IDLEWYLD
Analytics & Consulting Services

SQUEEZING INFORMATION AND MEANING OUT OF COMPLEX DATA

Patrick Boily · President

☐ (819) 816-3150 | ✉ idlewyld@idlewyldanalytics.ca | ⌂ idlewyldanalytics.ca | in patrickboily

Idlewyld consultants are seeking challenging projects where they can apply high-level skills in problem-solving, modeling, and data analysis. Our consultants have a strong background in mathematics/statistics and in their application to various endeavours, as well as extensive project experience in both the public and the private sectors.

Skills

Core Competencies	Creative problem solver · Dynamic team leader and team player
	Quick and efficient learner and educator · Accomplished technical and scientific writer
	Meticulous data gatherer, processor, and analyzer · Experienced teacher and mentor
Programming	SAS · MATLAB · R · Python · IBM SPSS Modeler · SQL · Maple · LaTeX · some C/C++/C#/Perl · MS Office
Analysis	statistical/data analysis & interpretation · queueing networks · operations research · modeling · stochastic modeling & analysis · predictive modeling · forecasting · data science & analytics · optimization · sampling design, size & allocation · simulations · numerical analysis · performance evaluation
Languages	French, English

Selected Achievements

Started-up and **currently managing** the Centre for Quantitative Analysis and Decision Support (CQADS) at Carleton University, which provides consulting and training to clients in the private, public and academic sectors, including (but not limited to):

- Bayne Sellar Boxall
- Canada's Accredited Zoos and Aquariums
- Canadian Air Transport Security Authority
- Canadian Mortgage and Housing Corporation
- Clarity Consulting
- Commission for Public Complaints Against the RCMP
- Communications Research Centre Canada
- Department of Foreign Affairs, Trade and Development
- Nuclear Waste Management Organization
- Ottawa Professional Fire Fighters Association
- Privy Council Office
- Public Health Agency of Canada
- Synchro Canada
- Taitomo Consulting
- Transport Canada
- United Way Centraide Canada
- Various academics and private citizens

A description of relevant projects can be found in appendix A – Relevant Project Experience.

Designed and **implemented** the award-winning *Canadian Vehicle Use Study*, which provides provincial and national estimates of 60 vehicle related quantities, including fuel consumption, kilometers traveled and passenger-kilometers traveled for Transport Canada.

Designed and **implemented** a model predicting the effects of various scenarios on offender populations for Correctional Service of Canada.

Designed and **implemented** a model imputing missing Blood Alcohol Content data in the National Collision Database. Accepted for presentation at the Transportation Research Board.

Designed an ecological model and graphic user interface at the behest of Parks Canada and Little Red River Cree Nation to be used to assess the ecological damage associated with various bison depopulation scenarios in Wood Buffalo National Park, Alberta/NWT.

Presented the results of my research in mathematics to experts at various conferences and seminars over the years.

Taught over 40 courses in mathematics and statistics at universities in the Ottawa area.

Taught myself, over a period of a single month, the pre-requisites necessary to take advanced statistics courses in data mining and sampling design, as well as how to use the statistical soft-wares SAS, R, SPSS Clementine.

Wrote a calculus textbook and provided first year francophone students in management and commerce at the University of Ottawa with a quality affordable alternative.

Completed over 40 university courses in mathematics and statistics.

Relevant Experience

Idlewyld Analytics and Consulting Services *Wakefield, Canada*

PRESIDENT AND SENIOR CONSULTANT *Jan 2016 – current*

- Providing quantititative, data science and analytics advice to public and private sectors clients.

Centre for Quantitative Analysis and Decision Support, Carleton University *Ottawa, Canada*

MANAGING CONSULTANT *Sep 2012 – current*

- Duties include (but are not limited to) the administration of the Centre (marketing, accounting, finances, consultant selection and supervision, etc.), teaching regular workshops on various analytical and data science concepts, and mathematical and statistical consulting with over 40 clients (see list above).

Transport Canada *Ottawa, Canada*

ECONOMIC ADVISOR (EC-06) *Jul 2011 – Aug 2012*

- Analyst for the Economic and Environmental Analysis and Research group in the Policy directorate. Duties included (but were not limited to) the design, implementation, documentation and fine-tuning of the ongoing nation-wide Canadian Vehicle Use Study (CVUS), the design of a model to predict future driving behavior based on past driving, as well as the design of the Heavy Duty Vehicle Use Study.

