

## Curriculum Vitae

### Georg Kaser

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#### *Research Interests*

• mass and energy balances on glaciers • fluctuations of climate and glaciers • glaciology, climatology and hydrology in tropical mountain regions • global glacier mass change and drivers.

#### *Professional Career:*

Since 2010: Full professor for Climate and Cryospheric Research at the Institute for Meteorology and Geophysics, University of Innsbruck;  
Chair: Innsbruck University Centre of Climate and Cryosphere.  
1997 - 2010: Associate professor at the Institute of Geography, University of Innsbruck.  
1985 - 1997: Assistant professor at the Institute of Geography, University of Innsbruck.  
1984 - 1985: Assistant professor at the Institute of Meteorology and Geophysics, University of Innsbruck.  
1973 - 1982: Student Assistant in the research project "Combined studies of ice, water, and energy balance of glacier catchment areas" in the Rofen Valley, Ötztal, Austria, as part of the "International Hydrological Decade (IHD)" and the "International Hydrological Project (IHP)".

#### *Positions in Scientific Organisations*

1999 – 2003: Secretary of the International Commission of Snow and Ice, ICSI/IAHS/IUGG  
2003 – 2007: President elect and President of the IUGG-Commission for the Cryospheric Sciences.  
2007 – 2011: Funder President and Immediate Past President of the International Associations for Cryospheric Sciences, IACS/IUGG.  
2004 – 2007: Lead Author: WG1, Ch. 4, IPCC 4th Assessment Report (2007)  
2007 – 2008: Lead Author: IPCC Technical Paper on Water and Climate Change (2008)  
2010 – 2013: Lead Author: WG1, Ch. 4, IPCC 5th Assessment Report (2013)  
2012 – 2013: Contributing Author: Summary for Policy Makers and Technical Summary, IPCC 5th Assessment Report (2013)  
2011 – 2014 – 2017: Member of the board of trustees: Austrian Science Fund (FWF)

#### *Teaching Activities*

Since 1986: University lecturer in different topics of glaciology, climatology, hydrology, cartography.  
1997-2010: Co-organiser and lecturer: International Karthaus Summer School on "Glaciers and Ice Sheets in the Climate System" (Karthaus, Italy)  
2002: Organiser, trainer: ICSI/UNESCO training course: glacier mass balance measurements and analyses (New Delhi and Chhota Shigri Glacier, India).  
2005: Co-organiser: ICSI/UNESCO training course: glacier mass balance measurements and analyses (Zongo Glacier, Bolivia).  
2009: Organiser, trainer: IACS/UNESCO training course: glacier mass balance measurements and analyses (Kathmandu and Yala Glacier, Nepal),.

#### *Supervision of Graduate Students and Postdoctoral Fellows*

10 Postdocs (since 1999)/ 8 PhD (since 1999)/ 27 Diploma/Master Students (since 1987)  
Institutes of Geography and Meteorology-Geophysics, University of Innsbruck; Austria

#### *Organisation of Scientific Meetings*

Since 1997: Co-initiator and-co-coordinator of the annual Alpine Glaciology Meeting.  
1999, 2004, 2009, 2014: Organiser: Alpine Glaciology Meetings in Innsbruck.

- 2007: Member of Scientific Program Committee, IUGG Assembly, Perugia.  
 2009 Member of the Scientific Program Committee, Joint IAMAS-IAPSO-IACS Assembly MOCA, Montreal, Canada.  
 2011 Member of the Scientific Program Committee, IUGG General Assembly Melbourne.

*Other services to the community*

- Convener of various symposia and sessions at scientific conferences since 1997.
- Editor of conference proceedings.
- Reviewer for scientific journals (Science, Global and Planetary Change, Journal of Glaciology, Geophysical Research Letters, Journal of Geophysical Research etc.).
- Reviewer for Australian, UK, USA, German, Danish, and Swiss Science Foundations.

*Institutional Responsibilities*

Since 1978: Member of Faculty (Fakultät) Assembly for several terms.  
 Since 1986: Member of the Department (Fachgruppe) and Institute Assembly for several terms  
 ;Institutes of Geography and the Institute of Meteorology and Geophysics.  
 Since 2013: Member of the Senate of the University of Innsbruck.

