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**14 March- Punta Arenas and Resistencia**

**Big Picture**

As was the case last week, much of the large-scale flow is determined by wave breaking along the polar jet stream, with tropical and midlatitude systems contributing to how meridional the jet stream has been. With several AWB events to the west south of Australia and New Zealand, downstream flow is being amplified. Much of the period's weather will come from the mean pattern: progressive disturbances along the jet coupled with a return of the Atlantic subtropical high. The changing of seasons can also be seen in the split jet structure in the later portions of the forecast, with a displacement away from the aptly named "roaring 40s" south of Patagonia. The forecast period starts with a similar confluence zone across central Argentina due to the anticyclone off the eastern coastline and the jet stream approaching from the south. By day 3 an upper-level cutoff low from an earlier PV streamer over southern SA moves slowly northeastward, helping to induce cyclogenesis along the Uruguay/Argentina coastline. As the jets splits later in the forecast period, the northern branch is enhanced through momentum advection, strengthening this jet streak that by days 4 and 5 becomes favorable grounds for cyclogenesis and cyclone enhancement across the south Atlantic. The northern portion of the domain remains mostly dry, with only a small shortwave trough to bring light precipitation to the Buenos Aires area on days 7 and 8. Southern areas will experience a series of progressive disturbances throughout the forecast period, with mostly upslope precipitation. The upper-level low in the beginning of the period and the dual jets for much of the second half means the meridional temperature gradients over the domain are reduced or even eliminated, with much below average surface temperatures in northern Argentina and above average in southern Argentina and Chile.

**Day 7-10**

While the middle forecast period had a distinct split jet across South America, this transitions toward singular southwest to northeast jet. As stated above, a shortwave disturbance along the jet will move northeastward into east-central Argentina, inducing weak cyclogenesis along the coast and light precipitation to parts Argentina, Uruguay, and southern Brazil. This features begins to phase with a larger trough off the coast and deepen rapidly on days 8 and 9. While little to no precipitation from this larger storm will move in, the southerly component to the wind does increase the cold air advection and allow for temperatures to become even more anomalously cold. By day 10 and beyond, there does seem to be an overall jet strengthening in the south Pacific, presumably by developing cyclones along the Antarctic coast as cold air develops more over the ice sheets meets the warmer ocean temperatures.

**Day 4-6**

A broad longwave trough over southern Chile and Argentina will begin to lift the eastward moving shortwave centered over eastern Argentina and Uruguay. Ahead of the shortwave, precipitation will be favored where upward motion and warm air advection are present throughout day 4, particularly extending from Paraguay to Uruguay. Subsidence from the upper-level jet favors high pressure as it begins building in from the Atlantic, followed by the advection of relatively cold and dry air into much of central South America. An area of enhanced mean sea level pressure gradient will favor zonally enhanced winds in Patagonia contributed by a subtropical high west of Chile and polar cyclones induced by upper-level shortwaves that move east along 60S. This westerly flow regime will favor light precipitation and climatological temperatures for areas over the southern tip of South America.

### **Day 0-3**

Rossby wave breaking develops an elongated filament of high PV air that extent from the Atlantic into the southern region of Argentina throughout day 0 of the period. This features manifests as a cutoff cyclone at the 500mb level submerged under a poleward ridge. This feature begins dissolving as convection enhances the upward transport of heat and momentum from the surface. A low-level dryline-like feature develops by day 1 in southern Argentina moving fairly quasi-stationary in conjunction with precipitation further north in Paraguay where surface heating and tropospheric instability provide favorable conditions for convective showers. By day 2, converging winds at 850-hPa will aid in driving precipitation for much of Paraguay and the surrounding areas. Additionally, a confluent area of moisture and winds enhanced by large pressure gradients allow for orographically driven precipitation along the southern Andes and throughout Patagonia. Cyclonic vorticity advection from the degraded shortwave centered over central Argentina and the high theta-e advection from the Amazon aids in promoting ascent for much of Bolivia to southern Brazil by the end of the period.

### **Probabilistic Forecasts for the period**

#### **Punte Arenas, Chile**

##### **Day 0-3**

High Temperature	10th: 53°F	50th: 55°F	90th: 57°F
Low Temperature	10th: 43°F	50th: 45°F	90th: 47°F
Precipitation	10th: 0.75"	50th: 1.00"	90th: 1.25"

##### **Day 4-6**

High Temperature	10th: 50°F	50th: 52°F	90th: 54°F
Low Temperature	10th: 41°F	50th: 43°F	90th: 45°F

Precipitation 10th: 0.05" 50th: 0.20" 90th: 0.40"

Day 7-10

High Temperature 10th: 51°F 50th: 53°F 90th: 55°F

Low Temperature 10th: °F 50th: °F 90th: °F

Precipitation 10th: 0.00" 50th: 0.00" 90th: 0.00"

## **Resistencia, Argentina**

Day 0-3

High Temperature 10th: 89°F 50th: 91°F 90th: 92°F

Low Temperature 10th: 71°F 50th: 72°F 90th: 73°F

Precipitation 10th: 0.10" 50th: 0.40" 90th: 0.75"

Day 4-6

High Temperature 10th: 83°F 50th: 86°F 90th: 89°F

Low Temperature 10th: 69°F 50th: 71°F 90th: 73°F

Precipitation 10th: 0.00" 50th: 0.00" 90th: 0.15"

Day 7-10

High Temperature 10th: 74°F 50th: 79°F 90th: 84°F

Low Temperature 10th: 62°F 50th: 64°F 90th: 66°F

Precipitation 10th: 0.15" 50th: 0.25" 90th: 0.40"