

## Europass Curriculum Vitae



### Personal information

Surname(s) / First name(s) **Fritz, Steffen**

Address(es) International Institute for Applied Systems Analysis (IIASA),  
Ecosystem Services and Management (ESM) Program  
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Nationality German

Date of birth 11/06/1969

Gender Male

### Occupational field **Deputy Program Director, ESM Program**

### Work experience

Dates Since 2007

Occupation or position held Deputy Program Director, ESM  
Group Leader, Earth Observation Systems (EOS)  
Senior Research Scholar

Main activities and responsibilities Deputy Program Director (ESM), Group Leader (EOS) and Principal Investigator of the Crowdland (funded by the European Research Council); LandSense and WeObserve (funded by the European Commission - H2020) Projects

Name and address of employer International Institute for Applied Systems Analysis (IIASA), ESM Program,  
Schlossplatz 1, A-2361 Laxenburg, Austria

Type of business or sector International, Non-governmental Research Institute

Dates 2001 - 2006

Occupation or position held Researcher in GIS, Agronomy, Land Monitoring

Main activities and responsibilities GIS, Data Analysis, Land Cover Mapping

Name and address of employer Joint Research Centre, European Commission  
Via Fermi, 1, Italy

## Education and training

Dates 1997 - 2001  
Title of qualification awarded Ph.D.  
Principal subjects / occupational skills covered Geographical Information Systems, Wildland Research, Biogeography, Biodiversity  
Name and type of organisation providing education and training University of Leeds, UK

Dates 1995 – 1996  
Title of qualification awarded M.Sc. Masters in Geographical Information for Development  
Principal subjects / occupational skills covered Theory of Geographical Information Systems  
Remote Sensing, Integration of GIS and Remote Sensing  
Dissertation: Wilderness mapping of Venezuela (distinction)  
Name and type of organisation providing education and training University of Durham, UK

Dates 1990 - 1995  
Title of qualification awarded Physics and Geography, Zwischenprüfung  
Principal subjects / occupational skills covered Physics: Practical work in Experimental Physics II  
Geography: Map Interpretation, Civilisation Ecology  
Name and type of organisation providing education and training University of Tübingen, Germany

Dates 1993 - 1994  
Principal subjects / occupational skills covered Exchange Student  
Name and type of organisation providing education and training University of Newcastle, UK

## Personal skills and competences

Languages German (native)  
English (fluent)  
Italian (very good)  
French (very good)

Social skills and competences Team spirit; Ability to adapt to multicultural environments; Excellent communication skills

Organisational skills and competences Project management; Team leadership; Problem solving; Multitasking; Sense of organisation

## Selected Scientific Publications

Schepaschenko D, **Fritz S**, See L, Laso Bayas JC, Lesiv M, Kraxner F, & Obersteiner M (2017). *Comment on "The extent of forest in dryland biomes"*. *Science* 358 (6362).

Laso Bayas JC, Lesiv M, Waldner F, Schucknecht A, Duerauer M, See L, **Fritz S**, Fraisl D, et al. (2017). *A global reference database of crowdsourced cropland data collected using the Geo-Wiki platform*. *Scientific Data* 4.

Laso Bayas JC, See L, Perger C, Justice C, Nakalembe C, Dempewolf J, & **Fritz S** (2017). *Validation of Automatically Generated Global and Regional Cropland Data Sets: The Case of Tanzania*. *Remote Sensing* 9 (8).

**Fritz S**, See L, Perger C, McCallum I, Schill C, Schepaschenko D, Duerauer M, Karner M, et al.(2017). *A global dataset of crowdsourced land cover and land use reference data*. *Scientific Data* 4: p. 170075.

Bechtel B, Demuzere M, Sismanidis P, Fenner D, Brousse O, Beck C, Van Coillie F, Conrad O, et al. (2017). *Quality of Crowdsourced Data on Urban Morphology—The Human Influence Experiment (HUMINEX)*. *Urban Science* 1 (2).

Fonte CC, Minghini M, Patriarca J, Antoniou V, See L, & Skopeliti A (2017). *Generating Up-to-Date and Detailed Land Use and Land Cover Maps Using OpenStreetMap and GlobeLand30*. *ISPRS International Journal of Geo-Information* 6 (4).

Herold M, See L, Tsendbazar N-E, & **Fritz S** (2016). *Towards an Integrated Global Land Cover Monitoring and Mapping System*. *Remote Sensing* 8 (12): p. 1036.

