data
summary

Southern Surveyor Voyage ss2013_t03

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ss2013_t03

Title

"**Microbial oceanography of northern Australia**"

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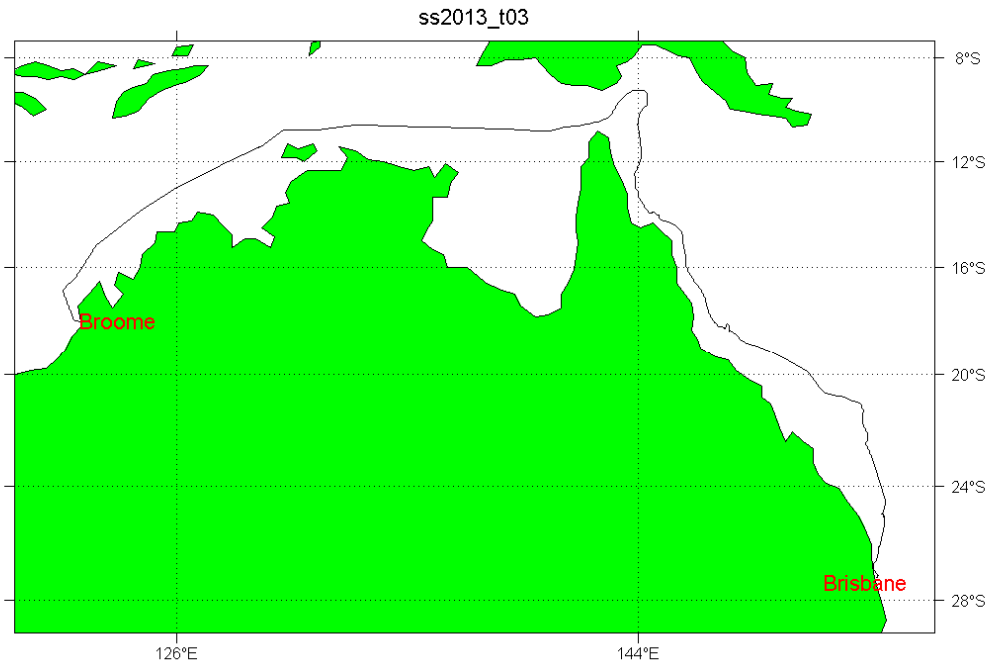Phone: 02 9514 8307 Mobile:

Ports

Depart*:* Broome 1600 on Saturday 27 July, 2013
Arrive*:* Brisbane 1200 Saturday 10 August, 2013

Date

27-Jul-2013 07:54:40 to 10-Aug-2013 00:16:15 (UTC)

Voyage Track

ss2013_t03

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 16 August 2013 and final by running a Java application, written by Lindsay Pender of CMAR, UwyMerger version 1.8.0 with data time range of 27-Jul-2013 07:54:40 to 10-Aug-2013 00:16:15 (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 0.8 degrees, otherwise both sensors gave very close reading with the mean absolute difference of about 0.06 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 temperature differential between the port and starboard temperature sensors.

A similar discrepancy (max differences of about 5.8%) between the port and starboard humidity sensors was observed. It should also be noted that the port humidity sensor appears to give a lower reading with the mean absolute difference of about 1.07%. 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.

There were unusual spikes in the courseOG data and these have been set to NaNs and their QG flags set to {'bad','none','operatorFlagged'}.

The main mast wind sensor had intermittently recorded erroneous values. Therefore the erroneous values for windSpeed, WindDir and uncorrWindDir along with the maxWindGust were NaNed and their QG flags set to {'bad','none','operatorFlagged'}.

The optical rain sensor (which provides IMOSRain and IMOSRainRate) was not functional during this voyage. Therefore IMOSRain and IMOSRainRate have been set to NaNs and their QG flags set to {'bad','none','operatorFlagged'}.

The main mast rain gauge data (syphon rain gauge) has been accepted as good.

It was noted that values recorded by the IMOS port and starboard Radiometer and Pyranometer had a mean absolute difference of 3.49 and 30.52 W/m^2 respectively and in particular the port Radiometer values were mostly smaller than the starboard sensor.

The SST (Sea Surface Temperature i.e. waterTemp in UWY data set) was recorded via the CAP acquisition system due to the incompatibility between the remote temperature sensor and the refurbished TSG (set up from the previous voyage, pls see ss2013_v04 reports for further details) . The SST was obtained from the CAP deployment files and this data was spliced into the underway data set (i.e. waterTemp) and erroneous waterTemp spikes were removed and their QC flags set to {'bad','none','operatorFlagged'}.

The main gaps in the waterTemp data are from
29-Jul-2013 23:43:50 to 30-Jul-2013 03:25:55
02-Aug-2013 22:17:50 to 4-Aug-2013 02:35:45
06-Aug-2013 08:12:25 to 06-Aug-2013 08:55:25
07-Aug-2013 21:13:20 to 08-Aug-2013 14:46:25
09-Aug-2013 03:04:20 to 09-Aug-2013 04:51:50

The CTD calibration data for the primary sensor was obtained from the processed CTD file ss2013_t03020Ctd (i.e. CTD offset and scale 0.00194388015689495, 0.999424733837894). This data was then used to derive the TSG salinity calibration against the calibrated CTD data.

The salinity data has been calibrated in two parts. This was due to the incorrect TSG salinity and temperature sensor coefficients within the TECHSAS acquisition system for the first few days of the voyage.

Using CTD/TSG calibration run ss2013_t03001Ctd.nc the salinity scaling factor of 1.070134948396224 was calculated against the primary CTD conductivity cell. This was then applied to the TSG salinity data from the start of the voyage until 30-Jul-2013 04:46:45 and the thermosalingraph salinity QC was set to {'good' ,'manually adjusted','no error'}.

Using CTD/TSG calibration run ss2013_t03004Ctd.nc and ss2013_t03005Ctd.nc the average salinity scaling factor of 1.000844293257164 was calculated against the primary CTD conductivity cell. This was then applied to the TSG salinity data from 30-Jul-2013 04:55:45 to the end of the voyage and the thermosalingraph salinity QC was set to {'good' ,'manually adjusted','no error'}.

All erroneous salinity spikes were then removed and their QC flags set to {'bad','none','operatorFlagged'}.

Note: Depth data is no longer processed. The non QCed data is available in the underway data. QCed depth data could be obtained from processed Swath dataset for this voyage. Moreover please note that the EM300 centre beam depth is measured from the transducer rather than below the waterline. The transducer is 6.5m below the waterline.

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
ss2013_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, IMOSStbdRadiometerQC, IMOStbdPyranometer, IMOSStbdPyranometerQC, IMOSRainRate, IMOSRainRateQC, IMOSRain, IMOSRainQC, IMOSWindSpeed, IMOSWindSpeedQC, IMOSWindDir,IMOSWindDirQC, IMOSPortRadiometer, MOSPortRadiometerQC, IMOSPortPyranometer, IMOSPortPyranometerQC, IMOSUncorrWindSpeed,MOSUncorrWindSpeedQC, IMOSUncorrWindDir,IMOSUncorrWindDirQC rain, rainQC	10 seconds
ss2013_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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