

Curriculum Vitae

Personal details

Name: Dr. Derek Karssenber
Nationality: Dutch
Date of birth: 25 November 1968
Gender: Male
Marital status: Married, no children

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WWW (PCRaster project): <http://www.pcraster.eu>

Education

MSc degree: Physical Geography, Utrecht University, the Netherlands.
Specialisation: Land degradation and Geographical Information Science
Date: 01/09/1994

PhD degree: Physical Geography, Utrecht University, the Netherlands.
Title of thesis: Building dynamic spatial environmental models.
Supervisors: Prof. Dr. P.A. Burrough, Prof. Dr. M.F.P. Bierkens, Dr. W.P.A. van Deursen
Date: 08/11/2002

Key qualifications

- Development of concepts and software for modelling and analysis of spatio-temporal systems in the geosciences with an emphasis on field-agent representations and supercomputing.
- Spatio-temporal modelling to understand physical geographical systems and socio-ecological systems with an emphasis on model – data integration and complex system behaviour.
- Development of blended learning methodologies and materials for spatio-temporal modelling and physical geography.
- Proven leadership qualities, 20 years' experience with leading multidisciplinary research teams, initiator of innovative teaching methods at faculty level.
- Experience in acquisition and management of research and education projects.

Academic career

- 2015 – present: Associate Professor in Geocomputation, Department of Physical Geography, Utrecht University, 1.0 fte, permanent position, supervision (co-promotor) of ~5 PhD students, supervisor of 3 scientific software engineers/modellers, 3 postdocs.
- 2013 – 2015: Teaching Fellow to the Dean. Focus on blended learning. 0.2 fte position combined with Assistant Professorship.
- 1999 – 2013: Assistant Professor in GIS & Hydrology, Department of Physical Geography, Utrecht University, 1.0 fte, permanent position, supervision (co-promotor) of PhD students, 1-2 scientific software engineers and junior researchers, teaching fellow e-learning
- 1997 – 1999: Researcher in EU research projects, educational projects and teaching postgraduate courses, Department of Physical Geography, Utrecht University, 0.3 fte, fixed-term.
- 1997 – 1999: Assistant Professor in GIS & Hydrology, Department of Physical Geography, Utrecht University, 0.5 fte, permanent position.
- 1995 – 1997: Junior researcher writing technical documentation for PCRaster and teaching postgraduate courses, Department of Physical Geography, Utrecht University, 0.8 fte, fixed-term.
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Research

Supervision of PhD candidates (co-promotor)

Ongoing

- De Jong, K., 2018-2021. Development of algorithms and modelling framework for hardware-scalable tools and applications to geographical data-analysis. With Prof. Dr. S.M. de Jong (Dep. of Physical Geography, Utrecht Univ.), Prof. Dr. M. van Kreveld, Dr. D. Panja (Dep. of Information and Computing Sciences).
- Ntarladima, A.-M. 2015-2019. Impact of personal environmental exposure on health. With Dr. I. Vaartjes, Prof. Dr. R. Grobbee (University Medical Center Utrecht), Prof. Dr. M. Dijst (Dep. Human Geography and Spatial Planning, Utrecht Univ.).
- Loozen, Y. 2014-2019. Taking a remote look at canopy nitrogen to improve global climate models. With Prof. Dr. S.M. de Jong (Dep. of Physical Geography, Utrecht Univ.), Prof. Dr. M.J. Wassen, Dr. K.T. Rebel (Copernicus Institute of Sustainable Development, Utrecht Univ.).
- Bernhard, J. 2013-2019. Optimizing water resources at river basin and continental scale. With Prof. Dr. S.M. de Jong and Prof. Dr. A.P.J. de Roo (Dep. of Physical Geography, Utrecht Univ.).

- Babel, L., 2014-2020. Mediating models: implications on scientific research and communication. With Prof. Dr. D. Vinck (University of Lausanne), Prof. Dr. M.F.P. Bierkens (Dep. of Physical Geography, Utrecht Univ.).
- de Bakker, M.P., 2013-2020. Field-agent integration in simulation modelling. With Prof. Dr. S.M. de Jong (Dep. of Physical Geography, Utrecht Univ.).

