NORTHWEST TERRITORIES

GEOSCIENCE OFFICE

RESEARCH • ANALYSIS • INFORMATION

Strategic Plan 2011-2016

Northwest Territories Industry, Tourism and Investment

Canada

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Introduction

The Northwest Territories Geoscience Office (NTGO) is a partnership between the Government of the Northwest Territories (GNWT) Department of Industry, Tourism and Investment (ITI) and the federal department of Aboriginal Affairs and Northern Development (AAND). It provides geoscience data, information and knowledge as a public good to support evidence-based decision-making by governments, industry, civil society and the general public.

NTGO traces its origin to the NWT Geology Program of AAND, which operated much like a provincial geological survey, focussed primarily on mining development and administration of the Canada Mining Regulations. In 1988, the GNWT Mineral Initiatives Office was established with funding from the Canada-Northwest Territories Economic Development Agreement. When the EDA ended in 1996, the office became part of the newly created GNWT Department of Resources, Wildlife and Economic Development (RWED) and, in the following year, the bedrock mapping activities of RWED and AAND were combined in a single, jointly-managed program. The work of the two departments was more fully integrated in 1999 with the establishment of the C.S. Lord Geoscience Centre, and the mission was expanded in 2000 to include oil and gas geoscience. Responsibility for non-renewable resources within the GNWT was transferred to ITI in 2004, and the name of the C. S. Lord Geoscience Centre was changed to the Northwest Territories Geoscience Office to better reflect its role. While the mission of NTGO remains firmly focussed on mineral and petroleum resources, it is seeing a growing demand for public geoscience information to address issues of land management, sustainable infrastructure environmental stewardship, and adapting to the changing climate.

This strategic plan envisions NTGO's future as the principal source of public geoscience information about the Northwest Territories (NWT). Realization of this vision would require, among other things, that the capacity of the office be broadened and deepened to address the not only the needs of traditional users in the mining and petroleum industries, but also those concerned with these other issues. As the only critical mass of geoscience expertise in the territory, NTGO would be a logical foundation upon which to build capacity in the NWT.

In delivering its mission, NTGO is often called upon to provide unbiased scientific advice about issues where stakeholders' opinions diverge. In this context, its role is to be an honest broker of geoscience information - to inform without advocating.

Mission and Vision

Mission Statement

Our mission is to map, interpret and explain the geology of the Northwest Territories to inform decisions by governments, industry, and the public concerning the responsible development of mineral and energy resources, use of the land, and protection of the environment.

Vision

The NTGO will be recognized as the principal source of public geoscience knowledge about the economy, land and resources of the Northwest Territories.

Strategic Outcome

The people of the Northwest Territories benefit from the responsible use of their land.

Stakeholders – Clients, Users and Partners

The ultimate beneficiaries of the work of NTGO are the people of the NWT. However, in shaping a program that best serves the public interest, the office must address the needs and priorities of a broad range of stakeholders – clients, primary and indirect users, suppliers and partners.

Clients or customers are those that pay for a service. NTGO currently receives funding from three sources: – AAND, ITI, and the Canadian Northern Economic Development Agency (CanNor). NTGO will seek funding from other sources where appropriate and consistent with its mission.

Primary users are those that directly access the geoscience expertise and information provided by NTGO. In approximate order of frequency of use, these include the mining industry; petroleum industry; geoscience service industry; federal, territorial, and aboriginal government departments, boards and agencies; communities and the general public.

Indirect users avail themselves of NTGO information through an intermediary such as a private consultant or another government agency. It is sometimes difficult to know the identity and needs of these users, but they are an important constituency.

Partners are critical to NTGO's ability to deliver its mission. NTGO recognizes that the availability of the public geoscience information required to meet the needs of the NWT is contingent on its ability to successfully influence other organizations and implement appropriate partnerships. Current partners include Geological Survey of Canada (GSC), the GNWT Department of Environment and Natural Resources, and several universities.

Governance

The governance of NTGO is set out in a Memorandum of Understanding between GNWT Department of Industry, Tourism and Investment and the federal Department of Indian Affairs and Northern Development, the most recent version of which was signed in January 2010.

