

Professor Mark New

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African Climate and Development Initiative
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Summary

Mark New is Pro-VC for Climate Change and Director of the African Climate and Development Initiative (ACDI) at the University of Cape Town. He is also Professor in Climate Science at the University of Oxford.

As Pro-VC for Climate Change he is responsible for the ACDI and the coordination of cutting-edge research and teaching at UCT on the twin issues of low carbon and climate resilient development, from a strongly African perspective. The ACDI draws on the intellectual capital of the range of disciplines at UCT and external collaborators, to create the largest concentration of expertise in climate and development in Africa.

Professor New has a BSc Hons in Geology from UCT, an MPhil in Environment and Development from Cambridge, and a PhD in Geography from Cambridge. Prior to his current posts, he was, from 1999-2011 Lecturer, Reader and then Professor of Climate Science at the School of Geography, University of Oxford, and from 1995-1999 Senior Research Fellow at the Climatic Research Unit, University of East Anglia.

His research has encompassed detection of climate change trends, climate modelling and scenarios, assessment of uncertainty in climate projections and impacts, and climate change adaptation. His current research focuses on hydrology in earth system science, decadal scale climate change, improved understanding of the concept of dangerous climate change, adapting to emerging climate risks and multiple climate impacts, especially water and agriculture, and on the interactions between multiple climate and environmental stressors, and in the application of the "Safe Operating Spaces" concept at regional, national and local scales.

Prof New has consulted and advised a range of organisations on climate and development issues, including the World Bank, the Asian and African Development Banks, DfID, USAID, and WWF. He has worked in a range of countries including: South Africa, Lesotho, Botswana, Namibia, Mozambique, Zambia, Rwanda, India, Nepal, Peru, Chile, Brazil, and several Caribbean states.

Qualifications

- PhD, Cambridge, 1998
- MPhil, Cambridge, 1992
- BSc Hons., Cape Town, 1987
- BSc, Cape Town, 1986

Employment

2011-Present

Pro-VC and Director, African Climate and Development Initiative, University of Cape Town
Research Professor in Climate Science, School of Geography & Environment, Oxford University

2007-2011

Reader in Climate Science, School of Geography & Environment, Oxford University
Official Student in Geography, Christ Church

2005-2007

University Lecturer, School of Geography & Environment, Oxford University
Official Student in Geography, Christ Church

1999-2005

Departmental Lecturer, School of Geography & Environment, Oxford University

2012

- Butt, N., **M. New**, et al. (2012). Shifting dynamics of climate-functional groups in old-growth Amazonian forests. *Plant Ecology & Diversity*: 1-13.
- Fung, F., **M. New**, et al. (2012). Using Large Climate Ensembles to Plan for the Hydrological Impact of Climate Change in the Freshwater Environment. *Water Resources Management*: 1-22.
- Halladay, K., **M. New**, et al. (2012). Cloud frequency climatology at the Andes/Amazon transition: 1. Seasonal and diurnal cycles. *J. Geophys. Res.* **117**(D23): D23102.
- Halladay, K., **M. New**, et al. (2012). Cloud frequency climatology at the Andes/Amazon transition: 2. Trends and variability. *J. Geophys. Res.* **117**(D23): D23103.
- Rahiz, M. and **M. New** (2012). Spatial coherence of meteorological droughts in the UK since 1914. *Area* **44**(4): 400-410.

2011

- **New, M.**, et al. (2011). The possible impacts of high levels of climate change in 2060 and implications for migration. *UK Government Foresight Project on Global Migration SR8*: 24pp.
- Willis, K. J., **M. New**, et al. (2011). Quantification of UV-B flux through time using UV-B-absorbing compounds contained in fossil Pinus sporopollenin. *New Phytologist*: DOI: 10.1111/j.1469-8137.2011.03815.x
- **New, M.**, et al., Eds. (2011). *4 degrees and beyond: the potential for a global change of 4+ degrees and its implications*. Themed Issue of Philosophical Transactions of the Royal Society A. London, Royal Society.
- Fung, F., **New, M.**, et al. (2011). Water availability in +2 degrees C and +4 degrees C worlds. *Philosophical Transactions of the Royal Society A* **369**(1934): 99-116.

