UK-JAPAN WORKSHOP

ON

Climate Modelling and Business Risks

26 & 27 January, 2009

Organiser **Science and Innovation Section, British Embassy Tokyo**

Walker Institute for Climate System Research, University of Reading

Contents

Outline of the Workshop

UK-Japan Workshop on Climate Modelling and Business Risks
The climate is changing, and these changes have the potential to affect all areas of business practice. It is essential that businesses address the impacts of climate change on their activities, preparing to minimise the costs and maximise the opportunities. Building adaptive capacity within a business is essential for adaptation to occur, and one way to do this is through increased knowledge.

Date
26 (Mon) – 27 (Tue) January 2009

Venue
New Hall, British Embassy Tokyo
1 Ichiban-cho, Chiyoda-ku, Tokyo 102-8381, Japan

Organiser
Science and Innovation Section, British Embassy Tokyo
Walker Institute for Climate System Research, University of Reading

Workshop aim
To explore how access to clear climate science information can help climate sensitive businesses make more informed business decisions in the face of environmental change, leading to a more resilient and sustainable business approach.

Workshop content
Through presentations from climate scientists and senior business representatives from both Japan and the UK, and through discussion sessions, the following knowledge building themes will be explored:

- Awareness of the impacts of climate change on business relevant timescales
- Understanding the relevance of these impacts to business practice in Japan
- Awareness of the cutting-edge climate science research taking place in both Japan and the UK
- Importance of partnerships between climate research and industry to help increase and sustain knowledge and hence adaptive capacity
- Understanding business activities and concerns can help climate researchers undertake more end-user driven research

Secretariat
Science and Innovation Section, British Embassy Tokyo

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Workshop Programme

Day 1 (26 January)

Time	Activity		
9.30-10.00	Workshop registration		
10.00-10.10	Welcome speech from Embassy representative		
10.10-10.20	Background, Workshop outline and aims		
SESSION 1: How is climate variability and change affecting Japan? (Parallels with UK)			
Session moderator:			
10.20-10.30	Introduction		
10.30-10.55	How is climate variability and change affecting Japan? Overview from the IPCC Fourth Assessment Report	Dr Jane Strachan	Willis Research Fellow, Walker Institute for Climate System Research, University of Reading
10.55-11.20	How is the climate of Japan changing and projected to change?	Dr Akio Kito	Director, Climate Research Department, Meteorological Research Institute
11.20-11.45	What are the impacts of climate change on Japan?	Dr Yasuaki Hijioka	Senior Researcher, Social and Environmental Systems Division, National Institute for Environmental Studies
11.45-12.00	Questions and Discussion		
12.00-1.00	Lunch		
SESSION 2: Cutting-edge climate science taking place in the UK and Japan			
Session moderator:			
1.00-1.10	Introduction		
1.10-1.35	Societal needs and the challenges for climate science	Dr Pier Luigi Vidale	National Centre for Atmospheric Science – Climate & Walker Institute for Climate System Research, Department of Meteorology University of Reading
1.35-2.00	Met Office Hadley Centre and the UJCC – strategy for seamless climate prediction from months to centuries	Dr Malcolm Roberts	Co-manager, UK-Japan Climate Collaboration, Climate Research, Met Office Hadley Centre
2.00-2.25	Modeling the impacts of climate change and uncertainty on global and regional river flows	Mr Simon Gosling	Research Fellow (Hydrology), Walker Institute for Climate System Research, University of Reading
2.25-2.40	Refreshment break		
2.40-3.05	CLIMATE2030: A Japanese Project for Decadal Climate Prediction	Prof Masahide Kimoto	Centre for Climate System Research, University of Tokyo
3.05-3.30	Shaping CO2 Emission Scenarios with Earth System Modelling	Dr Michio Kawamiya	Group Leader, Frontier Research Centre for Global Change Japan Agency for Marine-Earth Science and Technology
3.30-3.55	Ultra high resolution climate modelling	Prof Masaki Satoh	Associate Professor, Center for Climate System Research, University of Tokyo & Japan Agency for Marine-Earth Science and Technology
3.55-4.15	Questions and Discussion		
4.15-4.25	Wrap-up of day's events, outline for tomorrow		
4.30-6.00	Drinks reception and poster session		

Day 2 (27 January)

Time	Activity		
8.45-9.00	Arrivals		
9.00-9.10	**Introduction to the day's events**		
SESSION 3: Climate Science and Business: examples of climate science influencing business practice and vice versa			
Session moderator:			
9.10-9.35	How the UK Government is helping organisations to adapt to climate change	Ms Clare Hawley	Deputy Director, Adapting to Climate Change Programme, Department for Environment, Food and Rural Affairs
9.35-10.00	Adaptation to Climate Change	Dr Malcolm Roberts	Representing Met Office Consulting
10.00-10.25	Willis Research Network: a long term collaboration between academia and the insurance industry	Mr Rowan Douglas	Managing Director, Willis Re & Chairman, Willis Research Network
10.25-10.50	Adapting the business community to climate change	Mr Gareth Williams	Climate Change Adaptation Business Advisor, Environment, Business in the Community
10.50-11.05	Coffee break		
11.05-11.30	Business and climate change- challenges for business education	Prof Michael Norton	Professor, Innovation Management Institute, Economics Faculty, Shinshu University
11.30-11.55	Introduction of an industry-university collaborative research consortium on climate change	Mr Terumasa Miyoshi	Managing Director and Senior Research Officer, The Tokio Marine Research Institute
11.55-12.20	S5 Programme- Hosted by the Japanese Ministry of the Environment	Dr Seita Emori	Chief, Climate Risk Assessment Research Section, Center for Global Environmental Research, National Institute for Environmental Studies
12.20-12.45	Questions and Discussion		
12.45-1.30	**Next steps- discussion of action plans**		
1.30-2.15	Lunch		

