Dr Joel Fiddes

Geoscientist

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Currently

I am a geoscientist with over 10 years of interdisciplinary experience working across research institutions, international organistations and multilateral donor projects. My main interest is on high mountain processes related to natural hazards, water resources and resulting impacts upon communities. I use and develop geoscientific models and other datascience tools in combination with field campaigns to understand these processes and improve mapping and forecasting methods.

Education

2009–13 University of Zurich PhD Geoscience. Thesis: Subgrid Simulation of Land Surface Variables in Heterogeneous and Remote Environments: Application to Mountain Permafrost. ETH library.

2006–07 University of Edinburgh MSc Environment & development. Thesis: Impact of climate change on snow-based water resources in Afghanistan.

2001–04 University of Aberdeen BSc Environmental science. Thesis: Sustainability of subsistence hunting on Neotropical mammal species in North-East Peruvian Amazon.

Employment & Projects

2018– WSL Institute for Snow and Avalanche Research SLF *Research scientist*. Investigating snow processes in High Asia using models, EO data and field measurements under SNF project “From Cloud to Ground: Snow Accumulation in Extreme Environments”.

2018–2019 Landell Mills Ltd *Consultant* Zarafshan River Basin Programme, EU TA project with Ministry of Energy and Water Resources, Tajikistan. Develop pilot routines for monitoring and modelling snow based water resources.

2017–2018 University of Oslo *Scientist* Swiss National Science Foundation research scholar. Developing data assimilation and uncertainty framework for large area snowpack simulations in mountain regions.

2017–2019 World Meteorological Organistation *Consultant* for the WMO programme Global Cryosphere Watch. Developing a global solution for interoperability of CryoNet monitoring stations and GCW dataportal.

2014–2017 WSL Institute for Snow and Avalanche Research SLF *Data scientist*. Developing and managing data systems for the SwissEx/ OSPER project a large interdisciplinary environmental data acquisition and management project with multiple ETH domain partners. The WSL/ SLF is a leading federal institue in Switzerland for both hydrology and natural hazard assesments.

2016 Himalaya Permafrost ETH SEED *Scientist* Establishment of high altitude permafrost monitoring sites Langtang, Nepal. Training young Nepalese scientists. International permafrost and data tools workshop with participants from Afghanistan, India and Nepal.

2014 University of Zurich *Scientist*. Managing PERMOS network of ground and rock temperature measurements at Jungfraujoch, Schilthorn, Piz Corvatsch. Including extensive fieldwork and rope-access work. Processing GST, meteorological station and borehole data (www.permos.ch).

2014 University of Zurich *Scientist*. Swiss Development Cooperation/DEZA funded climate change adaptation programme (www.ihcap.in). Developing baseline maps for key land surface variables in the Indian Himalaya with direct coordination with several Indian Government agencies (lead Department of Science & Technology).

2012 Afganistan Research Evaluation Unit *Consultant*. Remote sensing analysis of water availability in irrigated zones in Sar-i-Pul River Basin.

2011 GIZ/ Hydroc *Consultant*. Disaster risk management project in Badahkshan, Afghanistan for GIZ. Component avalanche hazard risk zones.

2011 Afganistan Research Evaluation Unit *Consultant*. Remote sensing analysis of water availability in irrigated zones in Panj Amu River Basin.

2010–2011 Landell Mills Ltd. *Consultant*. As part of Panj-Amu River Basin Programme (P-ARBP) in north-east Afghanistan developed a strategy together with a range of tools to improve water resource management. Training the first government team in snow sampling techniques (training course Wakhan Corridor). Establishment of high altitude field sites.

2009 Agha Khan Foundation *Consultant*. Project “PMIS”: Remote sensing analysis of irrigated zones in Baghlan NE AFghanistan. GIS & Remote Sensing – Applications in Social Water Management. –>

2009–2013 University of Zurich *Scientific researcher/ PhD Candidate*. National science foundation funded research undertaken to develop and test tools that enable efficient application of numerical models driven by climate datasets in complex terrain. Work resulted in three first author publications. Oral and poster presentations at several international conferences. Supervision of Msc and BSc. students. Fieldwork in high mountain environments. Large-scale deployment of temperature sensors.

2009 Agha Khan Foundation *Consultant*. Training in GIS systems and geospatial survey for AKF project engineers in Puli Khumri NE Afghanistan.

2007–2011 Independent Consultant Projects mainly in field of water resources include: Environmental change analysis, capacity building, surveying / mapping, technical training. Clients include: multinational/ national donors, development consultancies, NGOs, e.g. European Commission, Landell Mills Ltd. Agha Khan Foundation, GIZ, Concern Worldwide.

