

The Ship Of Opportunity Programme and the XBT Network

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NOAA/AOML

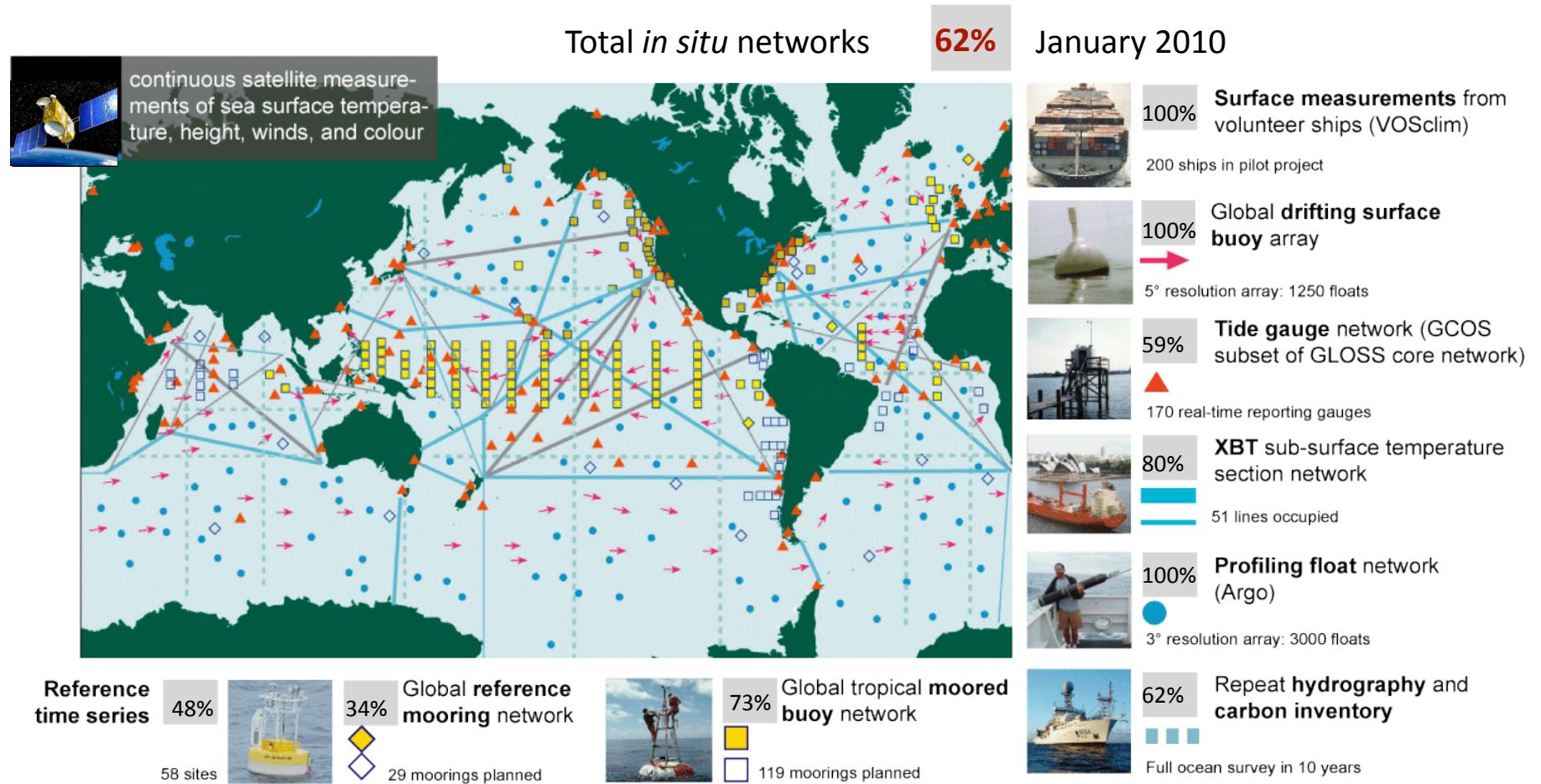
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XBT Science Workshop
July 2011
Melbourne, Australia

