



UNIVERSITY OF
TORONTO



Short Course on Forecasting for Decision-Making

An Epidemiological & Ecological Perspective





UNIVERSITY OF
TORONTO



Financial & Logistical Support for the Short Course



Organizers



Korryn Bodner



Chris Brimacombe



Carina Rauen Firkowski



Marie-Josée Fortin



Sharmistha Mishra

Instructors



Brooke Davis



Mike Dietze



Mike Irvine



Irena Papst

TA



Cole Brookson

Guest Lecturers



Colin Daniel



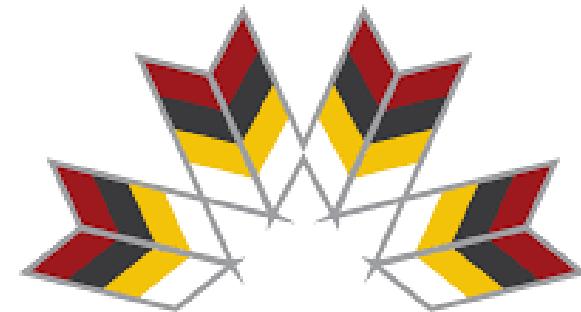
Alessandro Filazzola



Freya Olsson



Beate Sanders



FNIGC | CGIPN
First Nations Information Governance Centre
Le Centre de gouvernance de l'information des Premières Nations

https://github.com/kbbodner/cefi_shortcourse_students_2023.git



Screenshot of a web browser displaying a GitHub repository page. The URL in the address bar is https://github.com/kbbodner/cefi_shortcourse_students_2023.

The repository name is **cefi_shortcourse_students_2023**, which is Public. It has 2 branches and 0 tags. The main branch is selected. There are 28 commits in total, with the most recent being a update to README.md by kbbodner 4 hours ago.

The repository description is: Short Course Materials for Forecasting for Decision-Making: An Epidemiological & Ecological Perspective.

Repository statistics: 2 stars, 3 forks, and 7 watchers.

Commit	File	Time
kbbodner Update README.md	README.md	4 hours ago
CaseStudy_Covid19	README for macpan	5 hours ago
CaseStudy_Fisheries	Updated folder names	3 days ago
CaseStudy_WaterQu...	minor edits	yesterday

