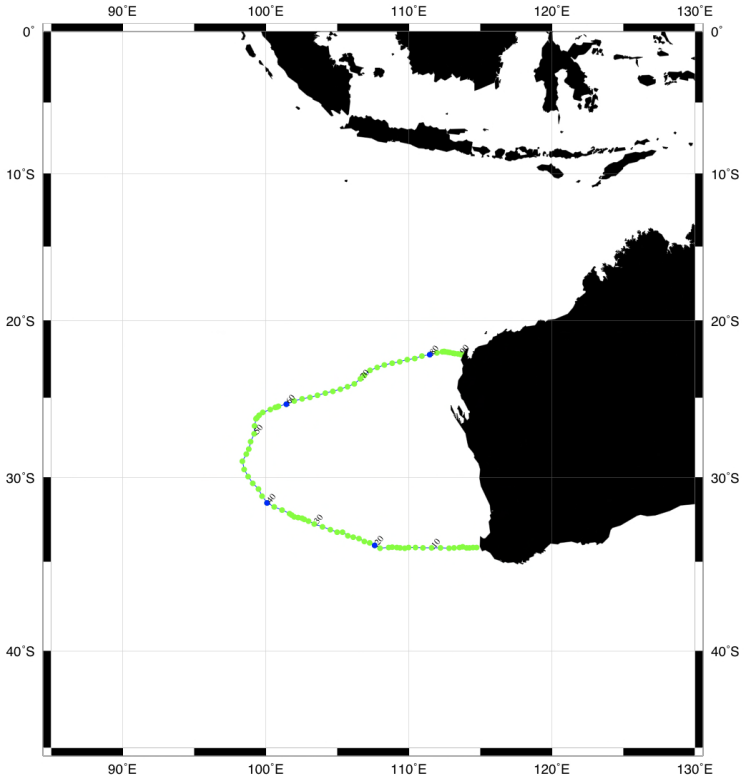
Cruise Report: ISS03

(Updated APR 2012)



Highlights

Cruise Summary Information

WOCE Section Designation	**ISS03**
Expedition designation (ExpoCodes)	**09FA9605**
Chief Scientists	**Peter McIntosh / CSIRO**
Dates	1996 May 7 - 1996 May 31
Ship	*R/V Franklin*
Ports of call	Fremantle, Australia - Dampier, Australia
Geographic Boundaries	21° 59.14' S 98° 22.37' E 114° 45.01' E 34° 14.34' S
Stations	92
Floats and drifters deployed	0
Moorings deployed or recovered	0

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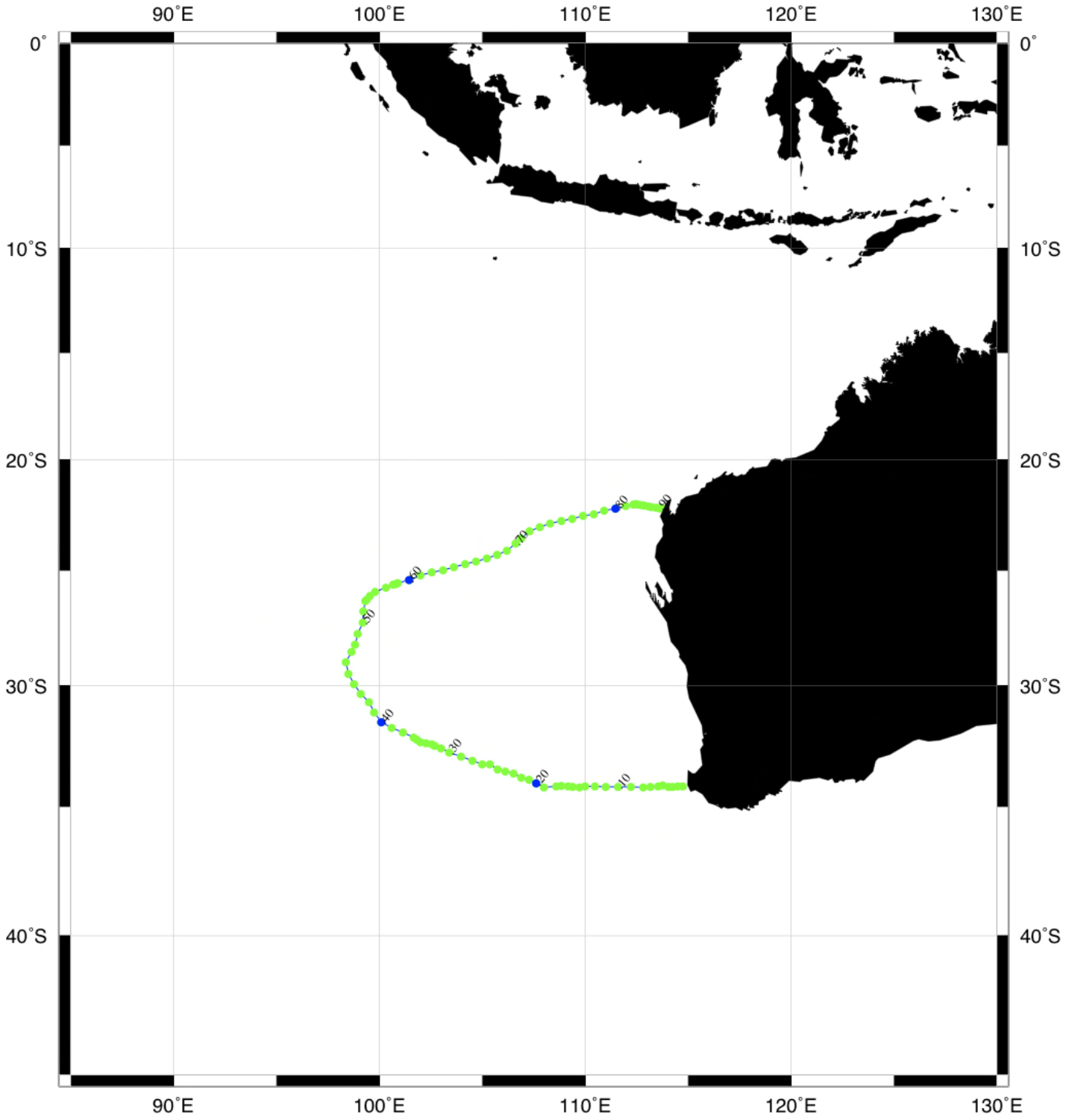
Links to select topics

