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JOINT WMO/IOC TECHNICAL COMMISSION FOR
OCEANOGRAPHY AND MARINE METEOROLOGY (JCOMM)
SHIP OBSERVATIONS TEAM

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GENEVA, SWITZERLAND, 16 TO 21 APRIL 2007

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**SOOPIP-VII
PROGRAMME IMPLEMENTATION**

Status of the current sampling programme

(Submitted by Mr Steven K. Cook, Chairperson of the JCOMM SOOP Implementation Panel (SOOPIP))

Summary and purpose of document

This document reviews the status of the current sampling programme. It is based on partial 2005 data from the Draft Semestrial Report produced by Ms Hester Viola Technical Coordinator.

ACTION PROPOSED

The SOOP Implementation Panel is invited to:

- (a) Review the current sampling of the SOOP Programme, as well as more up to date information that might be presented by the SOT Coordinator;
- (b) Identify deficiencies in the system;
- (c) Make recommendations regarding possible improvements in the future sampling, as necessary;

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- Appendices:**
- A. SOOP lines that were sampled during the period and number of drops made by each operator
 - B. SOOP Global sampling

DISCUSSION

This status of Current Sampling is based on partial 2005 data from the Draft Semestrial Report produced by Hester Viola, SOOPIP Technical Coordinator

The scientific objective of the XBT programme remains the same as for the previous intersessional period, and is based on the recommendations from the proceedings of the Ocean Observations for Climate Conference (St. Raphael, France) and *The Role of XBT Sampling in the Ocean Thermal Network in Observing the Oceans in the 21st Century* (2001). The SOOP continues to provide complementary data to Argo and the TAO/TRITON/PIRATA moored arrays. As Argo comes on line, the plans are that the SOOP should gradually reduce the Low Density Sampling mode while at the same time shifting the SOOP resources into Frequently Sampled and High Density line modes.

As noted at the Third Session of the Ships Observation Team (SOT-III; Brest, France, 7-12 March 2005), there has been a measurable growth in the past years in the number of XBTs being reported on the GTS. While this increase is to be commended, the SOOPIP faces a challenge in balancing national priorities with the internationally agreed climate observing plans.

The draft Semestrial report for 2005 was based upon input provided by the SOOP operators. The NIO data were not taken into account, as the data had not been provided to the SOOP Coordinator.

During the period of January to December 2005, it was noted that 21757 drops were committed to the SOOP by the participants (other drops for which information was not provided to the SOOP Coordinator are not counted here, e.g., NIO probes). Number of probes committed to the programme is slightly lower than the same period last year (i.e., about 23244 probes for January-December 2004).

Of those, 16913 were assigned to Upper Ocean Thermal (UOT) review lines. Based on UOT recommended lines and proposed sampling, it is estimated that about 25500 probes are required per year in order to sample all UOT lines properly. This review ignores national requirements, which sometimes lead to over sampling of certain lines when compared to global SOOP requirements. Considering that over 90% of Argo is now deployed, the UOT goal is realistic.

For a total of 45 FRX and HDX UOT lines (some of them operated in both modes), the following summarised results for the period are obtained:

- Well sampled lines: 15
- 50% sampled lines: 2
- Oversampled lines: 2
- Undersampled lines: 15
- Not sampled: 11

Appendix A lists the SOOP lines that were sampled during the considered period as well as the number of drops made by each operator participating in the programme.

Figure 1, 2, and 3 are provided in Appendix B and provide information regarding the broadcast mode. It appears that the: (i.) SOOPIP helped in achieving relatively good coverage globally, although this is not as essential now as 2/3 of Argo array is implemented, and (ii.) SOOPIP can potentially enhance the situation in the Southern Ocean where there is still a lack of data.

Figure 4 shows the SOOP status by country for the period of January to December 2005. It should be noted that the NIO data do not appear here because the data were not submitted to the SOOP Coordinator. As of 2005, efforts remain to be made in the SW Indian Ocean (all with the exception of: IX01 and IX12), the Western Pacific Ocean (PX04 and PX05) and where little or no sampling was made over the whole year (e.g., AX15, AX20, AX25, IX06, IX07, IX08, IX09S, IX21, IX22, PX09, PX11, PX17,

PX21, PX30, PX35, PX36, PX38, PX50 and PX81).