*Scientific and Teaching Expeditions led*

Cordillera Blanca, Kilimanjaro, Mt. Kenya, Rwenzori, Alps, Himachal Pradesh, Langtang.

*Publications since 2003 (selected)*

- Kaser, G.**, I. Juen, C. Georges, J. Gomez, and W. Tamayo (2003): The impact of glaciers on the runoff and the reconstruction of mass balance history from hydrological data in the tropical Cordillera Blanca, Perú. *Journal of Hydrology*, 288(1-4), 130-144.
- Mölg, T., C. Georges, **G. Kaser** (2003): The contribution of increased incoming shortwave radiation to the retreat of the Rwenzori Glaciers, East Africa, during the 20th century. *International Journal of Climatology*, vol. 23, 291-303.
- Kaser, G.**, D.R. Hardy, T. Mölg, R. Bradley, T.M. Hyera (2004): Modern glacier retreat on Kilimanjaro as evidence of climate change: Observations and facts. *International Journal of Climatology* **24**, 329-339.
- Mölg, T., D.R. Hardy, **G. Kaser** (2003): Solar-radiation maintained glacier recession on Kilimanjaro drawn from combined ice-radiation modelling. *J. of Geophysical Research*, **108**(D23), 4731, doi:10.1029/2003JD003546, 2003.
- Mölg, T., M. Renold, M. Vuille, N.J. Cullen, T.F. Stocker, **G. Kaser** (2006): Indian Ocean Zonal Mode activity in a multicentury-integration of a coupled AOGCM consistent with climate proxy data. *Geophysical Research Letters*, **33**, L18710, doi:10.1029/2006GL026384.
- Kaser, G.** J.G. Cogley, M.B. Dyurgerov, M.F. Meier, A. Ohmura (2006): Mass balance of glaciers and ice caps: Consensus estimates for 1961–2004. *Geophysical Research Letters*, **33**, L19501, doi:10.1029/2006GL027511.
- Lemke, P., J. Ren, R.B. Alley, I. Allison, J. Carrasco, G. Flato, Y. Fujii, **G. Kaser**, P. Mote, R.H. Thomas and T. Zhang (2007): Observations: Changes in Snow, Ice and Frozen Ground. In: *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Mölg, T., D.R. Hardy, N.J. Cullen, **G. Kaser** (2007): Tropical glaciers in the context of climate change and society: Focus on Kilimanjaro (East Africa). In Orlove, B., E. Wiegandt, B. Luckman (eds.): *Mountain Glaciers and Society*. California University Press, Berkeley.
- Cullen, N.J., T. Mölg, D.R. Hardy, K. Steffen, and G. Kaser (2007): Energy balance model validation on the top of Kilimanjaro using eddy correlation data. *Annals of Glaciology*, **46**, 227-233.
- Mölg, T., Cullen, N.J., Hardy, D.R., **Kaser, G.** and Klok, L. (2007) Mass Balance of a Slope Glacier on Kilimanjaro and its Sensitivity to Climate. *International Journal of Climatology*. DOI: 10.1002/joc.1589
- VUILLE, M., **G. KASER**, I. JUEN (2008) Glacier mass balance variability in the Cordillera Blanca, Peru and its relationship with climate and the large-scale circulation. *Global and Planetary Change*, 62(1/2), 14-28. doi: [10.1016/j.gloplacha.2007.11.003](https://doi.org/10.1016/j.gloplacha.2007.11.003)

