

2022

ANNUAL REPORT



Advancing transdisciplinary research for sustainable development

BC3 BASQUE CENTRE FOR
CLIMATE CHANGE
Klima Aldaketa Ikergai

 EXCELENCIA
MARÍA
DE MAEZTU
2023-2027



**EUSKO JAURLARITZA
GOBIERNO VASCO**

HEZKUNTZA SAIALA
DEPARTAMENTO DE EDUCACIÓN

Advancing transdisciplinary research for sustainable development



The Basque Centre for Climate Change (BC3) is an international and multidisciplinary research institute based in the Basque Country. Since its foundation in 2008 by the Basque Government and the University of the Basque Country, BC3 belongs to the Basque Research Centres of Excellence (BERC) program.

With 90+ employees from various fields of knowledge, BC3 is a consolidated centre dedicated to the co-production of relevant knowledge for decision-making, integrating the environmental, socioeconomic and ethical dimensions of climate change.

By following a transdisciplinary and participatory approach, BC3 contributes to the testing and demonstration of scalable solutions for sustainable development in collaboration with 40 international organisations and research centres in more than 20 countries.

BC3 has excellent results in attracting talent (3 ERCs and 5 individual MSCAs) and in securing research projects (22 European projects). Thanks to our people and partners, those who make it possible for us to achieve our goals and allow us to see ourselves as an organization unrestricted by our physical boundaries.

Since BC3's creation, we have sought to be a cutting-edge and motivating centre from which researchers can continue co-creating scientific knowledge, tools and methodologies on the causes and effects of climate change and contributing to solving the most pressing challenge modern humans have ever faced.

Transdisciplinary research integrates knowledge through active collaboration across academic disciplines and with non-academic stakeholders. Being a transdisciplinary researcher implies more than raising awareness through

scientific evidence, it is a unique approach to engaging with different ways of knowing the world and generating new knowledge to address societal challenges.

Transdisciplinarity moves us to understand the world in which we live and to find suitable and fair solutions. It brought us together to co-design and implement policies leading to sustainable development.

This Report presents our efforts towards building a more sustainable science. Come find out what transdisciplinary research is about.

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01 Coordinated transdisciplinary research in the post-Paris Agreement era

- RL.1 Climate Basis
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- RL.5 Integrated Modelling



SO5



SO1



SO1 UNDERSTANDING PAST AND FUTURE CLIMATE CHANGES

Understand physical processes that drive climate change with a primary focus on the most sensitive environments, like the cryosphere.

Learning from the past: analysis of ancient and recent climate and environmental history.

Exploring the present: changes in extreme and vulnerable environments.

Looking upon the future: Climate and environmental modelling, projections and scenarios.



SO2 SUPPORT DECISION MAKING IN THE TRANSITION TO A LOW CARBON SOCIETY

Better understand the challenges, opportunities, risks and uncertainties associated with low carbon transitions, and also the designing, communicating, implementing and evaluating of specific actions.

Strengthen modelling capacities for an integrated assessment of climate policies.

Assessing climate policies with the engagement of stakeholders.

Assessing and designing policies for a just transition for all.



SO3 UNDERSTANDING AND MANAGING TERRESTRIAL SYSTEMS FOR SUSTAINABILITY

Process understanding and consideration of the interplay of social, economic and environmental effects on land use change, the recovery pathways of agricultural systems, and the socio-ecological tradeoffs between SDGs.

Understanding, predicting and mitigating the effects of global change on ecosystem functioning.

Understanding the vulnerability of forest ecosystems to climate change and assisting their adaptation. Food systems in the global change era.

The role of the livestock systems in reaching GHG neutrality and promoting sustainability.

Mitigating climate change through land systems.

Social-ecological analysis of the biodiversity-climate-society nexus.



SO4 SUPPORT DECISION MAKING FOR SUCCESSFUL AND EFFECTIVE ADAPTATION

Adaptation economics, adaptation policy analysis, climatic risk assessment, adaptation tracking and climate resilience.

Investigating pathways to improve climate risk analysis and -governance under uncertainty.

Exploring the dynamics of adaptation and the ways to reinforce positive impacts of adaptation actions.

Understanding the local nature of adaptation and the role of urbanization and local politics.

By integrating climate considerations into decision-making processes across scales, and linking to sustainability, justice and other societal challenges.

Placing health and society at the heart of the adaptation process.

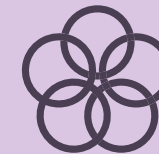


SO5 INTEGRATED MODELLING OF COUPLED HUMAN-NATURAL SYSTEMS

Modelling of ecosystem services to provide a view of coupled human-natural systems that has been widely recognized in science, management and governance.

Scaled complexity in biophysical and social modelling. Bridging disciplines: from biophysical to social through agriculture and food security.

Bridging scales: from process detail and agent behaviour to economic and policy instruments.



