Geophysical Research Abstracts,
Vol. 11, EGU2009-8895, 2009
EGU General Assembly 2009

On the quality of hydrographic data collected in the Southern Ocean by instrumented elephant seals

F. Roquet (1), J.-B. Charrassin (1), Y.-H. Park (1), M. Fedak (2), M. Biuw (3), L. Boehme (2), and C. Guinet (4)

(1) MNHN USM402, LOCEAN-IPSL, Paris, France (roquet@mnhn.fr), (2) Sea Mammal Research Unit, Natural Environment Research Council, Gatty Marine Laboratory, University of St Andrews, St Andrews, UK, (3) Norwegian Polar Research Institute, Polarmiljøsenteret, Tromsø, Norway, (4) Centre d'Etudes Biologiques de Chizé, CNRS, Beauvoir-sur-Niort, France

To study the foraging ecology of elephant seals in relation to oceanographic conditions, Satellite-Relayed Data Loggers (SRDL) with an integrated Conductivity-Temperature-Depth (CTD) have been developped by the Sea Mammal Research Unit (University of St Andrews), which autonomously collect and transmit hydrographic profiles (temperature/salinity) in near-real time via Argos satellites. These devices have the potential to provide detailed oceanographic information in logistically difficult areas at comparatively low cost, being therefore highly interesting for the oceanographic community as well.

Large efforts for calibrating and validating the huge amount of collected hydrographic data have been constantly made since the first deployments in 2004, as a necessary step to produce data useful for oceanography. When possible, at-sea experiments were performed on ships of opportunity before deployments on seals, consisting in comparing hydrographic profiles from SRDLs with reference profiles obtained simultaneously with a standard CTD. These experiments brought to light a satisfying repeatability of SRDL sensors but also the presence of systematic biases, especially for salinity, which should be corrected.

In 2007 and 2008, more than 6000 valid temperature/salinity (T/S) profiles were collected by 17 SRDLs around the Kerguelen Islands in the Southern Indian Ocean. We present several delayed-mode methods of estimation and reduction of systematic biases, applied to this peculiar seal dataset. These methods are based on comparisons of T/S profiles from SRDLs with available historical profiles (mainly CTD and ARGO profiles) or with each other (cross-comparisons). Based on this two-fold procedure, we show here the important technical and methodological improvements made since 2004 to produce hydrographic data suitable for oceanographic studies.