Time Slots

9:00 -
Lecture 1

10:00 -
Coffee Break

10:20 -
Lecture 2

11:20 -
Break

11:30 -
**Exercise
or
Lecture 3**

12:30 -
Lunch

1:30 -
**Extra Lecture,
Exercise or Group
Work**

3:00 -
Coffee Break

3:20 -
Group Work

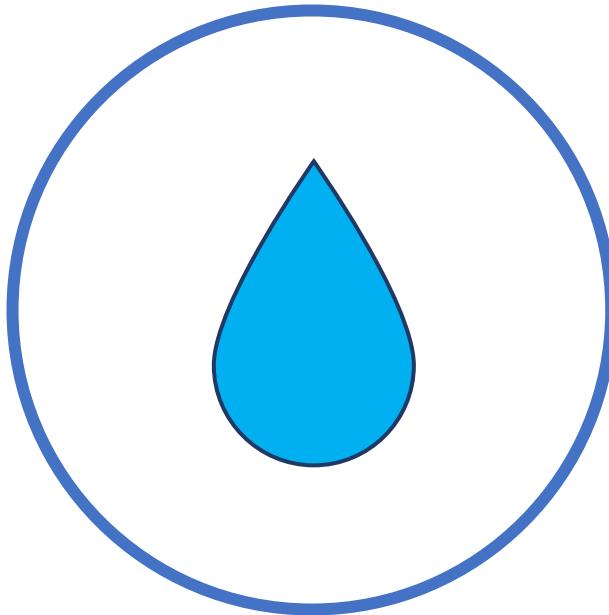
6:00 -
Evening Events

Time Slots		Monday	Tuesday	Wednesday	Thursday	Friday
9:00 - 10:00	Lecture 1	Topic: (1) Introductions & Schedule Overview; (2) Introduction to Forecasting Lead(s): (1) KB, CRF & Instructors; (2) Mike Dietze	Topic: Bayesian Analysis - Part 2 Instructor: Mike Dietze	Topic: Model Assessment Instructor: Mike Irvine	Topic: Delivering Forecasting Models to Decision Makers Instructor: Colin Daniel and Alex Filazzola	Topic: OCAP Training Part 1 Instructor: OCAP
10:00 - 10:20	Coffee Break					
Lecture 2	Topic: Introduction to the Modelling Landscape Instructor: Irena Papst	Topic: Reproducibility & Transparency Instructor: Mike Irvine	Topic: Combining Fish Population Forecasting with Fisheries Management: an Introduction to Management Strategy Evaluation (MSE) Instructor: Brooke Davis	Topic: Experiences Building Collaborations and Bridging Communication Instructor: Brooke Davis + Other Instructors	Group Work: Finalize Presentation Overview of NEON Ecological Forecasting Challenge	
11:20 - 11:30	Break					
Exercise or Lecture 3	Topic: Bayesian Analysis - Part 1 Instructor: Mike Dietze	Exercise 2: Paired Coding Lead: Mike Dietze	Exercise 3: MSE Exercise Lead: Brooke Davis	Topic: Science Communication and Decision Analysis Instructor: Beate Sanders	Group Work: Finalize Presentation Group Project Presentations	
12:30 - 1:30	Lunch					
Extra Lecture, Exercise or Group Work	Exercise 1: Introduction to Bayesian Analysis Lead(s): Mike Dietze + Mike Irvine	Topic: (1) Code Review Example; (2) Propagating, Analyzing, & Reducing Uncertainty Instructor: Mike Dietze + Irena Papst	Group work	Exercise 4: Writing Lay Summaries Exercise Lead: Korrlyn Bodner	Group Project Presentations	
3:00 - 3:20	Coffee Break					
Group Work	Case Study Introductions (30 mins) Case Study Overviews (in small groups) Lead(s): All Instructors	Group work	Group work	Group work		
6:00 - 8:00	Evening Events				Group Dinner	

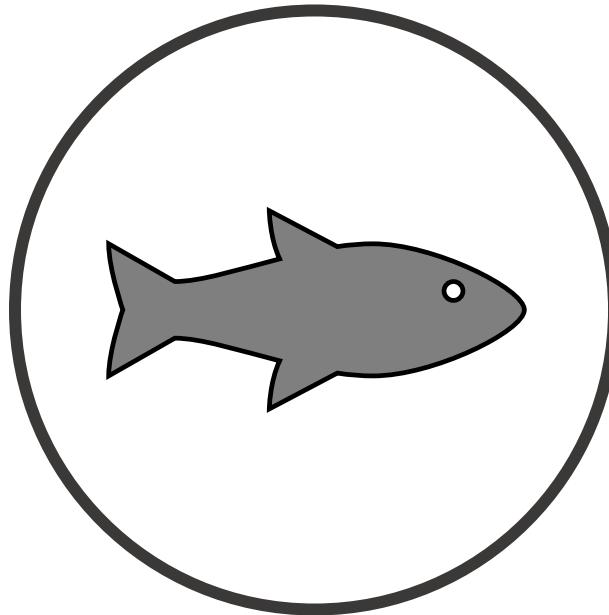
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11:20 - 11:30		Break	Exercises				
11:30 - 12:30		Topic: Bayesian Analysis - Part 1 Instructor: Mike Dietze	Exercise 2: Paired Coding Lead: Mike Dietze	Exercise 3: MSE Exercise Lead: Brooke Davis	Topic: Science Communication and Decision Analysis Instructor: Beate Sanders	Group Work: Finalize Presentation Group Project Presentations	
12:30 - 1:30		Lunch	Group Work				
1:30 - 3:00		Exercise 1: Introduction to Bayesian Analysis Lead(s): Mike Dietze + Mike Irvine	Topic: (1) Code Review Example; (2) Propagating, Analyzing, & Reducing Uncertainty Instructor: Mike Dietze + Irena Papst	Group work	Exercise 4: Writing Lay Summaries Exercise Lead: Korrin Bodner	Group Project Presentations	
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3:20 - 5:30		Case Study Introductions (30 mins) Case Study Overviews (in small groups) Lead(s): All Instructors	Group work	Group work	Group work		
6:00 - 8:00		Evening Events					
					Group Dinner		

