

Vincenzo Coia

Ph.D. · P.Stat. (Statistical Society of Canada)

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EDUCATION

Ph.D. Statistics — The University of British Columbia - Vancouver, BC	2017
M.Sc. Statistics — Brock University - St. Catharines, ON	2012
B.Sc. Mathematics — Brock University - St. Catharines, ON	2011
B.Sc. Biology (3-year) — Brock University - St. Catharines, ON	2011

EMPLOYMENT HISTORY

Research Fellow — Politecnico di Milano, Italy · C2E Lab, Dept. of Civil and Environmental Engineering (DICA) 2025-2027

- Advances in the statistical modelling of risk due to compound climate-related events like rain-on-snow flooding, under a changing climate.

Senior Statistician — BGC Engineering Inc. - Canada 2022-2025

- Statistical modelling of complex earth science applications like flooding and climate change.

Assistant Professor of Teaching — The University of British Columbia, Vancouver · Department of Statistics 2020-2022

- Taught and developed courses at all levels in statistics and data science.

Lecturer — The University of British Columbia, Vancouver · Master of Data Science Program and Dept. of Statistics 2019-2020

- Taught and developed courses in the Master of Data Science program.

Postdoctoral Teaching and Learning Fellow — The University of British Columbia, Vancouver · Master of Data Science Program and Dept. of Statistics 2017-2019

- Taught and developed courses in the Master of Data Science program.

PUBLICATIONS

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- Abdelmoaty, HM; Papalexiou, SM; Mamalakis, A; Singh, S; **Coia, V**; Hairabedian, M; Szeftel, P; Grover, P (2025). *Does Non-Stationarity Affect GAN-Based Downscaling? Insights from High-Resolution WRF Simulations over the Canadian Prairies*. Artificial Intelligence for the Earth Systems. (Accepted)
 - Abdelmoaty, HM; Papalexiou, SM; Mamalakis, A; Singh, S; **Coia, V**; Hairabedian, M; Szeftel, P; Grover, P (2025). *Generative Adversarial Networks for Downscaling Hourly Precipitation in the Canadian Prairies*. Journal of Geophysical Research: Machine Learning and Computation. (Under minor revision)
 - LeSueur, P; Zubrycky, S; McDougall, S; **Coia, V**; Strouth, A; Porter, M (2025). *Vulnerability of people in wood-frame buildings to rapid flow-type landslides*. Natural Hazards. <https://doi.org/10.1007/s11069-025-07736-9>
 - Zahradka, A; **Coia, V**; Grover, P; Mitchell, A; Porter, M; Adair, T (2025). *Applying Machine Learning to Geohazard Management: Efficient Assessment of Pipeline Watercourse Geohazards by Learning from 3 Million Kilometer-Years of Geohazard Field Inspections*. Proceedings of the 20th Pipeline Technology Conference.
 - **Coia, V**; Joe, H; Nolde, N (2024). *Copula-based conditional tail indices*. Journal of Multivariate Analysis. vol. 201, pp. 105268.
 - Bale, S; **Coia, V**; Russell, B; Clohan, D (2024). *Probability Distributions of Tailings Dam Breach Volumes by Failure Mode as Part of a Risk Screening-Level Tool*. Proceedings of Tailings and Mine Waste 2024.
 - Vidal-Llana, X; Salort Sánchez, C; **Coia, V**; Guillen, M (2023). *Non-Crossing Dual Neural Network: Joint Value at Risk and Conditional Tail Expectation Regression with Non-Crossing Conditions*. Available at SSRN 4351877.

