

Climate Research in Ireland 2023



2023 Climate Research Highlights¹

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186
new research
projects funded



€6.2m
in core research
activities



€115m
in competitive
funding awarded



€2m
for new EU LIFE
projects



€44m
EU funding leveraged
by Irish researchers



¹ Reporting Period January to December 2023. Figures represent data submitted by NERCG member organisations and include both climate and climate-related research activities.

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Overview

The National Environmental Research Co-ordination Group (NERCG) seeks to support and promote coordination and knowledge exchange between state bodies involved in funding environmental research in Ireland. The group is coordinated and chaired by the EPA and has 39 member organisations consisting of research funding organisations, state agencies and government departments, listed in Appendix I.

This Climate Research in Ireland report, the sixth of its kind, provides an update on climate research funding administered by NERCG member organisations in 2023. Some key activities of NERCG members in 2023 are also highlighted. The report is based on information provided to the EPA by the following NERCG member organisations:

- Department of Agriculture, Food and Marine
- Department of the Environment, Climate and Communications
- Department of Transport
- Department of The Taoiseach
- Department of Further and Higher Education, Research, Innovation and Science
- Environmental Protection Agency
- Marine Institute
- Met Éireann
- Taighde Éireann – Research Ireland²
- Sustainable Energy Authority of Ireland
- Geological Survey Ireland

² Returns were provided separately by Science Foundation Ireland and the Irish Research Council prior to the establishment of Research Ireland.

The data presented includes both:

- **climate research**, which contributes directly to our understanding of climate and how it is changing; and
- **climate-related research**, which includes research on the impacts of climate change in different sectors and solutions to address it.

All data used to compile the report will be made available on the EPA's [National Climate Research Database](#).

As detailed in the report, in 2023, NERCG member organisations awarded €115m in competitive funding for 186 projects in climate and climate-related research, representing a significant increase of €35m on 2022, although much of this can be attributed to a single large award. Considering only climate research, the overall amount of funding awarded decreased by €6.8m compared to 2022, with 34 projects to a value of €19.5m awarded in 2023.

There continues to be active co-ordination between funders to maximise the impact of their resources, with €3.3m in co-funding provided between NERCG members. In addition a further €3.9m in co-funding was provided by non-NERCG member organisations, including, for example, the Ministry of Primary Industries (New Zealand), Fota Wildlife Park, National Organic Training Skillnet, and Údarás na Gaeltachta. A number of NERCG member organisations also carry out essential climate research in-house which amounted to €6.2m in 2023.

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Overview (cont'd)

Horizon Europe continues to be an important source of funding and collaborative opportunity for the climate and climate-related research community in Ireland. Within Clusters 5 and 6, researchers in Ireland secured approximately €44m for climate and climate-related research under relevant calls in 2023 (up from €40m in 2022), as part of international collaborative projects worth over €500m.

A high-level analysis of research outputs reveals a continued upward trend in both climate and climate-related publications with Irish-based authors over the last five years.

The first Ireland's Climate Change Assessment (ICCA) was completed in 2023 and published by the EPA in January 2024. It highlights that Ireland's response to the climate crisis must be informed by the best available science, and the role of innovation, research and systematic observations. Continued and sustained investment in climate and climate-related research is essential to ensure we have the science and data required to understand how Ireland is being impacted by climate change and how we respond to this unprecedented challenge.

Other selected highlights from 2023 are outlined, including new funding initiatives, some key project outputs and events related to climate research.



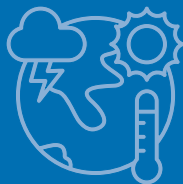
€115m

in competitive funding
for 186 projects in
climate and climate-
related research



€44m

for climate and climate-
related research under
relevant calls in 2023



Sustained investment in climate and climate-related research is essential to ensure we have the science and data required to understand how Ireland is being impacted by climate change and how we respond to this unprecedented challenge.

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A total of €19.5m was invested in 34 projects in climate research in 2023 (Figure 1). This represents an decrease of €8.4m on 2022.

