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About

Dr Gregor Leckebusch is one of the foremost experts in the field of linking natural science research on meteorological and climatological extreme events with the estimation of natural hazards damage potentials. He played a key role in several national and international interdisciplinary projects dedicated to the assessment of natural and anthropogenic changes in extreme events and impacts of climate change to economy and society.

Biography

Dr Gregor Leckebusch studied Meteorology at the University of Cologne (Germany), where he completed his PhD on meteorological diagnostics of polar ice cores by means of paleoclimate model simulations. He subsequently worked as a Postdoc to regional extreme event modelling and impact assessment. He acted as Associate Professor from 2004 to 2010 (Habilitation 2009) at Freie University of Berlin (Institute for Meteorology) and substituted the chair of Dynamical Meteorology at the University of Leipzig (2010/2011) before taking up the post of Senior Lecturer at Birmingham.

Teaching

Teaching activities at all levels e.g. in dynamical and synoptic meteorology, polar meteorology, general meteorology and climatology, weather prediction and impact assessment, and practical meteorological observation courses. In Birmingham (**MSc in Applied Meteorology and Climatology (/postgraduate/courses/taught/gees/applied-met-climatology.aspx)**) he is leader of the modules “Meteorological Applications and Services” and “Physical Climatology”. He contributes to the module “Weather, Climate and Society”.

Postgraduate supervision

Dr Leckebusch offers a wide range of postgraduate supervision, spanning from pure meteorological topics (e.g. studies to extreme wind storms) to impact research (e.g. trends of forest fire under future climate conditions). Actual or recently finished supervisions:

- Jens Grieger: Anthropogenic Climate Change and its influence of extreme cyclone development around Antarctica. (FU Berlin)
- Auwal Farouk Abdussalam: Climate Change and Variability: The Impacts on Climate-Sensitive Diseases in the 2050s for North-Western Nigeria. (UoB)
- Tim Kruschke: A transferfunction for downscaling extreme storm events (FU Berlin)
- Tobias Pardowitz: Analysis of the impact of extreme wind storms under ACC for the state of Hesse.(FU Berlin)
- Daniel Befort: Modeling extreme phases of the South-Asian Monsoon in paleoclimates and future climate conditions. (FU Berlin)
- Dominik Renggli: Seasonal predictability of wind storms over Europe. (FU Berlin)

For more information on possible projects see **FindAPhD (http://www.findaphd.com/)** .

Research

Actual and Past Projects (Investigator or Co-Investigator)

- SEASTOC
  Risk Prediction Initiative (Bermuda), **2014-2016**: Seasonal Extra-tropical Storm Clustering (SeaStoC)
- EVE
  Extreme Events Variability over Europe (/research/activity/environmental-health/projects/extreme-events.aspx) , **2012-2016,** EU FP7 Marie Curie Career Integration Grants (CIG), FP7-PEOPLE-2012-CIG
- VESPA
  Variability of extremes, its causes and predictability on decadal time scales in ensembles of climate simulations (VESPA), BMBF *MIKLIP*Research Group on Decadal Climate Prediction. Funder: German Federal Ministry of Education and Research (BMBF)
- EnsDiVal
  MBF *MIKLIP*Research Group on Decadal Climate Prediction; Subproject EnsDiVal: Scientific and Technical Coordination of Module E including research activities with flagship character for the systematic data-based and process-oriented validation. Funder: German Federal Ministry of Education and Research (BMBF)
- PAK-Sturm
  Storm surges in the German Bight: dynamical downscaling and anthropogenic climate change perspective.Funder: Bundesamt fuer Seeschiffahrt und Hydrology (BSH)
- ABS-EQECAT
  European storm risk and future changes, collaboration for risk assessment and risk modelling
- German Insurance Association (GDV: Gesamtverband der Deutschen Versicherungswirtschaft)
  Assessment of potential impacts of anthropogenic climate change on the German insurance economy. Cooperation with Potsdam Institute for climate impact research (PIK, Prof. Dr. H. Held)