Public Works and Government Services Canada *Ottawa, Canada*

SENIOR CONSULTANT (EC-06) *Jan 2011 – Jun 2011*

- Consultant with the Finance and Analytics group at Government Consulting Services, until the group's demise. Duties included (but were not limited to): the design and implementation of a stochastic model to predict the effects of various scenarios on offender populations for Correctional Service of Canada, the design of a model to optimize the transportation schedule on Parliament Hill, the design of a resource management visualization tool for the Department of National Defence, continuing work on the Canadian Vehicle in Use Survey for Transport Canada and the preparation of numerous Memoranda of Understanding with various government agencies.

Transport Canada *Ottawa, Canada*

RESEARCH ANALYST (EC-05/06) *Jan 2009 – Dec 2010*

- Analyst for the Evaluation and Data Systems group in the Road Safety and Motor Vehicle division. Duties included (but were not limited to): road safety research through mathematical and statistical means, the design and analysis of a Field-of-View study, the design of a Blood Alcohol Content imputation algorithm for missing data in the National Collision Database, the review of selected papers for inclusion in the Transportation Research Record of the Transportation Research Board, the procurement of services from researchers at HEC Montréal in regards to a vehicle incompatibility study, the procurement of a motorcycle VIN database from Sanford-Evans and the sampling design of a pilot for a revamped Canadian Vehicle Survey.

University of Ottawa/Université du Québec en Outaouais *Ottawa/Gatineau, Canada*

LECTURER/PROFESSOR *Sep 1999 – Apr 2009*

- Planned, organized, taught and graded university-level mathematics courses at the Department of Mathematics; engaged in mathematical research and published results in academic journals.

Statistics Canada *Ottawa, Canada*

METHODOLOGIST (MA-02) *Jun 2008 – Dec 2009*

- Methodologist for the Canadian Health Measure Survey (CHMS), Household Survey Division. Duties included (but were not limited to): the selection of the survey sample from a multi-phase design and the computation of the exact variance for numerous laboratory variables associated with the CHMS.

Canada Border Services Agency *Ottawa, Canada*

PROJECT OFFICER (FSWEP) *Jan 2008 – May 2008*

- Data Miner in the Harmonized Risk Scoring and Advanced Trade Data team, Commercial Projects Division. Duties included (but were not limited to): the research into data-mining techniques to enhance the effectiveness of the CBSA risk scoring algorithm for marine cargo containers entering the country and the analysis and organization of the complex information found in a database with roughly 2.5 million observations.

Institute of the Environment *Ottawa, Canada*

RESEARCH ASSOCIATE *Sep 2004 – Nov 2007*

- Created a stochastic simulation model for Parks Canada and Little Red River Cree Nation to minimize the ecological damage associated with various bison-culling strategies used to try to rid Wood Buffalo National Park of bovine tuberculosis; designed a graphical user-interface to assist the involved managers in their decision making; wrote a user manual.

Education and Personal Development

Univeristy of Ottawa *Ottawa, Canada*

Ph.D. (Mathematics) *2006*

- Thesis: Spiral Wave Dynamics under Full Euclidean Symmetry-Breaking
- Topics: modeling spiral wave dynamics; numerical analysis and implementation
- Results published in *JNonlinSci*

University of Ottawa *Ottawa, Canada*

M.Sc. (Mathematics) *2000*

- Thesis: Analyse numérique des bifurcations dans les systèmes dynamiques paramétrés
- Topics: bifurcations in ordinary differential equations; numerical analysis and implementation

University of Ottawa *Ottawa, Canada*

B.Sc. (Mathematics) *1998*

- *Magna Cum Laude*
- Dean's List, 1998

Carleton University *Ottawa, Canada*

Graduate-level Statistics Courses *2007-2009*

- Design of Experiments, Time Series Analysis, Data Mining, Survey Sampling

Personal

Active Interests and Miscellaneous Factoids

Cycling, Badminton, Hockey, Reading, Crossword puzzles, Music, Gardening

- Member of former rock band Treebeard (1993 – 2005) which produced 5 CDs, 4 videos and was recognized as Ottawa's "Favorite Rock Band" in 2000 by the Ottawa X-Press
- Member of a lifeguard team (1999 – 2000) that won a gold medal in the Priority Assessment event at the 1999 Ontario Lifeguard Championships
- Federal Government Security Clearance: Level II (Secret) - valid until November 18, 2018

The following table lists, from most recent to most ancient, a subset of projects for which I was main contributor or co-lead.

Contents

22. Data Envelopment Analysis of Security Officers Performance (Feb '16 – Jun '16)

Project Description
▪ Developed a DEA approach (with SAS code) to score the performance of security officers at Canadian airports.

