

## Publications 01/2020

### Kay Helfricht, PhD

#### *Oral presentations*

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#### **2014-2019**

Helfricht, K. (2019): Rapider Gletscherschwund - Prozesse und Folgen gegenwärtiger Verluste. ARGE-Alp Workshop: Felsstürze am Gletscherrand - Einflussfaktoren, Auslösemechanismen, Schlussfolgerungen für die Praxis, Rudolfshütte, Austria, 18.09.2019.

Helfricht, K. (2019): Das Klimagedächtnis Hochgebirge - ein Archiv mit Ablauffrist? PRO SCIENTIA summer school, Bozen, Italy, 04.09.2019.

Helfricht, K., Hartl, L., Koch, R., Marty, C. and Olefs, M. (2019): Investigating performance of using snow depth data to minimize the error in winter precipitation measurements. European Geosciences Union (EGU) General Assembly 2019, Wien, 09.04.2019.

Hartmeyer, I., Keuschnig, M., Helfricht, K., Leith, K., Otto, J.C. and Krautblatter, M (2018): Thinning Glaciers, Falling Rocks? The intriguing (and unknown) contribution of recent glacier retreat to increased high-alpine rockfall activity. 19. Österreichischer Klimatag, Salzburg, Austria, 24.04.2018.

Helfricht, K. (2018): GlacierRocks - Wechselwirkungen zwischen Gletscher und Felswand in Randklüften und deren Auswirkungen auf die Steinschlag-Aktivität. Jahrestagung des Arbeitskreises Hochgebirge (AKH), Innsbruck, Austria, 02.02.2018.

Helfricht, K. (2017): Korrekturen des festen Niederschlages unter Verwendung der Schneehöhe. 2. Workshop zur Alpen Hydrologie; Hydrologische Prozesse im Hochgebirge im Wandel der Zeit. 16.11.2017.

Helfricht, K. (2017): Increasing the temporal resolution of new snow measurements. FINSE workshop: Cool models for a warm climate - operational snow models for the present and future climate, Finse, Norway, 10.10.2017.

Helfricht, K. (2016): Using snow depth data to minimize the error in winter precipitation measurements. Colloquium at WSL Institute for Snow and Avalanche Research SLF, Davos, 25.08.2016.

Fischer, A. and Helfricht, K. (2016): One decade of scientific studies of snow management on Austria's glacier ski resorts. European Geosciences Union (EGU) General Assembly 2016, Wien, 21.04.2016.

Fischer, A., Stocker-Waldhuber, M., Seiser, B. and Helfricht, K. (2016): A decade of research on snow farming in glacier ski resorts: Any ice left? 20th Alpine Glaciology Meeting AGM, 25.02.2016.

Helfricht, K. (2015): Zur Verbesserung von hydrologischen Modellen in Gebirgsräumen auf Grundlage von ALS Schneehöhenmessungen. Von der hydrologischen Modellierung zu wasserwirtschaftlichen Entscheidungen – Fallstudien. Seminarveranstaltung der ÖGH anlässlich der Verleihung des Werner-Kresser-Preises, 30.11.2015

Helfricht K., Fischer, A., Stocker-Waldhuber, M., Seiser, B. and Hartl, L. (2015): Long term monitoring of Austrian glaciers as key for modelling future developments. ASG-Rhein Schnee & Gletscher Workshop, Viktorsberg, Austria, 26.-27.11.2015, 26.11.2015.

Helfricht, K. and Fischer, A. (2015): Gletscherstürme und Gipfelglück. Leben im Risikoraum Alpen. Deutscher Kongress für Geographie, Berlin, 1.-6.10.2015, Symposium Tag der Schulgeographie, 3.10.2015.

Helfricht, K., Huss, M. and Fischer, A. (2015): A comparison of measured and modelled ice thickness distributions as a basis for future glacier scenarios in the Ötztal Alps. International Union of Geodesy and Geophysics (IUGG), 26<sup>th</sup> General Assembly, 22.6.-02.07.2015, Prague, 24.06.2015.