- AXA Research Fonds
  EuFloLoss: Large-Scale European Flooding under Climate Change: Meteorological and hydrological conditions translated to economic loss. Cooperated project with GeoForschungsZentrum Potsdam (GFZ, Prof. B. Merz)
- DFG *Forschergruppe HIMPAC*
  Himalaya: Modern and Past Climates, Project proposal: IP8: Monsoon variability and its physical mechanisms under different paleo- and future climate conditions. Speaker: Prof. M. Strecker (UniversityPotsdam)
- DFG *Forschergruppe584*
  Earth rotation and Global Dynamic Processes, Project P10: Long-term ERP time series as indicators for global climate variability and climate change (ERP-CLIVAR)
- DFG Research program "Antarctic Research, SPP 1158" (LE1865/1-1/2)
  The shift of Southern Hemisphere storminess under anthropogenic climate change around Antarctica and its impacts
- Munich Re
  Event set catalogue for the estimation of the frequency and impacts of extreme extra-tropical storms over Europe
- Hessian State agency of Environment and Geology
  ABS-Hessen: Anthropogenic impact on the European storm climate and potential consequences for the Hessian region
- Hans-Ertel-Zentrum für Wetterforschung beim DWD: WEXICOM-Berlin
  Improving the process of weather warnings and extreme weather information in the chain from the meteorological forecasts to their communication for the Berlin conurbatio
- BMBF *RegioExAkt*
  Regional risks of convective extreme events: Concepts for Stakeholders and adaptation
  Project: Frequency and intensity of convective extreme events under future climate conditions and its regional forecast potentials
- EU *Contract no.: 036961* CIRCE
  Climate Change and Impact Research: the Mediterranean Environment. EU 6thIntegrated Framework Program.
- Munich Re
  Seasonal predictability of frequencies of winter storms over Europe.
- DFG *SP 191/21-1/2*
  Southern Hemispheric circulation anomalies related to ENSO and its impacts on Antarctica.
- DFG *SP 191/25-1/2*
  Interactions of the variability of katabatic drainage flows from Antarctica with the Southern Hemispheric circulation on different time and spatial scales.
- EU *EVK2-CT-2001-00118*
  MICE: Modelling the Impact of Climate Extremes. EU 5thIntegrated Framework Programme.
- EU *Proposal no. 505539*
  ENSEMBLES: ENSEMBLE-based Predictions of Climate Changes and their Impacts. EU 6thIntegrated Framework Programme.
- FU Berlin "University of Excellence special funding scheme"
  Centre for Scientific Simulation: Advanced Methods of Time Series Analysis and their Application to Climate Research and Insurance Risk Optimization.

Other activities

- Member of the German Meteorological Society (DMG)
- Member of the European Geosciences Union (EGU)
- Member of the American Geophysical Union (AGU)
- Member of the CLM user community
  (CLM = Climate version of the Lokal-Modell of the German Weather Service (DWD))
- Head of working group "Evaluation" in the CLM community
- Member of the COSMO-CLM Coordination committee
- Assisting Chairman of the user group committee of the German High Performance Computing Centre for Climate- and Earth System Research (DKRZ) (2002 – 2004)
- **Geo.X** - Coordinator for Freie Universität Berlin, Faculty of Geosciences (**www.geo-x.net (http://www.geo-x.net/)**); Geo-Research cluster in the area Berlin-Brandenburg (2009-2010)
- Member of the **IMILAST**- Coordination group (IMILAST-Project: Intercomparison of mid latitude storm diagnostics; **http://www.proclim.ch/IMILAST/) (http://www.proclim.ch/IMILAST/))**
- External expert consulter at University of Arba Minch (Ethiopia) to establish a new study programme (BSc, MSc) in the field of Meteorology and Hydrology in accordance with the European Bologna process at the Water Technology Institute, University of Arba Minch, Ethiopia. Collaboration with DAAD and GTZ (27.08.2008 – 25.09.2008)
- Radiosonde campaign at Parakou (Benin, West-Africa) in the framework of the research initiative IMPETUS (Integrative Management Project for efficient and sustainable Use of freshwater in West-Africa) (12.07.2002 – 20.08.2002)

Reviews

- Peer reviews for scientific journals, e.g. J. Climate, Meteorol. Z., Climate Dynamics, Climatic Change, Climate Research, TellusA, NHESS, etc.
- Referee for grant applications e.g. NERC (UK), BSF (USA), etc.
- Referee for the IPCC Working Group II, Fourth Assessment Report Cross-chapter Case Study: The European 2003 heat wave.