[Reference] Programme for the Open Seminar (27 January)

Time	Activity		
2.30 – 3.00	Registration		
3.00 – 3.10	Opening Remarks: **Mr David Fitton,** Minister, British Embassy		
3.10 – 3.30	Societal needs and the challenges for climate science?	Dr Pier Luigi Vidale	National Centre for Atmospheric Science – Climate & Walker Institute for Climate System Research, Department of Meteorology, University of Reading
3.30 – 3.50	How to Understand Global Warming Risks?	Dr Seita Emori	Chief, Climate Risk Assessment Research Section, Center for Global Environmental Research, National Institute for Environmental Studies
3.50 – 4.10	The Importance of Climate Change to the Insurance industry	Mr Rowan Douglas	Managing Director, Willis Re & Chairman, Willis Research Network
4.10 – 4.25	Q&A Session		
4.25 – 4.40	Coffee Break		
4.40 – 5.00	Role of insurance in climate change adaptation	Mr Terumasa Miyoshi	Managing Director and Senior Research Officer, The Tokio Marine Research Institute
5.00 – 5.20	Adapting the business community to climate change	Mr Gareth Williams	Climate Change Adaptation Business Advisor, Environment, Business in the Community
5.20 – 5.40	How the UK Government is helping organisations to adapt to climate change	Ms Clare Hawley	Deputy Director, Adapting to Climate Change Programme, Defra
5.40 – 5.55	Q&A Session		
5.55 – 6.00	**Closing remarks**		
6.00 – 7.30	Reception (and poster session)		

Workshop Participants

- Alphabetical Order by Organisation Names
- Presenters in bold

UK-based Participants

1.	**Mr Gareth Williams**	**Climate Change Adaptation Business Advisor Environment, Business in the Community**
2.	**Ms Clare Hawley**	**Deputy Director, Adapting to Climate Change Programme Department for Environment, Food and Rural Affairs**
3.	**Dr Malcolm Roberts**	**Co-manager, UK-Japan Climate Collaboration, Climate Research, Met Office Hadley Centre**
4.	**Dr Simon Gosling**	**Research Fellow (Hydrology), Walker Institute for Climate System Research, University of Reading**
5.	**Dr Jane Strachan**	**Willis Research Fellow, Walker Institute for Climate System Research, University of Reading**
6.	**Dr Pier Luigi Vidale**	**National Centre for Atmospheric Science – Climate & Walker Institute for Climate System Research, Department of Meteorology, University of Reading**
7.	**Mr Rowan Douglas**	**Managing Director, Willis Re & Chairman, Willis Research Network**

Japan-based Participants (1)

1.	Mr Takafumi Hashitani	Director, Environmental Engineering Center Corporate Environmental Affairs Unit, Fujitsu Ltd.
2.	**Dr Michio Kawamiya**	**Group Leader, Frontier Research Centre for Global Change, Japan Agency for Marine-Earth Science and Technology (JAMSTEC)**
3.		Japan Agency for Marine-Earth Science and Technology
4.		Japan Agency for Marine-Earth Science and Technology
5.	Mr Yasunori Abe	V.P. Environmental Affairs, Japan Airlines
6.	Dr Kazuo Kurihara	Head, Third Research Laboratory, Atmospheric Environment and Applied Meteorology Research Department, Meteorological Research Institute, Japan Meteorological Agency
7.	Dr Hiroatsu Maki	Director, Atmospheric Environment and Applied Meteorology Research Department, Meteorological Research Institute, Japan Meteorological Agency
8.	Dr Yasushi Suzuki	Deputy General Manager, Administrative Planning Dept., Japan Weather Association
9.	Mr Dave Mateo	LRQA Japan
10.	**Prof Akio Kito**	**Director, Climate Research Department, Meteorological Research Institute**
11.	Mr Hirota Tani	Director, Office for Earth and Environmental Science and Technology, Research and Development Bureau, Ministry of Education, Culture, Sports, Science and Technology
12.	Mr Shinichiro Toyomura (26) Mr Toru Hashimoto (27)	Office of Research and Information, Global Environment Bureau, Ministry of the Environment
13.	Mr Masaaki Naoe	Deputy General Manager, CSR Department, Mitsubishi Estate Co., Ltd.
14.	Mr Goro Shiina	Deputy Director, Financial Solutions Department, Mitsui Sumitomo Insurance
15.	Dr Masayuki Nishimori	Senior Researcher, Division of Agro-Meteorology (Atmospheric Science), National Institute of Agro-Environmental Science

Japan-based Participants (2)

