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**Career Profile**

My career includes 10 years as a scientist in environmental applications of Geographical Information Systems (GIS), and 13 years as an information technology professional. I have worked as a professor in Canadian and New Zealand universities, authored 30 publications on spatial information systems and applied multivariate statistics, and I was a forestry data-mining consultant. My IT work includes project roles such as developer, development team lead, systems analyst, application and information architect, and application maintenance and support analyst.

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**Data Science Expertise**

My expertise in data science originates from an academic interest in multivariate statistical techniques that bridge the spatial scales of ecology and biogeography. This approach combined field experiments with large databases of species distribution, multispectral satellite imagery, climate, and GIS land use coverages. I commonly employed classification and regression tree methods, K-means clustering, principal components analysis, generalized additive and linear models, and spatial and geostatistics. I have also applied my expertise to the IT industry, most notably to redevelop the TravelAlberta.com website with a custom content management system designed to exploit marketing initiatives and customer analytics - website traffic rose from 207,000 (2002) to 2.2 million visitors (2004). In my current job I investigate trends in S2S message performance in the Pharmaceutical Information Network application (Alberta Health). This involves a daily performance analysis of up to 60,000 S2S messages per day. I also designed and conducted a 1-year analysis, a significant effort with short deadlines requiring exploratory analysis of 6.3 million messages, mining performance trends by message type and time of day/week, and graphical visualization.

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**Education**

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| Ph.D. | Geography | 1989, University of California at Santa Barbara, USA |
| M.Sc. | Geography | 1984, University of Florida, USA                     |
| B.Sc. | Biology   | 1981, University of Regina, Canada                   |

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**Experience**

**9/2010 - present - Application Maintenance and Support Analyst**, CGI Edmonton, AB - Pharmaceutical Information Network  
Develop analytical techniques for monitoring performance of XML message processing. Resolve trouble tickets and service requests. Assist with application transition, implementation, and release. Conduct regular reporting, problem analysis, and troubleshooting.

**9/2002 - present - Owner and Consultant**, eLucid Solutions Inc., Edmonton, AB  
Consult and develop web applications

**4/2009 - 9/2010 - Systems Analyst**, CGI Inc., Edmonton, AB - Alberta Continuing Care Information System  
Conducted Joint Application Design sessions with the client to collect design requirements. Created the Functional Requirements, Detailed Design Specifications, and

- Operations Manual. Designed, developed, and tested JasperReports templates.
- 3/2006 – 3/2009 – Consultant and Team Lead**, CGI Inc., Edmonton, AB – Alberta Sustainable Resource Development  
Led development and management of ArcIMS websites and the MetaXpress application for management of forestry, fish and wildlife, wildfire, recreation, and other environmental activities. Planned, designed, developed, tested, and managed enhancements on 28 ArcIMS websites. Assisted with development of data models. Wrote specifications, estimates, and user documentation. Interacted with the client to plan and develop GIS solutions.
- 9/2002 – 3/2006 – Lead Web Developer and Application Architect**, Parcom Marketing Inc., Edmonton, AB – Travel Alberta Websites Migration  
Contracted to design and develop a content management system for Travel Alberta websites. Developed e-marketing web contests, RSS news feeds, and email newsletters. Performed project management duties, managed internationalized content, conducted web-server stress tests, and advised on online mapping applications.
- 2/2001 – 8/2001 – Senior Web Developer**, CyberElves, Auckland, New Zealand – RiteSite Web Application  
Planned, developed, and tested website.
- 1/2000 – 1/2001 – Senior Web Developer**, ZIVO NZ Ltd., Auckland, New Zealand  
Co-developed more than 40 government, e-commerce, tourism, telecommunications, and corporate websites. Co-developed algorithms to parse XML in cellphone SMS messaging authentication and live stock market data. Wrote technical documentation for website administration, and technical and functional specifications.
- 2/1998 – 1/2000 – Associate Professor**, Simon Fraser University, Burnaby, B.C. – School of Resource and Environmental Management  
Taught postgraduates and undergraduates the fundamentals of applied ecology, spatial data and metadata formats, spatial statistics, development of process and data models, and environmental applications of geospatial information and global positioning systems. Developed e-learning websites, managed scientific research projects, and published scientific articles. Supervised graduate students and computing staff. Managed geospatial information computer labs.
- 8/1992 – 2/1998 – Lecturer**, University of Auckland, Auckland, New Zealand – Department of Geography  
Taught spatial statistics and environmental applications of geospatial information and global positioning systems. Managed e-learning websites and scientific research projects, and published scientific articles. Supervised graduate students and computing staff. Managed advanced geospatial information computer labs.
- 8/1997 – 12/1997 – Data Mining Consultant**, Rayonier Forestry, Auckland, New Zealand –  
Regional analysis of upper mid-crown yellowing in *Pinus radiata*  
Conducted multivariate statistical analysis of a large environmental and geospatial database, prepared final report, and consulted with forestry scientists.
- 1/1991 – 5/1992 – Adjunct Assistant Professor**, Geography, Queen's University, Canada
- 7/1990 – 7/1992 – NSERC Post-Doctoral Fellow**, Geography, Queen's University

## Skills

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### **Data Analysis & GIS**

R / S-Plus; ArcGIS; ArcIMS; ArcView; ArcSDE; ERDAS IMAGINE; ENVI Image Analysis; SQL (DB2, Oracle, SQL Server).