Finished

- Watson, L. J., 2014-2017. Spatial-based assessment at continental to global scale. With Prof. Dr. S.M. de Jong, Dr. M. Straatsma (Dep. of Physical Geography, Utrecht Univ.).
- Verstegen, J., 2011-2015. Quantifying and reducing uncertainty in land use change model projections. Case studies on the implications of increasing bioenergy demands. With Prof. Dr. A. Faaij, Dr. F. van der Hilst (Copernicus Institute of Sustainable Development, Utrecht Univ.), Prof. Dr. S.M. de Jong (Dep. of Physical Geography, Utrecht Univ.).
- Wanders, N., 2011-2015. Hydrological extremes. Improving simulations of flood and drought in large river basins. With Prof. Dr. S.M. de Jong, Prof. Dr. A.P.J. de Roo, Prof. Dr. M.F.P. Bierkens (Dep. of Physical Geography, Utrecht Univ.).
- Vannamettee, E., 2007-2014. Hydrograph prediction in ungauged basins. Development of a closure relation for Hortonian runoff. With Prof. Dr. M.F.P. Bierkens, Prof. Dr. S.M. de Jong, Dr. M.R. Hendriks (Dep. of Physical Geography, Utrecht Univ.).
- Schmitz, O., 2009-2014. Integrating environmental component models. Development of a software framework. With Prof. Dr. S.M. de Jong, Prof. Dr. M.F.P. Bierkens (Dep. of Physical Geography, Utrecht Univ.), Dr. J.-L. de Kok (VITO, Belgium).
- Youssef, F., 2008-2012. Effect of vegetation cover and transitions on regional wind erosion in drylands. PhD at Wageningen University. With Prof. dr. L. Stroosnijder, Dr. S. Visser (Wageningen University).
- Hiemstra, P., 2006-2010. Ensemble modeling and statistical mapping of airborne radioactivity. With Prof. Dr. S.M. de Jong, Prof. Dr. E.J. Pebesma (Department of Physical Geography, Utrecht Univ.). Dr. G.B.M. Heuvelink (Wageningen University).
- Arieira Couto, J., 2006-2010. Spatial Variability of Vegetation in Response to the Edaphical, Hydrological and Topographical Conditions for means of a Multi-Scalar Approach Seeking for the Sustainable Land Planning, in North Pantanal, Mato Grosso, Brazil. PhD at Federal University of Mato Grosso, Brazil. With Prof. Dr. E.G. Guimarães Couto, Prof. Dr. C. Nunes da Cunha.
- van der Kwast, H., 2005-2009. Quantification of top soil moisture patterns. Evaluation of field methods, process-based modelling, remote sensing and an integrated approach. With Prof. Dr. S.M. de Jong, Prof. Dr. V.G. Jetten (Dep. of Physical Geography, Utrecht Univ.), Prof. Dr. Z. Su (University of Twente).

Member of evaluation committees

PhD candidates

- Abdulkareem, S. 2019. Enhancing Agent-Based Models with Artificial Intelligence for Complex Decision Making. PhD at University of Twente, the Netherlands.

Augustijn-Beckers, P.W.M. 2018. Revealing Patterns: Spatio-temporal Pattern Detection and Reproduction. PhD at University of Twente, the Netherlands.

Soomers, H. 2012. Fragmentation and seed dispersal in freshwater wetlands. PhD obtained at Utrecht University, the Netherlands.

Chandra Das, I. 2011. Spatial statistical modelling for assessing landslide hazard and vulnerability. PhD obtained at University of Twente, the Netherlands

Hagen-Zanker, A. 2008. Measuring the performance of geosimulation models by map comparison. PhD obtained at Maastricht University.

Habilitation candidates

Depraetere, C. 2013. Introduction à l'hydrogéomorphométrie. Habilitation a diriger des recherches obtained at Université Paris Diderot.

Research projects

Nordic eInfrastructure Globalisation Initiative (NeGI) – Nordic Centres of Excellence. Member of international expert evaluation group. Mid-term assessment of two research projects and the NeGI programme.

Research Projects

Projects, applicant or co-applicant

LUE, 2017 – present. Design of the LUE Scientific Database and Environmental Modelling Framework. Involvement: coordinator. Co-workers: K. de Jong, MSc., Dr. O. Schmitz (Scientific Software Engineers), M. de Bakker, MSc. Department of Physical Geography, Utrecht University.

PCRaster, 1997 – present. Design of the PCRaster spatio-temporal modelling system. Involvement: coordinator (1997-2003: with P.A. Burrough). Co-workers: K. de Jong, MSc. (software engineer), M. de Vries, MSc. (environmental modeller), Dr. O. Schmitz (software engineer), K. Alberti, MSc., R. Baarsma, MSc. Department of Physical Geography, Utrecht University. Cooperation with: Ing. C. Wesseling, Dr. W.P.A. van Deursen (PCRaster Environmental Software).

PCRaster software maintenance contracts, 2012 – present. Involvement: applicant, supervisor. Funding: Deltares (the Netherlands), ECMWF (UK), Joint Research Centre (Italy, EU). Co-workers: senior software engineer. Grant: 45 KE per year, for 2-6 years.

Meten & Detecteren van Gezond Gedrag, 2018-2020. Involvement: co-applicant and supervisor of Postdoc. Funding: NWO. Grant: 70 KE.

Development of algorithms and modelling framework for hardware-scalable tools and applications to geographical data-analysis, 2017 – 2021. Involvement: applicant and supervisor of PhD student. Funding: Research IT Utrecht University. Grant 300 KE.

Global Geo Health Data Centre, 2015-2021. Development of a data centre for global personal environmental exposure assessment. Involvement: co-applicant, project coordinator. Funding: Utrecht University. Supervisor of 2 senior software engineers, 3 postdocs, 1 web-GIS developer. Cooperation with Julius Center (UMCU, Utrecht),

Department Human Geography and Planning, Interfaculty Institute for Risk Assessment Sciences, Information and Technology Services (Utrecht University). Grant 2000 KE, for 3 years.