Fonte, C.C. and See, L. 2017. *The role of citizen science in Earth observation*. *Remote Sensing*, 9(4), 357.

Laso Bayas, J.C., See, L., **Fritz, S.**, Sturn, T., Perger, C., Dürauer, M., Karner, M., Moorthy, I., Schepaschenko, D., Domian, D. and McCallum, I. (2016) *Crowdsourcing In-Situ Data on Land Cover and Land Use Using Gamification and Mobile Technology*. *Remote Sensing*, 8 (11). p. 905.

Obersteiner, M., Walsh, B., Frank, S., Havlik, P., Cantele, M., Liu, J., Palazzo, A., Herrero, M., Lu, Y., Mosnier, A., Valin, H., Riahi, K., Kraxner, F., **Fritz, S.** and van Vuuren, D. (2016) *Assessing the land resource-food price nexus of the Sustainable Development Goals*. *Science Advances*, 2 (9).

See, L., **Fritz, S.**, Dias, E., Hendriks, E., Mijling, B., Snik, F., Stammes, P., Vescovi, F.D., Zeug, G., Mathieu, P.-P., Desnos, Y.-L. and Rast, M. (2016) *Supporting Earth-Observation Calibration and Validation: A new generation of tools for crowdsourcing and citizen science*. *IEEE Geoscience and Remote Sensing Magazine*, 4 (3). pp. 38-50.

Salk, C., Sturn, T., See, L. and **Fritz, S.** (2016) *Local knowledge and professional background have a minimal impact on volunteer citizen science performance in a land-cover classification task*. *Remote Sensing*, 8 (10). p. 774.

**Fritz S.**, Schepaschenko D., and See L. (2016) *Carbon tracking: Limit uncertainties in land emissions*. *Nature*, 534 (7609). p. 621.

McCallum, I., Liu, W., See, L., Mechler, R., Keating, A., Hochrainer-Stigler, S., Mochizuki, J., **Fritz, S.**, Dugar, S., Arestegui, M., Szoenyi, M., Laso Bayas, J.C., Burek, P., French, A. and Moorthy, I. (2016) *Technologies to Support Community Flood Disaster Risk Reduction*. *International Journal of Disaster Risk Science*, 7 (2). pp. 198-204.

See, L., Mooney, P., Foody, G., Bastin, L., Comber, A., Estima, J., **Fritz, S.**, Kerle, N., Jiang, B., Laakso, M., Liu, H.-Y., Milcinski, G., Niksic, M., Painho, M., Podör, A., Olteanu-Raimond, A.-M. and Rutzinger, M. (2016) *Crowdsourcing, Citizen Science or Volunteered Geographic Information? The Current State of Crowdsourced Geographic Information*. *ISPRS International Journal of Geo-Information*, 5 (5). p. 55.

Waldner, F., **Fritz, S.**, Di Gregorio, A., Plotnikov, D., Bartalev, S., Kussul, N., Gong, P., Thenkabail, P., Hazeu, G., Klein, I., Löw, F., Miettinen, J., Dadhwal, V., Lamarche, C., Bontemps, S. and Defourny, P. (2016) *A Unified Cropland Layer at 250 m for Global Agriculture Monitoring*. *Data*, 1 (1). p. 3.