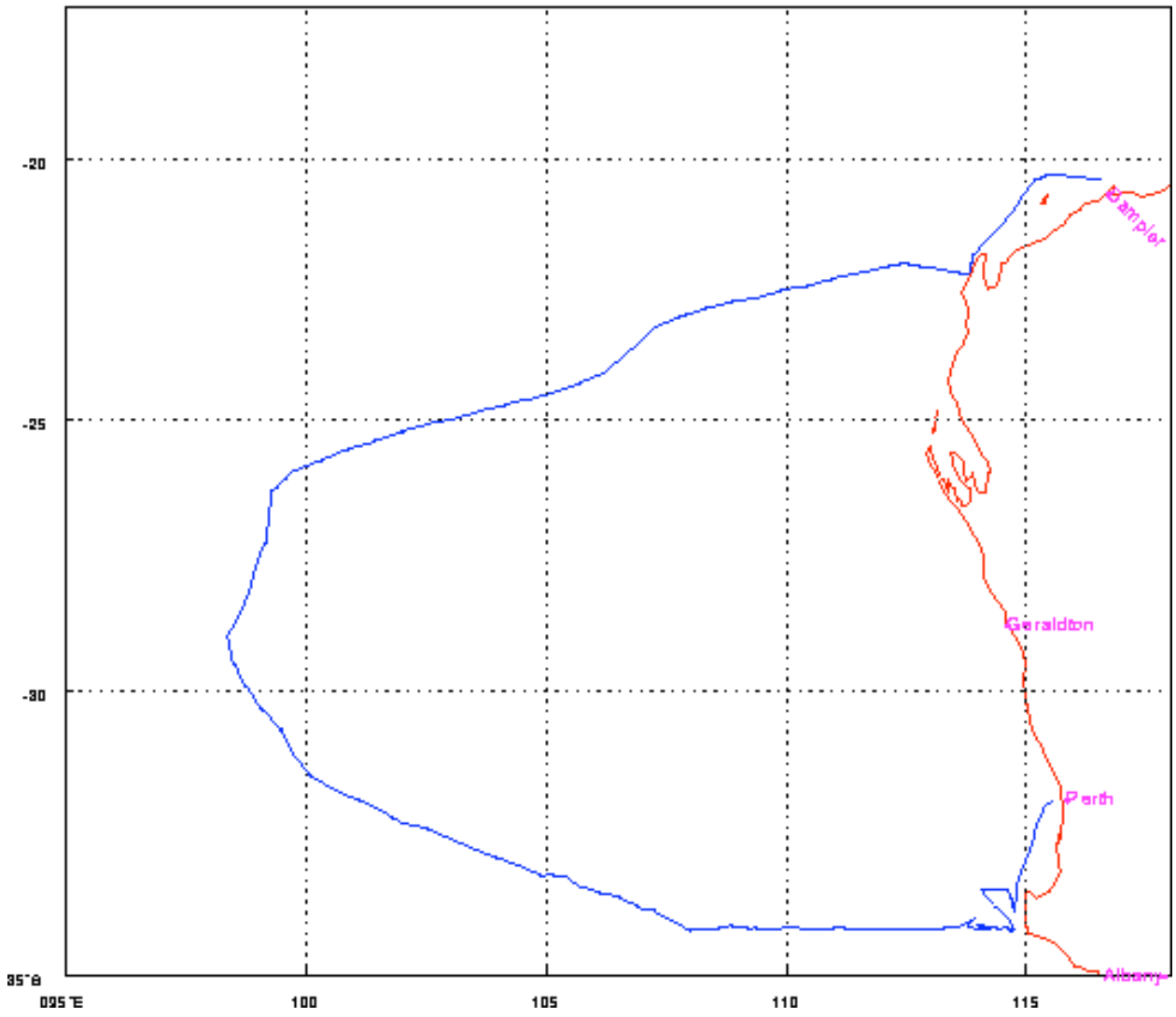
Shaded sections are not relevant to this cruise or were not available when this report was compiled.

