

Climate Smart Agricultural Development

Project team

Deakin (via Centre for Regional and Rural Futures)

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Madeleine Johnson and Dr Fiona Gray



Spiire

Jane Macey



Goulburn-Broken Greenhouse Alliance

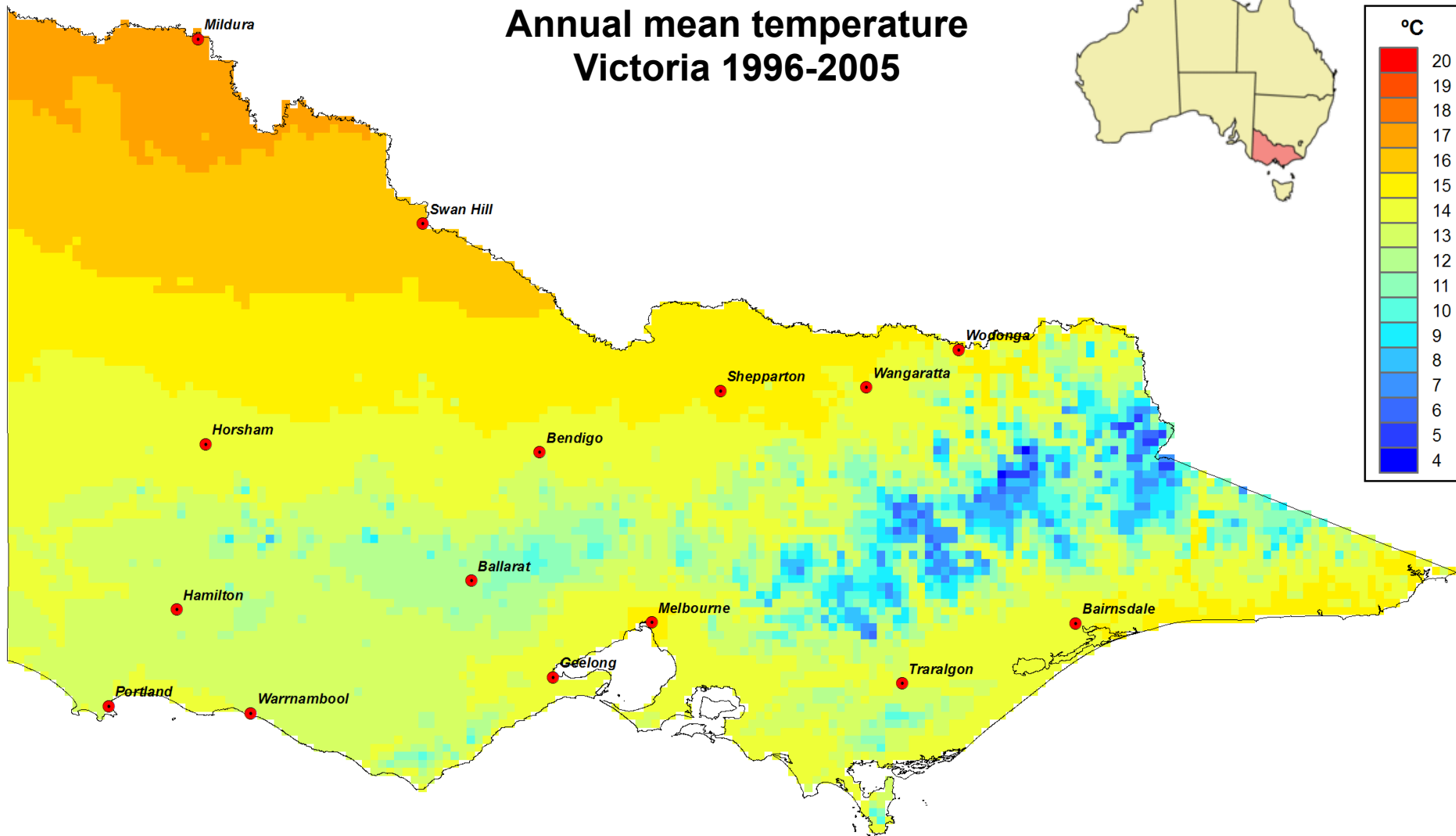
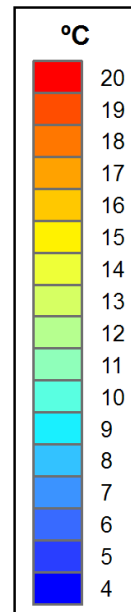
Tom Brown and Marisa O'Halloran



Key Project Partners

Moira Shire Council, Benalla Rural City Council, Campaspe Shire Council, Mansfield Shire Council, Greater Shepparton City Council, Murrindindi Shire Council, Strathbogie Shire Council, Goulburn Broken Catchment Management Authority, Victorian Department of Environment Land Water and Planning.

Annual mean temperature Victoria 1996-2005



Map Prepared by Spatial Sciences Parkville
Department of Primary Industries

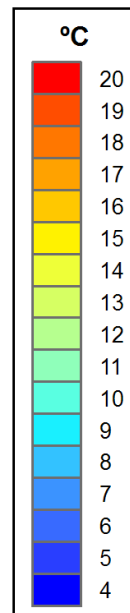
Data Source: Corporate Geospatial Data Library, DSE/DPI, 2008
SILO, Bureau of Meteorology of Australia, 2010



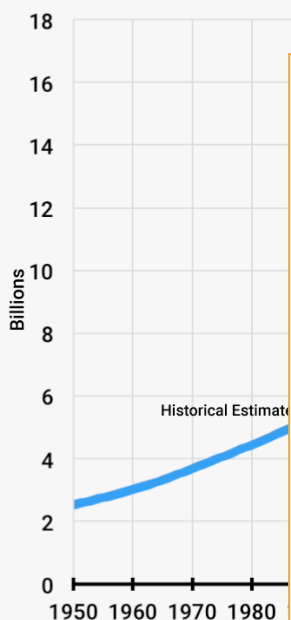
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inappropriate use of the map data.

Projection: GCS GDA 1994

Annual mean temperature Victoria 2050

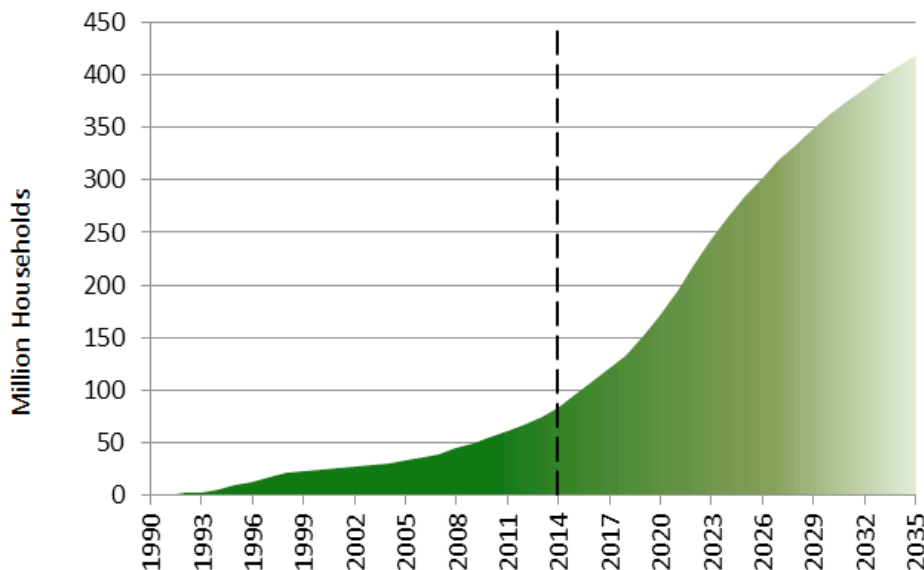


PROJECTED WORLD POPULATION



SOURCE: United Nations, "World Population Prospects"

China's Growing Middle Class*

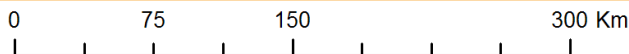


*Households with income above \$20,000 US.

Source: Global Insight

Map Prepared by Spatial Sciences Parkville
Department of Primary Industries

Data Source: Corporate Geospatial Data Library, DSE/DPI, 2008
OzClim, CSIRO of Australia, 2010



Projection: GCS GDA 1994

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Asparagus Industry

93% of Australia's Asparagus is grown in Koo Wee Rup and Dalmore area (also Lindenow) in part because of ideal soil and climate.

8th largest in the world by production volume, but 12th largest by area.

Important export crop.

No change in land suitability out to 2050.

