Evaluation of the XBT Network: OceanObs2009 CWP

Gustavo Jorge Goni
NOAA/AOML
Miami, FL
Gustavo.Goni@noaa.gov

The Ship Of Opportunity Program:
G. Goni[1], D. Roemmich[2], R. Molinari[3] , G. Meyers[4], T. Rossby[5], C. Sun[6], T. Boyer[6], M. Baringer[1] , S. Garzoli[1], G. Vissa[7], S. Swart[8], R. Keeley[9], C. Maes[10]CWP
http://www.oceanobs09.net/blog/ Please provide comments.

Why we need a CWP on the XBT network?

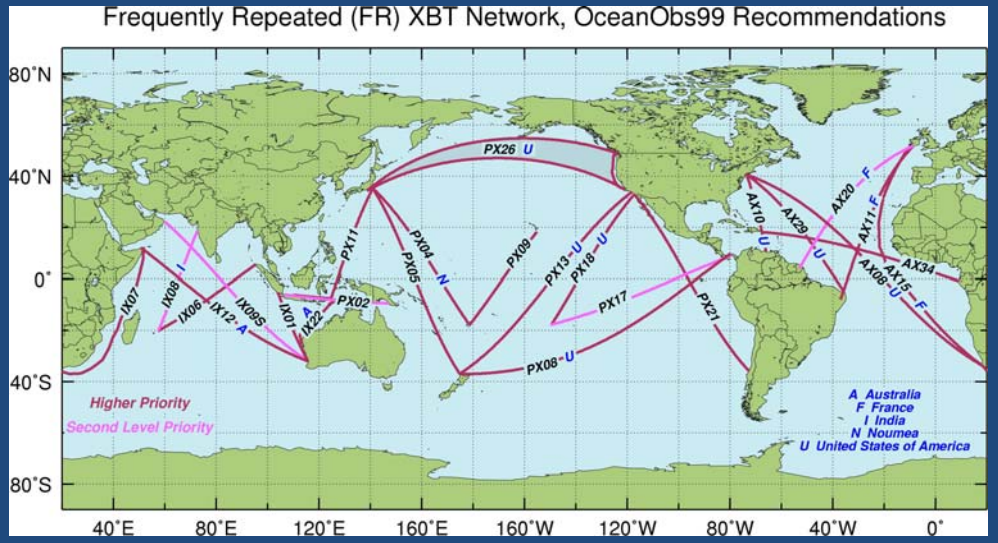
- To assess the state of the XBT network as recommended by the last upper ocean thermal review panel (OceanObs99).

- To communicate the value of XBT observations in scientific research and in model initialization.

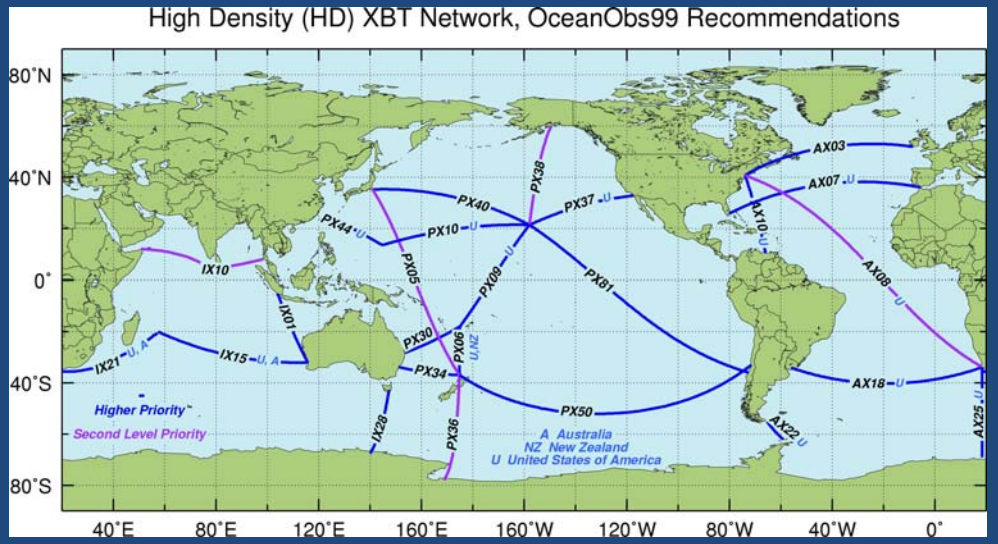
- To evaluate if the OO09 network still holds

- To make new recommendations based on the current knowledge of the ocean, the full implementation of Argo, operational altimetry, improvement of ocean models, etc.

