data summary

Southern Surveyor Voyage ss2012_t03

CSIRO

MARINE NATIONAL FACILITY

Table of Contents

ss2012_t03

Title

“Predicting the sources, distribution and fate of floating marine debris”

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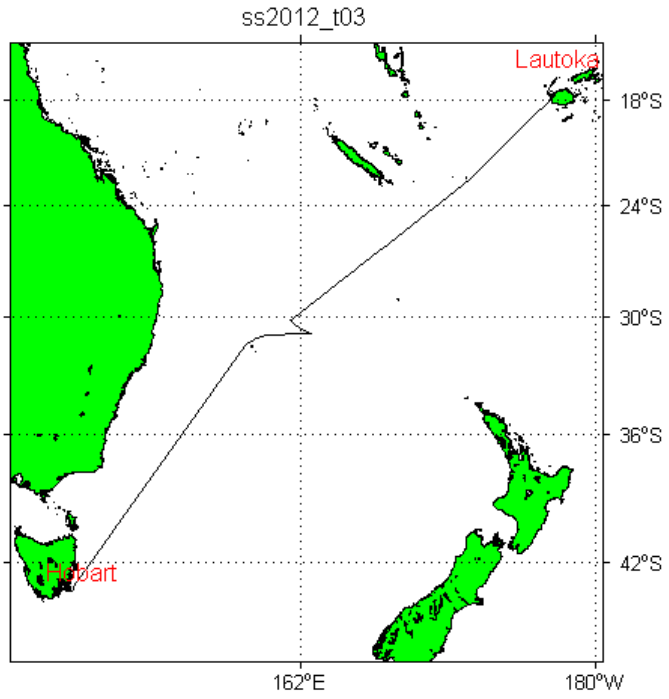
Ports

Original schedule (local time):
Depart: Lautoka (Fiji) 1000hrs, Thursday 07 June, 2012
Arrive: Hobart 0800hrs, Sunday17 June, 2012

Date

06-Jun-2012 22:03:45 to 17-Jun-2012 21:06:40 (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 data”.

A combined file was made on 18-Feb-2013 by running a Java application, written by Lindsay Pender of CMAR, UwyMerger version 1.8.0 with data time range of 06-Jun-2012 22:03:45 to 17-Jun-2012 21:06:40 (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

A number of minor discrepancies between the port and starboard air temperature sensors were noted (max differences of about 1.3 degrees, otherwise both sensors gave very close reading with the mean absolute difference of about 0.046 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 air due to the ship becoming stationary or cooling of the air temperature due to the evaporation of the 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 11.5%) between the port and starboard humidity sensors was observed. It should also be noted that the starboard humidity sensor appears to consistently give a higher humidity reading with the mean absolute difference of about 0.51%. 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.

Between 11-Jun-2012 04:08:15 and 13-Jun-2012 15:59:05 the speedOG data is very noisy and in particular between 11-Jun-2012 20:35:20 and 12-Jun-2012 20:21:25 the ship was more or less stationary (hove to) to avoid bad weather and high winds. This period coincided with high winds of between 40-60 knots which would have caused excessive rolling of the ship and this would have affected the speedOG values from the DGPS unit. A maximum speed difference of 14 knots between two adjacent speed recording data points (i.e. 14 knots speed change in 5 seconds) was noted over this period. Given the capabilities of the Southern Surveyor, such values are improbable. This variability in the speedOG data is most likely due to the inaccuracies with the GPS and the rolling effect of the ship. The speedOG data was QCed as good as the noise in the data is as expected for the GPS under such situations. However it is recommended that the speedOG data is used with reference to the Doppler velocity log that records the ships speed through water. The Doppler velocity log variable name is ‘shipsLog‘ in the netCDF underway file (ss2012_t03uwy.nc). It should be noted that Doppler velocity is not QCed as part of the underway processing and there can be obvious anomalous spikes in this data which should be ignored. However as this data is less noisy than

some of the recorded speedOG (i.e. for periods without DGPS) it could provide a point of reference when using the speedOG data.

Due to a Metstation software fault some IMOS hourly rain data was incorrect. These were manually set to NaNs and their QC flag set to {'bad','none','operatorFlagged'}.

It was noted that values recorded by the IMOS starboard Radiometer and Pyranometer were on average about 3.55 and 7.5.52 W/m^2 respectively greater than the port Radiometer and Pyranometer throughout the voyage.

IMOSPortPyranameter recorded negative values at night time, also the maximum day time difference of upto 555 W/m^2 against the IMOSStbdPyranameter was noted. Moreover on subsequent voyage it was determined that the lower reading for IMOSPortPyranameter was attributed to seawater that had leaked into the connector of the radiometer causing the instrument to give erroneous reading. Therefore all the data for IMOSPortPyranameter has been marked as suspect with its QC flag set to {'suspect','none','hardwareError'} however the data has been left in the data set (i.e. not NaNed) for reference.

No CTD water samples for salinity hydrochemistry were collected during this voyage. Therefore the TSG calibration factor of 1.000535213338116 from the previous voyage ss2012_v01 with a conductivity lag of 32 seconds were applied to the TSG salinity data and the thermosalingraph salinity QC was set to {‘good’ ,‘manually adjusted’,‘no error’}.

All erroneous salinity spikes (likely caused by air bubbles) were manually set to NaNs and their QC flag set to {'bad','none','operatorFlagged'}.

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_t03uwy10.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,	10 seconds

	IMOSStbdRadiometerQC, IMOStbdPyranometer, IMOSStbdPyranometerQC, IMOSRainRate, IMOSRainRateQC, IMOSRain, IMOSRainQC, IMOSWindSpeed, IMOSWindSpeedQC, IMOSWindDir,IMOSWindDirQC, IMOSPortRadiometer, MOSPortRadiometerQC, IMOSPortPyranometer, IMOSPortPyranometerQC, IMOSUncorrWindSpeed,MOSUncorrWindSpeedQC, IMOSUncorrWindDir,IMOSUncorrWindDirQC rain, rainQC	
ss2012_t03uwy5min.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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