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### A WORLD CLASS TERRESTRIAL RESEARCH INFRASTRUCTURE: BRINGING THE SCIENTIFIC COMMUNITY TOGETHER IN REMOTE, COLD REGIONS

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Amplified Global warming in the Arctic is already having many profound effects with implications for Arctic residents and the global community. Despite the great magnitude and critical importance of the changes in cold regions, these regions are remote, have harsh environments with few inhabitants and our ability to detect, understand and predict changes are severely limited. Furthermore, detection of change by remote sensing shows a surprising heterogeneity of environmental trends, but these are not understood.

In 2001, an EU-supported network (SCANNET) of 9 North Atlantic research stations was initiated to build capacity for environmental monitoring and research: by 2010, 33 research stations located in all 8 Arctic and neighbouring countries joined together to create INTERACT ([www.eu-interact.org](http://www.eu-interact.org)), funded by the EU. Just 4 years later, the number of stations had grown to 71. The stations are multi-disciplinary covering the cryosphere, biosphere, lower atmosphere and human dimensions. In 2014, together, the stations hosted over 5,100 researchers and 76 single discipline networks.

INTERACT is building significant capacity for research, monitoring and education. It brings together managers of the research stations in a Station Managers Forum to improve standardised monitoring, data accessibility and best practices for operating stations. Major output includes reports on facilities and environment at each station, best practices of operating a remote research station and a metadata base of monitoring and research projects.

INTERACT provides transnational access (Fig. 1) which is centralised funding for researchers mobility. This EU funding has been leveraged to gain funding in Canada and the US and for the first time, researchers can apply to INTERACT for travel and subsistence to visit stations in all northern countries including Russia. By the end of 2014, about 520 INTERACT-sponsored researchers (including early career scientists) will have spent around 10, 000 research days at cold region research stations.

INTERACT monitoring programmes are supported by R&D. New energy-balance equipment has been designed, tested and established at multiple sites in collaboration with ICOS (Integrated Carbon Observing System) while improved methods for recording phenology and networking sensors have been developed. In addition, a GIS system has been developed to combine station management with archiving research and monitoring data. INTERACT also has a strong outreach component and is actively involved with school education and citizen science.

The stations and the network integrate projects and build collaborations. INTERACT integrates monitoring, environmental manipulation, and modelling which facilitate knowledge-based environmental management.

INTERACT is increasingly sought-after as a partner by national and international programmes and is happy to collaborate. It has applied for further funding for innovative activities such as developing a rapid Arctic-wide observational and sampling system to detect potential environmental hazards and also to implement key recommendations from ICARP III.



Figure 1. INTERACT's transnational access scheme. Dots are nationalities of research groups receiving awards: the size of the dot is proportional to the number of national groups receiving funding.