

Message from the President

**Thoughts about COVID-19 and its impacts on the Environment**

Dear TIES Members,

I sincerely hope you are doing well and keeping healthy in these difficult times. The recent experience on the worldwide lockdown due to COVID-19 pandemic has changed many things affecting all aspects of human life in a very short time. The concept of *One Health: Fauna, Ecosystems and Humans*, takes an even more important role in understanding the fragile equilibrium that can be disrupted due to the failure of one of these components.



*Lelys Bravo de Guenni*

Climate and health are interconnected, and climate change and climate variability jointly with deforestation and important ecosystem losses, have already enhanced environmental conditions for the spread of several infectious diseases such as the mosquito-borne diseases malaria, dengue and chikungunya. The increase of infectious diseases has also been incremented around the world due to a myriad of factors, as the highest concentrations of domesticated animals and the uncontrolled use of wild animals for human consumption, easing pathogens path for human's transmission. Biodiversity losses associated to climate change and habitat losses due to the combined deforestation and land use change effect, are producing animal migrations and relocations to places where virus's propagation might increase.

The COVID-19 health emergency worked as an experiment where pollution and carbon emissions were cut substantially, resulting in a decrease of 8% of the world's CO<sub>2</sub> emissions this year, according to the International Energy Agency. This short-term worldwide exercise has accomplished what years of climate negotiations have not been able to accomplish. However, the price paid has been countless with the disappearance of more than 500,000 loved ones and the economics and social impacts causing enormous distress, job losses and human interaction limitations with the social distance measures held in place.

Measuring these impacts and providing scientific method-based assessments, continues to be the most pressing role for the scientific community and professionals in statistics. Contributions from the environmental statistical community will continue playing an important role in this new societal challenge. Now more than ever we need to be strong and keep producing the best answers that our society needs in this pandemic situation.

Keep making our network strong to share the analysis and solutions we need to implement in order to ensure a more sustainable and healthier future.

Best wishes,

Lelys Bravo de Guenni  
TIES President 2019-2021

## TIES/ISI Conferences

### **Annual General Meeting (AGM) 2020**

The TIES Annual General Meetings normally take place in person during the ISI meetings or the TIES conferences. Due to the actual situation, the TIES AGM 2020 will take place virtually. The meeting is scheduled on Friday, 21<sup>st</sup> of August 2020 at 1pm (BST). **Please mark this date in your calendar!!!**

### **TIES Virtual Conference 2020**

Since the 29<sup>th</sup> TIES Conference has been postponed to September 20-22, 2021, we have decided to organize a Virtual meeting by the end of this year to celebrate the International Year of Women in Statistics. Please keep an eye on the news alerts about this coming event on our [web page](#).

### **TIES/ISI Conferences**

29<sup>th</sup> TIES general meeting will be held at the Imperial College in London in September 20-22, 2021. This conference is organized by **Marta Blangiardo** as chair of the Local Organizing Committee, and **Michela Cameletti** as chair of the Scientific Committee. Please check the [conference website](#) for keynote speakers, invited and contributed sessions and more information about the conference. We look forward to seeing you in London in 2021!

And it is never too soon to start planning for the next regional TIES meetings in 2022, or satellite meetings of ISI WSC 2021, that will be held in The Hague, Netherlands. Your inputs are most welcome!

### **TIES/ISI membership**

If you've not already renewed your TIES membership for 2020 please look out for reminder emails from the ISI with details of how to do this. We really appreciate your continual support for TIES and if you have any questions around membership please feel free to contact [secretary@environmetrics.org](mailto:secretary@environmetrics.org).

Please check the [link](#) for more details about differenced fees. If you are interested in the prestigious status of ISI elected member, please take a look at the [ISI webpage](#).

Best wishes,

Lelys Bravo de Guenni  
TIES President 2019-2021

## 2019 Wiley-TIES Best *Environmetrics* Paper Award

### 2019 Wiley-TIES Best *Environmetrics* Paper Award:

On behalf of the 2019 Wiley-TIES Best Paper Award Committee of The International Environmetrics Society (TIES), we would like to take this opportunity to congratulate Philip A. White and co-authors: C. Shane Reese, William F. Christensen, Summer Rupper for the paper, entitled "[A model for Antarctic Surface mass balance and ice core site detection.](#)" This paper appeared in *Environmetrics*, has been selected as the recipient of the 2019 Wiley-TIES Best *Environmetrics* Paper Award.

