

Table 1 Summary of offsets in TCO2, Talk and pH for the crossover locations in the North and South Atlantic

Nominal position Longitude Latitude	Cruise name/ WOCE line	Actual position		CO ₂ parameters compared ^a	Date of occupation	Station	TCO ₂			TALK			pH			pCO ₂		
		Longitude	Latitude				Average	StdDev	R ²	Average	StdDev	R ²	Average	StdDev	R ²	Average	StdDev	R ²
66° W 24.2° N	A22	65.997° W	23.535° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	24Aug1997	42			0.753			0.767			0.611			
	A22	66.001° W	24.204° N	Hydro.,Nutr.	25Aug1997	43												
	A22	65.999° W	24.874° N	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pi	25Aug1997	44	-1.9	1.1	0.804	-1.4	2.4	0.892	-0.0015	0.0031	0.730			
	A5	65.34° W	24.506° N	Hydro.,Nutr.	10Aug1992	83												
	A5	66° W	24.499° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	10Aug1992	84	-3.4	3.1	1.000	-2.1	4.7	0.892	0.0383	0.0113	0.364			
66° W 24.2° N	A5	66.665° W	24.501° N	Hydro.,Nutr.	10Aug1992	85												
	A22	65.997° W	23.535° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	24Aug1997	42			0.753			0.767			0.611			
	A22	66.001° W	24.204° N	Hydro.,Nutr.	25Aug1997	43												
	A22	65.999° W	24.874° N	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pi	25Aug1997	44	-0.9	2.0	0.804	-1.4	2.4	0.892	-0.0016	0.0031	0.730			0.729
	A5R	65.469° W	24.501° N	Hydro.,Nutr.,pH	14Feb1998	84												
66° W 24.2° N	A5R	65.2° W	24.5° N	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pi	15Feb1998	85	-3.4	4.6	0.714	-0.3	3.0	0.870	0.0119	0.0012	0.625	6.8	3.6	0.280
	A5R	66.939° W	24.5° N	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pi	15Feb1998	86	-1.5	0.4	0.909	9.0	10.4	1.000	0.0148	0.0022	0.708	7.0	4.0	0.952
	A20	52.341° W	24.854° N	Hydro.,Nutr.	30July1997	46												
	A20	52.342° W	24.186° N	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pi	30July1997	47			0.984			0.961			0.915			
	A20	52.342° W	23.514° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	31July1997	48	-0.7	0.1	0.979	0.8	0.8	0.970	-0.0008	0.0020	0.852			
52.3° W 24.2° N	A5	51.664° W	24.501° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	4Aug1992	62	-0.7	2.3	0.999				-0.0016	0.0059	0.999			
	A5	52.25° W	24.5° N	Hydro.,Nutr.	4Aug1992	63												
	A5	52.833° W	24.5° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	5Aug1992	64	-4.5	5.9	1.000	-6.0	9.9	0.974	0.0051	0.0371	0.200			
	A20	52.341° W	24.854° N	Hydro.,Nutr.	30July1997	46												
	A20	52.342° W	24.186° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	30July1997	47			0.971			0.976			0.908			
52.3° W 24.2° N	A20	52.342° W	23.514° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	31July1997	48	-0.7	1.4	0.979	0.6	0.7	0.969	-0.0004	0.0020	0.869			
	A5R	51.533° W	24.5° N	Hydro.,Nutr.	8Feb1998	64												
	A5R	52.637° W	24.5° N	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pi	9Feb1998	66	-2.5	2.8	0.886	-4.5	1.4	0.975	0.0130	0.0003	0.789			
	A5R	53.183° W	24.499° N	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pi	9Feb1998	67	-5.7	1.0	0.975	-6.9	3.9	0.992	0.0123	0.0009	0.880			
	A20	50.815° W	43.01° N	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pi	20July1997	6												
50° W 43.5° N	A20	50.879° W	42.93° N	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pi	20July1997	7												
	A20	50.905° W	42.894° N	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pi	20July1997	8			0.903			0.751						
	A20	50.97° W	42.817° N	Hydro.,Nutr.,pCO ₂	20July1997	9												
	A20	51.122° W	42.835° N	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pi	20July1997	10	-3.9	5.0	0.287	-10.9	11.2	0.176						
	A02	48.997° W	43.138° N	Hydro.,Nutr.,TCO ₂ ,TALK	30June1997	334	2.7	0.9	0.948	-11.4	13.9	0.827						
	A02	49.115° W	43.195° N	Hydro.,Nutr.	30June1997	335												
	A02	49.37° W	43.253° N	Hydro.,Nutr.,TCO ₂ ,TALK	30June1997	336	-6.9	9.8	0.936									
