Title	A decision tool for predicting N_2O emissions and targeting mitigation (N_2O Switch)
Project Timeframe	Jul 2017 – Sep 2020
Countries Involved	New Zealand (Lincoln University) Germany (Karlsruhe Institute of Technology, Institute of Meteorology and Climate Research Atmospheric Environmental Research)
Aim	To generate soil redox, soil oxygen concentrations, and N_2O production pathway data that will demonstrate the potential for using relative soil diffusivity (Dp/Do) as a tool for predicting soil environmental conditional that favour specific N_2O emission pathways.
Research Highlights	• Reliable and accurate site preference values for N_2O are more exacting to establish than previously considered, confirming that the soil diffusivity (Dp/Do) values explain well the dynamics in N_2O site preference. • Karlsruhe Institute of Technology (KIT) performed an advanced experiment, correcting for interferences and low N_2O concentrations, examining nitrification inhibition effects. • Found that N_2O produced during nitrification was negligible compared to that produced during denitrification. • Enhanced collaboration on grassland nitrogen cycling saw collaboration on a manuscript and attempts made to explore existing data from new angles. • Collaboration with KIT and the Institute of Meteorology and Climate Research Atmospheric Environmental Research in Germany.
Future Work	Sophisticated instrumental set ups are required to measure site preference, in order to better understand the mechanisms generating N_2O evolving from grazed pasture systems.
Key Research Output(s)	Journal article(s) Clough, T.J., Cardenas, L.M., Friedl, J., Wolf, B. (2020) Nitrous oxide emissions from ruminant urine: science and mitigation for intensively managed perennial pastures. *Current Opinion in Environmental Sustainability*, 47:21-27.