Considering both climate and climate-related research, 186 projects were awarded in 2023 to an amount of €114.7m, which is €35m more than in 2022. Figure 1 shows fluctuations in total investment in climate and climate-related research since 2018, ranging from a low of €20m in 2020 to a peak

of €114.7m in 2023. This fluctuation can be attributed to an expansion in the scope of what was counted as 'climate-related research' in 2021, as well as fluctuations arising from large single awards in certain years, for example, for Research Ireland Centres and Strategic Partnerships.

Projects ranged in size, with the largest proportions in the ranges €300-400k (39 projects) and €500k-1m (41 projects).

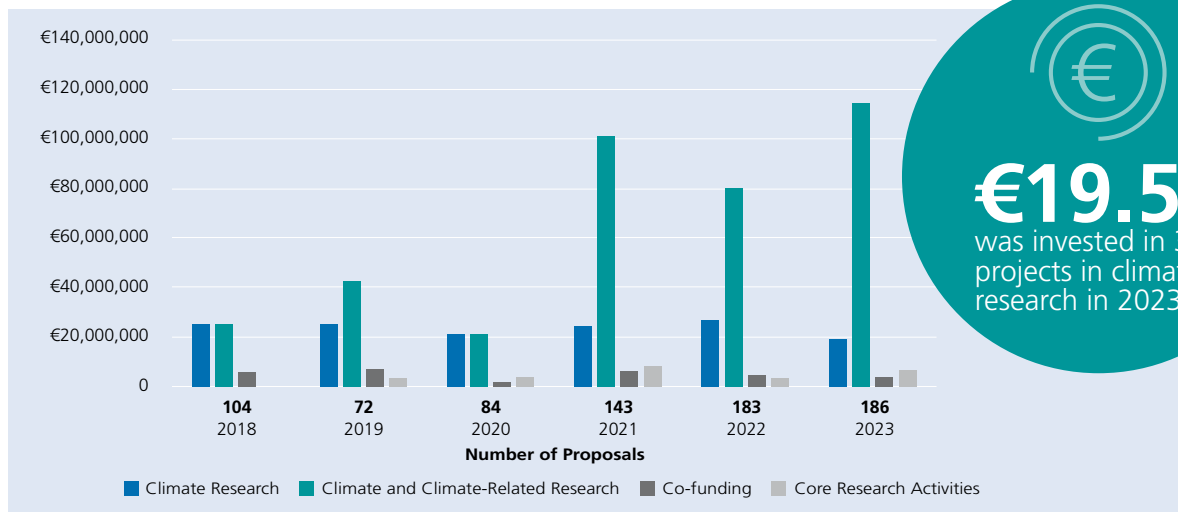


Figure 1 NERCG Funding Activities 2018 – 2023³.

³ Scope of what constituted 'Climate-related Research' was expanded significantly in 2021. Core Research Activities were not recorded in 2018.

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Figure 2 shows the budget committed by NERCG member organisations for new competitive awards in climate and climate-related research in 2023. It also shows the amount of co-funding supplied by non-NERCG members.

For clarity, a single €30.8m award by Research Ireland is shown separately; this was for the second phase of the BiOrbic Research Centre, which is focused on the development of a sustainable circular bioeconomy.

