

## Interested in pursuing an ME in 2012?

The Hydrological and Ecological Engineering research group in the Department of Civil and Natural Resources Engineering is seeking a highly motivated and competent student interested in pursuing a Masters of Engineering degree in 2012 on the following project:

### “GIS modelling of contaminant loadings to urban streams”

Stormwater from urban catchments in Christchurch contains considerable amounts of contaminants such as heavy metals and various suspended solids that impact our urban waterways. The three most common metal contaminants impacting urban waterways in Christchurch and around New Zealand are zinc, copper, and lead. Sources of heavy metal contaminants have been identified from car traffic in parking lots/roads and metal roofs. In order to improve stream health, a tool is needed to predict contaminant loads from surfaces in urban catchments.

The focus of this ME project is the development of a new innovative model that will help inform regulators and operators of the optimum stormwater management criteria to be applied in urban contexts fulfilling best practice solutions. The GIS-based model will relate contaminant build-up and wash-off information to different types and areas of urban surfaces (such as roofs, carparks, roads) in a given catchment (e.g Okeover and Avon catchments). Predictions of contaminant loadings to urban streams will be determined for a given rain event following a certain number of antecedent dry days. The loadings on urban surfaces can be derived from recent experimental data and will be complemented by literature values. Results of ongoing experiments can later be used to update the literature values with more precise data specifically valid for Christchurch conditions. The use of water quality and quantity data gathered real-time by an innovative wireless sensor network system operating on campus will help to validate model outcomes. Furthermore, model predictions can be compared to results of samples taken during certain storm events and analysed for heavy metals by the new on-campus ICP-MS instrument.

The model should be flexible enough to allow for the integration of ecological engineering solutions (i.e. sustainable drainage systems - SUDS) such as the use of vegetation to control contaminant transport and the placement of alternative (ecologically integrated) treatment devices (raingardens, swales, etc.) as part of the treatment train design. We expect that the model will also help in earthquake recovery efforts, including helping determine the ideal placement of stormwater treatment devices for maximising contaminant load treatment and improve the design of replacement urban structures.

For more information contact: Tom Cochrane ([tom.cochrane@canterbury.ac.nz](mailto:tom.cochrane@canterbury.ac.nz)) or Aisling O’Sullivan ([aisling.osullivan@canterbury.ac.nz](mailto:aisling.osullivan@canterbury.ac.nz))

Funding for this project can be available by applying for an ECAN scholarship (10K for 1 year). Applications for this scholarship are restricted to NZ citizens and permanent residents and need to be made directly through the following site by the October 3<sup>rd</sup> deadline:

<http://ecan.govt.nz/about-us/work-for-us/Pages/postgraduate-scholarship.aspx>