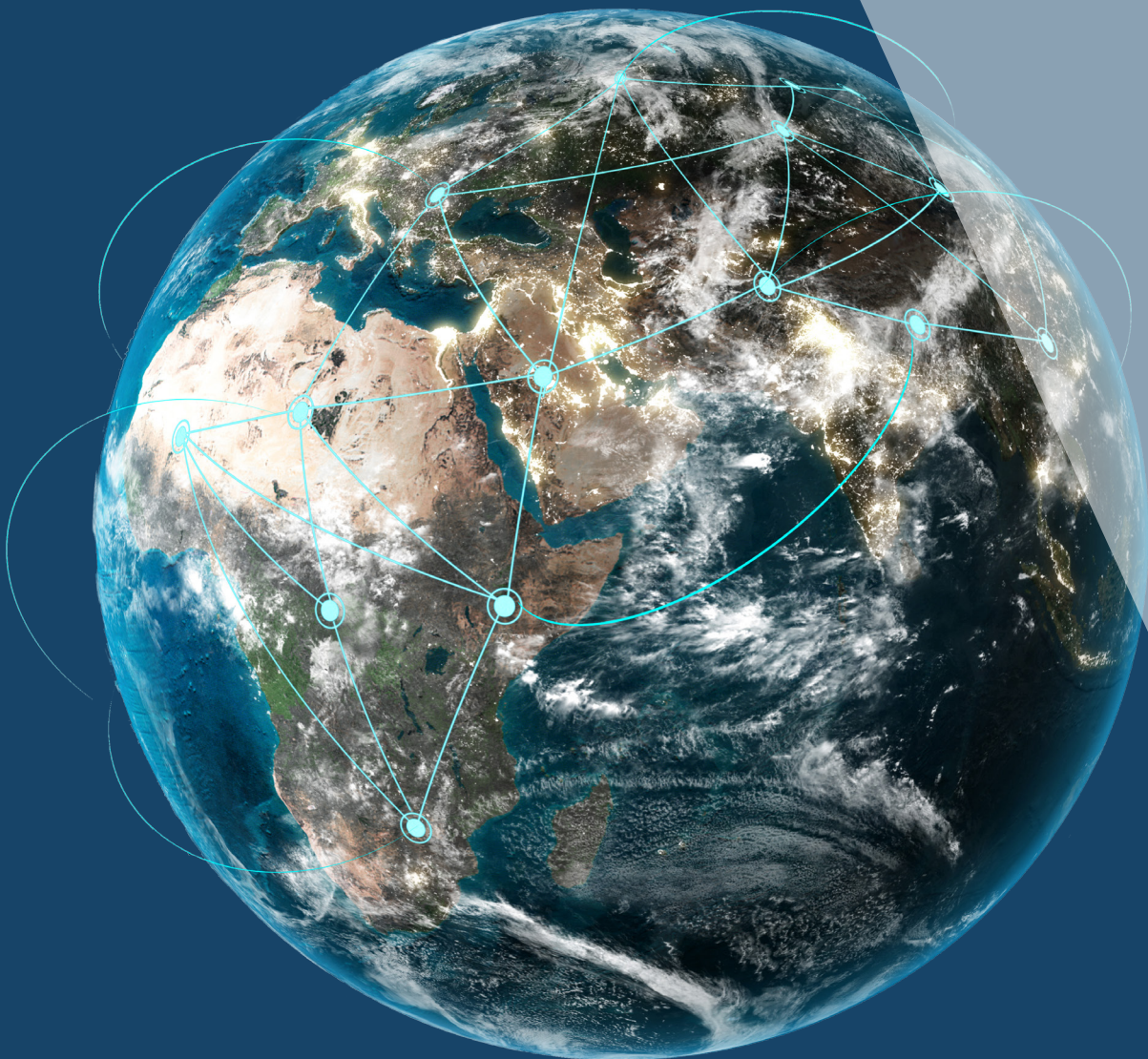


How Will Risk Modelling Shape The Future of Risk Transfer?

Extreme Events and Climate Risk Forum - Scientific Seminar

SCOR, Paris, 9 March 2017



The Geneva Association

The Geneva Association is the leading international insurance think tank for strategically important insurance and risk management issues. The Geneva Association identifies fundamental trends and strategic issues where insurance plays a substantial role or which influence the insurance sector. Through the development of research programmes, regular publications and the organisation of international meetings, The Geneva Association serves as a catalyst for progress in the understanding of risk and insurance matters and acts as an information creator and disseminator. It is the leading voice of the largest insurance groups worldwide in the dialogue with international institutions. In parallel, it advances—in economic and cultural terms—the development and application of risk management and the understanding of uncertainty in the modern economy.

The Geneva Association membership comprises a statutory maximum of 90 chief executive officers (CEOs) from the world's top insurance and reinsurance companies. It organises international expert networks and manages discussion platforms for senior insurance executives and specialists as well as policymakers, regulators and multilateral organisations.

Established in 1973, The Geneva Association, officially the 'International Association for the Study of Insurance Economics', is based in Zurich, Switzerland and is a non-profit organisation funded by its members.

The Scor Foundation for Science

The SCOR Corporate Foundation for Science was created in late 2011 as part of SCOR's long-term commitment to risk research and the dissemination of risk-related knowledge. This commitment is an integral part of SCOR's identity.

Over the years, SCOR has developed a number of partnerships with universities. Risk is the "raw material" of insurance and reinsurance, and SCOR aims to be at the cutting edge of risk expertise and research. These partnerships involve a large number of disciplines: mathematics, actuarial, physics, chemistry, geophysics, climatology, sociology, law, economics, finance, and so on.

The SCOR Corporate Foundation for Science may lend its support to various kinds of projects within the framework of its orientations and means, for example by financing university chairs, supporting specific research projects, launching calls for projects on specific topics, being involved in conferences and publications or sponsoring scientific awards.

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INTRODUCTION

I am very pleased to welcome you to the Extreme Events and Climate Risk Forum, co-organised with SCOR Foundation, entitled, "How Will risk Modelling Shape the Future of Risk Transfer?"

