

Victorian Adaptation Forum 2014

*Strengthening adaptation policy and practice through
co-production research*



19 and 20 March 2014

Rydges on Swanston

701 Swanston St, Carlton VIC 3053

Presented by:



Victorian Adaptation Forum overview

The 2014 Victorian Adaptation Forum comes after a year of record breaking heat waves, extreme weather, floods and fires across Australia, and one year after the release of the Victorian Climate Change Adaptation Plan (VCCAP) which will shape the agenda for adaptation action in this state. The forum will explore how greater collaboration and closer engagement with the research sector can strengthen adaptation policy and practice to better equip the Victorian community in the face of a changing climate.

Keynote presentations, round-table discussions, research workshops and presentation sessions are organised around priority areas identified in the VCCAP, from assets and infrastructure to natural assets, from industry to partnerships with local government and community. These will provide local and state government decision-makers, researchers and others stakeholders with knowledge to better prepare for and manage the impacts of climate related events.

The forum aims to demonstrate how greater collaboration and closer engagement between researchers, policy makers and practitioners can strengthen adaptation policy and practice and support greater climate resilience in Victorian communities and industries.

The presentations, workshops, parallel sessions and discussion at the forum will be framed by four strategic questions:

1. How have research endeavours to date been used in capacity building and/or adaptation policy development and practice?
2. What are the key challenges to using adaptation research for policy development and practice?
3. When is co-production of knowledge needed to generate research outcomes relevant to policy and practice?
4. What additional steps are needed to translate research into action?

Forum highlights

- Keynote address by Lord John Krebs FRS, Chair of House of Lords Select Committee on Science and Technology
- A private sector corporate social responsibility adaptation case study presented by Olivia Tyler from Treasury Wine Estates
- Presentation of climate adaptation research and its benefits to Victoria by Kevin Hennessy from CSIRO, Neil Plummer from the Bureau of Meteorology Professor Jean Palutikof of the National Climate Change Adaptation Research Facility (NCCARF) and Professor Rod Keenan from VCCCAR
- Workshops showcasing the latest climate adaptation research in VCCCAR
- Sessions on priority themes identified in the Victorian Climate Change Adaptation Plan
- A review and reflection on adaptation research in Australia by Dr Benjamin Preston from Oakridge National Laboratories (USA).

About the organisers

The 2014 Victorian Adaptation Forum is presented by the Victorian Centre for Climate Change Adaptation Research (VCCCAR), CSIRO and the Bureau of Meteorology.

Program

VCCCAR research workshops – Wednesday 19 March 2014

Rydges on Swanston, 701 Swanston Street, Carlton

These workshops present results from recent VCCCAR research projects explore the application of adaptation research to decision-making and consider future research needs. There will be project presentations with responses from government and the opportunity for general discussion on the role of research in supporting decision-making in the sectors involved with the projects.

Time	Activity	Location
12.00-1.00pm	Registration	Parkview Lounge
12.30-1.00 pm	Complementary lunch	Parkview Lounge
1.00-1.15 pm	Welcome and overview of the VCCCAR research program Professor Rod Keenan VCCCAR Director	Parkview Lounge
1.20-3.30 pm	VCCCAR Research Workshops (4 x concurrent sessions)	
	Workshop 1: Implementing tools to increase adaptive capacity in the community and natural resource management sectors Convener: Dr Hartmut Fünfgeld, RMIT University	Bouverie Room
	Workshop 2: Governance models for adaptation and natural disaster risk management: legal, regulatory, institutional and financial assessment Convener: Annette Wiltshire, University of Melbourne	Rathdowne Room
	Workshop 3: Decision taking under uncertainty: towards an efficient strategy to manage risk and uncertainty in climate change Conveners: Assoc Prof Jens Zinn & Patricia Fitzsimons, University of Melbourne	Drummond Room
	Workshop 4: Coproducing knowledge in research and policy Conveners: Dr Liam Smith, Monash University, Dr Eve Merton, La Trobe University	Lygon Room
3.30-3.45 pm	Afternoon tea	Parkville Lounge
3.45-4.15 pm	Plenary and reflection <i>In this session, VCCCAR workshop conveners will discuss with other participants the key learnings from VCCCAR research projects, future research needs and what tools and approaches are required to assist in policy development and implementation.</i> Professor Rod Keenan VCCCAR Director	Carlton Room
4.15 pm	VCCCAR Research Forum close	

Lecture by Lord John Krebs – Wednesday 19 March 2014

PUBLIC LECTURE BY PROFESSOR LORD KREBS, FRS



International and national perspectives on adapting to climate change: a conversation between Robyn Williams and Professor Lord Krebs.

In this conversation with the ABC's Robyn Williams, Lord Krebs will focus on actions the UK and Europe are taking to build resilience in preparing and responding to climate change, and lessons learnt that might be applicable to Australia's climate adaptation challenges.

Distinguished scientist Professor Lord Krebs Kt FRS FMedSci chairs the UK's House of Lords Select Committee for Science and Technology, sits on the UK Climate Change Committee and chairs its Adaptation Sub-Committee. He is also Principal of Jesus College, Oxford.



Professor Lord Krebs, FRS

Wednesday 19 March
5.30 pm Light refreshments, 6.00–7.00 pm Public Lecture
Deakin Edge, Federation Square, Melbourne

Sponsored by Deakin University and the Victorian Centre for Climate Change Adaptation Research.

This Public Lecture is open to the public and admission is FREE.

Click here to register.



deakin.edu.au
vcccar.org.au

Deakin University CRICOS Provider Code: 00113B

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Victorian Adaptation Forum – Thursday 20 March 2014

Rydges on Swanston, 701 Swanston Street, Carlton

Time	Activity	Location
8.30-8.50 am	Registration	Parkview Lounge
8.50-8.55 am	<i>Welcome to the 2014 Victorian Adaptation Forum</i> Rob Gell AM (MC)	Carlton Room
8.55-9.00 am	<i>Welcome to Country</i> Aunty Georgina Nicholson	Carlton Room
9.00-9.10 am	<i>Overview of Victorian climate adaptation research and VIP welcomes</i> Professor Rod Keenan VCCCAR Director	Carlton Room
9.10-9.25 am	<i>Climate change adaptation – the Victorian perspective</i> The Hon. Brad Battin MP, Parliamentary Secretary for Environment	Carlton Room
	Keynote presentations	
9.25-9.50 am	<i>The role of research in adaptation policy and action: a view from the UK and Europe</i> Professor Lord Krebs Kt FRS FMedSci	Carlton Room
9.50-10.15 am	<i>A strategic approach to climate change adaptation – Treasury Wine Estates</i> Olivia Tyler, Group Manager – Corporate Social Responsibility, Treasury Wine Estates	Carlton Room
10.15-10.45 am	Morning tea	Parkview Lounge
10.45 am – 12.20 pm	An overview of climate adaptation research in Victoria and its value to the community <i>This session will share knowledge about the climate adaptation research context and its links to government policy and projects in climate change adaptation, with particular relevance to Victoria. Participants will talk about current research and its importance to the Victorian community and government decision-makers, future research needs and how to navigate across the research-policy interface.</i> <i>10 minute overviews from the participants below will be followed by round-table conversations in which government department representatives will facilitate discussions on the benefits on research and future research / information needs of decision-makers.</i> NCCARF Professor Jean Palutikof, NCCARF Director Bureau of Meteorology Neil Plummer, Assistant Director, Climate Information Services CSIRO Kevin Hennessy, Principal Research Scientist at CSIRO VCCCAR Professor Rod Keenan, VCCCAR Director	Carlton Room
12.20-1.20 pm	Lunch	Parkview Lounge

1.20-2.50 pm	<p>Parallel sessions – strategic priorities arising from the Victorian Climate Change Adaptation Plan</p> <p><i>The key objectives of these parallel sessions are to present recent results and application of adaptation research projects, to assess its utility and consider future research needs. Short project presentations, in some cases with responses from government, will be used to inform general discussions on the role of research in supporting adaptation in these different sectors. Q and A sessions will follow up on key questions emerging from the presentations and responses.</i></p> <p><i>Assets and infrastructure</i> Convener: Professor Darryn Mc Evoy, RMIT University</p> <p><i>Natural assets and natural resource based industries</i> Convener: Professor Andy T.D. Bennett, Deakin University</p> <p><i>Supporting adaptation in industry</i> Conveners : Professor Nigel Tapper, Monash University, Celeste Young, Victoria University</p> <p><i>Supporting partnerships with local government and the community</i> Convener: Professor John Martin, University of Technology, Sydney</p>	<p>Bouverie Room</p> <p>Lygon Room</p> <p>Drummond Room</p> <p>Rathdowne Room</p>
2.50-3.05 pm	Afternoon tea	Parkview Lounge
3.05-4.35 pm	<p>Parallel sessions continue...</p> <p><i>Assets and infrastructure</i> Convener: Professor Darryn Mc Evoy, RMIT University</p> <p><i>Natural assets and natural resource based industries</i> Convener: Professor Andy T.D. Bennett, Deakin University</p> <p><i>Supporting adaptation in industry</i> Conveners : Professor Nigel Tapper, Monash University, Celeste Young, Victoria University</p> <p><i>Supporting partnerships with local government and the community</i> Convener: Professor John Martin, University of Technology, Sydney</p>	<p>Bouverie Room</p> <p>Lygon Room</p> <p>Drummond Room</p> <p>Rathdowne Room</p>
4.35-4.55 pm	<p>Review and reflection on adaptation research in Australia</p> <p>Dr Benjamin Preston, 2014 VCCCAR Visiting Fellow</p>	Carlton Room
4.55-5.00 pm	<p>Conference close</p> <p>Professor John Zillman, Chair, VCCCAR Advisory Board</p>	Carlton Room

