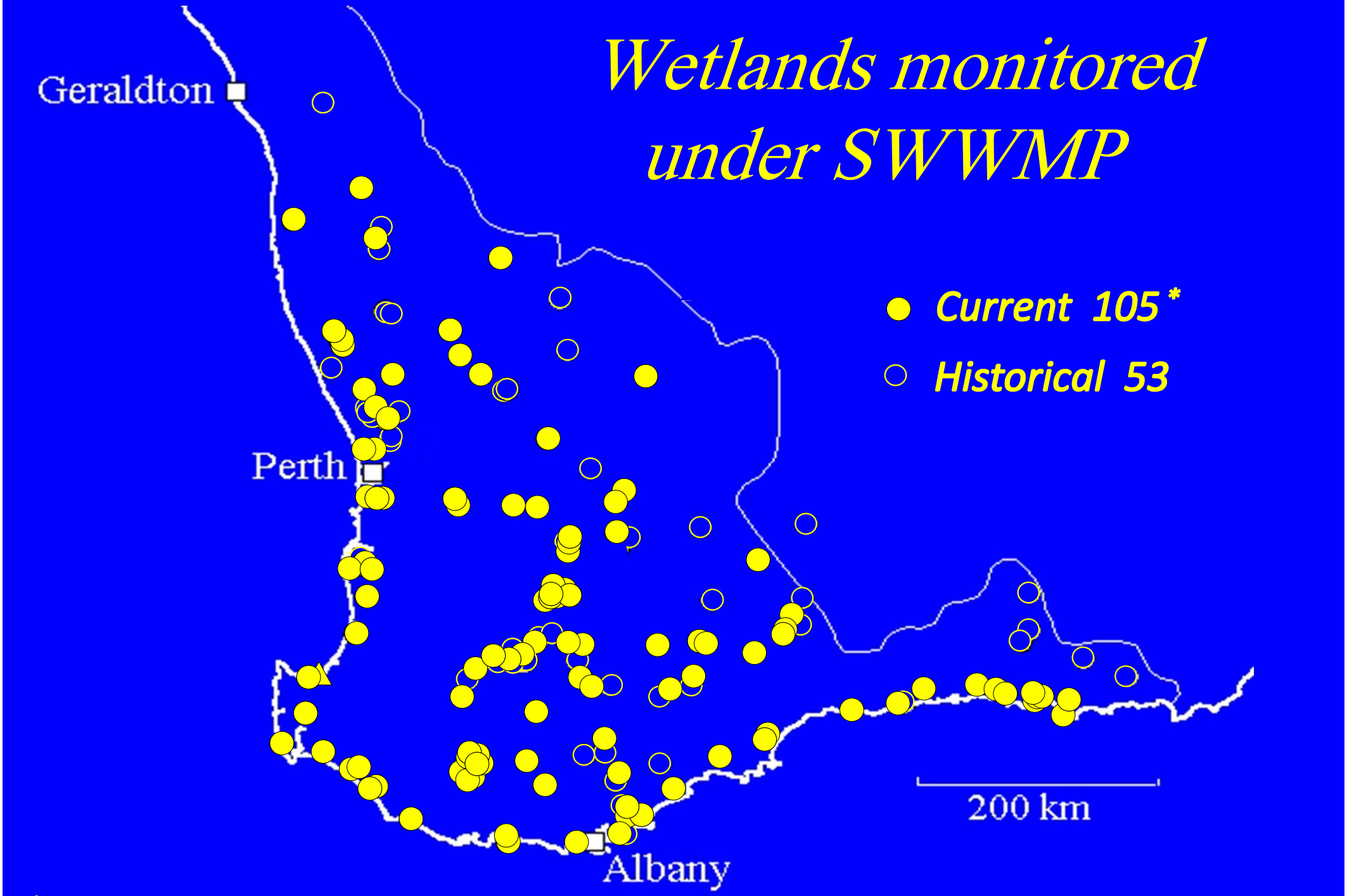
WA Department of Biodiversity,
Conservation & Attractions

SWWMP and the Australasian Bittern

Jim Lane
Alan Clarke
Yvonne Winchcombe

November 2018


Wetlands monitored under SWWMP
Geraldton
Perth
Albany
Current 105*
Historical 53
200 km
* To 2017

Long-term systematic and event-related monitoring of several key determinants of wetland condition

- *Depth*
- *Salinity*
- *pH*
- *Total N & Total P (to 2007)*

And

- *Detailed water chemistry*
- *Bathymetric mapping*
- *High resolution aerial oblique photography*
- *Annual reports*
- *Long-term trends analyses*

SWWMP has strong links to

- *Natural Diversity Recovery Catchment actions (under State Salinity Strategy)*
- *Waterbird, aquatic invertebrate, wetland vegetation, groundwater monitoring (Cale, Pinder, Lyons, Halse, Walker and others)*

