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Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

EPA Research Programme 2021-2030

EPA Research Call 2023 – Technical Description Document

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The EPA Research Programme is a Government of Ireland initiative funded by the Department of the Environment, Climate and Communications.

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Document Version History

Version No.	Changes Made
Version 1	Initial version of document for EPA Research Call 2023

The EPA Research Programme is a Government of Ireland initiative funded by the Department of the Environment, Climate and Communications.

EPA Research Call 2023

This document provides the Technical Description for the Environmental Protection Agency (EPA) Research Call 2023. Applicants should read this document carefully and also consult the other documentation provided (e.g., 2021 - 2030 Guidelines and Terms & Conditions).

Contents

Introduction

Effective management of the environment is increasingly science-driven. The EPA Research Programme delivers funded research that increases national understanding of our environment, the challenges it faces and responses to these. Underpinned by the research framework, EPA Research 2030, it focuses on achieving environmental objectives, informing policy and bringing together researchers and research users. The annual EPA Research Call is the primary mechanism through which the EPA funds these research projects.

EPA Research 2030

EPA Research 2030[1] is the ten-year high-level framework for the EPA's research programme (2021-2030), designed to be agile, responsive and flexible. EPA-funded research is essential to:

- Supporting the monitoring, assessment, reporting and regulatory activities of the EPA.
- Generating evidence crucial in assisting Ireland in meeting its commitments and requirements under the various international, EU and national policies and strategies.
- Generating the evidence base that supports decision making, behaviour change and policy development.
- Addressing knowledge gaps, providing the evidence-base and responding to priority challenges.
- Supporting multi-disciplinary, cross-sectoral and multi-stakeholder partnership projects.
- Developing environmental research capacity in Ireland, recognising the importance of not only sustaining the research-base but also of building and training the researchers in specific areas.

Research Hubs

EPA Research 2030 has a thematic structure comprising the following four interconnected hubs, which bring an integrated and cross-sectoral approach, enabling holistic management and protection of our environment:

Addressing Climate Change Evidence Needs: Climate change is already having an impact in Ireland, and strong mitigation and adaptation measures are needed. Research is essential in providing the evidence necessary to improve our knowledge systems and inform policy decisions that will advance our ambitions to be carbon neutral and resilient to climate disruption.

Facilitating a Green and Circular Economy: Environmental and sustainability challenges are inextricably linked to economic activities and lifestyles. Research under this hub will contribute to the mainstreaming of sustainable management of natural resources and waste, unlocking the potential of the circular and bio-economies, and boosting competitiveness, through resource efficiency and deployment of innovative technologies and solutions.

Delivering a Healthy Environment: A clean, vibrant and safe environment is a prerequisite for good health and wellbeing. Environmental degradation, pollution, as well as known and emerging substances of concern threaten our health and that of our supporting ecosystems. Research under this hub will contribute to understanding the environmental risks and benefits to our health, and to identifying appropriate policy and behavioural responses.

Protecting and Restoring our Natural Environment: Our natural environment provides us with clean air and water, food and the raw materials to sustain us and our economy. Research is required to inform and support a cross-sectoral approach to managing our natural environment and for the development of policies relating to the regulation of emissions and activities, and the protection of our water, land, and ecosystems.

[1] https://www.epa.ie/our-services/research/epa-research-2030/

Funding Structure

Under the EPA Research Call 2023, funding is available for proposals for:

Desk Studies – 6 to 12 months in duration with an indicative cost of up to €150,000

Medium Scale Projects – 24 to 48 months in duration with an indicative cost of up to €600,000

The type and scale of each project is provided as part of the scope detailed in this document.

Co-funding partnerships

The EPA is pleased to announce that the EPA Research Call 2023 involves co-funding partnerships with the following organisations:

Geological Survey Ireland (GSI) Founded in 1845, Geological Survey Ireland is Ireland's public Earth science knowledge centre and is a division of the Department of the Environment, Climate and Communications. GSI is committed to providing free, open and accurate data and maps on Ireland's subsurface to landowners, the public, industry, and all other stakeholders. GSI also acts as a project partner in leading international projects providing expertise, data and developing models and viewers in a diverse array of topics including geological mapping, geothermal energy, groundwater, seabed mapping, natural hazards, and public health risks. (www.gsi.ie)

The **National Parks and Wildlife Service** (NPWS) provides the legislative and policy framework for the conservation of nature and biodiversity in the Republic of Ireland. It also oversees its implementation, based on good science, with particular emphasis on the protection of habitats and species. The conservation of restoration of biodiversity and habitats in Ireland necessitates scientific monitoring to inform management design and to evaluate the relative success of implemented works. The conservation of habitats is also increasingly valued as an important component of global processes such as climate regulation, food security and water supply. (www.npws.ie)

Met Éireann's mission is to monitor, analyse and predict Ireland's weather and climate and to provide a range of high quality meteorological and related information. As Ireland's National Meteorological Service, Met Éireann is maintained by the State under the UN Convention of the World Meteorological Organisation (WMO). It is the public service scientific organisation responsible to the Irish State for the collection and production of high-quality meteorological data; the communication of authoritative weather and climate services to protect life and property, and to promote wider societal and economic wellbeing; conducting research into weather and climate, to inform decision-making; and representing Ireland to the WMO, ECMWF (European Centre for Medium-Range Weather Forecasts) and EUMETSAT (European Organisation for the Exploitation of Meteorological Satellites). (www.met.ie)

Call Structure

The EPA Research Call 2023 includes both open and targeted research areas under which applications may be submitted, designated as follows:

- **Themes** are broad research areas and invite applications for innovative projects that will inform policy and build capacity in current and emerging priority areas. All awards made under these Themes will be for Medium Scale Projects of four years in duration. A Theme may be aligned to one or more of the Research Hubs outlined above. In the latter case, applicants will be required to indicate primary alignment to one of the Research Hubs.
- **Topics** are targeted in scope and address identified research and evidence needs to inform national policy. The scale of these projects varies and is based on the specific needs. Topics will be aligned to one of the Research Hubs outlined above.

Application Process

All applications must be made using the EPA's Online Grant Management and Application Portal (https://epa.smartsimple.ie) in advance of the deadline.

In addition to this document, applicants should also review the following documentation in advance of preparing an application, which is available to download from the EPA's Online Grant Management and Application Portal or from the EPA website[2]:

- EPA Research Programme 2021 - 2030 Guidelines and Terms & Conditions
- EPA Online Grant Management and Application Portal System User Guides

Frequently asked questions on the EPA Research Call are available on our website and will be updated throughout the application period. For other queries, please contact research@epa.ie.

Applications must be submitted under the correct *Research Hub* and *Call Topic Reference* as indicated in the detailed scope for each of the Themes and Topics. Proposals submitted under the incorrect Research Hub or Call Topic Reference will be considered ineligible and will not proceed to evaluation.

Note that for the purposes of the Application Portal, the term *Call Topic Reference* is used to identify both Themes and Topics. Please refer carefully to the *Call Topic Reference* provided in this document when applying through the Online Application Portal.

Applicants are permitted to make multiple submissions to the call but may only make a single submission under any Call Topic Reference.

Applicants must adhere to the following deadlines which will be strictly enforced:

- **Technical queries deadline** — **25 May 2023 (16:00, Irish standard time)**
- **Applicant submission deadline** — **1 June 2023 (16:00, Irish standard time)**
- **Approval deadline** — **8 June 2023 (16:00, Irish standard time)**

[2] http://www.epa.ie/our-services/research/

Summary of Themes

The Themes included in the EPA Research Call 2023 are listed in Table 1. The scope of these Themes is broad and invites applications for innovative research projects to inform policy and build capacity in current and emerging priority areas. All awards made under these Themes will be for Medium Scale Projects of four years in duration. Three awards are expected for each of the Themes included in the call.

Applicants should carefully review the information provided in Scope of Themes section of this document, which can be accessed using the links in the table below. This details the expected scope and outputs of proposals under each Theme. Importantly, it also specifies the *Research Hub* and *Call Topic Reference* for each Theme, which should be carefully noted when applying through the Online Application Portal. (Note that for the purposes of the Application Portal, the term *Call Topic Reference* is used for both Themes and Topics).

Table 1. List of Themes in the EPA Research Call 2023

Theme Title	Max Budget (€) Per Project
Addressing the Societal Dimension of Environmental Challenges	€600,000
Harnessing Data and Digitalisation for the Environment	€600,000
Advancing Climate Science for Ireland	€600,000*
Climate Adaptation: Planning for an Uncertain Future	€600,000*
Nature Based Solutions: Delivering Co-benefits for the Environment and Society	€600,000

* Co-funding may be provided by Met Éireann for relevant proposals

Summary of Topics

The EPA invites research proposals under the Topics listed in Table 2 for the EPA Research Call 2023. Up to one award is expected for each of the topics included in the call, unless indicated otherwise.

Applicants should carefully review the information provided in Scope of Topics section of this document, which can be accessed using the links in the table below. This details the expected scope and outputs of proposals under each Topic. Importantly, this section also specifies the *Research Hub* and *Call Topic Reference* for each Topic, which should be carefully noted when applying through the Online Application Portal.

