**Dr Maria Tattaris**

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Key Skills

• Image processing and spectral analysis

• GIS applications

• Strong mathematical and problem-solving abilities.

• Using mathematical theory for applied sciences, e.g. environmental.

• Programming in IDL, ENVI.

• Accomplished written and verbal communications, including documentation and report writing.

• Strong editing skills, including academic papers, reports, educational documents etc.

**Career History**

***Food and Agriculture Organisation of the United Nations (FAO)* August 2021– December 2022**

**Remote Sensing Expert**

* Retrieval and analysis of key atmospheric pollution species using satellite data.
* Preparing the methodological approach to analyse the spatiotemporal dynamics of air pollution and delineation of hotspots, considering available global, regional, national and local data, for monitoring spatiotemporal dynamics of different sectors and the corresponding pollution constituents to air pollution.
* Assess the contribution from the different species (NO2, SO2, aerosols etc.) to air pollution with comparisons of sectoral air pollutant emissions (power, industry, transport, and crop residue burning).
* Statistical analysis to determine relationships between pollution indicators (e.g., NO2, SO2, aerosols etc.) and potential sources (e.g., biomass burning, industrial activity etc.).
* Delineate hotspots of air pollution considering seasonal variation for different indicators (e.g., vulnerability) by integrating remote sensing and available field, global, regional and national data.
* GIS analysis for emergency response, e.g., flood mapping, changes in coastline, and agricultural areas affected following a tsunami.
* Mapping of potential air pollution trajectories via trajectory modelling.
* Integration and analysis of multiple data types (satellite, climatic, ground-based pollution monitoring, quantitative fieldwork, national datasets).
* Completion of reports, executive summaries, concept notes for different audiences.
* Presentations of remote sensing and GIS analysis to colleagues, technical staff and government officials.
* Liaising with colleagues across the globe.
* Provide technical guidance for national consultant to collect data from national organizations/ partners.

***Freelance Editor and Data Scientist* January 2016 – Present**

* GIS and remote sensing projects
* Editing academic and non-academic text
* Academic report writing.

***International Maize and Wheat Improvement Centre (CIMMYT)***

Remote Sensing Associate Scientist January 2014 – November 2015

Remote Sensing Post-Doctoral Scientist January 2012 – January 2014

* In-charge of airborne remote sensing platform for phenotyping within wheat physiology group.
* Data collection in field: UAV thermal/RGB/multispectral imagery, helium blimp and proximal sensors.
* Working with high-resolution satellite imagery and hyperspectral, multispectral and thermal UAV imagery.
* Pre-processing: Image correction and calibration, geo-referencing, creating mosaics.
* Extraction of individual experimental plots from imagery.
* Working with 3D-point clouds derived from RGB images to extract height of the plots.
* Derivation of standard spectral indices and investigation of new indices via mathematical methods.
* Linking spectral indices to physiological and agronomical parameters and
* Data analysis, interpretation and writing up.

*Kings College London*

Teaching Assistant Academic Year 2010-2011

* Statistical packages for first year BSc Geography students.
* Computational GIS systems for MSc Environmental, Monitoring and Modelling students.
* Assisting with class and coursework.

*Kings College London*

PhD Researcher September 2007 - November 2011

* Field campaigns in Kruger National Park, South Africa, Arhnem Land, Northern Australia and Dartmoor, Uk.
* Use of proximal remote sensing equipment e.g. Differential Optical Absorption Spectrometer and other instruments (weather meters, GPS) to collect data.
* Analysis of UV and IR spectral data to estimate trace gas fluxes and emissions from biomass burning.
* Inverse and forward modelling.
* Pre-processing of hyperspectral satellite imagery and deriving FRP (Fire Radiative Power) from active fires.
* Accustomed to multitasking and working within short time frames.

*Bank of America*

Internship, Operations Department Summer 2006

* Overseeing and confirmation of trades from front office. Inputting and error checking of transactions.

