**Professor Rachel Frances Warren**

**PERSONAL RECORD**

**Address:** Tyndall Centre, School of Environmental Sciences, University of East Anglia, Norwich NR4 7TJ

 Tel. +44 1603 593912 Email: r.warren@uea.ac.uk

**Nationality**: British

**HIGHLIGHTS**

Interdisciplinary synthesist with experience in global environmental challenges air pollution, stratospheric ozone, biodiversity conservation, and climate change.

Led key partnership projects with UK Treasury and other government departments in support of Oslo and Gothenburg UN ECE protocols, UK Stern Review on the Economics of Climate Change, UK Climate Change Risk Assessments, and UNFCCC Paris Agreement

 Lead Author in four Intergovernmental Panel on Climate Change (IPCC) Assessments

 University of East Anglia Media Star (2018)

**EDUCATION**

B.A. (Honors), 1985 (Natural Sciences, Cambridge, UK)

Ph.D. Physics, 1989 (Cavendish Laboratory, Cambridge, UK)

**PROFESSIONAL AWARDS**

University of East Anglia Consultancy of the Year Award 2019

University of East Anglia Enterprise and Engagement Award 2014

Environmental Modelling & Software’s Best Paper Award 2008

Co-recipient of 2007 Nobel Peace Prize as a lead author of the Fourth Assessment Report of the IPCC

Outstanding scientific paper award, Environmental Research Laboratories, National Oceanic and Atmospheric Administration, United States Dept of Commerce, 1996

**EXPERIENCE**

Professor, Global Change and Environmental Biology, Tyndall Centre for Climate Change Research, School of Environmental Sciences, University of East Anglia, Norwich, UK, 2016 - Present

Reader, Integrated Assessment of Climate Change, Tyndall Centre for Climate Change, School of Environmental Sciences, University of East Anglia, Norwich, UK, 2012 –2016

Leader, Integrated Modelling, Tyndall Centre for Climate Change, School of Environmental Sciences, University of East Anglia, Norwich, UK, 2009 - Present

NERC Advanced Research Fellow, Tyndall Centre for Climate Change, School of Environmental Sciences, University of East Anglia, Norwich, 2009 - 2013

Senior Research Fellow, Tyndall Centre for Climate Change, School of Environmental Sciences, University of East Anglia, Norwich, 2002 – 2008; Joint appointment with 4CMR, Department of Land Economy, University of Cambridge, Cambridge UK, 2007 - 2008.

Secondment, Global Atmosphere Division, Department of the Environment, Food and Rural Affairs (DEFRA), 2004

Research Lecturer & Head of Integrated Assessment Unit, TH Huxley School, Imperial College, London, UK, 2000 – 2001

Senior Research Fellow, TH Huxley School of Environment, Earth Sciences& Engineering, Imperial College, London UK, 1992 – 2000

Research Associate, National Oceanic and Atmospheric Administration Cooperative Institute for Research in Environmental Sciences, University of Colorado. Boulder, Colorado USA, Jan 1990-Dec 1992

**SCIENTIFIC LEADERSHIP AND COORDINATION**

Member of Tyndall Climate Change Centre Council and co-leader of Tyndall’s theme ‘Building Resilience’

UEA PI and UEA project manager for EU interdisciplinary multi-partner collaborative projects EUCalc (2017), HELIX (2013-2017), TOPDAD (2012-2015); work package leader and UEA PI, EU project ERMITAGE (2010-2013) (see Grants)

Led £4m 12-partner international consortium bid submitted to NERC/DFID ‘Future Climate for Africa’ (October 2014)

Led £8m 11-partner international consortium bid submitted to EU Horizon 2020 ‘NEWLANDS’ (April 2015)

Lead Community Integrated Assessment System modelling group, Tyndall Centre (2002-2017) (typically 4 postdoctoral researchers and 4 PhD students)

Lead, work stream 1 Avoiding Dangerous Climate Change (AVOID) project funded by UK Dept. of Energy and Climate Change (2009-2013) (www.avoid.uk.net); co-led similar work stream in follow on project AVOID2 (2014-2016), and lead work package C, Implications of Global Warming of 1.5°C and 2°C, 2017

Member IPCC TGICA (Task Group on Climate Impact Assessment) (2012-2017)

 Member of NERC Peer Review College (since 2011)

 Member of British Energy Climate Change Working Group (since 2009)

Member of UKCIP09 (UK Climate Impacts Project) Steering Committee

Lead Author, IPCC Fourth Assessment, WG III, Ch. 3 (2004-2007) *Long-term aspects of mitigation*. Contributing author, IPCC WG II, Ch. 4, *Ecosystems* and Ch. 18, *Adaptation & mitigation*, (2004-2007)

Coordinating Lead Author, IPCC Fifth Assessment, Working Group (WG) II, Chapter 19 (2011-2014)

Lead Author, UK Climate Change Risk Assessment 2 (2016)

Lead Author, IPCC Special Report on 1.5°C warming (2017-2018)

Lead Author, Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment. (2019-2021)

Scientific Advisory Board Helmholtz Institute for Climate Service Science (Germany).

Member Expert Advisory Panel for UK 3rd Climate Change Risk Assessment.

