Charting a course for network research: GEOIDE's research directions

Nicholas R. Chrisman
Scientific Director, Réseau GEOIDE Network; Professor Université Laval, Québec CANADA

BACKGROUND

Established in 1998, GEOIDE (GEOmatics for Informed DEcisions) is a research network group assembling 130 researchers at 31 universities across Canada, in a range of fields including termed "geomatics" in Canada (including surveying, geodesy, photogrammetry, remote sensing, geography, planning, and geographic information science). This network is funded through the Networks of Centres of Excellence (NCE) [1] programme, a permanent programme of the Government of Canada. After a rigorous review process in 2004 that mobilized talents from across the network, our second NCE funding cycle (2005-2012) was assured. At about the same time, Nicholas Chrisman became Scientific Director.

Figure 1: The GEOIDE logo depicts a three-dimensional Earth with cities and mountains rather vertically exaggerated, and a human form leaping off into Space. Perhaps a bit busy for its function, it provides a bilingual unity that other NCE networks rarely provide.

In its current phase of funding, GEOIDE supports 19 major projects covering a range of disciplines (See Table 1 below). These are four-year projects designed to finish in March 2009. In addition, the Strategic Investment Initiative (SII) supports shorter term projects, often tied to specific deliverables for industrial or government partners. The total budget for GEOIDE amounts to approximately 3.5 million$ (CAD) per year.

The mix of disciplines involved in GIScience or geomatics has fallen out differently from place to place, country to country. The role of institutions has varied, with strong state support in some places, and more industry role in others. Overall, this multi-disciplinary convergence presents an interesting case study in the history and sociology of science and technology. The naming of the field itself demonstrates this diversity of approaches, as well as signaling the complexity in building true international coherence. The long-established disciplines of cartography, surveying, geography, and geodesy have merged in various ways in different countries. For example, cartography as an academic subject is mostly practiced inside geography departments in North America, but this is not the case in most of Europe. Surveying as an academic subject has declined in North America despite the dramatic technological advances in the field. In most countries there have been mergers, but which have merged with the others is not guaranteed. The more recent fields of photogrammetry, remote sensing, geographic information systems have been merged in some places with some of the older

[1] GEOIDE acknowledges the continued support of funding from the Networks of Centres of Excellence as well as its seven Partners.

disciplines under the title of geocomputation or geographic information science. In Canada, the term “geomatics” took root twenty years ago as a covering term for the whole collection of undertakings to collect, analyze and distribute geographic information.

RESEARCH PROGRAMME

The core of the GEOIDE Strategic Plan is to promote the development of geomatics research in a way that delivers benefits to Canadians. Unlike "curiosity-driven" research councils, NCE favors an interaction between "receptors" and the research community. Through this two-way flow, the traditional linear model of a linear pipeline of "technology transfer" is abandoned. Projects have been selected for their robust interdisciplinary communication and for their collaborations with a user sector in industry, government, or the non-profit sector. Table 1 lists the 19 projects at the core of Phase III.

Table 1: GEOIDE Phase III Projects

No	Title
01	Hyperspectral reflectance spectroscopy for rapid characterization of oil sands
05	SIST-Chronic diseases and primary care
06	GIST II- Intelligent Sensor Data / Knowlege Fusion for Geotechnical and Policy Decision Support
08	Multi-Scale Multi-Agent Geo-Simulation to support decision making in multi-actor dynamic spatial simulations MUSCAMAGS
11	Integrated Expertise Towards the Development of an Ice Jam Related Flood Warning System (FRAZIL)
12	Integrated geomatics for the Coastal Zone: Fusion of Terrestrial, Airborne and Marine Data (FUDOTERAM)
13	Géomatisation for archaeological digs: From data collection to analysis in context
14	Integrated modelling of juvenile Atlantic Salmon movement and physical habitat in fluvial and estuarine environments
15	Development of a 3D predictive modeling platform for exploration, assessment and efficient management of mineral, petroleum and groundwater resources
17	Promoting sustainable communities through participatory spatial decision support
20	Collaborative for Interactive Research with Communities Using Information Technologies for Sustainability
27	Mapping the ocean surface with geodetic and oceanographic tools
31	Next-generation algorithms for navigation, geodesy and earth sciences under modernized Global Navigation Satellite Systems (GNSS)
32	A National System for Water Vapour Estimation Using GPS and its Applications
34	Geomatics Enhancement With Dual Use of GPS II/III and Galileo
35	Monitoring Changes to Urban Environmental using Wireless Sensing Networks
36	Space gravimetry contributions to Earth monitoring
37	The Development of M2G- A Mobile Multi-sensor Geomatics system for Inventory and Analysis of Highway and Road Network Features
38	Coastal Security and Risk Management using GIS and Spatial Analysis

