

JENNIFER KOCH

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CURRICULUM VITAE

EDUCATION

- 06/2010 Dr.-Ing. (Tech. Ph.D) · Environmental Systems Engineering
Magna cum laude
Dissertation: Modeling the impact of land-use change on ecosystems at the regional and continental scale
University of Kassel · Kassel · GERMANY
- 03/2005 Diplom (Univ.) · Geoecology
Thesis: Analyzing the dynamics of a multi-agent simulation with complexity measures (in German)
Majors: Ecological Modeling, Agricultural Ecology
Minors: Object Oriented Programming, Hydrogeology
University of Bayreuth · Bayreuth · GERMANY

PROFESSIONAL EXPERIENCE

- 10/2013 - present Postdoctoral Research Scholar · Center for Geospatial Analytics
Supervisor: Ross Meentemeyer
North Carolina State University · Raleigh, NC · USA
- 06/2013 – 10/2013 Postdoctoral Research Scholar · Center for Applied GIScience
Supervisor: Ross Meentemeyer
University of North Carolina · Charlotte, NC · USA
- 07/2011 – 05/2013 Postdoctoral Research Associate · Biological & Ecological Engineering
Supervisor: John P. Bolte
Oregon State University · Corvallis, OR · USA
- 07/2010 – 06/2011 Postdoctoral Research Associate · Center for Environmental Systems Research
Supervisor: Joseph Alcamo
University of Kassel · Kassel · GERMANY
- 10/2005 – 06/2010 Doctoral Student · Center for Environmental Systems Research
Supervisor: Joseph Alcamo
University of Kassel · Kassel · GERMANY
- 06/2005 – 09/2005 Research Assistant · Ecological Modeling
Supervisor: Michael Hauhs
University of Bayreuth · Bayreuth, GERMANY

PUBLICATIONS

PEER-REVIEWED JOURNALS

- Submitted Dorning, M.A.; **Koch, J.**; Shoemaker, D.A.; Meentemeyer R.K. (submitted) *Simulating urbanization scenarios under various landscape planning policies reveals trade-offs between disparate conservation goals*. Landscape and Urban Planning.
- Under review Spies, T.A.; White, E.M.; Kline, J.D.; Fischer, P.A.; Ager, A.A.; Bolte, J.P.; **Koch, J.**; Platt, E.K.; Olsen, C.S.; Jacobs, D.; Shindler, B.; Steen-Adams, M.; Hammer, R. (under review)

Examining fire-prone forest landscapes as coupled human and natural systems. Ecology & Society.

- 2013 Schaldach, R.; Wimmer, F.; **Koch, J.**; Volland, J.; Geißler, K.; Köchy, M. (2013) *Model-based analysis of environmental impacts of grazing management in Eastern Mediterranean ecosystems in Jordan.* Journal of Environmental Management 127, S84-S95.
- 2012 Schaldach, R.; **Koch, J.**; aus der Beek, T.; Kynast, E.; Flörke, M. (2012) *Current and future irrigation water requirements in pan-Europe: An integrated analysis of socio-economic and climate scenarios.* Global and Planetary Change 94-95, 33-45.
- 2011 Schaldach, R.; Alcamo, J.; **Koch, J.**; Kölking, C.; Lapola, D.M.; Schüngel, J.; Priess, J.A. (2011) *An integrated approach to modelling land-use change on continental and global scales.* Environmental Modelling & Software 26(8), 1041–1051.
- Alcamo, J.; Schaldach, R.; **Koch, J.**; Kölking, C.; Lapola, D.M.; Priess, J.A. (2011) *Evaluation of an integrated land use change model including a scenario analysis of land use change for continental Africa.* Environmental Modelling & Software 26(8), 1017–1027.
- 2010 Lapola, D.M.; Schaldach, R.; Alcamo, J.; Bondeau, A.; **Koch, J.**; Koelking, C.; Priess, J.A. (2010) *Indirect land-use changes can overcome carbon savings from biofuels in Brazil.* Proceedings of the National Academy of Sciences of the United States of America (PNAS) 107, 3388-3393.
- 2009 Menzel, L.; **Koch, J.**; Onigkeit, J.; Schaldach, R. (2009) *Modelling the effects of land-use and land-cover change on water availability in the Jordan River region.* Advances in Geosciences 21, 73-80.
- 2008 **Koch, J.**; Schaldach, R.; Köchy, M. (2008) *Modeling the impacts of grazing land management on land-use change for the Jordan River region.* Global and Planetary Change 64(3-4), 177-187.