Member International Union for Conservation of Nature Climate Change Specialist Group

**ENTERPRISE & ENGAGEMENT**

In 2004 I was seconded with the former Dept. of Environment, Food and Rural Affairs Global Atmosphere Division, managing part of the Hadley Centre contract and writing briefs on climate change science for Government Ministers, the UK Secretary of State and Prime Minister Tony Blair. This increased my experience of working at science-policy interface and indirectly being involved in the political application of new science, such as attribution of the extreme European 2003 summer to anthropogenic causes. I have an exceptional level of interaction with government having produced over 50 reports for UK, EU and UN bodies communicating scientific results relating to climate change and air pollution for use by policy makers. I have secured and managed over £500,000 of consultancy projects whilst at UEA including the UEA contribution to the AVOIDing dangerous climate change and impacts assessment projects for the UK DECC/BEIS (2009-2013, 2014-2016, 2017-2018, 2018-2020) and work for World Wildlife Fund (UK). This ongoing work has delivered, and continues to deliver, key policy relevant science that informs the UK negotiating position within the UNFCCC, as stated by the Secretary of State.

I led a chapter of the second UK Climate Change Risk Assessment (CCRA2). During 2005-2009 I led key projects for HM Treasury that contributed key scientific evidence to the Stern Review on the Economics of Climate Change

**MAJOR ACADEMIC VISITS AND COLLABORATIONS**

I have a multi-institutional and international network of colleagues with whom I can forward my research plans to explore the natural and social science related to climate change and sustainability. I lead a number of international teams to deliver projects and publications. I have a long standing collaboration with James Cook University’s Centre for Tropical Biodiversity and Climate Change. Other collaborators/visits include academics based at University of Queensland, Griffith University and Macquarie University. In 2015, I led a multi-national north-south interdisciplinary proposal for £4m entitled Science for East African Responses to Climate Change. Collaboration is or has taken place with the Universities of Southampton, Exeter, Reading, Imperial College, the Open University and the Met Office Hadley Centre (UK), the Potsdam Institute for Climate Research (Germany), Ecole Polytechnique Federale de Lausanne (Switzerland), the Stockholm International Water Institute (Sweden), the Centre for of Tropical Agriculture (CIAT, Colombia), and many others. Whilst working at Imperial College I collaborated with the International Institute of Applied Systems Analysis (IIASA), AEA Technology, and the Stockholm Environment Institute at York.

**CURRENT RESEARCH INTERESTS**

Exploring tradeoffs and synergies in efforts to meet the Sustainable Development Goals

Impacts of climate change on biodiversity, agriculture and water resources

Integrated assessment modeling of biodiversity, land use change, and climate change and related policies.

Exploring the integrated world of climate change, mitigation, and adaptation

Investigating the benefits (avoided climate change and avoided climate change impacts) associated with various potential future climate change and climate policy scenarios

Exploring the robustness of integrated assessment results to uncertainties within and between models

Exploring climate change impacts on ecosystem services and human systems, and how these in turn damage the economy

Using science to inform decision making in the areas of (for example) climate change mitigation and adaptation policy, land use planning

**GRANTS: since 2009 I brought in £5 m of funds to UEA as principal investigator and a further £4 million as co-investigator.**

EUH2020 PROVIDE UEA PI, £231,000 to start June 2021 if successful.

NERC “Open Climate Impacts Modelling Framework”, co-I, £2m, May 2020-April 2023

NERC “IMPRES UK Impacts and Risk Assessment to better inform Resilience Planning”, PI, (Feb 2018-Jan 2019), £239,876

UK Dept. of Business and Industrial Strategy “Climate Impacts between 1.5°C and 4°C of warming”, PI, (Sep 2018 – Mar 2020), £250,000

NERC “IMPALA Implications of the Paris Agreement for Biodiversity and Conservation Planning”, PI, (Oct 2016 - Oct 2017), £100,000

UK Dept. of Business and Industrial Strategy “Implications of Global Warming of 1.5°C and 2°C”, UEA Co-I, (2017-2018), £300,000

UK Climate Change Committee Climate Change Risk Assessment, PI, (2016), £9,000

World Wildlife Fund “Climate change risks to WWF Priority Places”, Co-I, (2016), £26,680

EU Horizon 2020 “EU Calculator: trade-offs and pathways towards sustainable and low-carbon European Societies” UEA PI, (2016-2019), £300,000 (total €5m, PI Jurgen Kropp, PIK)

Science without Borders, PhD studentship ‘Climate Change, Land Use and Food Security’ for study by Cristina Telhado (2014-2018), £40,000, Primary supervisor

UK Dept. of Energy and Climate Change “Avoiding dangerous climate change II”, UEA PI, (2014-2016), £225,000

 EU FP7 “HELIX - High end climate impacts and extremes”, UEA PI (2013 – 2017), €1.1 million to UEA, €9 million overall

EU FP7 “TOPDAD - Tool-supported policy-development for regional adaptation”, UEA PI, (2012 – 2015), £239,320

UK DECC, “AVOID” supplement, (2011), PI, £8,900

UK DECC, Scoping study of mitigation and adaptation, PI, (2011 – 2012), £8,300

EU FP7 “ERMITAGE - Enhancing model integration”, UEA PI, (2010 – 2013), £423,466

EU FP7 “CLAMER - Climate change and the marine ecosystem”, Co-I, (2010 – 2011), £54,293

AXA insurance, PhD studentship, “Climate change and extreme weather”, PhD Supervisor, (2010 – 2012), £88,889

CEFAS, PhD studentship, “Adapting to future climate change in the marine environment”, PhD Supervisor, (2010 – 2012), £64,914