Related Reports and Presentations
▪ Boily, P. (2016) Security Officers Profiles Indexing Tool, *Canadian Air Transport Security Agency*, Ottawa, Canada – REPORT.

21. Analytics Advice for the CRC (Jan '16 – Mar '16)

Project Description
▪ Provided expert advice to the CRC on the subject of time series analysis and clustering methods.

Related Reports and Presentations
▪ Schellinck, J., Boily, P., Warren, R., Liu, D. (2016) A Primer of Methods for SEA Data Analytics, *Communications Research Centre*, Ottawa, Canada – REPORT.
▪ Boily, P., Liu, D. "Introduction to Spectral Clustering", *Communications Research Centre*, Ottawa, Canada, March 2016 – PRESENTATION DECK.
▪ Boily, P. "A Primer of Time Series Analysis – Trend Extraction and Forecasting", *Communications Research Centre*, Ottawa, Canada, March 2016 – PRESENTATION DECK.

20. Evaluation and Assessment of FINA's Scoring System (Dec '15 – Feb '16)

Project Description
- Provided a stochastic simulation model to demonstrate the potential effect of various biases in the current FINA scoring system on competition results.

Related Reports and Presentations
- Boily, P., Hagiwara, S. (2016) An Evaluation of FINA's Synchronized Swimming Scoring System Using Stochastic Simulations, *Synchro Canada*, Ottawa, Canada – REPORT.

19. Analytics Literature Search and Review (Dec '15 – Feb '16)

Project Description
- Identified numerous specific examples of data analytics in the public sectors (Canadian or not), seeking in particular examples with strong replicability within the Canadian federal system.
- Classified and described these examples into generalizable problem archetypes and the types of policy or program questions they can solve.
- Highlighted the development process and limitations of these model archetypes.
- Identified systematic barriers that public sector organizations have experienced in utilizing data analytics and their solution to address the barrier.
- Identified various databases used in these models.

Related Reports and Presentations
- Boily, P., Liu, D., Rahal, N. (2016) Review and Examples of Analytics and Data Science Use in the Public Sector, *Privy Council Office*, Ottawa, Canada – REPORT.

18. Assessment and Analysis of Consular Data (Dec '15 – Mar '16)

Project Description
- Cleaned-up and analyzed consular operations data set.
- Identified what the available data can and can't reveal about the current consulate operations program and how to manage it.
- Identified possible gaps in the information that could be addressed through modifications to the software.
- Identified possible sources of data that could enhance and improve on the currently available data.

Related Reports and Presentations
- Schellinck, J., Boily, P., Liu, D. (2016) Assessment and Analysis of GAC (DFATD) Consular Data, *Global Affairs Canada*, Ottawa, Canada – REPORT.

17. Factors Influencing Security Incidents at Airport Screening (Oct '15 – Nov '15)

Project Description
- Used association rules mining to determine potential factors influencing security incidents at airports for CATSA.

Related Reports and Presentations
- Results kept confidential, at client's request.

16. Queueing Model of Wait Time at Pre-Board Screening Checkpoints (Jun '13 - Dec '13, Jan '15 – Jun '15)

Project Description
- Built a model using queueing theory and general operations research to predict the number of servers required to process pre-board screening travellers to some wait time quality of service (QoS) level at Canadian airports checkpoints for CATSA
- The model also allows for the prediction of QoS levels given an arrival profile.

Related Reports and Presentations
- Boily, P. "Queues and Wait Times at Canadian Airports", *CORS*, Montréal, Canada, June 16, 2015.
- Boily, P., Ye, W., Zhao, Y. (2015, 2013) Wait Time Impact Model at Pre-Board Screening Checkpoints for Canadian Airports, *Canadian Air Transport Security Agency*, Ottawa, Canada – REPORT.

APPENDIX A -- RELEVANT PROJECT EXPERIENCE

15. Nuclear Waste Repository System Probability Failure Model
15.1 Feasibility Assessment and Methodology Design (Sep '14 – Dec '14)
15.2 Phase 1: Prototype and Conceptual Model (Apr '15 – May '16)

Project Description
- This project encompassed a feasibility study and methodology development for the creation of a probability of failure model of a proposed nuclear waste barrier system (the Adaptive Phased Management Repository Design – Mark II). Project activities included:
  - a review of currently available statistical and simulation techniques for failure probability evaluation, along with failure analysis methodologies developed for structured failure analysis.
  - an assessment of the availability of evidence and data on factors identified to be relevant to the design of a failure model for a deep geological repository for nuclear waste
  - an assessment of the feasibility of creating a probability failure model for the system in question and a development of a methodological approach for the construction of this model
  - A development of a step-by-step methodology and analytic approach for the creation of the required failure model for the Adaptive Phased Management Repository Design – Mark II

Related Reports and Presentations
- Schellinck, J., Boily, P. (2015) Requirements for the design and analysis of a statistical failure model for the Adaptive Phased Management Repository Design – Mark II, *Nuclear Waste Management Organization*, Toronto, Canada – REPORT.
- Schellinck, J., Boily, P., Hagiwara, S., MacDougall, K. (2016) Failure Analysis Simulation Model for the APMRD-II, *Nuclear Waste Management Organization*, Toronto, Canada – REPORT.