Figure 5 shows all the XBT profiles that were distributed on the GTS during the periods of January to December 2005. Note that, it includes profiles that were made available to the GTS but not necessarily to the SOOP (or the SOOP Coordinator for the purpose of this report).

Appendices: 2

APPENDIX A

SOOP lines that were sampled during the period and number of drops made by each operator

Line	Type	Thermal Type	End points	Program	Drops	Transects
AX01	LDX	///	Greenland - Iceland - Ireland/Scotland/Denmark	SOO IRD_BREST	87	6
AX02	LDX	///	Newfoundland - Iceland	SOO SEAS	60	3
AX03	HDX	HDX	Europe - New York	SOO BSH	177	3
AX04	LDX	///	New York - Gibraltar	SOO SEAS	558	43
AX05	LDX	///	Europe - Panama Canal	SOO IRD_BREST	294	24
AX07	HDX	HDX	Florida Straits - Gibraltar	SOO SEAS	931	7
AX08	FRX	FHD	New York - Cape Town	SOO SEAS	1069	8
AX10	HDX	FHD	New York - Puerto Rico	SOO SEAS	595	28
AX11	FRX	FRX	Europe - Brazil	SOO BSH	412	8
AX11	FRX	FRX	Europe - Brazil	SOO IRD_BREST	150	11
AX18	LDX	HDX	Buenos Aires - Cape of Good hope	SOO SEAS	535	3
AX19	LDX	///	Cape Horn - Cape of Good Hope	SOO SEAS	8	2
AX20	LDX	FRX	Europe - French Guyana	SOO IRD_BREST	184	7
AX22	HDX	HDX	Drake Passage	SOO SEAS	2	2
AX22	HDX	HDX	Drake Passage	SOO SIO	427	6
AX29	FRX	FRX	Antigua - Cabo de Sao Roque, Brazil	SOO SEAS	225	11
AX29	FRX	FRX	Antigua - Cabo de Sao Roque, Brazil	SOO SEAS/SIO	1	1
AX31	LDX	///	End points??	SOO SEAS	24	1
AX32	LDX	///	New York - Bermuda	SOO SEAS	179	8
AX33	LDX	///	Boston - Halifax/Nova Scotia	SOO SEAS	38	4
AX34	LDX	FRX	Gulf of Guinea - Caribbean	SOO SEAS	166	4
IX01	FRX	FHD	Fremantle - Sunda Straits	SOO BOM	730	39
IX01	FRX	FHD	Fremantle - Sunda Straits	SOO IRD_NOUMEA	6	2
IX09N	FRX	///	Sri Lanka - Persian Gulf (IX09 North)	SOO JMA/JAMSTEC	185	10
IX10	LDX	HDX	Red Sea - Malacca Strait/Singapore	SOO IRD_NOUMEA	32	3
IX10	LDX	HDX	Red Sea - Malacca Strait/Singapore	SOO JMA/JAMSTEC	112	11
IX12	FRX	FRX	Fremantle - Red Sea	SOO BOM	1007	22
IX15	LDX	HDX	Mauritius - Fremantle	SOO SEAS	160	1
IX15	LDX	HDX	Mauritius - Fremantle	SOO SEAS/SIO	173	1
IX15	LDX	HDX	Mauritius - Fremantle	SOO SIO	147	1
IX21	LDX	HDX	Cape of Good Hope - Mauritius	SOO SEAS/SIO	88	1
IX21	LDX	HDX	Cape of Good Hope - Mauritius	SOO SIO	15	1
IX22	FRX	FRX	Shark Bay - Timor Strait/Banda Sea	SOO BOM	97	5
IX28	HDX	HDX	Hobart, Tasmania - Dumont d'Urville	SOO CSIRO	220	3
MX01a	HDX	///	Haifa-Messina	SOO MFSPP	321	4
MX01b	HDX	///	Palermo-Gibraltar	SOO MFSPP	10	1
MX02c	LDX	///	End points??	SOO MFSPP	155	2
MX03	HDX	///	Sete-Tunis	SOO MFSPP	73	2
MX04	HDX	///	Genova-Palermo	SOO MFSPP	362	11
MX05	HDX	///	Ploce-Malta	SOO MFSPP	122	4
MX06	HDX	///	Pireus-Crete-Alessandria	SOO MFSPP	111	3
MX07	HDX	///	P.Said-Limassol	SOO MFSPP	134	9
PX02	LDX	FRX	Flores Sea - Torres Strait	SOO BOM	241	13
PX04	FRX	FRX	Japan - Kiribati - Fiji/Samoa	SOO IRD_NOUMEA	167	5
PX05	FRX	FHD	Japan - New Zealand	SOO IRD_NOUMEA	37	9
PX05	FRX	FHD	Japan - New Zealand	SOO JMA/JAMSTEC	290	9
PX06	HDX	HDX	Suva, Fiji - Auckland, New Zealand	SOO SEAS	20	2
PX06	HDX	HDX	Suva, Fiji - Auckland, New Zealand	SOO SEAS/SIO	279	4
PX08	LDX	FRX	Auckland, New Zealand - Panama	SOO SEAS	1312	32
PX08	LDX	FRX	Auckland, New Zealand - Panama	SOO SEAS/SIO	831	3
PX09	FHD	FHD	Hawaii - Fiji/Auckland	SOO SEAS	64	3