Risk information is the foundation for informed decision-making, it increases the understanding of the characteristics of risk, supports pricing risk, and designing and evaluating cost-benefits of various risk management strategies. The origins of catastrophe risk modelling are rooted in the field of property insurance and scientific research of natural hazards. Over the last 20 years, these models have revolutionised (re)insurance industry's approach to pricing, underwriting and managing their complex risk portfolios.

A recent paper of The Geneva Association, "An Integrated Approach to Managing Extreme Events and Climate risks" highlighted the importance of harnessing the (re)insurance industry's risk knowledge and risk modelling expertise in supporting the public sector as well as new opportunities for development of the next generation of predictive catastrophe risk models by leveraging latest scientific and technological advancements.

The programme of our conference will examine four critical issues: (i) lessons learned from 25 years of developing and utilising catastrophe risk models and opportunities for enhancing current models, (ii) development of the next generation of risk models, (iii) opportunities for harnessing latest scientific and technological advancements and (iv) expanding risk modelling to the public sector.

Today's conference brings together over 140 leading international experts from the (re)insurance industry, risk modelling community, international organisations, international donors, governments and the scientific community to share experiences and insights as well as explore opportunities for strengthened cooperation and partnerships.

I also would like to thank Professor Denis Kessler, who also serves as the co-chair of the Extreme Events and Climate Risk Working Group of The Geneva Association, for his deep commitment to this topic. I also would like to extend our appreciation to the SCOR Foundation and SCOR SE for co-organising and hosting this event. I wish you fruitful discussions and a very productive meeting.



Anna Maria D'Hulster
Secretary General
The Geneva Association

FOREWORD

It is with great pleasure and honor that I welcome you to the Scientific Seminar "How will Risk Modelling shape the Future of Risk Transfer?" here at the SCOR Group's headquarters in Paris.

This international event, organized by the SCOR Foundation for Science in partnership with the Geneva Association, is bringing together high-level researchers, academics, risk modelling specialists, climatologists, actuaries and insurance and reinsurance industry professionals from all around the world. It aims to address the current state of knowledge, the upcoming challenges and the foreseeable developments of Natural Catastrophe and weather risk modelling, and also to look at the question of how such risk modelling can be further enhanced to enable risk transfer and to drive innovation.

Risk modelling is key to the insurance and reinsurance industry, as it allows us to assess, quantify, forecast and ultimately manage the raw material of the sector, namely risk, in all its diversity and richness. This is all the more true at a time when the risk universe is expanding: its different constituents are transforming, and increasingly complex interdependence patterns are being drawn between them. Because risks are evolving constantly, and the interconnections between them are becoming more intricate, modelling techniques and tools require continuous enhancement. How to improve the modelling and forecasting of Natural Catastrophes and weather-related risks in particular is a highly topical issue, with climate change and its wide range of potential impacts, notably those on the severity and variability of extreme natural events across different time scales, being widely explored and discussed.

This Scientific Seminar is a unique opportunity to think about and discuss these issues and challenges, with contributions from both research and business. I am therefore delighted to welcome you to this exciting scientific exchange!

Denis Kessler
CEO and Chairman of SCOR
Co-Chair of Extreme Events and Climate Risk of the Geneva Association



Programme

9 March 2017

- 8:30-9:00 **Registration and breakfast**
- 9:00-9:30 **Welcome and opening remarks:** Denis Kessler, CEO and Chairman of SCOR, Co-Chair of the Extreme Events and Climate Risk of the Geneva Association
- 9:30-10:00 **Keynote Speech:** Professor Jean Tirole, Chairman, Toulouse School of Economics (TSE)
Chairman of the Executive Committee, Institute for Advanced Study in Toulouse (IAST)
- 10:00-11:15 **Panel 1: Challenges, opportunities and lessons learned from 25 years of developing and utilizing Catastrophe (CAT) risk models for risk transfer applications**
- The panel will discuss the foundations, challenges and opportunities with CAT Risk Modelling and opportunities for enhancing these models and their utilization for risk transfer around the world:*
- How has Cat Risk Modelling shaped risk transfer in the last 25 years; what have we learned?
 - What are the challenges with these tools and what improvements are needed?
 - A discussion of Hazard/Exposure/ Vulnerability , Methodologies, Data requirements and challenges, Open source versus restricted/propriety data and methodologies; Verification aspects and estimating model uncertainty; Model standards and interoperability issues; Resource requirements for development, interpretation and utilizations of CAT risk models
 - What are the next steps with enhancing these tools and expand their utilization for risk transfer applications around the world?
- Special Remarks & Moderator:** Ian Branagan (Renaissance Re)
- Panellists:**
- Jay Guin (AIR)
 - Dickie Whitaker (OASIS)
 - Lixin Zeng (AlphaCat)
 - Alexandre Allmann (Munich Re)
- 11:15-11:30 Coffee Break

11:30-12:45 Panel 2: Next generation risk models: approaches, opportunities, challenges

The panel will examine the needs, challenges and opportunities for next generation of risk models, specifically:

- *What are the latest innovations in risk modelling methodologies:*
 - From peril-specific risk modelling to systems' approach and integrated models e.g., supply chains, cities and urban systems, energy/food/water systems; health/epidemics/pandemics, critical infrastructure;
 - End-to-end risk assessment for building socio-economic resilience to a specific peril (e.g., prevention, early warning and preparedness and risk transfer measures for floods)
 - Complex natural and man-made catastrophes such as the Great Japan earthquake/tsunami/nuclear disaster, Iceland's volcanic risks, etc.)
- Challenges and opportunities with accessibility to high quality data (e.g., environmental and socio-economic, exposure and vulnerability, etc.) to support new modelling approaches
- Other relevant technologies: AI, Big data, Satellites, etc.

