

Pre conference-course

Nathaniel Newlands, AAFC, Canada

Deep Learning for Environmental Sciences

Plenary Speakers

Keynote lecture: Amy Braverman, NASA JPL, USA

Uncertainty Quantification for NASA's Orbiting Carbon Observatory-2 Mission

Keynote lecture: Charmaine Dean, University of Waterloo, Canada

Joint Outcome Modeling: A review, and application to storm cell modeling

2017 Wiley-TIES best paper: Claire Miller, University of Glasgow, Scotland

"Flow-directed PCA for monitoring networks" K. Gallacher, C. Miller, E. M. Scott R. Willows, L. Pope, J. Douglass

President's Invited Lecture: Douglas Nychka, NCAR, USA

Nonstationary spatial data: think globally act locally

J. Stuart Hunter Lecture: Christopher Wickle, University of Missouri, USA

Using "deep" models from machine learning for parsimonious and efficient implementation of multiscale spatio-temporal statistical models

Conference Mini-course

E. Ashley Steel, US Forest Service

Beyond Calculations: Teaching Statistical Thinking

Confirmed Invited Sessions

01

Organizer: Marta Blangiardo and Monica Pirani, Imperial College London UK

Enhanced statistical modelling for characterizing air pollution exposure

Chair: Ed Boone

Luis Gutiérrez, Pontifical Catholic University of Chile, Chile	<i>A time dependent Bayesian nonparametric model for air quality analysis</i>
Chiara Forlani, Imperial College London, UK	<i>A Bayesian Space-Time Model to Integrate Spatially Misaligned Air Pollution Data</i>
Dimitris Evangelopoulos, King's College London, UK	<i>Investigation of multi-pollutant model results in the presence of measurement error: a simulation study</i>
Matthew Thomas, University of Bath, UK	<i>Global air pollution and health: revealing the differences in the quality of the air that we breath</i>

02

Organizer: Marta Blangiardo and Monica Pirani, Imperial College London UK

Towards a causality approach in environmental epidemiology

Chair: Monica Pirani

Melanie Davis, Medical University of South Carolina, USA	<i>Addressing Geographic Confounding through Spatial Propensity Score Matching</i>
Monica Pirani, Imperial College London, UK	<i>Improving inference in area-referenced environmental health studies</i>
Slava Lyubchich, University of Maryland CES, USA	<i>Spatio-temporal analysis of nitrogen yield on a global scalesetting</i>

03

Organizer: Lelys Bravo, Univ. Simón Bolívar, Caracas, Venezuela and Northern Illinois University, USA

Risk/Natural hazards

Chair: Lelys Bravo

Eliane Rodrigues, IMATE-UNAM, Mexico	<i>An application to ozone data of a non-homogeneous Poisson model with spatial anisotropy and change-points</i>
Sazcha Marcelo Olivera Villarroel, UAM, Mexico	<i>Increases in the extreme rainfall events: using the Weibull distribution</i>
Dexen DZ. Xi, Western University, Canada	<i>Joint Models for the Duration and Size of Fires in British Columbia, Canada</i>
Lelys Bravo, Northern Illinois University, USA	<i>Spatio-Temporal Modeling of Risk to Environmental Hazards: approaches, examples and challenges</i>

04

Organizer: Daniela Castro, KAUST, Saudi Arabia

Extremes in climate and environmental studies

Chair: Daniela Castro

Raphaël Huser, KAUST, Saudi Arabia	<i>Penultimate modeling of spatial extremes: statistical inference for max-infinitely divisible processes</i>
Thomas Opitz, BioSP, INRA, France	<i>Modeling nonparametric covariate effects on extremal dependence: an application to air pollution in France</i>
Daniela Castro, KAUST, Saudi Arabia	<i>Local likelihood estimation of complex tail dependence structures, applied to U.S. precipitation extremes</i>

05

Organizer: Singdhansu Chatterjee, University of Minnesota, USA

Facets of Environmental Big Data Analysis

Chair: Wendy Meiring

Margaret Johnson, North Carolina State University, USA	<i>Multisensor Fusion of Remotely Sensed Vegetation Indices using Space-Time Dynamic Linear Models</i>
Soutir Bandyopadhyay, Colorado School of Mines, USA	<i>A Model for Large Multivariate Spatial Datasets</i>
Andee Kaplan, Duke University, USA	<i>A Fast Sampler for Data Simulation for Markov Random Fields</i>