Cruise Summary Information	Hydrographic Measurements
Description of Scientific Program	**CTD Data:**
Geographic Boundaries	Acquisition
Cruise Track (Figure): PI CCHDO	Processing
Description of Stations	Calibration
Description of Parameters Sampled	Temperature Pressure
Bottle Depth Distributions (Figure)	Salinities Oxygens
Floats and Drifters Deployed	**Bottle Data**
Moorings Deployed or Recovered	Salinity
	Oxygen
Principal Investigators	Nutrients
Cruise Participants	Carbon System Parameters
	CFCs
Problems and Goals Not Achieved	Helium / Tritium
Other Incidents of Note	Radiocarbon
Underway Data Information	**References**
Navigation Bathymetry	
Acoustic Doppler Current Profiler (ADCP)	
Thermosalinograph	
XBT and/or XCTD	
Meteorological Observations	**Acknowledgments**
Atmospheric Chemistry Data	
Data Processing Notes	

Station Locations • ISS03 • 1996 • McIntosh • *R/V Franklin*



Franklin cruise 5/96



FRANKLIN

National Facility
Oceanographic Research Vessel

RESEARCH SUMMARY
FR 05/96

Sail	Fremantle	1100 Tuesday	7 May 1996
Arrive	Dampier	0900 Friday	31 May 1996

Mixing and Circulation in the Perth Basin

Principal investigators

Dr Peter C. McIntosh CSIRO Division of Oceanography (Chief Scientist)
Dr Trevor J. McDougall CSIRO Division of Oceanography

and

Horizontal and **Spatial Dynamics of Surface Phytoplankton**

Principal Investigator

Ms Esmee Van Wijk Flinders University (piggyback project)

June.1996,

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Cruise Objectives

- To conduct a closely-spaced CTD survey around the perimeter of the Perth Basin so that the flows into and out of the basin at all depths can be estimated by inverse methods.
- To deduce the importance of mixing processes in the Perth Basin by examining the changes in water-mass properties as fluid flows through the basin and by using inverse methods on the hydrographic data from the perimeter of the Perth Basin.
- To investigate horizontal changes in chlorophyll a and phytoplankton species composition across hydrographic fronts.
- To correlate continuous chlorophyll a measurements with discrete samples of phytoplankton species composition.

Cruise Track

The actual voyage track is shown in Figure 1. It retraces the path of the 1987 Daxwin section along the southern leg of the box, passing over the deep current meter moorings of McDougall and Toole. It also duplicates the CTD's in this region conducted on Franklin Voyage FR6/95. The track then turns north, passing over Gulden Draak Knoll and Batavia Knoll, then turning northeastwards into the Cuvier Basin and closing the box over the ICM6 Tornczak and Church current meter moorings of Northwest Cape.

Cruise Narrative

Franklin departed Fremantle at 1100 on 7 May 1996, delayed one hour due to port traffic. We steamed down towards the first station of Cape Leeuwin with a moderate wind (15-20 knots) behind us. About midnight, 1 hour from the first station, the wind had swung to the NW and freshened to over 30 knots. We hove to, doing 2 knots to the NW. Some gusts reached 60 knots overnight. We were hove to all next day (8/5), and many people were feeling less than 100%, although a new influx of bean bags helped. The weather was caused by an unseasonably-late tropical cyclone ("Jenna") which travelled south. The morning of 9/5 we were about 50nm from first station, and steamed down there in a moderating wind (25-30 knots). Arrived about 10am and did the first station in 120m of water. The wind freshened again, and so we hove to rather than travel to the next station. Once the wind eased again, we travelled to the next station and did CTD #2 at about 1pm.

On Friday 10/5 the weather moderated and we got 3 stations done (#'s 3,4,5) in one watch. Then the fuel pump on the main engine broke about 9pm, and we drifted for about 4 hours while it was fixed. Luckily the seas were almost dead calm. The next morning we continued CTD's as planned. The voyage track was altered slightly to account for the lost time, reducing the number of CTD's to about 90, but still enclosing most of the original area. The major change was along the northern leg, where it was decided not to pass over the Wallaby Plateau, but stay in deep water to the south to avoid having to resolve deep and narrow boundary currents. We lost no further time due to bad weather.

On Sunday 12/5 we had a fire alarm, which turned out to be false. This is apparently quite rare, and no cause was found. Some of the scientific crew had trouble recognising the alarm as they had not heard it before.

Wednesday 15/5 we had a fire drill. Deepest cast of the voyage was here at station 27, with pressure of 5989db and 6150m of wire out. Started to notice a problem with the deep thermometers triggering at the next depth up (see equipment section below).

Saturday 18/5 the bridge noticed a loose strand of wire on the CTD cable about 800m from the CTD itself; the splice was beginning to unravel (see equipment section). We were now out of email range, somewhat later than anticipated.

Sunday 19/5 we celebrated Andreas's birthday with a formal (black tie) lunch, complete with birthday cake and a present from his wife (two Mr Bean videos).

The bathymetry in this region (around station 50, western-most section of loop) is different from the charts by up to 1000m. This prompted the question: What happens to bathymetry data from Franklin voyages?

Thursday 23/5 celebrated Dave's birthday with an informal (blue overalls) dinner, another birthday cake (thanks again cooks!) a lei made of sampling bottles and a highly edible present from friends.

Friday 24/4 we started to have trouble reaching the bottom because of the reducedwire length. Failed to reach the bottom on 3 stations altogether, one by about 400m. We were very lucky not to lose the wire earlier in the voyage. Not reaching the bottom in the region of the McDougall current meters would have reduced the value of the entire experiment considerably.