2008 Welt Hunger Hilfe *Consultant*. Upper catchment protection project “PEEP”: training in geospatial survey and GIS systems for PEEP project staff.

2008 Concern Worldwide/ Welt Hunger Hilfe *Consultant*. Social water management and upper catchment protection projects “SWIM/SMILE”: Established GIS systems and conducted training in geospatial surveys for project staff. Surveying of irrigation channels and infrastructure.

2008 Concern Worldwide *Consultant*. Market analysis for natural resorce based products in Takhar NE Afghanistan.

2007 Landell Mills Ltd. *Consultant*. Environmental screening report for irrigation rehabilitation component of Kunduz River Basin Programme. Additionally provided concept note on methods in snow and ice monitoring.

2007 Mercy Corps *Researcher*. Author of a policy document for global humanitarian agency Mercy Corps. Construction and analysis of a 30 year satellite data record to assess possible changes in snowcover area (SCA) over this period and implications for water resources of Northern Afghanistan. Collaboration with the Landell Mills led European Commision Kunduz River Basin Programme.

1999–2004 Formative research expeditions Gulf apex predator prey project (*University Alaska Fairbanks, Alaska, 2004*). Subsistence hunting study (*University of Aberdeen/ Royal Geographical Society, Peruvian Amazon, 2003*), Coral reef biodiversity monitoring (*Greenforce/ University of Malaysia, Borneo, 2001*), Tian Shan biodiversity study (*BSES/CEH, Kyrgyzstan, 1999*).

Core competences

Technical Land-surface modelling and model development with focus on mountain environments.

Environmental analysis using climate data and other large datasets.

Remote sensing services, analysis of environmental change, snow cover, drought conditions, cropping patterns etc.

Proposal writing and Project management.

Field Establishment of field monitoring tools, deployment of sensors/ stations.

Scientific expedition planning and leading.

Impact of climate change in mountain regions and implications for development activities/ communities.

Training Development of project specific modelling tools.

Workshops and lectures.

Field training in glacio-hydrological methods.

Technical skills

Geospatial analysis
Numerical models
Remote sensing / image processing
Statistical analysis
Large data processing
SQL / Postgres
Database management
Server admin
Cluster/HPC computing
Linux
R
Python
AWK

Bash
LaTeX

Publications

Peer reviewed

2020 Bavay, M., Fiddes, J. and Godøy, Ø., 2020. Automatic Data Standardization for the Global Cryosphere Watch Data Portal. Data Science Journal, 19(1), p.6. DOI: 10.5334/dsj-2020-006

Bender, E., Lehning, M., & Fiddes, J. 2020. Changes in climatology, snow cover and ground temperatures at high alpine locations, Front. Earth Sci. *In press*.

2019 Fiddes, J., Aalstad, K., and Westermann, S.: Hyper-resolution ensemble-based snow reanalysis in mountain regions using clustering, Hydrol. Earth Syst. Sci., 23, 4717–4736, 2019._ 10.5194/hess-23-4717-2019

2016 Allen, SK., Fiddes J., Linsbauer, A., Randhawa, S.S., Salzmann, N. 2016: Indo-Swiss partnership initiates first local permafrost studies in the Indian Himalaya. Current Science, 11, 3, 550-553, Researchgate

2015 Fiddes, J., Endrizzi, S., and Gruber, S.: Large-area land surface simulations in heterogeneous terrain driven by global data sets: application to mountain permafrost, The Cryosphere, 9, 411-426, doi:10.5194/tc-9-411-2015, 2015. 10.5194/tc-9-411-2015

2014 Fiddes, J. & Gruber, S. 2014: TopoSCALE v.1.0: downscaling gridded climate data in complex terrain, Geoscientific Model Development, 7, 387-405, 10.5194/gmd-7-387-2014

2013 Habib, H., Anceno, A. J., Fiddes, J., Beekma, J., Ilyuschenko, M., Nitivattananon, V., & Shipin, O. V. (2013). Jumpstarting post-conflict strategic water resources protection from a changing global perspective: Gaps and prospects in Afghanistan. Journal of environmental management, 129, 244-259. Researchgate

2012 Fiddes, J. & Gruber, S. 2012: TopoSUB: a tool for efficient large area numerical modelling in complex topography at sub-grid scales, Geoscientific Model Development, 5, 1245–1257,10.5194/gmd-5-1245-2012