UK Dept. of Energy and Climate Change (DECC) “AVOIDing dangerous climate change”, UEA PI, (2009 – 2012), £113,586

NERC Advanced Fellowship, “Avoiding dangerous climate change”, PI, (2009 – 2013), £468,409

OMII UK, “Enhancing the Community Integrated Assessment System”, PI, (2009 – 2010), £81,560

NERC/ESRC/EPSRC, Tyndall Centre transition, Co-i, (2009 – 2010), £815,185

GBIF, “Bridging the gap: is conservation planning by taxa a realistic aim”, PhD Supervisor, (2009 – 2013), £2963

CEFAS, “British Energy Climate Change Committee Service”, (2008 – 2017), £8,000

EU FP7 “Climate Cost: Full costs of climate change” Co-I, (2008 – 2011), £67,876

ESRC, PhD studentship, “Economic and social impacts of drought under climate change”, PhD Supervisor, (2008 – 2010), £60,000

NERC/ESRC/EPSRC, Tyndall Centre phase 2, Co-I, (2006 – 2009), £2,730,742

H.M. Treasury, Contribution to the U.K. Stern Review on the Economics of Climate Change, “Spotlighting impacts of climate change in integrated assessment”, PI, (2006), £15,400

H.M. Treasury Contribution to the UK Stern Review on the Economics of Climate Change “Understanding the regional impacts of climate change”, PI, (2006), £20,000

European Science Foundation, P.I., 2004, €20,000 for an international workshop at Clare College, Cambridge

UK Dept. of Environment, Food and Rural Affairs, PI: Avian Research in London (2001-2002, £40k); Acidification and Terrestrial Birds (1999 – 2000, £40k); Climate Change Impacts (2005, £5k)

UK Dept. of Environment, Food and Rural Affairs as Co-Investigator: Cost-benefit study for proposed EC directive (2000); Cost-benefit study for proposed Gothenburg protocol (1999); Shipping emissions (1998 – 1999); Critical review of cost curves used in integrated assessment modeling (1998 – 1999)

**Internally funded grants:**

Obtained internal support for PhD studentship to explore land use and climate change linkages (2013)

 Obtained UEA research council PhD studentship for study of climate change impacts on biodiversity (2008)

PI, Climate change on a millennial timescale in partnership with UK Environment Agency, (2004)

 PI, Linkages between air pollution and climate (2003)

 Led team to design softIAM, a technology for community integrated assessment (2002-2005)

**TEACHING**

Senior Fellow of the Higher Education Academy

CourseDirector BSc & MSci Climate Change, 2016 - 2018

Course Convener and lecturer (UEA), Climate Change: Science and Policy (undergraduate), 2013 -

Guest Lecturer (UEA),Energy and Climate Change module 2014 –

Guest Lecturer (UEA), Climate Change and Development MSc 2014 -

Guest Lecturer and theme coordinator (Imperial College),Climate Change: Principles, Policies and Responses, 2002-2005

Research Lecturer**,** Imperial College, 1999-2001

Supervisor at Cambridge University, Mathematics for Natural Sciences, 1986-1988

 **Contributions to courses convened by other staff:**

Climate Change & Development Short Course. *Understanding climate change scenarios.* UEA, July 2016 & July 2017

Seminar: The Science-Policy Interface in Climate Change. UEA DEV UG module *Climate Change & Development 1* 2014-2017

Global Environmental Change Team Project Supervisor. *Economics of Climate Change.* UEA, 2010&2014

Lecture: for MSc in Sustainable Agriculture and Food Production (UEA), climate change and agriculture, 2013

Lecture: for Ecological responses to climate change module, modelling climate change impacts (UEA), 2013

MPhil in Land Economy (University of Cambridge), lectures on climate change science and impacts, 2006

MSc Environmental Technology (Imperial College): lectures on air pollution, response of industry to proposed environmental regulations, 1999-2001; stratospheric ozone depletion, long-range transboundary air pollution, 1997-2001

 **Undergraduate Lectures and Tutorials:**

 For Environmental Sciences (UEA), Climate Change Impacts, 2006

For second-year Earth Sciences students (Imperial College), Air Pollution and the Geological Record, 1999-2001

For first year natural science students (University of Cambridge), entire course Mathematics for Natural Scientists, 1986-1989

 **Open University course video:** History of Air Pollution, 2002.

 **Supervision of PhD students as Primary Supervisor:**

 Cristina Telhado, climate change, land use and food security in Brazil. (UEA, 2015 - )

 Rhosanna Jenkins, effects of climate change on hydrology (UEA, 2014 - ) (passed viva)

 Osgur McDermott, effects of extreme weather events on ecosystems (UEA, 2013 – 2017, granted PhD)

Delphine Deryng, interactions between land use change, agriculture and climate change (UEA, 2010 –2014, granted PhD)

Amy McDougall, impacts of future climate change on species (UEA, 2009-2014, granted PhD)

 Miranda Jones, as above but for marine species and fisheries (UEA, 2010-2013, granted PhD)

Katie Jenkins, Economic & social consequences of drought under climate change, Cambridge, UK, 2007–2011 (granted PhD)

 **As Secondary Supervisor:**

Portia Williams, Adaptation to climate change impacts on agriculture (based at University of Cape Town, UCT)

Temitope Egbebeyi, Climate change impacts and adaptation on agriculture (based at University of Cape Town, UCT)

