

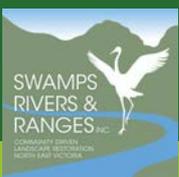


SWAMPS, RIVERS & RANGES WITH NRCL PRESENTS

AUGUST 27, 2021

NAVIGATING CLIMATE CHANGE IN NORTH-EAST LANDSCAPES

A constructive forum for practical actions to help our region adapt and keep delivering what we value into the future of a changing climate



TODAYS FORUM HAS BEEN SUPPORTED BY THE FOLLOWING ORGANISATIONS

Swamps, Rivers & Ranges (SRR)

SRR is a community-driven landscape restoration group. SRR exists to make positive contributions to enhancing the natural environment of our region, filling strategic gaps and applying a long-term perspective at a broad landscape scale.

SRR aims to initiate, enhance and collaborate with community efforts to conserve and restore healthy landscapes, with benefits for nature conservation, natural resource management and agricultural production.

SRR is a 'grassroots' organisation that enjoys working with private landholders, government agencies and non-government organisations. It started with philanthropic backing from the Wettenhall Environment Trust, and continues to receive their support.

Natural Resources Conservation League of Victoria (NRCL)

NRCL is an independent, not-for-profit charity committed to the promotion of the sustainable management of Victoria's natural resources and supporting the efforts of community-based networks working to restore landscapes across the state.

NRCL commenced way back in 1944, and the current board, chaired by Ken King, has sought to build on the NRCL's proud heritage of supporting community engagement and building the capacity of community based organisations to undertake conservation projects that reflect our Purpose of "The Protection, Sustainable Use and Enhancement of the natural environment".

NRCL supports Regional forums such as this event, and related projects that promote community responses to Climate Change.



North East Catchment Management Authority (NECMA)

NECMA is one of ten authorities established by the Victorian Government in July 1997. It is responsible for coordinating integrated catchment management and sustainable land and water use in Victoria's North East. Each CMA works with the community, government, and funding organisations to protect and enhance land, water and biodiversity resources.

We encourage landholders, community groups and government to address the 'big' natural resource management issues facing our region, including adapting to climate change, fostering sustainable agriculture, managing cultural heritage and identifying the impacts of 'tree change' trends on land management in the North East.

The CMA assists in the development of regional natural resource management priorities. Our work in these areas is guided by the North East Regional Catchment Strategy, which is a twenty year strategy that sets the direction for investment in natural resource management across the region. We track and report our progress towards achieving Regional Catchment Strategy targets through an annual report on the condition and management of land & water resources.

Department of Environment, Land, Water and Planning (DELWP)

The Department of Environment, Land, Water and Planning (DELWP) provides Victoria's climate change, energy, environment, water, forests, planning and emergency management functions.

We work collaboratively to deliver services that support liveable, inclusive and sustainable communities and thriving natural environments, connecting environmental, community, industry and economic priorities.

The Victorian Government is taking strong and lasting action to reduce Victoria's emissions to net zero by 2050 and build resilient communities prepared to deal with the impacts of climate change.

The Climate Ready Hume Team within DELWP has worked closely with the Hume community in the development of the Regional Climate Change Adaptation Strategy which outlines our shared vision and goals for the next five years. Adapting to the impacts of climate change and managing current and future risks is critical to building resilience in our North East and Goulburn Broken communities, working together for a shared vision of a healthy, prosperous and connected present and future.

Rural City Of Wangaratta

As a local council in North-East Victoria, the Rural City of Wangaratta recognises the importance of building climate resilience and seeking mitigation and adaptation actions to respond to climate change. Our commitment to address climate change in our municipality is supported by our recently endorsed Environmental Sustainability Strategy, and the strong community feedback we received that has shaped our Council Plan and Community Vision.

