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PROFESSIONAL SUMMARY

A research scientist and teacher, specialising in glaciology and climate science, I enjoy carrying out research in multidisciplinary teams and like to use my knowledge and skills to engage students and members of the public in thinking about the environment around them and how we interact with it.

My research focuses on understanding glacier-climate interactions, which is exciting as glacier changes provide and visual record of filtered climate changes that can be appreciated by everyone. I particularly enjoy working on research projects that have a practical outcome such as providing predictions of water resources for glaciated mountainous regions and assessment and mitigation of glaciological hazards.

TECHNICAL SKILLS

- Expert in managing environmental monitoring instruments and designing monitoring programs
- Experienced in environmental sampling of ice, sediment, rock and water
- Topographic and geophysical surveying: Theodolite, DGPS, EM, GPR and sonar
- Regional climate modelling (NCAR ARW model: <http://www.wrf-model.org/index.php>)
- Optically stimulated luminescence dating of sediments
- Ion chromatography for analysis of water chemistry
- Air photograph interpretation, geomorphological mapping and sedimentary logging
- Data organisation and analysis, statistics and time series analysis
- Energy balance, hydrological and earth-process modelling in MATLAB (and IDL)
- Wide range of teaching experience to students and professionals
- Able communicator and supportive team member or manager

EDUCATION

Ph.D. Glaciology | University of St Andrews (2000-2004)

Title: *Modelling melt beneath supraglacial debris: implications for the climatic response of debris-covered glaciers*
Supervised by Prof. Doug Benn, Examined by Prof O. Humlum and Prof. C.K.B. Ballantyne.

Numerical modelling of sub-debris ice ablation to explore (i) environmental controls on sub-debris ablation rate and the response of debris-covered glaciers to climate changes and (ii) how differential ablation affects overall ablation and leads to the formation of potentially dangerous ice contact lakes on some debris-covered glaciers.

B.Sc. Honours in Geography 1st class | University of Edinburgh (1996-2000)

Core subjects in philosophy and methodology of geography and geographical research methods. Elective courses in glaciology, glacial geomorphology, macrogeomorphology, environmental sensitivity and change, meteorology, oceanography and geology.

Dissertation: *The geomorphological impact of climate change on glaciers in the Ngozumpa valley, Khumbu Himal, Nepal.*

RESEARCH EMPLOYMENT

2013-2017 | Postdoctoral researcher, Center for Climate and Cryosphere, University of Innsbruck, Austria

- FWF Elise Richter Award (V 309-N26): Modelling of debris-covered glaciers
- Using laboratory experiments and numerical modelling to explore the best way to model the mass balance and meltwater runoff for debris covered glaciers
- Supervising PhD students researching on the same topic
- National Geographic Waitt grant: Measuring snow and ice penitentes with an Xbox Kinect

2009-2013 | Postdoctoral researcher, Center for Climate and Cryosphere, University of Innsbruck, Austria

- FWF Grant P21288-N21: Climate-glacier relationship on Mt Kenya (PI: Prof. Georg Kaser).
- Mass and surface energy balance monitoring and modelling of Lewis Glacier, Mt Kenya to determine glacier-climate interactions.
- Regional atmospheric modelling of East African climate (WRF atmospheric model).

2007-2009 | Investigator/Leader Glaciology Group, Centro de Estudios Avanzados en Zonas Áridas (CEAZA), Universidad de La Serena, Chile

- Leader of 5 researchers using direct measurements and satellite imagery to monitor mass and energy balance of glaciers to assess the glacial contribution to hydrological resources in Norte Chico, Chile.
- Manger of a USD 1M commercial project to assess impact of mining activity on glaciers in the Pascua Lama project area, results of which are reported to the operator and Chilean water authority. 10 technical reports produced in 12 months.

2005-2007 | Postdoctoral Researcher, University of Alberta, Canada

- Project: Variability of Arctic climate and sea ice over the past millennium: implications for ice cap mass balance (PI: Prof. Martin Sharp).
- Responsible for glacier hydrochemistry laboratory and all major ion analyses in a collaborative Arctic ice coring project involving Universities of Alberta, Calgary, Ottawa and the Geological Survey of Canada.
- Supervisory role to graduate students focussed on Arctic climate change issues.

2002-2004 | Luminescence dating laboratory analyst, University of St Andrews, UK

- Produced six new age dates on Himalayan glacial sediments using optically stimulated luminescence.

