



# TIES 2002 Annual Conference

## Program Agenda

June 18-22, 2002

Facoltà di Ingegneria, Università di Genova  
Villa Cambiaso, Via Montallegro 1  
Genova, Italy

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The International  
**ENVIRONMETRICS**  
Society - TIES

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Sponsoring Organizations:

The Committee on Probability and Statistics in the Physical Sciences of the Bernoulli Society  
for Mathematical Statistics and Probability

Società Italiana di Statistica

The International Environmental Modelling and Software Society

ASA Statistics and Environment Section

Associazione Italiana di Ingegneria Chimica

Financial support by Regione Liguria, John Wiley & Sons, LTD and Università di Genova is  
gratefully acknowledged

## Monday, June 17

5:00 - 6:00 p.m. **Registration**

## Tuesday, June 18

9:00 - 5:30 p.m. **Registration**

**Salone della Facoltà  
Main Floor**  
9:00 - 10:15 a.m. **Opening Plenary Session**

9:00 - 9:15 a.m. **Opening Address**  
**R. Levaggi**, Ministry of the Environment, Regione Liguria, Italy

**Welcome Address**  
**R. Del Borghi**, Head of DICHEP, Università di Genova, Italy

9:15 - 10:15 a.m. **TIES President's Invited Lecture**  
Chair: Sylvia Esterby, Okanagan University College, Canada

**Is the Earth's climate changing?**  
**Lennart Bengtsson**, Max Planck Institute for Meteorology, Hamburg, Germany  
and Environmental Systems Science Centre, University of Reading, UK

10:15 - 10:45 a.m. **Coffee break**

**Salone della Facoltà  
Main Floor**  
10:45 - 0:45 p.m. **Remote Sensing  
Invited Paper Session**  
Chair: William Cooke, Southern Research Station, U. S. Forest Service, USA  
Organizer: R. E. McRoberts, North Central Research Station U. S. Forest Service, USA

10:45 - 11:10 a.m. **Two methods for quickly and accurately constructing forest/non-forest classifications from satellite imagery and inventory data**  
**Ronald E. McRoberts**  
North Central Research Station, U. S. Forest Service, USA

11:10 - 11.35 a.m. **Combining hyperspectral data and ground surveys for the assessment of non wood goods and services of forests**  
**Michael Köhl**, Wolfgang Stümer, Bernhard Kenter  
Dresden University of Technology, Chair of Forest Biometrics and Computer Sciences, Germany

11:35 - 0:00 p.m. **Predicting aboveground biomass using field data and high resolution spectral imaging data**  
**Edzer J. Pebesma**, Steven M. de Jong  
Dept. of Physical Geography, Utrecht University, The Netherlands

## Tuesday, June 18

0:00 - 0:25 p.m. **Selecting weights of satellite image and ancillary information in k-NN estimation: a genetic algorithm approach**

**Erkki Tomppo**<sup>1</sup>, Merja Halme<sup>2</sup>

<sup>1</sup>Head of Finnish National Forest Inventory, Finland

<sup>2</sup>The Finnish Forest Research Institute, Finland

0:25 - 0:45 p.m.

**Discussant**

**William Cooke**

Southern Research Station, U. S. Forest Service, USA

### Room A7

10:45 - 0:45 p.m.

**Application of Extreme Values Distributions**

**Contributed Paper Session**

Chair: Mohammed A. El-Saidi, Ferris State University, USA

10:45 - 11:15 a.m.

**Properties of quartile estimators for rainfall enhancement experiments**

**Tressa L. Fowler**

National Center for Atmospheric Research, Boulder, CO, USA

11:15 - 11.45 a.m.

**Evidence for climate variables having heavy-tailed distributions**

**Richard W. Katz**

National Center for Atmospheric Research, Boulder, CO, USA

11:45 - 0:15 p.m.

**Short term ground-level ozone forecasting with extreme value methods**

Silvano Bordignon<sup>1</sup>, **Francesco Pauli**<sup>2</sup>

<sup>1</sup>Dip. di Scienze Statistiche, Università di Padova, Italy

<sup>2</sup>Dip. di Scienze Economiche e Statistiche, Università di Trieste, Italy

0:15 - 0:45 p.m.

**Hierarchical modeling of extreme rainfall**

Daniela Cocchi, **Michele Scagliarini**

Dipartimento di Scienze Statistiche, Università di Bologna, Italy

0:45 - 2:00 p.m.

**Lunch**

### Salone della Facoltà

#### Main Floor

2:00 - 3:30 p.m.

**Statistical Assessment of Large Computer Models**

**Invited Paper Session**

Chair and Organizer: Peter Guttorp, NRCSE, University of Washington, USA

2:00 - 2:30 p.m.

**Uncertainty in Ocean/Climate Models**

**Peter Challenor**

Southampton Oceanography Centre, UK

2:30 - 3:00 p.m.

**A geostatistical approach to assessment of regional air quality models**

**Paul D. Sampson**, Peter Guttorp

University of Washington, Seattle, USA

**Tuesday, June 18**

3:00 - 3:30 p.m.     **Statistical assessment of air quality numerical models**  
**Montserrat Fuentes**  
North Carolina State University, USA

**Room A7**  
2:00 - 3:30 p.m.     **Environmental Turbulent Diffusion and Dispersion**  
**Invited Paper Session**  
Chair and Organizer: P.J. Sullivan, Department of Applied Mathematics, University of Western Ontario, London, Canada

2:00 - 2:30 p.m.     **A probability density function for concentration in relative dispersion of a contaminant plume in the atmosphere**  
R.J. Munro, P.C. Chatwin, **N. Mole**  
Dept. of Applied Mathematics, University of Sheffield, UK

2:30 - 3:00 p.m.     **Some statistical problems in turbulent diffusion**  
**Tom Schopflicher**  
Chemical Computing Group Inc., Montreal, Canada

3:00 - 3:30 p.m.     **Review of a Strategy for the Prediction of the PDF of Scalar Concentrations**  
**Paul J. Sullivan**  
Department of Applied Mathematics, University of Western Ontario, London, Canada

