



Rialtas na hÉireann
Government of Ireland



Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

EPA Research Programme 2014–2020

Water 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

Water Research Call 2019

This document provides the Technical Description for the Environmental Protection Agency (EPA) Water 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).

Contents

Introduction	1
EPA Water Research	1
Funding Structure	2
Co-funding and Partnerships	2
Application Process	3
Making an Application	3
Value for Money	3
Open Access and Open Data	3
Deadlines.....	3
List of Topics.....	4
Call Content.....	5
Theme 1: Safe Water	5
Theme 2: Ecosystem Services and Sustainability.....	6
Theme 3: Innovative Water Technologies	7
Theme 4: Understanding, Managing and Conserving our Water Resources.....	8
Theme 5: Emerging and Cross-cutting Issues	15
Expected Outputs.....	19
Indicative Time Frame.....	19
Further Information	20

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 Water Resources

Ireland's State of the Environment report (SoE) 2016¹ states that, overall, the assessments of water quality and quantity show significant challenges ahead to bring all waters to a satisfactory level and to protect waters that are already in a good condition. Of concern is that preliminary results from the preparation of the River Basin Management Plan indicate that there has been no overall improvement in water quality over the first river basin planning cycle. Elevated nutrient concentrations continue to be the most widespread water quality problem in Ireland, arising primarily from human activities such as agriculture and wastewater discharges to water from human settlements, including towns, villages and rural houses (SoE, 2016).

EPA Water Research

The EPA Research Programme has a strong focus on policy and is driven by national regulations and European directives. A sustained Water Research Programme is an essential component of Ireland's role in protecting its water resources and meeting its requirements under water-related European Union (EU) directives, the United Nation's Sustainable Development Goals and national policies.

The EPA Research Water Pillar deals with groundwater, surface water, transitional and coastal water, wastewater, drinking, bathing and shellfish waters. The EPA Research Water Pillar is structured into five thematic areas of research, as follows:

Theme 1: Safe Water;

Theme 2: Ecosystem Services and Sustainability;

Theme 3: Innovative Water Technologies;

Theme 4: Understanding, Managing and Conserving our Water Resources;

Theme 5: Emerging and Cross-cutting Issues.

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

Funding Structure

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

Proposals can be Medium Scale Projects or Capability Development 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

Capability Development Projects will typically last from 48 to 60 months, with an indicative cost above €500,000

Co-funding and Partnerships

Co-funding will be provided by the following organisation:



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 on 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.

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.

Value for Money

All research proposals **must** build on findings and recommendations from past and current research² 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.

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.**

² Including EPA-funded, other Irish and EU and international research projects and initiatives/activities.

List of Topics

The EPA invites research proposals under the topics listed in Table 1 for the Water 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 Water 2019 Call

Call Topic Reference	Thematic Areas and Call Topic Titles	Max Budget (€) Per Project	Co-funded By
Theme 1: Safe Water			
No project	n/a	n/a	n/a
Theme 2: Ecosystem Services and Sustainability			
No project	n/a	n/a	n/a
Theme 3: Innovative Water Technologies			
No project	n/a	n/a	n/a
Theme 4: Understanding, Managing and Conserving our Water Resources			
Water 2019 Call – Project 1	Characterisation of oligotrophic lakes of habitat types 3110 and 3160, as defined by the Habitats Directive and the Water Framework Directive (WFD)	€350,000	–
Water 2019 Call – Project 2	Investigation and development tools to monitor the impact of flow on ecology in Irish rivers	€350,000	–
Water 2019 Call – Project 3	Alternatives to the percolation test for evaluating soil suitability for domestic wastewater treatment system discharges, especially for evaluating low permeability soils	€100,000	–
Theme 5: Emerging and Cross-cutting Issues			
Water 2019 Call – Project 4 (*)	Water futures: effectiveness of mitigation measures in a changing environment – investigating the effects of future population growth, land use and climate change scenarios on water quality in Ireland	€1.5 million	DAFM

Call Content

Theme 1: Safe Water

Water quality and human health may be threatened by emerging pollutants, priority substances, endocrine disruptors and emerging risks, such as pathogens (including antibiotic-resistant bacteria and viruses), cyanotoxins and nanomaterials. Key knowledge gaps remain concerning their environmental behaviour in surface water, treated waters and groundwater, and their impact on human health through the irrigation of crops, the water supply and distribution and storage in rural or urban environments. In addition, water quality and supply can be threatened by climate change, natural hazards and extreme events such as droughts and floods.

