

Aaron Springford GStat

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Education

- **PhD Statistics**, Queen's University. Supervisor: David Thomson, FRSC. December 2017.
Thesis: Spectral analysis of time series 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

Weyerhaeuser: Statistician

2017 – 2019

As a Statistician at Weyerhaeuser (WY), I provided statistical assistance and expertise on a variety of projects and initiatives. I was internally recognized (financial award) for my contribution to process improvements, including the introduction of a company R package repository, software deployment using gitlab CI, and statistical training in the design of experiments, data wrangling, and graphics/visualization. Projects included:

1. Analysis of existing survey data for the marbled murrelet – an endangered species – and development of a new survey protocol, in collaboration with the Pacific Seabird Group.
2. Market delineation and price curve estimation for the WY strategic planning group.
3. Analysis of experimental forestry data and scientific publication of research results, e.g. survival of created snags and the impact of intensive forestry on bird communities.
4. Use of remote sensing data for silviculture decision-making.
5. Seedling nursery inventory, forecasting of marketable seedling counts, and a case-control study examining the causes of seedling stunting.
6. Development of R packages and Shiny apps to streamline various processes.

Demonstrated skills: *Data analysis, experimental design, machine learning, graphics, programming, CI workflow, professional development and training, internal and external collaboration, UI design.*

Queen's University: Research Assistant and Course Instructor

2012 – 2017

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.* Health Canada project to capture 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. *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: *Database design, creating R packages, writing proposals, writing scientific reports, budgeting, public speaking, communication.*

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.

Simon Fraser University: Research Assistant and Course Instructor

2008 – 2010

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, git, LaTeX, WinBUGS and BUGS, Stan, 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.

Service

- American Statistical Association Puget Sound Chapter Representative, 2018-2019.
- 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.
- Chair, International Fisheries and Marine Ecosystems Conference, 2007.

References

Weyerhaeuser: Mr. Jay Jones. Lead Statistician.

Email: jay.jones@weyerhaeuser.com | Phone: (253) 508-6551.

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

Simon Fraser University: Dr. Sean Cox. Professor of Resource and Environmental Management.

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