

Kim C. Green, P.Geo., PhD.

Cirriculum Vitae
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CONTACT INFORMATION

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CURRENT POSITION

Principal and consulting fluvial geomorphologist and hydrologist for Apex Geoscience Consultants Ltd.
Nelson BC. (www.apexgeoconsultants.com)

EDUCATION

PhD University of British Columbia, 2014. Forestry, Department of Forest Resource Management
MSc University of Calgary, 1990. Department of Geoscience.
BSc University of British Columbia, 1986. Geological Sciences

ADDITIONAL TRAINING/EDUCATION

1993 Short Course in Water Quality and Quantity Monitoring Techniques, Water Survey of Canada
1994 Geomorphology and Terrain Mapping Certificate, UBC Continuing Studies
1995 Mapping and Assessing Terrain Stability Certificate, UBC Continuing Studies

AWARDS AND GRANTS

2008 BC Forest Sciences Program award. Cotton Creek Phase II: Multi-scale, spatially explicit studies of forest management and disturbance impacts on watershed function. Project Y081214, D. Moore, Y. Alila and M. Weiler faculty proponents. (\$113,400)
2007 Tembec Industries – Cranbrook BC Division. Industry award to K. Green in support of the Cotton Creek Experimental Watershed project (\$12,500)
2006 Tembec Industries – Cranbrook BC Division. Industry award to K. Green in support of Cotton Creek Experimental Watershed (\$12,500)
2006 Kalesnikoff Lumber Co. Ltd. (Thrums BC). Industry award to K. Green in support of the Cotton Creek Experimental Watershed research project (\$5000)
2005 BC Forest Sciences Program award. Forest management in interior British Columbia: Moving beyond Equivalent Cut Area. Project Y052294 Y. Alila and M Weiler UBC faculty proponents (\$115,000)

RESEARCH EXPERIENCE

2006 to 2013 **Doctoral Researcher**
Department of Forest Resources Management, University of British Columbia.
Designed and applied a research program to study the effects of forest removal on the flow regime and sediment transport dynamics in snowmelt watersheds. The research

focussed on: 1) Using a meta-analysis approach to investigating forest removal on aspects of the flow regime including flood magnitude, frequency and duration, 2) investigating hydrological controls on bedload sediment transport dynamics in two forested headwater streams and 3) development of a conceptual model of stream channel response potential to forest removal in snowmelt watersheds.

1993 – 1996 Research Assistant
BC Ministry of Forests, Nelson Forest Region
Assisted in field data collection, statistical analyses and reporting for the following research projects: 1) Snow accumulation and melt in adjacent forest and clearcut areas across a range of aspects and elevations in the Kootenay Columbia Region, 2) Picloram® dispersion in soil water, 3) Repeatability of Interior Watershed Assessment Procedure findings between independent assessors. Examined channel morphology and disturbance indicators in stream channels across a range of geology and physiography.

PROFESSIONAL EXPERIENCE

1997 - Present **Hydrologist/Fluvial Geomorphologist**
Apex Geoscience Consultants Ltd., Nelson BC.
Professional consulting in the fields of terrain stability, channel stability, fluvial geomorphology, hydrology, riparian ecosystem function and hydroecology to the resource development sectors, community water user groups and private land owners.

1995 to 1997 **District Earth Scientist**
B.C. Ministry of Forests, Arrow Forest District
Professional consulting in the fields of geomorphology, hydrology, slope stability and watershed management. Understanding and communicating information outlined in the BC Forest Practices Code with District staff, forest licensees and consultants. Making informed decisions and recommendations regarding slope stability and hydrological issues on behalf of the district management. In house consulting for the BC Timber Sales Program on issues of slope stability and hydrology. Reporting on and prescribing mitigative measures for landslide events.

1993 to 1995 **Assistant Research Hydrologist**
B.C. Ministry of Forests, Nelson Forest Region.
Assisting with data collection and analysis, research site installation and monitoring for hydrology/geomorphology research projects. Responsibilities also included technical report writing and providing professional consulting services to Districts in the Nelson Forest Region on hydrology and geomorphology related issues.