100%

Data Source: Corporate Geospatial Data Library

Map prepared by Spatial Sciences Parkville
Department of Primary Industries

CeRRF
CENTRE FOR REGIONAL
+ RURAL FUTURE

Deakin University CRICOS Provider Code

Victoria
Primary Industries

Legend

- Towns
- Rivers
- Protected Area
- Lakes
- Green Wedge Boundary
- Granitic Rocky Outcroppings (Predominantly Crests)
- Coarse Fragments - Moderate
- Coarse Fragments - Slight

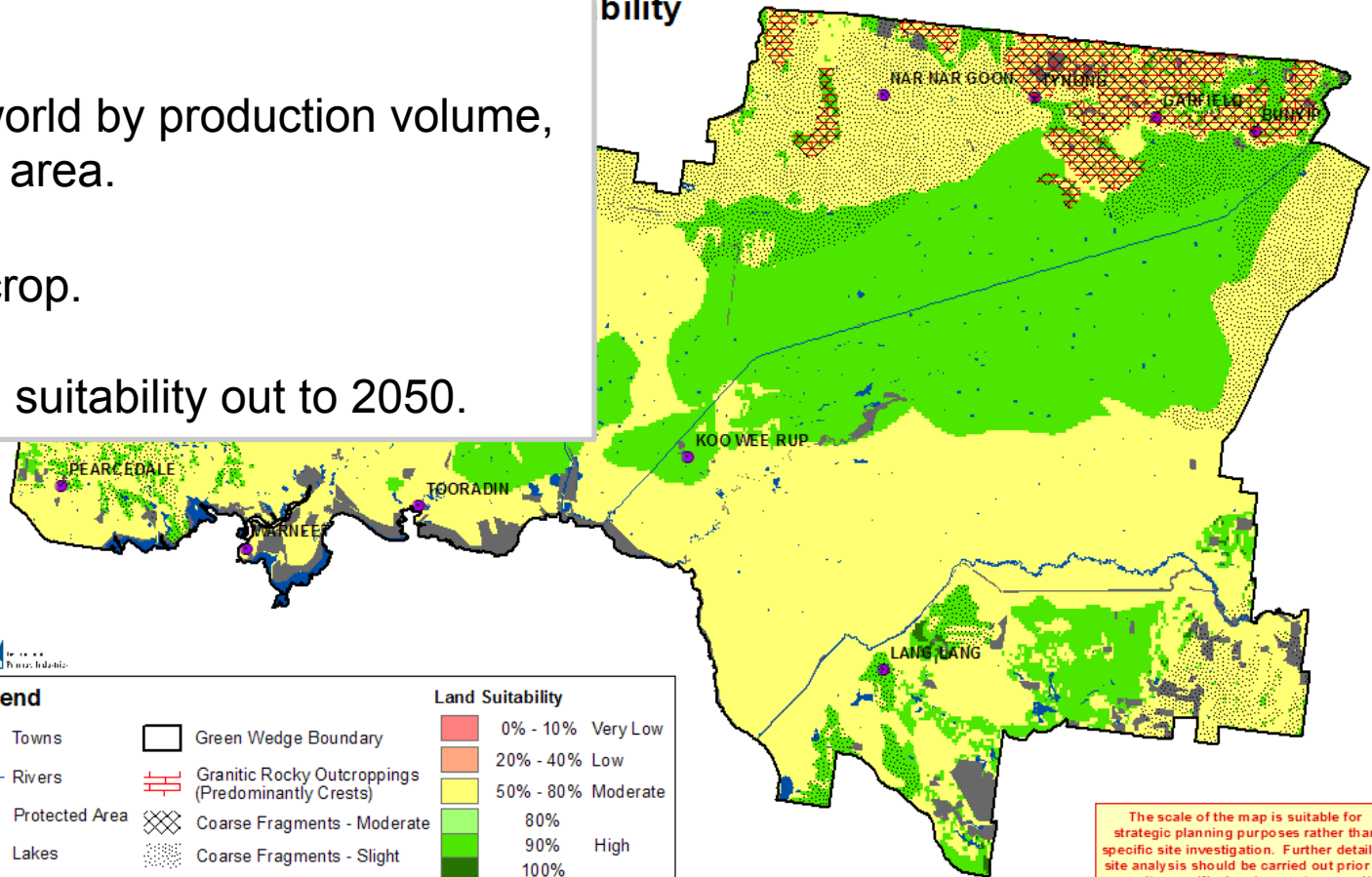
Land Suitability

- 0% - 10% Very Low
- 20% - 40% Low
- 50% - 80% Moderate
- 80%
- 90% High
- 100%

Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 55

Map prepared by Spatial Sciences Parkville,
Future Farming Systems Research,
Department of Primary Industries

Ability



The scale of the map is suitable for strategic planning purposes rather than specific site investigation. Further detailed site analysis should be carried out prior to new, site-specific development proceeding.

Data Source: Corporate Geospatial Data Library, DPI/DSE, 2011
SILO, Bureau of Meteorology of Australia, 2010

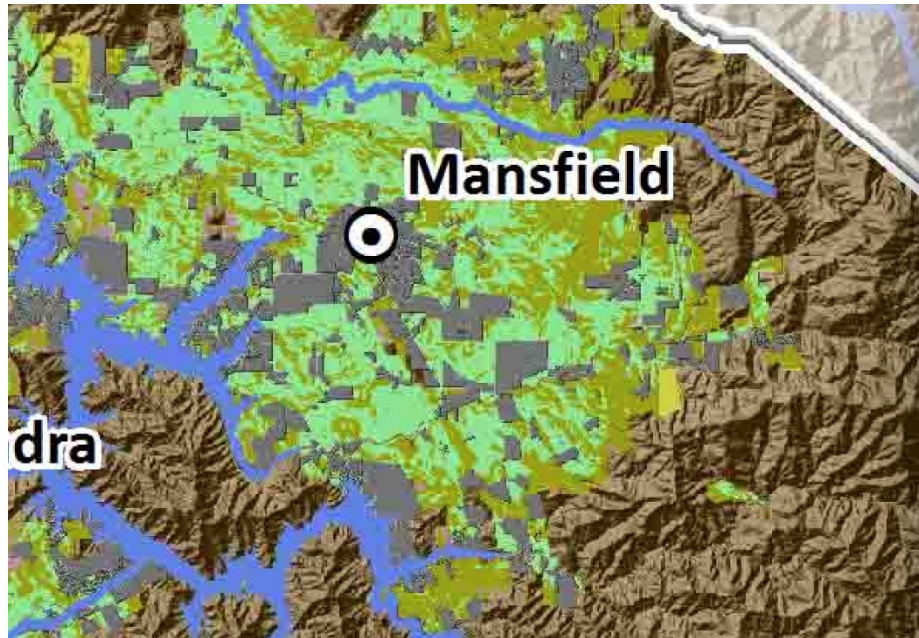
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How is the modelling useful?

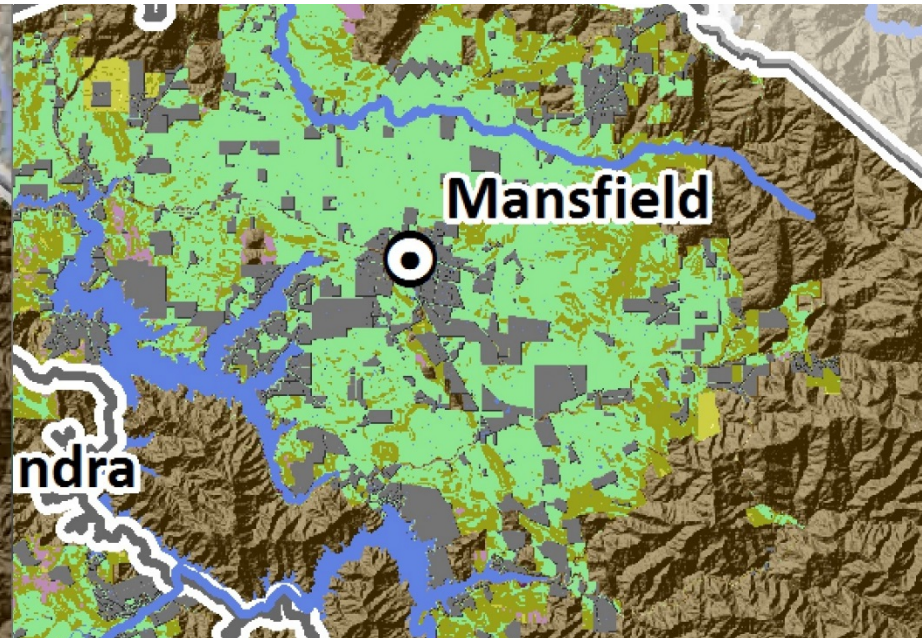
- **Farm level**
 - Adaptation planning
 - Changing varieties and sowing times
 - Impacts of different management practices
- **Industry level**
 - Inform breeding programs
 - Processing varieties vs fresh market
- **Region**
 - Agriculture industry transformation
 - Infrastructure planning
 - Strategic and statutory land use planning