This thematic area will:

- Provide a better understanding of the fate and behaviour of new or poorly understood contaminants and their impacts on water quality, with an emphasis on drinking and bathing waters and on ecosystems and human health.
- Improve our resilience to climate change, extreme events and natural hazards. It will support the implementation and refinement of the relevant policies and develop new tools and best practices in relation to water infrastructure and the prediction and management of natural hazards to ensure that economic investments in this area will result in the ongoing availability and delivery of high-quality water.
- Develop a better understanding of the socio-economic aspects, governance and behavioural changes associated with this area, including the impact of water charges on water consumption, as well as behavioural changes.

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**.

There are no topics included in the EPA Water 2019 Call under Theme 1: Safe Water

Theme 2: Ecosystem Services and Sustainability

Water demand and availability pressures, amplified by climate change (including the apparent changing frequency and severity of extreme events such as floods and droughts), have increased the stress on water bodies and associated ecosystems. The environment does not exist in isolation; it both affects and is affected by many aspects of our lives.

Environmental resources and ecosystem services are direct inputs into the economy. The concept of ecosystem services is based on the assumption that there is a connection between good ecological status and the provision of several benefits, such as water supply, food supply, biodiversity, landscape value and others. It is already used by some managers and decision makers as a powerful tool for building and implementing programmes of measures. Approaches using ecosystem services could therefore support the Water Framework Directive (WFD) objectives.

This thematic area will:

- further our understanding of the context, functions and processes of ecosystems and safeguard natural resources for future generations by identifying measures to help the adaptation and reaction to current and future pressures on the aquatic environment;
- develop new tools in the field of ecological engineering and early warning systems;
- develop a better understanding of the socio-economic aspects, governance and behavioural changes associated with this area, including issues of preservation versus restoration costs and the demonstration of the economic value and social benefits of aquatic ecosystem services.

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.**

There are no topics included in the EPA Water 2019 Call under Theme 2: Ecosystem Services and Sustainability

Theme 3: Innovative Water Technologies

Innovative technologies are required by the water industry to create products and services. This thematic area will contribute to improving the quantity and quality of water bodies, such that our resources will be used in a more efficient way and a better understanding will be gained of the socio-economic aspects, governance and behavioural changes associated with this area. The objectives of this research area are aligned with the aims of the "Roadmap to a Resource Efficient Europe"³.

This thematic area will:

- develop novel treatment and distribution options and improve water systems efficiency, focusing on aspects such as new materials and processes, new management tools, information and communication technology, energy efficiency and small-scale water storage;
- develop problem-solving research leading to the development of market-orientated solutions such as the development of sensor networks and real-time information systems in the water cycle and improved water treatment technologies;
- improve the quantity and quality of water bodies and develop ways to use these resources more efficiently, and gain a better understanding of the socio-economic aspects, governance and behavioural changes associated within this area, including social acceptance of reused waste and assessing costs against beneficial outcomes to avoid disproportionate costs.

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**.

There are no topics included in the EPA Water 2019 Call under Theme 3: Innovative Water Technologies

³ <https://www.eea.europa.eu/policy-documents/com-2011-571-roadmap-to>

Theme 4: Understanding, Managing and Conserving our Water Resources

This thematic area will contribute to the better use and protection of water resources by gaining a better understanding of: (i) the potential impacts of human activities such as abstractions, discharges and land use on groundwater, rivers, lakes, estuaries and coastal waters; (ii) the views of local communities and ways to encourage behavioural change; and (iii) the means of minimising these impacts. Attention will be given to pressures on water arising from agricultural activities. Regulatory measures are essential tools to ensure compliance with environmental standards of water quality and quantity. Understanding the mechanisms leading to improved water management will lead to better policy design, implementation and adaptation.