Once the casts became shallower than 3000m we mounted the fluorometer on the CTD so that Esmee could get vertical profiles. We also devoted spare Niskin bottles to collecting a large volume of water from the chlorophyll maximum to provide phytoplankton samples.

Wednesday 29/5 finished the last CTD, giving us plenty of time to steam to Dampier. On the way we spent a number of hours practising picking up current meters for the benefit of Ian Moss, who will be master on the voyage to retrieve the McDougall current meters.

Equipment

The 1.7l Niskin bottles worked well, and there were no major problems. We lost one bottle on Monday 20/5 - it was simply missing when the CTD came out of the water. No idea what happened.

We had a continual problem for the first half of the voyage with two deep bottles apparently triggering at the same depth. This was eventually tracked down to a slight alignment problem in the rosette, which Erik fixed, and we had no further problems. The backup rosette had problems operating at depths around 5000m or deeper, and we only used this for a few casts.

On Saturday 18/5 the splice in the CTD wire started to unravel, and we had to cut off 835m of cable and re-terminate it. This took about 3 hours. The cable length was now estimated to be 5675m. This meant our maximum wire out for subsequent casts was about 5555m. There were three casts where we couldn't reach the bottom after this time. If this had happened earlier in the voyage, so that we couldn't reach the bottom in the region of the McDougall current meters, it would have reduced the value of the entire experiment considerably. I suggest that if another splice is used, that the number of times it goes over the sheaves is logged, and consideration be given to a backup strategy for intensive deep CTD voyages when the splice nears the end of its expected working life.

About halfway through the voyage we received the news that CSIRO was considering buying new Guildline salinometers. This caused some consternation among the OMS people because they had not been consulted. Aren't they the local experts?

For this voyage we had been given specific guidelines concerning CTD wire tension. We monitored this carefully, and logged all casts fully. Wire tension was always below the absolute limit of 1.3 tonnes, but did occasionally exceed 1.2 tonnes. The major factor was ship roll when the CTD was below 5000m. The next important factor was the winch acceleration, and the winch drivers were careful to start the winch slowly. We found it made no appreciable difference to ascend at half the usual speed while at depth, suggesting the drag of the CTD package is not important.

It quickly became clear that deep CTD's were taking about 30 minutes longer than estimated. We eventually established that the wire-speed readout was reading high by about 10%, although the wire-out readout was accurate. From 17/5 we ran the winch at an indicated 65m/min.

The colour printer was installed via Appletalk - it could not be made to work directly on the ethernet.

Two new cuvette caps for the fluorometer were purchased for this voyage, but they had the wrong thread size. The old one was adequate until the engineers managed to machine one of the new caps to fit. The other new cap has not been touched.

We were only without email for about 4 days. This was an important facility, allowing faster communication, and reducing the isolation. I suggest that consideration be given to improving this facility, so that it is always available. It might also be a good idea to arrange for some form of regular news service to be sent by email.

I found out that most of the crew phone home about once a week. It is important that this is as easy and cheap as possible - it might save some relationships! At the moment it is both expensive and bad quality. I recommend this be fixed as soon as possible.

Conclusion

This was a very successful voyage in terms of the data collected. A large section of ocean was fully enclosed with deep CTD's, which will allow the construction of an inverse model to study mixing processes and property fluxes in this region. In addition, a large amount of surface data on chlorophyll and phytoplankton was collected in the region of a number of surface fronts. There were very few problems on this voyage, and everybody seemed to get along very well. With the exception of the first three days, the weather was also kind.

Acknowledgements

Thank you to the two CTD watches, and to the chemists, for working hard and caring about the quality of the data. Thank you to Esmee for helping with the CTD's when needed. A special thank you to the ship's crew for their hard work, dedication and generosity. And thanks to everyone for also making the voyage enjoyable.

Science Crew

Peter McIntosh	CSIRO Oceanography Chief Scientist
Andreas Schiller	CSIRO Oceanography
Yukio Masumoto	University of Tokyo
Esmee Van Wijk	Flinders University (piggyback project)
Neil White	CSIRO-ORV Cruise Manager
Erik Madsen	CSIRO-ORV
Helen Beggs	CSIRO-ORV
Dave Terhell.	CSIRO-ORV
Val Latham	CSIRO-ORV
Kate Berry	CSIRO-DF (on loan)

Ships Crew

Neil Cheshire	Master
lan Moss	Mate
Ian Menzies	2nd Mate
Mike Culpepper	Chief Engineer
Lindsay Cale	1st Engineer
Don Roberts	Electrical Engineer
Yannick Hansen	Bosun
Norm Marsh	AB
Peter Genge	AB
Wayne Golding	AB
Phil French	Greaser
John Tilley	Chief Steward
Lindsay Ballinger	Chief Cook
Peter Dux	2nd Cook

Notes on ADCP data for Fr 5/96

(Helen Beggs, 23 June, 1997)

1 Features of this voyage

The first three days of the cruise were very rough and this appears to have affected the data quality. The current vectors are suspect during 7 May'96/0800 - 1500 UTC and 8 May'96/0200 - 0900 UTC due to the very rough seas. The major reason for data being rejected during post-processing was due to %Good being less than 30% in any one ensemble.

GPS "SA" degradation (see section 2) was in force during this voyage, and UPS coverage was nearly 100%.

