The SOUTHERN OCEAN RESEARCH PARTNERSHIP (SORP) is an international consortium of scientists investigating the post-exploitation status, health, dynamics and environmental linkages of Southern Ocean (SO) whale populations using non-lethal techniques. The SROP BLUE AND FIN WHALE ACOUSTIC TRENDS PROJECT (ATP) aims to implement a long term research program examining trends in Southern Ocean Antarctic blue (ABW) and fin whale (FW) population growth, distribution, and seasonal presence using passive acoustic monitoring techniques.

**Motivation**

In the SO, Antarctic blue whales (ABW) and fin whales (FW) were severely depleted during commercial whaling. From 1978 to 2010 the International Whaling Commission (IWC) supported 3 circumpolar sets of sighting (IDCR/SOWER) to estimate the abundance of ABW. To continue to monitor the post-exploitation status of ABW and to estimate a first abundance of FW in this remote study area, the use of a circumpolar-Antarctic network of long-term passive acoustic recorders has been proposed. This is the aim of the blue and fin whale Acoustic Trends Project (ATP)

**Past & Current Passive Acoustic Monitoring (PAM) Effort**

Past and current PAM efforts do not readily allow assessments of ABW and FW trends in abundance because:

- recordings were made over different time frames between sites
- some areas are data deficient
- different recording instrumentation was used
- passive acoustic data were processed differently

**How to Coordinate PAM Data Processing and Archival?**

The ATP will provide a blueprint of analysis methods in order to standardize analyses so that data can be merged into a circumpolar-Antarctic database.

Several analytical tools exist:

- LTSA (Long-term-spectrogram-average): useful for assessing species presence and seasonal occurrence. Also used for assessing the general soundscape (Fig right)
- Automated detectors (event detection):
  - Energy detection:
  - Archiving & Managements

All acoustic data collected as part of SOHN will be archived so that partner collaborators will have access to the data.
- checking quality
- provide clear recommendations and framework for data analyses

**We need your help to listen to whales**

To make the SOHN a reality, we are seeking collaboration partners to deploy instruments especially at proposed sites in areas I and IV.

**What is needed to assess trends in ABW and FW abundance?**

A PAM data base that has coincident longterm circumpolar-Antarctic coverage (~10 years of monitoring with at least one instrument preferably between 63° and 66° S in each of the six IWC management areas). Procedures for data collection, processing and analysis would be based on standards and recommendations presented by the ATP. In this way, the distribution, seasonal presence and relative abundance of ABW and FW can be evaluated in a consistent and robust manner

**Additional benefits**

- Recordings will provide information on environmental noise and soundscapes on a decadal scale, which is relevant to other research efforts e.g., the International Quiet Ocean Experiment.
- Network provides an opportunity for international student training to deploy and work with PAM.
- The coordination and standardization of data collection and analysis required for SOHN may be a useful benchmark for future networks

**How to get from PAM data to population trends?**

To estimate animal abundance from PAM data, (1) the size of the area monitored by the instruments and (2) the probability of detecting animals acoustically within that area must be estimated.

Data about call production are also essential. Often abundance methods rely on call rate estimates, which may come from auxiliary behavioural studies.

To then assess trends in abundance, long term time series are required.

**What is the Southern Ocean Research Partnership (SORP)**

**Background:**

- proposed to IWC by Australian Government in 2008
- aim: to develop a multi-lateral, non-lethal scientific whale research program that will improve the coordinated and cooperative delivery of science to the IWC, in line with IWC priorities
- 5 research projects
  - SROP Partners: Argentina, Australia, Brazil, Chile, France, Germany, New Zealand, Norway, South Africa and USA

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