3:30 - 4:00 p.m.     **Coffee break**

**Salone della Facoltà**  
**Main Floor**  
4:00 - 5:30 p.m.     **Statistical Models for Categorical Data in Air Quality Monitoring**  
**Invited Paper Session**  
Chair and Organizer: Alessandro Fassò, Università di Bergamo, Italy

4:00 - 4:30 p.m.     **Multivariate logit models with regime switching for forecasting air pollutants levels**  
**Roberto Colombi**  
Facoltà di Ingegneria, Università di Bergamo, Italy

4:30 - 5:00 p.m.     **Non homogeneous Hidden Markov Models for categorical space-time series and an application to pollution data from the monitoring network in Rome**  
**Francesco Lagona**  
Università di Roma Tre, Italy

5:00 - 5:30 p.m.     **Data-Analysis of Environmental Air Pollutant Monitoring Systems in Europe**  
**Kristina Voigt<sup>1</sup>, Gerhard Welz<sup>1</sup>, Rainer Brüggemann<sup>2</sup>**  
<sup>1</sup>GSF - National Research Center for Environment and Health, Institute of Biomathematics and Biometry, Department of Biostatistics, Neuherberg, Germany, <sup>2</sup>Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Department of Ecohydrobiology, Berlin, Germany

**Tuesday, June 18**

**Room A7**

4:00 - 5:30 p.m.

**Monitoring Networks**

**Contributed Paper Session**

Chair: H. Wackernagel, Centre de Géostatistique, Ecole des Mines de Paris, France

4:00 - 4:30 p.m.

**An experimental catchment for first flush flows in the town of Genova**

**C. Berretta**, I. Gnecco, P. La Barbera, L.G. Lanza, A. Molini

Dipartimento di Ingegneria Ambientale, Università di Genova, Italy

4:30 - 5:00 p.m.

**Statistical modelling of pollutants concentration in the surface waters of River Ave Basin**

Teresa Alpuim<sup>1</sup>, **Armanda Manuela Gonçalves**<sup>2</sup>

<sup>1</sup>University of Lisbon, Portugal, <sup>2</sup>University of Minho, Portugal

5:00 - 5:30 p.m.

**How to test information redundancy of environmental detectors in the time domain**

**Emma Sarno**

Dipartimento di Economia e Statistica, Università della Calabria, Italy

**Palazzo Ducale**

**Welcome cocktail**

6:00 p.m.

## Wednesday, June 19

9:00 - 5:30 p.m. **Registration**

### Room A7

9:15 - 10:15 a.m.

#### **Plenary Session**

Chair: Sylvia Esterby, Okanagan University College, Canada

9:15 - 10:15 a.m.

#### **J. Stuart Hunter Lecture**

##### **The Ozone Hole: Spatial Trend in a Massive, Global Dataset**

Noel Cressie, The Ohio State University, Columbus, OH, USA

10:15 - 10:45 a.m.

#### **Coffee break**

### Room A7

10:45 - 0:45 p.m.

#### **Environmental Indicators**

##### **Invited Paper Session**

Chair: Bimal Sinha, University of Maryland Baltimore County, USA

Organizers: T. Olsen<sup>1</sup>, N. P. Ross<sup>2</sup>

<sup>1</sup>US EPA NHEERL Western Ecology Division, Corvallis, Oregon, USA, <sup>2</sup>USEPA

10:45 - 11:15 a.m.

#### **Environmental Assessment Based on Multiple Indicators**

**Jerzy A. Filar**<sup>1</sup>, N. Phillip Ross<sup>2</sup>, Ming-Lu Wu<sup>3</sup>

<sup>1</sup>CIAM University of South Australia, <sup>2</sup>US EPA, <sup>3</sup>City University of Hong Kong

11:15 - 11:45 a.m.

#### **Indexing Environmental Quality Indicators: A Multiple Criteria Decision-making Approach**

**Ranjan Maitra**<sup>1</sup>, N. Phillip Ross<sup>2</sup>, Bimal Sinha<sup>1</sup>

<sup>1</sup>Department of Mathematics and Statistics, University of Maryland, Baltimore County, Baltimore, MD, USA, <sup>2</sup>United States Environmental Protection Agency

11:45 - 0:15 p.m.

#### **Prioritization and Ranking of Watersheds based on Watershed Indicators Without Having to Integrate Indicators for Multi-Criterion Decision Support**

**G. P. Patil**

Center for Statistical Ecology and Environmental Statistics  
The Pennsylvania State University, University Park, PA, USA

0:15 - 0:45 p.m.

#### **Discussant**

**Barry Nussbaum**

USEPA

### Room A5

10:45 - 0:45 p.m.

#### **Models in Time and Space**

##### **Contributed Paper Session**

Chair: T. Alpuim, University of Lisbon, Portugal

10:45 - 11:15 a.m.

#### **A simple nonseparable space-time covariance model for ozone**

**Francesca Bruno**<sup>1</sup>, Peter Guttorp<sup>2</sup>, Paul Sampson<sup>2</sup>, Daniela Cocchi<sup>1</sup>

<sup>1</sup>Dipartimento di Scienze Statistiche, Università di Bologna, Italy, <sup>2</sup>Department of Statistics, University of Washington, Seattle, USA

## Wednesday, June 19

- 11:15 - 11.45 a.m. **Spatial covariance modelling in a complex coastal domain by multidimensional scaling**  
**Gudmund Høst**, Anders Loland  
Norwegian Computing Center, Norway
- 11:45 - 0:15 p.m. **A Pairwise Framework for Geostatistics**  
**Cristiano Varin**<sup>1</sup>, Gudmund Høst<sup>2</sup>  
<sup>1</sup>Dipartimento di Scienze Statistiche, Padova, Italy, <sup>2</sup>Norwegian Computing Center, Norway
- 0:15 - 0:45 p.m. **Looking at ozone station data and model output in the framework of external drift kriging**  
**H. Wackernagel**<sup>1</sup>, C. Lajaunie<sup>1</sup>, C. Roth<sup>2</sup>, N. Blond<sup>3</sup>, R. Vautard<sup>3</sup>  
<sup>1</sup>Centre de Géostatistique, Ecole des Mines de Paris, France <sup>2</sup>Airparif, France, <sup>3</sup>Laboratoire de Météorologie Dynamique, Ecole Polytechnique, France