PEER-REVIEWED CONFERENCE PROCEEDINGS

- 2012 **Koch, J.**; Wimmer, F.; Schaldach, R.; Onigkeit, J.; Folberth, C. (2012) *Modelling the impact of climate change on irrigation area demand in the Jordan River region.* In Seppelt, R., A.A. Voinov, S. Lange and D. Bankamp (eds.) Proceedings of the 2012 International Congress on Environmental Modelling and Software: Managing Resources of a Limited Planet, Sixth Biennial Meeting, Leipzig, Germany, July 2012, Leipzig, Germany.
- Koch, J.**; Sulzman, J.M.; Bolte, J.P.; Pabst, R.J.; Spies, T.A.; Sheehan, T.; Olsen, K.A.; Kline, J.D. (2012) *An agent-based modelling approach to project future habitat suitability for Northern Spotted Owl in Central Oregon.* In Seppelt, R., A.A. Voinov, S. Lange and D. Bankamp (eds.) Proceedings of the 2012 International Congress on Environmental Modelling and Software: Managing Resources of a Limited Planet, Sixth Biennial Meeting, Leipzig, Germany, July 2012, Leipzig, Germany.
- 2009 **Koch, J.**; Schaldach, R.; Kölking, C. (2009) *Modelling the impact of rangeland management strategies on (semi-)natural vegetation in Jordan.* In Anderssen, R.S., R.D. Braddock and L.T.H. Newham (eds.) 18th World IMACS Congress and MODSIM09 International Congress on Modelling and Simulation. Modelling and Simulation Society

of Australia and New Zealand and International Association for Mathematics and Computers in Simulation, July 2009, Cairns, Australia, pp. 1929-1935.

BOOK CHAPTERS

- 2014 Boone, C.G.; Redman, C.L.; Blanco, H.; Haase, D.; **Koch, J.**; Lwasa, S.; Nagendra, H.; Pauleit, S.; Pickett, S.T.A.; Seto, K.C.; Yokohari, M. (2014) *Reconceptualizing Land for Sustainable Urbanity*. In Seto, K.C. and A. Reenberg (eds.) *Rethinking Global Land Use in an Urban Era*, MIT Press, pp. 313-332.
- 2012 **Koch, J.**; Wimmer, F.; Schaldach, R.; Onigkeit, J. (2012) *An integrated land-use system model for the Jordan River region*. In Appiah-Opoku, S. (ed.) *Environmental Land Use Planning*, InTech, ISBN 978-953-51-0832-0.
- 2009 Schaldach, R.; **Koch, J.** (2009) *Conceptual design and implementation of a model for the integrated simulation of large-scale land-use systems*. In Athanasiadis, I.N., P.A. Mitkas, A.E. Rizzoli and J. Marx-Gómez (eds.) *Information Technologies in Environmental Engineering*, Springer Berlin Heidelberg, pp. 425-438.

