data summary

Southern Surveyor Voyage ss2009_t02

CSIRO

MARINE NATIONAL FACILITY

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ss2009_t02

Title

"Quantifying tuna prey resources off eastern Australia in relation to the regional oceanography"

Principal Investigator

Dr. Jock Young (Chief Scientist)

CMAR Hobart

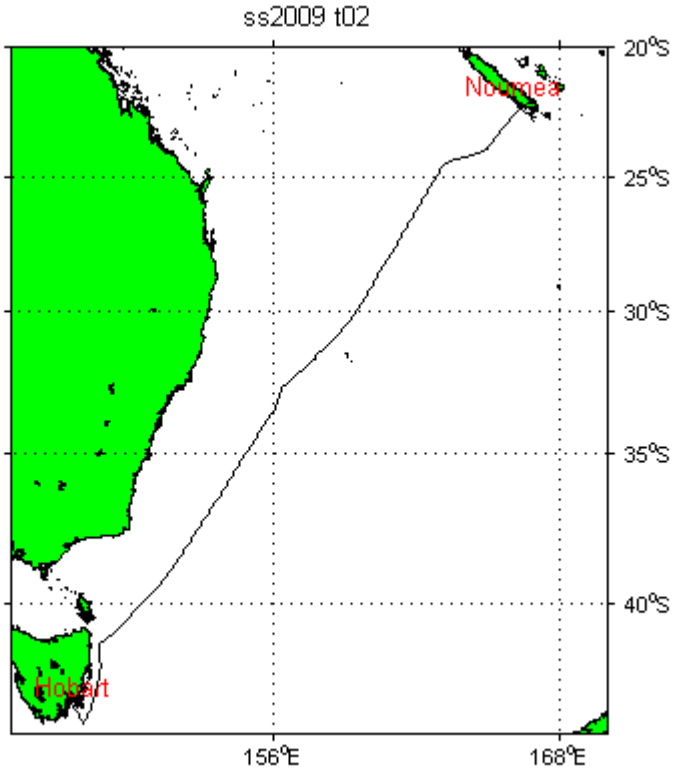
Ports

Noumea to Hobart

Date

29-Jul-2009 21:27:00 to 06-Aug-2009 20:50:30 (UTC)

Voyage Track



Underway Data

Navigation data is acquired using the Seapath 200 position and reference unit, which is also differentially corrected by data from the FUGRO DGPS receiver.

The Meteorological data consists of 2 relative humidity and temperature sensors; a barometer, wind sensor, and licor light sensor.

Thermosalinograph data is acquired with a Seabird TSG and remote temperature SBE 3T. Data from a flow meter is also recorded.

Digital depth data is recorded from a Simrad EA500 sounder. Echograms are also recorded using SonarData's Echolog software. Digital depth data can be re-picked using SonarData's Echoview software.

Data from "IMOS" (Integrated Marine Observing System) sensors was also included. The sensors are port and starboard radiometers and pyranometers; wind speed and gust along with direction; rain and rainrate.

See Electronics report for this voyage for instruments used and serial numbers.

Navigation, meteorological, thermosalinograph, IMOS and depth data are quality controlled by combining all data from hourly recorded files to 5 second values in a netCDF formatted file; the combined data is referred to as "underway data".

A combined file was made on 7 Jan 2010 by running a Java application, written by Lindsay Pender of CMAR, uwyLogger version 7.11 with data time range of 29-Jul-2009 21:27:00 to 06-Aug-2009 20:50:30 (UTC).

Completeness and Data Quality

Navigation data (latitude and longitude, speed over ground, course over ground, ship's heading); meteorological data (air temperature, humidity, wind speed, wind direction, maximum wind gust, light, atmospheric pressure, uncorrected wind speed and direction) and IMOS data (port and starboard radiometers, port and starboard pyranometers, derived wind speed and direction, derived maximum wind gust, derived maximum wind gust direction, rain and rainrate, uncorrected wind speed and direction), thermosalinograph (salinity and water temperature) data and depth data were evaluated and quality controlled.

Processing Comments

On 03-Aug-2009 between 06:18:45 to 06:44:25 and 04-Aug-2009 between 07:56:30 to 08:35:05 and 17:35:35 to 18:22:10 and 20:28:45 to 20:40:45 and 05-Aug-2009 between 01:26:45 to 01:47:15 notable discrepancies between the port and starboard air temperature sensors were noted (difference between 0.8- 1.5 degree). These occurred during rapid temperature decreases. There may be other less significant periods manifesting this behaviour which were not considered to be significant enough to be noted. Investigation of these have shown that they have occurred during/following periods of rainfall and coincided with high wind speeds of about 20-35knots blowing on the bow of the ship. This phenomenon has probably come about due to the cooling of the air temperature due to the evaporation of the rain around the sensor housing. It is unclear as to why there should be such a notable temperature differential between the port and starboard temperature sensors.