Rita Yu, Climate change impacts on future drought (UEA, 2010-2013, granted PhD)

Ruth Wood, interaction between air pollution and climate policies at the regional scale, (UEA, 2003-2007 granted PhD)

Teresa Gonzalez, IAM of particulate matter and IAM at the city scale, (Imperial College, 1998-2001 granted PhD)

 **Supervision of MSc** **Students:**

 Euan Dickson, Climate change impacts on European biodiversity (UEA, 2019)

 Evalyn Drake, Climate change impacts on World Heritage Sites, (UEA, 2018)

 Barry Read, Analysis of the mechanisms in the Nationally Determined Contributions (NDCs) (UEA, 2018)

 Dilsad Begum, Climate change impacts in Bangladesh, (UEA, 2016, with Distinction)

 Tolani Lambe, Climate policy in Nigeria, (UEA, 2015)

 Tamsin Lockwood, Hydrological impacts in Africa, (UEA, 2015)

Joel Quilter, Climate change and hydrology in Hertfordshire, (UEA, 2015)

Anna Yeo Chai Luan, Ecosystems and Climate change in Malaysia, (UEA, 2014, with Distinction)

Rita Yu, Investigating the sensitivity of European/UK drought prediction under climate change and under stabilisation scenarios to use of different GCMs, (UEA, 2006-2007, with Distinction)

David Sizer, Future changes in direct radiative forcing over India due to sulphur dioxide pollution, (UEA, 2004-2005, Best Dissertation Award)

Anna Rumplmayr, Investigating the influence of the Kyoto protocol on integrated assessment studies of emission reduction schemes, (Imperial College, 1997).

 **Acting as External/Internal Examiner for PhD Candidates:**

PhD theses: University of Leeds, 2018 (Stewart Jennings); Kings College, 2013 (Arnout Van Soesbergen); University of Greenwich, 2013 (Isah Nagode)

**SERVICE IN ACADEMIC ADMINISTRATION**

Serve on UEA School of Environment promotions committee

Act as Plagiarism Officer for the School of Environment

Serve on UEA School of Environment Teaching Executive

Chaired UEA School of Environment’s Researchers Affairs Forum (2009-2013)

Served on the UEA Senate and UEA School of Environment Executive Group

**PUBLICATIONS**: **80 peer reviewed publications, including 9 in *Nature* journals/*Science*. H factor is 30 (Scopus) or (Google Scholar) with 5 publications cited more than 100 times and three others highly cited. 9100 Google Scholar citations.**

**Peer-reviewed journals and peer-reviewed book chapters (published/accepted)**

Zommers, Z., *et al.* including **Warren R.,** 2020. Burning Embers: Towards more transparent and robust climate change risk assessments. *Nature* in press.

Egbebiyi T.S., *et al.* including **Warren, R.,** 2020**,** Investigating the potential impact of 1.5, 2 and 3°C global warming levels on crop suitability and planting season over West Africa. *Peer J* 8:e8851

Hoegh-Guldberg, O., *et al.* including **Warren R.,** 2019. The human imperative of stabilizing global climate change at 1.5°C. *Science* 365, 6459-6463, doi: 10.1126/science.aaw6974.

Koutroulis, A.G., *et al.* including **Warren R.,** 2019. Global water availability under high end climate change: A vulnerability based assessment. *Global and Planetary Change*175, 52-69

**Warren R.F.**, *et al.* 2019. Producing Policy-relevant Science by Enhancing Robustness and Model Integration for the Assessment of Global Environmental Change *Environmental Modelling and Software* 111, 248-258

Colon-Gonzalez, F.J. *et al.* including **Warren R.,** 2018. Limiting global-mean temperature increase to 1.5–2 °C could reduce the

incidence and spatial spread of dengue fever in Latin America *Proc Natl Acad Sci* USA 115:6243–6248.

IPCC, 2018: Summary for Policymakers. In: *Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty* [Masson-Delmotte, V., *et al.* (eds.)]. *World Meteorological Organization, Geneva, Switzerland, 32 pp.*

Hoegh-Guldberg, *et al.* including **Warren R.,** 2018. Impacts of 1.5ºC Global Warming on Natural and Human Systems. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V.,*et al.* (eds.)]. *World Meteorological Organization, Geneva, Switzerland,*

Dietz, S., *et al.* including **Warren R**. 2018. The economics of 1.5°C climate change *Annual Review Environment and Resources* 43, 455-480*.*

**Warren, R.,** Price, J., Graham, E., Forstenhaeusler N., Vanderwal J. 2018. The projected effect on insects, vertebrates and plants of limiting global warming to 1.5°C rather than 2°C. *Science* 360, 791-795 DOI: 10.1126/science.**aar3646.** Highly cited.

**Warren, R.,** Wilby, R.L., Brown K., Watkiss P., Betts R.A., Murphy J.M., and Lowe J.A. 2018. Advancing national climate change risk assessment to deliver national adaptation plans. *Phil Trans Roy Soc A* 376: 20170295 DOI 10.1098/rsta.2017.0295.

Seneviratne, S., *et al.* including **Warren, R**., 2018**.** The many possible climates from the Paris Agreement’s aim of 1.5°C warming. *Nature* 558, 41-49

Smith P., Price J., Molotoks A., **Warren R.,** and Malhi Y. Impacts on terrestrial biodiversity of moving from a 2°C to a 1.5°C target. *Phil Trans Roy Soc A* 376: 20160448DOI 10.1098/rsta.2016.0456.