16.	**Dr Seita Emori**	**Chief, Climate Risk Assessment Research Section, Center for Global Environmental Research, National Institute for Environmental Studies**
17.	**Dr Yasuaki Hijioka**	**Senior Researcher, Social and Environmental Systems Division, National Institute for Environmental Studies**
18.	Dr Kiyoshi Takahashi	National Institute for Environmental Studies
19.	Mr Kazuki Norose	Social System Consulting Department, Nomura Research Institute
20.	Mr Masashi Sato	Assistant Manager, Social System Consulting Department, Nomura Research Institute
21.	Mr Hiroshi Uramoto	Senior Management, Corporate Environment Division, Ricoh Company, Ltd.
22.	**Prof Michael Norton**	**Professor, Innovation Management Institute, Economics Faculty, Shinshu University**
23.	Mr Hidemi Tomita (26 only)	CSR Department, Sony Corporation
24.	Mr Hirokazu Yasuda (27 only)	Counselor, Project Promotion Group, Ecology Div., Taisei Corporation
25.	Dr Shiekazu Sumita (27 only)	Director, Corporate Technology Planning Dept., TDK Corporation
26.	Mr Naoki Arai	Executive Adviser, Teijin Limited
27.	**Mr Terumasa Miyoshi**	**Managing Director and Senior Research Officer, The Tokio Marine Research Institute**
28.	Mr Daisuke Sakai	Deputy Manager, Research & Institutional Relations, Corporate Planning Department, Tokyo Electric Power Company
29.	Ms Makiko Ito	Engineering Section, Environmental Affairs Department, Tokyo Gas Co., Ltd.
30.	Mr Hiroaki Suganuma (26) Mr Mitsuru Muraki (27)	Manager, Corporate, Planning Department/ General Manager, Planning Department Tokio Marine & Nichido Fire Insurance
31.	Mr Kenji Kimura	Director for Environmental Policies, Environmental Policy, Division, Bureau of Environment, Tokyo Metropolitan Government
32.	**Prof Masahide Kimoto**	**Centre for Climate System Research, University of Tokyo**
33.	**Prof Masaki Satoh**	**Associate Professor, Center for Climate System Research, University of Tokyo & Japan Agency for Marine-Earth Science and Technology**
34.	Dr Tomonori Sato	Center for Climate System Research, The University of Tokyo
35.		Willis Re
36.	Ms Masako Konishi	Climate Change Program Officer, WWF Japan
37.		Yokohama City
38.		
39.		

Speaker CVs and Abstracts

Session 1 – Talk 1: Dr Jane Strachan

Willis Research Fellow, Walker Institute for Climate System Research, University of Reading

Short CV

After completing an MPhys in Theoretical Physics at the University of York I moved to Reading University to undertake a PhD in Climatology. During my PhD I was selected for a fellowship position at the UK Parliamentary Office of Science and Technology to produce briefing material on adapting to climate change in developing countries. As a Willis Research Fellow I now undertake research to help inform the insurance industry about climate related risk.

Current Research Interests

- Application of global climate model simulations for impact studies relating to the insurance industry.
- Dynamical climate modelling and its integration with the statistical approaches used in catastrophe modelling.
- Simulation of tropical cyclones in global climate models and the extraction of impact relevant information.

Presentation Title

How is climate variability and change affecting Japan? Overview from the IPCC Fourth Assessment Report

Presentation Abstract

During this presentation a summary will be given on how the climate is changing in East Asia, particularly in Japan, and how these changes are leading to significant social, economic and environmental impacts.
This summary of observations and projections has been taken from the Intergovernmental Panel on Climate Change Fourth Assessment Report (IPCC AR4), which was released to the public in 2007. This comprehensive report contains findings from thousands of researchers on the latest scientific, technical and socio-economic literature produced worldwide relevant to the understanding of the risk of climate change, its observed and projected impacts and options for adaptation and mitigation.
It is shown that Japan is sensitive to shifts in mean climate, such as increases in average temperature in both winter and summer months. These subtle shifts can lead to large impacts in many sectors including crop production, energy demand, tourism and retail. Japan is also likely to experience more extreme climate related events. Increased frequency and intensity flooding as a result of intense rainfall events, tropical cyclones, sea-level rise or a combination of these, has significant impacts on the insurance industry, and industrial and transport systems, especially those located on the densely populated coastal regions.
These examples show that the impacts of climate change are not just projections, they are already being observed and effecting multiple business sectors. Businesses will need to begin responding to these impacts.

Session 1 – Talk 2: Dr Akio Kito

Director, Climate Research Department, Meteorological Research Institute

Short CV

He graduated Kyoto University and joined Japan Meteorological Agency (JMA) in 1978. He moved to Meteorological Research Institute (MRI) in 1980, since then he is engaging in development of MRI climate models and performing numerical experiments and analyses on monsoons, El Niño/Southern Oscillation (ENSO), past and future climate. He engaged in the 2nd, 3rd and 4th IPCC WGI Assessment Report as a lead author. As a Director of the Climate Research Department of MRI, he is leading two projects on future climate projections. He got the Society Award of the Meteorological Society of Japan in 1993, and the Okada Award of the Japan Weather Association in 2008.