### Room A6

- 10:45 - 0:45 p.m. **The Analysis of Pollution in Elbe River**  
**Contributed Paper Session**  
Chair: Anders Grimvall, Department of Mathematics, Linköping University, Sweden

- 10:45 - 11:15 a.m. **Empirical predictions of the Elbe oxygen deficit using data from different sources**  
**Laurent Bertino**<sup>1</sup>, Wilhelm Petersen<sup>2</sup>, Hans Wackernagel<sup>1</sup>  
<sup>1</sup>Centre de Géostatistique, ENSMP, Fontainebleau, France, <sup>2</sup>Institute for Coastal Research, GKSS, Geesthacht, Germany
- 11:15 - 11.45 a.m. **Assessment of Primary Production by Statistical Analysis of Water-Quality Data**  
**Wilhelm Petersen**<sup>1</sup>, Ulrich Callies<sup>2</sup>  
<sup>1</sup>Institute for Coastal Research; <sup>2</sup>GKSS, Geesthacht, Germany
- 11:45 - 0:15 p.m. **Identification of meteorologically induced variations of water quality using an over-parameterised mechanistic model**  
**Mirco Scharfe**, Ulrich Callies  
GKSS Research Center, Germany
- 0:15 - 0:45 p.m. **Interpolating counts of exceedance of thresholds for NO<sub>x</sub> and ozone air quality data**  
**Jan van de Kastele**<sup>1</sup>, M. Velders<sup>2</sup>, Arnold L.M. Dekkers<sup>2</sup>  
<sup>1</sup>Mathematical and Statistical Methods Group, Wageningen University, the Netherlands <sup>2</sup>RIVM, Bilthoven, The Netherlands.

0:45 - 2:00 p.m. **Lunch**

### Room A7

- 2:00 - 3:30 p.m. **Methods for Identifying and Quantifying Trend**  
**Invited Paper Session**  
Chair: R. Smith, CEH, Edinburgh, UK  
Organizer: M. Scott, CEH, Edinburgh, UK
- 2:00 - 2:30 p.m. **Incorporation of concomitant information and deterministic models into statistical trend tests**  
**Anders Grimvall**  
Department of Mathematics, Linköping University, Sweden



## Wednesday, June 19

- 2:30 - 3:00 p.m.    **Exploration of trends in atmospheric temperatures**  
**Howard Grubb**  
School of Applied Statistics, The University of Reading, UK
- 3:00 - 3:30 p.m.    **Air quality assessment in UK and Republic of Ireland using non parametric methods**  
**Marian Scott<sup>1</sup>**, Ron Smith<sup>1</sup>, Marco Giannitrapani<sup>2</sup>  
<sup>1</sup>CEH, Edinburgh, UK, <sup>2</sup>University of Glasgow and Palermo, Italy

### Room A5

2:00 - 3:30 p.m.    **Ecosystem Health and its Measurement at Landscape Scale**  
**Invited Paper Session**  
Chair: Orazio Rossi, Dipartimento di Scienze Ambientali, Università di Parma, Italy  
Organizer: G. P. Patil, Center for Statistical Ecology and Environmental Statistics, The Pennsylvania State University, University Park, PA, USA

- 2:00 - 2:25 p.m.    **Comparative Patterns of Habitat Richness and Rarity for Pennsylvania Vertebrates**  
**W. L. Myers<sup>1</sup>**, G. P. Patil<sup>2</sup>, C. Taillie<sup>2</sup>  
<sup>1</sup>Center for Remote Sensing of Earth Resources, Penn State University, USA  
<sup>2</sup>Center for Statistical Ecology and Environmental Statistics, Penn State University, USA
- 2:25 - 2:50 p.m.    **Detection and Delineation of Critical Areas for Assessment and Management at Landscape Scales using Cellular Synoptic Data**  
**G. P. Patil<sup>1</sup>**, W. L. Myers<sup>2</sup>, C. Taillie<sup>1</sup>  
<sup>1</sup>Center for Statistical Ecology and Environmental Statistics, The Pennsylvania State University, University Park, PA, USA; <sup>2</sup>Center for Remote Sensing of Earth Resources, The Pennsylvania State University, University Park, USA
- 2:50 - 3:15 p.m.    **Use of Landscape and Land Use Parameters for Classification and Characterization of Watersheds in the Mid-Atlantic across Five Physiographic Provinces**  
**D. H. Wardrop<sup>1</sup>**, J. A. Bishop<sup>1</sup>, M. Easterling<sup>1</sup>, W. L. Myers<sup>2</sup>, G. P. Patil<sup>3</sup>, C. Taillie<sup>3</sup>  
<sup>1</sup>Co-operative Wetlands Center, Penn State University, USA, <sup>2</sup>Center for Remote Sensing of Earth Resources, Penn State University, USA, <sup>3</sup>Center for Statistical Ecology and Environmental Statistics, Penn State University, USA
- 3:15 - 3:30 p.m.    **Discussant**  
**Giovanni Zurlini**, Dipartimento di Scienze Ambientali, Università di Parma, Italy

### Room A6

2:00 - 3:30 p.m.    **Engineering and Environment**  
**Contributed Paper Session**  
Chair: A. P. Reverberi, Dipartimento di Ingegneria Chimica e di Processo, Università di Genova, Italy

- 2:00 - 2:30 p.m.    **Managing CO2 emissions in the chemical industry**  
**V. Dovì**, M. S. Fumagalli  
Dipartimento di Ingegneria Chimica e di Processo, Università di Genova, Italy
- 2:30 - 3:00 p.m.    **Environmental impact from dust generated by refuse materials: a new approach**  
**C. Solisio<sup>1</sup>**, V. Gareri<sup>2</sup>, A. Del Borghi<sup>1</sup>, M. Pescetto<sup>2</sup>  
<sup>1</sup>Dipartimento di Ingegneria Chimica e di Processo, Università di Genova, Italy, <sup>2</sup>Provincia di Savona, Italy

