 11_07_2022

Reducing sugar consumption to achieve climate and sustainability goals 25_07_2022

Exposure to urban greenness has unequal effects on men's and women's mental health 29_07_2022

Marine mollusc shells to reconstruct the sea temperatures 06_09_2022

Greener and more walkable urban areas promote physical activity 15_09_2022

The expansion of capitalism led to a deterioration in human welfare 23_09_2022

Report calls for Indigenous Peoples' knowledge to be included in climate policy 29_09_2022

Melting permafrost increases the emission of greenhouse gases in Arctic lakes 06_10_2022

Urban greening protects against cardiovascular risk factors, some diseases, and mortality depending on gender and sex differences 18_10_2022

European project to explore pathways towards post-growth economics 25_10_2022

Project to analyse microplastic pollution in cities 28_10_2022

Shepherds of the Earth poses the dilemma between tradition and nature conservation in Africa at the SUNCINE Festival 31_10_2022

ICTA-UAB teaches the course Crazy about Sustainability 2023 31_10_2022

European project JustWind4All to accelerate the transition to wind energy 08_11_2022

A low-carbon energy transition may result in substantial emissions 18_11_2022

Ocean warming and acidification impact marine food web 24_11_2022

17% of rural land exposed simultaneously to high degrees of depopulation and aridity 05_12_2022

Scientists outline key policies for degrowth in the fight against climate change 12_12_2022

Greener cities promote social and climate inequalities 19_12_2022

Microplastics deposited on the seafloor triple in 20 years 22_12_2022

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