**Warren, R**., Price J., Vanderwal J., Cornelius S, and Sohl, H. 2018. The implications of the United Nations Paris Agreement on Climate Change for Globally Significant Biodiversity Areas. *Climatic Change* 147, 395-409. Downloaded 19,000 times.

Yang, X., **Warren, R.**, *et al.* 2018. Impacts of Climate Change on Total Nitrogen load and its control in a river basin with complex pollution sources. *Science of the Total Environment* 615, 1155-1163

Suggitt, A., *et al.* including **Warren, R**. 2017. Conducting robust ecological analyses with climate data. *Oikos* 126, 1533-1541

Lowe, J.A., *et al.* including **Warren, R**., 2017. Avoiding dangerous climate change: results from the AVOID2 programme. *Weather* 72, 340-345.

O’Neill, B.C., *et al.* including **Warren, R**., 2017. IPCC Reasons for Concern regarding climate change risks *Nature Climate Change* 7, 28-37.

McDermott-Long, O., **Warren R**., *et al.* 2016. Sensitivity of UK butterflies to local climatic extremes: which life stages are most at risk? *Journal of Animal Ecology* 86, 108–116.

Hallgren, W., et al. including Warren R. 2016. The Biodiversity and Climate Change Virtual Laboratory: where ecology meets big data. Environmental Modelling & Software 76, 182-186.

Jenkins, K., and **Warren, R.** 2015. Drought-Damage Functions for the estimation of drought costs under future projections of climate change *J Extreme Events*, Vol. 1, No. 1 1550001 (29 pp.).

Jenkins, K., and **Warren, R.** 2015. Quantifying the impact of climate change on drought regimes using the Standardised Precipitation Index. *Theor Appl Climatol* 120, 41-54.

Deryng, D., Conway, D., Ramankutty, N., Price, J., and **Warren, R**. 2014. Global crop yield response to extreme heat stress under multiple climate change futures. *Environmental Research Letters* 9:034011 (13pp).

**Warren, R**. 2014. Optimal carbon tax doubled. Nature Climate Change 4:534-5.

Jones M.C., Dye S.R., Pinnegar, J.K., **Warren, R**., and Cheung, W.W.L. 2014. Using scenarios to the changing profitability of fisheries under climate change. Fish and Fisheries 16, 603-622.

IPCC 2014. Summary for Policy Makers. In Climate change 2014: impacts, adaptation, and vulnerability. Part a: global and sectoral aspects. Contribution of working group II to the fifth assessment report of the intergovernmental panel on climate change [Field, C.B., Barros, V.R., Mastrandrea, M.D….including **Warren, R.**]

Field, C.B., Barros, V.R., Mach, K.J….including **Warren, R.** 2014. *Technical Summary.* In Climate change 2014: impacts, adaptation, and vulnerability. Part a: global and sectoral aspects. Contribution of working group II to the fifth assessment report of the intergovernmental panel on climate change.

Oppenheimer, M., Campos, M., **Warren, R**. *et al.* 2014: Emergent risks and key vulnerabilities. In: *Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L. White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 1039-1099.

Root, T.L., Schneider, S.H., **Warren R.,** and Price J. 2013. *Climate Change and Wild Species.* Pp. 79-99 in Levin, (ed). *Encylopedia of Biodiversity.* Elsevier. ISBN: 978-0-12-384720-1Jones M.C., Dye, S.R., **Warren, R**., and Cheung W.W.L. 2013. Applying distribution models for an uncertain future: the case of the Pacific Oyster in UK waters. *Aquatic Conservation: Marine and Freshwater Ecosystems* 23: 710-722.

Gerten, D., *et al.* including **Warren, R.** 2013. Asynchronous exposure to global warming: freshwater resources and terrestrial ecosystems.  *Environmental Research Letters* 8, 034032(12 pp)

**Warren, R.**, *et al* 2013. The AVOID programme’s new simulations of the global benefits of stringent climate change mitigation. *Climatic Change* 120: 55-70 (*doi: 10.1007/s10584-013-0814-4*)*.*

**Warren, R.**, *et al.* 2013. Quantifying the benefit of early mitigation in avoiding biodiversity loss. *Nature Climate Change* 3: 678- 682. (*doi:10.1038/nclimate1887*)*.*

Arnell, N.W., *et al.* including **Warren R.** 2013. A global assessment of the effects of climate policy on the impacts of climate change. *Nature Climate Change* 3: 512-519

Jones, M.C., Dye, *et al* including **Warren, R.,** 2013. Predicting the impact of climate change on threatened species in U.K. waters. *PLoS ONE* 8(1): e54216. (doi:10.1371/journal.pone.0054216).

**Warren R.**, Yu, R.M.S, Osborn, T.J., and de la Nava Santos, S. 2012. European drought regimes under mitigated and unmitigated climate change. *Climate Research* 51:105–123. (doi: 10.3354/cr01042).

Jones, M.C., Dye, S., Pinnegar, J., **Warren, R.,** and W. Cheung. 2012. Modelling commercial fish distributions: Prediction and assessment using different approaches. *Ecological Modelling* 225: 133-145.

**Warren, R.** 2011.The Role of interactions in a world implementing adaptation and mitigation solutions to climate change. *Phil. Trans. R. Soc. A* 369:217-241. (doi:10.1098/rsta.2010.0271).

