IRANZ Connections.
www.iranz.org.nz

Nelson citizens see science, education and industry in action

Several young Nelsonians declared they are now 'hooked on science' after a visit to Cawthron Institute's Glenhaven Aquaculture Centre open day on Sunday 12 February.

Over 500 visitors of all ages and nationalities stepped into a world of suspended animation, cryopreservation, algal towers and the unseen life of shellfish, on tours of the Centre's facilities conducted by Cawthron scientists.

The facility provides a shared space for research, education and learning for Cawthron researchers, visiting scientists and students, the Nelson Marlborough Institute of Technology Aquaculture Diploma, the SPATnz seafood industry consortium, and the larval production facilities for the Institute's Pacific oyster nursery. Visitors heard about research being done by the Cawthron scientists doing the work and, in many cases, saw real research projects in progress.

DR ZOË HILTON WITH SOME YOUNG NELSONIANS AT THE CAWTHRON INSTITUTE OPEN DAY.

Issue 7: APR 2012

The response to the tours was overwhelming and they were fully booked a week before the big day.

"It was thrilling to see the response from our neighbours and friends wanting to learn about our research and gain insight into the work we do to support the New Zealand economy" says Cawthron Chief Executive Gillian Wratt.

Cawthron has been contributing research and development expertise to the aquaculture sector from its Glenhaven base since 1991.
www.cawthron.org.nz

New filters for the gas industry

Filtering tar and debris from gas has just got more efficient thanks to the Titanium Industry Development Association's (TiDA) development of new filters. TiDA designed these filters using Solidworks, a 3-dimensional CAD program, and then built them using a selective laser melting system.

The selective laser melting system uses a high power laser to fuse small particles of metal into a desired 3-dimensional shape. "Compared to current filters being manufactured, these offer a higher flow rate and are significantly smaller," says TiDA CEO Warwick Downing. "They are also very competitively priced and are able to be reused which greatly reduces lifecycle costs."There are two types of filter shown in the image: a cone shaped filter with a hole diametre of 0.5mm and 0.1mm between holes, and a filter with nine layers. In the nine layered filter, every second layer rotates 90 degrees from the one above, and each layer is offset 0.05mm from the previous layer running in the same direction.
www.tida.co.nz

Lincoln Ventures adapts new technology for spray drift research

Lincoln Venture's agrichemical and spray drift analysis capabilities have been advanced by a world-first project. Lincoln Ventures worked alongside the United States based manufacturer of a newly developed portable technology based on light refraction physics to customise it for spray drift field studies.

The new system brings with it a number of advantages to Lincoln Venture's field trial capabilities. Science Group Manager, Dr Andrew Hewitt says "scientific data will now be of a higher quality; with the new system able to provide additional data on the size and velocity of the drifting droplets in complement to the standard flux data from field sprays."

The new system will also reduce sampling time and uncertainty. Most current approaches to field testing of spray drift currently require vertical towers with line collectors and fluorescent dyes, which are time consuming to set up and have to be reset with change in wind direction. This incurs cost, loss of data collection opportunity, as well as inconvenience to all involved including the site owner, spray operator and research team.

Finally, the new technology offers another advantage in its unique ability to ignore readings from solid dust particles, a common complication affecting spray application field studies.

www.lvl.co.nz

CRL Energy research programme earns gold rating from Government

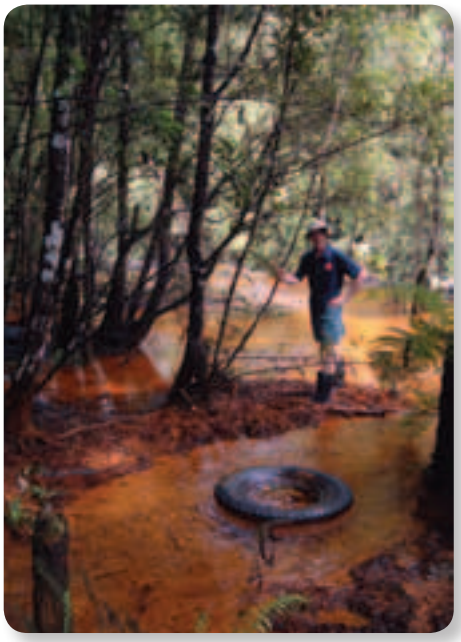
CRL Energy's Delivering Pathways to Mineral Wealth and Environmental Sustainability research programme has earned a 'gold rating' from the Ministry of Science and Innovation (MSI).

