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## Samuel D. N. Johnson

School of Resource and Environmental Management, Simon Fraser University  
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*Place of birth:* Newcastle, Australia      *Date of birth:* 25 October 1984  
*Citizenship:* Australian      Permanent Resident of Canada

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### Education

- 2014 - Present** PhD Candidate, Resource and Environmental Management, Simon Fraser University  
Thesis topic: Management models for multi-species fisheries  
*Supervisor: Sean Cox*
- 2010 - 2012** Master of Science in Mathematics, Simon Fraser University  
Thesis topic: Asymptotic analysis of walks with small steps in the quarter plane  
*Supervisor: Marni Mishna*
- 2006 - 2009** Bachelor of Mathematics (Honours), University of Newcastle, Australia  
Honours thesis title: Simple groups of automorphisms of locally finite trees.  
*Honours supervisor: George Willis*

### Employment

- Jan 2016 - Present** Sub-contracting Analyst, Landmark Fisheries Research  
*Supervisor: Ashleen Benson*
- September 2016 - Present** MITACS Accelerate Intern, shared between Wild Canadian Sablefish, Pacific Halibut Management Association, and Canadian Groundfish Research and Conservation Society  
*Supervisors: Sean Cox, Chris Acheson, Chris Sporer, Bruce Turris*
- September 2015 - August 2016** MITACS Accelerate Intern, Wild Canadian Sablefish  
*Supervisors: Sean Cox, Chris Acheson*
- Sep 2012 - Aug 2014** Graduate Research assistant, Department of Mathematics, Simon Fraser University  
*Supervisor: Marni Mishna*

### Awards, Honors and Scholarships

- 2017** John Koolman Memorial Graduate Award in Environmental Science, Simon Fraser University
- 2016** President's PhD Scholarship, Simon Fraser University
- 2016** Research travel grant, Simon Fraser University

**2015** Research travel grant, Simon Fraser University  
**2014** Fall graduate fellowship, Simon Fraser University  
**2014** Summer graduate fellowship, Simon Fraser University,  
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**2012** Summer graduate fellowship, Simon Fraser University  
**2012** Research travel grant, Simon Fraser University  
**2009** Honours scholarship, University of Newcastle  
**2008** Ivan Lincoln Rose Prize in Applied Mathematics, University of Newcastle  
**2008** Undergraduate summer research scholarship, AMSI  
**2005 - 2009** ESSUN Commonwealth scholarship, administered by the University of Newcastle

## Research

### Research Interests

I'm interested in quantitative fisheries stock assessment and statistical learning applications in fisheries management. My thesis topic is focused on multi-species fisheries management systems, with a focus on methods for overcoming data limitations from unequal allocation of scientific resources. By broadening our view from single-species to multi-species management, it may be possible to borrow information from more data-rich species to improve management of data-poor species. For example, hierarchical statistical models in stock assessments can facilitate information sharing between data-rich and data-poor species through a hierarchical prior structure that reflects phylogeny, or technical interactions between species through covarying fishing mortality rates. My research tests the statistical and management performance of multi-species management tools using simulations conditioned on data from the BC groundfish fishery.

### Publications

#### Theses

1. Johnson S. Analytic combinatorics of planar lattice paths. Simon Fraser University, 2012, 97 pages.

### Refereed journal publications

2. Johnson, S. D. N. and Cox, S. P. Evaluating the role of data quality when sharing information in hierarchical multi-stock assessment models, with an application to dover sole, Canadian Journal of Fisheries and Aquatic Sciences, 2019. <https://doi.org/10.1139/cjfas-2018-0048>
3. Doherty, B., Johnson, S. D. N. and Cox, S. P. Using autonomous video to estimate the bottom contact area of longline trap gear and presence-absence of sensitive benthic habitat, Canadian Journal of Fisheries and Aquatic Sciences, 2018. <https://doi.org/10.1139/cjfas-2016-0483>
4. Johnson S., Mishna M. and Yeats K. A combinatorial understanding of lattice path asymptotics. *Advances in Applied Mathematics*, 2017. <https://doi.org/10.1016/j.aam.2017.08.001>

### Manuscripts in progress

5. Johnson, S. D. N., and Cox, S. P. A hierarchical age-structured operating model for 5 species of British Columbia right-eyed flounders (Pleuronectidae) in three stock areas.
6. Johnson, S. D. N., Cox, S. P., Benson, A. J. The effect of posterior sampling on metrics of objective performance when conditioning operating models for management strategy evaluation
7. Johnson, S. D. N., Wang, L., and Cox, S. P. Avoiding non-target species in a multi-species fishery, with an application to regulatory discards of juvenile sablefish.

## Presentations

### Conference Presentations

- Jan 2019** University of Washington School of Aquatic and Fisheries Sciences Quantitative Seminar. *The effects of posterior sampling design on management procedure performance in MSE.*
- Aug 2017** American Fisheries Society Annual Meeting, Tampa, Florida. *Should we steal from the data-rich and give to the data-poor?*
- Nov 2016** University of Washington School of Aquatic and Fisheries Sciences Quantitative Seminar. *Simulation Testing Hierarchical Multi-Stock Assessment Models for a BC Flatfish Complex.*
- Feb 2016** Western Groundfish Conference, Newport Oregon. *Avoiding Non-Target Species in a Multispecies Fishery.*
- Jan 2016** IDEAS, Simon Fraser University. *Avoiding Non-Target Species in a Multispecies Fishery.*
- Jan 2015** IDEAS, Simon Fraser University. Talk entitled *Near Shore Inlets and Their Contribution to Canadian Sablefish Stocks*, with Michelle Jones
- May 2013** Prairie Discrete Math Workshop, Thompson Rivers University. *Towards a combinatorial understanding of lattice path asymptotics.*

**June 2012** CMS Summer Meeting, University of Regina. *The exponential growth of restricted lattice paths.*

**June 2012** CMS Summer Meeting, University of Regina. *The exponential growth of lattice paths. (Poster presentation)*

**August 2011** Computational Math Day, Simon Fraser University. *Asymptotic analysis of walks with small steps in the quarter plane. (Poster presentation)*

**May 2011** CanaDAM, University of Victoria. *Asymptotic analysis of walks with small steps in the quarter plane,* with Steve Melczer.