2010

- **New, M.** (2010) Water security in an uncertain world. *SciDev.net*, 3, online only at <http://goo.gl/w22A> [Invited Commentary].
- McSweeney, C., **M. New**, et al. (2010). The UNDP Climate Change Country Profiles. *Bulletin of the American Meteorological Society* **91**(2): 157-166.
- Fung, F, A Lopez and **M New** (Eds), 2010. *Modelling the Impact of Climate Change on Water Resources*. Wiley, Chichester.
- Butt, N., **M. New**, et al. (2010). Diffuse radiation and cloud fraction relationships in two contrasting Amazonian rainforest sites. *Agric. Forest Meteorol.* **150**(3): 361-368.
- Hofstra, N., **M. New**, et al. (2010). The influence of interpolation and station network density on the distributions and trends of climate variables in gridded daily data. *Climate Dynamics*.
- McSweeney, C., **M. New**, et al. (2010). The UNDP Climate Change Country Profiles. *Bulletin of the American Meteorological Society* **91**(2): 157-166.

2009

- **New, M.**, et al. (2009). Mind the gap - Policymakers must aim to avoid a 2C temperature rise, but plan to adapt to 4C. *Nature Reports Climate Change* **3**: 143-144. [Invited Commentary].
- **New, M.** and C. McSweeney (2009). Climate and invasive species: the limits to climate information *Invasive Species in a Changing Climate*. C. Perrings, et al. CUP: 30-41.
- Butt, N., **M. New**, et al. (2009). Spatial patterns and recent trends in cloud fraction and cloud-related diffuse radiation in Amazonia. *J. Geophys. Res.* **114**.
- Hofstra, N., **M. New**, et al. (2009). Testing E-OBS European high-resolution gridded data set of daily precipitation and surface temperature. *J. Geophys. Res.* **114**.
- Lopez, A., **M. New**, et al. (2009). From climate model ensembles to climate change impacts and adaptation: A case study of water resource management in the southwest of England. *Water Resour. Res.* **45**.

2008

- Butt, N., **M. New**, et al. (2008). Floristic and functional affiliations of woody plants with climate in western Amazonia. *Journal of Biogeography* **35**(5): 939-950.
- Haylock, M. R., **M. New**, et al. (2008). A European daily high-resolution gridded data set of surface temperature and precipitation for 1950-2006. *J. Geophys. Res.* **113**.
- Hofstra, N., **M. New**, et al. (2008). Comparison of six methods for the interpolation of daily, European climate data. *J. Geophys. Res.* **113**(D21110): doi:10.1029/2008JD010100.
- Hofstra, N. and **M. New** (2008). Spatial variability in correlation decay distance and influence on angular-distance weighting interpolation of daily precipitation over Europe. *Int. J. Climatol.*

published online: <http://dx.doi.org/10.1002/joc.1819>.

- Mahe, G., et al. (2008). Comparing available rainfall gridded datasets for West Africa and the impact on rainfall-runoff modelling results, the case of Burkina-Faso. *Water SA* 34(5): 529-536.

2007

- **New, M.** (2007). *Probabilistic regional and local climate projections: false dawn for impacts assessment and adaptation? Keynote Talk*. IPCC-TGICA Regional Meeting: Integrating Analysis of Regional Climate Change and Response Options, Nadi, Fiji, IPCC Working Group 1.
- **New, M.**, et al. (2007). Challenges in using probabilistic climate change information for impact assessments: an example from the water sector. *Phil. Trans. Royal Soc. A* **365**(1857): 2117-2131.
- Araujo, M. B. and **M. New** (2007). Ensemble forecasting of species distributions. *Trends Ecol. Evol.* **22**(1): 42-47.
- Botkin, D. B., et al. incl. **M. New** (2007). Forecasting the effects of global warming on biodiversity. *Bioscience* **57**(3): 227-236.
- Stainforth, D. A., et al. incl. **M. New** (2007). Issues in the interpretation of climate model ensembles to inform decisions. *Phil. Trans. Royal Soc. A* **365**(1857): 2163-2177.
- Willis, K. J., et al. incl. **M. New** (2007). Testing the impact of climate variability on European plant diversity: 320 000 years of water-energy dynamics and its long-term influence on plant taxonomic richness. *Ecol. Let.* **10**: 673-679.