As a large agriculture region with diverse landscapes and areas of high conservation value, Council is vulnerable to the impacts of climate change. We therefore recognise the importance of this forum to empower our industry and community in preparing for future impacts of climate change that include increased intensity and frequency of extreme weather such as bushfires, droughts and flood, risks to food safety and water availability.

Council seeks to work together with external stakeholders and local community to ensure a sustainable future for our municipality and recognises the collective role we all need to play in its conservation, protection and remediation of our natural environment. It is our hope that this will be a constructive forum, to hear expert advice for our region and to drive practical actions within our community.

FORUM PROGRAM OF SPEAKERS

| Time | Topic | Presenter |
|---------|---|--|
| 8.45am | Registrations and entry | |
| 9.00am | Housekeeping and Introduction | Sophie Enders <i>Swamps, Rivers & Ranges</i> |
| 9.05am | Welcome/Acknowledgement of Country | |
| 9.15am | Welcome to Rural City and opening of forum | Mayor Dean Rees, <i>Rural City of Wangaratta</i> |
| 9.30am | Introduction to the day and the Purpose of the forum | Sophie Enders <i>Swamps, Rivers & Ranges</i> |
| 9.40am | <i>Keynote speaker</i> Importance of localized knowledge and action when facing Climate change | Graeme Anderson <i>Climate Specialist, Agriculture, DJPR</i> |
| 10.15am | Overview of Changing Climate Patterns in Rural Victoria | Dr Lynette Bettio <i>Team Lead- Extended and long-range forecasting, Bureau of Meteorology</i> |
| 10.40am | BREAK- Morning tea | |
| 10.55am | Overview of changing water availability in Rural Victoria | Geoffrey Steendam <i>Senior Manager Hydrology and Climate Science, DELWP</i> |
| 11.20am | Getting Climate Projection Information to People in NRM | John Clarke, CSIRO <i>Research Team leader of Regional Projections, CSIRO</i> |
| 11.50am | Impacts of Climate Change on Agriculture | Professor Snow Barlow, <i>University of Melbourne</i> |
| 12.15am | Wetlands as a signal of Climate Change | Professor Max Finlayson, <i>Adjunct Professor, Charles Stuart University & University of New South Wales</i> |
| 12.35pm | BREAK- LUNCH | |

FORUM PROGRAM OF SPEAKERS CONTINUED

| | | |
|--------|---|--|
| 1.15pm | Farming under landscape and climate challenges. Panel discussion | Lachlan Campbell , <i>Catchment coordinator regional agricultural Landcare facilitator, NECMA</i> Joel Tilbrook , <i>Chief Winemaker, Brown Brothers</i> Hugh Stewart , <i>Forestry consultant and Farmer</i> |
| 2.00pm | Citizen science and emerging trends from monitoring birds across the <u>North East</u> region | Dr Richard Loyn , <i>Swamps, Rivers & Ranges Inc. & Forest Ecologist</i> |
| 2.20pm | Vegetation genetics and ecological change | Dr Lynda Broadhurst , <i>Senior Research Scientist, CSIRO</i> |
| 2.50pm | <u>Bunanyung</u> Landscape Alliance- a community response at landscape scale | Peter Gell , <i>Deputy Chair, Bunanyung Landscape Alliance & Professor (Emeritus), Federation University</i> |
| 3.10pm | Break – Afternoon tea | |
| 3.20pm | Question time- Identify NRM priority issues from forum for action in NE Victoria | Everyone |
| 4.10pm | Collation of Responses - next steps Thankyous and acknowledgements | Sophie Enders <i>Swamps, Rivers & Ranges</i> |
| 4.30pm | FINISH | |

Please note this program may be subject to minor changes in the days leading up to the forum.

