Prof. Dr. Benjamin D. Stocker

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Education

Nov. 2009-Dec. 2013 **Ph.D. Climate Sciences at Climate- and Environmental Physics**, University of Bern,
Climate Forcings and Feedbacks from the Terrestrial Biosphere – From Greenhouse-Gas Emissions to Anthropogenic Land Use Change
Supervised by Prof. Fortunat Joos, date obtained: 13. Dec. 2013

Sep. 2007-Oct. 2009 **M.Sc. Climate Sciences at Climate- and Environmental Physics**, University of Bern,
Transient Simulations of Land Use Change in the Holocene – Separating the Human Impact from Natural Drivers of the Carbon Cycle
Supervised by Prof. Fortunat Joos, date obtained: 16. Nov. 2009

Jun. 2006 **Undergraduate in Geography** (120 ECTS) with a Minor (60 ECTS) in **Physics**, and a complementary (15 ECTS) in **General Ecology**, University of Bern

Employment

Since Sep. 2019 **Assistant Professor** for Computational Ecosystem Science, Department for Environmental Systems Science, ETH Zürich, and WSL Birmensdorf, Switzerland

Apr. 2019-Aug. 2019 **Visiting Scholar** with Prof. Robert Jackson, Department of Earth System Science, Stanford University, USA

Mar. 2017-Feb. 2019 **Marie Skłodowska-Curie Postdoctoral Research Fellow** with Prof. Josep Peñuelas, Ecological and Forestry Applications Research Centre (CREAF), Barcelona, Spain

Sep. 2017-Feb. 2018 **Postdoctoral Researcher** with Prof. S. Seneviratne, Department for Environmental Systems Science, ETH Zürich, Switzerland

Mar. 2014-Sep. 2016 **Postdoctoral Research Fellow**, with Prof. I. C. Prentice, Department of Life Sciences, Imperial College London, U.K.

Jan.-Feb. 2014 **Postdoctoral Researcher** with Prof. F. Joos, Climate- and Environmental Physics, University of Bern.

Mar.-Jun. 2011 **Visiting Scholar** with Prof. I. C. Prentice, at Macquarie University, Sydney, Australia

Grants

- **SNF Eccellenza Professorial Fellowship**, *MIND - developing next-generation Modelling approaches for simulating processes in the terrestrial biosphere by Including New Data streams and optimality approaches*; Swiss National Science Foundation, 60 months, Sep. 2020 - Aug. 2024, total 1.8 mio. CHF (approx. 1.6 mio. EUR)
- **Marie Sklodowska-Curie Actions Individual Fellowship**, *Understanding soil fertility impacts on terrestrial biomass production in a changing environment*, Mar. 2017-Feb. 2019, project number H2020-MSCA-IF-2015-701329 FIBER, total 158 kEUR (approx. 181 kCHF)

- **WSL Internal Innovative Project**, *Increasing cold stress on photosynthesis in a warming world?* Granted Aug. 2019, 60 kCHF (approx. 56 kEUR) [*Wald Schnee Landschaft* research centre internal project]
- **Schmidt Futures, Virtual Earth System Research Institute**, *Land Ecosystem Models based On New Theory, obseRvations, and ExperimEnts (LEMONTREE)*, starting 2021, co-PI, 10 mio. US$ (approx. 9 mio. CHF)
- **[Offered] Incoming PEGASUS Fellowship,** granted by the Flemish Science Foundation (FWO), 36 months, July 2016. Not accepted due to acceptance of the MSCA Fellowship (see above).
- **SNF Early Postdoc.Mobility scholarship**, *Ecosystem impacts of climatic extremes versus gradual environmental change*, Swiss National Science Foundation, 18 months, Mar. 2015 - Aug. 2016, project number P2BEP2_158964, total 63 kEUR (72 kCHF).
- **INQUA Travel grant** for early career scientists for participation at the XIX INQUA Congress in Nagoya (60,000 JPY – approx. 1.5 kCHF)

