

UK Arctic Science Conference 2025: High-Level Summary of Key Messages and Discussion Points

The UK Arctic Science Conference held in Northumbria University in September 2025 provided a valuable opportunity to look at the UK's current strengths, the strategic challenges, and the ethical imperatives facing UK Arctic science at a pivotal point for potential leadership in Arctic science.



These notes are a summary and reflection of the presentations, discussions and inputs shared during the conference. They are intended to provide a general overview and do not represent the views, opinions or endorsements of the notetakers or affiliated organisations. The 'Action Points and Recommendations' section below reflect the various views of participants, rather than the conference as a whole.

A closed large language model was first used to generate summaries from handwritten notes, presentations and comments and questions posted on a live online discussion board. The following high-level summary has been edited and verified by conference organisers. While every effort has been made to capture the key points accurately, these notes should not be considered comprehensive records of the sessions.

1. The Global and Geopolitical Urgency of the Arctic

The Arctic is presented as fundamentally relevant to UK policy and global stability, especially concerning the current climate emergency. Climate change is causing profound impacts, including dramatic reductions in sea ice, permafrost thaw, infrastructure damage, and shifts in marine ecosystems. These environmental changes create societal instability, heightening risks of conflicting territorial claims over resources and defence implications.

A major discussion point centred on the reality, perceptions and future risks around Arctic research and data capabilities within the United States, particularly the ability and appetite to work in international science partnerships. Long-term questions remain about how to integrate critical data from the Russian Arctic.

2. UK's Core Strengths and Leadership Potential

The UK Arctic science community is recognised as internationally leading and world-class across marine, terrestrial, cryospheric, and computational domains.

- **Technological Infrastructure:** Key strengths include world-leading research vessels, advanced capabilities and facilities.
- **Computational Power:** The UK benefits from powerful High-Performance Computing (HPC) resources (e.g. JASMIN, MAGEO), providing access to high computing power, often for free. This computational strength, combined with remotely sensed data, positions the UK well for developing AI and modelling tools in Arctic science.
- **Human Capital and Collaboration:** The community boasts a strong interdisciplinary research base with examples of high institutional cooperation. Early Career Researchers (ECRs) are a strength, supported by unique doctoral training programmes that foster interdisciplinary connections.

- **Soft Power and Policy:** Arctic science is actively used to project soft power, facilitating bilateral relations and network formation. The Government demonstrates active interest, providing funding and maintaining committees focused on climate change and the Arctic.

3. Critical Challenges and Ethical Imperatives

Despite its strengths, the UK community faces several structural challenges that limit its capacity for effective leadership:

- **Fragmentation and Communication:** The Arctic science community is often scattered and fragmented. There is sometimes a lack of communication between organisations, resulting in data silos and the risk of duplicating research. Researchers, particularly ECRs, struggle with an information overload and difficulty knowing how to access resources, grants, and contacts within organisations.
- **Indigenous and Ethical Responsibility:** There is an ethical imperative to transition to more just research. Past UK activity often disregarded Indigenous communities and the geopolitical context. The need to centre Indigenous and local community voices in agenda-setting is paramount, including ensuring self-determination in research.
- **Funding Barriers:** Funding models, such as those used by NERC, often do not permit the adequate compensation or employment of international collaborators, including Indigenous individuals, abroad. This creates a significant barrier to meaningful co-creation and partnership.
- **Emerging Threats and Policy Gaps:** Two major areas requiring immediate strategic planning are the increase in exploitation (e.g. natural resources, shipping, tourism) following sea ice melt and the necessity of addressing the emerging topics around geoengineering.

Potential Action Points and Recommendations for the Future

Participants at the conference highlighted several strategic recommendations intended to inform the UK's leadership, improve internal coordination, and ensure ethical practice:

Strategic and Institutional Actions

Action	Details and Rationale
Establish a Centralised Arctic Hub	Create a centralised hub for UK Arctic Science to coordinate scattered resources, communicate opportunities, and share data. This hub would improve coordination and reduce duplication.
Develop Proactive Arctic Strategy	Require a clear strategy for interacting with an ice-free Arctic detailing the UK's scientific, political, ethical, and economic position. Include a near-future strategy around the Central Arctic Ocean, leveraging vessels like the <i>Sir David Attenborough</i> .

Strengthen International Alliances and Collaborations	Establish long-term partnerships with international funders such as Canadian (CINUK) and Nordic (Arctic Ocean 2050) frameworks, and show clearer and stronger UK leadership in applying for European Commission Pillar 2 Arctic science.
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Ethical and Funding Reforms

Action Point	Details and Rationale
Reform Funding for International Collaboration	Ensure funding structures do not pose a barrier to co-creation with Indigenous communities. Adaptation of current UKRI funding models is needed to adequately compensate or employ international and Indigenous collaborators.
Innovative Funding Models	Investigate innovative funding models, e.g. exploring opportunities associated with Arctic tourism. This could involve placing scientific equipment on cruise ships for data sharing.
Centre Indigenous Voices in Agenda Setting	Centre Indigenous and local community voices in developing research priorities and objectives. Research institutions must ensure projects align with and respect Indigenous knowledge systems and communities. Develop and follow an ethical code of conduct for Arctic research to ensure responsible and transparent practice, which aligns with CARE Principles for Indigenous Data Governance.

Scientific and Collaborative Improvement

Action Point	Details and Rationale
Upskilling in AI and Computer Science	Address the lack of machine learning and complex data analysis knowledge by upskilling incoming PhD students and researchers in computer science and AI through training programmes.
Improve Field-Model Dialogue	Foster more dialogue between modellers and field scientists to ensure that relevant and feasible data is collected in remote locations to improve research outcomes.
Promote Shared Data Infrastructures	Strengthen collaboration and overcome data silos through shared data infrastructures, e.g. Greenland portal, SIOS. Invest in open, interoperable Arctic data systems.