	A02	49.582° W	43.335° N	Hydro.,Nutr.,TCO ₂ ,TALK	30June1997	337												
	A02	50.005° W	43.503° N	Hydro.,Nutr.	30June1997	338												
	A6	44.667° W	7.493° N	Hydro.,Nutr.	18Feb1993	139									0.970			
44.5° W 7.4° N	A6	44.001° W	7.467° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	18Feb1993	140			0.786			0.502						
	A17	44.004° W	7.126° N	Hydro.,Nutr.,pH	11March1994	200							-0.0509	0.0487	0.821			
	A17	44.508° W	7.416° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	12March1994	201	5.4	14.9	0.832	2.2	11.8	0.933	-0.0477	0.0497	0.615			
	A17	45.014° W	7.711° N	Hydro.,Nutr.,TCO ₂ ,pH	12March1994	202							-0.0512	0.0456	0.848			
	A17	39.735° W	30.889° S	Hydro.,Nutr.,TCO ₂ ,TALK,pH	30Jan1994	72			0.715			0.951						
39° W 30° S	A17	39.38° W	30.489° S	Hydro.,Nutr.,TCO ₂ ,pH	31Jan1994	73												
	A17	39.036° W	30.099° S	Hydro.,Nutr.,pH	31Jan1994	74												
	A17	38.686° W	29.701° S	Hydro.,Nutr.,TCO ₂ ,TALK,pH	31Jan1994	75	-6.0	4.4	0.769	0.0	2.2	0.784						
	A17	38.344° W	29.314° S	Hydro.,Nutr.,pH	31Jan1994	76												
	A10	39.53° W	30.003° S	Hydro.,Nutr.	3Jan1993	10												
	A10	39.35° W	30° S	Hydro.,Nutr.,TCO ₂ ,TALK	4Jan1993	11	2.0	3.5	0.872	25.1	2.5	0.847						
	A10	38.917° W	30.003° S	Hydro.,Nutr.	4Jan1993	12												
	A10	38.522° W	30° S	Hydro.,Nutr.,TCO ₂	4Jan1993	13	0.5	3.9	0.726									
	A10	38° W	30.001° S	Hydro.,Nutr.	4Jan1993	14												
	36.6° W 54° N	A24	36.501° W	54.367° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	21June1997	114											
A24		35.933° W	53.883° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	22June1997	115			0.710			0.492						
A01W		36.82° W	54.34° N	Hydro.,Nutr.,TCO ₂ ,TALK	19June1995	55	0.5	0.7	0.616	15.3	4.9	0.296						
A01W		36.635° W	53.681° N	Hydro.,Nutr.,TCO ₂ ,TALK	19June1995	57	-1.3	2.3	0.913	-8.6	17.6	0.277						
A01W		36.457° W	53.021° N	Hydro.,Nutr.,TCO ₂ ,TALK	20June1995	58	-1.0	2.2	0.725	4.0	9.8	0.563						
35° W 7.5° N	A6	36° W	7.45° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	22Feb1993	154			0.603			0.519			0.995			
	A6	35.507° W	7.45° N	Hydro.,Nutr.	22Feb1993	155												
	A6	34.999° W	7.448° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	22Feb1993	156	-15.5	8.3	0.894	-15.4	5.2	0.894	0.0042	0.0057	0.989			
	A6	34.501° W	7.449° N	Hydro.,Nutr.	23Feb1993	157												
	A6	34° W	7.449° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	23Feb1993	158	-11.7	12.1	0.818	-9.5	10.6	0.882	0.0096	0.0055	0.988			
	A7	35° W	6.582° N	Hydro.,Nutr.	6Feb1993	117												
	A7	34.999° W	7.001° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	6Feb1993	118												
	A7	35° W	7.499° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	7Feb1993	119	-13.0	2.5	0.581	-8.7	5.4	0.151	0.0102	0.0063	0.989			
35° W 2° N	A17	34.444° W	1.585° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	6March1993	180									0.873			
	A17	34.946° W	1.874° N	Hydro.,Nutr.,pH	7March1993	181							-0.0001	0.0008	0.903			
	A17	35.447° W	2.168° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	7March1993	182			0.935			0.939	-0.0106	0.0009	0.895			
	A17	35.948° W	2.46° N	Hydro.,Nutr.,pH	7March1993	183							-0.0208	0.0030	0.962			
	A7	35.001° W	1.499° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	4Feb1993	110	-26.1	2.6	0.271	-15.5	6.9	0.021	0.0351	0.0384	0.980			
	A7	35° W	2.083° N	Hydro.,Nutr.	4Feb1993	111												
	A7	35.003° W	2.75° N	Hydro.,Nutr.,TCO ₂ ,TALK,pH	5Feb1993	112	-15.5	10.9	0.835	-8.5	2.0	0.093	0.0380	0.0343	0.889			
31.6° W 45.8° N	A01W	31.634° W	46.311° N	Hydro.,Nutr.,TCO ₂ ,TALK	25June1995	77			0.755			0.201						
	A01W	31.314° W	45.653° N	Hydro.,Nutr.,TCO ₂ ,TALK	26June1995	78	0.6	1.5	0.757	1.2	14.4	0.924						
	A01W	30.996° W	45° N	Hydro.,Nutr.	26June1995	79	-6.6	5.3	0.954	-10.0	2.7	0.110						

