

List of publications of Stefan Hagemann

Ph.D. thesis

Hagemann, S., 1998: Entwicklung einer Parameterisierung des lateralen Abflusses für Landflächen auf der globalen Skala, Examensarbeit 52, Max Planck Institute for Meteorology, Hamburg

Habilitation thesis

Hagemann, S., 2011: The Hydrological Cycle: How observational data are able to improve climate models. Universität Hamburg, published as: *Reports on Earth System Science* **90**, Max Planck Institute for Meteorology, Hamburg

Reviewed publications

1998-2001

1. Hagemann, S., L. Dümenil, 1998: A parameterization of the lateral waterflow for the global scale. *Clim. Dyn.* **14** (1), 17-31
2. Hagemann, S. and L. Dümenil, 1999: Application of a Global Discharge Model to Atmospheric Model Simulations in the BALTEX Region, *Nordic Hydrology* **30** (3), 209-230
3. Hagemann, S. and A. Kleidon, 1999: The Influence of rooting depth on the simulated hydrological cycle of a GCM, *Physics and Chemistry of the Earth* (B) **24** (7), 775-779
4. Hagemann, S., M. Botzet and B. Machenhauer, 2001: The summer drying problem over south-eastern Europe: Sensitivity of the limited area model HIRHAM4 to improvements in physical parameterization and resolution, *Physics and Chemistry of the Earth*, Part B, Vol. **26/5-6**, 391-396
5. Hagemann, S., and L. Dümenil Gates, 2001: Validation of the hydrological cycle of ECMWF and NCEP reanalyses using the MPI hydrological discharge model, *J. Geophys. Res.* **106**, 1503-1510

2003

6. Bueh, C, U. Cubasch und S. Hagemann, 2003: Impacts of global warming on changes in the East Asian monsoon and the related river discharge in a global time slice experiment. *Clim. Res.* **24**, 47-57
7. Hagemann, S., L. Bengtsson and G. Gendt, 2003: On the determination of atmospheric water vapor from GPS measurements. *J. Geophys. Res.* **108**, No. D21, 4678
8. Hagemann and Dümenil Gates, 2003: Improving a subgrid runoff parameterization scheme for climate models by the use of high resolution data derived from satellite observations. *Clim. Dyn.* **21**, 349-359
9. Latif, M., E. Roeckner, M. Botzet, M. Esch, H. Haak, S. Hagemann, J. Jungclaus, S. Legutke, S. Marsland, U. Mikolajewicz, 2003: Reconstructing, Monitoring, and Predicting Decadal-Scale Changes in the North Atlantic Thermohaline Circulation with Sea Surface Temperature, *J. Climate*, **17**, 1605-1613

2004

10. Bengtsson, L., S. Hagemann and K. I. Hodges, 2004: Can Climate Trends be Calculated from Re-Analysis Data?, *J. Geophys. Res.* **109**, No. D11.
11. Bengtsson, L., K. Hodges and S. Hagemann, 2004: Sensitivity of Large Scale Atmospheric Analyses to Humidity Observations and its Impact on the Global Water Cycle and Tropical and Extra-Tropical Weather Systems, *Tellus*, **56A**, 202-217
12. Bengtsson, L., K. I. Hodges and S. Hagemann, 2004: Sensitivity of Re-Analyses to the Observing System: Determination of the Global Atmospheric Circulation from Reduced Observations, *Tellus*, **56A**, 456-471
13. Hagemann, S., B. Machenhauer, R. Jones, O.B. Christensen, M. Deque, D. Jacob, and P.L. Vidale, 2004: Evaluation of water and energy budgets in regional climate models applied over Europe, *Clim. Dyn.*, **23**, 547-567, DOI: 10.1007/s00382-004-0444-7

2005

14. Arpe, K., S. Hagemann, D. Jacob and E. Roeckner, 2005: The realism of the ECHAM5 models to simulate the hydrological cycle in the Arctic and North European area, *Nordic Hydrology*, **36** (4), 349-367
15. Jacob, D., and S. Hagemann, 2005: Verstärkung und Schwächung des regionalen Wasserkreislaufs - wichtiges Kennzeichen des Klimawandels, In: J.L. Lozán, H. Graßl, P. Hupfer, L. Menzel, C.-D. Schönwiese (Ed.), Warnsignal Klima: Genug Wasser für alle?, *Wissenschaftliche Auswertungen*, Hamburg
16. Uppala, S.M., P.W. Kållberg, A.J. Simmons, U. Andrae, V. da Costa Bechtold, M. Fiorino, J.K. Gibson, J. Haseler, A. Hernandez, G.A. Kelly, X. Li, K. Onogi, S. Saarinen, N. Sokka, R.P. Allan, E. Andersson, K. Arpe, M.A. Balmaseda, A.C.M. Beljaars, L. van de Berg, J. Bidlot, N. Bormann, S. Caires, A. Dethof, M. Dragosavac, M. Fisher, M. Fuentes, S. Hagemann, E. H—lm, B.J. Hoskins, L. Isaksen, P.A.E.M. Janssen, A.P. McNally, J.-F. Mahfouf, R. Jenne, J.-J. Morcrette, N.A. Rayner, R.W. Saunders, P. Simon,

- A. Sterl, K.E. Trenberth, A. Untch, D. Vasiljevic, P. Viterbo and J. Woollen, 2005, The ERA-40 Re-analysis, *Q. J. R. Meteorol. Soc.*, Oct. 2005 Part B
17. van den Hurk, B., M. Hirschi, C. Schär, G. Lenderink, E. van Meijgaard, A. van Ulden, B. Rockel, S. Hagemann, P. Graham, E. Kjellström and R. Jones, 2005: Soil control on runoff response to climate change in regional climate model simulations. *J. Climate*, **18**, 3536-3551.
- 2006**
18. Hagemann, S., K. Arpe and E. Roeckner, 2006: Evaluation of the hydrological cycle in the ECHAM5 model, *J. Climate*, **19**, 3810-3827
19. Roeckner, E., R. Brokopf, M. Esch, M. Giorgetta, S. Hagemann, L. Kornbluh, E. Manzini, U. Schlese, and U. Schulzweida, 2006: Sensitivity of simulated climate to horizontal and vertical resolution in the ECHAM5 atmosphere model, *J. Climate*, **19**, 3771-3791
- 2007**
20. Graham, L.P., Hagemann, S., Jaun, S. and Beniston, M., 2007: On interpreting hydrological change from regional climate models. *Climatic Change* (Prudence Special Issue), **81**, Supplement 1: 97-122
21. Hagemann, S., and D. Jacob, 2007: Gradient in the climate change signal of European discharge predicted by a multi-model ensemble. *Climatic Change* (Prudence Special Issue), **81**, Supplement 1: 309-327
22. Hirschi, M., S.I. Seneviratne, S. Hagemann and C. Schär, 2007: Analysis of seasonal terrestrial water storage variations in regional climate simulations over Europe. *J. Geophys. Res.* **112**, D22109, doi:10.1029/2006JD008338
23. Jacob, D., Bärring, L., Christensen, O.B., Christensen, J.H., Hagemann, S., Hirschi, M., Kjellström, E., Lenderink, G., Rockel, B., Schär, C., Seneviratne, S.I., Somot, S., van Ulden, A., and van den Hurk, B., 2007: An inter-comparison of regional climate models for Europe: Design of the experiments and model performance. *Climatic Change* (Prudence Special Issue), **81**, Supplement 1, 31-52
24. Jacob, D., and S. Hagemann, 2007: Intensification of the hydrological cycle - An important signal of climate change. Eds. J. Lozán, H. Graßl, P. Hupfer, L. Menzel & Chr. Schönwiese GLOBAL CHANGE: Enough Water for all?, *Wissenschaftliche Auswertungen/GEO*, Hamburg, 170-173.
- 2008**
25. Döll, P., K. Berkhoff, H. Bormann, N. Fohrer, D. Gerten, S. Hagemann, and M. Krol, 2008: Advances and visions in large-scale hydrological modelling: findings from the 11th Workshop on Large-Scale Hydrological Modelling. *Adv. Geosci.* **18**, 51-61.
26. Göttel, H., J. Alexander, E. Keup-Thiel, D. Rechid, S. Hagemann, T. Blome, A. Wolf, D. Jacob, 2008: Influence of changed vegetations fields on regional climate simulations in the Barents Sea Region. *Climatic Change* (BALANCE special issue), **87**, doi: 10.1007/s10584-007-9341-5: 35-50.
27. Rechid, D., S. Hagemann and D. Jacob, 2008: Sensitivity of climate models to seasonal variability of snow-free land surface albedo. *Theoretical and Applied Climatology*, doi: 10.1007/s00704-007-0371-8
28. Schuur, E.A.G, J. Bockheim, J. Canadell, E. Euskirchen, C.B. Field, S. Goryachkin, S. Hagemann, P. Kuhry, P. Laflour, H. Lee, G. Mazhitova, F. E. Nelson, A. Rinke, V. Romanovsky, N. Shiklomanov, C. Tarnocai, S. Venevsky, J. G. Vogel, S.A. Zimov, 2008: Vulnerability of permafrost carbon to climate change: Implications for the global carbon cycle. *Bioscience*, **58** (8), 701-714
- 2009**
29. Berg, P., J. O. Haerter, P. Thejll, C. Piani, S. Hagemann and J. H. Christensen, 2009: Seasonal characteristics of the relationship between daily precipitation intensity and surface temperature. *J. Geophys. Res.*, **114**(d18): D18102, doi:10.1029/2009JD012008.
30. Hagemann, S., H. Göttel, D. Jacob, P. Lorenz and E. Roeckner, 2009: Improved regional scale processes reflected in projected hydrological changes over large European catchments. *Climate Dynamics* **32** (6), doi: 10.1007/s00382-008-0403-9: 767-781.
31. Saeed, F., S. Hagemann and D. Jacob, 2009: Impact of irrigation on the South Asian Summer Monsoon. *Geophys. Res. Letters* **36**, L20711, doi:10.1029/2009GL040625.
- 2010**
32. Hänsler, A., S. Hagemann and D. Jacob, 2010: Dynamical downscaling of ERA40 reanalysis data over southern Africa: added value in the representation of seasonal rainfall characteristics. *Int. J. Climatology*, doi:10.1002/joc.2242.
33. Hänsler, A., S. Hagemann and D. Jacob, 2010: How the future climate of the southern African region might look like: Results of a high-resolution regional climate change projection. *Nova Acta Leopoldina*, **112**(384), 183-193.
34. Haerter, J.O., P. Berg, and S. Hagemann, 2010: Heavy rain intensity distributions on varying time scales and at different temperatures, *J. Geophys. Res.*, **115**, D17102, doi:10.1029/2009JD013384.
35. Piani, C., G.P. Weedon, M. Best, S. Gomes, P. Viterbo, S. Hagemann, and J.O. Haerter (2010) Statistical