SOME BACKGROUND ON TODAY'S SPEAKERS

Graeme Anderson - Climate Specialist, Agriculture, DJPR

Graeme is an experienced science communicator and extension leader with Agriculture Victoria. He leads a small team who deliver climate services (The Break & Soil Moisture Monitor, Climate webinars, ClimateDog animations, Making Sense of Carbon) which assist farmers, advisors and communities in making sense of emerging issues associated with climate change and adapting to their local farm systems. He has a 33 year background in science and policy communication, practice change & adoption, farm & catchment, salinity & vegetation management, farm forestry and industry development, carbon share-farming, land use change and climate/carbon issues affecting agriculture. Graeme will share some important observations on our changing climate, the implications locally and the importance of local knowledge, action and leadership.

Peter Gell - Deputy Chair, Bunanyung Landscape Alliance & Professor (Emeritus), Federation University

Peter Gell is a paleoecologist who specialises in examining long term change to wetlands to provide context for present management. He has 35 years experience as an academic in Australia, France and the UK. He was a member of the Scientific Steering Committee of the Global Research Project 'Past Global Changes' and was leader of the PAGES Aquatic Transitions working group. He is co-chair of the Grampians region Climate Adaptation Group, committee member of the Ballarat Environment Network and member of the Environmental Science Advisory Panel at Winton Wetlands.

Geoffrey Steendam- Senior Manager Hydrology and Climate Science, DELWP

Geoff manages the Hydrology and Climate Science team in the Victorian Department of Environment, Land, Water and Planning (DELWP). As knowledge-brokers for the water sector, Geoff and his team invest in targeted scientific research, and work with Victorian water stakeholders to apply the knowledge to inform water resource decisions. Geoff is a hydrologist and water resource expert who has worked in climate, hydrology and water resource planning roles for over 20 years, including roles in DELWP and with consulting engineering firms in Australia and the UK.

Dr Lynda Broadhurst- Director Centre for Australian National Biodiversity Research (CANBR) and Director Australian National Herbarium (ANH) at CSIRO National Research Collection Australia

Dr Linda Broadhurst has been working at CSIRO in Canberra since 2001. Her early research assessed how remnant size, isolation and degradation associated with recent landscape fragmentation affected long-term plant population viability. Her most recent research aims to assist NRMs and NGOs to understand how these changes influence their seed sourcing and seed production to ensure that restored populations have the broad genetic base required to respond to changing environments.



Dr Lynette Bettio - Team Lead- Extended and long-range forecasting, Bureau of Meteorology

Dr Lynette Bettio has a PhD in climate science and leads the Long-range forecast team at the Australian Bureau of Meteorology. The Long-range forecast team is responsible for the issuance and communication of all sub-seasonal to seasonal forecasts as well as regularly issuing commentary around the current and future state of large-scale climate drivers such as ENSO. These forecasts are used by a wide range of industry and government managers to plan and prepare for future rainfall and temperature conditions. Lynette in her role regularly engages with a wide range of stakeholders, particularly in Emergency Management to increase resilience and planning for the coming seasons.

Lynette has extensive experience in the area of communicating climate change science in Australia, with a focus on the physical science basis and what this means for future risk. A focus is on increasing resilience to changing risk through integrating the physical science into future planning scenarios. She is one of the authors, with CSIRO, of the widely used and cited biennial State of the Climate report, which summarises trends observed in Australia's climate and has presented extensively around this.

Dr Richard Loyn - Swamps, Rivers & Ranges Inc. & Forest Ecologist

Richard is a widely-published ecologist with special interests in forests, fire, wetlands, conservation and sustainable development. He worked for the Victorian Government, mainly at the Arthur Rylah Institute for Environmental Research. In 2013 he established a consultancy (Eco Insights), conducting strategic projects in Australia and occasionally overseas. He was awarded the D.L. Serventy Medal by Birdlife Australia in 2014 and a senior doctorate (DSc) by the University of Melbourne in 2019 for a thesis on forest management and biodiversity conservation. He is an adjunct professor at La Trobe University, holds adjunct positions at Charles Sturt and Melbourne Universities and is president of Swamps Rivers & Ranges. Richard developed the timed area-search method for counting bush-birds and instigated many long-term monitoring programs on bush birds and waterbirds involving citizen science (one in its 48 th year), and research on duck hunting, fire, logging and despotic birds. His team's work on forest owls protected 170,000 ha of forest to conserve those top predators and the ecosystems on which they depend. He and his family love to travel and have visited remote parts of every continent. Richard recognises that birds and other wildlife provide unique windows on the natural world, helping us conserve its diversity in partnership with local people.