GEORGE: Groundwater percolation modelling of pesticides. Involvement: applicant, supervisor, 2016-2018. Funding: BASF Germany. Co-workers: assistant professor, postdoc. Grant 150 KE.

Spatial Century: a software library for pollutant dispersal modelling, 2015. Involvement: applicant, supervisor. Funding: National Institute for Public Health. Co-workers: senior software engineer. Grant 20 KE.

High-performance geocomputation: a software library to run hyper-resolution models in real-time including uncertainty analysis, 2014-2015. Involvement: co-applicant, supervisor. Funding: Maps4Society (Dutch Science Foundation). Co-workers: two scientific software engineers. Grant: 50 KE.

Spatial network simulation in the geosciences, 2014. Involvement: applicant, supervisor. Funding: Faculty of Geosciences. Co-worker: junior software engineer. Grant: 25 KE.

Taking a remote look at canopy nitrogen to improve global climate models, 2014-2018. Involvement: co-applicant and co-promotor of PhD student. Funding: Dutch Science Foundation. Partners: multiple international partners. Grant: 250 KE.

Using big data to relate air pollution exposure and health in Dutch urban areas, 2014-2018. Involvement: applicant and coordinator. Co-workers: scientific software engineer. Funding: Knowledge Centre Healthy Urban Living. Grant: 25 KE.

Meta-modelling of Sustainable City Systems, 2013-2017. Involvement: applicant and coordinator. Co-workers: PhD student. Funding EU-Climate KIC. Grant 225 KE.

A virtual globe for environmental impact assessment, 2013. Involvement: applicant, supervisor. Co-workers: junior software engineer. Grant: 15 KE.

Next generation tools for operational water management. Involvement: applicant, supervisor. Co-workers: scientific software engineer. Funding: International Marine & Dredging Consultants NV (IMDC). Grant: 5 KE.

Nested modelling of the discharge from large catchments using hydromorphological units, 2008-2013. Involvement: Co-applicant and co-supervisor. Funding: Anandamahidol Foundation, Thailand. Content: Modelling in the Representative Elementary Watershed framework. Grant: 250 KE.

Improving near real-time flood forecasting using multi-sensor soil moisture assessment, 2011-2014. Involvement: Co-applicant and daily supervisor. Funding: Dutch Science Foundation. Content: Assimilation of remotely sensed soil moisture in real-time hydrological models. Partners: EU-JRC, Technical University Vienna (Austria), CESBIO (France). Grant: 250 KE.

Remote Sensing Data Assimilation in Modelling of Urban Dynamics, 2010-2013. Involvement: applicant and coordinator at Utrecht University. Funding: STEREO II, Belgian Federal Public Planning Service Science Policy. Content: To develop methods to assimilate remotely sensed information into land-use change models for improved forecasting of land-use change. Co-workers: Dr. H. van der Kwast (VITO, Belgium), G. Engelen, MSc. (VITO, Belgium). Partners: VITO, Belgium. Grant: 100 KE

Design and implementation of a life cycle management system supporting model component construction and integration for modelling coupled spatio-temporal systems, 2009-2013 Involvement: applicant and coordinator. Funding: VITO, Expertisecentrum Integrale Milieustudies, Belgium government. Content: To develop a

modelling language for coupled systems. Co-workers: Dr. O. Schmitz (PhD student, VITO, Belgium), Dr. H. van der Kwast (VITO, Belgium), G. Engelen, MSc. (VITO, Belgium), Ing. C. Wesseling (PCRaster Environmental Software, the Netherlands). Partners: VITO, Belgium. Grant: 200 KE.

Effect of changing vegetation cover in drylands on regional wind erosion: upscaling a process-based wind erosion model to the regional scale, 2009-2012. Involvement: applicant and coordinator. Funding: Turkish government, Wageningen University. Co-workers: F. Youssef (PhD student, Ankara University), Dr. G. Erpul (Ankara University), Dr. S. Visser (Wageningen University, the Netherlands). Partners: Soil Science Department, Faculty of Agriculture, Ankara University; Wageningen University, ESW group. Grant: 100 KE.

3D Block Analyst, 2010-2012. Involvement: applicant and coordinator. Funding: Deltares, the Netherlands. Content: development of 3D subsurface analysis software. Co-workers: K. de Jong, MSc. (Utrecht University), J. Gunnink, MSc. (Deltares). Partners: Deltares, the Netherlands. Grant: 25 KE.

Towards a European-scale water quality model, 2011-2012. Involvement: applicant & coordinator. Funding: JRC-EU. Content: development of pollution routing algorithms. Co-workers: Dr. M. van der Perk, K. de Jong, MSc. Grant: 15 KE.