Special Remarks & Moderator: Paul Nunn (SCOR)

Panellists:

- Robert Muir Wood (RMS)
- Federico Waisman (Ariel Re)
- Molly Jahn (University of Wisconsin-Madison and Oak Ridge National Laboratories)
- Madeleine Thomson (Columbia University)

12.45-14:00 Lunch

14:00-15:30 Panel 3: Harnessing latest development in weather/water/climate research, earth observations, forecasting for next generation of forward looking risk models

The panel will examine the following issues:

- State of the art in research, earth observations and environmental surveillance
- Synthetic data and simulations, seamless forecasting systems for extreme events (fast and slow onsets) from next minute to decadal time scales
- Latest research on understanding natural modes of climate variability and impacts of climate change and implications for predicting and modelling of extreme events.
- State-of-the-art with modelling of Climate and Health; Agriculture; and Energy interfaces
- Expansion of publically funded scientific research to support information needs of decision-driven risk modelling tools
- Opportunities for harnessing scientific developments in a scalable and sustainable way for risk modelling

Special Remarks & Moderator: Maryam Golnaraghi (The Geneva Association)

Panellists:

- Jianming Yin (Tokio Marine Technologies)
- Johnny Chan (City University of Hong Kong)
- Ghassem Asrar (Pacific Northwest National Laboratory, PNNL)
- Dame Julia Slingso (Former Chief Scientist - UK Met Office)
- Lawrence Buja (National Center for Atmospheric Research, NCAR)

15.30-15:45

Coffee Break

15:45-17:15

Panel 4: Role of Risk Modelling as an enabler to stimulate new sovereign and regional risk transfer

This panel will examine the following issues:

- Overall challenges and opportunities for risk knowledge and risk modelling for development and implementation of new sovereign and regional risk transfer solutions in high-, middle- and low-income nations
- Governments' needs, capacities and challenges with development and utilizations of risk information
- How can the (re)insurance industry and the risk modelling community assist governments to enhance their capacities to develop and utilize risk information (distinguish high-, middle-, and low-income countries)
- How can the development community and international donors support this area in a more coordinated and sustainable manner
- What critical partnerships need to be strengthened and which new ones need to be across different segments?

Special Remarks & Moderator: Mamiko Yokoi-Arai (OECD)

Panellists:

- Alanna Simpson (GFDRR's Risk and Innovation Lab)
- Gary McNally (Flood Re)
- Nicola Ranger (UK DFID)
- Gerry Lemcke (Swiss Re)
- Kirsten Dunlop (Climate-KIC)

17:15-17:30

Overall Summary of the Day - Maryam Golnaraghi (Geneva Association)

Closing Remarks - Anna Maria D'Hulster (Geneva Association)

SPEAKER BIOGRAPHIES

Welcome

Denis Kessler

Chairman and Chief Executive Officer at SCOR

Denis Kessler is 64 years old. He is a professor with advanced degrees in economics and social sciences, and is a Fellow of the French Institute of Actuaries. He also holds a PhD in economics and is a graduate of the Ecole des Hautes Etudes Commerciales (HEC Paris). Denis Kessler has been Chairman & Chief Executive of SCOR since 4 November 2002.

He is Chairman of the Cercle de l'Orchestre de Paris, member of the Board of the Geneva Association, of the International Advisory Panel (IAP) of the Monetary Authority of Singapore (MAS) and of the Boards of Le Siècle, the Global Reinsurance Forum and the Reinsurance Advisory Board, as well as being a Global Counsellor of the Conference Board, member of the Steering Committee of Insurance Development Forum (IDF).

Prior to joining the SCOR group, he was Chairman of the Fédération Française des Sociétés d'Assurances -FFSA- Association of French Insurers (1990-1997 and 1998-2002), Member of the Conseil National des Assurances (1990-1997 and 1998-2002), Member of the Presidential Council (1990-1996 and 1998-2001) and Vice-President (1996-1998 and 2001-2002) of the Comité Européen des Assurances -CEA-, Senior Executive Vice-President and Member of the Executive Committee of the AXA Group (1997-1998), Member of the Executive Committee (1991-1994), Executive Vice Chairman (1995-1998) and First Executive Vice Chairman (1998-2002) of the French Business Confederation Mouvement des Entreprises de France -MEDEF- (called Conseil National du Patronat Français -CNPFP- until 1998), member of the "Conseil Economique et Social" (1993-2010), Chairman of the Board of Le Siècle (2008-2010), member of the "Commission Economique de la Nation", member of the Board of the Fondation pour la Recherche Médicale (2006-2012), Chairman of the Global Reinsurance Forum (2009-2011), and Chairman of the Reinsurance Advisory Board (2009-2010).

Denis Kessler holds a PhD from the University of Paris and honorary degrees from the Moscow Academy of Finance and HEC Montréal. He was elected to join the "Insurance Hall of Fame" of the International Insurance Society (IIS) in 2014. In January 2016, he was elected to join the French Institute's Academy of Moral and Political Sciences. In May 2016, he was appointed "Honorary Freeman of the City of London".



Anna Maria D'Hulster
Secretary General, The Geneva Association

Anna Maria was appointed Secretary General of The Geneva Association by the membership on 2 June 2014.

Before joining The Geneva Association, she was responsible for the insurance practice at swissQuant Group, a technology company specialising in the development and implementation of mathematical algorithms and software for risk management and big data purposes.

From 2002 to 2012, she had different roles with the Baloise Group in Switzerland and Europe. She acted as Head of Group Risk Management from 2002 to 2004, and Head of Group Performance Management while also representing the Holding on the boards of various subsidiaries (from 2004 to 2008). She subsequently established and developed the life insurance company Baloise Life of which she became the CEO (2008 to 2012). Anna Maria was a member of the Executive Committee of the European Insurance Association (CEA/Insurance Europe) from 2009 to 2012.

Before her career in the insurance industry, Anna Maria was a Principal at the Boston Consulting Group, leading banking and insurance projects in Germany and the United States. She started her career as a corporate finance analyst at Deutsche Bank.

Anna Maria holds an INSEAD MBA (1993) and a business-engineering degree from the Free University of Brussels, Belgium. She is a Belgian citizen. In 2014 Anna Maria was appointed as non-executive Director to the Board of Hardy (Underwriting Agencies) Ltd., London.



Maryam Golnaraghi

Director of Extreme Events and Climate Risk at The Geneva Association

Dr. Golnaraghi is the Director of Extreme Events and Climate Risk at The Geneva Association. With over 20 years in international executive and senior advisory positions in industry, government and the United Nations, Maryam has been working at the forefront of developing proactive strategies, policies and innovative solutions related to developing: (i) economic resilience to disaster and climate risks; and, (ii) sound pathways for transitioning to low carbon economy with focus on technological innovations and investment strategies.

