

# Land Reclamation

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A newsletter for the Helmholtz-Alberta Initiative (HAI) Land Reclamation Theme and the Land Reclamation International Graduate School (LRIGS)

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## LRIGS Honoured for Significant Contribution to Land Reclamation



Starting back row left:  
Dr Peter Beckett, Chris  
Powter, Andrea Granger,  
Zhichao Jiao, Alison Bijman,  
Brett Campbell, Matthew  
Gelderman  
Middle row left: Jenna Abou  
Rizk, Valerie Miller, Dr M  
Anne Naeth, Kangyi Lou,  
Alison Murata  
Front row left: Sarah Ficko,  
Michal Guzowski, Victoria  
Collins, Nils Dietrich

In only the second year of operation, the Land Reclamation International Graduate School (LRIGS) has been honoured by the Canadian Land Reclamation Association (CLRA) with the Dr Edward M Watkin Award for significant contribution to the field of Land Reclamation. The award was announced at the CLRA annual meeting awards night, this past September in Whitehorse, Yukon. LRIGS Director, Dr M Anne Naeth, Coordinator Michal Guzowski and all the current LRIGS students accepted the award. The students were participating in the CLRA annual meeting as part of the LRIGS Northern Canada trip.

Dr Edward M Watkin was a founding member of the CLRA and this award is given to a person or group to recognize major contributions to land reclamation, especially through service to foster advances in regulation, reclamation success, or development of personnel or students.

The plaque was proudly hung in the LRIGS office during the LRIGS Welcome Back event on September 25.

Many thanks to the CLRA for this wonderful recognition.

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## Successful LRIGS Trip to Northern Canada

The beautiful cities of Whitehorse, Yukon and Yellowknife, Northwest Territories, were destinations for this year's LRIGS trip, September 8 to 18. Eleven graduate students, including a visiting PhD student from Brandenburg Technical University, Cottbus, Germany, and the LRIGS Coordinator travelled to northern Canada for the second annual LRIGS trip. Participants visited historical and current land reclamation sites in the two territories and attended the Canadian Land Reclamation Association (CLRA) conference held in Whitehorse, September 9 to 12.

At the CLRA conference, our students participated in a short course and learned more about sustainable mining, an initiative of the mining and mineral processing industries to incorporate social and environmental dimensions into their operations. Reclamation, and specifically tailings management, is a key component of sustainable mining providing much relevance for the students. Other components of the conference included presentations by land reclamation practitioners and scientists which covered a diversity of topics including the use of remote sensing in reclamation monitoring, natural processes as effective models for mine reclamation, bio-char applications for revegetation and bioremediation in northern climates. The final day of the conference included a trip to the Keno Hill Silver District Mine which gave our students the opportunity to speak with current mine personnel and learn about investigations taking place on site into ground water pathways, mine pool dewatering, bioreactor treatment and managed natural attenuation. The opportunity to meet and speak with current land reclamation practitioners between sessions and at formal social events at the conference was invaluable for our students.

The remaining time in Whitehorse was spent



Top and bottom photos: LRIGS group, including Victoria Collins, Valerie Miller, Kangyi Lou, Michal Guzowski, Matthew Gelderman, Alison Murata, Zhichao Jiao, Jenna Abou Rizk, Sarah Ficko, Alison Bijman, Brett Campbell and Nils Dietrich

participating in other valuable site visits and events. On the morning of Friday, September 13, our students attended a seeding workshop hosted by the Yukon Government. The workshop provided an interesting opportunity for them to observe, first hand, the development of government policy related to restoration and maintenance of lands adjacent to highways in the territory. Later in the afternoon, Access Consulting hosted a trip to Whitehorse Copper Tailings Reprocessing and Reclamation Project just south of Whitehorse to view the historical legacy of the site and to talk about future plans with the current operator. Dr Katherine Stewart led a



tour of the Yukon Research Centre at Yukon College and related research sites around Whitehorse on Saturday, September 14, during which students talked to reclamation scientists and viewed work being conducted in bioremediation and water recycling for mining impacted waters, hydrocarbon remediation with willows and fungi, local biochar production for hydrocarbon remediation, local greenhouses for growing native species for restoration and slope stabilization and revegetation at reclaimed sites.