1986 to 1993 **Research Geoscientist**
B.C. Ministry of Energy, Mines and Petroleum Resources
Undertaking regional geological mapping projects to investigate the geological structure, stratigraphy and mineral potential of British Columbia. Research areas included Cassiar Mountains, Nechako Plateau and Chilcotin Plateau. This position also involved data analysis, writing and publishing scientific reports and bulletins.

PROFESSIONAL QUALIFICATIONS AND MEMBERSHIPS

- 1993 - Present Professional Geoscientist - Member in good standing with the B.C. Association of Professional Engineers and Geoscientists.
- 1999- Present Member of the Division of Engineers and Geoscientists working in the Resource Sector (DEGIRS).
- 2006 - Present Member of the American Geophysical Union
- 2012 - Present Member of the European Geosciences Union

RECENT PEER-REVIEWED PUBLICATIONS

- Green, K., Brardinoni, F. and Y. Alila, 2014. Patterns of bedload entrainment and transport in forested headwater streams of the Columbia Mountains, Canada. *Earth Surface Processes and Landforms* Special Issue: Morphodynamics of steep mountain streams.
- Alila Y. and K.C. Green, 2014. Reply to Bathurst, J.C., 2014. Comment on: Green, K. C., and Y. Alila (2012), A paradigm shift in understanding and quantifying the effects of forest harvesting on floods in snow environments, *Water Resources Research*, 48, W10503, doi:10.1029/2012WR012449. Submitted to *Water Resources Research*.
- Alila Y. and K.C. Green, 2014. Reply to comment by Birkinshaw on “A paradigm shift in understanding and quantifying the effects of forest harvesting on floods in snow environments,” *Water Resour. Res.*, 50, doi:10.1002/2013WR014198.
- Green, K.C. and Y. Alila. 2012. A paradigm shift in understanding and quantifying the effects of forest harvesting on floods in snow environments. *Water Resources Research* Vol. 48, W10503, doi:10.1029/2012WR012449,
- Green, K.C. Brardinoni, F. and Y. Alila. 2012. Channel morphology and bed-load yield in fluvial, formerly-glaciated headwater streams of the Columbia Mountains, Canada. *Geomorphology* 188, 96-109.
- Green, K.C. and C.J. Westbrook. 2009. Changes in riparian area structure, channel hydraulics, and sediment yield following loss of beaver dams. *BC Journal of Ecosystems and Management* 10(1):68–79.

OTHER PUBLICATIONS

- Treacy, S., 2012. Deforestation in snowy regions causes more floods. American Geophysical Union, Release No. 12-43. (AGU Press release on Green and Alila, 2012)
- Green, K.C., 2005. A Qualitative Hydrogeomorphic Risk Analysis for British Columbia’s interior watersheds: A discussion Paper. In *Streamline Watershed Management Bulletin*, Vol 8, No. 2. Spring 2005.
http://www.forrex.org/sites/default/files/publications/full_issues/Streamline_Vol13_No1.pdf
- Green, K.C. and W.H. Halleran, 2001. Drainage Plans – A Comprehensive planning tool in high risk terrain. In *Terrain Stability and Forest Management in the Interior of British Columbia: Workshop Proceedings*, May 23-25, 2001. Nelson, B.C.

MANUSCRIPTS IN PREPARATION

- Green, K.C., and Y. Alila, Effects of forest removal on the frequency and duration of geomorphically effective floods in snowmelt headwater streams. For Publication in WRR special issue, *Disturbance Hydrology*.