From 2004 to 2014, she was the Chief of Disaster Risk Reduction Program at the World Meteorological Organization (UN). In this capacity, she headed up and led an international program that leveraged strategic multi-stakeholder partnerships and latest technological advancements in meteorology, hydrology and climate to implement disaster and climate risk management measures (i.e., risk modeling, early warning systems, prevention and risk transfer) in over 40 countries around the world. From 1997 to 2004, as the CEO and President of Climate Risk Solutions, Inc., she provided innovative climate risk assessment and risk management solutions to the US government and companies in energy, agriculture and insurance sectors. She also worked at the forefront of developing state-of-the-art risk modeling tools and weather derivatives products.

Dr. Golnaraghi serves in a number of advisory boards. She has authored numerous internationally referenced reports and a book (Springer-Verlag 2012). She holds a BS in Chemical Engineering from Cornell University, an MS in Applied Physics and a PhD in Physical Oceanography from Harvard University, after which she held a two-year senior research position at the Harvard Business School.



Conference Speaker

Professor Jean Tirole

Chairman, Toulouse School of Economics (TSE)

Chairman of the Executive Committee, Institute for Advanced Study in Toulouse (IAST)

Jean Tirole is chairman of the Jean-Jacques Laffont - Toulouse School of Economics Foundation, and scientific director of the Institute for Industrial Economics, University of Toulouse Capitole. He is also affiliated with MIT, where he holds a visiting position, the Ecole des Hautes Etudes en Sciences Sociales, and the Institute for Advanced Study in Toulouse, which he co-founded in 2011. Professor Tirole's research covers industrial organization, regulation, finance, macroeconomics and psychology-based economics.

Jean Tirole has given over eighty distinguished lectures and has published over two hundred articles in economics and finance, as well as eleven books. His wide-audience book, *Economics for the Common Good*, was published in 2016 in France and sold over eighty thousand copies. He is the laureate of numerous distinctions for his important work, including the 2014 Sveriges Riksbank prize in economic sciences in memory of Alfred Nobel.



Panel 1: Challenges, opportunities and lessons learned from 25 years of developing and utilizing Catastrophe (Cat) Risk Models for risk transfer applications

Ian Branagan

Group Chief Risk Officer and Senior Vice President RenaissanceRe Holdings Ltd.

Mr. Branagan has served as Group Chief Risk Officer since February 2009 and as Head of Group Risk Modeling since 2005. Mr. Branagan joined the Company in 1998 to open the Dublin office, later relocating to Bermuda with additional responsibilities for underwriting risk and modeling across the insurance and reinsurance operations. Prior to joining RenaissanceRe, he headed up Applied Insurance Research Inc.'s (AIR) international activities, which included the development and marketing of AIR's cat models and tools. He also worked in the London market at DP Mann Limited, developing pricing and risks analytics.

Mr. Branagan has a bachelor of science degree in Economics and European Economic History from Manchester Metropolitan University.



Jayanta Guin

Executive Vice President and Chief Research Officer for AIR

Dr. Jayanta Guin is AIR's Executive Vice President and Chief Research Officer, responsible for strategic management of the AIR Research and Modeling group. Under his leadership, the group has developed a global suite of catastrophe models and continues to enhance modeling techniques. Jayanta also provides strategic input into AIR's product development and consulting work for insurance-linked securities. He has more than 20 years of experience in probabilistic risk analysis for natural catastrophes worldwide and is well recognized in the insurance industry for his deep understanding of the financial risk posed by natural perils. His expertise includes a wide range of natural and man-made phenomena that drive tail-risk. Jayanta received his B.S. in Civil Engineering from Jadavpur University in India. He earned an M.S. and a Ph.D. in Civil Engineering from the State University of New York, Buffalo, with a specialization in dynamic soil-structure interaction and computational mechanics.

Jayanta is a member of the governing board for the Global Earthquake Model (GEM) initiative and he also contributes to the Research Advisory Council of Institute of Business and Home Safety (IBHS).



Dickie Whitaker

Senior Insurance and Risk Advisor at the UK Department for International Development, Oasis

He has 30 years experience in the Re(in)surance business and for the last 20 years has specialised in risk and innovation and linking academia, government and finance. Dickie has written and presented extensively on these subjects and has operated globally and has worked in both London and New York. He has co-founded and works for The Lighthill Risk Network, FiNexus Ltd, Oasis Palm Tree Ltd and is chief executive of Oasis Loss Modelling Framework Ltd. He also works with and advises the following organisations:

- NERC's Innovation Advisory Board
- Satellite Applications Catapult Advisory Group
- South West Centre of Excellence Board - SAT APPS
- The Institute for Environmental Analytics (IEA)
- Insurance Development Forum (IDF) Risk modelling and management steering group
- Institute and Faculty of Actuaries Research & Thought Leadership committee

**lixin Zeng**

Chief Executive Officer: AlphaCat Managers Ltd

Lixin Zeng, Ph.D., CFA, is the Chief Executive Officer of AlphaCat Managers Ltd. and has played a key role in the Manager since its formation in 2008. Prior to this role, he was Executive Risk Officer of Validus Reinsurance Ltd, responsible for developing and executing the catastrophe risk strategy of the entire Validus Group. Dr. Zeng was one of the original employees at the founding of Validus in 2005.

His prior positions include: Chief Catastrophe Risk Officer at the ACE Group from 2004 to 2005, Head of Development at Willis Re Inc from 2001 to 2004, Analyst at EW Blanch Co. from 1998 to 2001 and Research Scientist at Arkwright Mutual Insurance Co from 1996 to 1998. Mr. Zeng has expertise in insurance portfolio optimization and risk management and has published multiple articles in professional journals on related topics. He has a Ph.D. in atmospheric sciences from the University of Washington where he graduated in 1996. He received a B.S. in Meteorology from Beijing University, graduating in 1990 and is a CFA charterholder.



