

ISI Publications

- [47] M. Mann, S. Rahmstorf, K. Kornhuber, B. Steinman, S. Miller, D. **Coumou**, Influence of Anthropogenic Climate Change on Planetary Wave Resonance and Extreme Weather Events, *Nature* (in review)
- [46] K. Kornhuber, V. Petoukhov, D. Karoly, S. Petri, S. Rahmstorf, D. **Coumou**, Summertime Planetary Wave-Resonance in the Northern and Southern Hemisphere, *Journal of Climate* (in review)
- [45] S. Molnos, A.V. Eliseev, S. Petri, M. Flechsig, L. Caesar, D. **Coumou**, The Dynamical Core of Aeolus' Statistical-Dynamical Atmosphere Model: Validation and Parameter Optimization, *Geoscientific Model Development Disc.*
- [44] J. Lehmann and D. **Coumou**, Changes in record-wet and record-dry months in global land observations, *Environ. Res. Lett.* (in review)
- [43] M. Kretschmer, D. **Coumou**, L. Agel, M. Barlow, E. Tziperman, J. Cohen, More frequent weak stratospheric polar vortex states linked to cold extremes, *BAMS* (in review)
- [42] S. Molnos, T. Mamdouh, S. Petri, T. Nocke, T. Weinkauff, D. **Coumou**, A network-based detection scheme of the jet stream core, *Earth System Dynamics Disc.*
- [41] M. Knaus, A. Robinson, D. **Coumou**, Shift in evaporative regime intensifying recent heat extremes in southeastern Europe, *Environ. Res. Lett.* (in review)
- [40] K. Kornhuber, D. **Coumou**, V. Petoukhov, S. Petri, S. Rahmstorf, Evidence for wave resonance as a key mechanism for generating high-amplitude quasi-stationary waves in boreal summer, *Climate Dynamics* (accepted)
- [39] G. di Capua and D. **Coumou**, Changes in meandering of the Northern Hemisphere circulation, *Environ. Res. Lett.*, 11, 094028, 2016
- [38] D. **Coumou**, K. Kornhuber, V. Petoukhov, Weakened Flow, Persistent Circulation and Prolonged Extreme Weather Events in Boreal Summer, in *Climate Extremes: Mechanisms and Potential Prediction*, S. Wang et al. (Eds.), AGU Monograph, American Geophysical Union (in print)
- [37] V. Petoukhov, S. Petri, S. Rahmstorf, D. **Coumou**, K. Kornhuber, H-J. Schellnhuber, The role of quasi-resonant planetary wave dynamics in recent boreal spring-to-autumn extreme events, *Proc. Nat. Ac. Sci.*, doi:10.1073/pnas.1606300113, 2016
- [36] M. Kretschmer, D. **Coumou**, J. Donges, J. Runge, Using Causal Effect Networks to Analyze Different Arctic Drivers of Midlatitude Winter Circulation, *Journal of Climate*, 29, 4691-4081, 2016
- [35] L. Stadtherr, D. **Coumou**, V. Petoukhov, S. Petri, S. Rahmstorf, Record Balkan floods of 2014 linked to planetary wave resonance, *Science Advances*, 2, 4, 2016
- [34] K. Waha, R. Marcus, S. Adams, V. Aich, F. Baarsch, D. **Coumou**, M. Fader, H. Hoff, G. Jobbins, L. Krummenauer, M. Mengel, M. Perette, M. Rocha, A. Robinson, C-F Schleussner, Regional Review: Middle East and Northern Africa, *Reg. Environ. Change* (accepted)
- [33] F. Baarsch, S. Adams, D. **Coumou**, R.V. Donner, W. Hare, T. Lissner, M. Perette, M. Rocha, A. Robinson, M. Schaeffer, O. Serdeczny, A. Svirejeva-Hopkins, Climate change in South East Asia: coastal zones and productivity in the eye of the cyclone, *Reg. Environ. Change* (accepted)
- [32] M. Kretschmer, D. **Coumou**, J-F Donges, J. Runge, Using Causal Effect Networks to analyze different Arctic drivers of mid-latitude winter circulation, *Journal of Climate* (published online) doi:10.1175/JCLI-D-15-0654.1, 2016
- [31] K. Vinke, M.A. Martin, S. Adams, F. Baarsch, D. **Coumou**, R. Donner, M. Perette, K. Rehfeld, A. Robinson, S. Schwan, O. Serdeczny, Climatic Risks and Impacts in South Asia: Extremes of Water Scarcity and Excess, *Reg. Environ. Change*, doi:10.1007/s10113-015-0924-9, 2016