Helfricht, K., Schöber, J., Hanzer, F., Schneider, K., Strasser, U., Lehning, M. and Kuhn, M. (2015): Airborne laser scanning: a basis for hydrological model studies in glacierized catchments. International Union of Geodesy and Geophysics (IUGG), 26<sup>th</sup> General Assembly, 22.6.-02.07.2015, Prague, 23.06.2015.

Fischer, A., Helfricht, K. and Mitterer, C. (2015): Time series of measured mountain glacier volumes from Little Ice Age to today as a playground for model validation. International Union of Geodesy and Geophysics (IUGG), 26<sup>th</sup> General Assembly, 22.6.-02.07.2015, Prague, 23.06.2015.

Schattan, P., Baroni, G., Förster, K., Francke, T., Kormann, C., Huttenlau, M., Oswald, S.E., Sailer, R., Schöber, J., Sprenger, S. and Strasser, U. (2015): Evaluating the above-ground cosmic-ray neutron sensor for measuring snow water equivalent at a multi-sensor snow research site (Kauertal, Austrian Alps). International Union of Geodesy and Geophysics (IUGG), 26<sup>th</sup> General Assembly, 22.6.-02.07.2015, Prague, 24.06.2015.

Helfricht, K., Kuhn, M., Keuschnig, M. and Heilig, A. (2014): Experiences with velocity assumptions for GPR measurements of snow depth. Workshop: Liquid water in snow - Measurement techniques and modelling approaches, Davos, 02.04.2014.

Hanzer, F., Helfricht, K., Schneider, K., Marke, T., Kuhn, M. and Strasser, U. (2014): Improved runoff simulations for glacierized catchments in the Ötztal Alps (Austria) using airborne laser scanning and energy and mass balance modelling. 18th Alpine Glaciology Meeting (AGM 2014), Innsbruck, 28.02.2014.

### **2010-2013**

Helfricht, K., Hanzer, F., Schneider, K., Marke, T., Kuhn M. and Strasser, U. (2013): Using LiDAR data for enhanced simulation of snow accumulation distribution in hydrological modelling of Alpine glacierized catchments. Davos Atmosphere and Cryosphere Assembly (DACA 2013), Davos, 10.07.2013.

- Schöber, J., Schneider, K., Helfricht, K., Achleitner, S., Schöberl, F. and Kirnbauer, R. (2013): Modelling of the spatial variability of the snow cover and the runoff of glacierized catchments. Davos Atmosphere and Cryosphere Assembly (DACA 2013), Davos, 09.07.2013.
- Helfricht, K., Schneider, K., Schöber, J., Sailer, R. and Kuhn, M. (2013): Analysis of multi-annual end-of-season snow accumulation patterns from LiDAR data. Davos Atmosphere and Cryosphere Assembly (DACA 2013), Davos, 08.07.2013.
- Hanzer, F., Helfricht, K., Schneider, K., Marke, T., Kuhn, M. and Strasser, U. (2013): Simulation of snow and ice melt discharge into the Gepatsch reservoir (Kaunertal/Austrian Alps). European Geosciences Union (EGU) General Assembly 2013, Wien, 12.04.2013.
- Helfricht, K., Hanzer, F., Schneider, K. and Kuhn, M. (2013): Poster: Snow cover distribution derived from multi-temporal LiDAR application in high alpine catchments. Workshop on the Dynamics and Mass Budget of Arctic Glaciers & the IASC Network on Arctic Glaciology Annual Meeting, Obergurgl, 26.02.2013.
- Helfricht, K. and Kuhn, M. (2012): Application of airborne laser scanning for hydrological investigations in alpine catchments. One Decade of Airborne Laser Scanning at Hintereisferner 2012, Obergurgl, 04.10.2012.
- Schöber, J., Schneider, K., Helfricht, K., Kirnbauer, R., Stötter, J. and Schöberl, F. (2012): The application of airborne laser scanned snow depth data for the analysis and modelling of the spatial variability of the alpine snow cover. One Decade of Airborne Laser Scanning at Hintereisferner 2012, Obergurgl, 04.10.2012.
- Helfricht, K., Schöber, J., Seiser, B., Fischer, A., Kuhn, M. and Stötter, J. (2011): Characteristics of snow accumulation in a high alpine catchment from LIDAR measurements. 15. Workshop Großskalige Hydrologische Modellierung, Igls, 03.11.2011.
- Helfricht, K., Seiser, B., Strasser, U., Kuhn, M., Sailer, R., Stötter, J., Vuilliet, E., Saltelli, A., Tarantola, S. and Schönlaub, H. (2011): Multiscale Snow/Icemelt Discharge Simulation into Alpine Reservoirs - the alpS MUSICALS project. 15th Alpine Glaciology Meeting (AGM 2011), München, 25.02.2011.
- Helfricht, K. (2012): Mass balance variability at Hallstätter Glacier since 1856. 14th Alpine Glaciology Meeting (AGM 2010), Milano / Mailand, 25.03.2010.