- Winkler, M., I. Juen, T. Mölg, P. Wagnon, J. Gómez, and **G. Kaser** (2009): Measured and modelled sublimation on the tropical Glaciar Artesonraju. *The Cryosphere*, **3**, 21-30.
- Mölg, T., N.J. Cullen, D.R. Hardy, M. Winkler, and **G. Kaser** (2009): Quantifying climate change in the tropical mid troposphere over East Africa from glacier shrinkage on Kilimanjaro. *Journal of Climate*, **22**, 4162-4181.
- Mölg, T., N.J. Cullen, and **G. Kaser** (2009): Solar radiation, cloudiness and longwave radiation over low-latitude glaciers: Implications for mass balance modeling. *Journal of Glaciology*, **55**, 292-302.
- Cogley, J.G., J.S. Kargel, **G. Kaser**, and C.J. van der Veen (2010): Tracking the Source of Glacier Misinformation. *Science*, **327**, 522.
- Winkler, M., **G. Kaser**, N.J. Cullen, T. Mölg, D.R. Hardy, and W.T. Pfeffer (2010): Land-based marginal ice cliffs: focus on Kilimanjaro. *Erdkunde*, **64**, 2, 179-193.
- Mölg, T., N.J. Cullen, and **G. Kaser** (2010): Glacier loss on Kilimanjaro is an exceptional case. *Proceedings of the National Academy of Sciences USA*, **107**, E68.
- Kaser, G.**, T. Mölg, N.J. Cullen, D.R. Hardy, and M. Winkler (2010): Is the decline of ice on Kilimanjaro unprecedented in the Holocene? *The Holocene*, **20**, 1079-1091.
- Hofer, M., T. Mölg, B. Marzeion, and **G. Kaser** (2010): Statistical downscaling of NCEP/NCAR reanalysis to high-resolution air temperature and specific humidity above a glacier surface (Cordillera Blanca, Peru). *Journal of Geophysical Research*, **115**, D12120, doi:10.1029/2009JD012556.
- Kaser, G.**, M. Großhauser, and B. Marzeion (2010): Contribution potential of glaciers to water availability in different climate regimes. *Proceedings of the National Academy of Sciences*, **107**, 20223-20227.
- Ajai, L. Bengtsson, D. Breashears, P.J. Crutzen, S. Fuzzi, W. Haeberli, W.W. Immerzeel, **G. Kaser**, C. Kennel, A. Kulkarni, R. Pachauri, T. H. Painter, J. Rabassa, V. Ramanathan, A. Robock, C. Rubbia, L. Russell, M. Sánchez Sorondo, H.J. Schellnhuber, S. Sorooshian, T. F. Stocker, L.G. Thompson, O.B. Toon, D. Zaelke (2011). *Fate of Mountain Glaciers in the Anthropocene*. A Report by the Working Group Commissioned by the Pontifical Academy of Sciences. The Vatican, May 2, 2011, pp. 15.
- Prinz, R., A. Fischer, L. Nicholson, and **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.
- 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.
- Mölg, T., and **G. Kaser** (2011): A new approach to resolving climate-cryosphere relations: Downscaling climate dynamics to glacier-scale mass and energy balance without statistical scale linking. *Journal of Geophysical Research*, **116**, D16101.
- Marzeion, B., Hofer, M., Jarosch, A. H., **Kaser, G.**, and Mölg, T. (2012): A minimal model for reconstructing interannual mass balance variability of glaciers in the European Alps, *The Cryosphere*, **6**, 71-84, doi:10.5194/tc-6-71-2012.
- Prinz R, Nicholson L, **Kaser G.** Variations of the Lewis Glacier, Mount Kenya, 2004-2012. (2012) *Erdkunde*. 66:255 - 262.
- Diemberger, H., K. Hastrup, S. Schaffer, C. F. Kennel, D. Sneath, M. Bravo, H.-F. Graf, J. Hobbs, J. Davis, M. L. Nodari, G. Vassena, R. Irvine, C. Evans, M. Strathern, M. Hulme, **G. Kaser** & B. Bodenborn (2012) Communicating Climate Knowledge Proxies, Processes, Politics. *Current Anthropology*, **53**, 226-244.
- Painter TH, Flanner MG, **Kaser G**, Marzeion B, VanCuren RA, Abdalati W. End of the Little Ice Age in the Alps forced by industrial black carbon. (2013) *Proceedings of the National Academy of Sciences*. 110:15216 - 15221.
- Paal P, Brugger H, **Kaser G**, Putzer G, Tiefenthaler W, Wenzel V. (2013) Surviving 6 days in a crevass. *The Lancet*. 381:506.
- Nicholson L, Prinz R, Mölg T, **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.