OTHER PUBLICATIONS

- 2013 Fischer, P.A.; Korejwa, A.; **Koch, J.**; Spies, T.A.; Olsen, C.S.; White, E.M.; Jacobs, D. (2013) *Using an agent-based social network model to investigate interactions between social and ecological systems: Early reflections on the Forest, People, Fire project*. *Practicing Anthropology* 35(1), 8-13.
- 2011 **Koch, J.**; Onigkeit, J.; Schaldach, R.; Alcamo, J.; Köchy, M.; Wolff, H.-P.; Kan, I. (2011) *Land-use change scenarios for the Jordan River region*. *International Journal of Sustainable Water and Environmental Systems* 3(1), 25-31.
- 2010 **Koch, J.** (2010) *Modeling the impacts of land-use change on ecosystems at the regional and continental scale*. Thesis, kassel university press GmbH, Kassel, Germany.
- Kölking, C.; Schaldach, R.; **Koch, J.**; Lapola, D.M.; Bartocha, D.; Giese, O. (2010) *Assessing factors of relevance for the global occurrence of cropland*. In Gnauck, A. (ed.) *Modellierung und Simulation von Ökosystemen*, Workshop Kölpinsee 2009.
- 2006 **Koch, J.**; Schaldach, R. (2006) *Adapting a Land Use Change Model to the Jordan River Region*. In Ünal, Y., C. Kahya and D. Demirhan Bari (eds.). *Proceedings of the International Conference on "Climate Change and the Middle East: Past, Present and Future"*, pp. 358-364.
- 2005 Hauhs, M.; **Koch, J.**; Lange, H. (2005) *Comparison of time series from ecosystems and an artificial multi-agent network based on complexity measures*. In Kim, J.T. (ed.). *Systems Biology Workshop at the 8th European Conference on Artificial Life*, CD-ROM.

PROFESSIONAL PRESENTATIONS

*Denotes presenter if not self.

- 2014 *Wimmer, F.; **Koch, J.**; Onigkeit, J.; Schaldach, R.; (2014) *Future Challenges for Crop Production and Food Security in Jordan*. GLP 2nd Open Science Meeting 'Land

Transformations: between global challenges and local realities', 19-21 March 2014, Berlin, Germany. Oral Presentation.

2013 **Koch, J.**; Morzillo, A.T.; Pabst, R.J.; Sulzman, J.M.; Fischer, A.P.; Bolte, J.P.; Spies, T.A. (2013) *Modeling the Coupled Human-Natural Systems of the Fire-Prone Landscapes of Central Oregon*. Land Systems Science Symposium at the AAG Annual Meeting, 09 – 13 April 2013, Los Angeles, CA, USA. Oral Presentation.

2012 **Koch, J.**; Morzillo, A.T.; Pabst, R.J.; Sulzman, J.M.; Fischer, A.P.; Bolte, J.P.; Spies, T.A. (2012) *Developing an agent-based modeling approach to simulate the dynamics in fire-prone landscapes of central Oregon*. 5th International Fire Ecology and Management Congress: Uniting Research, Education and Management, 03 – 07 December 2012, Portland, OR, USA. Oral Presentation.

Koch, J.; Sulzman, J.M.; Bolte, J.P.; Pabst, R.J.; Spies, T.A.; Sheehan, T.; Olsen, K.A.; Kline, J.D. (2012) *Modeling future habitat suitability for Northern Spotted Owl in central Oregon*. iEMSs International Congress on Environmental Modelling and Software: Managing Resources of a Limited Planet 2012, 01 – 05 July 2012, Leipzig, Germany. Oral Presentation.

*Wimmer, F.; **Koch, J.**; Schaldach, R.; Onigkeit, J.; Folberth, C. (2012) *Modelling the impact of climate change on irrigation area demand in the Jordan River region*. iEMSs International Congress on Environmental Modelling and Software: Managing Resources of a Limited Planet 2012, 01 – 05 July 2012, Leipzig, Germany. Oral Presentation.

*Marshall, A.; Stevenson, J.; **Koch, J.**; Bolte, J.; Lach, D. Sridhar, V. (2012) *A stakeholder-informed alternative futures analysis of climate impacts in the Big Wood River Basin, Idaho*. 3rd Annual Pacific Northwest Climate Science Conference, 01 – 02 October 2012, Boise, Idaho, USA. Poster Presentation.