Presentation Title

How is the climate of Japan changing and projected to change?

Presentation Abstract

First, observed changes of climate of Japan since 1898 are summarized. Annual mean surface air temperature in Japan has been rising at a rate of about 1.10°C per century. There are large decadal fluctuations in precipitation and no significant trend is discernible, but the fluctuations have gradually increased. Long-term trends in extreme temperatures and precipitation are shown. Data from about 1,300 regional meteorological observing stations since the late 1970s shows a clear increase og heavy rainfall in Japan.
Next, our modeling activity is introduced. We perform climate projections in the near future and at the end of the 21st century with a global 20-km mesh AGCM with emphasis on various extreme events including tropical cyclones and heavy precipitation during the rainy season. Furthermore, focusing on the local climate

change over Japan, 5-km mesh regional atmospheric model embedded in the global model is utilized to investigate the frequency change of heavy precipitation. Uncertainty of projected climate change are quantified with multiple sets of ensemble experiments to provide information on reliability for the users of simulated results based on a 60-km mesh AGCM experiments.

Session 1 – Talk 3: Dr Yasuaki Hijioka

Senior Researcher, Social and Environmental Systems Division, National Institute for Environmental Studies

Short CV

Yasuaki Hijioka is a senior researcher at the National Institute for Environmental Studies in Japan. He received his Doctor of Engineering from the University of Tokyo, Japan in 2001. After graduating the university, he has started his current job. His research topics cover modeling analysis for environmental issues related to climate change impacts, and he is involved in the development of the Asian-Pacific Integrated Model (AIM) to estimate climate change impacts and to assess policy options for stabilizing global climate change.

Presentation Title

What are the impacts of climate change on Japan?

Presentation Abstract

This presentation introduces a compilation of the research results for the first three years (fiscal 2005-2007) of the Global Environment Research Fund Strategic R&D Area Project entitled “S-4 Comprehensive Assessment of Climate Change Impacts to Determine the Dangerous Level of Global Warming and Appropriate Stabilization Target of Atmospheric GHG Concentration” being implemented by the Ministry of the Environment, Japan.

In the first part of the research term up to fiscal 2007, targeting the period up to the end of the present century while focusing on the period up to around 2050, the project have made projections of climate change impacts on Japan as well as economic assessments in key fields such as water resources, forests, agriculture, coastal zones, and human health. The project have also developed an integrated assessment model in order to comprehensively analyze and assess the impacts and risks, and conducted quantitative studies to elucidate the levels and regional distributions of impacts occurring in Japan as well as their rate of appearance in Japan. The results of these studies reveal that although the level of impact and rate of increase vary according to the field, severe impacts will also appear in Japan even with a relatively low temperature increases, and that while impacts will vary by region, there are especially vulnerable regions for each field.

Session 2 – Talk 1: Dr Pier Luigi Vidale

National Centre for Atmospheric Science – Climate
Walker Institute for Climate System Research, Department of Meteorology, University of Reading

Short CV

Dr. Vidale obtained his Ph.D. from Colorado State University in 1998, with research on land surface processes within NASA's BOREAS project. Since then, he has worked on biosphere-atmosphere interactions and high-resolution climate modelling at CSU, UC Santa Barbara, ETH Zürich and Reading University, including the supervision of several master's and Ph.D. students. Dr. Vidale is a Joint Climate Research Programme and National Centre for Atmospheric Science Principal Investigator; currently he is also the (NERC) lead PI for two major global high-resolution climate modelling consortia in the UK and Japan: the UK-Japan Climate Collaboration, NERC (2004-present), and the UK High-Resolution Global Atmospheric Modelling (HiGEM). Dr. Vidale is a member of NERC’s Peer Reviewer’s College, of the Joint UK Land and Ecosystems Simulator (JULES) Board and of the Met Office Hadley Centre HadGEM2 Project Assurance Team as well as the HadGEM next model development team (MORPH3). Dr. Vidale is Director of the joint UJCC-NCAS Summer School on Climate Modelling, held bi-annually at Cambridge University, UK.

Presentation Title

Societal needs and the challenges for climate science

Presentation Abstract

We introduce recent developments in climate modeling science that will lead the way to effective prediction and attribution of climate change at the regional scale.

Our main points:

- Current (IPCC AR4) global climate models lack many of the skills required to answer questions that society needs for decision-making at the regional scale;
- A new generation of GCMs combines the capabilities previously in the domain of Regional Climate Models, providing:
  - o globally consistent synthetic data sets, traceable in terms of mechanisms
  - o global information at scales that start to be appropriate for regional impacts studies
- HOWEVER, very robust statistical techniques and intensive use of observations need to be applied before we can make significant statements about climate variability and change at the regional scale
- Examples from long-term, high-resolution global climate simulations, performed on the Earth Simulator and in the UK, indicate that combining simulation length, resolution and ensemble techniques is already helping us to complement and interpret current observations, providing some of the pre-requisite capabilities for climate prediction at the regional scale;
- The UJCC experience has had a large impact on UK climate modelling practice, in particular in terms of Met Office and NERC future strategies;
- Our participation in the next IPCC, with the submission of near-term, high resolution decadal predictions to CMIP5, embodies the essence of UJCC and HiGEM, marking the shift to a new level of collaboration between NERC and the Met Office under the Joint Climate Research Programme.