**Warren, R., *et al.*** 2011. Increasing impacts of climate change upon ecosystems with increasing global mean temperature rise. *Climatic Change* 106(2): 141-177.

Goswami, S., and **Warren, R.** 2011. Configuring, building and running models in CIAS. Pages 79-85 *in*: *Earth System Modelling - Volume 5, Tools for Configuring, Building and Running Models*. Series: Springer Briefs in Earth System Sciences, R. Ford, G. Riley, R. Budich, and R. Redler (eds). ISBN 978-3-642-23931-1.

Gosling, S.N., **Warren, R.,** Arnell, N.W., Good, P., Caesar, J., Bernie, D., Lowe, J.A., and van der Linden, P. 2011. A review of recent developments in climate change science. Part II: The global-scale impacts of climate change. *Progress in Physical Geography* 35:443-464.

Wilby, R.L., Nicholls, R., **Warren, R.,** Wheater, H., and Dawson, R.J. 2011. Keeping nuclear and other coastal sites safe from climate change. *Proceedings of the Institution of Civil Engineers: Civil Engineering* 164(4): 129-136, ISSN: 0965-089X.

Good, P., *et al.* including **Warren, R.** *et al.* 2011. A review of recent developments in climate change science. Part 1: Understanding of future change in the large scale climate system. *Progress in Physical Geography* 35:281-296.

Van Vuuren, D., Lowe, J., Stehfest, E., Gohar, L., Hof, A.F., Hope, C., **Warren, R.,** Meinshausen, M., and

Plattner, G.-K. 2011. How well do integrated models simulate climate change? *Climatic Change.*104: 255-285**.**

Murphy, J.M *et al.,* including **Warren, .**. 2009. UK Climate Projections Science Report: Climate Change Projections. Exeter, UK, Meteorological Office Hadley Centre, 192pp.

**Warren, R.,** Mastrandrea, M., Hope, C., and Hof, A. 2010. Variation in the climatic response of integrated models. *Climatic Change* 102 (3-4): 671-685.

**Convention on Biological Diversity** CBD Technical Series No.41: Connecting Biodiversity and Climate Change Mitigation and Adaptation - Report of the Second Ad Hoc Technical Expert Group on Biodiversity and Climate Change 2009. (Numerous authors including **Warren, R.F.**).

**Warren, R.***, et. al..* 2008. Development of the Community Integrated Assessment System (CIAS), a multi-institutional modular integrated assessment approach for modelling climate change, and of SoftIAM, its supporting software. *Environmental Modelling and Software* 23: 592-610. Winner of Environmental Modelling and Software Best Paper Award.

**Warren, R.**, Arnell, N., and Nicholls, R. 2008. *Impacts of Climate Change* in Cuff, David J. and Andrew S. Goudie (Eds), Oxford Companion to Global Change, New York, Oxford University Press.

Fisher, B., *et al.* including **Warren, R**. (Lead Author). 2007. *Issues Related to Mitigation in the Long-term Context*. *Pages 169- 250 in:* Climate change 2007: Mitigation of Climate Change. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel of Climate Change (IPCC) (eds Metz B, et al.), Cambridge University Press, Cambridge, UK.

Fischlin, A., *et al.* including **Warren, R.** (Contributing Author). 2007. *Ecosystems, their properties, goods, and services*. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, 211-272.

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**SELECTED RECENT PRESENTATIONS**

**Academic Seminars, Conference Presentations/Posters and Communication of Science to Policy Makers:**

*Climate Change, Biodiversity, and Ecosystem Services: Informing Climate Action.* 40th session of the Human Rights Council, International Organisation for LDCs (IOLDCs). 6th March 2019, Geneva.

*IMPALA: Implications of the Paris Agreement for Biodiversity and Conservation Planning*. Swedish Oikos conference, 4-7 Feb 2019, Uppsala, Sweden.

*IMPALA: Implications of the Paris Agreement for Biodiversity and Conservation Planning*. Pathways to and impacts of a 1.5C rise in global temperature. NERC-BEIS policy workshop. 11th Sep 2018, London.

*IPCC Special Report on Global Warming of 1.5C: Impacts on Human and Natural Systems.* UK Launch of IPCC SR1.5 and Great Britain Green Work, 15th Oct 2018, Imperial College, London.

*Climate risks at 1.5C and 2C compared to the present*. Meeting a Global Temperature Goal of 1.5 C, Royal Meteorological Society, 14th Nov 2018, London.

*IPCC Special Report on Global Warming of 1.5C.* OECD ENVIRONET, 22nd Oct 2018, Paris.

*IPCC Special Report on Global Warming of 1.5C: Impacts on Human and Natural Systems.* UN 21st Conference of the Parties, side event hosted by UK BEIS, 4th Dec 2018, Katowice, Poland.

*How much difference does half a degree of global warming make for humans and ecosystems?* Tyndall Centre departmental seminar, University of East Anglia, 4th July 2018

*Overview of Climate Change Impacts: the Burning Embers Figure* Global Forum on the Environment and Climate Change (GFECC), 14th March 2017, OECD, Paris.

*Providing relevant information to decision makers: Can we avoid dangerous climate change?* Presentation to delegation of staff from Brazilian ministries of Environment and Forestry. University of East Anglia, 13 Oct 2015

*The AVOIDing dangerous climate change project: the Tyndall Centre contribution.* Tyndall Assembly, University of Sussex, 10 September 2015

*The UK Climate Change Risk Assessment 2.* Tyndall Assembly, University of Sussex, 10 September 2015

*What’s Unique about Modelling the Impacts of Climate Change on Ecological Systems?* British Ecological Society, 13 September 2015

*Reasons for Concern about Climate Change.* U.K. Parliament Library, 10 June 2015, with Profs. Jordan and LeQuere.