Model and map validation with local farmers

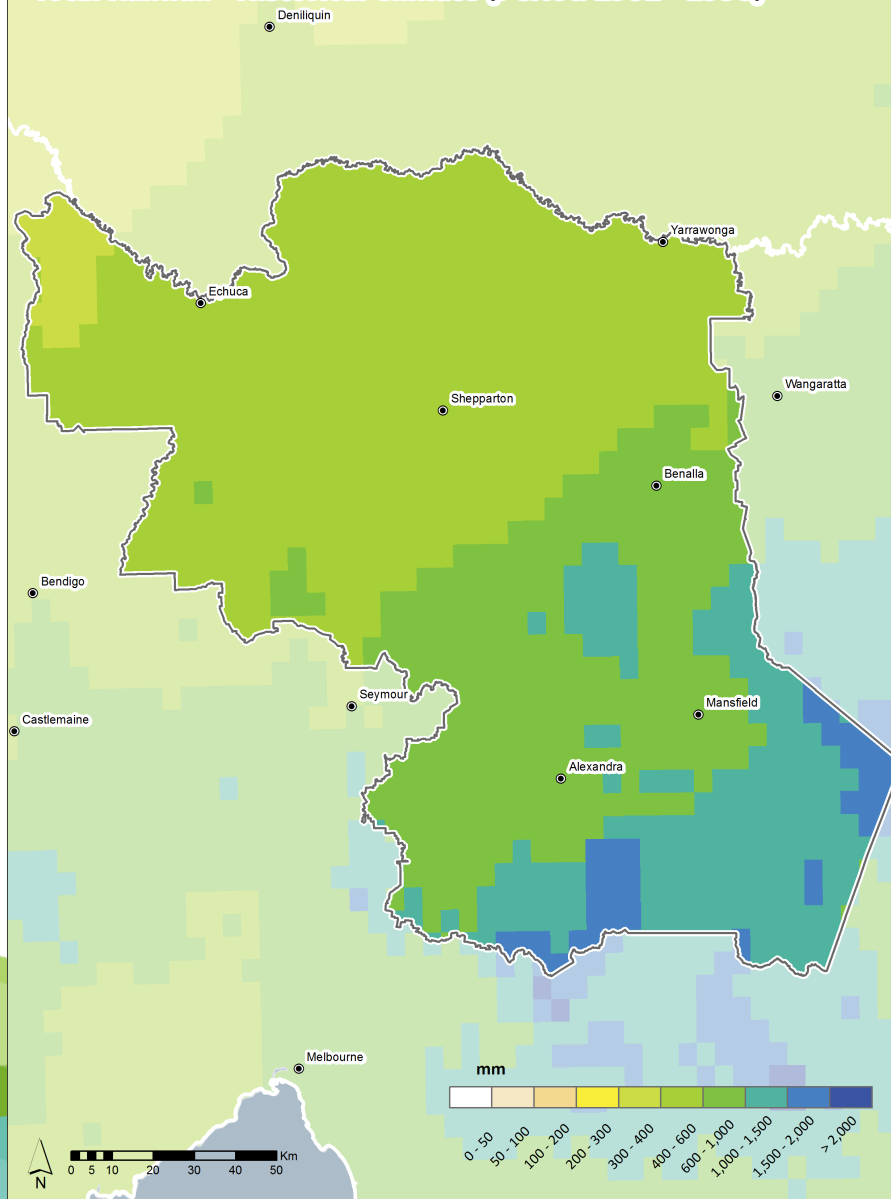
BEFORE



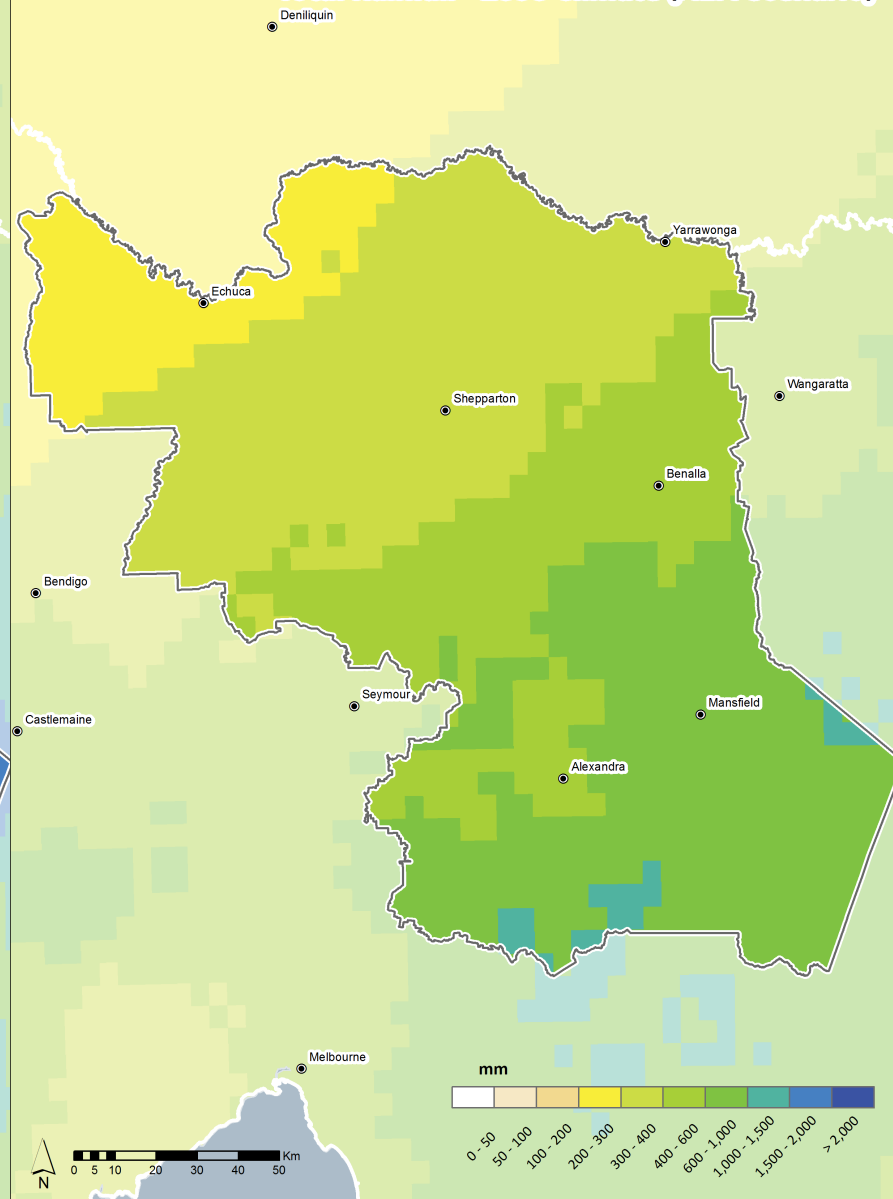
AFTER



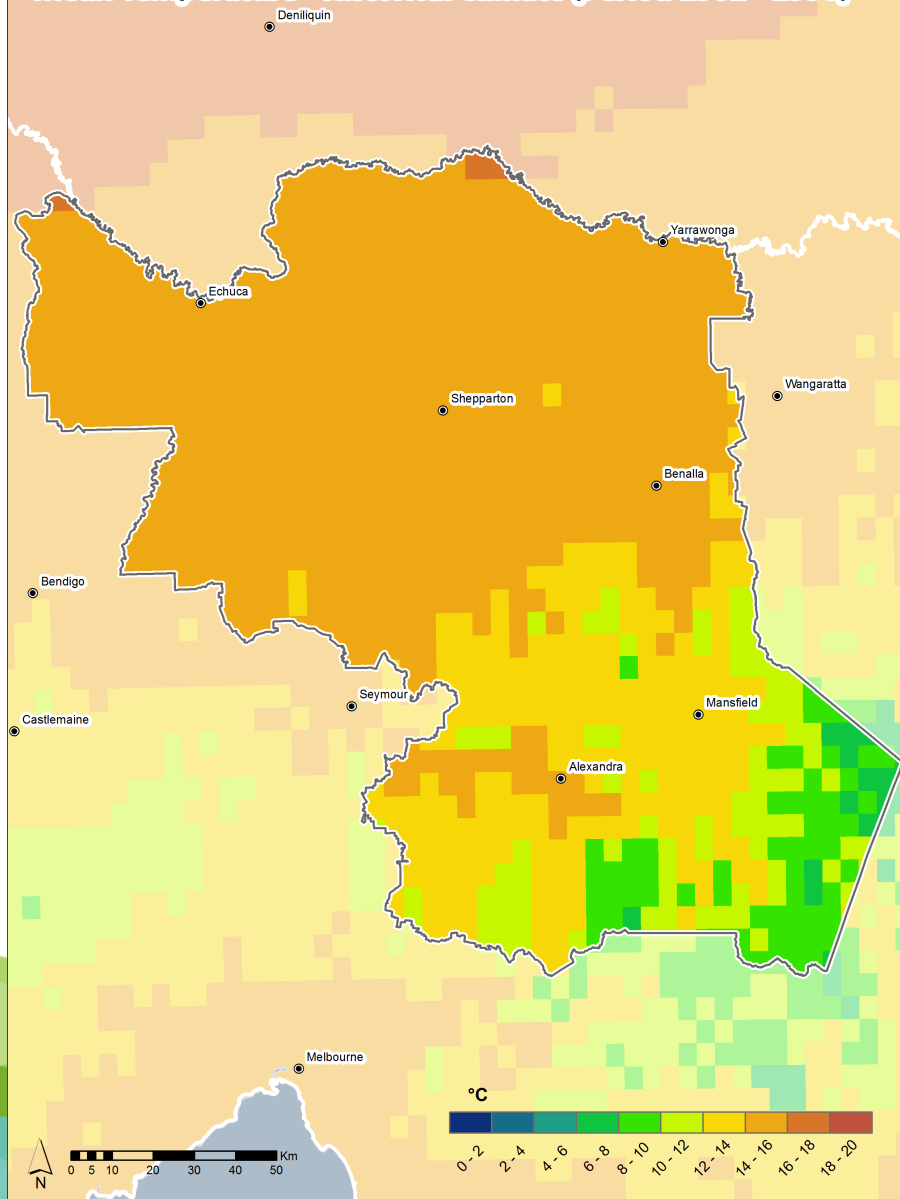
Total Rainfall - Historical Climate (Period 1961 - 1990)