OceanObs99 recommendations



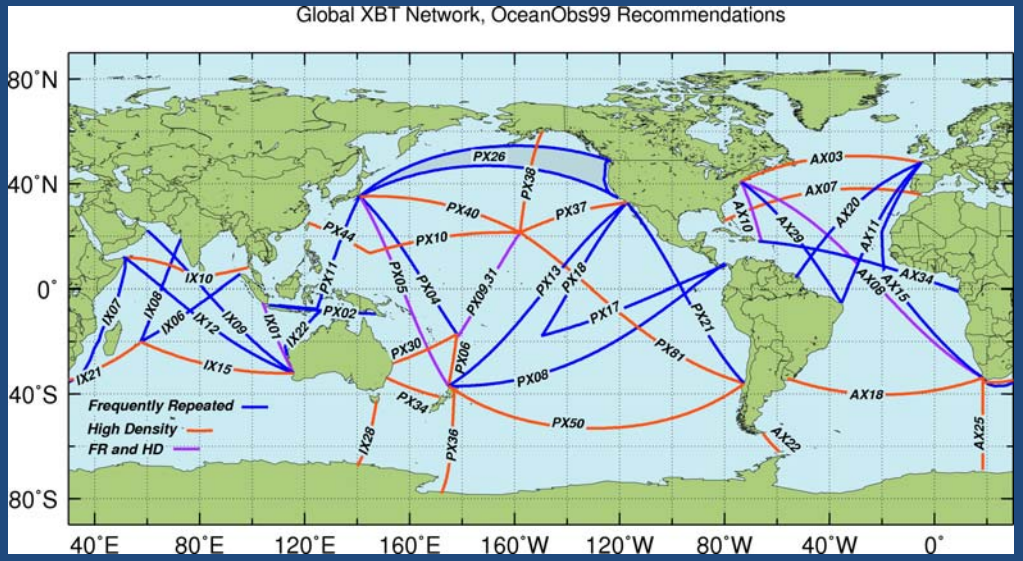
FR recommendations
NO LD recommendations



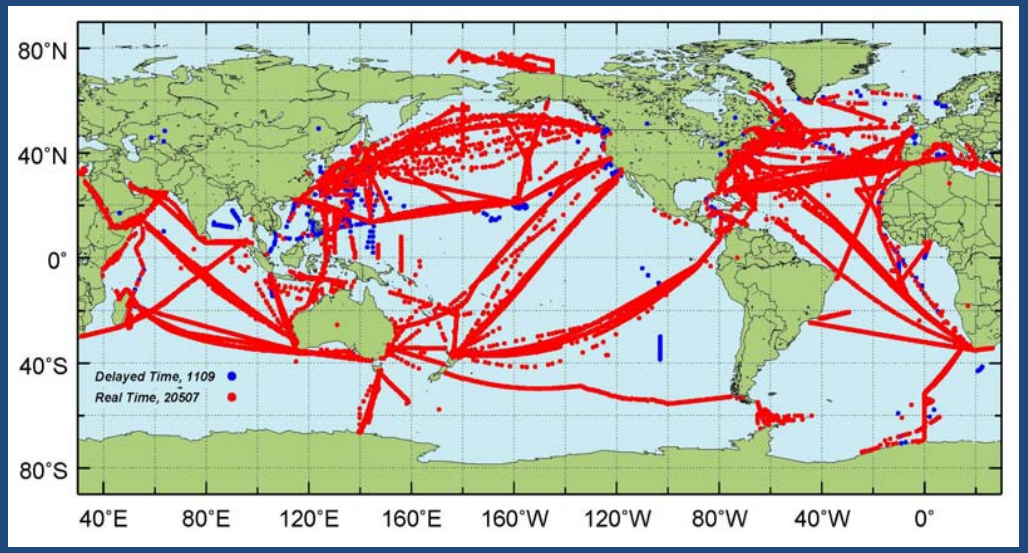
HD recommendations

Adapted from N. Smith et al

XBT Network



OceanObs99 Recommendations



2008

Recruiting problems with PX38, PX50, IX15, AX18.

OceanObs09 SOOP CWP

1) Review status OceanObs99 recommendations.

2) Summarize goals of XBT transects in each of the three different modes.

3) Summarize key results obtained from XBT observations.

4) Highlight key results:
   AMOC, by NOAA/AOML
   ACC, by UCT and AOML
   tropical Pacific, by SIO
   Indian Ocean, by CSIRO and NIO

5) Provide recommendations:
   Transects
   Data transmissions
   Data management

OceanObs 1999 Recommendations

1) Begin phase reduction of LD sampling. Done.

2) Have sufficient overlap between LD and Argo floats. No.

