GO-SHIP Reference Sections

GO-SHIP Reference Sections are repeat hydrographic sections that are coast-to-coast or coast-to-ice, follow standard WOCE lines with small modifications as necessary for territorial waters, ice coverage, etc., and maintain the standard WOCE sampling strategy. Sections labelled in **bold text** are sections that are re-occupied on a decadal timescale; sections in normal text are sections that are repeated more frequently (1-3 years). A table of measurements for each cruise is provided at the end of this document.

Last updated: May 2010 *Please send updates to maria.hood@ioccp.org*

ATLANTIC			
Section	**Description (ship track)**	**Last Occupation Chief Scientist Country**	**Next Occupation Chief Scientist Country**
A01E / AR7E	Greenland to Ireland	2007 G.-J. Brummer Netherlands	2011 H. van Aken Netherlands *Pelagia* Measurements
A01W / AR7W	From Labrador to Greenland 53°N 56°W to 61°N 48°W; 1/year (spring)	2009 R. Hendy Canada 2009 M. Rhein Germany	2010 G. Harrison (Chief Sci / bio); I. Yashayaev (phys); K. Azetsu-Scott (chem.) Canada *CCGS Hudson* Measurements 2011 (August) M. Rhein Germany *RV Meteor (2010)* Measurements
A02 *(SFB-460)*	~ 48° N, Ireland to St John's Bay, Canada.	2007 (full line) / 2009 (western part) M. Rhein Germany	2010-13 M. Rhein Germany *RV Meteor (2010)* Measurements

A05	24° N (note: this line is part of the UK RAPID program with repeats every ~ 5 years).	2004 S. Cunningham UK	2010 S. Cunningham UK *RV Discovery* Measurements 2010 P. Velez Spain *RV Sarmiento de Gamboa* Measurements
A10 **A 9 ½**	30°S 24° S	2009 (A 9 ½) B. King UK	2011 (A10) M. Baringer USA Measurements
A16 N	20 – 25° W Iceland to 5° S	2003 J. Bullister USA	2013 R. Wanninkhof USA Measurements
A16S	25 - 35° W, 5° S to 60° S	2005 R. Wanninkhof USA	2014 R. Wanninkhof USA Measurements
A20	52°W	2003 J. Toole USA	2012 J. Swift USA Measurements
A22	66°W	2003 T. Joyce USA	2012 J. Swift USA Measurements
A21 / SR1b (eastern passage)	Drake Passage (*note: SR1b repeated annually with CTD, SADCP, LADCP*)	2009 A21 and SR1b E. McDonagh UK 2009 C. Provost France (full physics, chem., and tracers)	2010 SR1b E. McDonagh UK Measurements

A13.5	0°; Cape Town to Ghana	2003 M. Hoppema Germany	2010 J. Bullister USA *Ronald H. Brown* Measurements
SR04	Section from tip of Antarctic Peninsula to Kapp Norvegia (approx 12° W) along the northern edge of the Weddell gyre (nominally 60° S); often done as a pair with A12.	2009/10 B. King UK	2011 E. Fahrbach / M. Hoppema Germany / Netherlands *FS Polarstern* Measurements
A12	Capetown to the Antarctic continent along the prime meridian; often done in a pair with SR04.	2008 E. Fahrbach / H. De Baar Germany / Netherlands	2011 E. Fahrbach / M. Hoppema Germany / Netherlands *FS Polarstern* Measurements
OVIDE (A25)	Iberian Peninsula – Greenland	2008 A. Rios Spain	2010 H. Mercier France *Thalassa* Measurements
FICARAM (A17)	Ushuaia – Cartagena (Spain), following part of the line WOCEA A17 and from 10°S to 36°N along 28°W	2006 A. Rios Spain	2013 A. Rios Spain Measurements

PACIFIC			
Section	**Description (ship track)**	**Last Occupation Chief Scientist Country**	**Next Occupation Chief Scientist Country**
P01	47° N	2007 T. Kawano Japan	Unknown
P14 N	Aleutians intersection with P01 and northward.	2007 T. Kawano and A. Murata Japan	Plan is for approximately decadal occupation of P14 by Japan.

P02	30° N	2004 J. Swift USA	2013 J. Swift USA Measurements
P03	24°N; Okinawa to San Diego.	2006 Kawano, Murata, and Watanabe Japan	To be conducted by JMA. Japan
P06	30°S	2009 A. MacDonald/R. Curry USA	Unknown
P21	17°S	2009 A. Murata Japan	Plan is for decadal occupations by Japan
P09	137°E	1994 I. Kaneko Japan	2010 T. Nakano Japan *RV Ryofu Maru III* Measurements
P10	147° E	2005 T. Kawano Japan	Plan is for decadal occupations by Japan
P13	165°E	1992 J. Bullister USA	2011 T. Nakano Japan *RV Ryofu Maru III* Measurements
P14S / C	174°E (done along with S04I / S04P)	2007 T. Kawano / A. Murata Japan	2013 T. Kawano Japan *RV Mirai* Measurements
P15S	Equator – 50°S 175°W (strategy calls for section to go to 67° S when possible).	2009 B. Sloyan Australia	Unknown
P16N / S	150° W (55°N-15°S / 15°S –to ice S)	2005 (P16S) B. Sloyan and J. Swift USA 2006 (P16N) R. Feely USA	2014 R. Feely/J. Swift USA Measurements