The Ocean Observing System for climate studies



Ship Of Opportunity Programme (SOOP)

- One of two components of the JCOMM Ship Observations Team (SOOP and VOS): Graeme Ball (ABOM) chairperson SOT, Judy Fletcher (NZ) chairperson VOS, Gustavo Goni (NOAA) chairperson SOOP
- Charged with coordinating international effort: recruiting, software, hardware, riders, science, XBT probes, data transmission, data management, data quality control
- Dedicated mainly to support XBT and TSG observations; helping other platforms (surface drifters, pCOs, Argo floats, etc)
- Terms of reference:
 - (i) Maintain close communications with the scientific community
 - (j) Support the formation of a SOOP Science Team dedicated to meet and discuss on a periodic basis results and ongoing research performed with XBT observation

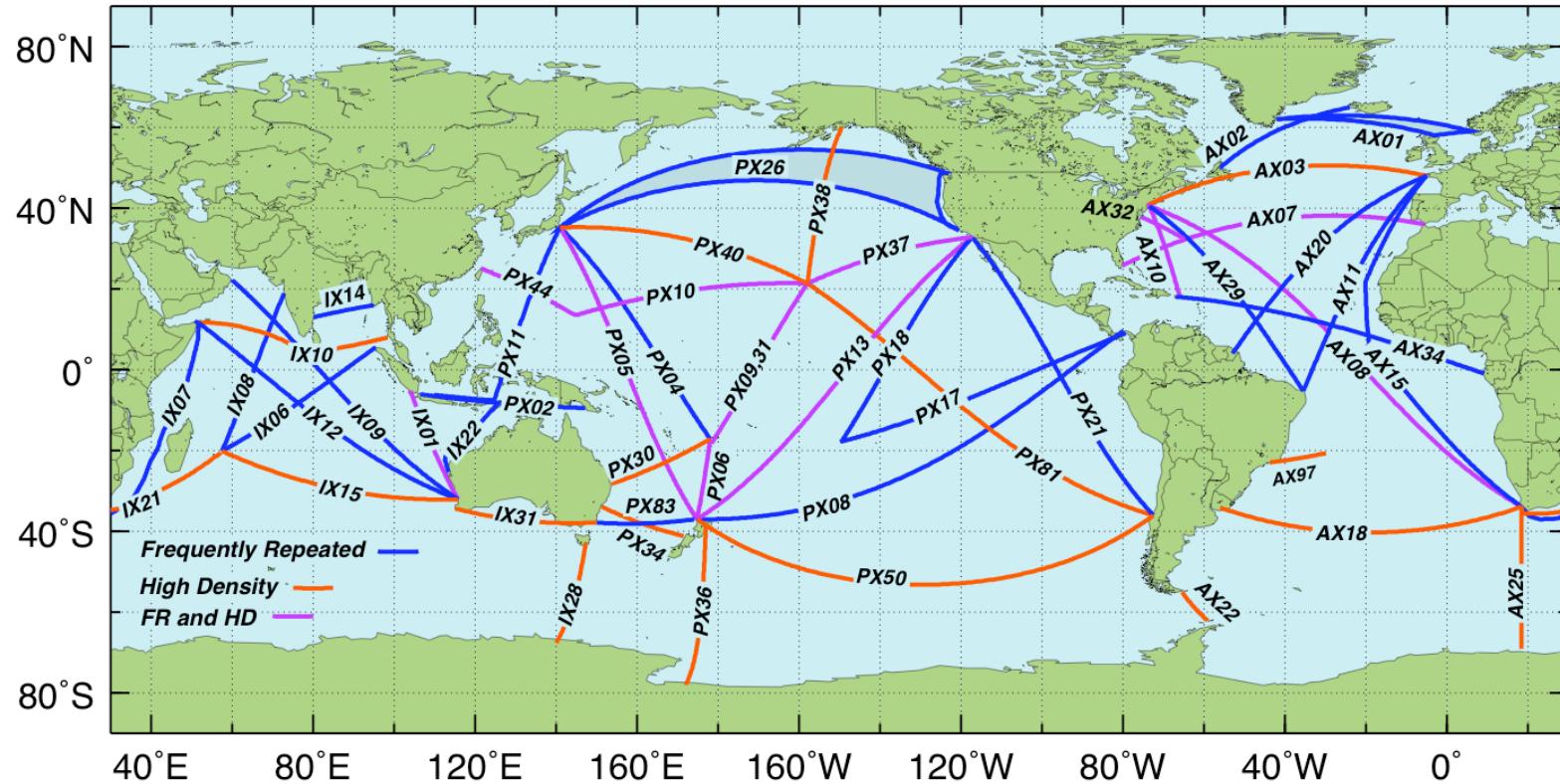


Science applications of XBTs

- *Repeat transects*
 - *Mesoscale resolving*
 - *Synergy with other observational platforms*
-
- **Western boundary currents**
 - **Subsurface currents and undercurrents**