Forum presenters

	<p>The Hon. Brad Battin, MP, Parliamentary Secretary for the Environment Brad is the State Member for Gembrook and Parliamentary Secretary for Environment in the Victorian Coalition Government. The Gembrook Electorate spans part of the Casey-Cardinia Growth Corridor and the Dandenong Ranges. Prior to his election in 2010, Brad was a Small Business owner and had previously served in the Victoria Police force, with a particular focus on youth issues and engagement. Brad holds a Graduate Diploma in Adolescent Health and Welfare from the University of Melbourne.</p>
	<p>Rob Gell AM Rob began his career teaching Geography and Environmental Science at the University Melbourne, then as a television weather presenter. He is now a Director of several environmental consultancies, Chairman of the UNESCO Western Port Biosphere and Wildlife Victoria, a member for the Victorian Coastal Council and the Commissioner for Environmental Sustainability's Reference Group. Rob was appointed an AM for his service to conservation in the 2014 Australia Day honours.</p>
	<p>Kevin Hennessy, Principal Research Scientist at CSIRO Kevin has been involved in climate change research for over 26 years, and leads the Pathways to Adaptation Theme in the Climate Adaptation Flagship. Amongst over 200 publications, he has analysed the impact of climate change on drought, fire, snow, extreme temperature and extreme rainfall. He was Coordinating Lead Author of the Australia and New Zealand chapter of the 2007 IPCC assessment of climate change impacts, adaptation and vulnerability. In 2012 and 2014, he was a co-author of the State of the Climate report published by CSIRO and the Bureau of Meteorology.</p>
	<p>Rod Keenan, Director, Victorian Centre for Climate Change Adaptation Research (VCCCAR) Rod has a BSc (Forestry) from the ANU and a PhD in forest ecology from University of British Columbia. He research interests span forests and climate change, forest ecosystem services, forest resource assessment and environmental policy. He is author or coauthor of over 50 refereed journal publications or book chapters and numerous reports to government and industry. Rod is also Head of the Department of Resource Management and Geography at the University of Melbourne.</p>
	<p>Lord John Krebs Kt FRS FMedSci Professor Lord Krebs Kt FRS FMedSci was appointed to the House of Lords in 2007 where he is Chairman of the Select Committee for Science and Technology, sits on the UK Climate Change Committee and chairs its Adaptation Sub-Committee. He was Chief Executive of the UK's Natural Environment Research Council 1994-1999, and the inaugural Chairman of the UK's Food Standards Agency (2000-2005). He is Master of Jesus College Oxford, a Fellow of the Royal Society, and foreign member of the US National Academy of Sciences (USA). He has authored over 300 scientific papers.</p>

	<p>Jean Palutikof, Director, National Climate Change Adaptation Research Facility (NCCARF)</p> <p>Jean is Director of the National Climate Change Adaptation Research Facility (NCCARF) and Professor at Griffith University in Queensland. Her career has focused on climate change impacts and adaptation, seeking to understand the vulnerabilities of human societies and ecosystems to climate change, and how we can successfully respond to the challenge. She was Lead Author and Review Editor for the second, third and fifth assessments of the Intergovernmental Panel on Climate Change (IPCC).</p>
	<p>Neil Plummer, Assistant Director, Climate Information Services, Bureau of Meteorology</p> <p>Neil joined the Bureau in 1986 and started his career as a weather forecaster. He has held positions on various World Meteorological Organization expert teams and management committees and has been a coordinating author with the Intergovernmental Panel on Climate Change. In 2008 he was appointed Manager Extended Hydrological Prediction before taking up his current position.</p>
	<p>Benjamin Preston, VCCCAR Visiting Fellow</p> <p>Ben is the Deputy Director of the Climate Change Science Institute at Oak Ridge National Laboratory (USA), where his research focuses on the assessment of climate risk to human systems and the role of adaptation in risk management. His prior appointments have included work with CSIRO's Climate Adaptation Flagship and the Pew Centre on Global Change in Washington, DC. Ben commenced his 3 month VCCCAR visiting fellowship in January 2014.</p>
	<p>Olivia Tyler, Group Manager, Corporate Social Responsibility, Treasury Wine Estates</p> <p>Olivia is Group Corporate Responsibility Manager at Treasury Wine Estates and leads the development and execution of the global Corporate Responsibility Strategy for the business. She works to position the CR agenda to deliver competitive and commercial advantage, with a strong focus on responsible alcohol consumption, sustainable supply chains, community investment and thought leadership on CSR related matters through various external stakeholder networks.</p>
	<p>Robyn Williams, ABC Radio National</p> <p>Robyn is best known as the host of the award-winning Science Show, now one of the longest-running programs on Australian radio. He has made frequent appearances on ABC TV for such programs as Quantum and Catalyst, and narrated the series Nature of Australia. Outside the ABC, Robyn has served as president of the Australian Museum Trust, chairman of the Commission for the Future and president of Australian Science Communicators. In 1993 he became the first journalist to be elected a Fellow of the Australian Academy of Science. Robyn will host a conversation with Lord Krebs at a public presentation on Wednesday, 19 March.</p>
	<p>John Zillman, VCCCAR Advisory Board Chair</p> <p>John is Chair of the VCCCAR Advisory Board and a former Commonwealth Director of Meteorology. He has been actively engaged in international scientific analysis and advice on climate change since the formation of the Intergovernmental Panel on Climate Change (IPCC). His honours include an Officer in the Order of Australia (AO) in 1996 and a Centenary Medal in 2003. He has been elected to Fellowship of many Australian and overseas professional societies.</p>

VCCCAR workshop convenors

	<p>Hartmut Fünfgeld, RMIT University Hartmut is a Research Fellow and Acting Director of the Urban Research Centre at RMIT University. His research focuses on approaches and frameworks to facilitate planning and decision-making for local and regional climate change adaptation. Hartmut has several years' experience working on climate change and sustainability issues with local government and communities in Australia and abroad. He has a PhD in human geography from the University of Heidelberg, Germany.</p>
 	<p>Lee Godden and Annette Wiltshire, University of Melbourne Lee is Director of the Centre for Resources, Energy and Environmental Law and has a longstanding research interest in climate change law. She has published widely on the topic of climate change governance, including local governance and climate adaptation. Lee also researches in environmental law, natural resources law, property law and indigenous peoples' land rights. Lee is the Chief Investigator on the VCCCAR project – Governance models for adaptation and disaster risk management.</p> <p>Annette is the Research Fellow and Project Manager for the VCCCAR project Governance Models for Adaptation and Natural Disaster Risk Management. Annette is a lawyer who previously worked for 18 years in several Victorian government departments, most recently as Acting Deputy General Counsel at the Department of Transport.</p>
 	<p>Liam Smith, Monash University, and Eve Merton, La Trobe University Liam is the Director of BehaviourWorks Australia at the Monash Sustainability Institute. Previously he was Director of the Tourism Research Unit, also at Monash University. Liam's primary research interest is human behaviour, particularly pro-environmental behaviour. He has published over 50 journal articles, book chapters and reports on human behaviour and behaviour change. With Eve Merton, Liam is the Chief Investigator of the VCCCAR project – Cogenerating knowledge in research and policy.</p> <p>Eve's research interests are around the communication of the natural and social sciences, development of evidence-based and evidence-informed policy, and research-into-policy. Her professional background is in science, technical and medical editing, writing and research. She currently works across the Research Focus Areas and Disciplinary Research Programs at La Trobe University, to engage researchers and build capacity.</p>
 	<p>Jens Zinn and Patricia Fitzsimons, University of Melbourne Jens is Associate Professor in Sociology at the University of Melbourne. He worked in a number of collaborative research centres and networks on risk in Germany and the UK before joining the University of Melbourne in 2009. An expert in interdisciplinary risk research, which includes risk perception and communication, risk governance and regulation, and socio-cultural approaches to risk. Patricia's research interests include: institutional capacity to adapt to climate change; the socio-economic impact of change on Victorian landscapes; the role of social networks in adaptive governance; and regional strategic planning. She is a former Board Member and Chair of the Environmental Planning Chapter of the Planning Institute of Australia (PIA). With Jens, Patricia is Chief Investigator of the VCCCAR project – Decision taking in times of uncertainty: towards an efficient strategy to manage risk and uncertainty in climate change adaptation.</p>