Implementing ERFRAD, 2011. Involvement: applicant. Funding: RIVM. Content: implementation of data assimilation in radionuclide dispersal forecasts. Co-workers: A. Lam, MSc., Dr. C. Twenhofel (RIVM). Partners: RIVM, the Netherlands. Grant: 25 KE.

Quantification of uncertainty in radiological risk assessment after radiological and nuclear accidents, 2010-2011. Involvement: applicant & coordinator. Funding: RIVM, the Netherlands. Content: application of data assimilation to radionuclide dispersal models. Co-workers: A. Lam, MSc., K. de Jong, MSc., Dr. C. Twenhofel (RIVM). Partners: RIVM, the Netherlands. Grant: 50 KE.

On-line coupling of spatial optimization tools and spatially distributed simulation models, 2007-2009. Involvement: Coordinator and main applicant. Funding: Ruimte voor Geo-Informatie (RGI, the Netherlands). Content: On-line coupling of optimisation tools, simulation models, tested on the European Flood Alert System. Co-workers: Dr. O. Schmitz (software engineer, Utrecht University), Dr. A. de Roo (JRC-EC). Partners: Land Management and Natural Hazards Unit, JRC-EC (Italy), PCRaster Environmental Software (the Netherlands). Grant: 50 KE.

Simulation of a hydrocarbon reservoir analog using a process-based model of fluvial stratigraphy, 2005-2009. Involvement: Coordinator and applicant. Funding: ACS/PRF, U.S.A. Content: Development of a three dimensional model of alluvial deposition conditioned to well data. Co-workers: K. de Jong, MSc. (software engineer, Utrecht University), M. de Vries, MSc. (environmental modeller, Utrecht University), Dr. O. Schmitz (software engineer, Utrecht University), Prof J. Bridge (Binghamton University, U.S.A.). Partners: Binghamton University, U.S.A. Grant: 50 KE.

Simulation and GIS: the OpenMI framework for access to spatial temporal data and the linking of models, 2005-2007. Involvement: Coordinator at Utrecht University. Funding: Ruimte voor Geo-Informatie (RGI, the Netherlands). Content: Development of a standardized coupling between MODFLOW and PCRaster. Co-workers: Dr. O. Schmitz (software engineer), K. de Jong, MSc. (software engineer). Co-operation: PCRaster Environmental Software. Grant: 50 KE.

Projects, participant

- Societal Embedding of a Biobased Society, Identifying, Quantifying and Qualifying Sustainability for the Biobased Economy, 2011-2015. Involvement: project participant and daily supervisor. Funding: BE-BASIC. Partners: Department of Energy Science, Utrecht University (the Netherlands).
- Fragmentation and seed dispersal in freshwater wetlands. 2008-2011. Involvement: project participant. Partners: Department of Environmental Sciences, Utrecht University (the Netherlands).
- eWaterCycle, 2012-2014. Involvement: project participant. Funding: eScience center, the Netherlands. Content: Development of a global high resolution hydrological model. Partners: Delft University, eScience Center (the Netherlands)
- Water2Invest, 2012-2014. Involvement: model development. Funding: Climate KIC. Content: development of online global water management tool. Partners: Deltares, FutureWater, Carthago (the Netherlands), Imperial College (UK)
- Dunetracking, 2010-2012. Involvement: coordinator. Funding: RWTH Aachen University. Content: Development of a river dune tracking algorithm and software. Partners: RWTH Aachen University.
- Control of woody plants in native pastures: definition of criteria to support the the field management law in the Pantanal of Mato Grosso, 2009-2011. Funding: Instituto Nacional de Áreas Úmidas (INAU), Brazil. Co-workers: Dr. W. Junk, Dr. J. Couto (University of Mato Grosso,Brazil), colleagues at INAU. Partners: INAU, University of Mato Grosso, Brazil.
- A 4D (time-space) process-based alluvial architecture model and its application to the Holocene Rhine-Meuse delta, the Netherlands, 2002-2006. Involvement: Model development. Funding: Dutch Science Foundation (MEERVOUD). Content: Construction of a 4D (time-space) process-based alluvial architecture model.
- Eurodelta, 2003-2005. Involvement: Project participant, river morphology model development and nesting approach. Funding: EU. Partners: Faculty of Earth Sciences (Utrecht University), several European research institutes.
- A European research network for the application of Geomorphology and Environmental impact assessment to Transportation Systems (GETS), 1999-2003. Involvement: Project participant, developer of decision support system for planning ski runs. Funding: EU. Partners: research institutes and private industry from EC countries.
- SPARTACUS, RESTORE, 1998-2000. Involvement: Project participant, organiser & lecturer in modelling workshops. Funding: EU. Content: Spatial redistribution of radionuclides within catchments, restoration of radioactively contaminated ecosystems. Partners: several institutes from EC countries and the former Soviet Union.
- Mediterranean Desertification and Land Use, 1993-1995. Involvement: Project participant, model developer. Funding: EU. Content: Development of a rainfall-runoff model for a catchment near Murcia, Spain (Utrecht case study).
- Effects of agricultural land use on surface runoff and erosion in a Mediterranean area, 1996-2000. Involvement: Developer of the EUROSEM model in PCRaster. Funding: EU. Content: Effects of agriculture on runoff and erosion in vineyards. Co-workers: Researchers at Utrecht University.