Philip White is an Assistant Professor, Shane Reese is the Academic Vice President, and William Christensen is a Professor at Brigham Young University (BYU), all affiliated with the Department of Statistics. Summer Rupper is a Professor in the Department of Geography at the University of Utah. This project started when Philip was an undergraduate at BYU and was funded by a NASA Glaciology grant on Bayesian quantification of Antarctic surface mass balance.

In conjunction with the Editor-in-Chief of *Environmetrics*, all regular submissions to the journal accepted in 2019 were considered for presenting novel theory or methodology for a relevant and current environmental application, offering important data application with large potential for broad use, and demonstrating a significant contribution to research in environmental fields.

Lelys Bravo de Guenni  
TIES President 2019-2021

Alessandro Fassò  
*Environmetrics* Editor-in-Chief

### Meet Philip White



Joshua Hewit

**Philip White** is an Assistant Professor, Shane Reese is the Academic Vice President, and William Christensen is a Professor at Brigham Young University. Here is Philip's story:

Antarctica's ice sheets are the world's largest freshwater reservoir, holding 61% of the Earth's freshwater. For this reason, understanding how climatic changes affect snow water accumulation in Antarctica is essential. Because Antarctica is so large and inhospitable, the snow water accumulation data that are essential to improve our scientific understanding are sparsely available, expensive, and difficult to acquire. Moreover, the data available are not equally reliable. We use a unique spatial statistical model accounting for variable data reliability that allows us to estimate snow water accumulation

where we do not have data. Given the great cost of data acquisition and the scientific community's financial commitment to better characterize the nature of Antarctic climate change, we propose a novel approach to determine the optimal allocation of new data acquisition sites.

We are currently working on several extensions of this work. The primary goal of this work is to better understand how snow water accumulation varies over time to allow us to identify regions where accumulation trends are changing. An important component for estimating accumulation is understanding how snow density changes below the surface of the ice sheet. We are collaborating on multiple projects to improve the estimation of snow density over space and time. With these models, we can use climate models and airplane-acquired ice-penetrating radar to understand how snow water accumulation is changing.

In the future, we plan on drawing upon satellite remote sensing data and climate models to estimate and project ice sheet mass balance gains or losses to obtain a better picture of future sea-level changes due to climate change. We also plan to apply these methodologies to other critical glacier regions (e.g., High-Mountain Asian).

Philip White

### 2020 Abdel El-Shaarawi Early Investigator Award

Meet **Andrew Zammit-Mangion**, the 2020 Abdel El-Shaarawi Early Investigator Award Recipient:

My journey with environmental statistics began in 2007, when I wrote a PhD proposal for developing spatio-temporal methods for modelling the carbon cycle in the UK. Fast-forward 13 years and I am now a senior research fellow with the Centre of Environmental Informatics (CEI) at the University of Wollongong, Australia. My current and future work in environmental statistics has two flavours: one focuses on modelling and forecasting the Antarctic contribution to sea-level rise, and the other on modelling and predicting sources and sinks of carbon dioxide from remote-sensing and in-situ data. I have also recently been exploring the connections between spatio-temporal statistical models and deep learning.



*Andrew Zammit-Mangion*

I first interacted with TIES in 2013, at the TIES meeting in Anchorage, Alaska. This meeting was pivotal for me in many ways. First, there I met a large contingent from the Australian organization CSIRO, which helped motivate me to apply and come to work in Australia a year later. Second, it was the first time I got to see and meet some of the authors whose work I had been reading for several years. Third, the enthusiasm in that meeting solidified my conviction that I would like to work in this fascinating area of research, which combines statistics, statistical computing, and the environmental sciences.