Teaching

- **Environmental Systems Data Science**, lecturer and co-author, for M.Sc. in Environmental Sciences and M.Sc. in Agricultural Sciences, ETH Zürich; designed new course material (2020)
- **Global Change Biology**, lecturer, for M.Sc. in Environmental Sciences and M.Sc. in Agronomy, ETH Zürich (2020)
- **Introduction to the Carbon Cycle**, guest lecturer, for MRes in Ecosystem and Environmental Change, Imperial College London; designed own course material (2015)
- **Teaching assistant** for several courses: *Introduction to Carbon Cycle* 2012, 2013; *Introduction to Climate- and Environmental Physics,* 2010, 2012; *Physics Lab, 2013*

Mentoring

- **Current:** Dr. Laura Marqués, Postdoc, 2019-present (topic: global change effects on forest dynamics); Yunke Peng, Ph.D., 2019-present (topic: carbon-nutrient cycle interactions); Francesco Giardina, Ph.D., 2019-present (topic: water-carbon coupling)
- **Past** (co-supervision): Paula Casadei, M.Sc., 2018-2019; Fabian Feissli, M.Sc., 2011; Guan Jie Low, B.Sc. 2014

Organisation of conferences

- **Workshops:** *Terrestrial nitrogen cycling in Earth system models revisited*, UK, Feb. 2016; *Palaeoclimate experiments to evaluate the impact of LULC on climate and the carbon cycle: a joint co-design workshop of the PAGES LandCover6ka WG and the Palaeoclimate Modelling Intercomparion Project*, Sep. 2018
- **Conference sessions:** *Terrestrial ecosystem responses to global change: integrating experiments and models to understand carbon, nutrient, and water cycling* (EGU 2018, 2019, 2020); *Scaling terrestrial ecosystem carbon and water response from leaf to continent with observations and simulations* (EGU 2019, EGU 2020); *Predicting the response of carbon, nutrient and water to global change: Where theory, data and models meet* (SIBECOL 2019); *Understanding past variations in atmospheric greenhouse gases to constrain future feedbacks in the Earth system (PAGES OSM 2017); Using palaeo-environmental data to quantify climate feedbacks* (INQUA 2015)

Awards

- **Faculty prize** for best Master's thesis at the Physics Institute, University of Bern, obtained Feb. 2010

Professional service and panel memberships

- **Review Editor** for *Forest Growth - from trees to ecosystems*, a specialty of *Frontiers in Forests and Global Change*
- **Ph.D. jury member:** Dr. Marcos Fernández-Martínez, UAB Barcelona, Spain (Jan. 2016)
- **Reviewer for grant proposals:** ERC Consolidator Grant Call 2018

- **Completed peer reviews** for journals: *Nature* (3)*, Nature Geoscience* (4), *Nature Climate Change* (1), *New Phytologist* (3), *Global Change Biology* (2), *Geoscientific Model Development* (5), *Biogeosciences* (8), *Journal of Climate* (1)*, Earth System Dynamics* (1)*, Environmental Research Letters* (1)*, Geophysical Research Letters* (1), *Global Biogeochemical Cycles* (1), *Earth and Planetary Science Letters* (1), *Journal of Geophysical Research – Biogeosciences* (1), *Earth's Future* (1), *AGU Advances* (2) [see also publons.com/a/1186022/]

Invited seminars and keynotes

- [Scheduled] *Searching for principles to predict terrestrial ecosystem dynamics*, Colloquium in Climatology, Climate Impact and Remote Sensing, Institute of Geography, University of Bern, invited seminar, December 2020
- *(How) can we predict and observe global patterns of plant rooting depth?* BIOGEO Seminar Series, IPSL - LSCE, Paris, invited seminar, 2020
- *Soil moisture controls on C cycle variability and drought impacts across scales*, Lunch Seminar, Department of Global Ecology, Carnegie Institution for Science, Stanford, invited seminar, 2019
- *Towards a cost-based approach to understand and model nutrient limitation in terrestrial ecosystems,* INRA Bordeaux, invited seminar, 2018
- *Using data from ecosystem manipulation experiments to calibrate and validate (improve) models*, ClimMani Cost Action Final Conference, Utrecht, invited keynote, 2017
- *Trade-offs and optimality principles to guide the development of a next-generation vegetation model?* IPSL – LSCE, Paris, invited seminar, 2017
- *Large CO2 emissions from preindustrial land use change – Does the carbon budget add up?* University of Cambridge, invited seminar, 2016
- *Optimal plant carbon allocation implies a biological control on nitrogen availability*, PLECO, University of Antwerp, invited seminar, 2016
- *Preindustrial human impacts on the carbon cycle*, University of Reading, invited seminar, 2015
- *Preindustrial human impacts on the carbon cycle*, University College London, invited seminar, 2015
- *Spatio-temporal dynamics of global peatland extent and carbon stocks as simulated for the past twenty thousand years,* MPI Hamburg, invited seminar, 2014

