



Rialtas na hÉireann
Government of Ireland



Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

EPA Research Programme 2014–2020

Climate Research Call 2019 – Technical Description Document

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

EPA Research Programme 2014–2020

Climate Research Call 2019

This document provides the Technical Description for the Environmental Protection Agency (EPA) Climate Research Call 2019. Applicants should read the following carefully and consult the other documentation provided (e.g. Guide for Applicants, Guide for Grantees, Terms and Conditions for Support of Grant Awards).

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Introduction

The EPA's Research Programme 2014–2020 is designed to identify pressures, inform policy and develop solutions to environmental challenges through the provision of strong evidence-based scientific knowledge:

- **Identifying Pressures:** Providing assessments of the current environmental status and future trends to identify pressures on our environment.
- **Informing Policy:** Generating evidence, reviewing practices and building models to inform policy development and implementation.
- **Developing Solutions:** Using novel technologies and methods that address environmental challenges and provide green economy opportunities.

Ireland's Climate and Air Quality

Ireland's State of the Environment Report (SoER) 2016¹ states that responding effectively to climate change is both urgent and long term. It is urgent in that our global actions and responses in the next 5–15 years may effectively lock in large-scale and irreversible planetary changes over this and subsequent centuries. While the 2015 Paris Agreement sets the international agenda, Ireland's actions for addressing climate change need to occur at national and sub-national levels and within and between communities. The Climate Action and Low Carbon Development Act 2015, National Mitigation Plan² and National Adaptation Framework³ provide the policy framework for these actions.

These, in combination with European Union (EU)-level emissions targets for 2020 and 2030, will inform and specify the short-term actions and longer term strategies to advance mitigation and adaptation actions (SoER, 2016). Similarly, the United Nations Economic Commission for Europe (UNECE) Air Convention, the EU Clean Air Package and the resulting European and national legislation set the agenda and policy framework for addressing air quality issues.

EPA Climate Research

A sustained Climate Research Programme is an essential component of Ireland's role in meeting its requirements under the 2015 Paris Agreement, the Climate Action and Low Carbon Development Act 2015, the UNECE Air Convention, the EU Clean Air Package and the United Nations Sustainable Development Goals. It is committed to aligning our research to assist in the delivery of these goals. The EPA Climate Research Programme priorities include:

- Supporting the transition to a low-carbon, climate-resilient and environmentally sustainable economy by the end of 2050. This will be done through developing the public's, policymakers' and the research community's understanding of what this objective means in an Irish context and how it might be achieved.

¹ http://www.epa.ie/pubs/reports/indicators/SoE_Report_2016.pdf

² <https://www.dccae.gov.ie/documents/National%20Mitigation%20Plan%202017.pdf>

³ <https://www.dccae.gov.ie/documents/National%20Adaptation%20Framework.pdf>

- Developing integrated approaches and growth opportunities through management of the challenges that arise from climate change, air quality and other environmental issues.

The EPA Climate Research Pillar is structured into four thematic areas of research, as follows:

Theme 1: Carbon Stocks, Greenhouse Gas (GHG) Emissions, Sinks and Management Options;

Theme 2: Ireland's Future Climate, its Impacts and Adaptation Options;

Theme 3: Climate Solutions, Transition Management and Opportunities;

Theme 4: Air Science.

Funding Structure

The EPA invites research proposals under the specific topics listed in Table 1.

Proposals can be Desk Studies, Medium Scale Projects or Large Scale Projects:

Desk Studies will typically last from 9 to 12 months, with an indicative cost of up to €100,000.

Medium Scale Projects will typically last from 24 to 36 months, with an indicative cost of up to €350,000.

Large Scale Projects will typically last from 36 to 48 months, with an indicative cost of up to €500,000.

Co-funding and Partnerships

Co-funding will be provided by the following organisations:



The **Marine Institute (MI)** manages competitive marine research funding programmes. Its competitive research awards have supported more than 260 researchers in the period 2007–2013. It also provides information on marine research funding opportunities from national and EU programmes.



Met Éireann, Ireland's national meteorological service, is the leading provider of weather information and related services in the State. Its mission is to monitor, analyse and predict Ireland's weather and climate and to provide a range of high-quality meteorological and related information to the public and to specific customers in, for example, the aviation and agricultural sectors. As a scientific and technical organisation, it strives to utilise the latest technological and scientific advances to improve the efficiency, effectiveness and accuracy of its forecasts.



**An Roinn Talmhaíochta,
Bia agus Mara**
Department of Agriculture,
Food and the Marine

In carrying out its mandate, the **Department of Agriculture, Food and the Marine (DAFM)** undertakes a variety of functions, including:

- policy advice and development in all areas of departmental responsibility;
- representation at national, European and international negotiations;
- development and implementation of national and EU schemes in support of agriculture food, fisheries, forestry and the rural environment;
- monitoring and controlling aspects of food safety;
- control and audit of public expenditure under its control;
- regulation of the agriculture, fisheries and food industries through national and EU legislation;
- monitoring and controlling of animal and plant health and animal welfare;
- monitoring and direction of state bodies engaged in the following areas: research training and advice, market development and promotion, industry regulation and development, commercial activities;
- direct provision of support services to agriculture, fisheries, food and forestry.

The DAFM operates three “public good” competitive research funding programmes for agriculture, food and forestry to support innovation and economic success across the bioeconomy. The DAFM also provides support for Irish involvement in the EU Horizon 2020 research funding programme.



The **Office of Public Works (OPW)** has a long and proud history, having played a central and unique role in developing, using, maintaining, preserving and celebrating Ireland’s rich tapestry of public buildings and structures, which together represent a critical aspect of national heritage and which serve to uphold and promote Irish identity, culture and civic pride.

While having always been associated with the provision, maintenance and care of public buildings and property, the OPW has in the past, and up to the present, had a number of related but distinct roles and responsibilities. Today, the OPW is responsible for:

- ownership and stewardship of the State property portfolio and the acquisition, maintenance and disposal of lands and property for use by the State;
- provision of accommodation for the civil service and delivery of property-related services to central government departments and offices;
- management and conservation of the State’s built heritage;
- co-ordination of policy and service delivery in flood risk management; within that the OPW has distinct responsibility for flood risk planning, capital projects and the provision of flood risk and planning advice;
- organisation, management and operation of events and ceremonies of national significance.
- undertaking the role of State Architect and delivering on government policy on architecture.

The OPW provides services to government, other government departments, offices and agencies across the wider public service, as well as services to the general public. Its role and remit therefore have a number of dimensions and features that distinguish it from other government departments and many other civil service organisations:

- it is a service organisation, albeit one that advises on and informs policy development in areas of its responsibility;
- it owns and maintains property on behalf of the State;
- it funds and delivers public works in areas of core responsibility;
- it acts as a service agency to other State organisations in property-related matters and technical and professional advisory services;
- it manages, maintains and maximises the potential of national monuments and the State's historic properties.



The Department of Communications, Climate Action and Environment (DCCA) established four **Climate Action Regional Offices (CAROs)**, recognising the significant obligation that has been placed on local government to develop and implement its own climate action measures, as well as the need to build capacity within the sector to engage effectively with climate change, in terms of both mitigation and adaptation.

The CAROs are being operated by a lead local authority in four different regions that have been grouped together based on a climate risk assessment, with a focus on the predominant risk(s) in each geographical area. The establishment of these offices will enable a more co-ordinated engagement across the whole of government and will help build on the experience and expertise that exists across the sector.



An Roinn Iompair
Turasóireachta agus Spóirt
Department of Transport,
Tourism and Sport

As a central government department, serving the government and the people of Ireland, the mission of the **Department of Transport, Tourism and Sport (DTTAS)** is to shape the safe and sustainable development of transport, tourism and sport, to support economic growth and social progress. Its high-level goals are as follows:

- land transport: to best serve the needs of society and the economy through safe, sustainable and competitive transport networks and services;
- aviation: to maximise air transport connectivity with a safe, competitive, cost-effective and sustainable aviation sector;
- maritime: to facilitate safe and sustainable maritime transport and the delivery of emergency management services;
- tourism: to support the tourism industry to grow in a sustainable way;
- sport: to contribute to a healthier and more active society by promoting sports participation and by supporting high performance and the provision of sport facilities.



The **National Parks and Wildlife Service (NPWS)** is part of the Heritage Division of the Department of the Culture, Heritage & the Gaeltacht. One of its roles is to secure the conservation of a representative range of ecosystems to maintain and enhance populations of flora and fauna in Ireland. In this it is supported by several National and EU legislation and policies for nature conservation and biodiversity including the [EU Habitats and Birds Directives](#).



The mission of Fingal County Council is to be the place of choice to live, work, visit and to do business in Ireland. This is reflected through a wide range of strategic assets supporting vibrant communities, prosperous businesses and tourism. As part of its Corporate Plan 2015-2019, key strategic actions within the Environment and Water Services Department of Fingal County Council include developing an adaptation policy regime in line with the National Climate Change Adaptation Framework as well as protecting and enhancing the natural environment of Fingal through effective education, awareness, monitoring and enforcement of national and local legislation and policy. For more information on Fingal County Council's work in safeguarding biodiversity in the area, please visit <http://www.fingalbiodiversity.ie/index.html>

Application Process

Making an Application

Applications **must** be made online at <https://epa.smartsimple.ie>

You will also need to refer to the following documentation, which is available to download from the EPA's Online Grant Management and Application Portal or from the [EPA website](#):

1. 2019 Guide for Applicants;
2. 2019 Terms and Conditions for Support of Grant Awards;
3. EPA Online Grant Management and Application Portal – User Guide for Applicants;
4. EPA Online Grant Management and Application Portal – Registration and General User Notes.

