data summary

Southern Surveyor Voyage ss2012_v04

CSIRO

MARINE NATIONAL FACILITY

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ss2012_v04

Title

"Observations of remarkable eastward flows and eddies in the subtropical southeast Indian Ocean"

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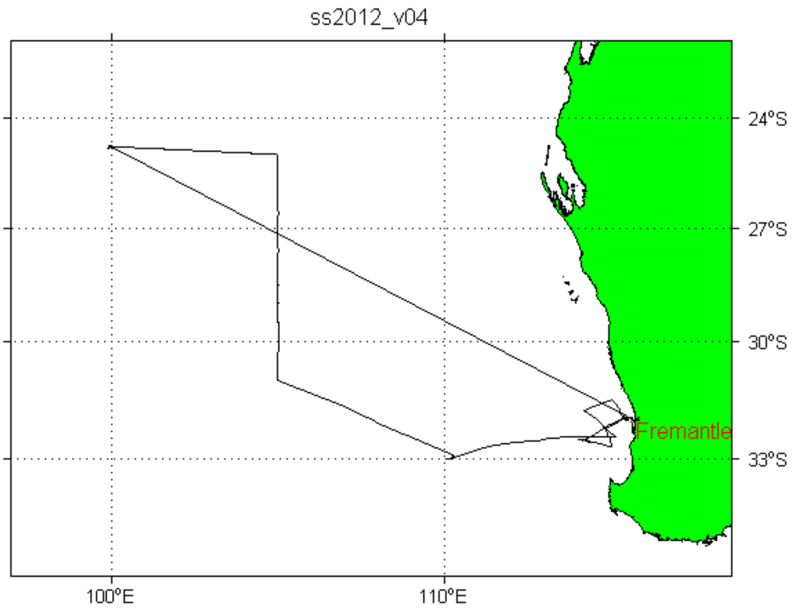
Ports

Leg 1:
Departed Fremantle Friday, 10 August 2012
Arrived Fremantle Tuesday, 14 August 2012
Leg 2:
Departed Fremantle Friday, 24 August 2012
Arrived Fremantle Thursday, 6 September 2012

Date

11-Aug-2012 06:08:55 to 05-Sep-2012 22:59:05 (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 by SBE 3T. Data from a flow meter is also recorded.

Digital depth data is recorded from a Simrad EK60 sounder.

Data from “IMOS” (Integrated Marine Observing System) sensors are also included. The sensors are port and starboard radiometers and pyranometers, wind speed and direction; rain and rainrate.

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

Navigation, meteorological, thermosalinograph, IMOS and depth data are preliminary 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 sdata”.

A combined file was made on 13-Mar-2013 by running a Java application, written by Lindsay Pender of CMAR, UwyMerger version 1.8.0 with data time range of 11-Aug-2012 06:08:55 to 05-Sep-2012 22:59:05 (UTC).

Completeness and Data Quality

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

Processing Comments

The Southern Surveyor departed Fremantle at 1400, Saturday 11 Aug 12 (Local Time), on voyage ss2012_v04, led by Dr Helen Phillips. However, due to engine failure it returned to Fremantle on Tuesday 14th Aug 12 and then departed Fremantle after repairs were carried out to resume the voyage on Friday 24th Aug 12. Therefore, there were no sensor data recorded between 14-Aug-2012 11:54:55 and 23-Aug-2012 23:11:00 (UTC).

A number of minor discrepancies between the port and starboard air temperature sensors were noted (max differences of about 1.1 degrees, otherwise both sensors gave very close reading with the mean absolute difference of about 0.038 degrees). These occurred usually during periods of rapid temperature increase or decrease. Investigation of these indicated that they have usually occurred when the ship was stationary with little wind or during/following periods of rainfall. This phenomenon has probably come about due to the rapid warming of the ships metal structure and air due to the ship becoming stationary or cooling of the air temperature due to the ship speeding off from stationary or due to the evaporation of rain water around the sensor housing. It is unclear as to why there should be a notable temperature differential between the port and starboard temperature sensors.

A similar discrepancy (max differences of about 10.4%) between the port and starboard humidity sensors was observed with the mean absolute difference of about 0.62%. The recorded values are within instrument tolerance.

The courseOG values when the ship is stationary are not true values as the ship is not travelling a course however this is a feature of the current acquisition system. The QC flags have been set as good however this feature should be noted if the values during the stationary periods are to be used.

The optical rain gauge appears to have stopped working. Its last recorded good value was made on 13-Aug-2012 16:00 and it has recorded zeros for IMOSRain and IMOSRainRate from 13-Aug-2012 16:00 to the end of the voyage whilst the siphoning rain gauge has been recording non zero values. There is nothing noted in the voyage computing or electronics report regarding this. However the next voyage’s (ss2012_t06) computing and electronics report notes that the optical rain gauge is not functional. Therefore the bad data (i.e. recorded zeros) from 13-Aug-2012 16:00 to the end of the voyage have been NaNed and and their QC flag set to {'bad','none','operatorFlagged'}.

It was noted that values recorded by the IMOS port and starboard Radiometer and Pyranometer had a mean absolute difference of 1.98 and 11.92 W/m^2 respectively.

The CTD calibration data for the primary sensor was obtained from the processed CTD file ss2012_v04011Ctd (i.e. CTD offset and scale factor = 0.00153784193579332, 0.999433391797147). This data was then used to derive the TSG salinity calibration against the calibrated CTD data. Using CTD/TSG calibration run in the CTD deployments ss2012_v04014Ctd.nc and ss2012_v04034Ctd.nc with a TSG conductivity lag of 25 seconds, an averaged salinity scaling factor of 1.001738714974765 was calculated for the primary CTD conductivity cell. This scaling factor along with the lag of 25 seconds was applied to the TSG salinity data and the thermosalingraph salinity QC was set to {'good' ,'manually adjusted','no error'}.

Note: Depth data is no longer processed, however, non QCed data is still available in the underway data set. QCed depth data can be obtained from processed Swath dataset for this voyage.

Final Underway Data

The navigation, meteorological, thermosalinograph, IMOS and depth data will be entered into the CMAR divisional data warehouse. All data timestamps are in UTC.

Filename	**Parameters**	**Resolution**
ss2012_v04uwy10.csv	latitude, latitudeQC, longitude, longitudeQC, speedOG, speedOGQC, courseOG, courseOGQC, shipHeading, shipHeadingQC, uncorrWindDir, uncorrWindDirQC, uncorrWindSpeed, uncorrWindSpeedQC, waterDepth, waterDepthQC, portAirTemp, portAirTempQC, stbdAirTemp, stbdAirTempQC, portHumidity, portHumidityQC, stbdHumidity, stbdHumidityQC, 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, MOSPortRadiometerQC, IMOSPortPyranometer, IMOSPortPyranometerQC, IMOSUncorrWindSpeed,MOSUncorrWindSpeedQC, IMOSUncorrWindDir,IMOSUncorrWindDirQC rain, rainQC	10 seconds
ss2012_v04uwy5min.csv	Ditto 10 second data	5 minutes

References

Subversion repository version of DPG Matlab generic tools 3974
Pender, L., 2000. Data Quality Control flags.
http://www.marine.csiro.au/datacentre/ext_docs/DataQualityControlFlags. Pdf

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