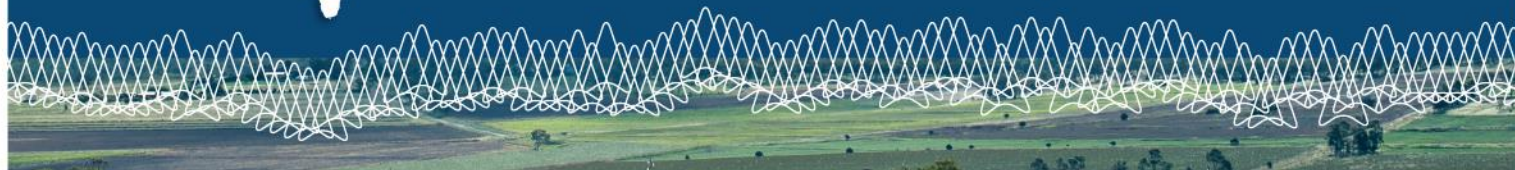




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# Burnett-Mary Natural Resource Management Region: Horticultural Sector

## Key Points

- The horticultural sector contributed 49% of the gross value of agricultural commodities in Burnett-Mary in 2010-11.
- The sector employed 2.3% of the labour force or 36.7% of the agricultural workforce.
- Characteristics of the sector that potentially **decrease** its vulnerability to the impacts of climate change include 1) its location in areas classified as 'inner regional Australia' where access to services is generally better than more remote areas; and 2) the young age profile of the total workforce and the sector's owner managers.
- Characteristics of the sector that potentially **increase** its vulnerability to the impacts of climate change include 1) its occurrence within local economies that are more specialised with fewer alternative employment options; and 2) relatively high levels of socio-economic disadvantage within the populations in which the horticultural sector is an employer.

## Introduction

This brochure focuses upon the horticultural sector in Burnett-Mary Natural Resource Management Region (NMR). It has been prepared as part of a top-down socio-economic vulnerability assessment to the impacts of climate change based upon freely available, national data sets from the Australian Bureau of Statistics (ABS). Sub-sector classifications (i.e., Nursery & Floriculture Production, Vegetable Growing, and Fruit & Tree Nut Growing) are derived from the ABS classifications used to report data from the 'Census of Population and Housing 2011' and the 'Agricultural Census 2010-11'. It is recommended that the brochure be read and interpreted in the context of more detailed knowledge of local circumstances.

### Brief Sector Profile

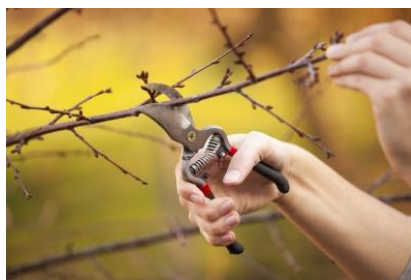
In 2011, the horticultural sector employed 2,849 persons, which represented 2.3% of the total Burnett-Mary labour force or 36.7% of the total agricultural workforce.

The sector comprised three sub-sectors:

- Nursery & Floriculture Production
- Vegetable Growing
- Fruit & Tree Nut Growing

More than half of those employed in the horticultural sector worked in the Fruit & Tree Nut sector (56%), 37% worked in the Vegetable Growing sector, and the remaining 7% worked in the Nursery &

Floricultural Production sector (Figure 1). The majority of the workforce comprised employees (73%). Owner managers of horticultural businesses comprised 19% of the workforce, and 7% were family members who contributed to a business.



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Combined, these three sub-sectors contributed \$541 million (49%) of

the gross value of agricultural production in Burnett-Mary in 2010-11. The Vegetable Growing sector contributed more than half of the value of horticultural production (56%; \$305 million), the Fruit & Tree Nut Growing sector contributed \$196 million (36%) and the Nursery & Floricultural Production sector contributed \$40 million (7%) (Figure 2).

