



21st Century
Weather

ARC Centre of Excellence

WGNE at 40 – Reflections and Thoughts for the Future

Christian Jakob, Director 21st
Century Weather

A little bit of the “old times”

Camaraderie and
international relations



WGNE 2010 - Tokyo

A little bit of the “old times”



The WGNE Pub

WGNE 2010 - Tokyo

A little bit of the “old times”



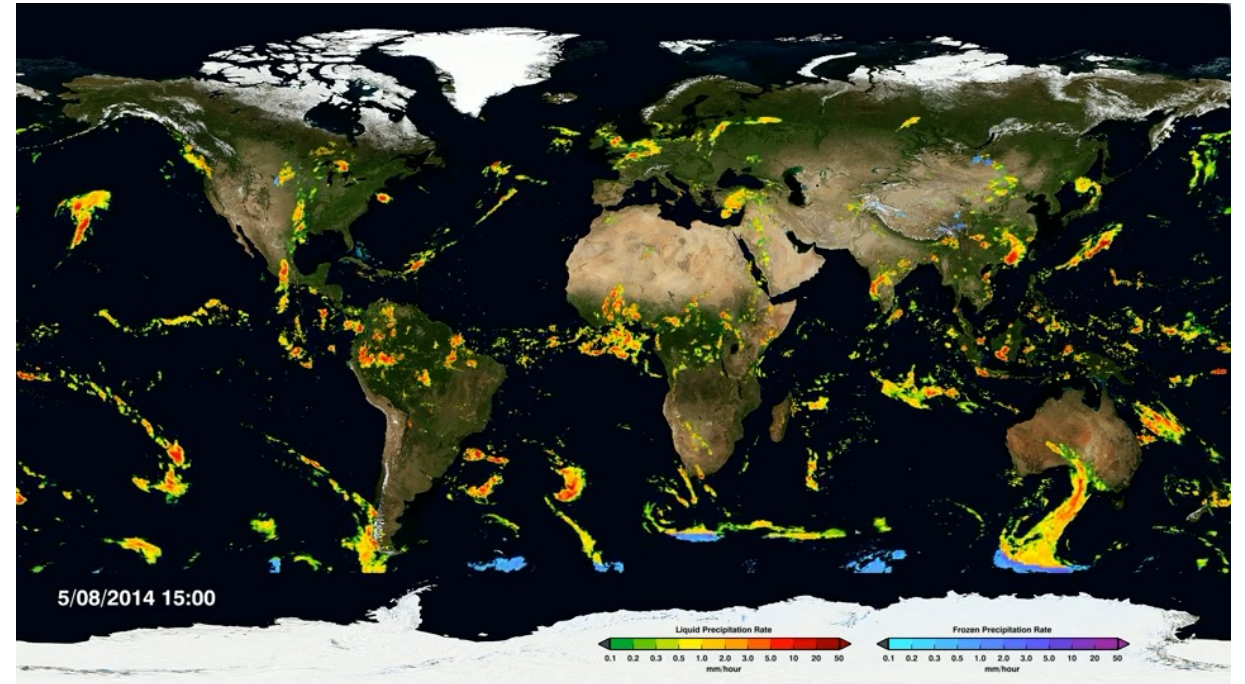
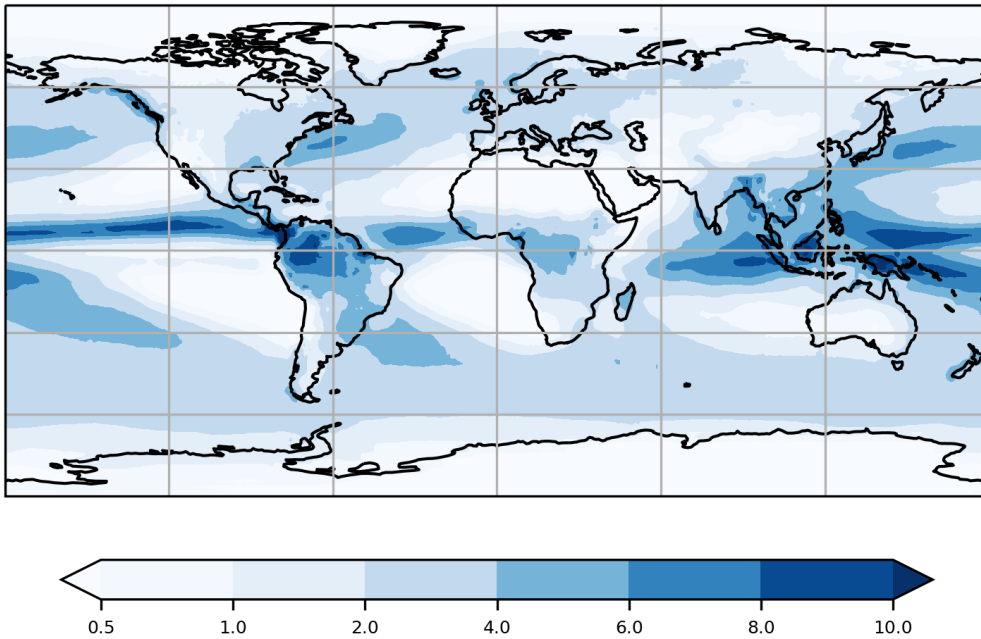
Who knows what this acronym stands for?