bias correction of global simulated daily precipitation and temperature for the application of hydrological models. *J. Hydrol.*, **395**, 199–215.

36. Saeed, S., W. A. Müller, S. Hagemann and D. Jacob, 2010: Circumglobal wave train and the summer monsoon over northwestern India and Pakistan: The explicit role of the surface heat low. *Climate Dynamics*, doi:10.1007/s00382-010-0888-x.
37. Tomassini, L., S. Hagemann, C. Moseley, A. Haumann, R. Podzun and D. Jacob, 2010: Extremes and predictability in the European pre-industrial climate of a regional climate model. *Climate Dynamics*, doi:10.1007/s00382-010-0814-2.

2011

38. Chen C., Jan O. Haerter, Stefan Hagemann and Claudio Piani (2011) On the contribution of statistical bias correction to the uncertainty in the projected hydrological cycle, *Geophys. Res. Lett.* **38**, L20403, doi:10.1029/2011GL049318.
39. Haddeland, I., D.B. Clark, W. Franssen, F. Ludwig, F. Voß, N.W. Arnell, N. Bertrand, M. Best, S. Folwell, D. Gerten, S. Gomes, S.N. Gosling, S. Hagemann, N. Hanasaki, R. Harding, J. Heinke, P. Kabat, S. Koirala, T. Oki, J. Polcher, T. Stacke, P. Viterbo, G.P. Weedon and P. Yeh (2011) Multi-Model Estimate of the Global Terrestrial Water Balance: Setup and First Results. *J. Hydrometeorol.* **12**: 869-884, doi:10.1175/2011JHM1324.1.
40. Haerter, J.O., S. Hagemann, C. Moseley and C. Piani (2011) Climate model bias correction and the role of timescales. *Hydrol. Earth Syst. Sci.* **15**, doi:10.5194/hess-15-1-2011: 1065-1079.
41. Hagemann, S., C. Chen, J.O. Haerter, D. Gerten, J. Heinke, C. Piani (2011) Impact of a statistical bias correction on the projected hydrological changes obtained from three GCMs and two hydrology models. *J. Hydrometeorol.*, **12**: 556-578, doi:10.1175/2011JHM1336.1.
42. Hagemann, S., D. Jacob und S. Bakan (2011) Erwärmung des Meeres und Zunahme des Niederschlags. In: J.L. Lozán, H. Graßl, L. Karbe und K. Reise (Ed.), Warnsignal Klima: Die Meere - Änderungen & Risiken, *Wissenschaftliche Auswertungen*, Hamburg: 102-107
43. Hänsler, A., S. Hagemann and D. Jacob, 2011: Will the southern African west coast fog be affected by climate change? *Erdkunde* **65**: 261-275.
44. Hänsler, A., S. Hagemann and D. Jacob, 2011: The role of the simulation setup in a long-term high-resolution climate change projection for the southern African region. *Theor. Appl. Climatology*, **106**: 1523-169.
45. Harding, R., M. Best, E. Blyth, S. Hagemann, P. Kabat, L.M. Tallaksen, T. Warnaars, D. Wiberg, G.P. Weedon, H. van Lanen, F. Ludwig and I. Haddeland (2011) Preface to the Water and Global Change (WATCH) special collection: Current knowledge of the terrestrial Global Water Cycle. *J. Hydrometeorol.* **12**: 1149-1156, doi: 10.1175/JHM-D-11-024.1
46. Lucas-Picher, P., J.H. Christensen, F. Saeed, P. Kumar, S. Asharaf, B. Ahrens, A. Wiltshire, D. Jacob and S. Hagemann (2011) Can regional climate models represent the Indian monsoon? *J. Hydrometeorol.*, **12**: 849-868, doi: 10.1175/2011JHM1327.1, in press.
47. Mächel, H., B. Rudolf, T. Maurer, S. Hagemann, R. Hagenbrock, L. Kitaev, E.J. Førland, V. Rasuvaev and O.E. Tveito, 2011: Observed hydrological cycle. Chapter 5 in: P. Lemke and H.-W. Jacobi (Eds.): ARCTIC Climate Change - The ACSYS Decade and Beyond, *Atmospheric and Oceanographic Sciences Library*, **43**, Springer Verlag, 464 pp.
48. Prudhomme, C., S. Parry, J. Hannaford, D.B. Clark, S. Hagemann and F. Voss (2011) How well do large-scale models reproduce regional hydrological extremes in Europe? *J. Hydrometeorol.* **12**: 1181-1204, doi: 10.1175/2011JHM1387.1.
49. Saeed, F., S. Hagemann and D. Jacob (2011) A framework for the evaluation of the South Asian Summer Monsoon in a regional climate model applied to REMO. *Int. J. Climatol.*, doi:10.1002/joc.2285.
50. Saeed, S., W.A. Müller, S. Hagemann, D. Jacob, M. Mujumdar and R. Krishnan, 2011: Precipitation variability over the South Asian monsoon heat low and associated teleconnections. *Geophys. Res. Lett.*, **38**, L08702, doi:10.1029/2011GL046984, in press.

2012

51. Dobler, C., S. Hagemann, R.L. Wilby and J. Stötter (2012) Quantifying different sources of uncertainty in hydrological projections in an Alpine watershed. *Hydrol. Earth Syst. Sci.*, **16**, 4343-4360, doi:10.5194/hess-16-4343-2012.
52. Gudmundsson, L., L.M. Tallaksen, K. Stahl, D.B. Clark, E. Dumont, S. Hagemann, N. Bertrand, D. Gerten, J. Heinke, N. Hanasaki, F. Voß and S. Koirala (2012) Comparing Large-scale Hydrological Models to Observed Runoff Percentiles in Europe. *J. Hydrometeorol.* **13**, doi: 10.1175/JHM-D-11-083.1: 604-620.
53. Haddeland, I., J. Heinke, F. Voß, S. Eisner, C. Chen, S. Hagemann and F. Ludwig (2012) Effects of

- climate model radiation, humidity and wind estimates on hydrological simulations. *Hydrol. Earth Syst. Sci.*, 16, 305-318, doi:10.5194/hess-16-305-2012.
54. Jacob, D., A. Elizalde, A. Hänsler, S. Hagemann, P. Kumar, R. Podzun, D. Rechid, A. R. Remedio, F. Saeed, K. Sieck, C. Teichmann and C. Wilhelm (2012) Assessing the Transferability of the Regional Climate Model REMO to Different COordinated Regional Climate Downscaling EXperiment (CORDEX) Regions. *Atmosphere* 3 (1):181-199.
 55. Kotlarski, S., S. Hagemann, P. Krahe, R. Podzun and D. Jacob (2012) The Elbe River Flooding 2002 as seen by an extended regional climate model. *J. Hydrol.*, doi: 10.1016/j.jhydrol.2012.09.020.
 56. Saeed, F., S. Hagemann, S. Saeed and D. Jacob (2012) Influence of mid-latitude circulation on upper Indus basin precipitation: the explicit role of irrigation. *Clim. Dyn.*, doi:10.1007/s00382-012-1480-3.
 57. Stacke, T. and S. Hagemann (2012) Development and validation of a global dynamical wetlands extent scheme. *Hydrol. Earth Syst. Sci.* 16, doi:10.5194/hess-16-2915-2012: 2915-2933
 58. Timmreck, C., H.-F. Graf, D. Zanchettin, S. Hagemann, T. Kleinen and K. Krüger (2012) Climate response to the Toba super-eruption: regional changes. *Quaternary International* 258, doi:10.1016/j.quaint.2011.10.008: 30-44.
 59. Zhang, S., B. Ye, S. Liu, X. Zhang and S. Hagemann (2012) A modified monthly degree-day model for evaluating glacier runoff changes in China. Part I: model development. *Hydrol. Proc.* 26, 10.1002/hyp.8286: 1686-1696.
 60. Zhang, S., X. Gao, B. Ye, X. Zhang and S. Hagemann (2012) A modified monthly degree-day model for evaluating glacier runoff changes in China. Part II: application. *Hydrol. Proc.* 26, 10.1002/hyp.8291: 1697-1706.
 61. Zhang, S., X. Gao, X. Zhang and S. Hagemann (2012) Projection of glacier runoff in Yarkant River basin and Beida River basin, western China. *Hydrol. Proc.* 26, 10.1002/hyp.8373: 2773-2781.

