

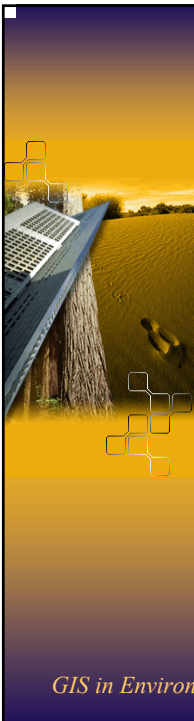
Geographic Information Systems (GIS) in Environmental Studies

ENVS 3520 3.0 – Fall 2003
Closing Session

John Sorrell

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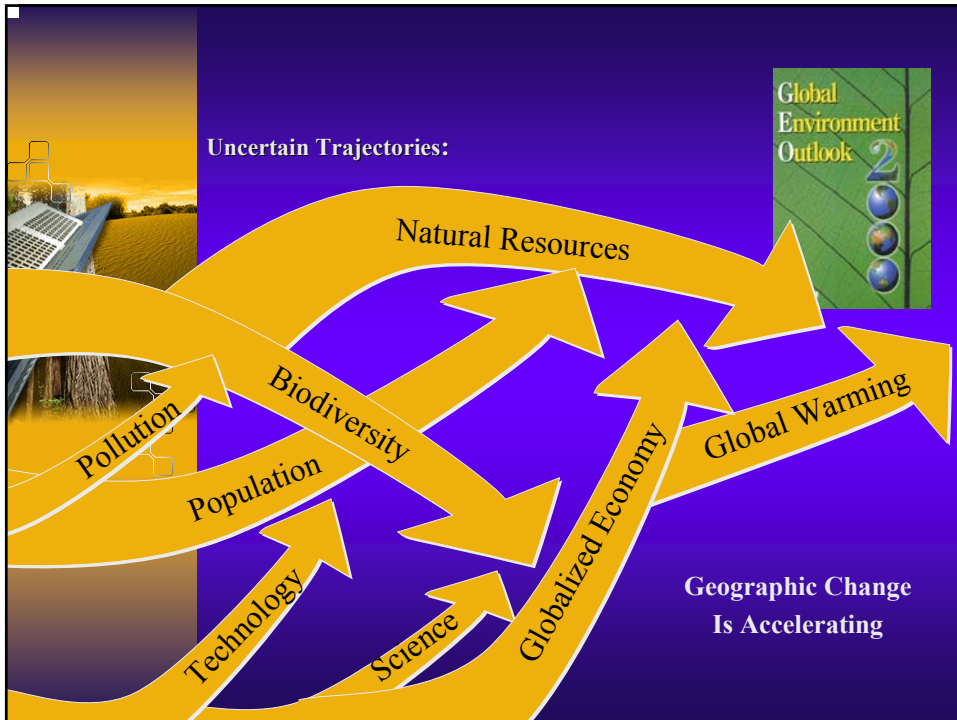
York University
sorrell@yorku.ca



Session Purpose:

To discuss the unique opportunities for
Environmental Studies students in the
future of Geomatics in Canada.

GIS in Environmental Studies



The Promise of Geomatics:

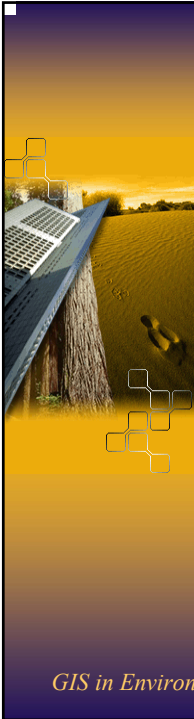
“Geomatics is a key discipline for the 21st century.”

“The ability to acquire, represent, use and disseminate spatially referenced data will transform most sectors of the emerging information economy.”