Alexandre Allmann

Head of the Georisk team in Munich Re

Alexander Allmann is heading the Georisk team in Munich Re since four years. He is responsible for the Natural Catastrophe model development and evaluation. Alexander has more than 20 years' experience in probabilistic earthquake model development.

He is a seismologist by training and participated in numerous reconnaissance missions after earthquake catastrophes. He was leading the development of more than 30 earthquake models in Munich Re and is also overseeing the development of winter storm, tropical cyclone, hail or flood models.



Panel 2: Next generation risk models: approaches, challenges and opportunities

Paul Nunn

Head of Catastrophe Risk Modelling at SCOR Global P&C

Paul Nunn is Head of Catastrophe Risk Modelling at SCOR Global P&C; responsible for the management of natural hazard perils globally. A key aspect of the role is the provision of analytics and data for internal and external stakeholders including SCORs internal capital model, rating agencies, regulators and retrocessionaires.

Before joining SCOR Global P&C, Paul was Head of Exposure Management at Lloyd's and previously worked at cat modelling specialist firm, AIR Worldwide Ltd. He is also a director of the non-profit Oasis Loss Modelling Framework company.



Robert Muir Wood

Chief Research Officer, RMS, UK

Vice Chair of the OECD High Level Advisory Board on the Financial Management of Large-scale Catastrophe Risks

Robert Muir Wood is the Chief Research Officer at RMS, a leading catastrophe modelling firm, where he focuses on advances to catastrophe modelling and emerging catastrophe risks. Over the last 25 years, Dr Muir-Wood has led projects to develop catastrophe models for a wide range of perils and was instrumental in developing RMS's first probabilistic perspective on terrorism risk in 2002.

He has been a member of the Steering Group of 'Sovereign Disaster Risk Finance Impact' Project (jointly run by the World Bank, the Global Fund for Disaster Risk Reduction and the UK Department for International Development) and was Expert Review Panel member on the 'Risky Business' study of the future US economic impacts of climate change in 2013-2014. Most recently, his research has included how to model the multiple ways in which insurance losses escalate after major catastrophes. Dr Muir-Wood has a Master's degree and PhD in Natural Sciences from Cambridge University, England.

He is a visiting Professor at the Institute for Risk and Disaster Reduction at University College, London. His latest book: 'The Cure for Catastrophe – How We Can Stop Manufacturing Natural Disasters' was published in the US and UK at the beginning of September 2016."



Federico Waisman
Head of Analytics at Ariel Re

Federico Waisman acts as Head of Analytics at Ariel Re since May 2006 when he joined Goldman Sachs as Chief Risk Officer and Senior Vice President of Arrow Capital in Bermuda and later moved to London in 2008 when Arrow Syndicate 1910 started operating at Lloyd's of London. In April 2012 Goldman Sachs acquired the businesses of Ariel Re and Federico was then assigned to the position of Senior Vice President and Head of Analytics. Prior to his experience at Ariel Re he was at Swiss Re in the Natural Catastrophe Perils Unit based in Armonk, NY leaving as Head of Vulnerability. Since 2001 Federico worked in the development of MultiSNAP (Swiss Re's natural catastrophe rating tool) and supported the Americas' underwriting divisions of this reinsurer. Before that, Federico worked for EQE International/EQECAT performing risk consulting and model development of their commercial software EQECAT.

His academic background includes a Ph.D. and Master's degrees in Structural Engineering from Cornell University and Structural Engineer degree from Universidad de Belgrano, Buenos Aires, Argentina. Federico is affiliated with the following professional organizations: the American Meteorological Society, the American Association for Wind Engineering, Earthquake Engineering Research Institute, the American Society of Civil Engineers and was formally a member of the Board of the International Society of Catastrophe Managers.



Molly Jahn
Professor in the Department of Agronomy, the Center for Sustainability and the Global Environment, and the Global Health Institute at University of Wisconsin-Madison

Molly Jahn is a professor in the Department of Agronomy, the Center for Sustainability and the Global Environment, and the Global Health Institute at University of Wisconsin-Madison and served as the 12th Dean of the College of Agricultural and Life Sciences. She has had a distinguished career in plant genetics, genomics and plant breeding, trained dozens of students and postdoctoral associates at UW Madison and Cornell University and has authored >100 peer-reviewed publications.

Crop varieties from her research programs are grown commercially and for subsistence on six continents under > 60 commercial licenses. She consults globally for business, government, philanthropic organizations, and international multi-lateral institutions in agriculture, food security and risk in food systems, life sciences and environment.



Madeleine C. Thomson

Senior Research Scientist, International Research Institute for Climate and Society, Earth Institute, Columbia University

Dr. Thomson also holds appointments as a senior research scholar at the Mailman School of Public Health in the Department of Environmental Health Sciences; Visiting Professor, CHICAS Group, Medical School, Lancaster University, UK; and Director of the World Health Organization Collaborating Centre on Early Warning Systems for Malaria and other Climate Sensitive Diseases. She trained as a field entomologist and has spent much of her career engaged in operational research in support of large-scale health interventions, mostly in Africa.

She arrived at IRI in 2002 to lead the institute's health-related activities. She has developed a climate and health research and operations agenda supported by US federal agencies, UN agencies, other bilateral organizations and foundations. Her research targets the development of new data, methodologies and tools for improving climate-sensitive health interventions. Her focus has been on malaria, onchocerciasis and zika and other vector-borne diseases, but in recent years has expanded to include air and water-borne infections such as meningococcal meningitis and cholera. Through partnerships with national and international agencies, Dr. Thomson also has investigated the broader health challenges associated with food security/nutrition and disasters. She is particularly interested in improving institutional and human capacity for incorporating climate information into health planning.



Panel 3: Harnessing latest development in weather/water/ climate research, earth observations, forecasting for current and next generation of forward-looking risk models

Julia Slingo

Former Chief Scientist UK Met Office

Professor Dame Julia Slingo served as Chief Scientist of the UK Met Office from 2009 to 2016. She led a team of more than 500 scientists working on a broad portfolio of research that underpins weather forecasting, climate predictions and climate change projections. Through her career she has also worked at the European Centre for Medium-range Weather Forecasts (ECMWF), the US National Center for Atmospheric Research (NCAR) and Reading University.

