The Ship Of Opportunity Programme Implementation Panel Report

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Ship of Opportunity Program

SOOP Provides platform to deploy or install:

Expendable BathyThermographs (XBTs)
ThermoSalinoGraphs (TSGs)

EXpendable CTDs (XCTDs)
pCO2 systems
Acoustic Doppler Current Profilers (ADCP)
Drifters and profiling floats

Accomplishments

Continue maintaining a very complex network.

Expanding transmissions with Iridium.

Improved autolauncher for multiple types of probes.

Collaboration between Australia and US to incorporate Devil system in data acquisition.

Testing of BUFR and initiated exchange with NOAA/NCEP

Initiated TSG data transmission from (15 ships of the) NOAA fleet.

Started collaboration with SeaKeepers to place TSG data into GTS.

Two XBT training courses, Ghana and Nigeria.

Accomplishments

First draft of global XBT bibliography.

Collaborated in the implementation of real-time transmissions of XBT deployments made by India, Brazil, and South Africa.

RT and DT data access: Strong use of XBT observations for scientific studies.

Started collaboration with $pC0_2$ community (TSG operations and ship recruitment)

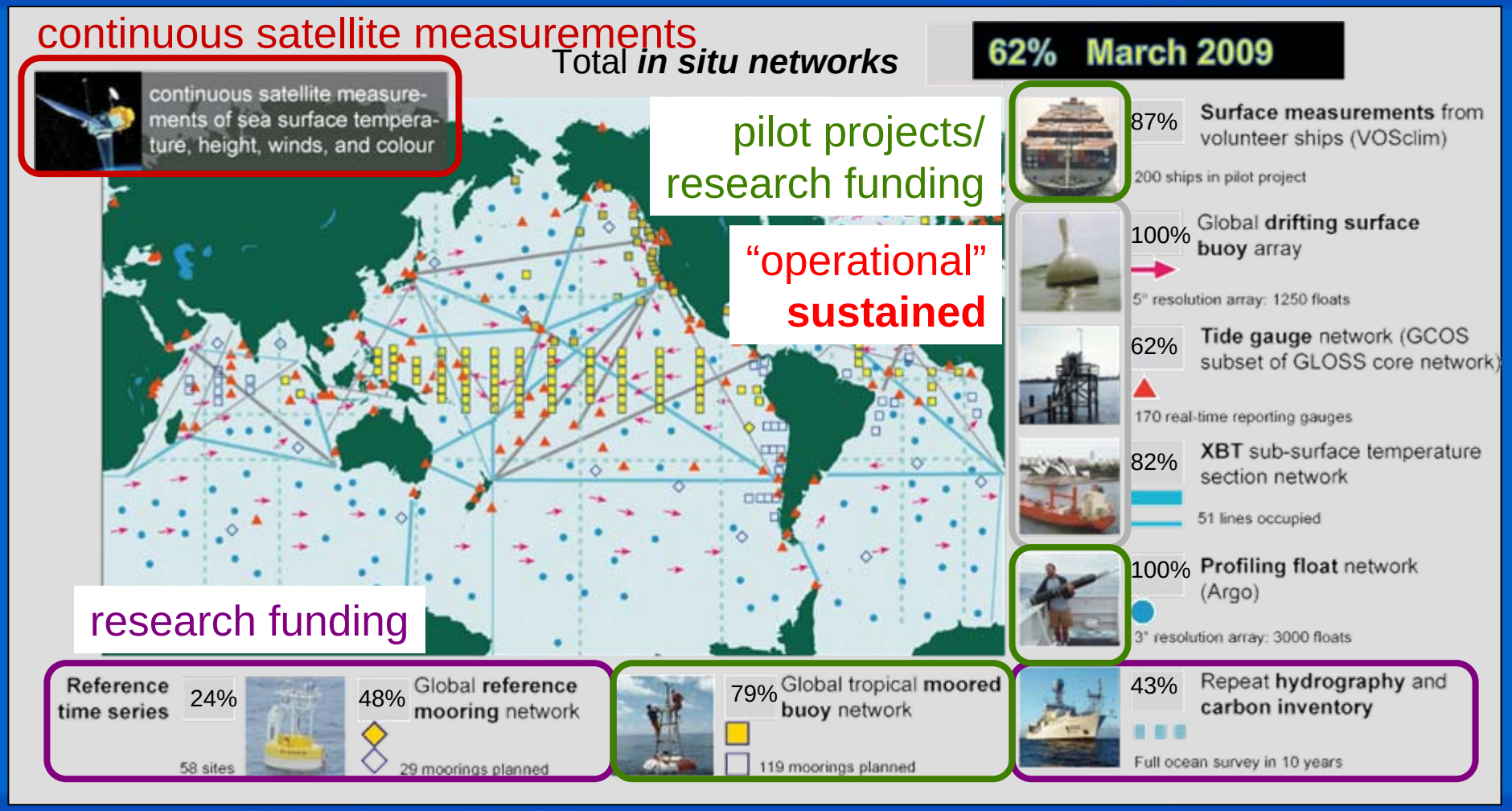
Continue with XBT collaboration for fishery studies (NESFC)