WGNE 2010 - Tokyo

From your website:

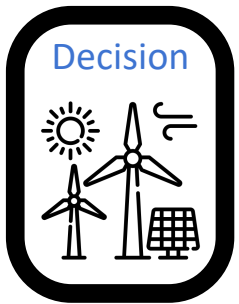
The Working Group on Numerical Experimentation (WGNE) has responsibility for the development of Earth system models for use in weather, climate, water and environmental prediction on all time scales, and diagnosing and resolving shortcomings.

Climate change is actually weather change



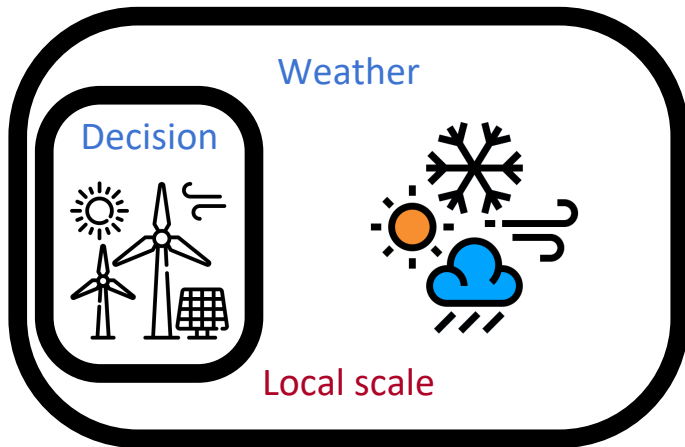