Professor Max Finlayson - Adjunct Professor, Charles Stuart University & University of New South Wales

Max Finlayson is a wetland ecologist with extensive experience nationally and internationally in the science and management responses to wetland degradation, including the impacts of climate change. He has participated in global assessments conducted by the Intergovernmental Panel for Climate Change, the Millennium Ecosystem Assessment, the Global Environment Outlook, and since the early 1990s he has been a technical adviser to the Ramsar Convention on Wetlands.

He has been actively involved in environmental NGOs and science organisations and has worked with government, community-based organisations and industry to investigate the causes of ecosystem change and management responses, including adaptation to climate change, and ensuring the active participation of local communities in efforts to limit the impacts of development and develop policy for our rivers, floodplains and wetlands.

He has advocated for further concerted efforts to improve the collection of evidence for responding to climate change and providing guidance to managers and policy makers recognising that the social, economic and ecological consequences of climate change are inter-dependent and operate across multiple scales.

John Clarke - Research Team leader of Regional Projections, CSIRO

John currently leads the Regional Projections Team within the CSIRO Climate Science Centre where has worked for the past 12 years. He brings a range of experience from previous roles in the Australian media and biodiversity conservation sectors and has over 30 years' experience doing, teaching and communicating science nationally and internationally. His expertise lies in developing applicable, fit-for-purpose, scientifically robust climate projections and helping people understand and use them. John recently led the Victorian Climate Projections 2019 project which included developing a new suite of high-resolution modelling and had a strong focus on assisting users to make sense of the abundance of data.

Professor Snow Barlow - University of Melbourne

Snow Barlow is an agricultural scientist, currently Emeritus Professor at the University of Melbourne. Snow has been intimately involved in climate change research and policy within the land-based sector for more than 30 years publishing his first paper in 1983. He was a member of the Australian delegation to COP3 in Kyoto and served on 2 ministerial taskforces in the development of the Clean Energy Technology legislation (Carbon Tax). Snow then chaired the Expert Advisory Panel of the Department of Agriculture; Carbon Farming Futures RDE programs, directed the development of a Climate Change Research Strategy for Primary Industries (CCRSPI) and co-ordinated of the NCCARF Primary Industries Adaptation Research Network.

With his partner Winsome McCaughey, Snow operates a wine business in the Strathbogie Ranges of Northeastern Victoria and markets premium wine under the Baddaginnie Run label while chairing the Agriculture and Food Forum of ATSE.

Agricultural industries are uniquely vulnerable to climate change, being strongly impacted by warming and drying trends, but also a major emitter with the capacity for significant sequestration. It is most existential threat the industry faces in the next half century. No one aspect of climate change is more critical than the other because while we must adapt immediately a changing climate, we also lead the way in reducing emissions to achieve net carbon neutrality by 2050. We seek to be metaphor for what the nation must do, immediate adaptation to climate while immediately and simultaneously reducing our emissions to achieve net CN by 2050.



"For me a real challenge for vegetation restoration in the future is across southern Australia will be the drying climate and warmer temperatures. These changes will likely influence the amount of seed that plants can produce as well as the quality of that seed." - Dr Lynda Broadhurst

WE WISH TO THANK ALL OF OUR SPEAKERS, PANELISTS & GUESTS FOR THEIR CONTRIBUTION AND THOUGHTS ACROSS THE FORUM.