## Wednesday, June 19

- 3:00 - 3:30 p.m. **Nonlinear Statistical Sensitivity Analysis of Environmental Models with Application on Heavy Metals Absorption from Contaminated Wastewater**  
**A. Fassò<sup>1</sup>, E. Porcu<sup>1</sup>, A. Esposito<sup>2</sup>, A.P. Reverberi<sup>2</sup>, F. Vegliò<sup>2</sup>**  
<sup>1</sup>Dipartimento di Ingegneria, Università di Bergamo, Italy  
<sup>2</sup>Dipartimento di Ingegneria Chimica e di Processo, Università di Genova, Italy

3:30 - 4:00 p.m. **Coffee break**

### Room A7

- 4:00 - 5:15 p.m. **Bayesian Model Comparison and Model Averaging**  
**Invited Paper Session**  
Chair and Organizer: Annibale Biggeri, Università di Firenze, Italy

- 4:00 - 4:30 p.m. **Evaluation of model uncertainty in ecological risk assessment using Bayesian Model Averaging**  
**Eric P. Smith, Keying Ye**  
Department of Statistics, Virginia Tech., USA
- 4:30 - 5:00 p.m. **Bayesian variable selection in multinomial probit models with application to spectral data**  
**Marina Vannucci**  
Department of Statistics, Texas A&M University, USA
- 5:00 - 5:15 p.m. **Discussion**

### Room A5

- 4:00 - 5:15 p.m. **Sampling in State and National Level Monitoring Programs**  
**Invited Paper Session**  
Chair: S. Rathbun, The Pennsylvania State University, USA  
Organizers: Don Stevens<sup>1</sup>, E.P. Smith<sup>2</sup>  
<sup>1</sup>Oregon State University, <sup>2</sup>Department of Statistics, Virginia Tech, USA

- 4:00 - 4:30 p.m. **Implementing Regional Scale Monitoring in the Pacific Northwest Region of the US**  
**Dan McKenzie**  
US EPA
- 4:30 - 5:00 p.m. **The San Francisco Estuary Regional Monitoring Program: management implications and benefits of redesign**  
**Karen Taberski<sup>1</sup>, Don Stevens<sup>2</sup>, Sarah Lowe<sup>3</sup>, Bruce Thompson<sup>3</sup>, Jay Davis<sup>3</sup>, Rainer Hoenicke<sup>4</sup>**  
<sup>1</sup>San Francisco Bay Regional Water Quality Control Board, USA <sup>2</sup>Oregon State University, USA  
<sup>3</sup>San Francisco Estuary Institute, USA <sup>4</sup>California Resources Agency, USA
- 5:00 - 5:15 p.m. **Discussant**  
**Barry Nussbaum, USEPA (Tentative)**

**Wednesday, June 19**

**Room A6**

4:00 - 5:15 p.m.

**Statistical Issues of Scale-Invariance and Scale-Dependence in  
Environmetrics**

**Invited Paper Session**

Organizers: Vijay Gupta<sup>1</sup>, Harry Pavlopoulos<sup>2</sup>

<sup>1</sup>CIRES, University of Colorado, Boulder, USA, <sup>2</sup>Athens University of Economics and Business,  
Greece.

Chair: Harry Pavlopoulos, Athens University of Economics and Business, Greece.

4:00 - 4:30 p.m.

**Scale Invariance of Regional Wet and Dry Durations of Rainfields: a Diagnostic Study**

**Harry Pavlopoulos<sup>1</sup>, Vijay K. Gupta<sup>2</sup>**

<sup>1</sup>Department of Statistics, Athens University of Economics and Business, Greece <sup>2</sup>CIRES,  
University of Colorado, Boulder, USA

4:30 - 5:00 p.m.

**On the dynamic scaling of rainfall fields**

**C. De Michele, P. Bernardara, N.T. Kottegoda, R. Rosso**

DIAR, Politecnico di Milano, Milano, Italy

5:00 - 5:15 p.m.

**Discussant**

**R. Katz**

National Center for Atmospheric Research, USA

**Room A7**

5:30 p.m.

**TIES Annual General Meeting**

## Thursday, June 20

9:00 - 0:45 p.m.     **Registration**

### Room A7

9:15 - 10:15 a.m.     **Plenary Session**

Chair: R. Pastorino, Dipartimento di Ingegneria Chimica e di Processo, Università di Genova, Italy

9:15 - 10:15 a.m.     **A model for structuring the quantitative assessment of public health and environmental risk of toxic substances**

Saul M. Lemkowitz<sup>1</sup>, **Hans J. Pasman**<sup>2</sup>

<sup>1</sup>Faculty of Applied Sciences, Delft University of Technology, the Netherlands, <sup>2</sup>Defence Research, Netherlands Organisation for Applied Research, Delft, the Netherlands

10:15 - 10:45 a.m.     **Coffee break**

### Room A7

10:45 - 0:45 p.m.     **International Environmental Statistics**

**Invited Paper Session**

Chair: Ranjan Maitra, UMBC/EPA

Organizer: N. P. Ross, USEPA

10:45 - 11:15 a.m.     **Monitoring Tailor Made III International Workshop on information for sustainable water management**

**Wim Cofino**

RIZA Netherland, the Netherlands

11:15 - 11:45 a.m.     **Environmental Indicators Initiative - Keeping the Quality in**

**Barry Nussbaum**

USEPA

11:45 - 0:15 p.m.     **Human Environment Index (HEI): A Measure of Progress Towards Environmental Protection**

**Ashbindu Singh**<sup>1</sup>, Parvina Shamsieva-Cohen<sup>2</sup>

<sup>1</sup>Regional Coordinator UNEP Division of Early Warning and Assessment, North America,

<sup>2</sup>Independent Consultant, Seattle, Washington, USA

0:15 - 0:45 p.m.     **Discussants**

**David Redlin**             USEPA

**Bimal Sinha**             University of Maryland, Baltimore County, USA

### Room A5

10:45 - 0:45 p.m.     **Environmental Surveys and Environmental Indicators**

**Contributed Paper Session**

Chair: D. McKenzie, USEPA (Tentative)

