Climate change scenarios for Australian farms

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Recent shifts in climate have reduced farm profits

Percentage change in farm profits Recent (2001 to 2020) climate relative to the Historical (1950 to 2000) period

Hughes et al. 2019, Effects of drought and climate variability on Australian farms
Climate change scenarios

**Low emissions**
RCP4.5 × 6 GCMs

- Summer temp.*: +0.5°C to +1.2°C
- Winter rain**: -3% to -21%

**High emissions**
RCP8.5 × 6 GCMs

- Summer temp.*: +1.3°C to +2°C
- Winter rain**: -6% to -30%

Source: Climate Change in Australia CIMP5 ‘application ready’ data and ABARES AAGIS, *Nov. to March average max. temperature, **Apr. to Oct. rainfall
Key assumptions

- Current commodity prices
- No adaptation

Hughes et al. (2019) *farmpredict*: A microsimulation model of Australian farms
Percentage change in farm profits relative to the *Historical (1950 to 2000)* period by farm group

**Results**

-80 -70 -60 -50 -40 -30 -20 -10 0 10 20

Recent (2000 to 2020)

-23%

Average
Simulated changes in farm profits

Percentage change in farm profits relative to the *Historical (1950 to 2000)* period by farm group

<table>
<thead>
<tr>
<th>Farm Group</th>
<th>RCP4.5</th>
<th>RCP8.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef</td>
<td>-2% to -32%</td>
<td>-11% to -50%</td>
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<tr>
<td>Sheep</td>
<td></td>
<td></td>
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<tr>
<td>Cropping</td>
<td></td>
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<tr>
<td>All farms</td>
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</tbody>
</table>

Average

- RCP4.5: -2% to -32%
- RCP8.5: -11% to -50%
Simulated changes in farm profits

Percentage change in farm profits relative to the Historical (1950 to 2000) period

RCP 4.5

RCP 8.5
Potential for adaptation

Improvements in technology are already helping farms adapt

Potential for farm structural change
• Shift away from cropping
• Shift to larger farm sizes

More transformative change is also possible

Better information can support adaptation
• Farm specific scenario analysis