- Salk, C., Sturn, T., See, L., and Fritz, S. (2016) *Limitations of Majority Agreement in Crowdsourced Image Interpretation. Transactions in GIS*. pp. 1-17.
- Antoniou, V., Fonte, C., See, L., Estima, J., Arsanjani, J., Lupia, F., Minghini, M., Foody, G. and Fritz, S. (2016) *Investigating the Feasibility of Geo-Tagged Photographs as Sources of Land Cover Input Data. ISPRS International Journal of Geo-Information*, 5 (5). p. 64.
- Arsanjani, J., See, Linda and Tayyebi, A. (2016) *Assessing the suitability of GlobeLand30 for mapping land cover in Germany. International Journal of Digital Earth*, 9. pp. 1-19.
- Comber, A., Fonte, C., Foody, G., Fritz, S., Harris, P., Olteanu-Raimond, A.-M. and See, L. (2016) *Geographically weighted evidence combination approaches for combining discordant and inconsistent volunteered geographical information. Geoinformatica*, 20 (3). pp. 503-527.
- Danylo, O., See, L., Bechtel, B., Schepaschenko, D. and Fritz, S. (2016) *Contributing to WUDAPT: A Local Climate Zone Classification of Two Cities in Ukraine. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (J-STARS)*, 9 (5). pp. 1841-1853.
- Erb, K.-H., Luysaert, S., Meyfroidt, P., Pongratz, J., Don, A., Kloster, S., Kuemmerle, T., Fetzel, T., Fuchs, R., Herold, M., Haberl, H., Jones, C. D., Marin Spiotta, E., McCallum, I., Robertson, E., Seufert, V., Fritz, S., Valade, A., Wiltshire, A. and Dolman, A.J. (2016) *Land management: data availability and process understanding for global change studies. Global Change Biology*. 23 (2): 512-533.
- Lesiv, M., Moltchanova, E., Shchepaschenko, D., See, L., Shvidenko, A., Comber, A. and Fritz, S. (2016) *Comparison of Data Fusion Methods Using Crowdsourced Data in Creating a Hybrid Forest Cover Map. Remote Sensing*, 8 (3). art.no. 261.
- Foody, G.M., See, L., Fritz, S., van der Velde, M., Perger, C., Schill, C., Boyd, D.S. and Comber, A. (2015) *Accurate attribute mapping from volunteered geographic information: issues of volunteer quantity and quality. The Cartographic Journal*, 52 (4). pp. 336-344.
- See, L., Fritz, S., Perger, C., Schill, C., McCallum, I., Schepaschenko, D., Dürauer, M., Sturn, T., Karne, M., Kraxner, F. and Obersteiner, M. (2015) *Harnessing the power of volunteers, the internet and Google Earth to collect and validate global spatial information using Geo-Wiki. Technological Forecasting and Social Change*, 98. pp. 324-335.
- Salk, C.F., Sturn, T., See, L. and Fritz, S. (2015) *Assessing quality of volunteer crowdsourcing contributions: lessons from the Cropland Capture game. International Journal of Digital Earth*. pp. 1-17.
- Schepaschenko, D., See, L., Lesiv, M., McCallum, I., Fritz, S., Salk, C., Perger, C., Shvidenko, A., Albrecht, F., Kraxner, F., Dürauer, M. and Obersteiner, M. (2015) *Development of a global hybrid forest mask through the synergy of remote sensing, crowdsourcing and FAO statistics. Remote Sensing of Environment*, 162. pp. 208-220.
- Waldner, F., Fritz, S., Di Gregorio, A. and Defourny, P. (2015) *Mapping priorities to focus cropland mapping activities: Fitness assessment of existing global, regional and national cropland maps. Remote Sensing*, 7 (6). pp. 7959-7986.
- Fritz, S., See, L., McCallum, I., Bun, A., Moltchanova, E., Dürauer, M., Perger, C., Havlik, P., Mosnier, A., Schepaschenko, D., van der Velde, M., Dunwoody, A., Kraxner, F. and Obersteiner, M. (2015) *Mapping global cropland field size. Global Change Biology*, 21 (5). pp. 1980-1992.
- See, L., Schepaschenko, D., Lesiv, M., McCallum, I., Fritz, S., Perger, C., Vakolyuk, M., Schepaschenko, M., van der Velde, M., Kraxner, F. and Obersteiner, M. (2015) *Building a hybrid land cover map with crowdsourcing and geographically weighted regression. ISPRS Journal of Photogrammetry and Remote Sensing*, 103. pp. 48-56.
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- See, L., **Fritz, S.**, You, L., Ramankutty, N., Herrero, M., Justice, C., Becker-Reshef, I., Thornton, P., Erb, K., Gong, P., Tang, H., van der Velde, M., Ericksen, P., McCallum, I., Kraxner, F. and Obersteiner, M. (2015) *Improved global cropland data as an essential ingredient for food security*. *Global Food Security*, 4, pp. 37-45.