10:45 - 11:15 a.m.     **Pointing in the Right Direction: Using Indicators of System Behaviour to Assess Sustainability**

**Louise Erasmus**<sup>1</sup>, Albert S. van Jaarsveld<sup>2</sup>

<sup>1</sup>Centre for Environmental Studies, University of Pretoria, South Africa, <sup>2</sup>Conservation Planning Unit, Department of Zoology and Entomology, University of Pretoria, South Africa

**Thursday, June 20**

- 11:15 - 11.45 a.m. **Different methodologies to evaluate/quantify uncertainties of air emission estimates**  
**Daniela Romano**<sup>1</sup>, Antonella Bernetti<sup>2</sup>, Riccardo De Lauretis<sup>3</sup>  
<sup>1</sup>ANPA (Agenzia Nazionale Protezione Ambiente) Consultant, Italy, <sup>2</sup>Independent consultant,  
<sup>3</sup>ANPA (Agenzia Nazionale Protezione Ambiente), Italy
- 11:45 - 0:15 p.m. **Evaluation of standards using a mixed model**  
**Eric P. Smith**, Alyaa Zahran, Mahmoud Mahmoud, Keying Ye  
Department of Statistics, Virginia Tech., USA
- 0:15 - 0:45 p.m. **The development of statistical uncertainty assessments for air pollution effects**  
**R. I. Smith**  
Centre for Ecology and Hydrology, Edinburgh, UK

**Room A6**

10:45 - 0:45 p.m. **Time Series Analysis for Environmental Data**  
**Contributed Paper Session**  
Chair: R. Correll, Commonwealth Scientific and Industrial Research Organisation, Australia

- 10:45 - 11:15 a.m. **Time series of air pollutants**  
**Jiri Neubauer**, Jaroslav Michalek, Frantisek Bozek  
Masaryk University, Brno, Czech Republic
- 11:15 - 11.45 a.m. **Using wavelets for decomposing and forecasting air pollution time series**  
**Orietta Nicolis**, Alessandro Fassò  
Università di Bergamo, Italy
- 11:45 - 0:15 p.m. **Fractional Vector Autoregressive Models for Environmental Data**  
Mariagrazia Granturco, **Eugenia Nissi**  
Università D'Annunzio di Chieti, Italy
- 0:15 - 0:45 p.m. **An automatic device for dynamic calibration of tipping bucket rain gauges**  
D. Cerisola, **A. Vallebona**, P. La Barbera, L. Lanza, A. Molini, L. Stagi  
DIAM - Dipartimento di Ingegneria Ambientale, Università di Genova, Italy

0:45 - 2:00 p.m. **Lunch**

**Friday, June 21**

9:00 - 6:00 p.m.     **Registration**

9:15 - 10:45 a.m.

**Panel Session**

**The Perspective of Quantitative Science in the Debate about Environmental Degradation**

Chair: I. B. MacNeill, University of Western Ontario, London, Canada

Organizer: Sylvia Esterby, Okanagan University College, Canada

**Panelists:**

**Noel Cressie**, The Ohio State University, Columbus, OH, USA

**V. Dovì**, Dipartimento di Ingegneria Chimica e di Processo, Università di Genova, Italy

**P. Guttorp**, NRCSE, University of Washington, USA

**T. Jakeman**, Centre for Resource and Environmental Studies, Australia

**P. Sullivan**, Department of Applied Mathematics, University of Western Ontario, London, Canada

10:45 - 6:00 p.m.

**Poster Papers**

**Human encroachment in National Parks in South Africa**

M.W. Barry<sup>1</sup>, B. Reyers<sup>2</sup>, A.S. van Jaarsveld<sup>1</sup>, K.I. Meikeljohn<sup>3</sup>

<sup>1</sup>Centre for Environmental Studies, University of Pretoria, South Africa <sup>2</sup>Dept. of Zoology and Entomology, University of Pretoria, South Africa <sup>3</sup>Dept of Geography and Geoinformatics, University of Pretoria, South Africa

**Probabilistic Quantitative Ecological Risk Assessment Modelling using AQUARISK**

Jayasuriya Perera<sup>1</sup>, Ray Correll<sup>2</sup>, John Twining<sup>1</sup>

<sup>1</sup>Australian Nuclear Science & Technology Organisation, Australia, <sup>2</sup>Commonwealth Scientific and Industrial Research Organisation, Australia.

**Heavy metals in TSP and PM10 measured in an industrial site of Southern Italy: source characterization and dependence on meteorological conditions**

R. Caggiano<sup>1</sup>, M. D'Emilio<sup>2</sup>, M. Ragosta<sup>2</sup>, M. Macchiato<sup>3</sup>, S. Sabia<sup>3</sup>

<sup>1</sup>Istituto di Metodologie Avanzate di Analisi Ambientale CNR, Italy, <sup>2</sup>INFM - Dipartimento di Ingegneria e Fisica dell'Ambiente - Università degli Studi della Basilicata - Potenza, Italy, <sup>3</sup>INFM - Dipartimento di Scienze Fisiche -Università Federico II, Napoli, Italy

**A new Model for the Inference of Population Characteristics from Experimental Data Using Uncertainties in Data. Application to Interlaboratory Studies**

Wim P. Cofino<sup>1</sup>, D.E. Wells<sup>2</sup>

<sup>1</sup>Ministry of Transport, Public Works and Water Management, Directorate-General for Public Works and Water Management, institute for Inland Water Management and Waste Water Treatment RIZA, the Netherlands, <sup>2</sup>Scottish Office, Fisheries Research Station, Marine Laboratory, Aberdeen, UK

