

# SUSAN C.H. GRANT, M.Sc.

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## EDUCATION

on-going

**GRADUATE DIPLOMA IN QUANTITATIVE METHODS IN FISHERIES MANAGEMENT**

School of Resource and Environmental Management  
Simon Fraser University, Burnaby, British Columbia

**Graduate Level Courses:** Risk Assessment and Decision Analysis (Dr. Randall Peterman); Quantitative Analysis in Resource Management and Field Biology (Dr. Steve Thompson); Quantitative Fisheries Stock Assessment (Dr. Sean Cox)

1995-1998

**MASTER OF SCIENCE**

Environmental Biology and Ecology, University of Alberta, Edmonton

**Thesis:** Quantitative Evaluation of Fish Recruitment Responses to Environmental Change (Nutrient Enrichment)

**Graduate Level Courses:** Current Problems in Ecology; Limnology; Graduate Core Course (Advanced Communication Skills); Philosophy, Sociology, and Politics of Science (Dr. David Schindler)

1989-1994

**BACHELOR OF SCIENCE**

Marine Biology, McGill University, Montreal

## AWARDS AND GRANTS

- DFO Immediate Award, 2002 and 2003
- Circumpolar/Boreal Alberta Research Grants Awards, 1997-1998
- Myer Horowitz Graduate Scholarship, 1997-1998
- Challenge Grant in Biodiversity, 1995-1997
- National Center of Excellence (NCE), 1995-1997

## LANGUAGES

- English (fluent); French (functional)

## COMPUTER SKILLS

- *MSoftware:* Access; Excel; Outlook; PowerPoint; Word
- *Statistics:* R: Statistical Software; Crystal Ball (Monte Carlo simulation); VISTA (principal components analysis); SPSS, WinBugs, Turbo Pascal, DPA (creel software)
- *Graphics:* Adobe Photoshop; Optimas image analysis; CorelDraw
- *Database:* Access; Reference Manager; Endnote; DPA (creel software)

**WORK EXPERIENCE**

**February 2008 – present**

**Position: BI-03 Program Head  
Sockeye & Pink Analytical  
Fraser Stock Assessment**

**Supervisor:** Mr. Timber Whitehouse (February 2008 – present)

Area Chief, Stock Assessment, Fraser River, Fisheries and Oceans Canada

- Fraser sockeye and pink analytical lead
- Generate forecasts using models and Bayesian statistics (WinBugs and R: statistical software) for Fraser River sockeye and pink returns; completed numerous reports and presentations for technical and non-technical audiences.
- Provide advice on Fraser Sockeye and Pink stock status: productivity and abundance trends, biology, Wild Salmon Policy stock status, annual stock outlooks, etc.
- Member of the Cultus Sockeye Conservation Team
- Stock Assessment representative at Pacific Salmon Treaty processes, First Nations Treaty processes and international forums.

**November 2004 – January 2008**

**Position: BI-03 Program Head (Acting)  
Sockeye, Pink, Chum & Creel  
Fraser Stock Assessment**

**Supervisor:** Mr. Timber Whitehouse (April 2005 – present)

Area Chief, Stock Assessment, Fraser River, Fisheries and Oceans Canada

**Supervisor:** Mr. Neil Schubert (November 2004 – April 2005)

Area Chief, Stock Assessment, Lower Fraser Area, Fisheries and Oceans Canada

- Managed sockeye, pink, chum and recreational fisheries assessment programs:
  - designed, planned, directed, evaluated and reported on assessment projects;
  - managed, analyzed and interpreted data to provide scientific (stock status and fisheries impacts) and technical advice to client groups (DFO and non-DFO);
  - staffed, supervised and trained biologists and technicians;
  - directed budget tracking and financial planning and reporting;
- Coordinated Species At Risk Act (SARA) Cultus Lake sockeye projects:
  - led collaborative teams of scientists, biologists, consultants and technicians on study design development, project planning and directing, analysis, reporting;
  - managed SARA and Pacific Salmon Treaties Southern Endowment Fund (SEF) budgets (\$183K); led financial planning, proposal submissions and budgets;
  - initiated, managed and finalized contracting and staffing processes;
- Developed partnerships with Chehalis and Tsleil-Waututh First Nation (FN); provided input on the Squamish Assessment Framework and Lil'wat and Douglas FN sockeye assessment program; provided scientific/technical advice to FN groups.
- Generated forecasts using models and Bayesian statistics (WinBugs and R: statistical software) for Fraser River sockeye and pink returns; completed a technical report.
- Successfully wrote proposals for alternative funding (SARA, SEF).
- Presented results to client groups (technical, non-technical, fisheries management).