14. Attainability of Sick Leave Objectives and Assessment of the Recording of Training Hours (Jan '14 – May '16)

Project Description
- Investigating and modeling the effect of the current 24-hour shift on the rate at which leaves of all kinds are being taken.

Related Reports and Presentations
- Hagiwara, S., Boily, P. (2015) Analysis of the OPFFA's Sick Leave and Training Hours Data, *Ottawa Professional Firefighters Associations*, Ottawa, Canada – REPORT.
- Hagiwara, S., Boily, P. (2016) Analysis of OPFFA Data, *Ottawa Professional Firefighters Association*, Ottawa, Canada – REPORT.

13. Covariance Analysis of Irritable Bowel Syndrome Study Data (Mar '13 – Jun '14)

Project Description
- Covariance analysis conducted on the data collected by the Canadian College of Naturopathic Medicine (CCNM) to determine the effect (if any) of an agent on Irritable Bowel Syndrome.
- Made suggestions for experimental design of second phase.

Related Reports and Presentations
- Hagiwara, S., Boily, P. (2014) Covariance Analysis of Irritable Bowel Syndrome Study II, *Canadian College of Naturopathic Medicine*, Ottawa, Canada – REPORT.
- Hagiwara, S., Boily, P. (2013) Covariance Analysis for the 2010 CCNM Pilot Study on Irritably Bowel Syndrome, *Ottawa Integrative Cancer Center*, Ottawa, Canada – REPORT.

12. Statistical Analysis of Use-of-force Data (Jun '14 - Nov '14)

Project Description
- Provided advice on data cleaning, identifying invalid or anomalous entries, and dimension reduction in the use-of-force data for the Commission for Public Complaints Against the RCMP.
- Provided descriptive statistical analysis for the same data.
- Provided a predictive analytics tool using clustering analysis on the same dataset.

Related Reports and Presentations
- Boily, P. (2014) Cluster Analysis of Use-of-Force Data, *Commission for Public Complaints Against the RCMP*, Ottawa, Canada – REPORT.

APPENDIX A -- RELEVANT PROJECT EXPERIENCE

11. Analysis of Housing Choices and Changing Housing Needs of Seniors and Pre-seniors by Age Group (Apr '14 - Nov '14)

Project Description
- Provided profile analysis to help Clarity Consulting establish a comprehensive portrait of Canadian seniors living in housing with supportive services as well as seniors who express a strong interest in supportive housing by helping to for the Canada Mortgage and Housing Corporation
- Provided explanatory and predictive analysis of the same data set.

Related Reports and Presentations
- Rubenfeld, S., Boily, P., Robitaille, A. (2014) Determinants of Supportive Housing for Canadian Seniors, *Canada Mortgage and Housing Corporation*, Ottawa, Canada – REPORT.

10. Statistical Analysis of United Way Centraide Canada Fundraising Data (Feb '13 - Aug '14)

Project Description
- Conducted statistical and cluster analyses of trends in fundraising outputs for roughly 100 Canadian United Way chapters.
- The latest phase of the project dwells on fundraising data from 2011 to 2013.
- Previous phases looked at simpler data from 2003 to 2011, then 2007 to 2012 data.

Related Reports and Presentations
- Boily, P. (2014) Analysis of 2011-2013 United Way/Centraide Canada Fundraising Data, *United Way/Centraide Canada*, Ottawa, Canada – REPORT.
- Boily, P., Almaskut, A., "Analysis of United Way Centraide Canada fundraising data", *UW Toronto*, Toronto, Canada, June 6, 2014 – PRESENTATION.
- Boily, P. (2013), Analysis of United Way Fundraising Data, *United Way/Centraide Canada*, Ottawa, Canada – REPORT.

9. Evaluation of Canadian Aquariums and Zoos Accreditation Scoring Procedure (Feb '13 - Aug '14)

Project Description
- Investigated the current accreditation scoring procedure used by Canada's Accredited Zoos and Aquariums (CAZA).
- Suggested and implemented a new scoring model.

