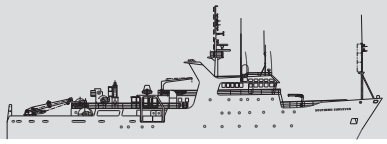


MARINE
NATIONAL FACILITY

2012 program

RV Southern Surveyor

voyageplan
ss2012_t05

The benthic fauna of the Great Australian Bight

Itinerary

Depart Hobart 18:00 hrs
Monday the 30th of July, 2012.

Arrive Fremantle 16:00 hrs
Thursday the 9th of August, 2011.

Principal Investigators

Dr Sebastian Holmes *(Chief Scientist/Benthic Invertebrates)*
The University of Western Sydney
The School of Natural Sciences,
The University of Western Sydney,
Locked Bag 1797, Penrith NSW 2751.
Phone: 02 9685 9904 **Email:** s.holmes@uws.edu.au

Other Principal Investigators

Dr Rudy Kloser *(swath)*
CSIRO Marine and Atmospheric Research
Phone: 03 6232 5222 **Email:** rudy.kloser@csiro.au

CSIRO

Scientific Objectives

The focus of this program is to give students a taste of what it is like to live and work on an ocean going research vessel and to expose them to some of the different sampling methods and equipment that are used in oceanographic research. The students will have two (quasi) scientific aims, all of which will contribute to our knowledge about Australian waters, as follows: 1) to characterise the macro-fauna inhabiting the benthos at range of deep water (~500 m) sites along Australia's southern coast; 2) to investigate regional surface productivity (POM) along the southern shelf of Australia.

For Kloser, the voyage provides an ongoing opportunity to use vessel transit time to complete a national mapping of the upper-mid slope seabed with multi-beam mapping and associated ecological interpretation. The upper-slope and mid-slope seabed 100 m to 1500 m depth range, are regions important for regional marine planning, biodiversity and conservation assessments and fisheries habitat mapping. The swath mapping will be integrated as a part of the student activities.

Voyage Objectives

The voyage objectives fall into three categories, pelagic sampling, benthic sampling and swath mapping.

Pelagic sampling

Throughout the voyage, surface seawater will be filtered (using the onboard seawater supply) to look at the isotopic signature of surface particulate organic matter (POM) along the transect path.

At each of the stations, a standard hydrocast will be made. XBT's may deployed at some stations rather than a CTD to calibrate the swath mapper. Throughout the voyage the CPR will be deployed (retrieval and re-deployment will depend on station arrival/departure and the necessity to replace silks (every ~250 Nm)