February 14 – 28, 2005  
March 9 – 20, 2009

**Position: BI-04 Area Chief (Acting)**

**Stock Assessment**

**Supervisor:** Mr. Neil Schubert/Mr. Timber Whitehouse  
Area Chief, Stock Assessment, Lower Fraser Area

- Coordinated and led stock assessment technical and biological staff in the 2005-06 budget planning process for the Stock Assessment Coordinating Committee (SACC). Initiated and supervised staff in the conversion of all budgets to a common budget template. Initiated, developed, and led group in the preparation of a comprehensive information package on a) completed budgets; b) budget rationales under different budget allocation scenarios; c) different budget versions for low to high precision study designs; and d) descriptions of each study design version.
- Led regular Program Head meetings and supervised year end expenditure tracking and spending.

September 2001 – November 2004

**Position: Biologist, Chum Salmon  
and Fisheries Assessments**

**Supervisor:** Mr. Neil Schubert  
Area Chief, Stock Assessment, Lower Fraser Area  
Fisheries and Oceans Canada, 100 Annacis Parkway, Vancouver, BC

- Designed, planned, directed, and evaluated seven recreational fishery assessment field programs; designed databases, managed and analyzed data, evaluated results, and produced reports; designed a webpage for public access of assessment reports; received a DFO immediate award for my recreational fisheries assessment work.
- Compiled, analyzed and interpreted results from DFO and partnership group chum stock assessment projects to provide advice on chum stock status and fisheries impacts.
- Designed and planned the study design of a chum visual escapement study on Fraser River creeks; designed an area-under-the curve spreadsheet for escapement calculations used by DFO and First Nation's staff; designed and supervised a chum residence time study; provided a framework for future coho and chum residence time and observer efficiency studies; initiated crew exchanges between DFO and First Nation crews.
- Prepared, tracked, and managed an annual assessment budget exceeding \$100,000.
- Staffed, supervised and trained technical and data entry staff.
- Initiated, developed, and supervised technicians and biologists in the preparation of a DFO Technical reports: creel and chum/coho visual enumeration reports.
- Member of the Pacific Salmon Commission Southern Panel Chum Technical Committee, the Recreational Fisheries Data Management Working Group, the Recreational Fisheries Working Group, and the Species at Risk Working Group.
- Liaised with the Tsleil-Waututh First Nation, Squamish First Nation, and Chehalis First Nations on multi-species stock assessment projects; established a partnership with Stó:lō First Nation for recreational fisheries assessments (prepared a proposal and obtained \$46,000 in funding for capacity building with Stó:lō First Nations and trained Stó:lō technical staff); trained and supervised Soowhalie First Nation technicians for a creel project; received a DFO Immediate Award for my First Nation's partnership work.

- Initiated, designed, and supervised the development of a literature database for biological and technical staff to facilitate writing of technical reports.
- Presented results to client groups (technical, non-technical, fisheries management).

**October 2000 – September 2001**

**Position: Scientific Contractor**

**Supervisor:** Dr. Peter S. Ross

Research Scientist

Fisheries and Ocean Canada, Institute of Ocean Sciences, Sidney, BC

- Identified spatial and temporal trends of contaminants in Pacific salmon, killer whales and their ecosystems in British Columbia and Washington State marine waters.
- Identified local point sources (e.g. sewage treatment plants, landfills, pulp mills, mines) and regional/global non-point sources (e.g. combined sewer outfalls, agricultural activities, atmospheric transport, etc.) of contaminants in these regions.
- Completed a comprehensive review of existing information and literature to identify the extent of regional contaminant sources.
- Created a literature database and library of reports and journal articles.
- Successfully wrote two research proposals to: a) study contaminants in the Vancouver Island Marmot (\$15K) and b) study contaminants and their effects on sockeye salmon (*Oncorhynchus nerka*) (\$10K).
- Weekly contributor to the Institute of Ocean Sciences “Ecotox Newsletter”.
- Published a DFO Technical Report (primary author) and presented results at international conferences.