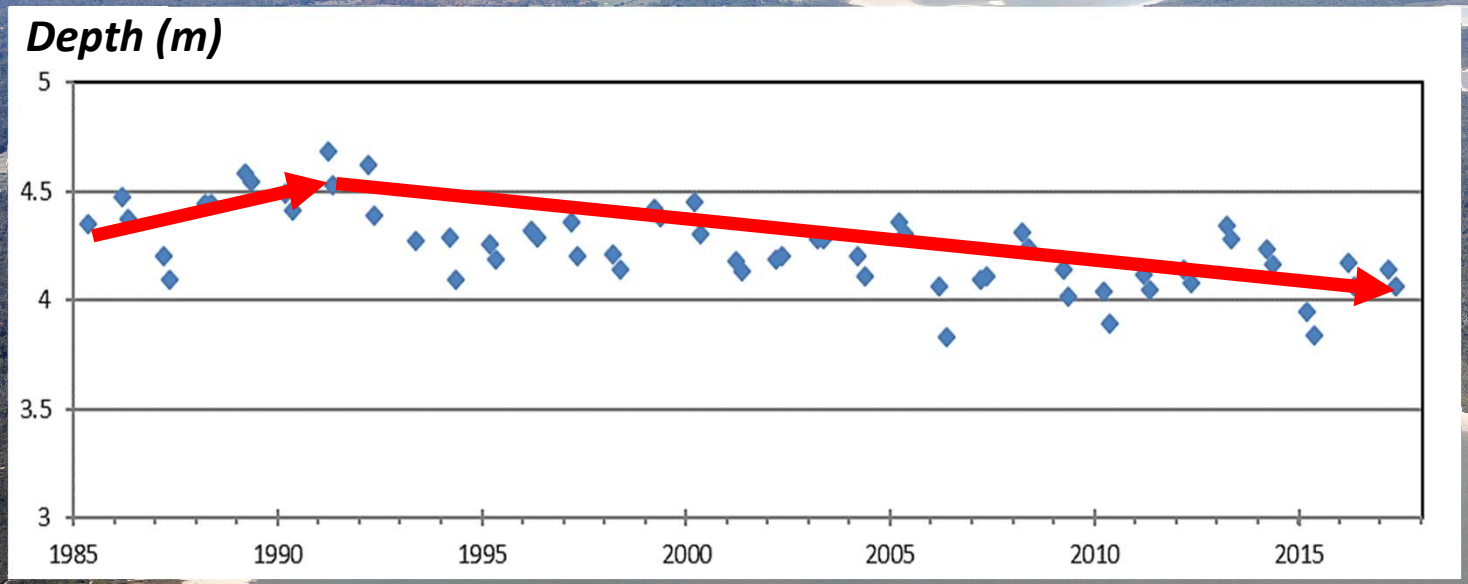
And

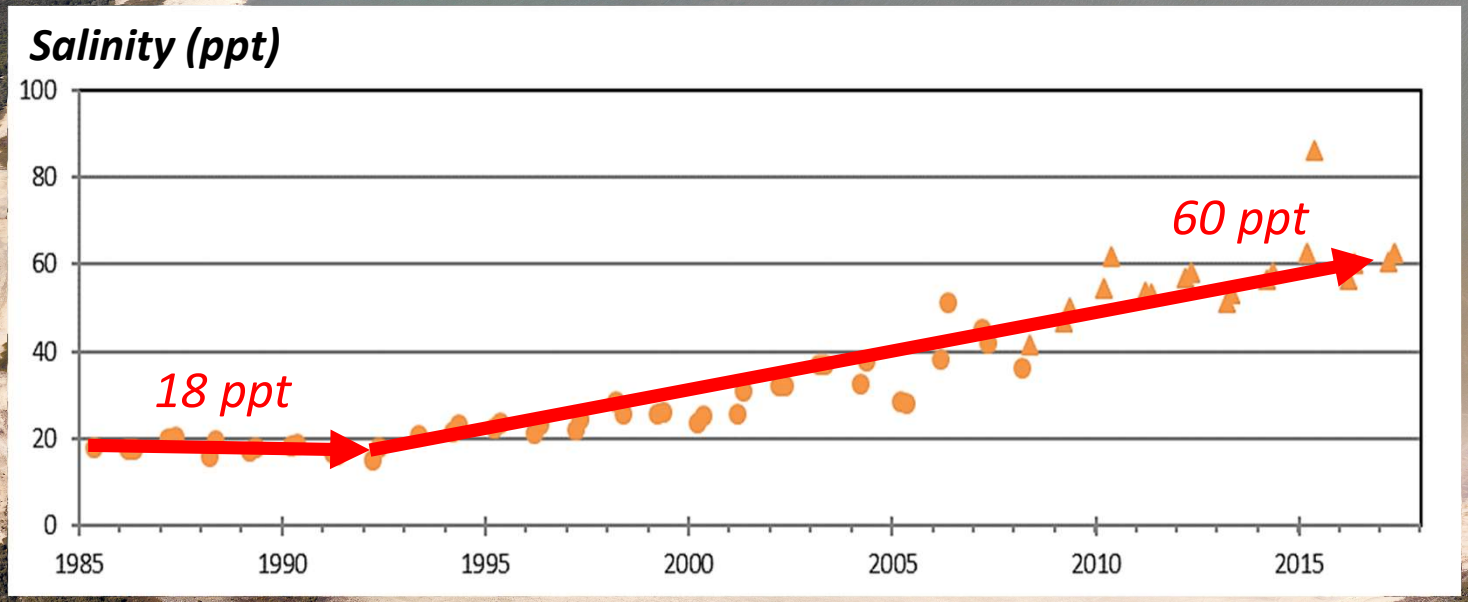
- *'1981-85 assessment of waterbird use of wetland nature reserves of south-western Australia'*

  (BirdLife Western Australia, WA Department of Fisheries & Wildlife)

Lake Clifton (Ramsar Site)

1985–2017: 33 years





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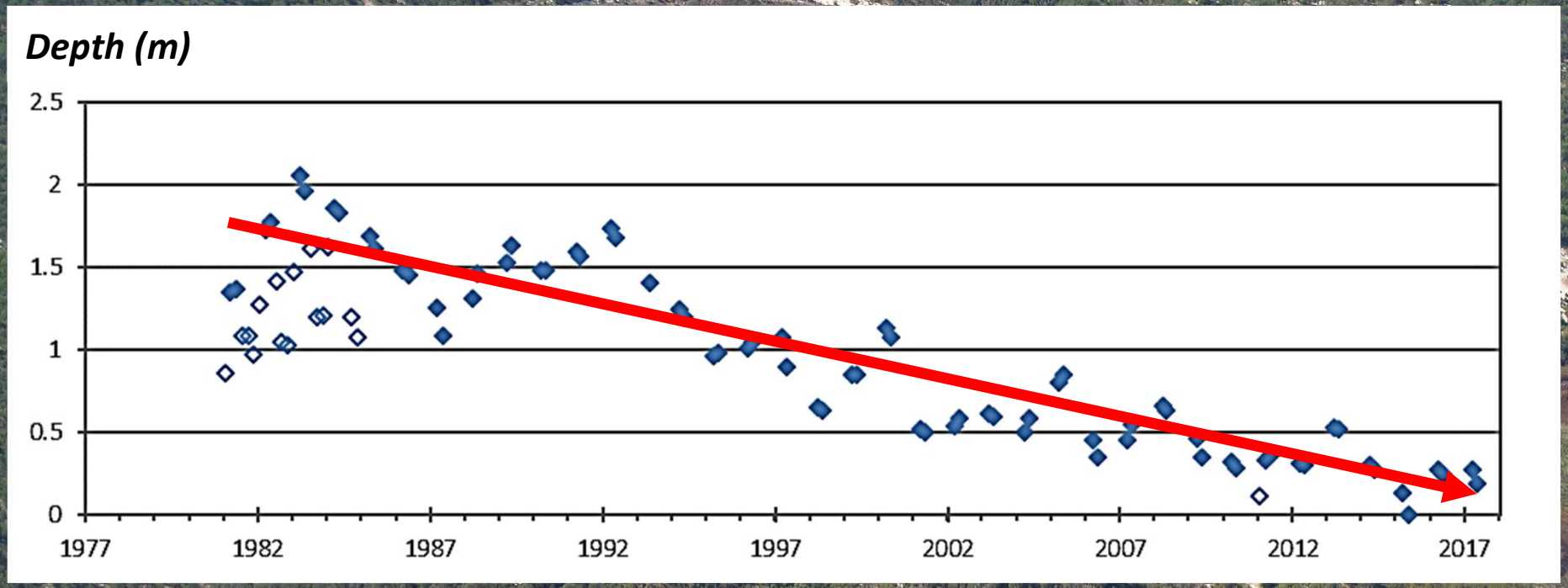
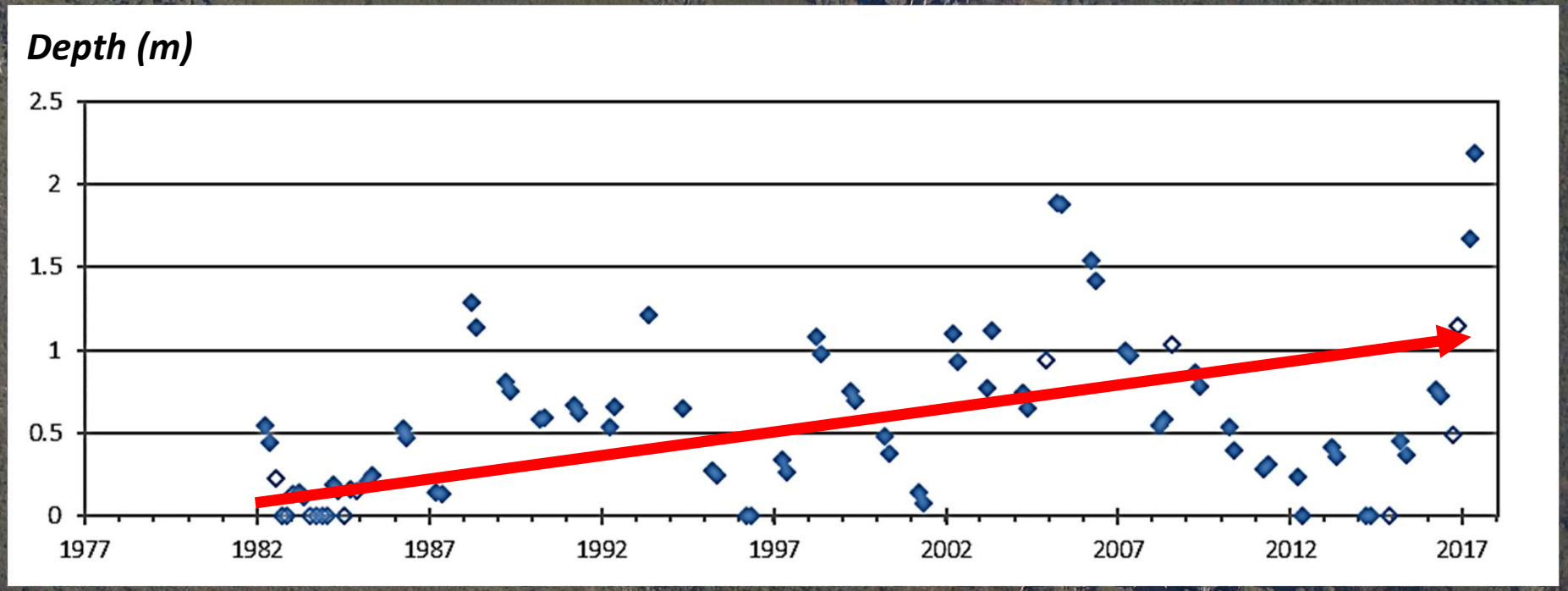
Nine Mile Swamp