A number of these projects have explicit linkages to international partners. The NCE funding, like most research council support around the world, is targeted towards Canadian institutions. Often the research agenda aligns with other projects and funding sources in partner countries. Recently, GEOIDE has explored more of these avenues and specific project-to-project links have been forged with Ireland, Netherlands, Australia and others.

Specific exchange prospects

GEOIDE continues to host an annual Summer School, a Students’ Network, an annual scientific conference (ASC), workshops and significant knowledge exchange activities. Every year, over 200

delegates from around the world attend our ASC. These activities are ongoing and have kept the Network on its toes. GEOIDE also supports mentor exchanges and student travel. Up to ten foreign graduate students attend the annual Summer School without registration or lodging cost.

Recently, GEOIDE has renewed its links with partner networks in other countries. In 2006, GEOIDE hosted a meeting in Banff, Alberta with twelve leaders from similar organizations around the world, including NCG Ireland. This network of networks will provide the basis for enhanced collaboration on exchanges and shared projects. The role of the GEOIDE Network in the coming years is to ensure that Canada is actively engaged in the geomatics research that will support a sustainable world in social, economic and environmental terms.

TOWARDS THE NEXT PHASE

A major focus during 2006 was to develop a new strategy. The Network worked with specific user communities, groups of government, industry, and associations to determine the most pressing needs by region across the country. This process culminated in a workshop held in conjunction with a Board meeting. The new approach will decide the broad directions of research, including the potential partners interested in working with the research community right from the start. The intent is to combine a more top-down selection of network directions with the ability for researchers to develop innovative solutions that pass through the refinement of peer-review from the bottom-up. The new strategic plan also includes innovative ways to ensure self-sustainability at the end of the NCE funding in 2012. In preparation for Phase IV (2009-2012), specific themes have emerged through a process of strategic planning. The three themes are purposely broad at this stage, to try to avoid too much duplication.

Mobility: centers on tracking and predicting the motion of people and objects. User representatives will include transportation sector, logistics enterprises, and security services. Researchers working on tracking technology, space-time models and simulations, and dispatching analysis at various scales will form the teams working on this theme.

Environmental change: centers on modeling changes in the earth system, fast or slow. User representatives will include natural hazard response agencies, geomatics industry representatives, and environmental policy makers. Researchers working on instruments, remote sensing applications, and sustainability policy dimensions will join this grouping.

Distributed sensors: centers on advanced technology to measure the environment and delivery innovative information products to users. User representatives will include instrument manufacturers, geomatics service providers, and resource managers from government and private sector. Researchers working on sensors, distributed network interactions, and integrative software will form teams on this theme.

GEOIDE has issued a call for participation to build the teams that will respond to these three axes. There will be a two-phase process of letters of interest followed by proposals. All decisions will be made by early spring 2008 so that the new projects can begin in April 2008. The first year of funding will be in a pilot format, followed by full funding for three years.

For all future projects, GEOIDE intends to seek international collaboration at every level for students and researchers to networks such as NCG Ireland, SIGMA-Cassini France, and CRCSI-Australia, plus regional groupings such as AGILE.

BIBLIOGRAPHY

http://www.geoide.ulaval.ca