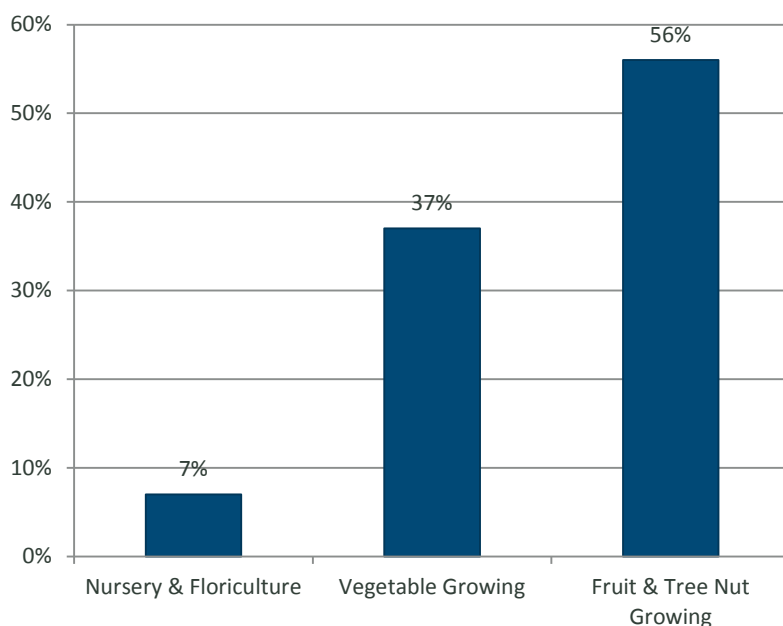
The value of commodities produced in the Vegetable Growing sector was dominated by tomato production (42%; \$127 million). In the Fruit & Tree Nut Growing sector, citrus production contributed 54% (\$107 million) of the value of commodities produced.



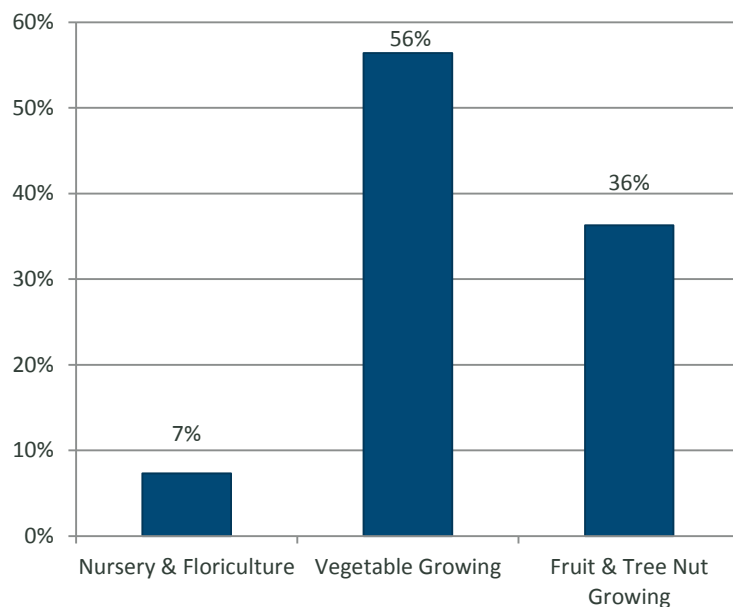
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**Figure 1: % horticultural workforce resident in Burnett Mary**



**Figure 2: % of gross value of horticultural commodities produced 2010-11**

### Geographic Remoteness

Rural and regional areas are often characterised by higher levels of disadvantage than urban areas because of the interaction between socio-economic characteristics of

the population and the characteristics of particular places.<sup>7</sup> For example, following the natural disasters in Queensland in 2010-11, higher proportions of people living in rural and remote areas reported suffering adverse impacts when