Table 2. List of Topics in the EPA Research Call 2023

Call Topic Title	Max Budget (€) Per Project
Research Hub: Addressing Climate Change Evidence Needs	
Developing groundwater recharge estimates for future climate change scenarios	€300,000*
Historic emissions of greenhouse gases in Ireland from pre-industrial to present day	€300,000
Quantifying air quality co-benefits from climate change policy	€150,000
Developing future socio-economic scenarios for Ireland and testing their resilience	€600,000*
Research Hub: Delivering a Healthy Environment	
Review sources of non-methane volatile organic compound (NMVOC) emissions in Ireland and assess mitigation options	€150,000
Assessment of air pollutant emissions from residential solid fuel burning in Ireland	€450,000
Cost benefits of improving raw water quality in the catchment, versus treatment costs at the drinking water supply	€150,000
Emerging novel toxins in the Irish marine environment – characterising algal species and their potential impacts, due to climate change and other vectors, on human health	€450,000
Gamma Radiation Dose Evaluation (GRaDE): Terrestrial gamma dose evaluation for the Irish population	€600,000
Remediation of faulty septic tanks and risk communication	€150,000
Source apportionment of PM2.5 in ambient air	€450,000
Research Hub: Facilitating a Green and Circular Economy	
Barriers and enablers to Ireland's transition to the circular economy – carbon-intensive materials and waste streams	€450,000
Enhancing the circular economy approach to tourism in Ireland	€450,000
Exploring sustainable uses for end-of-life tyres	€150,000

Call Topic Title	Max Budget (€) Per Project
Developing options to investigate levels of natural radioactivity in building materials in Ireland	€300,000
Investigating regulatory barriers and enablers to the development of Ireland's Bioeconomy	€300,000
Evaluating the impacts of national end-of-waste and by-product decisions for construction-based materials	€150,000
Research Hub: Protecting and Restoring our Natural Environment	
Lake water level fluctuations, ecology and hydrology interactions	€450,000
Quantification of the benefits of SEA using examples from Ireland	€150,000
Developing the evidence base for land use review**	€150,000
Ecological response to altered flow regimes in modified channels	€600,000
Carbon and Catchments	€600,000*

* Co-funding may be provided by one of the partners mentioned above (see Detailed Scope for more information)
** Up to three projects may be funded under this topic

Scope of Themes

Theme: Addressing the Societal Dimension of Environmental Challenges

Call Topic Reference:	*Applicants must select one of the following Call Topic References according to the Research Hub most relevant to their proposal:* **Addressing Climate Change Evidence Needs - Topic 1** **Delivering a Healthy Environment - Topic 1** **Facilitating a Green and Circular Economy - Topic 1** **Protecting and Restoring our Natural Environment - Topic 1**		
Project Type:	Medium Scale Project		
Maximum Budget:	€600,000	**Maximum Duration:**	48 months

Background

The European Green Deal is an ambitious plan to transform the EU into a modern, resource-efficient and competitive economy that ensures no net emissions of greenhouse gases by 2050, economic growth is decoupled from resource use and no person and no place is left behind. Achieving this transition represents a complex and multifaceted challenge that will necessitate collective action across all parts of society – from individuals, households and communities to businesses, policymakers and government. Initiatives such as Climate Change in the Irish Mind[3] and Creating our Future[4] demonstrate the commitment of Irish society to achieve this transition, but the scale of action required is unprecedented. While there is urgency in moving to a sustainable society and economy, it is imperative that this is done in ways that are just and equitable.

Research is required to better understand and inform this transition, including how to engage individuals and communities, how to drive behavioural change, and how to achieve systems-level change across all sectors.

Scope

Within this theme, it is envisaged that research proposals will address areas such as:

- Behavioural change, interventions and incentivization for successful implementation of policy
- Enablers and barriers to societal change, acceptance of policy measures, and the 'say-do gap'
- Communication, engagement, literacy and perception of climate/environmental action and societal transition
- Interconnectedness, trade-offs and co-benefits of actions
- Economics and behavioural economics
- Formation of 'environmental identity'

All sectors of the society and economy will be key to this transition, so proposals are encouraged to consider not only climate action, but also areas such as adoption of circular economy principles, consumption and waste reduction, shifts in transport patterns, energy usage, amongst others.

Proposals should consider other relevant initiatives and research projects including, but not limited to, the National Dialogue on Climate Action[5], Imagining 2050[6], and Redesigning Ireland's Transport for Net Zero[7].

[3] Climate Change in the Irish Mind | Environmental Protection Agency (epa.ie);
[4] Creating Our Future
[5] gov.ie - National Dialogue on Climate Action (NDCA) (www.gov.ie)
[6] EPA Research Report 415: A Roadmap for Local Deliberative Engagements on Transitions to Net Zero
[7] Redesigning Ireland's Transport for Net Zero | OECD iLibrary (oecd-ilibrary.org)

Inter- and trans-disciplinary research teams that include researchers from the arts, humanities and social sciences are strongly encouraged.

All applications must provide actionable insights and/or recommendations for decision makers in a specific policy area. All proposals must include an interim report for policy makers as a key deliverable of the project.

Applications to this cross-cutting Theme are encouraged across any of the EPA Research Hubs but must indicate clear alignment to at least one.

Click here to return to List of Themes

Theme: Harnessing Data and Digitalisation for the Environment

Call Topic Reference:	*Applicants must select one of the following Call Topic References according to the Research Hub most relevant to their proposal:* **Addressing Climate Change Evidence Needs - Topic 2** **Delivering a Healthy Environment - Topic 2** **Facilitating a Green and Circular Economy - Topic 2** **Protecting and Restoring our Natural Environment - Topic 2**		
Project Type:	Medium Scale Project		
Maximum Budget:	€600,000	**Maximum Duration:**	48 months

Background

The rapid development of digital technologies and growth of data represent new opportunities and challenges for environmental protection. Sources of environmental data are now available at multiple spatial levels, may be near-real time and may come from remote or in-situ observations. Rich sources of socio-economic data are also available, which may offer additional insights when integrated with environmental data. The EU's 8th Environment Action Programme[8] supports an integrated approach to policy development and implementation, including the need to harness the potential of digital and data technologies to support environmental policy, while ensuring transparency, authenticity, interoperability and public accessibility of the data and information. Research is needed to fully exploit the opportunities and address the challenges of using environmental data for effective policy and decision making.

Scope

Within this theme, proposals will develop insights and applications of data to support environmental policy development, implementation and decision-making. Proposals should focus on using existing data sources and not the development of new technologies for sensing, data capture, etc. It is envisaged that proposals will address areas such as, but not limited to:

- Novel applications of earth observation data;
- Monitoring, analysis, and modelling to support decision making;
- Integration of distributed or diverse data sources;
- Application of AI, machine learning and other data analytics techniques;
- Development of digital twins relevant to the environment.

Research proposals must clearly demonstrate how they advance the current state-of-the-art and should not rely solely on the application of existing tools, workflows, dashboards, etc.

Proposals should consider relevant initiatives and research projects including, but not limited to, Destination Earth[9], Copernicus[10] and ICOS[11]. They should also build on other ongoing research projects[12].

All applications must provide actionable insights and/or recommendations for decision makers in a specific environmental policy area. All proposals must include an interim report for policy makers as a key deliverable of the project.

Applications to this cross-cutting Theme are encouraged across any of the EPA Research Hubs but must indicate clear alignment to at least one.

Click here to return to List of Themes

[8] Environment action programme to 2030 (europa.eu)
[9] Destination Earth | Shaping Europe's digital future (europa.eu)
[10] Homepage | Copernicus
[11] ICOS - Integrated Carbon Observation System (icos-cp.eu)
[12] For example, SoMoSAT, INFER, RePEAT Project and Terrain-AI and those funded under the EPA Research Call 2022

Theme: Advancing Climate Science for Ireland

Call Topic Reference:	Addressing Climate Change Evidence Needs - Topic 3		
Project Type:	Medium Scale Project		
Maximum Budget:	€600,000*	Maximum Duration:	48 months

*Co-funding may be provided by Met Éireann for relevant projects

Background

Climate science helps us to understand the complex systems that govern our planet's climate and how human activities are impacting these systems. By studying the causes of climate change, we can develop strategies to mitigate its effects in line with the Paris Agreement and the Sustainable Development Goals (SDGs), including biodiversity objectives. Advancing climate science is also crucial to inform the Irish societal transition towards ambitious greenhouse gas reduction targets by 2030 and a climate neutral and climate resilient society by 2050. A more robust understanding of climate science and earth systems can also help us to develop effective strategies for mitigating the impacts of climate change.

Improvements in our understanding of past, present and expected future changes in climate and its implications on ecosystems and society and closing knowledge gaps in this area will assist policymakers with the data and information they need to make informed decisions about how to address climate change.

Scope

Within this theme, it is envisaged that research proposals will focus on climate science, as relevant within an Irish context, advancing knowledge and informing solutions in any of the following areas:

- Climate attribution;
- Climate system science;
- Climate and earth systems modelling;
- Pathways for Ireland to climate neutrality;
- Climate tipping points or unexpected climate events;
- Better understanding of climate-ecosystems interactions.

Proposals should seek to build on existing capacity in the area of climate science, with reference to Irish specific research or policy aims where applicable. Coordination and synergies with existing infrastructure and datasets or engagement with wider initiatives such as Destination Earth[13] or relevant modelling efforts (e.g., CMIP6[14] and EURO-CORDEX[15]) are strongly encouraged.

Click here to return to List of Themes

[13] Destination Earth | Shaping Europe's digital future (europa.eu)
[14] CMIP6 Homepage (llnl.gov)
[15] EURO-CORDEX

Theme: Climate Adaptation: Planning for an Uncertain Future

Call Topic Reference:	Addressing Climate Change Evidence Needs - Topic 4		
Project Type:	Medium Scale Project		
Maximum Budget:	€600,000*	Maximum Duration:	48 months

*Co-funding may be provided by Met Éireann for relevant projects

Background

The process of climate adaptation – adjusting to the current and expected impacts of climate change to minimize its negative effects and take advantage of any opportunities that may arise – is now urgent. Climate change is already having and will continue to have significant impacts on the environment, human societies, and economies worldwide and these impacts, which include sea-level rise, extreme weather events, changing precipitation patterns, and increased temperatures, are already causing significant challenges in many parts of the world, Ireland included. These challenges are projected to increase in the coming decades and it is necessary to act now, as even if successful mitigation policies are implemented, the climate will continue to change as some level of climate change is already locked in due to past emissions.

