Geohazards 7 Field Trip

In 2013, Canmore and the adjacent Municipal District of Bighorn suffered the worst hydroclimatic event in their history. Andy Esarte, manager of engineering in Canmore, will narrate the event and its aftermath and will talk about how geohazard risk management policy evolved post event.

Tens of millions of dollars of damages resulted from debris flows, debris floods, flooding and bank erosion. Given the choice of Canmore as the venue for the geohazard conference, our field trip will begin with Canada's most densely developed alluvial fan: Cougar Creek. This creek produced significant damage to residences along its margins and blocked the TransCanada Highway for a week, severed the CP rail line and distributed approximately 90,000 m^3 debris on its fan. Detailed frequency-magnitude analyses were conducted and debris floods were numerically modeled. A 30 m high debris barrier is currently being planned and construction may have begun by the time the conference rolls around. At the time of the visit at the Cougar Creek barrier site, Matthias Jakob of BGC will talk about the hazard assessment and Andy Esarte will explain the design input to the barrier and construction techniques.

Following the visit at Cougar Creek, we will drive about 1.5 hours through one of the most scenic routes Canada has to offer past Banff to the small hamlet of Field in British Columbia. Similar to parts of Canmore situated on Cougar Creek and other tributary fans of the Bow River, Field is entirely located on the alluvial fan of Stephen Creek which is a steep and debris-flow prone creek. At this time, no protection structures or warning measures are in place at Field and there is a risk that a large debris flow could impact the townsite. Tetra Tech did a study in 2014 which showed significant hazard and risk potential. Since, temporary surface water diversions have been installed above an unstable slope located about 200 m upstream of the fan apex and slope monitoring is ongoing. An options assessment for long-term mitigation is currently underway. Matthias Busslinger of Tetra Tech is leading the current study and will tell us about their findings.

We'll have a lunch with us that we will munch down in Field while looking at the mountain and the fan.

We'll depart field and drive towards Mount Stephens where a steep creek descends from the mountain that has produced debris flows overwhelming the Icefields Parkway and CP Rail line. It is also a notorious snow avalanche path. We will learn about the history of debris flows and mitigation at this site.

Just a few kilometers to the east is Cathedral Mountain which has a history of producing supra- and sub-glacial lake outbursts that evolve into debris flows apt to impact the CP rail line in the Spiral Tunnel area. A number of workers have studied this system and we will have the chance to listen to a spirited debate on this subject. Climate change will invariably discussed in the context of glacial recession and permafrost degradation.

After this stop, we will head back to Canmore where we should arrive at around 5 pm.

Field Trip Itinerary – Cougar Creek and Trip to Field

Time	Location	Speakers
08:30	Keynote	A. Esarte/Mayor Borrowman
09:30	Depart Hotel	
09:40	Arrive Cougar	M. Jakob (Hazards), A. Esarte (mitigation)
11:00	Depart Cougar	
12:30	Arrive Field Townsite (Stop at Visitor Center)	M. Busslinger (confirmed)
12:30 to 13:30	Lunch + beers while M. Busslinger talks	
13:45 to 14:15	Mt. Stephens Debris Flows (Hazards/Risks/Mitigation) (Stop on Yoho Valley Road Campground)	Lionel Jackson (GSC) (contacted)
14:45 to 15:30	Cathedral Mountain (tricky parking for 3 buses), wide pullout on the west-bound lane. May need to drive to Wapta Lake and turn around (8 km round trip)	L. Arenson or M. Jakob, or R. Guthrie or C. Bunce
16:45	Arrival Hotel in Canmore	

Artist rendition of Mt. Stephens debris flow channel and show shed. Artist unknown.