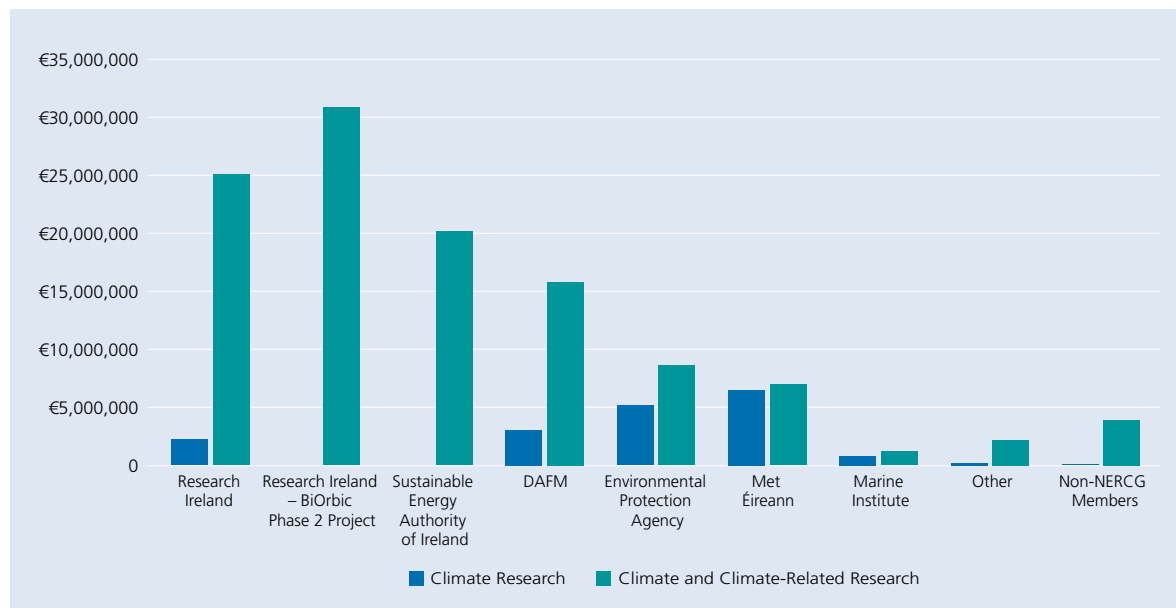


Figure 2 Budget committed by NERCG member organisations for new competitive research awards in climate and climate-related research in 2023. Co-funding supplied by non-NERCG member organisations is also shown.

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Thematic Area

Figure 3 provides a breakdown of the climate research awards in 2023 by thematic area. Of the total €19.5m, 'Ireland's future climate, its impacts and adaptation options' was the most highly funded thematic area in 2023 at €9.2m (up €5.1m on 2022). 'Climate solutions, transition management and opportunities' was the second highest funded thematic area (at €5.4m), with 'Carbon stocks, GHG emissions, sinks and management options', and 'Air science' receiving €2.4m and €1.8m in funding respectively in 2023.

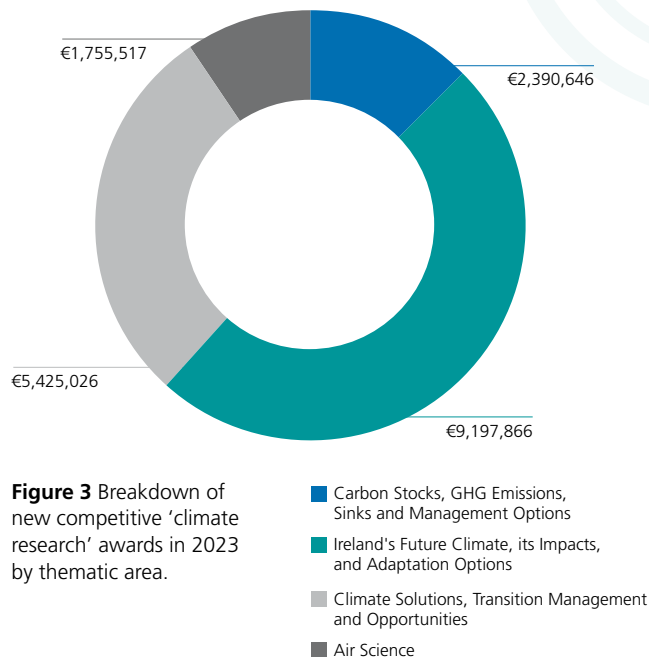


Figure 3 Breakdown of new competitive 'climate research' awards in 2023 by thematic area.

€9.2m

for 'Ireland's future climate, its impacts and adaptation options', the most highly funded thematic area in 2023.

€5.4m

for 'climate solutions, transition management and opportunities', the second highest.

€2.4m

was awarded to 'carbon stocks, GHG emissions, sinks and management options'.

