

International Workshop, University of Colorado Boulder, CO, USA, 14-16 May/2006
http://nsidc.org/events/IPY_APCV/abstracts.html

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

Meridional circulation between the Antarctic Peninsula and southeastern South
America: cold surges one way and biomass burning emissions the other way.

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In this paper we present two meridional circulation patterns in the lower troposphere between the north of the Antarctic Peninsula (AP) and South America (SA) that occur in all seasons of the year, so far not yet presented in the literature. Low pressure systems in the Weddell Sea produce outbursts of cold air at surface level that protrude 60° of latitude northwards, causing temperature declines of 10°C and precipitation in tropical areas in southeast and east SA. In the opposite direction, southward flow from central SA reaches the north AP under high pressure ridges, causing temperature increases of also 10°C or more. These meridional flows are corroborated with plenty of evidence of observational data from weather stations in the north of the AP and southeast SA, satellite imagery, synoptic charts, and with aerosol sampling in the South Shetlands.