CWP for OceanObs 09.

Educational component: Semester At Sea Program, TSG installation.

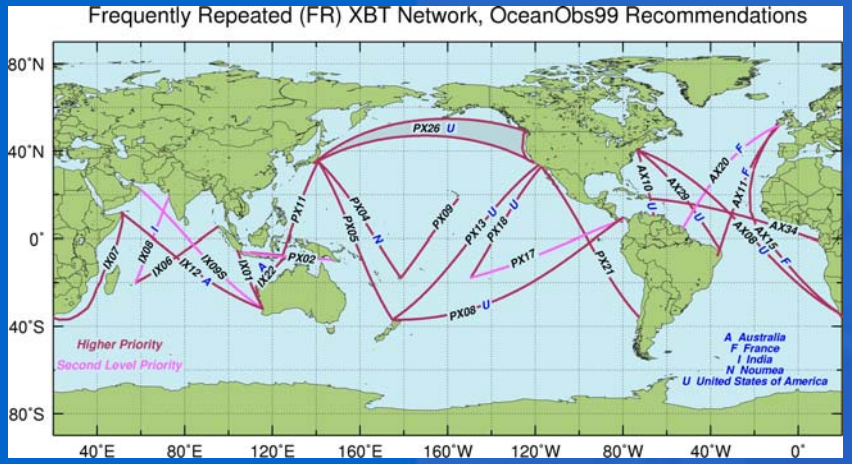
Google Earth animation with SOOP observations.

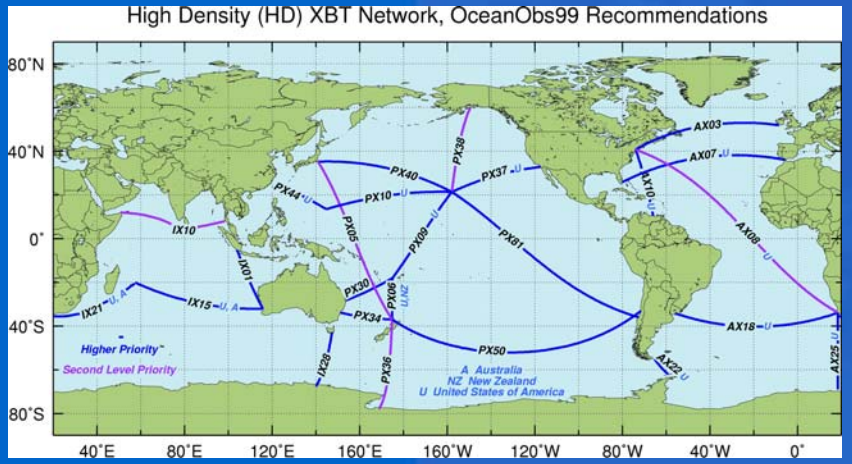
The Ocean Observing System



Approximately 62% complete

Requirements (OceanObs99, CLIVAR panels, regional/national)





High density (HD) mode (24):