This thematic area will:

- further an integrated approach to water management by improving our understanding of the impact of pressures on water quality and quantity, looking at adaptive water management approaches, as well as socio-economic issues;
- promote the concept of water foot-printing while increasing water resource efficiency and reducing water pollution;
- strengthen socio-economic approaches to conserve our water resources, covering governance issues such as public participation and decision support systems (DSS), as critical tools to integrate scientific knowledge into decision making and facilitate buy-in/policy acceptance from the public;
- deal with socio-economic considerations and practical measures for mitigating the impacts of pressures.

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 Water 2019 Call under Theme 4: Understanding, Managing and Conserving our Water Resources	
Water 2019 Call – Project 1	Characterisation of oligotrophic lakes of habitat types 3110 and 3160, as defined by the Habitats Directive and the Water Framework Directive (WFD)
Water 2019 Call – Project 2	Investigation and development tools to monitor the impact of flow on ecology in Irish rivers
Water 2019 Call – Project 3	Alternatives to the percolation test for evaluating soil suitability for domestic wastewater treatment system discharges, especially for evaluating low permeability soils

Topic Title:	Characterisation of oligotrophic lakes of habitat types 3110 and 3160, as defined by the Habitats Directive and the Water Framework Directive (WFD)		
Call Topic Reference:	Water 2019 Call – Project 1		
Project Type:	Medium Scale Project		
Maximum Budget:	€ 350,000	Maximum Duration:	36 months

Background

Oligotrophic lakes of habitat types 3110 and 3160 are identified in the second cycle of the River Basin Management Plan⁴ (RBMP) as protected habitats for which current water quality standards may not provide sufficient protection. The RBMP specifies oligotrophic lakes as being sensitive ecosystems and identifies them as a priority for further investigation and follow-up actions, including the development of supporting conditions for future management measures. Therefore, proposals submitted under this call must respond to the requirements set out in the RBMP.

Scope

Currently, there is a gap in the knowledge and understanding of the biological, physical and chemical characteristics of lakes within habitat types 3110 and 3160, including their natural ecological variation, where they occur and the pressures and/or threats that these lake habitats are under. Innovative proposals should address the urgent need for a clear assessment method that addresses the requirements of both the EU Habitats Directive⁵ and EU Water Framework Directive⁶ (WFD). In addition, proposals should address the environmental conditions that need to be in place to maintain and/or restore these habitats to a favourable conservation status. Proposals should describe the monitoring and assessment methods required to ensure compliance with both Directives. Proposals should also consider the pressures and impacts on these lakes and make recommendations for the appropriate measures required to manage them to ensure compliance with the RBMP and other relevant EU Directives.

Outputs

Final outputs could include recommendations to inform the development of catchment management plans (including measures, a monitoring and assessment framework, etc.) to address the environmental conditions that are required for the protection of these sensitive habitats.

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.

⁴ https://www.housing.gov.ie/sites/default/files/publications/files/rbmp_full_reportweb.pdf

⁵ <https://www.npws.ie/legislation/irish-law/eu-regulations>

⁶ <https://www.housing.gov.ie/water/water-quality/water-framework-directive/water-framework-directive>

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:	Investigation and development tools to monitor the impact of flow on ecology in Irish rivers		
Call Topic Reference:	Water 2019 Call – Project 2		
Project Type:	Medium Scale Project		
Maximum Budget:	€ 350,000	Maximum Duration:	36 months

Background

In summer 2018, Ireland experienced its worst drought on record since the 1970s. Little or no rainfall for a prolonged period and soaring temperatures put extreme pressure on water resources. In the future, more regular extreme weather events like this are expected. Low flows and drought conditions put the ecology in rivers under extreme stress by reducing dissolved oxygen levels and habitat availability, in addition to exacerbating the impacts of nutrient concentrations and siltation. Currently, the relationship between ecology and flow is not fully understood. There is a critical need for a better understanding of the ecology–flow relationships in Irish rivers and lakes.