 - **Meridional heat transport**
 - **Upper ocean heat content**
 - **Validation of numerical models**
 - **Initialization of numerical models for weather and climate forecasts**



XBT network (OceanObs 09)



High density (HD) mode (24): 4 realizations per year, ~25km deployments

Frequently repeated (FR) mode (25): 18 realizations per year, ~100km deployments

Low density (LD) mode (0): 12 realizations per year, ~100km deployments



XBT Network

Atlantic Ocean

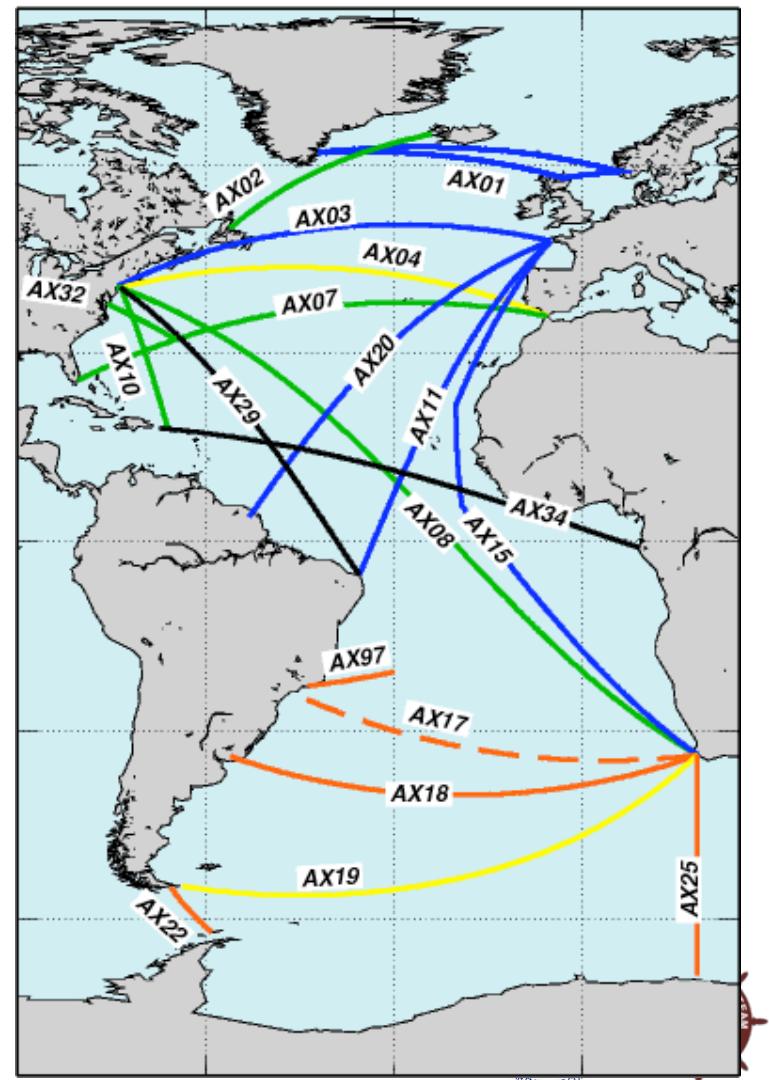
Transect	Agency	Mode (Target) 2010	Status	Year
AX01	5, 1, 23	FR (5)	Active	1997
AX02	1, 23	HD (1)	Active	
AX03	10	FR (3)	Active	1989
AX07	1	FR (9) / HD (4)	Active	1995
AX08	1, 6	FR (5) / HD (4)	Active	2000
AX10	1	FR (20) / HD (5)	Active	1997
AX11	10	FR (8)	Active	1990
AX15	5	FR (5)	Active	1997-2010
AX18	1, 11, 6	HD (3)	Active	2002
AX20	5, 1, 23	FR (9)	Active	
AX22	2, 1, 11	HD (9)	Active	1996
AX25	1, 6	HD (2)	Active	2004
AX29			Inactive	
AX32	1, 3	FR (2) / HD (8)	Active	1981
AX34			Inactive	
AX97	1, 13	HD (2)	Active	2004
AX04	1	FR (1)	Targeted	
AX19	1	HD (1)	Targeted	