2013

62. Davie, J.C.S., P. D. Falloon, R. Kahana, R. Dankers, R. Betts, F. T. Portmann, D. Wisser, D. B. Clark, A. Ito, Y. Masaki, K. Nishina, B. Fekete, Z. Tessler, Y. Wada, X. Liu, Q. Tang, S. Hagemann, T. Stacke, R. Pavlick, S. Schaphoff, S. Gosling, W. Franssen and N. Arnell (2013) Comparing projections of future changes in runoff from hydrological and biome models in ISI-MIP. *Earth Syst. Dyn.* 4, 359-374, doi:10.5194/esd-4-359-2013.
63. Galos, B., S. Hagemann, A. Haensler, G. Kindermann, D. Rechid, K. Sieck, C. Teichmann and D. Jacob (2013) Case study for the assessment of the biogeophysical effects of a potential afforestation in Europe. *Carbon Balance and Management* 8: 3. doi:10.1186/1750-0680-8-3..
64. Hagemann, S., T. Blome, F. Saeed and T. Stacke (2013) Perspectives in modelling climate-hydrology interactions. *Surveys in Geophysics* 35: 739-764, ISSI special issue on Hydrological Cycle, doi:10.1007/s10712-013-9245-z.
65. Hagemann, S., C. Chen, D.B. Clark, S. Folwell, S.N. Gosling, I. Haddeland, N. Hanasaki, J. Heinke, F. Ludwig, F. Voss, and A.J. Wiltshire (2013) Climate change impact on available water resources obtained using multiple global climate and hydrology models. *Earth Syst. Dyn.* 4, 129-144, doi:10.5194/esd-4-129-2013.
66. Hagemann, S., A. Loew, A. Andersson (2013) Combined evaluation of MPI-ESM land surface water and energy fluxes. *J. Adv. Model. Earth Syst.* 5: 259-286, doi:10.1029/2012MS000173.
67. Hoyos, I., A. Baquero-Bernal and S. Hagemann (2013) How accurately are climatological characteristics and surface water and energy balances represented for the Colombian Caribbean catchment basin? *Clim. Dyn.* 41: 1269-1290, doi: 10.1007/s00382-013-1685-0.
68. Kumar, P., A. Wiltshire, C. Mathison, S. Asharaf, B. Ahrens, P. Lucas-Picher, J.H. Christensen, A. Gobiet, F. Saeed, S. Hagemann and D. Jacob (2013) Downscaled climate change projections with uncertainty assessment over India using a high resolution multi-model approach. *Sci. Total Environ.*, dx.doi.org/10.1016/j.scitotenv.2013.01.051.
69. Loew, A., T. Stacke, W. Dorigo, R. de Jeu, and S. Hagemann (2013) Potential and limitations of multidecadal satellite soil moisture observations for climate model evaluation studies. *Hydrol. Earth Syst. Sci.* 17, 3523-3542, doi:10.5194/hess-17-3523-2013.
70. Prudhomme, C., I. Giuntoli, E.L. Robinson, D.B. Clark, N.W. Arnell, R. Dankers, B. Fekete, W. Franssen, D. Gerten, S.N. Gosling, S. Hagemann, D.M. Hannah, H. Kim, Y. Masaki, Y. Satoh, T. Stacke, Y. Wada and D. Wisser (2013) Hydrological droughts in the 21st century: hotspots and uncertainties from a global multi-model ensemble experiment. *Proc. National Academy Sci.*, doi:10.1073/pnas.1222473110.
71. Saeed, F., A. Haensler, T. Weber, S. Hagemann and D. Jacob (2013) Representation of Extreme Precipitation Events Leading to Opposite Climate Change Signals over the Congo Basin. *Atmosphere* 4 (3), 254-271; doi:10.3390/atmos4030254.

72. Seneviratne, S., M. Wilhelm, T. Stanelle, B. van den Hurk, S. Hagemann, A. Berg, F. Cheruy, M. Higgins, A. Meier, V. Brovkin, M. Claussen, A. Ducharne, J.L. Dufresne, K. Findell, J. Ghattas, D.M. Lawrence, S. Malyshev, M. Rummukainen and B. Smith (2013) Impact of soil moisture-climate feedbacks on CMIP5 projections: First results from the GLACE-CMIP5 experiment. *Geophys. Res. Letters* **40**: 5212-5217, doi:10.1002/grl.50956.
73. Zhang, S., J. Xu, Q. Zhao and S. Hagemann (2013) Estimating the characteristics of runoff inflow into Lake Gojal in ungauged, highly glacierized upper Hunza River Basin, Pakistan. *J. Earth Sci.* **24** (2): 234-243, doi: 10.1007/s12583-013-0324-3.

2014

74. Arpe, K., S.A.G. Leroy, F. Wetterhall, V. Khan, S. Hagemann and H. Lahijani (2014) Prediction of the Caspian Sea Level using ECMWF seasonal forecasts and reanalysis. *Theor. Appl. Climatol.* **117**: 41-60, doi:10.1007/s00704-013-0937-6.
75. Chen, C., S. Hagemann and J. Liu (2014) Assessment of impact of climate change on the blue and green water resources in large river basins in China. *Environ. Earth Sci.*, doi:10.1007/s12665-014-3782-8.
76. Ekici, A., C. Beer, S. Hagemann, J. Boike, M. Langer and C. Hauck (2014) Simulating high latitude permafrost regions by the JSBACH terrestrial ecosystem model. *Geosci. Model Dev.* **7**: 631-647, doi:10.5194/gmd-7-631-2014.
77. Kumar, P., R. Podzun, S. Hagemann and D. Jacob (2014) Impact of modified soil thermal characteristic on the simulated monsoon climate over south Asia. *J. Earth. Syst. Sci.* **123**: 151-160.

2015

78. Berg, A., B.R. Lintner, K. Findell, S.I. Seneviratne, B. van den Hurk, A. Ducharne, F. Cheruy, S. Hagemann, D.M. Lawrence, S. Malyshev, A. Meier and P. Gentine (2015) Interannual coupling between summertime surface temperature and precipitation over land: processes and implications for climate change. *J. Clim.* **28**: 1308–1328, doi:10.1175/JCLI-D-14-00324.1.
79. Bozkurt, D., O.L. Sen and S. Hagemann (2015) Forcing a hydrological discharge model with RCM and GCM outputs in the Euphrates-Tigris Basin: Evaluation of the model performance and projected river discharges. *Clim. Res.* **62**:131-147, doi:10.3354/cr01268.
80. Ho-Hagemann, H.T.M., B. Rockel and S. Hagemann (2015) On the role of soil moisture in the generation of heavy rainfall during the Oder flood event in July 1997. *Tellus A*, **67**, 28661, dx.doi.org/10.3402/tellusa.v67.28661.
81. Hagemann, S., and T. Stacke (2015) Impact of the soil hydrology scheme on simulated soil moisture memory. *Clim. Dyn.* **44**: 1731-1750, doi:10.1007/s00382-014-2221-6.
82. May, W., A. Meier, M. Rummukainen, A. Berg, F. Cheruy and S. Hagemann (2015) Contributions of soil moisture interactions to climate change in the tropics in the GLACE-CMIP5 experiment. *Clim. Dyn.*, doi:10.1007/s00382-015-2538-9.
83. Mbaye, M.L., A. Haensler, S. Hagemann, A.T. Gaye, C. Moseley and A. Afouda (2015) Impact of statistical bias correction on the projected climate change signals of the Regional Climate Model REMO over the Senegal River basin. *Int. J. Clim.* **36**: 2035-2049, DOI:10.1002/joc.4478.
84. Mbaye, M.L., S. Hagemann, A. Haensler, T. Stacke, A.T. Gaye and A. Afouda (2015) Assessment of Climate Change Impact on Water Resources in the Upper Senegal Basin (West Africa). *American J. Clim. Change* **4**:77-93, doi:10.4236/ajcc.2015.41008.
85. Poulter, B., N. MacBean, A. Hartley, I. Khlystova, O. Arino, R. Betts, S. Bontemps, M. Boettcher, C. Brockmann, P. Defourny, S. Hagemann, M. Herold, G. Kirches, C. Lamarche, D. Lederer, C. Otle, M. Peters and P. Peylin (2015) Plant functional type classification for Earth System Models: Results from the European Space Agency's Land Cover Climate Change Initiative. *Geosci. Model Dev.* **8**: 2315-232, doi:10.5194/gmd-8-2315-2015.
86. Sein, D.V., U. Mikolajewicz, M. Gröger, I. Fast, W. Cabos, J.G. Pinto, S. Hagemann, T. Semmler, A. Izquierdo and D. Jacob (2015) Regionally coupled atmosphere - ocean – sea ice – marine biogeochemistry model ROM. Part I: Description and validation. *J. Adv. Model. Earth Syst.* **7**: 268–304 doi:10.1002/2014MS000357.
87. Sgubin, G., D. Swingedouw, S. Drijfhout, S. Hagemann and E. Robertson (2015) Multimodel analysis on the response of the AMOC under an increase of radiative forcing and its symmetrical reversal. *Clim. Dyn.* **45**: 1429-1450, doi:10.1007/s00382-014-2391-2.