OUR PANELISTS

Lachlan Campbell - Catchment coordinator regional agricultural Landcare facilitator, NECMA

I have been at the Northeast Catchment Management Authority for 15 years working the area of Agriculture as a senior project officer. My current projects are "Embedding climate change in agriculture" and supporting the Regional Agriculture Landcare Facilitator role working primarily with the six agricultural industries in the region (cropping, grazing, horticulture, viticulture, Forestry and dairy). Climate plays a key role in the management decisions that land managers make to ensure that farms remain sustainable and viable. With climate change a key topic of discussion the role Lachlan has played in supporting the community transition is a key part of the work he undertakes. The Northeast CMA has developed a climate modelling tool that has identified the key risks to the region using CSIRO and the IPCC data. This information provides a strong foundation block for having conversations around adaptation options with communities and land managers.

Joel Tilbrook - Chief Winemaker, Brown Brothers

As Chief Winemaker, Joel is responsible for leading our Winemaking and Viticultural team. In that role he oversees all aspects of wine production, from grape growing and fruit sourcing through to stylistic direction at wine blending.

Joel completed his Bachelor of Agricultural Science (Oenology) at the University of Adelaide and worked as a winemaker in the Adelaide Hills for 4 years prior to joining Brown Family Wine Group in 2004. He has held roles of Winemaker, Senior Winemaker / Winery Manager and most recently Chief Winemaker at Brown Family Wine Group, the parent company of Brown Brothers, Innocent Bystander, Devils Corner, Tamar Ridge and Pirie.

In his current role, Joel works with a team of talented people to produce high quality wines from premium grape growing regions throughout Victoria, Tasmania and New Zealand. Joel is passionate about growing the best quality grapes and crafting wines that over deliver in terms of value and quality. Joel is also an active wine show judge, judging at numerous regional and capital city wine shows across Australia.

Hugh Stewart- Forestry consultant and Farmer

The Stewart family farm is the Yan Yan Gurt West Farm, a 230-hectare regenerative grazing and agroforestry property in the Otways. Hugh's brother Andrew was just named the national winner of Landcare Australia's prestigious Bob Hawke Award.

"(We must) recognise that (Climate change) is not a problem for the future – it's a problem right now.

We have squandered the opportunities for orderly transition that were available to us in the past two decades and must now act quickly." - John Clarke



EXTRA RESOURCES

Climate Ready Hume - Hume's Regional Adaptation Strategy:

Climate Ready Hume is a three-year program engagement and capacity building that focuses on facilitating place-based adaptation action on climate change. Through extensive consultation from 18 months of community feedback, the draft Regional Adaptation Strategy was created. It outlines the priority adaptation actions, goals, and visions for the Regional community and supports local projects, education and awareness on climate change adaptation within the six most important thematic areas for Hume. The program has the shared vision for Hume's adapted future: "Hume communities are informed and empowered to make transformational change in the face of a changing climate".

For more information on the strategy and its actions, or to keep up to date with the Climate Ready Hume program you can sign up to the Hume Region's monthly climate change and renewable energy newsletter. Send an email to climateready.hume@delwp.vic.gov.au and write SUBSCRIBE in the subject line.

Victoria's Climate Change Strategy 2021-2025 sets out the Victorian Government's current action on climate change and our next steps. It outlines opportunities for Victorians to save money, to work and to grow innovative businesses and is a roadmap to net-zero emissions and a climate resilient Victoria by 2050.