Dame Julia has brought innovative approaches to understanding and modeling weather and climate. She has developed and used complex weather and climate models to deliver new insights into how the atmosphere and climate system works, as well as significant advances in predictive skill and climate services. Her special interests are tropical weather and climate variability.

Dame Julia was elected a Fellow of the Royal Society in 2015 and Foreign Member of the US National Academy of Engineering in 2016.



Ghassem R. Asrar

Director of Joint Global Change Research Institute of the Pacific Northwest National Laboratory

Dr. Ghassem R. Asrar is Director of Joint Global Change Research Institute of the Pacific Northwest National Laboratory hosted by the University of Maryland, USA. Prior to this position, he served as Director of World Climate Research Program (WCRP) in Geneva, Switzerland (2008-2013); the Deputy Administrator of Agricultural Research Service (ARS), of the U.S. Department of Agriculture (2006-2008); and in several science positions with the U.S. National Aeronautics and Space Administration (NASA), 1987-2006.

Dr. Asrar earned his graduate degrees in civil engineering and environmental physics from Michigan State University, East Lansing, Michigan. He conducted research and trained undergraduate, graduate and post-graduate students in academia prior to joining NASA in 1987. He has authored more than 180 peer-reviewed scientific and technical papers and books, primarily in the fields of Earth system science and remote sensing. Dr. Asrar is chief editor and member of editorial boards of several scientific journals.



Johnny Chan

Chair Professor of Atmospheric Science and the Director of the Guy Carpenter Asia-Pacific Climate Impact Centre

Professor Johnny Chan received his Ph.D. in atmospheric science from Colorado State University in the US. After being a Post-doctoral Research Associate and an Adjunct Research Professor at the US Naval Postgraduate School, he returned to Hong Kong.

Professor Chan is currently Chair Professor of Atmospheric Science and the Director of the Guy Carpenter Asia-Pacific Climate Impact Centre at City University of Hong Kong. He is also one of the Co-Directors of the Asian Network on Climate Science and Technology.

Professor Chan's research on typhoons and monsoons is internationally renowned. He has published over 190 SCI journal articles. He is the Chair of the Tropical Cyclone Panel of the World Meteorological Organization Tropical Meteorology Research Working Group. He is an Honorary Fellow of the UK Energy Institute, a Fellow of the American Meteorological Society and a recipient of the International Journal of Climatology Award of the Royal Meteorological Society.

**Lawrence Buja**

Director of the Climate Science and Applications Program at the National Center for Atmospheric Research

Dr. Lawrence Buja directs the Climate Science and Applications Program at the National Center for Atmospheric Research in Boulder Colorado. CSAP addresses societal vulnerability, impacts and adaptation to climate variability and change using scenarios of projected climate change, development of tools and methods for analyzing current and future vulnerability, and integrated risk analyses of climate impacts and adaptation at local, regional and global scales.

Previously, Dr Buja conducted earth system climate model simulations of the earth's past, present and future climates that made up the joint US NSF/DOE submission to the Intergovernmental Panel on Climate Change (IPCC). Lawrence is a contributing author to both the 2001 IPCC Third Assessment Report (AR3) and the breakthrough IPCC AR4 in 2007

Lawrence also works closely with international agencies and banks applying NCAR's science expertise to help guide sustainable development strategies throughout the developing world.



Jianming Yin

Executive Vice President and leads the Research and Modelling group in Tokio Marine Technologies

Dr. Jianming Yin is Executive Vice President and leads the Research and Modelling group in Tokio Marine Technologies (TMTech) based in USA. He has more than 20-year experience in modelling natural catastrophic risks from (re)insurance perspectives. Prior to joining TMTech, Dr. Yin developed probabilistic tropical cyclone risk models and was responsible for developing tornado hail risk models. As managing partner of McDonald, Mehta and Yin Wind Engineers LLP, Dr. Yin developed tornado wind field models and debris trajectory models for nuclear waste storage sites.

In TMTech, Dr. Yin led the efforts in developing innovative solutions to quantify typhoon risk in Pacific Rim, global tornado hail risk, flood and earthquake risks for countries in Asia and North America. He was invited speaker and panelist for the technical conferences as well as government, university, and industry sponsored conferences on natural catastrophic risks and financial modelling of the risks.



Panel 4: Role of Risk Modelling as an enabler to stimulate new sovereign and regional risk transfer

Mamiko Yokoi-Arai

Principal Administrator at the Organisation of Economic Co-operation and Development (OECD)

Mamiko Yokoi-Arai heads the insurance work and is Principal Administrator at the Organisation of Economic Co-operation and Development (OECD). She is responsible for the coordination and organisation of the OECD's Insurance and Private Pensions Committee which provides policy guidance on insurance and private pensions systems, and works extensively on providing policy guidance on disaster risk financing. In recent times, she has authored reports on InsurTech, "can pension funds and life insurance companies keep their promise?", and the G20 report on "Regulation on insurance company and pension fund investment."



Dr Yokoi-Arai previously worked in the Bank of Japan, and the Financial Services Agency of Japan (FSA). She was a Reader in International Finance Law at Queen Mary, University of London for several years, teaching financial regulation and emerging market issues. Dr Yokoi-Arai has published extensively in the area of banking regulation, financial services trade, Asian regional issues, financial competition policy, and financial consumer protection.

Alanna Simpson

Senior Disaster Risk Management Specialist for the World Bank's Global Facility for Disaster Reduction and Recovery

Dr. Alanna Simpson is a Senior Disaster Risk Management Specialist for the World Bank's Global Facility for Disaster Reduction and Recovery. In this role, she leads the technical team responsible for supporting the World Bank's Disaster Risk Management (DRM) regional teams in disaster risk assessments, and geospatial and remote sensing technologies. This includes the design and quality assurance of disaster risk assessments and their communication to end users; open-source tool development (e.g., Think Hazard!); the Open Data for Resilience Initiative (OpenDRI); promotion of new innovation through the Challenge Fund; and international knowledge exchange through publications and the Understanding Risk Forum.

