Sustainable Land Management and Climate Change (SLMACC) Research Fund

2014/15 Projects

These projects are currently at the contracting stage so are yet to commence.

Project Number	Project Title	Executive Summary	Topic
408660	Known-unknowns and transformational change in the pastoral sector	The recent IPCC AR5 report did not identify any key risks of climate change for New Zealand agriculture; however, it also made clear that there were several 'known unknown' impacts – e.g. on animal health, pasture weeds and pests – that had not been factored into assessments and might prove, cumulatively, to present a larger range of risk than currently projected. Here we use a farm model to integrate for the first time the potential impacts of known unknown factors and use new climate projections, including an extreme drought scenario, to explore a fuller range of potential risk for a pastoral system. In addition, the approach allows us to consider whether the current approach to adaptation that emphasises managing risks arising from current variability may allow land managers to 'cope' but may also conceal the necessity to take transformational decisions.	**1**
408657	Impacts of climate change on river flows for agricultural use	This research will develop models to explain the likely effect on water resources of projected climate change impacts as contained in the IPCC fifth assessment (IPCC5). It will build on modelling work already done in previous national water accounts (at regional and annual scales) to provide a broad range of national-scale information about the vulnerability of New Zealand's primary sector to water resource impacts of climate change using ensemble predictions of six regional climate models (RCMs) and four Representative Concentration Pathways (RCPs) over the next 100 years, based on IPCC5. Such work is vital as the effect of recently updated changes in climate on water resources have not explicitly been studied before for New Zealand.	**2**
408661	Sensitivity of carbon footprint of milk to greenhouse gas-specific metrics	A wide range of New Zealand (NZ) and overseas dairy farm system data-sets will be used for Life Cycle Assessment of total greenhouse gas (GHG) emissions resulting from milk production. It will include new data for average NZ farms in dairy systems 1-5 covering increasing use of supplementary feeds, as well as multiple data-sets from recent research covering dairy intensification options, and alternative management and mitigation practices. Estimates of total methane, nitrous oxide and carbon dioxide emissions from these data-sets will be used in a sensitivity analysis of the effects on estimation of total GHG emissions from using a range of metric values including Global Warming Potential, Global Temperature change Potential and Climate-Change Impact Potential factors over various time horizons. Findings will be published in a scientific paper and will provide increased understanding of the implications of the choice of GHG metrics on total GHG emissions for future dairy systems.	**3**

408658	Use of modern technology including LiDAR to update the New Zealand Land Resource Inventory	We will carry out a pilot study of part of Northland, over an area of approximately 100km^2, to update the New Zealand Land Resource Inventory (NZLRI) and associated land use capability (LUC) classification. The study will be underpinned by a high resolution LiDAR-based digital elevation model (DEM), and use other relevant medium to high resolution data sources (e.g. Land Cover Database, radiometrics), legacy datasets at various scales (e.g. NZLRI and farm plans), LUC knowledge (e.g. regional and national LUC legends) along with targeted field work. The individual inventory layers will be prepared and combined to create an updated LRI/LUC. This pilot project has a particular focus on forestry land use applications, but resource mapping and assessment techniques developed in this pilot will be applicable throughout the Northland Region and New Zealand to resolve a wide range of resource management issues that rely on accurate information about the land.	**4**
408654	Water and climate: Benefiting from synergies and avoiding conflict	How far might Freshwater reforms go toward reducing greenhouse gas (GHG) emissions in New Zealand in both absolute terms and relative to food production? How can we ensure that this potential policy complementarity is realised and any negative interactions minimised? This project will strengthen our understanding of farm-scale interactions between nutrients and GHGs at the farm scale for actual farmers, and strengthen integrated modelling capability at catchment and national scales. It will update underlying datasets and evidence, validate models against external data and improve their parameterisation and structure, and integrate the strongest components of different models. For the first time, the project will provide a national-level assessment of the scale and drivers of potential policy complementarities and risks, using plausible sets of nutrient limits across New Zealand's heterogeneous catchments and regions. We will identify key considerations that farmers and regulators should be aware of when trying to maximise complementarity.	**5***
408659	Climate mitigation co-benefits arising from the Freshwater Reforms	The National Policy Statement for Freshwater Management directs regional councils to develop regional plans for improved freshwater quality. In some catchments and for some enterprises, decreases in nutrient and/or sediment losses to water will be required. As well as improved water quality from these changes, there may be co-benefits for GHG emissions from changed farming practices that target reductions in nutrient/sediment losses. This project aims to assess whether there are co-benefits or additional risks for GHG emissions arising from these freshwater reforms. It will provide information to MPI and other stakeholders (such as the primary sector industries) on the size of the benefit (or cost) and how that might be realised, identify situations where emissions may increase in response to water limits, and where actions may need to be taken to reduce any increase in emissions that may arise from the Freshwater Reforms.	**5***
*	*It has been agreed that the two projects addressing Topic 5 will be delivered as a joint project.*		