PX09	FHD	FHD	Hawaii - Fiji/Auckland	SOO SEAS/SIO	9	1
PX10	HDX	HDX	Hawaii - Guam/Saipan	SOO SEAS	201	10
PX10	HDX	HDX	Hawaii - Guam/Saipan	SOO SEAS/SIO	641	8
PX12	LDX	///	Tahiti - Nouméa	SOO IRD NOUMEA	186	4
PX13	LDX	FRX	New Zealand - California	SOO SEAS	909	18
PX13	LDX	FRX	New Zealand - California	SOO SEAS/SIO	1265	16
PX17	FRX	FRX	Tahiti/Maruroa - Panama	SOO IRD NOUMEA	182	8
PX18	FRX	FRX	Tahiti - California	SOO SEAS	836	22
PX26	TRANSPAC	///	TRANSPAC	SOO SEAS	558	28
PX26	TRANSPAC	///	TRANSPAC	SOO SEAS/SIO	127	9
PX28	LDX	///	Tahiti - Sydney/Auckland	SOO IRD NOUMEA	54	5
PX30	HDX	HDX	Brisbane/Sydney - Noumea - Fiji	SOO CSIRO	116	2
PX30	HDX	HDX	Brisbane/Sydney - Noumea - Fiji	SOO IRD NOUMEA	11	3
PX31	LDX	FHD	Nouméa/Suva, Fiji - California	SOO SEAS/SIO	592	4
PX34	HDX	HDX	Sydney - Wellington	SOO CSIRO	146	3
PX37	HDX	HDX	Hawaii - California	SOO SEAS	83	7
PX37	HDX	HDX	Hawaii - California	SOO SEAS/SIO	340	5
PX38	HDX	HDX	Hawaii - Alaska	SOO SEAS/SIO	97	1
PX38	HDX	HDX	Hawaii - Alaska	SOO SIO	12	1
PX40	HDX	HDX	Hawaii - Japan	SOO TOHOKU-U	341	3
PX44	HDX	HDX	Guam - Hong Kong/Taiwan	SOO SEAS	74	9
PX44	HDX	HDX	Guam - Hong Kong/Taiwan	SOO SEAS/SIO	345	6
PX45	LDX	///	(3N, 137E) - (34N,137E)	SOO JMA	154	4
PX46	LDX	///	(3S, 165E) - (50N, 165E)	SOO JMA	90	4
PX50	HDX	HDX	Valparaiso - Auckland	SOO SEAS/SIO	224	1
PX53	LDX	///	Taiwan/Mindanao - Fiji	SOO IRD NOUMEA	109	5
XX00	LDX	///	End points??	SOO MFSP	299	13
XX01	///	///	No specific line assigned	SOO BOM	40	2
XX01	///	///	No specific line assigned	SOO SEAS	93	8
Total					21757	616