**October 2000 – September 2001**

**Position: Scientific Contractor**

**Supervisor:** Dr. Robie W. Macdonald

Research Scientist

Fisheries and Ocean Canada, Institute of Ocean Sciences, Sidney, BC

**Project Objective:** To determine spatial trends and sources of contaminants in the Arctic marine food web (zooplankton and fish).

- Conducted multivariate principal components analysis on contaminant concentrations measured in zooplankton and fish in the Arctic Ocean to identify spatial trends.
- Described the Arctic food web using stable carbon and nitrogen isotope data.
- Conducted statistical analysis and prepared charts, figures, and tables.
- Conducted an extensive literature review and managed literature with reference management software.

**January 2000 – September 2000**

**Position: Biological Research Assistant**

**Supervisor:** Dr. David W. Welch

Program Head, High Seas Salmon Research & PICES-GLOBEC Co-Chair

Climate Change & Carrying Capacity Implementation Plan

Fisheries & Oceans Canada, Pacific Biological Station, Nanaimo, BC

**Project Objective:** To study the effects of climate change on Pacific salmon (*Oncorhynchus* sp.) populations.

- Participated in research cruises to sample five species of Pacific salmon and water quality in the North Pacific Ocean (including the B.C., Washington, and Alaskan coast).
- Sampled fish tissues (mercury, cesium, DNA, and stable isotope analysis), fish ageing structures (otoliths and scales) and stomach contents, water (chlorophyll *a*, nitrates, phosphates, dissolved oxygen, temperature, and salinity), and zooplankton.
- Contributed to writing a successful research proposal for Bonneville Power (U.S.A.).
- Analyzed otoliths and scales for age and growth determination; researched otolith microchemistry techniques (stable isotopes and elemental analysis) used to distinguish between stream- versus ocean-type chinook salmon.
- Designed databases and managed and analyzed data for reports and publications.

**June 1999 – January 2000**

**Position: Production Assistant**

- Worked as a production assistant for Hansard (in the Legislative Assembly of British Columbia); updated the Hansard website; responsible for desktop publishing and proofreading; worked for the Capital Health Region to manage databases and statistics.

**September 1995 – December 1998**

**Position: Graduate Student**

**Supervisor:** Dr. William Tonn, Associate Professor, University of Alberta, Edmonton

**Project Objective:** To quantitatively evaluate responses in fish populations (recruitment dynamics) to environmental change (increased nutrient loads).

- Designed, planned, and directed a three year fish recruitment field and laboratory study.
- Hired, trained and supervised a team of research assistants in field and laboratory work.
- Wrote successful research proposals (\$30K); prepared, tracked, managed the project's budget; prepared and submitted financial reports to funding agencies.
- Designed, planned, directed and implemented a sampling program for fish populations (egg, juvenile, and adult production, population structure: age, sex, and condition), ecosystem productivity (phytoplankton, periphyton, zooplankton, benthic invertebrates) and water quality (nitrates and phosphates, dissolved oxygen, pH, conductivity, and chlorophyll *a*, Secchi disc depth, vertical illumination, temperature).
- Conducted laboratory analysis of chlorophyll *a*, phosphorus, dissolved oxygen, and pH.
- Developed otolith analysis methods to assess fish age, growth, and survival.
- Designed databases and managed large data sets.
- Conducted quantitative statistical analysis and modeling of ecological data.

- Wrote proposals, progress reports, final reports, committee reports, a final thesis manuscript (170 pages), and a publication in the primary literature (CJFAS).
- Presented results at international conferences and meetings.
- Organized and maintained a literature database and a filing system for research papers.