The next phase of the trip was centered around Yellowknife, Northwest Territories. Participants talked to federal government employees tasked with remediation of Giant Mine. Giant Mine is a former gold mine just outside Yellowknife with arsenic contamination. Our students were taken on a tour of the site and learned about the Government of

Canada's plans to immobilize the arsenic by reintroducing permafrost to the underground chambers of the mine. The tour participants visited the Diavik Visitor Centre in downtown Yellowknife which does an excellent job of explaining the Diavik diamond mining operations farther north in the Territories. Two of our students, Sarah Ficko (PhD) and Valerie Miller (PhD) are conducting reclamation research on site at the Diavik operation and were able to greatly supplement the information on display for the benefit of their fellow students.

Overall, the trip was a huge success. Our annual trips continue to be great opportunities for our students to network with and learn from professionals actively conducting reclamation and to bond with their fellow participants in the program. Thanks to all who helped make it a success.



Top row: Nils Dietrich, Zhichao Jiao, Matthew Gelderman; Valerie Miller, Victoria Collins, Kangyi Lou  
Bottom row: City of Yellowknife; Sarah Ficko, Alison Bijman, Jenna Abou Rizk

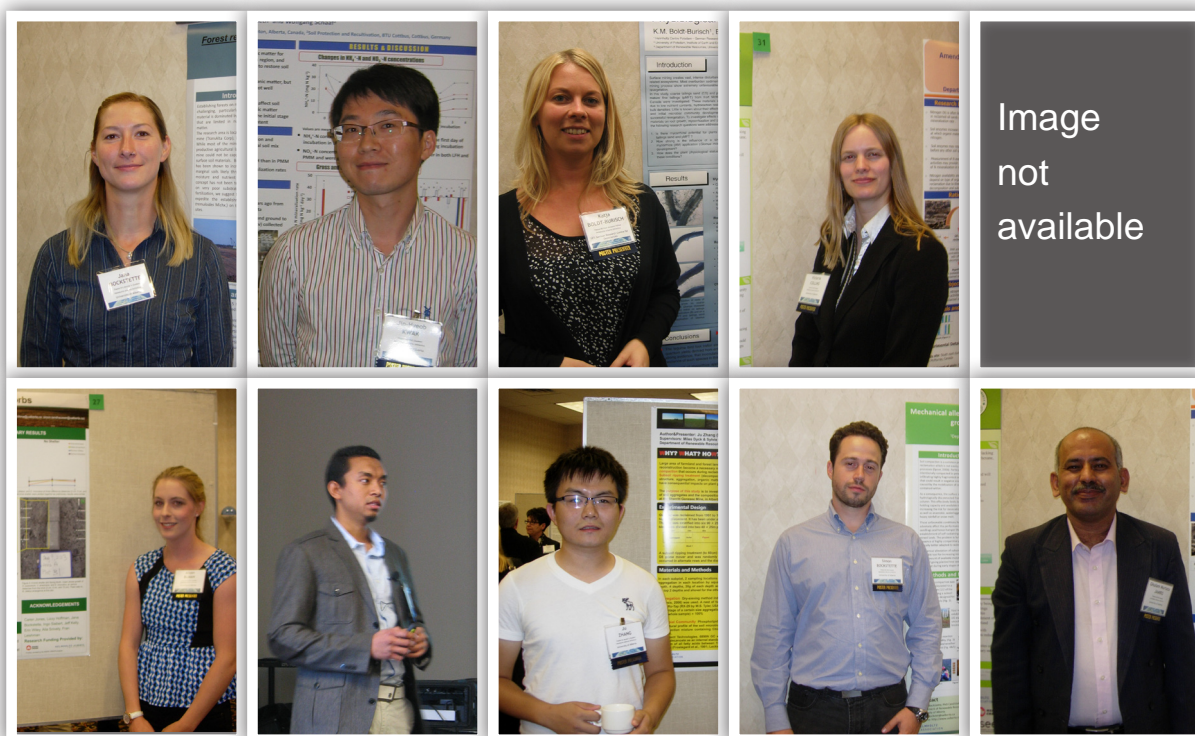
## The Helmholtz-Alberta Initiative Third Science Forum