- Exner, A., Bartels, L.E., Windhaber, M., **Fritz, S.**, See, L., Politti, E. and Hochleithner, S. (2015) *Constructing landscapes of value: Capitalist investment for the acquisition of marginal or unused land. The case of Tanzania*. *Land Use Policy*, 42, pp. 652-663.
- Perger, C., LeDrew, E., See, L. and **Fritz, S.** (2014) *Geography Geo-Wiki in the classroom: Using crowdsourcing to enhance geographical teaching*. *Future Internet*, 6 (4), pp. 597-611.
- See, L., **Fritz, S.** and McCallum, I. (2014) *Satellite data: Beyond sharing Earth observations*. *Nature*, 514 (7521), p.168.
- Gomez, A., Bussink, C., Bauer, T., **Fritz, S.**, Escobar, A., Giusti, M., See, L. and Atzberger, C. (2014) *Examining the potential of using information on fire detected by MODIS and socio-economic variables to highlight potential coca cultivations in forest areas in Colombia*. *The Open Geography Journal*, 6, pp.18-29.
- Mosnier, A., Havlik, P., Obersteiner, M., Aoki, K., Schmid, E., **Fritz, S.**, McCallum, I. and Leduc, S. (2014) *Modelling impact of development trajectories and a global agreement on reducing emissions from deforestation on Congo Basin forests by 2030*. *Environmental and Resource Economics*, 57 (4), pp. 505-525.
- van der Velde, M., Folberth, C., Balkovič, J., Ciais, P., **Fritz, S.**, Janssens, I.A., Obersteiner, M., See, L., Skalsky, R., Xiong, W. and Penuelas, J. (2014) *African crop yield reductions due to increasingly unbalanced Nitrogen and Phosphorus consumption*. *Global Change Biology*, 20 (4), pp. 1278-1288.
- Havlik, P., Valin, H., Herrero, M., Obersteiner, M., Schmid, E., Rufino, M.C., Mosnier, A., Thornton, P.K., Bottcher, H., Conant, R.T., Frank, S., **Fritz, S.**, Fuss, S., Kraxner, F. and Notenbaert, A. (2014) *Climate change mitigation through livestock system transitions*. *PNAS*, 111 (10), pp. 3709-3714.
- Hochrainer-Stigler, S., van der Velde, M., **Fritz, S.** and Pflug, G.C. (2014) *Remote sensing data for managing climate risks: Index-based insurance and growth related applications for smallhold-farmers in Ethiopia*. *Climate Risk Management*, 6, pp. 27-38.
- Footy, G.M., See, L., **Fritz, S.**, van der Velde, M., Perger, C., Schill, C. and Boyd, D.S. (2013) *Assessing the accuracy of volunteered geographic information arising from multiple contributors to an Internet collaborative project*. *Transactions in GIS*, 17 (6), pp. 847-860.
- Kraxner, F., Nordström, E., Havlik, P., Gusti, M., Mosnier, A., Frank, S., Valin, H., **Fritz, S.**, Fuss, S., Kindermann, G., McCallum, I., Khabarov, N., Bottcher, H., See, L., Aoki, K., Schmid, E., Mathe, L. and Obersteiner, M. (2013) *Global bioenergy scenarios - Future forest development, land-use implications, and trade-offs*. *Biomass and Bioenergy*, 57, pp. 86-96.
- McCallum, I., Franklin, O., Moltchanova, E., Merbold, L., Schmulius, C., Shvidenko, A., Schepaschenko, D. and **Fritz, S.** (2013) *Improved light and temperature responses for light-use-efficiency-based GPP models*. *Biogeosciences*, 10 (10), pp. 6577-6590.
- See, L., **Fritz, S.** and de Leeuw, J. (2013) *Editorial: The rise of collaborative mapping: Trends and future directions*. *ISPRS International Journal of Geo-Information*, 2 (4), pp. 955-958.
- Tall, A., Patt, A. and **Fritz, S.** (2013) *Reducing vulnerability to hydro-meteorological extremes in Africa. A qualitative assessment of national climate disaster management policies: Accounting for heterogeneity*. *Weather and Climate Extremes*, 1, pp. 4-16.
- Comber, A., See, L., **Fritz, S.**, van der Velde, M., Perger, C. and Footy, G. (2013) *Using control data to determine the reliability of volunteered geographic information about land cover*. *International Journal of Applied Earth Observation and Geoinformation*, 23, pp. 37-48.
- See, L., McCallum, I., **Fritz, S.**, Perger, C., Kraxner, F., Obersteiner, M., Deka Baruah, U., Milli, N. and Ram Kalita, N. (2013) *Mapping cropland in Ethiopia using crowdsourcing*. *International Journal of Geosciences*, 4 (6), pp. 6-13.