1 USA-NOAA/AOML
 2 USA-SIO
 3 USA-NMFS
 5 FRA-IRD/BREST
 6 ZAF-UCT

10 GER-BSH
 11 ARG-SHN
 13 BRA-FURG
 23 FRA-UP

- Active (FR)
- Active (HD)
- Active (FR and HD)
- Inactive
- Not Recommended

Atlantic Ocean XBT transects (2010)

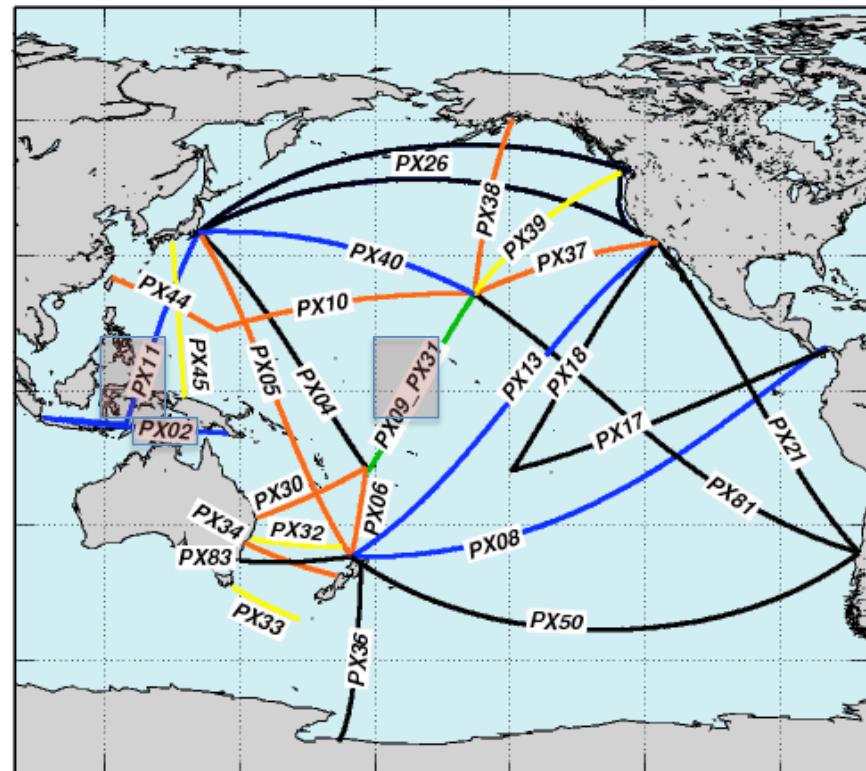


XBT Network

Pacific Ocean

Transect	Agency	Mode (Target)	Status	Year
PX02	9	FR (20)	Active	1983
PX04	7		Inactive	
PX05	2, 7	HD (8)	Active	2009
PX06	2, 7, 1	HD (7)	Active	1986
PX08	2, 1	FR (6)	Suspended	2004
PX09	2, 1	FR (2) / HD (1)	Active	1987
PX10	2, 1	HD (4)	Active	1991
PX11	9	FR (8)	Active	1986
PX13	2, 7, 1	FR (5)	Active	1986
PX17			Inactive	
PX18			Inactive	
PX21			Inactive	
PX26			Inactive	
PX30	4, 2, 7	HD (4)	Active	1991
PX31	2, 7, 1	HD (7)	Active	1986
PX34	4, 2	HD (1)	Active	1991
PX36			Inactive	
PX37	2, 1	HD (10)	Active	1991
PX38	2	HD (1)	Active	1993
PX40	8	FR (3)	Active	1998
PX44	2, 1	HD (4)	Active	1991
PX50	18, 2		Inactive	1993
PX81	2		Inactive	1997
PX83			Inactive	
PX32	4	HD (2)	Active	
PX33	4	HD (1)	Active	
PX39	25	FR (1)	Targeted	
PX45	16	FR (1)	Targeted	

Pacific Ocean XBT transects (2010)



1 USA-NOAA/AOML

2 USA-SIO

4 AUS-CSIRO

7 FRA-IRD/NOUMEA

8 JPN-TOHOKU-U

9 AUS-BOM

16 JPN-JMA

18 NZL-MSNZ

25 CAN-DFO

- Active (FR)
- Active (HD)
- Active (FR and HD)
- Inactive
- Not Recommended



XBT Network

Indian Ocean

Transect	Agency	Mode (Target)	Status	Year
IX01	9, 1	FR (37)	Active	1987
IX06	6, 2		Suspended	2007
IX07			Inactive	
IX08	12		Inactive	1992
IX09			Inactive	
IX10			Inactive	
IX12	9, 2	FR (14)	Active	1986
IX14	12	FR (1)	Active	1990
IX15	2, 4, 6	HD (3)	Active	1994
IX21	2, 4, 6	HD (3)	Active	1994
IX22	9	FR (7)	Active	1986
IX28	4, 2	HD (5)	Active	1993
IX31	2		Suspended	2006
IX02	2	HD (1)	Targeted	
IX29	4	HD (1)	Active	