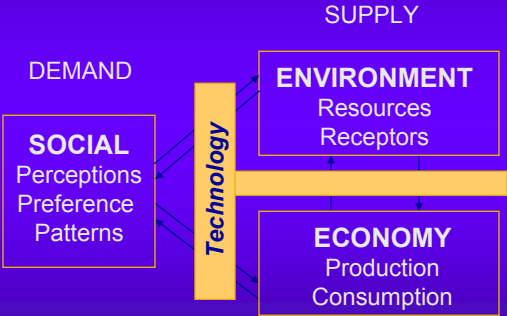
GEOIDE Updated Strategic Plan

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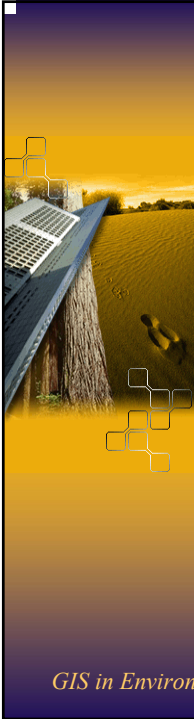
This block has a dark blue background with a vertical strip on the left side containing a background image of a laptop and a field, and a decorative grid pattern. The text is centered and includes a bolded quote, a definition in quotes, and a reference to the GEOIDE Updated Strategic Plan. The footer 'GIS in Environmental Studies' is located at the bottom left.



Geomatics and Future Knowledge Infrastructure:



Modified from: Briassoulis, 2001



Driver of Change in Geomatics:

Markets – rapid advances driven by profit and issues of technology transfer, IP and other R&D issues are typically managed to the advantage of those with market-place power.

Technology – Spatial and analytic resolution increasing, horizontal agency broadening as a result of Internet proliferation. However, advances in productivity alone may not be the catalyst for Geomatics to reach its next level of potential.

Segmenting the Providers:

Core Technology

Hosting Services

Applications Development

Systems Integration

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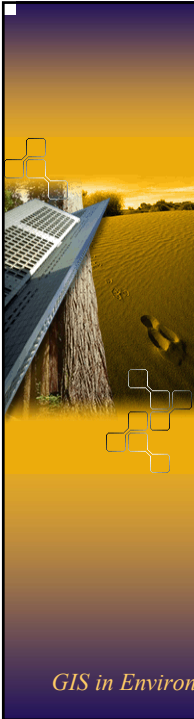
Generic Skills for Geomatics:

Knowledge Areas – skill sets and knowledge areas that are the foundation of Geomatics related activities were developed through extensive Canadian consultations.

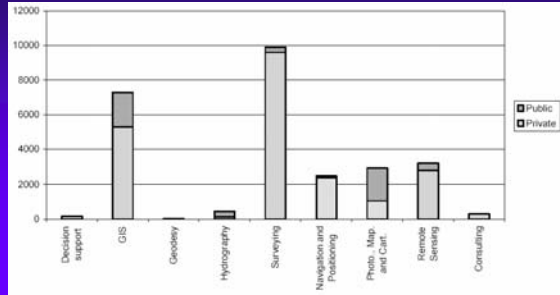
Generic Skills	
Business Skills	Technical Skills
Financial statement analysis	Geodesy
Contract negotiation	Geographic Information Systems (GIS)
Proposal, report and science paper writing	Global Positioning Systems (GPS)
Marketing	Computer Aided Drafting systems (CAD)
The ability to secure funding	Computer hardware and software
Leadership and management skills	Data visualization and interpretation
Team skills	Data formats and transfer
Presentation skills	
Project management skills	

Sources:
HRDC, 2001

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Canadian Geomatics Workforce:



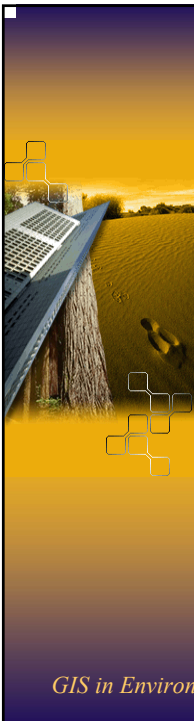
2001: 2B dollar market
27,000 employed (5K in public)

2004: 3B dollar market
32,000 employed in private sector

NB: Over 80% of Geomatics workforce now has university level education. 1991 only 15% had declared a university education.