If Ireland is to achieve its 2050 goal of transitioning to a climate resilient, environmentally sustainable, biodiversity rich and climate neutral economy, then it is imperative that we increase our capacity in the area of climate adaptation.

Research will play a crucial role in identifying the most effective routes for adaptation, including complex considerations such as minimising cross-sectoral and cascading risks, incorporation of adaptation in identifying the most effective mitigation actions, accounting for equity and social justice, and the long timeframes for implementation and impact of adaptation choices.

Scope

Within this theme, applications will focus addressing key knowledge gaps in areas relevant to climate adaptation such as:

- Spatial and temporal dynamics of exposure and vulnerability;
- Decision-making in climate adaptation under conditions of uncertainty;
- Predicting unintended consequences or response risks of adaptation choices;
- Understanding the co-benefits and trade-offs of different adaptation options, and how they can be realised within an Irish context;
- How adaptation can be integrated into future planning and policy. This may consider ensuring alignment of National Adaptation Planning with National Development Planning, River Basin Management Planning, etc. (and what co-benefits might exist), as well as its role in local climate action plans;
- How cost-benefit and economic analyses can be properly applied to adaptation options (e.g., to account for factors such as ecosystem services).

While international research will be relevant, it will be important to build capacity and an evidence base in an Irish context, with particular reference to existing adaptation research (TRANSLATE project[16] etc.) and relevant national policies such as the National Adaptation Framework[17]. Also, of importance to consider within this theme is the interaction with other environmental and social objectives. Research that aims to widen the solution space, increase participation and co-operation and facilitate 'action by all', is encouraged.

Click here to return to List of Themes

[16] TRANSLATE - Met Éireann - The Irish Meteorological Service
[17] gov.ie - Adapting to Climate Breakdown (www.gov.ie)

Theme: Nature-based Solutions: Delivering Co-benefits for the Environment and Society

Call Topic Reference:	**Protecting and Restoring our Natural Environment - Topic 3**		
Project Type:	Medium Scale Project		
Maximum Budget:	€600,000	**Maximum Duration:**	48 months

Background

Nature-based Solutions (NbS) are "actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits"[18].

NbS have been included as measures to be implemented in a number of plans and policies in Ireland[19], and it is critical that the effectiveness of different NbS is evaluated, the most effective options identified, and that post-implementation monitoring is carried out. NbS also have potential to deliver multiple benefits that may span different policies and plans, and it is necessary to quantify and understand co-benefits, trade-offs and interactions to ensure the best use of resources in responding to multiple environmental issues.

Research is needed to develop novel NbS across different sectors, practical tools (e.g., GIS-based) to identify where NbS could be utilised to greatest effect, best practise guidelines for practitioners, and approaches for monitoring of NbS post implementation.

Scope

All proposals should be linked to current environmental policy or future policy directions and must demonstrate how they can provide data/evidence and facilitate actionable insights for decision-making in relation to NbS.

Proposals are welcomed in any area relevant to the remit of the EPA, including but not limited to water quality, flood mitigation, urban drainage, environmental noise, air quality, transport and infrastructure.

Proposals should give consideration to potential co-benefits and trade-offs for climate, biodiversity, human health and wellness and likely needs of the upcoming EU Nature Restoration Law. Understanding of barriers to implementation of NbS should also be considered, including societal, behavioural and governance issues.

Where relevant, proposals should build on the knowledge being developed in other EPA-funded projects, such as SLOWWATERS, RAIN Solutions[20] and BLUE C[21] (co-funded with the Marine Institute).

Click here to return to List of Themes

[18] Information on reports and updates by the Technology and Economic Assessment Panel (unep.org)
[19] For example, Article 17 update to Ireland's Marine Strategy Part 3: Programme of Measures, Climate Action Plan 2023, Draft River Basin Management Plan for Ireland 2022-2027
[20] RainSolutions — Water challenges for a changing world (waterjpi.eu)
[21] BlueC Project

Scope of Topics

Addressing Climate Change Evidence Needs (4 Topics)

Developing groundwater recharge estimates for future climate change scenarios

Call Topic Reference:	**Addressing Climate Change Evidence Needs - Topic 5**		
Project Type:	Medium Scale Project		
Maximum Budget:	€300,000*	**Maximum Duration:**	24 months

*Co-funding to be provided by Geological Survey Ireland and Met Éireann

Background

Groundwater recharge maps are tools used to identify areas where groundwater can be recharged or replenished naturally. These maps show the locations and characteristics of areas where rain water can infiltrate into the ground and replenish underground aquifers, and are created by analysing various data sources such as precipitation, actual evapotranspiration, land use, soil and subsoil type, subsoil thickness, aquifer type, and topography. Climate change can have a significant impact on groundwater recharge, and changes in temperature and precipitation patterns can affect the amount and timing of water that infiltrates into the ground, which can impact the recharge of groundwater aquifers.

Groundwater recharge maps that are produced using a standard set of projections will form an important data set under the national framework for Climate Services and will facilitate climate change risk assessment and adaptation planning in a coherent way on a national basis in multiple sectors including water, biodiversity and agriculture. Specifically, the availability of these maps would be important for facilitating the completion of a high quality coordinated National Climate Change Risk Assessment and to ensure the effectiveness of Sectoral Adaptation Plans and Local Authority Climate Action Plans under the National Adaptation Framework.

Scope

The main objectives of the proposed project are to generate groundwater recharge maps for future climate change scenarios. This will include:

1. Updating of methodology for the generating groundwater recharge maps (see note below);
2. Baselining by generating updated groundwater recharge maps for the WMO period 1990-2020;
3. Contextualising by generating updated groundwater recharge maps for the preceding decades to 1960s.

Specific outputs should include:

1. Updated groundwater recharge mapping methodology;
2. Average annual groundwater recharge map for WMO Period 1990-2020;
3. Seasonal and annual/ hydrological year groundwater recharge maps for the period 1990-2020 and preceding years to 1960 or 1970;
4. Estimated seasonal and annual groundwater recharge for future climate change scenarios
5. Analysis and interpretation of results and summary report.

Where relevant, maps, GIS code, input variables or other tools should be made available as part of the outputs.

Note: The current groundwater recharge map was produced using the methodology outlined in Hunter Williams et al. (2013[22]; 2022[23]), which requires updating to account for factors such as rainfall intensity, slope, directly calculated runoff, allogenic recharge, as well as for estimating actual evapotranspiration. Groundwater recharge mapping[24] (Geological Survey Ireland, 2011, 2021) uses data produced in the EPA/GSI-funded project (2016-W-DS-29) [25] and from Met Éireann (currently MÉRA[26]). These data, along with outputs from the Met Éireann TRANSLATE project[27] should be used in the updated maps.

Click here to return to List of Topics

[22] Hunter Williams, N. H., Misstear, B. D. R., Daly, D., & Lee, M. (2013). Development of a national groundwater recharge map for the Republic of Ireland. *Quarterly Journal of Engineering Geology and Hydrogeology*, *46*(4), 493-506.
[23] Schuler, P., Campanyà, J., Moe, H., Doherty, D., Williams, N. H., & McCormack, T. (2022). Mapping the groundwater memory across Ireland: A step towards a groundwater drought susceptibility assessment. *Journal of Hydrology*, *612*, 128277
[24] Groundwater (gsi.ie)
[25] Research 267: High-resolution Gridded Datasets of Hydro-climate Indices for Ireland
[26] MÉRA - Met Éireann - The Irish Meteorological Service
[27] TRANSLATE - Met Éireann - The Irish Meteorological Service

Historic emissions of greenhouse gases in Ireland from pre-industrial to present day

Call Topic Reference:	**Addressing Climate Change Evidence Needs - Topic 6**		
Project Type:	Medium Scale Project		
Maximum Budget:	€300,000	**Maximum Duration:**	24 months

Background

Historic emissions data provides a critical baseline for understanding the extent to which human activities have contributed to the increase in atmospheric greenhouse gas concentrations, which are the primary drivers of global warming. Analysing these historic emissions, identifying trends and patterns in the amount and types of greenhouse gases emitted over time and estimating the total amount of emissions that have been released into the atmosphere, provides information that feeds into climate-systems models and predicts possible future climate scenarios. These models and scenarios are critical for policymakers to allow them to make informed decisions about how to mitigate and adapt to climate change.

Historic emissions data is also important for monitoring progress in reducing emissions and achieving climate goals, and whether policies and strategies to reduce emissions are effective. Having robust Irish specific historic emissions data is crucial to inform the public and policy debate on proposals for Ireland's "fair share" contribution to global climate action, a topic area highlighted by the advice to the EU Commission with respect to EU-wide carbon budgets to 2040[28]. They will also be important in informing Ireland's second programme for national carbon budgets to 2040.

Scope

Proposals should aim to establish the following:

- A robust timeseries of historic emissions of greenhouse gases in Ireland from pre-industrial to present day;
- Quantify the impact on the climate of these emissions;
- Put the potential climate impact of current activities driving emissions and removals of the major greenhouse gases in an historical context;
- Address a gap in knowledge and create a robust narrative regarding Ireland's cumulative contribution to global warming;
- A database of times series of emissions and removals of greenhouse gases disaggregated by gas with as high a temporal resolution as feasible from the source material;
- A consolidated and collated database of sectoral activity data, or equivalent proxies, supporting the emissions and removals estimates;
- An assessment of the climate impact (temperature, radiative forcing) of Ireland's emissions over time, including assessment of Ireland's contribution to observed global warming to date.

Interim outputs for the above, to inform time critical policy processes would be expected during the lifetime of this project.

It is envisaged that the analysis will inform debate relevant to the objective of climate neutrality set out in Ireland's Climate Act 2021 and contribute to establishing baseline criteria on which Ireland communicates its contribution to global actions on climate change. It will provide stakeholders with a shared understanding of the contribution of each (major) sector to climate change.

