

The Third International Conference on Contaminants in Freezing Ground, Hobart, Tasmania, 14–18 April 2002

The International Conferences on Contaminants in Freezing Ground are organised under the auspices of an International Steering Committee to promote a better understanding of the unique characteristics and problems posed by contaminants in freezing ground. The first meeting was held in Cambridge in 1997 and was attended by 33 participants from nine countries. Results from the meeting were reported in *Polar Record* in 1998 (volume 35). The themes covered at the first meeting reflected a broad range of interests, including a synthesis of the Arctic environmental strategy as it stood in 1997; the fundamental physical, chemical, and biological properties of contaminated frozen soils; experimental approaches to determining contaminant movement; and possibilities for *in situ* bioremediation of petroleum spills.

The second conference was held in 2000, also in Cambridge. Sixty participants from 12 countries attended the three-day meeting and workshops. Much of the research was again dominated by discussion of Arctic issues and case studies, although scientists from Australia and New Zealand contributed a southern perspective from their work in Antarctica. Formal papers from the meeting gave rise to a three-part collection, which comprised special peer-reviewed issues of *Polar Record* (volume 37) and *Cold Region Science and Technology* (volume 32) that were published in 2001, and a supplemental volume of papers that did not fit neatly into the remit of the two journals. In total, 26 papers were published, spanning a wide range of issues. Many of the themes were interdisciplinary and involved presentations prepared by several authors reflecting the team approach that is often required to address the complex issues surrounding contaminants in freezing ground. It was also apparent at the second conference that although there are many similarities between the Arctic and Antarctic, there are also important differences.

Even though the extent of contamination in the Arctic is greater than in the Antarctic (see Poland and others, this issue), contamination in Antarctica is still of the order of 1- to 10-million m³ of abandoned waste, with possibly a similar volume of petroleum-contaminated soil. It is therefore surprising how little research or remediation has been undertaken on a continent that is widely perceived as being of global environmental significance and a symbol of good environmental stewardship.

One of the reasons for the apparent lag in Antarctic remediation is that site-specific research and development is not as advanced as in the Arctic. Another factor that is perhaps not appreciated is how the legal and political forces that drive site remediation differ between the two regions. Many Arctic regions have well-established guidelines and protocols for the assessment and sub-

sequent management of contaminated sites, and generally the commitment to clean up contaminated sites is driven by legislature or litigation. This is not the case for Antarctica, where there are no universally accepted guidelines and no binding process for assigning liability for environmental damage. However, the Protocol on Environmental Protection of the Antarctic Treaty (ATCPs 1993; *Polar Record* 29 (170): 256–275), which was ratified in 1998, does commit Treaty Parties to the comprehensive protection of the Antarctic environment and dependent and associated ecosystems, and designates Antarctica as a natural reserve devoted to peace and science. Annex III to the Protocol (Waste Disposal and Management) established that past and present work sites shall be cleaned up unless they are designated as a historic site or monument, or removal by any practical option would result in greater adverse environmental impact than leaving in its existing location or condition. At present it is too early to tell how different Antarctic Treaty Nations will respond to this, or if they are financially or technically capable of responding in a way that would satisfy the condition that clean-up should not lead to greater adverse environmental impacts. It was this caveat that prompted Australia to host the Third International Conference in Hobart.

The main objective of the conference was to facilitate the exchange of scientific, technical, and practical expertise in dealing with contaminants in freezing ground between Northern and Southern Hemisphere scientists, environmental managers, industry stakeholders, and national Arctic and Antarctic operators. This would strengthen and broaden the network of individuals working on contaminants in freezing ground to include Antarctic practitioners. There were 115 participants who attended the conference in Hobart, and 71 abstracts were received from researchers from Australia, Canada, Estonia, Finland, France, Holland, Japan, New Zealand, Norway, Russia, Sweden, the UK, and the US. The themes from the first and second conferences were developed further, and included five presentations that either compared or directly considered both Arctic and Antarctic issues, 40 that concerned the Antarctic directly, 23 that concerned the Arctic directly, and three that were of a purely experimental nature. During the four days of the meeting, representatives from the contaminants community gave 55 media interviews, including local, national, and international television, radio, and newspapers. The Hobart conference website also had nearly 12,000 visits during the 18 months prior to the conference, indicating a high level of media and public interest.

In addition to oral presentations and poster sessions, three workshops discussed key issues identified at the

Second International Conference. The general topics covered were: 'Development of meaningful environmental guidelines for contaminants in freezing ground,' 'Development of best practice for bioremediation in freezing ground,' and 'Principles of contaminant monitoring in freezing ground and associated ecosystems.' The outcomes of the formal workshops and of session discussions are described by Snape and others in this issue. The strategy for disseminating information from the conference series again has been to aim for the highest quality publication of peer-reviewed papers in *Polar Record* and *Cold Regions Science and Technology*. This capitalises on the different mandates of the two journals to provide a wide avenue for contaminants researchers and practitioners. Many of the best scientific presentations were written into full papers and 11 successfully passed through the *Polar Record* peer-review process and have been incorporated into this dedicated issue. A further 10 peer-reviewed publications that have more of a technology focus are being published in *Cold Regions Science and Technology* this year. These journal publications are supplemented by a web-based conference that has recently developed into a sponsored portal — essentially a one-stop-shop for the research on contaminants in freezing ground and the growing industry in cold regions remediation (available at www.freezingground.org/portal).

The cost of running the conference series is heavily subsidised by corporate and institution sponsorship. All the sponsors acknowledged on the website have a

long-term commitment to advancing knowledge about contaminants in freezing ground. Most sponsors are part of the industry in cold regions remediation and are world leaders in their particular field of endeavour. Special thanks go to the Australian Antarctic Division executive for hosting the third conference as part of Australia's goal 'to protect the Antarctic environment,' and to the major sponsors: bp, Philips Analytical, and IntelEco for their substantial financial contributions to the meeting.

In many ways the International Conference on Contaminants in Freezing Ground series provides a holistic approach to improve the way that contamination is managed in these ecosystems. The strength of the meetings comes from the range of specialists who participate in the various forums, and the long-lasting networks of contacts and collaborations. Representatives are environmental managers, engineers, remote-sensing specialists, and scientific researchers from a diverse range of disciplines. Participants come from a broad spectrum of organisations, including universities, corporations, government, military, and non-government organisations. The common interest that brings all participants together is the shared desire to do something practical to improve the environment of the polar regions by reducing the presence of contaminants in freezing ground.

Ian Snape
Human Impacts Research
Australian Antarctic Division