Victorian Adaptation Forum session convenors

	<p>Andy T D Bennett, Deakin University Andy is at the Centre for Integrative Ecology at Deakin University. Over the last 6 years, he has been Head of the School of Life and Environmental Sciences, established the Centre for Integrative Ecology, served on the editorial boards of the Royal Society's Proceedings B and Austral Ecology, and is Deakin's representative on VCCCAR Implementation Committee. Prior to this he was Reader at University of Bristol and at Oxford for a D.Phil with John Krebs. He leads research projects on bird navigation, sensory ecology, and improving animal and land management in response to human impacts. He is President-elect of the Australasian Society for the Study of Animal Behaviour.</p>
	<p>Darryn Mc Evoy, RMIT University Darryn is the Innovation Professor and Leader of the Climate Change Adaptation Program at RMIT University and VCCCAR Deputy Director. A qualified geographer, Darryn has an interest in interdisciplinary 'solutions-oriented' action research, His expertise covers climate risk assessment and adaptation, innovative adaptation practice (both institutions and technologies), institutional adaptive management (and adaptation as a process), vulnerability assessment, the building of local adaptive capacity, and the relationship between the adaptation and mitigation agendas.</p>
	<p>John Martin, University of Technology, Sydney John was Director of La Trobe University's Centre for Sustainable Regional Communities in Bendigo from 2005-13. He is the Visiting Professor at the Australian Centre of Excellence for Local Government at University of Technology, Sydney. John consults to local governments across Australia, is currently engaged on an AusAID project working with local governments in Indonesia. He is a Fellow of the Regional Australia Institute and Local Government Managers Australia.</p>
	<p>Hartmut Fünfgeld, RMIT University Hartmut is a Research Fellow and Acting Director of the Urban Research Centre at RMIT University. His research focuses on approaches and frameworks to facilitate planning and decision-making for local and regional climate change adaptation. Hartmut has several years' experience working on climate change and sustainability issues with local government and communities in Australia and abroad. He has a PhD in human geography from the University of Heidelberg, Germany.</p>
	<p>Nigel Tapper, Monash University, and Celeste Young, Victoria University Nigel holds a Personal Chair in Environmental Science at Monash University where over the last 10 years he has variously served as Head of the School of Geography and Environmental Science, Foundation Director of the Monash Sustainability Institute, and Joint Coordinator of the Monash Atmospheric Science Program. Nigel has an active research program in surface-atmosphere interaction, climate change adaptation and mitigation, and climate impacts, especially as they relate to urban environments, human health, dust and fire.</p>
	<p>Celeste is Collaborative Research Fellow at the Centre for Strategic Economic Studies at Victoria University. She is a sustainability/climate change professional who works as a communication and operational specialist with a particular interest in innovation and the use of creative and business processes. Her primary work focus is with trans-disciplinary projects across diverse stakeholders to build a greater understanding and capacity.</p>

Victorian Adaptation Forum speakers

Natural assets and natural resource based industries

[Lynda Chambers, Centre for Australian Weather & Climate Research,](#)

Presentation: *Research for climate adaptation and natural resource management*

Lynda specialises in climate variability and climate change adaptation research, particularly as it relates to biodiversity. She is a project leader for an AusAid funded project investigating the use of traditional knowledge for forecasting seasonal climate conditions to increase the adaptive capacity of Pacific Islanders to climate extremes.

[Mike Dunlop, CSIRO Climate Adaptation Flagship](#)

Presentation: *Climate-ready conservation objectives*

Mike is an ecologist come 'integration scientist'. He focuses on trying to help policy makers and managers understand how the challenge of conserving biodiversity is changing in the face of climate change. He has worked with National, State and local governments, NRM bodies and NGOs, developing concepts to help future biodiversity conservation and climate adaptation in other sectors. He recently completed a project on climate-ready conservation objectives for NCCARF.

[Janine Haddow, Consultant, Janine Haddow and associates](#)

Presentation: *How does government support ILM in regional Victoria under climate change?*

Janine Haddow consults for State and Local Governments, Statutory Agencies and Boards in natural resource and land management primarily public policy, strategy, implementing change and stakeholder engagement. She has extensive experience working in senior executive positions with the Victorian State Government & Statutory Agencies.

[Graeme Newell, Department of Environment & Primary Industries](#)

Presentation: *The (as yet fully realised) promise of applying informatics to ecosystem management*

Graeme has been a research scientist with DSE at the Arthur Rylah Institute since 1997, and the Program Leader for Ecological Analysis & Synthesis. His recent work with the EAS team has focussed on developing spatially-explicit yet statistical-robust methods of modelling or 'mapping' ecological phenomena across south-eastern Australia. These approaches have been applied to developing new datasets for Government agencies around the distribution, type and condition of native vegetation, distribution of native plant and animal species, landscape connectivity, the potential impacts of climate change, and integrated conservation planning and prioritisation tools.

[Craig Nitschke, Research Fellow, Forest Vulnerability and Health, University of Melbourne](#)

Presentation: *Climate and growth relationships in Melbourne's urban-European forest: the role of temperature and drought on the observed decline in forest health*

Craig's expertise is on integrating climate change into forest management through the linking of ecological knowledge, management policy and modelling. He currently leads the Forest Vulnerability and Health Research Group funded by DEPI which studies the impacts of disturbance, climate and management on the native forests of Victoria.

[Lauren Rickards, MSSI, University of Melbourne](#)

Presentation: *Adaptation as adoption? Exploring insights from rural practice change*

Lauren is a human geographer working on cultural understanding and socio-political responses to climate change and climatic extremes, including scenario planning. At Melbourne Sustainable Society Institute she leads the research cluster on Sustainability in the Anthropocene. Recent work includes collaborative research with CSIRO into transformational adaptation in Australian rural communities. She also lectures on interdisciplinarity in environmental research.

[Carla Sgrò, Monash University](#)

Presentation: *Biodiversity conservation and climate adaptation: an evolutionary perspective*

Carla is an evolutionary biologist interested in understanding organisms adapt to environmental change. She is also interested in exploring how evolutionary processes can be explicitly incorporated into biodiversity conservation and management.

Philip Wallis, Monash University

Presentation: *Transforming planning for climate change in NRM*

Philip is a Research Fellow at Monash University's Sustainability Institute. His current research focuses on the governance of social-ecological systems, particularly in the areas of water resources, Australia's Murray-Darling Basin, climate change adaptation, catchment management and water sensitive cities. This research is mainly trans-disciplinary in nature, drawing on social, political and technical inquiry into complex situations.

Penny Whetton, CSIRO Climate Adaptation Flagship

Presentation: *Climate change projections for Victoria to support natural resource management planning*

Penny is a Senior Principal Research Scientist with CSIRO's Climate Adaptation Flagship. She has worked on projecting regional climate change and its impacts for over 20 years and taken a leading role in Australian climate change scenarios released by CSIRO in 1992, 1996 and 2001, and by CSIRO and the Bureau of Meteorology in 2007. Dr Whetton was also a lead author of the regional projection chapters of Third and Fourth Assessment Reports of the IPCC and is currently a lead author of the forthcoming Fifth Assessment Report.

Assets and infrastructure

David Higgins, RMIT University

Presentation: *Fires, floods and financial meltdowns: Black swan events and property asset management*

Marwa Khalaf, Department of State Development, Business and Innovation

Presentation: *Adaptation and emergency management in energy*

Marwa has recently taken on the challenge of heading up energy emergency management in the Department of State Development, Business and Innovation. She manages a team that is responsible for the maintenance and ongoing development of energy emergency arrangements in Victoria. Prior to this she has been in a number of roles providing advice to government on energy policy across a number of different Victorian Government Departments. Most recently she was at the Department of Premier and Cabinet and advised the Gas Market Taskforce on the eastern gas market.

Beth McLachlan, Sustainability Policy Coordinator, City of Melbourne

Presentation: *Rockerfeller Resilient Cities initiative*

Beth is Senior Sustainability Coordinator at the City of Melbourne, where she is responsible for the implementation of their climate change adaptation strategy and the review and update of their climate change mitigation and water strategies. Prior to starting at the City of Melbourne, Beth spent four years working on climate change, water and waste initiatives at EPA Victoria, where she lead EPA Victoria's climate change team and was instrumental in the development of their carbon neutral strategy. Beth has experience in climate change and sustainability management across various sectors including government, education, manufacturing and finance.

Celeste Morgan, Sustainability Director, E2Designlab

Presentation: *Demonstrating the business case for joint delivery of water sensitive urban design as a climate change adaptation strategy*

Celeste is a recognised and highly skilled sustainability professional, with experience in leading the sustainability agenda internationally. Celeste relocated in 2013 from the UK, where she was instrumental in the development of the sustainability strategies for the London 2012 and Rio 2016 Olympic Parks and four of UK's zero-carbon Eco-towns. Celeste is personally recognised in the UK as a leader in the development of water sensitive urban design and won government funding for climate change adaptation studies in the water industry. Her recent work in Melbourne has led the development of integrated water strategies to future-proof major redevelopment areas.

Michael Nolan, AECOM Global Leader - Climate Adaptation

Presentation: *Infrastructure adaptation: Tools for 'measuring success'*

Michael has 20 years of experience managing sustainability and climate change outcomes for business and government. Michael has led over 120 climate change impact, risk assessment and adaptation projects relating to local government, power, mining, ports, water, road, rail, buildings, facilities, coasts, states and cities. Michael has represented the Infrastructure Sustainability Council of Australia in developing an Australian Standard AS5334 for Climate Change Adaptation for Settlements and Infrastructure. Michael leads a City Resilient Scorecard program in combination with IBM for the United Nations International Strategy for Disaster Reduction. He has worked on projects in USA, Canada, China, India, Brazil, New Zealand, and United Kingdom.

