

# Introduction

## The 11th International Circumpolar Remote Sensing Symposium

The 11<sup>th</sup> International Circumpolar Remote Sensing Symposium (ICRSS) was held at the Scott Polar Research Institute in Cambridge from 20 to 24 September 2010. The ICRSS series began in Yellowknife in 1990 and has been held biennially since then. The 2010 meeting was the sixth time it had been held in Europe and the second time in the UK, but the first time in Cambridge. 35 people attended the meeting, from 11 countries, and over 20 oral presentations were made in addition to a well-attended poster session. The majority of the oral presentations have been developed into papers and appear in this issue of *Polar Record*, having been subjected to the normal peer review and editorial process, and they give a fair idea of the range of topics covered at this lively meeting. Sessions at the symposium were organised around the themes of cross-platform observations, ice and snow, topography, vegetation and observations of animals. The last theme produced three fascinating presentations on the monitoring of penguins, seals and fish from spaceborne and airborne platforms. The papers in this issue address two broad areas: terrestrial ice and snow, and high-latitude vegetation (sea ice, and polar zoology, were also represented at the meeting). All of them deal to a greater or lesser extent with technological innovation in assessing, mapping and monitoring these aspects of the polar regions, and several of them focus strongly on the development of new methods, or the assessment of newly available datasets. This issue of *Polar Record* thus provides a limited snapshot of the 'state of the art' in remote sensing of polar regions. It is the result of sustained effort by the authors of the papers, and the team of anonymous reviewers. I am glad here to record my gratitude to all of them, and to the helpers at the symposium, particularly Katya Shipigina, Allen Pope and Claire Lampitt.

Three papers, by Friedt and others, Laffly and others and Schneevoigt and others, are concerned with the dynamics of glaciers in Svalbard over timescales ranging from hours to years, using spaceborne interferometric radar (InSAR), *in situ* photography and the application of Digital Elevation Models (DEMs) acquired by various means including the use of global position system (GPS) methods. The paper by Marsh and Rack explores a new idea for measuring ice-shelf surface velocities using high-precision spaceborne laser altimetry. This is the only paper included here to have a study site in Antarctica rather than in the Arctic. The potential uses of a new source of satellite-derived DEMs, with coverage to much higher latitudes than previously possible, is explored in

a paper by Rees. This paper considers applications to Arctic research in general. The paper by Larsen and others is also directed towards the exploration of new technology. In this case, it is the possibility of monitoring ship traffic in the Arctic by using a satellite to receive transmissions from ships.

The remaining six papers are concerned with mapping and monitoring of vegetation distribution in the Arctic. Johansen and others describe the methodology and present the results of satellite-based mapping of the vegetation cover of Svalbard. Mikheeva and others investigate the scope of the technique of spectral mixture modelling for mapping spatially complex and inhomogeneous tundra vegetation from satellite imagery. The other four papers are explicitly concerned with monitoring changes in vegetation distribution as a result of climate change and more local disturbances. Colpaert and Kumpula examine changes in reindeer pasture in northern Finland over two decades, while Fraser and others examine changes over an even longer period for northern Yukon. The papers by Shipigina and Rees and by Rees develop methods for automatic detection of local changes in Arctic vegetation from satellite imagery.

A major aspect of the meeting was the close involvement of, and extension of financial support to, early career scientists. This was hugely successful and the organising committee expressed the strong wish to continue this at future meetings. An early career workshop was organised by APECS (the Association of Polar Early-Career Scientists, <http://www.apecs.is/>) on the first day of the meeting, and was contributed to enthusiastically by several scientists at not quite such an early stage in their careers! Several of the symposium's sessions were chaired by early career scientists, who were also prominent in their contribution to the poster session and to the process of peer review of the papers included here.

The 11th ICRSS (<http://alaska.usgs.gov/science/geography/CRSS2010/>) was enormously successful scientifically and indeed socially, thanks to the enthusiastic participation of everyone who attended, but also to the generous support of the United States Geological Survey and of Environmental Research and Assessment Ltd. The 12th ICRSS will be held at Levi in Finland in 2012 (<http://alaska.usgs.gov/science/geography/CRSS2012/>), and is eagerly anticipated.

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