

University of Ottawa Geography

Researchers Utilize GeoBase

Geography researchers utilize GeoBase in climate, telecommunications and visualization research.

GeoBase

products are being used by Professor Michael Sawada of the University of Ottawa's Laboratory for Applied Geomatics and GIS Science (LAGGISS) for projects ranging from telecommunications to climate change as well as for the introduction of geomatics concepts into the teaching curriculum of multiple programs.

Professor Sawada and graduate student Daniel Cossette are working with the Canadian Communications Research Center and Industry Canada to study the market potential of different broadband wireless technologies to service the almost 5 million Canadians who have no broadband internet access. Population distribution, socio-economic characteristics, and environmental factors all combine to determine the profitability of a given wireless broadband solution. Using GeoBase CDED Level 1 and GeoBase Landsat 7 imagery, the team is able to characterize surface roughness and parameterize the effects of topography on various technologies in rural and remote regions. These studies will identify locations where existing technologies are likely to fail and provide indications of the market potential for targeted innovations to develop better systems. To accommodate these new technologies, frequency licensing and regulatory policies can be updated using this research as its scientific basis.

LAGGISS and Dr. Sawada are also involved in the often heated issue of climate change. A fundamental goal of the Climate System History and Dynamics (CSHD) project, the second largest earth science project in Canada, is to create spatially explicit past (e.g., 6000 years ago) quantitative climate reconstructions using the relation between modern pollen and climate. These reconstructions are compared to past climates modeled from the Canadian Climate Model (CCCma AGCM2) and favorable results suggest increased confidence in model predic-

tions of future warming scenarios. Working with U.S. researchers and the Laboratory for Paleoclimatology and Climatology (LPC) at the University of Ottawa, Professor Sawada and colleagues have produced a geo-referenced database of 4000+ modern pollen samples from the work of individual researchers spanning the last half-century. In the production of this monumental database, GeoBase CDED Level 1 data was indispensable in retrieving missing elevation data for older samples. Good elevation control, particularly in regions of high relief, translates into better atmospheric lapse rate corrections in the assignment of modern climate to the pollen sample sites. The quality of the elevation data directly impacts the quality of the climate reconstructions that are based on the pollen dataset for past time periods. CDED was also used in positional accuracy assessment by comparing original recorded elevations from sites with those extracted from the CDED. Large discrepancies suggested coordinate imprecision and/or error and the need for manual sample reappraisal.

Geomatics principles and approaches are used in research and teaching in such diverse fields as Archaeology, Biology, Ecology, Mathematics, Geology, Canadian Studies, Epidemiology and Engineering. A geomatics approach can contribute to any research endeavor that takes an interest in geographic space – in determining why things are the way they are where they are. Policies, research and practical decisions are based on the output of geomatics analyses; there can be significant fiscal, legal or scientific consequences if the basic theory and associated concepts and capabilities are not fully understood by students. To aid students getting an understanding of this important technology Professor Sawada and graduate student Zoran Reljic are utilizing GeoBase CDED, Landsat 7, and Road Network files to produce 3D photo-realistic animations to convey difficult concepts of geomatics to students. These visualizations will be available in late fall for the general community on the LAGGISS website:

www.geomatics.uottawa.ca