Lalitha Ramachandran, Senior Project Manager Sustainability, City of Port Phillip **Presentation:**

Coastal defences & flood risk management

Lalitha has worked in environmental management in the Australian Local Government sector for over 15 years at national and local levels. Her work has focussed on the development, implementation and evaluation of greenhouse management, sustainability strategy and systems, climate adaptation and community sustainability programs. As Senior Project Manager Sustainability at the City of Port Phillip, she has been responsible for the introduction of Council's key environmental approaches, targets and strategies, resulting in the City's Toward Zero Sustainable Environment Strategy, and the city being one of the first local governments to commission a climate risks assessment and the development of a Climate Adaptation Plan.

Xiaoming Wang, CSIRO

Presentation: *Developing climate adaptation engineering nexus for resilient built assets*

Xiaoming Wang is a Senior Principle Scientist in CSIRO Ecosystem Sciences, and now theme leader of the Sustainable Cities and Coasts, CSIRO Climate Adaptation Flagship. He is adjunct professor with the Faculty of Engineering and Industrial Sciences in Swinburne University of Technology. He has published more than 200 research papers, among which about 100 are published in journals. He has extensive experiences working on climate impact and adaptation related projects of national significance. He is currently a contributing author to the Australasia chapter in IPCC AR5.

Simon Whitehead, Public Transport Victoria

Presentation: *Climate risks and resilience for transport infrastructure*

Simon brings over 20 years' experience in project and engineering management in private and government sectors, across the rail, road, aviation and military domains; as well as significant experience in strategic and operational planning, and delivering customer centric products and services; and strong leadership in a variety of tactical and strategic positions both locally and internationally. As General Manager of Engineering for Public Transport Victoria, he oversees the development and maintenance of engineering policy, strategy and standards as well as the technical direction of projects, maintenance and renewal across the public transport portfolio.

Simon Wilkinson, Manager, Water Efficiency, City West Water

Presentation: *Greening the West – A regional collaborative approach to urban greening*

Simon handles management of water efficiency strategy and delivery including: demand modelling, appliance based water efficiency programs and drought response/ water restrictions. Management of Greening the West - initiative aiming to increase the health and well-being of the community in the western suburbs of Melbourne by creating a servicing strategy for the environment linking alternative water projects to urban greening.

Annette Wiltshire, Research Fellow & Project Manager, University of Melbourne

Presentation: *Permission to adapt? Legal and financial considerations in a port environment*

Annette worked on a VCCCAR project entitled: *Governance models for adaptation and natural disaster risk management: legal, regulatory, institutional and financial assessment*. It investigated Victorian legal, financial and institutional frameworks for managing the risks of extreme events and natural disasters and make recommendations for incorporating decision-making under the uncertainty introduced by climate risk.

Supporting partnerships with local government and the community

Kate Auty, Commissioner for Environmental Sustainability

Presentation: *Community participation and environmental reporting*

Professor Kate Auty became Commissioner for Environmental Sustainability in June 2009. She has worked in agriculture and academia, as a solicitor in her own law firm, and as a barrister. She was a senior lawyer for the Royal Commission into Aboriginal Deaths in Victoria, Tasmania and Western Australia. In 2008 and 2009, she held the Chair of the Ministerial Reference Council on Climate Change Adaptation and was a member of the Premier's Reference Committee on Climate Change. Kate is also an Adjunct Professor in the LaTrobe Institute for Social and Environmental Sustainability Centre.

Bernie Cotter, Executive Officer ABM, & Michael Nolan, Global Leader, Climate Adaptation

Presentation: *The Port Phillip Bay coastal adaptation pathways project*

Bernie has been involved in the local government sector for many years. He has an interest in the coast and how decision makers will consider the future pressures of climate change in an urbanised coastline. Michael is the Global Leader – Climate Adaptation and Technical Director – Sustainability & Climate Change for AECOM. Michael works both nationally and internationally in the climate adaptation sector.

Paul Davis, Manager Innovation and Change, Fire Services Commissioner

Presentation: *2021 – preparing for a different future*

Paul Davis has worked in Government, community, commercial and not for profit organisations in fire and emergency management roles, strategy, marketing and strategic communication. Paul was appointed by the Fire Services Commissioner in 2010 to lead the change and innovation agenda across the fire and emergency services. Paul contributes a strong focus on community needs, alignment to common vision and developing culture, commitment and capability to lead change across and within the emergency services of Victoria.

Alex Edwards, Manager: Sustainability and Adaptation Programs, & Ross Martin, Senior Sustainability Manager, Department of Environment and Primary Industries

Presentation: *An analysis of approaches and lessons learnt to delivering four pilot Local Coastal Hazard Assessments under present and future climate conditions*

Dave Griggs Director, Monash Sustainability Institute

Presentation: *Use of indigenous knowledge for natural resource management - lessons learned and future work*

Dave is Director of the Monash Sustainability Institute which aims to deliver solutions to key sustainability challenges. In November 2008 he also became CEO of the newly created ClimateWorks Australia, an independent, research-based non-profit organisation committed to catalysing greenhouse gas emissions reductions. Previous positions he has held include UK Met Office Deputy Chief Scientist, Director of the Hadley Centre for Climate Change, and Head of the Intergovernmental Panel on Climate Change scientific assessment unit. Dave is a past vice-chair of the World Climate Research Programme. He is a Fellow of the Australian Academy of Technological Sciences and Engineering.

Rohan Hamden, Department of Environment and Natural Resources, South Australia

Presentation: *Community driven adaptation planning: The bottom up approach that's delivering results*

Rohan is responsible for working with community and industry groups to mitigate greenhouse gas emissions and adapt to the impacts of climate change. His focus is on the implementation of South Australia's Climate Change Adaptation Framework. This purpose of the framework is to drive reform across communities, industries and government to prepare for the impacts of climate change. It recognises that regional communities most affected by climate change are best equipped to determine how to prepare. The framework establishes a mechanism of bottom up decision making that will inform state wide adaptation planning.

Scott McKenry, Regional Coordinator, Eastern Alliance for Greenhouse Action

Presentation: *EUA finance for the regions - The economic benefits of retrofitting Victoria's building stock through environmental upgrade agreements*

Scott has a proven track record in delivering many high profile and innovative sustainability initiatives, including energy efficiency projects, carbon management programs and climate change adaptation initiatives. Before joining EAGA, Scott spent six years as Team Leader at Swinburne's National Centre for Sustainability and more recently as Engagement Manager with ClimateWorks Australia.

Neville Nicholls, Monash University

Presentation: *Adaptation as adoption? Exploring insights from rural practice change*

Neville spent 35 years in climate research at BoM before joining Monash University in 2006. His research has included developing systems using the El Niño – Southern Oscillation to predict climate variations such as droughts and tropical cyclone activity, documenting climate and weather impacts on agriculture, ecosystems, and human health, and developing and analysing data sets for monitoring climate variations and change. He was a Coordinating Lead Author for the Intergovernmental Panel on Climate Change (IPCC) 21012 special report on climate extremes.

Elissa Waters, Research Fellow, University of Melbourne

Presentation: *Community perceptions of responsibility for adaptation to sea level rise*

Elissa is a Research Fellow and PhD candidate at the Department of Resource Management and Geography at University of Melbourne. Her research investigates the social and institutional aspects of climate change adaptation in Australia. Additionally, for the last six years she has worked as a researcher in both federal and state governments, developing policy on the social and political aspects of environmental change and adaptation in Australia.

Supporting adaptation in the private and social services sector

Ross Allen, CRC for Water Sensitive Cities / Monash University Michael Lord

Presentation: *Resilient and Liveable Cities: Adaptation in the Urban Water Industry*

Ross is a project leader within the Adoption Pathways Program of the CRC for Water Sensitive Cities. He facilitates two-way knowledge transfer between researchers and practitioners, and the application of new urban water research in policy, planning and design. Ross utilises his practical ecological engineering and urban design experience to support the integration of research knowledge across multiple disciplines, and its adoption by local and state government organisations, water utilities and consultants. Ross has previously held urban water management roles in private consulting and local government organisations in Australia and the United Kingdom.

Mark Baker-Jones, Special Counsel, Planning, Environment and Climate Change

Presentation: *Will a failure to consider climate legal risk result in failure: a message from the courts*

Mark is a lawyer and Special Counsel with DLA Piper, the world's largest law firm. Mark is leading in the emergent area of climate legal risk. He advises on the assessment and management of corporate climate legal risk, and development and implementation of strategies and guidelines for dealing with that risk.

Che Biggs, Research Fellow, The Victorian Eco-Innovation Lab (VEIL)

Presentation: *Uncork the genie: Networked localised infrastructures building climate resilience*

Ben Honan, Public Policy, Suncorp General Insurance

Presentation: *Risky business – the changing relationship between insurance and natural disaster risk*

Michael Lord, Senior Consultant, Sustainability and Climate Change (RPS Group)

Presentation: *Adaptation in the energy sector*

Michael is a Senior Sustainability Consultant with experience providing environmental and sustainability advice on infrastructure and the built environment. He has worked with public and private sector clients at all levels. He has particular expertise in climate risk, and has led research and provided adaptation advice to major energy and water companies. Michael led the infrastructure program Climate Ready - the UK's Government's initiative to help the England adapt to climate change. As part of this he ran a forum on adaptation for the UK's main infrastructure operators, and produced national guidance on infrastructure resilience. He also worked with UK's energy regulator (Ofgem) to strengthen requirements on companies to consider climate change.