€1.8m

was received by 'air science' thematic area.

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Research-performing Organisations

University College Dublin (UCD) again received the most funding through competitive research calls in 2023 for climate and climate-related research (Figure 4). Notwithstanding that a significant amount of this was for a single award (€30.8m for BiOrbic Phase 2, Research Ireland Centre Award, as indicated

by green shaded area in Figure 4), UCD still represented the most successful higher education institution for climate and climate-related research funding in 2023, followed by Teagasc, University of Galway and University College Cork. UCD was also the most highly funded research body when considering only climate research, followed by University of Galway and University College Cork.

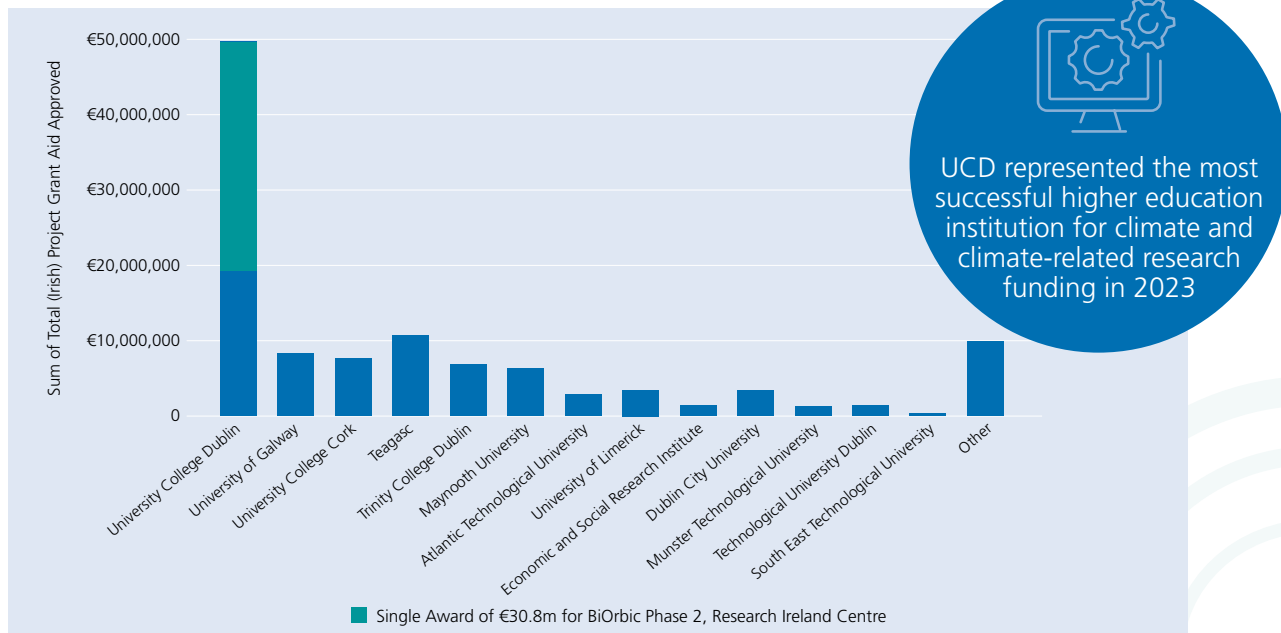


Figure 4 Total budget awarded in 2023 per receiving lead research-performing organisation through new competitive funding in climate and climate-related research.

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Publications

Publications are a key research output and indicative of the level of research activity in a given area. Figure 5 shows the total numbers of publications with Irish-based authors over rolling five-year periods for climate and climate-related research based on a bibliographic analysis⁴. The trends show increases in the numbers of publications in both climate and associated research areas over the period 2018 to 2023.

As shown in Table 1(overleaf), a high proportion of the publications in 2023 involved international collaboration. Looking at the performance of publications, it is positive that the Normalised Citation Impact is above average (>1) meaning that publications were cited more than average (Table 1, overleaf).

