

# Brian C. Tucker

821 East Parkview Estates  
Edmonton, Alberta, Canada, T5W 4R1  
Phone: 780.669.2689  
Email: btucker@ualberta.ca  
Website: www.ualberta.ca/~btucker/

## Education

### **Ph.D. Candidate in Biology**

Department of Biological Sciences  
University of Alberta, Edmonton, Alberta, Canada

### **M.Sc. Biology, (2004)**

Application of hidden Markov models in terrestrial ecology.  
Laurentian University, Sudbury, Ontario, Canada

### **B.Sc. Honours, Environmental Earth Science, (2002)**

Laurentian University, Sudbury, Ontario, Canada

### **Environmental Engineering Technology (1999)**

The Confederation College of Applied Arts and Technology, Thunder Bay, Ontario, Canada

Three year diploma with co-operative education at the Ontario Ministry of Natural Resources, GPA 3.89/4.00

## Publications

Tucker, B.C., Anand, M. 2005. On the use of stationary vs. hidden Markov models to detect simple vs. complex ecological dynamics. *Ecological Modelling*, 185: 177-193.

Tucker, B.C., Anand, M. 2004. The application of Markov models in restoration and recovery. *International Journal of Ecology and Environmental Sciences*, 30: 131-140.

Tucker, B.C., Anand, M. 2003. The use of matrix models to detect natural and pollution-induced forest gradients. *Community Ecology*, 4(1):89-100.

Anand, M., Tucker, B.C. 2003. Defining Biocomplexity: An ecological perspective. *Comments on Theoretical Biology*, 8:1-14.

Anand, M. Tucker, B.C., Desrochers, R. 2002. Ecological monitoring of terrestrial ecosystem recovery from man-made perturbation: assessing community complexity. pp. 341-351 In: *Modeling, Monitoring and Management of Air Pollution*, Brebbia, C.A. And Martin-Duque, J.F.(eds), WIT Press, Southampton, UK.

## Oral Papers

Tucker, B.C. Application of hidden Markov models in ecology. 2003. International Conference on Eco-Restoration. Dehradun and New Dehli, India.

Anand, M., \*Tucker, B.C. Matrix modelling of natural and pollution-induced forest vegetation gradients. 2003. The Ecological Society of America 88th Annual Meeting. Savannah, Georgia.

Tucker, B.C. Application of hidden Markov models in ecology. Biocomplexity Dynamics: An international symposium. 2003. Laurentian University, Sudbury, ON, Canada.

## Poster Presentations

\*Tucker, B.C., Anand, M. 2003. Application of hidden Markov models in ecology. Ontario Ecology and Ethology Colloquium. McMaster University, Hamilton, ON, Canada.

Anand, M., \*Desrochers, R., \*Tucker, B.C. 2001. Sudbury Restoration Workshop. Laurentian University, Sudbury, ON, Canada.

\* presenting author(s)

## Conferences Attended

International Conference on Eco-Restoration. 2003. Dehradun and New Dehli, India.

The Ecological Society of America 88th Annual Meeting. 2003. Savannah, Georgia, USA.

Ontario Ecology and Ethology Colloquium. 2003. Hamilton, ON, Canada.

International Complex Systems Conference. 2002. Nashua, Masshetucets, USA.

Sudbury Restoration Workshop. 2001 and 2002. Sudbury, ON, Canada.

## Manuscripts Reviewed

One manuscript for *Canadian Journal of Botany* 2005.

One manuscript for *Ecological Modelling* 2003.

## Short Courses

One-week Intensive Introduction to Complex Systems, New England Complex Systems Institute, 2003, Boston, Mass.

## Lectures

*An Introduction to Neural Networks*. Laurentian University, 2003. (1hr) Given to 4th year Quantitative Ecology.

## Awards and Scholarships

NSERC CGSD 2004-06 (\$35 000/yr for two years)

Faculty of Science Graduate Entrance Scholarship 2004 (\$2 000)

Walter H. Johns Graduate Fellowship 2004-06 (\$4, 322 /yr for two years)  
\*honourary

University of Alberta Ph.D. Scholarship 2004-06 (\$20,000 /yr for two years plus tuition and fees) \*honourary

NSERC PGS A 2002-04 (\$17 000/yr for two years)

OGS (Ontario Graduate Scholarship) 2002-04 (\$10 000/yr for two years) \*declined

NSERC Undergraduate Student Research Award (USRA) 2002 (\$4000)

Laurentian University In-Course Scholarship 2001-02 in recognition of outstanding scholastic achievement (90 average) (\$2500)