What we need to think about



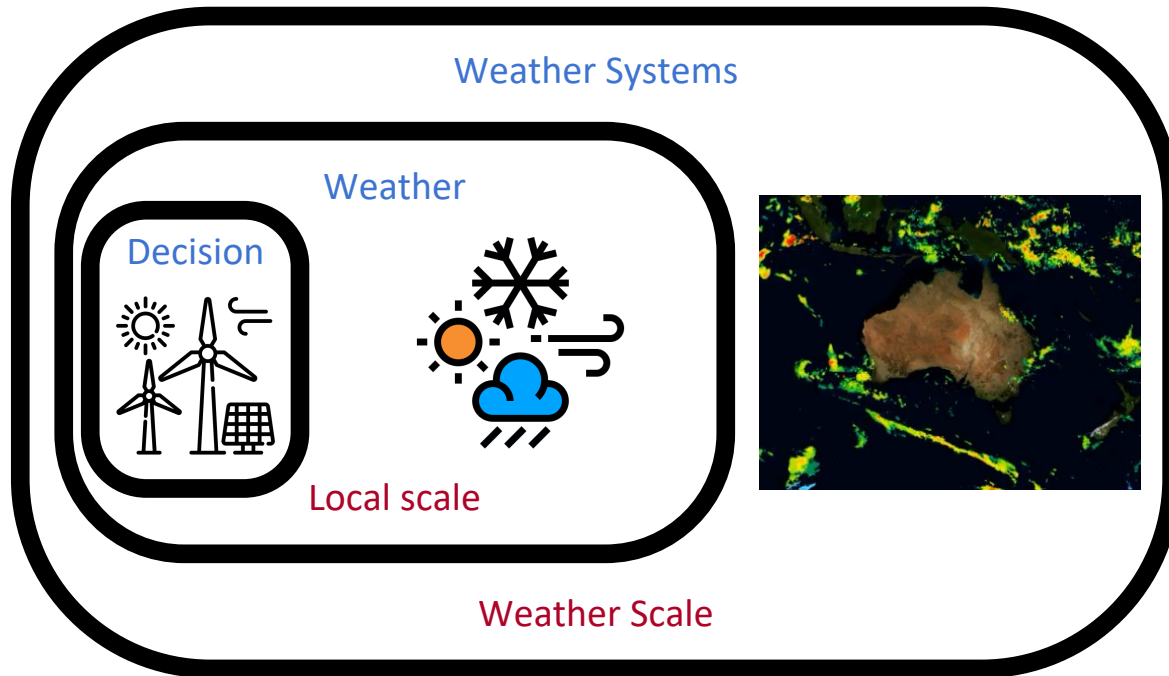


What we need to think about



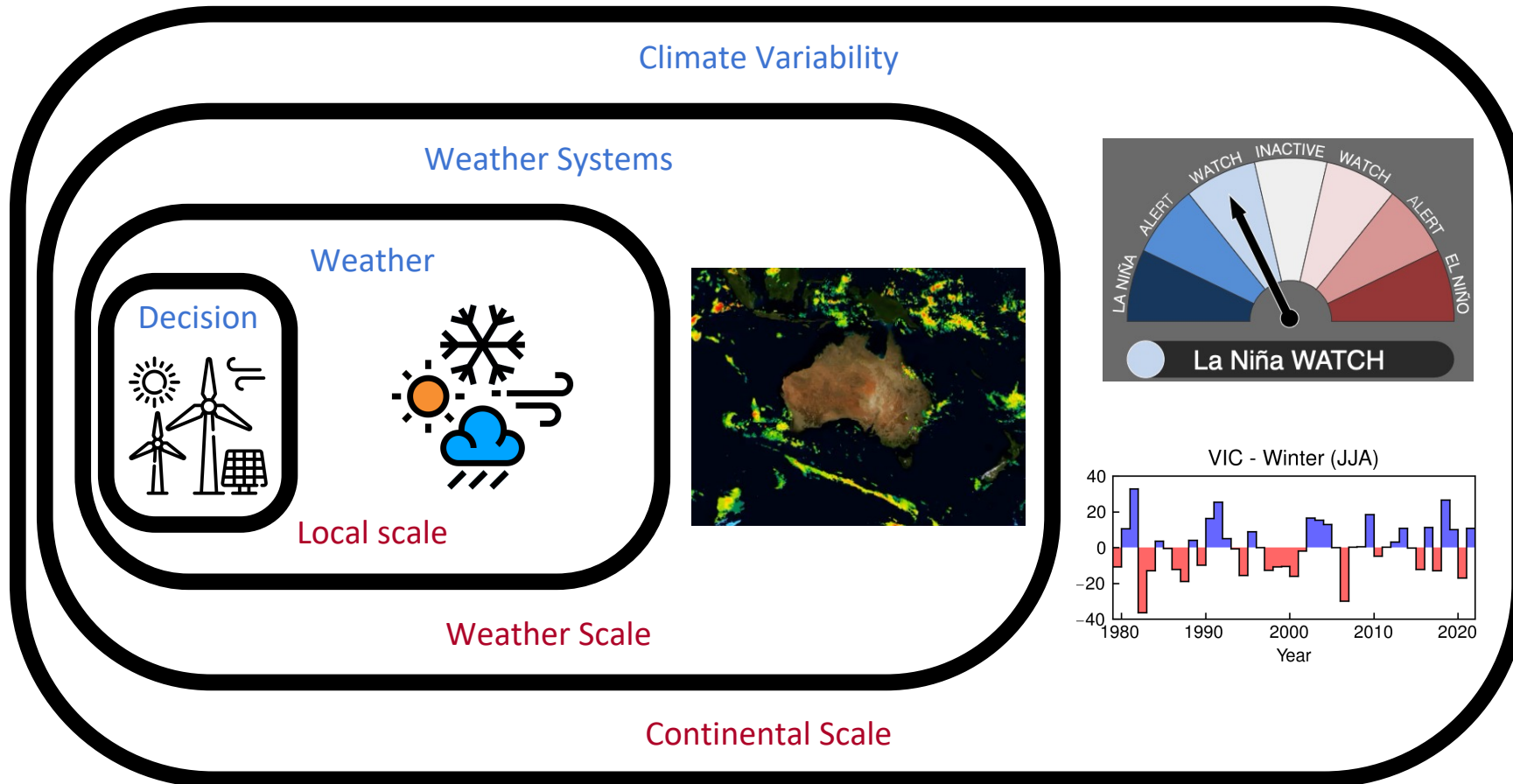


What we need to think about





What we need to think about





What we need to think about

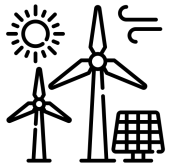
Climate Change

Climate Variability

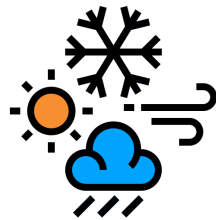
Weather Systems

Weather