The partners are individually responsible for salaries of their own staff and share infrastructure costs on an in-kind basis. AAND provides the building, building maintenance, and telephones, while ITI is responsible for computers and IT support.

NTGO is managed on a collaborative basis by the Chief Geologist of AAND and the Senior Geologist of ITI. These managers are individually accountable to their respective departments, and jointly responsible for the development of work plans, budgeting, staff supervision, and representing NTGO to the outside world (e.g., Committee of Provincial Geologists, media relations).

A six-member Joint Advisory Committee is the principal source of external advice to NTGO. It reports at least annually on the performance and strategic direction of the NTGO to the Regional Director General (NWT), AAND and the Deputy Minister, ITI.

The Planning Environment

Non-renewable resources are the principal drivers of economic prosperity in the Northwest Territories, currently accounting for about two-thirds of the Gross Domestic Product. The value of mineral production amounted to $2 billion in 2010, while oil and gas production was valued at $477 million. It is estimated that completion of the Mackenzie Gas Project could boost annual oil and gas production to $2.2 billion by the end of the decade, but in the meantime there are significant opportunities for increased production close to existing infrastructure. The fact that diamonds account for 99 percent of mineral production raises two key considerations for strategic planning: the need to sustain diamond production into the future, and the need to diversify mineral production to make the economy less sensitive to the market conditions of a single commodity. Priorities with respect to energy include the discovery and development of oil and gas that can take advantage of existing infrastructure, and advancing opportunities to reduce dependence on imported diesel fuel for space heating and power generation. While development of the territory's abundant hydroelectric resources is seen as essential to addressing the latter need, exploitation of local gas sources and geothermal energy may be viable options for some communities.

The availability of public geoscience information is a key determinant of the investment climate for resource exploration. It increases economic efficiency because industry does not have to duplicate broad-scale precompetitive surveys. By allowing companies to focus their efforts on areas of highest potential, it not only lowers costs, but also reduces the "footprint" of exploration.

Geoscience information is also essential in siting, designing, and building of all manner of physical infrastructure. This information is used to assess the structural suitability of the ground, the proximity to natural hazards, and the local availability of aggregate and other building materials. On a broader scale, understanding of resource potential can inform decisions about locating transportation infrastructure to best serve future development needs.

A Fragile Environment

The land holds a special place in the hearts of all Northerners, but especially of indigenous peoples pursuing traditional lifestyles. The fact that so much of the land of the NWT is pristine offers opportunities for conservation not available in more developed parts of Canada. For these reasons, land use planning and environmental protection are of particular importance. At the same time, the current regulatory framework is perceived as an impediment to economic development, particularly with respect to non-renewable resources. Federal, territorial and aboriginal governments seek to promote both responsible economic development and environmental integrity, and are committed to evidence-based regulatory decision-making. Specific priorities, broadly shared by governments and industry, include completion of the NWT Protected Areas Strategy, completion of land-use plans in Land Claim Settlement Areas, efficient environmental impact assessment, and effective delivery of the community-based Cumulative Impacts Monitoring Program. Geoscience information is needed to a greater or lesser extent in support of each of these.

A Changing Climate

It is often said that the impacts of climate change will be felt first in the North. The cryosphere is particularly sensitive, and the reduced extent and thickness of sea, lake and river ice is already noticeable. Similarly, shorter ice road seasons and reduced weight limits are anticipated. Permafrost degradation can trigger ground heaving, slope failure

and subsidence, accelerate erosion of river and stream banks with potentially severe consequences for all types of infrastructure. Rising sea levels will promote coastal erosion and more frequent flooding of low lying communities. These changes have the potential to profoundly affect Northerners'' way of life and economic prosperity, and it is clear that society will need to understand and adapt to them. Recent studies by government and external bodies alike have emphasized the role of scientific knowledge in meeting this challenge. A specific geoscience priority identified in the GNWT Climate Change Impacts and Adaptation Report is better mapping of permafrost, which is required for adaptation planning for all types of infrastructure.