Short Course Components: Group Work

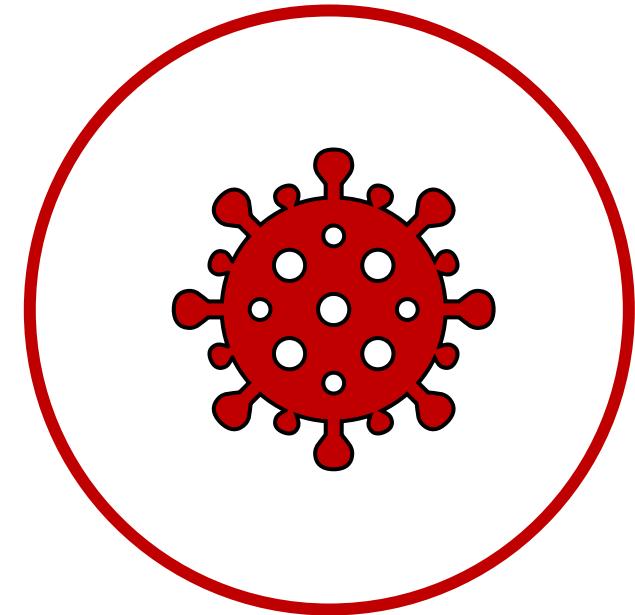
Three Case Studies



Water Quality
Monitoring



Fisheries
Management



Infectious Disease
Control

Short Course Components: Group Work

First Name	Last Name	Case Study	Team
Franz	Kafka	Fisheries Management	1
Jane	Goodall	Fisheries Management	1
Charles	Darwin	Fisheries Management	2
Beyonce	Knowles	Fisheries Management	2
Marie	Curie	Infectious Disease Control	3
Freddie	Mercury	Infectious Disease Control	3

All participants have been assigned to a Team (8 teams in total)

Your Team number, which indicates your team, is on the google drive sheet sent to your email

Your Team number can also be found in [Participants_TeamNum.pdf](#), stored in the short course GitHub repository.

Short Course Components: Group Work

First Name	Last Name	Case Study	Team	GitHub Username
Franz	Kafka	Fisheries Management	1	
Jane	Goodall	Fisheries Management	1	
Charles	Darwin	Fisheries Management	2	
Beyonce	Knowles	Fisheries Management	2	
Marie	Curie	Infectious Disease Control	3	
Freddie	Mercury	Infectious Disease Control	3	

Please remember to add your GitHub Username to the Google Sheet, “Short Course Teams & GitHub Info”, sent to your email ASAP

All participants will receive an invitation to contribute to a fork of the course’s GitHub Repo

Each participant will only be able to contribute to their team’s fork

Short Course Components: Group Work

You (and your team) will present your forecasting model for your case study on Friday

- 8-10 minutes for the presentation
- 5 minutes for questions following the presentation

By the end of the week, each group should push to their GitHub fork:

- A copy of their presentation slides (pdf)
- All code & forecasting model materials
- A README file with a lay summary