2016

88. Berg, A., K. Findell, B. Lintner, A. Giannini, S. Seneviratne, B. van den Hurk, R. Lorenz, A.J. Pitman, S. Hagemann, A. Meier, F. Cheruy, A. Ducharne, S. Malyshev and P. Milly (2016) Land-atmosphere feedbacks amplify aridity increase over land under global warming. *Nature Clim. Change*, doi:10.1038/nclimate3029.

89. deVrese, P., S. Hagemann and M. Claussen (2016) Asian Irrigation, African Rain: Remote Impacts of Irrigation. *Geophys. Res. Letters*. **43**, doi:10.1002/2016GL068146.
90. de Vrese, P., and S. Hagemann (2016) Explicit representation of spatial sub-grid scale heterogeneity in an ESM. *J. Hydrometeorol.* **17**: 1357-1371, doi: 10.1175/JHM-D-15-0080.1.
91. de Vrese, P., J.-P. Schulz and S. Hagemann (2016) On the representation of heterogeneity in land surface-atmosphere coupling. *Boundary Layer Meteorol.*, doi 10.1007/s10546-016-0133-1.
92. Eyring, V., M. Righi, M. Evaldsson, A. Lauer, S. Wenzel, C. Jones, A. Anav, O. Andrews, I. Cionni, E. L. Davin, C. Deser, C. Ehbrecht, P. Friedlingstein, P. Gleckler, K.-D. Gottschaldt, S. Hagemann, M. Juckes, S. Kindermann, J. Krasting, D. Kunert, R. Levine, A. Loew, J. Mäkelä, G. Martin, E. Mason, A. Phillips, S. Read, C. Rio, R. Roehrig, D. Senftleben, A. Sterl, L. H. van Uft, J. Walton, S. Wang, and K. D. Williams (2016) ESMValTool (v1.0) - A community diagnostic and performance metrics tool for routine evaluation of Earth system models in CMIP. *Geosci. Model Dev.* **9**: 1747-1802, doi:10.5194/gmd-9-1747-2016.
93. Gao, Y., T. Markkanen, T. Thum, M. Aurela, A. Lohila, I. Mammarella, M. Kämäräinen, S. Hagemann and T. Aalto (2016) Assessing various drought indicators in representing drought in boreal forests in Finland. *Hydrol. Earth Syst. Sci.* **20**: 175-191, doi:10.5194/hess-20-175-2016.
94. Hagemann, S., T. Blome, A. Ekici and C. Beer (2016) Soil-frost-enabled soil-moisture-precipitation feedback over northern high latitudes. *Earth Syst. Dynam.* **7**: 611-625, doi:10.5194/esd-7-611-2016.
95. Knauer, J., S. Zaehle, M. Reichstein, B.E. Medlyn, M. Forkel, S. Hagemann and C. Werner (2016) The response of ecosystem water use efficiency to rising atmospheric CO₂: Sensitivity and large-scale biogeochemical implications. *New Phytologist*, doi: 10.1111/nph.14288.
96. Lorenz, R., D. Argueso, M.G. Donat, A.J. Pitman, B. van den Hurk, A. Berg, D.M. Lawrence, F. Cheruy, A. Ducharne, S. Hagemann, A. Meier, P.C.D. Milly and S.I. Seneviratne (2016) Influence of land-atmosphere feedbacks on temperature extremes in the GLACE-CMIP5 ensemble. *J. Geophys. Res. Atmos.*, **121**: 607–623, doi:10.1002/2015JD024053.
97. Mäkelä, J., J. Susiluoto, T. Markkanen, M. Aurela, I. Mammarella, S. Hagemann and T. Aalto (2016) Constraining ecosystem model with Adaptive Metropolis algorithm using boreal forest site eddy covariance measurements. *Nonlin. Processes Geophys.* **23**: 447-465, doi:10.5194/npg-23-447-2016.
98. May, W., M. Rummukainen, F. Chéruy, S. Hagemann and A. Meier (2016) Contributions of soil moisture interactions to future precipitation changes in the GLACE-CMIP5 experiment. *Clim. Dyn.*, doi:10.1007/s00382-016-3408-9.
99. Stacke, T., and S. Hagemann (2016) Life time of soil moisture perturbations in a coupled land-atmosphere simulation. *Earth Syst. Dyn.* **7**: 1-19, doi:10.5194/esd-7-1-2016.
100. van den Hurk, B., H. Kim, G. Krinner, S.I. Seneviratne, C. Derksen, T. Oki, H. Douville, J. Colin, A. Ducharne, F. Cheruy, N. Viovy, M. Puma, Y. Wada, W. Li, B. Jia, A. Alessandri, D.M. Lawrence, G.P. Weedon, R. Ellis, S. Hagemann, J. Mao, M.G. Flanner, M. Zampieri, S. Materia, R.M. Law and J. Sheffield (2016) The Land Surface, Snow and Soil moisture Model Intercomparison Program (LS3MIP): aims, set-up and expected outcome. *Geosci. Model Dev.* **9**: 2809-2832, doi:10.5194/gmd-9-2809-2016.

2017

101. Almagro, A., P.T.S. Oliveira, M.A. Nearing and S. Hagemann (2017) Projected climate change impacts in rainfall erosivity over Brazil. *Scientific Rep.* **7**, No. 8130, doi:10.1038/s41598-017-08298-y.
102. Hattermann, F., V. Krysanova, S. Gosling, R. Dankers, P. Daggupati, C. Donnelly, M. Flörke, S. Huang, Y. Motovilov, S. Buda, T. Yang, C. Müller, G. Leng, Q. Tang, F. Portmann, S. Hagemann, D. Gerten, Y. Wada, Y. Masaki, T. Alemayehu, Y. Satoh and L. Samaniego (2017) Cross-scale intercomparison of climate change impacts simulated by regional and global hydrological models in eleven large river basins. *Climatic Change*, available online, doi:10.1007/s10584-016-1829-4.
103. Maraun, D., T. Shepherd, M. Widmann, G. Zappa, D. Walton, J.M. Gutiérrez, S. Hagemann, I. Richter, P. Soares, A. Hall and L. Mearns (2017) Towards process-informed bias correction of climate change simulations. *Nature Clim. Change*, **7**, 764–773, doi:10.1038/nclimate3418.
104. Vogel, M., R. Orth, F. Cheruy, S. Hagemann, R. Lorenz, B. Van den Hurk and S. Seneviratne (2017) Regional amplification of projected changes in extreme temperatures strongly controlled by soil moisture-temperature feedbacks. *Geophys. Res. Letters*, accepted.

2018

105. Bunzel, F., W.A. Müller, M. Dobrynin, K. Fröhlich, S. Hagemann, H. Pohlmann, T. Stacke and J. Baehr (2018) Improved seasonal prediction of European summer temperatures with new 5-layer soil-hydrology scheme. *Geophys. Res. Letters*, doi: 10.1002/2017GL076204.
106. de Vrese, P., and S. Hagemann (2018) Uncertainties in modelling the climate impact of irrigation. *Clim. Dyn.*, **51**:2023, doi: 10.1007/s00382-017-3996-z.

107. de Vrese, P., T. Stacke & S. Hagemann (2018) Exploring the biogeophysical limits of global food production under different climate change scenarios. *Earth Syst. Dyn.*, 9: 393-412.
108. Georgievski, G., and S. Hagemann (2018) Characterizing uncertainties in the ESA CCI land cover map of the epoch 2010 and their impacts on MPI-ESM climate simulations. *Theor. Appl. Climatol.*, doi:10.1007/s00704-018-2675-2
109. Hagemann, S., and T. Stacke (2018) Wechselwirkungen von Klima und Hydrologie. In: J.L. Lozán, S.-W. Breckle, H. Graßl, D. Kasang, R. Weisse (Ed.), *Warnsignal Klima: Extremereignisse, Wissenschaftliche Auswertungen*, Hamburg:153-160
110. Krinner, G., Derksen, C., Essery, R., Flanner, M., Hagemann, S., Clark, M., Hall, A., Rott, H., Brutel-Vuilmet, C., Kim, H., Ménard, C. B., Mudryk, L., Thackeray, C., Wang, L., Arduini, G., Balsamo, G., Bartlett, P., Boike, J., Boone, A., Chéruy, F., Colin, J., Cuntz, M., Dai, Y., Decharme, B., Derry, J., Ducharne, A., Dutra, E., Fang, X., Fierz, C., Ghattas, J., Gusev, Y., Haverd, V., Kontu, A., Lafaysse, M., Law, R., Lawrence, D., Li, W., Marke, T., Marks, D., Ménégos, M., Nasonova, O., Nitta, T., Niwano, M., Pomeroy, J., Raleigh, M. S., Schaedler, G., Semenov, V., Smirnova, T. G., Stacke, T., Strasser, U., Svenson, S., Turkov, D., Wang, T., Wever, N., Yuan, H., Zhou, W., and Zhu, D. (2018) ESM-SnowMIP: assessing snow models and quantifying snow-related climate feedbacks, *Geosci. Model Dev.*, 11, 5027-5049, <https://doi.org/10.5194/gmd-11-5027-2018>.
111. Lauer, A., C. Jones, V. Eyring, M. Evaldsson, S. Hagemann, J. Mäkelä, G. Martin, R. Roehrig and S. Wang (2018) Process-level improvements in CMIP5 models and their impact on tropical variability, the Southern Ocean, and monsoons, *Earth Syst. Dynam.*, 9, 33-67, <https://doi.org/10.5194/esd-9-33-2018>.
112. Riddick, T., V. Brovkin, S. Hagemann and U. Mikolajewicz (2018) Dynamic hydrological discharge modelling for coupled climate model simulations of the last glacial cycle: the MPI-DynamicHD model version 3.0, *Geosci. Model Dev.*, 11, 4291-4316, <https://doi.org/10.5194/gmd-11-4291-2018>.