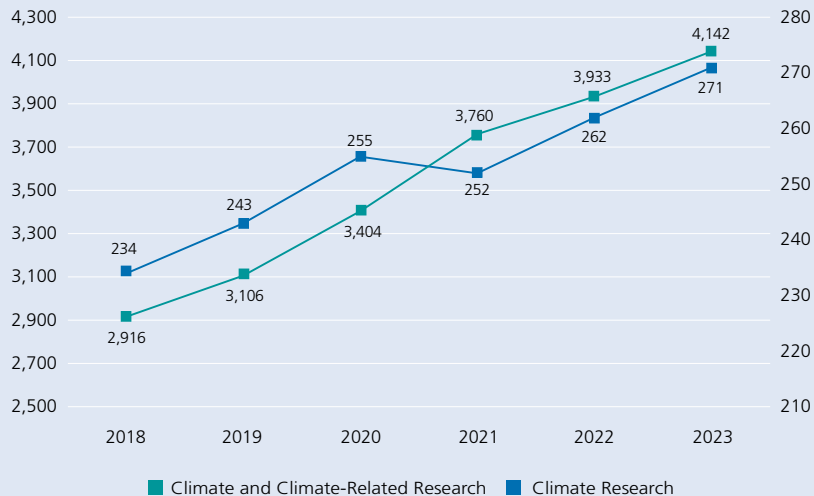


Figure 5 Numbers of publications over preceding 5-year period

⁴ Data was gathered from [Incites](#) (Clarivate Analytics) on 15 August 2024 and includes Articles and Reviews. The classifications used were based on the [Australian and New Zealand Standard Research Classification](#), which is the basis for [Research Classification Ireland](#). Climate-related Research includes all publications under the broad Level 1 Field of Research Classifications: Environmental Sciences (41) and Earth Sciences (37). Climate Research includes only publications under the more detailed Level 2 Field of Research Classifications: Climate change science (3702) and Climate change impacts and adaptation (4101). Note that the categorisation of publications under this Classification Scheme has been refined in the Incites platform so that more publications are included in Level 1 than in 2022, but the trends remain unchanged.

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Table 1: Numbers of research publications in 2023 with Irish-based author and associated bibliographic metrics in climate and climate-related research. The normalised citation impact provides a comparison to the world average for these categorisations. A value above one indicates that it is above average; for example, 1.6 indicates 60% higher than the world average.

Publications in 2023	Number of Publications	Normalised Citation Impact	% International Collaborations
Climate-related Research (Level 1 Classification: Environmental and Earth Sciences)	680	1.12	84%
Climate Research (Level 2 Classification: Climate change science, and impacts and adaptation)	42	1.61	85%

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Horizon Europe

In calls in 2023, Ireland was successful in receiving a total of 70 grants under Clusters 5 and 6 of Pillar 2 in Horizon Europe, which represent the subject areas of Climate, Energy, Mobility, Food, Bioeconomy, Natural Resources, Agriculture and the Environment (comparable to climate and climate-related research). These awards represent a total of almost €44m for Ireland and are part of overall projects worth €502m (Table 2). While it is difficult to make direct comparisons between years as the available funding opportunities differ, this reflects an increase on the reported amount in 2022 and is a positive trend for the Irish research community's engagement in climate and climate-related research in Europe. Of these awards, 17 are being coordinated by researchers in Ireland, compared to 10 in the data used for the 2022 report.

Table 2: Funding awarded to Irish researchers in climate and climate-related Horizon Europe funding calls in 2023

	Signed Grants	Funding for Irish Partners	Total Project Funding ⁵
Climate	11	€3.21m	€52.66m
Climate, Energy and Mobility	32	€14.6m	€186.5m
Climate, Energy and Mobility; Food, Bioeconomy, Natural Resources, Agriculture and Environment	70	€43.63m	€501.6m

⁵ The data shown was gathered from the [Horizon Europe Dashboard](#) on 15 August 2024. The data corresponds to grants issued through calls issued in 2023 (grants may have been signed in 2024) and only includes calls under Pillar 2 "Global Challenges and European Industrial Competitiveness". 'Climate' refers to calls specific to climate science (HORIZON-CL5-2023-D1, HORIZON-CL5-2023-D2-, HORIZON-CL6-2023-CLIMATE). 'Climate, Energy and Mobility' includes all calls in 2023 under Cluster 5. 'Climate, Energy and Mobility; Food, Bioeconomy, Natural Resources, Agriculture and Environment' includes all calls under Clusters 5 and 6.