P18	110° W	2008 J. Bullister and G. Johnson USA	Unknown
SR03	Tasmania to Antarctic Continent, 140 – 145° E	2007 S. Rintoul Australia	2010 S. Rintoul Australia *Aurora Australis* Measurements
S04P (modified)	Nominal 67° S; McMurdo to Punta Arenas; connects to S04I and SR04 (Atlantic) with sections from 67 to the continent along P14, P15, P16, and P18.	1992 Koshlyakov and Richman Russia	2011 J. Swift USA *Nathaniel B. Palmer* Measurements

INDIAN			
Section	**Description (ship track)**	**Last Occupation Chief Scientist Country**	**Next Occupation Chief Scientist Country**
I01W	8°N, Oman to Sri Lanka	1995 J. Morrison USA	Unknown
I01E	8°N, Sri Lanka to Singapore	1995 H. Bryden USA	Unknown
I02 + I10	I02 (10°S) + I10 (8°-25° S at 111°E) **note: may be changed to I8N + I5E + I10 for security reasons.*	1995 J. Sprintall USA	2011-12 A. Murata Japan *RV Mirai* Measurements
I05	32°S, Durban to Freemantle	2009 J. Swift USA	Unknown
I06S	30° E Cape Town to Antarctic Continent	2008 K. Speer USA	Unknown
I07N	65° - 55° E, Oman to Mauritius	1995 J. Toole/D. Olson USA	Postponed indefinitely for security reasons
I09N	95° E, 28° - 4° S	2007 J. Sprintall USA	Unknown

I08S	95 - 82°E from 27° S to Antarctic Continent	2007 J. Swift USA	Unknown
I09S	115° E	2005 S. Rintoul Australia	2012 S. Rintoul Australia *Aurora Australis* Measurements
S04I	Section connecting I09S and S04P at ~ 60° S; S04/S04I + P14S, 62° S (33.5° E-168° E) + 174° E	1996 J. Swift USA	2013 T. Kawano Japan *RV Mirai* Measurements

ARCTIC			
Section	**Description (ship track)**	**Last Occupation Chief Scientist Country**	**Next Occupation Chief Scientist Country**
75°N	Iceland – Greenland.	2009 T. Johannessen and A. Olsen Norway	2011 T. Johannessen and A. Olsen Norway Measurements
Barrow to Svalbard	Barrow Alaska to Svalbard Norway	2005 L. Anderson Sweden	2012 L. Anderson Sweden Measurements
Davis Straits	Baffin Island to Greenland	2009 C. Lee and B. Petrie USA and Canada	2010 C. Lee and K. Azetsu-Scott USA and Canada *R/V Knorr* Measurements
Barrows and Nares Straits	Barrow Strait (74.09° N 90.44° W to 74.83° N 93.00° W); Nares Strait (occupied irregularly)	2009 J. Hamilton Canada	2010 J. Hamilton Canada *CCGS Henry Larsen* Measurements

RUSALCA	Bering and Chukchi Seas	2009 R. Woodgate USA	2010 R. Woodgate USA *RV Professor Khromov* Measurements

GO - SHIP

TOWARDS A SUSTAINED GLOBAL SURVEY OF THE OCEAN INTERIOR

GO-SHIP Reference Sections Measurement Tables

GO-SHIP Reference Sections are repeat hydrographic sections that are coast-to-coast or coast-to-ice, follow standard WOCE lines with small modifications as necessary for territorial waters, ice coverage, etc., and maintain the standard WOCE sampling strategy. Sections labeled in **bold text** are sections that are re-occupied on a decadal timescale; sections in normal text are sections that are repeated more frequently (1-3 years). Column header explanations are given at the end of the document. The following list of measurements does not constitute a list of core or recommended variables, but is provided to facilitate collaborations among groups. For cruises beyond 2010, measurements listed are provisional only. Cruises left blank have not yet been planned.