APPENDIX B

SOOP GLOBAL SAMPLING

Figure 1: JAF00S density maps, December 2005

<http://www.bom.gov.au/bmrc/ocean/JAF00S/UOT.html>

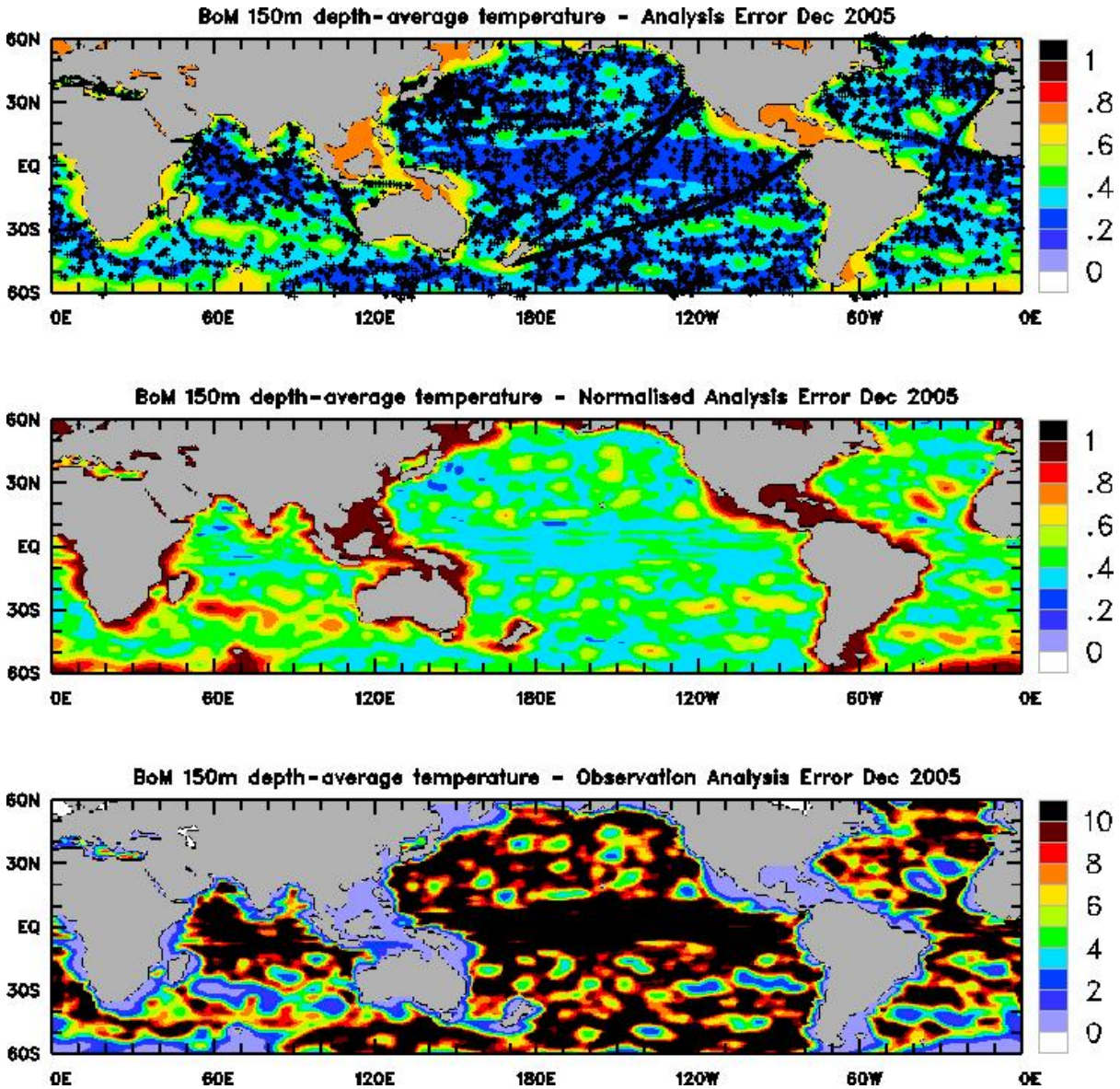
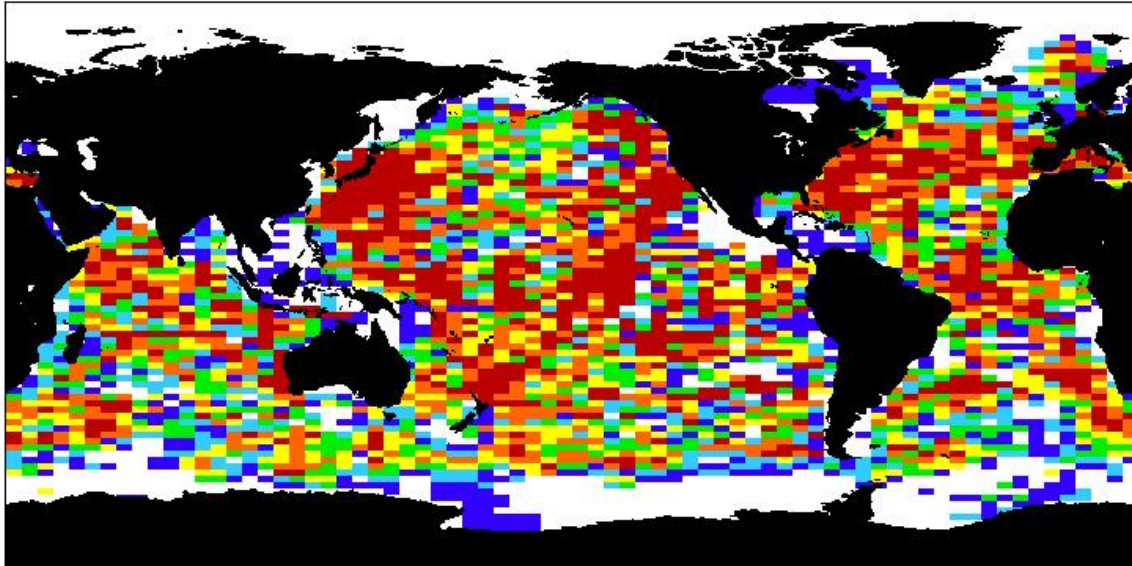