2002-2004 | PhD student, University of St Andrews, UK

- Development of 1D numerical models of surface energy balance of debris-covered ice.
- Deployment of automatic weather stations and instrumentation to record the thermal properties of supraglacial debris to measure model input conditions.
- Determination of the role of latitudes and climatic conditions on debris covered glacier ablation.

2000-2004 | Research assistant, University of St Andrews, UK

- Assistant for a 4-year project surveying and monitoring the evolution of supraglacial lakes on debris-covered glaciers.
- Collaborator in an international project studying the thermal regime of ice-contact lakes involving Universities of St Andrews, Dundee, Milan and the Italian Glaciological Committee.

- 15 Gurgiser, W, Marzeion, B., **Nicholson**, L., Kaser, G. and Ortner, M. (2013) Modeling energy and mass balance of Shallap Glacier, Peru. *The Cryosphere*, 7, 1787-1802.
- 14 MacDonell, S., Kinnard, C., Mölg, T., **Nicholson**, L. and Abermann, J. (2013) Meteorological drivers of ablation processes on a cold glacier in the semiarid Andes of Chile. *The Cryosphere*, 7, 1513-1526.
- 13 Gurgiser, W., Mölg, T., **Nicholson**, L. and Kaser, G. (2013) Mass balance model parameter transferability on a tropical glacier. *Journal of Glaciology*, 59 (217), 845-858.
- 12 **Nicholson**, L., Prinz, R., Mölg, T. and Kaser, G. (2013) Micrometeorological conditions and surface mass and energy fluxes on Lewis glacier, Mt Kenya, in relation to other tropical glaciers. *The Cryosphere*, 7, 1205-1225.
- 11 **Nicholson**, L. and Benn, D. I. (2013) Properties of supraglacial debris in relation to surface energy and mass balance modelling of debris covered glaciers. *Earth Surface Processes and Landforms*, 38 (5), 490-501.
- 10 MacDonell, S., **Nicholson**, L. and Kinnard, C. (2013) Parameterisation of incoming longwave radiation over glacier surfaces in the semiarid Andes of Chile. *Theoretical and Applied Climatology*, 111, 3-4, 513-528.
- 9 Prinz, R., **Nicholson**, L. and Kaser, G. (2012) Variations of the Lewis Glacier, Mount Kenya, 2004-2012. *Erdkunde*, 66 (3), 255-22.
- 8 Benn, D.I., Bolsch, T., Hands, K., Gulley, J., Luckman, A. **Nicholson**, L.I., Quincey, D., Thompson, S., Toumi, R., Wiseman, S. (2012) Response of debris-covered glaciers in the Mount Everest region to recent warming, and implications for outburst flood hazards. *Earth-Science Reviews*, 114, 156-174
- 7 Prinz, R., A. Fischer, L. **Nicholson**, G. Kaser (2011) Seventy-six years of mean mass balance rates derived from recent and re-evaluated ice volume measurements on tropical Lewis Glacier, Mount Kenya. *Geophysical Research Letters*, 38, L20502, doi:10.1029/2011GL049208.
- 6 Rabatel, A., H. Castebrunet, V. Favier, L. **Nicholson** and C. Kinnard (2010) Glacier changes in the Pascua-Lama region, Chilean Andes (29° S): recent mass-balance and 50-year surface-area variations. *The Cryosphere Discussions*, 4: 2307-2336.
- 5 **Nicholson**, L., J. Marín, D. Lopez, A. Rabatel, F. Bown, F and A. Rivera (2010) Glacier inventory of the upper Huasco valley, Norte Chico, Chile: glacier characteristics, glacier change and comparison to central Chile. *Annals of Glaciology*, 50(53), 111-118.
- 4 Kinnard C., R. M. Koerner, C. M. Zdanowicz, D. A. Fisher, J. Zheng, M. J. Sharp, L. **Nicholson** and B. Lauriol (2009) Stratigraphic analysis of an ice core from the Prince of Wales icefield, Ellesmere Island, Arctic Canada, using digital image analysis: high-resolution density, past summer warmth reconstruction and melt effect on ice core solid conductivity. *Journal of Geophysical Research*, 113, D24120, doi:10.1029/2008JD011083.
- 3 **Nicholson** L. and D. I. Benn (2006) Calculating ice melt beneath a debris layer using meteorological data. *Journal of Glaciology*, 52, No. 178, 463-470.
- 2 Diolauti, G., M. Kirkbride, C. Smiraglia, D. I. Benn, C. D'Agata, C., and L. **Nicholson** (2005) Calving processes and Lake evolution at Miage glacier (Mont Blanc, Italian Alps). *Annals of Glaciology*, 40, pp. 207-214.
- 1 Lukas, S., L. **Nicholson**, F. H. Ross and O. Humlum (2005). Formation, meltout processes and landscape alteration of high-arctic ice-cored moraines – examples from Nordenskiöld Land, Central Spitsbergen. *Polar Geography*, 29, No. 3, pp. 157-187.