- See, L., Comber, A., Salk, C.F., **Fritz, S.**, van der Velde, M., Perger, C., Schill, C., McCallum, I., Kraxner, F. and Obersteiner, M. (2013) *Comparing the quality of crowdsourced data contributed by expert and non-experts*. *PLoS ONE*, 8 (7).
- Fritz, S.**, See, L. and Valin, H. (2013) *Current issues and uncertainties in estimating global land availability for biofuel production (Editorial)*. *Biofuels*, 4 (4). pp. 343-345.
- van der Velde, M., See, L., You, L., Balkovič, J., **Fritz, S.**, Khabarov, N., Obersteiner, M. and Wood, S. (2013) *Affordable nutrient solutions for improved food security as evidenced by crop trials*. *PLoS ONE*, 8 (4).
- Fritz, S.**, See, L., van der Velde, M., Nalepa, R.A., Perger, C., Schill, C., McCallum, I., Schepaschenko, D., Kraxner, F., Vakolyuk, M., Albrecht, F., Shaw, B. and Obersteiner, M. (2013) *Downgrading recent estimates of land available for biofuel production*. *Environmental Science & Technology*, 47(3): 1688-1694.
- Fritz, S.**, See, L., You, L., Justice, C., Becker-Reshef, I., Bydekerke, L., Cumani, R., Defourny, P., Erb, K., Foley, J., Gilliams, S., Herrero, M., McCallum, I., Obersteiner, M., Ramankutty, N. and van der Velde, M. (2013) *The need for improved maps of global cropland*. *Eos, Transactions American Geophysical Union*, 94 (3). pp. 31-32.
- Vancutsem, C., Marinho, E., Kayitakire, F., See, L. and **Fritz, S.** (2013) *Harmonizing and combining existing land cover/land use datasets for cropland area monitoring at the African continental scale*. *Remote Sensing*, 5 (1). pp. 19-41.
- Heumesser, C., **Fritz, S.**, Obersteiner, M., Pearlman, J. and Singh Khalsa, S.J. (2012) *Benefits and challenges of voluntary contribution to GEOSS*. *Space Policy*, 28 (4). pp. 244-252.
- Seebach, L., McCallum, I., **Fritz, S.**, Kindermann, G., Leduc, S., Bottcher, H. and Fuss, S. (2012) *Choice of forest map has implications for policy analysis: A case study on the EU biofuel target*. *Environmental Science & Policy*, 22. pp. 13-24.
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- Fritz, S.**, McCallum, I., Schill, C., Perger, C., See, L., Schepaschenko, D., van der Velde, M., Kraxner, F. and Obersteiner, M. (2012) *Geo-Wiki: An online platform for improving global land cover*. *Environmental Modelling & Software*, 31. pp. 110-123.
- Strassburg, B.B.N., Rodrigues, A.S.L., Gusti, M., Balmford, A., **Fritz, S.**, Obersteiner, M., Turner, R.K. and Brooks, T.M. (2012) *Impacts of incentives to reduce emissions from deforestation on global species extinctions*. *Nature Climate Change*, 2 (5). pp. 350-355.
- van der Velde, M., See, L. and **Fritz, S.** (2012) *Agriculture: Soil remedies for small-scale farming*. *Nature*, 484 (7394). p.318.
- Schepaschenko, D., **Fritz, S.**, McCallum, I., Shvidenko, A., Perger, C., Schill, C., See, L., Kraxner, F. and Obersteiner, M. (2012) *A platform to visualize, analyze and improve biomass datasets: <http://biomass.geo-wiki.org>*. *Folia Forestalia Polonica, Series A - Forestry*, 54 (2). pp. 137-139.
- Schepaschenko, D., McCallum, I., Shvidenko, A., **Fritz, S.** and Obersteiner, M. (2011) *A new hybrid land cover dataset for Russia: A methodology for integrating statistics, remote sensing and in situ information*. *Land Use Science*, 6 (4). pp. 245-259.
- Fritz, S.**, See, L., McCallum, I., Schill, C., Obersteiner, M., van der Velde, M., Bottcher, H., Havlik, P. and Achard, F. (2011) *Highlighting continued uncertainty in global land cover maps for the user community*. *Environmental Research Letters*, 6 (4). 044005.

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- McCallum, I., Wagner, W., Schullius, C., Shvidenko, A., Obersteiner, M., **Fritz, S.** and Nilsson, S. (2010) *Comparison of four global FAPAR datasets over Northern Eurasia for the year 2000*. *Remote Sensing of Environment*, 114 (5). pp. 941-949.
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