Related Reports and Presentations
- Hagiwara, S., Boily, P. (2014) Evaluation of CAZA's Accreditation Scoring Procedure, *Canada's Accredited Zoo and Aquariums*, Ottawa, Canada – REPORT.

8. Mathematical Modeling Using the Canadian Incidence Study of Reported Child Abuse and Neglect (Jun '13 - Mar '14)

Project Description
- The CIS introduced a new abuse category between its second (2003) and third (2008) cycles.
- Analyzed the datasets and built a Classifying Trees and Random Forests prediction model for PHAC to determine what the abuse type distribution would have been in 2003 had the 2008 abuse types definitions been in place.

Related Reports and Presentations
- Boily, P., Huang, Y. (2014) Analysis of Canadian Incidence Study of Reported Child Abuse and Neglect Data, *Public Health Agency of Canada*, Ottawa, Canada – REPORT.
- Boily, P., Huang, Y. "Analysis of Canadian Incidence Study of reported child abuse and neglect data", *Public Health Agency of Canada*, Ottawa, Canada, March 28, 2014 – PRESENTATION.

7. Time-series Analysis of Multi-Modal Supply Chain Networks (May '13 - Jul '13)

Project Description
- Developed a methodology for Transport Canada to produce a seasonally dependent index to track container transit times in multi-modal chain networks, depicting the reliability and the variability of transit times at each node.
- The index is defined in such a way as to facilitate the comparison of performance between differing time periods.

APPENDIX A -- RELEVANT PROJECT EXPERIENCE

<u>Related Reports and Presentations</u>
- Boily, P., Huang, Y. (2013) Analysis of Fluidity Indicators and Seasonality Adjustments for Containers Transit Times in a Multi-Modal Supply Chain Networks, *Transport Canada*, Ottawa, Canada – REPORT.

6. Scheduling Optimization for Online Food Ordering (May '13 - Jul '13)

<u>Project Description</u>
- Designed a scheduling algorithm for Fast2eat that prioritizes meal preparation in a food court for which the orders were made online.
- Algorithm was implemented and testing against empirical data began at Carleton in May '14.

<u>Related Reports and Presentations</u>
- Ye, W., Boily, P. (2013) Scheduling Algorithm for Food Court Online Ordering, *Fast2eat*, Ottawa, Canada – REPORT.

5. Statistical Surveying and Analysis of Canadian Vehicle Use (Jun '10 - Sep '12)

<u>Project Description</u>
- Designed and participated in the implementation of the CVUS for Transport Canada, which has been providing provincial and national estimates of 60 vehicle related quantities since 2012, including fuel consumption, kilometers traveled and passenger-kilometers traveled.
- Prepared a series of CVUS "calculators" which can be used by end users to customize their estimate reports
- Winner of a 2012 GTEC Distinction Award

<u>Related Reports and Presentations</u>
- Boily, P. (2011) Methodology of the Canadian Vehicle Use Study, *Transport Canada*, Ottawa, Canada – REPORT.
- Boily, P. "Usage and interpretation of Canadian Vehicle Use Study results", *Transport Canada/Natural Resources Canada/Environment Canada*, Ottawa/Gatineau, Canada, June 2012 – PRESENTATION.

4. Simulation of the Size of Population of Offenders in Canadian Correctional Facilities (Jan '11 - Jun '11)

<u>Project Description</u>
- Designed and implemented a complex stochastic simulation model predicting the effects of various policy scenarios on the size of offender populations for Correctional Service of Canada

<u>Related Reports and Presentations</u>
- Boily, P. (2011) CPSM Modeling System, *Correctional Services Canada,* Ottawa, Canada – USER MANUAL.

3. Imputation of Blood Alcohol Contents Level in Driver and Pedestrian Fatalities (Dec '09 - Jun '10)

<u>Project Description</u>
- Designed and implemented a model imputing missing Blood Alcohol Content data in the National Collision Database for the Ministry of Transportation (Ontario)
- Accepted for presentation at the Transportation Research Board meetings in Washington, D.C.

<u>Related Reports and Presentations</u>
- Boily, P. (2010) An Imputation Algorithm of Blood Alcohol Content Levels for Drivers and Pedestrians in Fatal Collisions, *Ministry of Transportation (Ontario)*, Toronto, Canada – REPORT.

2. Forecasting Fatal Traffic Collisions Using Economic Indicators (May '09 - Jun '09)

<u>Project Description</u>
- Developed a statistical model showing a link between Canadian road fatalities and the state of the Canadian economy
- Presented at the Canadian Multi-Disciplinary Road Safety Conference in Saskatoon.

