2017-18 Sustainable Land Management and Climate Change Research Programme – Funded Projects

Project Number	Priority	Title	Applicant Group Name	Project Summary	Total
Theme 1: Impact of climate change & adaption					
405421	1.1	Analysis of potential climate change impacts on horticulture's spatial footprint	The New Zealand Institute for Plant & Food Research Limited	We will estimate potential impacts of climate change on the spatial footprint of NZ horticulture under a range of climate-change scenarios. The focus will be primarily, but not exclusively, on NZ's three major horticultural export industries: viticulture, kiwifruit, and apples. Simulated weather data downscaled to a 5 km spatial grid across NZ will be used to predict how changing climate will affect the potential for production in different areas, with soil and topographical data used to rule out unsuitable areas. For each crop, some growing areas may become less suitable with climate change, but new opportunities may arise elsewhere. The results will be integrated into an existing model of Land Use in Rural New Zealand (LURNZ) so the effects of changing climatic suitability can be assessed in the context of other socioeconomic drivers of land-use change. Projections will aid strategic planning and risk assessments for our policy-makers and horticultural industries.	**$ 450,000**
Theme 1 Total					**$ 450,000**
Theme 2: Mitigation of agricultural and forestry GHG emissions					
405416	2.1	The economics and carbon impacts of transitioning clear fell planted forests to permanent cover forests on severely erosion prone steep lands	New Zealand Forest Research Institute Ltd	We will investigate economics of transitioning clear-fell planted forests to permanent cover forests on severely erosion prone steep lands. Doing this will further protect soils and receiving environments from erosion impacts and maintain or build forest carbon stocks as a contribution to New Zealand's 2030 climate change commitments. There is no knowledge on how to transition from current radiata clear-fell regimes or what economic or carbon effects there may be. We will evaluate possible transition paths to a permanent cover forest using an adaptive forest management framework, building on national and international experience. We will evaluate the economics of these paths and compare against the current practise baseline. This will result in a suite of new options for steepland forests to be considered by investors and policy makers to help grow the economy and meet our climate commitments through maintaining our forest based carbon stocks or establishing new long-term carbon forests.	**$449,672**

Project Number	Priority	Title	Applicant Group Name	Project Summary	Total
405423	2.1	Testing the New Zealand ETS to facilitate native forest regeneration on Māori land	Motu Economic and Public Policy Research Trust	Converting some Māori land to native forest carbon farming offers financial benefits and environmental and cultural co-benefits for Māori landowners and carbon emitters alike. This projects seeks to: • investigate how Māori groups have engaged with native forest regeneration as part of the Emissions Trading Scheme (ETS) to date; • work with stakeholders to help generate a variety of effective tailored contractual agreements and processes; and • evaluate current/future engagements between NZ unit purchasers and Māori groups as they evolve and generate different outcomes, including the role of contracts and processes. This research will identify the strengths and weaknesses of different arrangements for native reforestation and assess the outcomes. The project involves deep case study analysis, economic analysis, and the tracking of engagement among parties using quasi-experimental qualitative methods.	**$373,850**
405417	2.2	Growing diversity: Improving growth models for less common species and forest types for ETS carbon look-up tables	New Zealand Forest Research Institute Ltd	Several exotic and indigenous forest species, other than radiata pine and Douglas-fir, are highly suitable for offsetting greenhouse gas emissions. However, predictions on their performance of less common species and their carbon sequestration potential throughout the country are uncertain. Gathering the best available data to improve or create statistical models for less common species would provide certainty to growers, investors, and Government on the accuracy of carbon storage for the less common species. Scion and Landcare Research will work together to combine the best available data resources to improve current look-up tables for less common exotic and indigenous forest species. Advanced data mining and machine learning techniques will be employed to assess data resources to build more accurate growth models and the statistical approach will be complemented with process-based models and physiological measurements. Results will provide spatial surfaces and/or look-up tables of growth and productivity for each targeted species/forest type.	**$450,000**

Project Number	Priority	Title	Applicant Group Name	Project Summary	Total
405415	2.3	Best Options for Land Use Following Radiata Harvesting in the Gisborne District	Landcare Research New Zealand Ltd	A significant proportion of the exotic forest estate established since Cyclone Bola in 1988 is planted on highly erosion-prone landscapes and is now of harvestable age. Subsequent storms have confirmed that parts of these forests remain highly erodible, as evidenced during storms as recent as 2015. Societal concerns about the impacts that forest harvesting is having on ecosystems (e.g. water quality) and infrastructure downstream of forests appear to be increasing. Climate change is projected to increase the frequency and intensity of storm events. The vulnerability to future storm events is forcing a rethink of the most appropriate long-term use for the most at-risk parts of the East Coast forest estate. We will assess the potential impacts associated with land-use change from *Pinus radiata* plantations to natural regeneration or mānuka plantations against the status quo of production forestry.	**$450,000**
405422	2.4	Evaluation of profitability and future potential for low emission productive uses of land that is currently used for livestock	The New Zealand Institute for Plant & Food Research Limited	New Zealand's climate change target is to reduce greenhouse gas (GHG) emissions by 30% below 2005 levels by 2030. This cannot be achieved without changing current livestock-dominated land use - even if all possible mitigation strategies for reducing enteric methane emissions were implemented. More diversified land use will enable New Zealand to meet its agricultural emission targets, whilst offering additional economic, social and environmental benefits. We will evaluate profitability, suitability and future potential of crops with low absolute GHG emissions for land currently used for livestock production. To identify land-use alternatives, we will consider economic factors, in particular export market and profitability, and screenpotential crops with low absolute GHG emissions that may be profitable. Of these, we will identify the crops best suited to our climate and soil resources, and assess the GHG profile of each potential crop. This will aid the strategic planning of land use diversification	**$450,000**
Theme 2 Total					**$2,173,522**
Theme 3: Cross-cutting issues including economic and social impact					

Project Number	Priority	Title	Applicant Group Name	Project Summary	Total
405419	3.1	Integrating extension and land management networks with enabling policy environments to support action to mitigate and adapt to climate change at a catchment scale	New Zealand Forest Research Institute Ltd	This research programme will demonstrate how effective engagement of Regional Councils, Iwi, extension networks and other bodies in addressing the challenge of climate change mitigation and adaptation and addressing adverse events such as the Edgecumbe floods at a catchment scale, may only be enhanced and accelerated through the co-development of tools and frameworks that reflect the priorities and aspirations of end users. New approaches will be developed in which coordinated action reflects jointly negotiated action. The identification and empowerment of community influence that combines networks, governance and science is essential in demonstrating delivering of change on the ground.	**$434,885**
405413	3.2	Energy efficiency of New Zealand livestock agrifood products through their life cycle to overseas markets and implications of energy and carbon costs	AgResearch Limited	This project will focus on the energy use efficiency of New Zealand (NZ) dairy, beef and sheep meat products exported to NZs main overseas markets. It will commence with a survey of energy use on dairy farms to provide recent and more accurate data. A review will be carried out of energy use through all life cycle stages of agrifood products, including production of inputs and retail/consumer stages. Detailed life cycle estimates will then be made of the energy use and related greenhouse gas emissions for average NZ dairy, beef and sheep meat products to China, USA and UK markets, respectively. This will be compared with energy use for the same products produced within those market countries, using established links with researchers in those three countries. Finally, the implications of changes in energy price and carbon costs on economics and trade of these exported agrifood products will be assessed.	**$297,894**
Grand Total					**$3,356,301**