3) Build network based on existing transects. Done.

4) Data distribution in RT 12-h delay. Now done in 24 hours.

5) Perform delayed-mode QC. Currently done by GTSPP, WData

6) Full depth resolution. Being partly done. (Is FR needed in RT?)

7) Unique identifier. Partly done.

8) Identify data originators. Will be done when BUFR is implemented.

9) Develop a world ocean data base. Done by GTSPP and

Three sampling modes

Low Density (LD)

- Investigate intraseasonal to Interannual variability in the tropical oceans,
- Measure temporal variability of boundary currents, and
- Investigate historical relationship between sea height and upper ocean thermal structure.

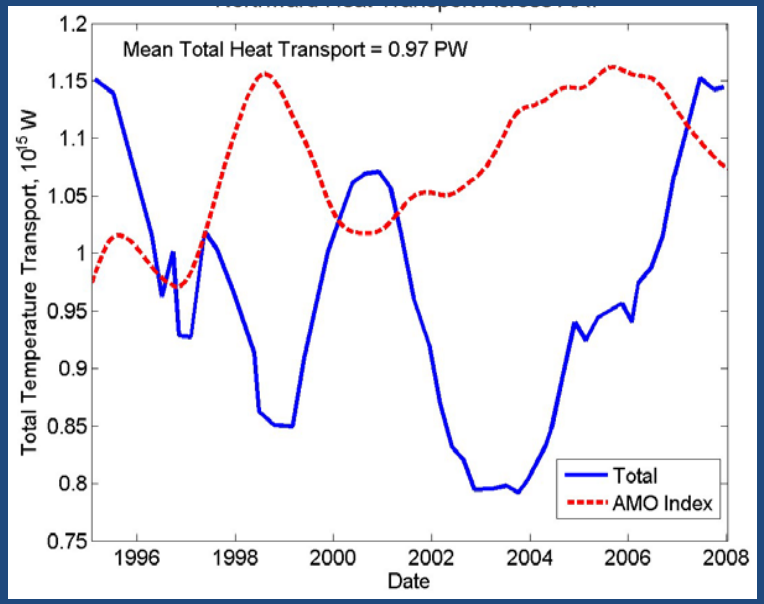
Frequently Repeated (FR)

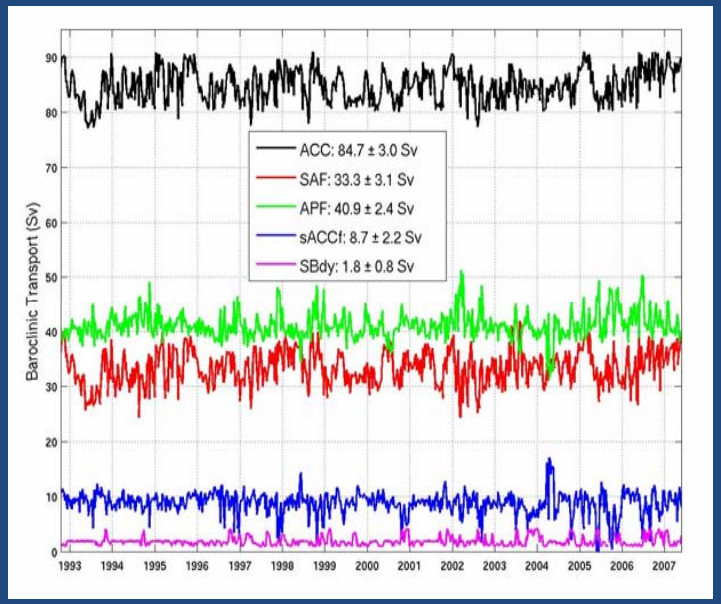
- Measure the seasonal, interannual, and decadal variation of volume transport of major ocean currents.
- Characterization of seasonal and interannual variation of thermal structure and their relationship with climate and weather.
- Identify the relationship between sea surface temperature, depth of the thermocline and ocean circulation at interannual to decadal timescales.
- Rossby and Kelvin wave propagation.
- Validation of variation of thermal structure and currents in models.

