

ability and enable farmers to take better account of environmental considerations. Data supplied by a number of sources, ranging from measurements taken in the field to data collected from space, are used to assess the current condition of soils and crops. Changes in the state of these conditions can be monitored over time, providing the information required for near real time mitigation or for prescribing soil and crop treatments for subsequent years. Once fertilizing or harvesting needs have been identified using images from remote sensing satellites, in some instances, GPS technology can be used to guide the application of fertilizer or harvesting equipment.

Forests

The earth sciences help promote the sustainable management of Canada's forests. Governments and forest companies use remotely sensed data to collect information on forest type and health, as well as the extent of harvests and burns, among other things. GIS technology is being used in Canada to monitor forestry programs, assess site access routes, and manage reforestation efforts. The Government of Canada is developing thematic layers of data that are significant in the development and monitoring of criteria and indicators of sustainable forest management. GPS is used by forestry companies in Canada to record the location of trees within forests and to make decisions about which trees to cultivate. Satellites are also used to track forest fires and to identify forest fire hot spots.

The Global Positioning System (GPS) is an important geomatics tool. GPS is a constellation of satellites that beams signals to earth where they are picked up by receiving devices that range from hand-held units to more sophisticated vehicle-mounted and stationary equipment. Learn more at <http://www.geocan.nrcan.gc.ca/geomatics>

Minerals and Energy

Geoscience knowledge makes a fundamental contribution to the sustainable development of Canada's mineral and energy resources. In particular, geoscientific mapping and research are used to find new mineral and energy resources, to increase extraction and processing efficiency and transform raw material into value-added products, and to monitor and remediate deposit sites throughout their life cycle. Geoscience mapping and resource studies are of particular importance in rural and northern areas that have mineral and energy potential of economic significance — the creation of jobs, the stimulation of economic development, and the support of healthy, sustainable communities. Geoscience knowledge is also essential to land use decision making where land is restricted or excluded from resource exploration and development. For example, assessments of mineral, energy, and hydrogeological resources are used in defining or delineating national parks and marine protected areas.