TECHNICAL REPORTS AND OTHER PUBLICATIONS

Unpublished technical reports to Compañía Minera Nevada, Chile, co-authored by the CEAZA glaciology group:

- CEAZA informe 2008-01: Balance de masa de los glaciaretos Toro 1, Toro 2, Esperanza y Ortigas 2, y los glaciares Guanaco, Estrecho y Ortigas 1, región de Pascua-Lama, año hidrológico 2007-08*
CEAZA informe 2008-02: Mediciones meteorológicas (temperatura, humedad y viento) sobre los glaciares Toro1, Guanaco, y Ortigas 1, verano 2007-2008
CEAZA informe 2008-03: Balance de energía de los superficies de los cuerpos de hielo, Pascua -Lama
CEAZA informe 2008-04: Medición del albedo de superficie de los glaciares en la zona de Pascua Lama
CEAZA informe 2008-06: Resultados de Medición de rutas nieve en el sector de la Olla – Valle del Estrecho

CEAZA informe 2008-07: *Investigaciones glaciológica sobre el Glaciar Guanaco cerca del Proyecto Pascua Lama 2008*
CEAZA informe 2008-09: *Evolución de la superficie de 20 glaciares en la zona y al sur de Pascua Lama, entre 1955 y 2007*
CEAZA informe 2008-10: *Inventario de los cuerpos de hielo y glaciares de rocas activas en la Valle Huasco Alta, 2004*

Mölg, T., Cullen, N. J., Hardy, D., Kaser, G., Nicholson, L., Prinz, R., Winkler, M. (2013) East African glacier loss and climate change: Corrections to UNEP article "African without ice and snow", *Environmental Development*, 6, 1-6.

Cogley, J.G., R. Hock, L.A. Rasmussen, A.A. Arendt, A. Bauder, R.J. Braithwaite, P. Jansson, G. Kaser, M. Möller, L. **Nicholson** and M. Zemp (2011) Glossary of Glacier Mass Balance and Related Terms, IHP-VII Technical Documents in Hydrology No. 86, IACS Contribution No. 2, UNESCO-IHP, Paris.

Winkler, M., R. Prinz, L. **Nicholson**, N. Cullen and C. Kinnard (2011) Ice-mounted masts as platforms for micro-meteorological measurements on glaciers. In: IASC Workshop on the use of automatic measuring systems on glaciers: Extended abstracts and recommendations, Pontresina, Switzerland. IMAU, Utrecht University, the Netherlands.

Lukas, S., **Nicholson**, L.I., Humlum, O., (2007). Comment on Lønne and Lyså 2005: "Deglaciation dynamics following the Little Ice Age on Svalbard: Implications for shaping of landscapes at high latitudes, *Geomorphology* 72, 300-319". *Geomorphology* 84: 145-149.

Nicholson, L. (2003) Thermal properties of supraglacial debris, Ngozumpa Glacier, Nepal. *Quaternary Newsletter*, 101, pp. 66-69.

PRESENTATIONS AT SCIENTIFIC MEETINGS

Oral contributions:

- 19 Collier, S. E., **Nicholson**, L., Maussion, F., Mölg, T. (2013) Parameterizing moisture in glacier debris cover using a bucket scheme. European Geosciences Union (EGU) General Assembly 2013, Wien, 8 Apr. 2013.
- 18 Gurgiser, W., Mölg, T., **Nicholson**, L., Kaser, G. (2013) Mass balance model parameter transferability on a tropical glacier. European Geosciences Union (EGU) General Assembly 2013, Wien, 9 Apr. 2013.
- 17 Racoviteanu, A., Arnaud, Y., **Nicholson**, L. (2013) Surface characteristics of debris-covered glacier tongues in the Khumbu Himalaya derived from remote sensing texture analysis. European Geosciences Union (EGU) General Assembly 2013, Wien, 8 Apr. 2013.
- 16 Prinz, R., **Nicholson**, L., Gurgiser, W., Mölg, T., Kaser, G. (2012) Can we quantify mid-tropospheric climate change from small tropical mountain glaciers? American Geophysical Union (AGU) Fall Meeting 2012, San Francisco, 6 Dec. 2012.
- 15 Benn, D. I., Lefeuvre, P. M., Ng, F., **Nicholson**, L. (2012) Response of Himalayan debris-covered glaciers to climate warming: from observations to predictive modeling. American Geophysical Union (AGU) Fall Meeting 2012, San Francisco, 5 Dec. 2012.
- 14 Prinz, R., Fischer, A., **Nicholson**, L., Kaser, G. (2011) Mean mass balance rates derived from ice volume changes on Lewis Glacier, Mount Kenya, East Africa, 1934-2010. "Climate Change in High Mountain Regions. From Understanding of the Past to Modelling of the Future", International Conference on the Occasion of the 125 Anniversary of Sonnblick Observatory, Salzburg, 31 Aug. 2011.
- 13 **Nicholson**, L. (2011) Automatic measurements of glaciers in the arid Andes of Chile. IACS Workshop on the use of automatic measuring systems on glaciers, Pontresina, Switzerland, 23 - 26 Mar. 2011.
- 12 Hofer, M., Großhauser, M., Jarosch, A., Juen, I., Marzeion, B., Mölg, T., **Nicholson**, L., Prinz, R., Winkler, M., Kaser, G. (2010) Mountain cryospheric reservoirs and societies: Case studies and a modelling perspective. BMBF - Forum für Nachhaltigkeit, Berlin, 3 Nov. 2010.
- 11 Lukas, S., D. I. Benn, M. Temminghoff, C. M. Boston, T. Irvine-Fynn, P. R. Porter, N. E. Barrand, L. I. **Nicholson**, F. H. Ross, and O. Humlum (2010) The response of polar glaciers to Late Holocene climate change reconstructed from terrestrial geomorphological evidence on Svalbard. European Geosciences Union (EGU) General Assembly 2010, Wien, 2-7 May 2010.

- 10 MacDonell, S., N. Cullen, L. **Nicholson**, T. Mölg and C. Kinnard (2010) The behaviour of turbulent heat fluxes on Guanaco Glacier, upper Huasco valley, Chile, using eddy covariance data and energy balance modeling. Valdivia Ice and Climate Change Meeting, Valdivia, Chile, 1-3 Feb. 2010.
- 9 Kinnard, C. S. MacDonell, S. Gascoïn, J. Marin, J. Araos, R. Garrido, R. Ponce, J. L. Castro, A. Rabatel and L. **Nicholson** (2010) Glacier and hydroclimate interactions in the high-altitude, semi-arid Chilean Norte Chico region: progresses and challenges. Valdivia Ice and Climate Change Meeting, Valdivia, Chile, 1-3 Feb. 2010.
- 8 **Nicholson** L. and R. Prinz (2010) 6 months of meteorological data from Lewis Glacier, Mt Kenya: computed surface energy and mass change compared to measured surface change. 14th Alpine Glaciology Meeting, Milan, 25-16 Mar. 2010.
- 7 **Nicholson** L. (2009) Energy and mass fluxes in the glacier boundary layer. IGAD Climate Prediction and Applications Center, Nairobi, 8-9 Oct 2009
- 6 **Nicholson**, L., and CEAZA glaciology group (2008) Mass balance monitoring of glaciers in the arid Andes of Norte Chico, Chile. IGS Workshop on mass balance measurements and modelling, Skeikampen, Norway, 26-28 Mar. 2008.
- 5 **Nicholson**. L. (2007) Studies of the cryosphere in Norte Chico region, Chile, 2nd Chile - New Zealand Scientific Meeting on Climate Variability and Change in the Southern Hemisphere, Santiago, Chile, Oct 15-20, 2007.
- 4 **Nicholson**, L., M Sharp (2006) Snow and ice core chemistry from the Prince of Wales Icefield, Ellesmere Island, Nunavut. 36th Annual Northwest Glaciology Meeting, Fairbanks, 15-16 Sept, 2006.
- 3 **Nicholson**, L., Koch, I., Colgan, L., E. Doxey-Whitfield, M. Sharp and C. Zdanowicz (2005) High-resolution Ice Core Records from the Prince of Wales Icefield, Ellesmere Island. ArcticNet Second Annual Scientific Meeting, Banff, 13-16 Dec. 2005.
- 2 **Nicholson**, L. (2003) Modelling sub-debris ablation rate: considerations of annual thermal regime in supraglacial debris, Ngozumpa Glacier, Nepal. IGS British Branch Meeting 2003, Belfast, 14-16 Sep. 2003.
- 1 **Nicholson**, L. (2002) Keynote address : The development of supraglacial lakes, Ngozumpa Glacier, Nepal. International Conference on Mountain Hazards and Mitigation, Kathmandu, 18-22 Nov. 2002.