Personal Dutch Science Foundation grant proposal, not granted (selection)

Coupled field-agent modelling: a new modelling paradigm for the geosciences. 2010. NWO VIDI scheme proposal. Assessment: 3 times A+ (highest quality, significance and recommendation for funding), 1 time A (high quality, significance and recommendation for funding).

Scientific Software

LUE Scientific Database and Environmental Modelling Framework, 2017 - current.
Framework for field-agent based data storage and modelling. Involvement: coordinator.
Co-workers: K. de Jong, MSc., Dr. O. Schmitz. LUE is the core of personal human environmental exposure assessment tools used in the Global Geo Health Data Center.
PCRaster spatio-temporal modelling software. PCRaster 1.0 (with PCRcalc, 1996), PCRaster 2.0 (upgrade to PCRaster Python, 2007), PCRaster 3.0 (upgrade to data assimilation framework, 2010), PCRaster 4.0 (2017, upgrade containing parallel Fern library).
Involvement: coordinator. Co-workers Dr. W.P.A. van Deursen (Carthago Consultancy), C.G. Wesseling, K. de Jong, Dr. O. Schmitz. PCRaster maintenance is supported by JRC-EU, Deltares, and Utrecht University, PCRaster is the core of multiple continental scale models including PCR-GLOBWB (Utrecht University), LISFLOOD (JRC-EU), OpenStreams (Deltares). PCRaster has ~3000 downloads / year.

Activities for international journals

Editor-in-Chief

Computers & Geosciences, 2017 – present. With Dr. G. Mariethoz and Dr. D. Grana.

Member of editorial board

Environmental Modelling & Software, Transactions in GIS, Environmental Modelling & Assessment.

Guest Editor

Complexity and nonlinearity in Earth surface processes - concepts, methods and applications. Special issue in Earth Surface Processes and Landforms, 2015. Co-Guest-Editor with A.J.A. Temme, M. Keiler, A. Lang.

Reviewer

Applied Geography, Catena, Computers, Environment and Urban Systems, Computers & Geosciences, Earth Surface Processes and Landforms, Environmental Modelling & Software, Geoderma, GeoInformatica, Journal of Hydroinformatics, Hydrological Processes, Hydrological Sciences Journal, International Journal of Geographical Information Science,

Journal of Soil and Water Conservation, Journal of Sedimentary Research, Soil & Tillage Research, Transactions in GIS, Water Resources Research.

Conferences & presentations

Conferences organized

Framing Land Use Dynamics II Conference, 18-20 April 2007, the Netherlands. Involvement: Member of the Organization Committee. Content: Organizing the conference, 150 participants.

Policies and tools for the sustainable water management in the EU, 21 - 23 Nov. 2002, Venice, Italy. Involvement: Member of steering committee organizing conference content & programme. Content: Reviewer of conference papers, structuring the conference programme, approximately 75 participants.

Conference sessions, workshops and seminars organized

Coping with systemic changes in environmental modelling. Workshop organized at AGILE Conference on Geographic Information Science, Wageningen, the Netherlands, 9-12 May, 2017. With Dr. J. Versteegen (University of Münster), Dr. O. Schmitz (Utrecht University).

Analysing spatio-temporal data with R, workshop at the AGILE International Conference on Geographic Information Science, 15-17 May 2013, Leuven, Belgium. Involvement: co-convener.

Complexity and nonlinearity in Earth surface processes – Concepts, methods and applications, session at European Geosciences Union General Assembly 2012, 22 - 27 April 2012. Involvement: co-convener.

Simplicity and complexity in evolution of coupled geomorphologic systems: concepts, models and applications, session at European Geosciences Union General Assembly 2011, 3 - 8 April 2011. Involvement: co-convener.

Higher-dimensional GIS, introducing PCRaster 3, workshop organized at 14th AGILE International Conference on Geographic Information Science, 18-21 April 2011, Utrecht, the Netherlands. Involvement: convener.

Conferences: steering committee membership

AGILE 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019. AGILE Conferences on Geographic Information Science. Involvement: member of Steering Committee.

GISCIENCE 2014, 8th International Conference on Geographic Information Science, 24-26 September 2014. Involvement: member of Steering Committee.

CUPUM, 13th International Conference on Computers in Urban Planning and Urban Management. Involvement: member of Steering Committee.

GISCIENCE 2012, 7th International Conference on Geographic Information Science, 19 -21 September, 2012, Columbus, U.S.A. Involvement: member of Program Committee.

Landslide Processes: from geomorphologic mapping to dynamic modelling, Strasbourg, France, 6-7 February 2009. Involvement: member of Scientific Committee.

Dynamic Modeling in a GIS Environment, e-seminar series Global GIS academy, 2009.
Involvement: co-convener and e-seminar chair.