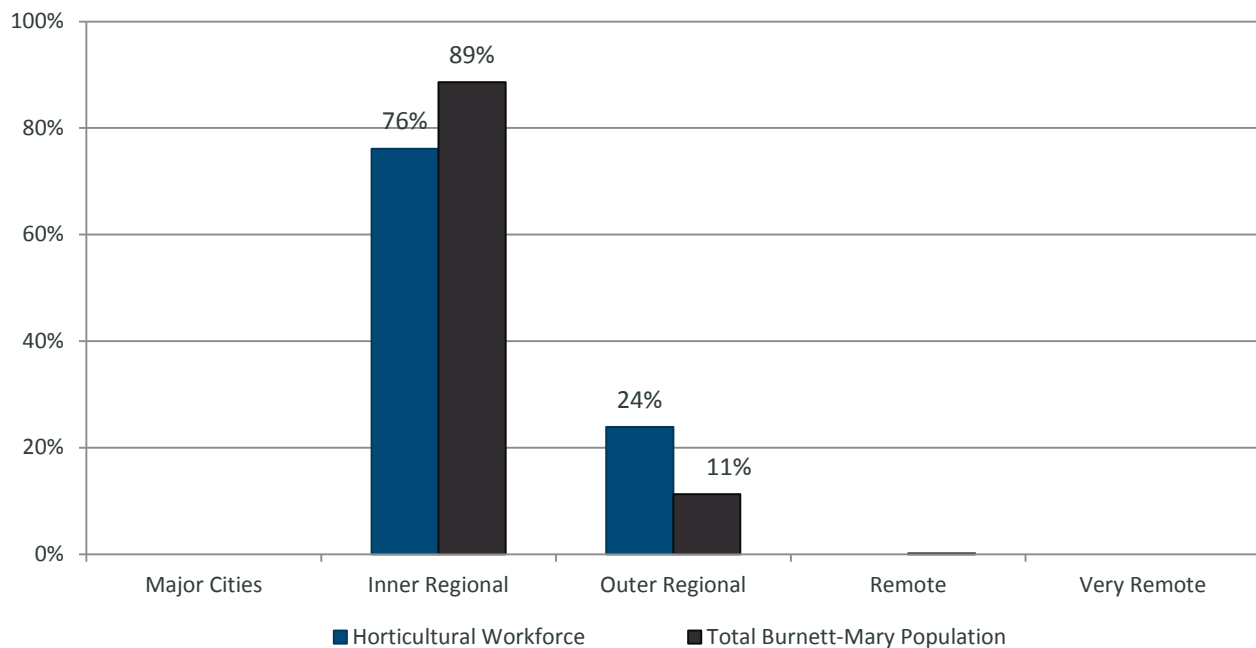
compared to people living in larger urban areas.<sup>5</sup> Similarly, more negative social impacts of drought were experienced in rural areas that had experienced a reduction in the level of services when compared to areas where service provision was more stable.<sup>8</sup>

The measure used here is the Australian Bureau of Statistics' 'Remoteness Structure' which divides Australia into five areas based upon relative access to services by measuring the physical road distance between populated localities and the nearest service centres. There are five categories: Major Cities of Australia, Inner Regional Australia, Outer Regional Australia, Remote Australia, and Very Remote Australia.<sup>9</sup>

In 2011, 76% of the horticultural workforce lived in areas classified as 'inner regional Australia'. The remaining 24% of the workforce resided in 'outer regional Australia'. The distribution of the workforce is comparable to the distribution of the wider Burnett-Mary population, although the wider population was more concentrated in areas classified as 'inner regional Australia' (89%); 11% lived in 'outer regional Australia' (Figure 3).

### Significance of Agriculture

Sensitivity to the impacts of climate change has been associated with the degree to which a population is dependent upon natural resources.<sup>1,2</sup> Populations dependent upon economic sectors that are characterised as being highly resource dependent may be highly sensitive to climatic variability. Agriculture, broadly defined, is highly dependent upon natural resources; thus, populations



**Figure 3: Geographic remoteness**

in which agriculture is socially and economically significant may be more vulnerable to downturns in one or more agricultural sectors. One way to assess the significance of agriculture to a given population is to consider the percentage of the labour force that is employed in the sector.