It should be noted that the result of this variation between the port and starboard sensor causes the derived air temperature (as calculated by underway logger) to alternate between the port and starboard air temperature values depending on the relative wind direction. This has resulted in fine to moderate spikes in the derived air temperature during these periods.

The depth data was re picked using Sonar Data's echoview software.

During TSG/CTD calibration and examination of the overlapped salinity plots a notable discrepancy in the TSG salinity relative to the CTD salinity was observed.
The investigation of this anomaly has not been conclusive so far. However examination of TSG data has revealed that if the TSG conductivity is advanced by about 32 seconds relative to the TSG sensor temperature, when calculating the derived salinity, a significant improvement in TSG salinity relative to the CTD salinity is obtained.

Whilst this issues is being investigated further, a conductivity lag correction factor is introduced as part of TSG calibration and utilised for the calculation and processing of TSG salinity. This lag factor is henceforth documented in this processing report.

The CTD calibration data for the primary sensor was averaged using figures obtained from voyage 1 (file: ss200901_ss200901128CTD.nc) and ss2009_v05 CTD processing report (first 15 deployments) by Lindsay Pender and a scaling factor of 0.99984 was calculated and applied to the CTD data. This data was then used to calibrate the TSG against the (calibrated) CTD data where an averaged scale factor of 0.999748856709685 was calculated (using TSG lag of 32 seconds) and applied to the TSG data. The thermosalingraph salinity QC was set to 'good' 'manually adjusted' 'no error'.

Between 30-Jul-2009 12:37:00 to 19:39:00 and again between 31-Jul-2009 02:33:30 to 02:50:40 (UTC) there were a number of air temperature spikes of between 1-2 degrees. This is most likely caused due to the ship's exhaust blowing over the sensors given that the relative wind direction was around 235 degrees.

The starboard humidity sensor calibration is suspect and therefore the port humidity sensor data was used only to represent humidity. The humidity data was then flagged as 'good' 'none' 'none'.

From 01-Aug-2009 22:56:05 to 04-Aug-2009 05:20:10 UTC there were no values recorded for IMOSStbdRadiometer, IMOStbdPyranometer, IMOSPortPyranometer, IMOSPortRadiometer. These have been marked as NaN and their QG flags set to 'Bad', 'none', 'noData'.

Final Underway Data

The navigation, meteorological, thermosalinograph, IMOS and depth data will be entered into the CMAR Divisional data warehouse.

Filename	Parameters	Resolution
ss2009_t01_uwy10.csv	latitude, latitudeQC, longitude, longitudeQC, speedOG, speedOGQC, courseOG, courseOGQC, shipHeading, shipHeadingQC, uncorrWindDir, uncorrWindDirQC, uncorrWindSpeed, uncorrWindSpeedQC, waterDepth, waterDepthQC, airTemp, airTempQC, humidity, humidityQC, windSpeed, windSpeedQC, maxWindGust, maxWindGustQC, windDir, windDirQC, PAR, PARQC, atmPressure, atmPressureQC, waterTemp, waterTempQC, salinity, salinityQC, IMOSStbdRadiometer, IMOSStbdRadiometerQC, IMOStbdPyranometer, IMOSStbdPyranometerQC, IMOSRainRate, IMOSRainRateQC, IMOSRain, IMOSRainQC, IMOSWindSpeed, IMOSWindSpeedQC, IMOSWindDir,IMOSWindDirQC, IMOSPortRadiometer, IMOSPortRadiometerQC,IMOSPortPyranometer, IMOSPortPyranometerQC , IMOSMaxWindGust,IMOSMaxWindGustQC,IMOSMaxWindGustDir,IMOSMaxWindGustDirQC , IMOSUncorrWindSpeed, IMOSUncorrWindSpeedQC, IMOSUncorrWindDir,IMOSUncorrWindDirQC	10 seconds
ss2009_t01_uwy5min.csv	Ditto 10 second data	5 minute
ss2009_t01_pdr10.csv	Latitude, longitude, waterDepth, waterDepthQC	10 seconds

References

Pender, L., 2000. Data Quality Control flags.
http://www.marine.csiro.au/datacentre/ext_docs/DataQualityControlFlags. Pdf

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