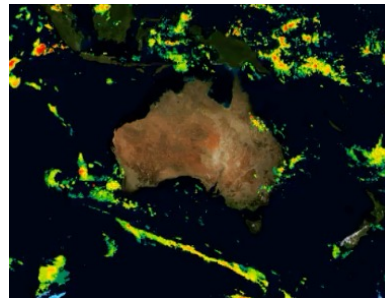
Decision



Local scale

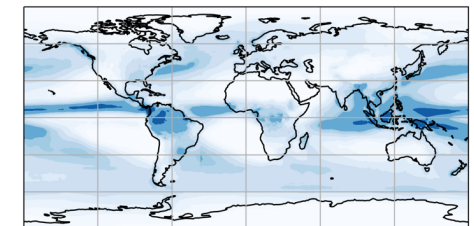
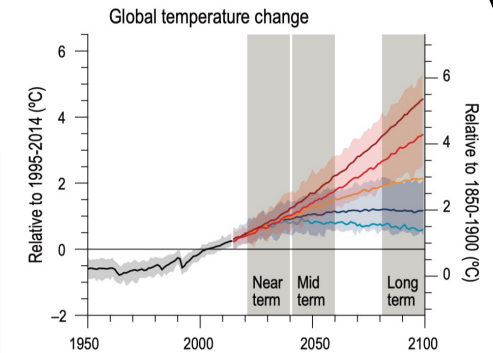
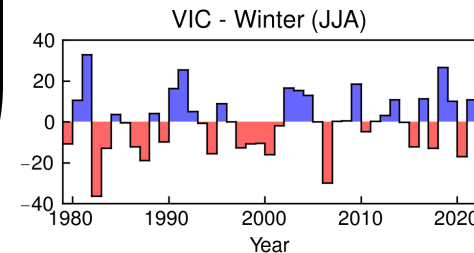


Weather Scale



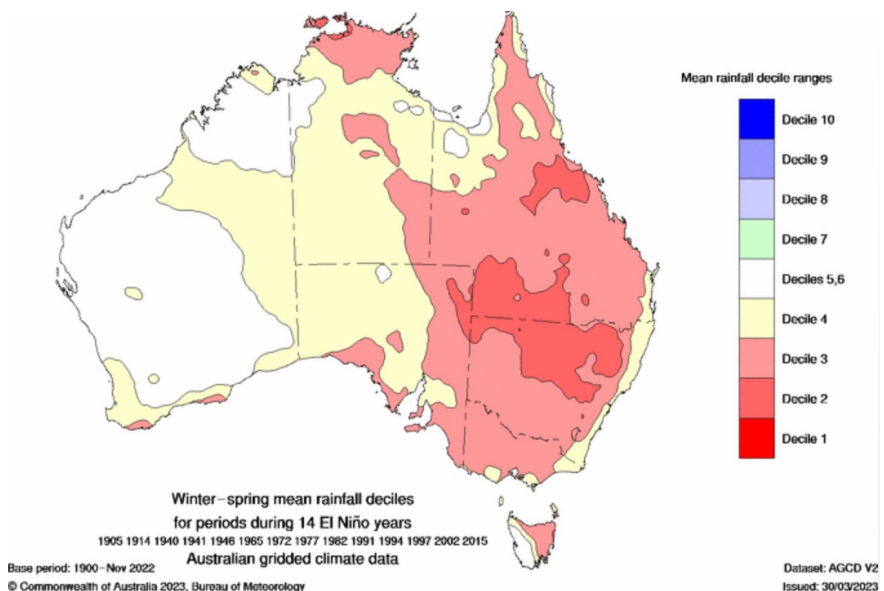
Continental Scale

Global scale





Looking beyond the headlines: El Niño rainfall variations are the result of the presence or absence of certain weather systems.