Dr. Simpson previously worked for the Australian Government, where she led efforts to improve risk assessment capability in East Asia and the Pacific. A New Zealand and Australian national, Dr. Simpson holds a PhD in Geoscience from the University of Queensland, a M.Sc. from the University of Otago and a B.Sc. from the University of Auckland.



Gerry Lemcke

Head of Business Development of Global Partnerships at Swiss Re

Gerry Lemcke is Head of Business Development of Global Partnerships at Swiss Re. Global Partnerships focusses to provide insurance solutions to governments, public sector entities, development organizations and NGOs (altogether "Public Sector").

His work aims to strengthen the sectors financial viability and economic resilience. In this global function Mr. Lemcke oversees consultancy, specialized insurance structuring and pricing as well as business and product development, tailored to the specific needs of public entities. Products are brought to market via insurance and reinsurance solutions, or capital market placements.

Mr. Lemcke received a Master in Geology from the University of Göttingen (Germany) in 1993, and a PhD in Environmental Physics from the ETH (Switzerland) in 1996. A fellow of the American Meteorological Society he started his career building probabilistic risk assessment programs with focus on atmospheric perils.



Nicola Ranger

Senior Insurance and Risk Advisor at the UK Department for International Development

Dr Nicola Ranger is a Senior Insurance and Risk Advisor at the UK Department for International Development. She currently leads DFID's insurance portfolio within the Private Sector Dept. of DFID's Economic Development Division. Previous to this, Nicola led on natural disaster and climate research at DFID. She has a background in catastrophe risk modelling, the economics of risk and decision making and atmospheric sciences; and a strong interest in innovation. Prior to joining DFID in early 2013, Nicola was a Senior Research Fellow and a Munich Re Research Fellow at the London School of Economics and Political Sciences focussing on risk assessment, decision making under uncertainty and insurance, and during 2012, was head of the adaptation and development research team of the Grantham Research Institute.

Nicola also spent two years working for the catastrophe risk modeller, Risk Management Solutions, and several years working as a scientific and policy advisor on climate risks for the UK's Department of Environment, Food and Rural Affairs and HM Treasury. She has written more than 30 peer-reviewed articles and contributed to the Foresight report on Future Disasters, UK National Climate Change Risk Assessment, the IPCC Special Report on Extreme Events and the Stern Review. Nicola has a PhD in atmospheric physics from Imperial College London and a BSc in Physics from the University of Warwick.



Gary McNally
Chief Actuary at Flood Re

Gary is Chief Actuary at Flood Re, where he is responsible for all aspects of the actuarial function, including flood modelling. Gary began his actuarial career in pensions and life insurance before becoming the first in-house actuary at Lloyd's Managing Agent, Liberty. Gary then spent several years as a consultant at PwC providing actuarial advice to UK and international insurers before joining Canopus as Head of Capital where he was key in satisfying SII requirements and developed a capital team that supported significant growth and ultimately the sale of Canopus to SJNK Japan.



Kirsten Dunlop
Climate KIC

Dr Kirsten Dunlop joined Climate-KIC in January 2017, from Suncorp Australia, where she was Executive General Manager Strategic Innovation At Suncorp, which is itself a long standing partner of Climate-KIC, Kirsten was instrumental in the formation of Climate-KIC Australia, based on the proven Climate-KIC model from the European Union.

Kirsten succeeds Ian Short, who led Climate-KIC for just over one year as interim CEO and successfully oversaw the transition of Climate-KIC towards a single entity for Europe, from a number of different partner-based organisations.

A British and Australian national, Kirsten's career spans academia, consulting, banking, insurance, innovation design, strategy and leadership across Europe, Australia and the United Kingdom.

Her strong focus on leading transformational change, driving innovation and emphasis on an empowering and inspiring company culture will help drive forward Climate-KIC's important work in speeding up the transition towards a net-zero carbon economy.



Our Host



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How to Find Us

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By Public Transport

 Line 6: Kléber station, located at the foot of the building

 Line 1: Charles de Gaulle-Etoile station

 Line 2: Charles de Gaulle-Etoile station

 Charles de Gaulle-Etoile station (Champs Elysées exit)

 Vélib' docking station: 2, av. des Portugais, 75016 Paris

 Lines 22, 30: bus stop Charles de Gaulle-Etoile-Kléber

 Closest Autolib' docking station:
16, place de Etats-Unis, 75016 Paris

By Car

SCOR car park: 29, rue la Pérouse, 75016 Paris

To get to the car park from the place de l'Etoile, take avenue d'Iéna and the rue la Pérouse.

From the northern ring road (périphérique nord)

- Exit - Porte Maillot
- Take avenue de la Grande Armée towards the place de l'Etoile
- Follow directions for avenue Kléber

From the Southern ring road (périphérique sud)

- Exit - Porte Dauphine
- Take avenue Foch towards the place de l'Etoile
- Follow directions for avenue Kléber



Conferences Organised and/or Supported by The Geneva Association

2017

March

2-3, Zürich **33rd Regulation and Supervision (PROGRES) Seminar**
Description: High level regulatory forum discussing current developments and challenges in global insurance regulation and supervision
Target Audience: Senior level regulators and supervisors, high level industry representatives from large international companies, academics, trade associations

9-10, Paris **Climate Risks and Extreme Events Forum**
How will Risk Modelling Shape the Future of Risk Transfer? Co-organised with SCOR Foundation and hosted by SCOR.
Target Audience: CRO, Head of Risk Modelling, Head of Emerging Risks, Head of Risk Modelling, Head of Natural Catastrophe, Head of Geo Risks, Head of CAT Risk

22-23, Zeist **19th Meeting of the Annual Circle of Chief Economists (ACCE)**, hosted by ACHMEA
Description: Platform to exchange ideas and visions about the future development of insurance and analysis of key challenges to the industry
Target Audience: Chief economists, strategists from large international insurance companies

May

10-12, Madrid **14th ART of CRO conference**, hosted by MAPFRE (CRO's of member companies only)
Description: Platform to discuss the roles, objectives and tasks of CROs. Provides a network to exchange experiences and discuss specific risk problems.
Target Audience: CROs of member companies

June

14-17, San Francisco **44th General Assembly of The Geneva Association**, hosted by US Members (Members only)

22-23, Reykjavik **17th Joint Seminar of the European Association of Law and Economics (EALE) and The Geneva Association**
Target Audience: Academics, economists, risk and insurance researchers with interest in law and economics

29-30, Singapore **IRFRC Annual Conference on Cyber**
Description: The theme of this year's conference is "New Applications of Actuarial Science in Managing Risks". Under the conference's broad theme, the conference will welcome papers that address topics include (1) cyber risks, (2) longevity risk and ageing, (3) long-term investment products, (4) catastrophe risks and extreme weather
Target Audience: The target audience is academics, economists, risk and insurance researchers and executives with focus on Cyber mainly from Asia.