**November 1996 – May 1997**

**Position: Research Assistant**

**Supervisors:** Dr. Cindy Paszkowski, Associate Professor, and Paula Siwik, M.Sc., University of Alberta, Edmonton, AB

**Project Objective:** To study the toxicological effects of oil sand process wastewater from Syncrude Canada on fathead minnow populations.

- Examined short-term (seven-day growth and survival) and long-term effects of oil sand process wastewater on reproduction, growth and survival of fish.
- Reared and cultured larval, juvenile, and adult fathead minnows.

**January 1996 – May 1996**

**Position: Research Assistant**

**Supervisors:** Dr. William Tonn, Associate Professor, and Andy Danylchuk, PhD Candidate, University of Alberta, Edmonton, AB

**Project Objective:** To investigate the impacts of clear-cut logging and varying riparian buffer strip widths on fish populations in northern Alberta.

- Goal was to provide guidelines for mitigating the effects of logging activities.
- Processed adult fathead minnow specimens. Extracted otoliths, scales, gonads, and digestive tract. Qualitatively assessed fish condition, sex, and the gonadosomatic index.

**May 1995 – September 1995**

**Position: Field Research Assistant**

**Supervisors:** Dr. William Tonn, Associate Professor, University of Alberta, Edmonton, AB, Rena Vandenbos, M.Sc., and Mariola Janowicz, M.Sc.

**Project Objectives:**

1. To determine top-down, bottom-up trophic control on water quality.
  2. To determine density-dependent mechanisms affecting fish population dynamics.
- Field research was conducted at the Meanook Biological Station, Athabasca, AB.
  - Monitored fish productivity in the egg, juvenile and adult stages, water quality (nutrient concentrations, pH, chlorophyll *a*, temperature, Secchi disc depth, and vertical illumination), and ecosystem productivity (phytoplankton, periphyton, zooplankton, benthic invertebrates).
  - Conducted laboratory analysis (chlorophyll *a*, phosphorus, nitrogen, dissolved oxygen).
  - Identified and quantified zooplankton in samples to the genus level.
  - Designed and managed databases, conducted statistical analysis, prepared figures/tables.

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May 1994 – May 1995

**Position: Research Assistant**

**Supervisors:** Dr. William Leggett, Dr. Mathew Sclafani, Dr. Tom Miller, McGill University, Montreal, Quebec

**Objective:** To assess condition-driven vertical migration of young cod (*Gadus morhua*); results from this study are applied to the prediction of larval transport and recruitment in cod using modelling approaches.

- Conducted research at the Ocean Sciences Centre, Memorial University, St. Johns, Newfoundland and at research facilities at McGill University, Montreal, Quebec.
- Set-up marine rearing facilities in both locations; obtained cod eggs and reared larvae.
- Captured and saved images of young fish and fish eggs using imaging software (Optimas™); enhanced images using several different image filters; wrote macro programs to automate measurements; measured enhanced images.
- Conducted experiments on cod larvae to validate daily increment formation.
- Read and critiqued relevant journal articles.
- Designed databases and input, error checked, and managed large data sets.

## TEACHING EXPERIENCE

**January 1996 – December 1997**

*Teaching Assistant, University of Alberta*

- Instructed laboratories, prepared and conducted lectures, and led group discussions.
- Edited over 100 proposals, reports, and term papers prepared by undergraduate students on a variety of scientific topics; edited laboratory manuals.
- Designed and wrote exams and quizzes and tutored students on course material.

### Courses Taught:

***(Biology 338): Community Ecology***

A study of niche theory (food webs, competition, predation, disturbance and their effects on community diversity). Labs also emphasized communication skills in scientific research (scientific reports, research papers, and presentations).

***(Biology 224): Vertebrate Diversity***

A comparative survey of vertebrates; focused on their morphology, classification, and phylogeny. Labs involved specimen examination and comparative anatomy.

***(Biology 208): Principles of Ecology***

Scientific study of the interactions between organisms and their environment in a hierarchy of levels of organization (individuals, populations, communities, and ecosystems). Labs emphasized communication skills (written and oral) and the collection, analysis, and interpretation of data from ecological experiments.