### **Programming & Scripting**

Java; ColdFusion; JSP; C; JavaScript; shell scripting.

### **Mark-Up**

HTML 4, 5; XHTML 1.1; XML; CSS 2, 3.

### **Platforms**

AIX; Microsoft Windows; Mac OS X; Ubuntu Linux; WebSphere Application Server; Microsoft IIS Server; Apache Tomcat Server.

### **Teaching Experience**

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Supervised three Simon Fraser University graduate students and was on the advisory committees for seven others. Supervised 16 University of Auckland graduate students and examined the thesis of 13 others. Taught three Simon Fraser University courses and developed a new course in spatial information technology in environmental management. Taught 11 University of Auckland graduate and undergraduate courses.

### **Management Experience**

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#### ***Simon Fraser University:***

As a member of the School of Resource and Environmental Management GIS/Computing Committee I co-managed approximately 75 PC and Sun Unix computers networked among 25 offices and labs. I also supervised two computing staff and managed a geographic information systems lab.

#### ***University of Auckland:***

As Chair of the Geography Computer Committee I administered a NZ\$1.441 million grant to install over 100 desktop computers and 28 SGI Unix workstations. I co-authored the funding proposals, negotiated hardware and software orders, and assisted in setup of the facilities and hiring and supervising of five computing staff. I also developed and managed the first departmental website in 1994.

#### ***Queen's University:***

Assisted with installation and management of an IBM Unix geographic information systems lab.

### **Publications**

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#### ***Refereed Publications:***

- 1998 Ofren, R. L. and L. E. Harvey. A multivariate decision-tree analysis of biophysical factors in tropical forest fire occurrence, *Proceedings, Integrated Tools for Natural Resources Inventories in the 21st Century*, 16-19 August, Boise, Idaho.
- 1997 Harvey, L. E. Priority-areas analysis of New Zealand bird diversity. In, *Proceedings of the ACSM/ASPRS Annual Convention & Exposition: Vol. 4*, Seattle, WA, pp. 692-701.
- 1997 Lee, A. and L. E. Harvey. Simulating impacts of urban limits policy on vegetation change in New Zealand. In, *Proceedings of the ACSM/ASPRS Annual Convention & Exposition: Vol. 4*, Seattle, WA, pp. 702-711.
- 1997 Merton, R. N. and L. E. Harvey. Analysis of seasonal changes in Jasper Ridge vegetation biochemistry using multi-temporal hyperspectral data, In, *Proceedings of the ACSM/ASPRS Annual Convention & Exposition: Vol. 3*, Seattle, WA, pp. 157-166.
- 1996 Harvey, L.E. Macroecological studies of species composition, habitat and biodiversity using GIS and canonical correspondence analysis. In, *Proceedings, Third International Conference/ Workshop on Integrating GIS and Environmental Modeling*, Santa Fe, NM, January 21-26, 1996, CD-ROM and WWW ([http://www.ncgia.ucsb.edu/conf/SANTA\\_FE\\_CD-ROM/main.html](http://www.ncgia.ucsb.edu/conf/SANTA_FE_CD-ROM/main.html))