Research under this research topic area should advance the current knowledge and understanding of the interactions between flow and ecology in Irish rivers and lakes. For example, the UK Environment Agency has developed the LIFE (Lotic-invertebrate Index for flow Evaluation) score to assess the potential impact of flow-related stresses on lotic macroinvertebrate communities. It seeks to link the macroinvertebrate community of a site to the prevailing flow regime. Proposal recommendations should seek to inform future monitoring programmes including drought monitoring/climate mitigation, hydro-morphological monitoring for the Water Framework Directive(WFD), abstraction license applications and the Blue Dot programme.

Scope

Innovative research proposals are invited to address the knowledge gaps in relation to investigating and developing diagnostic tools that could be used in association with other tools (i.e. that look at nutrient enrichment, sedimentation, chemical pollution) to provide a better understanding of the causes of deterioration in our rivers and lakes. These tools could be used to quantify the biological response to degrees of flow alteration from naturalised flows, including both decreases and increases in flow.

However, rather than looking at a flow index in isolation, a more holistic approach could be taken to include investigations of flow impacts on macrophytes, fish and macroinvertebrates. Flow tolerances for each group should be investigated so that the results can be used to inform future monitoring programmes. A large body of research has already been completed for several taxa; however, there is a need to collate the information and examine its relevance in an Irish context.

Research proposals could consider:

- testing existing diagnostic tools to determine their suitability in an Irish context;
- investigating the relationships between macroinvertebrates and flow to derive a flow index;
- the determination of optimal flow conditions for the protection of sensitive fish species, undertaken in partnership with Inland Fisheries Ireland (IFI);
- investigating the relationships between macrophytes and flow rates.

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 the research will assist Ireland to meet its monitoring and reporting requirements under the Water Framework Directive and provide the necessary tool(s) to generate required information/data on ecology-flow relationships.

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:	Alternatives to the percolation test for evaluating soil suitability for domestic wastewater treatment system discharges, especially for evaluating low permeability soils		
Call Topic Reference:	Water 2019 Call – Project 3		
Project Type:	Desk Study		
Maximum Budget:	€100,000	Maximum Duration:	12 months

Background

The EPA is responsible for the Code of Practice for Wastewater Treatment and Disposal Systems Serving Single Houses⁷, published in 2009 under Section 79 of the EPA Act. The first major revision to the Code was issued for public consultation in December 2018 and closed at the end of March 2019. The main reason for the revision was to incorporate key findings from EPA Research Report No. 161⁸, *Assessment of Disposal Options for Treated Waste Water from Single Houses in Low Permeability Subsoils*, which recommended new treatment options for areas with low permeability soils. This Code is very important to the rural development sector in Ireland, as well as a range of stakeholders, including prospective rural dwellers, consultants/engineers, planners and others involved in the domestic wastewater treatment sector. The proposed changes to the Code will allow domestic wastewater treatment systems to be installed in areas with soil percolation values up to 120, with the current limit being 75/90. The current percolation test would need to be attended for up to 24 hours to achieve a percolation value of 120 (i.e. excluding the preparation and pre-soaking of the test hole). This is therefore very impractical in low permeability soils and risks poor-quality testing and/or results. Therefore, a reliable alternative method that takes less time to prepare/complete and produces a valid, robust and usable result is required.

Scope

Innovative project proposals are invited to develop a desktop review that examines and provides recommendations regarding the number and types of alternative methods that are available for percolation testing to evaluate soil suitability for domestic wastewater treatment system discharges, especially for evaluating low permeability soils in Ireland. The study could provide evidence of international best practice from relevant sectors (e.g. soil science, engineering). The study recommendations could include: (i) a description of the types of applications and sectors where alternative percolation test methodologies are currently used; (ii) the purpose and function of various alternative methods; (iv) reliability and robustness; (v) the time taken to prepare and complete the tests; (vi) implementation costs; (vii) engineering/scientific evidence supporting the alternative methods; and (viii) readiness and suitability for use in the Irish context.