### *Poster presentations*

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#### **2014-2019**

- Helfricht, K., Achleitner, S., Haas, F., Hohensinner, S. and Schwaizer, G. (2019): Hidden.ice - Changing debris cover on Eastern Alpine glaciers: Quantification and hydrological impacts. 3. Workshop zur Alpen Hydrologie - Hydrologische Prozesse im Hochgebirge im Wandel der Zeit, Obergurgl, 21.11.2019.

- Helfricht, K., Achleitner, S., Hohensinner, S., Schwaizer, G. and Haas, F. (2019): Hidden.ice - Changing debris cover on Eastern Alpine glaciers: Quantification and hydrological impacts. International Mountain Conference, Innsbruck, 11.09.2019.
- Helfricht, K., Hartmeyer, I., Keuschnig, M., Krautblatter, M., Leith, K. and Otto, J.-C. (2019): The microclimate and temperature distribution inside a randkluft system – first observations and insights. European Meteorological Society (EMS) General Assembly 2019, Copenhagen, 09.09.2019.
- Helfricht, K., Huss, M., Fischer, A. and Otto, J.-C. (2019): Calibrated ice thickness estimate for all glaciers in Austria. Alpine Glaciology Meeting 2019, Innsbruck, 28.02.2019.
- Helfricht, K., Hartl, L., Koch, R., Marty, C., and Olefs, M. (2018): Investigating performance and correlation of ground-based snow depth and precipitation measurements. International Snow Science Workshop 08.10.2018, Innsbruck/AUSTRIA.
- Helfricht, K., Hartl, L., Koch, R., Marty, C., Lehning, M. and Olefs, M. (2017): Calculation of new snow densities from sub-daily automated snow measurements. European Geosciences Union (EGU) General Assembly 2017, Wien, 24.04.2017.
- Helfricht, K., Huss, M., Fischer, A. and Otto, J.C. (2017): Modelling distributed mountain glacier volumes: A sensitivity study in the Austrian Alps. European Geosciences Union (EGU) General Assembly 2017, Wien, 27.04.2017.
- Hartmeyer, I., Keuschnig, M., Krautblatter, M., Helfricht, K., Leith, K. and Otto, J.C. (2017): GlacierRocks – Glacier-Headwall Interaction and its Influence on Rockfall Activity. European Geosciences Union (EGU) General Assembly 2017, Wien, 25.04.2017.
- Fischer, A., Helfricht, K., Seiser, B., Stocker-Waldhuber, M., Hartl, L. and Wiesenegger, H. (2017): The challenge of monitoring the cryosphere in alpine environments: Prepare the present for the future. European Geosciences Union (EGU) General Assembly 2017, Wien, 26.04.2017.
- Otto, J.C., Helfricht, K., Prasicek, G., Buckel, J. and Keuschnig, M. (2017): Predicting future glacial lakes in Austria using different modelling approaches. European Geosciences Union (EGU) General Assembly 2017, Wien, 28.04.2017.
- Helfricht, K., Koch, R., Hartl, L. and Olefs, M. (2016): Potential and Challenges of an extensive operational use of high accuracy optical snow depth sensors. 16<sup>th</sup> International Snow Science Workshop ISSW, Breckenridge, Colorado, 3.10.2016.
- Helfricht, K., Huss, M. and Otto, J.C: (2016): Ice thickness estimations based on multi-temporal glacier inventories – potential and challenges. European Geosciences Union (EGU) General Assembly 2016, Wien, 20.04.2016.
- Helfricht, K., Koch, R. and Olefs, M. (2016): Do we have to correct winter precipitation for nowcast applications? European Geosciences Union (EGU) General Assembly 2016, Wien, 20.04.2016.

