Research & Innovation Needs

The Strategy is guided by a structured framework of research needs, expressed as strategic questions and organised into interconnected themes spanning the full system from observation to decision-making:

- **Earth System Science, Modelling & Forecasting:** advancing seamless, high-resolution forecasting and integrated modelling across timescales, including compound events and uncertainty.
- **Impact-Based Services & Decision Support:** translating science into actionable, user-centred services, including early warning systems and sector-specific decision tools.
- **Climate, Resilience & Long-Term Risk:** addressing long-term climate risks such as heatwaves, drought and sea level rise, and supporting adaptation, infrastructure planning and sectoral resilience.
- **Observations & Digital Infrastructure:** strengthening observational networks, data systems and interoperable platforms underpinning forecasting and services.
- **AI & Advanced Technologies:** harnessing AI, digital twins and advanced computing to enhance forecasting, modelling and decision support, while ensuring responsible, sustainable and transparent use.
- **Communication, Behaviour & Societal Engagement:** improving how information is understood and acted upon, including co-design, behavioural insights and social sensing to capture real-time public perception in an increasingly diverse and segmented society.
- **System, Interdisciplinary Methods & Governance:** ensuring that the R&I system is integrated, collaborative, well-governed and aligned with national and international priorities.

Cross-Cutting Enablers

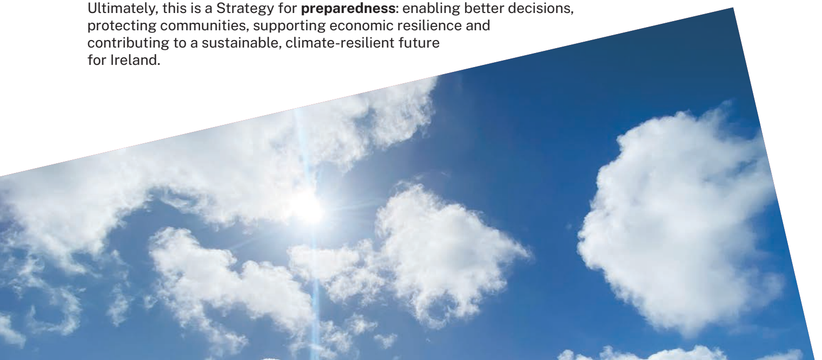
Two cross-cutting enablers underpin the system:

- **Impactful Communication:** ensuring knowledge is shared, understood and used, strengthening trust and supporting informed decision-making.
- **Robust Governance:** providing oversight, quality assurance and accountability through structured delivery mechanisms, including implementation planning, performance monitoring and coordinated programme management.

Delivering for Society

This Strategy positions Met Éireann as a central pillar in Ireland's resilience system: connecting knowledge to action in a rapidly changing environment. By strengthening scientific excellence, accelerating innovation, embedding impact and intensifying partnerships, Met Éireann will ensure that research delivers where it matters most.

Ultimately, this is a Strategy for **preparedness**: enabling better decisions, protecting communities, supporting economic resilience and contributing to a sustainable, climate-resilient future for Ireland.



Met Éireann

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

Rialtas na hÉireann
Government of Ireland

Met Éireann

Weather-Flood-Climate

Knowledge to Preparedness

Met Éireann Research & Innovation Strategy 2026–2034

Helping Irish society to navigate and respond to weather and climate risks

An Roinn Tithíochta, Rialtais Áitiúil agus Oidhreachta
Department of Housing, Local Government and Heritage

Knowledge to Preparedness

Ireland is entering a transformative decade in weather, flood and climate sciences. Advances in modelling and data systems are reshaping how national meteorological services operate, while societal expectations for timely, trusted and actionable information continue to grow. In this context, Met Éireann's Research & Innovation (R&I) Strategy sets out how scientific knowledge will be transformed into preparedness: protecting lives and livelihoods, supporting decision-making and enabling a resilient, climate-adapted Ireland.

At its core, this R&I Strategy establishes Research & Innovation as a **connected system** linking science, technology, operations and users to deliver tangible societal outcomes. It builds on Met Éireann's role as Ireland's national meteorological service: a trusted authority, an accountable public body and a real-world **proving ground** where new knowledge, ideas and innovations are tested, validated and refined in operational environments.