In 2011, 6.4% of the labour force resident in Burnett-Mary was employed in agriculture, but this varied across the region. The percentage of the labour force was calculated for 39 statistical areas that intersect with the Burnett-Mary NRM boundary in which the labour force was greater than 100 persons. The percentage of the labour force employed in agriculture ranged from 0.2% to 29.8%. In 14 of these areas, more than 6.4% of the labour force was employed in agriculture; in seven areas less than 1.0% of the labour force was employed in agriculture.

The percentage of the labour force employed in agriculture increased westward. In the north-west of the region, more than 60% of the labour force was employed in agriculture. Similarly, the percentage of the labour force employed in horticulture increased westward. However, the percentage of the labour force employed in horticulture (with the exception of a small concentrated area south of Bundaberg) is generally less than the percentage of the labour force employed in agriculture, suggesting that horticulture in Burnett-Mary co-exists with other agricultural sectors.

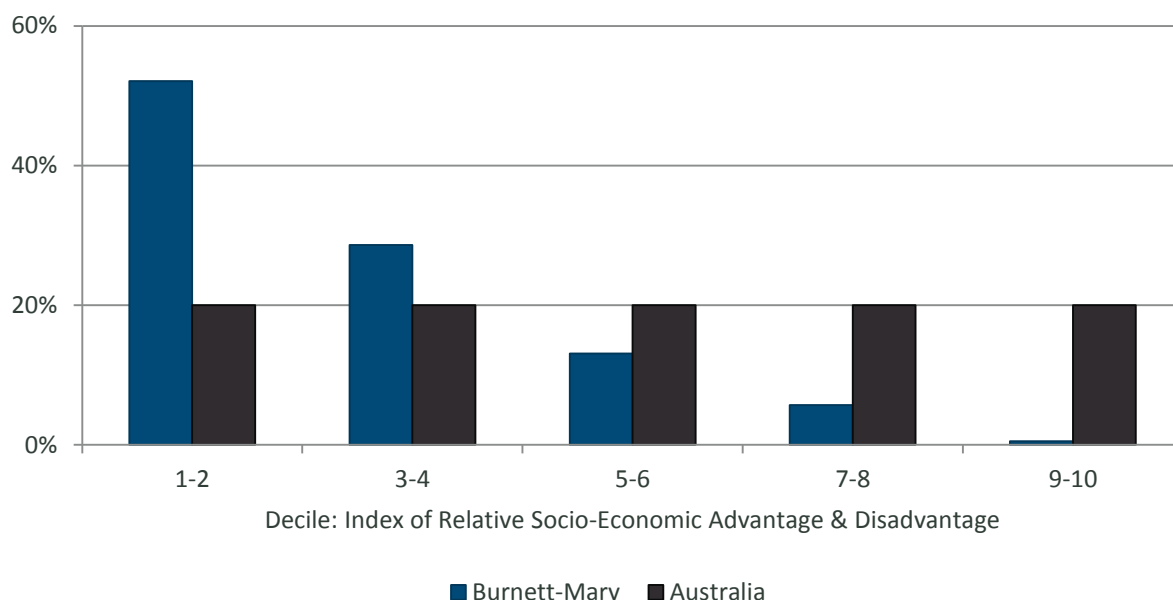
### Socio-Economic Advantage & Disadvantage

As mentioned above, the role remoteness plays in socio-economic vulnerability to the impacts of climate change intersects with

other socio-economic characteristics. In general, populations with higher levels of socio-economic disadvantage may have reduced capacity to respond to climatic and environmental changes.<sup>5, 10</sup>

The indicator used here is the Australian Bureau of Statistics' 'Index of Relative Socio-Economic Advantage & Disadvantage' (IRSAD) which is a measure of people's "access to material and social resources, and their ability to participate in society".<sup>11</sup> The index is derived from a range of data collected in the 'Census of Population and Housing'. Geographic areas are assigned a decile from 1-10. A low decile indicates a high proportion of relatively disadvantaged people in an area. A high decile indicates that an area has a relatively low incidence of disadvantage.