Evolving Governance

The structure and responsibilities of various government entities in the NWT are likely to change significantly over the planning period as a result of two ongoing processes. The first is devolution. Agreement in Principle was reached in January 2011 to devolve remaining "provincial-type" responsibilities from the federal to the territorial government, including administration, control and management of Crown land, water, mines, minerals and oil and gas. The two parties have undertaken to make best efforts to conclude a final agreement within one year. The second is the comprehensive land claims and self-government negotiation process. Comprehensive land claim agreements have been settled in the Inuvialuit (1984), Gwich'in (1992), Sahtu (1993), and Tlicho (2003) areas, and negotiations are proceeding with the Dehcho, Akaitcho, and Northwest Territory Metis Nation. Self-government negotiations are under way with the latter three, as well as the Deline, Norman Wells, and Tulita communities. Regardless of the outcome of these various negotiations, the underlying need for geoscience information in the NWT will not change. What is in play, however, is whether these needs will be met and by whom. Effective and efficient delivery of public geoscience is in the interests of all stakeholders.

Building Science Capacity

The GNWT science agenda- Building a Path for Northern Science - was approved by the Legislative Assembly in 2009. The agenda identifies the need for a systematic and long term approach to science capacity-building in NWT as well as priorities to guide this. Five priorities were identified: cultural sustainability, environmental science and stewardship, health and wellness, natural resource management, and sustainable communities. NTGO already contributes significantly to elements of natural resource management including assessment of natural resource potential, diversification of the commodity base, unconventional energy, and environmental impact assessment. Elements of other priorities also have geoscience dimensions including the impact of changing permafrost regimes on infrastructure (under sustainable communities) and groundwater hydrology (under environmental science and stewardship). A strategic question for NTGO is the extent to which it can and should be involved in addressing these other priorities.

For its part, the Government of Canada has announced important science initiatives as part of Canada's Northern Strategy. These include the Canadian High Arctic Research Station (CHARS) to be established at Cambridge Bay, Nunavut. It is expected that once operational, CHARS mission will be to "advance Canada's knowledge of the Arctic in order to improve economic opportunities, environmental stewardship, and the quality of life of Northerners and all Canadians". For these purposes, the Arctic is defined to include lands and waters north of the southern limit of permafrost. It is envisioned that CHARS will anchor a network of research infrastructure in the North and there should be opportunities for synergy with NTGO.

NWT Geoscience Office Goals and Plans

Goal 1: **To ensure the availability of regional geoscience knowledge about the Northwest Territories to support natural resource management, environmental stewardship, and sustainable communities.**

Strategy 1.1: Increase regional bedrock, surficial, geophysical and geochemical map coverage.

Planned Actions

1.1.1 Evaluate the state of regional geoscience map coverage as a basis for setting priorities and targets for further work in consultation with partners and clients.

1.1.2 Work with partners to increase map coverage in priority areas.

1.1.3 Continue timely production of high-quality, geoscience map data and information.

1.1.4 Continue development of digital collection of geosciences field data and information, incorporating evolving information technology.

Strategy 1.2: Interpret and explain the geology of the NWT, to add value to regional geoscience information, attract research investment, and support informed decision-making.

Planned Actions

1.2.1 Work with partners in universities and the Geological Survey of Canada (GSC) to address significant gaps in knowledge of the geology of the Northwest Territories.

1.2.2 Release the next instalment of the geological compilation of the NWT.

Performance Indicators[1]

1.1.1: Evaluation completed and reviewed by NTGO Joint Advisory Committee.

1.1.2: Percentage of relevant NWT land area with adequate mapping of prescribed types and scales.

1.2.1: Number/value of collaborative research projects and number of theses supported.

1.2.1: Stakeholders confirm significance of problems addressed and relevance of work undertaken.

1.2.2: Geological compilation released on time.

[1] The number and timeliness of actual outputs (maps, reports, data) relative to annual work plan commitments are routine performance indicators in all areas.