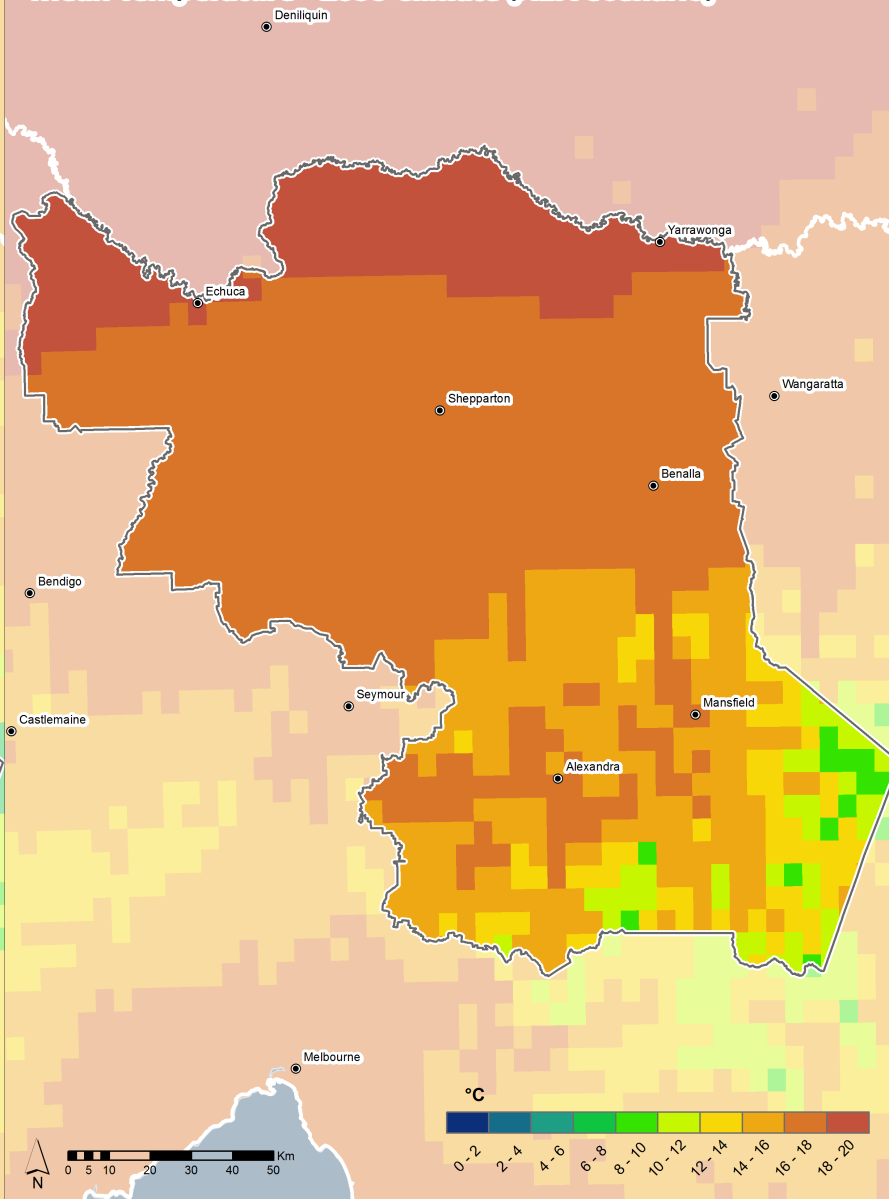
Total Rainfall - 2050 Climate (A1FI Scenario)



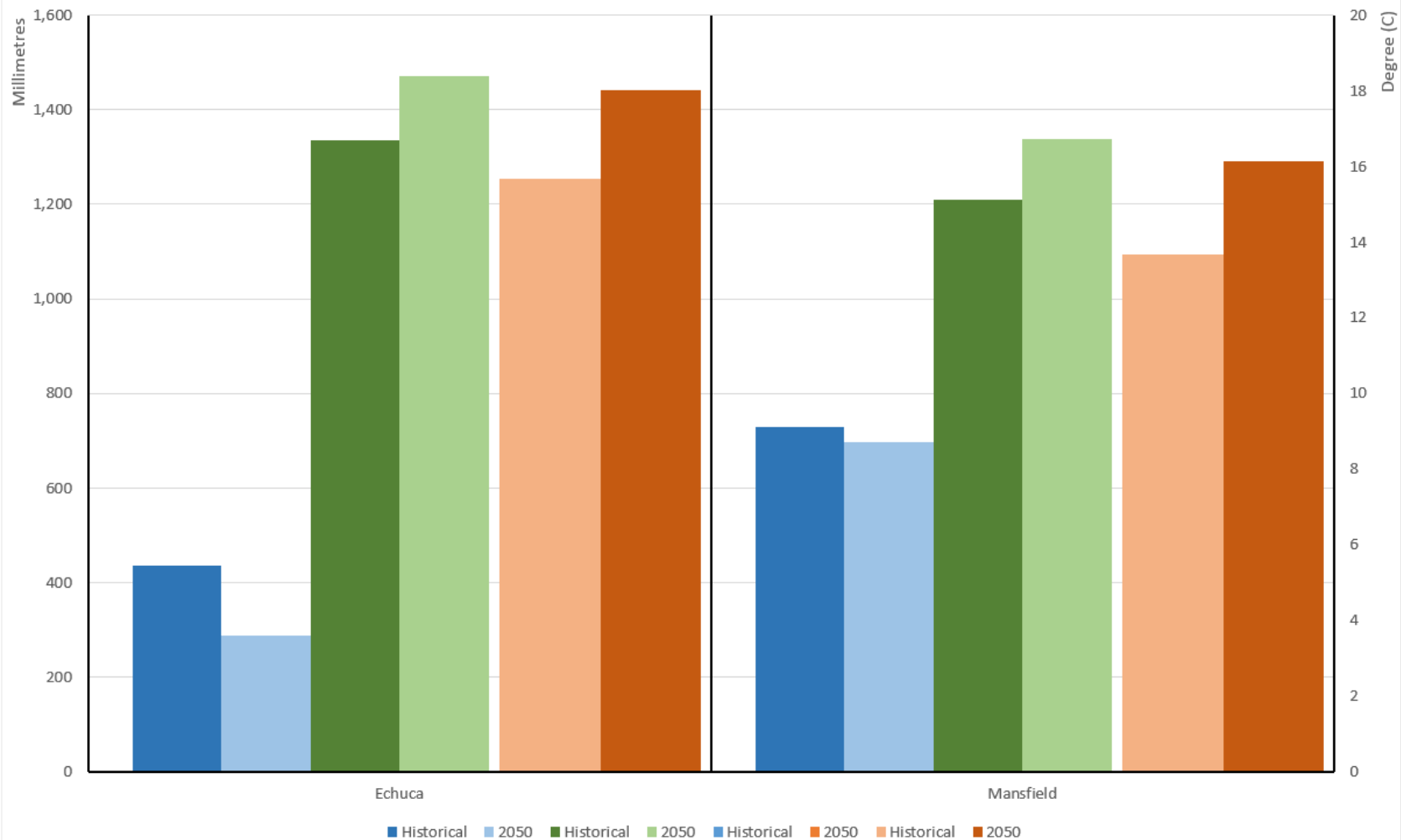
Mean Temperature - Historical Climate (Period 1961 - 1990)