1981–2017: 37 years



Mettler Swamp

1982–2017: 36 years

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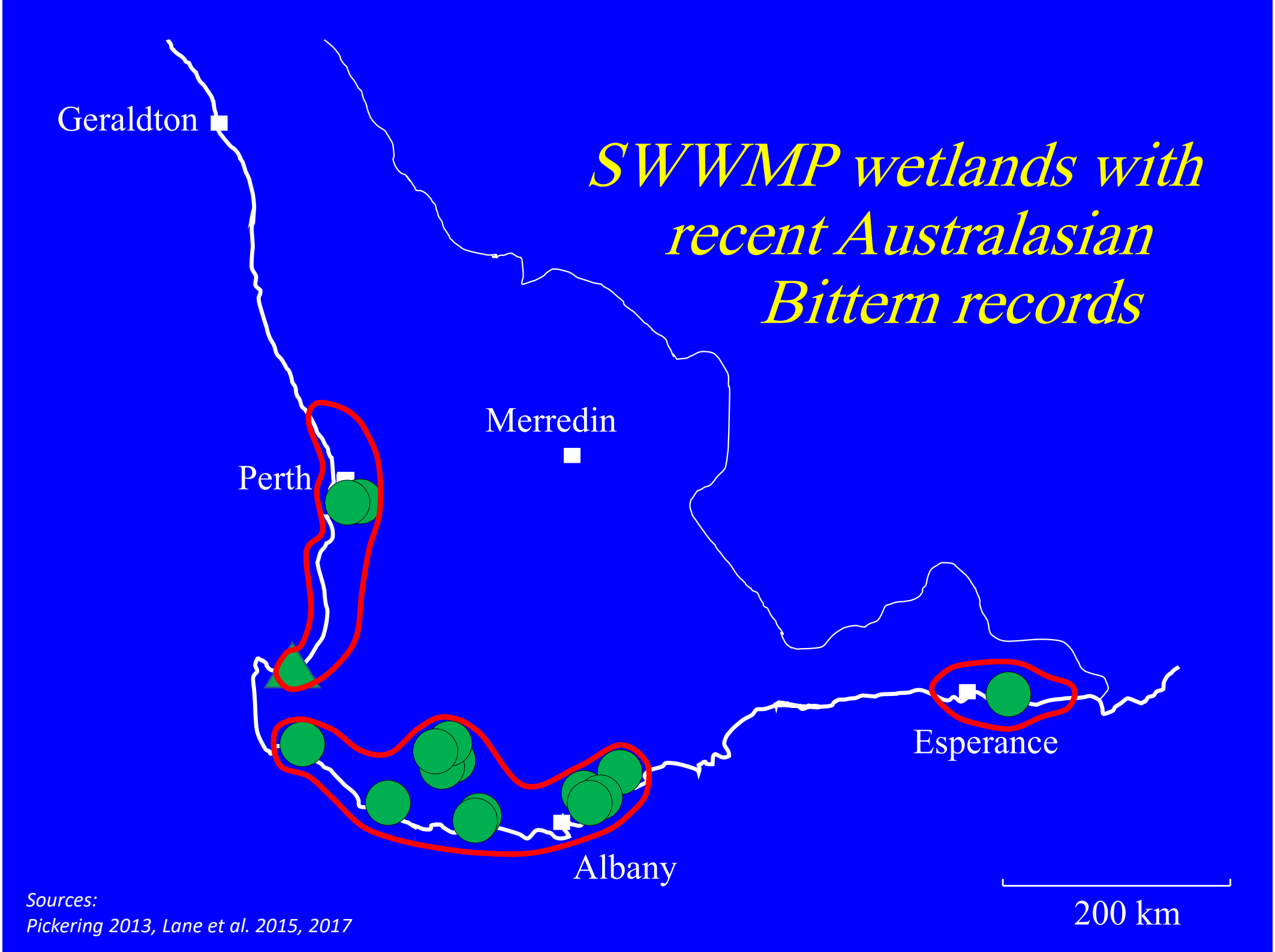
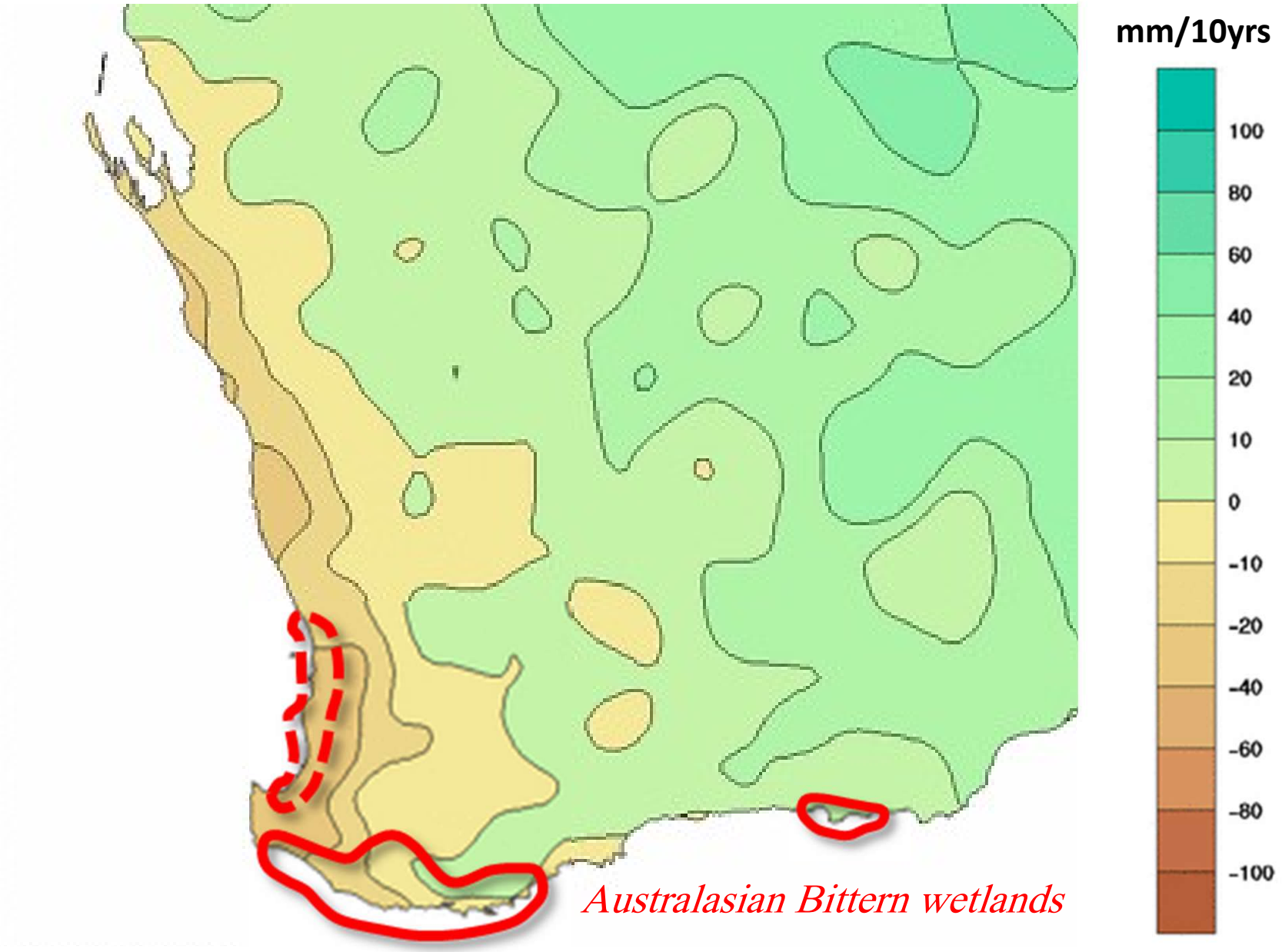
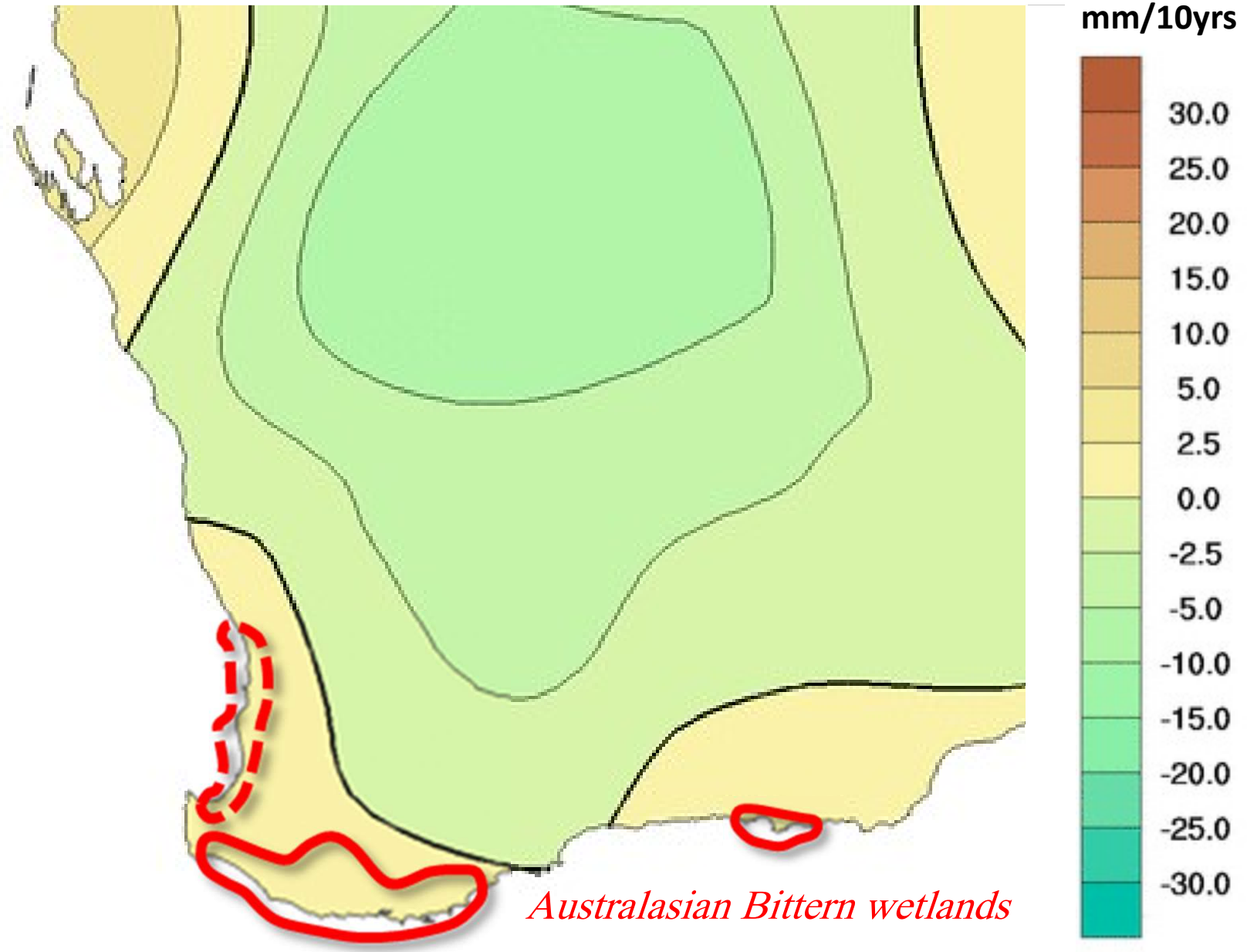