2019

113. Green, J.K., S.I. Seneviratne, A.M. Berg, K.L. Findell, S. Hagemann, D.M. Lawrence and P. Gentile, Large soil moisture constraint on terrestrial carbon cycle, *Nature*, 565: 476-479.
114. Mauritsen, T., Bader, J., Becker, T., Behrens, J., Bittner, M., Brokopf, R., et al. (incl. S.Hagemann) (2019) Developments in the MPI-M Earth System Model version 1.2 (MPI-ESM1.2) and its response to increasing CO₂. *J. Adv. Model. Earth Syst.*, 11, doi: 10.1029/2018MS001400.
115. Zhou, S., A.P. Williams, A.M. Berg, B.I. Cook, Y. Zang, S. Hagemann, R. Lorenz, S.I. Seneviratne and P. Gentile, Land-atmosphere feedbacks exacerbate concurrent soil drought and atmospheric aridity. *PNAS*, 116, doi:10.1073/pnas.1904955116.

2020

116. Almagro, A., P. Tarso S. Oliveira, R. Rosolem, S. Hagemann and C. A. Nobre (2020) Performance evaluation of Eta/HagGEM2-ES and Eta/Miroc5 precipitation simulations over Brazil. *Atmos. Res.* 244: 105053, doi:10.1016/j.atmosres.2020.105053
117. Ardelean, F., A. Onaca, M.-A. Chețan, A. Dornik, G. Georgievski, S. Hagemann, F. Timofte, O. Berzescu (2020) Assessment of spatio-temporal landscape changes from VHR images in three different permafrost areas in the Western Russian Arctic. *Remote Sens.*, 12, 3999; doi:10.3390/rs12233999.
118. Chetan, M.-A, A. Dornik, F. Ardelean, G. Georgievski, S. Hagemann, V. E. Romanovsky, A. Onaca and D. S. Drozdov (2020) 35 Years of Vegetation and Lake Dynamics in the Pechora Catchment, Russian European Arctic. *Remote Sens.* 12, 1863; doi:10.3390/rs12111863.
119. Essery, R., Kim, H., Wang, L., Bartlett, P., Boone, A., Brutel-Vuilmet, C., Burke, E., Cuntz, M., Decharme, B., Dutra, E., Fang, X., Gusev, Y., Hagemann, S., Haverd, V., Kontu, A., Krinner, G., Lafaysse, M., Lejeune, Y., Marke, T., Marks, D., Marty, C., Menard, C. B., Nasonova, O., Nitta, T., Pomeroy, J., Schädler, G., Semenov, V., Smirnova, T., Swenson, S., Turkov, D., Wever, N., and Yuan, H. (2020) Snow cover duration trends observed at sites and predicted by multiple models, *The Cryosphere*, 14, 4687-4698, <https://doi.org/10.5194/tc-14-4687-2020>.
120. Eyring, V., Bock, L., Lauer, A., Righi, M., Schlund, M., Andela, B., Arnone, E., Bellprat, O., Brötz, B., Caron, L.-P., Carvalhais, N., Cionni, I., Cortesi, N., Crezee, B., Davin, E., Davini, P., Debeire, K., de Mora, L., Deser, C., Docquier, D., Earnshaw, P., Ehbrecht, C., Gier, B. K., Gonzalez-Reviriego, N., Goodman, P., Hagemann, S., Hardiman, S., Hassler, B., Hunter, A., Kadow, C., Kindermann, S., Koirala, S., Koldunov, N. V., Lejeune, Q., Lembo, V., Lovato, T., Lucarini, V., Massonnet, F., Müller, B., Pandde, A., Pérez-Zanón, N., Phillips, A., Predoi, V., Russell, J., Sellar, A., Serva, F., Stacke, T., Swaminathan, R., Torralba, V., Vegas-Regidor, J., von Hardenberg, J., Weigel, K., and Zimmermann, K. (2020) Earth System Model Evaluation Tool (ESMValTool) v2.0 – extended set of large-scale diagnostics for quasi-operational and comprehensive evaluation of Earth system models in CMIP. *Geosci. Model Dev.* 13: 3383-3438, doi:10.5194/gmd-13-3383-2020.

121. Hagemann, S., T. Stacke and H. Ho-Hagemann, High resolution discharge simulations over Europe and the Baltic Sea catchment. *Front. Earth Sci.*, 8:12. doi: 10.3389/feart.2020.00012.
122. Ho-Hagemann, H.T.M., Hagemann, S., Grayek, S., Petrik, R., Rockel, B., Staneva, J., Feser, F., and Schrum, C. (2020) Internal variability in the regional coupled system model GCOAST-AHOI, *Atmos.*, 11, 227, doi: 10.3390/atmos11030227
123. Menard, C. B., R. Essery, G. Krinner, G. Arduini, P. Bartlett, A. Boone, C. Brutel-Vuilmet, E. Burke, M. Cuntz, Y. Dai, B. Decharme, E. Dutra, X. Fang, C. Fierz, Y. Gusev, S. Hagemann, V. Haverd, H. Kim, M. Lafaysse, T. Marke, O. Nasonova, T. Nitta, M. Niwano, J. Pomeroy, G. Schädler, V. Semenov, T. Smirnova, U. Strasser, S. Swenson, D. Turkov, N. Wever and H. Yuan, Scientific and human errors in a snow model intercomparison. *Bull. Amer. Meteor. Soc.*, 102, E61-E79, doi: 10.1175/BAMS-D-19-0329.1.
124. Peng, J.; Albergel, C.; Balenzano, A.; Brocca, L.; Cartus, O.; Cosh, M. H.; Crow, W. T.; Dabrowska-Zielinska, K.; Dadson, S.; Davidson, M. W.; de Rosnay, P.; Dorigo, W.; Gruber, A.; Hagemann, S.; Hirschi, M.; Kerr, Y. H.; Lovergine, F.; Mahecha, M. D.; Marzahn, P.; Mattia, F.; Musial, J. P.; Preuschmann, S.; Reichle, R. H.; Satalino, G.; Silgram, M.; van Bodegom, P. M.; Verhoest, N. E.; Wagner, W.; Walker, J. P.; Wegmüller, U. & Loew, A. (2020) A roadmap for high-resolution satellite soil moisture applications – confronting product characteristics with user requirements. *Remote Sens. Environ.* **252**, 112162, doi: 10.1016/j.rse.2020.112162.
125. Sein, D.V., M. Gröger, W. Cabos, F.J. Alvarez-Garcia, S. Hagemann, J.G. Pinto, A. Izquierdo, A. de la Vara,, N.V. Koldunov, A.Y. Dvornikov, N. Limareva, E. Alekseeva, B. Martinez-Lopez and D. Jacob (2020) Regionally coupled atmosphere - ocean - marine biogeochemistry model ROM: 2. Studying the climate change signal in the North Atlantic and Europe. *J. Adv. Model. Earth Syst.*, **12**, doi:10.1029/2019MS001646.

2021

126. Gonzalez-Rouco, J.F., N.J. Steinert, E.J. García-Bustamante, S. Hagemann, P. de Vrese, J.H. Jungclaus, S.J. Lorenz, C. Melo-Aguilar, F. García-Pereira and J. Navarro (2021) Increasing the depth of a Land Surface Model. Part I: Impacts on the subsurface thermal regime and energy storage. *J. Hydrometeorol.*, 12: 3211-3230, doi:10.1175/JHM-D-21-0024.1.
127. Gröger, M., Dieterich, C., Haapala, J., Ho-Hagemann, H. T. M., Hagemann, S., Jakacki, J., May, W., Meier, H. E. M., Miller, P. A., Rutgersson, A., and Wu, L. (2021) Coupled regional Earth system modeling in the Baltic Sea region, *Earth Syst. Dynam.*, 12, 939–973, <https://doi.org/10.5194/esd-12-939-2021>.
128. Stacke, T. and Hagemann, S. (2021): HydroPy (v1.0): a new global hydrology model written in Python, *Geosci. Model Dev.*, 14, 7795–7816, <https://doi.org/10.5194/gmd-14-7795-2021>.
129. Steinert, N.J., J.F. González-Rouco, P. de Vrese, E. García-Bustamante, S. Hagemann, C. Melo-Aguilar, J.H. Jungclaus and S.J. Lorenz (2021) Increasing the depth of a Land Surface Model. Part II: Temperature sensitivity to improved subsurface thermodynamics and associated permafrost response. *J. Hydrometeorol.*, 12: 3231-3254, doi:10.1175/JHM-D-21-0023.1.
130. Steinert, N.J., J.F. González-Rouco, C. Melo-Aguilar, F. García-Pereira, E.J. García-Bustamante, P. de Vrese, V. Alexeev, J.H. Jungclaus, S.J. Lorenz and S. Hagemann (2021) Agreement of analytical and simulation-based estimates of the required land depth in climate models. *Geophys. Res. Letters*, 48, doi:10.1029/2021GL094273.
131. Zhou, S., A.P. Williams, B.R. Lintner, A.M. Berg, Y. Zhang, T.F. Keenan, B.I. Cook, S. Hagemann, S.I. Seneviratne & P. Gentile (2021) Soil moisture–atmosphere feedbacks mitigate declining water availability in drylands. *Nat. Clim. Chang.* doi:10.1038/s41558-020-00945-z