⁷ <http://www.epa.ie/pubs/advice/water/wastewater/code%20of%20practice%20for%20single%20houses/>

⁸ <http://www.epa.ie/pubs/reports/research/water/researchreport161.html>

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 5: Emerging and Cross-cutting Issues

This thematic area will cover the emerging policy and implementation research needs in relation to the implementation of the Water Framework Directive (WFD), as well as marine research considerations, in support of the formulation and implementation of policies over the period 2014–2020.

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.**

One topic is included in the EPA Water 2019 Call under Theme 5: Emerging and Cross-cutting Issues	
Water 2019 Call – Project 4 (*)	Water futures: effectiveness of mitigation measures in a changing environment – investigating the effects of future population growth, land use and climate change scenarios on water quality in Ireland

Topic Title:	Water futures: effectiveness of mitigation measures in a changing environment – investigating the effects of future population growth, land use and climate change scenarios on water quality in Ireland		
Call Topic Reference:	Water 2019 Call – Project 4		
Project Type:	Capability Development Project		
Maximum Budget:	€ 1.5 million	Maximum Duration:	48 months
Co-funded by: Department of Agriculture, Food and the Marine			

Background

The EPA Research Programme developed integrated catchment management tools that supported the development of the second River Basin Management Plan⁹ (RBMP, 2018–2021) under the Water Framework Directive¹⁰ (WFD). The evidence base for identifying the pressures impacting on water quality for the RBMP 2018–2021 resulted from the outputs and recommendations from EPA-funded research projects including the: PATHWAYS project,¹¹ SILTFLUX project,¹² HYDROFOR project¹³ and Catchment Tools project¹⁴. Such projects have advanced the EPA’s knowledge of current pressure–impact relationships for water. Furthermore, this evidence base informed the Programme of Measures (actions) contained in the RBMP. The assessments of the impact of human activity underpinning the RBMP did not, however, include impacts of future population growth (animal or human), land-use changes or climate change scenarios on water quality in Ireland. Subsequently, the actions in the RBMP address only historical water quality problems rather than anticipating future water challenges. The regulatory and legislative landscape is dynamic and this impacts the context for planning future actions to mitigate impacts on water quality. The Project Ireland 2040: National Planning Framework¹⁵ sets out expected demographic changes and settlement patterns for Ireland in the next 20 years. It sets out a vision for the development of agriculture in Ireland in five-yearly intervals. In addition, FoodWise 2025¹⁶ identifies ambitious and challenging growth projections for the industry over the next ten years.

Climate change scenarios, despite a high degree of uncertainty at a national level, indicate that there will be substantial changes in the patterns of rainfall and temperature over the next 80 years. Therefore, in this dynamic context, planning for effective, resilient actions to prevent water pollution, and the assessment of the scenarios regarding the potential impact of actions, requires a holistic and multi-disciplinary approach to water quality. A critical aspect of such assessment is the consideration of the resilience of actions taken over extended time periods; this would help to better inform investment decisions regarding water protection measures.

⁹ <https://www.housing.gov.ie/water/water-quality/river-basin-management-plans/river-basin-management-plan-2018-2021>

¹⁰ <https://www.housing.gov.ie/water/water-quality/water-framework-directive/water-framework-directive>

¹¹ <http://erc.epa.ie/safer/iso19115/displayISO19115.jsp?isoID=3082>

¹² <http://77.74.50.157/siltflux/Home.aspx>

¹³ <http://www.ucd.ie/hydrofor/home.htm>

¹⁴ http://www.epa.ie/pubs/reports/research/water/Research_Report_249.pdf

¹⁵ <http://npl.ie/wp-content/uploads/Project-Ireland-2040-NPF.pdf>

¹⁶ <https://www.agriculture.gov.ie/foodwise2025/>

Ireland will not achieve all of the objectives of the WFD by 2027 and therefore it is very likely that further cycles of actions will be required to address water quality challenges. The outputs from and impacts of this research project should be relevant to a range of European and Irish regulatory and statutory requirements, including the RBMP, WFD, Nitrates Directive (91/676/EEC),¹⁷ relevant water policy regulations, Good Agricultural Practice for Protection of Waters Regulations 2014,¹⁸ Habitats Directive (92/43/EEC)¹⁹ and Birds Directive (79/409/EEC as amended 2009/147/EC), National Mitigation Plan²⁰ and National Adaptation Framework (NAF).²¹ Proposals submitted under this topic call will require a multi-disciplinary approach to examine short-term (i.e. 2027–2040) and longer term (2050–2100) water quality scenarios.