*Economic Costs of Climate Change.* International Workshop ‘New Climate Economy – Prospects for Russia’. Higher School of Economics, Moscow, 20 March 2015

*Ecosystem Impacts and the Economic Costs of Climate Change.* AVOID2 Foreign & Commonwealth Office Roshydromet workshop “Climate change: Risks to wellbeing and infrastructure” Ambassador’s Residence, Moscow, 19 March, 2015

*Quantifying the benefits of mitigation for ecosystems.* Seminar at University of York, 26 January, 2015

*Impacts of Climate Change: Findings of Working Group II of the Fifth Assessment Report of the IPCC.* University of East Anglia, 4 April 2014

*REDD is essential to achieve a 2°C target.* U.K. Dept. of Energy and Climate Change, 22 March 2013.

*Climate change impacts avoided by mitigation.* Presented at the AVOID Symposium, for the Avoiding Dangerous Climate Change end of project event, funded by the Department of Energy and Climate Change, held at Royal Society, London, 12 February 2013.

*Roadmap to completion of ERMITAGE model couplings.* ERMITAGE EU workshop, Postdam, Germany, Sept 2012.

*Applications of the Wallace Initiative to the Study of Climate Change Impacts on Agriculture,* ELSA Agricultural Transitions Workshop, University of East Anglia, November 2012.

*AVOIDing Dangerous Climate Change.* Poster Presentation at *Planet under Pressure,* London, 28 Mar 2012.

*Modelling the interaction between mitigation and adaptation for decision making.* Presentation of a scoping study to UK DECC, DEFRA and ELWEC. 23 Mar 2012.

*Low carbon emissions scenarios in the Community Integrated Assessment System,* Launch of Fudan Tyndall Centre, Shanghai, May 2011.

*Climate Change and Land Use Change in the Community Integrated Assessment System, CIAS.* Seminar at Brown University, USA, March 2011.

*REDD is essential to achieve a 2°C target.* Presented at the Dept. of Energy and Climate Change, 22 November 2011.

*AVOIDing Dangerous Climate Change.* Capitol Hill, Washington D.C., 17th September 2010.

*The AVOID Programme and Climate Change Scenarios.* UK-USA Workshop Avoiding Dangerous Climate Change, American Geophysical Union, Washington D.C., 14-16th September 2010.

*Community Integrated Assessment System, Design and Applications.* Environmental Modelling and Software Society, Ottawa, Canada, 7th July 2010.

*Climate Change Impacts on Ecosystems.* Cambridge Conservation Forum, 21st June 2010.

*Climate Change Impacts and How to Avoid Them.* At Roshydromet, St. Petersburg, Russia, 13 May 2010.

*AVOIDing Dangerous Climate Change: Overview of Work Stream One*. AIMES Open Science Conference, Earth System Science 2010: Global Change, Climate and People. Edinburgh, UK. 11 May 2010.

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*AVOIDed Impacts.* UNFCCC COP15 Copenhagen, Dec 2009, at AVOID side-event.

*REDD is essential to achieve a 2 degree target.* At Biodiversity Summit co-organised by the Australian Green Insitute and Lawyers for Forests, Canberra, Australia, Aug 8th 2009.

*CIAS and CLIMASCOPE.* Seminar McQuarie University, Australia, Jul 28th 2009.

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*Variation in the Climatic Response to SRES Emissions Scenarios in Integrated Assessment Models.* Copenhagen IARU conference, March 10-12, 2009.

*Reducing Climate Change Impacts in the Water Sector: A Study of Mitigation Scenarios with the Community Integrated Assessment System****.*** At Copenhagen IARU conference, March 10-12, 2009.

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*Impacts of Climate Change* a *Life in the Freezer or the Sauna? The latest scientific facts and theories on the subject of Climate Change.* Cambridge Enterprise and Technology Club, 27 March 2008

*Avoiding Dangerous Climate Change.* Seminar at 4CMR (Forseeing Mitigation), Dept. of Land Economy, University of Cambridge, UK, 12 Nov 2007

*Delivering risk analysis for climate policy*. Seminar at the National Centre for Atmospheric Research, Boulder, Colorado, March 2007

*Impacts of Climate Change on Cropping.* UK Irrigation Association Spring Seminar, East of England Showground, 1st March 2007.

*“Solving” climate change: mitigation targets and the earth’s climate system*, Centre for Clean Air Policy's February 13-14 2007 Climate Policy Initiative dialogue meeting focused on US climate policy targets at the Capitol View Conference Center in Washington, DC.

*Avoiding impacts of global climate change which might be considered dangerous*. American Geophysical Union Conference, San Francisco, Dec 2006.

*Impacts of global climate change at different annual global mean temperature increases …and how to avoid them*. Presentation at the Russell Senate House building on Capitol Hill, hosted by DEFRA and the British Embassy in Washington. May 2006.

*Impacts of global climate change at different annual global mean temperature increases …and how to avoid them,* as part of the launch of the *Avoiding Dangerous Climate Change* book in the USA. Presentation at the JP Morgan-Chase Bank, New York, May 2006.