**April 2011** PIMS Young Researcher Conference, University of British Columbia. *Asymptotic analysis of walks with small steps in the quarter plane,* with Steve Melczer.

### **Instructional Talks**

**October 2011** Simon Fraser University. Instructional talk on Multiple Zeta Values, focusing on the algebra of Lyndon words.

**May 2011** Simon Fraser University. Series of four one hour long instructional talks on the paper ‘Basic analytic combinatorics of directed lattice paths’ by Cyril Banderier and Phillippe Faljolet.

### **Research Seminar Presentations**

**March 2013** Simon Fraser University Discrete Mathematics Seminar. *Towards a combinatorial understanding of lattice path asymptotics.*

**December 2011** University of Newcastle weekly maths seminar. *Analytic combinatorics of walks with small steps in the quarter plane.*

**November 2011** Simon Fraser Discrete Mathematics Seminar. *Analytic combinatorics of walks with small steps in the quarter plane.*

### **Presentations for the general public**

**March 2016** Math outside the box seminar, SFU Department of Mathematics. *A Salute to the Sockeye - Some Mathematics of Applied Population Ecology*

**June 2013** SFU math camp (Talks and activities for highschool students). *Platonic solids and counting symmetries.*

### **Conferences Attended**

**Summer 2017** American Fisheries Society (AFS) Annual Meeting, Tampa, Florida, August 20 - 25, 2017

**Spring 2016** 19th Western Groundfish Conference (WGC), Newport, Oregon, February 8 - 12, 2016

**Fall 2015** Canadian Fisheries Research Network (CFRN) Annual General Meeting, Halifax, Nova Scotia, November 16 - 20 2015

**Spring 2014** Symposium on Discrete Algorithms (SODA14) and Analytic Algorithms and Combinatorics (ANALCO14), Hilton Hotel, Portland, Oregon, January 4 - 7 2014

**Fall 2013** Combinatorial Potlatch, University of Victoria, BC, Saturday November 23, 2013

**Spring 2013** Combinatorial Probability and Statistical Mechanics Workshop, Queen Mary University of London, 21 - 23 February 2013.

**Spring 2013** Journées de combinatoire de Bordeaux, LaBri, l'université Bordeaux I, 13 - 15 February 2013.

### **Coursework**

**Fall 2015** REM 611, Applied Population and Community Ecology, Assoc. Prof. Anne Salomon. Grade: A+

**Spring 2015** REM 802, Research Approaches for REM Ph.D. Students, Prof. Ken Lertzman. Grade: A+

**Fall 2014** REM 621, Ecological Economics, Asst. Prof. Jonn Axsen. Grade: A

**Fall 2014** REM 614, Advanced Methods in Fisheries Stock Assessment, Assoc. Prof. Sean Cox. Grade: A+

**Fall 2014** REM 644, Public Policy Analysis and Administration, Assoc. Prof. Sean Markey. Grade: A

## TA Duties

Semester	Assignment	Hours/week	Duties
2014-1	Math 190: Principles of Mathematics for Teachers	12	Marking, moderation of online discussions.
2013-3	Math 242: Intro to Analysis	9	Preparing and presenting a weekly one hour tutorial, marking.
2013-1	Math 302: Permutation Puzzles	6	Preparing and presenting a weekly one hour tutorial, marking.
2012-3	Calculus Support	9	Preparing and presenting a weekly one hour tutorial for at risk calculus students.
2012-3	Applied Calculus Workshop	9	Workshop hours, marking, moderation of online discussion boards.
2012-1	Applied Calculus Workshop	9	Workshop hours, marking, moderation of online discussion boards.
2012-1	Calculus Support	6	Preparing and presenting a weekly one hour tutorial for at risk calculus students.
2011-3	MACM316 - Numerical Analysis	9	Tutorials, marking.
2011-1	Algebra Workshop	6	Marking.
2011-1	Math150 - Centre for Online and Distance Education	9	Marking, moderation of online discussion boards.
2010-3	Applied Calculus Workshop	15	Workshop hours, marking, moderation of online discussion boards.

## Teaching Activity

Semester	Course	Number	Institution (blank implies SFU)	# Students
2014-3	Foundations of Analytic Reasoning	FAN X99		12
2015-1	Foundations of Analytic Reasoning	FAN X99		12
2015-3	Foundations of Analytic Reasoning	FAN X99		12
2016-1	Foundations of Analytic Reasoning	FAN X99		12

## Service to the Academic Community

- **Conference organizing committee**

- 2011 Volunteer, ThinkAgain! cross discipline graduate student conference, Simon Fraser University

- **Student life**

- 2011-2014 Mathematics Graduate Student Caucus President, Simon Fraser University (SFU)
- 2011-2014 Member of the Collective Advocacy and Campaigns Committee of the SFU Graduate Student Society (GSS)
- 2010-2014 Member of the Graduate Student Society Benefit Plan Committee of the SFU GSS

- 2010-2011 GSS council representative for the SFU Department of Mathematics Graduate Student Caucus
- 2005 University of Newcastle Union (UNU) Limited director, Faculty of Engineering, University of Newcastle

JANUARY 30, 2019, NEW WESTMINSTER, BC