A very small amount of on-station data was mildly corrupted in the top 50 m by one acoustic beam intersecting water dragged by the CTD wire. All but the most subtly affected bins have been removed (as there is no way of correcting for this effect).

The alignment angle calibration coefficient, a, varied sinusoidally with heading through the voyage, probably due to variation in the heading gyro synchro-digital converter. Specifically, $\alpha = 0.95 \sin(\text{heading}) + 1.1 +/- 0.3$. The scaling factor, $1+\beta$, did not change significantly with time.

1.1 Profiles integrated

- Bottom track corrected, no reference layer averaging in final integration:
- 203 20 minute profiles (-12% of voyage covered).
- GPS corrected (position-derived GPS ship velocities preferred to direct GPS velocities)
- 1679 20 minute profiles (-99% of voyage covered). Use with care, if at all, as SA was active.
- 562 60 minute profiles (-100% coverage).

- Non-integrated profiles (3 minute ensembles)
- All possible ensembles with best available correction (bottom track preferred to position-derived UPS velocities, preferred to direct GPS velocities).

2 GPS data degraded by SA (Selective Availability)

The US Department of Defence, who operates the UPS satellites, has introduced deliberate complex errors into UPS data. It is generally considered that these errors cannot be removed without extra equipment and post processing (and even then cannot be achieved with deep ocean work.)

The characteristics of SA errors are probably changed from time to time, however they usually seem to be across quite a wide time spectrum. Of most concern for ADCP data are the errors of order 50 cm/s over 5 to 10 minute periods. There also appears to be a smaller and lower frequency component, the worst case so far observed had a residual error of 6 cm/s after averaging an hour's data.

2.1 The implications for ADCP data are:

- individual GPS corrected ensembles (3 minute or less) often have errors of around.5 m/s.
- The existence of such errors prohibits the use of some quality control measures, especially of course dv/dt.
- 20 minute integrated profiles will usually have little extra error, maybe 1 or 2 cm/s. However, at times low frequency components of SA may cause larger errors, up to 10 or 20 cm/s.
- 60 minute profiles will rarely have more than 1 or 2 cm/s extra error.
- Incomplete 20 minute profiles (low 'icover' percentage) are less reliable because they are probably incomplete due to a break in GPS coverage, and data adjacent gaps is usually of poorer quality. Also, the SA errors are less likely to have been removed by averaging.
- Bottom track and shear data are, of course, unaffected by this. When using UPS to get ship's position, these errors are negligible (200m or 300m at most).

3 Calibration

ADCP water profile vectors are calibrated by being rotated through an angle a and multiplied by scaling factor $1 + \beta$. The rotational calibration primarily corrects for misalignment of the transducer with respect to the ship, of the ship with respect to the gyro compass, and the error in the gyro compass. The scaling multiplier primarily corrects biases arising from the profiler itself. Both of these calibrations make a large difference to the resultant currents, particularly because they are both applied to the usually large ship-relative currents. For example, a scaling multiplier of .01 applied when the water velocity with respect to the ship is 6 m/s alters the measured absolute currents by 6 cm/s. Calibration is particularly difficult when the coefficients change with time, as appeared to be the case on this voyage.

Calibration chosen for this voyage:

$$\alpha = 0.95 \sin(\text{heading}) + 2.05 \pm 0.3$$

$$1 + \beta = 1.019 \pm 0.005.$$

4 Data Quality

The data provided should not be taken as absolutely true and accurate. There are many sources of error, some of which are very hard to quantify. Often the largest error is that of determining the ship's actual velocity.

Accuracy of water velocity relative to the ship

The theoretical approximate short-term velocity error for our 150 kHz ADCP is:

sigma = (pulse length X square root of pings per average) - 1

For a 3 minute ensemble with say 170 pings, using 8m pulse, this gives a theoretical error of 1 cm/s for each value (that is, independently for each bin).

For 20 minute profiles, with say 1150 pings averaged, the error in measuring the velocity of the water relative to the ship is probably reduced to the long term systematic bias. Of this bias, RDI says

> "Bias is typically of the order of 0.5 - 1.0 cm/s. This bias depends on a variety of factors including temperature, mean current speed, signal/noise ratio, beam geometry errors, etc. It is not yet possible to measure ADCP bias and to calibrate or remove it in postprocessing."

As well as that, there are the transducer alignment and gyro-compass errors, which probably have a residual effect after calibrating of roughly:

> 0.3 cm/s per m/s of ship speed, due to, say, 0.3 degree uncertainty and variation in alignment angle.
>
> 0.5 cm/s per m/s of ship speed, due to, say, 0.005 uncertainty and variation in scaling factor.

This gives us say 0.58 cm/s error per m/s of ship speed, or 3.6 cm/s at 12 knots.

Other sources of bias might be the real-time and post-processing data screening, and depth- dependant bias.

GPS profiles

In the presence of SA, errors are larger and even very large errors cannot be removed by dvidt screening (because this would bias the long term average - there is reason to assume that given a long enough period the accumulated SA error is close to zero).

Bottom track profiles

Firstly note that errors arising from transducer alignment and gyro limitations will substantially cancel out. Normally, the accuracy of screened bottom track data appears to be of the same order of accuracy as non-SA UPS, that is, about 2 - 3 cm/s for a 20 minute profile.