1 USA-NOAA/AOML

2 USA-SIO

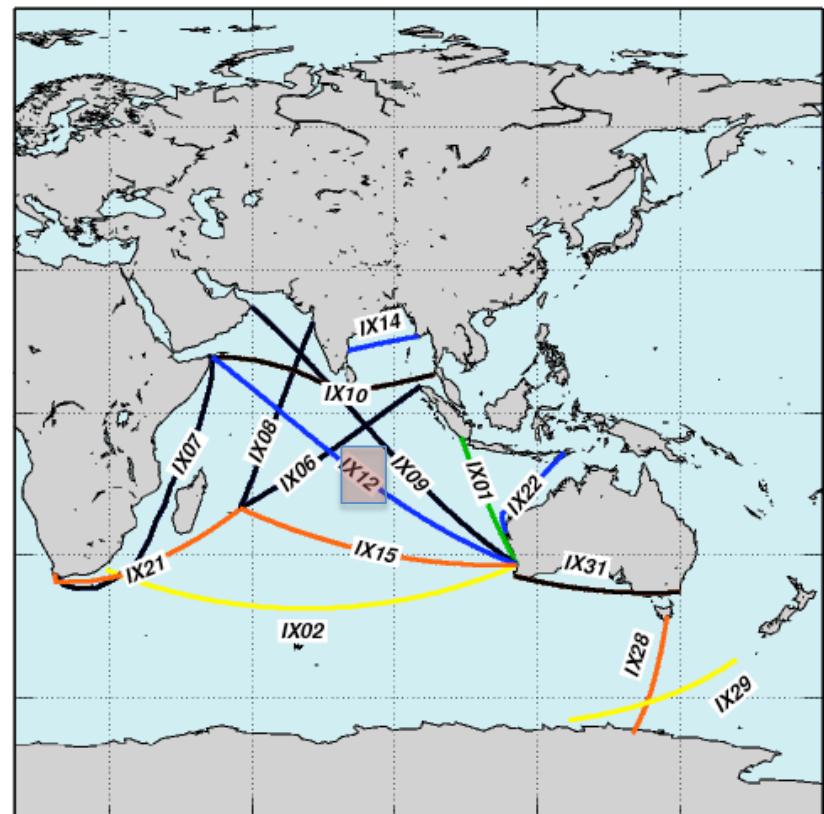
4 AUS-CSIRO

6 ZAF-UCT

9 AUS-BOM

12 IND-NIO

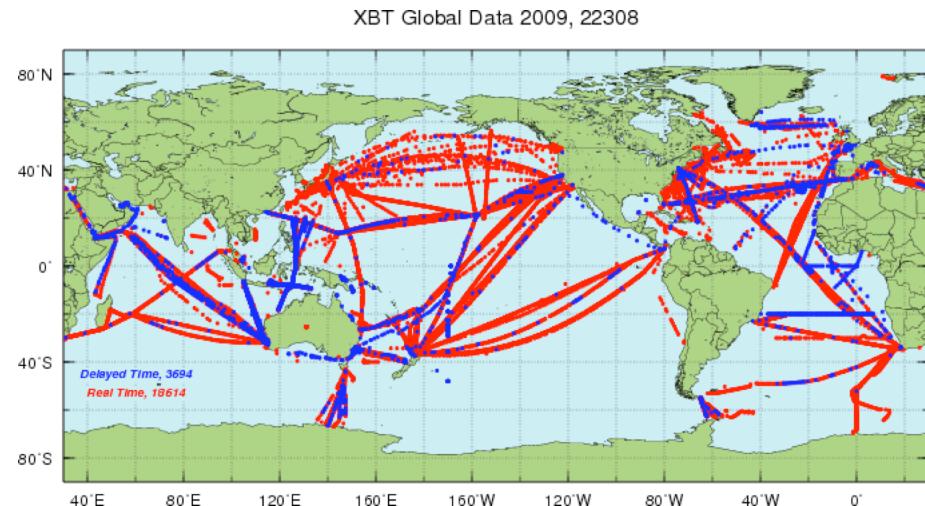
