

# FUTURE RESEARCH TRENDS IN THE EARTH SCIENCES

## An Introduction

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In 1992, the Geological Survey of Canada (GSC) celebrated 150 years of distinguished service to the nation. To honour this record of achievement, the Geological Association of Canada (GAC) considered that hosting a symposium and publishing the proceedings would be an appropriate tangible recognition. As a former president of GAC and a recent director general within the GSC, I was asked to arrange a symposium for the GAC annual meeting in Wolfville, Nova Scotia, May 1992. After discussions with colleagues and approval by GAC Council, the theme selected for the symposium was "Future Research Trends in the Earth Sciences".

For most of its 150-year history, the GSC has been the leading geoscience institution in Canada. In more recent years, with a staff of approximately 1000 and an annual budget of approximately \$100 million, it has certainly been the largest organization and one with a broad national mandate. Programs such as the Mineral Development Agreements with provincial geoscience surveys and Research Agreements with academic scientists have aided in collaborative research programs. The quality of research undertaken by GSC staff has been high, perhaps attested to by the fact that GSC scientists have received nearly half of the GAC's highest award, the Logan Medal, since the medal's inception in 1964.

Many presentations and citations were made to the GSC in 1992 to honour past contributions. At a time when the earth sciences are rapidly evolving, when new opportunities and responsibilities are emerging, and when funding pressures are particularly severe, it was perhaps more helpful to look forward rather than be retrospective. A modern national geological survey must respond to many pressures, priorities and clients; however, it must remain at the vanguard of the discipline and must provide leadership and collaboration to ensure international competitiveness within the discipline. For a nation that has the largest land surface and longest coastline, fronts three oceans, and is a polar country, Canada has both an obligation and an opportunity to be a world leader in the earth sciences. To help lead, it is useful to identify future research trends, although the very nature of science defies precise planning.

Leading Canadian earth scientists were invited to speculate on future research trends in the earth sciences, taking broad natural, but interacting components: the core, mantle, lithosphere, biosphere, oceans and atmosphere. To these was added a contribution considering the special role of research platforms in advancing the earth sciences. Given a limited page length for manuscripts and being prepared for a broad *Geoscience Canada* readership, the articles published herein and presented at the symposium paint a broad canvas, and are not designed to be comprehensive, but rather are intended to spark discussion.

In recent decades, Canadian university earth science departments have expanded, and the number of professors approximates the number of research scientists in the GSC.

As the principal funder of academic scientific research, the Natural Sciences and Engineering Research Council of Canada (NSERC), like the GSC, has recently been struggling with the problems of setting priorities, operating with inadequate funding, and responding to exciting scientific advances. NSERC has formalized part of this review into a series of Health of the Discipline Statements. As discussion papers, they are prepared by one or more of the discipline Grant Selection Committees, sometimes over more than one committee tenure. Also published in this issue of *Geoscience Canada*, to complement the symposium articles, is the current Health of the Discipline Statement on the Earth Sciences. This version has evolved by refinements of the two committees (Solid Earth Sciences and Environmental Earth Sciences) over two successive grant years.

The NSERC Health of the Earth Sciences Discipline Statement is intended to be a snapshot opinion, to be reviewed within at least three years. It is hoped that it will engender debate and refinement by representatives of all sectors (industry, government and academia). As a discussion document, it has been kept deliberately succinct. These statements may assist NSERC in appreciating the advances, problems and needs in a discipline, and to better compare these issues between disciplines. Whether they are of value in reviewing budget allocations between disciplines remains to be seen.

This issue of *Geoscience Canada*, therefore, offers a fascinating contrast in the process of speculating on future research trends in the earth sciences. Seven articles based on the symposium reflect individual perceptions; the NSERC Health of the Discipline Statement represents the merged views of more than 30 active researchers (from all three sectors). The combination of the articles and the statement provide a reference source for further debate, for future planning in the GSC, and especially for the next revision of the NSERC Statement. Your views may be contributed as articles or letters in *Geoscience Canada*, as direct input into NSERC (Earth Sciences Awards Officer, NSERC, Constitution Square (Tower 11), 350 Albert Street, Ottawa, Ontario K1A 1H5), or to the GSC (Chief Scientist, GSC, 601 Booth Street, Ottawa, Ontario K1A 0E8).

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