Gold ratings are reserved for research contracts which are performing above expectation, and of almost 400 MSI-funded contracts only 18 received such a distinction.

The CRL Energy-led programme, featured in IRANZ Connections December 2010 is in collaboration with Landcare Research, Canterbury University, and Otago University. The CRL Energy Mine Drainage Framework was developed in conjunction with stakeholders and end-users including Department of Conservation, West Coast Regional Council, Environment Southland, Solid Energy NZ Ltd, Oceania Gold, Francis Mining, and the Coal Association.

The work was most recently reviewed at a stakeholders' workshop held at the AusIMM Conference in Queenstown in August 2011.

The framework document can be found on the CRL Energy Website. *http://www.crl.co.nz/services/research/mine_drainage_framework.htm*



LEAD RESEARCHER DR DAVE TRUMM AT THE BLACKBALL MINE

Transport, Energy and Urban form: The future

If the cost of petrol was two to three times higher than its current price, would New Zealand households choose to surrender one or more household vehicles, or even live by public transport alone? Would they accept living in higher density mixed-use neighbourhoods around public transport nodes?

These are all questions that scientists at Opus Central Laboratories are trying to answer in their research programme into a very low transport energy scenario for New Zealand. Opus' Transport, Energy and Urban Form programme leader Vince Dravitzki explains that transport energy costs and availability are having a strong influence on the structure and function of our cities. New Zealand needs to reappraise its transport energy for a number of reasons: "Petrol prices are volatile and increasing, and this has a large impact on household budgets. Also there are current and developing international climate change treaties, and global trading imperatives that mean New Zealand needs to change its transport energy profile to remain a competitive and acceptable trading partner."

The low transport energy research scenario presents a period 10 to 15 years into the future when petrol costs have doubled or tripled and an electrified public transport system is available. Electricity is a local source energy with a less volatile price and could be at least 90% renewable. Public transport is the scenario choice because it can be up to 90% more energy efficient than private motor vehicles.

"If we can devise ways for our cities to function effectively with a much lower transport energy profile, we can both free up expenditure on transport for more productive investment, and decouple it from the economic pressures and uncertainty associated with petrol. At the same time New Zealand cities must be highly liveable to retain and attract a high skilled population" says Vince Dravitzki.

Examining the future urban forms in this scenario will reveal the likely business and retail locations, recreational options, and the economic and liveability gains needed to create liveable and economically successful cities and settlements. This research is funded by the Ministry of Science and Innovation.

www.successfulcities.co.nz

Crash course for seismic performance in steel connections

"Major earthquakes trigger research and investigations resulting in changes to building codes and specifications" says HERA Director Dr Wolfgang Scholz. "In the USA, for example, the Northridge earthquake in California instigated a series of investigations and reports for the Federal Emergency Management Agency." HERA invited Robert Shaw, one of the world's leading experts on seismic connections to present seminars on Seismic Performance in Steel Connections in February. "Robert was instrumental in the Northridge research and translating its results into building codes" says Dr Scholz.

The excellent performance of multi-storey steel-framed buildings in the Canterbury earthquakes highlighted the benefits of combining steel and well-researched structural systems for seismic design of these buildings. There is still room for increasing performance of structural steel seismic resisting frames, but the focus of research is shifting towards active seismic damage avoidance technology so buildings sustain no or low damage at higher seismic loads than those prescribed by the codes. For example, joints in Eccentrically Braced Frames (EBF) active links developed fractures at the very high loads experienced during the Canterbury earthquakes. These joints are easily repaired but the fractures have identified an opportunity for improving the details of these joints.