Goal 2: **To promote the discovery of mineral resources in the NWT by documenting resource potential, by generating regional and thematic geoscience knowledge to underpin successful exploration, and to provide scientific advice to inform policy decisions.**

Strategy 2.1: Support mineral resource management decisions and an efficient regulatory regime.

Planned Actions

2.1.1: Support the administration of the Northwest Territories and Nunavut Mining Regulations by reviewing the geoscience content of representation work reports submitted by industry.

2.1.2: Monitor and report on exploration activity in NWT from a geoscience perspective to inform decision-making in both government and industry.

2.1.3: Develop value-added compilation products based on representation work reports.

Strategy 2.2: Increase understanding and awareness of the mineral resource potential of the NWT, with a view to sustaining the contribution of mining to the economy.

Planned Actions

2.2.1: Undertake metallogenic studies, integrated with regional mapping to the extent possible, with an emphasis on mineral deposit types having potential to diversify mining production (including industrial minerals, building stone, and precious stones other than diamonds).

2.2.2: Increase the understanding of the diamond potential in the NWT and develop indicator mineral and other exploration databases.

2.2.3: Provide geoscience information to support community-based mineral development initiatives.

2.2.4: Ensure that the mineral occurrence (NORMIN) and publication databases are kept up to date.

Performance Indicators

2.1.1: Amount of use of representation work reports as indicated by download statistics.

2.1.2: Client feedback about the usefulness of the annual Exploration Overview report and satisfaction with advice provided to government.

2.2 (All): Exploration industry use of and satisfaction with information.

2.2 (All): Companies confirm that NTGO information influenced their decisions, including where to explore and strategies to use.

Goal 3: **To promote the discovery of energy resources in the NWT by assessing resource potential, by generating regional and thematic geoscience knowledge to underpin successful exploration, and to provide scientific advice to inform policy decisions.**

Strategy 3.1: Provide regional geoscience information (e.g., sedimentologic, stratigraphic and structural analysis; petroleum systems evaluation; basin modeling) to support industry exploration for oil and gas. Work will focus initially on areas where discoveries could tie-in to existing infrastructure.

Planned Actions

3.1.1: Complete thematic reports and petroleum potential studies of Mackenzie Plain, central NWT.

3.1.2: Provide data and information to support calls for nomination/bids.

3.1.3: Where possible, ensure correlation of results to areas where industry is more active.

3.1.4: In collaboration with partners, develop a petroleum database to increase accessibility to geoscience and industry legacy information.

Strategy 3.2: Support the assessment of energy resources that are not yet exploited in the NWT, including unconventional oil and gas, geothermal energy, and uranium.

Planned Actions

3.2.1: Following the recommendations of the 2010 scoping study, take a proactive approach to unconventional resources research (e.g., determine extent of shales in the NWT having gas and oil potential, collaborate with partners on gas hydrates research, pursue research on deep subsurface aquifers).

3.2.2: Work with partners to provide geoscience information and advice to better assess the geothermal energy potential of the NWT.

Strategy 3.3: Support potential community initiatives to develop local energy sources.

Planned Actions

3.3.1: Work with communities to support development of geothermal energy.

3.3.2: Work with communities to support development of local natural gas supplies for co-generation of electricity.

Performance Indicators

3.1 (All): Exploration industry use of and satisfaction with information.

3.1 (All): Companies confirm that NTGO information influenced their decisions, including where to explore and strategies to use.

3.2.1: Information on unconventional oil and gas resources is used by exploration industry.

3.2.2: Extent of interest in geothermal potential.

3.3 (All): Community satisfaction with information and advice provided by NTGO.

Goal 4: To promote evidence-based decisions affecting land use, environmental protection, and infrastructure security

Strategy 4.1: Ensure that land use and environmental regulatory decisions are informed by an adequate understanding of resource potential and terrain hazards.

Planned Actions

4.1.1: Provide non-renewable resource assessments of areas being evaluated for designation under the Protected Areas Strategy (PAS) or similar initiatives.

4.1.2: Engage relevant government departments, regulators, and community representatives to better understand their geoscience needs and to identify opportunities to support their decision-making. Follow-up by being responsive to requests for geoscience information relevant to land use planning, environment impact assessment, and constraints on development.