Helfricht, K., Wijngaard, R.R., Huttenlau, M. and Schneider, K. (2015): The separated effects of atmospheric forcing and changes in ice cover on runoff in the Ötztal catchment. International Union of Geodesy and Geophysics (IUGG), 26<sup>th</sup> General Assembly, 22.6.-02.07.2015, Prague, 24.06.2015.

Hanzer, F., Helfricht, K., Marke, T., Huttenlau, M. and Strasser, U. (2015): Mass balance and runoff simulations for glacierized catchments in the Ötztal Alps (Austria). International Union of Geodesy and Geophysics (IUGG), 26<sup>th</sup> General Assembly, 22.6.-02.07.2015, Prague, 27.06.2015.

Wijngaard, R. R., Helfricht, K., Schneeberger, K., Huttenlau, M., Schneider, K. and Bierkens, M. F.P. (2014): Climate change effects on runoff in the Ötztal glacierized catchments. European Geosciences Union (EGU) General Assembly 2015, Wien, 16.04.2015.

Helfricht, K., Lehning, M., Sailer, R. and Kuhn, M. (2014): The contribution of locally extreme snow depths to the winter snow cover volume of Alpine glaciers in the Ötztal Alps, Austria. 12th Swiss Geoscience Meeting 2014, Fribourg, 22.11.2014.

Helfricht, K., Schneeberger, K., Welebil, I., Schöber, J., Huss, M., Formayer, H., Huttenlau, M. and Schneider, K. (2014): Runoff scenarios of the Ötztal catchment (Tyrol, Austria) considering climate change driven changes of the cryosphere. European Geosciences Union (EGU) General Assembly 2014, Wien, 30.04.2014.

Helfricht, K., Schneeberger, K., Welebil, I., Formayer, H., Huttenlau, M. and Schneider, K. (2014): Abflussszenarien im Einzugsgebiet der Ötztaler Ache unter Berücksichtigung von veränderten klimatischen Bedingungen und einer damit verbundenen veränderten Kryosphäre. 15. Österreichischer Klimatag, Innsbruck, 03.04.2014.

Helfricht, K., Lehning, M., Sailer, R. and Kuhn, M. (2014): The influence of gravitational snow transport on the winter mass balance of Alpine glaciers in the Ötztal Alps. 18th Alpine Glaciology Meeting (AGM 2014), Innsbruck, 27.02.2014.

### **2011-2013**

Helfricht, K., Schneider, K., Sailer, R. and Kuhn, M. (2013): Lidar snow cover studies in the Ötztal Alps. 11th Swiss Geoscience Meeting 2013, Lausanne, 16.11.2013.

Helfricht, K., Schneider, K., Sailer, R. and Kuhn, M. (2013): Lidar snow cover studies in the Ötztal Alps. DACH Meteorologentagung 2013, Innsbruck, 04.09.2013.

