James Sweeney

Statistics

University of Limerick

Associate Professor in Dept of Mathematics & Statistics

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Expertise

- Spatio-temporal statistical modelling
- Statistical models for disease spread
- Design of experiments in field trials and animal studies
- Bayesian statistics
- Applied statistical modelling including non-parametric modelling

Research focus in VistaMilk

Contribute to development of spatial statistical models for geo-referenced data including soil, water, fertiliser. Disease modelling, particularly the spread of bovine tuberculosis amongst cattle herds

Research outcomes

- Lead investigator on SFI Challenges project GREEN-GRID. The project is focused on the development of spatio-temporal maps for wind and solar resources nationwide with a view to expediting the move to 100% electricity generation from renewables
- Lead investigator on SFI New Frontiers project 3-EX. The project is focused on the development of the next generation of respiratory disease spread models to ensure preparedness for future pandemics
- Contributor to World Health Organisation (WHO) proof-of-concept project on COVID-19 integrated epidemiological-economic modelling.

Lennon Ó Náraigh

Mathematical Modelling

University College Dublin

Associate Professor, School of Mathematics and Statistics

E-mail: onaraigh@maths.ucd.ie

Phone: +353 (0)1 716 2546

Expertise

- Mathematical modelling
- Fluid mechanics
- Multiphase flow
- Computational fluid dynamics
- Industrial drying

Research focus in VistaMilk

Develop mathematical models of water flow in soil at the pore scale, paddock scale, and catchment scale, to interface with the VistaMilk grass growth model. Also interested in applying mathematical modelling to industrial problem statements

Research outcomes

- Developed a mathematical model
- Developed an open-source multiphase flow model for simulating fluid, simulations run on 1000s computer processing units on Irish and UK national supercomputers, leading to highly-cited works in Journal of Fluid Mechanics
- OpenFOAM modelling of multiphase flow on a consultancy basis
- With a commercial collaborator, developed a mathematical theory for optimal control of an industrial disc drier

Karen Daly

Soil Science

Teagasc

Senior Research Officer

E-mail: karen.daly@teagasc.ie

Phone: +353 (0)53 917 1283

Expertise

- Developing indicators of soil health
- Spectroscopy
- Chemometrics
- Mitigation measures for water quality at farm and catchment scale
- Soil carbon sequestration

Research focus in VistaMilk

Develop strategies to improve soil health to increase soil carbon sequestration, increase soil biodiversity levels, protect water quality, increase nutrient use efficiency and grass growth, develop proximal sensing for soil data and upscaling models

Research outcomes

- Developed an Invention Disclosure Form and commercialisation plan for licensing soil spectral libraries for rapid analysis of 11 soil attributes using infrared spectroscopy
- Fund awarded for market analysis and customer discovery

Sara Vero

Soil

South East Technological University

Assistant Lecturer

E-mail: Sara.Vero@setu.ie

Expertise

- Nitrate time lags
- Soil physics
- Catchment management
- Field-based research
- Nutrient transport and availability

Research focus in VistaMilk

Estimating spreading opportunities for slurry and soiled water based on soil moisture deficit. Maximising draw-down of soil phosphorus from Index 4 to optimal levels. Planning to increase grazing efficiency

Research outcomes

- Estimate of slurry spreading windows based on soil moisture deficit across drainage classes for 14 locations.
- Ongoing supervision of PhD student research including pot trial on Phosphorus drawdown from high index soils and runoff experiment investigating different flow generation mechanisms
- Establishment of soil physics facilities at South East Technological University

William Burchill

Sustainable Agriculture

University College Cork

FBD Lecturer in Sustainable Agriculture

E-mail: WBurchill@ucc.ie

Expertise

- Nitrogen use efficiency
- Biological nitrogen fixation
- Nitrous oxide emissions
- Manure management
- Ammonia emissions

Research focus in VistaMilk

Quantifying strategies to reduce greenhouse gas and ammonia emissions from the manure management chain within Irish pasture based systems. Identifying alternative drought tolerance forage legume to develop more sustainable and resilient swards for Irish pasture based systems

Research outcomes

- Development of the marginal abatement cost curve for ammonia emissions from Irish agriculture
- Contributed to the revised Teagasc Greenbook - a guide for nutrient management planning in Ireland
- Developed a nitrogen use efficiency calculator which has been incorporated into Pasturebase Ireland
- Research has led to the refinement of Ireland's national ammonia emissions reporting to the EU