4.1.3: Investigate opportunities to provide geoscience information to the Cumulative Impacts Monitoring Program.

Strategy 4.2: Working with partners in government, communities and academia, contribute to the understanding of the impact of climate change on the northern environment and, in particular, on actual and proposed infrastructure.

Planned Actions

4.2.1: Support completion of studies of the long term viability ice road routing and of permafrost conditions.

4.2.2: Contribute to territorial and community adaptation planning.

Performance Indicators

4.1.1: Stakeholder satisfaction with PAS resource assessments.

4.1.2: Increased recognition of relevance of geoscience as measured by number and nature of user interactions.

4.1.3: Extent of NTGO involvement in CIMP.

4.2.1: Results used in infrastructure planning.

Goal 5: Excellence in information management, discovery & dissemination.

Strategy 5.1: To ensure the timely availability of high-quality, geoscience data, information and knowledge.

Planned Actions

5.1.1: Continue to populate databases in timely fashion and release the results of our research to our clients.

5.1.2: Develop and implement a plan to reduce the data entry backlog over the long-term.

5.1.3. Ensure that the NTGO's network environment (IT) remains at the leading-edge of rapidly evolving technological developments and user needs.

Strategy 5.2: Provide a highly accessible web-based delivery system for data and knowledge.

Planned Actions

5.2.1: Ensure that NTGO's web service, data query and retrieval systems remains at the leading-edge of rapidly evolving technological developments and user needs.

5.2.2: Improve "Help" resources and user feedback methods.

Strategy 5.3: Ensure integrity and accessibility of physical information assets.

Planned Actions

5.3.1: Develop and implement a plan to increase the accessibility of historical industry data and assessment files.

5.3.2: Develop a plan for the management of the rock and drill core collection, including storage, curation and access.

Strategy 5.4: Promote knowledge and understanding of the relevance of geoscience to society with particular reference to the NWT.

Planned Actions

5.4.1: Develop and implement a plan to provide information about NWT geoscience projects to Aboriginal governments, teachers, students, and the general public.

5.4.2: Develop and implement a plan to provide geoscience educational materials and career information and activities to NWT communities.

Performance Indicators

5 (All): Satisfaction of users, external and internal, with information services.

5.2.1: Web use statistics (number and breadth of user base, number of downloads).

5.3.1: Statistics on volume of historical industry data that is accessible.

5.3.2: Plan for management of rock and drill core collection endorsed by senior management and Joint Advisory Committee. Implementation will likely depend on funding.

Goal 6: To position NTGO to assume the role of a "full service" geological survey to better meet the geoscience needs of the Northwest Territories.

Strategy 6.1: Pursue opportunities to expand the science capacity of NTGO not only to ensure the robustness of current program areas, but also to address emerging needs related to climate change adaptation, environmental protection, and land use management.

Planned Actions

6.1.1: Develop a business case to demonstrate how a modest expansion in the capacity of NTGO would make NWT less reliant on non-resident geoscience expertise to address important issues.

6.1.2: Promote opportunities to co-locate or consolidate existing geoscience expertise in NTGO.

Strategy 6.2: Raise the profile of public geoscience and of NTGO's role.

Planned Actions

6.2.1: Engage stakeholders beyond the mineral and petroleum exploration sectors to better understand their geoscience needs. Continue to use the Geoscience Forum to increase awareness of broader implications of geoscience.

6.2.2: Expand the Joint Advisory Committee to include representation from the environmental geoscience industry, land use planning and regulatory boards.

6.2.3: Participate in evolution of GNWT science agenda and forge linkages with CHARS.

Performance Indicators

6.1.1: Business case completed and submitted to relevant authorities.

6.1.2: Opportunities identified and pursued.

6.2.1: Breadth of NTGO user base, as indicated by web statistics and contact-logging.

6.2.2: Joint Advisory Committee membership expanded; advice received represents broader range of geoscience needs in NWT.

6.2.3: NTGO is perceived as contributing to evidence-based decision making beyond its traditional remit as indicated by user feedback.

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