

ISSUE

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Smarter
Targeting of
Erosion Control

STECNews

New PhD
studies at
Massey
University

Raphael
Spiekermann

Thomas Smith

Forrest Williams

And more to come



this issue

Welcome **P.1**

Progress **P.2**

Outputs **P.3**

Coming up **P.4**

Welcome

We hope to produce a news letter at least annually and perhaps more frequently depending on interest and available resources.

Many of you will know that our 5-year MBIE research programme kicked off in October 2018 and after 8 months we are in a position to report our progress to date.

Programme Outline

To meet national freshwater objectives for catchment management, regional councils and land managers need higher-resolution data on catchment erosion and sediment delivery to streams, and new tools and models that provide information at appropriate scales. These are essential for efficient and cost-effective erosion and sediment mitigation, and will also assist planning for predicted increased storminess as a result of climate change.

The NZ landscape is characterised by a complex array of erosion processes with high spatial and temporal variability, which provides a challenging environment for process-based erosion and sediment science and modelling. Our research will address global research questions and put NZ at the forefront of international research by significantly improving understanding of:

- spatial and temporal patterns of erosion
- sediment-related water quality
- sediment mitigation performance
- model refinement (e.g. from average annual to storm-event scale)
- the economic analysis of erosion and sediment mitigation.

Research design

Research Area 1 – Measurement

Spatial and temporal patterns of sediment generation and sediment quality characterization

Research Area 2 – Mitigation

Improved understanding of soil erosion mitigation performance for better farm and catchment management

Research Area 3 – Modelling

From average annual to event scale and beyond sediment load to sediment quality

Research Area 4 – Economic Impact

The economic impact of erosion and the benefit-cost of mitigation

Progress update

Much of the early phase (first 6-9 months) involved:

- bringing the research team together with stakeholders for a research planning meeting in Palmerston North 26-27 November 2018.
- dealing with sub-contracting and work schedules
- beginning more detailed research planning within and across research areas
- linking with stakeholders and partners to determine locally-relevant aspects of research
- defining PhD projects
- choosing study sites and beginning data collection.

Several aspects of research have also been presented at conferences, stakeholder workshops and seminars.

Highlights

- commenced erosion source sampling in Manawatu catchment
- developing agreed sampling protocols with NIWA and Horizons Regional Council for sediment sampling in the Manawatu.
- presenting posters at the European Geoscience Union meeting in Vienna
- completed an initial analysis of a 120 km² area impacted by the 'Blue Duck' storm in March 2018 in the Whanganui catchment comprising automated before/after landslide mapping and quantitative spatial analysis of landslide presence/absence in combination with available rainfall, terrain and land cover spatial information
- sampling of channel banks along the Oreti River to test if bank erosion sources can be spatially discriminated using downstream variations in floodplain geochemistry
- key Horizon's sediment and SoE (water quality) sites within the Manawatu Catchment instrumented with acoustic sensors to augment existing turbidity sensors (run by HRC). Auto-samplers are being reinstated to obtain stormflow water samples for analysis of suspended sediment concentration and sediment properties
- facilitated two CHI (cultural health index) monitoring wānanga with Rangitāne iwi at Te Ahū a Tūranga Marae in Woodville to align with the Tu Te Manawa project; a collaborative effort that aims to re-connect eight Manawatū River hapū with their awa and its restoration
- held a programme launch and planning workshop attended by partners and supporters
- 2 interviews on national radio

Selected outputs 'connected' to STEC

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- Vale SS, Dymond JR (In Press). Interpreting nested storm event suspended sediment-discharge hysteresis relationships at large catchment



Working with local iwi groups in the Manawatū River



STEC is a collaborative research programme led by Manaaki Whenua Landcare Research and includes researchers from NIWA, Massey University, Waikato University and international collaborators from KU Leuvin, IRSTEA, University of Salzburg, HAFL Switzerland. Our partners include Whanganui iwi (Tamaūpoko Community Group) and Rangitāne o Manawatū.

We are supported by Northland, Waikato, Horizons, Hawke's Bay, Auckland Council, Environment Southland, Ministry for the Environment, Ministry for Primary Industry, Our Land & Water National Science Challenge, and Federated Farmers.

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Upcoming Events

- **STEC Programme meeting March 2020 – date to be advised**
- **NZ Hydrological Society Conference 3-6 December 2019, Rotorua**
- **NZ Association of Resource Management Conference 16-18 October 2019, Northland**
- **NZ Freshwater Sciences Society Conference, 1-4 December, Geelong, Australia**
- **SBEE 2020 – 5th International conference on soil, bio- and eco-engineering 13-19 June 2020, Bern, Switzerland**