Figure 2: MEDS density map, January – December 2005

(http://www.meds-sdmm.dfo-mpo.gc.ca/meds/Prog_Int/SOPIP/SOPIP_e.htm)

Jan to Dec, 2005 / Janvier à Décembre, 2005



MEDS - SDMM
Jan 2006

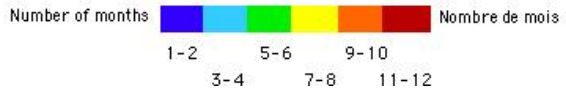


Figure 3: Main in-situ observing systems providing temperature profiles in December 2005



Sub-surface temperature profiles, December 2005 (profile data distributed on GTS)

Total stations: 2115

Total profiles: 28339

● BATHY (mainly XBTs) (41, 1579)

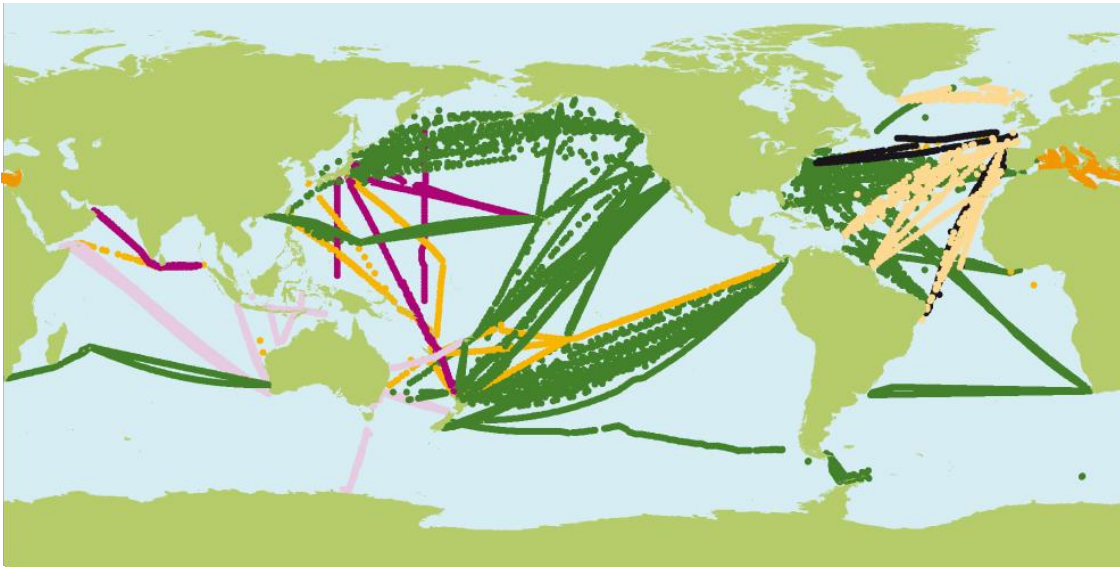
● TESAC (mainly Argo floats) (1981, 17407)

● BUOY (drifting & moored buoys) (93, 9353)

GTS data received at JCOMMOPS via Météo-France.