GIDays 2008, Interoperability and spatial processing in GI applications, 16-17 June 2008,
Münster, Germany. Involvement: Member of Program Committee

Keynotes

Karssenberg, D. 2018, Quantifying the exposome: challenges and solutions in computational geography, Data Science Day, Utrecht University, April 20, 2018, Utrecht, the Netherlands.

Karssenberg, D., 2011, PCRaster framework for developing space-time models. Brazilian Remote Sensing Symposium, XVBSR, April 30 - May 5, 2011, Curitiba, Brazil.

Karssenberg, D., 2009, Process-based models as instruments: how models facilitate the use of theory and data for solving various geomorphological problems. In *Landslide processes: from geomorphological mapping to dynamic modelling*, 6-7 February, 2009, Strasbourg, France).

Karssenberg, D., 2002, Geographical Information Systems and Hydrological Modelling, keynote. In *EuroConference Link Geo and Water Research*, Genova, Italy).

Karssenberg, D. and Burrough, P.A., 2000, sept 2-8, Teaching numerical modelling in the environmental sciences, keynote. In *International Conference on Integrating Geographic Information Systems and Environmental Modeling: Problems, Prospectus, and Needs for Research*. B.O. Parks, K.M. Clarke and M.P. Crane (Eds.), Banff, Canada: Boulder: University of Colorado - Cooperative Institute for Research in Environmental Sciences, Denver: US Geologic Survey - Center for Biological Informatics, and Boulder: NOAA National Geophysical Data Center - Ecosystem Informatics).

Invited speaker (selection)

Karssenberg, D., 2017, Quantifying the exposome: challenges and solutions in geocomputation. Data Science Summit, University of Technology, December 4, 2017, Eindhoven, the Netherlands.

Karssenberg, D., 2016. Global Geo Health Data Centre: a web service for human environmental exposures. Seminar Research ICT, University Medical Center Utrecht, March 31, 2016.

Karssenberg, D., 2016. Critical shifts in catchment evolution: land degradation in semi-arid regions. Boussinesq Lecture, Boussinesq Center for Hydrology, October 22, 2015.

Karssenberg, D., 2010. A software framework to assimilate observations into forward spatial models. Invited presentation at Helmholtz-Zentrum für Umweltforschung , UFZ Department Ökologische Systemanalyse, 16 March, 2010.

Karssenberg, D., 2008. Numerical modelling of geographic change: complexity in a fluvial system. Invited presentation at Institut für Geographie und Regionalforschung, Universität Wien, Vienna, Austria, 13 Oct 2008.

Karssenberg, D. 2004. Process-based alluvial stratigraphy modelling: predicting the architecture of fluvial deposits and conditioning to well data. Invited presentation at Statoil, Norway, Dec 1st, 2004.

Member of international committees

Advisory Group of the Global GIS Academy, 2006 – 2008. Content: Developing Geographical Information Science related activities in the World Wide Universities, speaker, chair of a number of e-seminars given by geographic information system experts and chair of postgraduate colloquia series. Involvement: Group member, e-seminar organizer. Co-members: International group of GIS experts.

Awards

Environmental Modelling & Software Top 10 Reviewer Award Honorable Mention, 2015.

Environmental Modelling & Software Top 10 Reviewer Award, 2014.

Environmental Modelling & Software Best Paper Award 2010: Software and Decision Support. Paper: Karssenberg, D., Schmitz, O., Salamon, P., De Jong, K. and Bierkens, M.F.P., 2010, A software framework for construction of process-based stochastic spatio-temporal models and data assimilation. Environmental Modelling & Software, 25, pp. 489-502.

Teaching

Courses taught

Bachelor and Master courses

Environmental modelling (7.5 ECTS, coordinator), 2001 - present. Theory of geoinformatics, spatio-temporal processes, application of models in physical geography.

Introduction to Geostatistics (3 ECTS, coordinator), 2000 - 2004. Spatial data analysis, interpolation methods.

Advanced methods and techniques in GIS (10 ECTS, second coordinator), 2005 - present. Geostatistics and dynamic modelling. Part of blended learning GIMA Master of Science Programme.

Physical Geographical Fieldwork (15 ECTS, second coordinator, coordinator), 2001 - present. Field mapping (geomorphology, geology, hydrology), modelling landscape dynamics.

Stochastic Hydrology (co-lecturer), 2005 - present. Error propagation modelling labs.

Bachelor and MSc thesis Earth Sciences, 2000 - present. Theses in geoinformatics and physical geography.

Spatial Analysis & GIS 1 (second coordinator, coordinator), 2005 - 2008. Concepts of spatial analysis, GIS techniques, Map Algebra.

Groundwater flow modelling (4 ECTS, coordinator), 2000 - 2003. Transient groundwater modelling, catchment scale.

Land degradation modelling (4 ECTS, coordinator), 1999 - 2001. Dynamic modelling of land degradation and landscape evolution.