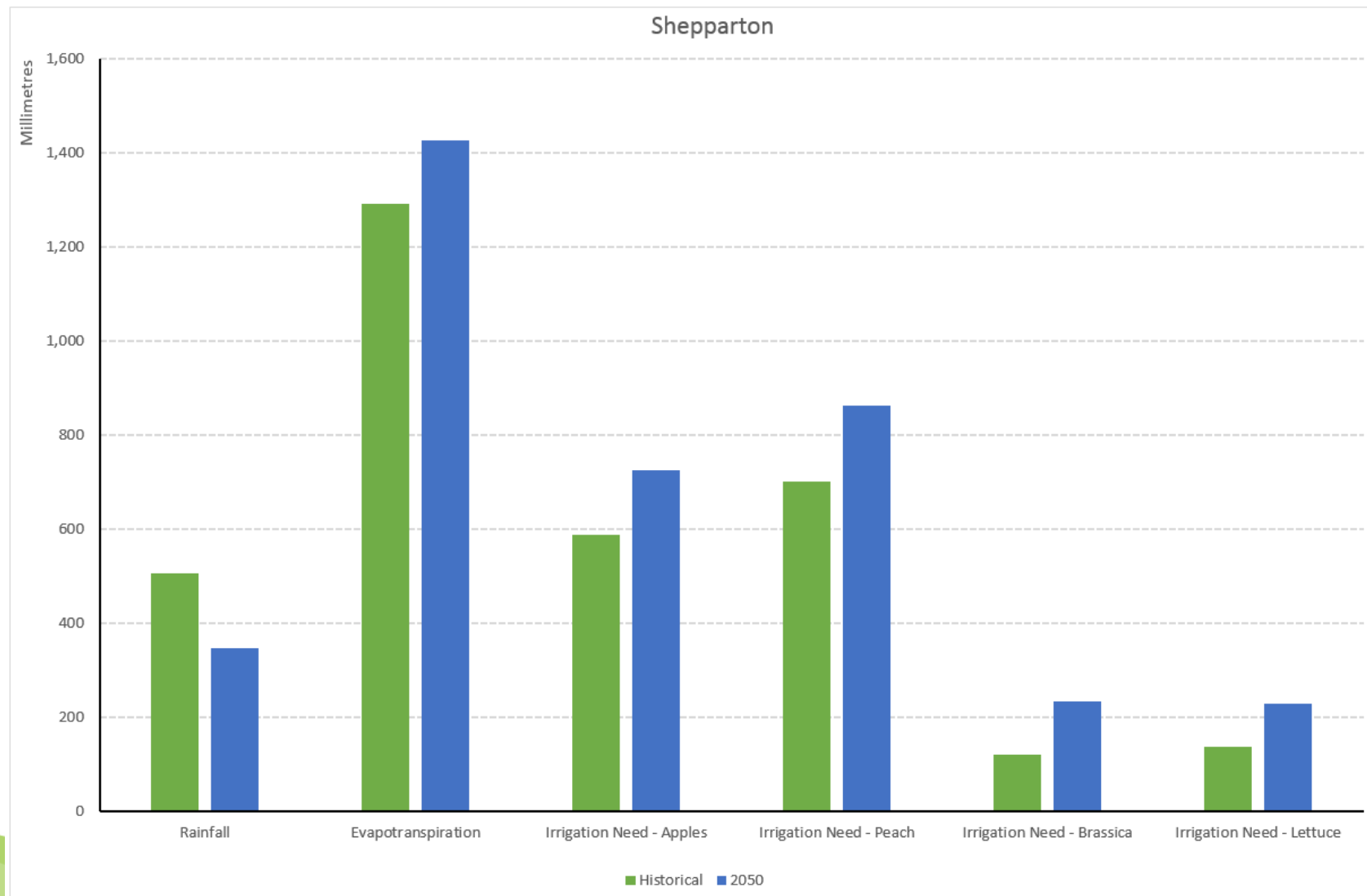


Mean Temperature - 2050 Climate (A1FI Scenario)

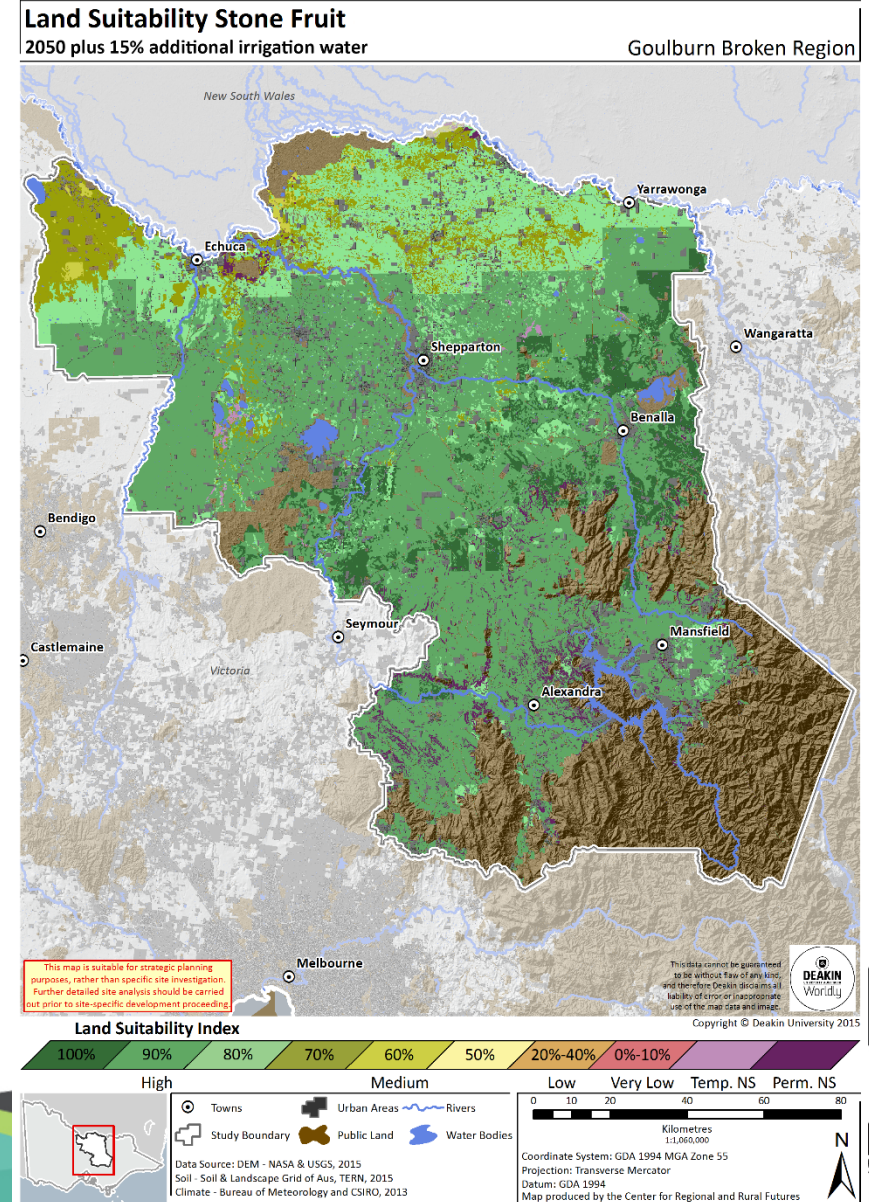
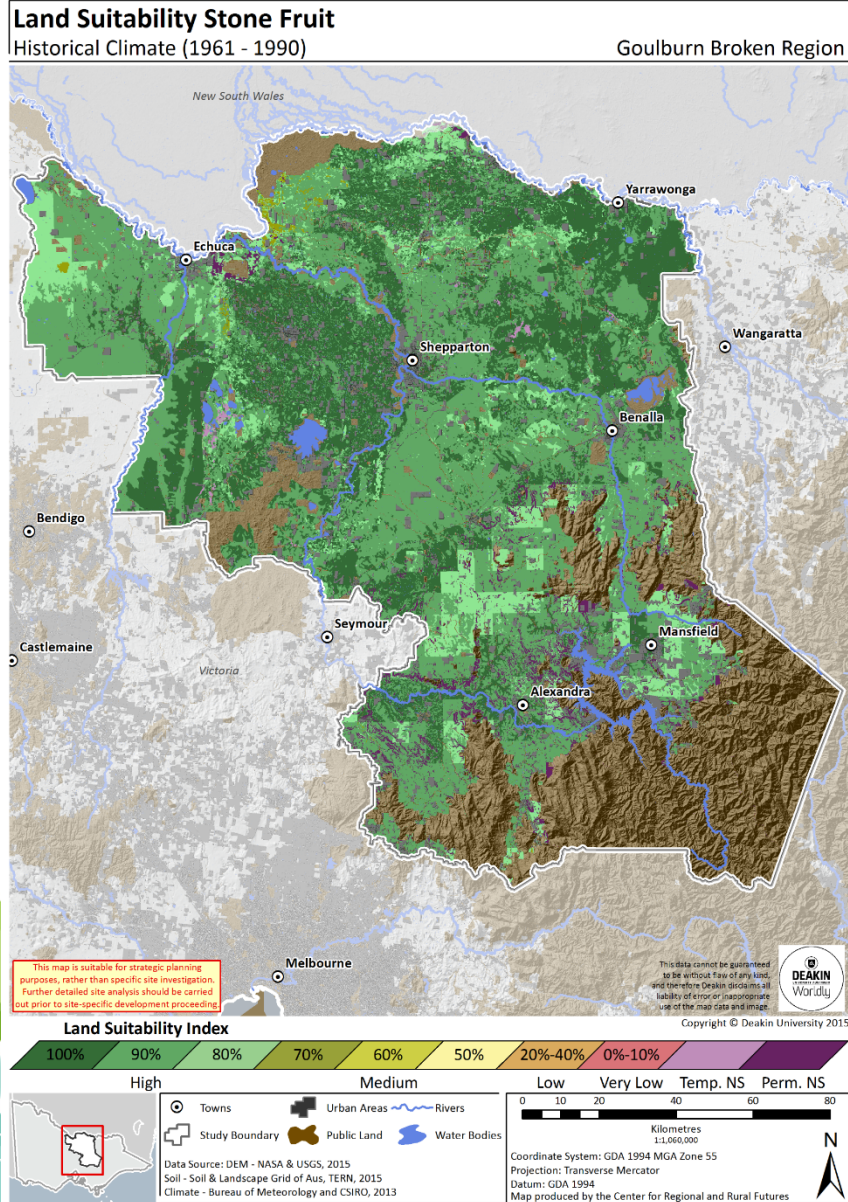