2006

- **New, M.**, et al. (2006). Evidence of trends in daily climate extremes over southern and west Africa. *J. Geophys. Res.* **111**(D14).
- Alexander, L. V., et al. incl. **M. New** (2006). Global observed changes in daily climate extremes of temperature and precipitation. *J. Geophys. Res.* **111**: D05109.
- Harrison, P. A., et al. incl. **M. New** (2006). Modelling climate change impacts on species' distributions at the European scale: implications for conservation policy. *Env. Sci. Policy* **9**(2): 116-128.
- Kaplan, J. O. and **M. New** (2006). Arctic climate change with a 2°C global warming: Timing, climate patterns and vegetation change. *Climatic Change* **V79**(3): 213-241.
- Kelin-Tank, A., et al. incl. **M. New** (2006). Changes in daily temperature and precipitation extremes in central and south Asia. *J. Geophys. Res.* **111**(D16).
- Lopez, A., **M. New**, et al. (2006). Two approaches to quantifying uncertainty in global temperature changes. *J. Climate* **19**(19): 4785-4796.
- Tadross, M. A., et al. incl. **M. New** (2006). MM5 simulations of interannual change and the diurnal cycle of southern African regional climate. *Theoret. Appl. Climatol.* **86**(1-4): 63-80.

2005

- **New, M. G.** (2005). Arctic climate change with a 2°C global warming. *Evidence and Implications of Dangerous Climate Change in the Arctic*. L. D. Rosentrater et al. Oslo, WWF: 1-15.
- Bharwani, S., et al. incl. **M. New** (2005). Multi-agent modelling of climate outlooks and food security on a community garden scheme in Limpopo, South Africa. *Phil. Trans. Royal. Soc. B* **360**(1463): 2183-2194.
- Efthymiadis, D., **M. New**, et al. (2005). On the reconstruction of seasonal oceanic precipitation in the presatellite era. *J. Geophys. Res.* **110**(D6): art. no.-D06103.
- Hulme, M., et al. incl. **M. New** (2005). Global warming and African climate change: a re-assessment. *Climate Change in Africa*. P. S. Low. Cambridge, CUP: 29-40.
- Mark, B. G., et al. incl. **M. New** (2005). Tropical snowline changes at the last glacial maximum: A global assessment. *Quaternary International* **138**: 168-201.
- von der Heyden, C. J. and **M. G. New** (2005). Differentiating dilution and retention processes in mine effluent remediation within a natural wetland on the Zambian Copperbelt. *Applied Geochemistry* **20**(7): 1241-1257.

2004

- Barboni, D., et al. incl. **M. New** (2004). Relationships between plant traits and climate in the Mediterranean region. *J. Veg. Sci.* **15**(5): 635-646.
- Mitchell, T. D., et al. incl. **M. New** (2004). A comprehensive set of climate scenarios for Europe and the globe. *Tyndall Working Paper* **55**: 33pp.
- von der Heyden, C. J. and **M. New** (2004). Groundwater pollution on the Zambian Copperbelt: deciphering the source and the risk. *Sci. Total Env.* **327**(1-3): 17-30.

- von der Heyden, C. J. and **M. New** (2004). Sediment chemistry: a history of mine contaminant remediation and an assessment of processes and pollution potential. *Journal of Geochemical Exploration* **82**(1-3): 35-57.
- 2003 and earlier**
- **New, M.**, et al. (2003). Sensitivity of southern African climate to soil moisture. *CLIVAR-Exchanges* **8**(2/3): 45-47.
 - **New, M.** (2002). Climate change and water resources in the southwest Cape, South Africa. *South African Journal of Science* **98**(7/8): 369-376.
 - **New, M. G.**, et al. (2002). A high-resolution data set of surface climate for terrestrial land areas. *Climate Research* **21**: 1–25.
 - **New, M.**, et al. (2001). Precipitation measurements and trends in the twentieth century. *International Journal of Climatology* **21**(15): 1889-1922.
 - **New, M.** and M. Hulme (2000). Representing uncertainty in climate change scenarios: a Monte-Carlo approach. *Integrated Assessment* **1**: 203-213.
 - **New, M.**, et al. (2000). Representing twentieth-century space-time climate variability. Part II: Development of 1901-1996 monthly grids of terrestrial surface climate. *Journal of Climate* **13**(13): 2217-2238.
 - **New, M.**, et al. (1999). Representing twentieth-century space-time climate variability. Part I: Development of a 1961-90 mean monthly terrestrial climatology. *Journal of Climate* **12**: 829-856.
 - **New, M. G.** and R. E. Schulze (1996). Hydrologic sensitivity to climate change in the Langrivier catchment, Stellenbosch, South Africa and some implications for geomorphic processes. *Zeitschrift Geomorphol. Supplementband* **107**: 11-34.
 - Swann, M., et al. incl. **M. New** (2003). Tropical oceans and the predictability of southern African rainfall in the HadCM3 coupled climate model. *CLIVAR-Exchanges* **8**(2/3): supplementary paper.
 - von der Heyden, C. J. and **M. G. New** (2003). The role of a dambo in the hydrology of a catchment and the river network downstream. *HESS* **7**(3): 339-357.
 - Booth, T. H., et al. (2002). A new world climatic mapping program to assist species selection. *For. Ecol. Manag.* **163**(1-3): 111-117.
 - Mitchell, T. D., M. Hulme and **M. New** (2002). Climate data for political areas. *Area* **34**(1): 109-112.
 - Hulme, M., et al. incl. **M. New** (2001). African climate change: 1900-2100. *Climate Research* **17**: 145-168.
 - Carter, T. R., et al. incl. **M. New** (2000). Climate change in the 21st century - interim characterizations based on the new IPCC emissions scenarios. Finnish Environment Institute. Helsinki. 148pp.
 - Hulme, M., et al. incl. **M. New** (1999). Global climate scenarios for fast-track impacts studies. *Global Environmental Change Supplementary Issue*: S3-S19.
 - Jones, P. D., **M. New**, et al. (1999). Surface air temperature and its changes over the past 150 years. *Reviews of Geophysics* **37**(2): 173-199.
 - Hulme, M. and **M. New** (1997). Dependence of large-scale precipitation climatologies on temporal and spatial sampling. *J. Climate* **10**(5): 1099-1113.