IMPORTANT:

1. Please refer carefully to the Technical Description Documents and ensure that you choose the correct Call Topic Reference when creating your application on the EPA's Grant Management and Application Portal as **mistakes will not be rectified**.
2. **For all co-funded topics**, researchers **may not** apply for or participate in projects that are to be co-funded by their organisation, even if their organisation would not be in receipt of funding.
3. **For Climate Projects 6 and 12** – as Met Éireann was involved in the drafting of the topics and in the preparation of the Call specifications, Met Éireann cannot participate in any proposals submitted under these particular topics, even if Met Éireann is not in receipt of funding.

Value for Money

All research proposals **must** build on findings and recommendations from past and current research⁴ projects (where relevant). Applicants **must** clearly demonstrate the value for money of their proposal and that the amount requested as the project budget will allow the proposed research to be addressed appropriately.

Open Access and Open Data

All projects must comply with the EPA's Open Data and Open Access rules, which are aligned with Horizon 2020 for the 2014–2020 EPA Research Programme.

⁴ Including EPA-funded, other Irish and EU and international research projects and initiatives/activities.

Deadlines

It is the responsibility of the Applicant to ensure that proposals are submitted before the call deadline, and the responsibility of the relevant Grant Authoriser (i.e. Research Offices/Managing Directors for companies) to ensure that proposals are authorised before the organisational approval deadline.

FAILURE TO MEET EITHER OF THE ABOVE DEADLINES MEANS THAT YOUR PROPOSAL WILL NOT BE CONSIDERED FOR FUNDING.

List of Topics

The EPA invites research proposals under the topics listed below for the Climate 2019 Call.

Up to one award is expected for each of the topics included in the 2019 Call. Awards will be funded from the 2019 and 2020 EPA budget (depending on budget availability). **Topics listed with an (*) may be placed on a Reserve List to be progressed in 2020, conditional on budget availability.**

Table 1. List of topics for the Climate 2019 Call

Call Topic Reference	Thematic Areas and Call Topic Titles	Max. Budget (€) Per Project	Co-funded By
Theme 1: Carbon Stocks, GHG Emissions, Sinks and Management Options			
Climate 2019 Call – Project 1	Options to maintain and enhance carbon stocks within the rural landscape	€250,000	DAFM
Climate 2019 Call – Project 2	Options for achieving mitigation through diversification of agriculture in Ireland	€100,000	–
Theme 2: Ireland's Future Climate, its Impacts and Adaptation Options			
Climate 2019 Call – Project 3	Climate proofing the emergency planning sector	€100,000	–
Climate 2019 Call – Project 4	Climate change adaptation – a review of the evidence on climate resilience in the private sector in Ireland	€100,000	–
Climate 2019 Call – Project 5	Best practice in implementing climate resilience in the built environment	€100,000	–
Climate 2019 Call – Project 6	A GIS-based risk assessment of climate impacts incorporating future climate impacts scenarios	€250,000	CAROs
Climate 2019 Call – Project 7	Climate action for coastal communities through serious games	€150,000	–
Climate 2019 Call – Project 8	The effects of climate change on sea levels, including astronomical tide levels and storm surges, and on wave climate conditions around the coast of Ireland	€175,000	MI; Met Éireann (pending confirmation); OPW
Climate 2019 Call – Project 9 (*)	The vulnerability of peatland ecosystems to a changing climate and increases in the frequency and severity of droughts	€300,000	National Parks & Wildlife Service

Call Topic Reference	Thematic Areas and Call Topic Titles	Max. Budget (€) Per Project	Co-funded By
Climate 2019 Call – Project 10	The impact of climate change on the habitats and wildlife of the Rogerstown Estuary and Ballyboughal River in North County Dublin	€100,000	Fingal County Council
Climate 2019 Call – Project 11	Health and wellbeing impacts of climate change	€350,000	–
Climate 2019 Call – Project 12	Modelling high-resolution soil moisture maps for Ireland using earth observation and <i>in situ</i> data	€350,000	–
Theme 3: Climate Solutions, Transition Management and Opportunities			
Climate 2019 Call – Project 13	Longitudinal analysis of the National Dialogue on Climate Action activities	€100,000	–
Climate 2019 Call – Project 14 (*)	Enabling vulnerable communities in transition to a resilient low-carbon economy	€250,000	–
Climate 2019 Call – Project 15 (*)	Children and youth in climate action	€200,000	–
Theme 4: Air Science			
Climate 2019 Call – Project 16 (*)	Impact of Irish agricultural activities on rural air quality	€300,000	–
Climate 2019 Call – Project 17	Impact of real-world driving emissions on air quality in Dublin	€350,000	DTTAS
Climate 2019 Call – Project 18	Reviewing the research infrastructure for monitoring the atmosphere in Ireland	€75,000	–
Climate 2019 Call – Project 19	An assessment of greenhouse gas and air pollution emissions from uncontrolled burning in upland areas using satellite imagery and remote sensing	€250,000	–
Climate 2019 Call – Project 20 (*)	Source apportionment of air pollution in the Dublin Port area	€500,000	–

Call Content

Theme 1: Carbon Stocks, GHG Emissions, Sinks and Management Options

Research undertaken under this thematic area aims to improve understanding of greenhouse gas (GHG) emissions and sinks, thereby providing better information to support actions to mitigate emissions and enhance sinks. Research in this area contributes to improving inventory and projections methodologies for estimation of emissions and sinks of GHGs and verification of these by independent analysis.

The estimation of emissions and sinks of GHGs from agriculture and land use remains a key uncertainty within land use, land-use change and forestry (LULUCF). The dynamic of land use within Ireland is not fully understood, particularly the impact of management of land within agriculture. Analysis is required to assess the potential of this activity on a national scale. The potential for GHG emissions and removals from peatland as a result of human activities is also a cause of ongoing concern.

IMPORTANT: Please refer carefully to the Technical Description Documents and ensure that you choose the correct Call Topic Reference when creating your application on the EPA's Grant Management and Application Portal as **mistakes will not be rectified.**

Two topics are included in the EPA Climate 2019 Call under Theme 1: Carbon Stocks, GHG Emissions, Sinks and Management Options:

Climate 2019 Call – Project 1	Options to maintain and enhance carbon stocks within the rural landscape
Climate 2019 Call – Project 2	Options for achieving mitigation through diversification of agriculture in Ireland

Call Topic Title:	Options to maintain and enhance carbon stocks within the rural landscape		
Call Topic Reference:	Climate 2019 Call – Project 1		
Project Type:	Medium Scale Project		
Maximum Budget:	€250,000	Maximum Duration:	24 months
Co-funded by: Department of Agriculture, Food and the Marine			

Background

Hedgerows and local woodland are an integral aspect of Ireland’s landscape. There is evidence that these have been in a state of steady decline in terms of extent and condition. Incentives to encourage improved maintenance of existing hedgerows and woodlands are required. In addition, there is a need for additional incentives to establish new hedgerows and woodlands in appropriate areas within the existing farming landscape.

The national policy position on climate action (as per the Paris Agreement) has the objective of an approach towards neutrality within the agricultural and land-use sector. Hedgerows and woodlands are estimated to account for at least 270 kha of land cover. The carbon sequestration and storage potential of these landscape features has been neglected in policy development. There is a need, therefore, for Ireland-specific analysis to establish appropriate management options for the landscape to enhance climate mitigation and adaptation potential.

New/updated models (supported with field research) on hedgerow and woodland biomass production and related carbon sequestration potential under different management scenarios need to be generated. This would enable the development of a robust inventory system for hedgerows and woodlands in Ireland.

The environmental co-benefits of hedgerows and woodlands (particularly native species) could be assessed and valorised where possible. The economic and resource potential of hedgerows and woodlands⁵ for the bioeconomy (biomass) can also be assessed within the scope of this topic. In this regard a cross-sectoral analysis to inform long-term policy development regarding hedgerows (and encompassing land management) and a cross-sectoral assessment of food and environment policy could be included. The research could consider the costs and benefits at both rural and national levels.

This research could expand the national discussion on the impact of management within the agricultural landscape and support the national dialogue on Ireland-specific options for climate action.

⁵ Note: woodlands in this context would not be classified as forest land as they are considered integral to agricultural land use.

Scope

Innovative research proposals are invited to undertake an assessment of current and projected carbon stocks within hedgerows and woodlands within the agricultural landscape. Analysis of co-benefits and trade-offs, especially with respect to rural development, biodiversity (improved nature value within productive agricultural areas), water quality and water flow regimes, could be included. The research could also explore attitudes and behavioural barriers to implementation of policies recommended by the research.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Call Topic Title:	Options for achieving mitigation through diversification of agriculture in Ireland		
Call Topic Reference:	Climate 2019 Call – Project 2		
Project Type:	Desk Study		
Maximum Budget:	€100,000	Maximum Duration:	12 months

Background

In Ireland, there is increasing evidence that the intensification of dairy and beef activities may be pushing beyond environmental sustainability in the context of greenhouse gas emissions, the nitrogen cycle (air and water quality), biodiversity and soil conditions.

There is a need for Ireland-specific analysis to consider options to achieve environmental, economic and social sustainability in the broader agricultural sector and develop approaches to diversify to more sustainable alternatives. Research is required to explore how these issues can be addressed through strategic management of dairy and beef activities and other sustainable alternatives, whilst maintaining (and improving) the economic and social sustainability of rural communities. The research could consider costs and benefits at both rural and national levels.