<u>Related Reports and Presentations</u>
- Provost, M., Boily, P., Boase, P. (2009) Improving the Ability to Predict Fatal Traffic Accidents From Economic Indices, *Proceedings of the 19th Canadian Multidisciplinary Road Safety Conference*, Saskatoon, Canada – CONFERENCE PROCEEDINGS.

APPENDIX A -- RELEVANT PROJECT EXPERIENCE

1. Ecosystem Risk Analysis of Various Repopulation/Depopulation Scenarios for Bisons with Bovine Tuberculosis in Wood Buffalo National Park (Jun '04 - Nov '08)

<u>Project Description</u>
- Designed a complex ecological simulation model and GUI (using stochastic drivers, cellular automata and trophic cascades), at the behest of Parks Canada and Little Red River Cree Nation to assess the ecological damage associated with various bison depopulation scenarios in WBNP.

<u>Related Reports and Presentations</u>
- Boily, P. "An ecosystem simulation and risk analysis of Wood Buffalo National Park", *Parks Canada*, Fort Smith, NWT, Canada, November 7, 2008 – PRESENTATION.
- Boily, P. (2007) ERAS★ : Ecosystem Risk Analysis Software, *Parks Canada*, Ottawa, Canada – USER MANUAL.
- Boily, P., Findlay, S. (2005) Ecosystem Risk Analysis of Wood Buffalo National Park, *Proceedings of the Bison Diseases Technical Workshop (October 28-29)*, University of Alberta, Edmonton, Canada – CONFERENCE PROCEEDINGS.

APPENDIX B – LIST OF PRESENTATIONS, PUBLICATIONS, AND REPORTS

Publications
- Provost, M., Boily, P., Boase, P. (2009) Improving the Ability to Predict Fatal Traffic Accidents From Economic Indices, *Proceedings of the 19th Canadian Multidisciplinary Road Safety Conference*, Saskatoon, Canada.
- Boily, P, Leblanc, V.G, Matsui, E. (2007) Spiral Anchoring in Media with Multiple Inhomogeneities: a Dynamical System Approach, *Journal of Nonlinear Science*, 17:399-427.
- Boily, P., Findlay, S. (2005) Ecosystem Risk Analysis of Wood Buffalo National Park, *Proceedings of the Bison Diseases Technical Workshop (October 28-29)*, University of Alberta, Edmonton, Canada.

Theses
- Boily, P. (2006) Spiral Wave Dynamics Under Full Euclidean Symmetry-Breaking: A Dynamical System Approach (Ph.D. Thesis), *University of Ottawa,* Ottawa, Canada.
- Boily, P. (2000) Analyse numérique des bifurcations dans les systèmes dynamiques paramétrés (M.Sc. Thesis), *University of Ottawa,* Ottawa, Canada.