Report on the Processing of Hydrology data from F9605

(David Terhell)

Hydrochemists on the voyage were Dave Terhell, Val Latham and Kate Berry. 92 CTD stations were sampled. Approximately 1940 samples were analysed for salinity and nutrients and approximately 1916 samples were analysed for oxygen.

The processing was performed by David Terhell. It was begun of 28/11/96 and completed on 22/5/97. the navigation data etc was transferred from the fr9605.sta file produced during CTD calibration to the hydrology .DAT files. The sample depths, CTD salinity and CTD temperature data were transferred to the hydrology .DAT files from the histcal.lis file produced during CTD calibration. The DO results were checked in Hobart and found to be correct. During processing corrections to the data were made (see below). The data was archived of 22/5/97 and all files copied to tape on 16/4/97.

One persistent problem which had to be corrected was that rosette position's 2 and 4 often didn't fire until the next rosette position was fired.

Station	RP	NBN	Comments	Action
1	2	4	salt sample taken from next deepest bottle	delete salt and bottle number
2	1	2	No oxygen for bottle 105 due to analysis problems	oxygen bottle deleted
3	16	23	temperature difference between CTD and thermometer data = 2.01 - chemistry fine	delete thermometer data
3	11	17	No salt for bottle 575 due to analysis problems	salt bottle deleted
4	16	23	thermometer temperatures far too low yet chemistry fine. Thermometers may not have been set correctly	delete thermometer data
4	5	15	oxygen far too low	delete oxygen and bottle number
4	5	15	wrong oxygen had been deleted earlier (RP 4)	corrected
4	4	14	rosette position fired next shallowest depth	depth corrected
4	2	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
5	16	10	oxygen high, salt difference = 0.007	delete niskin
5	4	3	rosette position fired next shallowest depth	depth corrected
5	2	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
6	16	10	phosphate high but other chemistry does not show anomaly	delete phosphate
6	4	3	rosette position fired next shallowest depth	depth corrected
6	2	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
7	2	1	no thermometer data	delete thermometer numbers
7	2	6	no nutrient samples taken due to sampling error (see CTD sheet)	nuts tube numbers deleted
8	22	23	no nitrate peak detected by DAPA	edited in 0.13 determined from DAPA trace
8	4	3	rosette position fired next shallowest depth	depth corrected
8	2	1	no nutrient sample taken	delete nutrient tube number
8	2	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
9	24	23	no nitrate peak detected by DAPA	edited in 0.1 determined from DAPA trace
9	22	8	no thermometers on this niskin	delete thermometer numbers
9	9	24	salt sampled from next shallowest niskin	delete salt and bottle number
9	4	3	no samples taken as duplicates of rosette posn 2	delete niskin
9	3	14	no samples taken as duplicates of rosette posn 2	delete niskin
10	22	8	niskin leaked so not sampled	delete niskin
10	21	12	no salt or nutrient sample - no reason given	delete salt bottle and nuts tube numbers

Station	RP	NBN	Comments	Action
10	2	1	pressure difference 388dbars - temps and chemistry fine	delete unprotected data
11	14	16	salt difference = 0.031 but on steep gradient	accept
11	2	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
12	2	1	Thermometer and chemistry data indicates bottle fired wrong depth	delete niskin
13	12	5	from chemistry niskin leaked badly	delete niskin
13	2	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
14	2	1	bottom cap of niskin stuck open	delete niskin
15	18	6	from chemistry niskin leaked badly	delete niskin
15	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
16	16	19	conductivity ratio recorded as 9560 instead of 8560	corrected
16	10	3	CTD sheet says niskin clearly leaked - no samples	delete niskin
16	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
17	24	23	DAPA didn't integrate nitrate peak	manually measured and the value of 0.2 was edited into file
17	8	21	rosette position fired next shallowest depth	depth corrected
17	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
17	3	14	CTD sheet says niskin leaked - no samples	delete niskin
18	8	21	rosette position fired next shallowest depth	depth corrected
18	4	1	thermometers were accidentally reversed before they were read	delete thermometer numbers
19	24	23	temperature difference between CTD and thermometer data = 1.22 - chemistry fine	delete thermometer data
20	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
21	12	11	salt difference = 0.021. suspect niskin leak as silicate trace has dog lag as well	delete niskin
21	4	1	thermometers didn't reverse	delete thermometer numbers
21	4	1	rosette position fired next shallowest depth	depth corrected
22	12	11	niskin leaked	delete niskin
22	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
23	4	1	thermometers were accidentally reversed before they were read	delete thermometer numbers
23	4	1	rosette position fired next shallowest depth	depth corrected
24	21	11	CTD sheet says niskin leaked - no samples	delete niskin
24	4	1	thermometer data and chemistry except silicatesay bottle fired next shallowest depth	depth corrected and thermometer data deleted
25	17	2	conductivity ratio recorded as 9700 instead of 8700	corrected
25	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
25	2	20	oxygen far too high	delete oxygen and bottle number
26	16	10	nutrients typical of much deeper sample but oxygen and salt show no anomoly -nuts taken from wrong niskin	delete nutrients and tube number
26	4	1	thermometers didn't reverse	delete thermometer numbers
26	4	1	rosette position fired next shallowest depth	depth corrected
27	19	7	Salt difference (CTD-Hydro) = 0.032. Other chemistry fine	delete salt and bottle number
27	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
28	24	23	no 5 min wait for thermometers	delete thermometer numbers
28	10	3	rosette position fired next shallowest depth	depth corrected
28	4	1	no 5 min wait for thermometers	delete thermometer numbers
28	4	1	rosette position fired next shallowest depth	depth corrected