06

Organizer: Daniela Cocchi, University of Bologna, Italy

Models for Ecology

Chair: Wendy Meiring

Tonio Di Battista, University of Chieti-Pescara, Italy	<i>Functional tools for increasing the accuracy of biodiversity assessment</i>
Konrad Abramowicz, University of Umea, Sweden	<i>Climate message from the past in Scandinavian lakes through clustering of misaligned dependent seasonal patterns in varved lake sediment</i>
Perla Reyes, Kansas State University, USA	<i>Spatial-Temporal Modeling of Land Surface Phenology of Kansas Farm Lands</i>

07

Organizer: Daniela Cocchi, University of Bologna, Italy

Statistical analysis of data with complex spatial structure

Chair: Jorge Mateu

Alessandra Menafoglio, Politecnico di Milano, Italy	<i>A geostatistical approach to the analysis of spatial tensor data</i>
Luigi Ippoliti, University G. d'Annunzio of Chieti Pescara, Italy	<i>Simple models for complex spatial and spatio-temporal data</i>
Debashis Mondal, Oregon State University, USA	<i>Spatial-Temporal Gaussian State-Space models</i>
Jorge Mateu Mahiques, Universitat Jaume I, Spain	<i>Linear models for complex spatial point process dependencies</i>

08

Organizer: Sophie Donnet and Lilian Bel, AgroParisTech, France

Modelling and inferring ecological interactions

Chair: Sophie Donnet

L. Leticia Ramirez Ramirez, CIMAT, Mexico	<i>Combining different information sources for forecasting emerging climate sensitive mosquito-borne diseases</i>
Sophie Donnet, AgroParisTech/INRA, France	<i>Generalization of block models for multipartite networks. Application in ecology</i>
Liliane Bel, AgroParisTech/INRA, France	<i>Predicting plant endemism based on herbarium data: application to French data</i>

09

Organizer: Sylvia Esterby, University of British Columbia at Okanagan, Canada

Water Quality Monitoring

Chair: Sylvia Esterby

Yasmine M. Abdelfattah	<i>Specification and Prediction of Blue Nile Basin Precipitation from Global-scale SST using CCA</i>
Hossam Hassan, Cairo University, Egypt	<i>Likelihood and Bayesian Inference for Regression Models under Type I Censoring</i>
Abdel El Shaarawi, Cairo University, Egypt	<i>Spatial Temporal Modelling of Precipitation Data</i>
Sylvia Esterby, University of British Columbia at Okanagan, Canada	<i>Changes in the water cycle: the quantity - quality link</i>
Biviana Suarez Sierra, Univ Nacional de Colombia, Colombia	<i>Comparing ozone and PM10 air quality in Mexico City and Bogota using non-homogeneous Poisson models</i>

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Organizer: Carolina Euan, KAUST, Saudi Arabia

New developments on Spatio-Temporal models for environmental applications

Chair: Daniela Castro

Israel Martinez, KAUST, Saudi Arabia	<i>Robust Depth-based Estimation of the Functional Autoregressive Model with Application to CO2 Data</i>
Robert Deardon, University of Calgary, Canada	<i>Spatial individual level infectious disease models incorporating aggregate level spatial structure</i>
Junho Lee, KAUST, Saudi Arabia	<i>Spatial Cluster Detection in a Mixed Effect Model for PM2.5 in the North East US</i>
Carolina Euan, KAUST, Saudi Arabia	<i>Bernoulli Vector Autoregressive Model with Applications to Spatio-Temporal Drought Events in Mexico</i>

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Organizer: Yulia R. Gel, University of Texas at Dallas, USA

Advances in Environmental Spatio-Temporal Modeling

Chair: Yulia Gel

Abdulkadir Hussein, University of Windsor, Canada	<i>Some models for zero-inflated and bivariate count time series with applications on health care data</i>
Alessandro Fasso, University of Bergamo	<i>Functional spatio-temporal modelling of atmospheric observation gaps</i>
Pasquale Valentini, University of Chieti, Pescara, Italy	<i>A Hierarchical Bayesian Spatio-Temporal Model To Estimate the Short-term Effects of Air Pollution On Human Health</i>
Ashley Steel, US Forrest Service, USA	<i>Visualizing and understanding riverine thermal landscapes in a changing climate</i>

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Organizer: Murali Haran, Penn State University, USA

Modern environmental science using observations and physical models

Chair: Rogelio Ramos

Owais Gilani, Bucknell University, USA	<i>Non-stationary Spatiotemporal Bayesian Data Fusion Model for Pollutants in the Near-road Environment</i>
Mandy Hering, Baylor, USA	<i>Mixture of Regression Models for Large Spatial Data Sets</i>
Ben Seiyon Lee, Penn State University, USA	<i>A Fast Particle-Based Approach for Computer Model Calibration</i>
Luis Barboza, CIMPA, Costa Rica	<i>Efficient Reconstructions of Common Era Climate via Integrated Nested Laplace Approximations</i>