**Figure 4: Percentage of statistical areas (SA1) in Burnett-Mary by IRSAD decile**

When compared to the IRSAD deciles for Australia, a higher percentage of areas in Burnett-Mary were categorised as having very high levels of disadvantage (deciles 1-2). In 2011, more than half (52%) of the statistical areas in Burnett-Mary were categorised as having a very high proportion of disadvantaged people (deciles 1-2). Less than 1% of statistical areas were categorised as having very low levels of disadvantage (deciles 9-10) when compared to Australia (Figure 4). Populations with low IRSAD deciles, indicating a high proportion of disadvantaged people, were concentrated in the north-east of the region, stretching in a south-westerly direction to the western border. This represents a similar pattern to where the horticultural workforce was located.

### Economic Diversity

A diverse economy may contribute toward reduced socio-economic vulnerability because it provides a broader range of employment

opportunities if individual sectors experience a downturn due to economic or environmental factors. For example, a study of farming and small communities in the Murray-Darling Basin revealed that widespread negative social impacts tended to be experienced more acutely in areas that were almost totally reliant on agricultural sectors, with almost no alternative avenues of employment.<sup>8</sup>

The indicator used here is the Hachman Index, a measure of how closely the employment distribution of Burnett-Mary resembles the employment distribution of the wider Australian economy. Scores range from 0.00-1.00, where the economic diversity of the Australian economy is considered to be equal to 1.00.

The Hachman Index for Burnett-Mary was 0.82 meaning that the economy is diverse but less diversified than Australia as a whole. All sectors of the economy are represented, but the top five sectors (out of 19 sectors) comprise

more than half of the region's employment (56.4%). The health and retail sectors contributed 28.0% of total employment (compared to 22.6% for the Australian economy). The agricultural sector was the fifth highest contributing sector (8.5% of employment compared to 2.5% for the Australian economy).

Within Burnett-Mary there was spatial differentiation. The Hachman Index was calculated for 40 statistical areas that intersect with the Burnett-Mary NRM boundary. Using 0.90 as representative of a diversified economy,<sup>12</sup> none of the statistical areas were diversified. Five (13%) areas which represent the urban areas of Maryborough, Gympie, Kingaroy, and parts of Bundaberg had a score above 0.75.

In 2010-11, the areas that contributed most to the gross value of horticultural production had specialised to moderately specialised economies represented by scores between 0.21 and 0.60,



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suggesting that they might be more vulnerable to downturns in one or more of the horticultural sub-sectors.

### Age

Age is one of the most common socio-economic variables to be associated with vulnerability to climate change impacts. In general, much of this research focuses upon the increased sensitivity of older populations to negative health impacts of changes to the climate<sup>3</sup> or their reduced capacity to respond to stressors.<sup>4</sup> However, the direction of the association between age and vulnerability to climate change is not straightforward. For example, a survey of 6,104 Queensland residents after the flood and cyclone events of 2010-11, revealed that adults of working age were more likely to report exposure to property damage, reduced incomes, and

adverse emotional impacts. The researchers of this study suggested that this is because people of working age have a greater likelihood of being employed, owning income producing property, and having dependent children.<sup>5</sup> Similarly, in an agricultural context, other researchers identify that both older- and younger-aged cattle producers can demonstrate similarly low levels of vulnerability to climate change impacts because of other intervening factors (e.g., strength of industry networks and willingness to make changes).<sup>6</sup>

In the Burnett-Mary horticultural sector, 7% of the workforce was aged 65 years or older compared to 18% for the total agricultural sector. There were differences between the age profiles of each sub-sector. The Fruit & Tree Nut Growing, and Nursery & Floriculture Production workforces were older than the Vegetable Growing workforce. In

the case of the Fruit & Tree Nut Growing, 8% of the workforce was 65 years or older and 8% of the Nursery & Floriculture Production workforce was 65 years or older. In comparison, 5% of the Vegetable Growing workforce was 65 years or older. (Figure 5 shows the age distribution for the horticultural sector and each sub-sector).