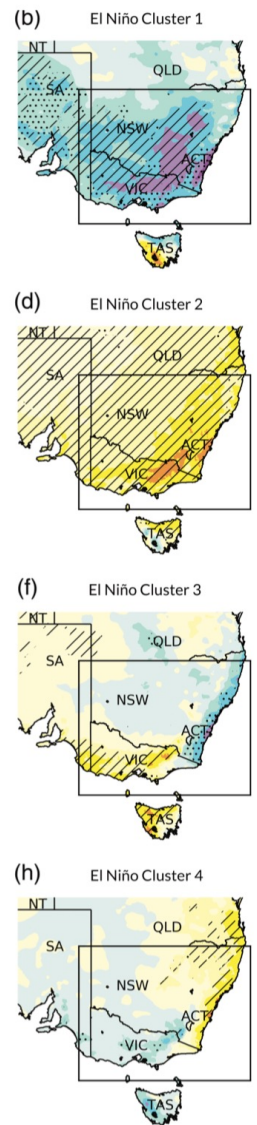


Wet everywhere
8.3 %

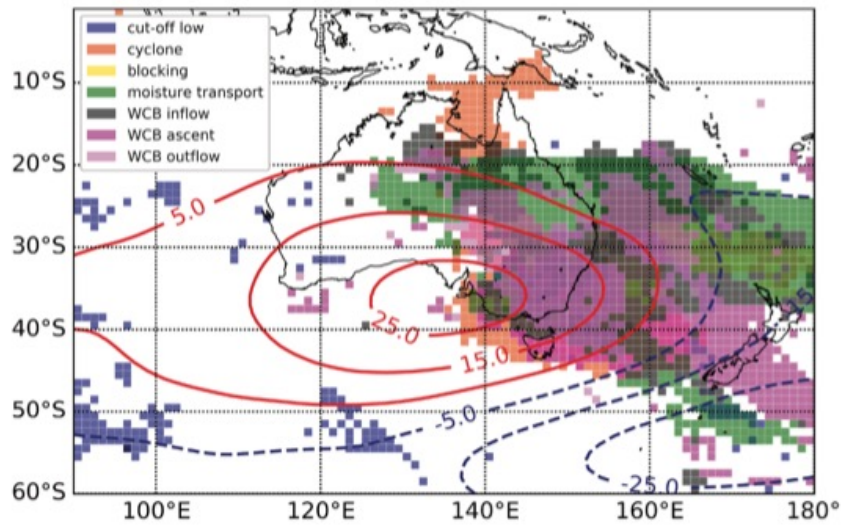
Dry everywhere
48.3 %

Wet east, dry south
20 %

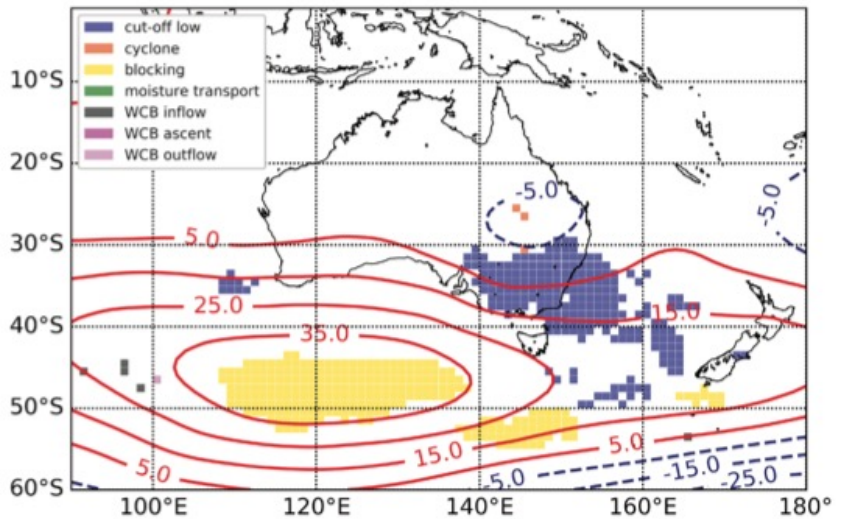
Dry east, wet south
23.4 %



Dry everywhere - Less:



Wet east, dry south - More:



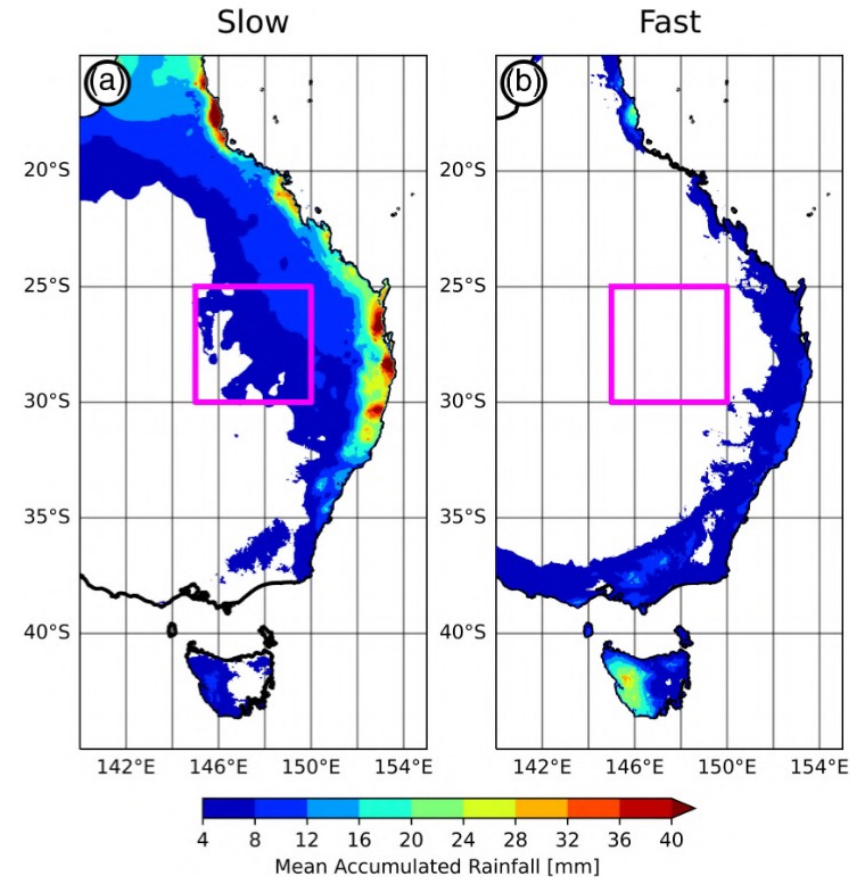
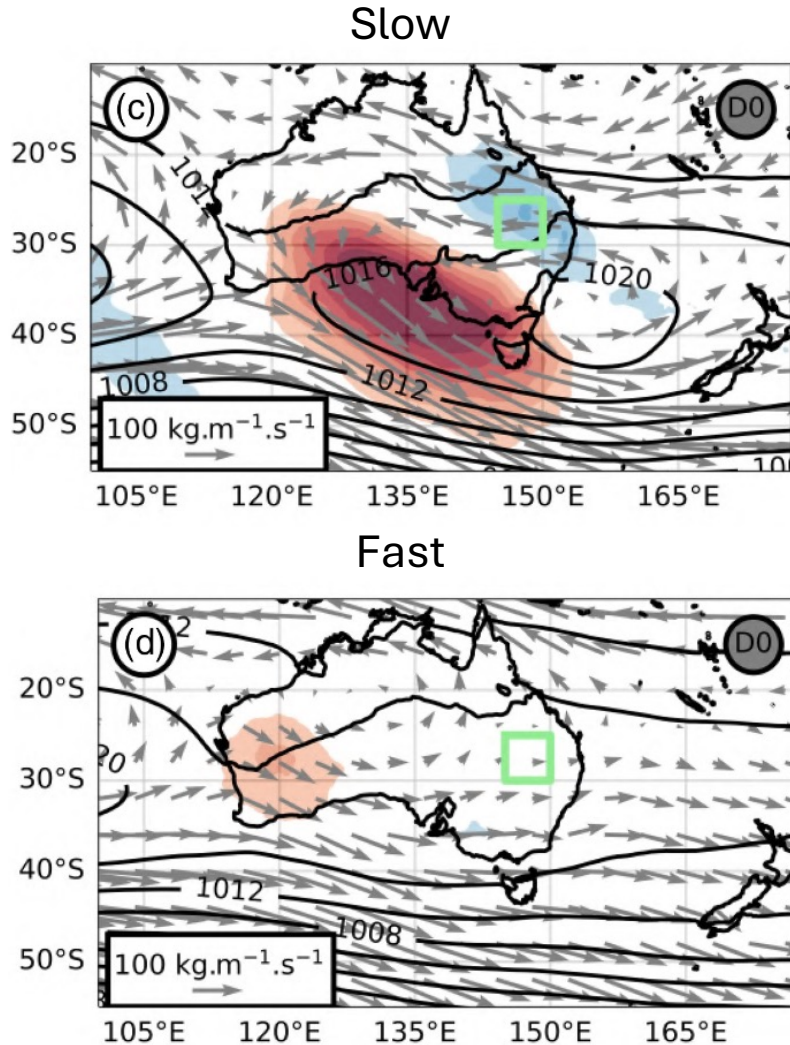
The well-known statistical relationship between El Niño and a reduction in rainfall in Eastern Australia in winter and spring can be understood through the absence/presence of particular weather systems.