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Organizer: Amanda Hering, Baylor University, USA

Statistics for Renewable Energy

Chair: Abdel El Shaarawi

Amanda Lenzi, KAUST, Saudi Arabia	<i>Spatio-Temporal Models for Probabilistic Wind Vector Forecasting in Saudi Arabia</i>
Lisa Madsen, Oregon State University, USA	<i>Estimating Binomial Index N with Application to Bird and Bat Mortality at Wind and Solar Power Facilities</i>
Eric Gilleland, NCAR	<i>Forecast Verification for Solar Power Forecasts</i>

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Organizer: Gabriel Huerta, The University of New Mexico, USA

Advances in Bayesian approaches for Spatial and Spatial-Temporal Modeling

Chair: Jonathan Stroud

Jonathan Bradley, Florida State University, USA	<i>Hierarchical Models with Conditionally Conjugate Full-Conditional Distributions for Dependent Data from the Natural Exponential Family</i>
William Christensen, Brigham Young University, USA	<i>Extracting Consensus Estimates of Precipitation from Diverse Data Sources in High Mountain Asia</i>
Erin Schliep, University of Missouri, USA	<i>Velocities for spatiotemporal point patterns.</i>
Jonathan Stroud, Georgetown University, USA	<i>Extended ensemble Kalman filters for high-dimensional hierarchical state-space models</i>

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Organizer: Iliyan Iliev, University of Southern Mississippi, USA

Data Fusion in Environmental Research

Chair: Iliyan Iliev

Wesley Burr, Trent University, Canada	<i>Ground-level Particulate Matter Mass and Component Observation Imputation and Correction using Remote-Sensing</i>
Wendy Meiring, UCSB, USA	<i>A study of snow water equivalent in the Sierra Nevada Mountains of California, using snow pillow data</i>
Phuong Truong, University of Twente, Netherlands	<i>Nonlinear area-to-point regression kriging for spatial-temporal mapping of malaria risk</i>
Aurelie Labbe, HEC, Canada	<i>Predicting geo-localized accidents on a road network from GPS-derived covariates</i>

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Organizer: Venkata K. Jandhyala, Washington State University, USA

Methods for Monitoring Changes in Environmental Factors

Chair: Vekanta K. Jandhyala

Blanca Lorena Figueroa Rangel, University of Guadalajara, Mexico	<i>Heterogeneous Forest Composition Responses to Temporal Environmental Changes in West-Central Mexico</i>
Venkata K. Jandhyala, Washington State University, USA	<i>Change-Point Analysis of Well-Log Data Under Frequency Domain</i>
Iliyan Iliev, University of Southern Mississippi, USA	<i>Spatio-temporal clustering of water quality trends</i>
Patricia Menéndez, Australian Institute of Marine Sciences, Australia	<i>Detection and quantification of regime shifts in ecological time series using dynamic models</i>

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Organizer: Robert Lund, Clemson University and NSF, USA

Environmental Changepoints

Chair: Robert Lund

Jon Woody, Mississippi State University, USA	<i>A Statistical Analysis of Snow Depth Trends</i>
Robert Lund, Clemson University and NSF, USA	<i>Multiple Changepoint Detection in Environmental Time Series</i>
Jaechoul Lee, Boise State University, USA	<i>Extreme U.S. temperature changepoints and trends</i>

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Organizer: Robert Lund, Clemson University/NSF, USA, and Walt Piegorsch, University of Arizona, USA

Showcases of the Environmetrics Journal

Chair: Robert Lund

Kimihiko Noguchi, University of Western Washington, USA	<i>Improved Short-Term Point and Interval Forecasts of the Daily Maximum Tropospheric Ozone Levels via Singular Spectrum Analysis</i>
Yulia R. Gel, University of Texas at Dallas, USA	<i>Can we weather proof our insurance?</i>
Ben Shaby, Pennsylvania State University, USA	<i>An exponentialgamma mixture model for extreme Santa Ana winds</i>

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Organizer: Slava Lyubchich, University of Maryland Center for Env. Sci., USA

Questions in Modern Spatio-Temporal Analysis

Chair: Slava Lyubchich

Eniuce Menezes de Souza, Universidade Estadual de Maringá, Brazil	<i>Plant disease detection from spectrometry using a hybrid model</i>
Ekaterina Smirnova, University of Montana, USA	<i>Functional Analysis of Spatial Aggregation Regions of Jeffrey Pine Beetle-Attack Within the Lake Tahoe Basin</i>
Joaquín Ortega, CIMAT, Mexico	<i>Stationarity Intervals for Random Waves: Time Series Clustering and Functional Data Analysis</i>
Victor DeOliveira, University of Texas at San Antonio, USA	<i>Models for Geostatistical Binary Data: Properties and Connections</i>