Indian Ocean XBT transects (2010)



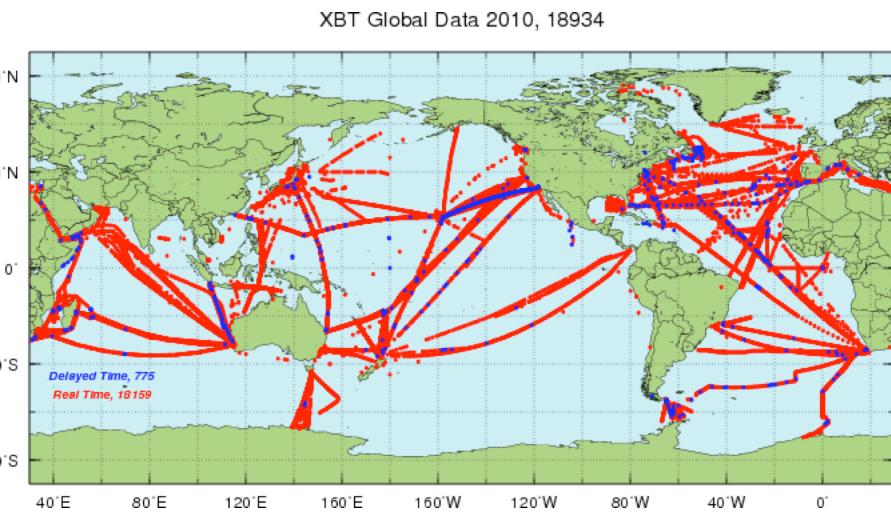
- Active (FR)
- Active (HD)
- Active (FR and HD)
- Inactive
- Not Recommended