Research Grants

- PI: “Shared visioning of development scenarios for Saldanha Bay”. (British High Commission Prosperity Fund, 2012-2013).
- Co-PI: “Climate Change Scenarios and Evaluation of Climate Models for East Africa, West Africa and the Indo-Gangetic Plain” (CCAFS & ILRI, £120k, 2010-2011).
- Co-I: “National Climate and Low Carbon Development Strategy for Rwanda” (Climate and Development Knowledge Network (CDKN) and the DFID, £300k, 2010-2011)
- PI: “Dangerous Climate Change Assessment Project”. (UK DECC/AVOID & Wallace Foundation, £100k, 2009-2010).
- PI: “Resilient and Adaptive Water Systems – ARCC WATER”. (EPSRC, £1.2M, 2009-2012).
- PI: “CARIBSAVE – Climate Change and Tourism in the Caribbean”. (DfID, £950k, 2009-2011).
- PI: “Regionalised narrative climate change scenarios for Nepal”. (DfID, £42k).
- Co-PI: Tyndall Centre Phase 3, Oxford Node (Research Councils UK, £250k; 2009-2010)
- PI: “Recent trends in climate in high-Himalaya, Nepal”, (WWF/Climate Justice; £2000; 2008).
- PI: “Country Scale Climate Change Information”. (UNDP; £40k; 2008).

- PI: "A coupled land-surface - atmosphere model for cloud forests". (Microsoft Research & John Fell Fund; £360k; 2008-2010).
- Co-PI: Tyndall Centre Phase 2, Oxford Node (Research Councils UK, £800k; 2006-2009)
- Co-PI: "TROBIT: Tropical Biomes in Transition (Natural Environment Research Council, £140k; 2006-2010)
- PI: "Development of a framework for probabilistic climate change impacts assessment and policy decision-making". (Environment Agency and Tyndall Centre for Climate Change Research, £180k; 2006-2009)
- Consultant: "Implications of 2°C global warming for the Arctic". (WWF, £2k, 2004)
- Co-I: "Diversity-climate relationships in Amazonia". (NERC Tied Studentship, 2004/5-2006/7).
- PI: "Role of wetlands in ensuring water-security. (NERC Small Grant; 2004-2005; £26k).
- PI: "Quantification of uncertainty in regional and local climate change". (NERC/Daphne Jackson Trust; 2004-2006; £40k).
- PI: High resolution probabilistic climate change impact prediction using GRID and DataGRID Technologies (NERC eScience Studentship; 2003-2006).
- Co-PI: "ENSEMBLES: Ensemble-based predictions of climate change and its impacts" (EU Integrated Project; 2004-2009; €92K)
- PI: "Lapse-rate variations in the observational record" (Max Planck Institute; 2003; €12k).
- Co-I: "Climate outlooks and agent-based simulation of adaptation in Africa" (Tyndall Centre; 2002-2004; £200k)
- PI: "Reconstruction of oceanic precipitation" (NERC; 2002-2003; £30k)
- PI: "Climate data reconstruction for continental shelf areas" (Max Planck Institute; 2001-2003; €15k)
- PI: "Observed climate data for the World Water and Climate Atlas" (International Water Management Institute; 1998-2001; £65k)