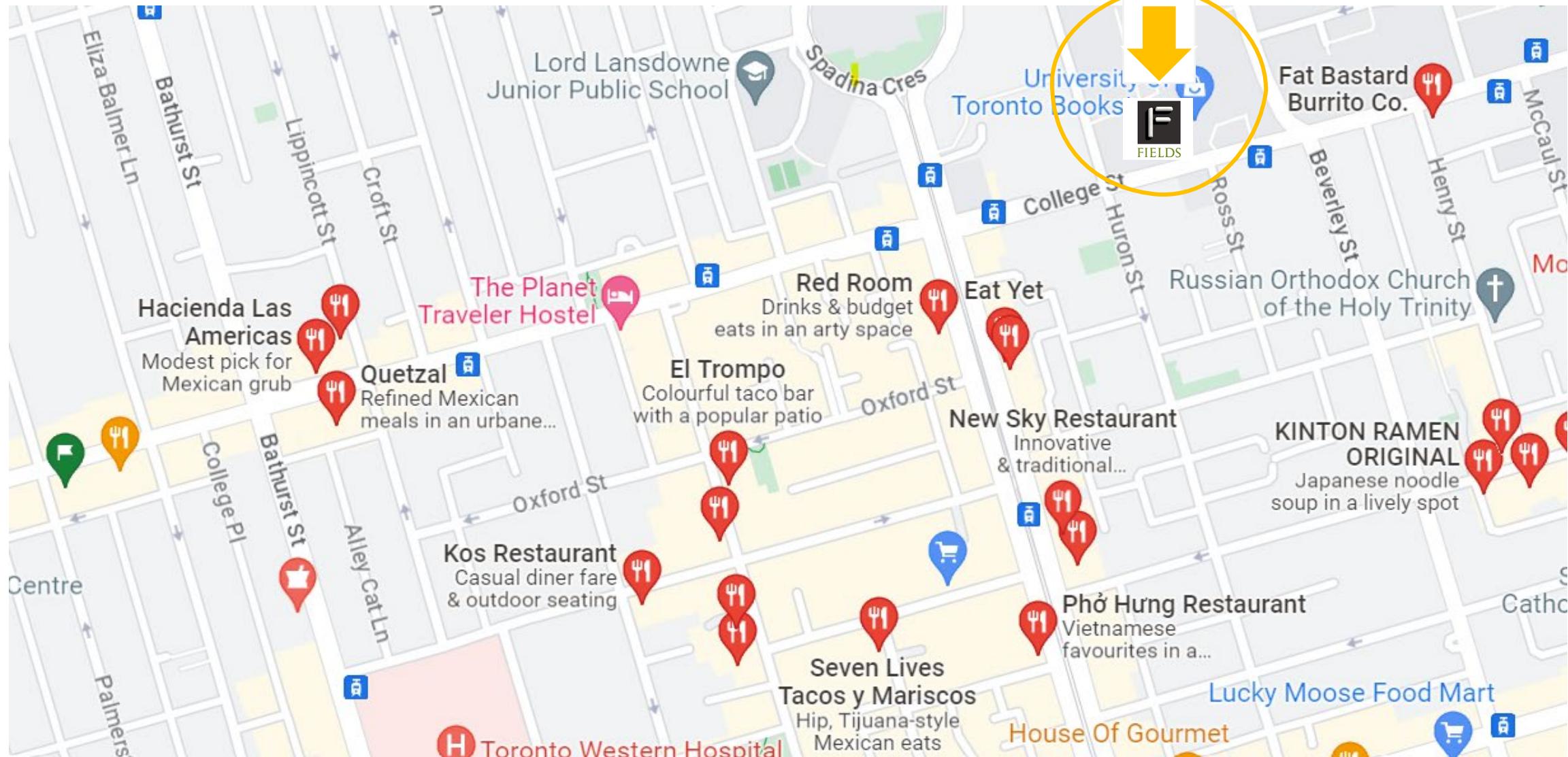
Time Slots	Friday
9:00 - 10:00 Lecture 1	Topic: OCAP Training Part 1 Instructor: OCAP
10:00 - 10:20 Coffee Break	
10:20 - 11:20 Lecture 2	Group Work: Finalize Presentation Overview of NEON Ecological Forecasting Challenge
11:20 - 11:30 Break	
11:30 - 12:30 Exercise or Lecture 3	Group Work: Finalize Presentation Group Project Presentations
12:30 - 1:30 Lunch	
1:30 - 3:00 Extra Lecture, Exercise or Group Work	Group Project Presentations

Time Slots		Monday	Tuesday	Wednesday	Thursday	Friday
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6:00 - 8:00	Evening Events				Group Dinner	

Fields Institute Logistics

- Lectures and Exercises will take place in this room (Lecture Hall 230)
- An extra room (Rm 210) will also be available during the group work timeslots
- Each day we start at 9 am but doors will open a few minutes before
- Exterior doors lock at 5 pm
 - However, you are welcome to stay later than 5:30 pm