Click here to return to List of Topics

[28] Setting climate targets based on scientific evidence and EU values: initial recommendations to the European Commission — European Environment Agency (europa.eu)

Quantifying air quality co-benefits from climate change policy

Call Topic Reference:	**Addressing Climate Change Evidence Needs - Topic 7**		
Project Type:	Desk Study		
Maximum Budget:	€150,000	**Maximum Duration:**	12 months

Background

Poor air quality has been described by the World Health Organization (WHO) as a major environmental health issue, causing premature death and disease, while the European Environmental Agency (EEA) has described air pollution as the single largest environmental health risk in Europe. Concurrently, climate change is a global crisis that also impacts our environment and health. The links between air quality and climate can be complex; however, it is clear that both of these issues threaten human, environmental and economic health across the globe.

Many of the actions that can be introduced to mitigate or adapt to the impacts of climate change can have a co-benefit for air quality and health. Climate mitigation/adaptation benefits take effect over longer timescales, whereas air quality co-benefits can be immediate and measurable. For example, the burning of fossil fuels for home-heating contributes to the release of CO_2 but simultaneously emits fine particulate matter ($PM_{2.5}$) which from a health perspective is the main culprit in the negative health impacts of poor air quality. Thus, a reduction in use of these fossil fuels should lead to dual benefits in terms of climate and air quality. However, some measures that have climate benefits can also have a negative impact on air quality in some circumstances, for example the increased use of biomass rather than fossil gas in residential or commercial heating in urban areas.

Focusing on the immediate health benefits could be used to help engage and mobilise society to take action on these important environmental issues that may play out over longer timescales, whilst an awareness of potential negative air quality and health impacts is important in avoiding those policies that have antagonistic impacts.

Scope

Research is required to investigate and, if possible, quantify the air quality co-benefits (and thus health benefits) from the implementation of planned Irish climate mitigation and adaptation policies, as well as identifying situations where climate benefits may be achieved at the expense of air quality.

Some specific aspects of research that should be considered are:

- Examining the relationship between climate change policies and air quality, and the impact of Irish climate change policies on air quality, as well as exploring the mechanisms through which these policies might improve air quality.
- Identifying and quantifying the co-benefits of climate change policies for air quality, e.g., potential reductions in air pollutants (e.g., particulate matter, nitrogen oxides) and the associated health and economic benefits.
- Assessing trade-offs between climate change mitigation and air quality, examining potential tensions between climate change mitigation strategies and air quality goals, as well as exploring ways to maximize co-benefits while minimizing negative impacts.

Click here to return to List of Topics

Developing future socio-economic scenarios for Ireland and testing their resilience

Call Topic Reference:	**Addressing Climate Change Evidence Needs - Topic 8**		
Project Type:	Medium Scale Project		
Maximum Budget:	€600,000*	**Maximum Duration:**	48 months

*Co-funding to be provided by Met Éireann

Background

Ireland is a Party to the Paris Agreement and has near-term obligations, to 2030, under the EU's Nationally Determined Contributions (NDC)[29]. Through its climate legislation, Ireland has also adopted national targets to 2030 and a climate neutrality goal by 2050. At global and regional levels, options for longer-term climate goals are explored through the use of socio-economic scenarios, also called Shared Socio-economic Pathways (SSPs). These use model-based analysis of sectoral emissions and removals based on development pathways and choices, and such scenarios are important instruments to support policy making in this area. However, the application of global and regional scenarios at national level is complex.

Research is needed to advance the development of national sectoral and cross-sectoral scenarios that take account of future states of the socio-economic system in Ireland, which can be used to inform future trends, potential decisions and the consequences of those decisions. The project should also develop an analysis of Ireland's emissions based on existing energy infrastructures.

Scope

Proposals will develop socio-economic scenarios or SSPs to 2050 and 2100 for Ireland that are aligned with climate policy. Specifically, the project should consider the following:

- Develop a framework that defines the key components of the SSPs, including factors such as population, economic growth, energy use, land use, technological development, the nature of governance and social and political values. The framework could be designed to enable comparisons across different regions, sectors and time periods.
- Develop a set of plausible, Ireland-focused SSP scenarios that explore the interactions between climate change, environmental change and socioeconomic development to 2050 and beyond. The scenarios should be based on a range of quantitative and qualitative methods, such as modelling, stakeholder interaction and scenario analysis.
- Conduct an analysis of the SSPs to explore the potential implications on climate change impacts and related areas such as energy systems. The analysis could be used to identify key research gaps, policy priorities and areas of uncertainty.
- Stress test various mitigation scenarios to 2050 and 2100 for Ireland using a range of climate futures predicated on the SSPs.
- Develop a range of communication products tailored to different audiences, including policymakers, industry stakeholders, civil society organisations and the general public.

Click here to return to List of Topics

[29] gov.ie - EU and International Climate Action (www.gov.ie)

Delivering a Healthy Environment (7 Topics)

Review sources of non-methane volatile organic compound (NMVOC) emissions in Ireland and assess mitigation options

Call Topic Reference:	**Delivering a Healthy Environment - Topic 3**		
Project Type:	Desk Study		
Maximum Budget:	€150,000	**Maximum Duration:**	12 months

Background

Ireland's Air Pollutant Emissions 1990-2030 report[30] identifies that the emission reduction commitments set for emissions of non-methane volatile organic compounds (NMVOCs) under Directive (EU) 2016/2284 are at risk of not being met. The key drivers of NMVOC emissions include solvents and other product use, and emissions from the food and beverage industry, in particular the increased spirit production in recent years.

Research is required to review the estimates of NMVOC emissions and, especially, to explore the options for mitigation of NMVOCs in Ireland.

Scope

Innovative research proposals are invited to, but not limited to:

- Review current emission inventory approaches in terms of activity data and identify new data sources where available. This work should be undertaken in the context of the emission inventory methodologies described in the 2019 EMEP/EEA Emission Inventory Guidebook[31].
- Explore how can projected exceedances of Ireland's legally binding NMVOCs emission reduction commitments be addressed. This should focus on the major sources of emissions of NMVOCs, including spirit production in the food and beverage industry. Proposals should consider, inter alia, technologies, good practice and cost benefits around mitigating NMVOC emissions.

The project will work closely with the EPA's Emissions Statistics team, who compile the National Inventory and the EPA's Licensing team who regulate industry[32].

Click here to return to List of Topics

[30] https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/EPA-Irelands-Air-Pollutant-Emissions-report_2021Final.pdf
[31] EMEP/EEA air pollutant emission inventory guidebook 2019 — European Environment Agency (europa.eu)
[32] https://www.epa.ie/our-services/licensing/industrial/industrial-emissions-licensing-ied/who-needs-an-industrial-emissions-licence/

Assessment of air pollutant emissions from residential solid fuel burning in Ireland

Call Topic Reference:	**Delivering a Healthy Environment - Topic 4**		
Project Type:	Medium Scale Project		
Maximum Budget:	€450,000	**Maximum Duration:**	36 months

Background

Residential solid fuel heating is the largest single source of fine particulate matter (PM) emissions in Ireland[33]. The European Environment Agency (EEA) estimate that fine PM is responsible for 95% of all mortality attributable to air pollution in Ireland[34]. Ireland currently uses emissions factors from the European Monitoring and Evaluation Programme (EMEP)/European Environment Agency (EEA) Air Pollutant Emission Inventory Guidebook 2019[35] that may not be representative of the types of solid fuel and appliances used in Ireland. This research topic seeks to address this lack of knowledge by developing emissions factors more representative of *'real world'* conditions in Ireland (e.g., fuel types and combustion devices).

Research is therefore needed to improve the robustness of current emission factor estimates for residential fuel burning to develop national specific emission factors to complement current guidance (as per the EMEP/EEA Guidebook). Emission factors are required that are representative of both the range of fuel types in use in Ireland (including coals, sod peat, peat briquettes and wet/dry wood) and combustion devices commonly used in Ireland (including both stoves and open fireplaces).

Scope

Innovative research proposals are invited to, but not limited to:

- Estimate the amount of emissions to air (in g/Gj or comparable units) released by the burning of different types of solid fuels used for residential heating in Ireland (including, but not limited to, peat briquettes, sod peat, seasoned wood and wet wood fuels). This should be carried out for (i) a type of stove representative of that currently in use in Ireland, as well as, (ii) for an open fireplace typical of that used in Ireland.

The research should address the full range of air pollutants listed in the EMEP/EEA Guidebook, including total PM (hot filterable and condensable).

It is well recognised that for PM emissions estimation[36] there is a wide variety of methods and measurement devices and that researchers must often develop their own rules for good laboratory practice. In determining condensable PM, proposals should demonstrate that the proposed methodology will provide reproducible results.

In addition to its literature and other preparatory reviews, the project should assess PM measurement standards and methodologies referred to in national solid fuel legislation[37] with a view to producing practical updated methodologies for solid fuel emission estimates (in g/Gj or comparable units) that provide standardised, consistent and comparable basis for emissions testing for different solid fuels and appliance types in line with the legislation, the inventory and other industry standards (e.g. Ecodesign regulations 2015/1188[38]).

Click here to return to List of Topics

[33] https://www.epa.ie/publications/research/air/Research_Report_318.pdf
[34] https://www.eea.europa.eu/publications/air-quality-in-europe-2021/air-quality-status-briefing-2021
[35] https://www.eea.europa.eu/publications/emep-eea-guidebook-2019
[36] https://task32.ieabioenergy.com/wp-content/uploads/2018/09/IEA-Paper_PM_determination.pdf
[37] Air Pollution Act 1987 (Solid Fuels) Regulations S.I. No 529 of 2022
[38] https://commission.europa.eu/energy-climate-change-environment/standards-tools-and-labels/products-labelling-rules-and-requirements/energy-label-and-ecodesign/energy-efficient-products/local-space-heaters_en

Cost benefits of improving raw water quality in the catchment, versus treatment costs at the drinking water supply

Call Topic Reference:	**Delivering a Healthy Environment - Topic 5**		
Project Type:	Desk Study		
Maximum Budget:	€150,000	**Maximum Duration:**	12 months

Background

Clean water and the provision of safe and secure drinking water is a fundamental goal (UN Sustainable Development Goal #6) and a legal requirement.