Total Rainfall (BLUE), Evapotranspiration (GREEN) and Mean Temperature (ORANGE)

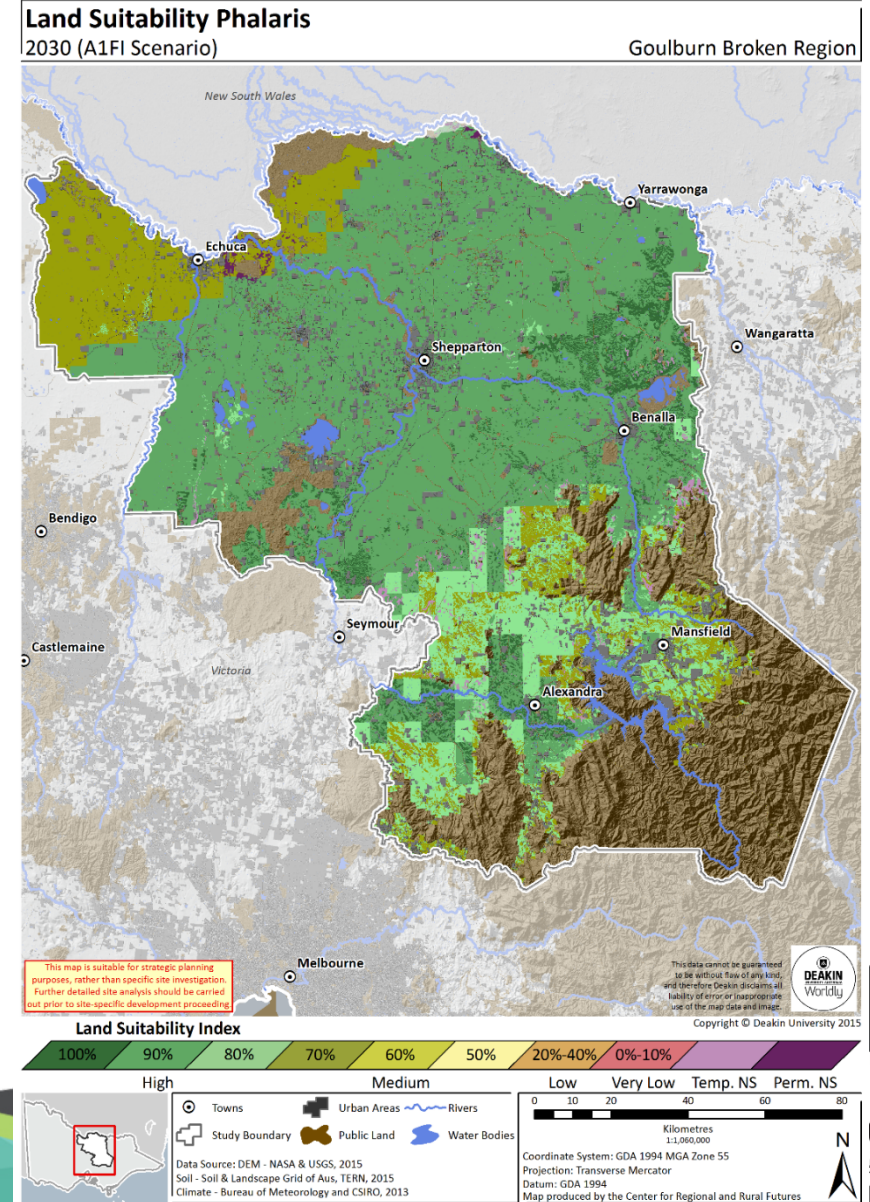
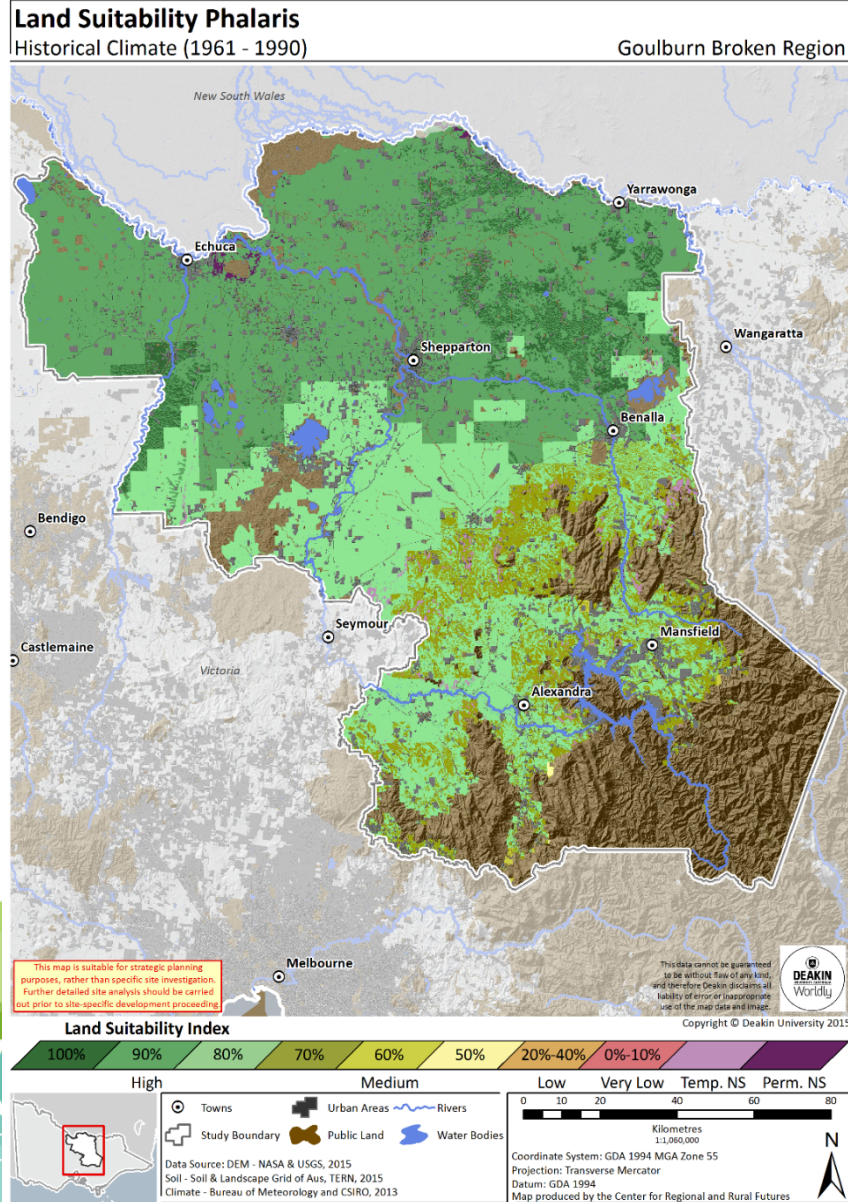