Station	RP	NBN	Comments	Action
28			rosette positions 1 and 2 fired at bottom and made all niskins out by one depth	corrected depths
29	4	1	niskin didn't close - thermometers OK	delete sample bottle numbers
30	20	12	Salt difference (CTD-Hydro) = 0.149. Possibly leaked	delete niskin
30	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
31	24	1	niskin fired at the bottom not at the surface	changed depth to 4842 db
31	23	8	as RP 24 fired at 4842 db the nitrate peak for RP23 was hidden by previous peak	no nitrate result
31	23	8	salt difference = 0.078 but on steep gradient	accept
31	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
31	3	14	phosphate high but other chemistry does not show anomoly	delete phosphate
32	23	8	salt difference = 0.053 but on steep gradient	accept
32	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
33	24	23	DAPA didn't integrate nitrate peak	manually measured and the value of 0.2 was edited into file
33	17	2	conductivity ratio recorded as 9445 instead of 8445	corrected
37	4	1	mercury in U/P thermometer fell through	delete 12088
38	10	19	niskin cap didn't seal so it wasn't sampled	delete niskin
39	21	23	DAPA didn't integrate nitrate peak	manually measured and the value of 0.1 was edited into file
39	20	12	bottom niskin cap lanyard caught in spigot so niskin not sampled	delete niskin
39	10	19	oxygen bottle number 188 was used twice in this station.	the correct bottle no. 186 was entered and the oxygen conc corrected.
40	21	23	first reading of first thermometer incorrectly entered	corrected
40	12	3	salt obviously wrong - trouble with analysis	delete salt
41	21	23	no 5 min wait for thermometers	delete thermometer data
41	20	12	DAPA didn't integrate nitrate peak	manually measured and the value of 0 was edited into file
42	21	23	DAPA didn't integrate nitrate peak	manually measured and the value of 0 was edited into file
42	10	19	niskin not sampled as the bleed valve was opened	delete niskin
42	3	14	fired at 2397 dbars	corrected depth
42	2	20	fired at 2397 dbars	corrected depth
42			rosette positions 1 and 2 fired at bottom and made all niskins out by one depth	corrected depths
43	4	1	niskin cap lanyard caught in spigot so niskin not sampled	delete niskin
48	5	15	top cap of niskin hadn't sealed so niskin not sampled	delete niskin
49	27	12	no salt sample	delete salt bottle number
51	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
52	2	20	rosette position fired next shallowest depth	depth corrected
55	20	23	DAPA didn't integrate nitrate peak	manually measured and the value of 0.1 was edited into file
55	12	12	conductivity ratio recorded as 0809 instead of 9809	corrected
55	5	15	conductivity ratio recorded as 8012 instead of 9012	corrected
58	2	20	oxygen sample appears to have been taken from next shallowest niskin	delete oxygen and bottle number
58			rosette positions 1 and 2 fired at bottom and made all niskins out by one depth	corrected depths
60	4	1	thermometer data and chemistry except silicate say that bottle fired next shallowest depth Silicate follows trend however	delete niskin
61	4	1	thermometer data and chemistry except silicate say that bottle fired next shallowest depth Silicate follows trend however	delete niskin

Station	RP	NBN	Comments	Action
62	5	15	salt difference = 0.008 at depth - bottle leaked	delete niskin
62	4	1	rosette position fired next shallowest depth - no 5 min wait on thermometers	depth corrected and thermometer data deleted
64	24	23	thermometer data had not been entered	entered it
64	23	12	salt difference = 0.055 but on steep gradient	accept
64	4	1	rosette position fired next shallowest depth	depth corrected
65	24	23	niskin fired at the bottom	corrected depth
65	12	12	all chemistry says niskin leaked - see CTD sheet	delete niskin
65	4	1	thermometer data and chemistry except silicate say that bottle fired next shallowest depth Silicate follows trend however	delete niskin
66	24	23	thermometer data had not been entered	entered it
66	17	6	no salt sample	delete salt bottle number
66	4	1	thermometer data and chemistry except silicate say that bottle fired next shallowest depth Silicate follows trend however	delete niskin
67	24	23	thermometer data had not been entered	entered it
67	14	6	niskin cap lanyard caught in niskin so niskin not sampled	delete niskin
68	24	23	niskin fired at the bottom	corrected depth
68	4	1	thermometer data and chemistry except silicate say that bottle fired next shallowest depth Silicate follows trend however	delete niskin
68			trouble with analysis of salinities	delete all salts
69	1	3	rosette position didn't fire so depths were wrong	corrected depths
70	24	23	DAPA didn't integrate nitrate peak	manually measured and the value of 0.1 was edited into file
71	22	11	nutrients taken from next deepest niskin	delete nutrients and tube number
73	17	6	Salt far too low - other chemistry fine	delete salt
73	11	17	conductivity ratio entered incorrectly	corrected
73	4	1	thermometers didn't reverse	delete thermometer numbers
75	24	23	first reading of thermometer 26038 was entered incorrectly	corrected
76	24	23	DAPA didn't integrate nitrate peak	manually measured and the value of 0 was edited into file
77	14	16	niskin cap lanyard caught in niskin so niskin not sampled	delete niskin
78	24	23	DAPA didn't integrate nitrate peak	manually measured and the value of 0.1 was edited into file
78	16	2	oxygen analysis problems	delete bottle number
79	24	23	DAPA didn't integrate nitrate peak	manually measured and the value of 0.2 was edited into file
82	24	23	DAPA didn't integrate nitrate peak	manually measured and the value of 0.2 was edited into file
82	8	21	phosphate high but other chemistry does not show anomoly	delete phosphate
82	4	1	not sampled - no reason given	delete bottle numbers
82	3	14	niskin leaked - no samples taken	delete niskin number
82	2	20	not sampled - no reason given	delete niskin
82	1	3	not sampled - no reason given	delete niskin
83	24	23	thermometer data not entered	entered it
83	3	14	all chemistry shows niskin leaked	delete niskin
85	15	4	niskin not sampled - see CTD sheet	delete niskin
85	3	14	oxygen far too high	delete oxygen and bottle number
85	1	3	oxygen sample did not dissolve fully	delete bottle number
86	24	23	oxygen bottle broke	delete bottle number
86	8	21	nutrients sampled from niskin 24	delete nutrients and tube number
86	4	1	pressure difference 465dbars - temps and chemistry fine	delete unprotected data
89	24	23	DAPA didn't integrate nitrate peak	manually measured and the value of 0.2 was edited into file
89	4	1	no thermometers read	delete thermometer numbers
91	23	12	Salt difference (CTD-Hydro) = 0.406. Other chemistry fine	delete salt and bottle number