Scope

Innovative research proposals are invited that should consider the following:

(a) Effectiveness of measures in a changing environment (2040 scenarios)

Proposals should address investigating the effectiveness and resilience of available water pollution mitigation measures (actions) in the context of: (i) climate variability; (ii) population and demographic changes; (iii) agricultural production and land use; and (iv) the resilience of the ecosystems. Each should be considered individually and collectively based on a selected set of scenarios. The scenarios should consider published plans in addition to the effects of multiple drivers, including changes in the societal context of environmental policies, innovations in agriculture and nutrition and lifestyle shifts, including changes in diet. The research should build on existing UK and Irish scenario modelling.

Proposals could also consider the multiple benefits and trade-offs between available mitigation measures in relation to: (i) biodiversity enhancement; (ii) flood risk mitigation; (iii) carbon capture (mitigation); (iv) adaptation to climate change; and (v) water quality.

And,

(b) Scenario planning for a resilient future environment (i.e. up to 2050 and beyond 2100)

The research should provide scientifically-based scenarios for Ireland's future environment for the purposes of informing future programmes of measures under the WFD. The scenarios should include the effects of multiple drivers including: (i) climate change; (ii) environmental and economic policies; (iii) innovations in agriculture and nutrition; and (iv) social and cultural shifts, including changes in diet, etc.

This project should consider both the short-term and long-term scenarios as follows:

- reviewing, assessing, evaluating and proposing potential changing environment scenarios in relation to: (i) food demand, food production and agriculture; (ii) climate change; (iii) hydrology, biology and water quality of our waters;

¹⁷ <https://www.housing.gov.ie/water/water-quality/nitrates/nitrates-directive%20>

¹⁸ <http://www.irishstatutebook.ie/eli/2014/si/134/made/en/print>

¹⁹ <https://www.npws.ie/legislation/eu-directives>

²⁰ <https://www.dccae.gov.ie/en-ie/climate-action/publications/Pages/National-Mitigation-Plan.aspx>

²¹ <https://www.dccae.gov.ie/en-ie/climate-action/topics/adapting-to-climate-change/national-adaptation-framework/Pages/default.aspx>

- modelling the effectiveness of existing and potential future measures in relation to these changing environment scenarios.

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

The expected project outputs and recommendations will help to inform actions between 2027 and 2033 and beyond. Therefore, in addition to the standard EPA requirements regarding research outputs, innovative proposals could consider the following:

- a state of knowledge report, completed in year one; this should summarise the advances in understanding of the effectiveness of measures, particularly those that are resilient in a changing environment, in the last ten years.
- water quality scenarios incorporating projections of climate and population changes spatially across Ireland, for key water quality elements (e.g. nutrients, macroinvertebrates, aquatic plants, algae and pathogens) in catchments.
- the effectiveness of mitigation measures within these scenarios. The research could focus on multiple benefits for water, climate, flooding and biodiversity.
- the identification of long-term demonstration catchments (existing or new) in various landscape settings for the provision of targeted monitoring data to evaluate measures in a changing environment.

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.

It is anticipated that a multi-organisation consortium will be required to carry out the project to ensure that there is a diverse range of expertise within the team (e.g. hydrology, climate science, catchment science, ecology, social and behavioural science, geography and economics). The project team will be expected to collaborate closely with the EPA Water Management Programme and the EPA Climate Services Programme.

To ensure that this research builds on existing knowledge, tools and approaches in use within the EPA, it is a requirement that some of the research team be based three days per week in the EPA Offices, Dublin (i.e. three researchers with the EPA Catchments Unit and one with the EPA Climate Unit).

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 ²²
November/December 2019	Grant award of successful projects
By 31 March 2020	Start of successful projects

²² 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.