It has been one year since the HAI/LRIGS joint trip to Potsdam, Germany for the second HAI Science Forum and reclamation tour. After a busy year, HAI students were able to meet again, this time in Edmonton on September 19, for the presentation and poster event. HAI and HAI/LRIGS land reclamation students and fellows from all over the world, including Germany, Pakistan, South Korea, Malaysia, Iran, China and Canada, presented their research projects and results. M Faizd Shahimin from the University of Alberta and Michael Lappé and Mareike Noah from GFZ German Research Centre for Geosciences, each showcased their work on the role of microorganisms in oil sands reclamation in oral presentations. Posters of research projects were displayed by Ju Zhang, Simon Bockstette, Jana Bockstette, Alison Bijman, Shirin Zahraei, Murtaza Jamro, Victoria Collins and Jin-Hyeob Kwak from the University of Alberta and Dr Katja Boldt-Burisch from the Brandenburg Technical University Cottbus,

Germany. HAI/LRIGS students, Valerie Miller and Alison Murata were nearby at the LRIGS display, available to speak to the many forum attendees about LRIGS.

This year a group of six students, one from each theme, participated in a panel discussion chaired by Dr Dan Wicklum of Canada Oil Sands Innovation Alliance (COSIA). The topic of discussion centered on the future of sustainable energy and research. Victoria Collins did an outstanding job on behalf of theme 6 and LRIGS.

Dr Lorne Babiuk, Vice President Research at the University of Alberta, Mr Werner Wnendt, German Ambassador to Canada, and Dr Wicklum presented the awards in the evening to wrap up a very busy and informative science forum. We are looking forward to the next occasion to meet with our international partners, September 29 and 30, 2014 in Edmonton.



Top row: Jana Bockstette, Jin-Hyeob Kwak, Dr Katja Boldt-Burisch, Victoria Collins, Shirin Zahraei  
Bottom row: Alison Bijman, M Faizd Shahimin, Ju Zhang, Simon Bockstette, Murtaza Jamro



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## LRIGS Mentorship Program

The development of a mentorship program for LRIGS land reclamation students and fellows was one of the foremost recommendations to come out of the LRIGS government and industry workshop held this past March. We are very pleased to announce that the LRIGS Mentorship Program is now up and running.

The mentorship program offers short term, in-

formal sessions between a land reclamation professional and an LRIGS student or fellow for approximately one hour per month at a time and location that fits busy schedules. Custom matches of mentors with students and fellows based on areas of interest and career goals, will ensure a valuable experience for both the professional and student or fellow. If you are interested in participating in the program as a mentor, please let us know.



LRIGS students, top row left: Kangyi Lou, Jenna Abou Rizk, Valerie Miller, Zhichao Jiao, Victoria Collins; Bottom row: Alison Murata, Brett Campbell



LRIGS students: Matthew Gelderman, Sarah Ficko, Alison Bijman

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## Visit From China University of Geosciences (Beijing)

On August 6, LRIGS had the honour of hosting visiting academics from China University of Geosciences (Beijing) (CUGB). Dr Zhongke Bai, Dean, Faculty of Land Science and Technology, and professors Dr Wei Zhou and Dr Jinman Wang, met with Dr Anne Naeth and Michal Guzowski to explore collaboration opportunities between CUGB and LRIGS, including student exchanges between China and Canada. The group discussed their respective research initiatives noting the marked similarities in their approach to reclamation research and gained an appreciation for the differences in the method of application.

Dr Linjun Yao, an LRIGS/HAI post doctoral fellow and alumna of CUGB, took the visitors to the Devonian Botanic Garden, where

they enjoyed a guided tour by Dr Lee Foote. The tour included a stop at the microsite research plots where HAI/LRIGS MSc student, Zhichao Jiao, described the experiment. LRIGS staff and students look forward to future collaborations with CUGB.