Reports
- Schellinck, J., Boily, P., Hagiwara, S., MacDougall, K. (2016) Failure Analysis Simulation Model for the APMRD-II, *Nuclear Waste Management Organization*, Toronto, Canada.
- Boily, P. (2016) Security Officers Profiles Indexing Tool, *Canadian Air Transport Security Agency*, Ottawa, Canada.
- Schellinck, J., Boily, P., Warren, R., Liu, D. (2016) A Primer of Methods for SEA Data Analytics, *Communications Research Centre*, Ottawa, Canada.
- Boily, P., Hagiwara, S. (2016) Analysis of OPFFA Data, *Ottawa Professional Firefighters Association*, Ottawa, Canada.
- Boily, P., Liu, D., Rahal, N. (2016) Review and Examples of Analytics and Data Science Use in the Public Sector, *Privy Council Office*, Ottawa, Canada.
- Schellinck, J., Boily, P., Liu, D. (2016) Assessment and Analysis of GAC (DFATD) Consular Data, *Global Affairs Canada*, Ottawa, Canada.
- Boily, P., Hagiwara, S. (2016) An Evaluation of FINA's Synchronized Swimming Scoring System Using Stochastic Simulations, *Synchro Canada*, Ottawa, Canada.
- Schellinck, J., Boily, P. (2015) Requirements for the design and analysis of a statistical failure model for the Adaptive Phased Management Repository Design – Mark II, *Nuclear Waste Management Organization*, Toronto, Canada.
- Boily, P., Ye, W., Zhao, Y. (2015, 2013) Wait Time Impact Model at Pre-Board Screening Checkpoints for Canadian Airports, *Canadian Air Transport Security Agency*, Ottawa, Canada.
- Hagiwara, S., Boily, P. (2015) Analysis of the OPFFA's Sick Leave and Training Hours Data, *Ottawa Professional Firefighters Association*, Ottawa, Canada.
- Hagiwara, S., Boily, P. (2014) Covariance Analysis of Irritable Bowel Syndrome Study II, *Canadian College of Naturopathic Medicine*, Ottawa, Canada.
- Boily, P. (2014) Cluster Analysis of Use-of-Force Data, *Commission for Public Complaints Against the RCMP*, Ottawa, Canada.
- Rubenfeld, S., Boily, P., Robitaille, A. (2014) Determinants of Supportive Housing for Canadian Seniors, *Canada Mortgage and Housing Corporation*, Ottawa, Canada.
- Boily, P. (2014) Analysis of 2011-2013 United Way/Centraide Canada Fundraising Data, *United Way/Centraide Canada*, Ottawa, Canada.
- Hagiwara, S., Boily, P. (2014) Evaluation of CAZA's Accreditation Scoring Procedure, *Canada's Accredited Zoo and Aquariums*, Ottawa, Canada.
- Boily, P., Huang, Y. (2014) Mathematical Assessment of the Reliability of Childhood Physical Abuse Measure in the National Population Health Survey, *Public Health Agency of Canada*, Ottawa, Canada.
- Boily, P., Huang, Y. (2014) Analysis of Canadian Incidence Study of Reported Child Abuse and Neglect Data, *Public Health Agency of Canada*, Ottawa, Canada.
- Hagiwara, S., Boily, P. (2013) Covariance Analysis for the 2010 CCNM Pilot Study on Irritably Bowel Syndrome, *Ottawa Integrative Cancer Center*, Ottawa, Canada.
- Boily, P. (2013), Analysis of United Way Fundraising Data, *United Way/Centraide Canada*, Ottawa, Canada.
- Boily, P., Huang, Y. (2013) Analysis of Fluidity Indicators and Seasonality Adjustments for Containers Transit Times in a Multi-Modal Supply Chain Networks, *Transport Canada*, Ottawa, Canada.
- Ye, W., Boily, P. (2013) Scheduling Algorithm for Food Court Online Ordering, *Fast2eat*, Ottawa, Canada.
- Boily, P. (2011) Methodology of the Canadian Vehicle Use Study, *Transport Canada*, Ottawa.
- Boily, P. (2010) An Imputation Algorithm of Blood Alcohol Content Levels for Drivers and Pedestrians in Fatal Collisions, *Ministry of Transportation (Ontario)*, Toronto, Canada.

Textbook
- Boily, P., Hart, R. (2009) Le calcul dans la joie (format économique), Quadrangle, Ottawa.

APPENDIX B – LIST OF PRESENTATIONS, PUBLICATIONS, AND REPORTS

User Manuals
- Boily, P. (2011) CPSM Modeling System, *Correctional Services Canada,* Ottawa, Canada.
- Boily, P. (2007) ERAS★ : Ecosystem Risk Analysis Software, *Parks Canada*, Ottawa, Canada.

Presentations
- Schellinck, J., Boily, P. "Data Science Strategies for Software Quality Evaluation and Development Resource Allocation", Ottawa, Canada, *Emenda Tech* Day, December 13, 2016.
- Boily, P., Liu, D. "Introduction to Spectral Clustering", *Communications Research Centre*, Ottawa, Canada, March 2016.
- Boily, P. "A Primer of Time Series Analysis – Trend Extraction and Forecasting", *Communications Research Centre*, Ottawa, Canada, March 2016.
- Schellinck, J., Boily, P., Liu, D. (2015) "Data Architecture Analysis, Renovation and Renewal: A Case Study with GAC Consular Data", presentation to the Consular IT-IM Colloquium
- Boily, P. "Queues and Wait Times at Canadian Airports", *CORS*, Montréal, Canada, June 16, 2015.
- Boily, P., Almaskut, A. "Analysis of United Way Centraide Canada fundraising data", *UW Toronto*, Toronto, Canada, June 6, 2014.
- Boily, P., Huang, Y. "Analysis of Canadian Incidence Study of reported child abuse and neglect data", *Public Health Agency of Canada*, Ottawa, Canada, March 28, 2014.
- Boily, P. "Usage and interpretation of Canadian Vehicle Use Study results", *Transport Canada/Natural Resources Canada/Environment Canada*, Ottawa/Gatineau, Canada, June 2012.
- Boily, P. "A model of the Canadian vehicle fleet", *Transport Canada*, Ottawa, September 2, 2010.
- Boily, P. "An ecosystem simulation and risk analysis of Wood Buffalo National Park", *Parks Canada*, Fort Smith, NWT, Canada, November 7, 2008.
- Boily, P. "Spiral anchoring under full Euclidean symmetry-breaking: a dynamical system approach", *International Conference on Recent Developments in Differential Equations and Applications*, Guangzhou, China, July 21, 2006.
- Boily, P. "Spiral anchoring under full Euclidean symmetry-breaking: a dynamical system approach", *University of Ottawa / University of Western Ontario / Queens University / University of Waterloo / Université de Montréal / University of Ontario Institute of Technology*, Ottawa / London / Kingston / Waterloo / Montréal / Oshawa, Canada, March – July, 2006.