Research is needed to support policy decisions that integrate the objectives of clean water and drinking water while optimising state expenditure and assisting Ireland in meeting its commitments and requirements under the various global, EU and national policies and strategies. Specifically, the third River Basin Management Plan (RBMP) is due to be published later in 2023. Under the Water Framework Directive[39], each RBMP must include an economic assessment. Traditionally, economic assessments tend to focus on the cost of measures with little detail on the cost savings and benefits of improved water quality. The recast Drinking Water Directive[40] has placed increased focus on source protection and work to transpose the directive is underway.

The purpose of this research is to undertake a review of the cost benefits of improving raw water quality versus treatment costs. Consideration should also be given to the cost/benefit of potential increases in treatment requirements due to climate change and emerging pollutants. This research should help inform the on-going implementation, funding and targeting of water quality measures and source protection work.

Scope

Innovative research proposals are invited to:

- Explore the evidence on the cost benefits of improving raw water quality in the catchment versus treatment costs at the drinking water supply, and the applicability of the findings in the Irish context, and under climate change scenarios.

The research should inform prioritisation and future funding of water quality measures and explore the multiple benefits for drinking water quality, climate, biodiversity and drinking water treatment costs.

Proposals should consider, inter alia, pesticides, nitrate, cryptosporidium, trihalomethanes, micropollutants and PFAS and explore the extent and role of monitoring of raw water.

Proposals should consider the role of water suppliers including Irish Water and the National Federation of Group Water Schemes and their funders and regulators.

Click here to return to List of Topics

[39] EUR-Lex - 32000L0060 - EN - EUR-Lex (europa.eu)
[40] EUR-Lex - 32020L2184 - EN - EUR-Lex (europa.eu)

Emerging novel toxins in the Irish marine environment – characterising algal species and their potential impacts, due to climate change and other vectors, on human health

Call Topic Reference:	**Delivering a Healthy Environment - Topic 6**		
Project Type:	Medium Scale Project		
Maximum Budget:	€450,000	**Maximum Duration:**	36 months

Background

Research on emerging risks at the EU level has shown the migration of toxigenic species of phytoplankton into areas outside their known range. For example, ciguatoxin has been detected in fish in the Canaries[41] and tetrodotoxin has been detected in live bivalve molluscs in Europe[42]. Many countries have not studied their marine environment sufficiently to understand the risks, if any, new phytoplankton species may pose. Ireland has a thriving aquaculture industry and excellent bathing waters which we need to protect by identifying emerging risks. Climate change (which may alter the marine water environment in terms of temperature, salinity, and nutrient availability) and other vectors have been identified as having a potential role in this emerging issue.

Toxic events due to the growth of certain phytoplankton need to be anticipated and early warning systems and control measures put in place to protect public health. Further research is needed to improve our understanding of the issue in a national context and support the development of policy on this matter.

Scope

Innovative proposals are invited to:

- Explore how climate change and other vectors are affecting the Irish marine environment regarding the prevalence and location of phytoplankton species and the frequency/timing of algal blooms. This should include the presence, if any, of phytoplankton expressing new biotoxins e.g., tetrodotoxins, ciguatoxins. It should also include research into the existence of hitherto unknown species of potentially toxic phytoplankton in Irish marine waters and the marine conditions which favour their growth. The research should also provide molecular data on new phytoplankton species and the presence and expression of toxin genes. Whilst the focus should be on current/proposed food production areas of the sea (e.g., bivalve molluscs, finfish, seaweed) the study of other coastal areas should also be included.
- Review the potential human health impacts from emerging novel toxins in the Irish marine environment. This should consider, inter alia, food/ingestion, bathing waters, toxicity, and other modes of human exposure. A risk assessment of potential vectors would be a positive element of the proposed research.

In the context of this research topic, consideration of the marine environment is limited to coastal and transitional waters.

The research should consider a *One Health* perspective[43] and researchers should seek to build on existing research[44].

The findings of the research should be put in the context of their relevance for EU policies, (e.g. Water Framework Directive, Shellfish Waters and Marine Strategy Framework Directive) and other international commitments (e.g. OSPAR).

Click here to return to List of Topics

[41] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3367630/
[42] https://ift.onlinelibrary.wiley.com/doi/full/10.1111/1541-4337.12881
[43] https://www.who.int/health-topics/one-health#tab=tab_1
[44] ToxVib - Genomics to Investigate Risks of Toxin-Producing Vibrio in Irish Shellfish; Lead: Dr Aoife Boyd (Univ. Galway)

Gamma Radiation Dose Evaluation (GRaDE): Terrestrial gamma dose evaluation for the Irish population

Call Topic Reference:	**Delivering a Healthy Environment - Topic 7**		
Project Type:	Medium Scale Project		
Maximum Budget:	€600,000	**Maximum Duration:**	48 months

Background

The Ionising Radiation Regulations 2019 (IRR 2019[45]) state that the gamma radiation dose to members of the public be evaluated and the EPA conduct these surveys on a regular basis. A comprehensive survey of terrestrial gamma radiation in Ireland was last conducted in the early 1990s and an up-to-date evaluation is required. The levels of terrestrial gamma radiation may have changed since the last survey, for example, as a result of the decay of fallout from nuclear weapons testing and nuclear accidents (particularly Chernobyl). In addition, the impact of the Fukushima nuclear accident on terrestrial gamma radiation has not been evaluated.

This research will provide a better understanding of the levels of gamma radiation in the environment (including geographical and temporal trends), which will be important to inform what actions may or may not be required in the event of elevated levels of terrestrial gamma radiation. Furthermore, the research will assist in building radiation monitoring, measurement and dose assessment capacity in Ireland which can assist in filling knowledge gaps in radiation protection that currently exist

Scope

Innovative research proposals are invited to:

- Determine what is the average annual dose a member of the Irish public receives from terrestrial gamma radiation. In this regard, the research will need to develop an appropriate sampling strategy along with suitable measurement techniques for terrestrial gamma radiation before carrying out a comprehensive dose evaluation. In addition to outdoor exposure (a result of terrestrial gamma radiation from natural radioactivity as well as fallout from nuclear weapons and nuclear accidents).
- Undertake a dose assessment taking into consideration of appropriate lifestyle habits of members of the Irish public (once the gamma radiation has been measured nationally).

The outputs from this research will include standard operating procedures for measuring natural and human-made gamma radiation in the environment; maps and datasets of gamma radiation throughout the country; and improved dose assessment methodologies.

Proposals should link to the Geological Survey Ireland's Tellus survey[46]. Proposals should also demonstrate how they will build national capacity in this area.

Click here to return to List of Topics

[45] IRR19 | Environmental Protection Agency (epa.ie)
[46] https://www.gsi.ie/en-ie/programmes-and-projects/tellus/Pages/default.aspx

Remediation of faulty septic tanks and risk communication

Call Topic Reference:	**Delivering a Healthy Environment - Topic 8**		
Project Type:	Desk Study		
Maximum Budget:	€150,000	**Maximum Duration:**	12 months

Background

The EPA is increasingly concerned at the lack of progress in improving water quality in Ireland and is seeking insight into what is happening on the ground in response to interventions under the River Basin Management Plans and in this instance the National Inspection Plan for Domestic Waste-Water Treatment Systems[47].

The EPA has statutory responsibility for oversight of septic tank inspections by local authorities. Local authorities complete over 1,000 inspections each year. About 50% of septic tanks fail in which case the homeowner is issued a notice requiring corrective action. While many septic tanks are subsequently repaired, a growing number are not being addressed over long periods, with over 500 notices open for more than two years. This failure to resolve older advisory notices has been highlighted by the EPA in annual reports on septic tank inspections for some years, including the most recent report for 2021[48].

The issue is important for reducing the risk to public health as septic tanks are often co-located with vulnerable household wells. Household wells in Ireland tend to be poorly protected, lack treatment and have concerning levels of faecal contamination[49].

This research has broader relevance to all local authority environmental enforcement functions. The EPA's Focus on Local Authority Environmental Enforcement – Performance Report 2021[50] highlighted the need for local authorities to target and follow through on enforcement actions to ensure regulation results in change on the ground. The information from this research should be applicable to follow-up enforcement under other regimes such as farm inspections where the EPA now has a role like that of septic tanks.

Scope

Research proposals are invited to:

- Explore why septic tanks identified as faulty through local authority inspections are not being remediated. The research should consider the roles and experiences of local authorities and homeowners in relation to individual cases and identify why septic tanks are not being fixed, e.g., lack of enforcement, technical issues, cost, availability of grants, capacity in the sector, homeowner attitude, etc. The research should recommend interventions that could improve compliance.

In considering both the barriers to remediation and recommended interventions, the research should consider the role of both the planning system (including enforcement and applications for development) and the septic tank inspection system, and the wider development of rural housing more generally.

The research should consider the risk perception of homeowners in regard to water resources such as drinking water supply and receiving waters.

Click here to return to List of Topics

[47] https://www.epa.ie/publications/compliance--enforcement/waste-water/national-inspection-plan-for-domestic-waste-water-treatment-systems-2022-2026.php
[48] https://www.epa.ie/publications/compliance--enforcement/waste-water/domestic-waste-water-treatment-system-dwwts-inspections-2021.php
[49] https://www.epa.ie/publications/research/water/research-251.php
[50] https://www.epa.ie/publications/compliance--enforcement/public-authorities/focus-on-local-authority-environmental-enforcement-performance-report-2021.php

Source apportionment of $PM_{2.5}$ in ambient air

Call Topic Reference:	Delivering a Healthy Environment - Topic 9		
Project Type:	Medium Scale Project		
Maximum Budget:	€450,000	Maximum Duration:	36 months

Background

In Ireland, the number of annual premature deaths attributable to air pollution is estimated at approximately 1,300 people[51]. Fine particulate matter ($PM_{2.5}$) is of particular concern. While EPA monitoring shows levels of $PM_{2.5}$ in Ireland are within the current EU legal limits specified in the CAFE Directive, they are above the recently revised World Health Organisation (WHO) air quality guidelines values[52]. The EU, as part of the Green Deal and Zero Pollution visions for 2050, is revising its air quality standards to align more closely with the lower WHO recommendations[53].