Deborah Ralston, Executive Director, Australian Centre for Financial Studies / Monash University

Presentation: *Supporting adaptation in the private and social services sector*

As Executive Director of the ACFS, a not-for profit consortium of Melbourne, Monash, Griffith and RMIT universities and the professional body Finsia, Deborah undertakes research, consulting and commentary across the areas of banking, funds management, superannuation and insurance. ACFS maintains an ongoing insurance research agenda through its Insurance Research Reference group, and through joint research publications and events with organisations such as the Insurance Council of Australia and the Victorian Centre for Climate Change Adaptation Research. Deborah is a Professor of Finance at Monash University.

Alianne Rance, Associate, Net Balance

Presentation: *Adaptation and Property Development*

Ali is an associate with Net Balance and has been working in the adaptation space for a number of years in both the private and public sectors. She is also currently undertaking her PhD at RMIT University.

Bridget Tehan, Victorian Council of Social Services

Presentation: *Climate change and the community sector*

Celeste Young, Victoria University

Presentation: *Smart Futures, SME's and adaptation in Victoria*

Celeste is Collaborative Research Fellow at the Centre for Strategic Economic Studies at Victoria University. She is a sustainability/climate change professional who works as a communication and operational specialist with a particular interest in innovation and the use of creative and business processes. Her primary work focus is with trans-disciplinary projects across diverse stakeholders to build a greater understanding and capacity.

Thursday afternoon session abstracts

Assets and infrastructure

Convener: *Darryn Mc Evoy, RMIT University*

Aim of session: *Public assets and services have been identified as particularly vulnerable to the impacts of climate change and climate-related extreme events by the Victorian State Climate Change Adaptation Plan. Droughts, heat-waves, bushfires, and floods have impacted assets and infrastructure disrupted public services in recent years. Projected changes to the frequency and intensity of such extreme events, and slow onset events such as sea level rise, mean that adaptation responses will be needed to ensure the resilience of the State's critical infrastructure in both the short and long-term. This session has been structured into two sub-sessions, one focusing on 'hard' infrastructure characterised by inputs from different sectors, the other what can be termed 'soft' infrastructure and a focus on urban resilience. The presentations, and follow up group discussions, will highlight the key risks that have been identified and will showcase the responses that a range of public and private actors have undertaken to adapt to these risks, including the role of the research community in supporting these efforts. Given the make-up of the presentations, the sub-sessions will be of interest to a range of groups, including State and local Government, practitioners, and academics.*

'Hard' infrastructure

Fires, floods and financial meltdowns: Black swan events and property asset management

Presenter: *David M. Higgins, RMIT University*

In these ever challenging times, conventional property decision theory appears inadequate to deal with Black Swan Events: those unforeseen, rare and extreme natural and man-made disasters. This research maps, characterises and assesses these threats into: Known Knowns, Known Unknowns and Unknown Unknowns categories. Whereas, Known Knowns events can be managed and Unknown Unknowns events are difficult to even identify, those Black Swan known unknowns events that impact on a location, can be modelled based on available past and comparable evidence. As a starting point, Black Swan Management tools can utilise available prediction based scale indices to highlight the possibility of these extreme events occurring in locations, and so form an important consideration for property asset managers in their decision making process.

Climate risks and resilience for transport infrastructure

Presenter: *Simon Whitehead, General Manager of Engineering for Public Transport Victoria*

Presentation will cover:

- The role of PTV and what's important to our customers
- The impact of consecutive hot days on our ability to service our customers
- The Batman Ave Bridge Lessons Learned
- The use of real time rail head monitoring to increase service reliability for our customers.

Coastal defences & flood risk management

Presenter: *Lalitha Ramachandran, Senior Project Manager Sustainability, City of Port Phillip*

Council has developed and is implementing holistic catchment and coastal inundation modelling to understand inundation impacts over time. This approach has included a range of changes to the way Council plans and acts, recognition of the growing need for a regional approach to adaptation planning, and has realised a range of lessons for other coastal councils. Council and CSIRO are currently developing a hydro-dynamic spatial model integrating catchment and coastal inundation, to test the effectiveness of likely adaptation infrastructure solutions and demonstrate the value of developing such a tool to test and provide relevant inundation mitigation actions. An early prototype of this will be demonstrated at the forum.

Developing climate adaptation engineering nexus for resilient built assets

Presenter: *Xiaoming Wang, CSIRO*

Development of climate Adaptation Engineering (CAE) nexus will be presented. It extends traditional engineering knowledge and practices to take into account current and future climate hazards on concerns, and develop corrective as well as prospective measures to ensure built assets meet not only the current but also future needs, at the scales of materials, structures, systems, and systems of systems. Moreover, multi-level instruments to enable the corresponding multi-scale climate adaptation engineering are also introduced, represented by standards, planning, regulations and policies, creating an adaptation nexus for resilient national built assets. To demonstrate the adaptation nexus, the presentation firstly introduces an approach to develop resilient construction materials, such as concrete, timber and steel, by enhanced design standards, to maintain durability under changing climate. Secondly, structural designs to improve built asset performance are also discussed by examples of building wall designs to improve heatwave resistance, and energy efficient buildings to accommodate future changing climate. Thirdly, an approach to develop green built-natural environment systems enabled by better urban planning is presented to reduce the impact of increasing heatwave and urban heat island. Furthermore, an approach considering integrated standard and planning changes to develop adaptation options is then demonstrated by the development of coastal buildings under the threats of inundation and/or extreme winds. Finally, national adaptation policy interventions are further examined to demonstrate the effectiveness to develop multi-scale climate adaptation nexus through the improvement in standards, planning and policy development, integrated with engineering solutions.

Adaptation and emergency management in energy

Presenter: *Marwa Khalaf, Department of State Development, Business and Innovation*

Often the same weather conditions that increase demand for energy also affect the ability of suppliers to provide that energy. This has been particularly true in the past for electricity networks where the interplay between heat, demand and bushfires is an integral part of how the network operates. As we experience more extreme weather events, like heatwaves, bushfires and storms, we will need to think about how energy networks can adapt and rise to those challenges to provide a safe, reliable and cost effective service.

'Soft' infrastructure

Greening the West – A regional collaborative approach to urban greening

Presenter: *Simon Wilkinson, Manager, Water Efficiency, City West Water*

Greening the West is an initiative that aims to deliver positive health and social outcomes and enhanced liveability for communities in the western suburbs of Melbourne. The initiative is driven by a steering committee consisting of 19 collaborative and committed partners including nine local government stakeholders. The vision for Greening the West is to enable sustainable, liveable, healthy communities through urban greening. Adopting a regional rather than local approach will deliver elevated benefits such as enabling of cross-border projects and consolidation of resources to promote the benefits of green space. The key strength of Greening the West is the commitment of the stakeholders and the belief that much can be achieved through cooperative efforts. A core driver for Greening the West is improving community health. Victorian Department of Health data suggest that, from a health perspective, the people of the west are disadvantaged. The department recognises the provisioning of quality green space that allows for passive and active recreation as a critical strategy to tackle health conditions such as obesity, diabetes, heat stress and the deleterious effects of air pollution. Influencing planning outcomes, including the establishment of new housing developments, is therefore considered an important aspect of Greening the West. In addition to enhancing and protecting community health, Greening the West will address the numerous other benefits offered by urban greening. Comprehensive data exists on vegetation cover, health status, demographics, socio-economic indicators and housing, all of which will assist in identifying priority sites where green space can deliver the most significant benefits.

Demonstrating the business case for joint delivery of water sensitive urban design as a climate change adaptation strategy

Presenter: *Celeste Morgan, Sustainability Director, E2Designlab*

The delivery of climate change adaptation measures is often most successful where there is an opportunity to make change to the urban environment in a cost-effective and timely manner. There is a great opportunity to deliver this kind of opportunistic adaptation by working with the planning and development sector to take advantage of redevelopment and public realm improvements in urban areas. This presentation shares the results of a series of business cases for investment in urban water systems in redevelopment areas to address climate change challenges like water scarcity, flooding, and heat waves, as well as the need to create resilient future urban areas that support liveability and population growth. The business cases will be drawn from case studies in Coventry and Birmingham in the UK and in the Northland Principal Activity Area in Melbourne. The business cases monetise the environmental benefits to help to appreciate a holistic view where climate change adaptation benefits can be more readily evaluated. The business cases also apportion costs and benefits for various stakeholders, including developers, councils and water companies and bring together stakeholders to demonstrate how a partnership approach can lead to more efficient funding.

Infrastructure adaptation: Tools for 'measuring success'

Presenter: *Michael Nolan, AECOM Global Leader - Climate Adaptation*

There are several tools to support the measurement of climate adaptation for infrastructure. The preferred tool depends on the sector, scale and complexity of the climate adaptation objectives. This presentation will provide insight into tools applied in Australia, US and Canada. These tools will be illustrated with case study examples of their application.

Permission to adapt? Legal and financial considerations in a port environment

Presenter: *Annette Wiltshire, Research Fellow, Project Manager, University of Melbourne*

Governance arrangements are critical underpinnings of adaptation actions. Governance includes legal, regulatory and financial frameworks. Organisations – government and private sector – can only take actions that are legally permitted. There is legislation that is focussed on climate change adaptation, and there is legislation that is capable of responding to the effects of climate change but is not necessarily climate change specific. This presentation will examine some of the legal tools that impact adaptation, including tools that have financial implications. A case study of Victorian ports will be used to explore these arrangements.