## COURSES AND TRAINING

- Finance, Admin., Contracting & Spending (FACS: DFO) July 8, 2010
- CPR and Wilderness First Aid (Saint John's Ambulance) March 18-20, 2009
- The Essentials of Managing in the Public Service (G110:DFO) Feb 2-6, 2009
- Integrated Business and Human Resource Planning (DFO) Jan. 21-23, 2008

- Personal Learning Plan training (DFO) May 4, 2007
- Preparation for a selection process (DFO) May 4, 2007
- OSH training Module 1 to 6 (DFO) April 24-26, 2007
- Staffing for Delegated Managers Mar. 5-8, 2007
- Media Training: television, radio, print Feb. 21, 2007
- Finance Training (DFO) Dec. 2006
- Quantitative Stock Assessment (SFU; Grade: A) Sep.-Dec. 2006
- Quantitative Analysis (SFU; Grade: A) Jan.-Apr. 2006
- Presentation Course (DFO) April 13-14, 2005
- Explorer First Aid and CPR (Wilderness Alert) Feb. 7, 2003
- Risk Assessment and Decision Analyses (SFU; Grade: A) Dec.- Jan. 2003
- French Conversation Course (UBC) Sep.-Dec. 2003
- Interpersonal Conflict Resolution (Justice Institute) Mar. 4, 2002
- Manager's Handbook on Staffing and Recruitment (DFO) Jan. 28, 2002
- Bayesian Statistics (Paul Starr) Dec. 12, 2002
- Swiftwater Training (Rescue Canada) Dec. 2, 2002
- Management Development Training (DFO) Nov. 18, 2002
- Staff Relations Course (DFO) July 10, 2002
- Emergency Response Training (DFO) June 17, 2002
- Harassment Training (DFO) Feb. 21, 2002
- Diversity Training (DFO) Jan 16, 2002

## PUBLICATIONS

**Grant, S.C.H.** 2010. Angler Effort and Catch in the 2001-2005 Lower Fraser River Sport Fishery. Can. Tech. Rep. Fish. Aquat. Sci. (in prep.).

**Grant, S.C.H.** 2010. Angler Effort and Catch in the 2001-2005 Chilliwack River Sport Fishery. Can. Tech. Rep. Fish. Aquat. Sci. (in prep.).

**Grant, S.C.H.,** Michielsens, C.G.J., Porszt, E.J. & Cass, A. 2010. Pre-season run size forecasts for Fraser River Sockeye salmon (*Oncorhynchus nerka*) in 2010. Can. Sci. Advis. Sec. Res. Doc. 2010/042.

[http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/ResDocs-DocRech/2010/2010\\_042\\_e.htm](http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/ResDocs-DocRech/2010/2010_042_e.htm)

**DFO (written by Grant, S.C.H.).** Pre-season run size forecasts for Fraser River Sockeye salmon (*Oncorhynchus nerka*) in 2010. Can. Sci. Advis. Sec. Rep. 2010/031.

[http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2010/2010\\_031\\_e.htm](http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2010/2010_031_e.htm)

**Grant, S.C.H. & Michielsens, C.G.J.** 2010. Fraser River Sockeye Salmon productivity and 2010 return forecasts. pp 121-124. In Crawford, W.R. & Irvine, J.R. eds. 2010. State of physical, biological, and selected fishery resources of Pacific Canadian marine ecosystems in 2009. DFO Can. Sci. Advis. Sec. Res. Doc. 2010/053. viii +137 p.

[http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/ResDocs-DocRech/2010/2010\\_053\\_e.htm](http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/ResDocs-DocRech/2010/2010_053_e.htm)

**DFO (written by Grant, S.C.H. & Cass, A.).** 2008. Pre-season run size forecasts for Fraser River sockeye & pink salmon in 2009. Canadian Science Advisory Secretariat. Sci. Advis. Rep. 2008/049.

[http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2009/2009\\_022\\_e.htm](http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2009/2009_022_e.htm)

**Grant, S.C.H.** 2009. Fraser River Sockeye forecasts (stock-recruitment data). pp 114-117. In Crawford, W.R. & Irvine, J.R. eds. 2009. State of the Pacific Ocean in 2008. DFO Can. Sci. Advis. Sec. Res. Doc. 2009/022. vi +121 p.