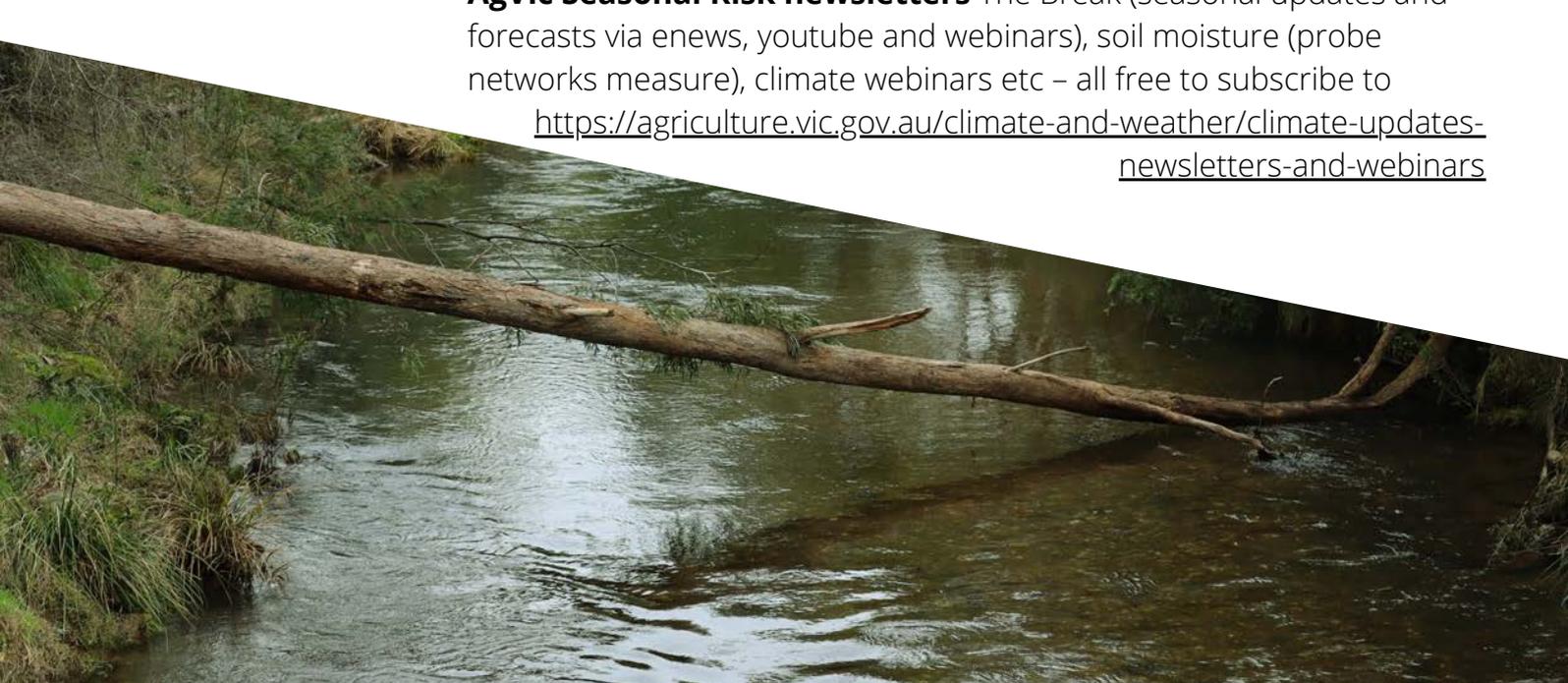
[Rural City of Wangaratta Environmental Sustainability Strategy.](#)

New **Victorian Climate 101 animation** – summarises the latest climate science into a few minutes. Can be useful to help set the scene quickly before launching into a session on what does climate change mean for farms and what actions we can take - Understanding weather and climate | Understanding weather, climate and forecasting | Climate and weather | Agriculture Victoria. It's also on the AgVic youtube <https://youtu.be/v39LBdXqoA0>

Climate posters – maps of rainfall variability and temp variability.