- [30] C. Reyer, I.M. Otto, S. Adams, T. Albrecht, F. Baarsch, M. Carlsburg, D. **Coumou**, A. Eden, E. Ludi, R. Marcus, M. Mengel, B. Mosello, A. Robinson, C-F Schleussner, O. Serdeczny, J. Stagl, Climate change impacts in Central Asia and their implications for development, *Reg. Environ. Change*, doi:10.1007/s10113-015-0893-z, 2016
- [29] O. Serdeczny, S. Adams, D. **Coumou**, A. Robinson, B. Hare, M. Perrette, Regional Review: Middle East and Northern Africa, *Reg. Environ. Change*, doi:10.1007/s10113-015-0910-2, 2016
- [28] C. Reyer, N.C. Trujillo, P. Pereznieta, D. **Coumou**, A. Robinson, M. Schaeffer, C-F Schleussner, M. Perette, M. Mengel, T. Albrecht, J. Reinhardt, M. Carlsburg, M. Rocha, A. Ramming, A. Boit, K. Thonick, F. Langerwisch, B. Sakschewski, O. Serdeczny, S. Adams, R. Marcus, F. Baarsch, E. Fernandes, D. Mira-Salama, A. Eden, Climate change impacts in Latin America and the Caribbean, *Reg. Environ. Change* doi:10.1007/s10113-015-0854-6, 2016
- [27] J. Lehmann and D. **Coumou**, The influence of mid-latitude storm tracks on hot, cold, dry and wet extremes, *Scientific Reports* 5, 17491, 2015
- [26] J. Lehmann, D. **Coumou**, K. Frieler, Increased record-breaking precipitation events under global warming, *Climatic Change* doi:10.1007/s10584-015-1434-y, 2015
- [25] I.M. Otto, A. Biewald, D. **Coumou**, G. Feulner, C. Köhler, T. Nocke, A. Blok, A. Gröber, S. Selchow, D. Tyfield, I. Volkmer, H.J. Schellnhuber and U. Beck, Socio-economic data for global environmental change research, *Nature Climate Change*, 5, p.503-506, 2015
- [24] D. **Coumou**, J. Lehmann, J. Beckmann, The Weakening Summer Circulation in the Northern Hemisphere Mid-latitudes, *Science*, 348 (6232), p.324-327, 2015
- [23] D. **Coumou**, V. Petoukhov, S. Rahmstorf, S. Petri and H-J. Schellnhuber, Quasi-resonant circulation regimes and hemispheric synchronization of extreme weather in boreal summer, *Proc. Nat. Ac. Sci.*, 111(34), p.12331-12336, 2014
- [22] J. Cohen, J. Screen, J.C. Furtado, M. Barlow, D. Whittleston, D. **Coumou**, J. Jones, J. Francis, K. Dethloff, D. Entekhabi and J. Overland, The Relationship between recent Arctic Amplification and Extreme Mid-Latitude Weather *Nature Geoscience*, 7, p.627-637, 2014
- [21] J. Lehmann, D. **Coumou**, K. Frieler, A. Eliseev and A. Levermann, Future changes in extratropical storm tracks and baroclinicity under climate change, *Environ. Res. Lett.*, 9, 2014
- [20] W. Cramer et al. (contributing author) Detection and attribution of observed impacts, in *Climate Change 2014: Impacts, Adaptation, and Vulnerability*, IPCC 5th Assessment Report, 2014
- [19] P. Weis, T. Driesner, D. **Coumou** and S. Geiger, Hydrothermal, Multi-phase Convection of H₂O-NaCl Fluids from Ambient to Magmatic Temperatures: A new Numerical Scheme and Benchmarks for Code Comparison, *Geofluids* (doi: 10.1111/gfl.12080), 2014 (awarded Geofluids Best Paper of 2014)
- [18] D. **Coumou** and A. Robinson, Historic and Future Increase in the Frequency of Monthly Heat Extremes, *Environ. Res. Lett.*, 8, 034018, 2013 (ranked among 25 best ERL papers of 2013)
- [17] A.V. Eliseev, D. **Coumou**, A.V. Chernokulsky, V. Petoukhov, and S. Petri. Scheme for calculation of multi-layer cloudiness and precipitation for climate models of intermediate complexity, *Geosci. Model Dev.*, 6(5), 1745-1765, doi:10.5194/gmd-6-1745-2013, 2013
- [16] D. **Coumou**, A. Robinson and S. Rahmstorf, Global increase in record-breaking monthly-mean temperatures, *Climatic Change*, doi:10.1007/s10584-012-0668-1, 2013
- [15] D. **Coumou** and S. Rahmstorf, A Decade of Weather Extremes, *Nature Clim. Ch.*, 2, p.491-496, 2012 (ranked 2nd in Altmetric score of NCC 2012 papers)
- [14] S. Rahmstorf and D. **Coumou**, Increase of extreme events in a warming world, *Proc. Nat. Ac. Sci.*, 108(44), p.17905-17909, 2011
- [13] D. **Coumou**, V. Petoukhov, A.V. Eliseev, Three-dimensional Parameterizations of the Synoptic Scale Kinetic Energy and Momentum Flux in the Earths Atmosphere, *Nonlin. Processes Geophys.*, 18, p.807-827, 2011