XBT deployments 2009 and 2010



2009:
Approx 22,500

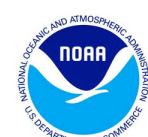
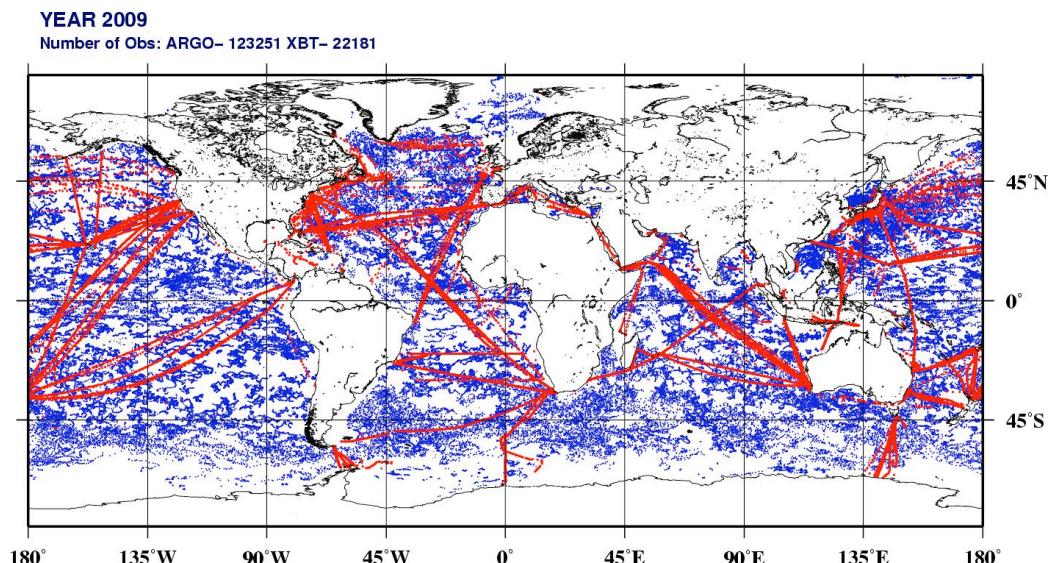
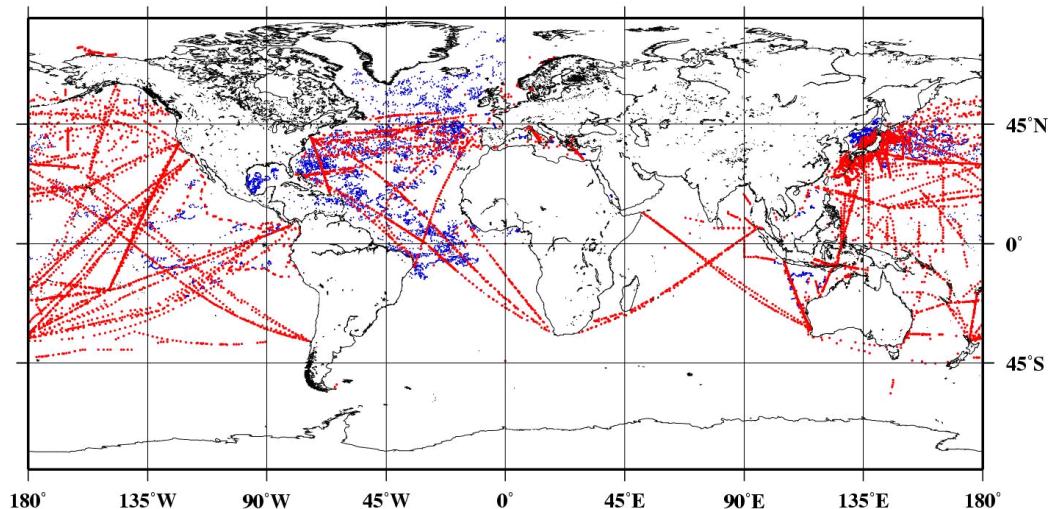