Every extreme event is a weather event and they depend on what happens throughout the atmosphere. Example: Slow vs fast moving disturbances over the East Coast.

Surface
Pressure
Temperature
anomaly

Water vapour
transport

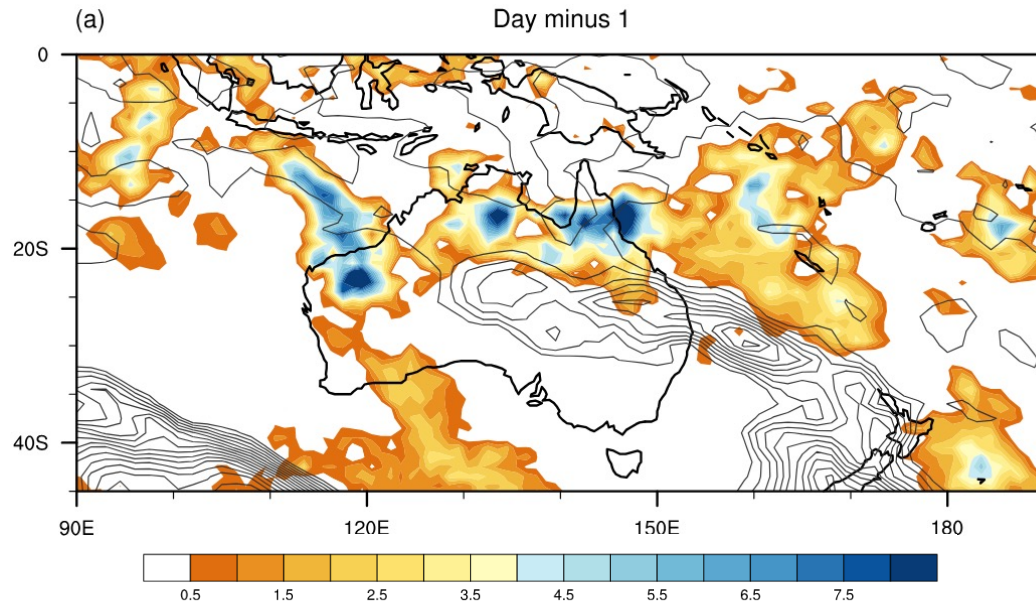


Rainfall

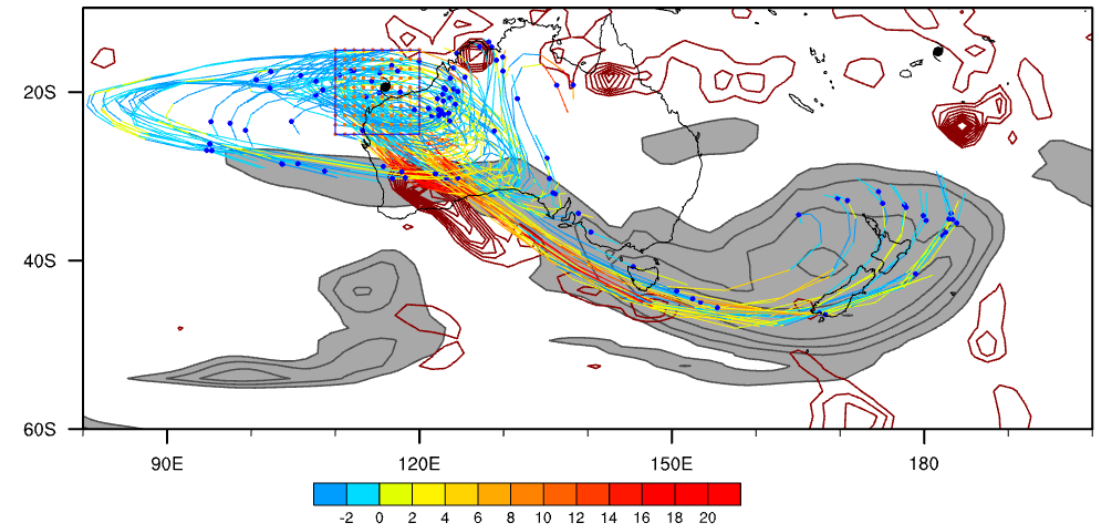


Compounding is a result of weather system dynamics too. It is once again not a statistical result.