This research could expand the national discussion of the impact of current land use and agricultural systems and support the national dialogue process on Ireland-specific options for climate action.

Scope

Innovative research proposals are invited to investigate options for diversifying agricultural activity in Ireland to reduce overall reliance on dairy and beef. The proposed research should include analysis of co-benefits and trade-offs with respect to input costs, farmer income and environmental pressures.

The research could also explore attitudes and behavioural barriers to implementation of any options recommended by the research.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Theme 2: Ireland's Future Climate, its Impacts and Adaptation Options

Research under this thematic area aims to provide information on future climate conditions in Ireland and their impacts. This information will create the basis for better informed decision making on adaptation in the years to come and make key economic and policy sectors more resilient to the effects of climate change.

The research focus of this thematic area is to improve climate observations and projections, identify risk and vulnerability and inform adaptation responses. In recent years, research has progressed on climate modelling, climate analysis and development of observation systems and indicators. This information has been used in impact analysis and risk and vulnerability assessment. The outputs from these assessments have been designed to support national-, sectoral- and local-level planning and decision making in the context of climate change, such as the National Adaptation Framework. At a broader scale, this research theme also develops a basis for the provision of future climate services, as identified by the Joint Programme Initiative – Climate and Horizon 2020.

IMPORTANT: Please refer carefully to the Technical Description Documents and ensure that you choose the correct Call Topic Reference when creating your application on the EPA's Grant Management and Application Portal as **mistakes will not be rectified.**

Ten topics are included in the EPA Climate 2019 Call under Theme 2: Ireland's Future Climate, its Impacts and Adaptation Options	
Climate 2019 Call – Project 3	Climate proofing the emergency planning sector
Climate 2019 Call – Project 4	Climate change adaptation – a review of the evidence on climate resilience in the private sector in Ireland
Climate 2019 Call – Project 5	Best practice in implementing climate resilience in the built environment
Climate 2019 Call – Project 6	A GIS-based risk assessment of climate impacts incorporating future climate impacts scenarios
Climate 2019 Call – Project 7	Climate action for coastal communities through serious games
Climate 2019 Call – Project 8	The effects of climate change on sea levels, including astronomical tide levels and storm surges, and on wave climate conditions around the coast of Ireland
Climate 2019 Call – Project 9	The vulnerability of peatland ecosystems to a changing climate and increases in the frequency and severity of droughts
Climate 2019 Call – Project 10	The impact of climate change on the habitats and wildlife of the Rogerstown Estuary and Ballyboughal River in North County Dublin
Climate 2019 Call – Project 11	Health and wellbeing impacts of climate change
Climate 2019 Call – Project 12	Modelling high-resolution soil moisture maps for Ireland using earth observation and <i>in situ</i> data

Call Topic Title:	Climate proofing the emergency planning sector		
Call Topic Reference:	Climate 2019 Call – Project 3		
Project Type:	Desk Study		
Maximum Budget:	€100,000	Maximum Duration:	12 months

Background

The Strategic Emergency Management (SEM) National Structures and Framework and their associated Annexes were approved by government on 26 July 2017.⁶ The SEM identifies 50 different emergency/incident types across a range of lead government departments. It provides the basis for national-level strategic emergency management and the supports required should such emergencies occur, when a national-level response is warranted, including security-related emergencies.

The importance of better aligning climate adaptation policy and emergency planning (particularly disaster risk reduction – DRR) is recognised at national, European Union and international level. A recent report from the European Environment Agency (EEA, 2017)⁷ notes that efforts to reduce disaster risk and at the same time adapt to a changing climate have become a global and European priority and that climate change adaptation (CCA) and DRR provide a range of complementary approaches for managing climate risks in order to build resilient societies. The EEA report further notes how both CCA and DRR are cross-cutting and complex but that both approaches face similar challenges, such as incomplete and uncertain knowledge bases, the interplay of multiple actors and limited resources.

Notwithstanding many innovative practices in Europe, the report also highlighted a need to foster coherence between DRR and CCA policies, practices and knowledge. Such coherence, the report argues, can be achieved by ensuring effective co-ordination and collaboration between the national, provincial and municipal administrations (i.e. multi-level governance).

Shine (2018)⁸ noted that the integration of CCA with DRR has not been achieved to any extent in Ireland. Planning for climate change can mean looking at current natural hazards and anticipating which of them will become more extreme in the future. One of the barriers to coherence and better integration is that the future being planned for is not likely to be next year, but many years from now. Emergency management, however, has traditionally been response based, which can present challenges to the sector in terms of integrating climate change in its planning.

This is an ongoing issue and there are proposals within the National Adaptation Framework to address this challenge. The Framework contains a supporting objective: “Ensure continued alignment with emergency planning for extreme weather events including where plans related to emergencies assigned to a sectoral department as Lead Government department under the ‘Strategic Emergency Management National Structures and Framework’ are climate proofed”. Under the National Adaptation Framework, it is foreseen that these relationships will continue to strengthen over time.

⁶ <https://www.emergencyplanning.ie/en/news/strategic-emergency-management>

⁷ <https://www.eea.europa.eu/publications/climate-change-adaptation-and-disaster>

⁸ http://www.epa.ie/pubs/reports/research/sss/Research_Report_252.pdf

In Ireland, there is therefore a need to look at how we approach the longer term planned response (i.e. CCA planning) in conjunction with how we respond in the short term to extreme weather (i.e. emergency management). It is important to ensure that co-ordination and coherence are maintained and enhanced as we move forward in planning for resilience, whether for tomorrow or for 2050 and beyond. Further connectivity and coherence between the two areas can improve the efficiency of data collection and build up a more complete picture of progress and priorities at the national level. This research will assist in these efforts by examining the implications of climate change for the emergencies identified within the SEM National Structures and Framework, as well as assist in ensuring that emergency plans prepared in line with national policy are climate proofed.

Scope

Innovative research proposals are invited which could:

- review the institutional challenges/barriers for Ireland in terms of how we better integrate the climate adaptation and emergency planning communities so that they are more effective in addressing their challenges;
- provide a roadmap for how best to mainstream climate change considerations for the emergency planning sector that address both the immediate and the long term;
- examine the implications of climate change for the emergencies identified within the SEM National Structures and Framework and assist in ensuring that emergency plans prepared in line with national policy are climate-proofed.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Call Topic Title:	Climate change adaptation – review of the evidence of climate resilience in the private sector in Ireland		
Call Topic Reference:	Climate 2019 Call – Project 4		
Project Type:	Desk Study		
Maximum Budget:	€100,000	Maximum Duration:	12 months

Background

Under the National Adaptation Framework (NAF), the requirement to adapt to climate change is identified as a whole of society issue. A primary role for government identified in the NAF is to provide an enabling environment to ensure that individuals and businesses have the necessary information and appropriate incentives to respond appropriately.⁹ This is to be achieved through increased information provision (through Climate Ireland,¹⁰ for example) and awareness raising (through initiatives such as the National Dialogue on Climate Action¹¹), including encouraging individuals and businesses to assess the impact of past weather events as a means of self-assessing resilience for events that may happen in the future. Research to date on climate adaptation with regard to the resilience of the private sector in Ireland is limited or based on earlier investigations, which now require updating (e.g. 2010 Forfás report *Adaptation to Climate Change: Issues for Business*¹²).

The impacts of climate change will likely raise significant issues for the private sector, for example in respect of supply chains, insurance availability, long-term planning and investment location.

Scope

Innovative research proposals are invited to analyse the implications of climate change from an enterprise perspective and expand the understanding of the specific risks involved. This work could also build on previous research carried out, including that by the insurance industry. The analysis could also include evidence of barriers to action and examples of best practice in an Irish and international context. The research could update the 2010 Forfás report, *Adaptation to Climate Change: Issues for Business*, and supplement it by identifying the level of preparedness of the private sector for climate change.

The inclusion of industry partners in research proposals for this desk study would be considered beneficial.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

⁹ <https://academic.oup.com/oxrep/article-abstract/24/2/337/423417>

¹⁰ <https://www.climateireland.ie/#/>

¹¹ <https://www.dccae.gov.ie/en-ie/climate-action/topics/national-dialogue-on-climate-action/Pages/default.aspx>

¹² http://www.itic.ie/wp-content/uploads/2015/05/Adaptation_to_Climate_Change_Summary_Report_ONLINE_FINAL.pdf

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Call Topic Title:	Best practice in implementing climate resilience in the built environment		
Call Topic Reference:	Climate 2019 Call – Project 5		
Project Type:	Desk Study		
Maximum Budget:	€100,000	Maximum Duration:	12 months

Background

How the spatial planning system (forward planning and development management) and the building control system and building regulations consider climate adaptation requirements is a key aspect of ensuring Ireland’s future climate resilience.

The implementation of the National Planning Framework¹³ represents a key opportunity in ensuring that the climate implications of our spatial choices are fully considered and addressed from the top of the planning hierarchy.

Action 11 of the National Adaptation Framework states that it is important to “Ensure climate proofing considerations are fully integrated into arrangements and reforms arising from the new Ireland 2040 – National Planning Framework including Guidelines, updated guidance on adaptation proofing of SEA (Strategic Environmental Assessment) and EIA (Environmental Impact Assessment) and also in revisions of building standards”.

Scope

Innovative research proposals are invited to review existing mechanisms intended to mainstream resilience into the planning system and building standards. The research could also examine potential mechanisms and opportunities to address climate change adaptation in the planning policy hierarchy.