**Friday, June 21**

**An application of wavelet transform for the comparative study of two different prospection magnetic techniques**

M. D'Emilio<sup>1</sup>, M. Ragosta<sup>1</sup>, D. Chianese<sup>2</sup>, E. Rizzo<sup>2</sup>, M. Lanfredi<sup>3</sup>, V. Lapenna<sup>3</sup>, M. Macchiato<sup>4</sup>  
<sup>1</sup>INFM - Dipartimento di Ingegneria e Fisica dell'Ambiente - Università degli Studi della Basilicata - Potenza, Italy, <sup>2</sup>Dipartimento di Ingegneria e Fisica dell'Ambiente - Università degli Studi della Basilicata - Potenza, Italy, <sup>3</sup>Istituto di Metodologie Avanzate di Analisi Ambientale CNR - Tito Scalo (PZ), Italy, - <sup>4</sup>Dipartimento di Scienze Fisiche -Università Federico II – Napoli, Italy

**Cost effectiveness and sampling efficiency in industrial sites soil characterization**

C.I. Giasi<sup>1</sup>, M.P. Masi<sup>2</sup>

<sup>1</sup>Politecnico di Bari, Italy, <sup>2</sup>Politecnico di Bari e stagista AGIP Petroli, Italy

**Estimation of the anthropogenic impact on nutrient loads carried by the Elbe River**

M. Hussian<sup>1</sup>, A. Grimvall<sup>1</sup>, W. Petersen<sup>2</sup>

<sup>1</sup>Department of Mathematics, Linköping University, Sweden, <sup>2</sup>Institute of Hydrophysics, GKSS Research, Germany

**Describing the air quality in Rome**

Sabrina Bellantone, Giovanna Jona Lasinio, Simona Sorrenti  
Università di Roma "La Sapienza", Italy

**Environmental risk in transportation of dangerous goods**

Roberto Lisi, Maria Francesca Milazzo, Giuseppe Maschio  
Dipartimento di Chimica Industriale ed Ingegneria dei Materiali, Università di Messina, Italy

**Estimation of Winter Respiration of a Lake with Markov Chain Monte Carlo Method**

O. Malve, P. Laine, G. Haario  
Finnish Environment Institute, Finland

**Wavelet transform as a tool in climate variability studies**

D. Novotna<sup>1</sup>, N. Datsenko<sup>2</sup>, D. Sonechkin<sup>2</sup>

<sup>1</sup>Institute of Atmospheric Physics, Prague, Czech Republic, <sup>2</sup>Hydrometeorological Research Centre of Russia, Moscow, Russia

**Analysis of Particulate Fine Matters in Lombardia Region, Italy: a Geostatistical Approach**

Emilio Porcu, Marco Geraci  
Università di Milano Bicocca, Italy

10:45 - 11:15 a.m. **Coffee break**

**Room A7**

11:15 - 0:45 p.m.

**Linear, Mixed Linear and Dynamic Linear Models in Environmetrics  
Invited Paper Session**

Chair and Organizer: G. Lovison, Dipartimento di Scienze Statistiche e Matematiche, Università di Palermo, Italy

11:15 - 11.45 a.m.

**Linear Modelling of Monthly Temperature Data  
Teresa Alpuim**

University of Lisbon, Portugal

## Friday, June 21

11:45 - 0:15 p.m. **Are car-free days effective? A case study in Palermo using Dynamic Linear Models**  
Gianfranco Lovison, **Daria Mendola**  
Dipartimento di Scienze Statistiche e Matematiche, Università di Palermo, Italy

0:15 - 0:45 p.m. **Kriging and mixed effects models: some connections and a case study on soil degradation**  
**Alessio Pollice**  
Dipartimento di Scienze Statistiche, Università degli Studi di Bari, Italy

### Room A5

11:15 - 0:45 p.m. **Trend Detection in Pollution Data**  
**Contributed Paper Session**  
Chair: P. Vieu, Laboratoire de Statistique et Probabilites, Université "Paul Sabatier", Toulouse, France

11:15 - 11.45 a.m. **Variance reduction for trend analysis of hydrochemical data in brackish waters**  
**Claudia Libiseller**, Anders Nordgaard  
Linköping University, Sweden

11:45 - 0:15 p.m. **Multivariate non-parametric tests of trend when the data are incomplete**  
**Alvo Mayer**, Jincheol Park  
University of Ottawa, Ottawa, Canada

0:15 - 0:45 p.m. **Normalisation of environmental air quality data using spatio-temporal analysis**  
**Renata Romanowicz**, Peter C. Young, Patrick Brown, Peter Diggle  
Lancaster University, UK

0:45 - 2:00 p.m. **Lunch**

### Room A7

2:00 - 3:30 p.m. **Statistical Techniques Applied to Environmental Data**  
**Invited Paper Session**  
Chair and Organizer: Ivana Horova, Masaryk University, Brno, Czech Republic

2:00 - 2:30 p.m. **Modelling Contaminant Age Relationship in Fish Tissue in the Great Lakes**  
**A.H. El-Shaarawi**  
National Water Research Institute and Department of Statistics, University of British Columbia, Canada

2:30 - 3:00 p.m. **Some nonparametric tests in meteorological time series**  
**Jana Jureckova**<sup>1</sup>, Jan Picek<sup>2</sup>  
<sup>1</sup>Charles University in Prague, Czech Republic <sup>2</sup>Technical University in Liberec, Czech Republic

3:00 - 3:30 p.m. **Maximum ozone concentration forecasting by functional nonparametric approaches**  
German Aneiros-Perez<sup>1</sup>, Herve Cardot<sup>1</sup>, Graciela Estevez-Perez<sup>1</sup>, Fredric Ferraty<sup>1</sup>, **Philippe Vieu**<sup>2</sup>  
<sup>1</sup>INRA Toulouse, Biometrie et Intelligence Artificielle, France, <sup>2</sup>Laboratoire de Statistique et Probabilites, Université "Paul Sabatier", Toulouse, France



**Friday, June 21**

**Room A5**

2:00 - 3:30 p.m.

**Statistical Issues in Air Pollution Emissions Inventories**

**Invited Paper Session**

Chair and Organizer: M. Cirillo, Agenzia Nazionale Protezione Ambiente, Italy

2:00 - 2:30 p.m.

