

## ***ARESSA THEME II: Climate Variability: Past, Present and Future***

### **Southern Ocean Hotspots: The influence of a submarine mountain ridge on the oceanographic setting of the Prince Edward Islands**

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The Southern Ocean is defined as the region between 40°S and the Antarctic continent. The circulation here is dominated by the Antarctic Circumpolar Current (ACC), which is the only current that flows completely around the globe. The ACC is a complex system comprising of narrow regions of sharp temperature gradients known as frontal bands, which are separated by broad zones with less intense gradients. Variability in the pathway of this current occurs in the form of meanders or eddy like features as a result of the current's interaction with shallow bathymetry such as underwater mountain chains and plateaux. Non oceanographers can liken this behaviour to a "speed wobble"! The Prince Edward Islands can be found in the middle of this current at approximately 38°E, 47°S. The islands form a very special habitat for seals, albatrosses and whales and have, for this reason, been designated a declared nature reserve. The ecology of the islands is directly dependent on the local ocean environment. With the advent of satellites it has become apparent that the Prince Edward Islands are in fact located on the northern edge of a region of remarkably high oceanic turbulence, which in turn influences the feeding behaviour of the island's top predators. This is an exciting discovery that will most probably explain the high physical and biological variability found at the islands and is a key thrust in South Africa's involvement in the International Polar Year.