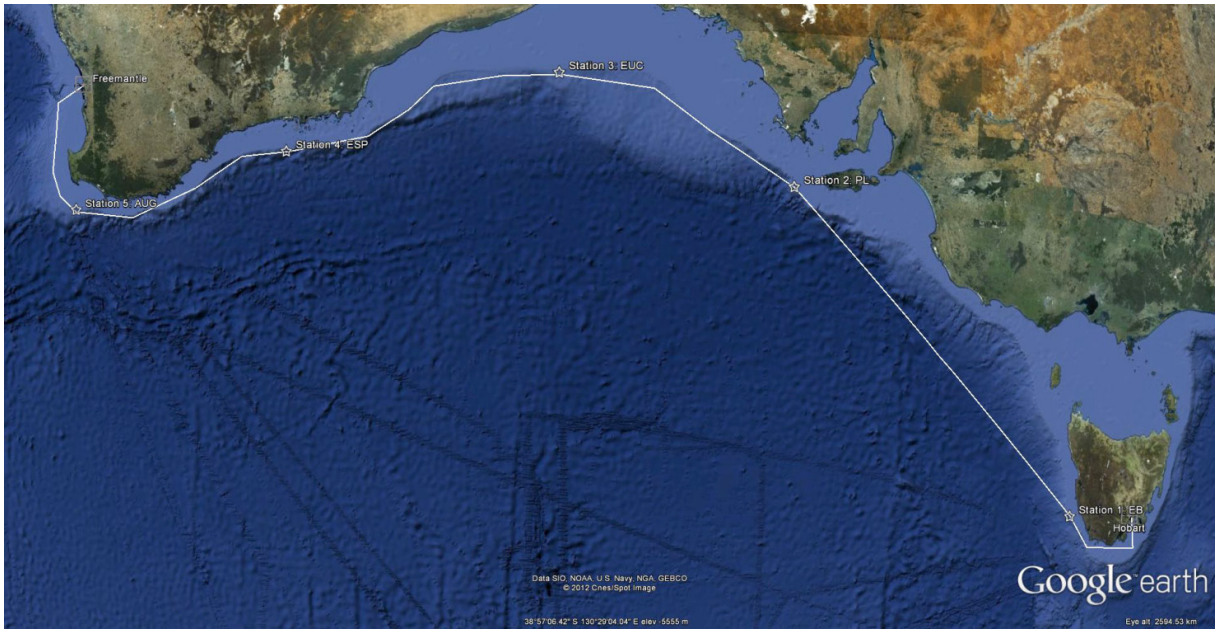
Benthic sampling

At each station, three Smith-McIntyre grabs, 500 m water depth, will be taken to collect both benthic macro-fauna and infauna. Grabs will be carefully sieved and all fauna collected and identified. In addition, the epi-benthic sled will be deployed to collect macro-fauna and/or salp carcasses, both of which will feed into research on the trophic nature of offshore benthic communities and extent of bentho-pelagic coupling.

Swath mapping

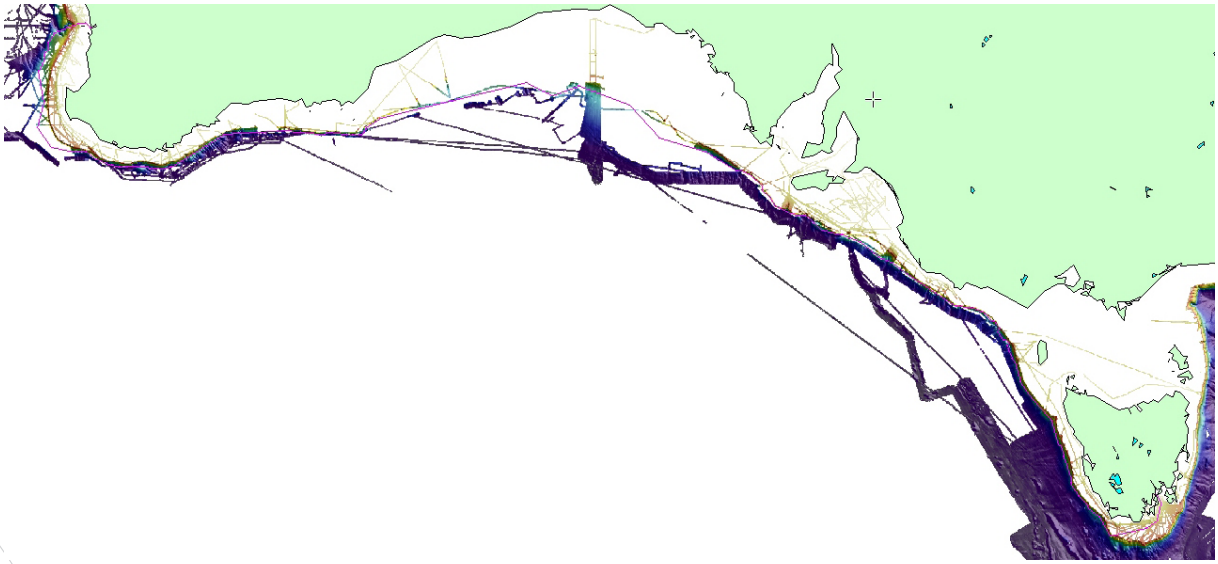
Throughout the voyage the swath will be continuously operated, providing another valuable track, at the 500 m depth contour, outlining Australia's continental shelf.