I feel very privileged to receive the Abdel El-Shaarawi Early Investigator's Award, and am thankful to my colleagues and collaborators who helped me reach this stage. The award serves to recognize my efforts in environmental statistics and informatics over the past years, and will help spur collaborations with like-minded researchers in the future. The award will also help fund my travel to the next TIES meeting, now in 2021,

where I will be presenting recent work on deep learning for spatio-temporal statistical forecasting, and hosting an invited session on Statistics and the Cryosphere.

Thank you TIES!

Andrew Zammit-Mangion

### Meet TIES Award Committee Members

Meet the TIES Award Committees (2020-2022) Members:

**Wendy Meiring** (USA), **Gabriel Huerta** (USA), **Andrew Zamit-Mangion** (Australia), **Nathaniel Newlands** (Canada), **Edward Boone** (USA), and **Joanna Mills Flemming** (Canada)



*Joanna Mills Flemming*

**Joanna Mills Flemming** is a Full Professor in the Department of Mathematics and Statistics at Dalhousie University. She also serves as Graduate Coordinator for its Statistics Division. She is an Associate Director of the Canadian Statistical Sciences Institute (CANSSI), Associate Editor of the *Canadian Journal of Statistics*, Chair of the Statistical Society of Canada Research Committee and Chair of the National Sciences and Engineering Research Council (NSERC) Mathematics

and Statistics Liaison Committee. Her research interests center on the development of statistical methodologies for data exhibiting spatial and/or temporal dependencies with a particular interest in what is important for fisheries science.

**Wendy Meiring** is Professor of Statistics and Applied Probability at UCSB. She has been active in TIES for many years, first presenting at TIES 2003 in South Africa. During TIES 2018 in Guanajuato, Mexico, Wendy Chaired the Best Presentations Awards Committee recognizing excellence in student and postdoc conference presentations. Her research interests include spatio-temporal statistics and functional data analysis, with environmental and ecological applications. She especially enjoys working within a collaborative cross-disciplinary Team Science Environment. Her environmental research interests were fostered during her PhD at University of Washington and postdoc at the National Center for Atmospheric Research in Boulder, Colorado. At UCSB she holds an affiliation (courtesy appointment) with the Bren School of Environmental Science and Management.



*Wendy Meiring*

**Nathaniel Newlands** is a strong lateral learner and systems thinker. His work addresses public-good food-water-energy nexus issues and tackles broad, integrated, complex global problems (e.g., climate change) to help support and advance global sustainable development. He works as a Research Scientist in the Science and Technology Branch of Agriculture and Agri-Food Canada (Government of Canada). He

is also a deemed employee with Statistics Canada, and an Adjunct Associate Professor in Geography with the University of Victoria, Canada, and previously, an Adjunct Professor in Statistics with the University of British Columbia. He is the recipient of a prestigious Government of Canada national award, the Public Service Award of Excellence in Innovation. In 2018, he was an invited International Researcher in Residence with Deakin University's Centre for Regional and Rural Futures and in 2019,



*Nathaniel Newlands*

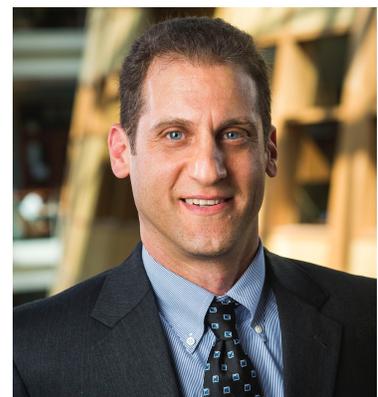
was awarded a prestigious international fellowship from the Organization for Economic Co-operation and Development's Collaborative Research Program to collaborate with the Australian Government's Bureau of Agriculture and Resource Economics. He is a member of many regional, national, and international working groups, advisory committees, including: The International Bioeconomy Forum's Information and Communication Technology in Precision Food Systems Working Group, The International Bridge Collaborative (Nature Conservancy, PATH, International Food Policy Research Institute, and Duke University), United Nations Global Risk Assessment Framework Risk Working Group, and International GEO Secretariat Group on Earth Observations, Disaster Risk Reduction Working Group. He is author of the book, "Future Sustainable Ecosystems: Complexity, Risk, Uncertainty" published in 2016, and a lead editor and author of "Evaluating Climate Change Impacts" CRC Press. He has authored 100+ peer-reviewed manuscripts, book chapters, and conference proceedings, including numerous other governmental and non-governmental technical reports.

