data summary

Southern Surveyor Voyage ss2013_v03

CSIRO

MARINE NATIONAL FACILITY

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ss2013_v03

Title

“Integrated Marine Observing System (IMOS) Facility 3. Southern Ocean Time Series (SOTS) moorings for climate and carbon cycle studies southwest of Tasmania (47ºS, 140ºE)”

Principal Investigators

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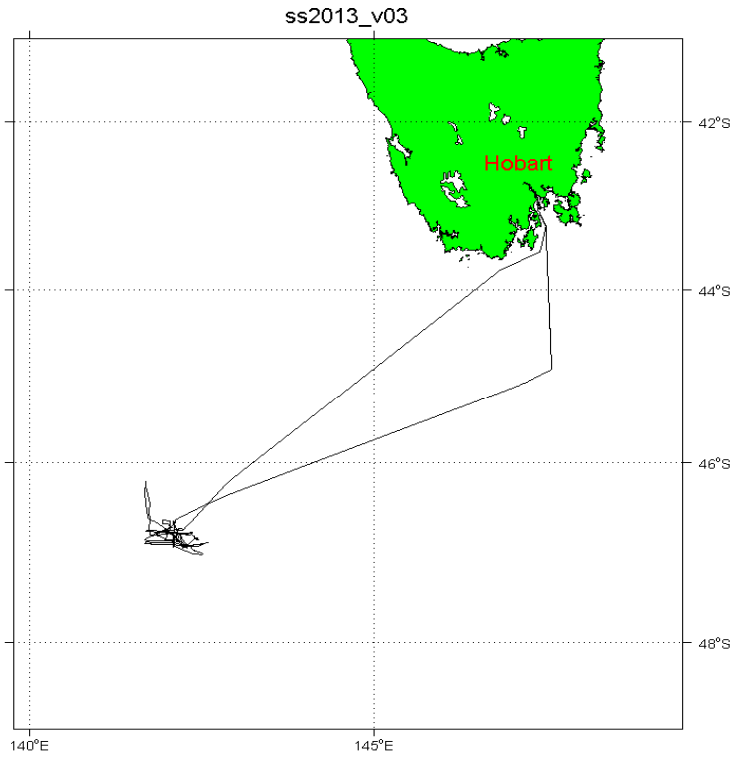
Ports

Depart*:* Hobart 0800hrs Sunday 28 April 2013
Arrive*:* Hobart 0800hrs Saturday 11 May 2013

Date

27-Apr-2013 22:13:20 to 09-May-2013 22:06:30 (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 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-Apr-2013 22:13:20 to 09-May-2013 22:06:30 (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 1.5 degrees, otherwise both sensors gave very close reading with the mean absolute difference of about 0.09 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 11.5%) between the port and starboard humidity sensors was observed. It should also be noted that the port humidity sensor appears to give a higher reading intermittently (and vice versa) with the mean absolute difference of about 0.78%. The recorded values are within instrument tolerance.

Between 06-May-2013 05:08:40 and 07-May-2013 03:06:45 port humidity and temp sensor recorded constant erroneous values due to a Metstation and TECHSAS software feature. The values during this period have been NaNed and their QC flags set to {'bad','none','operatorFlagged'}.

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 recorded unrealistically high values, these were assessed to be due to the strong seas and wind resulting in sea water spray on the sensor (see electronics and computing report). Therefore such values for 'IMOSRain', 'IMOSRainRate have been NaNed and their QC flags 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 2.62 and 5.98 W/m^2 respectively and in particular the port Radiometer values were mostly smaller than the starboard sensor.

The CTD calibration data for the primary sensor was obtained from the voyage CTD processed file ss2013_v03003Ctd (i.e. CTD offset and scale factor = -0.000851966207764843, 1.00004104507511). This data was then used to derive the TSG salinity calibration against the calibrated CTD data. Using CTD/TSG calibration run in CTD deployment ss2013_v03001Ctd.nc and ss2013_v03002Ctd.nc with a TSG conductivity lag of 32 seconds, an averaged salinity scaling factor of 1.000045243096293 was calculated for the primary CTD conductivity cell. This scaling factor along with the lag of 32 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. The non QCed data is available in the underway data. QCed depth data could 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
ss2013_v03uwy10.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_v03uwy5min.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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