- 1996 Strachan, I. and L. E. Harvey. Quantifying the effects of temporal autocorrelation on climatological regression models using geostatistical techniques, *Canadian Journal of Forest Research*, 26: 864-871.
- 1996 Young, B. and L. E. Harvey. A spatial analysis of the relationship between mangrove (*Avicennia marina* var. *australasica*) physiognomy and sediment accretion in the Hauraki Plains, New Zealand, *Estuarine, Coastal and Shelf Science*, 42: 231-246.
- 1995 Drabsch, J. and L. E. Harvey. Query-based information systems using GIS: A case study of riparian buffer zones in the Tutamoe Ecological District, Northland, *Proceedings 7th AURISA/SIRC Colloquium*, Spatial Information Research Centre: Otago, pp.165-174.
- 1995 Laituri, M. J. and L.E. Harvey. Bridging the space between indigenous ecological knowledge and New Zealand conservation management using GIS, in *Nature Conservation: The Role of Networks*, ed. by D.A. Saunders, J.L. Craig and E.M. Mattiske, Chipping Norton: Surrey Beatty and Sons, pp.122-133.
- 1995 Lee, A. and L. E. Harvey. Gap analysis of indigenous vegetation in the Hokianga Ecological District, Northland, *Proceedings 7th AURISA/SIRC Colloquium*, Spatial Information Research Centre: Otago, pp.175-188.
- 1995 Linzey, A. and L. E. Harvey. Modelling bird species distributions for gap analysis of the Tutamoe Ecological District, Northland, *Proceedings 7th AURISA/SIRC Colloquium*, Spatial Information Research Centre: Otago, pp.189-202.
- 1995 Merton, R. N. and L. E. Harvey. Methods for monitoring Auckland's diminishing indigenous vegetation, *Proceedings 7th AURISA/SIRC Colloquium*, Spatial Information Research Centre: Otago, pp.203-216.
- 1995 Pritchard, J. and L. E. Harvey. Quantifying the spatial structure of a landscape vegetation mosaic, *Proceedings 7th AURISA/SIRC Colloquium*, Spatial Information Research Centre: Otago, pp.217-228.
- 1994 Harvey, L. E. Spatial patterns of inter-island plant and bird species movements in the Galapagos Islands, *Journal of the Royal Society of New Zealand* 24: 45-63.
- 1994 Harvey, L. E. Multiscale analyses of animal habitat using satellite imagery: Red foxes in Ontario, Canada, *Proceedings of the Seventeenth New Zealand Geographical Society Conference*, NZ Geographical Society: Wellington, pp.58-62.
- 1991 Davis, F. W., M. Borchert, L. E. Harvey and J. Michaelsen. Factors affecting seedling survivorship of blue oak (*Quercus douglasii* H. & A.) in central California, *Symposium on California's Hardwood Rangelands*, USDA Forest Service Gen. Tech. Rep. PSW-126, pp. 81-86.
- 1988 Harvey, L. E., F. W. Davis and N. Gale. The analysis of class dispersion patterns using matrix comparisons, *Ecology* 69:537-542.

### **Non-refereed Publications:**

- 2001 Harvey, L. E. Animals in the physical environment, in *The Physical Environment: A New Zealand Perspective*, ed. by A. Sturman and R. Spronken-Smith, Oxford Univ. Press: Auckland, pp. 398-414.
- 1999 Harvey, L. E. Protecting biodiversity: Geographic strategies, computers and satellite technology can help in prioritising biodiversity protection. *New Zealand Science Monthly*, 10(5): 6-8
- 1998 Harvey, L. E. A background to conservation and environmental management in New Zealand, in *Setting Priorities for Conservation Projects*, ed. by Gretchen Harlow and Rod Silver, Environment Canada/Canadian Wildlife Service: Vancouver.
- 1997 Ofren, R. L. and L. E. Harvey. An Ecological and Spatial Assessment of the Dry Tropical Forest of Thailand, *International Workshop on Guidelines on the Protection of Forests Against Fire in Indonesia*, Bogor Agricultural University, International Tropical Organization, December 8, 1997.

- 1997 Harvey, L. E. Biogeographical problems for mapping biodiversity: technological solutions or ghost in the machine?, *New Zealand Map Society Journal* 11: in press.
- 1996 Lee, A.C., R. Merton and L. E. Harvey. Digital mapping of heterogeneous vegetation communities using remotely sensed imagery and geographic information systems, *Proceedings of the Eighteenth New Zealand Geographical Society Conference*, NZ Geographical Society: Christchurch.
- 1994 Laituri, M. J. and L. E. Harvey. Indigenous knowledge and GIS, *Proceedings of EcoPolitics VIII*, Lincoln University: Christchurch.

### **Research Reports:**

- 1997 Harvey, L. E. *Regional analysis of upper mid-crown yellowing in Pinus radiata using regression-tree and generalised additive modelling*, Rayonier New Zealand, Auckland, ~150pp.
- 1995 Harvey, L. E. and R. N. Merton. *Evaluation of techniques for monitoring indigenous vegetation cover in the Auckland Region*, Auckland Regional Council, 86pp + 3 floppy disks.
- 1992 Harvey, L. E. Applications of landscape ecology to fox rabies epidemiology. Rabies Unit, Ontario Ministry of Natural Resources, Canada, 74 pp.
- 1992 Harvey, L. E. *Small mammal population dynamics and habitat utilization in the Admiralty Islands, St. Lawrence Islands National Park*. Report SLI 91/92-03, St. Lawrence Islands National Park, Ontario, 100 pp.
- 1986 Harvey, L. E. and G. I. Thrall. *A behaviorally based autoregression model for avian abundance in severe winter weather*, Dept. Geography, UF.

### **Teaching Materials:**

- 1995 Harvey, L. E. *Writing HTML Documents for Computer-based Geography Labs, Intranet HTML document*, Department of Geography, University of Auckland, ~35pp.
- 1990 Harvey, L. E. and H. Veregin, 1990. *The spatial dynamics of a blue oak woodland*, three-minute animation in 16mm film.
- 1987 Harvey, L. E. and F. W. Davis, 1987. *A Laboratory Manual for Geography 3: Physical Geography*, Kendall-Hunt: Dubuque.

### **Academic Websites:**

- Three Simon Fraser University course websites (1998-2000).
- Five University of Auckland course websites (1994-1998).