Postgraduate courses

Spatio-temporal modelling of environmental processes & Geostatistics, 1996-2008. One week courses, taught eight times to an international audience at Utrecht University, the Netherlands; Cornell University, Ithaca, U.S.A.; University of Kiel, Germany; Vlaamse instelling voor technologisch onderzoek (VITO), Belgium. Form: Lectures, computer classes, in combination with distance learning through the World Wide Web. Involvement: Coordinator, lecturer.

Temporal spatial modelling (several topics, see <http://www.pcraster.eu>), 2001 – present. Form: Distance learning using interactive course material (Blackboard). Involvement: Coordinator.

Postgraduate seminar series in GIS and modelling, 2006 – 2010. Content: Postgraduates researchers, discussion groups and presentations. Form: Virtual room presentations and discussion groups. Involvement: Coordinator.

Discussion group on transient modelling of earth systems, the Netherlands Centre for Geo-ecological Research (ICG), 2003. Involvement: Coordinator. Content: Discussion group for postgraduate students and staff of ICG. Form: Discussion group meetings.

Teaching innovation projects

MAGIC, 2016 – 2018. Involvement: co-applicant, supervisor of one Postdoc. Regional PhD School based on Innovative HydroPlatform in Water and Environment to Enhance MAGhreb Inter-Research Centres. Grant: 24 KE.

Naar Buiten, 2016 – 2017. Development of mobile blended learning material for excursions. Involvement: co-applicant, member of steering committee. Funding: SURF. Co-workers: postdoc and junior researcher.

Improving fieldwork teaching using blended learning, 2014 – 2016. Development blended learning for fieldwork. Involvement: applicant, supervisor. Funding: Utrechts Stimuleringsfonds Onderwijs, Faculty of Geosciences. Co-workers junior software engineer and junior lecturer. Grant: 200 KE.

Teaching Fellow to the Dean, 2013-2015. Advising the faculty on e-learning in the curricula and the use of the electronic learning environment, supporting staff in converting courses to the blended learning courses, writing a vision on blended learning.

MUTATE, 2001-2003. Multimedia Tools for Advanced GIS Training in Europe, development of courseware and course content for advanced GIS training through the internet. Involvement: co-applicant and course developer. Funding: EU. Partners: Institutes and universities from different EC countries. Grant: 75 KE.

Virtual landscapes, 1999-2001. Development of interactive geomorphologic, ecological and hydrological models and study material for learning about geographical change. Involvement: Daily coordinator (with Prof. Dr. P.A. Burrough). Funding: Ministry of Education, the Netherlands.

Member of committees (Utrecht University)

Applied Data Science Bachelor Programme Project Team. 2018 – present. Project team for the development of the Applied Data Science Bachelor Programme at Utrecht University. Content: member representing the Faculty of Geosciences.

Applied Data Science MSc. Programme Project Team. 2017 – present. Project team for the development of the Applied Data Science MSc Programme at Utrecht University. Content: member representing the Faculty of Geosciences.

Big Data MSc Project Team. 2015 – 2016. Project team for the development of the Data Science MSc at Utrecht University. Role: member representing the Faculty of Geosciences.

Research & IT commission of Utrecht University. 2014 – present. Role: member. Co-author of vision on Research and IT of Utrecht University.

Research & IT commission of the Faculty of Geosciences, Utrecht University. 2014 – present. Role: chair.

e-Learning Committee of the Faculty of Geosciences, Utrecht University. 2013 – present. Co-author of vision on blended learning at the Faculty of Geosciences. Daily management related to e-learning.

Research Evaluation Report Commission, Dep. Of Physical Geography, Utrecht University, 2014. Content: Member of the committee writing the research evaluation report.

Strategic Planning Commission of the Dep. Of Physical Geography, Utrecht University, 2012. Content: Member of committee writing the strategic research plan of the Department and the bi-annual Mid Term Research Assessment report of the Department.

Master Education Council of the Earth Sciences programme ('opleidingscommissie'), Utrecht University, 2011 – present. Content: Member of council advising the Board of the Teaching Institute Earth Sciences on teaching programme content and quality

PhD monitoring committee (BEGCOM), Fac. of Geosciences, Utrecht Univ., 2006 – 2016. Content: Member of the committee monitoring the performance of PhD student using Progress Report Seminars given by PhD students.

PCRaster research team, 1994 – present. Content: Planning and co-ordinating PCRaster maintenance, development and cooperation with PCRaster Environmental Software. Involvement: Co-ordinator; Co-members: K. de Jong, MSc., Dr. O. Schmitz, M. de Vries, MSc.

Teaching Committee of the Inter-Faculty Centre for Hydrology Utrecht (ICHU), 1996-2000. Content: Developing an inter-faculty (Faculty of Geographical Sciences and Faculty of Earth Sciences) teaching programme for hydrology in Utrecht. Co-members: hydrology staff members from both Faculties.

Other international network activities (selection)

Sciences and Technologies Studies Laboratory, Institute of Social Sciences, University of Lausanne, Switzerland, 2018 – present. Contact person: Prof. Dr. D. Vinck. Content: joint research papers and supervision of PhD student.