**Educational History**

***Kings College London***

**PhD Atmospheric Science September 2007 – November 2011**

* Quantifying gaseous emissions from vegetation fires using ground-based spectroscopic measurements

***Kings College London***

**MSc Mathematics (Distinction) 2006-2007**

* Fourier Analysis, Stochastic Analysis, Manifolds, Applied Probability and Stochastics, Financial Markets, Numerical and Computational Methods in Finance.

***University College London (UCL)***

**BSc (Hons) Mathematics with Economics (2:1) 2003-2006**

**Publication List**

* Tattaris, M. (2013). Investigating methods used to quantify gaseous emissions from vegetation fires using spectroscopic measurements. Doctoral dissertation, King's College London, University of London.
* Tattaris M., Reynolds M., Pietragalla J., Molero G., Cossani M. C., Ellis M. (2014). Airborne remote sensing for high throughput phenotyping of wheat,” in Proceedings of the Workshop on UAV-Based Remote Sensing Methods for Monitoring Vegetation Cologne: 125–136.
* Tattaris, M., Reynolds, M.R., Molero, G., Cossani, M.C. and Ellis, M. High throughput phenotyping at MEXPLAT: A comparison of proximal and remote sensing approaches. Proceedings of the 4th International Workshop of the Wheat Yield Consortium, CENEB, CIMMYT, Cd. Obregon, Sonora, Mexico, 24-25th March, 2014.
* Tattaris, M. and Reynolds, M.R. Applications of an Aerial Remote Sensing Platform, Proceedings of the 5th International TRIGO (Wheat) Yield Potential Workshop 2015, CENEB, CIMMYT, Cd. Obregon, Sonora, Mexico, 24-26th March, 2015.
* Tattaris, M., Reynolds, M.P. and Chapman, S.C. (2016) A Direct Comparison of Remote Sensing Approaches for High-Throughput Phenotyping in Plant Breeding, Frontiers in Plant Science, 7, 1131, DOI=10.3389/fpls.2016.01131.
* Smith, T. E. L., Wooster, M. J., Tattaris, M., and Griffith, D. W. T. (2011) Absolute accuracy and sensitivity analysis of OP-FTIR retrievals of CO2, CH4 and CO over concentrations representative of "clean air" and "polluted plumes", Atmos. Meas. Tech., 4, 97-116, https://doi.org/10.5194/amt-4-97.
* Meyer, C. P., G. D. Cook, F. Reisen, T. E. L. Smith, M. Tattaris, J. Russell‐Smith, S. W. Maier, C. P. Yates, and Wooster, M. J. (2012), Direct measurements of the seasonality of emission factors from savanna fires in northern Australia, J. Geophys. Res., 117, D20305, doi: 10.1029/2012JD017671.
* Reynolds, M., Tattaris, M., Cossani, M.C., Ellis, M., Yamaguchi-Shinozaki, K. and Saint Pierre. (2015) Exploring Genetic Resources to Increase Adaptation of Wheat to Climate Change. Advances in Wheat Genetics: From Genome to Field. 355-368. 10.1007/978-4-431-55675-6\_41.
* Reynolds, M., Molero, G. , Tattaris, M., Cossani, C.M., Alderman, P. and Sukumaran, S. (2015) Improving Crop Adaptation to Climate Change through Strategic Crossing of Stress Adaptive Traits, Procedia
* Environmental Sciences, 29, 298-299, https://doi.org/10.1016/j.proenv.2015.07.272.
* Crossa, J., Jarquin, D., Franco, J., Pérez-Rodríguez, P., Burgueño, J., Saint-Pierre, C., Vikram, P., Sansaloni, C., Petroli, C., Akdemir, D., Sneller, C., Reynolds, M., Tattaris, M., Payne, T., Guzman, C., Peña, R.J., Wenzl, P. and Singh, S. (2016) Genomic Prediction of Gene Bank Wheat Landraces G3 (Bethesda), 6(7):1819-34. doi: 10.1534/g3.116.029637