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For additional highlights provided by NERCG members, please see the Supplementary Information document available for [download](#).

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DECC Research and Innovation Strategy

The Department of the Environment, Climate and Communications progressed the development of its inaugural Research and Innovation Strategy (to 2030) in 2023. The [Strategy](#) (published in 2024) aims to harness research to its full potential to drive the action and innovation needed to develop a climate neutral, sustainable, digitally connected, and cyber-resilient Ireland. Actions include publication of a Research Needs Statement for the Department to allow greater connectivity between DECC's research needs and the national R&I system, as well as the development of a framework for identifying national climate research and innovation priorities.

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Agriculture and Climate Change: Science into Action Conference

The Department of Agriculture, Food and the Marine hosted a national conference entitled '[Agriculture and Climate Change: Science into Action](#)' in November 2023. With 500 delegates from across the agri-food sector, the conference brought stakeholders up to date on the latest climate policy developments relating to agriculture and land use, including the latest scientific developments on measuring and mitigating the principal agricultural greenhouse gases. In this context, it facilitated discussion on how this research can inform policy and be implemented on farms and used for diversifying opportunities for agriculture and land use.

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Research Co-Centres Programme

Funding of €70 million was announced for research centres on climate and sustainable food, bringing together academics, industry and policymakers across the Irish Government, UK Government and Northern Ireland Government Departments to collaborate on common challenges such as food sustainability and climate change. The Co-Centres programme is funded over six years, with up to €40 million from Research Ireland (supported by the Department of Further, Higher Education, Research Innovation and Science and the Irish Government's Shared Island Fund), up to £17 million from Northern Ireland's Department of Agriculture, Environment and Rural Affairs (DAERA) and up to £12 million through UK Research and Innovation (UKRI), and is co-funded by industry.

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Co-Centre for Climate + Biodiversity + Water

The Co-Centre for Climate + Biodiversity + Water has the vision to be a home of research, innovation, and policy development across the interlinked challenges of climate change, biodiversity loss, and water degradation. This will be achieved through research to enable fair transformations to Net Zero, reverse biodiversity loss, restore water quality and ensure resilience for communities and a sustainable economy.

Horizon Europe Successes

In Horizon Europe funding calls in 2023, 17 projects were awarded where a research institution in Ireland is acting as coordinator. An example of this is the project [GoNaturePositive!](#), which is led by Trinity Business School and involves 20 partners across 14 countries and a network of global collaborators to accelerate awareness and transformative action towards a nature-positive economy. The research aims to provide more clarity on the concept of a nature-positive economy and guide businesses and policymakers on the priorities for transformation. In this context, the project will champion nature-based solutions and nature-based enterprises to redefine our economic landscape.

Met Éireann Research Professorship

In 2023, Met Éireann [announced a new multi-million-euro academic research programme](#) at University College Dublin (UCD) to support the further development of weather and climate services for Ireland using data science and Artificial Intelligence (AI). The Met Éireann Weather and Climate Research Professorship, to be recruited in 2024, represents a €1 million annual investment for an initial period of five years. Overseen by an expert knowledge transfer team at Met Éireann working closely with a professor-led research group at UCD School of Mathematics and Statistics and UCD Earth Institute, the partnership will build further capacity and capability in data science and AI in the higher education sector.

A white icon of a cloud with lightning bolts and rain falling from it, set against a blue circular background.

€1m

annual investment for
an initial period of five
years for the Met Éireann
Weather and Climate
Research Professorship.