Voyage Track



Indicative map of the transit from Hobart to Fremantle denoting the 5 stations, Elliot Bay (EB), Port Lincoln (PL), Eucla (EUC), Esperance (ESP) and Augusta (AUG).

Swath route



Route denoted in magenta (pink).

Time Estimates

A full list of activities and timings are tabulated below. Highest priority tasks are in bold, medium priority tasks are underlined and lowest priority tasks are italicised. At some stations, XBT's will be substituted for CTD's.

Hobart to Elliot Bay (EB) (~152 Nm), leg 1

Departing Hobart at 18:00 on Monday the 30th of July, the vessel will steam out to Storm Bay where the CPR will be deployed. Following the swath track the ship will sail along the west Tasmanian coastline arriving at the first station, Elliot Bay, at 11:00 on Tuesday the 31st of July. Once at station, the CTD will be deployed, followed by a Smith-McIntyre grab (500 m) and the benthic fauna sampled using the epi-benthic sled. The vessel will move off station sailing westerly to the next station off Port Lincoln.

Location	Time on station	Gear/deployment time	Sampling depth	Lat/Long	Cumulative distance
Hobart					
Storm Bay		Deploy CPR for steam to Elliot Bay	Follow designated swath track		
Elliot Bay		Retrieve CPR		43 03.32 S 145 10.01 E	(152 Nm)
Station 1 (EB 1)	2 hrs	Deploy CTD to bottom – 1 h (time dependant use an XBT instead). Deploy 1 x epi-benthic sled – 1 h.	500 m	43 03.32 S 145 10.01 E	(152 Nm)
Depart for Port Lincoln		Deploy CPR	Follow designated swath track		

Elliot Bay to Port Lincoln (PL) (~616 Nm), leg 2

Arriving 110 km off Port Lincoln the CTD will be deployed, followed by a Smith-McIntyre grab (500 m) and an epi-benthic sled. The vessel will move off station sailing westerly to the next station off Eucla.

Location	Time on station	Gear/deployment time	Sampling depth	Lat/Long	Cumulative distance
Port Lincoln		Retrieve CPR		36 01.97 S 135 42.94 E	768 Nm
Station 2 (PL 2)	2 hours	Deploy CTD to bottom – 1 h (time dependant use an XBT instead). Take 1 x Smith-McIntyre grabs – ½ h. Deploy epi-benthic sled x 1 – 1 h.	500 m	36 01.97 S 135 42.94 E	768 Nm
Depart for Eucla		Deploy CPR	Follow designated swath track		

Port Lincoln to Eucla (EUC) (~373 Nm), leg 3

Arriving 180 km off Eucla an XBT will be deployed, followed by a Smith-McIntyre grab (500 m) and an epi-benthic sled. The vessel will move off station sailing westerly to the next station off Esperance.

Location	Time on station	Gear/deployment time	Sampling depth	Lat/Long	Cumulative distance
Eucla		Retrieve CPR		33 24.51 S 129 19.16 E	1141 Nm
Station 3 (EUC 3)	2 hours	Deploy XBT. Take 1 x Smith-McIntyre grabs – ½ h. Deploy 1 x epi-benthic sled – 1 h.	500 m	33 24.51 S 129 19.16 E	1141 Nm
Depart for Esperance		Deploy CPR	Follow designated swath track		

Eucla to Esperance (ESP) (~408 Nm), leg 4

Arriving 70 km off Port Esperance the CTD will be deployed, followed by 3 trawls using the epi-benthic sled. The vessel will move off station sailing westerly to the next station off Augusta.

