Geoscience Canada

Canada's National Geoscience Mapping Program (NATMAP): Toronto 1990 Workshop

M. R. St-Onge

Volume 17, Number 2, June 1990

URI: https://id.erudit.org/iderudit/geocan17_2con01

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Publisher(s)

The Geological Association of Canada

ISSN

0315-0941 (print)
1911-4850 (digital)

Explore this journal

Cite this article

St-Onge, M. R. (1990). Canada's National Geoscience Mapping Program (NATMAP): Toronto 1990 Workshop. *Geoscience Canada*, *17*(2), 98–99.

Conference Reports

Canada's National Geoscience Mapping Program (NATMAP): Toronto 1990 Workshop [1]

M.R. St-Onge
Continental Geoscience Division
Geological Survey of Canada
588 Booth Street
Ottawa, Ontario K1A 0E4

"It is our perception that there has been a decline in the level of field activities of the Geological Surveys across the country relative to exploration activity and that present levels of field work are not as high as they have been in past years.
"We believe that a national perspective is imperative in the acquisition, production, and management of geoscientific data. Key words are integration, co-ordination, compatibility, and standardization."

PDAC Digest, Autumn 1988
(Prospectors and Developers Association of Canada)

"In most countries, including the United States, Canada and Australia, the need for high quality geologic maps has outstripped their production. The shortage of accurate, detailed geologic maps seriously impairs the ability of geologists to fulfill our diverse roles in meeting the dual challenges of economic development and environmental degradation. The problem is global. A mosaic of national solutions is urgently required."

Society of Economic Geologists Newsletter
April 1990, No. 1

[1] Geological Survey of Canada Contribution No. 14590

Introduction

Geoscientific maps constitute a principal earth science information base. In Canada, as in other countries, the number of uses for geoscientific maps in research, planning and development is growing markedly. However, a gap exists and continues to widen between the demands of geoscientific map-users for more up-to-date maps and the production of new maps. As exemplified by the above quotations, calls to satisfy the needs of map-users have been emphatically made by numerous individuals and interest groups in the private and public sectors. It is evident that in Canada a new initiative, co-ordinating the mapping programs of the federal, provincial and territorial surveys, as well as integration of efforts with other mapping activities of academia and industry, would enhance the overall production of geoscience maps. The concept, activities and mechanisms of such an initiative, called "Canada's National Geoscience Mapping Program (NATMAP)", constituted the themes of a workshop held in Toronto on March 8-10, 1990.

History of NATMAP

The concept of NATMAP was developed by an *ad hoc* committee of research scientists from the Ottawa office of the Geological Survey of Canada (GSC)(committee members are listed at the end of this report). This committee produced an internal GSC document in January 1989, outlining a potential GSC National Mapping Program. Following discussions with numerous mapping agencies in Canada during the summer and fall of 1989, a revised program — much broader in scope and potentially involving all mapping agencies in Canada — was outlined in October 1989 in a second internal GSC document, entitled "Canada's National Geoscience Mapping Program (NATMAP): A proposal". This proposal, which was intended to serve as a discussion document to set the stage for development of a National Geoscience Mapping Program, was circulated to provincial agencies in the winter of 1989-90, and was part of the background material sent to participants in the Toronto workshop.

In summary, this proposal suggested that geoscientific mapping in Canada could be enhanced through co-ordination of efforts amongst the various mapping agencies in Canada. Two main themes were suggested for the NATMAP program: (1) regional mapping projects whose principal goal is the complete, multi-parameter synthesis of information from surface geoscience, and (2) thematic mapping projects making use of "vertical mapping" in areas where economic and scientific interests require a knowledge of the distribution of rock units and an understanding of geological processes at depth. The report proposed that a national co-ordinating committee oversee NATMAP activities, evaluate project proposals and solicit funding. Activities within NATMAP were viewed as necessarily being compatible with the development of co-ordinated digital data systems, accepted standards and national small-scale compilation programs. Pooling of resources was considered to be both realistic and desirable in order to generate more cost-effective and scientifically efficient mapping by participating agencies.

The Toronto workshop was convened to stimulate further discussion of the NATMAP proposal among a broad base of Canadian geoscientists. The 70 participants included members of provincial and territorial surveys, industry, academia and the GSC. In advance of the workshop, all participants were provided copies of the GSC's NATMAP proposal and *précis* of nine discussion topics, prepared by members of the GSC NATMAP Committee. Discussion topics included: (1) the concept of NATMAP, (2) core activities, (3) technologies in mapping, (4) database management, standards and compilations, (5) client needs and concerns, (6) promoting NATMAP, (7) mechanisms and implementation, (8) funding mechanisms and (9) potential projects.

Workshop Proceedings

The workshop began with an afternoon and evening series of stage-setting presentations. Ken Babcock (GSC) gave his view of what NATMAP might comprise and noted that co-operation in geoscience mapping is essential in the face of declining funding and an increasing need for baseline geoscience data in a variety of fields. Mitchell Reynolds (United States Geological Survey) presented the US National Mapping Program,

which encourages state governments to carry out co-operative geoscientific mapping to common standards and specifications. Mitchell also made summary remarks about the Australian National Geoscience Mapping Accord, in order to provide workshop participants with information about another on-going national mapping program. John Hamilton (Cominco) related the needs of the Canadian mining industry with respect to mapping activities in a lively presentation requiring audience participation (!) and high-level mathematics. John noted that the total cost of mapping Canada to the appropriate level would be approximately $600 M, and that this sum was considerably less than the amount that the mining industry contributes annually in taxation. In closing this series of talks, Chris Findlay (GSC) introduced the GSC NATMAP proposal by highlighting its main objectives, mechanisms and potential benefits to participating agencies. Chris also summarized the feedback received on the initial GSC document from Canadian mapping agencies during the summer and fall of 1989. Ample opportunity throughout these talks was provided, and taken, for questions and comments from workshop participants.