Schmid, M.-O., Gubler, S., Fiddes, J. & Gruber, S. 2012: Inferring snow pack ripening and melt out from distributed ground surface temperature measurements, The Cryosphere, 6, 1127–1139,10.5194/tc-6-1127-2012

2011 Gubler, S., Fiddes, J., Keller, M., & Gruber, S. 2011. Scale-dependent measurement and analysis of ground surface temperature variability in alpine terrain. The Cryosphere, 5(2), 431-443, 10.5194/tc-5-431-2011

2010 Matthias Keller, Guido Hungerbuehler, Oliver Knecht, Suhel Sheikh, Jan Beutel, Stefanie Gubler, Joel Fiddes, and Stephan Gruber. 2010. iAssist: rapid deployment and maintenance of tiny sensing systems. In Proceedings of the 8th ACM Conference on Embedded Networked Sensor Systems (SenSys '10). ACM, New York, NY, USA, 401-402. 10.1145/1869983.1870043

Non-peer reviewed

2019 Muccione, V, and Fiddes, J. "State of the Knowledge on Water Resources and Natural Hazards under Climate Change in Central Asia and South Caucasus." Managing Disaster Risks and Water under Climate Change. 2019. reliefweb

The Status and Role of the alpine Cryosphere in Central Asia *(Book Chapter)*. Martin Hoelzle, Martina Barandun, Tobias Bolch, Joel Fiddes, Abror Gafurov, Veruska Muccione, Tomas Saks and Maria Shaghedanova *in* The Aral Sea Basin: Water for Sustainable Development in Central Asia eds.Stefanos Xenarios, Dietrich Schmidt-Vogt, Manzoor Qadir, Barbara Janusz-Pawletta, Iskandar Abdullaev, 2019, Routledge ISBN 9781138348882. Chapter 8 open access

2018 Muccione, Veruska; Huggel, Christian; Salzmann, Nadine; Fiddes, Joel; Nussbaumer, Samuel U; Novikov, Viktor; Hughes, Geoff (2018). Climate-cryosphere-water nexus: Central Asia outlook. Zoï Environment Network. doi: 10.5167/uzh-161876.

Mathias Bavay, Joel Fiddes, Charles Fierz, Michael Lehning, Fabiano Monti, Thomas Egger. The MeteoIO pre-processing library for operational applications. Proceedings, International Snow Science Workshop, Innsbruck, Austria, 2018 Montana Library.

2014 Fiddes, J. T. (2014). Subgrid Simulation of Land Surface Variables in Heterogeneous and Remote Environments: Application to Mountain Permafrost (Doctoral dissertation). ETH library.

2011 Beekma, J. and Fiddes, J. 2011. Floods and droughts: The Afghan water paradox. Centre for Policy and Human Development, Afghanistan Human Development Report 2011. online version

2010 Keller, M., Hungerbuehler, G., Knecht, O., Sheikh, S., Beutel, J., Gubler, S., Fiddes, J. and Gruber, S. (2010). iAssist: rapid deployment and maintenance of tiny sensing systems. In Proceedings of the 8th ACM Conference on Embedded Networked Sensor Systems (pp. 401-402). ACM.

Fiddes, J. (2010). Climbs and expeditions: Asia, Afghanistan, Hindu Kush, Koh-i-Beefy. American

Alpine Journal. 52, 84, pp.255. online version BBC article

2007 Fiddes, J. (2007). Afghanistan: Implications Of Climate Change For Water Resources In The Kunduz River Basin in Climate Challenges: Bridging the Knowledge Gap.Mercy Corps Climate change unit. online version

Grants & Awards

2019 Expedition to install permafrost monitoring network in Northern Alai Range Tajikistan, Mount Everest Foundation (*4K CHF*)

2017 TopoSAT: High resolution surface modelling of the Himalayan cryosphere with satellite data assimilation. Swiss National Science Foundation Post-doc mobility (*120K CHF*)

2015 Data and monitoring tools for improved water resource management in Afghanistan. SEED Grant (*10K CHF*)

2001 Prince of Wales Student Scholarship (Tuition fees)

Professional memberships

International Association of Cryospheric Sciences
European Geosciences Union

Reviewer for

The Cryosphere
Geoscientific Model Development
Remote Sensing
Journal of Climatology
Geograhpica Helvetica
Environmental Earth Sciences
Annals of Glaciology
Journal of Geophysical Research

Languages

English (*Mother tongue*)
German (*Intermediate*)
Romansh (*Basic*)
Dari (*Basic*)

Country experience

Afghanistan
Borneo
Kyrgyzstan
India
Nepal
Norway
Peru
Switzerland
Tajikistan

References

Available on request.

Short CV