2022

132. Hagemann, S., Stacke, T. (2022) Complementing ERA5 and E-OBS with high-resolution river discharge over Europe. *Oceanologia*, doi:10.1016/j.oceano.2022.07.003.
133. Jungclaus, J., S. J. Lorenz, H. Schmidt, V. Brovkin, N. Brüggemann, F. Chegini, T. Crüger, P. De-Vrese, V. Gayler, M. A. Giorgetta, O. Gutjahr, H. Haak, S. Hagemann, M. Hanke, T. Ilyina, P. Korn, J. Kröger, L. Linardakis, C. Mehlmann, U. Mikolajewicz, W. A. Müller, J. E. M. S. Nabel, D. Notz, H. Pohlmann, D. A. Putrasahan, T. Raddatz, L. Ramme, R. Redler, C. H. Reick, T. Riddick, T. Sam, R. Schneck, R. Schnur, M. Schupfner, J.-S. Von Storch, F. Wachsman, K.-H. Wieners, F. Ziemann, B. Stevens, J. Marotzke, M. Claussen (2022) The ICON Earth System Model Version 1.0 1. *J. Adv. Model. Earth Syst.*, **14** (4), doi: 10.1029/2021MS002813.
134. Mathis, M., Logemann, K., Maerz, J., Lacroix, F., Hagemann, S., Chegini, F., Ramme, L., Ilyina, T., Korn, P., Schrum, C. (2022) Seamless integration of the coastal ocean in global marine carbon cycle modeling. *J. Adv. Model. Earth Syst.*, 14, e2021MS002789. doi: 10.1029/2021MS002789.

Discussion papers for review

2010

Haerter, J.O., S. Hagemann, C. Moseley, and C. Piani (2010) Climate model bias correction and the role of timescales. *Hydrol. Earth Syst. Sci. Discuss.*, **7**, 7863–7898.

2011

Haddeland, I., Heinke, J., Voß, F., Eisner, S., Chen, C., Hagemann, S., and Ludwig, F. (2011) Effects of climate model radiation, humidity and wind estimates on hydrological simulations, *Hydrol. Earth Syst. Sci. Discuss.*, **8**, 7919-7945, doi:10.5194/hessd-8-7919-2011.

2012

Dobler, C., S. Hagemann, R.L. Wilby and J. Stötter (2012) Quantifying different sources of uncertainty in hydrological projections at the catchment scale. *Hydrol. Earth Syst. Sci. Discuss.*, **9**, 8173-8211, doi:10.5194/hessd-9-8173-2012.

Hagemann, S., C. Chen, D.B. Clark, S. Folwell, S.N. Gosling, I. Haddeland, N. Hanasaki, J. Heinke, F. Ludwig, F. Voss, and A.J. Wiltshire (2012) Climate change impact on available water resources obtained using multiple global climate and hydrology models. *Earth Syst. Dyn. Discuss.*, **3**, 1321-1345, doi:10.5194/esdd-3-1321-2012.

2013

Davie, J.C.S., P. D. Falloon, R. Kahana, R. Dankers, R. Betts, S. Gosling, N. Arnell, Q. Tang, X. Liu, D. B. Clark, Y. Masaki, B. Fekete, Z. Tessler, F. T. Portmann, T. Stacke, S. Hagemann, R. Pavlick, A. Itoh, K. Nishina, and W. Franssen (2013) Comparing projections of future changes in runoff and water resources from hydrological and ecosystem models in ISI-MIP. *Earth Syst. Dyn. Discuss.*, **4**, 279-315, doi:10.5194/esdd-4-279-2013.

Ekici A., C. Beer, C. Hauck and S. Hagemann (2013) Improved soil physics for simulating high latitude permafrost regions by the JSBACH terrestrial ecosystem model. *Geosci. Model Dev. Discuss.* **6**: 2655-2698, doi:10.5194/gmdd-6-2655-2013.

Loew, A., T. Stacke, W. Dorigo, R. de Jeu, and S. Hagemann (2013) Potential and limitations of multidecadal satellite soil moisture observations for climate model evaluation studies. *Hydrol. Earth Syst. Sci. Discuss.* **10**, 3541-3594.

2014

Poulter, B., N. MacBean, A. Hartley, I. Khlystova, O. Arino, R. Betts, S. Bontemps, M. Boettcher, C. Brockmann, P. Defourny, S. Hagemann, M. Herold, G. Kirches, C. Lamarche, D. Lederer, C. Otle, M. Peters and P. Peylin (2014) Plant functional type classification for Earth System Models: Results from the European Space Agency's Land Cover Climate Change Initiative. *Geosci. Model Dev. Discuss.* **8**: 429-462, doi:10.5194/gmdd-8-429-2015.

2015

Eyring, V., M. Righi, M. Ewaldsson, A. Lauer, S. Wenzel, C. Jones, A. Anav, O. Andrews, I. Cionni, E. L. Davin, C. Deser, C. Ehbrecht, P. Friedlingstein, P. Gleckler, K.-D. Gottschaldt, S. Hagemann, M. Juckes, S. Kindermann, J. Krasting, D. Kunert, R. Levine, A. Loew, J. Mäkelä, G. Martin, E. Mason, A. Phillips, S. Read, C. Rio, R. Roehrig, D. Senftleben, A. Sterl, L. H. van Ulft, J. Walton, S. Wang, and K. D. Williams (2015) ESMValTool (v1.0) - A community diagnostic and performance metrics tool for routine evaluation of Earth System Models in CMIP. *Geosci. Model Dev. Discuss.* **8**: 7541-7661, doi:10.5194/gmdd-8-7541-2015.

Gao, Y., T. Markkanen, T. Thum, M. Aurela, A. Lohila, I. Mammarella, S. Hagemann and T. Aalto (2015) Assessing various drought indicators in representing drought in boreal forests in Finland. *Hydrol. Earth Syst. Sci. Discuss.* **12**: 8091-8129, doi:10.5194/hessd-12-8091-2015.

Stacke, T., and S. Hagemann (2015) Life time of soil moisture perturbations in a coupled land-atmosphere simulation. *Earth Syst. Dyn. Discuss.* **6**: 1743-1788, doi:10.5194/esdd-6-1743-2015.

2016

Hagemann, S., T. Blome, A. Ekici and C. Beer, 2016: Soil frost-induced soil moisture precipitation feedback over high northern latitudes. *Earth Syst. Dynam. Discuss.*, doi:10.5194/esd-2016-5, accepted.

Mäkelä, J., J. Susiluoto, T. Markkanen, M. Aurela, I. Mammarella, S. Hagemann and T. Aalto, 2016: Constraining ecosystem model with Adaptive Metropolis algorithm using boreal forest site eddy covariance measurements. *Nonlin. Processes Geophys. Discuss.*, doi:10.5194/npg-2016-21, accepted.

van den Hurk, B., H. Kim, G. Krinner, S.I. Seneviratne, C. Derksen, T. Oki, H. Douville, J. Colin, A. Ducharne, F. Cheruy, N. Viovy, M. Puma, Y. Wada, W. Li, B. Jia, A. Alessandri, D. Lawrence, G.P. Weedon, R. Ellis, S. Hagemann, J. Mao, M.G. Flanner, M. Zampieri, R. Law and J. Sheffield, 2016: The Land Surface, Snow and Soil moisture Model Intercomparison Program (LS3MIP): aims, set-up and expected outcome. *Geosci. Model Dev. Discuss.*, doi:10.5194/gmd-2016-72, accepted.

2017

Lauer, A., C. Jones, V. Eyring, M. Ewaldsson, S. Hagemann, J. Mäkelä, G. Martin, R. Roehrig, and S. Wang, 2017: Process-level improvements in CMIP5 models and their impact on tropical variability, Southern Ocean and monsoons. *Earth Syst. Dynam. Discuss.*, doi:10.5194/esd-2017-61, accepted.

2018

Krinner, G., Derksen, C., Essery, R., Flanner, M., Hagemann, S., Clark, M., Hall, A., Rott, H., Brutel-Vuilmet, C., Kim, H., Ménard, C. B., Mudryk, L., Thackeray, C., Wang, L., Arduini, G., Balsamo, G., Bartlett, P., Boike, J., Boone, A., Chérut, F., Colin, J., Cuntz, M., Dai, Y., Decharme, B., Derry, J., Ducharne, A., Dutra, E., Fang, X., Fierz, C., Ghattas, J., Gusev, Y., Haverd, V., Kontu, A., Lafaysse, M., Law, R., Lawrence, D., Li, W., Marke, T., Marks, D., Nasonova, O., Nitta, T., Niwano, M., Pomeroy, J., Raleigh, M. S., Schaedler, G., Semenov, V., Smirnova, T., Stacke, T., Strasser, U., Svenson, S., Turkov, D., Wang, T., Wever, N., Yuan, H., and Zhou, W. (2018) ESM-SnowMIP: Assessing models and quantifying snow-related climate feedbacks, *Geosci. Model Dev. Discuss.*, <https://doi.org/10.5194/gmd-2018-153>, accepted.