- [12] P. Weis, T. Driesner, S. Geiger, C.A. Heinrich, D. **Coumou** and S. Geiger, Flow of Brine and Vapour in Subaerial and Submarine Magmatic Hydrothermal Systems, *Smart Science for Exploration and Mining*, Vol. 1 and 2, p.873-875, 2010
- [11] D. **Coumou**, T. Driesner, S. Geiger, A. Paluszny, C.A. Heinrich, High-Resolution 3D Simulations of Mid-ocean Ridge Hydrothermal Systems, *Journal of Geophysical Research*, 114, B07104, doi:10.1029/2008JB006121, 2009
- [10] D. **Coumou**, T. Driesner, C.A. Heinrich, and P. Weis, Phase-separation, Brine Formation and Salinity Variation at Black Smoker Hydrothermal Systems, *Journal of Geophysical Research*, 114, B03212, doi:10.1029/2008JB005764, 2009
- [9] S. Geiger, Q. Huangfu, F. Reid, S. Matthai, D. **Coumou**, M. Belayneh, C. Fricke, K. Schmid, Massively Parallel Sector Scale Discrete Fracture and Matrix Simulations, *SPE - Reservoir Simulation*, 118924, 2009
- [8] T. Driesner and D. **Coumou**, Permeability control on sub-seafloor phase separation, venting temperature and salinity in MOR hydrothermal systems, *Geochem. Cosmochem. Acta*, 73 (13), A305-A305, 2009
- [7] P. Weis, D. **Coumou**, T. Driesner, S. Geiger, I. Steinberg, G. Grün and C.A. Heinrich, Constraining timescales of ore-formation by numerical simulations of magmatic-hydrothermal systems, *Geochem. Cosmochem. Acta*, 73 (13), A1426-A1426, 2009
- [6] D. **Coumou**, T. Driesner, C.A. Heinrich, The Structure and Dynamics of Mid-Ocean Ridge Hydrothermal Systems, *Science*, 321, p.1825-1828, 2008
- [5] D. **Coumou**, T. Driesner, C.A. Heinrich, Heat Transport at Boiling, Near-critical Conditions, *Geofluids*, 8, p.208-215, 2008
- [4] D. **Coumou**, S.K. Matthai, S. Geiger, T. Driesner, A Parallel FE-FV Scheme to Solve Fluid Flow in Complex Geologic Media, *Computers and Geosciences*, 34, p.1697-1707, 2008
- [3] D. **Coumou**, T. Driesner and C.A. Heinrich, The influence of phase separation on the flow patterns of mid-ocean ridge hydrothermal systems, *Geochem. Cosmochem. Acta*, 72 (12), A184-A184, 2008
- [2] S.K. Matthai, S. Geiger, S.G. Roberts, A. Paluszny, M. Belayneh, A. Mezentsev, H. Lu, D. **Coumou**, T. Driesner, C.A. Heinrich. Numerical Simulation of Multiphase Fluid Flow in Structurally Complex Reservoirs, in Structurally Complex Reservoirs (ed. S.J. Jolley, D. Bar, J.J. Walsh and R.J. Knipe), *GSL Special Publications*, 2007
- [1] D. **Coumou**, S. Geiger, T. Driesner, C.A. Heinrich, S.K. Matthai, The Dynamics of Mid-ocean Ridge Hydrothermal Systems: Splitting Plumes and Fluctuating Vent Temperatures, *Earth and Planetary Science Letters*, 245, 1-2, p.218-231, 2006

Theses and Book Chapters (peer-reviewed)