Helfricht, K., Kuhn, M., Keuschnig, M., Heilig, A. and Schneider, K. (2013): Combination of LiDAR and GPR measurements to derive snow and ice dynamics at glacier surfaces. European Geosciences Union (EGU) General Assembly 2013, Wien, 09.04.2013.

Helfricht, K., Hanzer, F., Schöber, J. and Kuhn, M. (2012): Estimation of snow cover distribution in alpine catchments by application of airborne laser scanning. 10th Swiss Geoscience Meeting, 2012, Bern, 17.11.2012.

- Seiser, B., Helfricht, K., Huss, M., Fischer, A., Veulliet, E., Schönlaub, H., Kuhn, M. and Strasser, U. (2012): MUSICALS - (Multiscale Snow/ICemelt Discharge Simulation into ALpine ReservoirS): Validation of a method to estimate ice volume and ice thickness distribution in the Ötztal Alps, Tyrol, Austria. European Geosciences Union (EGU) General Assembly 2012, Wien, 23.04.2012.
- Helfricht, K., Keuschnig, M., Heilig, A., Mayer, C. and Kuhn, M. (2012): Airborne laser scan measurements of winter snow accumulation in high alpine catchments – hydrological implications and verification by ground penetrating radar at glacier surface. European Geosciences Union (EGU) General Assembly 2012, Wien, 22.04.2012.
- Helfricht, K., Keuschnig, M., Heilig, A., Mayer, C. and Kuhn, M. (2012): Evaluation of airborne laser scan measurements of winter snow accumulation at glacier surface. 16th Alpine Glaciology Meeting (AGM 2012), Zürich, 02.02.2012.
- Seiser, B., Helfricht, K., Huss, M., Fischer, A., Veulliet, E., Strasser, U., Kuhn, M. and Schönlaub, H. (2012): MUSICALS - (MULTiscale Snow/ICemelt Discharge Simulation into ALpine ReservoirS): First results of a method to estimate ice volume and ice thickness distribution in the Ötztal Alps, Tyrol, Austria. 16th Alpine Glaciology Meeting (AGM 2012), Zürich, 02.02.2012.
- Stocker-Waldhuber, M., Fischer, A., Helfricht, K., Reingruber, K. and Jurgeit, F. (2012): Five years of glacier mass balance on Mullwitzkees (Hohe Tauern) and Hallstätter Gletscher (Dachstein), Austria. 16th Alpine Glaciology Meeting (AGM 2012), Zürich, 02.02.2012.
- Sproß, M., Helfricht, K., Sailer, R. and Fischer, A. (2011): Quantitative Analysis of Local Snow Accumulation Patterns on an Alpine Glacier Surface Derived by LiDAR Data. Managing Alpine Future II, International Conference 2011, "Inspire and drive sustainable mountain regions", Innsbruck, 21.11.2011.
- Seiser, B., Huss, M., Fischer, A., Abermann, J., Helfricht, K., Strasser, U. and Kuhn, M. (2011): Modellierte Gletscherdicken zur Initialisierung hydrologischer Modellierung für die Ötztaler Alpen, Tirol. 15. Workshop Großskalige Hydrologische Modellierung, Igls, 03.11.2011.
- Seiser, B., Helfricht, K., Strasser, U., Kuhn, M., Sailer, R., Stötter, J., Veulliet, E. and Schönlaub, H. (2011): Modelling of snow- and icemelt contribution to Alpine streamflow with respect to climate change in the Ötztal Alps (Tirol, Austria): the alpS MUSICALS project. "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, 30.08.2011.
- Helfricht, K., Seiser, B., Strasser, U., Kuhn, M., Sailer, R., Stötter, J., Veulliet, E. and Schönlaub, H. (2011): Modelling of snow- and icemelt contribution to Alpine streamflow at different scales in the Ötztal Alps (Tirol, Austria): the alpS MUSICALS project. European Geosciences Union (EGU) General Assembly 2011 (EGU 2011), Wien, 04.04.2011.