[http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/ResDocs-DocRech/2009/2009\\_022\\_E.pdf](http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/ResDocs-DocRech/2009/2009_022_E.pdf)

**Grant, S.C.H.** & Cass, A. 2007. Pre-season run size forecasts for Fraser River sockeye salmon in 2008. Canadian Science Advisory Secretariat. Sci. Advis. Rep. 2007/049

[http://www.dfo-mpo.gc.ca/csas/Csas/status/2007/SAR-AS2007\\_049\\_E.pdf](http://www.dfo-mpo.gc.ca/csas/Csas/status/2007/SAR-AS2007_049_E.pdf)

**Grant, S.C.H.** 2008. Fraser River Sockeye pre-season forecasts for 2008. pp 106-109. In Crawford, W.R. & Irvine, J.R. eds. 2008. State of the Physical, Biological and Selected Fishery Resources of Pacific Canadian Marine Ecosystems. DFO Can. Sci. Advis. Sec. Res. Doc. 2008/013. ii +109 p.

[http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2008/2008\\_028\\_e.htm](http://www.dfo-mpo.gc.ca/CSAS/Csas/Publications/SAR-AS/2008/2008_028_e.htm)

DFO (written by **Grant, S.C.H.** and Cass, A.). 2006. Pre-season run size forecasts for Fraser River sockeye and pink salmon in 2007. Canadian Science Advisory Secretariat. Sci. Advis. Rep. 2006/043

[http://www.dfo-mpo.gc.ca/csas/Csas/status/2006/SAR-AS2006\\_043\\_e.pdf](http://www.dfo-mpo.gc.ca/csas/Csas/status/2006/SAR-AS2006_043_e.pdf)

**Grant, S.C.H.**, Kayln, S.M., Mahoney, J.E., & Tadey, J.A. 2007. Coho (*Oncorhynchus kisutch*) and chum (*O. keta*) salmon visual enumeration surveys in Lower Fraser Area Streams: 1999-2006. Can. Tech. Rep. Fish. Aquat. Sci. No. 2727.

[Coho \(\*Oncorhynchus kisutch\*\) and chum \(\*O. Keta\*\) salmon visual enumeration surveys in twenty-six lower Fraser area streams : 1999-2005](#)

Bradford, M., Amos, J., Tovey, C.P., Hume, J.M.B., **Grant, S.**, Mossop, B. 2007. Abundance and migratory behaviour of northern pikeminnow (*Ptychocheilus oregonensis*) in Cultus Lake, British Columbia and implications for predator control. Can. Tech. Rep. Fish. Aquat. Sci. No. 2723, 54 pp.

[Abundance and migratory behaviour of northern pikeminnow \(\*Ptychocheilus oregonensis\*\) in Cultus Lake, British Columbia and implications for predator control](#)

**Grant, S.C.H.** and P.S. Ross. 2002. Southern Resident Killer Whales at Risk: Toxic Chemicals in the British Columbia and Washington Environment. Can. Tech. Rep. Fish. Aquat. Sci. No. 2412.

[Southern resident killer whales at risk \[i.e. risk\] : toxic chemicals in the British Columbia and Washington environment](#)

**Grant, S.C.H.** and W.M. Tonn. 2002. Effects of nutrient enrichment on recruitment of age-0 fathead minnows (*Pimephales promelas*): potential impacts of environmental change on the Boreal Plains. Can. J. Fish. Aquat. Sci. 59: 759-767.

[HTTP://ARTICLE.PUBS.NRC-](http://article.pubs.nrc-)

[CNRC.GC.CA/RPAS/RPV?HM=HINIT&CALYLANG=ENG&JOURNAL=CIFAS&VOLUME=59&AFPF=FO2-054.PDF](http://cnrc.gc.ca/rpas/rpv?HM=HINIT&CALYLANG=ENG&JOURNAL=CIFAS&VOLUME=59&AFPF=FO2-054.PDF)

**Kiesling (Grant), S.C.H.** 1999. Effects of nutrient enrichment on recruitment of age-0 fathead minnows (*Pimephales promelas*). M.Sc. Thesis, University of Alberta. 170 pages.