WE ARE HERE



Instructors



Brooke Davis



Mike Dietze



Mike Irvine



Irena Papst

TA

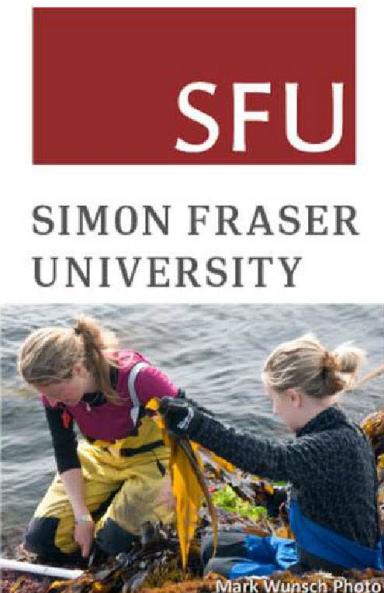


Cole Brookson

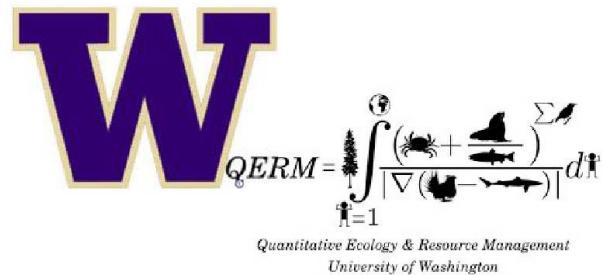
Brooke Davis, Fisheries and Oceans Canada

Quantitative Assessment Methods Section
Salmon Decision Support Tool Program Head
Delta, BC (Vancouver area)

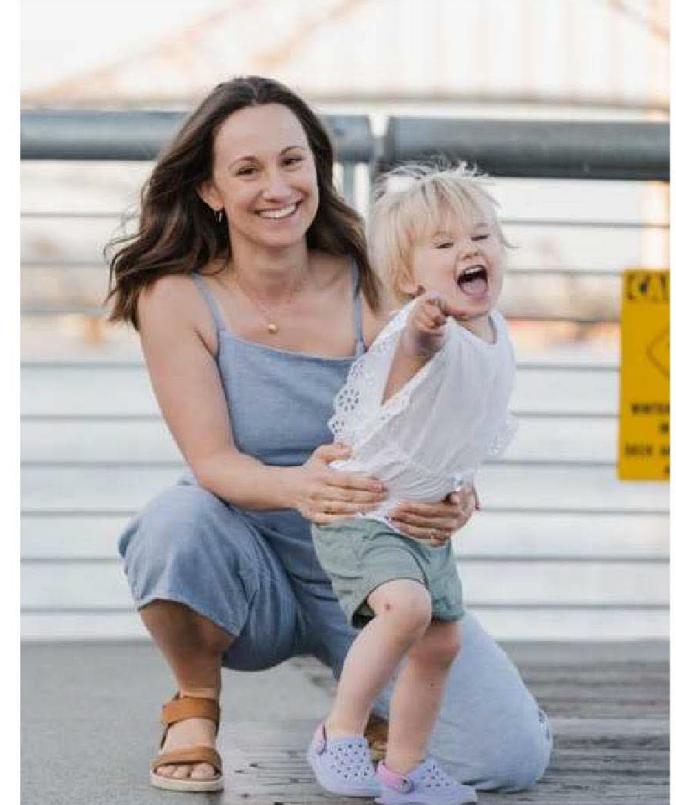
- Developing methods for Pacific Salmon to meet Fisheries Act reporting requirements
- Building a fishery planning tool to avoid endangered Interior Fraser Steelhead
- Improving species estimation from hydroacoustic sites in the lower Fraser River
- Pacific region rep. for National TESA Committee