**An emission inventory at regional level: results and uncertainties**

**Stefano Caserini**, Anna Fraccaroli, Anna Maria Monguzzi, Marco Moretti,

Angelo Giudici, Cinzia Pastorello

Fondazione Lombardia per l'Ambiente, Italy

2:30 - 3:00 p.m.

**The Need of Statistical Methodological Tools in the Compilation of Air Emission Inventories**

**Riccardo De Lauretis**<sup>1</sup>, Daniela Romano<sup>2</sup>

<sup>1</sup>ANPA (Agenzia Nazionale Protezione Ambiente), Italy, <sup>2</sup>ANPA (Agenzia Nazionale Protezione Ambiente) Consultant, Italy

3:00 - 3:30 p.m.

**Air emission inventories, needs for relevant statistics**

**Jean-Pierre Fontelle**

CITEPA, France

**Room A6**

2:00 - 3:30 p.m.

**Risk assessment and applications**

**Contributed Paper Session**

Chair: A. Lawson, University of Aberdeen, UK

2:00 - 2:30 p.m.

**On the Use of Hierarchical Models in Method Comparison Studies**

**Alessandra R. Brazzale**<sup>1</sup>, Alberto Salvan<sup>2</sup>, Stefano Roletti<sup>3</sup>

<sup>1</sup>Institute for Biomedical Engineering, National Research Council, Padova <sup>2</sup>Laboratory of Environmental Hygiene, Italian National Institute of Health, Rome and Institute for Biomedical Engineering, National Research Council, Padova <sup>3</sup>A.R.P.A. Piemonte, Dipartimento di Ivrea - SETIL workgroup

2:30 - 3:00 p.m.

**Modeling short-term health effects using air quality indices: an application to Bologna data (Italy)**

**Francesca Bruno**, Rossella Miglio

Dipartimento di Scienze Statistiche, Università degli Studi di Bologna, Italy

3:00 - 3:30 p.m.

**Environmental and Accident Risk Connected to Road Tunnel Fires: Experimental and Theoretical Investigation**

B. Fabiano, **F. Currò**, E. Palazzi, R. Pastorino

Dipartimento di Ingegneria Chimica e di Processo, Università di Genova, Italy

3:30 - 4:00 p.m.

**Coffee break**

**Room A7**

4:00 - 6:00 p.m.

**Climate and Statistics**

**Invited Paper Session**

Chair and Organizer: R. Katz, National Center for Atmospheric Research, USA

4:00 - 4:30 p.m.

**Multi-resolution analysis of the temporal evolution of polar stratospheric ozone and the detection of vortex breakpoint**

**Philippe Naveau**, Philippe Keckhut, Alain Hauchecorne, Leah Goldfarb

Institut Pierre Simon Laplace, Service d'Aeronomie, France

## Friday, June 21

- 4:30 - 5:00 p.m.     **Estimating Upper Ocean Currents in the Labrador Sea**  
**Thomas Bengtsson**<sup>1</sup>, Ralph Milliff<sup>2</sup>, Richard Jones<sup>1</sup>  
<sup>1</sup>Geophysical Statistics Project, National Center for Atmospheric Research, USA, <sup>2</sup>Colorado Research Associates, USA
- 5:00 - 5:30 p.m.     **Modelling precipitation at dense networks in large geographical areas**  
**Enrica Bellone**  
National Center for Atmospheric Research (NCAR), USA
- 5:30 - 6:00 p.m.     **Wavelet Analysis of Climate-Related Flood Variability**  
**Brandon Whitcher**<sup>1</sup>, Shaleen Jain<sup>2</sup>  
<sup>1</sup>Geophysical Statistics Project, National Center for Atmospheric Research, USA <sup>2</sup>NOAA-CIRES Climate Diagnostics Center, USA

### Room A5

- 4:00 - 6:00 p.m.     **Ecological and Environmental Quantitative Assessment**  
**Invited Paper Session**  
Chair and Organizer: A.H. El-Shaarawi, National Water Research Inst., Canada

- 4:00 - 4:30 p.m.     **Non Parametric Tests and Confidence Regions for Intrinsic Diversity Profiles of Ecological Populations**  
**Tonio Di Battista**, Stefano A. Gattone  
Università di Chieti, Italy
- 4:30 - 5:00 p.m.     **A Way to Model Periodicity in Environmental Modeling**  
Boyan Dimitrov<sup>1</sup>, **Mohammed A. El-Saidi**<sup>2</sup>, Zohel Khalil<sup>3</sup>  
<sup>1</sup>Kettering University, Michigan, USA, <sup>2</sup>Ferris State University, USA <sup>3</sup>Michigan, USA Concordia University, Canada
- 5:00 - 5:30 p.m.     **Detecting aberrations in waterborne infections surveillance data**  
**Elena N. Naumova**<sup>1</sup>, Ian B. MacNeill<sup>2</sup>  
<sup>1</sup>Tufts University School of Medicine, Boston, MA, USA <sup>2</sup>University of Western Ontario, London, Canada
- 5:30 - 6:00 p.m.     **Two-stage estimation of coverages with second-phase corrections**  
Lorenzo Fattorini, Marzia Marcheselli, **Caterina Pisani**  
Dipartimento di Metodi Quantitativi, Università di Siena, Italy

**Saturday, June 22**

**Room A7**

9:00 - 10:30 a.m.

**Small Area Inference in Environmental Problems**

**Invited Paper Session**

Chair: E. P. Smith, Department of Statistics, Virginia Tech, USA

Organizer: Daniela Cocchi, Dipartimento di Scienze Statistiche, Università di Bologna, Italy

9:00: - 9:30 a.m.

**Small area solutions for the analysis of pollution data**

**D. Cocchi**, E. Fabrizi, C. Trivisano

Dipartimento di Scienze Statistiche, Università di Bologna, Italy

9:30 - 10:00 a.m.

**Weighted jackknife method in small-area estimation with an environmental application**

Shijie Chen, **Partha Lahiri**

University of Nebraska-Lincoln, Lincoln, NE, USA

10:00 - 10:30 a.m.