On the second day of the workshop, the nine topics listed above were argued by six discussion groups, each comprising a mix of nine to twelve participants from various government agencies, industry and academia. Discussion was very lively and continuous, often carrying on through coffee breaks and organized group meals. In fact, the lengthy agenda and the enthusiasm of the discussions were such that most participants did not venture from the hotel until the workshop ended. As the day proceeded, substantive agreement emerged on several points, including the overall concept, goals and objectives of NATMAP.

On the final day of the workshop, summaries of the deliberations of the discussion groups were presented in a plenary session. Summaries were prepared by group *rapporteurs* and leaders during the course of the workshop, utilizing laptop computers brought from Ottawa. The plenary session featured more lively discussion and debate. The workshop was closed by Robin Riddihough (GSC), who reviewed the progress made during the workshop and thanked all participants for their active contributions. Following some final remarks, participants made plans to either head home or somehow catch up on sleep before the start of the annual meeting of the Prospectors and Developers Association of Canada on the next day.

Workshop Recommendations

The following recommendations for a National Geoscience Mapping Program in Canada are based on points of agreement reached during the workshop and recorded in the discussion group summaries. These recommendations are neither all-encompassing nor immutable. They do, however, have the legitimacy of general agreement from a majority of the workshop's 70 geoscientists, who represent a number of mapping agencies across Canada.

(1) The emphasis of NATMAP should be on regional programs of bedrock and surficial geology.

(2) The main priority of the program should be to "fill knowledge gaps" (*e.g.*, economic, geographic, environmental, academic), while striving for greater regional coverage.

(3) NATMAP should foster inter-agency co-operation by co-ordination of mapping activities among universities and federal, provincial and territorial surveys.

(4) The integration of geophysical and geochemical surveys with the geological databases would be beneficial to the program. Available information will be used and new information will be generated if essential, but systematic national geophysical and geochemical surveys should be conducted under other programs.

(5) Given the preceding recommendation, a co-ordinated, multi-disciplinary approach is important. The acquisition and integration of geological and other data should take advantage of shared logistics and scientific cadres.

(6) The nature of the specific problem should control the extent and shape of the area to be mapped.

(7) Transect studies are not the prime focus of NATMAP, but could be considered as an important methodology in some areas. The approach would be different from LITHOPROBE in that it would be spearheaded by geological mapping. In this way, NATMAP would be complementary to LITHOPROBE and not a replacement for it.

(8) In NATMAP's initial phases, efforts should be restricted to the continental landmass. In appropriate situations, near-shore activities might be included.

(9) NATMAP should use existing and future technology for mapping, *e.g.*, digital mapping, but development of technology is not specifically part of its mandate.

(10) Compilation projects, such as 1:1,000,000 scale bedrock maps, should be used for NATMAP planning, but are not a primary product of NATMAP.

(11) A streamlined NATMAP organizational structure is highly favoured. A nine-person National Co-ordinating Committee and a Secretariat, with the centralized Secretariat based at the GSC in Ottawa, was suggested. The Secretariat would run day-to-day affairs, handle correspondence, receive project proposals, promote the NATMAP program, and generally assist co-ordination of mapping activities among various agencies.

(12) The Natural Science and Engineering Research Council (NSERC) should be lobbied to consider geological mapping as research and provide funding for it.

(13) NATMAP should adopt a deliberate policy of employing undergraduate and graduate students with the aim of providing high-quality, on-going field training as a vital component of general geoscience education in Canada.

(14) Digital data acquisition in the field should be a component of all NATMAP projects. Standards for data acquisition should be set at some minimum level, to permit data transfer while allowing scope for innovation. NATMAP should look at standards used by the United States Geological Survey and other agencies, with a view to adopting/adapting them.

(15) All maps in the NATMAP program should be subject to a rigorous peer review process. The relevant study group of the National Geological Surveys Committee should be used to provide a consensus on cartographic standards.

(16) An interim NATMAP Steering Committee, with representation from federal, provincial and territorial surveys, industry and academia, should be established in order to provide direction for more formal guidelines and procedures needed to implement NATMAP.

Many more ideas, suggestions and comments were presented and discussed during the course of the workshop. Most of these have been compiled into a workshop report, which was written by the GSC NATMAP Committee. This document is scheduled for release in July 1990 as GSC Open File 2256, and includes the October 1989 NATMAP Proposal, the workshop topic *précis*, the discussion group summaries, general workshop recommendations and the results of a questionnaire on NATMAP distributed to workshop participants. The report should be of interest to all geoscientists involved in mapping activities in Canada.

Acknowledgements

The GSC NATMAP Committee includes K. Card, F. Chandler, R. Gibb, C. Jefferson, D. Lavoie, A. Menzel-Jones, J. Percival, M. St-Onge (chairperson) and J.-S. Vincent. Roy McLeod, Diane Bouchard and Jody Wagner of the GSC edited and prepared NATMAP-related text and organized the logistics of the workshop and the pre-workshop information packages. The active participation of discussion group leaders and *rapporteurs*, and of all attendees, resulted in a very constructive workshop on a matter of national importance.

Accepted 28 May 1990.