

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

Curriculum Vitae

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### **CONTACT INFORMATION**

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### **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

### **TEACHING EXPERIENCE**

2015 – Present

#### **Adjunct Faculty**

*Department of Forest Resources Management, University of British Columbia*  
FRST 555 – Guest lecturer and field trip leader addressing topics of Hydrology and Geomorphology.

1991 - 1993

#### **Sessional Instructor**

*Earth and Ocean Sciences, University of Victoria.*

GEOG 120 – Historical Geology, EOS 300 – Geology Field School.

1988 – 1990

#### **Teaching Assistant**

*Department of Geoscience, University of Calgary*

Geology 201 - Mineralogy, Geology 433 – Metamorphic petrology,

Geology 313 – Geology for Engineering, Geology 309 -Gemology

### **AWARDS AND GRANTS**

2015 National Research Council Canada IRAP Grant for Hydrological Modeling of wildfire effects in snowmelt watershed (Selkirk – Apex Industrial Research Partnership grant, \$10,000).

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

Sept 2015 to Feb 2016

### Research Hydrogeomorphologist

Apex Geoscience Consultants Ltd – Selkirk College research partnership.  
Investigated the effect of wildfire on flood risk in a snowmelt watershed using two different semi-distributed hydrological models.

2006 to 2014

### 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 to 1995

### Assistant Research Hydrologist

*B.C. 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.

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 EXPERIENCE

1997 - Present

### Hydrologist/Fluvial Geomorphologist

*Apex Geoscience Consultants Ltd., Nelson BC.*

Professional consulting in the fields of 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.

### **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
- 2015 – Present Member of the Canadian Water Resources Association

### **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.
- 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](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.

## **GEOLOGY PUBLICATIONS**

Green K. and S. Trupia (1988). Structure, Stratigraphy and Industrial Minerals in the Gang Ranch Area, Southern British Columbia (92O/8,9). British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1988, Paper 1989-1.

Green, K.C. and Trupia, S. (1988). Structure, Stratigraphy and Industrial Minerals in the Gang Ranch area, Southern British Columbia (92O/8,9). British Columbia Ministry of Energy, Mines and Petroleum Resources, Open File 1989-27.

Green, K.C. and L. Diakow. (1992). The Fawnie Range Project - Geology of the Nataalkuz Lake Map Area (93F/6). British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1992, Paper 1993-1.

Nelson, J., K. Bellefontaine, K. Green and M. McLean (1990). Regional Geological Mapping near the Mount Milligan Copper-Gold Deposit. (93K/16, 93N/1). British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1990, Paper 1991-1.

## **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**

- 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
- 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.
- 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.
- Connecting Riparian Function and Forest Management in Kootenay – Columbia Headwater Basins. Submitted Abstract: Riparian Management in Headwater Catchments: Translating Science into Management. February 2007, University of British Columbia.
- Hydrogeomorphic risk analysis for use in the forest sector. Presented at the APEGBC Annual General Conference, DEGIRS Division., October, 2005, Richmond BC.
- 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.

### **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 AND INVITED PRESENTATIONS**

- 2016 Risky Business: Managing Geohazards in the Forest Industry. Presented March 2016 to UBC Masters of Sustainable Forest Management Students
- 2015 Impacts of Forest Harvesting on Stream Channel Stability in Snowmelt Regions. Presented as an invited presentation at the Forest and Waters Workshop, November 17, 2015, Kelowna BC.
- 2015 Challenges of Applying a Risk-based Watershed Assessment in the BC interior. Presented at the annual conference of the BC Association of Engineers and Geoscientists, October, 2015, Kelowna BC.
- 2015 Sustainable Forest Management in Watersheds. Presented August 2015 to UBC Masters of Sustainable Forest Management Students.
- 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

#### **CONSULTING PROJECTS**

##### **Partial listing of Recent Projects**

- 2016 Hydrogeomorphic Assessment of Proposed Development in the Wensley-Brouse Operating Area. Report prepared for Nakusp Community Forest, Nakusp, BC.
- 2016 Effect of wildfire on flood hazard in Duhamel Creek: An investigation using the Raven Hydrological modeling platform. Study commissioned by Kalesnikoff Lumber Co. Ltd., Thrums BC.
- 2015 Crawford Creek spawning channel enhancement project – overview hydrogeomorphic assessment. Prepared for Kootenay Lake Eastshore Freshwater Habitat Society.
- 2015 Investigation using a semi-distributed hydrological model on the effects of wildfire on flood regime in Duhamel Creek, a forested snowmelt watershed.
- 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/ PUBLIC SERVICE**

- 2015 Peer-reviewer for research paper entitled Hydrologic Recovery Revisited: a frequency-based re-evaluation of stand-level snow ablation and rainfall interception recovery in a high elevation coastal forest. Accepted for publication in Hydrological Processes.
- 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 on 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.