Hydrogeology Field School in Waterloo, Canada, May 2013

The PhD-students of our IRTG attended the Hydrogeology Field School graduate course at the University of Waterloo from April 29th to May 17th, 2013, together with Master and doctoral students from Waterloo as well as from other parts of Canada and the world.

The course was given by Will Robertson (UW) and guest lecturers, including John A. Cherry (UW and University of Guelph), Robert W. Cleary (UW and Princeton University) and Emil O. Frind (UW).

During the course, we learned about well-established techniques and new approaches to characterize the subsurface, understand flow and transport processes and investigate contaminated sites. The course consisted of two parts: Lectures given by professors and project leaders from different parts of the world, and hands-on practice in hydrogeology field work on the North Campus site at the University of Waterloo. We gained interesting insights into state-of-the-art methods in hydrogeology, such as

- Performing slug and pumping tests to characterize aquifer properties
- Installing and sampling of multi-level wells to capture heterogeneities in water quality
- Determining hydraulic properties of the unsaturated zone
- Using geophysical methods to identify aquifer units
- Sampling for organic and inorganic substances
- Building numerical models to delineate capture zones
- Investigating fractured rock to estimate its hydraulic behavior
- Quantifying groundwater velocity to estimate travel times of substances
- Using infrared technologies to identify groundwater discharge areas
- Quantifying surface water-groundwater interactions with the help of seepage meters and mini-piezometers

The students were required to hand in assignments, which aimed at a deeper understanding of the topics presented in the class room or out in the field. Our group participated with great effort and motivation. We enjoyed the opportunity to learn about data collection and evaluation methods, which are the basis for our modelling tasks.

Finally, we took the chance to get to know more of the City of Waterloo as well as of its students and made networking connections and friendships. Some of our students will now continue their individual research stay in Canada to extend their collaboration with their Canadian supervisors.

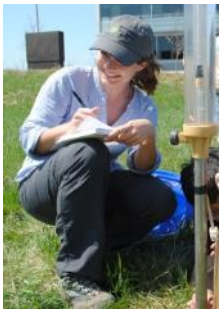
Personal experiences and comments:

[...
For a researcher, who spent most of the time working with computer models and collecting data for agricultural research, drilling wells, installing piezometers and measuring groundwater physicochemical properties, were unique and valuable experiences.

Atefeh Hosseini]

[...
Performing research on modelling mass transfer in soil/atmosphere systems, this course extended my field experience from the unsaturated zone to the groundwater domain. I will benefit from it when extending my work to consider groundwater interactions.

Zhongwen Bao]



[...
Being a groundwater hydrogeologist, I especially appreciated the opportunity to learn more about the hydraulic properties of the unsaturated zone and surface water-groundwater interactions. It completed the big picture of "integrated hydrosystem modelling".

Anneli Schöniger]

[...
On the monitoring screen of the metal detector, we captured suspicious resonant electromagnetic signals. Based on the intensity of the signal and its spatial pattern, it turned out to be water pipes buried near the lake of UW.

Chang-Hwan Park]

[...
A model can only ever be as reliable as the data that is used to develop and drive it. During the field school we got to appreciate the challenges and pitfalls involved in gathering good field data, which will help to keep us grounded when assessing the quality of our models.

Jürnjakob Dugge]

[...
The dedication of the professionals to the continuous enhancement of hydraulic data collection is remarkable. A good example is the Guelph Pressure Infiltrometer which we used to estimate the pressure head in the vadose zone.

Alicia Sanz-Prat]