

Ireland in Arctic Research: A Growing Scientific Presence

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Introduction

Global interest in the Arctic is intensifying, and demand for interdisciplinary Arctic research has never been greater. The Republic of Ireland (Ireland) is strategically positioned in the global Arctic research landscape and may be referred to as a sub-Arctic state, offering unique geographic, infrastructural, and diplomatic advantages. Its Atlantic-facing location, historic ties to polar exploration, and significant contribution to Arctic science are positioning it as a strategic actor in Arctic studies.

This article examines Ireland's evolving scientific engagement with the region through three key lenses: its research output and collaborations, institutional frameworks supporting polar studies, and emerging Arctic policy dimensions. Bibliometric analysis shows Ireland's substantial and growing engagement in creating an Arctic research footprint, with over 460 Arctic-related publications since 2000 showing a strong international collaboration. The particular strengths are climate science, marine technology, and renewable energy. This scientific activity is supported by research networks, as well as infrastructure including the vessel for Arctic monitoring such as RV Celtic Explorer.

The Ireland's scientific engagement connects with broader Arctic policy discourse, including its Arctic Council Observer application (Government of Ireland, 2020) and participation in major Arctic forums. These developments position Ireland as an important sub-Arctic research partner, yet the current absence of a consolidated national Arctic strategy reflects instability in the geopolitical sphere of Arctic governance.

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25 years of Arctic Research in Ireland

To assess Ireland's contribution to Arctic research, we conducted a bibliometric analysis using Scopus data from 2000 to 2025. The dataset was filtered with the search term "Arctic", either in title, abstract, or keywords, and was limited to at least one affiliation in Ireland. This section briefly presents an overview of key metrics, publication trends, international collaborations, and thematic focus areas.

The analysis showed that Ireland has contributed over 460 Arctic-related publications between 2000 and 2025, authored by nearly 5500 individuals. Irish Arctic publications' Compound Annual Growth Rate (CAGR) demonstrated in Figure 1 is at 7.5% over 24 years, indicating sustained growth. The peaks occurred in 2018 and recent years, reflecting increased research funding or collaborative Arctic initiatives.



Figure 1: Annual scientific production. Made by authors

The bibliometric analysis also identified a high degree of international collaboration in Arctic research involving Ireland's institutions, with an international co-authorship rate of 78.79% within Irish Arctic-affiliated publications. The cumulative co-authorship data shows Ireland's strong collaboration, particularly with the United States, as shown in Figure 2, which leads as the top co-authoring country.

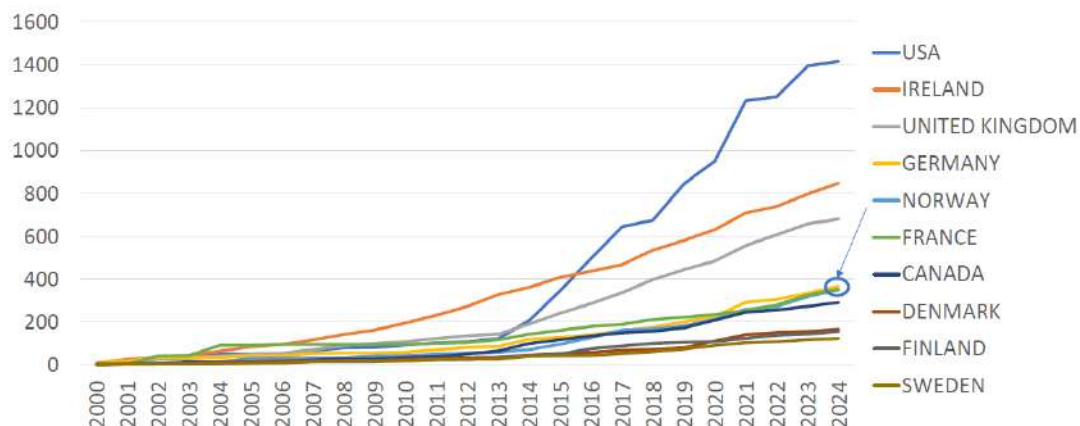


Figure 2: Cumulative number of co-authors in Ireland's Arctic research by country of affiliation (2000–2024). Made by authors

This is followed by significant collaborations with researchers from the United Kingdom, Germany, Norway, and France. Notably, Ireland itself ranks second overall in cumulative contributions. It shows its central role not just in originating research but also in collaborative Arctic projects. The data also demonstrated a steady growth in partnerships with Canada, Denmark, Finland, and Sweden, highlighting the transatlantic and pan-European nature of Arctic science networks.