- **Coia, V**; Joe, H; Nolde, N (2021). *Tail Behavior for Bivariate Distributions Based on Pareto Mixtures*. Advances in Statistics-Theory and Applications: Honoring the Contributions of Barry C. Arnold in Statistical Science. pp. 207–228.
- **Coia, V** (2017). *Forecasting of nonlinear extreme quantiles using copula models*. University of British Columbia.
- **Coia, V**; Huang, ML (2014). *A Sieve model for extreme values*. Journal of Statistical Computation and Simulation. vol. 84, pp. 1692–1710.
- Ayad, M; **Coia, V**; Kihel, O (2014). *The Number of Relatively Prime Subsets of a Finite Union of Sets of Consecutive Integers..* J. Integer Seq.. vol. 17, pp. 14–3.
- Huang, ML; **Coia, V**; Brill, P (2013). *A cluster truncated pareto distribution and its applications*. International Scholarly Research Notices. vol. 2013.
- **Coia, V** (2012). *On estimation of extreme value distributions*. Brock Report in Mathematics and Statistics.

SOFTWARE (R PACKAGES)

- **Coia, V** (2026). *famish: Refine a family of distributions to match observations*. <https://doi.org/10.32614/CRAN.package.famish> (R package version 0.2.1)
- **Coia, V** (2026). *distionary: Create and Evaluate Univariate Probability Distributions*. <https://doi.org/10.32614/CRAN.package.distionary> (R package version 0.1.1)
- **Coia, V**; MacKenzie, L; Wang, J (2026). *xchan: Cross Section Watercourse Geometry*. <https://github.com/fluvtools/xchan> (R package version 0.1.0.9000, pending CRAN submission)
- **Coia, V** (2025). *distplyr: Manipulation of Univariate Distributions*. <https://doi.org/10.32614/CRAN.package.distplyr> (R package version 0.2.0)
- **Coia, V**; Joe, H (2023). *igcop: Computational Tools for the IG and IGL Copula Families*. <https://doi.org/10.32614/CRAN.package.igcop> (R package version 1.0.2)

PRESENTATIONS

I delivered the following presentations.

- **Coia, V** (2024). *A Machine Learning PoF Model for Hydrotechnical Hazards*. Presentation at the 16th Annual Cambio User's Group.
- **Coia, V**; Hairabedian, M (2023). *A Tale of Two Tributaries: Dependence Modelling for Hydrologically Consistent Floodplain Maps*. Canadian Water Resources Association - National Conference, Halifax, 2023.
- **Coia, V**; Hille, M (2023). *Finding the Breaking Point: What Constitutes 'Extreme'?*. Main stage presentation at BGC Engineering Annual General Meeting.
- Hairabedian, M; **Coia, V**; Grover, P (2022). *Estimation of the Design Flood Generated by Mixed Processes for the Coldwater River Watershed*. Canadian Water Resources Association - National Conference, Canmore, Alberta, 2022.
- Hairabedian, M; **Coia, V** (2022). *The Coldwater River: A Watershed Moment*. Main stage presentation at BGC Engineering Annual General Meeting.
- Hairabedian, M; Lockwood, K; **Coia, V** (2022). *Flood Frequency-Magnitude Relationship for the Coldwater River*. Invited presentation, Fraser Basin Council Connect & Learn community of practice.
- **Coia, V**; Nolde, N; Joe, H (2016). *Forecasting Extremes for Flooding*. Invited Talk, The 44th Annual Meeting of the Statistical Society of Canada, Brock University, St. Catharines, ON, May 29–June 1, 2016. National.
- **Coia, V**; Jeanniard du Dot, T (2015). *Using the Grammar of Graphics and Interactivity to explore Biologging Data in R*. Invited Demonstration, Building a Bioanalytical Theory for Analysis of Marine Mammal Movements: A Peter Wall International Research Roundtable, The University of British Columbia, Vancouver, BC, May 6, 2015. International.
- **Coia, V** (2015). *Flood Warning: An Application of High-Quantile Regression*. Contributed Talk, SFU/UBC Joint Graduate Student Seminar (Winter), SFU Harbour Centre, Vancouver, BC, February 28, 2015.
- **Coia, V** (2012). *A New Sieve Model for Extreme Values*. Contributed Talk, SFU/UBC Joint Graduate Student Seminar (Fall), SFU Harbour Centre, Vancouver, BC, September 29, 2012.
- **Coia, V**; Huang, ML (2012). *On Estimation of Heavy Tailed Distributions*. Contributed Talk, The 40th Annual Meeting of the Statistical Society of Canada, University of Guelph, Guelph, ON, June 3–6, 2012.