Last updated: May 2010

Please send updates to maria.hood@ioccp.org

	CTD O2	CTD trans	S-ADCP	L-ADCP	SAL	Dis. O2	NO3 /NO2	PO4	SiO3	NH4+	DIC	TA	pCO2	pH	UW t,s, pCO2	CFCs	SF6/CCL4	Trit / He	13C	14C	TOC / DOC	TDN	Biology	Fe / other	UW other
ATLANTIC																									
A01E / AR7E (2011)	Y	N	Y	Y	Y	N	N	N	N	N	Y	Y	N	Y	N	Y	Y	N	N	N	N	N	N	N	N
A01W / AR7W Canada (2010) Germany (2011)	Y Y	N N	Y Y	Y Y	Y Y	Y Y	Y N	Y N	Y N	N N	Y N	Y N	N N	Y N	N N	Y Y	Y Y	N N	N N	N N	Y N	N N	Y N	N N	N N
A02 *(SFB-460)*(2010)	Y	N	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N
A05 UK (2010) Spain (2010)	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	Y Y	N N	Y Y	Y Y	N Y	N Y	N Y	Y N	Y N	N N	N N	N N	N Y	Y N	N N	N N	Y Y*
A10 (2011)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	Y*
A 9 ½																							N		
A16N (2012/13)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y*
A16S (2012/13)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y*
A20 (2012)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y*
A22 (2012)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y*

A21 / SR1b (2010)	Y	N	Y	Y	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
A13.5 (2010)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	Y*
SR04 (2011)	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y	N	N	N	N	Y	N	Y*
A12 (2011)	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	Y	Y	N	Y	N	N	Y	N	Y*
OVIDE (A25) (2010)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	N	Y	N	N	N	N	N
FICARAM (A17) (2010)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y	N	N	N	N	N	N	N	N	N	N

➔ *RETURN TO REFERENCE SECTION TABLE*

	CTD O2	**CTD trans**	**S-ADCP**	**L-ADCP**	**SAL**	**Dis. O2**	**NO3 /NO2**	**PO4**	**SiO3**	**NH4+**	**DIC**	**TA**	**pCO2**	**pH**	**UW t,s, pCO2**	**CFCs**	**SF6/CCL4**	**Trit / He**	**13C**	**14C**	**TOC / DOC**	**TDN**	**Biology**	**Fe / other**	**UW other**
PACIFIC																									
P01																									
P14 N																									
P02 (2013)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	N	N	Y*
P03																									
P06																									
P21																									
P09 (2010)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	Y	N	Y	N	Y	N	Y*
P10																									
P13 (2011)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	N	Y	N	Y	N	Y	N	Y*
P14S/C (2013)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	N	Y	Y	N	N	Y	N	N
P15S																									
P16N / S (2014)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y*
P18																									
SR03 (2010)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	N	Y	N	N	Y	Y	Y	Y	N	N	N

S04P (2011)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y*

➔ RETURN TO REFERENCE SECTION TABLE

	CTD O2	CTD trans	S-ADCP	L-ADCP	SAL	Dis. O2	NO3 /NO2	PO4	SiO3	NH4+	DIC	TA	pCO2	pH	UW t,s, pCO2	CFCs	SF6/CCL4	Trit / He	13C	14C	TOC / DOC	TDN	Biology	Fe / other	UW other
INDIAN																									
I01W																									
I01E																									
I02 + I10 (2011-12)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	Y	Y	N	N	Y	Y	N	N	Y	N	Y*
I05																									
I06S																									
I07N																									
I09N																									
I08S																									
I09S (2012)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	N	Y	N	N	Y	Y	Y	Y		N	N
SO4I+SO4P+ P14S (2013)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	Y	Y	Y	N	N	Y	Y	N	N	Y	N	Y*

➔ RETURN TO REFERENCE SECTION TABLE

	CTD O2	CTD trans	S-ADCP	L-ADCP	SAL	Dis. O2	NO3 /NO2	PO4	SiO3	NH4+	DIC	TA	pCO2	pH	UW t,s, pCO2	CFCs	SF6/CCL4	Trit / He	13C	14C	TOC / DOC	TDN	Biology	Fe / other	UW other
ARCTIC																									
75°N (2011)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	Y	N	N	N	N	N	N		N	N
Barrow to Svalbard																									
Davis Straits	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	N

(2010)																									
Barrows and Nares Straits (2010)	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N	N	N	N	N	N	N	N	N	Y	N	N
RUSALCA (2010)	Y	N	N	N	N	N	Y	Y	Y	Y	Y	N	N	N	N	N	N	N	Y	N	Y	Y	Y	N	N

➔ *RETURN TO REFERENCE SECTION TABLE*

Column Headers:

1. CTD O2
2. CTD transmissometer
3. S-ADCP
4. L-ADCP
5. Bottle salinity
6. Dissolved O_2
7. NO_3/NO_2
8. PO_4
9. SiO_3
10. NH_4
11. DIC
12. TA
13. Discrete pCO_2
14. pH
15. Underway T, S, pCO_2
16. CFCs
17. SF_6/CCl_4
18. ^{3}H-^{3}He
19. ^{13}C
20. ^{14}C
21. TOC
22. TDN (total dissolved nitrogen)
23. Biology (bottle samples or tows; e.g., Chl-a, pigments, CDOM)
24. Fe / trace metals

25. Other UW (* indicates surface meteorological measurements)