Infrastructure adaptation: Tools for 'measuring success'

Presenter: *Michael Nolan, AECOM Global Leader - Climate Adaptation*

South Australia has developed a multi-award winning program to help communities prepare for the impacts of climate change. State Government develops genuine partnerships with regional leaders to share the problem of climate adaptation, and work together to develop solutions. We have adopted a bottom up driven approach that empowers regional community leaders to jointly plan and deliver on adaptation actions for their regions. The Government of South Australia is an active participant in the process, and relies on the ideas and actions arising from regional planning to develop state-wide responses to climate change. This presentation will outline the mechanisms to identify and empower the right community leaders to participate in planning; the management framework to ensure that issues raised by communities are considered in government decision making; the communications mechanism for community engagement in decision making and planning; and the many benefits achieved through this approach.

Natural assets and natural resource based industries

Convener: Andy T.D. Bennett, Deakin University

Aim of session: To overview key climate change adaptation challenges for Victoria in the biodiversity and natural resource management sectors. Each talk will be 10 minutes, followed by a facilitated discussion of about 20 minutes. Each presenter will also be asked to consider the four strategic questions in their presentation and these will also be used to guide group discussions afterwards.

Biodiversity and ecosystems

Biodiversity conservation and climate adaptation: an evolutionary perspective

Presenter: *Dr Carla Sgrò, Monash University*

Evolution occurs rapidly and is an ongoing process in our environments. Evolutionary principles therefore need to be built into conservation efforts, particularly given the stressful conditions organisms are increasingly experiencing due to climate change and ongoing fragmentation. I will talk about the concept of evolutionary resilient landscapes as a way of emphasizing evolutionary considerations in biodiversity management and landscape planning. These landscapes need to allow in situ selection and capture high levels of genetic variation essential for responding to the direct and indirect effects of climate change. I will summarize ideas about how landscapes might be constructed and maintained and how evolutionary principles can be incorporated into policy and planning to maximise the resilience of natural systems in the face of climate change.

Climate-ready conservation objectives

Presenter: *Michael Dunlop, CSIRO Climate Adaptation Flagship*

Climate change has the potential to significantly affect biodiversity in coming decades. We now know many species and ecosystems are likely to be very sensitive to anticipated changes in levels of carbon dioxide, temperature, rainfall and fire regimes. In addition, the landscapes where native species and ecosystems are found will change in response to climate and other drivers, further affecting biodiversity and how people experience it. In the face of these changes, what does it mean to conserve biodiversity? What outcomes might be achievable? In the face of inevitable change, what would success look like and how might conservation priorities change? We outline three key issues that will shape how we might need to approach conservation to be ready for a rapidly changing climate: 1) the magnitude of ecological change, 2) uncertainty in the detail of change, and 3) the multiple ways society experiences and benefits from biodiversity. Addressing these issues together represents a significant departure from many aspects of current conservation practice. Developing and implementing a climate-ready approach to conservation will require new ecological science, innovation in policy and planning, and considerable debate in the community about how biodiversity is valued.

Climate and growth relationships in Melbourne's urban-European forest: the role of temperature and drought on the observed decline in forest health

Presenter: *Craig Nitschke, Research Fellow: Forest Vulnerability and Health, University of Melbourne*

More than a decade of drought and severe water restrictions has left Melbourne's tree population in a state of unprecedented decline. The majority of this decline is within the European tree species planted in the late 1800s. Modelling suggests that 44 per cent of the urban forest may be lost within the next 20 years - and drought is viewed as the main cause and threat. This study examined the climate-growth relationships of six European tree species across Melbourne and compared these to historical climate records (1856 to 2013). The response of species growth to climate suggested that all species are negatively affected by warm and dry springs though the response varied between species. The major

European species that occur in Melbourne's urban forest are sensitive to spring drought which suggests that the risk of continual and/or potentially accelerated decline in tree growth and vigour may occur if warmer, drier springs, which are predicted to occur under climate change, eventuate.

How does government support Integrated Land Management (ILM) in regional Victoria under climate change?

Presenter: *Janine Haddow, Consultant, Janine Haddow and associates*

In 2010 the Victorian Government commissioned VCCCAR to research *Policies and governance to support integrated landscape management in a changing climate* - the Integrated Landscape Management (ILM) project. In response to policy changes within the State Government the focus of the research became *How does government support Integrated Land Management (ILM) in regional Victoria under climate change?* ILM is a useful concept for helping land managers adapt to climate change, providing a basis for greater collaboration in land and natural resource management. It is 'a process of facilitating systemic action, both vertically and horizontally across stakeholders and scales, to enhance the resilience of socio-ecological systems'. ILM is about making decisions that work at state and local levels, based on scientific and local knowledge, to enhance the resilience and productivity of people and places. Based on research and interviews with landowners in southwest Victoria in 2010, the ILM project developed a working definition of ILM, identified barriers and enablers to ILM, proposed increased emphasis on integration in management and recommended an approach to overcoming the barriers to ILM.

Transforming planning for climate change in NRM

Presenter: *Phil Wallis, Monash University*

Climate change presents significant challenges for NRM, and although NRM bodies have differing mandates, organisational structures, priorities and histories, they have similar needs in planning for climate change. Australia's NRM agencies are now in the midst of developing plans that seek to both direct investment in climate change mitigation (through carbon sequestration), while also planning for adaptation in the longer term. This paper discusses a research partnership between NRM bodies, Universities and State Government agencies that is seeking to support NRM bodies as they undertake and work toward implementing these plans. The Southern Slopes Climate Change Adaptation Research Partnership (SCARP) has been working towards these goals through participatory action research, involving close collaboration with NRM regions across Victoria, Tasmania and NSW. Our premise is that planned adaptation is highly context dependent, including social, institutional and political settings, and historical influences. This means that in order for scientific information to have traction, it needs to relate to stakeholder concerns (Cash et al., 2003). Drawing from diverse research and experience in adaptation and linking science with decision-making, we are investigating how science can more effectively inform NRM decision-making, what institutions and processes work most effectively to link climate change science and NRM planning, and what enables and constrains organisational learning in adaptation planning. In this paper, we present SCARP's progress to date, highlighting both theoretical and practical aspects of planning for climate change in the NRM sector, and the effectiveness of participatory research methods for facilitating transformative change in adaptation planning.

Natural resources and resource based industries

Adaptation as adoption? Exploring insights from rural practice change

Presenter: *Lauren Rickards, MSSl, University of Melbourne*

Climate change adaptation options are presented in the literature as inventories, functional typologies or high level principles. But little work has gone into developing a more actor-based view of the sort that has been developed over previous decades in efforts to understand land managers' adoption (or lack of adoption) of conservation and other best practices. This paper will bring together the climate change

adaptation and rural practice change literatures to help work towards a more nuanced understanding of climate change adaptation as an adoption process, helping the field to shift beyond its current concern with whether people are simply adapting (undertaking any adaptation action) or not. In doing so, it will help to expand on the important notion of maladaptation and will delve into the complex practical, ethical and political challenges posed by the adaptation imperative. To end it will examine the limitations of conceiving of adaptation as an adoption problem and will explore what may be needed to enable more transformational change.

Climate change projections for Victoria to support natural resource management planning

Presenter: Penny Whetton, CSIRO Climate Adaptation Flagship

Regional climate change projections are required to serve the needs of adaptation planning in a broad range of human and natural systems. These descriptions of future climate need to convey all those aspects of climate change which may be important in driving system impacts, present uncertainties appropriately, but also be easy for users to understand and employ. With the support of Department of the Environment, CSIRO and BoM are completing a major new project aimed at providing updated climate change projections for Australia specifically aimed at supporting the needs of natural resource management (e.g. ecosystems, agriculture and water resources). The projections will be based on analysis of CMIP5 GCM results, as well as a range of downscaled results. These projections will also effectively form a major update to national projections last released in 2007. The presentation will focus on the Victorian component of the results and will show changes to range of variables, such as temperature, precipitation, potential evaporation, regional sea level rise will, as will various climate extremes (e.g. heat waves, extreme rainfall).

The (as yet fully realised) promise of applying informatics to ecosystem management

Presenter: Graeme Newell, Department of Environment & Primary Industries

Advances in informatics and machine learning offer new opportunities for modelling complex ecological systems by allowing us to find consistent patterns in very large datasets compiled from many and varied sources. We have collated and developed a library of spatial and aspatial data relevant to the ecosystems across SE Australia, and have coupled this with a suite of machine learning algorithms, some of which are novel to ecological modelling. From this toolbox we have produced 'maps' of many ecological phenomena, including the distributions of several thousand species; community structure; community function; landscape 'resilience' or stability, and expressions of physiological and ecological traits or behaviours. Together, these maps express where biological values worthy of management and protection occur, and where they are threatened. These maps are currently used in both developing and implementing environmental policies and programs for the Victorian Government. Predicting the responses of these phenomena to climate change will require new modelling approaches. It will be necessary to account for interactions between species, find ways to predict into novel environmental scenarios, account for plant and animal dispersal, and account for the influences of human land use. These constraints make it extremely difficult to make both gather appropriate data and form accurate predictions. It will also be increasingly important to find ways of quantifying and expressing our degree of uncertainty in model predictions so that the outputs can be used wisely by policy-makers. Promising approaches that may assist include multi-objective modelling, and the explicit and targeted use of expert opinion.