Session 2 – Talk 2: Dr Malcolm Roberts

Co-manager, UK-Japan Climate Collaboration, Climate Research, Met Office Hadley Centre

Short CV

Graduated from Nottingham University in 1991 with 1st class degree in Mathematics. Joined the Met Office Hadley Centre straight from university, initially working in the ocean modelling area. Completed a PhD in Ocean Modelling in 1998 at the University of Reading while working at the Met Office. Started working on the UK-Japan Climate Collaboration, a joint project with NCAS-Climate at the University of Reading, the JAMSTEC Earth Simulator Centre and the Center for Climate System Research at the University of Tokyo in 2004.

Presentation Title

Met Office Hadley Centre and the UJCC – strategy for seamless climate prediction from months to centuries

Presentation Abstract

With increasing demands on climate models to produce predictions with increased regional and local detail, while also giving probabilistic predictions, reducing uncertainty and including more complexity, there is a need to have a strategy to meet all these separate demands in a consistent way.

The Met Office Hadley Centre, in collaboration with the Natural Environment Research Council, are developing a hierarchy of models to span a range of timescales from days to centuries, and spatial scales from the global to the local, in order to provide the best advice to our customers, both governmental and commercial. This strategy and some examples of applications will be described in the presentation.

Session 2 – Talk 3: Mr Simon Gosling

Research Fellow (Hydrology), Walker Institute for Climate System Research, University of Reading

Short CV

Education

King's College London: Ph.D. Climate Change, Uncertainty & Heat-Related Mortality
University of Birmingham: M.Sc. Applied Meteorology and Climatology - with *Distinction*
University of Birmingham: B.Sc.(Hons) Physical Geography - *1st Class*
London School of Economics and Political Science: Postgraduate Certificate in Higher Education

Societies

Fellow of the Royal Geographical Society (F.R.G.S)
Fellow of the Higher Education Academy (F.H.E.A)
Associate Fellow of the Royal Meteorological Society

Recent Publications

Gosling SN et al. (2009) Climate change and heat-related mortality in six cities Part 2: Climate model evaluation, sensitivity analysis, and estimation of future impacts. *International Journal of Biometeorology* 53: 31-51

Gosling SN et al. (2008) Associations between elevated atmospheric temperature and human mortality: a critical review of the literature. *Climatic Change* doi:10.1007/s10584-008-9441-x

Presentation Title
Modeling the impacts of climate change and uncertainty on global and regional river flows

Presentation Abstract
Hydrological extremes have been associated with some of the most costly natural disasters in recent times. For example, river flooding in northern England in 2007 resulted in total insurance claims exceeding £1.5billion(GBP). To prepare for, and adapt to future extreme events, knowledge of the uncertainty in their frequency and magnitude is required to inform the decision making process.
Mac-PDM is a global hydrological model that is run with climate change data from climate models to simulate river flows on a 0.5ºx0.5º grid across the global domain. Validation exercises have demonstrated that Mac-PDM is capable of simulating present river flows to a good level of accuracy. A useful Mac-PDM output indicator of high river flows and therefore also of flood risk, is the 10-year return period maximum monthly runoff. This is the greatest monthly river flow that would be expected on average to occur once every 10 years.
The impacts of 2 sources of climate change uncertainty on future river flows are explored: (1) uncertainty in the degree of global warming, and (2) uncertainty due to climate model physics. Firstly we demonstrate spatial patterns in the 10-year return period maximum monthly runoff for global warming scenarios that are 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, 5.0, and 6.0˚C warmer than present. Secondly we present spatial patterns in the 10-year return period maximum monthly runoff when Mac-PDM is run with climate data from different climate models. In both cases, global and national (UK and Japan) patterns are explored.

Session 2 – Talk 4: Prof Masahide Kimoto

Centre for Climate System Research, University of Tokyo

Short CV
Masahide Kimoto is Professor and Deputy Director of the Center for Climate System Research (CCSR), University of Tokyo, Japan. He received a PhD in Atmospheric Sciences in 1989 from the University of California at Los Angeles. He joined Japan Meteorological Agency in 1980 after graduation from Kyoto University and moved to CCSR, Univ of Tokyo, in 1994. His research interest is climate variability and climate modeling. He acts as a principal investigator of Japanese CLIMATE2030 project which attempts at making near-term projections with a climate model initialized by observed data. He received Meteorological Society of Japan Award in 2004.