Riddick, T., V. Brovkin, S. Hagemann and U. Mikolajewicz (2018) Dynamic hydrological discharge modelling for coupled climate model simulations of the last glacial cycle. *Geosci. Model Dev. Discuss.*, accepted.

2019

Eyring, V., Bock, L., Lauer, A., Righi, M., Schlund, M., Andela, B., Arnone, E., Bellprat, O., Brötz, B., Caron, L.-P., Carvalhais, N., Cionni, I., Cortesi, N., Crezee, B., Davin, E., Davini, P., Debeire, K., de Mora, L., Deser, C., Docquier, D., Earnshaw, P., Ehbrecht, C., Gier, B. K., Gonzalez-Reviriego, N., Goodman, P., Hagemann, S., Hardiman, S., Hassler, B., Hunter, A., Kadow, C., Kindermann, S., Koirala, S., Koldunov, N. V., Lejeune, Q., Lembo, V., Lovato, T., Lucarini, V., Massonnet, F., Müller, B., Pandde, A., Pérez-Zanón, N., Phillips, A., Predoi, V., Russell, J., Sellar, A., Serva, F., Stacke, T., Swaminathan, R., Torralba, V., Vegas-Regidor, J., von Hardenberg, J., Weigel, K., and Zimmermann, K. (2019) Earth System Model Evaluation Tool (ESMValTool) v2.0 – extended set of large-scale diagnostics for quasi-operational and comprehensive evaluation of Earth system models in CMIP. *Geosci. Model Dev. Discuss.*, doi: 10.5194/gmd-2019-291, accepted.

2020

Essery, R., H. Kim, L. Wang, P. Bartlett, A. Boone, C. Brutel-Vuilmet, E. Burke, M. Cuntz, B. Decharme, E. Dutra, X. Fang, Y. Gusev, S. Hagemann, V. Haverd, A. Kontu, G. Krinner, M. Lafaysse, Y. Lejeune, T. Marke, D. Marks, C. Marty, C.B. Menard, O. Nasonova, T. Nitta, J. Pomeroy, G. Schaedler, V. Semenov, T. Smirnova, S. Swenson, D. Turkov, N. Wever, and H. Yuan (2020) Snow cover duration trends observed at sites and predicted by multiple models. *The Cryosphere Discuss.*, <https://doi.org/10.5194/tc-2020-182>, accepted.

2021

Gröger, M., C. Dieterich, J. Haapala, H. T. M. Ho-Hagemann, S. Hagemann, J. Jakacki, W. May, H. E. M. Meier, P. A. Miller, A. Rutgersson and L. Wu (2021) Coupled regional Earth system modelling in the Baltic Sea region, *Earth Syst. Dynam. Discuss.*, <https://doi.org/10.5194/esd-2021-14>, accepted.

Stacke, T., and S. Hagemann (2021) HydroPy (v1.0): A new global hydrology model written in Python. *Geosci. Model Dev. Discuss.*, <https://doi.org/10.5194/gmd-2021-53>, accepted.

2022

Heinrich, P., Hagemann, S., Weisse, R., Schrum, C., Daewel, U., and Gaslikova, L.(2022) Compound Flood Events: Analysing the joint occurrence of extreme river discharge events and storm surges in Northern and Central Europe, *Nat. Hazards Earth Syst. Sci. Discuss.* [preprint], <https://doi.org/10.5194/nhess-2022-187>, in review.

Reports

Hagemann, S., L. Dümenil, 1996: Development of a parameterization of lateral discharge for the global scale. Max Planck Institut für Meteorologie, Report 219

Hagemann, S. and L. Dümenil, 1998: Application of a grid-scale lateral discharge model in the BALTEX region. MPI Report No. 278, Max Planck Institute for Meteorology, Hamburg

Hagemann, S. and L. Dümenil, 1998: Documentation for the Hydrological Discharge Model. DKRZ Technical Report No. 17, Deutsches Klimarechenzentrum, Hamburg

- Hagemann, S., M. Botzet, L. Dümenil and B. Machehauer, 1999: Derivation of global GCM boundary conditions from 1 km land use satellite data, MPI Report No. 289, Max Planck Institute for Meteorology, Hamburg
- Dümenil Gates, L., S. Hagemann and C. Golz, 2000: Observed historical discharge data from major rivers for climate model validation, MPI Report No. 307, Max Planck Institute for Meteorology, Hamburg
- Christensen, J.H., O.B. Christensen, J.-P. Schulz, S. Hagemann and M. Botzet, 2001: High resolution physiographic data set for HIRHAM4: An application to a 50 km horizontal resolution domain covering Europe, Danish Meteorological Institute, Tech. Rep. 01-15, Copenhagen, 21 pp.
- Hagemann, S., 2002: An improved land surface parameter dataset for global and regional climate models, MPI Report No. 336, Max Planck Institute for Meteorology, Hamburg
- Hagemann, S., B. Machehauer, O.B. Christensen, M. Deque, D. Jacob, R. Jones and P.L. Vidale, 2002: Intercomparison of water and energy budgets simulated by regional climate models applied over Europe, MPI Report No. 338, Max Planck Institute for Meteorology, Hamburg
- Hagemann, S., L. Bengtsson and G. Gendt, 2002: On the determination of atmospheric water vapour from GPS measurements. MPI Report No. 340, Max Planck Institute for Meteorology, Hamburg
- Bengtsson, L., K. Hodges and S. Hagemann, 2003: Sensitivity of Large Scale Atmospheric Analyses to Humidity Observations and its Impact on the Global Water Cycle and Tropical and Extra-Tropical Weather Systems, MPI Report No. 347, Max Planck Institute for Meteorology, Hamburg
- Roeckner, E., G. Bäuml, L. Bonaventura, R. Brokopf, M. Esch, M. Giorgetta, S. Hagemann, I. Kirchner, L. Kornblueh, E. Manzini, A. Rhodin, U. Schlese, U. Schulzweida, A. Tompkins, 2003: The atmospheric general circulation model ECHAM 5. PART I: Model description, MPI Report No. 349, Max Planck Institute for Meteorology, Hamburg
- Bengtsson, L., S.Hagemann, and Kevin I. Hodges, 2004: Can Climate Trends be Calculated from Re-Analysis Data?, MPI Report No. 351, Max Planck Institute for Meteorology, Hamburg
- Roeckner, E., R. Brokopf, M. Esch, M. Giorgetta, S. Hagemann, L. Kornblueh, E. Manzini, U. Schlese, U. Schulzweida, 2004: The atmospheric general circulation model ECHAM 5. PART II: Sensitivity of Simulated Climate to Horizontal and Vertical Resolution, MPI Report No. 354, Max Planck Institute for Meteorology, Hamburg
- Hagemann, S., K. Arpe and L. Bengtsson, 2005, Validation of the hydrological cycle of ERA40, ECMWF ERA-40 Proj. Rep. Ser. 24, Reading, UK
- 2008**
- Gerten, D., I. Haddeland, S. Hagemann, F. Ludwig and D. Wiberg, 2008: Definition of socioeconomic scenarios for land surface hydrology simulations of the 21st century, WATCH Technical Rep. 5, <http://www.eu-watch.org>.
- Hagemann, S., P. Berg, J.H. Christensen and J. Haerter, 2008: Analysis of existing climate model results over Europe, WATCH Technical Rep. 7, <http://www.eu-watch.org>.
- Piani, C., J.O. Haerter, S. Hagemann, M. Allen, S. Rosier, 2008: Practical methodologies to correct biases in climate model output, and to quantify and handle resulting uncertainties in estimates of future components of the global water cycle, WATCH Technical Rep. 6, <http://www.eu-watch.org>.
- Saeed, F., and S. Hagemann, 2008: Assessing the characteristics of the regional climate that are essential for studies of hydrological changes over Upper Indus basin. Proceedings of 20th Congress 2008, Lahore, Pakistan
- Voß, F., J. Alcamo, N. Arnell, I. Haddeland, S. Hagemann, R. Lammers, T. Oki, N. Hanasaki, and H. Kim, 2008: First Results From Intercomparison Of Surface Water Availability Modules, WATCH Technical Rep. 1, <http://www.eu-watch.org>.
- 2010**
- Haensler, A., S. Hagemann and D. Jacob, 2010: Climate history of Namibia and western South Africa. In: Schmiedel, U., N. Jürgens [Eds.]: Biodiversity in southern Africa. Volume 2: Patterns and processes at regional scale: pp. 2–5, Klaus Hess Publishers, Göttingen & Windhoek.
- Haensler, A., S. Hagemann and D. Jacob, 2010: Surface climate and its simulated change along the BIOTA transects. In: Schmiedel, U., N. Jürgens [Eds.]: Biodiversity in southern Africa. Volume 2: Patterns and processes at regional scale: pp. 76–80, Klaus Hess Publishers, Göttingen & Windhoek.
- Haensler, A., S. Hagemann and D. Jacob, 2010: Regional climatological patterns and their simulated change. In: Schmiedel, U., N. Jürgens [Eds.]: Biodiversity in southern Africa. Volume 2: Patterns and processes at regional scale: pp. 24–28, Klaus Hess Publishers, Göttingen & Windhoek.
- 2011**
- Chen, C., Hagemann, S., Clark, D., Folwell, S., Gosling, S., Haddeland, I., Hanasaki, N., Heinke, J., Ludwig, F., Voß, F. and Wiltshire, A., 2011: Projected hydrological changes in the 21st century and related uncertainties obtained from a multi-model ensemble. WATCH Technical Rep. 45, <http://www.eu-watch.org>.
- Gerten, D., S. Hagemann, H. Biemans, F. Saeed and M. Konzmann, 2011: Climate change and irrigation: Global

impacts and regional feedbacks. WATCH Technical Rep. 47, <http://www.eu-watch.org>.