Nominal position Longitude/Latitude	Cruise name/ WOCE line	Actual position		CO ₂ parameters compared*	Date of occupation	Station	TCO ₂			TALK			pH			pCO ₂		
		Longitude	Latitude				Average	StdDev	R ²	Average	StdDev	R ²	Average	StdDev	R ²	Average	StdDev	R ²
	A07	5.5° E	4.5° S	Hydro.,Nutr.,TCO ₂ ,TALK,pH	5Jan1993	15	3.8	7.8	0.8575									
	A07	4.834° E	4.5° S	Hydro.,Nutr.	6Jan1993	16												
	A07	4.331° E	4.499° S	Hydro.,Nutr.,TCO ₂ ,TALK,pH	6Jan1993	17	11.9	1.7	0.748									
	A07	3.834° E	4.333° S	Hydro.,Nutr.,TCO ₂ ,TALK,pH	6Jan1993	18	-5.9	9.4	0.3512									
5° E 11.5° S	A13	5.001° E	12.5° S	Hydro.,Nutr.,TCO ₂	17March1995	195												
	A13	5° E	12° S	Hydro.,Nutr.	17March1995	196												
	A13	5.001° E	11.5° S	Hydro.,Nutr.	17March1995	197												
	A13	4.997° E	10.999° S	Hydro.,Nutr.,TCO ₂	17March1995	198	3.9	2.9	0.9266									
	A13	5.001° E	10.5° S	Hydro.,Nutr.	18March1995	199												
	A08	4.001° E	11.334° S	Hydro.,Nutr.,TCO ₂ ,CALK,pH	28April1994	254	2.6	0.9	0.8943									
	A08	4.667° E	11.334° S	Hydro.,Nutr.	29April1994	255												
	A08	5.333° E	11.334° S	Hydro.,Nutr.,TCO ₂ ,CALK,pCO ₂	29April1994	256	1.8	0.3	0.9316									
	A08	6° E	11.334° S	Hydro.,Nutr.	30April1994	257												
5° E 19° S	A13	5.001° E	20° S	Hydro.,Nutr.,TCO ₂	13March1995	179			0.981									
	A13	5° E	19.449° S	Hydro.,Nutr.	13March1995	180												
	A13	5° E	19.001° S	Hydro.,Nutr.	13March1995	181												
	A13	4.997° E	18.502° S	Hydro.,Nutr.,TCO ₂	13March1995	182	-3.0	2.1	0.995									
	A13	5° E	18° S	Hydro.,Nutr.	14March1995	183												
	A09	4.398° E	18.997° S	Hydro.,Nutr.	11March1991	211												
	A09	4.925° E	19.002° S	Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂	11March1991	212	-2.6	1.8	0.995									
	A09	5.453° E	18.998° S	Hydro.,Nutr.	11March1991	213												
	A09	5.975° E	18.998° S	Hydro.,Nutr.,TCO ₂ ,CALK,pCO ₂	12March1991	214	-5.8	0.8	0.991									
7° E 22.6° S	A13	7.465° E	23.417° S	Hydro.,Nutr.	10March1995	166												
	A13	7.317° E	23.209° S	Hydro.,Nutr.	10March1995	167												
	A13	7.161° E	22.999° S	Hydro.,Nutr.	11March1995	168												
	A13	7.016° E	22.794° S	Hydro.,Nutr.	11March1995	169												
	A13	6.813° E	22.511° S	Hydro.,Nutr.,TCO ₂	11March1995	170			1									
	A13	6.612° E	22.233° S	Hydro.,Nutr.	11March1995	171												
	A13	6.412° E	21.949° S	Hydro.,Nutr.	11March1995	172												
	A13	6.2° E	21.683° S	Hydro.,Nutr.,TCO ₂	11March1995	173	5.2	1.8	0.9549									
	A09	6.008° E	23.397° S	Hydro.,Nutr.	14March1991	216												
	A09	6.517° E	22.948° S	Hydro.,Nutr.,TCO ₂ ,CALK,pCO ₂	14March1991	217	-1.3	2.8	0.978									
	A09	7.028° E	22.502° S	Hydro.,Nutr.	14March1991	218												
	A09	7.55° E	22.05° S	Hydro.,Nutr.	14March1991	219												
	A09	7.548° E	21.643° S	Hydro.,Nutr.	15March1991	220												
10° E 29.8° S	A13	10° E	30.7° S	Hydro.,Nutr.,TCO ₂	3March1995	148			0.9614									
	A13	10° E	30.232° S	Hydro.,Nutr.	4March1995	149												
	A13	9.951° E	29.765° S	Hydro.,Nutr.	4March1995	150												
	A13	9.841° E	29.3° S	Hydro.,Nutr.,TCO ₂	4March1995	151	0.6	1.2	0.9622									
	A13	9.752° E	28.846° S	Hydro.,Nutr.	4March1995	152												
	A10	9.277° E	29.745° S	Hydro.,Nutr.,TCO ₂	25Jan1993	87	5.8	4.0	0.9811									
	A10	10.144° E	29.75° S	Hydro.,Nutr.	25Jan1993	88												
	A10	10.947° E	29.75° S	Hydro.,Nutr.,TCO ₂ ,TALK	26Jan1993	89	1.4	1.7	0.9139									
10° E 40° S	A13	10.582° E	39.601° S	Hydro.,Nutr.	26Feb1995	128												
	A13	9.997° E	39.999° S	Hydro.,Nutr.	27Feb1995	129												
	A13	10.002° E	39.502° S	Hydro.,Nutr.,TCO ₂	27Feb1995	130			0.8484									
	A13	9.999° E	38.999° S	Hydro.,Nutr.	27Feb1995	131												
	A12B	10.783° E	40.317° S	Hydro.,Nutr.	27May1992	550												
	A12B	10.2° E	40.833° S	Hydro.,Nutr.,TCO ₂	28May1992	551	-7.8	3.5	0.8163									
	A12B	9.4° E	41.05° S	Hydro.,Nutr.,TCO ₂	28May1992	552	-5.6	8.0	0.841									
OVERLAPPING CRUISES							multi linear regression			multi linear regression								
23.85° W 24.5° N	A5R			Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pI	28Jan1998	22	Average	StdDev	#	Average	StdDev	#						
69.13° W 24.5° N	A5R			Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pI	16Feb1998	89	0.4	3.0	534	0.0	4.4	313						
23.34° W 24.5° N	A5			Hydro.,Nutr.,TCO ₂ ,TALK,pH	24July1992	17	-1.6	8.1	144	0.0	7.7	159						
69.33° W 24.5° N	A5			Hydro.,Nutr.,TCO ₂ ,TALK,pH	11Aug1992	89												
25° W 1° N	A16S			Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pI	16July1991	7	-6.2	2.8	12	1.2	4.2	282						
25° W 4° S	A16S			Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pI	20July1991	12												
25° W 4° S	A16N			Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pI	8July1993	4	0.1	16.6	9	0.0	6.8	99						
25° W 1° N	A16N			Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pI	10July1993	14												
41.96° W 58.84° N	A24			Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pI	19June1997	103	0.5	1.7	167	3.6	1.9	151						
37.07° W 54.84° N	A24			Hydro.,Nutr.,TCO ₂ ,TALK,pCO ₂ ,pI	21June1997	114												
41.73° W 58.59° N	A01W			Hydro.,Nutr.,TCO ₂ ,TALK	17June1995	44	-0.5	1.5	111	-2.8	16.0	200						
37.07° W 55.03° N	A01W			Hydro.,Nutr.,TCO ₂ ,TALK	19June1995	55												