2012 →

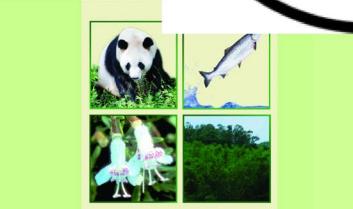
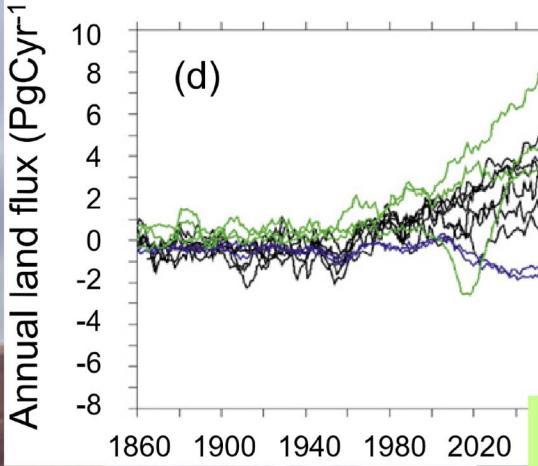
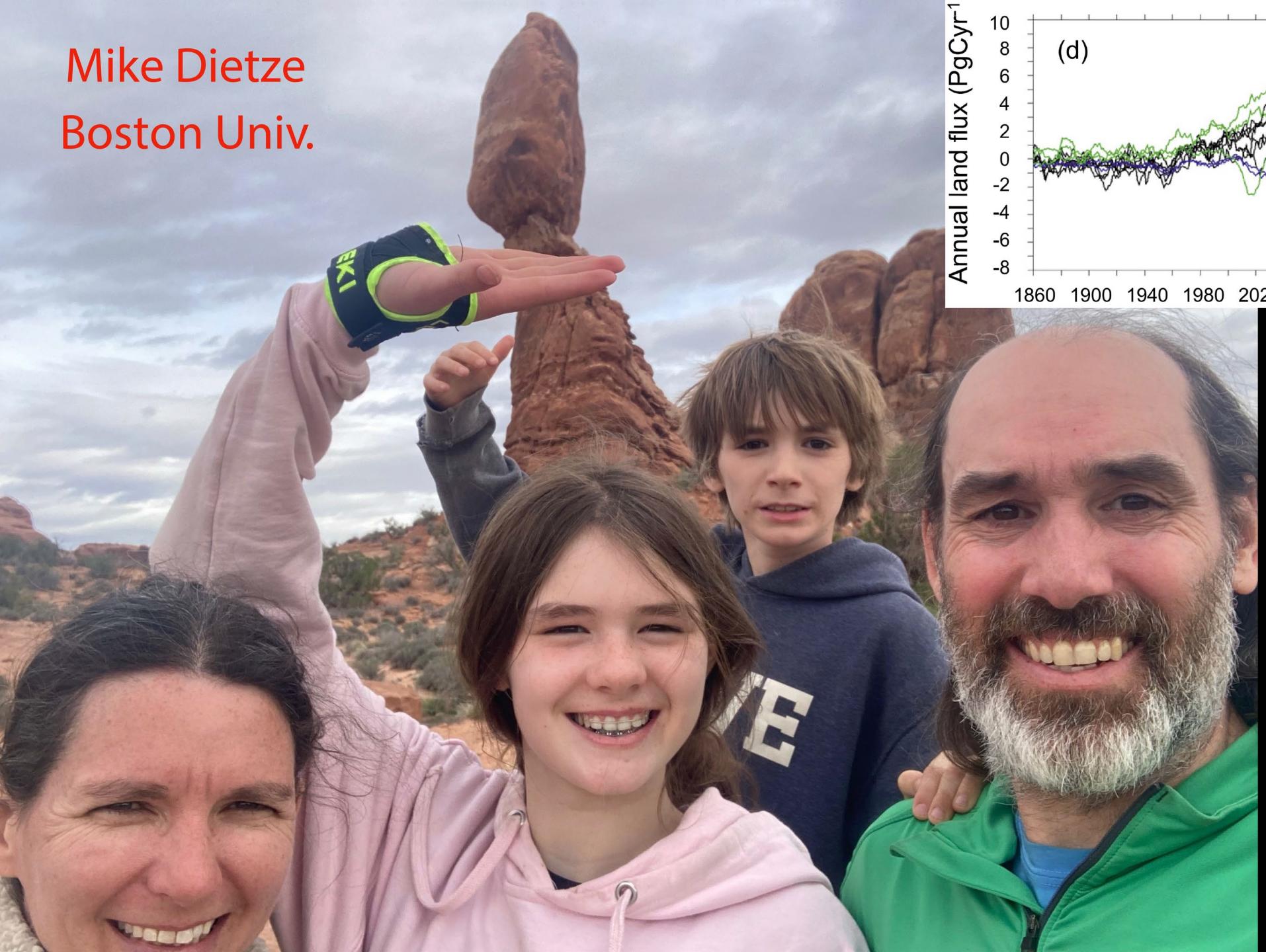