Geraldton
SWWMP wetlands with recent Australasian Bittern records
Merredin
Perth
Esperance
Albany
200 km
Sources:
Pickering 2013, Lane et al. 2015, 2017

Trends in ANNUAL RAINFALL (1970–2017)



Trends in ANNUAL EVAPORATION (1970–2016)



Government of Western Australia
Department of Water

Selection of future climate projections for Western Australia

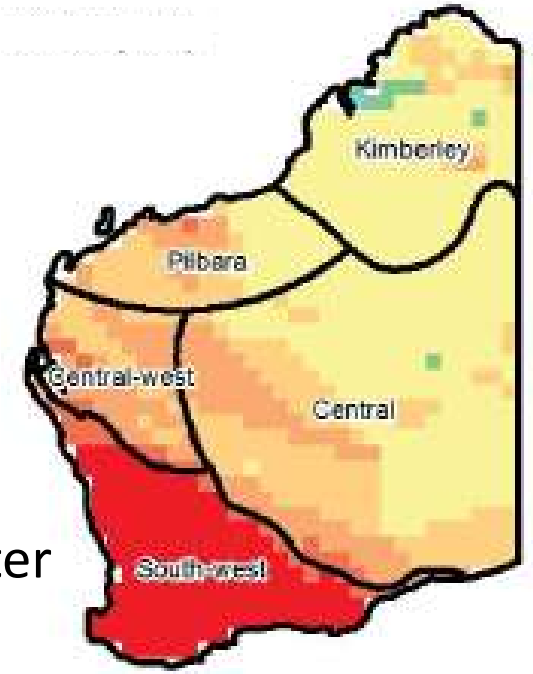
Securing Western Australia's water future

Water *Science*
technical series

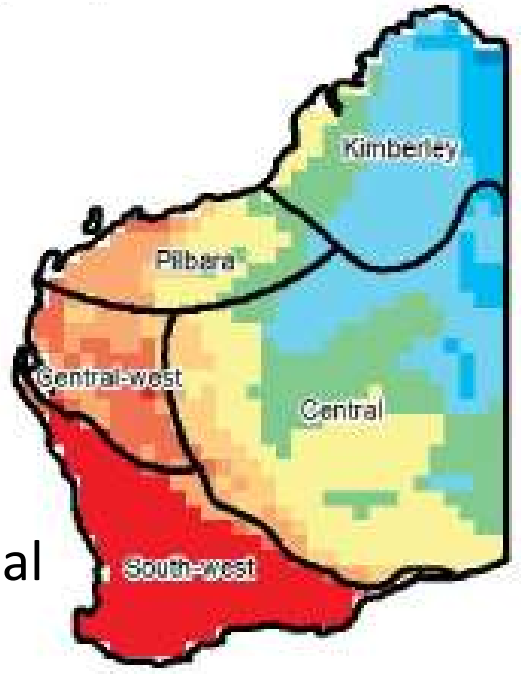
Report no. WST 72
September 2015

FUTURE RAINFALL PROJECTIONS

In the South West there is strong agreement among climate models that winter and annual rainfall will continue to decline through the 21st century