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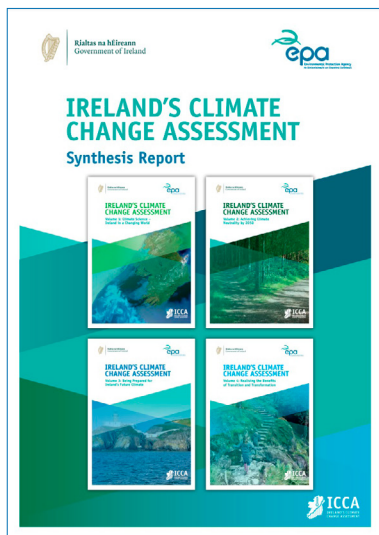
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Ireland's Climate Change Assessment

Ireland's Climate Change Assessment (ICCA) was published by the EPA in January 2024. It offers, for the first time, a thorough and authoritative evaluation of the current understanding of all crucial aspects of climate change for Ireland. The ICCA report is presented in four volumes, with each volume including a short Summary for Policymakers. Accompanying the four volumes is a Synthesis Report which integrates key findings across the underlying volumes and provides an accessible overall summary.



ECCA 2023

The **European Climate Change Adaptation Conference** took place in Dublin in 2023 with the theme of 'Actionable Knowledge for a Climate Resilient Europe'. It brought together 500 delegates and experts in scientific climate research, decision-makers, practitioners and policy to advance the adaptation of European territories to climate change and included thematic focus on climate platforms and services, sea level rise and coastal change, nature-based solutions, severe climate extremes, and societal transformation and resilience. The conference was presented by MAGICA in association with JPI Climate, with funding from the European Commission, hosted by University College Cork (UCC), MaREI and sponsored by the EPA, European Space Agency (ESA) and Dublin City Council.

Climate Change and Cultural Heritage

The EPA and the Department of Housing, Local Government and Heritage (DHLGH) supported the participation of the research community in Ireland in an international collaborative research action on addressing how cultural heritage will be impacted by climate change and its role in addressing it. The research action was coordinated by the Joint Programming Initiatives on Climate Action (JPI Climate) and Cultural Heritage (JPI CH) together with the Belmont Forum with funding support of €15M from across 16 countries. Three of the 16 successful projects involve Irish partners who will be supported by funding contributed by the EPA and DHLGH.

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Appendix I

Members of the National Environmental Research Coordination Group

An Fóram Uisce (The Water Forum)

Central Statistics Office

City and County Managers Association

Climate Action Regional Office (Dublin)

Climate Change Advisory Council Secretariat

Department of Agriculture, Food and the Marine

Department of Enterprise, Trade and Employment

Department of Foreign Affairs

Department of Further and Higher Education, Research,
Innovation and Science

Department of Health

Department of Housing, Local Government and Heritage

Department of the Environment, Climate and Communications

Department of the Taoiseach

Department of Transport

Enterprise Ireland

Environmental Protection Agency

Food Safety Authority Ireland

Geological Survey Ireland

Health and Safety Authority

Health Research Board

Health Service Executive

Inland Fisheries Ireland

Institute of Public Health

Uisce Éireann (Irish Water)

Local Authority Waters Programme

Marine Institute

Met Éireann

National Economic and Social Council

National Parks and Wildlife Services

National Transport Authority

National Treasury Management Agency

Northern Ireland Department of Agriculture,
Environment and Rural Affairs

Northern Ireland Environment Agency

Office of Public Works

Office of the Planning Regulator

Taighe Éireann – Research Ireland (formerly Science Foundation
Ireland and the Irish Research Council)

Sustainable Energy Authority of Ireland

Teagasc



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Acknowledgements

The EPA would like to acknowledge the contributions of the National Environmental Research Co-ordination Group members in the preparation of this annual report for 2023 and thank all organisations who provided the data included in this report.

Disclaimer

Although every effort has been made to ensure the accuracy of the material contained in this report, complete accuracy cannot be guaranteed. The EPA, the National Environmental Research Coordination Group and the authors do not accept any responsibility whatsoever for loss or damage occasioned, or claimed to have been occasioned, in part or in full, as a consequence of any person acting, or refraining from acting, as a result of a matter contained in this report.