2011 **Koch, J.**; Flörke, M.; Schaldach, R.; aus der Beek, T.; Kynast, E.; Kölking, C.; Schneider, C. (2011) *Impact of socio-economic development on land use and irrigation water withdrawals*. European Geosciences Union General Assembly, 03 - 08 April 2011, Vienna, Austria. Poster Presentation.

2010 **Koch, J.**; Onigkeit, J.; Schaldach, R.; Alcamo, J.; Köchy, M.; Wolff, H.-P.; Kan, I. (2010) *Land-use change scenarios for the Jordan River region*. IASKS International Conference on Energy, Water & Environment 2010, 12 – 15 December 2010, Amman, Jordan. Oral Presentation.

Koch, J.; Flörke, M.; aus der Beek, T.; Kynast, E.; Kölking, C.; Schneider, C.; Schaldach, R. (2010) *Modelling the spatio-temporal distribution of irrigated areas in Europe*. Ester Boserup Conference: A centennial tribute, 15 – 17 November 2010, Vienna, Austria. Oral Presentation.

*Schaldach, R.; **Koch, J.**; aus der Beek, T.; Flörke, M.; Kölking, C.; Stuch, B. (2010) *Modelling the spatio-temporal development of irrigated area and its impacts on water use*. GLP Open Science Meeting 2010: Land Systems, Global Change and Sustainability, 17 – 19 October 2010, Arizona, USA. Oral Presentation.

Koch, J. (2010) *Modelling of large-scale land-use change with LandSHIFT*. 6th GINKGO meeting, 30 September – 01 October 2010, Biodiversity and Climate Research Center (BIK-F), Frankfurt am Main, Germany. Oral Presentation.

*Stuch, B.; Schaldach, R.; **Koch, J.**; Kölking, C.; Schüngel, J. (2010) *Are Yield Vulnerability Indices (YVI) suitable to embrace climate extremes in food security simulations?* Conference "Continents under Climate Change", 21 – 23 April 2010, Humboldt-Universität zu Berlin and Potsdam Institute for Climate Impact Research, Berlin, Germany. Poster Presentation.

2009

Koch, J.; Schaldach, R.; Kölking, C. (2009) *Modelling the impact of rangeland management strategies on (semi-)natural vegetation in Jordan*. 18th World IMACS Congress and MODSIM09 International Congress on Modelling and Simulation, 13 – 17 July 2009, Cairns, Australia. Oral Presentation.

*Schaldach, R.; **Koch, J.** (2009) *Conceptual design and implementation of a model for the integrated simulation of large-scale land-use systems*. 4th International ICSC Symposium of Information Technologies in Environmental Engineering May 28 – 29, 2009, Thessaloniki, Greece. Oral Presentation.

*Schaldach, R.; Alcamo, J.; **Koch, J.**; Kölking, C.; Lapola, D. (2009) *Scenarios of agricultural land-use change in Africa under changing climate conditions*. Climate Change: Global Risks, Challenges and Decisions, 10 – 12 March 2009, Copenhagen, Denmark. Oral Presentation.

*aus der Beek, T.; Lapola, D.M.; Flörke, M.; Voß, F.; Kölking, C.; Stuch, B.; **Koch, J.** (2009) *Modelling current and future irrigation water demand on the continental scale: Europe*. 13. Workshop zur Großskaligen Hydrologischen Modellierung, 25 – 27 November 2009, Dresden, Germany.

*Kölking, C.; Lapola, D.M.; **Koch, J.**; Schaldach, R.; Msangi, S.; Alcamo, J. (2009) *Modelling the potential impact of bio-fuel crop production on natural land in India*. Conference "Climate Change: Global Risks, Challenges and Decisions", 10 – 12 March 2009, Copenhagen, Denmark. Poster Presentation.