Achieving the WHO Air Quality Guidelines in the future will be a major challenge for Ireland and all of Europe. Understanding the sources of $PM_{2.5}$ is essential to support the development, implementation and review of policies to improve air quality. It will require addressing emissions across a number of sectors, including, inter alia, residential heating, transport and agriculture.

On 31st October 2022, the Air Pollution Act 1987 (Solid Fuels) Regulations 2022 (S.I. No. 529 of 2022)[54] regulating the retail and distribution of solid fuel for residential heating came into effect. The Department of the Environment, Climate and Communications plans a National Clean Air Strategy for Ireland[55] to provide a high-level strategic policy framework to identify and promote the integrated measures across government policy that are required to reduce air pollution and promote cleaner ambient air while delivering on wider national objectives.

Detailed research in this area should inform policy development and address knowledge gaps in a national context.

Scope

Innovative research proposals are invited to:

- Undertake a comprehensive source apportionment analysis of $PM_{2.5}$ levels in Ireland. This should build on previous research in order to respond to the new air quality legislative and policy context.
- The research should focus on those small- to medium-sized towns where $PM_{2.5}$ levels are known to be elevated. The research should identify the fuels being used in residential heating as part of the source apportionment exercise. The research should address all sources of $PM_{2.5}$, including non-tailpipe emissions (tyre wear and break abrasion), agriculture and naturally occurring $PM_{2.5}$.

The research should make recommendations on actions to reduce $PM_{2.5}$ to achieve forthcoming levels included in the recast of the CAFE Directive and recommendations on further actions that would correspond to the WHO air quality guideline values.

This project should include an interim report after the first heating season. The interim report should include an assessment of the EU understanding of the natural contribution to $PM_{2.5}$ and the consequences for Ireland.

Click here to return to List of Topics

[51] https://www.epa.ie/publications/monitoring--assessment/air/EPA-Air_Quality_in-Ireland-Report_2021_-interactive-pdf.pdf
[52] https://www.who.int/publications/i/item/9789240034228
[53] https://environment.ec.europa.eu/topics/air_en
[54] https://www.epa.ie/our-services/licensing/air/solid-fuel-regulations/
[55] https://www.gov.ie/en/consultation/0a7cf-consultation-on-the-clean-air-strategy-for-ireland/

Facilitating a Green and Circular Economy (6 Topics)

Barriers and enablers to Ireland's transition to the circular economy – carbon-intensive materials and waste streams

Call Topic Reference:	Facilitating a Green and Circular Economy - Topic 3		
Project Type:	Medium Scale Project		
Maximum Budget:	€450,000	Maximum Duration:	36 months

Background

Extracting, processing, producing and consuming materials and products is responsible for a quarter of greenhouse gas emissions in Europe and a third globally. This creates an enormous environmental footprint. The EU Green Deal Circular Economy Action Plan[56] seeks to accelerate Europe's move from a linear to a circular economy, in which the economic value of materials is maintained, and waste is minimised. However, even where circular options for materials are available and technically feasible, successfully implementing and mainstreaming these requires the right supporting conditions to be in place. These include policy and regulatory provisions, e.g., around facilitating the reuse of secondary materials, economic/financial instruments to incentivise the use of recycled material over lower cost use of virgin materials, as well as supply chain considerations. Societal attitudes and acceptance of recycled or reused materials, and perceived lack of consumer demand are additional factors that require consideration.

With a circularity rate of just 2% in 2020, Ireland has significant room for progress. Research is needed to examine the current obstacles that inhibit the circular transformation, in the Irish context, and to recommend potential solutions and interventions. This research will inform circular economy policy in Ireland and ultimately accelerate our transition to a circular economy.

Scope

Innovative research proposals are invited to:

- Examine the current barriers (e.g., regulatory, economic, societal etc.) to Ireland's transition to a circular economy, focusing on waste/by-product materials that have high circularity potential. Case studies should be used to examine a selection of carbon-intensive materials that, if made circular, could substitute or supplement the use of virgin material. A particular focus on waste materials that are currently being exported for treatment abroad would be welcome, especially where making this material more circular could replace other imported materials/goods.
- Estimate the potential carbon emissions saved by making the range of selected materials more circular and determine the impact this would have on Ireland's circularity rate.
- Identify key enablers that would be most effective in overcoming the barriers identified in the case studies and that would provide the greatest impact in supporting Ireland's transition to a circular economy. These recommendations could be informed by reviewing the experiences of other countries with more progressive circular economy policies already in place.

The approach to this research should be cognisant of, and build upon, recent relevant reports and plans, including, but not limited to, the OECD Urban Study on the Circular Economy in Ireland[57], the European Commission's Green Deal Industrial Plan[58] and proposals on Critical Raw Materials[59] and the 2022 Environmental Impact Review for Ireland[60].

Click here to return to List of Topics

[56] Circular economy action plan (europa.eu)
[57] OECD Urban Studies - The Circular Economy in Ireland
[58] The Green Deal Industrial Plan
[59] Critical raw materials
[60] Environmental Implementation Review Country Report - Ireland

Enhancing the circular economy approach to tourism in Ireland

Call Topic Reference:	**Facilitating a Green and Circular Economy - Topic 4**		
Project Type:	Medium Scale Project		
Maximum Budget:	€450,000	**Maximum Duration:**	36 months

Background

Tourism is one of the biggest contributors to Ireland's economy, but it can have a negative impact on the environment and the tourism sector has an important role to play in tackling climate change. The transition to a circular economy is recognised as an essential building block in tackling climate change, aiming to reduce pressure on natural resources and to create sustainable growth and jobs. The European Network of the Heads of Environment Protection Agencies (EPA Network) Interest Group on Environment and Tourism (IGET), recently published a position paper (Environment and Tourism 2030-2050), which included a priority action to promote the circular economy approach in tourism[61]. Ireland, as a member of IGET, committed in this position paper, to propose innovative actions and solutions for sustainable tourism.

While there are initiatives within the tourism sector in Ireland aimed at promoting environmental sustainability for businesses, addressing issues such as energy and waste management[62], the wider area of considering a circular economy approach to the development of the sector needs to be developed further.

Research is needed to investigate how the circular economy approach can be applied to the tourism sector in Ireland to make it more environmentally sustainable.

Scope

Innovative research proposals are invited to, but not limited to:

- Identify approaches and opportunities for integrating the circular economy into the tourism sector in Ireland.
- Develop suitable indicators for measuring the effectiveness of these approaches that can be applied at both national, regional and local levels.
- Develop case studies from representative tourist areas in Ireland, e.g., coastal, island and on-land (rural/urban) areas, to explore where issues relating to the circular economy are arising, or may arise, and to recommend potential solutions.

Click here to return to List of Topics

[61] https://epanet.eea.europa.eu/reports-letters/reports-and-letters/ig-environment-and-toursim_position-paper.pdf
[62] https://supports.failteireland.ie/climate-action/

Exploring sustainable uses for end-of-life tyres

Call Topic Reference:	**Facilitating a Green and Circular Economy - Topic 5**		
Project Type:	Desk Study		
Maximum Budget:	€150,000	**Maximum Duration:**	12 months

Background

End-of-life tyres represent a significant waste stream with limited uses, with many being used as fuel in cement kilns. Some end-of-life tyres are recycled into granules and mulches for use in sports pitches and playgrounds. However, the granules and mulches may contain hazardous chemicals[63]. The granules also contribute to microplastic pollution. A proposed REACH restriction on microplastics[64] will likely result in this avenue for recycling coming to an end.

The full impact of the proposed REACH restriction on microplastics on end-of-life tyre recycling and waste streams in the Irish context is unclear. Alternative uses for end-life-tyres need to be explored and sustainable options identified that could potentially be adopted in Ireland.

Scope

Innovative research proposals are invited to, but not limited to:

- Conduct a review of the nature and extent of the use of end-of-life tyres in Ireland and the potential impacts of the REACH restriction on microplastics.
- Explore alternative uses for end-of-life tyres and identify sustainable approaches for Ireland to pursue.

Click here to return to List of Topics

[63] https://echa.europa.eu/hot-topics/granules-mulches-on-pitches-playgrounds
[64] https://echa.europa.eu/hot-topics/microplastics

Developing options to investigate levels of natural radioactivity in building materials in Ireland

Call Topic Reference:	**Facilitating a Green and Circular Economy - Topic 6**		
Project Type:	Medium Scale Project		
Maximum Budget:	€300,000	**Maximum Duration:**	24 months

Background

There is a wide range of building materials used in Ireland and a variety of potential uses of aggregate material (including recycled aggregate). The EPA has a statutory requirement to identify building materials that may be of concern due to levels of natural radioactivity[65]. If the activity concentrations of radioactive elements detected are above threshold levels, then restrictions on the use of that material may be invoked under the Construction Product Regulations, which currently sets out harmonised rules for the marketing of 35 construction product areas, one of which is aggregates[66]. While the Geological Survey Ireland (GSI) Tellus Survey includes the examination of soil and rocks in Ireland for radioactive elements[67], information available on the levels of natural radioactivity in building materials in Ireland is limited.