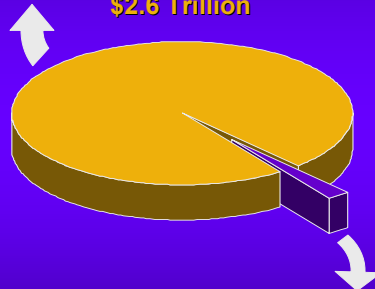
Sources:
HRDC, 2001

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GIS in Perspective:

**Projected Global IT Spending by 2005:
\$2.6 Trillion**



Figures Include:

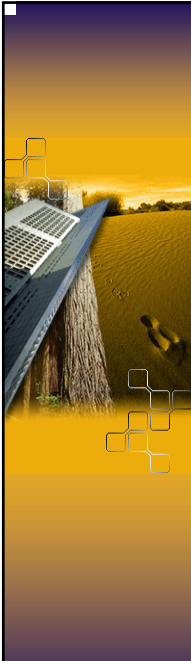
- Software
- Hardware
- Infrastructure
- Salaries
- Services
- Data

**Projected Global GIS Spending by 2005:
\$60 Billion**

~2.3% of all IT spending

Sources:
ibSystems, 2000
IDG News Service, 2001
ESRI Canada 2003

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Effect of Globalization on Geomatics?

BusinessWeek online

Feb 3rd, 2003

'The New Global Job Shift'

The next round of globalization is sending upscale jobs offshore. They include basic research, chip design, engineering--even financial analysis.

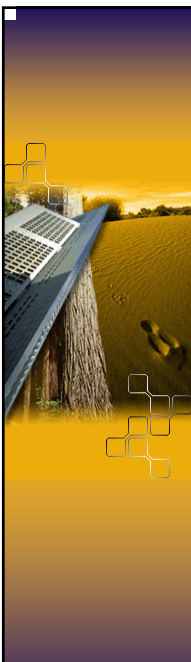
TORONTO STAR
www.thestar.com

Feb 24th, 2003

'Outsourcing' climbs up the job ladder'

It began as a way to harness cheap overseas labour And it's evolved -- can an out-sourced CEO be far off?