High Density (HD)

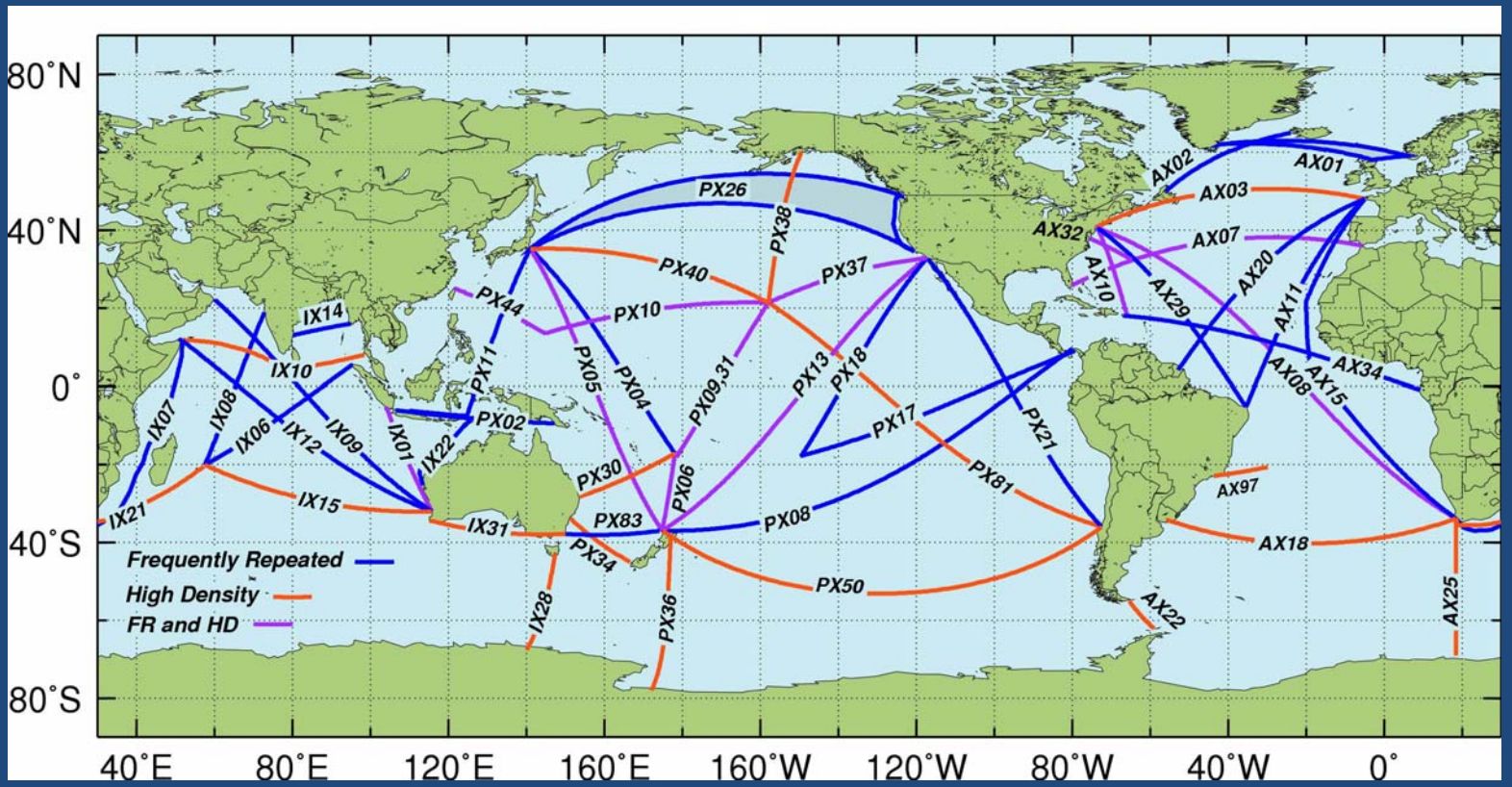
Seasonal to interannual fluctuation of mass and heat transports
Determine synergy between XBT and altimetry observations
Variability of boundary currents, fronts, eddies, rings.

Key Results


Mean Total Heat Transport = 0.97 PW
Total Temperature Transport, 10^{15} W
Date
Total
AMO Index


Baroclinic Transport (Sv)
ACC: 84.7 ± 3.0 Sv
SAF: 33.3 ± 3.1 Sv
APF: 40.9 ± 2.4 Sv
sACCf: 8.7 ± 2.2 Sv
SBdy: 1.8 ± 0.8 Sv

OceanObs09 recommendations



No OO99 transects dropped
Only 2 recommended modes (FR, HD)
A few transects added (AX98), reinstated (AX32)

OceanObs 2009 recommendations

- JCOMM should sponsor analysis to evaluate XBT network,
- New transects,
- Continue strong support of FR and HD modes,
- Create an XBT Science Team, similar to Argo Science Team,
- Continue experiments to evaluate XBT biases,
- Support simultaneous observations of other parameters,
- Data management following GCOS requirements,
- Explore new technologies,

CWP can be found at: *http://www.oceanobs09.net/blog/*
Please provide comments.