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26 February - Albany and Adelaide

Big Picture

Given that it is currently Austral summer, the polar jet stream is generally shifted poleward. With this, the progressive troughs are not able to penetrate into the continent of Australia much over the next 10 days. With quasi-stationary ridges stationed on the western and eastern coasts of Australia, troughs cresting the ridges to the south have a chance of making it onto the southern coast of Western Australia and South Australia. Without a predominant blocking signature, repeated anticyclonic wave breaking events act to influence these ridges. However, flow outside of the polar jet is very weak and much of Australia is experiencing hot, dry summertime conditions. This looks to be predominant for most of the forecast period, with only scattered precipitation. The only indication of an organized cyclone will be around day 7 as an anomalous trough is able to penetrate further north along the South Australia coast, with the strongest anomalies remaining offshore.

Day 7-10

This later period proves to offer the biggest shift in the forecast, with the confluence between a subtropical and polar jet streak right over the southwestern tip of Australia. With that, northwesterly flow can help to bring in disturbances from the Indian Ocean, along with any cyclones embedded within the polar jet that may make a northward excursion. Outside of this, much of Australia will experience typical summertime conditions with hot temperatures and limited rainfall due to the offshore wind direction in most locations in the major population centers. This is heavily susceptible to change with a few poorly resolved features in the models: a large cyclone near the Antarctic coast and a potential tropical cyclone in the Indian Ocean. Depending on these exact features and how the forecast pans out, this cyclone near South Australia may have a completely different outcome.

Day 4-6

Upon the passing of a cold front and an upper-level trough, the period begins with cooler than normal surface temperatures advected onto most of the southern coast of Australia throughout the period. By day 1, forecast models hint at the potential for a surface low to form along the southern coast of Australia due to the combination of tropospheric ascent ahead of an eastward moving upper-level trough initially centered over Albany, an approaching arctic air mass, and a coastal front along the coast characterized by an axis of enhanced baroclinicity and a local maxima in low-level cyclonic vorticity. A cold front associated with the aforementioned, southeastward moving surface cyclone will aid in low-level lifting for much of Western and South

Australia along with favorable large-scale ascent ahead of the eastward moving trough. The combination of these factors will aid in producing precipitation in the regions of interest, particularly Adelaide dependent on the intensity and track of the cyclone with respect to the uncertainty of the upper-level low.

Day 0-3

The period beings with a 1028mb high-pressure system and upper level ridge centered over the Great Australian Bight that moves eastward and away from the regions of interest due to the advancing upper level ridge by the end of day 0. On day 1, low pressure begins digging into Albany and forms a weak low south of the region along the coast. This feature however begins degrading as dry, stable air disrupts any further deepening of the surface low along the coast despite an upper level trough centered over 45S that begins moving east. By the end of the period, temperatures are cooler relatively over southwestern Australia extending into Indian Ocean while they are much warmer in the warm sector across South Australia and within the Great Australian Bight. A tight pressure gradient over West Australia directed from the northeast toward the southwest will allow air to initially move southwest and then become deflected to the southeast by the Coriolis force providing a northwesterly low-level jet feeding in relatively warm, dry air due to downsloping at approximately 900mb. This will favor both a mid- to upper-level moist layer and significantly dry low-level layer profile, enabling the potential for inclement wind conditions in Western Australia. Further east, Adelaide will be subjected to a change in southerly flow to a more northerly flow near the end of the period due to the presence of a passing cold front, though models have been in disagreement about the timing of its passing.

Probabilistic Forecasts for the period

Albany, Australia

Day 0-3

High Temperature	10th: 70°F	50th: 73°F	90th: 77°F
Low Temperature	10th: 59°F	50th: 63°F	90th: 66°F
Precipitation	10th: 0.00”	50th: 0.03”	90th: 0.07”

Day 4-6

High Temperature	10th: 70°F	50th: 72°F	90th: 74°F
Low Temperature	10th: 57°F	50th: 59°F	90th: 61°F
Precipitation	10th: 0.00”	50th: 0.02”	90th: 0.04”

Day 7-10

High Temperature 10th: 66°F 50th: 68°F 90th: 70°F
Low Temperature 10th: 56°F 50th: 58°F 90th: 59°F
Precipitation 10th: 0.00” 50th: 0.01” 90th: 0.02”

Adelaide, Australia

Day 0-3

High Temperature 10th: 87°F 50th: 90°F 90th: 92°F
Low Temperature 10th: 70°F 50th: 73°F 90th: 77°F
Precipitation 10th: 0.00” 50th: 0.00” 90th: 0.00”

Day 4-6

High Temperature 10th: 80°F 50th: 87°F 90th: 95°F
Low Temperature 10th: 65°F 50th: 71°F 90th: 75°F
Precipitation 10th: 0.00” 50th: 0.00” 90th: 0.05”

Day 7-10

High Temperature 10th: 80°F 50th: 84°F 90th: 90°F
Low Temperature 10th: 65°F 50th: 70°F 90th: 75°F
Precipitation 10th: 0.00” 50th: 0.05” 90th: 0.25”