I facilitated the following presentations.

- Hairabedian, M; Scordo, E; **Coia, V** (2023). *Meta-Analysis: Climate Change Impacts on Flooding in British Columbia*. (Canadian Water Resources Conference: BC Branch, Richmond, BC, 2023)

WORKSHOPS & INVITED TRAINING

The Basics of Flood Frequency Analysis: Part 1 (Statistics) — BGC Engineering internal training June 2026 platform

- 2 hours, virtual — Delivered as a freelance consultant

Designing and Sharing R Functions — Canadian Society for Hydrological Sciences (CSHS), Canadian Water Resources Association January 2026

- Invited workshop, virtual

The Basics of Flood Frequency Analysis: Part 1 (Statistics) — BGC Engineering internal training June 2024 platform

- 2 hours, virtual — Co-delivered (50:50) as a BGC employee

Intro to Risk Statistics (Part 2) — BGC Engineering internal training platform 2024

- 1 hour, virtual — Delivered as a BGC employee

Intro to Risk Statistics (Part 1) — BGC Engineering internal training platform 2023

- 1 hour, virtual — Delivered as a BGC employee

Workflows in R — BGC Engineering internal training platform May 2023

- 1.5 hours, virtual — Delivered as a BGC employee

CONSULTING REPORTS

- BGC Engineering Inc. (2024). *Prioritization of Low Hydrotechnical Vulnerability Sites.*
- BGC Engineering Inc. (2024). *Highway 1 Chilliwack to Hope Debris-Flow and Debris-Slide Triggering Thresholds.*
- BGC Engineering Inc. (2024). *Western Canadian Sedimentary Basin - Data Driven Landslide Awareness and Warning 2024 Summary Report.*
- BGC Engineering Inc. (2024). *Erickson Creek Water Balance and Michel Creek Load Balance Studies.*
- BGC Engineering Inc. (2023). *Detailed Floodplain Mapping Study: Summary Report.*
- BGC Engineering Inc. (2023). *Extreme Weather Events and Natural Disasters – Definitions and Timing.*
- BGC Engineering Inc. (2022). *Frequency-Magnitude Relationship for the Coldwater River (Draft Report).*

GRANTS

Open Space Innovation Platform — European Space Agency 2025-09 to 2027-09

- Deciphering compound rain-on-snow flood pathways as observed from satellites.

The 2024 ISC Grant Program — R Consortium 2024-09 to 2025-01

- Refactoring the distionary R package for submission to CRAN.

Postgraduate Award (Doctoral, 3-year) — Natural Sciences and Engineering Research Council of Canada 2012-09 to 2015-08

- Doctoral research in dependence modelling and extreme value prediction, with Dr. Harry Joe and Dr. Natalia Nolde.

Four-Year Fellowship — The University of British Columbia 2012-09 to 2016-08

- Doctoral research in dependence modelling and extreme value prediction, with Dr. Harry Joe and Dr. Natalia Nolde.

Alexander Graham Bell Canada Graduate Scholarship (Masters) — Natural Science and Engineering Research Council of Canada 2011-09 to 2012-08

- Masters research in the application of heavy-tailed distributions in statistics, with Dr. Mei Ling Huang.

Undergraduate Student Research Award — Natural Sciences and Engineering Research Council of Canada 2010-05 to 2010-08

- Summer research program in the application of heavy-tailed distributions in statistics, with Dr. Mei Ling Huang.

Undergraduate Student Research Award — Natural Sciences and Engineering Research Council of Canada 2009-05 to 2009-08

- Summer research program in the application of heavy-tailed distributions in statistics, with Dr. Mei Ling Huang.