Poster contributions:

- 27 Gurgiser, W., Marzeion, B., Nicholson, L., Ortner, M., Kaser, G. (2013) Modelling mass balance and temperature sensitivity on Shallap glacier. American Geophysical Union (AGU) Fall Meeting 2013, San Francisco, 12 Dec. 2013.
- 26 **Nicholson**, L., Prinz, R., Mölg, T and Kaser, G. (2013) Micrometeorological conditions and surface mass and energy fluxes on Lewis Glacier, Mt Kenya in relation to other tropical glaciers. Deutsch-Österreichisch-Schweizerische Meteorologentagung (DACH), Innsbruck, 2 – 6 Sep. 2013
- 25 Gurgiser, W., Nicholson, L., Marzeion, B., Mölg, T., Kaser, G.: Modelling distributed surface mass balance for estimating melt water contribution to runoff on Shallap glacier, Peru. Davos Atmosphere and Cryosphere Assembly (DACA 2013), Davos, 9 Jul. 2013.
- 24 **Nicholson**, L., Prinz, R., Kaser, G. (2013) Identifying climatic drivers of glacier mass balance variability of Lewis glacier, Mt. Kenya. EGU General Assembly 2013, Vienna, 7-12 April 2012
- 23 Gurgiser, W., Mölg, T., **Nicholson**, L., and Kaser, G. Mass balance model parameter transferability on a tropical glacier. EGU General Assembly 2013, Vienna, 7-12 April 2012.
- 22 **Nicholson**, L., Racoviteanu, A., Thompson, S and Arnaud, Y (2013) An analysis of satellite-derived debris-covered glacier surface temperatures for determining debris thickness on a Himalayan glacier. EGU General Assembly 2013, Vienna, 7-12 April 2012.
- 21 **Nicholson**, L., Prinz, R., Kaser, G. (2012) What can the mass balance of Lewis glacier tell us about east African and tropical climate dynamics? IGS International Symposium on Glaciers and Ice Sheets in a Warming Climate, Fairbanks, 24 – 29 June 2012
- 20 **Nicholson**, L. (2012) Impacts of debris cover on glaciers: research priorities and relation to glacier-climate interactions on clean-ice glaciers. International Conference on Cryosphere of the Hindu Kush Himalayas: State of the Knowledge, Kathmandu, 14 – 16 May, 2012.
- 19 **Nicholson**, L. (2012) Impacts of debris cover on glaciers: research priorities and relation to glacier-climate interactions on clean-ice glaciers. EGU General Assembly 2012, Vienna, 22-27 April 2012.

