

data summary

Southern Surveyor Voyage ss2011_v07



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ss2011_v07

Title

“ Integrated Marine Observing System (IMOS) observations for climate and carbon cycle studies southwest of Tasmania (47°S, 140°E).”

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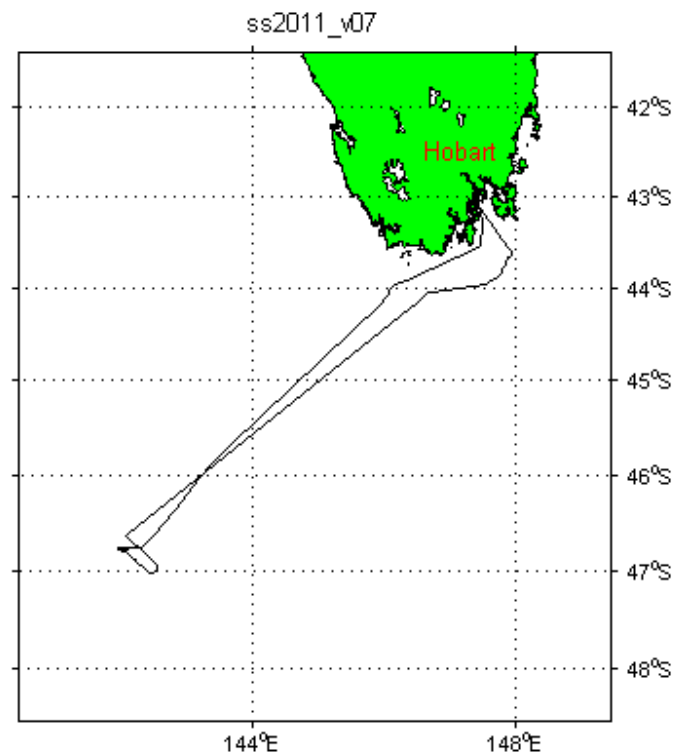
Ports

Original schedule (local time):
Depart: Hobart 1600hr, Monday 21 November 2011
Arrive: Hobart 1300hrs, Sunday 27 November 2011

Date

22-Nov-2011 01:39:10 to 26-Nov-2011 23:15:25 (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. 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 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 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 6 March 2012 by running a Java application, written by Lindsay Pender of CMAR, UwyMerger version 1.3 with data time range of 22-Nov-2011 01:39:10 to 26-Nov-2011 23:15:25 (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 and depth 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 0.4 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 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 7.59%) 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 appear to be 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.

It was noted that IMOS starboard Radiometer recordings were mostly about 2.11 (W/m²) greater than the port Radiometer recordings throughout the voyage.

Whilst the IMOS rain and IMOS rainRate both recorded zeros throughout the voyage the main mast rain gauge (syphon rain gauge) had recorded non zero values. There was nothing reported in the Computing report however in the Electronics report for this voyage the following was noted "As reported from the previous voyage, optical rain gauge appears to be currently unserviceable. ".

Therefore the whole data for IMOS rain and IMOS rainRate have been set to NaNs with their QG flags set to {'bad','none','operatorFlagged'}. The main mast rain gauge (syphon rain gauge) data has been accepted as good.

IMOSPortPyranameter had been recording negative values more than the expected usual at night time, the largest of which was -2.8, it also contained some negative spikes at night time.

During subsequent voyages ss2012_t03 and ss2012_v03 a large negative offset on the port-side PSP radiometer (i.e. IMOSPortPyranameter) both during the day and night was noticed. The problem turned out to be attributed to seawater that had leaked into the connector of the radiometer and the issues was fixed in port following ss2012_v03. It was suggested by the electronics technician that it was possible that this fault might have been present to a far smaller extent on previous voyages whereby the port-side PSP would be reading a couple of units lower than it ought to (compared with stbd-side). This suggestion seems to be consistent with the data examined and compared with IMOSStbdPyranameter . The notable negative spikes at night time have been removed and the data adjusted by an offset of +0.58 to bring it in line with the IMOSStbdPyranameter. This data has been manually adjusted and its QC flag set to {'suspect', 'adjusted', 'operatorFlagged'}. The unadjusted raw data is available in the netCDF file as rawIMOSStbdPyranameter should this be required.

The depth data was re-picked using Myriax Echoview software.

Notable periods without QCed depth data are listed below:

From 24-Nov-2011 02:15:40 to 24-Nov-2011 02:24:35

From 25-Nov-2011 03:23:10 to 25-Nov-2011 04:37:15

The waterTemp sensor was very noisy from time to time. The noisy data has been set to NaNs with their QG flags set to {'bad', 'none', 'operatorFlagged'}. The mean difference between the waterTemp and sensor temp was 0.27426. For periods without good waterTemp data, reference could be made to the TSG sensorTemp (in the netCDF file) which provides a good approximation to the waterTemp data with an averaged offset of -0.27426.

The CTD calibration data for the primary sensor was obtained from file ss2011_v07001Ctd (i.e. CTD offset and scale factor 0.00154486066881752, 0.999411412852366). This data was then used to derive the TSG salinity calibration against the calibrated CTD data. Using CTD/TSG calibration run in CTD ss2011_v07003Ctd.nc with a TSG conductivity lag of 23 seconds, a salinity scaling factor of 0.999952727362191 was calculated for the CTD primary conductivity cell. This scaling factor along with the conductivity lag of 23 seconds was applied to the TSG salinity data and the thermosalinograph salinity QC was set to {'good', 'manually adjusted', 'no error'}.

Note: All 2011 underway voyage data is acquired and preliminary processed by the TECHSAS and uwyMerger acquisition system respectively. It should further be noted that the following data and their QC flags are not supported in the TECHSAS/uwyMerger acquisition system: maxWindGustDir, maxWindGustDirQC, IMOSMaxWindGust, IMOSMaxWindGustQC, IMOSMaxWindGustDir, MOSMaxWindGustDirQC.

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
ss2011_v07uwy10.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, IMOSStbdPyranometer, IMOSStbdPyranometerQC, IMOSRainRate, IMOSRainRateQC, IMOSRain, IMOSRainQC, IMOSWindSpeed, IMOSWindSpeedQC, IMOSWindDir,IMOSWindDirQC, IMOSPortRadiometer, MOSPortRadiometerQC, IMOSPortPyranometer, IMOSPortPyranometerQC, IMOSUncorrWindSpeed,MOSUncorrWindSpeedQC, IMOSUncorrWindDir,IMOSUncorrWindDirQC rain, rainQC	10 seconds
ss2011_v07uwy5min.csv	Ditto 10 second data	5 minutes
ss2011_v07pdr10.csv	latitude, latitudeQC, longitude, longitudeQC, waterDepth, waterDepthQC	10 seconds

References

Subversion repository version of DPG Matlab generic tools 3427

Pender, L., 2000. Data Quality Control flags.

http://www.marine.csiro.au/datacentre/ext_docs/DataQualityControlFlags.Pdf

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