### Meet TIES Membership Committee Members

Meet the TIES Membership Committee (2020-2022) Members:

**Carolina Euan** (Saudi Arabia), **Stefano Castruccio** (USA), **Monica Pirani** (UK), **Susan Simmons** (USA), **Melanie Meis** (Argentina), and **Jonathan Stroud** (USA)

**Jonathan Stroud** is Associate Professor of Statistics in the McDonough School of Business at Georgetown University. He previously served on the faculty at the University of Pennsylvania, and at George Washington University. He obtained his PhD in Statistics from Duke University and was a postdoctoral researcher at the University of Chicago and Argonne National Laboratory. His main research areas are Bayesian methods, state-space models, dynamic spatio-temporal modeling, environmental statistics, finance, ensemble Kalman filters, and particle filters. He has published numerous articles in leading statistics and geophysics journals, including *Journal of the American Statistical Association*, *Journal of the Royal Statistical Society (Series B)*, *Journal of Geophysical Research*, and *Monthly Weather Review*.



*Jonathan Stroud*



*Stefano Castruccio*

**Stefano Castruccio** is Assistant Professor in Statistics and Concurrent Assistant Professor in Environmental Engineering at the University of Notre Dame (USA). He obtained his PhD in Statistics at the University of Chicago (USA) in 2013, and was postdoctoral scholar at King Abdullah University of Science and Technology (Saudi Arabia) until 2014 and Lecturer at Newcastle University (United Kingdom) until 2017. His research focuses on spatio-temporal statistics with environmental applications, ranging from emulation of climate models and stochastic weather generation, to monitoring air pollution and wind energy.

**Susan Simmons** currently works as a Teaching Professor at the Institute for Advanced Analytics located at North Carolina State University. She is an Associate Editor for *Environmetrics* and the Vice President for the North Carolina Chapter of the American Statistical Association (and the past chair of the Risk Analysis Section of ASA). Her research interests are in the area of Bayesian Statistics and Toxicology.



*Susan Simmons*



*Melanie Meis*

**Melanie Meis** is a teaching assistant in the Atmospheric and Oceanic Department (DCAO) in the Universidad de Buenos Aires (UBA); and in the Mathematics and Statistics Department in Universidad Torcuato Di Tella, Argentina. She finished her PhD in December 2019, in which she studied the streamflow as a climatic and hydrologic variability indicator, going deeper in the relation between discharge and several climatic oscillations such as ENSO for Argentine basins. Part of this work was presented in the TIES 2018, in which she was awarded with the TIES-Wiley Best Student Presentation Award. Nowadays, she is extending her research to study the association between precipitation and temperature extremes in South America through extreme

multivariate analysis, finding potential connections with physical processes. With this work she is aiming to understand whether the different future modeled scenarios of climate change, the frequency, intensity and interrelation in the precipitation and temperature extreme could be altered.

**Monica Pirani** is Lecturer in Biostatistics in the Department of Epidemiology and Biostatistics at the Imperial College London. Her research focuses on environmental biostatistics, investigating the health effects of air pollution and changes in climate. She is



*Monica Pirani*

interested in statistical methods for spatial and spatial-temporal data, time series analysis, Bayesian hierarchical methods and Bayesian nonparametric methods for clustering. Previously, she was a research associate in biostatistics at Imperial College London, and a research fellow in statistics at the University of Southampton. She received her PhD in Environmental Studies from King's College London (2016), working on statistical modelling for correlated metrics of airborne particles. She received a MSc in Biostatistics and Experimental Statistics from the University of Milan-Bicocca (2009), and a MSc in Epidemiology from the Catholic University of Rome (2004). She also received a degree in Political Science and a post-degree specialization in Sociology of Health from the University of Bologna.