- [10] F. Baarsch, M. Schaeffer, M. Krap, J. Granadilos, M. Rocha, D. **Coumou**, M. Knaus, B. Hare, et al., *Economic Growth, Development and Climate Change in Africa*, commissioned by African Development Bank (in review)
- [9] H-J Schellnhuber, C. Reyer, B. Hare, K. Waha, I. Otto, O. Serdeczny, M. Schaeffer, C-F Schleussner, D. Reckien, R. Marcus, O. Kit, A. Eden, S. Adams, V. Aich, T. Albrecht, F. Baarsch, A. Boit, N.C. Trujillo, M. Carlsburg, D. **Coumou**, M. Fader, H. Hoff, G. Jobbins, L. Jones, L. Krummenauer, F. Langerwisch, V. Le Masson, E. Ludi, M. Mengel, J. Möhring, B. Mosello, A. Norton, M. Perette, P. Pereznieta, A. Rammig, J. Reinhardt, A. Robinson, M. Rocha, B. Sakschewski, S. Schaphoff, J. Schewe, J. Stagl and K. Thonicke. *Turn Down The Heat: Confronting the new climate normal*, The World Bank, Washington, US, 2014
- [8] H-J Schellnhuber, B. Hare, O. Serdeczny, M. Schaeffer, S. Adams, F. Baarsch, S. Schwan, D. **Coumou**, A. Robinson, M. Vieweg, F. Piontek, R. Donner, J. Runge, K. Rehfeld, J. Rogelj, M. Perette, A. Menon, C-F Schleussner, A. Bondeau, A. Svirejeva-Hopkins, J. Schewe, K. Frieler, L. Warszawski and M. Rocha. *Turn Down The Heat: Climate Extremes, Regional Impacts and the Case for Resilience*. The World Bank, Washington, US, 2013
- [7] M. Schaeffer et al. Adequacy and feasibility of the 1.5°C long-term global limit. Published by Climate Action Network Europe, Brussels, Belgium, p 46, 2013

- [6] D. **Coumou** and M. Schaeffer. Risks of Loss and Damage due to Climate Change Today and under Future Scenarios. Report commissioned by *Germanwatch* (Bonn, Germany), *Munich Climate Insurance Initiative* (Munich, Germany), *United Nations University* (Bonn, Germany) and the *International Centre for Climate Change and Development* (Dhaka, Bangladesh), 2012
- [5] H.J. Schellnhuber, W. Hare, O. Serdeczny and D. **Coumou** K. Frieler, M. Martin, I.M. Otto, M. Perrette, A. Robinson, M. Rocha, M. Schaeffer, J. Schewe, X. Wang, and L. Warszawski. *Turn Down The Heat: Why a 4° C Warmer World Must be Avoided*, The World Bank, Washington, US, 2012
- [4] H.J. Schellnhuber, D. **Coumou**, M. Martin, M. Perrette, A. Robinson, *Preparing for a 4° C World – Analysis of Regional Sea-Level Rise and Extreme Heat Waves*. The World Bank, Washington, US, 2012
- [3] D. **Coumou**, Atmospheric Sciences - A Short History, In Heibach, C. (ed.), *Atmosphären erleben - Dimensionen eines Diffusen Phänomens*, Wilhelm Fink Verlag, Munich, Germany, p.328, 2012
- [2] D. **Coumou**, Numerical Simulation of Fluid Flow in Mid-ocean Ridge Hydrothermal Systems, PhD-thesis, *ETH-Zurich*. Distinguished with ETH-medal for best 5% theses, p.163, 2008
- [1] D. **Coumou**, Hot Fractured Rock systems. Case study of Soultz-sous-Forets HFR reservoir, MSc-thesis, *University of Utrecht*, Shell Technology Exploration and Production internal report EP 2001-5289, 2001

Selected Media Contributions & Technical Reports

- > For some recent media appearances: www.pik-potsdam.de/members/coumou/dim-coumou
- 2014 D. **Coumou**, Rossby waves and surface weather extremes, *RealClimate.org*, 10 July 2014
- 2013 Winner Most Scientific hack: The Windy Globe, *Science Hack Day*, 19 Nov, Berlin, Germany
- 2012 D. **Coumou**, Laat 'Energiewende' net zo integreren als 'Schwalbe' en 'Fingerspitzengefühl', *Volkskrant* (Dutch Daily), 6 Oct, Netherlands
- S. Rahmstorf and D. **Coumou**, Extremely hot, *RealClimate.org*, 26 March 2012
- 2011 S. Rahmstorf and D. **Coumou**, The Moscow Warming Hole, *RealClimate.org*, 26 October 2011
- 2010 J. Kurths, I. Brauer, M. Flechsig, S. Petri, W. von Bloh, D. **Coumou**, N. Botta, Towards a PIK-specific modeling strategy, *PIK*, Germany
- 2006 D. **Coumou**, CSP 5.0 - Parallel Computation Users Manual, *ETH-Zurich*, Switzerland
- 2004 D. **Coumou**, Red Sea pipeline route survey offshore Ras Gharib - Survey Results, *Thales GeoSolutions*, Egypte