**Cluster Modelling of Small Area Health Data in Environmental Risk Assessment**

**Andrew Lawson**

University of Aberdeen, U.K.

**Room A5**

9:00 - 10:30 a.m.

**Risk Assessment**

**Invited Paper Session**

Chair and Organizer: Silvia Esterby, Okanagan University College, Canada

9:00: - 9:30 a.m.

**Mortality and air pollution: a dynamic generalized linear modelling approach**

**Monica Chiogna**, Carlo Gaetan

Dipartimento di Scienze Statistiche, Università di Padova, Italy

9:30 - 10:00 a.m.

**Cumulative Risk Assessment Based on Quantitative Responses**

James J. Chen<sup>1</sup>, Yi-Ju Chen<sup>1</sup>, Linda K. Teuschler<sup>2</sup>, Glenn Rice<sup>2</sup>, Karen Hamernik<sup>2</sup>, Alberto Protzel<sup>2</sup>, **Ralph L. Kodell**<sup>1</sup>

<sup>1</sup>USFDA, <sup>2</sup>USEPA

10:00 - 10:30 a.m.

**Estimation of bioavailability of environmental oestrogens in population models**

**Silvia Selinski**

Department of Statistics, University of Dortmund, Germany

**Room A6**

9:00 - 10:30 a.m.

**Chemometrics**

**Contributed Paper Session**

Chair: T. Schopflocher, Chemical Computing Group, Canada (Tentative)

9:00: - 9:30 a.m.

**Structural analysis of effectors of the oncogenic Ras proteins**

**Marcus Brunnert**

Department of Statistics, University of Dortmund, Germany

9:30 - 10:00 a.m.

**Identification of Signal Peptides Using a Hidden Markov Model: its Application to a Lytic Hydrolase of Biotechnological Importance**

Mário Santos<sup>1</sup>, **Lisete Sousa**<sup>2</sup>, Maria Antónia Amaral Turkman<sup>2</sup>, Wolfgang Urfer<sup>3</sup>

<sup>1</sup>Dep of Plant Biology - Lisbon University, Portugal <sup>2</sup>Dep of Statistics and Operation Research - Lisbon University, Portugal <sup>3</sup>Dep of Statistics - Dortmund University, Germany

## Saturday, June 22

- 10:00 - 10:30 a.m. **Added value of a (hierarchical) bootstrap model in environmental standard setting**  
**Frederik A.M. Verdonck**<sup>1</sup>, Olivier Thas<sup>1</sup>, Joanna Jaworska<sup>2</sup>, Peter A. Vanrolleghem<sup>1</sup>  
<sup>1</sup>Department of Applied Mathematics, Biometrics and Process Control (BIOMATH), Ghent University, Belgium <sup>2</sup>Procter & Gamble, ETC

10:30 - 11:00 a.m. **Coffee break**

### Room A7

11:00 - 1:00 p.m. **Spatial and Temporal Modelling of Environmental Processes**

**Invited Paper Session**

Chair and Organizer: A.H. El-Shaarawi, National Water Research Inst., Canada

11:00 - 11:30 a.m. **Statistical Experiences: Estimating Bioavailability & Toxicity of Metals to Plants**

**Ray Correll**, Daryl Stevens, Mary Barnet, Mike Mc Laughlin

CSIRO, Australia

11:30 - 0:00 p.m. **Ecosystem Management via Interacting Models of Political and Ecological Processes**

**Timothy C. Haas**

School of Business Administration, University of Wisconsin at Milwaukee, USA

0:00 - 0:30 p.m. **Density Estimate and its Application to Analysis of Temperature Series**

**Ivana Horova**, Jiri Zelinka, Rudolf Brazdil, Marie Budikova

Masaryk University, Brno, Czech Republic

0:30 - 1:00 p.m. **Statistical Issues for Geostatistical Modeling of Soil Moisture**

**Stephen L. Rathbun**, Henry Lin

The Pennsylvania State University, USA

### Room A5

11:00 - 1:00 p.m. **Environmental Issues and Public Decision**

**Contributed Paper Session**

Chair: J. Jureckova, Charles University in Prague, Czech Republic

11:00 - 11:30 a.m. **Peoples' willingness to pay for environmental conservation in Tabriz, Iran: a preview of social and economic determinants**

**Ali Mohammad Khorshiddoust**

Physical Geography Department, Faculty of Humanities and Social Sciences, Tabriz University, Iran

11:30 - 0:00 p.m. **Mineral development and Quality of Life in Goa: A Indian Scenario**

Maria Ligia Norohna, **K. Nairy**

Tata Energy Research Institute, Goa, India

0:00 - 0:30 p.m. **Statistical - Means for Evaluating on Decision Support Systems**

**Kosta Sotiroski**

Faculty of Economy - Prilep, FYROM, Greece

0:30 - 1:00 p.m. **Effect of Environmental Regulation on Capital Markets: Some Evidence from the Indian Automobile Industry**

**Sreekanth Venkataraman**, Saumitra Bhaduri

Tata Energy Research Institute, Goa, India

**Saturday, June 22**

**Room A6**

11:00 - 1:00 p.m.    **Advanced Statistical methods for environmental problems**  
**Contributed Paper Session**  
Chair: L. Fattorini, Dipartimento di Metodi Quantitativi, Università di Siena, Italy

11:00 - 11:30 a.m.    **Nonparametric statistics for deterministic dynamical models**  
**Salim Lardjane**  
Université De Bretagne-Sud, Applied Statistics Laboratory, France

11:30 - 0:00 p.m.    **Environmental modeling using GLM - possibilities and limits**  
**Jaroslav Michálek**  
Department of Applied Mathematics, MU Brno, Czech Republic

0:00 - 0:30 p.m.    **The Advanced-Maximum-Linkage-Clustering-Approach and its application to aerial photographs and erosion data**  
**Lars Tschiersch, Matthias Zerbst**  
Department of Statistics, University of Dortmund, Germany

0:30 - 1:00 p.m.    **A clustering judging criterion and its application to aerial photographs**  
**Matthias Zerbst, Lars Tschiersch**  
Department of Statistics, University of Dortmund, Germany