Organisation of scientific sessions at international conferences and symposia

- "Zugang zu meteorologischen Daten", internationale Fortbildungsveranstaltung und Podiumsdiskussion für den Zweigverein Rheinland der Deutschen Meteorologischen Gesellschaft. Köln, 1996.
- "Employment Options for Professionals in Meteorology and Hydrology – Implications for Curriculum Development." Addis Ababa, 22.09.2008.
- Convener of session "Mid-latitude Cyclones and Storms: Diagnostics of Observed and Future Trends, and related Impacts", "European Geosciences Union" General Assembly, Vienna, 2009; 2010, 2011, 2012.
- Co-Convener of session "Urban Climate",11th EMS Annual Meeting; 10th European Conference on Applications of Meteorology (ECAM), 12 – 16 September 2011, Berlin, Germany.
- Member of the Programme and Science Committee (PSC) of the 11th EMS Annual Meeting / 10th European Conference on Applications of Meteorology (ECAM), 12

– 16 September 2011, Berlin, Germany.

Awards

- **The Gordon Manley Weather Prize of the Royal Meterological Society**
  The Prize for 2008 is awarded to Professor Andreas Fink and meteorology colleagues at the Institute for Geophysics and Meteorology, Cologne, Germany. London, 18 June 2008

  "Andreas Fink and a variety of colleagues have CO-authored a wide range of case studies of extreme weather events over Europe that have been published in *Weather* since the mid 1990s. The subjects have ranged from the mid-latitude storms of January 1999 to the central European floods of 2002, the heat and drought of summer 2003 and Snow accumulation in winter 2005. Each of the resulting articles has been distinguished by a careful balance between comprehensive meteorological analysis of the causes and impacts of the weather events and a lucid and accessible written style. As such, these articles embody many of the aims of *Weather*."

  Given under the seal of the society, 18th June 2008

Publications

Selected publications

Peer reviewed publications

Nissen, K.M., U. Ulbrich, G.C. Leckebusch, and I. Kuhnel, **2014**: Decadal windstorm activity in the North Atlantic-European sector and its relationship to the Meridional Overturning Circulation in an ensemble of coupled climate model simulations.
Climate Dynamics, 43:1545–1555. DOI 10.1007/s00382-013-1975-6.

Abdussalam, A.F., A.J. Monaghan, D.F. Steinhoff, V.M. Dukic, M.H. Hayden, T.M. Hopson, J.E. Thornes, and G.C. Leckebusch, **2014**: The Impact of Climate Change on Meningitis in Northwest Nigeria: An Assessment Using CMIP5 Climate Model Simulations.
Weather, Climate and Society, 6, 371–379. doi: **http://dx.doi.org/10.1175/WCAS-D-13-00068.1 (http://dx.doi.org/10.1175/WCAS-D-13-00068.1)**

Kruschke, T., Rust, H.W., Kadow, C., Leckebusch, G.C., and Ulbrich, U., **2014**: Evaluating Decadal Predictions of Northern Hemispheric Cyclone Frequencies.
Tellus A, 66, 22830, **http://dx.doi.org/10.3402/tellusa.v66.22830 (http://dx.doi.org/10.3402/tellusa.v66.22830)** .

Grieger, J., G.C. Leckebusch, M.G. Donat, M. Schuster, U. Ulbrich, **2014**: Southern Hemisphere winter cyclone activity under recent and future climate conditions in multi-model AOGCM simulations.
Int. J. Climatology, 34 (12), 3400–3416, DOI: 10.1002/joc.3917.

Abdussalam, A.F., A.J. Monaghan, V.M. Dukic, M.H. Hayden, T.M. Hopson, G.C. Leckebusch, and J. Thornes, **2014**: Climate influences on interannual variability of meningitis incidence in northwest Nigeria.
Weather, Climate and Society. Vol. 6, No. 1, 62-76. doi: 10.1175/WCAS-D-13-00004.1

Nissen, K.M., G.C. Leckebusch, J.G. Pinto, U. Ulbrich, **2014**: Mediterranean cyclones and wind storms in a changing climate.
Reg. Environ. Change, Vol. 14, Issue 5, 1873-1890. DOI 10.1007/s10113-012-0400-8

Nissen, K.N., U. Ulbrich and G.C. Leckebusch, **2013**: Vb cyclones and associated rainfall extremes over Central Europe under present day and climate change conditions.
Meteorologische Zeitschrift, 22 (6), 649-660, DOI: 10.1127/0941-2948/2013/0514

Held, H., F.-W. Gerstengarbe, T. Pardowitz, J.G. Pinto, U. Ulbrich, U. Boehm, K. Born, M. Buechner, M.G. Donat, M.K. Karremann, G.C. Leckebusch, P. Ludwig, K.M. Nissen, T. Nocke, H. Oesterle, B.F. Prahl, P.C. Werner, O. Burghoff, **2013**: Projections of global warming-induced impacts on winter storm losses in the German private household sector.
Climatic Change, Volume 121, Issue 2, pp 195-207. DOI 10.1007/s10584-013-0872-7.