Winter



Annual

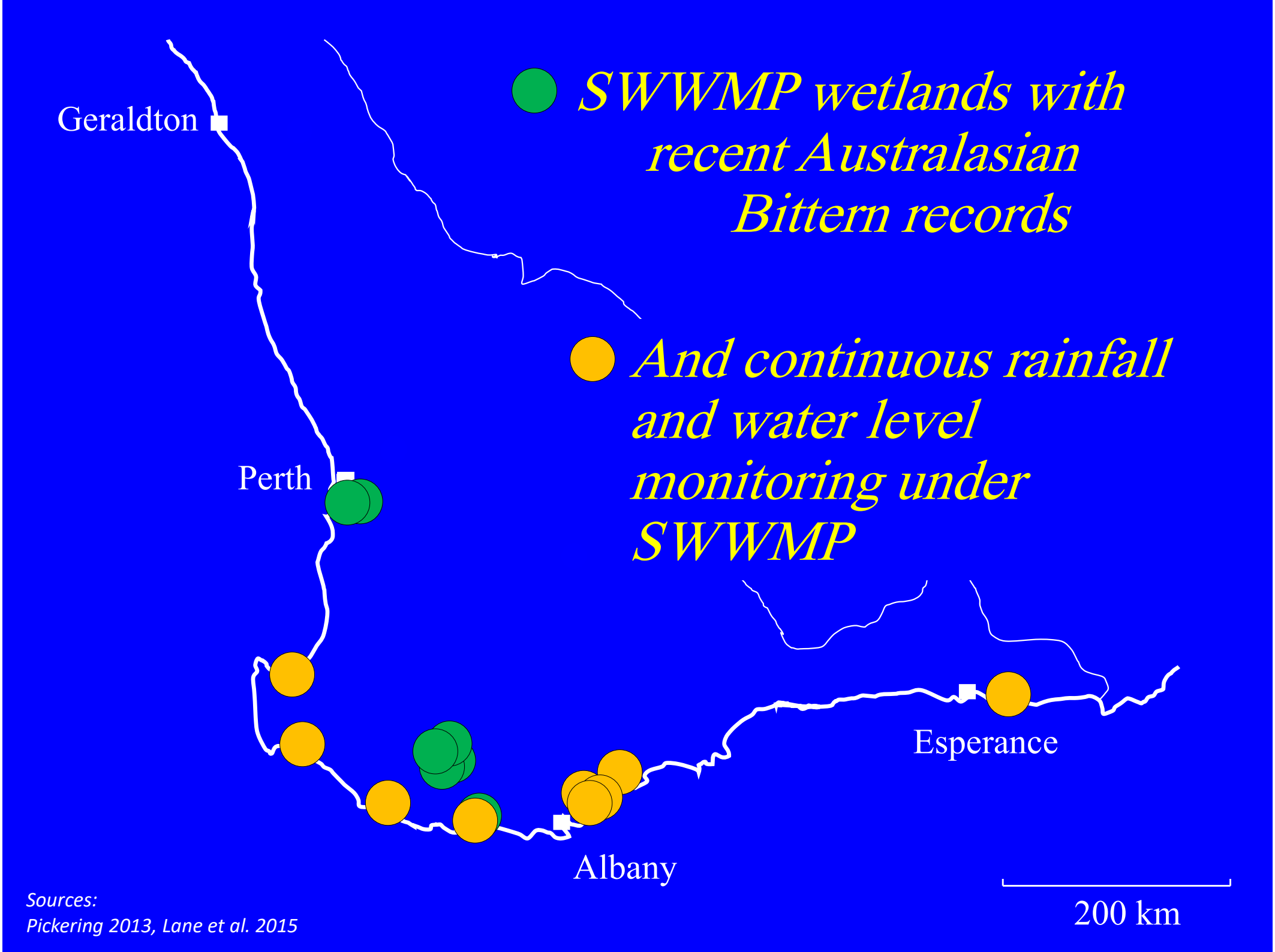
Source: DoW 2015


WHAT MIGHT THIS MEAN FOR
THE AUSTRALASIAN BITTERN?

Continuous rainfall recordings

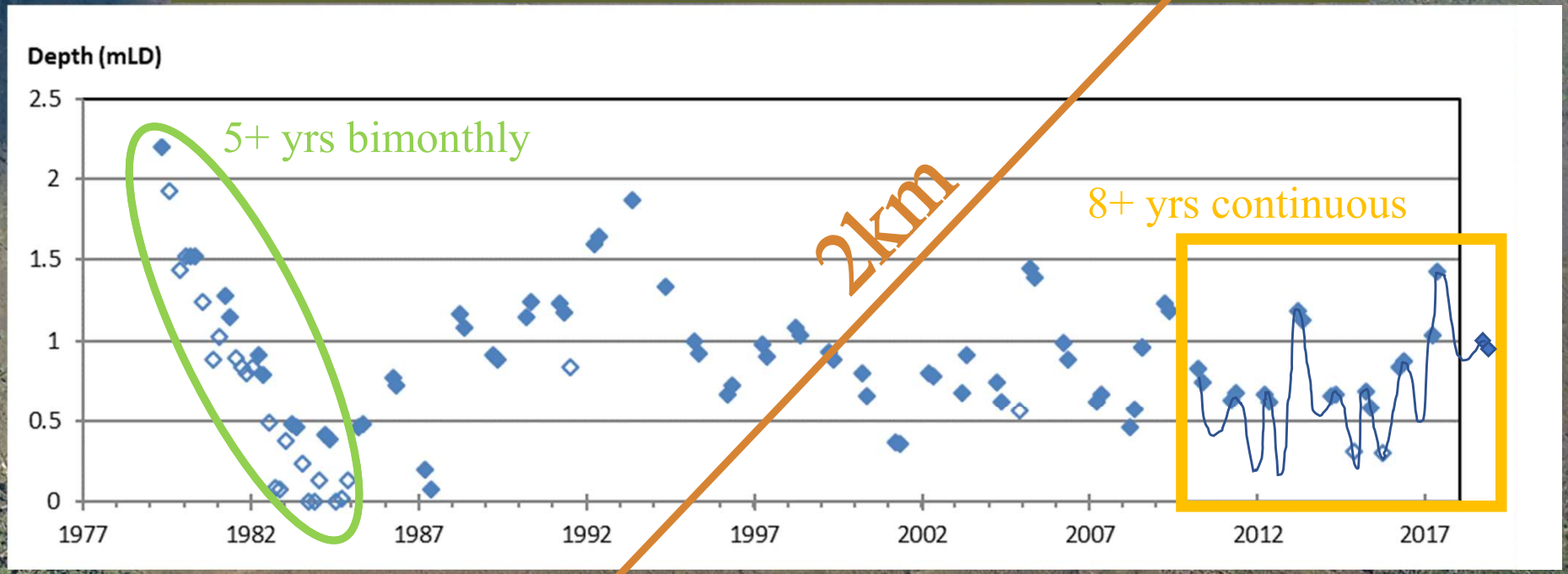
Source: J Lane

Continuous water level recordings


Geraldton
SWWMP wetlands with recent Australasian Bittern records
And continuous rainfall and water level monitoring under SWWMP
Perth
Esperance
Albany
200 km
Sources:
Pickering 2013, Lane et al. 2015

