Discovery DI209 SeaSoar Data

Introduction

The SeaSoar is a hydrodynamic fish towed behind the ship travelling at 8-9 knots linked by a faired cable. The unit has two stub wings whose angle of attack may be set by hydraulic servo motors. Thus the fish is able to climb or dive under the control of command signals from the ship or, more usually, by automatic command signals driven by the on-board pressure sensor. The wavelength and amplitude of the locus of the fish through the water depend upon the cable length, the ship's speed and the angle of attack selected for the wings.

Instrumentation

The fish can carry a range of sensors. Invariably, a CTD is fitted but fluorometers, transmissometers, light sensors and plankton counters may also be included. On this cruise it was instrumented with a Neil Brown MKIIIB CTD and oxygen sensor, an FSI ocean conductivity module, a Chelsea Instruments Aquatracka fluorometer and a 2-pi PAR downwelling scalar irradiance sensor. The FSI OCM was damaged within hours of the first deployment. Consequently, the SeaSoar was operated for most of the cruise without an OCM.

Data Processing

The data were logged and reduced to 1Hz by an RVS Level A logging microcomputer. The raw data were transferred to the P-EXEC processing system. This was used to de-spike the data and clean up any offsets due to instrument fouling. The conductivity data for this cruise were described as unusually noisy.

The data were calibrated against salinity, chlorophyll and dissolved oxygen samples taken from the ship's non-toxic sea water supply at times when the fish was at the surface. The analytical protocols were as described in the CTD data documentation.

The result was a cleaned (i.e. de-spiked) and calibrated 1 Hz data file. From this, a gridded file of 8db vertical resolution and between 3 and 4 km horizontal resolution (chosen to match the wavelength of the fish oscillations) was generated. It should be noted that calibrated SeaSoar salinity data are less accurate than calibrated deep CTD data with a figure of 0.02 PSU being generally accepted as the target accuracy for the instrument.

At BODC, this gridded data file was split into individual columns. Each column was converted into BODC's internal format (PXF) and inspected using a graphical editor. Any spikes or gridding artefacts observed were flagged suspect. Once screening was completed, the grid columns were loaded into Oracle as if they were a series of discrete CTD casts. Header information, such as water depth and position, were

automatically obtained from the underway data in the database using distance run as the linking key.