There is an increased emphasis on reducing construction and demolition waste and improving circularity of construction products and materials. This has been prioritised in Ireland's Waste Action Plan for the Circular Economy[68], the government's housing plan to 2030[69], as well as in the Circular Economy Programme[70]. Use of recycled aggregates including aggregates derived from waste rock, soils and stone, crushed concrete, bricks and ceramics, will substantially reduce material going to landfill and introduce the use of more sustainable materials in construction into the future.

Research is required to identify available techniques and approaches internationally that assess natural radioactivity in building materials including recycled aggregates. The research will provide the best evidence-based advice on how to develop an appropriately scaled and targeted monitoring programme to investigate natural levels of radioactivity in building materials in Ireland.

Scope

Innovative research proposals are invited to, but not limited to:

- Conduct a review of qualitative and quantitative national and international (particularly EU) information on natural radioactivity in building materials in use in Ireland including virgin and recycled aggregates. This should include an assessment of whether any identified radioactivity is likely to be naturally occurring associated with its original source (e.g., made from natural stone/ rock) or because of it being concentrated or enhanced due its re-use. (e.g., treatment during/ post construction)
- Conduct a comprehensive review of best practice in EU Member States on assessing natural radioactivity in building materials and the reuse of aggregate materials and present the different options available.
- Assess sampling protocols and sample measurements relating to natural radioactivity in construction materials.

[65] Regulation 67 of S.I. No. 30/2019 Radiological Protection Act 1991 (Ionising Radiation) Regulation 2019.
[66] Regulation (EU) No 305/2011, Construction Products Regulation (CPR).
[67] Geological Survey Ireland Tellus Survey
[68] A Waste Action Plan for a Circular Economy – Ireland's National Waste Policy 2020-2025
[69] Housing for All – a New Housing Plan for Ireland
[70] The Circular Economy Programme 2021-2027 – the Driving Force for Ireland's Move to a Circular Economy

- Provide recommendations for a monitoring programme in Ireland that reflects the likely levels of radioactivity in building materials and recycled aggregate in Ireland and that takes into account those in place or envisaged in other European Countries.

This research should build on, and interact with, data from the GSI Tellus survey[71].

Click here to return to List of Topics

[71] Tellus (gsi.ie)

Investigating regulatory barriers and enablers to the development of Ireland's Bioeconomy

Call Topic Reference:	**Facilitating a Green and Circular Economy - Topic 7**		
Project Type:	Medium Scale Project		
Maximum Budget:	€300,000	**Maximum Duration:**	24 months

Background

The bioeconomy is a circular and sustainable economic model that relies on the production of renewable biological resources and extends across many sectors and industries. The importance of the bioeconomy in Ireland's transition to a circular and low-carbon economy and society is recognised in Ireland's National Policy Statement on the Bioeconomy published in 2018[72], which commits the Government to supporting a policy and implementation framework for the bioeconomy. A key element of this commitment is to reduce regulatory uncertainty, to address barriers to entry into the bioeconomy and to ensure that appropriate, sustainable, and circular activities are supported in the bioeconomy, while also managing conflicting interests. The Bioeconomy Action Plan 2023-2025, currently in development, will seek to further develop the regulatory system to support a sustainable, circular, and regenerative bioeconomy.

Research is needed to explore regulatory approaches to the bioeconomy, to identify those that would best support the bioeconomy in Ireland and to make recommendations that could be used to inform decision making by policymakers.

Scope

Innovative research proposals are invited to, but not limited to:

- Conduct an analysis of how regulation enables/supports the bioeconomy, and what barriers it poses, including illustrative use-cases.
- Review international examples of regulatory environments that may better support the bioeconomy.
- Explore regulatory barriers to the advancement of the bioeconomy and how regulation can be adapted to new and innovative technologies that can use by-products and waste.
- Identify systems that policy makers can put in place to quickly identify and address regulatory issues, to avoid unnecessary barriers, and to support the development of bio-based businesses and the bioeconomy.

This research should build upon prior and ongoing relevant research including the EPA-funded Circular Bioeconomy Outlook Study 2030-2050[73].

Click here to return to List of Topics

[72] gov.ie - The Bioeconomy (www.gov.ie)

[73] Circular Bioeconomy Outlook Study 2030–2050 in Support of Climate Action, Sustainable Food and Biobased Systems

Evaluating the impacts of national end-of-waste and by-product decisions for construction-based materials

Call Topic Reference:	**Facilitating a Green and Circular Economy - Topic 8**		
Project Type:	Desk Study		
Maximum Budget:	€150,000	**Maximum Duration:**	12 months

Background

Ireland's Waste Action Plan for a Circular Economy[74] outlines the ambition to achieve a circular economy by avoiding the generation of unnecessary waste and reducing the use of virgin raw materials. National decisions that allow materials to cease to be regulated as waste, i.e., to achieve end-of-waste[75] or by-product status[76], and to be re-used, can support Ireland's circular economy ambition.

While 8.2 million tonnes of construction and demolition waste was generated in Ireland in 2020[77], the majority of this was stone and soil, with the potential for millions of tonnes to be beneficially used every year if end-of-waste or by-product status can be achieved for these materials. However, the full extent of the impact, including environmental, sectoral and financial, from decision making relating to end-of-waste and by-product status for construction-based materials, need to be better understood.

Research is needed to investigate the overall impacts of national circular economy regulation decisions based on end-of-waste and by-product criteria for construction-based materials.

Scope

Innovative research proposals are invited to identify and quantify the impacts of national decisions on end-of-waste and by-product criteria for construction-based materials. This should consider environmental, financial and sectoral impacts.

Click here to return to List of Topics

[74] Waste Action plan for a Circular Economy
[75] https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en#end-of-waste-criteria
[76] https://environment.ec.europa.eu/topics/waste-and-recycling/waste-framework-directive_en#by-products
[77] https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/

Protecting and Restoring our Natural Environment (5 Topics)

Lake water level fluctuations, ecology and hydrology interactions

Call Topic Reference:	**Protecting and Restoring our Natural Environment - Topic 4**		
Project Type:	Medium Scale Project		
Maximum Budget:	€450,000	**Maximum Duration:**	36 months

Background

The quality of Ireland's water is under significant pressure, with 31% of Irish lakes in an unsatisfactory condition[78]. Given the requirements of the Water Framework Directive (WFD) and in light of the publication of the Water Environment (Abstractions and Associated Impoundments) Bill 2022[79], measures are needed to improve the resilience of, and to protect and restore our lake water quality.

As hydromorphology is identified by the EPA as the second biggest pressure on freshwaters, research is needed to improve our understanding of the impact of hydrologically related anthropogenic activities (e.g., abstraction) on lake hydromorphology and ecology. This research will contribute towards addressing a gap in WFD implementation by identifying appropriate ecological supporting standards and conditions for lakes, in turn informing appropriate measures needed to improve and protect impacted lakes.

Scope

Innovative research proposals are invited to, but not limited to:

- Undertake a literature review and identify the hydrological factors/limits and ranges relevant to supporting lake ecology in Ireland.
- Identify the components of lake ecology (e.g., indicator species, sensitive species or habitats) most impacted by modifications to lake levels and changes in the flow regime to and from lakes.
- Provide recommendations to inform the development of tools

This project will be required to align with tools and models being developed and used in EPA and in collaboration with national partners on the National Hydromorphology Working Group (a subgroup of the WFD National Technical Implementation Group[80].

Click here to return to List of Topics

[78] Monitoring & Assessment: Freshwater & Marine Publications | Environmental Protection Agency (epa.ie)
[79] Water Environment (Abstractions and Associated Impoundments) Act 2022 – No. 48 of 2022 – Houses of the Oireachtas
[80] https://www.gov.ie/en/publication/f7c76-water-framework-directive/#the-national-technical-implementation-group-ntig

Quantification of the benefits of Strategic Environmental Assessment (SEA) using examples from Ireland

Call Topic Reference:	Protecting and Restoring our Natural Environment - Topic 5		
Project Type:	Desk Study		
Maximum Budget:	€150,000	Maximum Duration:	12 months

Background

The second Strategic Environmental Assessment (SEA) Effectiveness Review[81] identified the need to promote 'research into quantification or monetisation of the benefits of SEA', using Irish case studies. This has also been highlighted as an action in the SEA Action Plan 2021-2025[82]. The SEA Effectiveness Review also found that, 'while carrying out SEA incurs defined short-term costs in terms of labour and resources, undertaking SEA has the potential to lead to significant longer-term benefits…in environmental and social costs avoided, environmental and social benefits enhanced, reduced vulnerability of the plan to challenge and improved knowledge and inter-agency working. The costs tend to be monetisable, whereas the benefits (even where potentially monetisable, e.g., ecosystem services) are rarely quantified'.

Sectors such as agriculture, transport, waste, energy, water, forestry, tourism, land use, amongst others, come within the scope of the SEA Directive and the potential benefits of applying SEA to plans and programmes in these sectors are not clearly defined or measured in a consistent way. There is potential to use this knowledge to guide the SEA process so that the economic and environmental benefits are maximised, highlighting the usefulness of SEA to Plan and Programme makers.

Scope

Research is required to review a range of Irish Plans and Programmes to determine both the economic and environmental benefits of the application of SEA, including the identification, design and implementation of suitable indicators of SEA benefits. The review should target specific case studies to provide practical examples of SEA benefits. Outputs from the research could include, but are not limited to:

- An analysis of the quantification/monetisation of the benefits of SEA across a range of sectoral Plans and Programmes including avoided costs such as litigation, using both monetary and non-monetary valuation methods;
- Identification of a suite of suitable indicators for measuring and communicating the benefits of SEA;
- A proposed framework for capturing and monitoring benefits from SEAs;
- Good practice recommendations on how best to maximise the benefits of SEA to Plans and Programmes;
- Policy brief(s) highlighting the benefits of SEA to Plan and Programme makers.