Ulbrich, U., G.C. Leckebusch, J. Grieger, M. Schuster, M. Akperov, M. Yu. Bardin, Y. Feng, S. Gulev, M. Inatsu, K. Keay, S.F. Kew, M.L.R. Liberato, P. Lionello, I.I. Mokhov, U. Neu, J.G. Pinto, C.C. Raible, M. Reale, I. Rudeva, I. Simmonds, N.D. Tilinina, I.F. Trigo, S. Ulbrich, X.L. Wang, H. Wernli and the IMILAST team, **2013**: Are Greenhouse Gas Signals of Northern Hemisphere winter extra-tropical cyclone activity dependent on the identification and tracking algorithm?
Meteorol. Z., 22 (1), 61-68. DOI: 10.1127/0941-2948/2013/0420

Neu, U., M.G. Akperov, N. Bellenbaum, R. Benestad, R. Blender, R. Caballero, A. Cocozza, H.F. Dacre, Y. Feng, K. Fraedrich, J. Grieger, S. Gulev, J. Hanley, T. Hewson, M. Inatsu, K. Keay, S.F. Kew, I. Kindem, G.C. Leckebusch, M.L.R. Liberato, P. Lionello, I.I. Mokhov, J.G. Pinto, C.C. Raible, M. Reale, I. Rudeva, M. Schuster, I. Simmonds, M. Sinclair, M. Sprenger, N.D. Tilinina, I.F. Trigo, S. Ulbrich, U. Ulbrich, X.L. Wang, H. Wernli, **2013**: IMILAST – a community effort to intercompare extratropical cyclone detection and tracking algorithms: assessing method-related uncertainties.
Bulletin of the American Meteorological Society, Vol. 94 (4), 529-547. DOI: 10.1175/BAMS-D-11-00154.1

Donat, M.G., G. C. Leckebusch, S. Wild, and U. Ulbrich, 2011: Future changes in European winter storm losses and extreme wind speeds inferred from GCM and RCM multi-model simulations. **Nat. Hazards Earth Syst. Sci.**, 11, 1351-1370.

Donat, M.G., D. Renggli, S. Wild, L.V. Alexander, G.C. Leckebusch, and U. Ulbrich, 2011: Reanalysis suggests long-term upward trend in European storminess since 1871. **Geophys. Res. Let.**, 38, L14703, doi:10.1029/2011GL047995.

Leckebusch, G.C., B. Koffi, U. Ulbrich, J.G. Pinto, T. Spangehl, S. Zacharias, 2006: Analysis of frequency and intensity of European winter storm events from a multi-model perspective, at synoptic and regional scales. **Climate Research**, Vol. 31, 59-74.

Leckebusch, G.C., D. Renggli, and U. Ulbrich, 2008: Development and Application of an Objective Storm Severity Measure for the Northeast Atlantic Region.
Meteorol. Z., Vol. 17, No. 5, 575-587. DOI: 10.1127/0941-2948/2008/0323.

Leckebusch, G.C. and U. Ulbrich, 2004: On the relationship between cyclones and extreme windstorm events over Europe under climate change. **Global and Planetary Change**, 44 (1-4), 181-193.

Leckebusch, G.C., U. Ulbrich, L. Fröhlich, and J.G. Pinto, 2007: Property loss potentials for European mid-latitude storms in a changing climate. **Geophys. Res. Letters**, 34, L05703, doi:10.1029/2006GL027663

Leckebusch, G.C., A. Weimer, J.G. Pinto, M. Reyers, P. Speth, 2008: Extreme wind storms over Europe in present and future climate: a cluster analysis approach.
Meteorol. Z., Vol. 17, No. 1, 67-82. DOI: 10.1127/0941-2948/2008/0266.