This research could make recommendations on how best to ensure climate resilience in the built environment in the future and could contribute to future national adaptation policy. The research could include case studies from other jurisdictions and case studies of recent extreme weather and lessons learned for the built environment sector.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA’s policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

¹³ <http://npf.ie/>

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Call Topic Title:	A GIS-based risk assessment of climate impacts incorporating future climate impacts scenarios		
Call Topic Reference:	Climate 2019 Call – Project 6		
Project Type:	Medium Scale Project		
Maximum Budget:	€250,000	Maximum Duration:	24 months
Co-funded by: Climate Action Regional Offices (based in Dublin City Council, Mayo County Council, Kildare County Council and Cork County Council)			

IMPORTANT: As Met Éireann was involved in the drafting of the topic for Project 6 and was involved in the preparation of the Call specifications, Met Éireann cannot participate in any proposals submitted under this particular topic, even if Met Éireann is not in receipt of funding.

Background

Under the National Adaptation Framework, there is a requirement for 12 sectors (across seven government departments), as well as each local authority, to prepare a climate adaptation plan by September 2019. A recent sectoral climate adaptation workshop in December 2018 for the critical infrastructure and water sector highlighted the urgent need for key infrastructure providers to be sharing data together so that they can be used for climate impact risk assessment at a national, regional and local authority level.

Climate change adaptation at a local level requires the availability of a range of data and climate impact projections. Although there is considerable research ongoing in the projections of impacts using climate models, the availability of spatial data in a GIS format and the interpretation of these data, overlapped with future climate impact scenarios, is a gap at the sectoral and local levels. Local authorities hold data sets across various departments that need to be integrated into one central system to facilitate climate adaptation planning. Other national agencies and departments hold data relating to critical infrastructure that are crucial to sectoral adaptation planning. These also need to be integrated into a central online platform to facilitate climate adaptation planning. The identification of key assets at risk of climate change impacts will enable more informed investment decisions to be taken for adaptation actions.

This project will assist in implementation of the national adaptation plans and inform the decisions to be taken on adaptation actions. The Minister for Communications, Climate Action and Environment announced recently the development of an all-of-government Climate Action Plan. This project can assist in the national challenge of adapting to climate change.

This project will assist in the implementation of sectoral and local authority climate adaptation plans, which are due to be prepared by this September. Having access to data as outlined above will facilitate risk assessments by sectors, infrastructure providers and local authorities under different climate change scenarios.

Scope

Innovative research proposals are invited to prepare an online GIS-based platform that could be used by sectors and local authorities to assist in the assessment of climate risk in their areas. One of the cross-sectoral recommendations of the Citizens Assembly on climate change was that “. . . the state should undertake a comprehensive assessment of the vulnerability of all critical infrastructure (including energy, transport, built environment, water and communications) with a view to building resilience to ongoing climate change and extreme weather events . . .”¹⁴

Working with key data holders, the project will provide GIS layers of assets for a range of parameters relevant to climate adaptation, inter alia, housing and industrial developments, archaeological heritage sites, landfills and waste sites, water services (waste treatment plants, water treatment plants), roads and bridges and protected habitats (Special Areas of Conservation, Special Protection Areas).

The GIS risk assessment tool could be piloted in a rural and an urban local authority, as well as with a key infrastructure provider willing to collaborate on the project. The project could also liaise with the new Climate Action Regional Offices (CAROs) that are working with local authorities on the preparation and implementation of climate adaptation plans.

The project could also make recommendations on the best way to share and use these data for a sectoral and local adaptation risk assessment.

Proposals must include details of the transfer and roll-out of the GIS risk assessment tool, as well as training in its use. This includes details of where the tool will be located and how it will be managed and maintained after completion of the project.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA’s policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

The outputs must be compatible with GIS systems of the public authorities that are to use them.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

¹⁴ <https://www.citizensassembly.ie/en/How-the-State-can-make-Ireland-a-leader-in-tackling-climate-change/Recommendations/>

Call Topic Title:	Climate action for coastal communities through serious games		
Call Topic Reference:	Climate 2019 Call – Project 7		
Project Type:	Medium Scale Project		
Maximum Budget:	€150,000	Maximum Duration:	24 months

Background

Coastal communities are experiencing climate change-driven impacts of sea level rise, increases in storm surges and associated coastal erosion and coastal inundation. Furthermore, 40% of Ireland’s population live within 5 km of the coast, as documented in the 2016 Irish census. Potential solutions to managing our vulnerable coastlines include coastal realignment, changes in coastal planning policy and coastal protection. Many coastal communities are not aware of the current and future projected impacts of climate change on their coastlines. In addition, there are challenges in reaching equitable solutions to manage the impact of sea level rise and storm surges on coastal areas. Costs associated with coastal management are currently shouldered by local authorities drawing down funding from state agencies such as the Office of Public Works. Current Irish coastal management is also primarily reactive and focused on the short term. However, the status quo of coastal management will be challenged in the face of a changing climate and difficult decisions will need to be reached. Serious games provide an invaluable tool to help negotiate this difficult and contested space.

Climate change serious games typically have three primary objectives: to teach knowledge about, and provide familiarity with, the issues of climate change; to make players aware of the challenges associated with global warming; and to encourage players to develop solutions. Games also act as safe innovation spaces to interactively engage with alternate climate futures, build capacity and capability for resolving difficult problems and socialise adaptation with different publics.

This research will complement existing Irish coastal management policy. The Irish Coastal Protection Strategy Study (ICPSS)¹⁵ provides information on where our coastal communities are vulnerable to flood risk and coastal erosion. Local authorities currently hold responsibility for coastal management, including coastal maintenance and emergency works, identifying critical areas and applying for funding (from the Office of Public Works) to support coastal protection schemes. The research will create a tool that can help to inform, educate and empower local communities and their respective local authorities in navigating the complex space of climate-resilient coastal management. Through envisioning different climate futures the creation of a serious game will help to inform and complement existing Irish coastal management practices.

Scope

Innovative research proposals are invited to investigate the use of gaming tools as a means to overcome barriers to climate-resilient planning and development in Irish coastal communities.

Proposals could use existing agency data sets and consider piloting tools in a coastal area.

¹⁵ <https://www.opw.ie/en/flood-risk-management/floodanderosionmapping/icpss/>

Proposals must include details of the transfer and roll-out of the tool developed, as well as training in its use. This includes details of where the tool will be located and how it will be managed and maintained after completion of the project.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

The tool developed must be compatible with information technology systems of the public authorities that are to use it.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Call Topic Title:	The effects of climate change on sea levels, including astronomical tide levels and storm surges, and on wave climate conditions around the coast of Ireland		
Call Topic Reference:	Climate 2019 Call – Project 8		
Project Type:	Medium Scale Project		
Maximum Budget:	€175,000	Maximum Duration:	24 months
Co-funded by: Met Éireann (pending confirmation), Marine Institute, Office of Public Works			

Background

Coastal flooding and erosion, as natural hazards, can affect the environment directly or indirectly. To protect the environment there is a need for appropriate coastal flood and erosion risk management practices to be adopted. Information specific to the coast of Ireland forms a key part of the knowledge base required to assess and quantify the impacts on the environment.

Research under this topic will improve knowledge of the potential impacts of climate change on sea levels, storm surges and wave climate conditions around the coast of Ireland. This will provide valuable information for government bodies, local authorities and anyone involved in planning and/or managing infrastructure, assets and flood or erosion risk around the coast of Ireland.

The key challenges to be addressed will be the development of regional and local projections of the impact of climate change on sea levels (astronomical tides and storm surges) and on offshore and nearshore wave climate conditions (heights, periods and directions) around the coast of Ireland for a range of future emissions scenarios and epochs.

Scope

Innovative research proposals are invited to provide projections for the impacts of climate change on sea levels, storm surges and wave climate conditions around the coast of Ireland for a range of future scenarios. In this regard, proposals could seek to address the following research questions:

- What are the expected range of impacts of climate change on regional mean sea levels (the baseline water levels on which the local variability and sea level extremes are superimposed) around the coast of Ireland for a range of future emissions scenarios and epochs?
- What are the expected range of impacts of climate change on regional storm surges and extreme storm surges around the coast of Ireland for a range of future emissions scenarios and epochs?
- What are the expected range of impacts of climate change on regional and local (offshore and nearshore) wave climates and wave extremes around the coast of Ireland for a range of future emissions scenarios and epochs?
- Is there potential for changes in astronomical tide and storm surge characteristics at regional and/or local scales arising from mean sea level change around the coast of Ireland?

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Topic Title:	The vulnerability of peatland ecosystems to a changing climate and increases in the frequency and severity of droughts		
Call Topic Reference:	Climate 2019 Call – Project 9		
Project Type:	Medium Scale Project		
Maximum Budget:	€300,000	Maximum Duration:	24 months
Co-funded by: National Parks & Wildlife Service			

Background

Current climate projections for Ireland for the period 2041–2060 (Nolan *et al.*, 2017)¹⁶, using a high emissions scenario, predict significant decreases in mean annual, spring and summer precipitation. These projections imply significant increases in the frequency and severity of droughts, indicating that peatlands in Ireland are highly vulnerable to climate-induced hydrological change, with increased evapotranspiration rates and lower rainfall during the critical vegetation growing period. This will affect ecosystem stability and increase nutrient and greenhouse gas (GHG) emissions.

Currently, ecological restoration of peatland habitats is related to addressing pressures caused by land management (e.g. drainage), and much work can be site specific in nature. A broad assessment of the impacts on peatland eco-hydrology of projected increases in drought conditions caused by climate change is required, as this information is currently unknown. Specifically, a greater and more in-depth understanding is needed to determine:

- the eco-hydrological response to potential climatic changes in the context of Irish peatlands;
- how resilient Irish peatlands are to increases in the frequency and severity of drought;
- how predicted changes in rainfall/evapotranspiration patterns are incorporated into restoration/management scenarios;
- how Irish peatlands influence climate feedback dynamics and what impact rehabilitation and ecological restoration have on the local/regional climate.