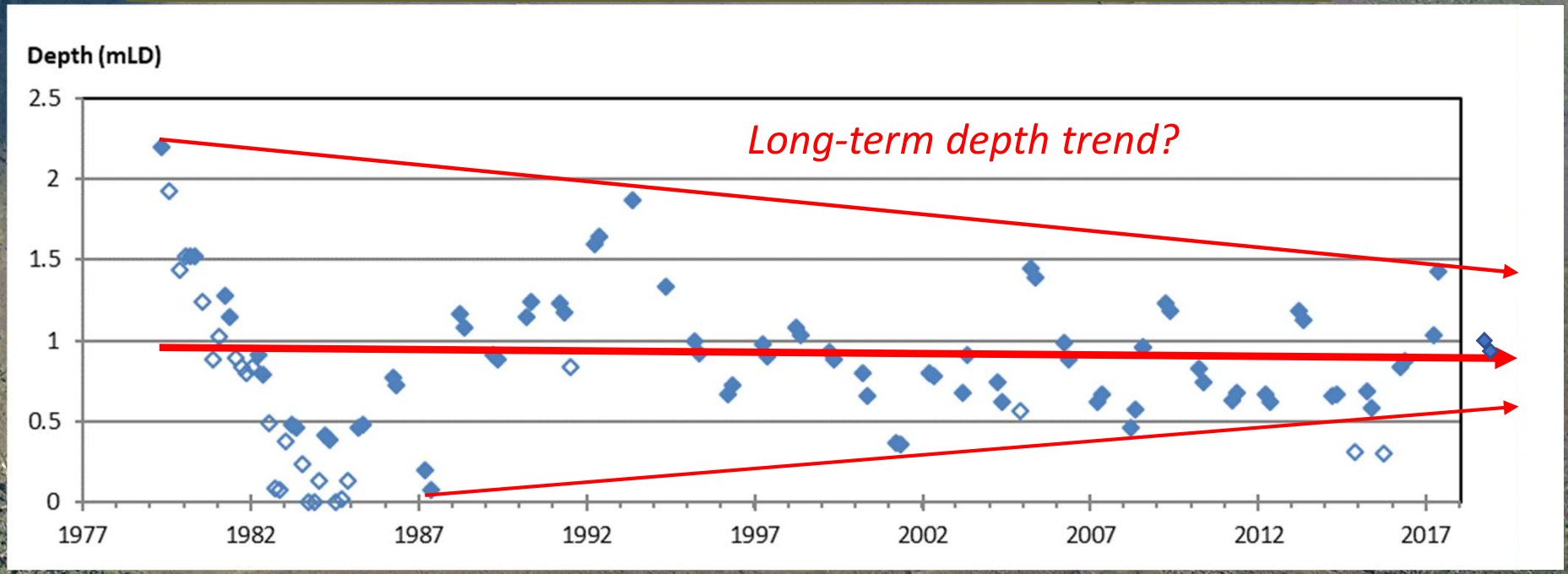
Lake Pleasant View NR

1979–2018: 40 years of Sep & Nov monitoring



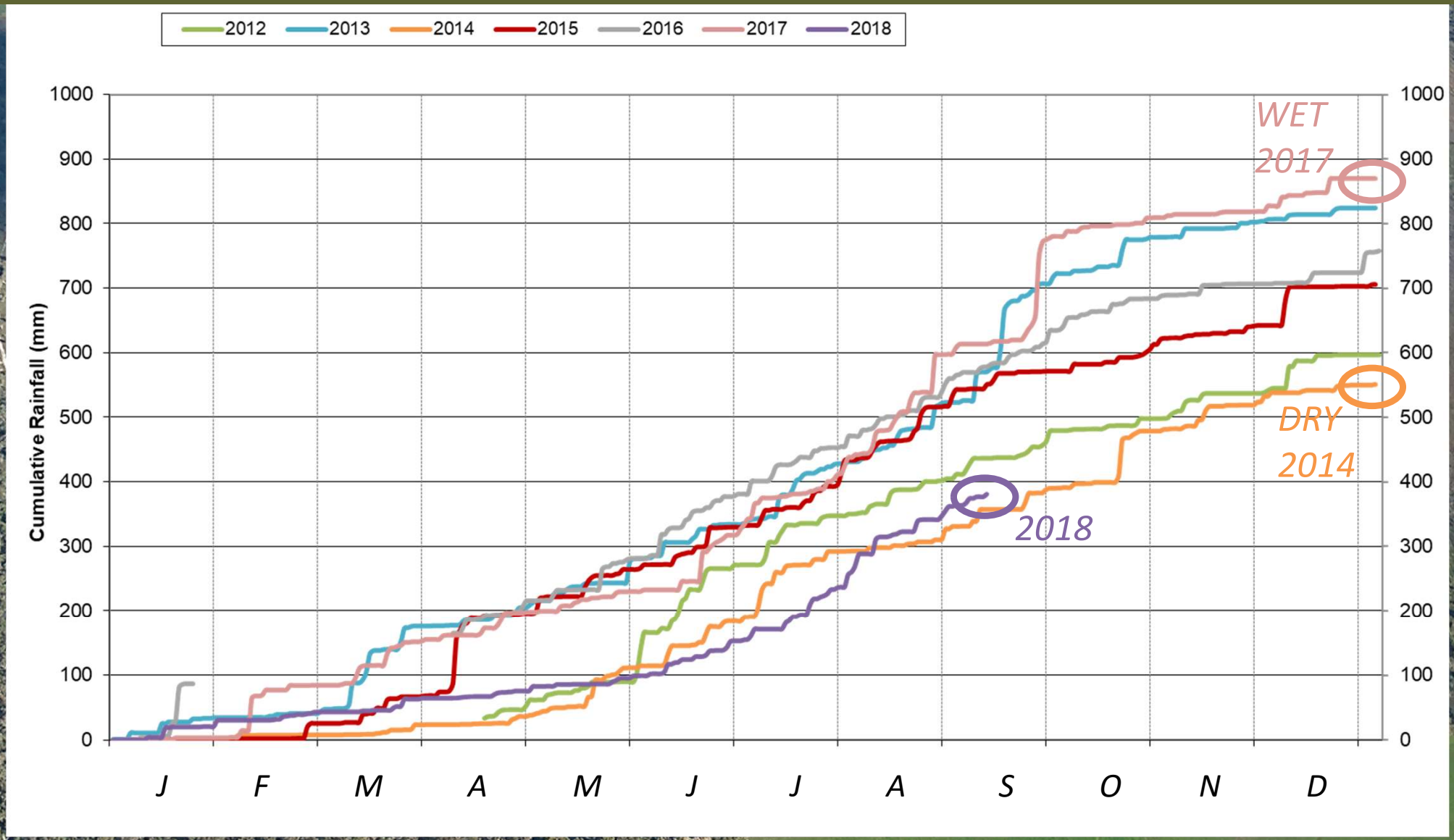
Lake Pleasant View NR

1979–2018: 40 years of Sep & Nov monitoring



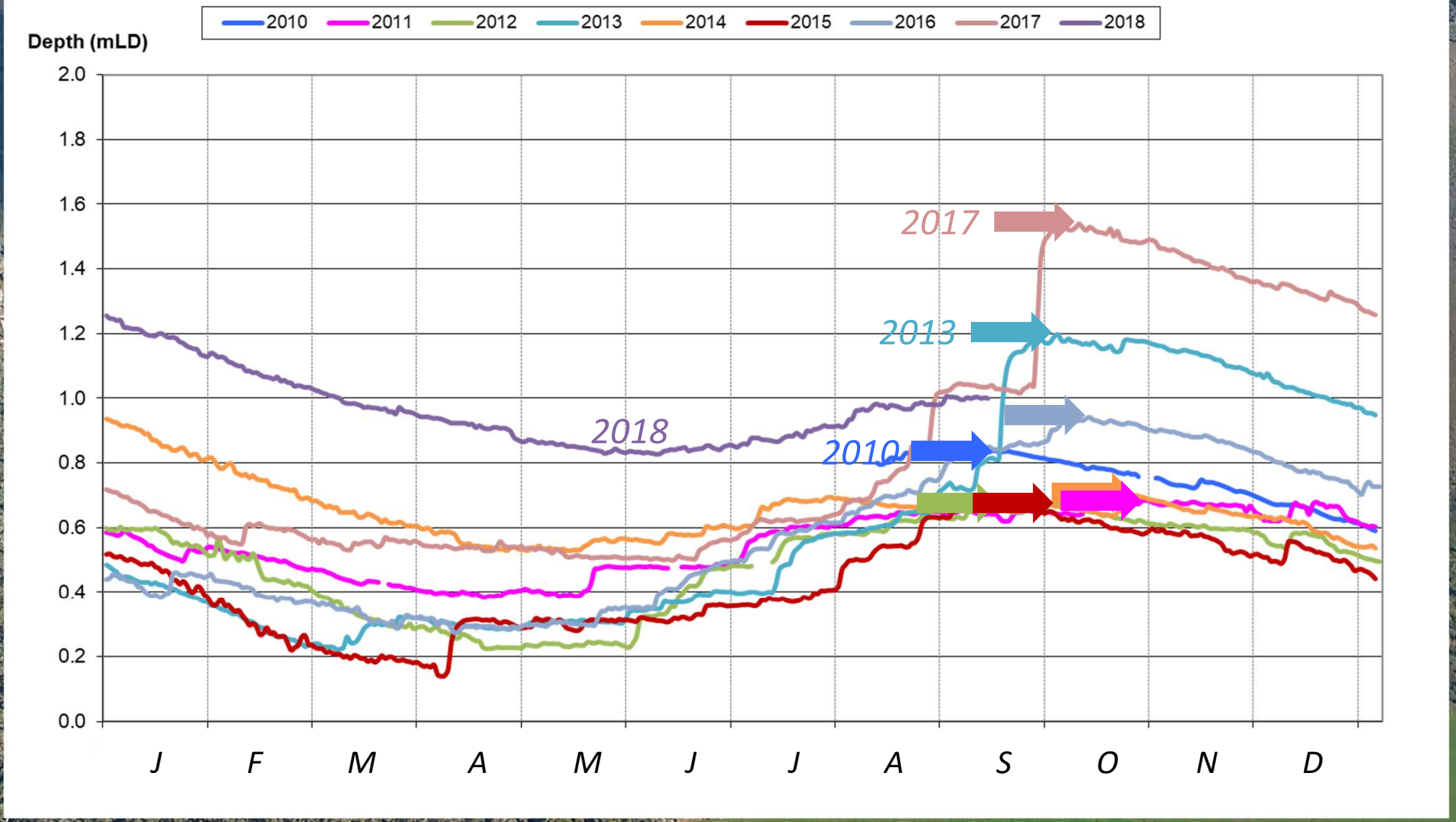
Lake Pleasant View

2012–2018: Seven years of continuous on-site RAINFALL recording



Lake Pleasant View

2010–2018: Nine years of continuous WATER LEVEL recording

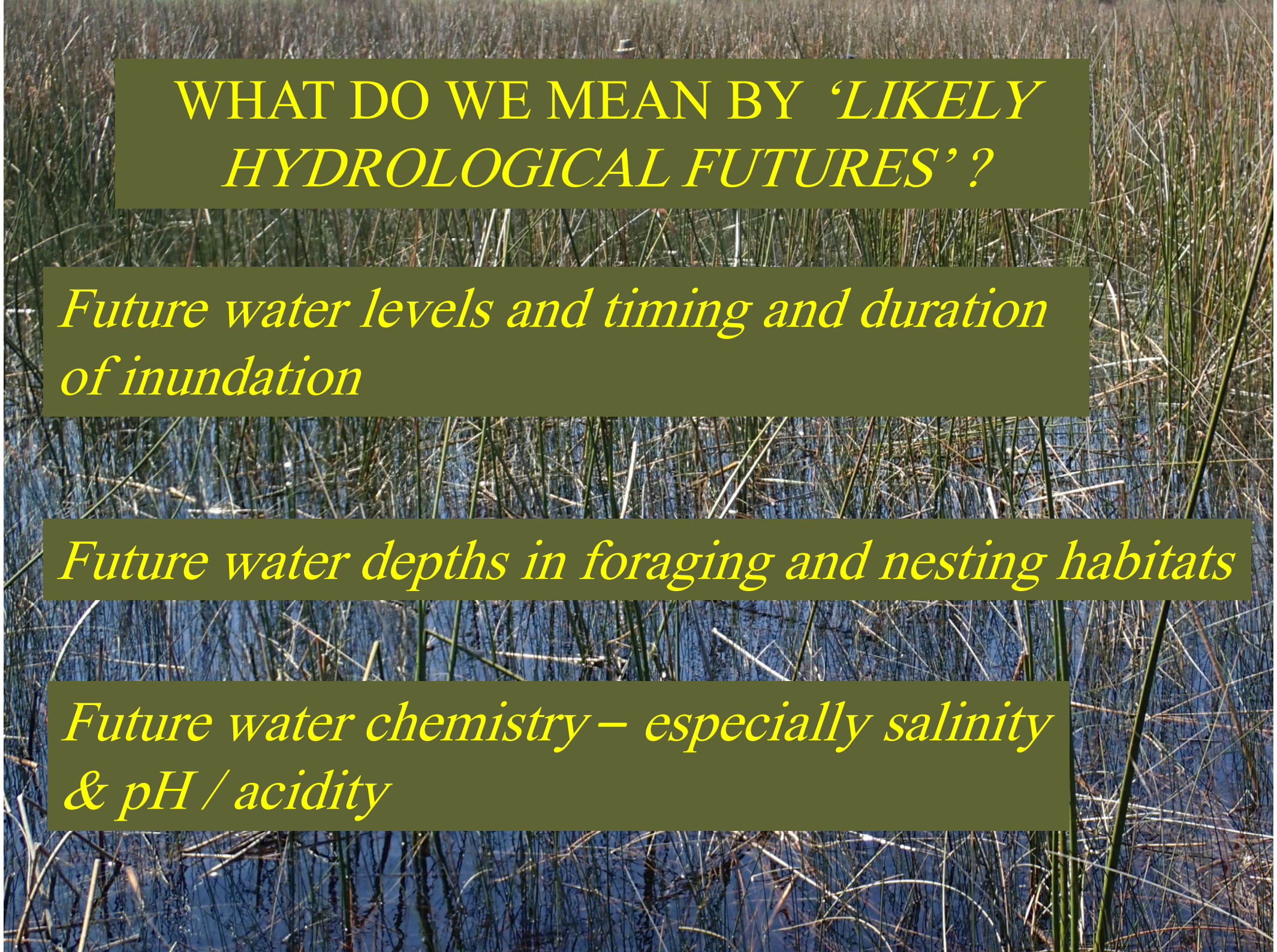


OBJECTIVES

Model likely hydrological futures of key habitats of Australasian Bittern under predicted climate change scenarios

Use knowledge from this modelling to identify consequential threats

Recommend ways of mitigating threats



WHAT DO WE MEAN BY *'LIKELY HYDROLOGICAL FUTURES'* ?

Future water levels and timing and duration of inundation

Future water depths in foraging and nesting habitats

Future water chemistry – especially salinity & pH / acidity


WHY ARE THESE
IMPORTANT ?