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Organizer: Claire Miller and Marian Scott, University of Glasgow, UK

Statistical emulation for environmental processes

Chair: Claire Miller

Marian Scott, University of Glasgow, UK	<i>Modelling the environmental impacts of aquaculture</i>
Francesco Finazzi, University of Bergamo, Italy	<i>Multivariate emulators for city-level air quality management</i>
Edward Boone, Virginia Commonwealth University, USA	<i>Sampling Regimes for Dynamic Models</i>

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Organizer: Nathaniel Newlands, Agriculture and Agri-Food Canada, Canada

Data Science, Big Data and Precision Agriculture: Identification, Adaptive Control, and Machine-Learning

Chair: Nathaniel Newlands

Bhushan Gopaluni, University of British Columbia, Vancouver, Canada	<i>Deep Reinforcement Learning as a Precision Agriculture Tool in Wheat Farming</i>
John Sulik, University of Guelph, Canada	<i>Encoding Dependence in Bayesian Causal Networks</i>
Jacob Bengtson, Farmer's Edge, Lethbridge, Alberta, Canada	<i>Rich Data at Farmers Edges</i>
Nathaniel K. Newlands, Sci. and Tech., Agriculture and Agri-Food Canada, Canada	<i>Forecasting of grape powdery mildew disease risk in vineyards using a Bayesian learning network model</i>

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Organizer: Bruno Sanso, University of California at Santa Cruz, USA

A showcase of papers from the SAMSI program on Mathematical and Statistical Methods for Climate and Earth Systems

Chair: Carolina Euan

Dorit Hammerling, NCAR, USA	<i>Climate Change Detection and Attribution: An overview of the SAMSI working group activities</i>
Howard Chang, Emory University, USA	<i>Statistical projections of future air quality and its health impacts under a changing climate</i>
Yawen Guan, North Carolina State University, USA	<i>Multivariate space-time data fusion: An application in air pollution modeling</i>
Mikael Kuusela, UNC Chapel Hill, USA	<i>Recent progress on statistical analysis of oceanographic data from Argo profiling floats</i>

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Organizer: Ekaterina Smirnova, University of Montana, USA

Spatio-temporal models in health and environment

Chair: Ekaterina Smirnova

James Russell, Muhlenberg College, USA	<i>Modeling Collective Animal Movement Through Interactions in Behavioral States</i>
Tanujit Dey, Case Western Reserve University, USA	<i>Urban Green Spaces and Hypertension</i>
Geoffrey "Colin" Peterson, EPA in Chapel Hill, USA	<i>Mediation analysis and the human health effects of improved air quality trends</i>

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Organizer: Inder Tecuapetla-Gomez, CONABIO, Mexico

Advances on Ecoinformatics and Remote Sensing in Latinamerica: A few examples

Chair: Joaquín Ortega

Juan M. Barrios, CONABIO, Mexico	<i>SPECIES: A web platform for the exploratory analysis of species occurrence databases</i>
Julian Equihua, CONABIO, Mexico	<i>Association rule learning for species co-occurrence analysis</i>
Inder Tecuapetla, CONACYT-CONABIO, Mexico	<i>Time delay estimation under sparsity with application to satellite imagery time series</i>

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Organizer: Hao Zhang, Purdue University, USA

Computational challenges for environmental studies

Chair: Hao Zhang

Whitney Huang, SAMSI and UNC Chapel Hill, USA	<i>Estimating Precipitation Extremes using Log-Histospline</i>
Hao Zhang, Purdue University, USA	<i>Theoretical studies in the big data era for spatial statistics</i>
Yen-Ning Huang, Purdue University, USA	<i>Bayesian Applications in Climate Data Analysis</i>

Confirmed Contributed Sessions

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Contributed Session

Chair: Belem Trejo-Valdivia

Andrea Meilán-Vila, Universidade da Coruña, Spain	<i>A goodness-of-fit test for spatial trends</i>
Smail Mahdi, University of West Indies, Barbados	<i>Modeling drought index attributes and sea water temperature from copula and transmuted marginal distributions</i>
Somak Dutta, Iowa State University, USA	<i>Matrix-free Conditional Simulations of Lattice Random Fields</i>
José A. Villaseñor, Colegio de Postgraduados, Mexico	<i>A goodness of fit test for extreme value distributions and its application for modeling maximum concentrations of air pollutants</i>
Marcela Tamayo y Ortiz	<i>Exposure to PM 2.5 in Mexico City's Metropolitan Area and its Association with Obesity</i>