

Geoscience

GOVERNMENT GEOSCIENCE IN SUPPORT OF MINERAL EXPLORATION

A new study commissioned by the PDAC¹ has highlighted the positive contribution that federal, provincial and territorial geological surveys make to the exploration and discovery of mineral resources in Canada. The geoscience information provided by governments as a public good is one of Canada’s competitive advantages in attracting mineral exploration and has contributed to its standing as a leading mineral producer. The study concludes that a more robust public geoscience effort should be part of a strategy to deal with decreasing rates and increasing costs of mineral discovery.

THE ROLE OF GOVERNMENT GEOSCIENCE IN MINERAL EXPLORATION

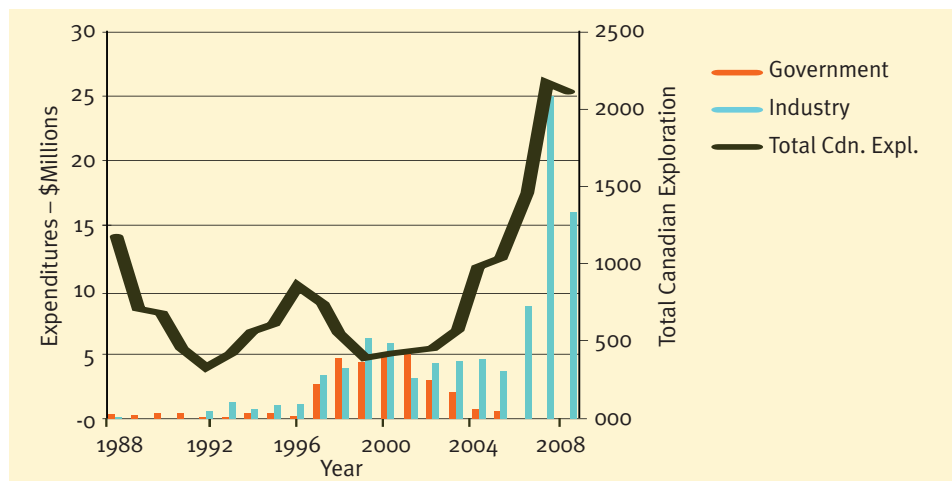
Most mineral resources in Canada are public assets. Our governments have, without exception, determined that the responsible development of these resources is in the public interest. Much of the geoscience information that underpins exploration has the economic characteristics of public goods, the provision of which is a central role of government.

Government geoscience attracts exploration investment by allowing industry to identify areas of favourable mineral potential. It increases exploration efficiency by making it unnecessary for individual companies to duplicate common information or to spend money on non-prospective ground. Public geoscience increases exploration effectiveness by providing key information inputs to risk-based decision-making. Because exploration occurs at the beginning of the mining cycle, its cost can have a disproportionate impact on the return on investment in a project. By reducing exploration costs, public geoscience not only improves returns on private investment but also increases revenues accruing to governments as royalties and taxes.

THE IMPACT OF GOVERNMENT GEOSCIENCE

The study reviews the evidence for the causal relationship between public geoscience, private exploration and discovery, mineral production, and the ultimate benefits to society in terms of economic development, employment, and prosperity. There is ample evidence that government geoscience stimulates private sector exploration. Program evaluations suggest that 6 of 10 mapping projects have immediate impact in terms of claim staking or new exploration activity. User surveys typically attribute 30 to 100 percent of increased activity to government input in these cases. Although incremental increases in exploration expenditures are difficult to quantify, the widely quoted assertion that *every \$1 million of government investment to enhance the geoscience knowledge base will likely stimulate \$5 million in private sector exploration expenditure* is a reasonable estimate. While users are almost unanimous in their view that government geoscience increases exploration efficiency and effectiveness, there have been few efforts to quantify these impacts. However, surveys of diverse user groups suggest efficiency improvements of 5 to 20 percent, and the impact could well be greater in the early stages of mineral exploration.

Grand Nord, Quebec – Geoscience stimulates exploration



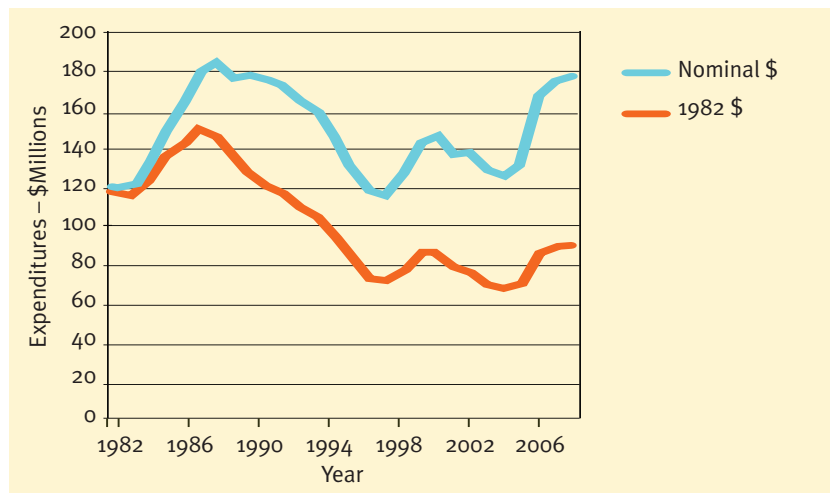
The reach of public geoscience is broad: it is virtually impossible to identify all of the actual and potential users. While it is safe to assume that any companies holding exploration licenses or claims in a given area have used available government maps or reports, there is no way of knowing how many other firms have reviewed this same information in the planning or reconnaissance stages of exploration. Moreover, the same public geoscience information is used in a range of other applications.

HOW MUCH GOVERNMENT GEOSCIENCE IS ENOUGH?

Governments seek to sustain or increase mineral production in existing mining camps and to promote new economic development, especially in areas with few other potential sources of prosperity. Economic analyses have shown that the provision of public geoscience is one of the most effective policies to achieve this goal. Although the amount of public geoscience necessary to achieve this goal is not readily predicted, the evidence suggests that the level of expenditures in Canada has been insufficient. Mineral discovery rates have decreased over the past two decades and discovery costs have increased. This has contributed to declining production and reserves of several important metals.

Government survey spending has decreased substantially over the same period. While there have been some recent increases, average annual expenditures during the past decade were 40 percent lower in constant dollars than during the 1980s. Canada's federal, provincial and territorial governments collectively spent \$1.8 billion less on their geological surveys than would have been the case had budgets been sustained at 1980s levels in inflation-adjusted terms. Enhanced government geoscience is one of the ingredients that will be required to "bend the curve" of discovery costs in Canada.

Total Government Survey Expenditures



1. *Government Geoscience: Public Policy Rationale and Impact*, prepared for PDAC by J.M. Duke, Ph.D. The illustration of Grand Nord Quebec is based on data provided by Geologie Quebec.