

# Antarctic Peninsula Climate Variability: History, Causes and Impacts



*Interdisciplinary Workshop  
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## Abstracts

*The Antarctic Peninsula is one of the most rapidly warming areas on Earth. Understanding the cause of this dramatic regional change, its future predictability and likely impacts requires a truly interdisciplinary approach.*



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# CLIMATOLOGY AND ATMOSPHERIC TEMPERATURE WARMING TREND FOR KING GEORGE ISLAND, ANTARCTICA

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This paper updates a previous 1995 King George Island (KGI) climatology up to 2003. Interannual variability and trends of wind speed, atmospheric pressure and air temperature at the Brazilian Comandante Ferraz Station (62°03'S; 58°54'W), Admiralty Bay, from 1986 to 2003, show the same patterns observed at other weather stations, in the northwestern side of the Antarctic Peninsula (AP). Mean monthly data reported by several local meteorological stations, at different periods, were used to build the atmospheric temperature time series for Admiralty Bay, from 1947 to 2003. Increasing average temperatures, particularly during winter months, were associated to a total warming trend of 0.031 °C a<sup>-1</sup> (i.e., 1.8 °C in 57 years). Reanalysis data for a cell of 5 x 5 degrees for the same area and period show a tendency with a remarkably similar gradient of 0.035 °C a<sup>-1</sup>. A cycle of about 5.5 years was identified in this KGI temperature time series. This cycle is also present at Vemasky, former Faraday (65°15'S; 64°16'W), AP. When cross-correlated to monthly mean temperatures, a 1-month time lag in the sea-ice extent series was observed for the period 1976-95, at 60° W longitude. Of particular importance is the temperature tendency indicating a marked decrease of about -0.28 °C a<sup>-1</sup>, since 1999, in opposition to the previous trend. The surface atmospheric pressure, which for the reanalysis span of 56 years shows a gradient decrease of -0.0974 hPa a<sup>-1</sup>, depicts an average increase of 0.35 hPa a<sup>-1</sup> since 1986. Wind speed, at surface level, presented an increase of about 0.0426 m s<sup>-1</sup> a<sup>-1</sup> for the same period.

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**Climate Variability, Bio-optical Properties and Phytoplankton**

## Poster Session 2 – Friday 17 September 2004

Rosa Compagnucci and Sandra Barreira

Is the ENSO events related to Antarctic Sea Ice Concentration?

Christopher Karmosky and Adam Burnett

The Role of Zonal and Meridional Atmospheric Circulation in Winter Antarctic Peninsula Warming

H. W. Ducklow, PI; K. S. Baker, A. C. Clarke, W. R. Fraser, D. M. Karl, D. G. Martinson, L. B. Quetin, R. M. Ross, R. C. Smith and M. Vernet

Palmer, Antarctica long-term ecological research project: "Long-Term Ecological Research on the Antarctic marine ecosystem: Climate migration, ecosystem response and teleconnections in an ice-dominated environment"

Juan Gujama

P-Band sounder instrument design for Antarctica

Steve Harangozo

What controls the winter ice extent in the Bellingshausen Sea?

John C. King and Nicole P. M. van Lipzig

The impact of atmospheric circulation variability on Antarctic Peninsula summertime temperatures

Nicole P.M. van Lipzig, Robert Mulvaney and John C. King

A model study on the effect of the accumulation history on chemical tracers measured in ice cores from the Antarctic Peninsula

G.P. Mlinevsky, Yu.I. Popov, V.V. Ukrainsky

Interannual changeability of the ocean-atmosphere state in Argentine Island region

Mikio Naganobu and Kunio Kutsuwada

Variability of Drake Passage Oscillation Index (DPOI) from 1952 to 2003 in the Antarctic Peninsula area

Marilyn Raphael

Influence of zonal wave 3 in the Southern Hemisphere atmospheric circulation on Antarctic sea-ice concentration

David B. Reusch, Richard B. Alley and Bruce C. Hewitson

Nonlinear Paleoclimatology: Reconstructions in West Antarctica

Francisco E. Aquino, Jefferson C. Simões, Alberto W. Setzer and Francisco A. Ferron

Climatology and atmospheric temperature warming trend for King George Island, Antarctica

R.C. Smith, K. Ireson & M. Vernet

Climate Variability, Bio-optical Properties and Phytoplankton Productivity in the WAP region

Andy M. Smith and David G. Vaughan

Updated assessment of surface lowering of the ice ramp at Rothera Point, Antarctic Peninsula

V. E. Tymofeyev

Climate warming and related phenomena at the region of Antarctic Peninsula