CONFERENCE AND WORKSHOP PRESENTATIONS AND ABSTRACTS

Oral Presentations

- Green, K.C., 2014. Influence of moderate levels of Forest harvesting on the flood regime and channel stability of forested snowmelt streams: How much is too much harvesting? SISCO (Southern Interior Silviculture Committee) Winter Workshop, February 2014, Thompson Rivers University, Kamloops, BC
- Green, K.C., 2013. Hydrogeomorphic controls on bedload yield, entrainment and mobility in forested snowmelt headwater streams. Presented at the Hydrology Working Group meeting September, 2013, University of British Columbia, Vancouver.
- Green, K.C., 2012. The influence of forest harvesting on floods in snowmelt regions: A meta-analysis investigation using a paired frequency approach. Presented at the Hydrology Working Group meeting September 2012, University of Washington, Seattle.
- Green, K.C., Brown, C. and C. Steeger, 2007. Connecting Riparian Function and Forest Management in Kootenay – Columbia Headwater Basins. Submitted Abstract: Riparian Management in Headwater Catchments: Translating Science into Management. University of British Columbia.
- Green, K.C., 2005. Hydrogeomorphic risk analysis for use in the forest sector. Presented at the APEGBC Annual General Conference, DEGIRS Division., October, 2005, Richmond BC.
- Green, K.C., 2004. Effects of Wildfire on Aquatic Habitat of the Wigwam River 70 Years Later: Insights into Temporal Dynamics in Watershed Processes, Channel Condition and Riparian Function. Abstract Submitted to Theoretical and Practical Approaches for Watershed Restoration and Stream Habitat Improvement, American Fisheries Society, Montana Chapter, Feb. 2004, Whitefish Montana.
- Green, K.C. and W.H. Halleran, 2001. Drainage Plans – A Comprehensive planning tool in high risk terrain. In Terrain Stability and Forest Management in the Interior of British Columbia: Workshop Proceedings, May 23-25, 2001. Nelson, B.C.

Poster Presentations

- Green K. and Y. Alila, 2014. Forest harvesting impacts on attributes of the flow regime in snowmelt regions. Poster presented at the American Geophysical Union annual meeting, San Francisco. December 2014.
- Green, K., Brardinoni, F., and Y. Alila, 2014. Bedload entrainment and transport dynamics in forested snowmelt streams. Poster presented at the European Geophysical Union annual meeting, Vienna. April 2014.egu poster EGU2014-4558
- Green, K., Brardinoni, F., and Y. Alila, 2013. Channel morphology and patterns of bedload transport in fluvial, formerly-glaciated, forested headwater streams of the Columbia Mountains, Canada. Poster presented at the European Geophysical Union annual meeting, Vienna. April, 2013.

GUEST LECTURES

- 2015 Managing Geohazards in the Forest Industry. Presented April 2015 to UBC Masters of Sustainable Forest Management program.
- 2014 The Secret Life of Watersheds. Presented March 2014 to Selkirk College, second year Hydrology
- 2012 Riparian Ecosystems of Kootenay-Columbia. Presented Nov 2012 to Selkirk College second year Biology

TEACHING EXPERIENCE

- 2015 – Present **Adjunct Faculty**
Department of Forest Resources Management, University of British Columbia
FRST 555 (Hydrology component)
University of British Columbia
- 1991 - 1993 **Sessional Instructor**
Earth and Ocean Sciences, University of Victoria.
GEOG 120, EOS 300.
- 1988 – 1990 **Teaching Assistant**
Department of Geoscience, University of Calgary
Geology 201, Geology 433, Geology 313,
Geology 309 (Gemology - no longer offered)

