ABSTRACT:

Name of Responsible Researcher:	**Andrea Piñones**
Project Title:	**Filling the gap: characterization of winter hydrographic conditions and habitat use in the Northern Antarctic Peninsula using instrumented seals and ocean modeling**

Describe the main issues to be addressed: objectives, methodology and expected results. **The maximum length for this section is 1 page** (use letter size format, Verdana font size 10 or similar).

The continental shelf waters of the Antarctic Peninsula (AP) are modified by air-sea interaction, the formation and melting of sea ice, and the influence of the Antarctic Circumpolar Current. Characterization of the temporal variability of the upper ocean waters in the AP shelf is primarily based on summer measurements made during ice-free conditions. Fall and Winter measurements along the northern AP are scarce and are based on conventional hydrographic sampling onboard of research vessels. In this proposal vertical profiles of temperature and salinity will be collected from sensors deployed on Weddell seals (*Leptonychotes weddellii*). These measurements will allow the thermohaline properties of the upper water column to be described, for the first time, for fall and winter and for a spatial resolution that is difficult to access with conventional sampling methods. Thus, the hydrographic measurements will allow implementation and validation of the fall-winter processes using a high-resolution model developed for the northern AP. Additionally, the seal tracklines will allow understanding of the foraging and movement behavior of Weddell seals, also poorly understood in the northern AP.

The three main objectives of this proposal are 1. To describe the variability in hydrographic conditions of the upper water column along the northern AP shelf, including the shelf north of the South Shetland Island and the Bransfield Strait. 2. To understand the interannual and climatic variability of the winter processes via a high-resolution ocean- sea ice -ice shelf model developed for the northern AP shelf and their coastal environment. 3. To understand the foraging and movement behavior of Weddell seals at the northern AP.

Conductivity-Temperature-Depth Satellite Relay Data loggers (CTD-SRDL) tags will be deployed in Weddell seals, during three consecutive years. Data transmission is via ARGOS satellite system when the animals are in the surface. The data obtained during three consecutive years is oceanographic but at the same spatial scale as animal behavior. Therefore the regions where the Weddell seals remain for extended periods will provide time series that will be used to describe interannual and regional differences in temperature and salinity on the shelf. The collected information will complement and validate a high-resolution model developed for the northern AP, which is planned to simulate seasonal and interannual variability of the hydrography and circulation over the continental shelf and nearshore regions of the northern AP. Using seals as oceanographic platforms allows the collection of environmental information data in remote, shallow and ice cover regions where conventional oceanographic platforms like ships and ARGOS floats cannot operate. These measurements also will record animal behavior to understand habitat and foraging in relation to environmental variables as well as to model seasonal foraging behavior in relation to various dive parameters.

This proposal will provide understanding of the main dynamical processes controlling fall and winter variability in the northern AP shelf. Thus, will advance our understanding of ecosystem linkages between oceanographic features and Weddell seals that are poorly understood for the northern AP.