



## Subsurface Processes in Braided Rivers

Lincoln Agritech is undertaking research which will enable water resources to be managed to meet national freshwater quality standards. Regional councils currently set water limits and identify management plans for braided rivers with only rough estimates of how much water is lost as rivers traverse their alluvial plains. The impact of river management on groundwater recharge and river flow during dry periods is also unknown.

Our research will deliver new knowledge on how braided rivers work in the subsurface. Models will be used to estimate water loss from any part of any braided river and to quantify the environmental and economic benefits of different river management strategies. Our study sites include the Selwyn/Waikirikiri River in Canterbury, Wairau River in Marlborough and Ngaruroro River in Hawke's Bay.

The team are using novel approaches to characterise river losses, hyporheic exchange

and parafluvial flow. Techniques include: subsurface fibre optics for distributed temperature sensing, multiple geophysical techniques to measure ground resistivity, river bathymetry, thermal imagery, radon emanation and water concentrations, groundwater temperature modelling and advanced 3D hydrological modelling.

The research will provide the first accurate information about how much water is lost from braided rivers into groundwater. This five-year research programme is funded by the Ministry of Business, Innovation and Employment (MBIE) with co-funding from Marlborough District Council, Hawke's Bay Regional Council and Environment Canterbury. The research partners include NIWA, Lincoln University, Canterbury University, Flinders University, Technische Universität Dresden, Aarhus University, and Ngāti Kahungunu.