The EU Habitats Directive (92/43/EEC) requires Member States to maintain or restore the favourable conservation status of habitats and species of community interest. Achieving favourable conservation status must account for projected changes in precipitation and temperature patterns, and inform management practice and conservation objectives. This research will fully address Action 14 of the National Peatlands Strategy 2015¹⁷.

Efficient and cost-effective restoration and management of Ireland’s peatlands will depend on a thorough understanding of their resilience to climate change impacts. This research addresses a core action of the National Peatlands Strategy and will assist Irish authorities to maintain or enhance peatland biodiversity and to ensure the most efficient means of realising the potential of peatlands

¹⁶

https://www.epa.ie/pubs/reports/research/climate/EPA%20159_Ensemble%20of%20regional%20climate%20model%20projections%20for%20Ireland.pdf

¹⁷ <https://www.npws.ie/peatlands-and-turf-cutting/peatlands-council/national-peatlands-strategy>

for carbon capture and storage. Moreover, the deployment of large-scale and land-based climate change mitigation measures is encouraged by the Intergovernmental Panel on Climate Change (IPCC) to reach the long-term temperature goals of the Paris Agreement.

Scope

Innovative research proposals are invited to undertake integrated climate and eco-hydrological research that could:

- assess how potential changes in climate will impact on peatland hydrology, ecological processes and their resilience to climate variability;
- identify the peatland areas in Ireland that are most at risk to projected changes in climate;
- estimate how potential changes in climate will alter peatland carbon dynamics and climate feedbacks by developing integrated hydrological–carbon cycle–climate models;
- assess how peatland rehabilitation and restoration can help decrease carbon emissions and influence climate feedbacks at the local/regional scale;
- develop guidelines describing how ecological management of peatlands must incorporate climate change.

The research should address degraded as well as near-intact peatlands.

It is envisioned that this project will carry out regional-scale numerical modelling simulations using available empirical data. At a national level, a significant body of peatlands-focused research has/is being performed in relation to eco-hydrological and GHG monitoring. It is essential that proposals for this topic include all appropriate existing data generated from national-level research (including, but not limited to, EPA-funded research¹⁸) within the modelling exercises to be performed. It is also expected that the project will examine the applicability of numerical models developed internationally¹⁹ to the Irish peatland environment.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

¹⁸ Most recent EPA-funded peatland research includes:

- *Vulnerability Assessment of Peatlands: Exploration of Impacts and Adaptation Options in Relation to Climate Change* (University College Dublin);
- *A Framework for the Restoration of Degraded Peatlands* (Trinity College Dublin);
- *AUGER: peAtland properties influencing greenhouse Gas Emissions and Removals* (University College Dublin);
- *SmartBog: Smart Observations of Management Impacts on Peatland Function* (Trinity College Dublin);
- *SWAMP: Strategies to Improve Water Quality from Managed Peatlands* (University College Dublin).

¹⁹ International eco-hydrological and climate models include:

- Baird, A.J., Morris, P.J. and Belyea, L.R., 2012. The DigiBog peatland development model 1: rationale, conceptual model, and hydrological basis. *Ecohydrology* 5: 242–255;
- Frohling, S., Roulet, N.T., Tuittila, E., Bubier, J.L., Quillet, A., Talbot, J. and Richard, P.J.H., 2010. A new model of Holocene peatland net primary production, decomposition, water balance, and peat accumulation. *Earth System Dynamics* 1: 1–21;
- Hilbert, D.W., Roulet, N. and Moore T., 2000. Modelling and analysis of peatlands as dynamical systems. *Journal of Ecology* 88: 230–242.

Outputs

Outputs from this research will provide a broad assessment of the resilience and vulnerability of Irish peatlands to the projected increases in the frequency and severity of droughts. It will thereby provide predictions on the ecological consequences of climate change and the resultant impacts on GHG emissions and destabilisation of the peatland carbon store.

Outputs from this research should inform land-use policy, carbon management, future ecosystem management and continued maintenance of biodiversity in Ireland.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Topic Title:	The impact of climate change on the habitats and wildlife of the Rogerstown Estuary and Ballyboughal River in North County Dublin		
Call Topic Reference:	Climate 2019 Call – Project 10		
Project Type:	Desk Study		
Maximum Budget:	€100,000	Maximum Duration:	12 months
Co-funded by: Fingal County Council			

Background

Many coastal habitats in Ireland are in an unfavourable condition. Sea level rise, increasing frequency of storms and extreme weather events are likely to have a further detrimental impact on these habitats. The most recent Article 17 assessment of the status of European Union (EU)-protected habitats and species in Ireland showed that 91% of the 58 habitats assessed have an unfavourable conservation status.²⁰ This includes several coastal habitats such as grey dunes. The EU Biodiversity Strategy²¹ and National Biodiversity Action Plan²² seek to restore these habitats to a favourable condition.

In the Conservation Objectives Supporting Document for the Rogerstown Estuary Special Area of Conservation (SAC), the coastal habitats are classed as *unfavourable-inadequate* and *unfavourable-bad*²³. This is mainly attributed to the future prospects for these habitats because of the potential impact of climate change. However, no detailed analysis has been carried out to establish what the future situation is for these habitats. The need for more detailed assessments of the impact of climate change on designated sites is outlined in Measure 60 of the Prioritised Action Framework (PAF) for Ireland²⁴.

Moreover, within the Rogerstown Estuary, there is significant pressure for housing and infrastructure development and improving coastal defences, which further highlights the need for the current research.

²⁰ <https://www.npws.ie/sites/default/files/publications/pdf/Art17-Vol1-web.pdf>

²¹ http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm

²²

<https://www.npws.ie/sites/default/files/publications/pdf/National%20Biodiversity%20Action%20Plan%20English.pdf>

²³

https://www.npws.ie/sites/default/files/publications/pdf/000208_Rogerstown%20Estuary%20SAC%20Coastal%20Supporting%20Doc_V1.pdf

²⁴ <https://www.npws.ie/news/prioritised-action-framework-launch>

Scope

Innovative research proposals are invited that could:

- determine the impact that sea level rise and extreme weather events (excessive rainfall and drought events) will have on the coastal habitats and associated wildlife of the Rogerstown Estuary SAC and Special Protection Area (SPA) and Ballyboughal River;
- focusing on the Ballyboughal River, assess the likelihood of brackish water travelling further upriver, compared with the existing situation, and identify the potential impacts of this on riverine habitats and species;
- identify and assess the appropriateness and feasibility of a suite of planning tools and practical nature conservation measures that could mitigate the impacts of climate change on estuarine habitats and species.

Some modelling work has already been carried out in the outer Rogerstown Estuary to determine the rate of coastal erosion and the extent of coastal flooding in various sea level change scenarios. This information will be made available by Fingal County Council for this project. In addition, Fingal-East Meath Flood Risk Assessment and Management (FEMFRAMS) flooding data for the Ballyboughal River will also be made available.

The focus of the current research topic is restricted to the Rogerstown Estuary as this will allow a comprehensive and in-depth assessment to be completed. It is expected that the evidence, findings and recommendations generated by this project will also be relevant to other estuarine and coastal habitats and species in Ireland.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this research should identify the impacts of climate change on the habitats and species of the Rogerstown Estuary SAC and SPA and identify and advise on appropriate measures for addressing these impacts in order to guide the management of this and other designated sites into the future.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Topic Title:	Health and wellbeing impacts of climate change		
Call Topic Reference:	Climate 2019 Call – Project 11		
Project Type:	Medium Scale Project		
Maximum Budget:	€350,000	Maximum Duration:	36 months

Background

There is an urgent need to better understand the diverse and wide-ranging impacts of climate change on public health and wellbeing in Ireland and to identify vulnerabilities that currently exist. The health and wellbeing of the population is vulnerable to climate change through direct changes in the frequency and character of extreme weather events, as well as indirectly through, for example, crop failures, changes in the range and activity of infectious diseases and social responses such as displacement of communities as a result of flooding. Public health emergency preparedness, rather than emergency response, is crucial to ensure that we can suitably cope with the intensifying climate-related health risks facing our society. Ireland’s National Adaptation Framework (NAF)²⁵ sets out the national strategy to “reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts”. As part of the NAF, co-ordinated adaptation planning is currently underway across a number of sectors. A national-level assessment of climate change impacts on human health and wellbeing is vital for our adaptation planning to ensure that Ireland can adequately respond to anticipated future health burdens arising from intensified climate conditions.

Scope

Innovation research proposals are invited that could:

- provide an assessment of climate change impacts facing Irish society under projected climate change scenarios, taking into account trends in population growth and urbanisation;
- provide an assessment of the physical and mental health and wellbeing impacts (direct and indirect), in the short and long term, under these different climate scenarios;
- perform a vulnerability mapping to identify current and future climate-related health and wellbeing risks and advise on adaptation requirements and policy responses to improve resilience and preparedness in term of public health.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

²⁵ <https://www.dcaae.gov.ie/documents/National%20Adaptation%20Framework.pdf>

Outputs

It is expected that the outputs of this research will provide evidence and knowledge to assist Ireland's adaptation efforts in reducing the vulnerability of our population to health-related impacts of climate change and increasing our resilience. Outputs should also inform and contribute to future co-ordinated adaptation planning efforts under the NAF.