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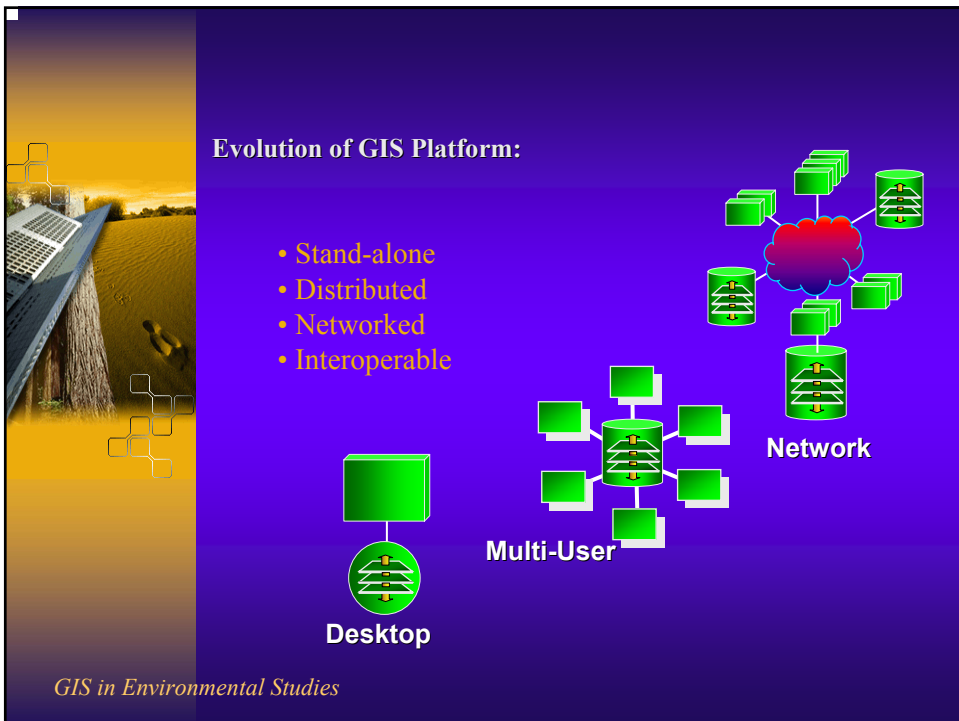
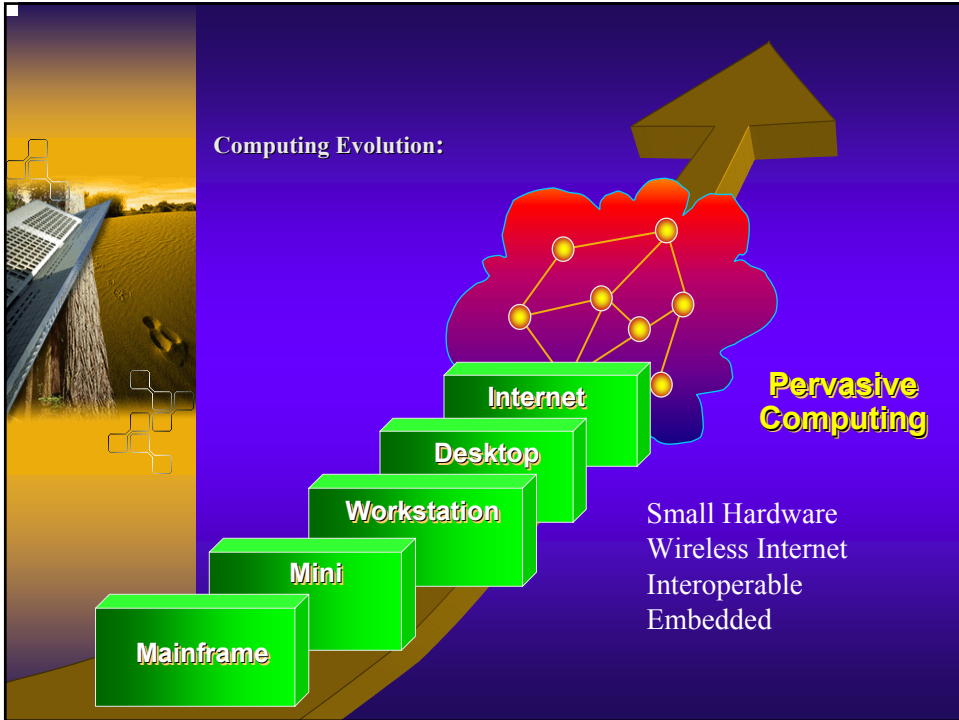


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Enabling Technologies:

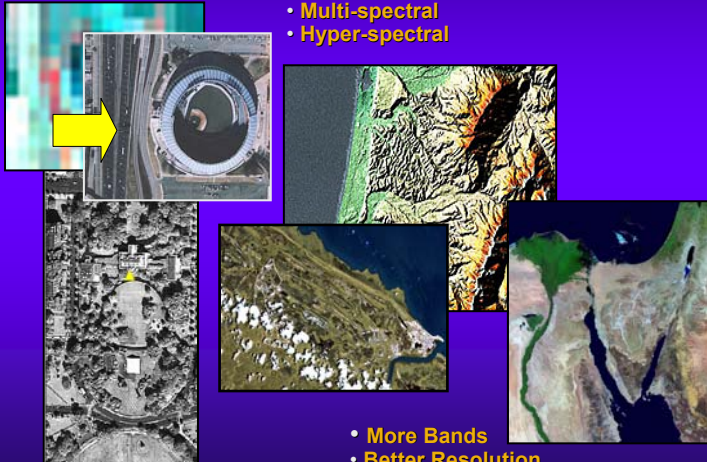
- Computers**
(Cost, Speed, Size, Mobile...)
- Networks**
(Faster, Wireless)
- Internet**
(New Standards, Growth)
- GIS Software**
(Enterprise-Scaled Suites)