Marsh A. Cooper Award in Earth Science 2001-02 in recognition of outstanding scholastic achievement (\$2200)

F. Jean MacLeod Conservation Endowment Fund Schol. 2001-02 (\$1000)

Thunder Bay Packaging Env. Engineering Award 1999

Mtis Nation of Ontario Scholarship 1999

Environmental Leadership Award 1998

Award for Environmental Studies 1997 and 1998

## Work Experience

### **Terrestrial Vegetation Sampling and Ecological Monitoring**

2001-2003

Conducted vegetation sampling at ecological monitoring sites (EMAN sites). Vegetation species identification, tree height and diameter, herbaceous cover abundance. Assisted in vegetation sampling of long-term ecological monitoring sites established by Dr. M. Anand 2001. Data collection, GPS use, plant specimen collection, species identification, quadrat sampling using Braun-Blanquet method, tree height estimation, and tree coring. Experience with various computer modelling techniques involving ecological theory with a special focus on Markov Models and Hidden Markov Models (HMM's). Use of various computer software packages (MATLAB and MULTIV). Gained familiarity with MATLAB programming language. Mounting and identification of plant specimens. Literature searches and review. Spreadsheet creation, manipulation, and data entry.

### **Teaching Assistant, Laurentian University, Biology Dept.**

2002-2003

Teaching assistant operating biology laboratories in 9 first to fourth year level courses. Course include: BIOL 4066 (Quantitative Ecology), BIOL 1507 (Biology II), BIOL 2386 (Diversity of Vascular Plants), BIOL 3327 (Experimental Methods in Biology), BIOL 2356 (Principles of Ecology).

### **Biology Field Camp Assistant**

Sept. 2002

I have led (with Dr. P. Beckett) a Biology Field Camp in 2001 during an exercise designed by Dr. M. Anand. The exercise was designed to introduce the processes involved in collecting and analyzing vegetation community data. This entailed training fourth year undergraduate students in sampling methods and tools, vegetation surveys, and plant identification. The field camp also included small mammal surveys, bird identification, and large mammal movement patterns.

### **Research Assistant, Laurentian University, Biology Dept.**

May - Sept. 2001 (full time)

(see Terrestrial Vegetation Sampling and Ecological Monitoring)

### **Fisheries Technical Assistant, Ministry of Natural Resources**

June - Aug. 1997/98 (full time)

Research assistant for walleye telemetry tracking project. Responsible for operating and interpreting telemetry radio equipment, recording fish locations with GPS, UTM and nautical maps, water quality tests. Assisted with Forest Ecosystem Classification vegetation plots. Assisted with bald eagle nest survey, commercial whitefish sampling, bald eaglet tagging, smelt surveys, bear surveys, environmental workplace inspections. Interpreted maps (topographical, provincial, hydrographical). Measured, sketched, and generated property site plans.

Data entry as well as spreadsheet manipulation, interpretation, and management.

### **Computer Lab Technical Advisor, Confederation College**

Sept. - May 1997/98 (full time)

Assisted students in college computer labs. Installed hardware and software. Solved software, hardware and network problems.

## **Computer Skills**

Operating platforms: UNIX/Linux/\*BSD, Macintosh, and Windows

Multivariate statistics: MULTIV, SYN-TAX, CANOCO, R

Programming languages: Python, MATLAB/Octave, C

Professional software packages: AutoCAD, CorelDraw, Photoshop

## **Personal Qualities**

I possess the ability to work in teams/groups well and have the capacity to complete projects and tasks individually. Excellent oral and written communication skills allow me to share my views, problems, solutions, and ideas clearly and accurately with others. I solve problems by utilizing analytical thinking as well as imaginative, innovative approaches and concepts. I am flexible to changing work environments and/or job requirements. An amiable disposition allows me to get along with co-workers and gives me the ability to function well within groups.

## **Community Involvement**

Volunteer science fair judge (grade 7-9) for the Nellie McClung Science Fair, Edmonton, AB (2004).

Volunteer science fair judge (grade 7-8) at Pinecrest elementary school, Sudbury, ON (2003).

Graduate Student Association Treasurer (2003-2004) Laurentian University, Sudbury, ON.

## References

- Dr. Madhur Anand, Associate Professor, Laurentian University  
Phone: (705) 675-1151 ext.2213, Email: manand@laurentian.ca
- Dr. Yves Alarie, Professor, Laurentian University  
Phone: (705) 675-1151 ext.2346, Email: yalarie@laurentian.ca
- Dr. Peter Beckett, Associate Professor, Laurentian University  
Phone: (705) 675-1151 ext.2259, Email: pbeckett@laurentian.ca