Presentation Title
CLIMATE2030: A Japanese Project for Decadal Climate Prediction

Presentation Abstract
CLIMATE2030 is a Japanese project for near-term climate projection which is a new category of internationally coordinated experiment toward the next IPCC assessment report. In the near-term projection, prediction of natural climate variability is important as well as those associated with anthropogenic climate forcing. In the CLIMATE2030 project, we update the coupled ocean-atmosphere climate model, MIROC, and develop an initialization scheme for decadal predictions by using historical subsurface ocean data. In addition to limited number of high-resolution (60 km atmosphere + 20x30 km ocean) ensemble predictions, a comprehensive suite of hindcast and forecast experiments are conducted by using a medium resolution (280 km atmos. + 140 km ocean) version of MIROC in order to explore impact of initialization and to assess predictability of natural climate variations. The system for assimilation and prediction by MIROC is called SPAM and is being tested not only for decadal prediction but also for seasonal to interannual predictions.
An initial result of SPAM on decadal prediction is reported. It is found in the hindcast experiments that there is useful decadal predictability in one of the well-known natural decadal modes, called the Pacific Decadal Oscillation (PDO), which is known to affect the pan-Pacific climate and ecosystems. In a prediction experiment started in year 2005, the PDO signal is expected to suppress the present global warming trend in the coming decade albeit with enhancement in some regions including the East Asia. The initial tendency of PDO polarity change has been successfully verified by observations.

Session 2 – Talk 5: Dr Michio Kawamiya

Group Leader, Frontier Research Centre for Global Change, Japan Agency for Marine-Earth Science and

Technology

Short CV
Dr. Michio Kawamiya received his PhD in Oceanography from the University of Tokyo, Japan in 1997. He since has held research positions at the University of Tokyo and the University of Kiel, Germany and JAMSTEC. He has been a Group Leader at JAMSTEC since 2004. His interests include modelling of carbon cycle, ocean ecosystem, and global warming projection. He is a contributing author of IPCC AR4, and a member of the national committee for IMBER, the editorial boards of "Journal of Oceanography" and "Geoscientific Model Development".

Presentation Title
Shaping CO2 Emission Scenarios with Earth System Modelling

Presentation Abstract
There are significant uncertainties in CO2 concentration projection. It has been pointed out that there could be a positive feedback between climate warming and carbon cycle but its strength differs by an order of magnitude among different models. Moreover, model-model differences in CO2 concentration projection based on the same emission scenario are comparable to those among different SRES concentration scenarios. Therefore it is important to examine the role of biogeochemical processes, such as carbon cycle, in projection of future climate. Indeed, many of recent climate models include terrestrial and oceanic carbon cycle. Such climate models can contribute to establishing scenarios to achieve stabilization of CO2 concentration by calculating backward emission pathways under stabilization scenarios. Another trend in global warming projection studies is to utilize simulation data in order to grasp impacts of climate change on people's life. To establish a link between climate modellers and impact researchers, Task Group for Climate Scenario (TGCS) has been created in Japan. TGCS's first priority is to facilitate information exchange between KAKUSHIN by MEXT and S-5 (and S-4) by MOE, national programs for global warming projection and impact assessment, respectively, but it is hoped that TGCS's activities will cover a wider scope and involve researchers outside the above-mentioned programs in future.

Session 2 – Talk 6: Prof Masaki Satoh

Associate Professor, Center for Climate System Research, University of Tokyo
Japan Agency for Marine-Earth Science and Technology

Short CV
Mar. 1993: Ph.D (Science), the University of Tokyo
Apr. 1993-Jul. 1993: Postdoctoral researcher of JSPS, working at Center for Climate System Research, the University of Tokyo
Aug. 1993-Mar. 2005: Saitama Institute of Technology (Aug. 1993-Dec. 1996: Lecturer; Jan. 1997-Mar. 2005: Associate Professor)
Apr. 1998-Mar. 1999: Department of Applied Mathematics and Theoretical Physics, Cambridge Univ.(UK), Senior visiting scholar
Oct. 1999-present: Frontier Research Center for Global Change (FRCGC), JAMSTEC (part time), researcher
Apr. 2005-present: Center for Climate System Research, Univ. of Tokyo, associate professor

Presentation Title
Ultra high resolution climate modelling

Presentation Abstract
NICAM - the Nonhydrostatic ICosahedral Atmospheric Model – is an extremely high-resolution atmospheric global model which simulates meso-scale cloud systems over the Earth with a few kilo-meter grid system. Because high computer resources are required to use NICAM, the simulation time cannot be extended more than several months under the present available super-computer. Successful results are shown for one-month simulations of the Madden-Julian Oscillation (MJO) and associated genesis of tropical cyclones. NICAM reproduces cloud distributions very similar to satellite observations. In particular, multi-scale structure of cloud systems seen in the tropics, that is, meso-scale convective circulations (~10km), cloud clusters (~100km), super-cloud clusters (~1,000km), and MJO (~3,000km). NICAM also simulates tropical cyclones which are closely related to the intra-seasonal variability including MJO. One of the prospects of NICAM is to use it for a month to seasonal forecasts. NICAM is also planned to use for climate studies such as future global warming predictions, at least under time slice conditions. NICAM is expected to reduce uncertainties related to cloud properties in climate simulations, since clouds are most ambiguous components of global warming prediction using current climate models.

Session 3 – Talk 1: Ms Clare Hawley

Deputy Director, Adapting to Climate Change Programme, Department for Environment, Food and Rural Affairs

Short CV

I am the joint Deputy Director in charge of the Government's Adapting to Climate Change Programme. We are a cross-Government Programme aimed at adapting the country to climate change through providing evidence, information and tools, a legislative framework and monitoring and enforcement. We work in every sector but concentrate at present on the public sector.