A System for Preparedness

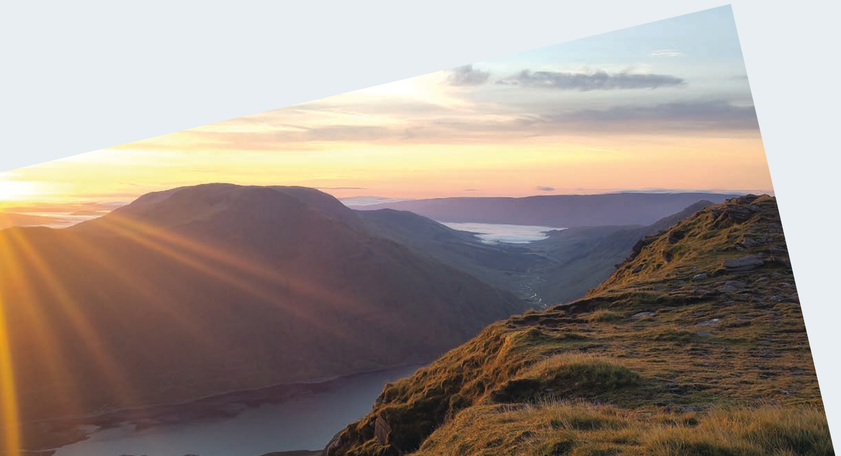
Met Éireann's R&I system is designed as a mission-driven engine that transforms research into societal impact. It operates through a clear and continuous loop:

Research Needs → Research Activity → Operational Capability → Societal Outcomes (back to needs)

Research needs, grounded in societal challenges, scientific opportunity and policy demand, act as the primary input shaping priorities. These needs reflect the sequential and compounding nature of risk and impact, recognising that effective preparedness depends on understanding how hazards translate into risks and impacts across systems and sectors.

At the centre of the system are four interdependent strategic goals, functioning as the core components of an integrated engine. Together, they ensure that scientific advances are not only achieved, but translated, delivered and used.

This system is dynamic and iterative. Research informs services, services generate feedback, and that feedback shapes future research. In this way, the system continuously evolves in response to emerging risks, technological change and societal needs.



Met Éireann Research & Innovation System

Grow Research Excellence & Talent

Building and sustaining scientific excellence is foundational to preparedness. Met Éireann will strengthen national capability in weather, flood and climate sciences through targeted and mission-driven research funding, expanded doctoral and fellowship programmes, and deeper integration with higher education institutions. It will advance integrated Earth system science, hybrid AI–physics modelling and an end-to-end **risk → impact → decision capability layer**, supported by modern, modular data and computational platforms.

Drive Research to Operations & Innovation Delivery

To ensure research delivers real-world value, Met Éireann will establish a structured **Research-to-Operations (R2O) pipeline**. This includes a dedicated R2O gateway, strengthened knowledge transfer processes and integrated governance. Decision and impact testbeds, living labs and place-based approaches will enable innovation to be tested in real-world settings. User needs will be embedded throughout, with strong engagement with emergency planning and response systems. Investment in infrastructure, standards and skills will ensure innovation is delivered safely, reliably and at scale.

Advance Value, Impact & Evidence for Policy

Met Éireann will ensure that R&I generates measurable societal value and informs decision-making. This includes developing outcome-based evaluation frameworks and strengthening collaboration with national socio-economic data bodies to link weather and climate information with economic and societal indicators. **A Rapid Evidence Service** will provide timely, policy-ready insights, including support for emergency response and long-term planning. Particular emphasis will be placed on integrating climate intelligence across key sectors, including health, energy, water, transport and agriculture.

Intensify Partnerships

Collaboration is essential to achieve scale and impact. Met Éireann will strengthen partnerships across academia, government, industry and communities. It will leverage co-funding opportunities, support centres and networks of excellence and position Ireland as a partner of choice internationally. Through coordinated national and international engagement, Met Éireann will help shape a cohesive, mission-driven R&I ecosystem.