Goal 4: To provide Canadians with safety and security in the natural resources sector

OBJECTIVES

People are central to the sustainable development equation. Progressive societies that are pursuing sustainable development need to be confident that programs are in place to ensure public safety and security. Government's role in this process is to instill confidence in people and communities that the public good is paramount. It is in this sense that NRCan has a role to play in advancing this Goal.

NRCan provides many products and services that support the institutions of public governance as part of a strong economic and social fabric. Its contributions include science and technology, legislation, regulations, codes and standards which reduce the health and safety risks associated with disasters and the development of resources.

Risks can range from direct on-the-job extraction activities, to ensuring that disasters can be dealt with in a timely manner, to identifying potential hazards that may arise from future access to resources. We must be confident that our interactions with natural resources do not put Canadians at risk.

4.1 Safeguard Canadians

NRCan works to ensure that Canadians are safe from the risks associated with natural resource development and use. Through research, science and technology, we may mitigate or eliminate risks. Risk assessment – the evaluation of the probability and magnitude of adverse effects from climate, earthquakes and landslides, fire and flood – enables NRCan to further safeguard the safety of Canadians. NRCan also undertakes risk management, which involves deciding how to prepare against possible dangers and what actions to take.

Technological advancements are the core of *SDS – Now and for the Future*: new concepts, technologies and information dissemination methods are enabling NRCan to provide hazard information more reliably and quickly.

Action: Monitor and address natural hazards and disasters

Issue	Approach	Target	Anticipated outcome
The earth and its processes pose a variety of hazards to human safety and infrastructure. NRCan has had an active program to monitor, understand and provide advice on such phenomena, including earthquakes, landslides, magnetic storms, volcanic eruptions, permafrost instability and explosive gas hydrates. New technologies, concepts and information dissemination methods will permit NRCan to provide hazard information more reliably and more quickly to mitigate the potential consequences to human safety and damage to buildings and service infrastructure.	NRCan will increase Canadians' capacity to predict, monitor, report and cope with natural hazards and disasters, and to mitigate their deleterious effects.	By 2002, publish new seismic hazard maps and hazard information for Canada and make data available on-line. By 2002, make client-tailored, online, magnetic forecasts routinely available. By 2002, publish the national landslide database, hazard map and synthesis of landslide hazard. By 2003, complete topographic mapping (including digital coverage) at scales suitable for resource exploration and development in the North.	*Reduce social, economic and environmental losses due to natural hazards, to provide reassurance to Canadians.*
NRCan is called upon to quickly provide maps and information needed by emergency teams responding to disasters. Many current paper maps of Canada are outdated, making them less relevant to rescuers. As well, clients increasingly require digital maps, data and on-line access, in addition to paper maps.		Through 2001, generate Internet-accessible fire reports, maps and tables as provided by the Canadian Wildland Fire Information System and the Fire Monitoring, Mapping and Modeling System (Fire M3), on a daily basis.	*A clearer, more up-to-date picture of fire activity in Canada, to permit better fire suppression resource deployment decisions, saving money and time.*

4.2 Spatial positioning, mapping and boundary maintenance

Canada's national spatial reference system has served as the foundation for surveys and mapping and is now extending to a multitude of disciplines involved in developing physical and spatially-related information infrastructures that use new technologies. Under ***SDS – Now and for the Future***, access to this system will be improved, spawning direct economic benefits by providing a national standard to facilitate the sharing and integration of spatially-referenced data, as well as enabling operational efficiencies and new applications such as intelligent transportation and precision farming that support sustainable development.

Action: Improve Canada's spatial reference infrastructure and the topographic information base