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Topic Title:	Modelling high-resolution soil moisture maps for Ireland using earth observation and <i>in situ</i> data		
Call Topic Reference:	Climate 2019 Call – Project 12		
Project Type:	Medium Scale Project		
Maximum Budget:	€350,000	Maximum Duration:	36 months

IMPORTANT: As Met Éireann was involved in the drafting of the topic for Project 12 and was involved in the preparation of the Call specifications, Met Éireann cannot participate in any proposals submitted under this particular topic, even if Met Éireann is not in receipt of funding.

Background

Soil moisture is a key factor in understanding climate and water management cycles. The availability of detailed soil moisture maps would support the identification of wetlands, high-intensity grasslands and grasslands appropriate for rewetting. When antecedent soil moisture conditions are known, timing errors in flood forecasting are greatly reduced because shorter lead times and floods can be accurately forecasted and drought management practices can be optimised. Better soil moisture data would also provide a better understanding of carbon fluxes in grasslands, the transport of nutrients and pollutants in catchments, flood management and agronomic practices. Soil moisture mapping supports sustainable agricultural practices (e.g. optimised timing for ploughing/planting/crop harvesting; slurry spreading; tree planting). Currently in Ireland, Met Éireann's soil moisture deficit (SMD) model is used to calculate SMD values at its 25 synoptic stations. The small network of stations and number of *in situ* data result in low-resolution regional data. Global and pan-European soil moisture models are either available or emerging, but these are unlikely to be aligned with the dynamic soils and soil moisture conditions that exist in Ireland (i.e. higher resolution data are required).

Scope

Innovative research proposals are invited that could:

- Provide a robust methodology for measuring soil moisture conditions in Ireland, support the monitoring of soil moisture changes and assess the associated impacts. The methodology should facilitate national land cover mapping, including wetlands, and support the tracking of land use, land-use change and forestry (LULUCF).
- Complete a feasibility study of existing and future national and international methodologies to determine how to implement higher resolution soil moisture maps in Ireland. The data should be suitable for use with existing and future local or national hydrological models (especially for flood forecasting).
- Develop tools and models that will produce high-resolution spatial and temporal soil moisture data for Ireland, to include both wet and dry periods/years.
- Investigate cost-effective options for directly measuring soil moisture.

- Develop an *in situ* soil moisture monitoring network that would support the implementation of remote sensing technology for soil moisture measurement (e.g. emerging sensor technologies, citizen science).
- Provide recommendations for and testing of a pilot network of observations as prerequisites for modelling and mapping developments.

The research should use data products from the Copernicus Programme²⁶ in combination with existing *in situ* data and processes.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs arising from this research will facilitate the identification of wetlands in Ireland and the monitoring of changes within these areas for the purposes of environmental conservation, as well as regulation of peat extraction activities. Outputs will provide an understanding of soil moisture to facilitate improved catchment management (flooding, movement of nutrients and pollutants) and inform how water supplies are managed and how commercial and agricultural sectors will respond to flooding and drought events. Outputs will also allow an assessment of climate impacts to be performed in terms of calculating the national inventory and targeting actions under the National Mitigation Plan.²⁷

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

²⁶ <https://www.copernicus.eu/en>

²⁷ <https://www.dccae.gov.ie/en-ie/climate-action/publications/Pages/National-Mitigation-Plan.aspx>

Theme 3: Climate Solutions, Transition Management and Opportunities

Research priorities are informed by our vision under this theme of “a carbon-neutral Ireland by 2050, with a thriving green economy and society” and the new national policy position on climate change aiming “to achieve transition to a competitive, low-carbon, climate-resilient and environmentally sustainable economy by 2050”. It is planned that research under this call will build on existing Irish climate research and policy analysis, such as the National Adaptation Framework and National Mitigation Plan.

The following research objectives have been identified under this theme:

- to advance socio-economic modelling of cross-sectoral greenhouse gas emissions to 2050;
- to promote cross-disciplinary analysis of effective options for behavioural change in businesses and households and to identify and assess current and future mitigation options including technologies;
- to bring together diverse research outputs to form a coherent picture of analysis for Ireland and, in so doing, to identify green economy and other opportunities from international trends in policy and economics.

Significant progress has already been achieved in building cross-sectoral modelling capacity. This call aims to engage a broad range of academic disciplines in examining the core questions and sectoral challenges behind transition management and identification of climate solutions and opportunities.

IMPORTANT: Please refer carefully to the Technical Description Documents and ensure that you choose the correct Call Topic Reference when creating your application on the EPA’s Grant Management and Application Portal as **mistakes will not be rectified.**

Three topics are included in the EPA Climate 2019 Call under Theme 3: Climate Solutions, Transition Management and Opportunities	
Climate 2019 Call – Project 13	Longitudinal analysis of the National Dialogue on Climate Action activities
Climate 2019 Call – Project 14	Enabling vulnerable communities in transition to a resilient low-carbon economy
Climate 2019 Call – Project 15	Children and youth in climate action

Call Topic Title:	Longitudinal analysis of the National Dialogue on Climate Action activities		
Call Topic Reference:	Climate 2019 Call – Project 13		
Project Type:	Desk Study		
Maximum Budget:	€100,000	Maximum Duration:	12 months

Background

The National Dialogue on Climate Action (NDCA)²⁸ is an initiative set up to:

- Create awareness, engagement and motivation to act (locally, regionally and nationally) in relation to the challenges presented by climate change;
- Create structures and information flows to facilitate people gathering to discuss, deliberate and maximise consensus on appropriate responses to these challenges, and to enable and empower appropriate action;
- Establish, on a long-term basis, appropriate networks for people to meet periodically to consider evidence-based inputs on the economic, social, behavioural, environmental and public aspects of climate and energy policy;
- Provide regular input, through the NDCA, into the prioritisation and implementation of climate and energy policy which can be reported and monitored at local/regional/national levels.

To support the effective delivery of the above tasks into the future, a longitudinal analysis of the outcomes of the NDCA would be beneficial. This analysis would focus specifically on the activities or approaches to public engagement that create lasting positive attitudes and behaviour change. This evaluation would feed into process improvements and have a direct impact on the success of the initiative.

The research would also develop indicators to quantify change in behaviours and can form analysis of progress towards any national targets developed in this area under the proposed whole-of-government Climate Action Plan or the National Energy and Climate Plan (NECP)²⁹.

This research should provide added value to the NDCA process, specifically influencing policy direction through identifying the approaches that provide the most long-term success. It is expected that the NDCA will be in existence at least 18 months by the time the project gets underway.

²⁸ <https://www.dccae.gov.ie/en-ie/climate-action/topics/national-dialogue-on-climate-action/Pages/default.aspx>

²⁹ <https://www.dccae.gov.ie/en-ie/energy/consultations/Pages/Ireland%E2%80%99s-Draft-National-Energy-and-Climate-Plan-2021-2030.aspx>

Scope

Innovative research proposals are invited to undertake the following research for the NDCA:

- Analysis of existing surveys of public attitudes to climate change (RED C, Eurobarometer, etc.) and further investigation through focus group activities.
- Longitudinal analysis of the impact on participants and stakeholders of activities and approaches within the NDCA process. This would have a specific focus on awareness raising, motivation to act on climate change, and changes in behaviour.
- The development of tools/indicators to measure the approaches, methods or activities that have the most lasting impact or give impetus to further actions.
- An assessment of what could be realistically achieved, using a review of similar international processes to inform the analysis.
- Evaluate comparable models in other countries that address climate change or related topics to inform the evolution and development of the NDCA in Ireland.
- Explore how the NDCA could integrate more effectively with other community initiatives in Ireland such as the EPA Local Authority Prevention Network³⁰ and wider Local Authority initiatives.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

³⁰ <https://localprevention.ie/>

Call Topic Title:	Enabling vulnerable communities in transition to a resilient low-carbon economy		
Call Topic Reference:	Climate 2019 Call – Project 14		
Project Type:	Medium Scale Project		
Maximum Budget:	€250,000	Maximum Duration:	36 months

Background

Achieving the profound transitions required to achieve a low-carbon, climate-resilient economy will require a high degree of public acceptance and recognition of the challenges that vulnerable communities will face. A number of traditional, socially important activities and industries will undergo major change and decline. Internationally, the coal and oil production sectors will face this challenge. In Ireland, peat extraction and natural gas extraction will face the same challenge.

As peat extraction activities across Ireland decline, there is a significant risk of the type of regional-scale marginalisation and economic and social decline observed in the “Rust Belt” in the USA and in coal and steel regions of the UK.

There is a need to assess national and international case studies in which transition has been managed successfully in response to major disruption of local and regional activities. Alternative economic opportunities will need to be developed that themselves contribute to the long-term transition goals.

Research under this topic will expand the national discussion regarding a *just transition* (to a low-carbon, climate-resilient economy), focusing on the needs of vulnerable communities. It is important that these communities are enabled in this transition, not least to provide wider public assurance that the longer term objective is worthwhile and can be achieved to the benefit of all.

Research under this topic could support the development of policy discussion papers on rural and community development, the environment and land use.

Scope

Innovative research proposals are invited to collate and review case studies (national and international) of successful transitions at community and regional scales and recommend ways to bring people on board with climate action.

The research could explore the costs and benefits at rural and national levels. The research could also explore attitudes and behavioural barriers to implementation of transitions required to achieve a low-carbon, climate-resilient economy.