Selected Invited Public & Scientific Lectures

- 2016 "Climate Change, Extreme Weather and Migration: State of the Science", *Disasters and displacement in a warming world: Current realities, legal perspectives*, workshop organised by Lund University, Lund, Sweden, May 2016
- "Using causal discovery algorithms to identify drivers of anomalous mid-latitude circulation", *The role of atmospheric circulation in regional climate change*, workshop organised by University of Reading, Reading, UK, Apr 2016
- 2015 "Weakened Flow, Persistent Circulation and Prolonged Heat Waves in Boreal Summer", *Understanding, modelling and predicting weather and climate extremes*, workshop organised by World Climate Research Program, Oslo, Norway, Oct 2015
- "Climate Services from a Scientific Perspective", *PPCR Climate Services*, workshop organised by The World Bank and the Climate Investment Funds, Frascati, Italy, July 2015
- "Weakened Flow, Persistent Circulation and Prolonged Heat Waves in Boreal Summer", *Our Common Future under Climate Change*, International Scientific Conference, Paris, France, July 2015
- "Weakened Circulation & Persistent Heat Extremes in Boreal Summer", *Nonlinear Dynamics, Extremes, Geohazards and Predictability of the Earth System*, workshop organised by CLISAP and University of Hamburg, Hamburg, Germany, May 2015

- "Extreme Weather in a Warming World", *ESS-2015*, Mainz, Germany, March 2015
- 2014 "Jet stream visualization to detect anomalous circulation regimes associated with extreme weather events".
Max Planck Institute for Informatics, Saarbrücken, Germany, May. 2014
"Weather Extremes and Heat on the Horizon", *World Bank – Capacity Building Workshop*, Potsdam, Germany, March. 2014
- 2013 "Climate Change and Extreme Weather Events" (invited). *AGU Fall Meeting*, San Fransisco, US
"Weather Extremes and Heat on the Horizon" (Invited), *Springtij*, Terschelling, Netherlands
"Development of the Aeolus 1.0 Atmosphere Model: An overview", *Meteorologisches Kolloquium*, FU Berlin
- 2012 "Klimawandel, Wissenschaftskommunikation und die Medien", *Aufgeheizt* workshop, Berlin, March. 2012
"Climate Change and its Mid- and Long-Term Impacts on the Mediterreanen and the Middle East", *Public climate change workshop organised by Goethe Institut Ramallah*, Ramallah, Jan. 2012
- 2011 "Climate Change: Facts and Future Impacts", *6th Executive Seminar for Diplomats from Latin America and the Caribbean*, German Federal Foreign Office, Berlin, Sept. 2011
"The Atmosphere from a Natural Science Perspective". Conference: *Atmosphären erleben. Dimensionen eines diffusen Phänomens*, HfG Forschungsinstitut (ZKM), Karlsruhe, Jun. 2011
- 2010 "Climate Change: Facts and Future Impacts", *5th Executive Seminar for Diplomats from Latin America and the Caribbean*, German Federal Foreign Office, Berlin, Oct. 2010
"Climate Change and Energy Security", International Diplomats Summer school *International Futures VII*, German Federal Foreign Office, Berlin, Aug. 2010
"Climate Change and its Mid- and Long-Term Impacts on the Middle East and North Africa", *14th DGAP International Summer School*, German Council on Foreign Relations, Berlin, Jun. 2010
- 2009 "Climate Change: Fact or Fiction", *4th Executive Seminar for Diplomats from Latin America and the Caribbean*, German Federal Foreign Office, Berlin, Oct. 2009
"Climate Change: Scientific Basis, Future Risks and Solutions", *Diplomats' College*, organized by German Federal Foreign Office, Potsdam Institute for Climate Impact Research, Potsdam, May 2009
"Simulating Submarine Hydrothermal Systems", *Centre de Recherches Pétrographiques et Géochimiques (CRPG-CNRS)*, Nancy (France), Feb. 2009
"Modeling Multiphase Fluid Flow in Submarine Hydrothermal Systems", *Institut de Physique du Globe (IPGP)*, Paris (France), Feb. 2009
- 2008 "Climate Change: Scientific Basis, Future Risks and Solutions", Symposium for Geography Students, Potsdam Institute for Climate Impact Research, Potsdam, Nov. 2008
- 2006 "Blacksmoker vent temperatures - A pure mathematical approach", *R2K Theoretical Institute*, Reno, U.S., Apr. 2006