Click here to return to List of Topics

[81] EPA Report 306: Second Review of SEA Effectiveness in Ireland
[82] gov.ie - SEA Action Plan 2021-2025 (www.gov.ie)

Developing the evidence base for land use review

Call Topic Reference:	**Protecting and Restoring our Natural Environment - Topic 6**		
Project Type:	Desk Study (up to 3 projects to be funded)		
Maximum Budget:	€150,000	**Maximum Duration:**	12 months

Background

The Programme for Government committed to a Land Use Review to ensure that optimal land use options inform all relevant government decisions. The Land Use Review – Phase 1[83] published in 2023 sets out specific recommendations that could be best addressed by independent research and could contribute to a more integrated assessment of land use to inform decision-making. The review includes a set of recommendations including those related to the development of indicators for soil monitoring, food system impacts, land-use measures and actions, urbanisation, amongst others.

Scope

Research proposals are invited that address any of the following recommendations from the Land Use Review – Phase 1:

- Recommendation 1 concerns the development of a national soils monitoring network. In response to this recommendation, research is required to inform which indicators should be measured, to assess the current state of the art for soil monitoring and any gaps in existing networks.
- Arising from Recommendations 3, 4, 5 and 6, a review of food system indicators to include all impacts of food systems from production to consumer, and post-consumer is required. The feasibility of such a review requires research and scoping to understand what indicators would apply to Ireland's food systems.
- Recommendation 13 outlines that fragmentation data should be combined with ecological data to determine where fragmentation is having the most acute impact in Ireland, and what thresholds should apply for different habitat or land use types. Research is required to integrate the use of a fragmentation map – such as the EEA map – with ecosystem extent and condition data to assess the impact of fragmentation on ecosystems and whether the impacts are greater on some habitat types than others.
- Recommendation 16 states that research is required to further develop urbanisation indicators for Ireland to assess the potential impacts of urban development.
- Recommendation 17 highlights the need to develop data sets and indicators to assess the impact of land use and any land-use measures or actions developed within the context of reviewing and optimising land use. Research is required to identify specific indicators that will address environmental concerns relating to air and water pollution, emissions and biodiversity, plus economics, resource availability, food, fibre and fuel production, and wider socio-economic factors. It is recommended that an integrated model (for example, a model like the Stockholm Resilience Centre model) is designed to illustrate and track how the implementation of a national land use strategy and accompanying changes are impacting upon a diversity of environmental factors.

It is envisaged that each of the recommendations above would require research through separate projects. To that end, there is capacity to fund a number of desk studies under this topic. Outputs relevant to addressing the specific recommendations may include scoping exercises, reports, datasets, indicators, strategies, assessments, etc.

Click here to return to List of Topics

[83] gov.ie - Land Use Review – Phase 1 (www.gov.ie)

Ecological response to altered flow regimes in modified channels

Call Topic Reference:	**Protecting and Restoring our Natural Environment - Topic 7**		
Project Type:	Medium Scale Project		
Maximum Budget:	€600,000	**Maximum Duration:**	48 months

Background

Human activities internal and external to the catchment have the potential to alter flow dynamics in rivers with implications for the ecological wellbeing of aquatic communities (particularly sensitive fish species). These kinds of interventions can include activities associated with flood risk mitigation (flood relief schemes and arterial drainage interventions), abstractions, and reduction and changes in rainfall runoff response as a result of land use change and/or climate change. Flow regimes may be sufficiently altered so that both high and low flows are impacted, and such that the patterns of flow changes within the seasons can interrupt important life cycle triggers for aquatic ecosystems. Shifts in flow may impact sensitive aquatic communities (including fish species) which are highly adapted to a given regime and rely on flow timing and magnitude for complete key life history events. Conserving such species may require maintenance of important seasonal flow patterns, i.e., 'ecological flows'.

There is considerable new and emerging evidence of how our catchments are likely to respond hydrologically under climate change scenarios (e.g., the HydroPredict[84] and WFD Futures projects), but the evidence is less clear on how aquatic ecosystems, particularly fish, are likely to respond. In addition, there is insufficient evidence to directly link the impacts of the other drivers of hydrological regime change (i.e., flood mitigation, channel maintenance, abstractions and land use change), to the health of aquatic ecosystems, particularly in the context of a compounding climate change influence.

Scope

Research is required to:

- Assess the impacts of hydrological changes due to arterial drainage schemes, land use change, and other human activities on aquatic ecosystem health with a focus on fish. Proposals should complement existing EPA-funded research (e.g., 2019-W-MS-45; Biological Tools to Measure the Impact of Flow on Ecology in Irish Rivers[85]).
- Determine the ecologically sensitive flow regimes needed to support aquatic fish species, under natural catchment conditions, and in hydrologically impacted catchments due to human activities.
- Assess the impacts of climate change on the ecologically sensitive flow regimes and make recommendations for interventions to protect aquatic species based on research in selected case study sites.

Click here to return to List of Topics

[84] HydroPredict: Ensemble Riverflow Scenarios for Climate Change Adaptation

[85] River Flow and Ecology – Biological tools to measure the impact of flow on ecology in Irish rivers (flowecology.com)

Carbon and Catchments

Call Topic Reference:	Protecting and Restoring our Natural Environment - Topic 8		
Project Type:	Medium Scale Project		
Maximum Budget:	€600,000*	Maximum Duration:	48 months

*Co-funding to be provided by National Parks and Wildlife Services

Background

Much of the research on land use and climate change has investigated direct atmospheric carbon losses from land. There is a significant knowledge gap on the magnitude and impacts of carbon losses to water, which is of critical importance to biodiversity, water and climate policies and associated monitoring and assessment. Research is required to quantify the significance of rainfall as a driver of carbon losses from land in Ireland, how much carbon is lost to water in sensitive catchments, and what happens to that carbon in rivers and lakes. In addition, it will be important to understand how this impacts sensitive protected aquatic habitats and species and water quality, and how hydrology and land use drive these processes.

Scope

In order to identify how to reduce carbon losses through water and associated ecological impacts, research is required to develop an improved and more holistic understanding of:

- Land use and condition, and their roles in the magnitude of carbon losses;
- The role of catchment hydrology in the mineralisation and transport of carbon, and how hydro-morphological changes influence these processes;
- The role of terrestrial wetlands in the cycling of aquatic carbon losses, and how this varies with wetland condition;
- The spatial scales (e.g., microhabitat, local and landscape) at which carbon-cycle changes occur;
- Natural background levels of carbon in water in intact wetland catchments.

Developments in catchment and hydrological modelling for Ireland, through EPA-funded research projects, such as the Pathways Project[86], Diffuse Tools[87], and most recently WaterFutures and HydroPredict[88], amongst others, also provide an opportunity to develop a carbon fate and transport module.

Research is also required to investigate the impacts of changes in the carbon cycle (i.e., increased carbon loading) on aquatic ecology, including:

- Impacts on primary producer and heterotrophic communities in rivers and lakes;
- Impacts on sensitive, protected aquatic habitats and species such as the Freshwater Pearl Mussel (1029), Slender Naiad (1833) and moderate alkalinity (3130) and marl (3140) lake habitats and implications for defining supporting conditions;
- Impacts on other aspects of aquatic ecology and water quality.

Click here to return to List of Topics

[86] EPA Research Report 165: Contaminant Movement and Attenuation along Pathways from the Land Surface to Aquatic Receptors: the PATHWAYS Project
[87] EPA Research Report 396: Catchment Models and Management Tools for Diffuse Contaminants (Sediment, Phosphorus and Pesticides): DiffuseTools Project
[88] HydroPredict: Ensemble Riverflow Scenarios for Climate Change Adaptation

Expected Outputs

Please consult the **2021-2030 Guidelines and Terms & Conditions** for the full list of expected outputs and interim/final reporting requirements.

Outputs from ALL projects must build on recently completed and existing research and other relevant information.

Where project outputs include data and/or technical solutions (websites, developed software, database solutions etc.) then the format of same must be agreed with the EPA to ensure that they can be installed on EPA infrastructure and maintained by EPA staff after the completion of the project. The EPA can supply a current list of approved data formats and technology on request and the exact format of all outputs must be agreed with the EPA before development of same commences. All data outputs must have a comprehensive set of metadata and all technical solutions must be fully documented according to EPA requirements.

It is essential that, in their proposal, applicants clearly demonstrate the policy-relevance of the outputs of their proposed research; the applicability of their findings; and how these outputs address a knowledge gap and can be efficiently transferred/applied to the implementation of policies and the protection of the environment. Applicants **must** clearly demonstrate how their proposed research will provide the evidence to support environmental policy in Ireland, in terms of identifying pressures, informing policy and developing solutions.

Timeframe

20 April 2023	Call opening
25 May 2023 at 16:00 (Irish standard time)	Deadline for queries relating to the technical contents of this call
1 June 2023 at 16:00 (Irish standard time)	Submission deadline
8 June 2023 at 16:00 (Irish standard time)	Approval deadline
July/September 2023	Evaluation process
October/November 2023	Notification / Negotiation[89]
November/December 2023	Grant award of successful projects
By 31 March 2024	Start of successful projects

[89] The EPA may consider calling the shortlisted applicants for interview at this stage.

Further Information

Information on current research projects being supported by the programme is available in the Research section of the EPA website: http://www.epa.ie/our-services/research/.

The following additional documents are available from the EPA website: http://www.epa.ie/publications/research/current-call-documents/

- EPA Research Programme 2021 - 2030 Guidelines and Terms & Conditions.
- EPA Research Programme 2021 - 2030 – Communicating Research.

Other relevant EPA Research Programme Strategies and Policies are also available from the EPA website: http://www.epa.ie/our-services/research/epa-research-2030/strategies-and-policies/.

For updates on the EPA Research Call 2023:

1. Subscribe to EPA Research Newsletters
2. Follow us on Twitter @EPAResearchNews
3. Visit the EPA Funding web pages
4. Check the Research Call Frequently Asked Questions web page

Any queries that are not covered in the call documentation or on the FAQs web page must be submitted to research@epa.ie.