### Meet TIES Liaison and Outreach Committee Members

Meet the TIES Liaison and Outreach Committee (2020-2022) Members:

**Jessica Matthews** (USA, connection to SIAM), **Robert Erhardt** (USA, connection to SOA/CAS), **Alexander Brenning** (Germany, connection to GIS societies), **John Boland** (Australia, connection to wind power societies), and **Wesley Burr** (Canada, connection to IBS)

**Jessica L. Matthews** earned a Ph.D. in applied mathematics from North Carolina State University in 2010. Her research interests focus on models of physical and biological phenomenon, the underlying mathematical principles, and the associated uncertainty quantification methodologies. As an undergraduate she participated in a cooperative education experience at NASA Goddard Space Flight Center in Greenbelt, MD, where she supported efforts of the Earth Observing System (EOS). Following completion of her master's degree, from 2004 through 2010, she worked as a biomathematician, primarily modeling agents under study by the National Toxicology Program in RTP, NC. Dr. Matthews has been at the North Carolina Institute for Climate Studies (NCICS) in Asheville, NC since 2010. Here she studies a number of climatological variables including research in the retrieval of climate data records from long-term satellite observations such as atmospheric temperature and humidity profile



*Jessica L. Matthews*



*Wesley Burr*

data from polar-orbiting infrared sounders and land surface albedo from geostationary imagers. Additionally, she collaborates on various applications of essential climate variables including model-based predictions of Arctic sea ice extent and innovative uses of vegetation climate data records for drought and invasive species monitoring.

**Wesley Burr** is Assistant Professor of Statistics at Trent University in Ontario, Canada. He completed his PhD with David J. Thomson at Queen's University in 2012, and was a postdoctoral research fellow at Health Canada's

Population Studies Division before coming to Trent. His research is currently focused on time series modelling, spectrum estimation methodology and environmental epidemiology, the last mainly concerned with temporal and spatial considerations in the interactions of air pollution and population health.



*Rob Erhardt*

**Rob Erhardt** is an Associate Professor of Statistics at Wake Forest University in Winston-Salem, NC. He holds a Ph.D. in Statistics and Operations Research from the University of North Carolina at Chapel Hill, an M.S. in Statistics from the University of Wisconsin-Madison, and a B.A. in Physics from SUNY Geneseo. He is also a credentialed actuary and Society of Actuaries Hickman Scholar. His research areas include environmental statistics, computational

statistics, and actuarial science, with a particular interest in work at the intersection of insurance and climate risk. Originally from rural New York State, he is an avid runner and backpacker, and a poor jazz pianist.

### Know your TIES Member - Lance Waller on COVID-19

**Posted on ASA Connect, 17 March 2020:**

As a profession, we as statisticians recognize the responsibility and challenges associated with developing and implementing evidenced-based policy and actions, particularly in a rapidly evolving setting like a public health emergency. The recent "Flatten the Curve" posts on the benefits of social distancing and other efforts to slow the spread of infection are good examples of how to express challenging quantitative ideas well. While some might quibble on the details, the central message is clear, understandable to a wide range of people, and helpful. Our analyses and our understanding of the analyses of others can help provide important interpretation and support for efforts to reduce the impact of the disease.



*Lance Waller*

As a profession, we as statisticians value the role of data, observation, and analysis in making the best decisions possible. We also note that, in a crisis, the "best decision possible" often requires continued assessment and updated analyses and conclusions as more data, more knowledge, and more evaluations become available. While we strive toward optimal results, in a crisis, there is often not enough time, data, or understanding to prove optimality. Our standard should not be whether we have THE answer, but rather whether we know more now than we did before, even if that is simply articulating what additional data are needed for the next steps. In all that we

do, we should ask whether our work, our statements, our input to the discussion, etc. help the present situation.