Workshops
- Boily, P., "Getting Technical: More Data Science Methods", *CQADS Workshop Series*, Oct. 2016.
- Boily, P., "Simple Data Discovery: Exploring Data with R", *CQADS Workshop Series*, Oct. 2016.
- Boily, P., "Mining for Information Gold: Data Science Concepts and Techniques", *CQADS Workshop Series*, Oct. 2016.
- Boily, P., "Introduction to Analytics: Preparing and Visualizing Data", *CQADS Workshop Series*, Oct. 2016.
- Boily, P., Schellinck, J., "Mining for Information Gold: Data Science Concepts and Techniques", *CQADS Workshop Series*, Mar. 2016.
- Boily, P., "The Basics of Data Science: A General Overview for Scientists", *Health Canada Workshop*, Feb. 2016.
- Boily, P., "Spotlight on Classification and Data Visualization", *Health Canada Workshop*, Feb. 2016.
- Boily, P., Schellinck, J., "Introduction to Analytics: Preparing and Visualizing Data", *CRCC Workshop*, Oct. 2015.
- Boily, P., Schellinck, J., "Mining for Information Gold: Data Science Concepts and Techniques", *CRCC Workshop*, Oct. 2015.
- Boily, P., Schellinck, J., "Data Discovery: Exploring Data with R", *CRCC Workshop*, Oct. 2015.
- Boily, P., "Analytics, Before and After: Gathering, Preparing and Visualizing Data", *CQADS Workshop Series*, Oct. 2014.
- Boily, P., Schellinck, J., "Mining for Information Gold: Data Science Concepts and Techniques", *CQADS Workshop Series*, Oct. 2014.
- Boily, P., Schellinck, J., "Hands-on Data Discovery: Exploring Data with IBM SPSS Modeler and Other Platforms", *CQADS Workshop Series*, Oct. 2014.
- Boily, P., "Challenges of Pre- and Post-Analytics", *CQADS Workshop Series*, Feb. 2014.

Blog Articles
- Boily, P., "The Basic Principles of Bayesian Data Analysis", *Dr. Idlewyld's Data Analysis Emporium and Assorted Quantitative Goodies*, Jan. 2016, Dec. 2016.
- Boily, P., "An Introduction to Support Vector Machines", *Dr. Idlewyld's Data Analysis Emporium and Assorted Quantitative Goodies*, Sep. 2016, Dec. 2016.
- Boily, P., "Edward Tufte's Fundamental Principles of Analytical Design", *Dr. Idlewyld's Data Analysis Emporium and Assorted Quantitative Goodies*, Sep. 2016.

APPENDIX B – LIST OF PRESENTATIONS, PUBLICATIONS, AND REPORTS

Short Courses – Presentation Decks
- Boily, P., Schellinck, J. (2016) Data Science Universals
- Boily, P. (2016) Data Clean-up and Validation
- Boily, P. (2016) The Basics of R
- Boily, P. (2016) Data Visualization
- Boily, P. (2016) Odds and Ends
- Boily, P., Schellinck, J. (2016) Fundamental Notions
- Boily, P., Schellinck, J. (2016) Association Rules
- Boily, P. (2016) Classification and Decision Trees
- Boily, P., Schellinck, J. (2016) Clustering and the k-Means Algorithm
- Boily, P. (2016) Data Science Issues and Challenges
- Boily, P. (2016) Support Vector Machines
- Boily, P., Schellinck, J. (2016) Artificial Neural Networks
- Schellinck, J., Boily, P. (2016) Hierarchical Clustering
- Schellinck, J., Boily, P. (2016) Density-Based Clustering
- Boily, P., Hagiwara, S. (2016) Naïve Bayes Classification
- Boily, P., Liu, D. (2016) Spectral Clustering
- Boily, P., Afodjo, N. (2016) Logistic Regression