The inclusion of an industry partner would benefit proposals under this topic.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Call Topic Title:	Children and youth in climate action		
Call Topic Reference:	Climate 2019 Call – Project 15		
Project Type:	Medium Scale Project		
Maximum Budget:	€200,000	Maximum Duration:	36 months

Background

The role of children and youth as a catalyst for climate action and societal transformation at home, school and the wider community level is recognised but is not systematically and coherently addressed in Ireland. New and emerging approaches from behavioural and social sciences to fully engage, motivate and inspire children need to be fully interrogated and integrated into policy development. Research on this topic is necessary to bridge the gap.

Research should explore approaches to create a climate-literate youth who not only understand the complexity of the issues involved but also are empowered to inspire, develop and act on workable solutions. It should provide a template for building support for climate action at the individual, family, community, national and international level. The research should also identify ways for the National Dialogue on Climate Action to implement and enable engagement with children and youth.

Scope

Innovative research proposals are invited to develop new and engaging approaches to connect with children and young people on climate action. This should include those who are currently motivated to act and those who are less engaged with the issue. The research should draw from social, political, economic and cultural approaches to tackling climate change. The research should consider:

- a critical review of international best practice on youth engagement in climate change and actions;
- evaluate in Ireland and internationally where children and youth have organised to address social issues, e.g. civil rights, and bring forward learnings from previous youth action to gain an understanding on how to maintain momentum and how to engage more effectively with the youth sector;
- the role of values and world views in determining how youth understand climate change;
- the efficacy of “information-based” interventions;
- the psychological distance of climate change and message framing;
- the role of trusted messengers/influencers;
- the role and uses of social media;
- the rise in civic engagement and implications.

The research could make use of new methods and technologies and include innovative approaches to engaging children with the science of climate change and solutions-based learning. The research should consider how children could be trained and supported as advocates (champions) for climate action at the level of the school and within peer groups.

Where appropriate, a trans-disciplinary and multi-institutional approach should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Theme 4: Air Science

The aim of research under this theme is to provide the analysis necessary for the achievement of clean air and co-benefits for climate, health, environment and society, to inform pathways for the achievement of the highest air quality standards in Ireland, and to advance integrated assessments of air pollution and wider environmental issues.

In particular, the objectives of this theme are to:

- advance analyses of emissions, transport and removal of air pollutants and increase understanding and awareness of the impacts of air pollutants;
- improve national inventories and projections of emissions over a wide range of pollutants including heavy metals and persistent organic pollutants;
- identify and promote emissions abatement options that can enable Ireland to achieve the highest air quality standards.

IMPORTANT: Please refer carefully to the Technical Description Documents and ensure that you choose the correct Call Topic Reference when creating your application on the EPA's Grant Management and Application Portal as **mistakes will not be rectified.**

Five topics are included in the EPA Climate 2019 Call under Theme 4: Air Science	
Climate 2019 Call – Project 16	Impact of Irish agricultural activities on rural air quality
Climate 2019 Call – Project 17	Impact of real-world driving emissions on air quality in Dublin
Climate 2019 Call – Project 18	Reviewing the research infrastructure for monitoring the atmosphere in Ireland
Climate 2019 Call – Project 19	An assessment of greenhouse gas and air pollution emissions from uncontrolled burning in upland areas using satellite imagery and remote sensing
Climate 2019 Call – Project 20	Source apportionment of air pollution in the Dublin Port area

Call Topic Title:	Impact of Irish agricultural activities on rural air quality		
Call Topic Reference:	Climate 2019 Call – Project 16		
Project Type:	Medium Scale Project		
Maximum Budget:	€300,000	Maximum Duration:	36 months

Background

The potential impact, if any, of the recent increase in agricultural activities in Ireland on rural air quality, particularly in relation to the levels of ammonia and particulate matter (PM), is unknown. The role of ammonia as a significant precursor for secondary PM has been highlighted in international literature in recent years. There are, however, limited data for the Irish context, where there are significant ammonia emissions from the agricultural sector.

Research in this area will provide a greater understanding of the Irish context in terms of agricultural activity and air quality.

Research under this topic is required to improve the knowledge base and capacity to support the implementation of the National Clean Air Strategy³¹, the Clean Air for Europe (CAFE) Directive (2008/50/EC) and the National Emissions Ceiling Directive (2016/2284/EU) and the roll-out of the National Ambient Air Quality Monitoring Programme 2017–2022³².

Scope

Innovative research proposals are invited to undertake an assessment of the impact of the recent increase in agricultural activities on air quality in Ireland. The research could include measurements of the levels of ammonia and PM, estimate the levels of secondary particulates arising from agricultural sources and provide a spatially resolved estimate of the levels of ammonia and secondary PM from agricultural sources. The research could also provide an assessment of the impact of agriculture on air quality.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

³¹ <https://www.dccae.gov.ie/en-ie/environment/topics/air-quality/national-clean-air-strategy/Pages/default.aspx>

³² <http://www.epa.ie/pubs/reports/air/quality/National-Ambient-Air-Quality-Monitoring-Programme-2017-2022.pdf>

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Call Topic Title:	Impact of real-world driving emissions on air quality in Dublin		
Call Topic Reference:	Climate 2019 Call – Project 17		
Project Type:	Medium Scale Project		
Maximum Budget:	€350,000	Maximum Duration:	24 months
Co-funded by: Department of Transport, Tourism and Sport			

Background

Although the composition of the Irish traffic fleet is well known, limited research to date has been carried out on the associated real-world emissions to air from traffic. Recent evidence from the National Ambient Air Quality Monitoring Programme 2017–2022 suggests that levels of NO₂ and particulate matter from traffic emissions in Dublin are significant. Although there is a considerable amount of information on Dublin’s traffic levels and flow rates, less is known in relation to vehicle emissions. Often, emissions are quantified using modelling or published literature findings, which quickly become outdated. One of the aims of this project is to quantify real-world emissions using actual measurements, which can then be compared with the current inventory information to allow for further improvements.

The outcomes of this research project will include providing a better understanding of road transport emissions in Dublin; adding to the information base to inform policy development as part of the National Clean Air Strategy; if required, informing action plans to address any potential air quality exceedances under the Clean Air for Europe (CAFE) Directive; and informing policy related to transport and the environment. In particular, the research will provide a greater understanding of the Irish context of real-world driving emissions and air quality.

The research will include, but not be limited to, measuring real-world emissions from vehicles at representative locations, detailing the breakdown of emissions from the vehicle fleet mix at different points of the day, and assessing the impacts of variances from expected vehicle performance as a result of factors such as vehicle modification and inadequate maintenance. In this regard, it will be important for the research to consider the use or misuse of diesel particulate filters and NO_x abatement systems. The identification of vehicles to Euro emissions standards would be essential for this research.

Proposals under this topic must demonstrate that the data generated will be statistically valid over a number of vehicle categories, including cars, vans, buses, motorbikes and trucks. In this regard, proposals must demonstrate that the sample size, sampling locations and monitoring tools used are adequate.

Scope

Innovative research proposals are invited to investigate the impact of real-world driving emissions on air quality in Dublin, taking account of the following criteria:

- measurement of real-world traffic emissions, considering the parameters NO, NO₂, particulate matter and ammonia in Dublin;
- comparison of real-world fleet composition against current literature values;
- assessment of the variation in speed of traffic flow and hourly traffic volumes;
- assessment of the use of abatement technology within the fleet.

The research outputs will identify the Euro emissions standards of the vehicles assessed in the research, identify the impact of various vehicle categories on ambient air quality and compare the contribution of various vehicles to transport emissions identified by this research with that included in the national inventory. The research could also provide recommendations on measures and options to reduce actual emissions.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Call Topic Title:	Reviewing the research infrastructure for monitoring the atmosphere in Ireland		
Call Topic Reference:	Climate 2019 Call – Project 18		
Project Type:	Desk Study		
Maximum Budget:	€75,000	Maximum Duration:	9 months

Background

The EPA has a leading role in atmospheric protection in Ireland. The research report, *Protecting the North Atlantic Atmosphere*,³³ published in 2018, provides a review of observatory-based atmospheric research in the North Atlantic region and how it relates to current science and policy questions and issues. It highlights that better integration of observation-based research with emerging weather, climate and environmental modelling/observational systems of Europe and North America can enhance understanding of key atmospheric protection issues and responses to emissions sources that impact on Ireland’s atmosphere. It identified an emerging framework for integration that would include:

- the Copernicus Atmosphere Monitoring Service (CAMS),³⁴ aimed at emerging research-based observational infrastructures in Europe;
- the In-service Aircraft for a Global Observing System (IAGOS),³⁵ aimed at atmospheric composition measurements from commercial aircraft;
- the Aerosols, Clouds, and Trace Gases Research Infrastructure Network (ACTRIS),³⁶ aimed at integrating European ground-based stations equipped with advanced atmospheric probing instrumentation for aerosols, clouds and short-lived gas-phase species;
- the Integrated Carbon Observation System (ICOS),³⁷ aimed at the measurement of greenhouse gases in Europe, to support the Global Atmosphere Watch (GAW) network of the World Meteorological Organization (WMO).³⁸

In combination, these advanced systems provide data to inform air pollution analysis, stratospheric ozone depletion, the spread of persistent organic pollutants and mercury, and climate change.

Ireland’s location in the North Atlantic region means that it is exposed to the changes that are occurring where observation and analysis systems are limited or fragmented. The efforts of the past should move to a more focused programme of research, combining observations, modelling, process studies and communications with users and the general public.