Research for climate adaptation and natural resource management

Presenter: Dr Lynda Chambers, Centre for Australian Weather & Climate Research, Bureau of Meteorology

The Centre for Australian Weather and Climate Research has a number of programs aimed at delivering new knowledge and applications for decision-making in climate-sensitive industries. They include understanding and predicting climate variability and change and its impacts to improve adaptive

responses and to inform policy and decision making. This presentation will highlight improvements in scientific understanding of the climate system and tools that have been developed to assist natural resource managers and policy makers in a changing climate. Case studies will be presented illustrating how this research has been applied in practice – from the development of strategic partnerships to selecting appropriate tools and adaptation options, including identifying barriers to implementation, to implementation and gauging project success.

Supporting adaptation in the private and social services sector

Conveners: *Nigel Tapper, Monash University & Celeste Young, Victoria University*

Aim of session: *Victorian business and industry play an important part in the Australian economy, producing almost one quarter of the nation's GDP. Ensuring long-term economic sustainability requires that overall productivity is maintained and that key industry sectors continue to grow in the face of a changing climate. To date with the exception of a few sectors such as tourism and primary industries, adaptation has not been a priority for business and industry due to more pressing concerns. However, an awareness of how climate change may impact on businesses is growing and the failure to adapt to climate change was listed this year as a key global risk by the World Economic Forum. Although adaptation presents new risks, it is also an area of innovation, offering new opportunities to Victorian industry and businesses. Research has a key role in this process in this process. A panel of experts from industry and research will share their work and observations to give insight as to what needs are emerging in different sectors and how best they can be supported.*

Adaptation overview for Victorian industry and adaptation in the finance, insurance and legal sectors

Smart Futures, SME's and adaptation in Victoria

Presenter: *Celeste Young*

Small to Medium Businesses make up the core of Victoria's economy and are the foundation of many communities across Victoria. With the exception of a few sectors such as tourism and primary industries, adaptation has not been a priority for many SME's due to more pressing concerns. However, an awareness of how climate change may impact in the business community is growing. For example, the failure to adapt to climate change was listed last year as a key global risk by the World Economic Forum. The increased focus of major organisations and some peak bodies on building resilience highlights this growing awareness but for many SME's understanding what this means for their businesses is still emerging. Drawing on observations from a series of workshops and discussions over the last 2 years, this presentation looks at what some of the key risks are for SMEs and also the challenges and opportunities which are arising as a result of climate change and the need to adapt.

Risky business – the changing relationship between insurance and natural disaster risk

Presenter: *Ben Honan, Public Policy, Suncorp General Insurance*

An average day for Suncorp includes the payment of around \$15 million in claims for homes, cars, businesses and other assets – many of which have been damaged by natural disasters. This number has been on the rise as a result of economic growth, urbanisation, population shifts toward the coast, and extreme weather events. As insurance provides a way to share risk, not reduce risk, these rising claims have translated into rising premiums. The news isn't all bad though because high premiums provide a market signal for risk that incentivises adaptation. Communities that make smart decisions now will face fewer natural disasters into the future, and enjoy a multitude of benefits including lower insurance premiums.

Will a failure to consider climate legal risk result in failure: a message from the courts

Presenter: *Mark Baker-Jones, Special Counsel, Planning, Environment and Climate Change*

The law relating to climate change is only just developing and it is questionable whether conventional legal reasoning is capable of dealing with the new realities that climate change brings. What is certain is a failure to enable decision makers to plan for climate change, to assess and consider their liabilities, and to deal with the associated climate legal risk, will leave affected parties with no other choice than to resort to the courts for a solution. This paper will consider how attempts to deal with climate legal risk under current legislation (whose drafters may never have anticipated the impacts of climate change) can only be effective as an interim measure. It will conclude that an attempt to regulate less might only result in increased risk to decision makers, particularly those at local government level. Finally, it will consider the solution - which the law can be used to promote good decisions, and should not be used to shield bad decision making.

Adaptation in the energy sector

Presenter: *Michael Lord, Senior Consultant, Sustainability and Climate Change (RPS Group)*

An overview of climate risks and action in the energy sector. The talk will focus on adaptation and incentives for action in the UK, and any lessons for Victoria.

Adaptation in the housing and property, tourism, urban water and social services sectors

Adaptation and Property Development

Presenter: *Alianne Rance - Associate, Net Balance*

Climate change is modifying the way we need to plan our cities and future human settlements. While current lack of regulation has left property developers in Australia with limited impetus for change, the viability of our future settlements and wider serious ramifications are of grave concern if adaptation is considered an option: not a requirement. There are however non-regulatory motivations that can be used to engage with the development industry and promote adaptation in new development. A series of knowledge leadership events were run by Net Balance to engage the property development industry and associated stakeholder groups such as the legal, financial, industry associations, insurance and developers themselves across the east coast of Australia. Stakeholders put forward their sector perspectives on why the property industry should adapt to a changing climate. These perspectives have been incorporated into an engagement model to more effectively motivate property developers to attenuate climate risk through adaptation. This presentation discusses the proposed model and aims to further the conversation using key perspectives from each stakeholder group.

Uncork the genie: Networked localised infrastructures building climate resilience

Presenter: *Che Biggs - Research Fellow, The Victorian Eco-Innovation Lab*

This talk will focus on the shift toward localised energy, food and water service provision - its relevance to adaptation and implications for business and policy. Rising resource costs, desire for more control over service quality and the falling cost of key technologies are driving a shift to distributed systems. A few years ago these localised, networked infrastructures of provision were limited to rooftop solar, backyard water tanks and community gardens but are now far more sophisticated. These changes represent an innovation trajectory that is gaining momentum and a positive step for building urban resilience to climate change. It is diversifying markets and supply systems, building adaptive capacity in end-users and improving security of supply. For the private sector, this trend offers untapped opportunities but almost certain risk of disruptive change. For regulatory agencies holding many of the levers impeding

innovation, distributed systems pose a dilemma. Removing barriers would create new social and political risks and threaten existing industry players. However, it would also better position social and business creativity behind climate adaptation and catalyse the types of systemic change needed for a 20C+ world. Researchers can help to resolve this problem by showing where the opportunities and benefits from distributed systems outweigh the risks and by exploring the implications of systems innovation with business and agency stakeholders.

Climate change and the community sector

Presenter: *Bridget Tehan, Victorian Council of Social Services*

Thousands of community sector organisations provide a range of key services to on a day to day basis, from mental health, aged care and family violence services through to housing, community health and refugee services. For disadvantaged and vulnerable Victorians they are the shock absorbers for every day adversity as well as crises. Unfortunately, the community sector is particularly vulnerable to the impacts of climate change. A report released last year found that up to 25% of small and medium-sized organisations would be at risk of permanent closure as a result of major damage to physical infrastructure and disruptions to critical services. The consequences of major disruptions to the provision of social services for disadvantaged and vulnerable people are very serious. In addition, climate change is not just an environmental issue. It is also a social justice issue with impacts disproportionately impacting disadvantaged and vulnerable people, including: higher costs - energy, water, food, fuel, insurance; health impacts - physical and mental health; economic changes; higher risks of bushfires, storms, floods, drought and heatwave; and displacement. Considering the needs of community sector organisations, and their clients, is critical in any discussion around climate change and adaptation.

Sustainable, Resilient and Liveable Cities: Adaptation in the Urban Water Industry

Presenter: *Ross Allen - CRC for Water Sensitive Cities / Monash University*

Victoria's urban water industry has a strong history of delivering reliable, safe and affordable water services to communities. The provision of high quality water to residents and business has underpinned public health and economic activity. Effective planning and management informed by rigorous science has reduced flood risk and damage. There have also been increasing efforts to understand and mitigate the negative impacts of urbanisation on aquatic ecosystems. Recent droughts, floods and fires have brought into sharp relief the increasing vulnerability of our urban water infrastructure and services to a changing and uncertain climate future. Increasing urban populations and densities further challenge established urban water practices. Beyond technological innovations, a clear vision, strong leadership and meaningful partnerships are required to ensure our urban water systems continue to meet community needs. Further reform of the urban water industry is required to achieve this goal. Research continues to play an important role in supporting adaptation in the industry and community to underpin sustainable, resilient and liveable cities and towns. Focused research adoption activities are required to ensure new knowledge and tools can effectively inform and influence policy development and practice.

Supporting partnerships with local government and the community

Convenor: *John Martin*

Aim of session: *The VCCAP states that 'Victoria's local governments have an important role to play in climate adaptation' and that 'partnerships between the Victorian Government and the local government sector are a critically important mechanism for adaptation planning across Victoria' (p.38), in particular because such partnerships can encourage community adaptation and adaptation planning at the local and regional scale. The VCCAP specifically recognises the importance of local knowledge and experience in adaptation planning and outlines shared responsibilities between state and local governments. This session discusses the current*

level of knowledge in regard to adaptation at the local government and community scale, with the aim to identify synergies and areas for future research.

Local government adaptation planning and implementation

EUA finance for the regions - The economic benefits of retrofitting Victoria's building stock through environmental upgrade agreements

Presenter: *Scott McKenry, Regional Coordinator, Eastern Alliance for Greenhouse Action*

Experience demonstrates that building retrofits are one of the most cost effective opportunities to enhance the resilience of assets, reduce operational costs and improve environmental performance. However, barriers often restrict such retrofits from occurring, including access to finance and split incentives. Environmental upgrade agreements (EUAs) have emerged as a key mechanism to overcome these barriers. EUAs are currently available in the City of Melbourne and a number of Councils in New South Wales. To make this type of finance available within Victoria beyond the City of Melbourne, a minor amendment to the Local Government Act is required.