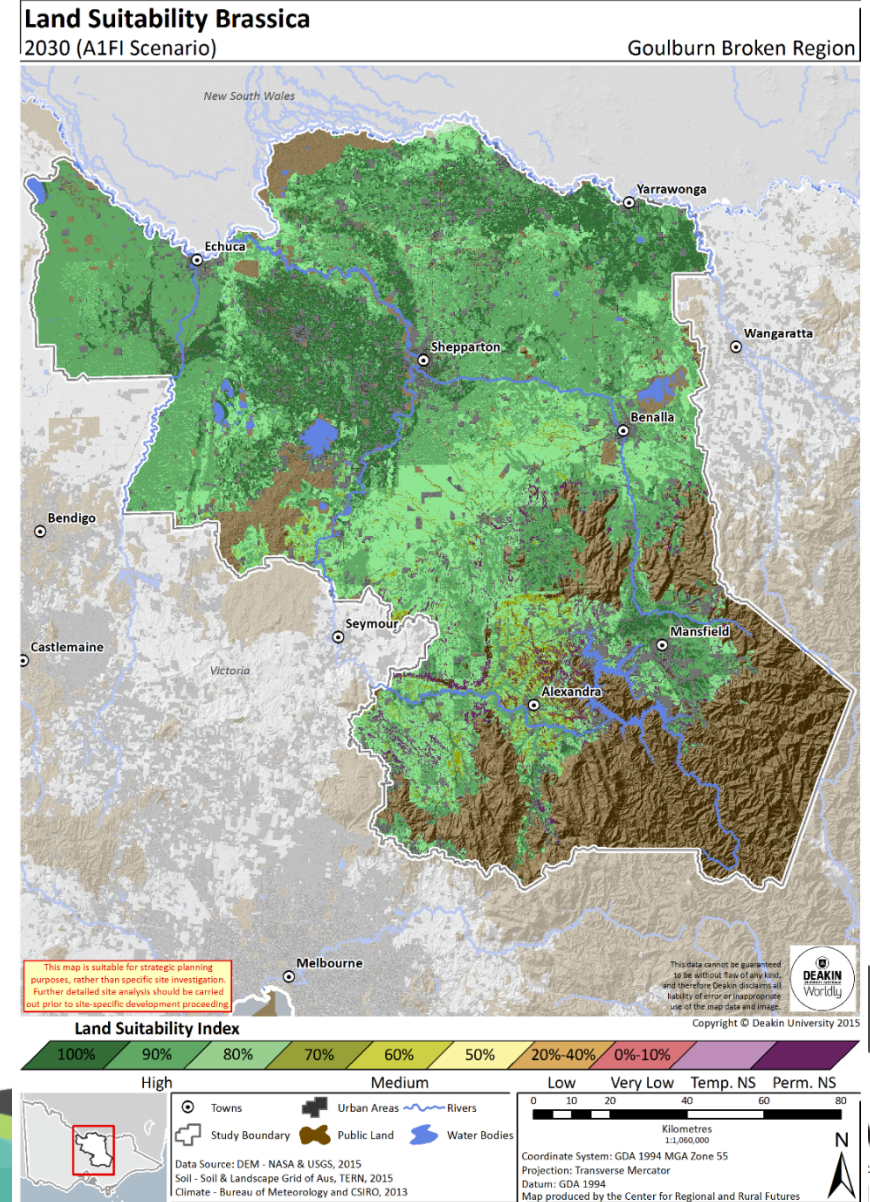
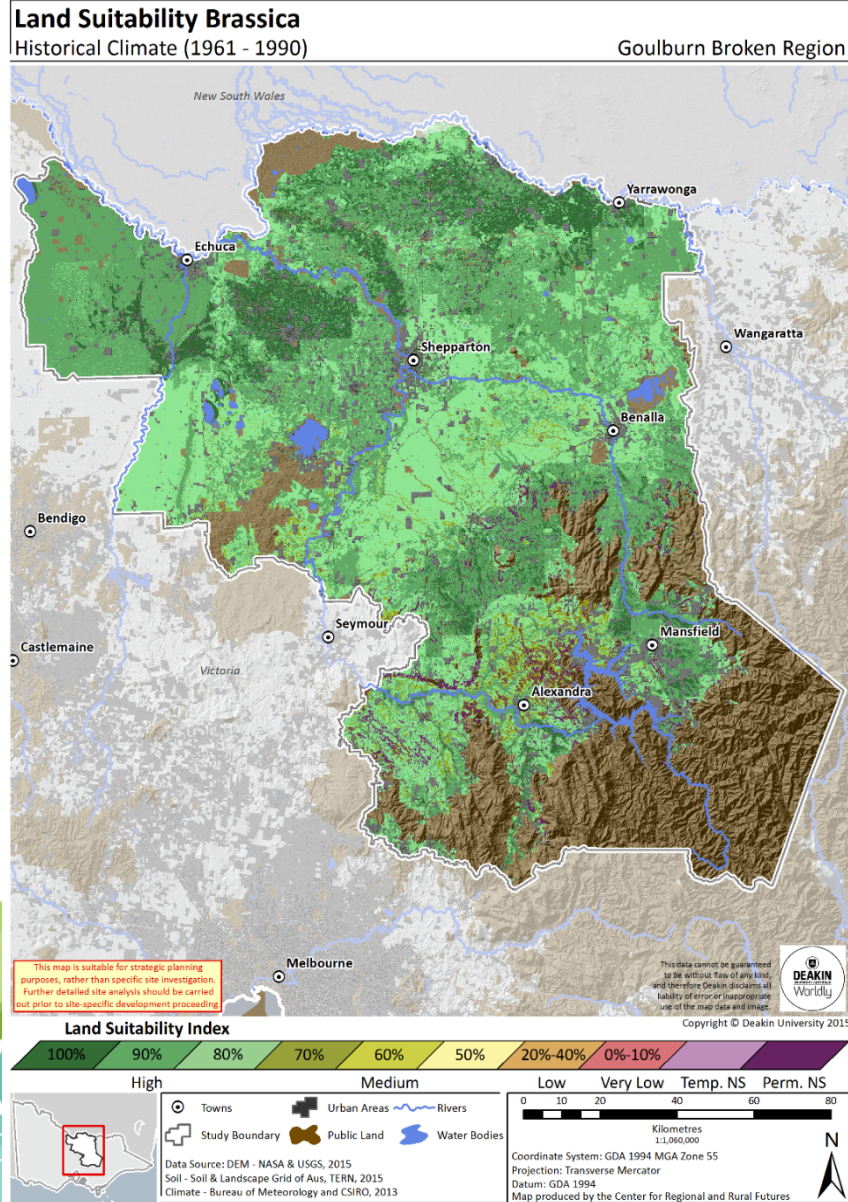
Regional stone fruit suitability assessment: historical vs 2050



Regional pasture suitability assessment: historical vs 2050



Regional brassica suitability assessment: historical vs 2050





Climate Smart Agricultural Development

Technical Report – Forestry Production



CLIMATE SMART
AGRICULTURE
DEVELOPMENT

ELECTRIC VEHICLE STUDY

WATTS WORKING BETTER

SUSTAINABILITY
TRAINING PROGRAM

REGIONAL CLIMATE
CHANGE ADAPTATION

PROJECT GOVERNANCE

STORY MAP - CLIMATE
SMART AG

MAPS

TECHNICAL REPORTS

MEDIA RESOURCES

EXTERNAL LINKS

involved the development of an interactive geographical information system tool to assess the impacts of climate change on the regions agriculture.

As at present the technology to make this a publicly accessible tool is limited. As a result, an interactive online map accompanied by dialogue to introduce the broader context of the interactive map is known as a 'story map'. It can be accessed by clicking on the

CLIMATE SMART
AGRICULTURE
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EXTERNAL LINKS

Goulburn Broken - Climate Smart Agricultural Development

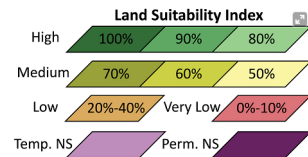
Climate Smart Ag - Goulburn Broken

Changes in commodities over time

Versatility of various commodity groups were modelled at historical climate and at 2050:

- Grain Crops ([Historical and 2050](#))
- Forestry ([Historical and 2050](#))
- Fruit ([Historical and 2050](#))
- Pasture ([Historical and 2050](#))
- Vegetable ([Historical and 2050](#))

These maps highlight the south-easterly shift in **highly suitable** production areas to a more **moderate suitability** for many commodity groups.



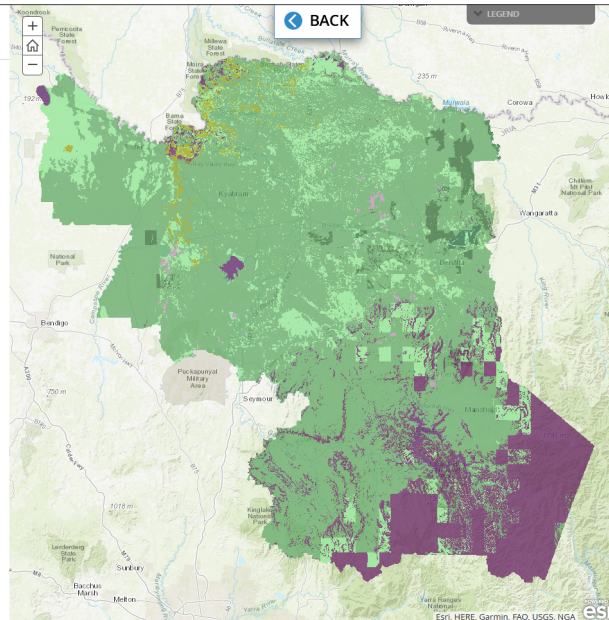
Legend - land suitability classes

What does this mean for our growers?

The Goulburn Broken is divided into two regions in terms of predicted climate change impacts (shown here for agricultural versatility in 2050):

- a) Campaspe, Moira and Shepparton Local Government Areas;
b) Benalla, Strathbogie, Mansfield, and Murrindindi Local Government Areas

Commodities vary in their ability to respond to the predicted changes in conditions, under current 'business as usual'



geographical information system tool
agriculture.

a publicly accessible tool is limited. As
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Climate Smart Agricultural Development

- In a national context, the economic importance of some regions will increase dramatically over time.