Location	Day/time of arrival	Gear/deployment time	Sampling depth	Lat/Long	Cumulative distance
Esperance		Retrieve CPR		34 36.28 S 121 37.86 E	1549 Nm
Station 4 (ESP 4)	4 hours	Deploy CTD to bottom – 1 h (time dependant use an XBT instead). Deploy 3 x epi-benthic sled – 3 h.	600 m (match to sites last year)	34 36.28 S 121 37.86 E	1549 Nm
Depart for Augusta		Deploy CPR	Follow designated swath track		

Esperance to Augusta (AUG) (~351 Nm), leg 5

Arriving 70 km off Augusta on Thursday the 9th of August at 05:00, the CTD will be deployed, followed by 1 x epi-benthic sled. The vessel will move off station at 07:00 sailing westerly to Fremantle port to arrive at 16:00 on Thursday the 9th of August.

Location	Time on station	Gear/deployment time	Sampling depth	Lat/Long	Cumulative distance
Augusta		Retrieve CPR		34 58.85 S 115 01.11 E	1900 Nm
Station 5 (AUG 5)	2 hours	Deploy CTD to bottom – 1 h (time dependant use an XBT instead). Deploy epi-benthic sled – 1 h.	500 m	34 58.85 S 115 01.11 E	1900 Nm
Depart for Fremantle		Deploy CPR	Follow designated swath track		

Augusta to Fremantle (~233 Nm), leg 6.

Location	Day/time of arrival	Gear/deployment time	Sampling depth	Lat/Long	Cumulative distance
Fremantle Port	Thursday 16:00	Pull in CPR 1 h before arrival.		32 02.88 S 115 44.75 E	2133 Nm

NB for all dredges/trawls the vessel is assumed to be effectively stationary/not heading in a particular direction (normally ½ - 1 knot trawl speed) and for calculating winch times for the benthic sampling a rate of 60 m per minute has been used and the appropriate amount of extra wire added in. For the CTD casts a retrieval winch speed of 20 m per minute has been used. Steaming speed has been calculated as 9 knots, except for the last leg (10 knots).

Piggy-back Projects

Distribution of plankton along the southern Australian seaboard

Kerrie Swadling (UTAS)/Frank Coman (AusCPR)

Using the continuous plankton recorder (CPR) our knowledge about the distribution of plankton can be greatly improved without impacting ship-time and/or activities.

Scientific objective: to obtain a transect of plankton distributions along the east coast of Tasmania.

Voyage objective/s: the CPR will be deployed on 6 legs of 130-616 Nm during the voyage.

Southern Surveyor Equipment

Smith-McIntyre grab

Small epi-benthic sled

XBT

CTD + bottles

Underway clean seawater supply

Underway thermosalinograph, fluorometer and pCO2 monitoring – systems running throughout the voyage duration

Blast freezer

Small winch set up for the continuous plankton recorder

User Equipment

Continuous plankton recorder (Kerrie Swadling/Frank Coman).

General sampling preservation equipment /material.

General laboratory equipment (microscopes, scales).

Special Requests

None.

Personnel List

Sebastian Holmes	UWS	Chief Scientist
Graeme Poleweski	UTS	Undergraduate student
Amber-Louise Burberry	UTS	Undergraduate student
Cristin Sheehan	UTS	Undergraduate student
Kelly Buchanan	UNSW	MSc student
Januar Harinato	JCU	Ph.D. student
Rod Palmer	CMAR	MNF Voyage Manager
Jeff Cordell	CMAR	MNF Electronics support
Anoosh Sarraf	CMAR	MNF Computing support
Tara Martin	CMAR	MNF Swath support
Sascha Frydman	CMAR	MNF Swath support
Mark Rayner	CMAR	MNF Hydrochemistry support

As per AMSA requirements for additional berths on Southern Surveyor, the following personnel are designated as System Support Technicians and are required to carry their original AMSA medical and AMSA Certificate of Safety Training on the voyage:

Name	AMSA Certificate of Safety Training No.
Rod Palmer	ACM41808
Jeff Cordell	CBP23418
Anoosh Sarraf	ACM41414
Tara Martin	ACM41868
Sascha Frydman	ACM40349
Mark Rayner	CBP25149

This voyage plan is in accordance with the directions of the Marine National Facility Steering Committee for the Research Vessel Southern Surveyor.