2015 →



 Fisheries and Oceans Canada
Pêches et Océans Canada

Mike Dietze
Boston Univ.



ECOLOGICAL
FORECASTING

Michael C. Dietze



EFI



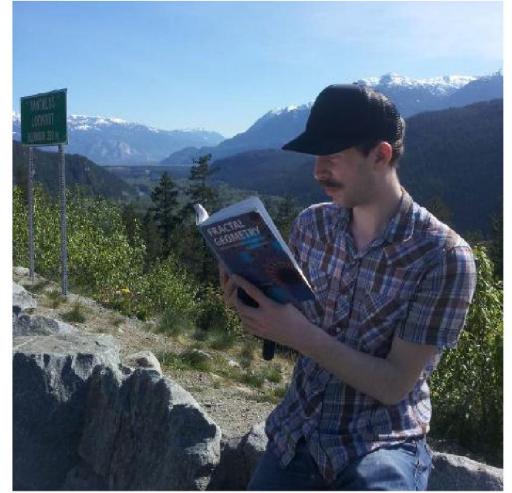
neon®

National Ecological Observatory Network



Mike Irvine

Senior Scientist, BC Centre for Disease Control
Adjunct Professor, Department of Statistics, UBC



Areas of interest

Mathematical modeling, Bayesian analysis, evidence synthesis

Biography

Mike earned an MSci in Mathematics from University College London and obtained a PhD in Mathematical Ecology and Complexity Science from the University of Warwick, along with an MSc in Complexity Sciences. He completed a postdoctoral fellowship evaluating elimination campaigns for neglected tropical diseases and received a CIHR Health Systems Impact Fellowship award for collaborative work assessing the impact of the province's overdose response with the BC CDC and the BC Ministry of Mental Health & Addictions.

Research

Mike's work lies at the interface between mathematical modelling, biostatistics, and machine learning. He incorporates a broad range of techniques into his work including Bayesian evidence synthesis methods that can utilize disparate data sources to provide insight for disease epidemiology and broader public health applications.

His work has supported the evaluation of a number of interventions including within: vector-borne disease, sexually transmitted and blood-borne infections, respiratory infections, and opioid-related overdose.