The Goulburn-Broken has some challenges and some very good opportunities in a changing climate. The region also has the advantage of already-established agricultural systems and supporting infrastructure.

- Fore-warned is fore-armed.
 - Objective regional assessment that captures local knowledge
 - Strategic 10, 30 and 50 year planning horizons
 - Plenty of opportunities for agricultural and regional development but regions must plan and act strategically to capitalise.

Our **Sustainable Regional Development** group
at Deakin's **Centre for Regional and Rural Futures**

PhD Students

Hanna Zydor (**Ground water** in changing climate)

Zahra Ghofrani (Managing climate change-induced **extreme weather**)

Jana Mrazova (**Forecasting and foresighting** to prepare regions for climate change)

Ana Spataru (**Peri-urban planning** in a changing climate)

Alejo Silvarrey (Assessing **water quality** changes using remote sensing)

Lauro Ribas (Assessing changing **land-use** across regions in a changing climate)

Edward Cornwell (Mountain-valley **hydrological systems** in a changing climate)

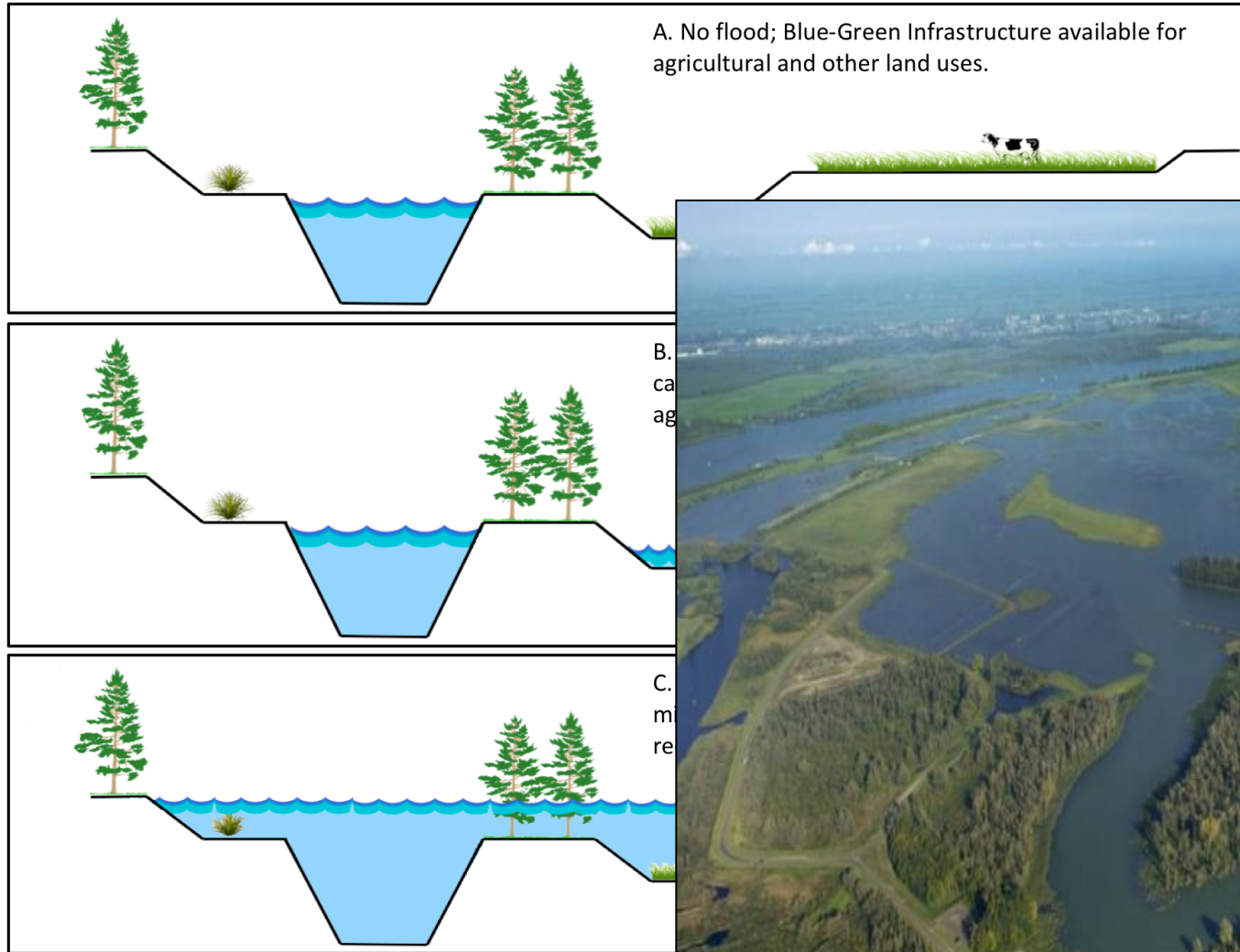
Madeleine Johnson (Sustainable **intensification of agriculture**)

Paul Stampton (**Fine-grained decision making** using course climate data)

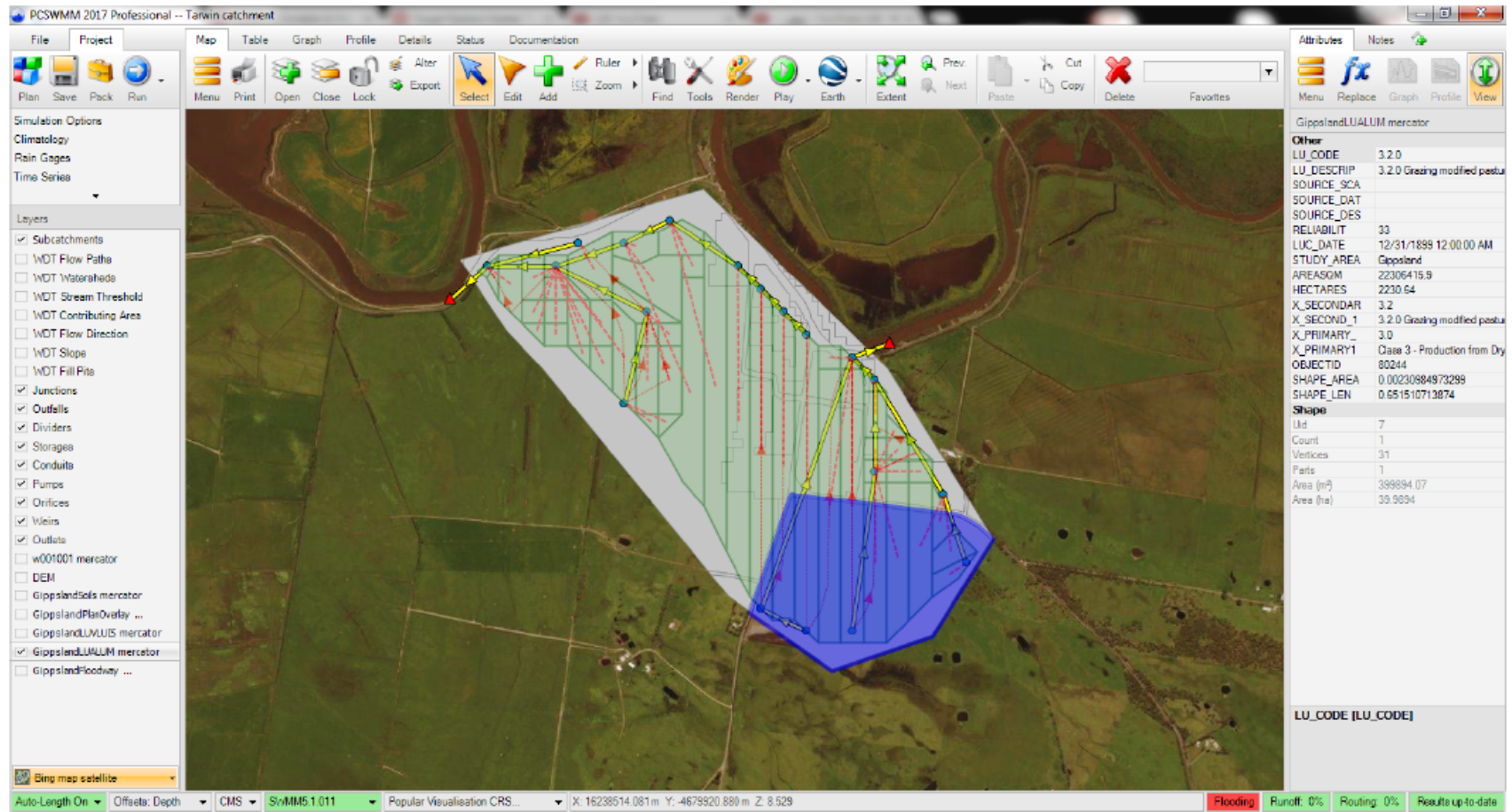
20+ Masters students

Master of Sustainable Regional Development

Key Infrastructure – Blue Green Infrastructure (BGI)



Key Infrastructure – Blue Green Infrastructure (BGI)



Contact Details

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