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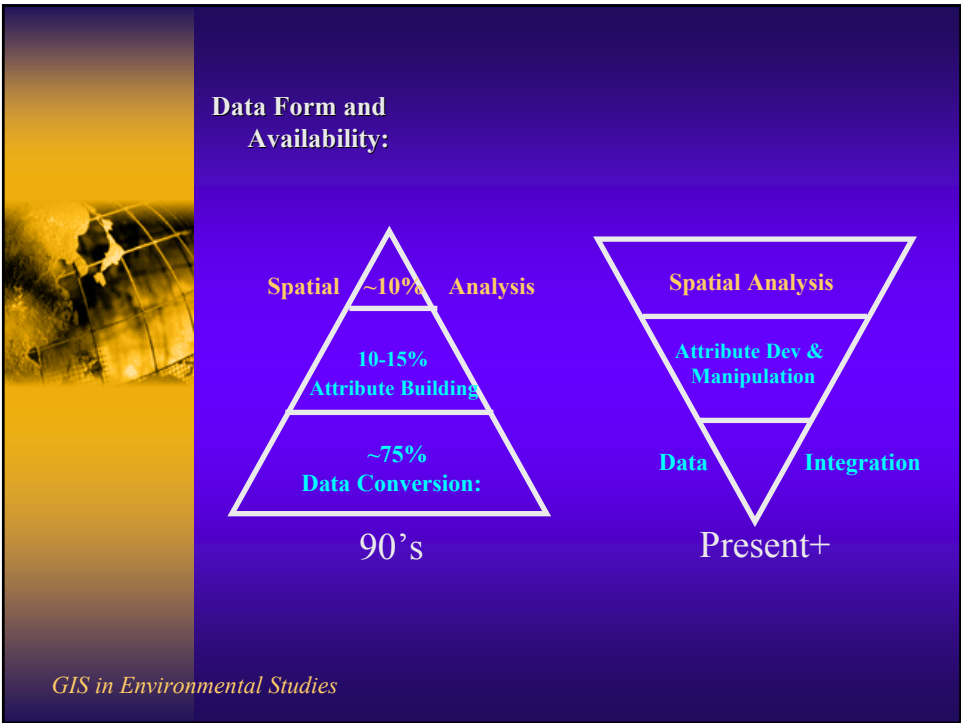
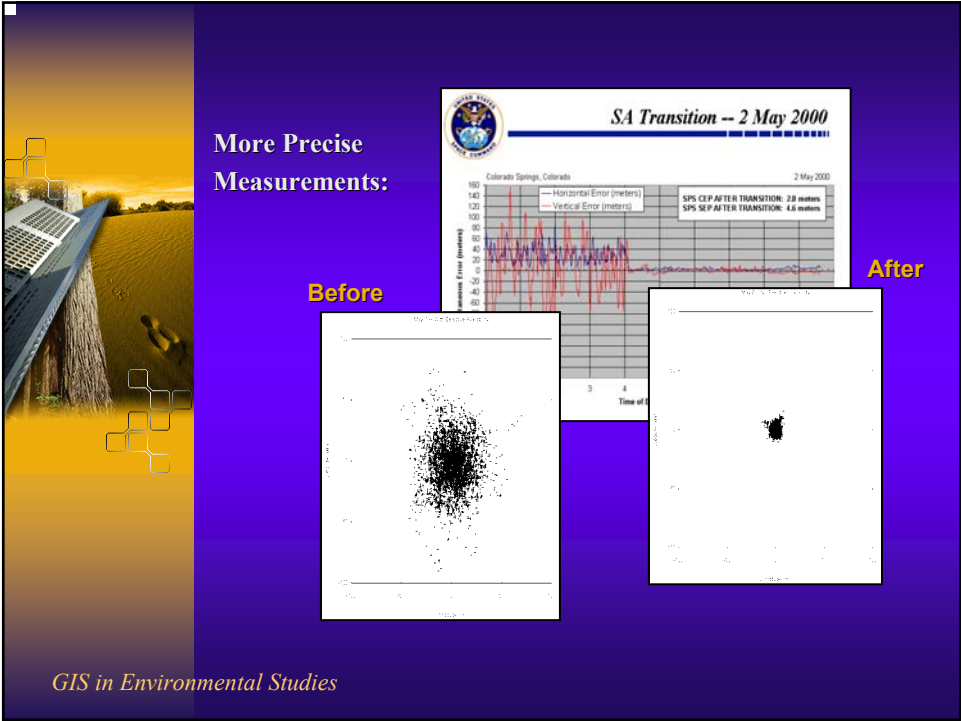
Better Accuracy:

- Thermal
- Radar
- Multi-spectral
- Hyper-spectral



- More Bands
- Better Resolution
- Terrain and Feature Extraction

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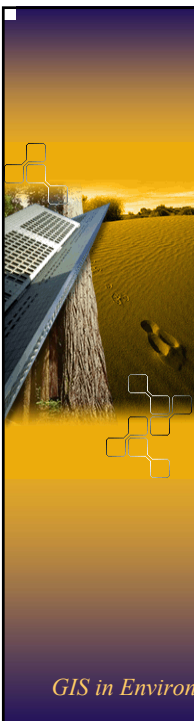




Pitfalls and Opportunities

So where are we?