When considering those horticultural workers who have decision-making responsibility, a higher percentage of owner managers were aged 65 years or older (13%). In comparison, 25% of owner managers in the agricultural sector as a whole were 65 years or older. Owner managers in the Fruit & Tree Nut Growing sector (17% were 65 years or older) were older than their counterparts in the Vegetable Growing sector (7% were 65 years or older).

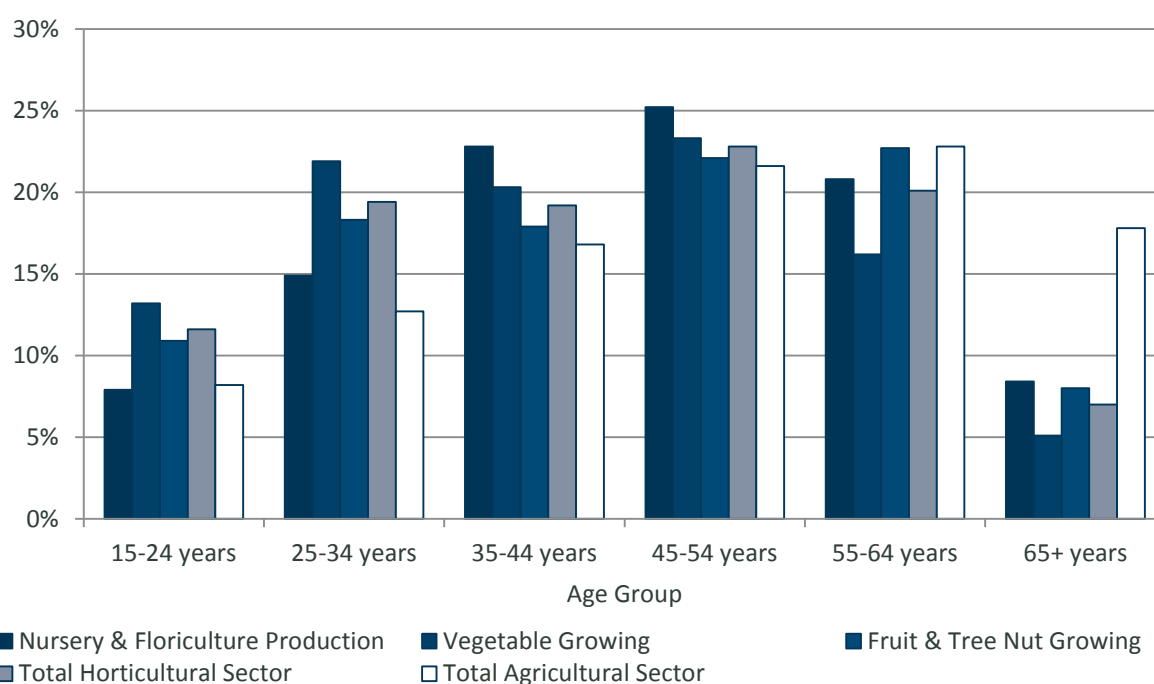


Figure 5: Percentage of horticultural workforce by age



## Summary

The following table summarises the indicators presented and the typical way in which they are interpreted concerning socio-economic vulnerability to the impacts of climate change.