Issue	Approach	Target
Satellite positioning systems have spawned a revolution in positioning capability resulting in new opportunities and demands for access to a highly accurate spatial reference system. NRCan maintains a modern, nation-wide, infrastructure to support the Canadian Spatial Reference System (CSRS). This system provides the framework of reference for positioning, necessary to secure the economic, environmental and social benefits of integrating spatially-referenced data, which is becoming more prevalent in today's technological society. While all nations require a positioning infrastructure in order to thrive in the information age, Canada's challenge lies in serving an immense and sparsely populated country.	Maintain, improve and ensure access to an increasingly accurate Canadian Spatial Reference System (CSRS) as the globally consistent foundation for spatially related knowledge associated with land and natural resources development and management, natural hazards, the environment, and a growing list of disciplines.	By 2001, meet targets to support an operational, Canada-wide Differential GPS Service (CDGPS) via MSAT satellite – a service to improve GPS-derived positions to a 1–2 metre accuracy. By 2002, develop an improved airborne gravimetry system, in collaboration with academia and industry. By 2002, establish a post-glacial rebound monitoring network. By 2003, establish an improved model of mean sea level (geoid) surface.
Geographically referenced information is increasingly crucial to the Canadian economy and to the wellbeing of its people. New tools to aid in the interpretation and application of geographic information are continually being developed to address society's problems and needs. A key element of success in the information age will be our ability to meet the need for current, accurate shareable map data.	NRCan will create a national base of topographic information as a fundamental underpinning to a broad base of geospatial applications in Canada. This new and unique coverage will be built from the royalty free Landsat 7 satellite imagery, allowing for unlimited redistribution of the related products. The images will be acquired by a broad coalition of the main geomatics stakeholders in Canada including provincial and major federal organizations in the field of geomatics. The image will be geometrically corrected using the best ground control available in Canada.	By 2003, produce an up-to-date, accurate and homogenous orthorectified satellite image of the entire country.

Anticipated outcome

An accessible infrastructure for sustainable development and related leading-edge positioning applications in Canada.

Anticipated outcome

Increased capacity and competitiveness in the emerging information economy.

A better connected, more enabled Canadian society.

4.3 Safe use of explosives and pyrotechnics

NRCan is the Government of Canada's primary source of expertise on explosives technology and regulation. As part of the Department's mandated responsibility to administer the *Explosives Act* and Regulations, NRCan authorizes and classifies all explosives used in Canada, regulates the use of display fireworks and pyrotechnics, trains and certifies fireworks supervisors and special effects pyrotechnicians, investigates accidents and incidents, and performs R&D related to explosives and pyrotechnics.

The Department's work on counter-terrorism related to explosives is an important aspect of promoting safer communities in Canada. In this regard, NRCan will increase its contributions to the fight against the use of explosives in criminal and terrorist acts at home and abroad.

Action: Promote safe communities by increasing public security related to explosives

Issue	Approach	Target	Anticipated outcome
There is increased awareness on the part of the international community with regard to terrorism and the use of explosives in terrorist acts. Canada has made a commitment to focus attention on new and emerging threats to Canadians and their neighbours around the world.	Contribute to the development of explosives detection and protection technologies and to the development of regulations to increase controls over explosives used in acts of terrorism. Partners include other government departments, international regulatory agencies, international law enforcement agencies, the US government and private industry.	By 2002, amend the *Explosives Act* to accommodate counter-terrorism initiatives. By 2002, build an Internet-based module called GERM (Global Explosives Regulatory Module) that will facilitate secure communication between international regulators, promoting increased control over items such as detonators which are used by terrorists. By 2003, perform research under the Canada/US Counter-terrorism R&D Program, on technologies to enhance detection of explosives. By 2003, perform studies on the effectiveness of advanced materials in increasing the blast resistance of windows and concrete building elements.	*Improved and more effective regulation of explosives in Canada.* *Increased public security through enhanced detectability of terrorist bombs and enhanced protection of occupants of federal buildings judged to be at risk.*

4.4 Enhance safety and security

In partnership with industry, the provinces and territories, NRCan works to improve the health and safety of all Canadians who work in, or are affected by, the natural resources sector. Health and safety regulation in Canada is the responsibility of the provinces and territories. However, for the most part they do not have the capacity to perform S&T related to mining health and safety. NRCan shares its S&T expertise, transferring its knowledge and technologies to reduce workers' injuries, including death. Application of appropriate technologies in underground mines makes for a healthier, more productive workplace and work force, and supports sustainable communities. For many years, NRCan has been a member of the Canadian Association of Chief Inspectors of Mines and has provided technical assistance and research support on health and safety issues.

Action: Enhance health and safety for mine workers

Issue	Approach	Target	Anticipated outcome
NRCan has been asked to assist in defining basic solutions for risk situations, work cooperatively with supporting parties to develop required technologies, and to provide sound science in support of the provincial/territorial regulations.	Perform S&T to develop knowledge and technologies to reduce potential health and safety hazards for mine workers. Partners include provincial/territorial chief inspectors of mines, mining companies, equipment manufacturers, and academia.	By 2002, develop prototype technology for vibration reduction for portable mining equipment. By 2003, contribute to improved diesel particulate sampling by developing a sampling system as well as a sampling and analysis protocol to meet new exposure guidelines. By 2003, provide improved underground air quality by optimizing ventilation air systems.	*A healthier work force which incurs fewer injuries.*