*Spotlighting Impacts in Integrated Assessment*, seminar at Dept. of Land Economy, University of Cambridge, May, 2006.

*Understanding the Regional Impacts of Climate Change*, seminar at Dept. of Land Economy, University of Cambridge, April, 2006.

*Understanding the Regional Impacts of Climate Change*. Presented to the Stern Review team, April 2006.

*Spotlighting Impacts in Integrated Assessment*. Presented to the Stern Review team, April 2006.

*Impacts of global climate change at different annual global mean temperature increases …and how to avoid them*, as part of the launch of the *Avoiding Dangerous Climate Change* book in the UK. Presentation at the Royal Society, February 2006.

*Impacts of global climate change at different annual global mean temperature increases …and how to avoid them*, as part of the side-event *Avoiding Dangerous Climate Change* hosted by DEFRA at the UNFCCC SBSTA, Montreal, September 2005.

*Impacts of global climate change at different annual global mean temperature increases,* presented at the Exeter Conference *Avoiding Dangerous Climate Change*, February 2005.

*The Community Integrated Assessment System: Model description and studies of carbon dioxide stabilization in the atmosphere.* Presentation at the Tyndall Assembly, Oxford, November 2005; Hadley Centre, June 2006.

*Joint air pollution and climate mitigation: integrated models for policymakers*. Royal Meteorological Society, meeting held at Oxford, 2004.

*A decision-analysis tool for policy makers: integrated assessment*. Presentation at seminar *Long-term action beyond the Kyoto Protocol* hosted by the Belgian government, 14 Sep 2004.

 Invited responder, *Environmental Kuznets Curves* conference Washington DC 2003.

*Using Regional Climate Scenarios for Impact, Adaptation and Integrated Assessments*, Rachel Warren and Mike Hulme, launch of SIAS project, Lisbon, Portugal June 2002.

**SELECTED MEDIA COVERAGE OF RESEARCH/INTERVIEWS:**

In 2018, I was named one of the University of East Anglia’s media stars: I obtained the third highest number of mentions in the media (466) during the last academic year of all university staff.

**Newspapers/magazines/web:** ABC News Online, ABC Nyheter, Alert Net, America Economia, AOL, AP Wire Services, BBCNews, Bloomberg Business, Blue and Green Tomorrow, Boston Globe, Breitbart News Network, BT News, Business Insider, Canberra Times, CarbonBrief, Care2, Chemistry Views, Chicago Sun-Times, Chicago Tribune, China.org, Christian Science Monitor, Daily Mail, Deutsche Welt, Earther, E Magazine, Economic Times of India, El Ciudadano, Elsalvador.com, El Spectador, El Universo, Environmental Research Web, Evening Express, EurekAlert, Farmer’s Weekly, Financial Times, French Tribune, Gazette & Herald, Global Advisors, Global News, Globe and Mail, Globo, Green Report (Italy), Guardian, Harvard Business Review, Health Medicinet, Herald Mail Media, Herald Scotland, Huffington Post, Inside Climate News, International Business Times, Inverse, IOL, Irish Examiner, Khaleej Times, Kypros, Laboratory Equipment, Labonline, La Prensa, La Repubblica, Le Monde, Le Point, livescience, Los Angeles Times, Malay Mail Online, Metro UK, N-TV, Neue Zuricher Zeitung, New Economist, New Scientist, Newsday, New York Daily News, New York Times, Oil & Gas News, PhysOrg, Physics World, Planet Ark, Portaldoagronegocia.com.br, Publico, Quartz, redOrbit, Reuter’s News Services, RIA Science (Russia), RT Network, RUV Fritter, Salon, San Francisco Chronicle, Science Alert, Science Daily, Sciencenet (China), ScienceNews, Science Newsline, Sciences et Avenir, Scientias, Scientific American, South African News, South End Standard, Sydney Morning Herald, The Age, The Argus, The Australian, The Conversation, The Economic Times, The Evening Telegraph, The Express, The Gazette, The Guardian, The Gulf Today, The Hindu, The Independent, The Japan Herald, The Japan Times, The Scientist Magazine, The Times of India, Times Online, Trends Dezukunft, Toronto Star, UPI Wire Services, USA Today, U.S. News and World Report, Vox.com, Washington Post, Western Telegraph, World News SBS, Xinhua (China), Yahoo News, Zimbabwe Star.

**Radio:** *Radio Norfolk, 11/7/2016, Radio Norwich, 11/7/2016, BBC Radio Scotland FM, Newsdrive, 31/03/2014, BBC Radio 4, PM Programme, 31/03/2014, Naked scientist podcast (UK), France24, News, 31/03/2014, Sky News, 31/03/2014and BBC Radio Norfolk, 31/03/2014,* Dr Rachel Warren (ENV) interviewed on the latest report by the UN's Intergovernmental Panel on Climate Change (IPCC) and its negative effects that will be felt across the globe, *ABC Radio National, Australia* 5/12/2009, *France 24, News, 28/11/15* Interviewed on the opening day of UNFCCC COP21 in Paris about the upcoming negotiations and the implications for climate change impacts., *BBC News 24, BBC World Service, BBC Radio Wales: 6-7/4/2007 release of IPCC 2007 WGII report, National Public Radio Chico radio station, California, USA 20/12/2007*

**Television:** *BBC News Channel, 31/03/2014, Sveriges TV*

**Popular Book (non-fiction):** Six Degrees, Mark Lynas