- 18 Prinz, R., Mölg, Thomas, Nicholson, Lindsey, Kaser, Georg: Modeling the mass balance of tropical Lewis Glacier, Mt Kenya, and its sensitivity to climate. American Geophysical Union (AGU) Fall Meeting 2011, San Francisco, 9 Dec. 2011.
- 17 **Nicholson**, L, Moelg, T, Prinz, R. and Kaser, G. (2011) Mesoscale modelling of summit weather conditions on Mt Kenya and their relation to the mass balance of Lewis glacier. AGU Fall Meeting 2011, San Francisco, 5-9 Dec. 2011.
- 16 **Nicholson**, L., R. Prinz (2011) Linking tropical glacier mass balance to regional climate drivers, Lewis glacier, Mt Kenya. XVIII INQUA-Congress, Bern, Switzerland, 21-27 Jul. 2011.
- 15 Prinz, R. A. Fischer, L. **Nicholson**, S. Gruber, and G. Kaser (2011) Rapid decline of the ice volume of tropical Lewis Glacier, Mount Kenya, during the last half-century. European Geosciences Union (EGU) General Assembly 2010, Wien, 3-8 Apr. 2011.
- 14 Prinz, R., L. **Nicholson**, T. Mölg, B. Marzeion, and G. Kaser (2010) Large scale climatological controls of the mass balance of tropical Lewis Glacier, Mt Kenya, East Africa. European Geosciences Union (EGU) General Assembly 2010, Wien, 2-7 May 2010.
- 13 **Nicholson**, L., R. Prinz, C. Kinnard, T. Mölg, M. Winkler, and G. Kaser (2010) Comparison of tropical and subtropical glacier surface energy balance in Africa and South America. European Geosciences Union (EGU) General Assembly 2010, Wien, 2-7 May 2010.
- 12 MacDonell, S., T. Mölg, L. **Nicholson**, and C. Kinnard (2010) The surface energy balance of the Guanaco and Toro 1 glaciers in the Norte Chico region, Chile. European Geosciences Union (EGU) General Assembly 2010, Wien, 2-7 May 2010.
- 11 MacDonell, S., N. Cullen, L. **Nicholson**, T. Mölg, and C. Kinnard (2010) Sublimation on the glaciers of the upper Huasco valley, Chile, using eddy covariance data and energy balance modeling. European Geosciences Union (EGU) General Assembly 2010, Wien, 2-7 May 2010.
- 10 Benn, D.I., S. Thompson, A. Luckman, L. **Nicholson**, and D. Quincey (2010) GLOFs - The Next Generation. European Geosciences Union (EGU) General Assembly 2010, Wien, 2-7 May 2010.
- 9 Bippus, G., L. **Nicholson** and R. Prinz (2010) Satellite mapping of snow cover extent on Mt Kenya, 2000-2009. Cold Regions Hydrology Workshop, Innsbruck, 28-30 Apr. 2010.
- 8 **Nicholson**, L., T. Mölg and S. MacDonell (2010) Modelling point surface ablation and associated energy balance at Glaciar Tapado, Norte Chico, Chile. Valdivia Ice and Climate Change Meeting, Valdivia, Chile, 1-3 Feb. 2010.
- 7 **Nicholson**, L., and CEAZA glaciology group (2008) Summer surface energy balance study on subtropical cold glaciers of the semi-arid Andes (Chile). 4th EGU Alexander von Humboldt International Conference, Santiago, 24-28 Nov. 2008.
- 6 Rabatel, A. and CEAZA glaciology group (2008) Glacier monitoring in the semi-arid Andes of Chile (29°S): Projections for their future. European Geosciences Union (EGU) General Assembly 2010, Wien, 13-18 Apr. 2008.
- 5 **Nicholson**, L., Sharp, M (2006) 1000 Years Climate Proxies from Prince of Wales Icefield, Ellesmere Island, Nunavut. ArcticNet Third Annual Scientific Meeting, Victoria, 12-15 Dec. 2006.
- 4 **Nicholson**, L. (2004) Modelling ablation gradients of debris-covered glaciers. IGS British Branch Meeting 2003, Sheffield, 14-16 Sep. 2004.
- 3 **Nicholson**, L., J. Spencer, R. Robinson, D.I. Benn (2003) OSL dating of glacial deposits from debris covered glaciers, Khumbu Himal, eastern Nepal. Luminescence/ESR British meeting 2003, Aberystwyth, 7-10 Sep. 2003
- 2 **Nicholson**, L. (2003) The thermal properties of supraglacial debris on Ngozumpa Glacier, Nepal Himalaya. BGRG/JAQR Conference – Cryospheric systems, London, 13-14 Jan. 2003.
- 1 **Nicholson**, L. and D. I. Benn (2002) Modelling ablation driven topographic development on a debris mantled glacier tongue, Ngozumpa Glacier, Nepal Himalaya. IGS International Symposium on Physical and Mechanical Processes in Ice in Relation to Glacier and Ice-Sheet Modelling, Chamonix, 26-30 Aug. 2002.

TEACHING EXPERIENCE

LECTURER (2013): Juneau Icefield Research Program

- Preparing and delivering lectures on glacier mass balance, glacier-climate interaction, applied glaciology

LECTURER (2011-2013): University Center in Svalbard (UNIS), Norway

- Preparing and delivering lectures, computer practicals and fieldtrips for the 1 week glacier mass balance and energy balance component of an international post-graduate course (AG-325: Glaciology)

LECTURER (2012) Summer school, Obergurgl, Austria.