Key words analysis in Figure 3 demonstrated that Irish research focuses particularly on climate change, Arctic engineering, oceanography, and renewable energy, including wave energy conversion. Arctic studies associated with Greenland constitutes also a significant component of Ireland's Arctic scientific output.



Figure 3: Key words analysis of the main topics of Arctic research in Ireland. Made by authors

A significant amount of published Irish Arctic research appears in conference proceedings, particularly in engineering-related venues like Ocean, Offshore and Arctic Engineering Conference (more than 55 publications in the journal) and the International Offshore and Polar Engineering Conference (more than 10 publications), suggesting a strong engineering and ocean systems orientation.

This scientific activity is supported by research networks, as well as infrastructure including the RV Celtic Explorer, a 65.5-metre purpose-built (2003) ocean-going research vessel operated by the Marine Institute. This is the first Ireland's vessel to receive Polar Code certification for Arctic operations and has been officially recognised as Ireland's first Integrated Carbon Observation System (ICOS) Ocean station (Ocean focus, 2020, Afloat.ie, 2025). It has conducted multiple expeditions in the Nordic and Greenland Seas, reaching as far north as 79°N (Ocean focus, 2020). An Irish-led team with researchers from Ireland from University of Galway, the UK, Germany, and Norway used the vessel in several expeditions to monitor ocean conditions, supporting Arctic climate research and strengthening Ireland's role in global climate monitoring.

At the same time the emerging Indigenous Rights Cluster at University College Cork's School of Law currently reflects a deliberate expansion into Arctic social sciences and humanities, diversifying Ireland's traditionally STEM-focused Arctic research portfolio.

Ireland's Strategic and Institutional Engagement with the Arctic

Ireland's engagement with the Arctic originates from deep historical connections to polar exploration (Smith, 2010; Larson, 2011; Smith, 2021). While geographically outside the Arctic Circle, Ireland has emerged as an active participant in contemporary Arctic affairs through policy engagement, research collaboration, and institutional support.

At the diplomatic level, Ireland has increased its visibility through the participation of Irish researchers in major Arctic forums such as the Arctic Circle Assembly, Arctic Frontiers, High North Dialogues, APECS events, and the International Arctic Science Committee's (IASC) Arctic Science Summit Week and many more. Scientifically, Ireland has developed two active Arctic research networks: the Network of Arctic Researchers in Ireland (NARI) with its membership in the UArctic consortium, and the regional branch of the Association of Polar Early Career Scientists (APECS). Institutional sponsorships, including the Arctic Frontiers Emerging Leaders Programme, further support individual researchers and foster international connections. These mechanisms reflect a structured, if informal, framework for engagement, now ripe for strategic consolidation.

As the nation's scientific output in Arctic studies has expanded, policy discourse has emerged regarding Ireland's potential dedicated Arctic Strategy (Kavanagh, 2024). However, during the current geopolitical instability in the Arctic, the national Arctic strategy will likely remain split into separate streams without being consolidated. The future Arctic strategy for Ireland for the next term may continue to be represented by the Strategy for the Nordic Region and the Strategy for the US and Canada, similarly to the current dual-track model (Government of Ireland, 2019; Government of Ireland, 2021).

Conclusion

Ireland's robust and growing contribution to Arctic research reflects both scientific ambition and alignment with global climate and oceanographic challenges. Through bibliometric analysis, we demonstrated how Ireland has developed a distinctive and increasingly influential role in Arctic research. The growing body of research is not occurring in a vacuum. The evidence presented in this article shows sustained growth in publications and robust international collaborations, growing influence of institutional networks like NARI and UArctic, demonstrating Ireland's capacity to punch above its weight in Arctic science. These findings position Ireland as a reliable sub-Arctic research partner and raise the importance of consolidating within a clear national Arctic Strategy.

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