Sebastian Holmes
Chief Scientist

Swath track

Long	Lat	Long (DMS)	Lat (DMS)	Distance (nm)	Cumulative distance	Bearing	Stations
Leg 1							
147.3483653	-42.90399058	147 20.9019E	42 54.2394S	0.0		0	Hobart
147.3773234	-42.91250535	147 22.6394E	42 54.7503S	1.4	1.4	111	
147.3773234	-43.05197842	147 22.6394E	43 03.1187S	8.4	9.7	180	
147.4838893	-43.24958413	147 29.0334E	43 14.9750S	12.7	22.5	158	
147.3504056	-43.54968377	147 21.0243E	43 32.9810S	18.9	41.4	197	
146.8639868	-43.66824834	146 51.8392E	43 40.0949S	22.3	63.7	251	
146.4864443	-43.68269927	146 29.1867E	43 40.9620S	16.4	80.1	266	
146.353778	-43.69754163	146 21.2267E	43 41.8525S	5.8	86.0	261	
146.2727511	-43.70235343	146 16.3651E	43 42.1412S	3.5	89.5	265	
145.7585317	-43.49963552	145 45.5119E	43 29.9781S	25.4	114.9	298	
145.6881336	-43.45809867	145 41.2880E	43 27.4859S	3.9	118.9	309	
145.5874707	-43.37352813	145 35.2482E	43 22.4117S	6.7	125.6	319	
145.4386706	-43.29106185	145 26.3202E	43 17.4637S	8.2	133.7	307	
145.3502415	-43.21383786	145 21.0145E	43 12.8303S	6.0	139.8	320	
145.1668676	-43.05533985	145 10.0121E	43 03.3204S	12.4	152.2	319	Station 1: Elliot Bay
Long	Lat	Long (DMS)	Lat (DMS)	Distance (nm)	Cumulative distance	Bearing	Stations
Leg 2							
137.4756732	-36.85243968	137 28.5404E	36 51.1464S	513.3	665.5	313	
137.2221286	-36.75230949	137 13.3277E	36 45.1386S	13.6	679.1	296	
137.1100113	-36.70454578	137 06.6007E	36 42.2727S	6.1	685.2	297	
136.9332475	-36.63941128	136 55.9948E	36 38.3647S	9.4	694.6	294	
136.7041508	-36.64049732	136 42.2490E	36 38.4298S	11.0	705.6	269	
136.5476014	-36.59287848	136 32.8561E	36 35.5727S	8.1	713.7	290	
136.2594338	-36.49319953	136 15.5660E	36 29.5920S	15.1	728.8	293	
136.1736894	-36.45967545	136 10.4214E	36 27.5805S	4.6	733.4	295	
136.0963787	-36.42926969	136 05.7827E	36 25.7562S	4.2	737.5	296	
135.9855635	-36.28936219	135 59.1338E	36 17.3617S	10.0	747.5	327	
135.9210704	-36.20393386	135 55.2642E	36 12.2360S	6.0	753.5	328	
135.7157245	-36.03297823	135 42.9435E	36 01.9787S	14.3	767.8	315	Station 2: Port Lincoln