Can be useful to help show rainfall variability versus the key climate change signature of climate change via temperature trends Climate posters | Understanding weather, climate and forecasting | Climate and weather | Agriculture Victoria

AgVic Seasonal Risk newsletters The Break (seasonal updates and forecasts via enews, youtube and webinars), soil moisture (probe networks measure), climate webinars etc – all free to subscribe to <https://agriculture.vic.gov.au/climate-and-weather/climate-updates-newsletters-and-webinars>



RESOURCES CONTINUED

Victoria's new climate change projections (2019). Has regional summary brochures as well as the full technical report <https://www.climatechange.vic.gov.au/adapting-to-climate-change-impacts/victorian-climate-projections-2019>

BoM Regional Climate Guides Show longer term climate history for each region and also any trends in last 30 years for rainfall, hot days, frosts etc <http://www.bom.gov.au/climate/climate-guides/>

Making Sense of Carbon & Emissions on Farms booklet (action areas of energy, nitrogen, soils, trees, and livestock productivity) <https://agriculture.vic.gov.au/climate-and-weather/understanding-carbon-and-emissions/making-cents-of-carbon-and-emissions-on-farm>

Questions to ask before farmers sell carbon <https://agriculture.vic.gov.au/climate-and-weather/understanding-carbon-and-emissions/selling-carbon-from-trees-and-soils>

Climate change analogues (what future climates might look like). Warming up by 1, 2, 3 or 4 degrees may not sound like much – but these maps show the isohyets at 1 degree annual max temp intervals) <https://agriculture.vic.gov.au/climate-and-weather/understanding-weather-climate-and-forecasting/climate-analogues>

Wodonga poster possible future climates

https://agriculture.vic.gov.au/_data/assets/pdf_file/0006/551238/Wodonga-climate-analogue-temp-2030-2090.pdf

Why the fuss about greenhouse gas emissions? (youtube explainer on the science from 1850's and the car dashboard and winding up the windows analogy) <https://youtu.be/7RyApq8COZw>

What's the story on Soil Carbon? (youtube on the research science and what we know about soil carbon) <https://youtu.be/LEYOkgcu6Cw>

Rule of thumb for practice change programs – the 3 key ingredients we always see when a practice or behaviour gets broadscale adoption) <https://youtu.be/PXk4QHwXtGU>

Climate dogs – animations explaining the key drivers of our seasonal rainfall variability in Victoria and how some are changing <https://agriculture.vic.gov.au/climate-and-weather/understanding-weather-climate-and-forecasting/the-climatedogs-the-six-drivers-that-influence-victorias-climate>

CLiMate tool (desktop or app) Load it up, register and then can download rainfall record for hundreds of locations and then undertake various analyses eg historical versus season thus far etc. <https://climateapp.net.au/>

RESOURCES CONTINUED

Rainfall data - The silo database of Aust rainfall used in climate is also available via the climateARM tool (done by Qld long paddock folks) <http://www.armonline.com.au/#/ca>

Rainfall, seasonal variability, climate drivers and making sense of forecasts. AgVic and GRDC collaboration. <https://forecasts4profit.com.au/>

Local Climate tool some Victorian rainfall locations where can see historical, but also overlay with how past seasons were affected when a specific climate drover phase was underway (Indian Ocean Dipole, or ElNino phases etc) <https://climatetool.forecasts4profit.com.au/>

Northeast CMA embedding adaptation into agriculture project

<https://www.necma.vic.gov.au/Solutions/Climate-Change/Embedding-Climate-Adaptation-in-Agriculture>

Future Climate Tool (DELWP based on new climate change projections – data can be downloaded) <https://vicfutureclimatetool.indraweb.io/>

Climate Change & Psychology – insights for mental health

<https://www.psychology.org.au/About-Us/What-we-do/advocacy/Advocacy-social-issues/Environment-climate-change-psychology/Resources-for-Psychologists-and-others-advocating>

https://www.psychology.org.au/getmedia/88ee1716-2604-44ce-b87a-ca0408dfaa12/Climate-change-empowerment-handbook.pdf?utm_medium=PromoTile&utm_source=website



Thankyou for your thoughts, insights and attendance at the 2021 "Navigating climate change in North East Landscapes"

Conversation and workshopping of the outcomes will continue on November 12th, 2021. Bookings to attend the November workshop will open closer to the date.