SO6 PROMOTING INTEGRATED INTERDISCIPLINARY AND TRANSDISCIPLINARY RESEARCH

Building and delivering applications online. BC3 structure dialogue to build an implementation plan for transdisciplinary projects.

CCT1 CLIMATE CHANGE COMMUNICATION

CCT2 PARTICIPATORY PROCESSES



SO4



SO3



SO2

02 2022 at a glance

S01 Understanding past and future climate changes

High mountains are among the regions most affected by climate change. The complex network of interactions between these regions' climate, biological, and sociocultural structures is being altered by the changing climate. In this work, BC3 researchers explored the future challenges for these unique regions.



S02 Support decision-making in the transition to a low-carbon society

Is the environmental taxation always regressive? Does a greener tax system have to be more unfair? BC3 researchers carried out a multistakeholder research to analyse the diesel tax reform in Spain. Learn more about our findings.



S03

Understanding and managing terrestrial systems for sustainability

Agricultural landscapes cover >60% of terrestrial landscapes, and provide food security and other critical ecosystem services. Although, biodiversity conservation and crop productivity have been seen as mutually exclusive options for a long time. BC3-led research found that strategies that are good for biodiversity conservation can also lead to increasing crop yields.



S04

Support decision-making for successful and effective adaptation

BC3 has taken leadership in revising adaptation plans of cities worldwide based on the approach of Nature-based Solutions aiming to advance pioneering science for evaluating urban adaptation and its governance across scales.



S05

Integrated modelling of coupled human-natural systems

BC3 will host a Sector Hub of the UN Global Platform from November 2022 onwards to expand the knowledge, technology, innovation and functionality behind the ARIES for SEEA application, developed by BC3 researchers in collaboration with UN DESA and UNEP.



S06

Promoting integrated interdisciplinary & transdisciplinary research

As a large and unique deliberative process, in line with similar ones in Europe, BC3 engaged in 2022 in the design and launch by the Spanish Government of the first Spanish Citizen Assembly on Climate Change, as part of the Coordination Independent Panel with SDSN Spain (Sustainable Development Solutions Network).