From left: Dr Linjun Yao, Dr Zhongke Bai and Zhichao Jiao at the Devonian Botanic Garden Microsite Research Plots

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## Profile: Kangho Jung

Dr Kangho Jung has the esteemed distinction of being the first graduate of LRIGS, completing the program this past summer. Dr Jung began the program in September 2012 studying the effect of textural interfaces on soil chemical and physical properties with supervisor, Dr Scott Chang.

Dr Jung worked at the National Institute of Agricultural Science in South Korea after completing his MSc in 2001. He conducted his PhD research in the Athabasca oil sands as he became interested in environmental issues around oil sands mining in Canada. He continued his post doctoral research in HAI and LRIGS, participating in the 2nd HAI

Science Forum and joint LRIGS tour of Germany in 2012. Dr Jung now resides back in his home country of South Korea, employed with the South Korean government.



Dr Kangho Jung, Germany exchange  
September 2012

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## Profile: Federico Mollard

The second graduate of the LRIGS program is Dr Federico Mollard, post doctoral fellow funded by both LRIGS and HAI. Dr Mollard studied seeding emergence and microsite revegetation with Dr Anne Naeth, establishing research plots at Devonian Botanic Gardens, Elk Island and Mattheis Ranch. They were awarded a Rangeland Research Institute grant in 2011.

Dr Mollard chose to study reclamation with LRIGS, drawn by the mission and research objectives and the reputation and professionalism of its members. "LRIGS gave me the possibility to interact and exchange experiences with industry executives, government staff and NGO representatives." says Dr Mollard. He also appreciated the oppor-

tunity to learn from renowned reclamation and restoration scientists from other institutions. Dr Mollard, originally from Argentina, will continue his academic activities and research in ecophysiology and reclamation at both the University of Alberta and the Universidad de Buenos Aires.



Dr Federico Mollard, Mattheis Ranch 2013



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## News and Events

The LRIGS donation account is now established and able to receive funds. Thank you to Dr Gord McKenna and Dr David Chanasyk, who each donated a financial gift to begin our fund raising for the future of LRIGS. To learn more about how to contribute, please visit <http://www.ualberta.ca/~lrigs/>.

The Department of Renewable Resources recently posted an article about LRIGS MSc student, Matthew Gelderman. To read the full article, visit: <http://www.rr.ualberta.ca/en/RenewableResourcesNews/2013/September/TrainingLandReclamation.aspx>.

Jin-Hyeob Kwak, a PhD student supervised by Dr Scott Chang, has had a busy fall season presenting posters on his work with coarse woody debris and nutrient distribution not only at the 3rd HAI Science Forum, but also at the 16th Conference of the International Boreal Forest Research Association and the Biological Solutions Forum, by Alberta Innovates and the Climate Change and Emissions Management Corporation.

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## Publications

Christenson, AF, H He, MF Dyck, EL Turner, DS Chanasyk, MA Naeth and C Nichol. 2013. In situ measurement of snowmelt infiltration under various topsoil cap thicknesses on a reclaimed site. *Canadian Journal of Soil Science* 93:497-510.

Cohen-Fernández, AC and MA Naeth. 2013. Reclamation of a limestone quarry to a natural plant community in the rocky mountains of southern Alberta. *British Columbia Mine Reclamation Symposium*. Vancouver, British Columbia. Pp 263-274.

Cohen-Fernández, AC, MA Naeth and SR Wilkinson. 2013. Anthroposol development from limestone quarry substrates. *Canadian Journal of Soil Science* 93:1-12.

Collins, CEV. 2013. Methane production in oil sands tailings under nitrogen-depleted conditions. MSc Thesis. Department of Renewable Resources, University of Alberta. 134 pp.

Li, XP, SX Chang, and F Salifu. 2014. Soil texture and layering effects on water and salt dynamics in the presence of a water table: a review. *Environmental Reviews*. [dx.doi.org/10.1139/er-2013-0035](http://dx.doi.org/10.1139/er-2013-0035).

Naeth, MA and SR Wilkinson. 2013. Can we build better compost? Use of waste drywall to enhance plant growth on reclamation sites. *Journal of Environmental Management* 129:503-509.

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For more information on the Helmholtz-Alberta Initiative please visit: <http://www.helmholtz-alberta.ca/>

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