2017

Bender, S., M. Butts, S. Hagemann, M. Smith, H. Vereecken and F. Wendland, 2017: Der Einfluss des Klimawandels auf die terrestrischen Wassersysteme in Deutschland. Eine Analyse ausgesuchter Studien der Jahre 2009 bis 2013. Report 29. Climate Service Center Germany. Hamburg.

2021

Reick, C., Gayler, V., Goll, D., Hagemann, S., Heidkamp, M., Nabel, J., Raddatz, T., Roeckner, E., Schnur, R. & Wilkenskield, S. (2021) JSBACH 3 - The land component of the MPI Earth System Model: Documentation of version 3.2. Berichte zur Erdsystemforschung, 240, Max Planck Institute for Meteorology, Hamburg, <http://doi.org/10.17617/2.3279802>.

Proceedings

Davie, J.C.S., P. D. Falloon, R. Kahana, R. Dankers, R. Betts, F. T. Portmann, D. B. Clark, A. Itoh, Y. Masaki, K. Nishina, B. Fekete, Z. Tessler, X. Liu, Q. Tang, S. Hagemann, T. Stacke, R. Pavlick, S. Schaphoff, S. N. Gosling, W. Franssen, N. Arnell (2013) Comparing projections of future changes in runoff from hydrological and ecosystem models in ISI-MIP for a second scenario. Proc. Impact World Conference on Climate Change Effects, Potsdam, May 27-30 2013, submitted.

Dümenil, L., S. Hagemann and K. Arpe, 1997: Validation of the hydrological cycle in the Arctic using river discharge data. Workshop on Polar Processes in Global Climate, 13-15 Nov. 1996, Cancun, Mexico. Publications of the AMS, 11-14

Hagemann, S. and L. Dümenil, 1997: Comparison of two wetlands datasets, In: G. Cecchi, E.T. Engman and E. Zilioli (Ed.), Earth Surface Remote Sensing, *Proceedings of SPIE* Vol. 3222, p. 193-200

Hagemann, S., 2001: Problematiken bei der Kopplung von hydrologischen und atmosphärischen Modellen, J. Sutmoeller und E. Raschke (Hrsg.): Modellierung in meso- bis makroskaligen Flusseinzugsgebieten. - Tagungsband zum gleichnamigen Workshop am 16./17. November 2000 in Lauenburg, GKSS 2001/15, pp. 9-21

Hagemann, S., 2002: Validierung des Niederschlags in globalen Klimamodellen

K. Stephan, H. Bormann und B. Diekkrüger (Hrsg.): 5. Workshop zur hydrologischen Modellierung - Möglichkeiten und Grenzen für den Einsatz hydrologischer Modelle in Politik, Wirtschaft und Klimafolgenforschung, Kassel University Press, Kassel, pp. 115-127

Hagemann, S., K. Arpe, L. Bengtsson and I. Kirchner, 2002: Validation of precipitation from ERA40 and an ECHAM4.5 simulation nudged with ERA40 data. 3. Workshop on Re-analysis, 5-9 November 2001, *ERA-40 Project Report Series*, Reading, UK, 211-227

Hagemann, S., L. Bengtsson and G. Gendt, 2003: Determination of atmospheric water vapour from GPS measurements and ECMWF Operational Analyses, URSI Special Symposium on Atmospheric Remote Sensing using Satellite Navigation Systems, 13-15 Oct. 2003, Matera, Italy

Hagemann, S., and D. Jacob, 2004: European discharge as simulated by a multi-model ensemble, Proceedings of WCRP Regional Climate Modelling Workshop, Lund, 29.3.-2.4.2004, Lund eRep. Phys. Geogr., ISSN No. 0348-3339

Hagemann, S. und D. Jacob, 2007: Ergebnisse des Klimamodells REMO für Deutschland und das Rheineinzugsgebiet. Band 46 der *IWW-Schriftenreihe* zum 20. Mülheimer Wassertechnischen Seminar am 22.11.2007, ISSN 0941-0961

Hagemann, S., und D. Jacob, 2007: Regionale Klimamodelle : Konsequenzen für das Einzugsgebiet von Elbe und Rhein. In: Natura 2000 und Klimaänderungen - Tagungsband zur gleichnamigen Tagung vom 28. - 31. August 2006 auf der Insel Vilm. *Naturschutz und biologische Vielfalt* 46, Bundesamt für Naturschutz, Bonn - Bad Godesberg: 33-48

Ludwig F., P. Kabat, S. Hagemann and M. Dorlandt, 2009: Impacts of climate variability and change on development and water security in Sub-Saharan Africa. *IOP Conf. Ser.: Earth Environ. Sci.* 6, 292002, doi:10.1088/1755-1307/6/29/292002.

Data and Code

Hagemann, S., & Ho-Hagemann, H.T.M. (2021). The Hydrological Discharge Model - a river runoff component for offline and coupled model applications (5.0.0). Zenodo. <https://doi.org/10.5281/zenodo.4893099>

Hagemann, S., and Stacke, T. (2021). Parameter fields for the Hydrological Discharge (HD) model at 0.5° and 5 Min. horizontal resolution (5.0.0) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.4892828>

Hagemann, S., and Stacke, T. (2021). Forcing for HD Model (JSBACH, MPI-HM) and HD Model discharge from Hagemann et al. (2020). World Data Center for Climate (WDCC) at DKRZ.

<https://doi.org/10.26050/WDCC/Hagemannetal2020>

- Hagemann, S., and Stacke, T. (2021). Forcing for HD Model from HydroPy and subsequent HD Model river runoff over Europe based on EOBS22 and ERA5 data. World Data Center for Climate (WDCC) at DKRZ. https://doi.org/10.26050/WDCC/EOBS_ERA5-River_Runoff
- Stacke, T., and S. Hagemann (2021) Source code for the global hydrological model HydroPy. <https://doi.org/10.5281/zenodo.4541380>
- Stacke, T., and S. Hagemann (2021) Land surface parameter fields at 0.5deg resolution for use with the HydroPy model. <https://doi.org/10.5281/zenodo.4541238>

Other publications

- Hagemann, S. and L. Dümenil, 1996: Development of a parameterization of the lateral discharge component for the global scale. In: A. Staniforth (Ed.), Research Activities in Atmospheric and Oceanic Modelling. Report No. 23, WMO/TD No. 734, WMO, Geneva.
- Hagemann, S. and L. Dümenil, 1997: Application of the hydrological discharge model in the BALTEX region: Comparison of simulated discharge using input from an atmospheric global circulation model and a regional climate model. In: A. Staniforth (Ed.), Research Activities in Atmospheric and Oceanic Modelling. Report No. 25, WMO/TD No. 792, WMO, Geneva.
- Hagemann, S. and L. Dümenil, 1998: The usage of a global discharge model to compare two global wetlands datasets. In: A. Staniforth (Ed.), Research Activities in Atmospheric and Oceanic Modelling. Report No. 27, WMO/TD No. 865, WMO, Geneva.
- Hagemann, S., M. Botzet, L. Dümenil and B. Machenhauer, 1999: Preparing a new global high resolution dataset of land surface characteristics depending on land use and vegetation, In: H. Ritchie (Ed.), Research Activities in Atmospheric and Oceanic Modelling, Report No. 28, WMO/TD No. 942, WMO, Geneva.
- Hagemann, S., and L. Dümenil Gates, 2000: Validation of the hydrological cycle and computation of discharge from ECMWF and NCEP reanalyses, Proceedings of the "Second WCRP International Conference on Reanalyses", WCRP-109, WMO/TD-No. 985, pp. 157-160
- Hagemann, S., M. Botzet, L. Dümenil Gates and B. Machenhauer, 2000: Impact of new global land surface parameter fields on ECHAM T42 climate simulations, In: H. Ritchie (Ed.), Research Activities in Atmospheric and Oceanic Modelling, Report No. 30, WMO/TD No. 987, WMO, Geneva.
- Hagemann, S., K. Arpe and E. Roeckner, 2005: Influence of Different Vertical and Horizontal Model Resolutions on the Simulated Hydrological Cycle of the GCM ECHAM5, In: J. CTMté (Ed.), Research Activities in Atmospheric and Oceanic Modelling, WGNE Blue Book 2005, WMO, Geneva, pp. 3-11, 3-12.
- Hagemann, S., and D. Jacob, 2005: European Discharge Under Climate Change Conditions Simulated by a Multimodel Ensemble, In: J. CTMté (Ed.), Research Activities in Atmospheric and Oceanic Modelling, WGNE Blue Book 2005, WMO, Geneva, pp. 7-11, 7-12.