**Table 1: Indicators for assessing potential socio-economic vulnerability**

Variable	Categories or Scores	Interpretation
Significance of Agriculture	Percentage of labour force employed in agriculture	A higher percentage of the labour force employed in agriculture indicates a population/region in which agriculture is more significant than populations/regions in which a lower percentage of the labour force is employed in agriculture. Higher significance of agriculture suggests higher levels of resource dependency and, therefore, higher sensitivity to the impacts of climate change.
Age	<ol style="list-style-type: none"> <li>15-24 years</li> <li>25-34 years</li> <li>35-44 years</li> <li>45-54 years</li> <li>55-64 years</li> <li>65 years or older</li> </ol>	Older aged people are often more sensitive to climate change impacts (e.g., increases in temperature) and often have lower levels of adaptive capacity. This combination suggests potentially higher levels of vulnerability.
Geographic Remoteness	<ol style="list-style-type: none"> <li>Major Cities of Australia</li> <li>Inner Regional Australia</li> <li>Outer Regional Australia</li> <li>Remote Australia</li> <li>Very Remote Australia</li> </ol>	Larger distances from service centres are suggestive of higher vulnerability.
Socio-Economic Advantage & Disadvantage	Deciles between 1 and 10	Deciles closer to 10 indicate a lower proportion of disadvantaged people which is suggestive of higher levels of adaptive capacity, and therefore potentially lower levels of vulnerability.
Economic Diversity	Scores between 0 and 1	Scores closer to 1 indicate a more diverse economy which is suggestive of lower levels of vulnerability

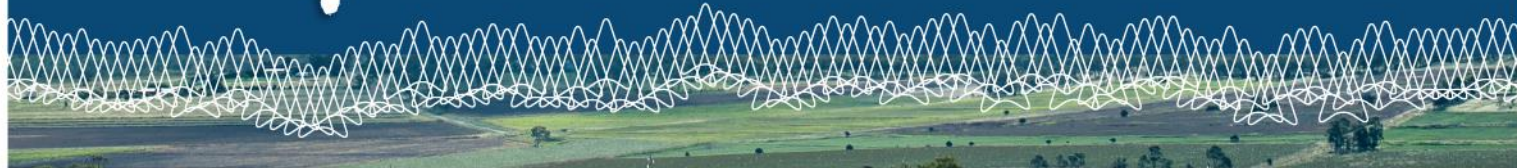




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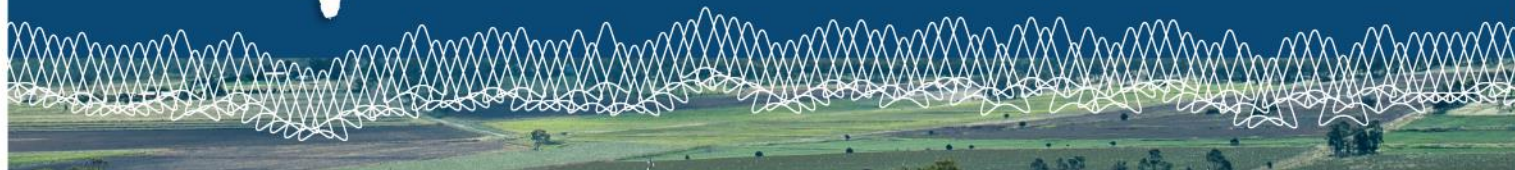
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### Further Information

This Fact Sheet should be referenced as:

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This Fact Sheet forms part of the activities of the East Coast NRM Cluster. This project aims to foster and support an effective "community of practice" for climate adaptation within the East Coast Cluster regions that will increase the capacity for adaptation to climate and ocean change through enhancements in knowledge and skills and through the establishment of long term collaborations. The

East Coast Cluster consists of the coastal Natural Resource Management (NRM) bodies in Queensland and New South Wales between Rockhampton and Sydney. The Research Consortium comprises: University of Queensland (Consortium leader); Griffith University; University of Sunshine Coast; CSIRO; University of Wollongong; New South Wales Office of Environment and Heritage; and Queensland Department of Science, IT, Innovation and the Arts (Queensland Herbarium). The views expressed herein are not necessarily the views of the consortium partners, and the consortium partners do not accept responsibility for any information or advice contained herein. The East Coast NRM Cluster received funding from the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary

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Contact information:

Professor Tim Smith  
+61 (0) 7 5459 4891  
[tsmith5@usc.edu.au](mailto:tsmith5@usc.edu.au)  
[www.usc.edu.au](http://www.usc.edu.au)  
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