- Micro-DICE (ESF networking project) Summer school on microstructures of ice and snow
- Lectures on the glacier-climate interaction

LECTURER (2010): Summer school, Obergurgl, Austria.

- Summer school on Monsoon Variability, Teleconnections, and Impacts on Mid to Low Latitude Glaciers
- Lectures on the glacier boundary layer

GLACIOLOGY INSTRUCTOR (April/May 2009): UNESCO Glacier mass balance field school, Nepal

- Training government hydrologists from the SE Asian region in theory and techniques of glacier mass balance and hydrological monitoring.

TEACHING FELLOW IN PHYSICAL GEOGRAPHY (2004-2005): Geography and Geosciences, University of St Andrews.

- Developer, coordinator and teacher of two courses in Quaternary Environmental Reconstruction: Covering the broad range of techniques used in reconstructing Quaternary Environments and key research and commercial application of these methods. Full material and support for the courses was made available online using WebCT.
- Lecturer in Glaciology: Glacial erosion, erosion processes and mechanics, erosional landforms, debris-covered glaciers and glacier mass balance
- Teaching assistant for analytical methods in Geoscience
- Tutor and advisor for first and second year students
- Field work leader on glaciology field trip to Norway

UNDERGRADUATE DEMONSTRATOR (2000-2004): Geography and Geosciences, University of St Andrews.

PART-TIME LECTURER AND TUTOR (2003): Geographical Foundations course, English Language Teaching Centre, University of St Andrews.

VOLUNTARY TUTOR (2000): Department of Geography, University of Edinburgh

FIELDWORK EXPERIENCE

I have successfully designed, planned and executed research programmes of up to 3 months duration in the Nepalese Himalaya (x5), Svalbard, Italian and Austrian Alps, Norway, Iceland, Chile (x25), Kenya (x3) and Tanzania.

Field research undertaken includes DGPS and theodolite surveying; surface scanning using terrestrial laser scanning, Xbox Kinect; glaciological studies on ablation, flow and stress fields; glacier mass balance measurement using stake networks and snowpits; geomorphological mapping and sedimentology studies; geophysical surveys using electromagnetics (EM) and ground penetrating radar (GPR); ice and sediment stratigraphy sampling for stable isotope analysis, magnetic provenance, luminescence and cosmogenic dating; deployment of automatic weather stations and eddy correlation systems; use of remote camera systems and photogrammetry.

I feel confident leading field groups on any of the topics and areas in which I have specialised.

MEMBERSHIPS AND SERVICES TO THE COMMUNITY

- **Member:** International Glaciological Society (IGS); American Geophysical Unions (AGU); European Geosciences Union (EGU); Quaternary Research Association, Royal Scottish Geographical Society (RSGS).
- **Journal reviewer:** Journal of Glaciology; The Cryosphere; Annals of Glaciology; Journal of Geophysical Research; Journal of Hydrology; Environmental Research Letters; Earth Surface Processes and Landforms; Earth Surface Dynamics
- **Project proposal reviewer:** Swiss National Science Foundation (SNF); Chilean National fund for scientific and technological development (FONDECYT); US National Science Foundation (NSF); Canadian Foundation for Innovation (CFI).
- **Member of Working group** on mass balance methods and terminology for the International Association of Cryospheric Sciences (IACS) (2008-2011)
- Regular attendee and presenter at international conferences and meetings (2003-present)
- **Convener:** Debris Covered Glacier session at EGU.
- **Scientific Editor:** IGS International Symposium on Changes in Glaciers

GRANTS SUBMITTED AND AWARDED

Royal Scottish Geographical Society Field Grant - 2002 - awarded
American Alpine Club Field Grant – 2002 - awarded
Quaternary Research Association Research Grant – 2003 - awarded
Marie Curie Fellowship – 2005 - not awarded
National Geographic Waitt Grant – 2013 - awarded
Austrian Science Fund Elise Richter Grant – 2013 - awarded

PROFESSIONAL REFERENCES

Prof. Georg Kaser
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Prof. Doug Benn
The University Centre on Svalbard (UNIS)
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Prof. Martin Sharp
University of Alberta
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Additional references are available on request from my Chilean colleagues (in Spanish or translated).