Design engineers who attended the seminars said that it was a crash course on getting welded and bolted seismic design details right. Robert emphasised that achieving adequate performance in seismic connections requires not only clear and concise designs, but also careful attention to weld detail and quality in the production of the connections by the fabricator, and thorough non-destructive examination by the inspecting agency.

www.hera.org.nz

SEISMIC CONNECTIONS EXPERT, ROBERT SHAW

ROBERT SHAW (LEFT) AND NEW ZEALAND WELDING CENTRE MANAGER MICHAIL KARPENKO VISITING THE 22-STOREY PACIFIC TOWER BUILDING IN CHRISTCHURCH

First Super-B train hits Hawke's Bay roads

The first Super-B train hit the road in the Hawke's Bay at the end of 2011. It is the largest trucking rig permitted under the High Productivity Motor Vehicle regulations which is now operating in the Hawke's Bay.

This large two trailer truck had its initial road test in late December. Although the low speed turning performance characteristics of the vehicle had previously been calculated by Transport Engineering Research New Zealand (TERNZ) using a computer simulation model, the road controlling authorities required a physical test on the route that the vehicle will be using. "The vehicle's performance was very close to its predicted performance and it was able to travel its route between Panpac's Whirinaki mill and the Port of Napier without going outside its lane even on the tightest turns and roundabouts" says John de Pont of TERNZ who oversaw the physical road test.

The 62-tonne Super-B train is 24.5 m in length and has 40 tyres fixed to wheels riding on 11 axles. It has a payload capacity nearly 39 tonnes compared to just under 26 tonnes for a maximum-sized standard truck and trailer. A second vehicle is scheduled to come into operation in June 2012. With both vehicles running, the annual number of truck trips required for transporting export pulp will almost halve from over 12,000 to about 6,700 trips, with significant savings in fuel use, greenhouse gas emissions and cost.

www.ternz.co.nz

Happenings at BRANZ

BRANZ has continued to evolve and grow throughout its 40 years of providing the building industry with knowledge and research. The latest evolutionary chapter in the BRANZ story involves the complete makeover of its Totara Building by Warren and Mahoney and Fletchers Construction. This has been a huge undertaking and an integral part of BRANZ's Judgeford refurbishment project. The building was officially opened on the 27th March with the Hon. Maurice Williamson and Nick Leggett, the Mayor of Porirua, taking part in the ceremony.

BRANZ has also been busy adding the finishing touches to its Strategy and Business Plan, which outlines the work BRANZ will undertake across its research, testing and administration services. BRANZ has increased its investment in research and the transfer of knowledge to the industry to its highest levels ever. Key elements of BRANZ's work programme include sustainability research, Canterbury earthquake research to test and validate inputs into the Building Code and Standards, and BRANZ's work responding to proposed regulatory changes.

www.branz.co.nz

CRL Energy partnership awarded six-year environmental monitoring contract

CRL Energy Ltd in partnership with Ecotech has been awarded a six year environmental monitoring contract for the Waterview Connection project in Auckland.

At $NZ1.4b, Waterview is the single largest capital infrastructure project in New Zealand's history. The environmental monitoring contract was awarded after a lengthy tender process, which was well bid by both the public and private sectors.

Ecotech, an Australian-owned company with over 35 years experience in providing the world with environmental monitoring instruments and services, has engaged CRL Energy to provide the local support. CRL Energy has more than 30 years experience in environmental monitoring. The combination of direct manufacturer's support combined with local support was viewed very positively by the Waterview Alliance.

The environmental monitoring programme includes six mobile Environmental Beta Attenuation Monitors for the construction phase, and two fixed ambient shelters for the operational phase, including particulate matter monitors (PM_{10}, $PM_{2.5}$ BAM1020s), meterological instruments, and Ecotech's Serinus NO_x gas analysers.

www.crl.co.nz

Who we are:

IRANZ is an association of independent research organisations. Its members undertake scientific research, development or technology transfer. Members include Aqualinc Research Ltd, BRANZ, Cawthron Institute, CRL Energy Ltd, Heavy Engineering Research Association (HERA), Leather & Shoe Research Association (LASRA), Lincoln Ventures Ltd, Opus Central Laboratories, Titanium Industry Development Association (TiDA) and Transport Engineering Research NZ Ltd (TERNZ).

IRANZ
Independent Research Association of New Zealand

Contact:

Kate Kilkenny Executive Adviser **t:** 04 973 3757 **m:** 021 0277 9317 **e:** information@iranz.org.nz **w:** www.iranz.org.nz