Long	Lat	Long (DMS)	Lat (DMS)	Distance (nm)	Cumulative distance	Bearing	Stations
Leg 3							
135.7074844	-35.93227585	135 42.4491E	35 55.9366S	6.1	773.8	356	
135.3812251	-35.68319961	135 22.8735E	35 40.9920S	21.8	795.6	313	
135.1099746	-35.56859572	135 06.5985E	35 34.1157S	14.9	810.5	297	
135.038469	-35.55496378	135 02.3081E	35 33.2978S	3.6	814.1	283	
134.9640214	-35.53234143	134 57.8413E	35 31.9405S	3.9	818.0	290	
134.8686512	-35.47330437	134 52.1191E	35 28.3983S	5.9	823.9	307	
133.6886274	-34.96251015	133 41.3176E	34 57.7506S	65.4	889.3	297	
133.4791997	-34.90585283	133 28.7520E	34 54.3512S	10.8	900.1	288	
133.2819434	-34.80840775	133 16.9166E	34 48.5045S	11.3	911.5	300	
133.2462172	-34.7729858	133 14.7730E	34 46.3791S	2.8	914.2	320	
133.1662242	-34.72524705	133 09.9734E	34 43.5148S	4.9	919.1	305	
133.1510651	-34.67651715	133 09.0639E	34 40.5910S	3.0	922.1	345	
133.0733444	-34.59942573	133 04.4007E	34 35.9655S	6.0	928.1	320	
132.7574535	-34.36888056	132 45.4472E	34 22.1328S	20.9	949.0	311	
132.6418122	-34.2719621	132 38.5087E	34 16.3177S	8.2	957.2	315	
132.5463716	-34.1980437	132 32.7823E	34 11.8826S	6.5	963.6	313	
132.1186546	-33.76428606	132 07.1193E	33 45.8572S	33.6	997.2	320	
131.6333996	-33.56204609	131 38.0040E	33 33.7228S	27.1	1024.3	296	
130.6551873	-33.41877192	130 39.3112E	33 25.1263S	49.7	1074.0	279	
130.048623	-33.39841799	130 02.9174E	33 23.9051S	30.4	1104.4	272	
129.319495	-33.40858737	129 19.1697E	33 24.5152S	36.5	1140.9	268	Station 3: Eucla

Long	Lat	Long (DMS)	Lat (DMS)	Distance (nm)	Cumulative distance	Bearing	Stations
Leg 4							
126.4846329	-33.31354352	126 29.0780E	33 18.8126S	142.1	1283.1	271	
126.0495045	-33.42828782	126 02.9703E	33 25.6973S	22.9	1306.0	252	
125.5459109	-33.82512672	125 32.7547E	33 49.5076S	34.7	1340.7	226	
125.1140484	-34.08176799	125 06.8429E	34 04.9061S	26.5	1367.2	234	
124.3065966	-34.31873806	124 18.3958E	34 19.1243S	42.6	1409.8	250	
123.9084157	-34.5265475	123 54.5049E	34 31.5928S	23.4	1433.1	237	
123.8007431	-34.61908644	123 48.0446E	34 37.1452S	7.7	1440.8	223	
123.6825659	-34.65772215	123 40.9540E	34 39.4633S	6.3	1447.1	248	
123.2294076	-34.65812924	123 13.7645E	34 39.4878S	22.4	1469.5	269	
123.0766926	-34.67125534	123 04.6016E	34 40.2753S	7.6	1477.0	263	
122.6856807	-34.66405742	122 41.1408E	34 39.8434S	19.3	1496.3	271	
122.3858879	-34.65050667	122 23.1533E	34 39.0304S	14.8	1511.2	273	
122.2987686	-34.64373045	122 17.9261E	34 38.6238S	4.3	1515.5	275	
122.1962753	-34.64923617	122 11.7765E	34 38.9542S	5.1	1520.5	266	
122.0281863	-34.64584808	122 01.6912E	34 38.7509S	8.3	1528.8	271	
121.804751	-34.60856988	121 48.2851E	34 36.5142S	11.3	1540.1	281	
121.6310249	-34.60475639	121 37.8615E	34 36.2854S	8.6	1548.7	271	Station 4: Esperance