2010:
Approx 19,000



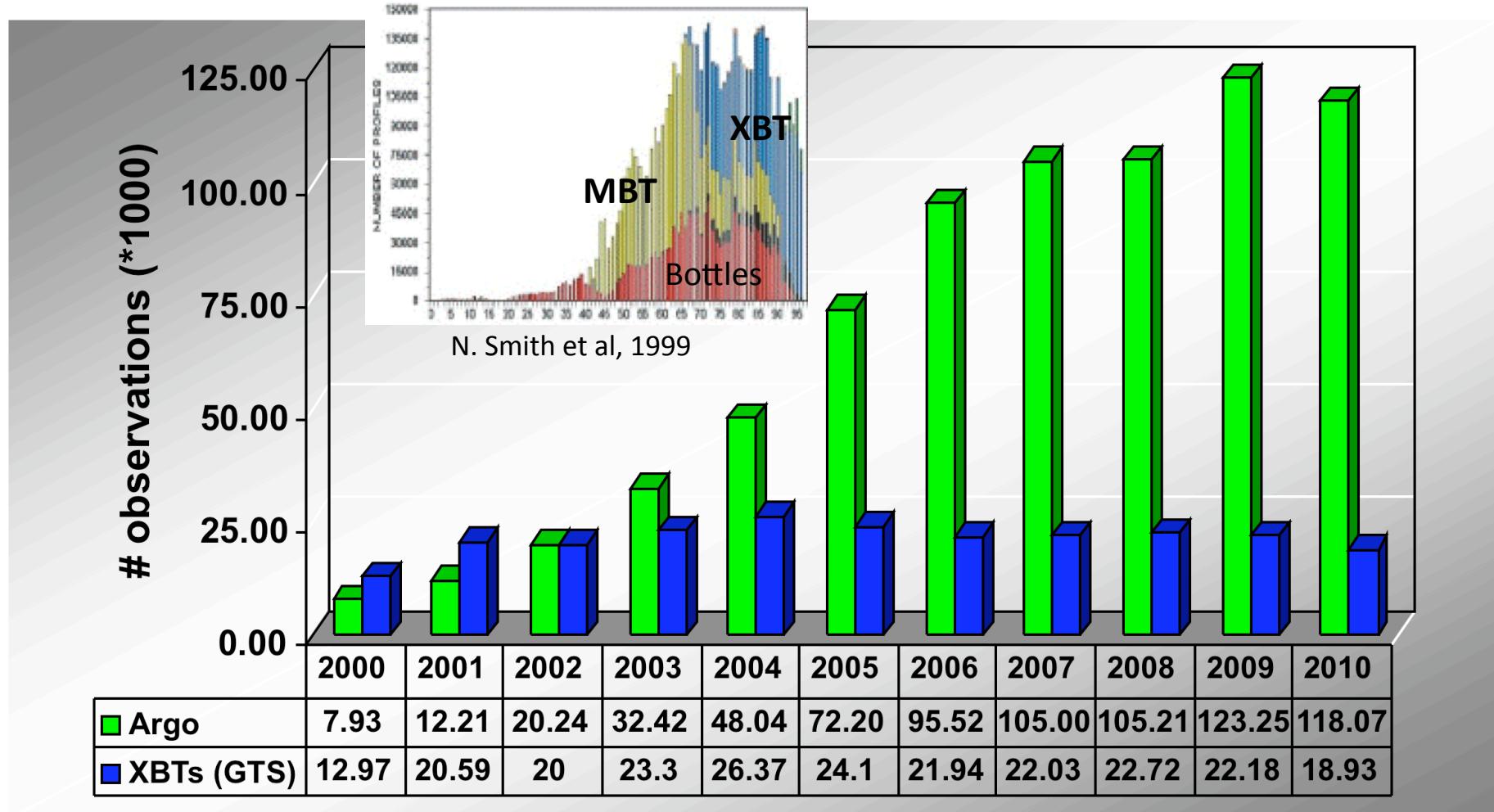
XBT and Argo floats observations

Spatial sampling



XBT and Argo floats observations

Temporal sampling



Immediate Future Work

- Thermal network with emphasis on HD transects
- Continue strong scientific use of data
- Problematic transects (AX18, North Pacific, IX25/31, ...)
- Implementing pressure switches in XBTs (will solve depth biases, but not of past observations) and better temperature sensors
- Observations in marginal seas (Med, GOM, ...)
- Ocean thermal review (OOPC 2012)
- Explore the establishment of XBT Science Panel, similar to the Argo Science Steering Team, to share and discuss scientific results in a periodic basis