CCHDO Data Processing Notes

Date	Person	Data Type	Action	Summary
2000-11-20	*James Crease*	CTD/BTL/SUM	Submitted	Submitted
2000-11-27	*Danie Bartolacci*	CTD/BTL/SUM	Website Updated:	Data added to website
	I have obtained the CTD and bottle data for 09FA9605. Both files are unformatted. Bottle data contains salinity in psu (needs converting) and oxygen, nitrate, silicate, phosphate only and all are in umol/l (need converting to umol/kg). Data has been linked in AS-IS condition with a note that reformatting is pending. Sumfile will need to be created from bottle file information.			
2000-11-28	*Terry Byrne*	CTD/BTL	Website Updated:	Status Changed to Public
	The conditions of use are not meant to override any standing agreements. I have not checked, but I presume there was some formal arrangement already in place, and there is no intention to vary this, so go ahead and use the data in the usual WOCE way. - T. Byrne Terry, I understood your provision of the data to me and the WOCE WHPO DAC implied that you were placing no restriction on their distribution as part of the WOCE dataset. Your Marlin database embargoed it fro 2 years after 1996 as I understand it. - J. Crease			
2000-12-11	*Dave Muus*	CTD/BTL/SUM	Website Updated:	Data Reformatted/OnLine
	Notes on formatting ISS3_a SUMMARY, BOTTLE and CTD files. (dated Dec 11, 2000/dm) R.V. Franklin May 7-31, 1996 EXPOCODE 09FA9605 1. Made WOCE formatted files from information in Australian files: ctd_format.htm aodc.txt hydro_format.htm f9605hyd.txt fr9605cd.txt 2. SUMMARY file: a) Original bottom depth labeled "Sonic depth at bottom in meters". (iss3_asu.txt) Put this value in uncorrected depth slot but do not know if value has been corrected per Carter Table. Do not know when bottom depth recorded: BE or BO? Put in BO slot. Bottom depth for Station 6 is missing on all sources. Max pressure bottle or ctd? 3. BOTTLE file: a) Only temperature in bottle file is DSRT. Used temp from CTD file (iss3_ahy.txt) for nearest CTD pressure to bottle file pressure. Always within one decibar. 4. CTD files: a) CTDO apparently not corrected. (iss3_a00xx.wct) Quality code 8888 not accepted by wctcvt			
2001-01-03	*Dave Muus*	CTD	Website Updated:	Reformatted data online
	Notes on ISS3a CTD file reformatting to exchange format. Jan 3, 2001 dm 1. Could not find any instructions on CTD file name format. I used "iss3a00ss_ct1.csv" where ss is station number to be consistent with WOCE file name format. "A01E_STN_sss_ct1.csv" where sss is station number was used for A01E ctd data. 2. Some header designations differ between Exchange Instructions and Exchange example. Instructions Example SECT_ID SECTION_ID STNNBR STATION CASTNO CAST DEPTH BOTTOM I used Instructions since they match BOTTLE instructions and WOCE designations. 3. CTD oxygen appears to be uncorrected. Noted in header comments. 4. No quality code information available.			

2001-01-19	*Danie Bartolacci*	CTD/BTL	Website Updated:	Reformatted Exchange files online
	I have replaced the current on line bottle and ctd files with the newly reformatted Exchange files created by D. Muus. All notes on editing are located in original/2001.01.18_ISS3_FRMTD_DMUUS all references have been updated to reflect this change, including a link to the Exchange file format description.			
2002-01-30	*Danie Bartolacci*	SUM	Website Updated:	SUM file added to website
	WOCE formatted sumfile created by D. Muus has been added to the website. Notes on file creation and bottle/CTD reformatting will be emailed separately to meta data manager. Index page has been edited to reflect this update. No WOCE formatted bottle or CTD files exist still, only CTD and bottle exchange files.			