Chris Marsh

contact

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chrismarsh.ca

languages

Native English
French (Grade 12)

general skills

Cold Regions Hydrology
Programming
Outdoorsmanship

Interests

Cryosphere-hydrology, modelling, programming, high-performance computing, the outdoors

Education

2012–present **Ph.D.** candidate in Physical Geography
University of Saskatchewan, Saskatoon, SK., Canada
Emergent Phenomena and Scale Dependency in Modelling Mountainous Hydrology

2009–2012 **M.Sc.** Physical Geography
University of Saskatchewan, Saskatoon, SK., Canada
Implication of mountain shading and topographic scaling on energy for snowmelt.

2005–2009 **B.Sc. Honours** Physical Geography, Minors: Math and Comp. Sci.
University of Saskatchewan, Saskatoon, SK., Canada
High resolution radiation modelling in complex terrain.

Academic Awards

2011 **D.M. Gray Hydrology Award**
CGU-HS award given for top student paper and presentation

2009–2012 **Graduate Student Scholarship**
University of Saskatchewan, awarded for academic performance

2009 **Most distinguished geography undergraduate**
Canadian Association of Geographers

2008 **Honours scholarship**
University of Saskatchewan, $1500 for academic performance

Field Experience

2009–2012 **Field work for M.Sc.**
Canmore, AB
Installing radiometers and time lapse cameras, snow surveys, and meteorological site maintenance.

Spring 2008 **International Polar Year**
Inuvik, NWT.
Field assistant for instrument installation (water level recorders, snow surveys, vegetation surveys, and surveying (Total Station).

Spring 2006 **NHRC, Environment Canada**
Inuvik, NWT.
Field assistant for instrument installation of water level recorders and surveying.

Research Experience

2012 **CRHM Tools developer**
Supervisor: John Pomeroy
Lead developer on the Cold Regions Hydrological Model (CRHM) Tools project at the University of Saskatchewan

2009 **MITACS summer employment with Environment Canada**
Supervisor: Bruce Davison and Raymond Spiteri
Improved MESH efficiency via parallelization and code optimization

2008 **Modelling with the Cold Regions Hydrological Model (CRHM) for work in ungauged basins**
Supervisor: John Pomeroy

Other Experience

2006–2009 **Salesperson and customer service.**
Saskatoon, SK
Boomtown Outfitters

Skills

Technical

Programming
- C/C++
- Matlab
- Python
- Fortran

Libraries
- OpenMP
- MPI
- CUDA
- Boost

Field work
- Datalogger maintenance
- Meteorological site installation

Other
- ArcGIS
- SAGA GIS
- Photoshop
- MS Office
- LaTeX

Certification

Instruction
- CRCA Canoe Moving Water Level 1 and 2
- CRCA Canoe Moving Water 1 Instructors
- CSIA Downhill Skiing Level 1 Instructors

Safety
- Rescue 3 International SwiftWater Rescue Technician Unit 1
- OHS Standard Level First Aid and CPR Level C
- Over 15 years of extensive remote outdoor experience such as wilderness camping and canoeing

Software

CRHM Tools

An open source Python Graphical User Interface (GUI) application, CRHM-tools, was developed to allow for the automated and systematic creation of Hydrological Response Units (HRUs) along with their parameters for input to the Cold Regions Hydrological Model (CRHM) framework.
`https://github.com/Chrismarsh/CRHM-tools`

libmaw

This library, Matlab API Wrapper, wraps the Matlab API in an easy-to-use way for use from C++. It supports automatic memory management.
`https://github.com/Chrismarsh/libmaw`

umbra

An unstructured-mesh horizon-shading model developed for my M.Sc work.
`https://github.com/Chrismarsh/umbra`

Affiliations

- Co-manager of the listserv `CRYOLIST.org`
- Founding member of the Global Institute for Water Security (GIWS) student group at the University of Saskatchewan.

Conferences Organized

- Lead organizer of the 2012 Canadian Geophysical Union Hydrology Section (CGU-HS) student conference.

Publications

Peer-reviewed journal

Marsh, C.B., J.W. Pomeroy, and R.J. Spiteri (June 2012), Implications of mountain shading on calculating energy for snowmelt using unstructured triangular meshes, *Hydrological Processes* **26**(12), pp. 1767–1778, DOI: `10.1002/hyp.9329`, URL: `http://doi.wiley.com/10.1002/hyp.9329`.

Technical report

Marsh, C.B., R.J. Spiteri, and B. Davison (2009a), Improved MESH efficiency via parallelization and code optimization, tech. rep., Department of Computer Science, The University of Saskatchewan, URL: `http://www.cs.usask.ca/content/researchinfo/techreports/2009/TR-2009-02.pdf`.

Conferences (Oral presentation)

Marsh, C.B., J.W. Pomeroy, and R.J. Spiteri (2011a), Implication of mountain shading and topographic scaling on energy for snowmelt, *CGU-HS student conference (Jan 29)*, Calgary, AB.

– (2011b), Implication of mountain shading and topographic scaling on energy for snowmelt, *CGU-HS (May 15–18)*, Banff, Alberta, Canada.

Posters

Marsh, P., S. Endrizzi, C. Derksen, M. Russell, C. Onclin, H. Wilson, J. Pomeroy, and C.B. Marsh (2010), *Factors controlling the spatial variability in end of winter snowcover and spring melt at an arctic tundra site*, San Francisco, California, USA.

Marsh, C.B., R.J. Spiteri, and B. Davison (2009b), *Improved MESH efficiency via parallelization and code optimization*, P3/WC2N Annual conference, Lake Louise, Alberta, Canada.

Marsh, C.B., S. Pohl, and G.E. Liston (2007), *Impact of increased shrub density on snow accumulation and melt in the Arctic tundra*, IUGG, Perugia, Italy.

Thesis

Marsh, C.B. (2012), Implications of mountain shading on calculating energy for snowmelt using unstructured triangular meshes, M.Sc. University of Saskatchewan.