AWARDS AND HONOURS

Governor General of Canada's Gold Medal — Brock University	2013-06
RM Davis Surgite Award — Brock University	2012-03-28
Dean of Graduate Studies Excellence Scholarship — Brock University	2011-09
Dean's Gold Medal — Brock University	2011-06-07
Distinguished Undergraduate Student Award in Mathematics — Brock University	2011-06-07
President's Surgite Award — Brock University	2011-03

SERVICE & PROFESSIONAL AFFILIATIONS

- Member, CSHS R Hydrology group — advise on hydrology-related software development in R.
- Co-chair, Undergraduate Development and Enhancement Committee, Department of Statistics, University of British Columbia (2021–2022).

TEACHING

Courses taught at The University of British Columbia – Vancouver, BC. I received some of the highest student evaluations in the Faculty of Science in 2021 Winter Term 1 and was subsequently formally congratulated by the Dean of Science. My overall median student evaluation score is 4.6 out of 5.

Statistical Inference for Data Science — STAT 201 (LEC)	2021W1
Data Wrangling, Exploration, and Analysis with R - Part I — STAT 545A (LEC)	2021W1
Data Wrangling, Exploration, and Analysis with R - Part II — STAT 545B (LEC)	2021W1
Statistical Consulting Practicum — STAT 551 (LEC)	2021W1
Communicating Science — SCIE 300 (LEC)	2021W1
Data Science Internship — DSCI 591 (-)	2020W2
Statistical Inference for Data Science — STAT 201 (LEC)	2020W1
Communicating Science — SCIE 300 (LEC)	2020W1
Communicating Science — SCIE 300 (LEC)	2020W1
Data Wrangling, Exploration, and Analysis with R - Part I — STAT 545A (LEC)	2020W1
Data Wrangling, Exploration, and Analysis with R - Part II — STAT 545B (LEC)	2020W1
Data Science Internship — DSCI 591 (-)	2019W2
Data Wrangling, Exploration, and Analysis with R - Part I — STAT 545A (LEC)	2019W1
Data Science Workflows — DSCI 551 (LEC)	2019W1
Data Science Internship — DSCI 591 (-)	2018W2
Business Applications of Machine Learning — BAIT 509 (LEC)	2018W2
Experimentation and Causal Inference — DSCI 554 (LAB)	2018W2
Data Visualization II — DSCI 532 (LAB)	2018W2
Regression II — DSCI 562 (LEC, LAB)	2018W2
Regression I — DSCI 561 (LAB)	2018W1
Data Visualization I — DSCI 531 (LEC, LAB)	2018W1
Programming for Data Science — DSCI 511 (LEC, LAB)	2018W1
Data Wrangling, Exploration, and Analysis with R - Part I — STAT 545A (LEC)	2018W1
Statistical Computing for Data Science — STAT 547M (LEC)	2018W1
Data Science Internship — DSCI 591 (-)	2017W2
Business Applications of Machine Learning — BAIT 509 (LEC)	2017W2
Data Visualization II — DSCI 532 (LAB)	2017W2
Regression II — DSCI 562 (LAB)	2017W2
Spatial and Temporal Models — DSCI 574 (LAB)	2017W2
Data Science Workflows — DSCI 553 (LAB)	2017W2
Data Wrangling, Exploration, and Analysis with R - Part I — STAT 545A (LEC)	2017W1
Statistical Computing for Data Science — STAT 547M (LEC)	2017W1
Supervised Learning I — DSCI 571 (LAB)	2017W1
Data Visualization I — DSCI 531 (LEC)	2017W1
Data Science Workflows — DSCI 551 (LAB)	2017W1
Programming for Data Science — DSCI 511 (LEC)	2017W1

Data Science Internship — DSCI 591 (-)	2016W2
Data Visualization II — DSCI 532 (LAB)	2016W2
Regression II — DSCI 562 (LAB)	2016W2
Advanced Machine Learning — DSCI 563 (LAB)	2016W2
Unsupervised Learning — DSCI 573 (LAB)	2016W2
Spatial and Temporal Models — DSCI 574 (LAB)	2016W2