Presentation Title

How the UK Government is helping organisations to adapt to climate change

Presentation Abstract

At the beginning of 2008, the UK Government set up the new central government "Adapting to Climate Change Programme", led from the Environment Department. The Programme's objective is to ensure that society, the economy and the environment adapt successfully to the changing UK climate. The Programme has developed a new legislative framework, and work is continuing at national, regional and local level to provide information, climate projections, methodologies and incentives to enable successful and sustainable adaptation.

The talk will cover the Programme's four workstreams, its priority projects and principles.

Session 3 – Talk 2: Dr Malcolm Roberts

Co-manager, UK-Japan Climate Collaboration, Climate Research, Met Office Hadley Centre

Short CV

See “Session 2 – Talk 2: Dr Malcolm Roberts”

Presentation Title

Adaptation to climate change

Presentation Abstract

We are committed to a certain amount of climate change through our past emissions of greenhouse gases, and hence as well as trying to reduce future emissions, we need to plan and take actions now to adapt to our future climate. Adaptation can help us to reduce the impact of the adverse effects of climate change, and potentially take advantage of any beneficial effects. The Met Office Hadley Centre’s climate model outputs have been used by a variety of government and industry sectors to make plans to deal with climate change, and change their current practices with a view to the future. The transport sector is interested in extreme temperatures and precipitation as well as storm surges, while the water sector has to deal with problems caused by both lack of water (drought), as well as excess water (flooding). The Met Office has been involved in a large project with all of the major energy companies in the UK to investigate the many ways in which climate change will interact with energy production and distribution, and some of these areas will also be discussed.

Session 3 – Talk 3: Mr Rowan Douglas

Managing Director, Willis Re & Chairman, Willis Research Network

Short CV

Rowan Douglas is Managing Director at Willis Re responsible for the analysis of regulatory capital, enterprise risk management, natural catastrophe risk modelling and actuarial analysis to support reinsurance transactions and portfolio management.

Rowan is also Chairman of the Willis Research Network, the world's largest collaboration between science and the re/insurance industry.

In 2008 he was appointed to the Natural Environment Research Council (NERC) which is responsible for allocating approximately £500m of annual research funding each year.

He was educated in geography at Durham University (BA) and the University of Bristol (MPhil) and sits on a range of academic advisory boards.

Presentation Title
Willis Research Network: a long term collaboration between academia and the insurance industry

Presentation Abstract
Integrating insurance and academic scientific communities and aligning research agendas is absolutely critical to ensure that high quality research has the maximum influence, impact and influence within industry and wider society. The Willis Research Network, a large programme with sixteen universities is undertaking this via a distinctive philosophy, structure and funding mechanism which has matched the needs of both sides and driven practical research of high academic standing.
The presentation will illustrate how the research agenda has been developed, the key themes and outputs and how this has become integrated in the management and trading of leading reinsurance organisations around the world. The presentation will also provide a summary of expected future developments
The session will summarise the factors which have contributed to the Network's success and highlight how opportunities for further Anglo-Japanese collaboration may be further facilitated by some of these approaches.

Session 3 – Talk 4: Mr Gareth Williams

Climate Change Adaptation Business Advisor, Environment, Business in the Community

Short CV
BSc (Hons) in Engineering Business Development, Bournemouth University, England
10 years in the manufacturing sector, working in design, development, engineering and management.
MSc in Design for Sustainability from Cranfield University, England
Consultant for Buckinghamshire County Council and Aylesbury Vale District Council, undertook the first combined Local Climate Impacts Profile identifying the financial, operational and reputational impacts from historical weather to local and district council services.
Project consultant for the UK Climate Impacts Programme (UKCIP), involved with two climate change studies; looking at the impact of the 2007 floods on small and medium companies, and assessing local authority adaptation strategies and action plans across the UK.
Currently regional climate change adaptation business advisor for the North East of England conducting a pilot 12 month project to provide advice and support to businesses across the region to help them adapt to climate change by identifying risks, increasing resilience and identifying opportunities.

Presentation Title
Adapting the business community to climate change

Presentation Abstract
Climate change adaptation is, in essence, a process by which a company increases its resilience to current extreme weather and prepares for the inevitable impacts of future climate change. The impacts from climate change can represent both risks and opportunities, identifying and managing these impacts are an important aspect of the long term sustainability of any business.
The presentation provides an overview of the approach taken in the North East of England, working with regional business networks, local and national government agencies and other key stakeholders to inform and assist the business community in becoming more resilient to current severe weather and future climate change. Including details of the approach taken, the message to engage companies and examples of working with local businesses to assist them in; identifying and addressing the risks and impacts of current severe weather, identifying future climate change risks to the business, investigating where commercial opportunities may present themselves and incorporating climate change into future business strategies. Including three case studies, benefits of the resilience from flooding for a micro business, adapting major capital projects to the effects of climate change and potential opportunities in new markets.