Rainfall anomaly the day before a heatwave in SE Australia



Where does the air from a tropical cyclone go?



Parker et al., 2014

Weather is often only seen as a hazard, but it is an important natural resource too – and its importance is increasing



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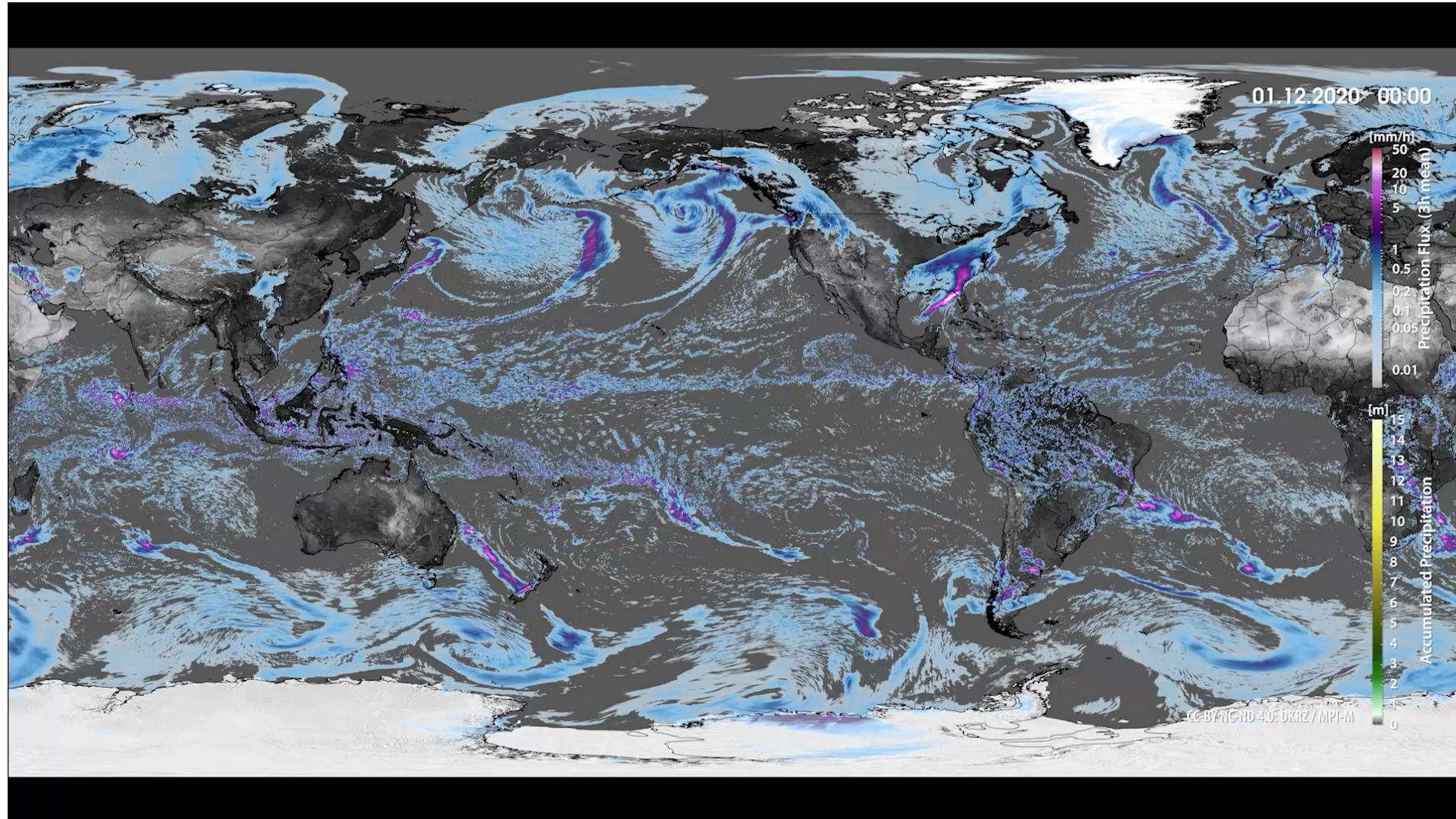


Enhancing the weather-climate connection is a huge opportunity for WGNE to take leadership and fulfil its role as the only joint WCRP-WWRP working group.



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