03

BC3's people

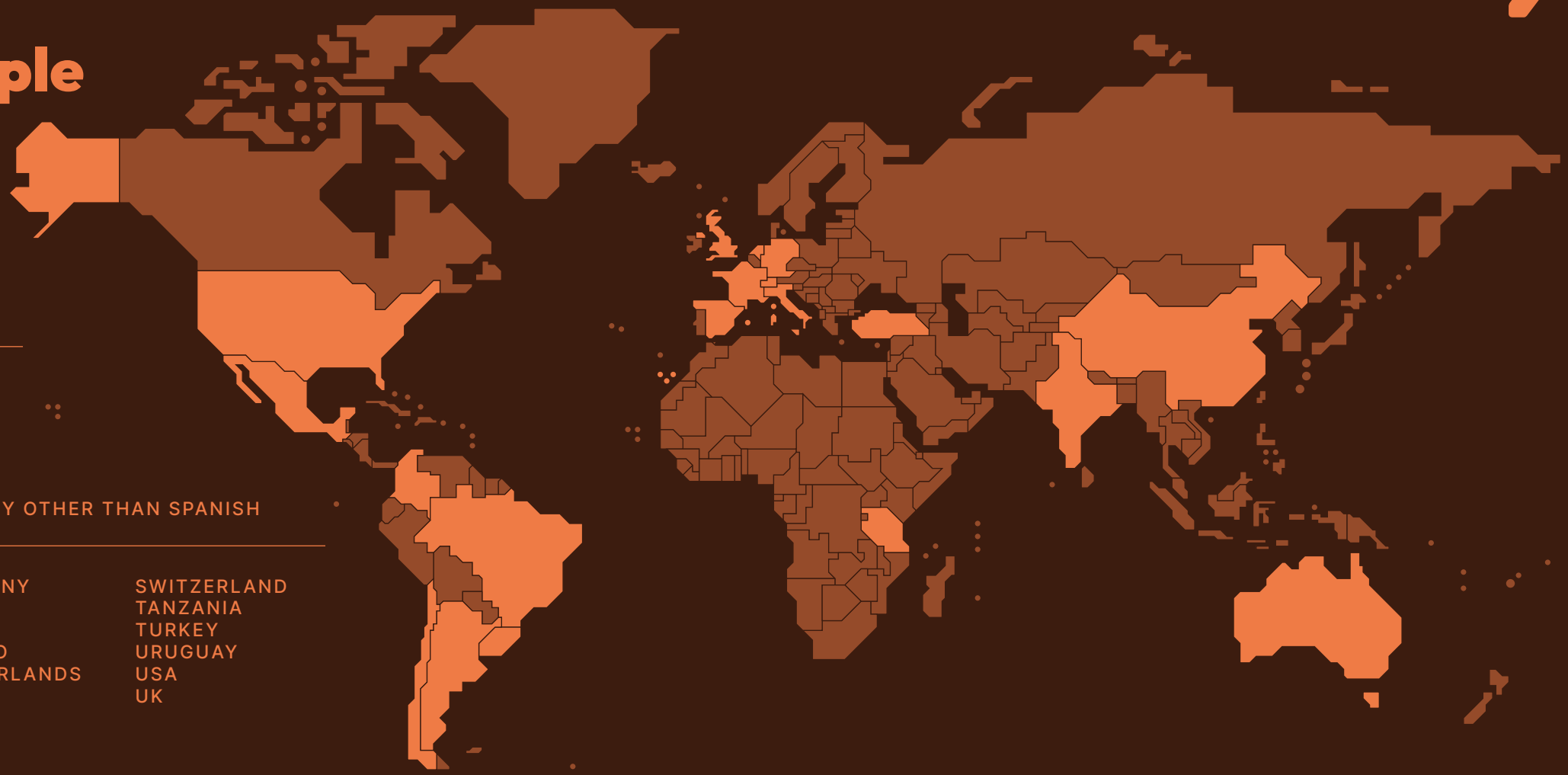
18

NATIONALITIES

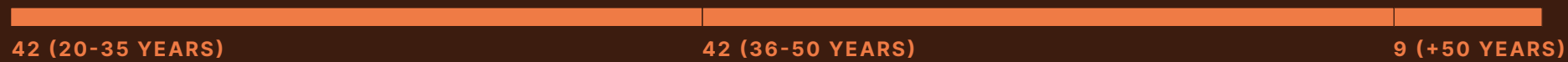
31%

OF US HAVE A NATIONALITY OTHER THAN SPANISH

- AUSTRALIA
- ARGENTINA
- BRAZIL
- CHINA
- COLOMBIA
- FRANCE
- GERMANY
- INDIA
- ITALY
- MEXICO
- NETHERLANDS
- SPAIN
- SWITZERLAND
- TANZANIA
- TURKEY
- URUGUAY
- USA
- UK



DISTRIBUTION OF PEOPLE BY AGE



DISTRIBUTION OF PEOPLE BY SEX



DISTRIBUTION OF PEOPLE BY AREA



Why I like working at BC3



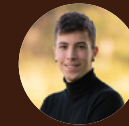
Patricia Muñoz,
Lab Technician

BC3 gives me the unique opportunity to dedicate myself to finding innovative solutions for experimentation in extreme temperatures. One of the most gratifying aspects of working at BC3 is knowing that my technical support contributes to scientific knowledge related to the cryosphere and its impact on the global climate balance.



Mikel González-Eguino,
Senior Researcher

I feel privileged to have worked at BC3 almost since its inception. BC3 allows me to help find solutions and design policies to contain the climate crisis. On this path, as on any other, there have been difficulties, but I have been fortunate to be accompanied by the excellent group of people who make up BC3 and who have helped me become a better researcher and a better person.



Ander Villar,
Junior Project Officer

Working at BC3 makes me feel part of a huge and very diverse family in terms of nationality, ideology, culture, age, etc., all working towards the same goal. BC3 provides me with a global vision of environmental trends and policies along with the many possible solutions that science is developing, driving me to be part of the solution and the change from the centre's managerial perspective.



Iratxe Rubio,
Adjunct Researcher

BC3 is a research centre where I have always felt at home. Although I am currently an adjunct researcher and independent to continue developing my professional career in the fields of knowledge transfer and education, I enjoy maintaining my relationship with BC3 as a daughter who never stops learning from her family and enriching it with her own experience.



Cristina Sánchez,
Scientific Director Assistant

What I like the most about my job is the people that surround me, colleagues from different parts of the world with different cultures. What unites all of them is their generosity and dedication to research and acquiring knowledge in such a way that we all have a healthier and more sustainable planet.



Lucas Elius Yamat,
Junior Researcher

BC3 has been a diverse home to people from different continents, backgrounds and groups – including the indigenous people to where I belong. Besides, at BC3 the study of climate change is done in a multi- and interdisciplinary manner blending both hard-science and social-economic perspectives, which lets me work on a multidimensional perspective that tells the whole story of climate change.



Alessio Bulckaen,
Research Project Manager

Collaborating with people involved in designing solutions to mitigate and comprehend climate change effects in a multidisciplinary and multicultural context is very exciting. There aren't many places where I could bring forward the same work, in which saving the planet (as we know) comes before any other interests, and I'm very proud to be part of it.



Ambika Markanday,
Research Fellow

BC3 is a great working environment for several reasons. I enjoy the flexibility it permits in terms of working remotely and how it allows me to organise my working hours in a way that suits both my professional and personal life. I also love how the centre is becoming more diverse, attracting a more international and multidisciplinary talent pool from across the world.