www.bccdc.ca/our-research/people/mike-irvine

<https://sempwn.github.io/>

<https://scholar.google.ca/citations?user=k0Z-4Z8AAAAJ&hl=en&oi=ao>

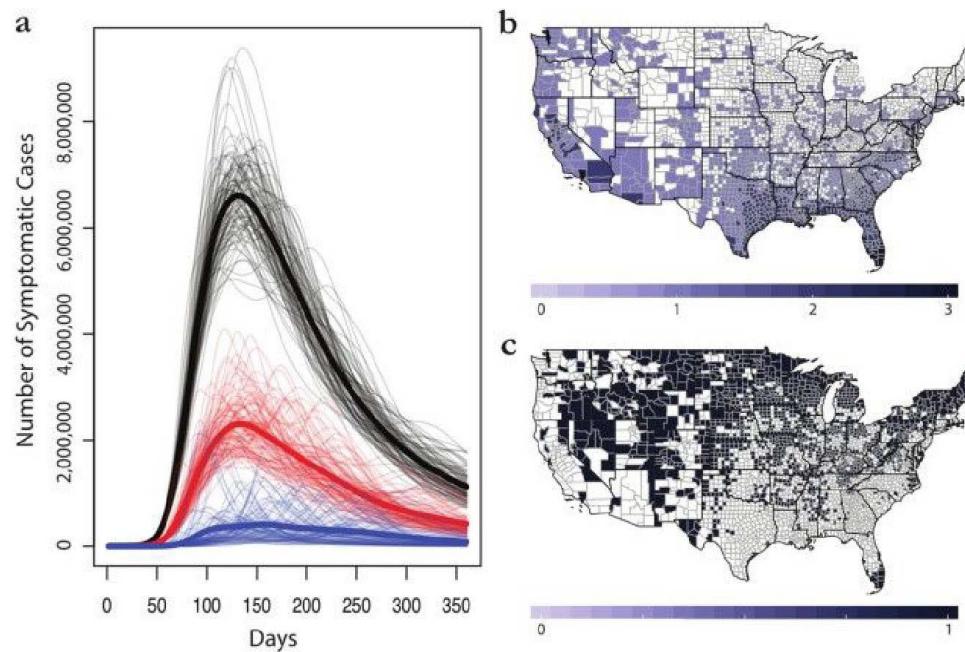
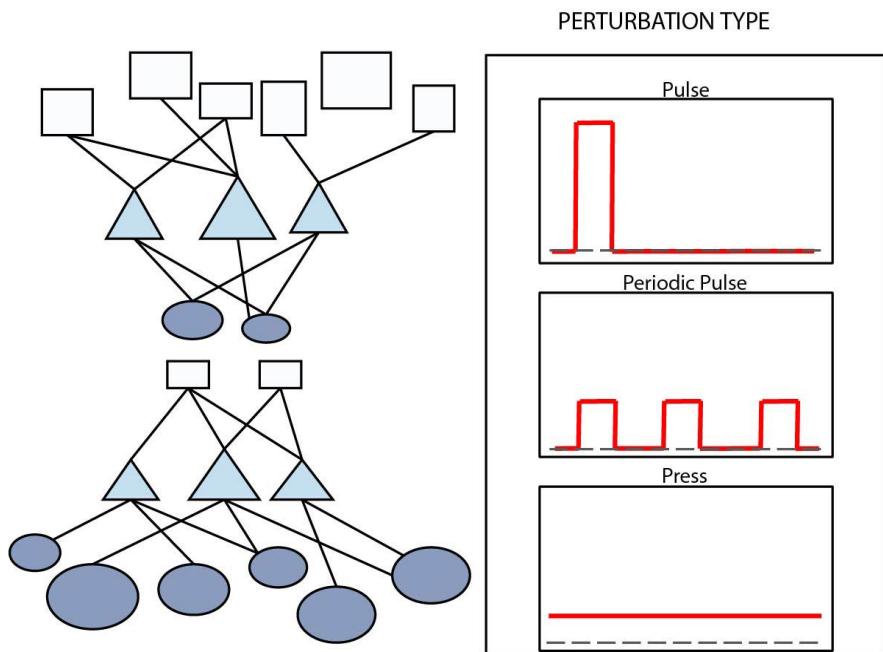
Irena Papst

Senior Scientist



- ▶ Public Health Risk Sciences Division
National Microbiology Laboratory
Public Health Agency of Canada
- ▶ PhD, Centre for Applied Mathematics
Cornell University
- ▶ Mathematical modelling of infectious disease spread
- ▶ Reproducible and open research,
automation, R package development
- ▶ Cooking, crafting, design

Cole Brookson, PhD student, Georgetown University



The R Manual About Contact EEB

Getting Started Basic R Working With Data Plotting Statistics in R

Welcome to the R Manual!

Getting Started Basic R Working with Data Plotting

Installing R/RStudio, understanding the basics of R, using the file ecosystem

Some important coding essentials, using objects, installing and using packages, and a daily workflow outline

Reading and writing data files with R, and manipulating data for analysis

The grammar of graphics, common and advanced plot types, and plotting with multiple dataframes

A screenshot of the "The R Manual" website. The header includes links for "The R Manual", "About", "Contact", "EEB", "Getting Started", "Basic R", "Working With Data", "Plotting", and "Statistics in R". The main content area features the title "Welcome to the R Manual!" and four main sections: "Getting Started", "Basic R", "Working with Data", and "Plotting", each with its own sub-sections and icons.