Long	Lat	Long (DMS)	Lat (DMS)	Distance (nm)	Cumulative distance	Bearing	Stations
Leg 5							
121.5526175	-34.56703564	121 33.1571E	34 34.0221S	4.5	1553.2	300	
120.6081419	-34.54244429	120 36.4885E	34 32.5467S	46.7	1599.8	271	
120.2386536	-34.56491599	120 14.3192E	34 33.8950S	18.3	1618.1	265	
120.0239302	-34.59119586	120 01.4358E	34 35.4718S	10.7	1628.9	261	
119.8686529	-34.62339846	119 52.1192E	34 37.4039S	7.9	1636.8	255	
119.644705	-34.70131044	119 38.6823E	34 42.0786S	12.0	1648.8	247	
119.5191508	-34.76096468	119 31.1490E	34 45.6579S	7.2	1655.9	239	
119.4453556	-34.75377463	119 26.7213E	34 45.2265S	3.7	1659.6	276	
119.2752168	-34.8362108	119 16.5130E	34 50.1726S	9.7	1669.3	239	
119.0784297	-34.9502158	119 04.7058E	34 57.0129S	11.9	1681.2	234	
118.9661995	-35.0134829	118 57.9720E	35 00.8090S	6.7	1687.9	235	
118.7864722	-35.08544516	118 47.1883E	35 05.1267S	9.8	1697.7	243	
118.7348267	-35.11130259	118 44.0896E	35 06.6782S	3.0	1700.7	238	
118.6298736	-35.16123765	118 37.7924E	35 09.6743S	6.0	1706.7	239	
118.4876225	-35.2362585	118 29.2574E	35 14.1755S	8.3	1715.0	237	
118.3991467	-35.2801811	118 23.9488E	35 16.8109S	5.1	1720.0	238	
118.3823838	-35.28445483	118 22.9430E	35 17.0673S	0.9	1720.9	252	
118.3106837	-35.31344094	118 18.6410E	35 18.8065S	3.9	1724.8	243	
118.2502528	-35.33029656	118 15.0152E	35 19.8178S	3.1	1727.9	251	
118.2062274	-35.37467936	118 12.3736E	35 22.4808S	3.4	1731.4	218	
118.1095055	-35.38332519	118 06.5703E	35 22.9995S	4.8	1736.1	263	
118.0170633	-35.43494709	118 01.0238E	35 26.0968S	5.5	1741.6	235	
117.9639946	-35.45035711	117 57.8397E	35 27.0214S	2.8	1744.4	250	
117.8256167	-35.47323317	117 49.5370E	35 28.3940S	6.9	1751.3	258	
117.7565704	-35.46249624	117 45.3942E	35 27.7498S	3.4	1754.7	280	
117.6658401	-35.42794155	117 39.9504E	35 25.6765S	4.9	1759.6	295	
117.5485754	-35.40411811	117 32.9145E	35 24.2471S	5.9	1765.5	283	
117.4173304	-35.38496079	117 25.0398E	35 23.0976S	6.5	1772.0	280	
117.3873722	-35.38332519	117 23.2423E	35 22.9995S	1.5	1773.5	273	
117.3103371	-35.35831981	117 18.6202E	35 21.4992S	4.1	1777.5	291	
117.2629747	-35.34943751	117 15.7785E	35 20.9663S	2.4	1779.9	282	
117.1140401	-35.37257617	117 06.8424E	35 22.3546S	7.4	1787.3	259	
117.0607548	-35.38782865	117 03.6453E	35 23.2697S	2.8	1790.1	250	
116.9434507	-35.41995321	116 56.6070E	35 25.1972S	6.1	1796.2	251	
116.9143728	-35.4538987	116 54.8624E	35 27.2339S	2.5	1798.6	214	
116.8698347	-35.45392683	116 52.1901E	35 27.2356S	2.2	1800.8	269	
116.4869653	-35.45681642	116 29.2179E	35 27.4090S	18.7	1819.5	269	
116.4166646	-35.36423113	116 24.9999E	35 21.8539S	6.5	1826.1	328	
116.2070098	-35.32372364	116 12.4206E	35 19.4234S	10.5	1836.6	283	
115.9645363	-35.30364605	115 57.8722E	35 18.2188S	11.9	1848.5	275	
115.8609817	-35.26294225	115 51.6589E	35 15.7765S	5.6	1854.2	295	
115.7991777	-35.20791892	115 47.9507E	35 12.4751S	4.5	1858.6	317	
115.65453	-35.15420793	115 39.2718E	35 09.2525S	7.8	1866.4	294	
115.4764613	-35.11127476	115 28.5877E	35 06.6765S	9.1	1875.5	286	
115.3204269	-35.10158096	115 19.2256E	35 06.0949S	7.7	1883.2	274	
115.0185206	-34.98095234	115 01.1112E	34 58.8571S	16.5	1899.7	295	Station 5: Augusta

