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Antarctic Peninsula Climate Variability: Observations, Models, and Plans for IPY  
Research

The sub-Antarctic atmospheric circulation between 15° W and 90° W and its effects on  
the climates of the Antarctic Peninsula and Southern South America

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Surface air temperature increases of up to about 3°C in the last 50 years have been recorded in the western coast of the Antarctic Peninsula (AP). Following world-wide tendencies, temperatures in continental South America have also increased in the same period, but to a much smaller extent; southern Brazil shows for the same half century an increase of 0.4°C, which for the last 20 years amounts to less than 0.2°C. Most studies have focused on global and hemispherical atmospheric circulation patterns and indices averaged over seasons and years during long-term periods to explain the temperature variations in the AP.

This paper considers specifically the longitude sector of 15° W to 90° W and shows that an important regional context in the scale of days can have marked effects in the temperatures of AP and in south South America as a result of meridional flows at surface level that result from synoptic systems in the region. Analyzing observational data for the period of 2004-2005 we show that cool and rainy spells in southeast South America result from the outflow of Weddell Sea surface air, and that increases of 10°C are common in the South Shetland Islands under northern flow from South America. The latitudinal position of the subpolar jet stream is one of the key factors in such synoptic configurations, and the further north it is located, the warmest temperatures are found in the north AP. An extended investigation for a period of 40 years to detail this meridional flow is under way to evaluate its effects in the warming records of AP temperatures.