Note: figures in bracket are number of platforms and number of profiles respectively

Figure 4: XBT drops by country for the period January to December 2005 (NIO, MFSP data missing)



SOOP semestrial survey, January 2005 to December 2005

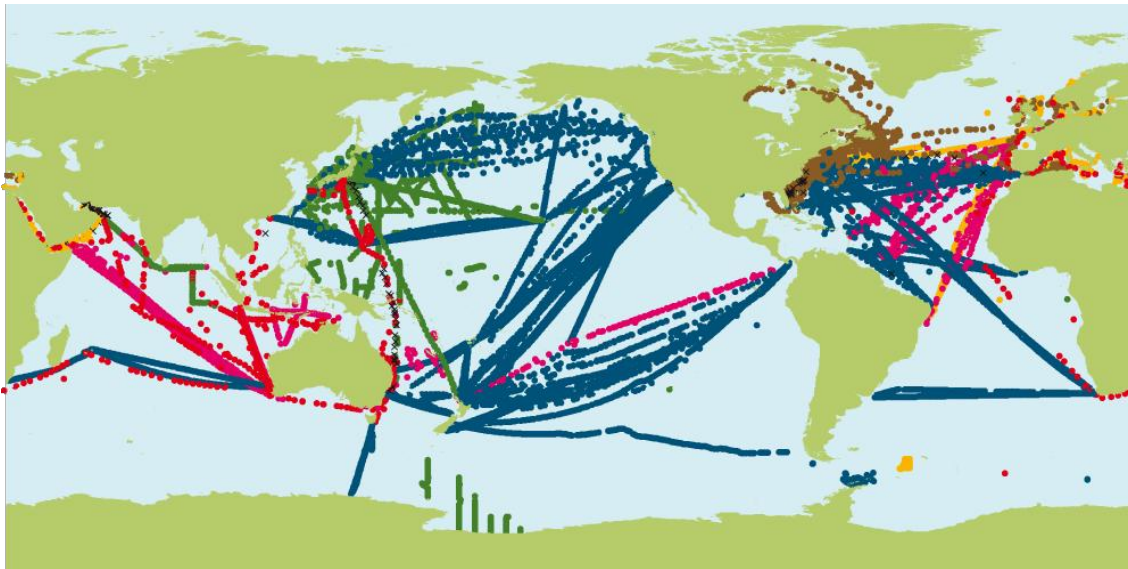
Total XBT profiles: 21434

- | | | |
|-------------------------|-------------------------|-----------------------|
| ● AUSTRALIA (2597) | ■ EUROPEAN UNION (1288) | ● FRANCE (715) |
| ● GERMANY (589) | ● JAPAN (1172) | ● NEW CALEDONIA (784) |
| ● UNITED STATES (14289) | | |

Information on drops submitted to SOOP Coordinator.

Note: Number of XBT profiles in brackets

Figure 5: XBT reports distributed on GTS during January to December 2005 (by originating centre)



SOOP semestrial GTS status, January 2005 to December 2005 (XBT profiles on GTS)

Total XBT profiles on GTS: 20802

- | | | |
|--------------------------|--------------------------------|---------------------------|
| ● AMMC (Melbourne) (666) | ● CWOW (Montreal) (1657) | ● EDZW (Offenbach) (1404) |
| ✕ KNWC () (120) | ● KWBC (Washington-DC) (11994) | ● LFPW (Toulouse) (2237) |
| ● RJTD (Tokyo) (2724) | | |

BATHY reports by GTS originating centre.

Note: Data received from GTS at JCOMMOPS via Météo-France; GTS data source is not necessarily related to country in charge of programme
