

## **SUMMERTIME DISTRIBUTION OF SURFACE CARBON DIOXIDE AND SEA-AIR GAS EXCHANGE IN ADMIRALTY BAY, ANTARCTIC PENINSULA**

**Rosane Gonçalves Ito\*, Cristiane Gallego Augusto\*, Alberto Setzer\*\*, Louise Franco de Oliveira\* and Antonio Gabriel Pontes e Dechiche\***

\* Instituto Oceanográfico, Universidade de São Paulo, Praça do Oceanográfico 191, São Paulo-SP, Brazil, 05508-900.

\*\* Centro de Previsão do Tempo e Estudos Climáticos, Instituto Nacional de Pesquisas Espaciais, C. Postal 515, São José dos Campos-SP, Brazil, 12245-970.

In order to understand the oceanic carbon cycle in the Southern Ocean it is essential to better estimate the sea-air CO<sub>2</sub> exchange. In situ data is still under sampled, and this fact leads to large global carbon budget uncertainties. Measurements of CO<sub>2</sub> partial pressure, pH, dissolved oxygen, salinity, *in situ* temperature, nutrients, and chlorophyll-a were done during the summers of 1999, 2001, and 2002 in Admiralty Bay, Antarctic Peninsula. The surface seawater CO<sub>2</sub>, pCO<sub>2</sub>(sw) partial pressures in 1999, 2001 and 2002 were respectively: 489.7±14.9 μatm, 559.9±11.7 μatm and 434.3±11.8 μatm. The impact of biological activity, sea-air exchange and physical processes on the pCO<sub>2</sub>(sw) variations have been evaluated. The main contributions to the pCO<sub>2</sub>(sw) gradients in Admiralty Bay have been the vertical mixing processes. The estimated net sea-air CO<sub>2</sub> fluxes for these summers indicate that the study area is a CO<sub>2</sub> source for the atmosphere. The sea-air CO<sub>2</sub> fluxes over Admiralty Bay may contribute to calculation refinements for the coastal areas on the global carbon budget.