Nissen, K.M., G.C. Leckebusch, J.G. Pinto, D. Renggli, S. Ulbrich, and U. Ulbrich, 2010: Cyclones causing wind storms in the Mediterranean: characteristics, trends and links to large-scale patterns. **Nat. Hazards Earth Syst. Sci.**, 10, 1379-1391.

Renggli, D., G.C. Leckebusch, U. Ulbrich, S.N. Gleixner, E. Faust, **2011**: The skill of seasonal ensemble prediction systems to forecast wintertime windstorm frequency over the North Atlantic and Europe.
Monthly Weather Review, Vol. 139, 3052–3068. doi: 10.1175/2011MWR3518.1

Ulbrich, U., G.C. Leckebusch, and J. Pinto, 2009: Extra-tropical cyclones in the present and future climate: a review. **Theo. Appl. Climatology**, Vol. 96, No. 1-2, 117-131. DOI: 10.1007/s00704-008-0083-8.

Ulbrich, U., J.G. Pinto, H. Kupfer, G.C. Leckebusch, T. Spangehl, M. Reyers, 2008: Changing Northern Hemisphere Storm Tracks in an Ensemble of IPCC Climate Change Simulations. **J. Climate**, Vol. 21, No. 8, 1669-1679. DOI: 10.1175/2007JCLI1992.1.

Further Reviewed Publications

Leckebusch, G.C., M. Donat, U. Ulbrich, and J.G. Pinto, 2008: Mid-latitude Cyclones and Storms in an Ensemble of European AOGCMs under ACC. **CLIVAR Exchanges**, No. 46, Vol. 13 (No.3), 3-5.

Other significant research outputs

Leckebusch, G.C. and A. Ganske, **2013**: Extreme Winds over the North Sea. In: Report on North Sea Region Climate Change Assessment (NOSCCA) (*ongoing*)

Cubasch, U., U. Ulbrich, G.C. Leckebusch, M. Donat, **2013**: EASAC Fact sheet: Large-scale Windstorms, EASAC (**European Academies Science Advisory Council**) Working Group Report on Adaptation to Extreme Weather. ISBN 978-82-7144-101-2

Leckebusch, G.C., **2012**: Contributing Author to section 2.2: Key climate variables. In: Climate change, impacts and vulnerability in Europe **2012**. **European Environment Agency Report**, No 12/2012, pp300, ISSN 1725-9177.

Book contributions

Ulbrich, U., **Leckebusch**, G. C. and Donat, M. G., **2013:** The most costly natural hazard in Europe: windstorms.
In: Natural Disasters and Adaptation to Climate Change. Boulter, S., Palutikof, J., Karoly, D. and Guitart, D. (eds.) Cambridge, UK: Cambridge University Press, in press.

Gualdi, S., S. Somot, W. May, S. Castellari, M. Déqué, M. Adani, V. Artale, A. Bellucci, J.S. Breitgand, A. Carillo, R. Cornes, A. Dell'Aquila, C. Dubois, D. Efthymiadis, A. Elizalde, L. Gimeno, C.M. Goodess, A. Harzallah, S.O. Krichak, F.G. Kuglitsch, **G.C. Leckebusch**, B.L'Hévéder, L. Li, P. Lionello, J. Luterbacher, A. Mariotti, R. Nieto, K.M. Nissen, P. Oddo, P. Ruti, A. Sanna, G. Sannino, E. Scoccimarro, F. Sevault, M.V. Struglia, A. Toreti, U. Ulbrich and E. Xoplaki, **2012**: Future Climate Projections in Regional Assessment of Climate Change in the Mediterranean.
In: Regional Assessment of Climate Change in the Mediterranean, A. Navarra, L.Tubiana (eds.), Springer, 2012, Dordrecht, The Netherlands.

Ulbrich, U.; Lionello, P.; Belušić, D.; Jacobeit, J.; Knippertz, P.; Kuglitsch, F. G.; **Leckebusch**, G.C., Luterbacher, J., Maugeri, M., Maheras, P., Nissen, K. M., Pavan, V., Pinto, J.G.; Saaroni, H.; Seubert, S.; Toreti, A.; Xoplaki, E.; Ziv, B., **2012**: Climate of the Mediterranean: synoptic patterns, temperature, precipitation, winds, and their extremes.
In: The Climate of the Mediterranean Region - From the Past to the Future. P. Lionello (ed.), Elsevier, 2012, Amsterdam, The Netherlands. ISBN: 9780124160422.

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