Universidad de La Rioja, Spain, 2010 – present. Contact person: Dr. N. Lana-Renault Monreal. Content: joint research projects in eco-hydrology, joint research papers, exchange visits, joint supervision of MSc students.

Faculty of Science and Engineering, Åbo Akademi University, Finland, 2015 – present. Contact persons Prof. Dr. J. Westerholm and J. Carabano. Content: exchange visit and joint project proposal.

Vienna University of Technology, Austria, 2011 – present. Contact persons: Prof. Dr. W. Dorigo, Prof. Dr. W. Wagner. Content: joint research proposals, projects, and papers.

Institute for Geoinformatics (ifgi), University of Münster, Germany, 2010 – present. Contact persons: Prof. Dr. E. Pebesma, Dr. J.A. Verstegen. Content: invited lecture, joint project proposal, shared use of software and teaching materials.

University of Stavanger, Norway, 2010 – present. Contact persons: Dr. L. Watson. PhD student and joint publications.

Institut für Geographie und Regionalforschung der Universität Wien, Austria, 2008 – present. Contact persons: Dr. M. Keiler, Prof. Dr. T. Glade. Content: A number of short visits, joint research proposal on complex systems.

Institute for Geoinformation and Cartography, Research Group Geoinformation, Technical University, Vienna, Austria, 2009 - present. Contact persons: Prof. Dr. A.U. Frank, Dr. B. Hofer. Content: Short research visit (Nov. 2009), invited presentation.

Faculty of Agronomics and Veterinary Science, Federal University of Mato Grosso, Brazil, 2008 – present. Contact persons: Prof. Dr. E.G. Couto. Content: Joint publications on forest ecosystem modelling, joint research proposal (accepted), short research visit, exchange of PhD student.

Department of Ecological Modelling, Helmholtz Center for Environmental Research, Leipzig, Germany, 2010 - present. Contact persons: Prof. Dr. V. Grimm. Content: short research visit.

Faculty of Agriculture, Department of Soil Science, Ankara, Turkey, 2008 - present. Contact persons: Prof. G. Erpul. Content: Joint research proposal on soil erosion modelling (accepted), exchange of PhD student.

Vlaamse instelling voor technologisch onderzoek (VITO), Belgium, 2008 - present. Contact persons: G. Engelen, MSc. Content: Research proposals on geocomputation (accepted, in review), joint publication (accepted), invited presentation, short course on modelling, joint PhD student.

Aula Dei Experimental Station, CSIC, Zaragoza, Spain, 2008 – present. Contact persons: Dr. S. Beguería. Content: Geocomputational methods for debris flow modelling (joint short project).

Institute: Nanjing Institute of Geography and Limnology, Nanjing, China; Fachabteilung für Hydrologie und Wasserwirtschaft / CAU Kiel, Germany, 2007 - present. Contact persons: Dr. ing. agr. Georg Hörmann (Kiel), Dr. G. Junfeng (Nanjing). Period: 2007 – present. Content: Joint development of a lake ecosystem model including nutrient budgets and algae growth.

European Commission - DG Joint Research Centre, Natural Hazards Action (NAHA), Ispra, Italy, 2005 - present. Contact person: Dr. Ad de Roo. Content: Cooperation between my research team and DG Joint Research Centre in the development of the Aguila visualisation tool, and development of data assimilation techniques for flood forecasting.

Faculty of Geosciences, Binghamton University, New York, U.S.A., 1999 – 2012. Contact person: Prof. Dr. J. Bridge. Content: Joint development of numerical model of alluvial architecture, resulting in several conference presentations and publications, annual short visits to Binghamton University, sabbatical of Prof. John Bridge at Utrecht University (spring 2004).

Environmental Systems Research Institute (ESRI), Redlands, U.S.A., 1998, 2006 – present. Contact person: David Maguire. Content: Cooperation between PCRaster research team and ESRI in development of dynamic modelling software and course materials, invited visit to Redlands including dynamic modelling workshop.

Department of Earth and Atmospheric Sciences, Cornell University, Ithaca, New York, U.S.A., 1999 – 2004. Contact person: Prof. Susan Riha, Dr. Karin Rebel. Content: Cooperation in eco-hydrological research, joint development of vadose zone model, resulting in conference presentations and publication, two one week visits to Cornell University including organisation of a dynamic modelling workshop for PhD students and staff of the Department of Earth and Atmospheric Sciences, Cornell University.

Academic qualifications and courses followed

Senior Qualification Research, Utrecht University, 2014.

Senior Qualification Teaching, Utrecht University, 2014.

Academic Leadership Course, 2015. Five-day course for Associate Professors.

Human languages

Dutch:	native speaker, C2
English:	excellent, C2
German:	good, B1
French:	fair, A1

Levels according to the Common European Framework of Reference for Languages (CEF)

Computer programming languages

C++, PCRcalc, Python, Pascal, R, SQL, Tcl

References

Upon request