THE ROLE OF GEOMATICS IN DEVELOPING THE ENVIRONMENTAL INFORMATION INFRASTRUCTURE

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1. Introduction

A considerable amount of discussion, debate and studies on the threats to the environment, the need for action now to protect the environment and the need to develop environmentally sound strategies for economic development have brought these issues to the public and political forums. A multitude of task forces, conferences and forums have set the stage for the necessary action.

Some might say that to date there has been a lot of talk and little action. However, important progress has been made in the areas of research required to understand the underlying issues. New environmental sciences based on ecology and ecosystems have matured. Projects both large and small have demonstrated that conservation and clean-up can be successful. Not only has there been considerable progress in developing the methodology of environmental impact assessment but the process is also accepted and applied to new initiatives that will affect the environment.

Most important from a business point of view is the new public and political awareness of environmental issues. The public recognizes that action must be taken and consequently politicians can now act with wide public support. This means that government resources can be committed to environmental programs along with new legislation to strengthen the mandate for action.

Nevertheless, most would agree we are only at the beginning of developing economies built on environmentally sound, sustainable development principles. A lot of warning flags are up: climate, ozone, dioxins, cancer, etc. The research so far has mainly been discipline specific and research scientists have to base their results on sparse data sets. Consequently, conclusions are open to debate among the scientists, challenged by their opponents and subject to error by the decisionmakers.

What is the next stage of development? The framework for the Report of the National Task Force on Environment and the Economy is based on the principles of 'shared responsibility and integrated decision making. The recommendations reflect the fundamental importance of education and informed decision making within and among all sectors of Canadian society'. What does this mean in terms of work? What needs to be done in order to be able to achieve these objectives? Are there business opportunities for the private sector to carry out the work? Are there opportunities for Canada to develop expertise,
products and services from this work that can be exported? Today we know what needs to be done to support education and informed decision making and yes, there are business opportunities.

In fact there are many good examples in Canadian history of how we have developed an industry in Canada to meet Canadian needs and then exported the expertise, products and services. One example is the aerial surveying and mapping industry and this example relates directly to the challenges and opportunities of surveying and mapping the environmental and resource parameters. In the broad fields of surveying and mapping, surveying or data collection is the process of measurement; mapping is correlating or showing the relationships of the data.

The business opportunities in developing this multipartite information support structure to initiate environment-economy integration can be discussed at three different levels: the project or program level, information infrastructure, and value-added products and services.

2. Projects and Programs and Mission Oriented Departments

Two projects designed to integrate multipartite processes are mentioned in the Progress Report of the Report of the National Task Force on Environment and the Economy – the St. Lawrence River Project in Quebec and the Cargill Project in Alberta. Several other projects are also being developed in Canada that involve interdepartmental (federal and provincial) coordination and cooperation. Each of these projects is attempting to integrate and correlate diverse data sets involving environmental, resource and economic parameters. In each of these projects the scientists are dealing with the problems of inadequate data; data that has been collected and processed for other applications, resulting in the difficulty of mapping multipartite processes. Common to virtually all of these problems of data integration is the spatial location of the data necessary to allow accurate correlation.

These problems occur because most program departments are currently mandated to collect data to support research in their specific disciplines. These include the provincial and federal mapping departments which provide base mapping including land use, property ownership, resource parameters, etc. The Environment, Agriculture, Energy, Forestry, Health, Fisheries departments etc. are all to some degree involved with the acquisition of geographical data and in developing and managing geo-related databases. In most cases the data is collected, processed and managed to meet the specific needs of the department. Seldom is it collected for general use by other government departments, industry or non-government uses.

In this context the existing research of the relationships of resource and economic parameters in support of sustainable development has been exploratory at best. Often the data that is available is inadequate for clear, undisputed decision-making which is both environmentally and economically sound. Based on this inadequate data, environmentalists are often accused of overstating the issues and/or that they are basing conclusions on unreliable data. The developers are accused of withholding data and/or basing decisions