Several years ago, a colleague pointed me to the ASA's Ethical Guidelines for Statistical Practice as part of a course on responsible conduct of research. These Guidelines can be found at <https://www.amstat.org/ASA/Your-Career/Ethical-Guidelines-for-Statistical-Practice.aspx>. The guidelines consist of eight principles and are particularly helpful in times like these. The principles (and a brief definition from the Guidelines) are:

- **Professional Integrity and Accountability:** "The ethical statistician uses methodology and data that are relevant and appropriate; without favoritism or prejudice; and in a manner intended to produce valid, interpretable, and reproducible results."
- **Integrity of Data and Methods:** "The ethical statistician is candid about any known or suspected limitations, defects, or biases in the data that may affect the integrity or reliability of the statistical analysis."
- **Responsibilities to Science/Public/Funder/Client:** "The ethical statistician supports valid inferences, transparency, and good science in general, keeping the interests of the public, funder, client, or customer in mind."
- **Responsibilities to Research Subjects:** "The ethical statistician protects and respects the rights and interests of human and animal subjects at all stages of their involvement in a project."
- **Responsibilities to Research Team Colleagues:** "Science and statistical practice are often conducted in teams made up of professionals with different professional standards. The statistician must know how to work ethically in this environment."
- **Responsibilities to Other Statisticians or Statistics Practitioners:** "The practice of statistics requires consideration of the entire range of possible explanations for observed phenomena, and distinct observers drawing on their own unique sets of experiences can arrive at different and potentially diverging judgments about the plausibility of different explanations. Even in adversarial settings, discourse tends to be most successful when statisticians treat one another with mutual respect and focus on scientific principles, methodology, and the substance of data interpretations."
- **Responsibilities Regarding Allegations of Misconduct:** "The ethical statistician understands the differences between questionable statistical, scientific, or professional practices and practices that constitute misconduct."
- **Responsibilities of Employers, Including Organizations, Individuals, Attorneys, or Other Clients:** "Those employing any person to analyze data are implicitly relying on the profession's reputation for objectivity. However, this creates an obligation on the part of the employer to understand and respect statisticians' obligation of objectivity."

My thanks go out to those involved in the analyses related to the outbreak; to those helping explain statistical and epidemiologic concepts to their friends, their family, their colleagues, and their representatives in decision-making positions; and to those who phrased the ethical responsibilities of our profession so well in the Guidelines above.

This is what we do and why we do it. Let's keep up the good work.

Lance Waller, Professor  
Biostatistics and Bioinformatics  
Rollins School of Public Health  
Emory University

### Note from Elena Naumova, the Publications Officer

In August of 2019 my team was completing the analysis of the MERS-CoV related outbreaks in Saudi Arabia as part of our IARPA-funded project, puzzling on the potential seasonal re-occurrences of coronavirus. Unfortunately, the predictions on pandemic potential presented by many experts in emerging infections got insufficient attention. Sadly, the importance of our current research on developing real-time and near-term forecast for COVID-19 is too real.



*Elena Naumova*

Last year, I was leading a Special Issue on “[Infectious Disease Modeling in the Era of Complex Data](#)” for the International Journal of Environmental Research and Public Health ([IJERPH](#)).

The issue was showcasing work from Costa Rica, Russia, India, South Korea, Saudi Arabia, USA, Peru on current methodology and challenges of modeling infectious outbreaks, disease trends, and their seasonal oscillations. With the growing demand, this issue had sprouted a special issue on COVID-19 on “[Responding to COVID-19 from Local, Regional and Global Perspectives: Challenges and Solutions](#)” among many others to provide a platform for advancing disease modeling and forecasting.

Together with many statisticians I am concern about data use, quality, and communication, especially now when data, models, predictions became part of daily routine discussions and media coverage. In my recent editorial on “[The traps of calling the public health response to COVID-19 “an unexpected war against an invisible enemy”](#)” I had stressed that any topic related to COVID-19 is too vast for a single paper and the right words and reliable data do matter.

Thanks to many scientists for raising their voices to improve collaboration, increase respect for science, and advance awareness of human impacts on the environment, in the interest of addressing the novel virus and protecting human health. I am happy to hear from TIES members interested in building collaborations and sharing own experience and research networks.

As Publications Officer I am committed to making stronger ties among TIES members, to help all getting to know each other, your passions, achievements, needs, and inspirations.

Stay safe, well, and healthy!

Elena Naumova  
*TIES Publications Officer 2019-2021*