Academic Leadership & External Contributions

- Steering Committee, 2nd International Adaptation Conference, Arizona, USA, July 2012
- Steering Committee, International Conference on Water Security, Oxford, UK, April 2012
- Author for chapter in UK Government Foresight report on Migration: *The potential for high end climate change and environmental tipping points as a driver of migration*, 2010-2011.
- Advisory Board, World Bank Ganges Strategic Basin Assessment, 2009-2010
- Guest Editor, Themed Issue of Philosophical Transactions of the Royal Society, on *4 Degrees of Climate Change*, 2010
- Convener, International Conference, *4 Degrees and Beyond*, 2009
- Editor, Geophysical Research Letters, 2006-2009
- Program Leader, Tyndall Centre & Member of Tyndall Council, 2006-2010.
- Contributing Author, IPCC 3rd & 4th Assessment Reports.
- Expert Reviewer, IPCC 4th Assessment Report, Chapters on Africa and Water.
- External Reviewer, UK Met Office 5-yr climate observation research strategy, 2004; Centre for Ecology and Hydrology five year strategy, 2006.
- Member of User Advisory Panel, UK Climate Impacts Program 2008 Scenarios.
- Organiser, WMO/CLIVAR Extremes Workshops, South Africa, 2005; India, 2005.
- Consultant, Science Museum, WWF, UNDP, BBC, Channel 4, DfID, DfT.
- NERC Peer Review College, 2003 onwards
- NERC Grant Panel A, 2005, 2006; EPSRC Grant Panel, 2008.
- Journal reviews for Science, Nature, PNAS, Climatic Change, Geophysical Research Letters, Journal Geophysical Research, Journal of Climate, International Journal of Climatology, Climate Research, Journal of Hydrology, HESS, Area, etc.
- International Grant Reviewer, USA NSF, South Africa NSF, Austria ZSF, Netherlands ERS.
- Seconded to WMO/CLIVAR Expert team on Climate Change Detection, Monitoring and Indices, 2004-2006.
- Keynote Speaker, *Dangerous Rates of Change* Conference, Exeter, September 2008
- Keynote Speaker, 5th Int. Conference Statistical Climatology, Cape Town, 2004
- Keynote Speaker, IPCC-TGICA Expert Meeting-- Integrating Analysis of Regional Climate Change and Response Options, Fiji, June 2007
- Invited Speaker, British Council INYS Workshop on Climate Change and Health, Bern, March 2007

<p>Doctoral Supervision</p>	<ul style="list-style-type: none"> ▪ Steven Arowolo (2013 – present) Economics of climate adaptation in the agricultural sector ▪ Megan Cole (2012 – present) Safe and just operating spaces at the national scale: South Africa ▪ Jagadishwor Karmacharya (2011 - present) The added-value of high resolution regional climate model simulations in the Himalaya. ▪ Muhammad Rahiz (2010-present) Droughts in future climate change in the United Kingdom ▪ Magdalena Bennet (2010-present) Climate change, hydrology and species relationships in the Chilean Altiplano ▪ Gareth Walker (2010 - present) Water demand management in the UK ▪ Kathryn Clark (2009 - present) Role of landslides in the Peruvian Andes in determining forest ecology and carbon transport ▪ Shobha Maharaj (2008-2011) Climate change, species distribution and forest conservation, Trinidad & Tobago ▪ Kate Halladay (2008 - 2012) Climate and Andean montane forests: the role of clouds ▪ Nathalie Butt (2007 - 2011) Response of Amazon forest species to observed climate change. ▪ David Stainforth (2008 - 2011) Uncertainty and confidence in predictions of climate change. ▪ Nynke Hofstra (2007 - 2010) Changes in daily climate and runoff trends in Europe. ▪ Gillian Kay (2004 - 2008) Mechanisms of southern African rainfall variability in coupled climate models. ▪ Natasha Kuruppu (2003 - 2009) Impacts on water sector adaptation strategies in Kiribati. ▪ Constantin von der Heyden (2000 - 2004) Wetland processes in Zambia
<p>Doctoral Examining</p>	<ul style="list-style-type: none"> ▪ Internal examiner for 6 DPhil theses, Oxford University ▪ External examiner for 10 PhD theses, incl. University of Cape Town, Leeds University, University of East Anglia, University of Natal.
<p>MSc Supervision</p>	<ul style="list-style-type: none"> ▪ 2005-2011, Course Director for MSc in Water Science, Policy & Management, Oxford University; supervision of approximately 4 dissertations per year. ▪ 2012-present, Academic Director, MSc in Climate Change and Sustainable Development, University of Cape Town, approximately three dissertations per year.