CONSULTING PROJECTS

Partial listing of Recent Projects

- 2015 Crawford Creek spawning channel enhancement project – overview hydrogeomorphic assessment. Project currently ongoing for Kootenay Lake Eastshore Freshwater Habitat Society.
- 2014 Deer Creek Hydrogeomorphic Risk Analysis. Prepared for Kalesnikoff Lumber Co. Ltd., Thrums, BC.
- 2014 Italy-Sutherland Hydrogeomorphic Risk Analysis. Prepared for Interfor, Grand Forks BC, and IS Forestry, Castlegar, B.C.
- 2013 Syncrude Fort Hill North Swale design. Prepared for Terra Erosion Control, Nelson, BC.
- 2013 Rosebury Creek Hydrological Assessment. Prepared for Pearkes and Fernandez Law. Nelson BC.
- 2013 Pedro Creek Hydrogeomorphic Assessment. Prepared for Slocan Integrated Forestry Cooperative, Winlaw. BC.
- 2013 Lois and Kimberley Creek Hydrogeomorphic Assessment and Partial Risk Analysis. Prepared for Canfor, Elko BC.
- 2012 Englishman Creek Hydrogeomorphic Assessment. Prepared for Canfor, Cranbrook BC.
- 2012 Detailed Riparian Assessment For Kalesnikoff Lumber Co. Ltd. West Kootenay Operating area. Prepared for Kalesnikoff Lumber Co. Ltd., Thrums, B.C.
- 2012 Deer Creek Large Woody Debris Removal Assessment. Prepared for Regional District of Central Kootenay, Nelson BC.
- 2011 Greenhills Creek Restoration Proposal. Joint project with Terra Erosion Control Ltd. Prepared for Teck Greenhills Ltd., Elkford, BC.
- 2011 Hydrological Risk Analysis for Etna Creek, Braunagel Creek and No Name North and South Creeks Prepared for Tembec, Kootenay South Division, Cranbrook B.C
- 2010 Trozzo Creek Hydrologic Review. Prepared for Slocan Integral Forestry Cooperative, Winlaw, BC.
- 2009 Integrated Riparian Assessment for the Invermere TSA. Volume 1: Strategic Overview. Prepared for Canfor, Radium Division and B.C. Timber Sales.

OUTREACH/SERVICE

- 2015 Peer-reviewer for research paper entitled Biogeomorphological effect of leaf accumulations in stepped-bed channels – Czech Republic. Submitted to Moravian Geographical Reports.
- 2015 Peer-reviewer for BC MFLNO research extension note on hydrological recovery of forest stands in snowmelt regions.

- 2015 Workshop on identifying and managing hydrological and geological hazards in the Kootenay Region. Presentation given to Regional District of Central Kootenay, City of Nelson, City of Kaslo, Grand Forks, Creston and BC Ministry of Transportation Staff, March 2015, Nelson BC.
- 2014 Presentation of research findings on the influence of Kootenay and Columbia River Dams on flood variability along Columbia River. Prepared for Kootenay Native Plant Society, Camas Distribution Research Project.
- 2014 Investigation of terrain conditions in areas with established camas. Letter and field trip presented to the Kootenay Native Plant Society.
- 2013 Workshop the effects of forest harvesting on floods in snowmelt watershed. Organised and presented to forest licensees, BC Ministry of Forest, Lands and Natural Resources and professional consultants of the West Kootenay area (November, 2013).
- 2012 A great and terrifying beauty: Geological Hazards of the Kootenay Region. An essay published in the Nelson Star following the Johnsons Landing Slide intended to inform public of natural hazards in the Kootenay Region.
- 2011 Proposal Reviewer – Belgium federal grant program. I reviewed a proposal to study beaver influence on riverine environments in Belgium.
- 2004 Initiated industry – government – academic partnership and developed a research proposal together with Drs Younes Alila (UBC, Forest Resource Management), Markus Weiler and Dan Moore (UBC, Geography) to investigate the effects of timber removal on hillslope runoff and sediment transport dynamics in a forested snowmelt watershed of the Columbia Mountains. This research proposal was funded through the BC Forest Investment Account and led to the establishment of the Cotton Creek Experimental Watershed. Two post-doctoral research projects, three PhD research projects (including my own) and several MSc research projects were supported by funding for this research project.
- 2002 Friends of Forest Hydrology field trip lead
- 1998 Mountain Streams Workshop (taught by Dr. Matt O'Connor), Initiator, organizer and facilitator, Nelson BC March 1998. Workshop intended to provide training to consultants undertaking stream channel assessments in the Kootenay Region
- 1995 Terrain stability assessment and mapping course – UBC Continuing studies (taught by Doug VanDine, P.Eng., P.Geo.). Initiator and collaborator in the development of a course designed to train professional geoscientists and engineers in assessing and mapping terrain stability for the resource sector.
- 1994 Geomorphology and terrain mapping course – UBC Continuing studies (taught by Dr. June Ryder, P.Geo.). Initiator and collaborator in the development of a course designed to provide earth science graduates with additional training to undertake terrain mapping for the forest sector.