2008

Koch, J.; Schaldach, R.; Onigkeit, J. (2008) *Scenario-based integrated assessment of land-use changes in the Middle East*. International Conference on Food Security and Environmental Change: Linking Science, Development and Policy for Adaptation, 2 – 4 April 2008, University of Oxford, United Kingdom. Oral Presentation.

Koch, J.; Schaldach, R. (2008) *Model-based assessment of overgrazing effects on land use in Eastern Mediterranean ecosystems*. International Conference on Impact Assessment of Land Use Changes, 6 – 9 April 2008, Humboldt University Berlin, Germany. Oral Presentation.

*Alcamo, J.; Schaldach, R.; Weiß, M.; **Koch, J.** (2008) *Simulating Environmental Change on the Global Scale: The Nexus of Food, Land and Water in Future Africa*. International Conference: Impact Assessment of Land Use Changes, 7 - 9 April 2008, Berlin, Germany. Keynote.

Koch, J.; Menzel, L.; Schaldach, R. (2008) *Coupled scenario studies for the Jordan River region*. Interaktionen von Atmosphäre-Hydrosphäre-Biosphäre, Modell-Konzepte zur integrierten Betrachtung komplexer Systeme. 12. Workshop großskalige hydrologische Modellierung, 12 - 14 November 2008. Kiel, Germany. Poster Presentation.

*Schaldach, R.; **Koch, J.**; Alcamo, J. (2008) *Effects of food production on natural vegetation: Land-use change scenarios for Africa in the 2050ies*. International

Conference on Food Security and Environmental Change: Linking Science, Development and Policy for Adaptation, 2 – 4 April 2008, University of Oxford, United Kingdom. Poster Presentation.

*Lübkert-Alcamo, B.; Onigkeit, J.; Alcamo, J.; Schaldach, R.; **Koch, J.**; Köchy, M.; Menzel, L.; Heckl, A.; Alpert, P.; Krichak, S. and the members of the GLOWA JR Scenario Panel (2008) *The Future of Water in the Middle East: The Scenario Exercise of the GLOWA Jordan River Project*. Conference “Global Change and Water Resources in West Africa - The German-African GLOWA Projects”, 25 – 28 August 2008, Ouagadougou, Burkina Faso. Poster Presentation.

2007 **Koch, J.**; Schaldach, R. (2007) *Estimating the Effects of Overgrazing on Land Use Change for the Jordan River Region*. Wengen Workshop on Global Change Research: Edition 2007, “Climate Change and Desertification: Monitoring, Modelling and Forecasting”, 10 – 13 September 2007, Wengen, Switzerland. Oral Presentation.

Koch, J.; Schaldach, R. (2007) *Scenario-based Land Use Simulations for the Jordan River Region*. Second International Conference on Earth System Modelling, 27 – 31 August 2007, Hamburg, Germany. Poster Presentation.

2006 **Koch, J.**; Schaldach, R. (2006) *Adapting a Land Use Change Model to the Jordan River Region*. International Conference on Climate Change and the Middle East: “Past, Present and Future”, 20 – 23 November 2006, Istanbul, Turkey. Oral Presentation.

Weiß, M.; **Koch, J.**; *Schaldach, R.; Onigkeit, J.; Menzel, L. (2006) *Vulnerability and Management of Water Resources in Eastern Mediterranean Ecosystems*. Global Environmental Change: Regional Challenges. An ESSP Global Environmental Change Open Science Conference, 9 – 12 November 2006, Beijing, China. Poster Presentation.

2005 Hauhs, M.; **Koch, J.**; Lange, H. (2005) *Comparison of Time Series from Ecosystems and an Artificial Multi-Agent Network Based on Complexity Measures*. Systems Biology Workshop, 8th European Conference on Artificial Life, 5 – 9 September 2005, Canterbury (Kent), United Kingdom. Oral Presentation.