Long	Lat	Long (DMS)	Lat (DMS)	Distance (nm)	Cumulative distance	Bearing	Stations
Leg 6							
115.0028855	-34.95950206	115 00.1731E	34 57.5701S	1.5	1901.2	329	
114.8882281	-34.91597124	114 53.2937E	34 54.9583S	6.2	1907.4	294	
114.7761766	-34.82914666	114 46.5706E	34 49.7488S	7.6	1915.0	313	
114.6890668	-34.73055173	114 41.3440E	34 43.8331S	7.3	1922.3	324	
114.5665918	-34.51082125	114 33.9955E	34 30.6493S	14.5	1936.8	335	
114.4876718	-34.26083751	114 29.2603E	34 15.6503S	15.5	1952.3	345	
114.4727812	-34.05349247	114 28.3669E	34 03.2095S	12.5	1964.8	356	
114.4649637	-33.98715766	114 27.8978E	33 59.2295S	4.0	1968.8	354	
114.4761316	-33.91363239	114 28.5679E	33 54.8179S	4.4	1973.2	7	
114.4705476	-33.65905848	114 28.2329E	33 39.5435S	15.3	1988.5	358	
114.414708	-33.59864468	114 24.8825E	33 35.9187S	4.6	1993.1	322	
114.4396497	-33.4059077	114 26.3790E	33 24.3545S	11.6	2004.7	6	
114.5003288	-33.1801882	114 30.0197E	33 10.8113S	13.9	2018.6	12	
114.6098453	-32.98451801	114 36.5907E	32 59.0711S	13.0	2031.5	25	
114.6538968	-32.90984557	114 39.2338E	32 54.5907S	5.0	2036.5	26	
114.8185318	-32.63542018	114 49.1119E	32 38.1252S	18.4	2055.0	26	
114.864589	-32.56123411	114 51.8753E	32 33.6740S	5.0	2060.0	27	
115.0330882	-32.34174305	115 01.9853E	32 20.5046S	15.7	2075.7	32	
115.1323526	-32.16524182	115 07.9412E	32 09.9145S	11.7	2087.4	25	
115.271787	-32.05460169	115 16.3072E	32 03.2761S	9.7	2097.1	46	
115.4028966	-31.9862619	115 24.1738E	31 59.1757S	7.8	2104.9	58	
115.5196536	-31.95090592	115 31.1792E	31 57.0544S	6.3	2111.2	70	
115.5486985	-31.95032731	115 32.9219E	31 57.0196S	1.5	2112.7	88	
115.663381	-31.98880779	115 39.8029E	31 59.3285S	6.3	2119.0	111	
115.714506	-32.05597427	115 42.8704E	32 03.3585S	4.8	2123.8	147	
115.7367782	-32.054681	115 44.2067E	32 03.2809S	1.1	2124.9	86	
115.7459745	-32.04800406	115 44.7585E	32 02.8802S	0.6	2125.5	49	Fremantle