04 Members of BC3's International Scientific Advisory Committee

BC3's ISAC is a consultative body of independent experts created to provide advisory opinions and analysis on the centre's research programme and general strategy



Neil Adger
Professor of
Human Geography
UNIVERSITY OF
EXETER



Tim Taylor
Senior Lecturer
in Environmental
and Public Health
Economics
UNIVERSITY
OF EXETER



**Mariana
Rufino**
Professor of
Livestock Systems
TECHNICAL UNIVERSITY
OF MUNICH



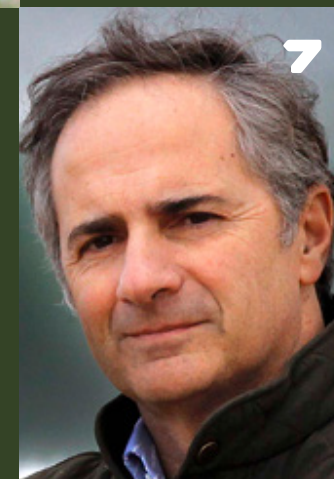
**Teresa
Moreno**
Scientific Director
INSTITUTE OF
ENVIRONMENTAL
ASSESSMENT AND WATER
RESEARCH (IDAEA-CSIC)



Iñigo Losada
Scientific Director
Cantabria Coastal
and Ocean Basin
IHCANTABRIA



**Annela
Anger-Kraavi**
Senior Research
Associate
CAMBRIDGE INSTITUTE
FOR SUSTAINABILITY
LEADERSHIP



**Reinhard
Mechler**
Lead Systemic Risk
and Resilience Group
INTERNATIONAL
INSTITUTE FOR APPLIED
SYSTEMS ANALYSIS
(IIASA)

05 Relevant data 2022

PUBLICATIONS

157

H INDEX

83

CITATIONS

7,6k

ANNUAL BUDGET

€5,7M

Relevant data since 2008

PUBLICATIONS

900+

H INDEX

482

CITATIONS

32,2k

TOTAL BUDGET

€46,9M

06

Annex 1.

Indexed journal articles

A global agenda for advancing freshwater biodiversity research. *Ecology Letters*,25(2) 255-263Maasri, A., Jähnig, S.C., Adamescu, M.C., et al. (2022).

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Annex 2. Other publications

TITLE	AUTHOR	PUBLISHER	LINK
Accelerating Clean, Green, and Climate-Resilient Growth in Vietnam: A Country Environmental Analysis. Washington, DC: World Bank. © World Bank.	Anil Markandya, Michael S. Brody, Hang Dang, Jason D. Russ, et al.	World Bank	VISIT
Análisis de impacto de alternativas para la financiación de las energías renovables en España	González-Eguino, M. García-Muros, X. Arto, I., et al.	Cuadernos Económicos de ICE	VISIT
Análisis del impacto económico de las ayudas a Oficinas de Transformación Comunitaria para la promoción y dinamización de comunidades energéticas (Programa CE OFICINAS)	Mikel Gonzalez Ruiz de Eguino, Iñaki Arto, et al.	Ministerio de Transición Energética y Cambio Climático	
Análisis del impacto económico de las ayudas a proyectos singulares de instalaciones de biogás	Mikel Gonzalez Ruiz de Eguino, Iñaki Arto, et al.	Ministerio de Transición Energética y Cambio Climático	
Análisis del impacto económico de las ayudas para energía sostenible en las Islas Baleares y Canarias	Mikel Gonzalez Ruiz de Eguino, Iñaki Arto, et al.	Ministerio de Transición Energética y Cambio Climático	
Análisis del impacto económico de las ayudas para la implantación de instalaciones de energías renovables térmicas en diferentes sectores de la economía	Mikel Gonzalez Ruiz de Eguino, Iñaki Arto, et al.	Ministerio de Transición Energética y Cambio Climático	
Análisis del impacto económico de las inversiones del Plan de Transición Energética y Cambio Climático 2021-2024	Arkaitz Usubiaga Liaño, Mikel Gonzalez Ruiz de Eguino, Iñaki Arto, et al.	Ministerio de Transición Energética y Cambio Climático	
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Análisis del impacto económico del Programa RENMARINAS DEMOS	María Victoria Román de Lara, Iñaki Arto y Mikel González-Eguino, et al.	Ministerio de Transición Energética y Cambio Climático	
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Monetary Valuation of Ecosystem Services and Assets for Ecosystem Accounting Interim version 1st edition	Anil Markandya (Basque Centre for Climate Change) was lead author of the initial version of the report. Other contributors are: David N. Barton (Norwegian Institute for Nature Research), Alejandro Caparrós (University of Durham), Bram Edens (United Nation, et al.	United Nations	VISIT
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