The Eastern and Western Alliances for Greenhouse Action have recently completed a research study that quantifies the potential direct economic benefits that could be unlocked by EUA finance within each municipality in Victoria. The report estimates Victoria's regions could benefit from an additional \$4.5B in capital investment and over 18,000 jobs if the finance is enabled.

The Port Phillip Bay coastal adaptation pathways project

Presenters: *Bernie Cotter, Executive Officer ABM, & Michael Nolan, Global Leader, Climate Adaptation*

The combined effects of sea level rise and increased rainfall as a result of climate change will exacerbate flood risk in many coastal areas, exposing areas to more frequent and severe inundation. A growing number of people and properties will be exposed to flooding during this century, resulting in damage to or loss of property and natural assets as well as economic and social disruption unless proactive adaptation is considered. Identifying cost effective adaptation options, and deciding when to apply those options, presents significant new challenges for governments and the community. Governments will be challenged to demonstrate clear and transparent decision making in responding to changing inundation risks in the face of the diverse range of expectations from the community as well competing pressures for limited financial resources. An adaptation pathways approach can provide a flexible course of action taken over time in response to potential or actual inundation in the short and long term.

Community perceptions of responsibility for adaptation to sea level rise

Presenter: *Elissa Waters, Research Fellow, Department of Resource Management and Geography, University of Melbourne*

Climate change adaptation requires clear regimes of responsibility to be negotiated between different levels of government, the private sector and the community. This becomes particularly important when attempting to build partnerships between local governments and the community on complex issues such as sea level rise. This presentation presents the findings of a project completed in 2013, which investigated community preferences for the distribution of responsibility for adaptation in two local government areas: Eurobodalla Shire in New South Wales and Mornington Peninsula Shire in Victoria. As well as presenting the findings of the 80 interviews that make up the empirical element of this project, this presentation will reflect on the challenges and opportunities that emerged from the research model and the role of researchers in building community/local government partnerships.

Community driven adaptation planning: The bottom up approach that's delivering results

Presenter: Rohan Hamden, Manager, Climate Change Partnerships, Department of Environment and Natural Resources, South Australia

South Australia has developed a multi-award winning program to help communities prepare for the impacts of climate change. State Government develops genuine partnerships with regional leaders to share the problem of climate adaptation, and work together to develop solutions. We have adopted a bottom up driven approach that empowers regional community leaders to jointly plan and deliver on adaptation actions for their regions. The Government of South Australia is an active participant in the process, and relies on the ideas and actions arising from regional planning to develop state-wide responses to climate change. This presentation will outline:

- The mechanisms to identify and empower the right community leaders to participate in planning
- The management framework to ensure that issues raised by communities are considered in government decision making
- The communications mechanism for community engagement in decision making and planning
- The many benefits achieved through this approach.

Community partnerships for adaptation

Are we adapting to heatwaves?

Presenter: Neville Nicholls, Monash University

The heatwaves in late January 2009 and January 2014 were similar in duration and intensity and both set records. The 2009 heatwave led to the death of about 60% more people than would have been expected for that time of year. This was despite the availability of a somewhat rudimentary heatwave alert system based on scientific work at Monash that had identified a threshold temperature above which Melbourne mortality increased substantially. Since 2009 work by the Victorian Department of Human Services, with Monash University, has extended and focussed the heatwave alert system. So, has this heatwave alert system been an effective adaptation to heatwaves? Early estimates suggest that the 2014 heatwave increased mortality by about 30%, suggesting that, even though there is still work to be done, the more focussed heatwave alert system has been an effective adaptation to heatwaves. Since we can confidently anticipate more numerous and intense heatwaves in the future due to increasing global emissions of greenhouse gases, it is important that the heatwave alert system continues to develop and improve, if we are to avoid a catastrophic heatwave in the future.

Presentation: 2021 – Preparing for a different future

Presenter: Paul Davis Manager Innovation and Change, Fire Services Commissioner

This presentation outlines the Fire Services Commissioner's 2021 Research program which looks at the future State of Victoria. The program aims to identify future trends and changes across Victoria and outline pathways for the emergency management sector to being planning, investing and adapting to changes. The presentation will also outline the next steps of the completed research; identifying pathways to implement the project's findings, as well as creating linkages with the emergency management sector and the community to plan for changes in Victorian communities.

Use of indigenous knowledge for natural resource management - lessons learned and future work

Presenter: Dave Griggs Director, Monash Sustainability Institute

A recently completed VCCCAR funded project investigated how the deep knowledge of the Yorta Yorta people can be used to strengthen their participation and influence in the complex national and regional

processes that determine how their traditional lands are managed, leading to improved adaptation decisions both for the Yorta Yorta and the wider community. Through discussions with the Yorta Yorta over several years, the approach developed for the project was the creation of a Geographical Information System (GIS) mapping framework containing both Yorta Yorta knowledge and more conventional knowledge. GIS allows for mapping and layering of different types of data, allowing the Yorta Yorta to access and present their knowledge in ways that relate to Western decision-making processes. This presentation will reflect on the lessons learned from this project from three perspectives: a university researcher perspective, a Yorta Yorta perspective and a policy perspective. The presentation will also look at ways the project could be further developed to lead to improved policy outcomes.

Community participation and environmental reporting

Presenter: *Kate Auty, Commissioner for Environmental Sustainability*

The Office of the Commissioner for Environmental Sustainability is accountable to the public for the environmental reporting undertaken, for assisting in generating knowledge of the triple bottom line, and for broad community engagement. To give effect to these accountabilities the four and a half years of my term in the office has been spent actively cultivating community engagement. The public have played a role in the reporting my office has undertaken. This presentation will focus first on the report which reflects public engagement with the 'idea' of reporting on the environment - Many Publics. Participation, inventiveness and change. I will provide short commentary on the importance of participation and its effects. The second half of my paper will focus on how the insights gained in the early stage of my time in office played out in the development of the framework for the state of the environment report, the consultation around indicators and themes and trends, and the report itself.

An analysis of approaches and lessons learnt to delivering four pilot Local Coastal Hazard Assessments under present and future climate conditions

Presenters: *Alex Edwards, Manager: Sustainability and Adaptation Programs & Ross Martin, Senior Sustainability Manager – Department of Environment and Primary Industries*

In the last two decades Victoria's coastline has experienced unprecedented development pressures; more Victorian's are using the coastline for lifestyle / recreation than at any other time in history. Climate events such as storms and floods can have significant effect on coastline and associated values and assets. Climate change impacts will have a profound effect on how coastal planners and land managers mediate the increasing conflict between natural coastal processes, existing uses / future development and risks. The Victorian Government, through the Future Coasts program, recognised the importance of planning for future sea level rise and increased frequency of extreme weather events. The Local Coastal Hazard Assessment program are undertaking detailed assessment of coastal hazards under present and future sea level rise and storm scenarios as pilots at four representative study areas. The variables in the study areas include the type of coastal landforms, high / low energy environments, number of land managers, mix of built and natural assets, complexity and variability of the impacted community. The study areas include Port Fairy, Bellarine Peninsula/Corio Bay, Western Port and Lakes Entrance / Gippsland Lakes; the program will be completed by June 2014. The four projects have regularly shared insights and assisted each other in project delivery. This paper explores the differences in approaches across the four locations and some of the initial lessons that have been learnt on the key themes of coastal hazard assessment, building and working in partnerships and sharing the journey with communities.

Join us

○ The National Climate Change Adaptation Research Facility and CSIRO invite you to the annual conference, Climate Adaptation 2014: Future Challenges. This is a national conference focused on the information needed to ensure Australia is adapting well to climate change

Bringing together researchers, practitioners and decision makers to share knowledge and research approaches that inform policy and practice in planning for climate change

CLIMATE ADAPTATION 2014

Future Challenges

NATIONAL CONFERENCE
30 SEP - 02 OCT 2014

● Gold Coast, Australia

Key themes

○ Building resilience of communities and community services ○ The governance, policy and regulation of adaptation ○ Communicating climate science and adaptation: building support for action ○ Planning for adaptation in natural resource management ○ Adapting coastal management ○ Local government: planning, building, leading

Confirmed speakers



Dr. Debra Roberts established and heads the Environmental Planning and Climate Protection Department of eThekweni Municipality (Durban, South Africa). Dr. Roberts has written

widely in the fields of urban open space planning, environmental management and urban climate protection and has received a number of awards for her work.



Andy Reisinger is currently the Deputy Director (International) of the New Zealand Agricultural Greenhouse Gas Research Centre. In this role, Andy focuses on promoting international

collaboration and capacity building towards the development and adoption of mitigation options for agricultural greenhouse gas emissions, particularly through the Livestock Research Group of the Global Research Alliance.

Andy is also a coordinating lead author for the 5th Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).



Dr Alistair Hobday leads CSIRO's Marine Climate Impacts and Adaptation research, is co-chair of the international CLIOTOP (Climate Impacts on Top Ocean Predators) program,

and contributed to the IPCC 4th and 5th assessment Australasia chapters, covering fisheries, oceanic and coastal systems. Much of his current research focuses on investigating the impacts of climate change on marine biodiversity and resources, and developing, prioritising and testing adaptation options to underpin sustainable use and conservation into the future.

More info at www.nccarf.edu.au/conference2014