³³ http://www.epa.ie/pubs/reports/research/climate/Research_Report_247.pdf

³⁴ <https://atmosphere.copernicus.eu/>

³⁵ <https://www.iagos.org/>

³⁶ <https://www.actris.eu/>

³⁷ <https://www.icos-ri.eu/>

³⁸ http://www.wmo.int/pages/prog/arep/gaw/gaw_home_en.html

The GAW report³⁹ related to measurement–model fusion for global total atmospheric deposition also highlighted that:

- there is a need to extend the GAW measurement network into regions that are presently poorly covered (e.g. intensive measurements at super sites);
- organic nitrogen, ammonia, NO_x, iron (over the ocean) and dust are deemed the highest priority globally for measurement in new and/or existing networks;
- publicly available, integrated, high-quality global data sets are critical to the success of the measurement–model fusion approach to improved deposition;
- satellite measurements and their products are evolving rapidly and should be included in future measurement–model fusion activities.

Scope

Innovative research proposals are invited to undertake a review of the research infrastructure in Ireland for monitoring the atmosphere and its contribution to national and international monitoring and analysis networks. The review could (1) consider how Ireland could contribute to an integrated North Atlantic atmospheric chemistry observing and modelling system for the climate and environment and (2) assess the national infrastructures in the context of the national and regional challenges these are addressing, including a gap analysis of nationally funded activities.

Options and a recommendation for an integrated observation and modelling system for Ireland, which integrates surface-based *in situ* and remote sensing and aircraft and ship observations, could be provided (see GAW report no. 159).⁴⁰ The review could identify what parts of the existing/recommended infrastructure have a national, regional or global interest.

The review could also include an assessment of how the research community in Ireland engages with the public on this matter, with a recommended strategy for future communication.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

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³⁹ http://www.wmo.int/pages/prog/arep/gaw/documents/FINAL_GAW_234_23_May.pdf

⁴⁰ http://library.wmo.int/pmb_ged/wmo-td_1235.pdf

Call Topic Title:	An assessment of greenhouse gas and air pollution emissions from uncontrolled burning in upland areas using satellite imagery and remote sensing		
Call Topic Reference:	Climate 2019 Call – Project 19		
Project Type:	Medium Scale Project		
Maximum Budget:	€250,000	Maximum Duration:	36 months

Background

Between January and May 2017 there were over 700 detections of fire events across Ireland using available NASA satellite data (Department of Agriculture, Food and the Marine Forest Service estimates)⁴¹. Many of these were uncontrolled fires in upland areas that caused damage to biodiversity, property, forestry stocks (e.g. Cloosh Valley, Galway, May 2017) and human health, through air pollution impacts. In addition, fires in peat/bog areas can also result in carbon sinks becoming carbon sources, which has impacts for global warming and national climate emission reduction obligations, as well as greenhouse gas (GHG) reporting and inventory compilation.

A more accurate method for the estimation of emissions from upland burning events is required. Such a method could help to improve national GHG and air quality inventory estimates and provide for better forecasting models. The impacts on grassland areas are particularly important as such areas will be accountable under the Kyoto Protocol 2020–2030 period.

Services such as the Copernicus programme⁴² can be used to estimate areas of land burned and proposals under this topic should aim to use such climate services.

The Clean Air Dialogue (March 2017)⁴³ between Ireland and the European Commission identified the impact of upland burning on air quality (and options to address this issue) as a key matter for Ireland. There are key data gaps with regard to the prevalence, extent, local authority notification and times of upland burning in Ireland.

Research under this topic is required to improve the knowledge base and capacity to support the implementation of the National Clean Air Strategy, the roll-out of the National Ambient Air Quality Monitoring Programme 2017–2022 and the National Mitigation Plan and the National Policy Position on climate change⁴⁴.

⁴¹

<https://www.agriculture.gov.ie/forests-service/forests-service-general-information/forest-statistics-and-mapping/annual-forest-sector-statistics/>

⁴² <https://www.copernicus.eu/en>

⁴³ <https://www.dccae.gov.ie/documents/CAD%20conclusions%20%20Final.pdf>

⁴⁴ <https://www.dccae.gov.ie/en-ie/climate-action/publications/Documents/5/National%20Climate%20Policy%20Position.pdf>

Scope

Innovative research proposals are invited to undertake an assessment of GHG and air pollution emissions from uncontrolled burning in upland areas using satellite imagery and remote sensing. The research could identify the following:

- loss of GHGs⁴⁵ from uncontrolled biomass burning and associated losses from soils;
- particulate matter and other air pollutant emissions, including short-lived climate pollutants, impacting on the atmosphere;
- the wider environmental impacts of upland burning.

The research could also develop recommendations on addressing the issue of upland burning to reduce its environmental impact.

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

⁴⁵ CO₂, methane and nitrous oxide.

Call Topic Title:	Source apportionment of air pollution in the Dublin Port area		
Call Topic Reference:	Climate 2019 Call – Project 20		
Project Type:	Large Scale Project		
Maximum Budget:	€500,000	Maximum Duration:	36 months

Background

Traffic statistics from Dublin Port indicate that sea freight traffic and cruise ship numbers visiting Dublin are increasing. Evidence from an earlier air quality study in Cork Harbour⁴⁶ showed that shipping and port activities can be a significant source of local air pollution to residential populations. The absence of shoreside electrical power supplies for cruise and other ships in Dublin means that electricity must be generated by the ships' engines using fuel oil containing sulphur while at berth. Anticipated increases in the number of large cruise ships and sea freight traffic could result in impacts on air quality in Dublin.

Much of the recent air quality research conducted in Ireland has looked at contributions from solid fuel and there is a gap in knowledge in terms of the contribution from different forms of traffic, including maritime and port traffic. Research in this area would inform the implementation of the MARPOL Convention (International Convention for the Prevention of Pollution from Ships)⁴⁷ and EU legislation and support the implementation of the National Clean Air Strategy, the roll-out of the National Ambient Air Quality Monitoring Programme 2017–2022 and the implementation of the National Mitigation Plan.

Although many countries throughout Europe have a reasonable estimate of their maritime-related emissions through real-world monitoring, this is lacking in Ireland. Officially reported emissions do not give an accurate reflection of real-world emissions. This research topic will allow Ireland (an island heavily reliant on port use) to quantify the real-world impact of ships on air quality.

Research under this topic could include a breakdown of the shipping and non-shipping activities that occur in Dublin Port, including temporal and seasonal profiles. The length of stay for cruise ships could also be assessed and the fuel types used in port and on approach to port could be examined. Accordingly, the relevant stakeholders will need to be engaged.

Scope

Innovative research proposals are invited to undertake a source apportionment of air pollution in the Dublin Port area, attributing pollution loads to different sources, for example road traffic, marine traffic, residential solid fuel use, construction, industrial sources. Proposals could demonstrate the use of state-of-the-art techniques. The research could highlight mitigation options to reduce levels of pollution in line with international best practice.

The information provided on the breakdown of shipping and non-shipping activities could be in a format that could be used in future iterations of an ambient model output for Dublin being developed by the EPA. Notwithstanding this, the scope of this research does not include the development of an air quality forecasting tool.

⁴⁶ http://www.epa.ie/researchandeducation/research/researchpublications/strivereports/STRIVE_71_web.pdf

⁴⁷ [http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-\(MARPOL\).aspx](http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx)

Where appropriate, a **trans-disciplinary** and **multi-institutional approach** should be considered. Proposals should demonstrate added value for money, as well as how the outputs from the proposed research will inform policy.

Outputs

Outputs from this project must build on existing research and other information. Proposals must comply with the EPA's policy on Open Access and Open Data.

Final outputs must include the standard Expected Outputs of EPA-funded projects listed in the 2019 Guide for Grantees.

Project Structure and Funding

Proposals that exceed the maximum duration and/or request funding in excess of the maximum specified for this call topic will be considered to be invalid and will not proceed to the evaluation stage under any circumstances.

Expected Outputs

Please consult the **2019 Guide for Applicants**, **2019 Guide for Grantees** and the **Terms and Conditions for Support of Grant Awards** for the full list of expected outputs and interim/final reporting requirements. Please also refer to the [EPA Guidelines for research project communication plans](#) when preparing your project communication Work Package.

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 our 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.

It is strongly recommended that applicants familiarise themselves with and utilise the tools provided in the EPA Bridging the Gap Resource Kit:

- [EPA Research Report 131](#): BRIDGE: Tools for Science–Policy Communication;
- [EPA Research Report 132](#): Good Practice Guide for Science–Policy Communication; and
- [EPA Research Report 133](#): A Knowledge Transfer Guide for Researchers.

Indicative Time Frame

30 April 2019	Call opening
19 June 2019 at 17:00 (Irish Standard Time)	Deadline for queries relating to the technical contents of this call
28 June 2019 at 17:00 (Irish Standard Time)	Deadline for submission of applications by applicants
10 July 2019 at 17:00 (Irish Standard Time)	Organisation approval deadline for authorisation by Research Offices
July/September 2019	Evaluation process
October/November 2019	Negotiation ⁴⁸
November/December 2019	Grant award of successful projects
By 31 March 2020	Start of successful projects

⁴⁸ 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: www.epa.ie/researchandeducation/research

The following additional documents are available from the EPA website:

<http://www.epa.ie/pubs/reports/research/opencalls/currentcalldocuments/>

- 2019 EPA Research Guide for Applicants;
- 2019 EPA Research Guide for Grantees;
- 2019 EPA Research Terms and Conditions for Support of Grant Awards;
- Guidelines to Open Access Research Publications and Data in Horizon 2020;
- Open Access to Publications and Data in Horizon 2020: Frequently Asked Questions (FAQs) – Fact Sheet;
- EPA Guidelines for Research Project Communication Plans;
- Communications Plan Template;
- Work Package Template.

For updates on the 2019 EPA Research Calls:

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.