September

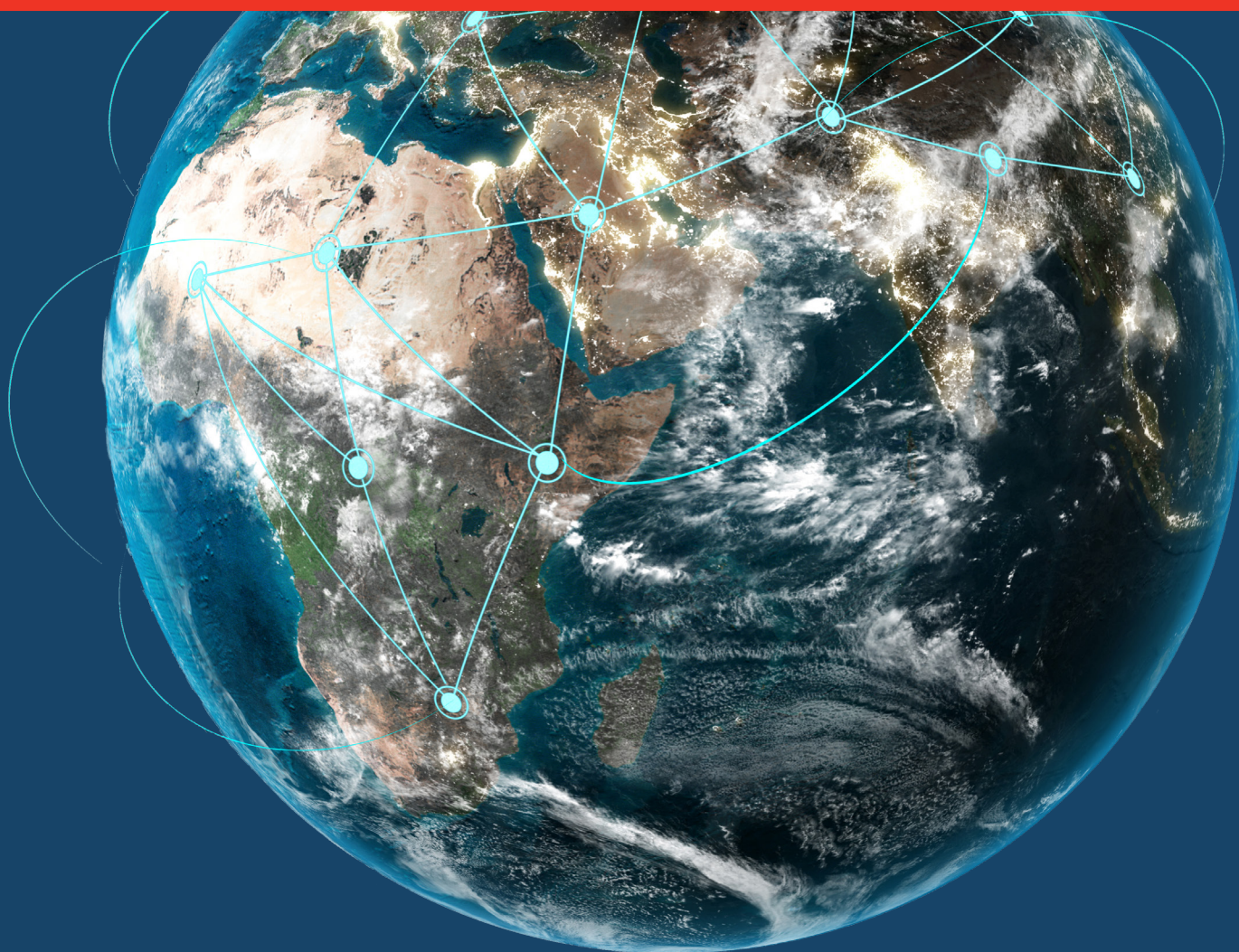
- 4-5, London** **11th Chief Investment Officers**, hosted by Lloyd's (CIO Members only)
Description: To exchange of experiences on key issues facing insurance asset management, and aims to establish a more effective dialogue with the external stakeholders of the insurance industry.
Target Audience: Chief Investment Officers and top asset managers from the largest international insurance and bancassurance groups
- 18-20, London** **44th Seminar of the European Group of Risk and Insurance Economists (EGRIE)**, sponsored by The Geneva Association
Description: Annual meeting of the leading European risk and insurance academics, discussing their latest research (promotes theoretical work on risk and insurance)
Target Audience: Academics, economists, risk and insurance researchers

November

- 2-3, Zürich** **14th Health and Ageing Conference**, hosted by Partner RE
Description: The conference will focus on new and emerging health risks, how they impact health and health financing mechanisms, and how insurance covers and manages these risks.
Target Audience: Participants from insurance and reinsurance companies, universities and related institutions.
- 9-10, Zürich** **13th Annual Liability Conference**, hosted by Zürich Insurance Group
Description: Each year's event draws on the knowledge of The Geneva Association and its members to gain further understanding of the liability challenge and to explore opportunities for insurers to provide the liability solutions needed by commerce and society.
Target Audience: Insurance industry decision-makers in management, risk management, emerging risk detection, underwriting and claims, with guests who are influential policymakers in the public and private sectors.
- 29-30, Zürich** **13th Chief Risk Officer Assembly**, hosted by Swiss Re
Description: Annual meeting of CROs to discuss the latest developments in Risk Management
Target Audience: CROs from insurance companies

Note: All events are upon invitation only.

This booklet provides information on the Geneva Association Extreme Events and Climate Risk Forum.



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