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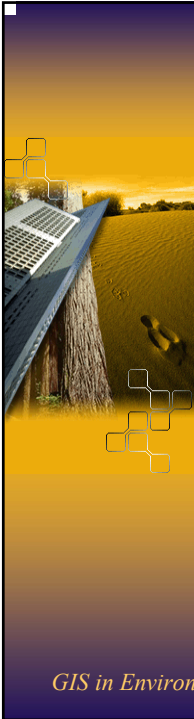
The Myopia of Over-Specialization:

When faced with pressures of evolutionary competition, most species survive not by generalizing, that is doing many things well, but by specializing and exploiting a narrow ecological niche. ... this new competitive advantage also makes the “specialist” less versatile and more vulnerable to change.

Organizational Analogy:

“Silos and Stovepipes”

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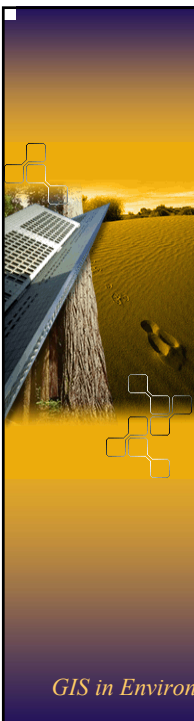


The Trap of Optimization:

Our ability to solve societal problems will be limited primarily by our lack of imagination in seizing opportunities rather than trying to optimize solutions.

The Law of Inefficiencies
Kevin Kelly

A reliance on optimization or emphasis on continued “refinement” rarely leads to needed “reform”



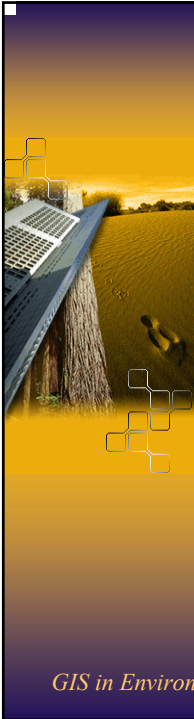
The Need for Ingenuity:

...Solutions to the major problems of our time ... require a radical shift in our perceptions, our thinking, our values.... a change of paradigms as radical as the Copernican revolution...

- Fritjof Capra
The Web of Life

Ingenuity consists not only of ideas for new technologies ... but, more fundamentally of ideas for better institutions and social arrangements....”

- T. Homer-Dixon
The Ingenuity Gap

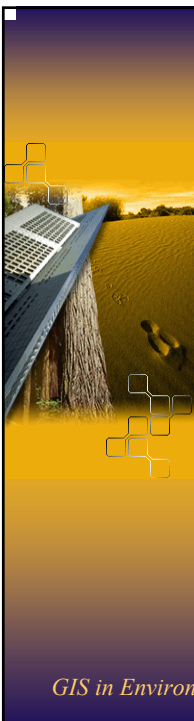


Time for New Thinking:

“We are confronted with insurmountable opportunities” Walt Kelly

- Geomatics is a key discipline for the 21st century but should be grounded in principles directed toward societal relevance;
- Advancing Application of Geomatics is not a technical exercise as much as it is a social activity.
- Geomatics Professional must have solid foundation in technical knowledge, domain knowledge specific to area of practice and ability to manage processes and relationships;

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Exploration of Undiscovered Country:

Geomatics is a Constellation of Disciplines

Learning context of Environmental Studies is Trans and Interdisciplinary – uniquely positions ES students to contribute to evolution of the application of GIS

Domestication of the unknown means departing (temporarily) from the successful known.

End.

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