Session 3 – Talk 5: Prof Michael Norton

Professor, Innovation Management Institute, Economics Faculty, Shinshu University

Short CV

Michael Norton obtained his BSc and PhD degrees in chemistry at Bristol University. He was a researcher at ICI (1970-74), and then joined the UK government science service. After 8 years working on environmental pollution, he spent 4 years in the USA as Science Attache, specialising in environment and biosciences. He returned to the UK to direct biotechnology research in a DTI Laboratory (1986-9) but was then chosen to set up a the new Parliamentary Office of Science and Technology. He developed POST's advisory services and oversaw its adoption as a formal part of the UK Parliament (1989-1998). From 1998 to 2004, he was Counsellor Science and Technology at the British embassy in Tokyo and promoted UK-Japan collaboration in S&T – particularly in environmental sciences and sustainability. He then took up a temporary Professorship at Tokyo Institute of Technology, teaching innovation, management of technology, and sustainable development. From April 2006 he became a Professor at Shinshu University specializing in innovation clusters, and environmental sustainability. He is a Fellow of the Royal Society of Chemistry.
http://www.im.shinshu-u.ac.jp/staff/norton/norton2008.htm

Presentation Title
Business and climate change-challenges for business education

Presentation Abstract
Businesses are increasingly unable to avoid considering the implications of climate change. Many may well see it as a threat to be contained (or avoided if possible), but others have started to adapt their business models to reflect the real and perceived threats from climate change. Unfortunately many of these responses are rather superficial as the plethora of 'green-tinged' advertising on TV demonstrates, and there remains some scepticism over the depth of business's commitment to engaging with climate change.
One problem is that there is very little provided in business schools on the fundamental shifts in business practice (and the economy) required for a more sustainable future; thus environmental issues continue to be seen as marginal externalities, or passing fads with an unreliable market. The Japanese Environment Ministry is concerned about this and is supporting the development of new curricula in management schools to train managers and technicians to understand the underlying seriousness of the sustainability challenge, and to see this as a central target for their business innovation.
This talk will explore the background thinking to this programme and describe the proposals under development at Shinshu University for a new Masters course aimed at equipping employees at SMEs with the knowledge and skills to enable their companies to develop new products and services contributing to sustainability and avoiding climate change.

Session 3 – Talk 6: Mr Terumasa Miyoshi

Managing Director and Senior Research Officer, The Tokio Marine Research Institute

Short CV
Terumasa Miyoshi has been Managing Director of "The Tokio Marine Research Institute" (TMRI) since June 2008, one year after joining TMRI as Director in 2007. TMRI is a think tank of Tokio Marine Group and conducts global warming/climate change related joint research with The Center for Climate System Research of The University of Tokyo.
Prior to joining TMRI, Miyoshi served 2004-2007 as Managing Director of Tokio Marine & Fire Insurance Co. (Singapore) Pte. Ltd., 2002-2004 as General Manager of Personnel Planning Department of "The Tokio Marine and Fire Insurance Co., Ltd."(Currently "Tokio Marine & Nichido Fire Insurance Co., Ltd.") with 14 years' overseas assignment as a Representative of Los Angeles Office (1979-1984) and the Chief Representative of Brussels Office (1995-2000) in addition to Exeter, UK and Singapore.
Miyoshi graduated from Hitotsubashi University, Japan, with LLB (1974), joined Tokio Marine in 1974 and participated in a graduate study program (1975-1976) at University of Exeter, UK.

Presentation Title
Introduction of an industry-university collaborative research consortium on climate change

Presentation Abstract
With "the protection of global environment" as a corporate philosophy, Tokio Marine & Nichido Fire Insurance Co., Ltd. have been carrying out various initiatives for putting the philosophy into practice, on the understanding that global warming/climate change is one of the most serious risks common to all human beings and the earth and its eco system.
Such initiatives include risk research on global warming/climate change.
Representing Tokio Marine Group, The Tokio Marine Research Institute conducts research on impacts of climate change on weather-related natural disasters and projections of loss or damages from them, based on industry-university collaboration with The University of Tokyo.

In the presentation, we introduce our industry-university collaborative research consortium on climate change. Firstly, we start it with several thoughts behind our collaborative research by referring to the devastating impacts of Hurricane Katrina 2005 on US economy and lessons learnt from typhoons in Japan. Secondly, we explain necessity for a new risk assessment method and the purpose of our collaborative research. Thirdly, we make the framework of our consortium clear. Fourthly, we show how we are thinking to apply new knowledge to industrial technologies. Fifthly, we clarify further potentialities of collaborative research's expansion in application building. And last but not least we touch upon some of our new roles that we are thinking that we need to bear domestically as well as globally.

Session 3 – Talk 7: Dr Seita

Chief, Climate Risk Assessment Research Section, Center for Global Environmental Research, National Institute for Environmental Studies

Short CV

1997 Researcher, Atmospheric Physics Section, Atmospheric Environment Division, National Institute for Environmental Studies
2001 Researcher, Integrated Modeling Research Program, Frontier Research System for Global Change
2004 Senior Researcher, Atmospheric Physics Section, Atmospheric Environment Division, National Institute for Environmental Studies
2006 Chief, Climate Risk Assessment Research Section, Center for Global Environmental Research, National Institute for Environmental Studies
Also serving as:
Group Leader, Global Warming Research Program, Frontier Research Center for Global Change, Japan Agency for Marine-Earth Science and Technology
Associate Professor, Center for Climate System Research, the University of Tokyo

Presentation Title

Presentation Abstract

Presentation Slides