note, all values are the difference between the first station and the second (or subsequent one). The difference between stations on a particular cruise is an indication of the station to station quality control
Average= average difference of 10 equispaced points on the least squares 2nd order polynomial line of property versus sigma 4 between nominally sigma 4= 45.5 and 46.1
st dev = standard deviation of 10 equispaced points on the least squares 2nd order polynomial line of property versus sigma 4 between nominally sigma 4= 45.5 and 46.1
R² = goodness of fit for the line

Overlapping cruises

A multi-linear fit of the form: TCO₂= a S + b Theta + c AOU + D NO₄ + e Si and:

TA = A S + b Theta + d Si + e NO₃

was created for the combined dataset and the average difference between the calculated values (from the fit) and observed points was determined

Nominal position		Cruise name/	Actual position		CO ₂ parameters compared*	Date of		TCO ₂			TALK			pH			pCO ₂		
Longitude	Latitude	WOCE line	Longitude	Latitude		occupation	Station	Average	StdDev	R^2	Average	StdDev	R^2	Average	StdDev	R^2	Average	StdDev	R^2

Nominal position		Cruise name/	Actual position		CO ₂ parameters compared*	Date of		TCO ₂			TALK			pH			pCO ₂		
Longitude	Latitude	WOCE line	Longitude	Latitude		occupation	Station	Average	StdDev	R^2	Average	StdDev	R^2	Average	StdDev	R^2	Average	StdDev	R^2

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