- Gurgiser W, Mölg T, Nicholson L, **Kaser G.** (2013) Mass balance model parameter transferability on a tropical glacier. *Journal of Glaciology*. 59:845 - 858.
- Gurgiser W, Marzeion B, Nicholson L, Ortner M, **Kaser G.** (2013) Modeling energy and mass balance of Shallap Glacier, Peru. *The Cryosphere*. 7:1787 - 1802.
- Gardner, A. S., G. Moholdt, J. G. Cogley, B. Wouters, A. A. Arendt, J. Wahr, E. Berthier, R. Hock, W. T. Pfeffer, **G. Kaser**, S. R. M. Ligtenberg, T. Bolch, M. J. Sharp, J. O. Hagen, M. R. van den Broeke & F. Paul (2013) A Reconciled Estimate of Glacier Contributions to Sea Level Rise: 2003 to 2009. *Science*, 340, 852-857.
- Vaughan, D. G., J. C. Comiso, I. Allison, J. Carrasco, **G. Kaser**, R. Kwok, P. Mote, T. Murray, F. Paul, J. Ren, E. Rignot, O. Solomina, K. Steffen & T. Zhang. 2013. Observations: Cryosphere. In *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, eds. T. F. Stocker, D. Qin, G.-K. Plattner, M. Tignor, S. K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex & P. M. Midgley. Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press.
- Pfeffer W. T., A. A. Arendt, A. Bliss, T. Bolch, J. G. Cogley, A. S. Gardner, J.-O. Hagen, R. Hock, **G. Kaser**, C. Kienholz, E. S. Miles, G. Moholdt, N. Mölg, F. Paul, V. Radic, P. Rastner, B. H. Raup, J. Rich, M. J. Sharp & the RGI Consortium (2014): The Randolph Glacier Inventory: a globally complete inventory of glaciers. *Journal of Glaciology*.
- Bahr, D. B., W. T. Pfeffer and **G. Kaser** (2014) Glacier volume estimation as an ill-posed inversion. *Journal of Glaciology*, 60, 922-934. doi: 10.3189/2014JoG14J062
- Bahr, D. B., Pfeffer, W. T., and Kaser, G., (2014): A Review of Volume-Area Scaling of Glaciers. *Reviews of Geophysics* 2014 RG000470.  
<http://onlinelibrary.wiley.com/doi/10.1002/2014RG000470/pdf>

#### Ongoing Grants (2014)

Project Title	Funding source	Period	Role of GK
Vulnerability to Water Scarcity and Glacier Fed Water Availability in the Tropical Callejón de Huaylas, Peru; A joint case study of human-geographers and glacio-hydrologists.	FWF <sup>1</sup> (+DFG <sup>2</sup> partner)	2012 - 2015	PI
A physically based regional mass balance approach for the glaciers of the Vinschgau catchment; glacier contribution to water availability	STSF <sup>3</sup>	2013 - 2015	PI
Mass Balance Hintereis- and Kesselwandferner, Ötztal, Austria	Tyrolean Gov./ Univ. Innsbruck	long term annual contracts	PI
Mass balance Langenferner, Ortles Cevedale Group, Italy	S-Tyrol. Gov.	long term annual contracts	PI
Downscaling of Climate Variability: Towards an Impact Assessment for Glaciers in the Cordillera Blanca, Peru	FWF	2009 - 2014	Co-PI
Multidecadal to Centennial Climate Variability: Assessing the Conditions for the Glaciation of Tropical Mountains for Glaciers in the Cordillera Blanca, Peru	FWF	2010 - 2015	Co-PI
Reconstructing and Projecting the Global Behavior of Glaciers from 1850 to 2300	FWF	2013 - 2016	Co-PI

<sup>1</sup> Austrian Science Fund

<sup>2</sup> Deutsche Forschungsgemeinschaft

<sup>3</sup> Südtiroler Wissenschaftsfonds