First-author oral presentations

- *Global climate controls on the plant rooting depth*, European Geosciences Union General Assembly, Vienna, Austria, 2020
- *Does flexible carbon allocation relieve nitrogen limitation? Theory and observations for a resource economics paradigm to model carbon-nitrogen cycle interactions in terrestrial ecosystems*, European Geosciences Union General Assembly, Vienna, Austria, 2019
- *Soil moisture controls on C cycle variability and drought impacts across scales,* American Geosciences Union Fall Meeting, Washington, USA, 2018
- *Satellite observations underestimate the impact of drought on terrestrial primary productivity*, European Geosciences Union General Assembly, Vienna, Austria, 2018
- *Evaluating revised past landuse change scenarios within carbon cycle constraints - a roadmap for including PAGES Landcover6K products for model-intercomparison*, 1st PMIP4 Conference, Stockholm, Sweden, 2017
- *Can observed ecosystem responses to elevated CO_2 and N fertilisation be explained by optimal plant C allocation?*, European Geosciences Union General Assembly, Vienna, Austria, 2016
- *Lost peatlands: Hindcasting the spatial shift in peatland distribution since the Last Glacial Maximum and its implication for the global peatland carbon balance,* XIX INQUA 2015, Nagoya, Japan, 2015
- *Multiple greenhouse gas feedbacks from the land biosphere under future climate change scenarios,* European Geosciences Union General Assembly, Vienna, Austria, 2013

First-author posters

- *Soil moisture effects are underestimated by global GPP datasets*, 10th International Carbon Dioxide Conference, Interlaken, Switzerland, 2017
- *Using reconstructions of the global peat C balance over the Holocene to constrain the timing and magnitude of anthropogenic land use emissions*, European Geosciences Union General Assembly, Vienna, Austria, 2016
- *How should we represent terrestrial carbon-nitrogen cycle interactions in Earth system models? A roadmap for model development*, Workshop on CMIP5 Model Analysis and Scientific Plans for CMIP6, Dubrovnik, Croatia, 2016
- *Feedbacks between climate change and the terrestrial biosphere,* International Scientific Conference: Our Common Future under Climate Change, Paris, France, 2016
- *Modelling C allocation in response to nutrient availability,* European Geosciences Union General Assembly, Vienna, Austria, 2015
- *Optimal Plant Carbon Allocation Implies a Biological Control on Nitrogen Availability,* American Geosciences Union Fall Meeting, Washington, USA*,* 2015
- *Spatio-temporal dynamics of global peatland extent and carbon stocks as simulated for the past twenty thousand years*, American Geosciences Union Fall Meeting, Washington, USA, 2014
- *Holocene atmospheric CO_2 and land use change - Analyses with a process-based model*, INQUA XVIII, Bern, Switzerland, 2011
- *Transient simulations of the global carbon cycle, atmospheric CO_2 and climate over the preindustrial Holocene: anthropogenic land cover change vs. natural drivers*, 8th International Carbon Dioxide Conference, Jena, Germany, 2009

Other skills

- **Spoken languages:** German: mother tongue; English: proficient; French: proficient; Spanish: advanced
- **Programming languages:** R, Fortran, Bash, Python, SQL, LaTeX
- **Machine learning:** R-caret, R-keras