Australasian Bittern food abundance – principally frogs, tadpoles and large crustaceans

Getty Images

B.Maryan WAM

Unknown

Food accessibility – bittern wading depth

Source: AG Clarke

Introduced terrestrial predator access – principally fox wading depth

Source: AG Clarke

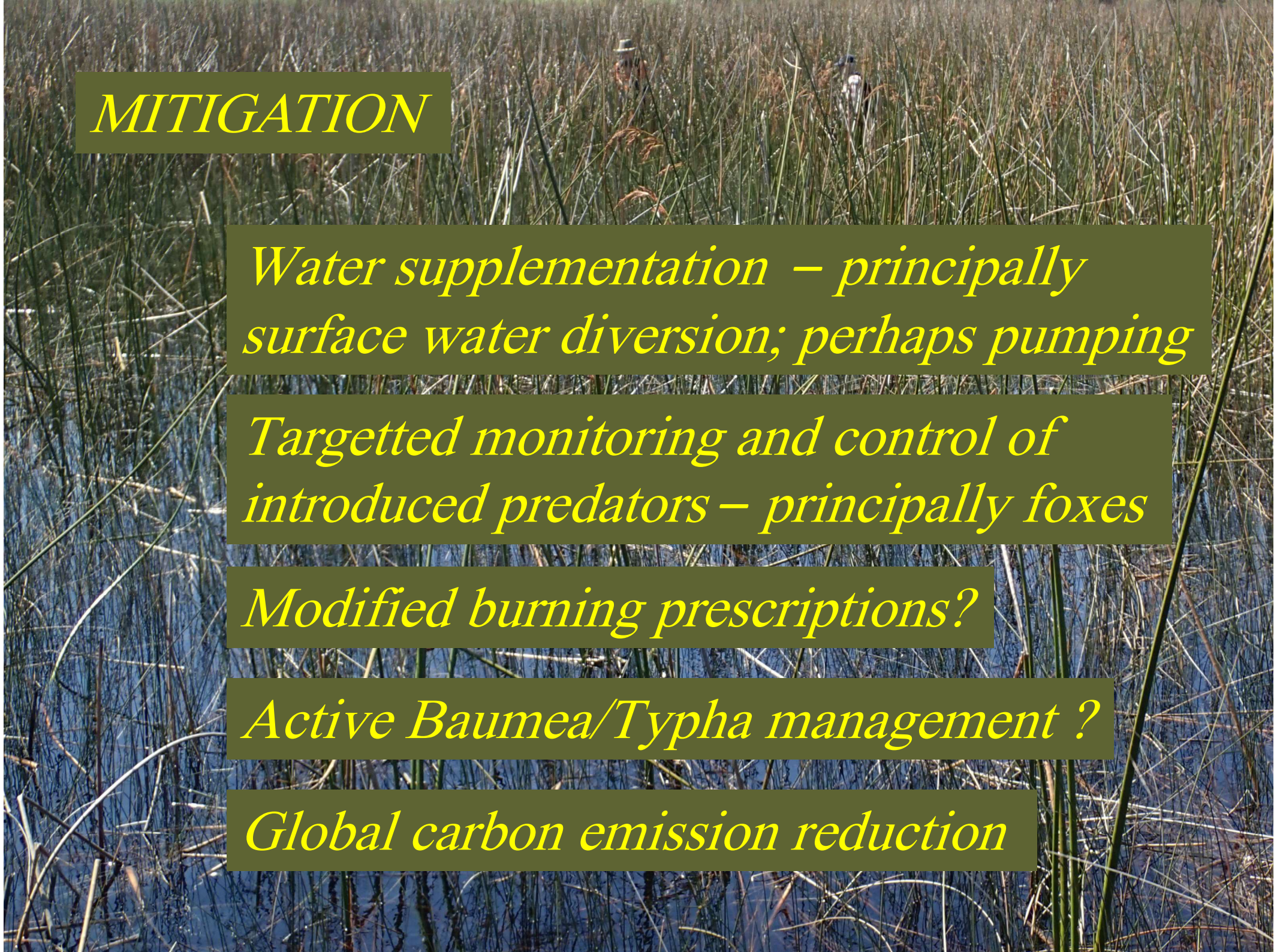
Rush/sedge extent, density, health – in particular Baumea (but also Typha) – especially for nesting

Source: AG Clarke

Fire behaviour and impact on rushbeds – and gauges!

Source: AG Clarke


WHAT THEN?



MITIGATION

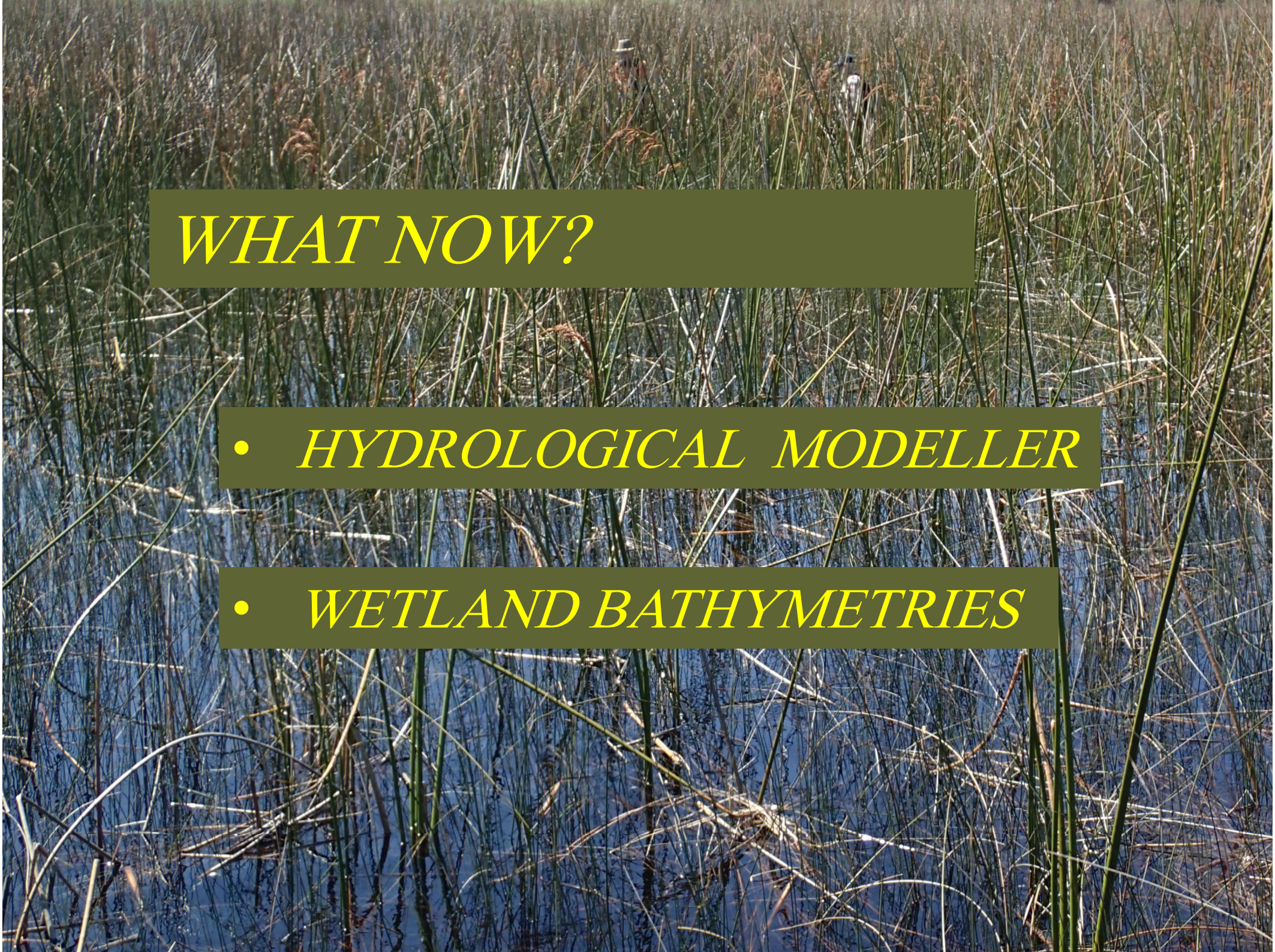
Water supplementation – principally surface water diversion; perhaps pumping

Targetted monitoring and control of introduced predators – principally foxes

Modified burning prescriptions?

Active Baumea/Typha management ?

Global carbon emission reduction


WHAT NOW?
• HYDROLOGICAL MODELLER
• WETLAND BATHYMETRIES

ACKNOWLEDGEMENTS

DFW–CALM–DEC–DPAW–DBCA
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John Graff (volunteer)
Scott Parsons (SPE)
Alf Lorkiewicz
Bureau of Meteorology

Questions ?