

# Aaron Springford GStat

Mathematics and Statistics, Queen's University, Kingston, ON, Canada, K7L 3N6  
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## Education

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- **PhD Statistics**, Queen's University. Supervisor: David Thomson, FRSC. Expected November 2017.  
*Thesis: Time series analysis with latent and irregular times.*
- **Master of Resource Management**, Simon Fraser University. Supervisor: Sean Cox. August 2008.  
*Project: A novel Bayesian method for making the most of spatial fishery catch and effort data.*
- **BSc (Hon) Environmetrics**, Simon Fraser University. Advisor: Rick Routledge. April 2004.

## Experience

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### Queen's University: Research Assistant and Course Instructor 2012 – Present

As a Research Assistant in statistics I initiated, advanced, and completed several projects. With collaborators, I wrote grant proposals to secure over \$286,000 in funding, designed and implemented research projects, and completed technical reports and executive summaries for clients and funding agencies. Projects included:

1. *Development of a three-pollutant air pollution risk model.* This project seeks an air quality indicator for Health Canada that captures the combined effects of ozone, nitrogen dioxide, and fine particulate matter on human mortality and morbidity.
2. *Preservation of magnetogram data by digitization.* This project created methods and software for digitization of trace data recorded on photographic paper.
3. *Statistical method development for long-term missing ozone based on relationships to precursors, solar and climate data.* This project filled large gaps in ozone records using machine learning techniques.
4. *Upgrading ground-level ozone data based on precursors and climate data.* An R package for data management and validation of pollutant data in Canada.
5. *Modelling high impact low frequency geomagnetic disturbances.* This project used data from solar-orbiting spacecraft to predict solar flare / coronal mass ejections and their local effects on geomagnetically induced currents in power systems.

**Demonstrated skills:** *Data analysis, graphics, programming, database design, creating R packages, writing proposals, writing scientific reports, budgeting, public speaking, communication, collaboration.*

As a Course Instructor I taught the following courses in the Department of Mathematics and Statistics:

1. STAT 462/862: Computational Data Analysis. Instructor, Winter 2014 and Fall 2014.
2. STAT 263: Introduction to Statistics. Instructor, Summer 2013.

**Demonstrated skills:** *Curriculum development, organization, technical presentation, time management, mentoring, lesson and computer lab planning, setting examinations, student evaluation.*

### Consulting Statistician

**2008 – Present**

I have been a statistical, quantitative, or resource management consultant for a variety of projects. Helping others answer questions and make decisions using data is what I love about being a statistician, and private consulting gives me this opportunity. Some of the projects that I have consulted on include:

1. *Legacy, Leisure and the "Work Hard - Play Hard" Hypothesis.* Multivariate analysis for Lonnie Aarsen at Queen's University. Subsequent paper published in *The Open Psychology Journal* 9(1):7-24, 2016.
2. *Stats, Data and Models: Instructor's Solution Manual (2nd, 3rd Canadian Editions).* Author for Pearson.
3. *Prospective evaluation of a management strategy for Rivers Inlet sockeye salmon.* Management strategy evaluation and report for Raincoast Conservation Society: Fall 2008.

**Demonstrated skills:** *Consulting, textbook publishing, elementary and advanced statistics, analysis of population dynamics, management of natural resources, multivariate statistics.*

As a Research Assistant in fisheries science I led development on two projects:

1. *Migration simulator for Fraser Sockeye*. Authored an R package that simulates co-migrating populations subject to cumulative effects. Simulations can include abundance surveys and harvesting for evaluation of management strategies to meet conservation, cultural, and economic objectives.
2. *An exposure-response methodology for assessing the impacts of bottom-fishing gear on benthic marine ecosystems*. Designed a spatial survey to assess the impact of bottom fisheries on benthic macrohabitat structure off the coast of British Columbia. Helped to write a successful three-year grant proposal for \$324,000 to implement the design.

As a Course Instructor I taught two courses in the Department of Resource and Environmental Management.

1. *REM 612: Simulation Modelling in Natural Resource Management*.
2. *REM 614: Advanced Methods in Fisheries Assessment*.

**Demonstrated Skills:** *Survey design, statistical simulation, management strategy evaluation, applied mathematics. In-depth knowledge of natural resource management and fisheries assessment.*

## Technical Skills & Training

- Proficient in R, LaTeX, WinBUGS and BUGS, SAS, MS Excel.
- Experience with C, SQL, Matlab, JMP, Fortran, Python, SPSS, Access, ADMB, VBasic for Apps.
- Bayesian Inference, Hierarchical Models, Spectrum Estimation, Time Series Analysis, Statistical Theory, Probability, Statistical Design, Data Analysis, Generalized Linear Models, Survival Analysis, Gaussian Process Models, Advanced Fisheries Assessment, Simulation Modelling, Parallel Computing, Subversion and Git Version Control.

## Conference Presentations

- Joint Statistical Meetings (2014-2017)
- Statistical Society of Canada Meetings (2012, 2014, 2016)
- American Geophysical Union Fall Meeting (2014)
- Canadian Solar Workshop (2012-2015)
- Mote International Symposium in Fisheries Ecology (2008)
- Fisheries and Marine Ecosystems Conference (2006, 2007)

## Service

- Topic-Contributed Session Organizer, Joint Statistical Meetings, 2016.
- Graduate Representative, Appointments Committee, Queen's Dept. of Math. & Statistics, 2013-2015.
- Founding Executive Member (President, Secretary), Queen's Graduate Mathematics Society, 2011-2015.
- Figure Skating Coach and Choreographer, Ontario University Athletics Varsity Clubs, 2010-2017
- Volunteer, International Year of Astronomy Public Outreach Events and Telescope Workshops, 2009.
- Chair, International Fisheries and Marine Ecosystems Conference, 2007.

## References

**Queen's University:** Dr. David Thomson, FRSC. Professor and Canada Research Chair in Statistics and Signal Processing. Email: [djt@queensu.ca](mailto:djt@queensu.ca) | Phone: (613) 533-2426.

**Simon Fraser University:** Dr. Sean Cox. Associate Professor and Department Chair Resource and Environmental Management. Email: [sean\\_cox@sfu.ca](mailto:sean_cox@sfu.ca) | Phone: (778) 782-5778.

**Team Project Collaborator:** Mr. David Riegert. PhD Candidate, Statistics, Queen's University. Email: [david.riegert@queensu.ca](mailto:david.riegert@queensu.ca) | Phone: (613) 217-0401.