- 1 XBT deployment every 25 km
- 4 transects per year

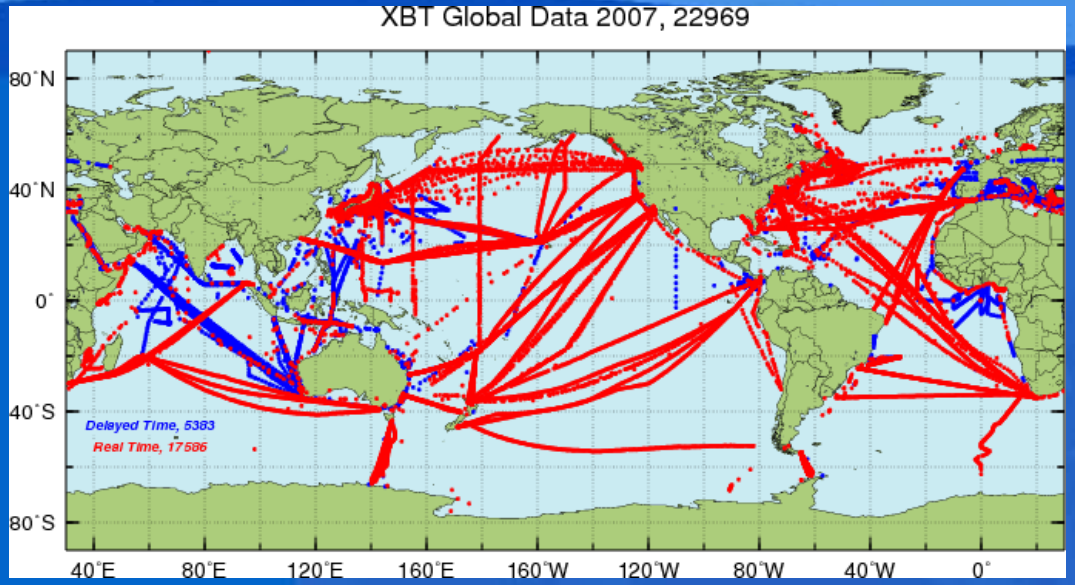
Frequently repeated (FR) mode (25):

- 6 XBT deployments per day (1 every 80 km)
- 12-18 transects per year

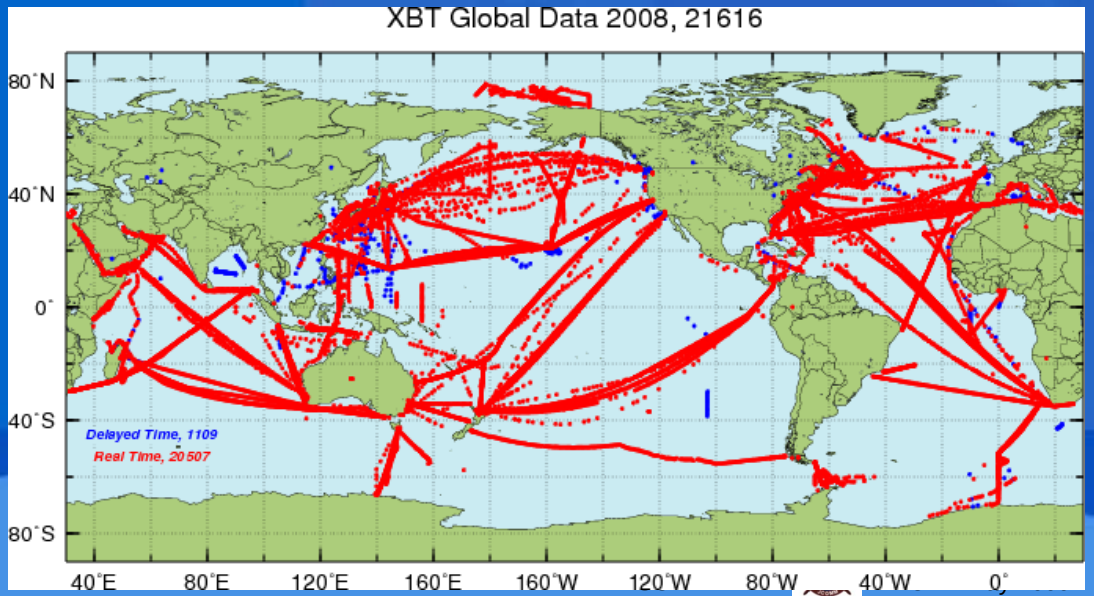
Low density (LD) mode:

- 4 XBT deployments per day (1 every 120 km)
- 12 transects per year
- *Being replaced by Argo observations*

XBT deployments 2007-2008

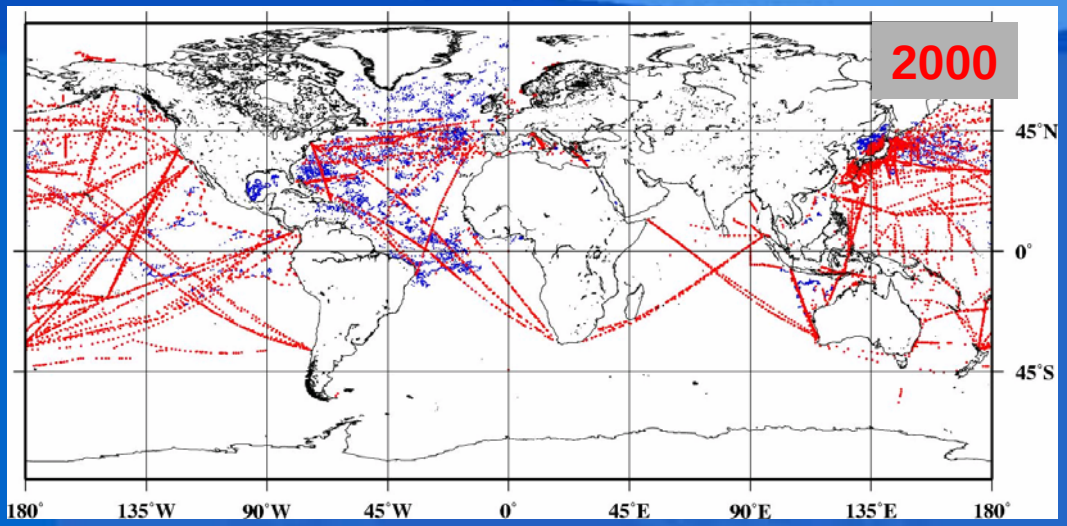


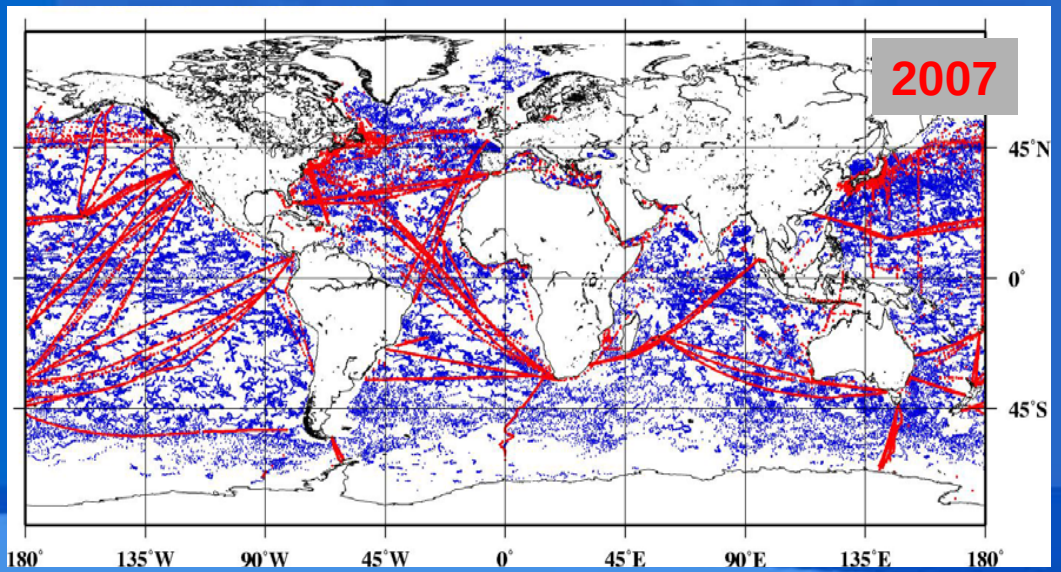
Approx 23,000



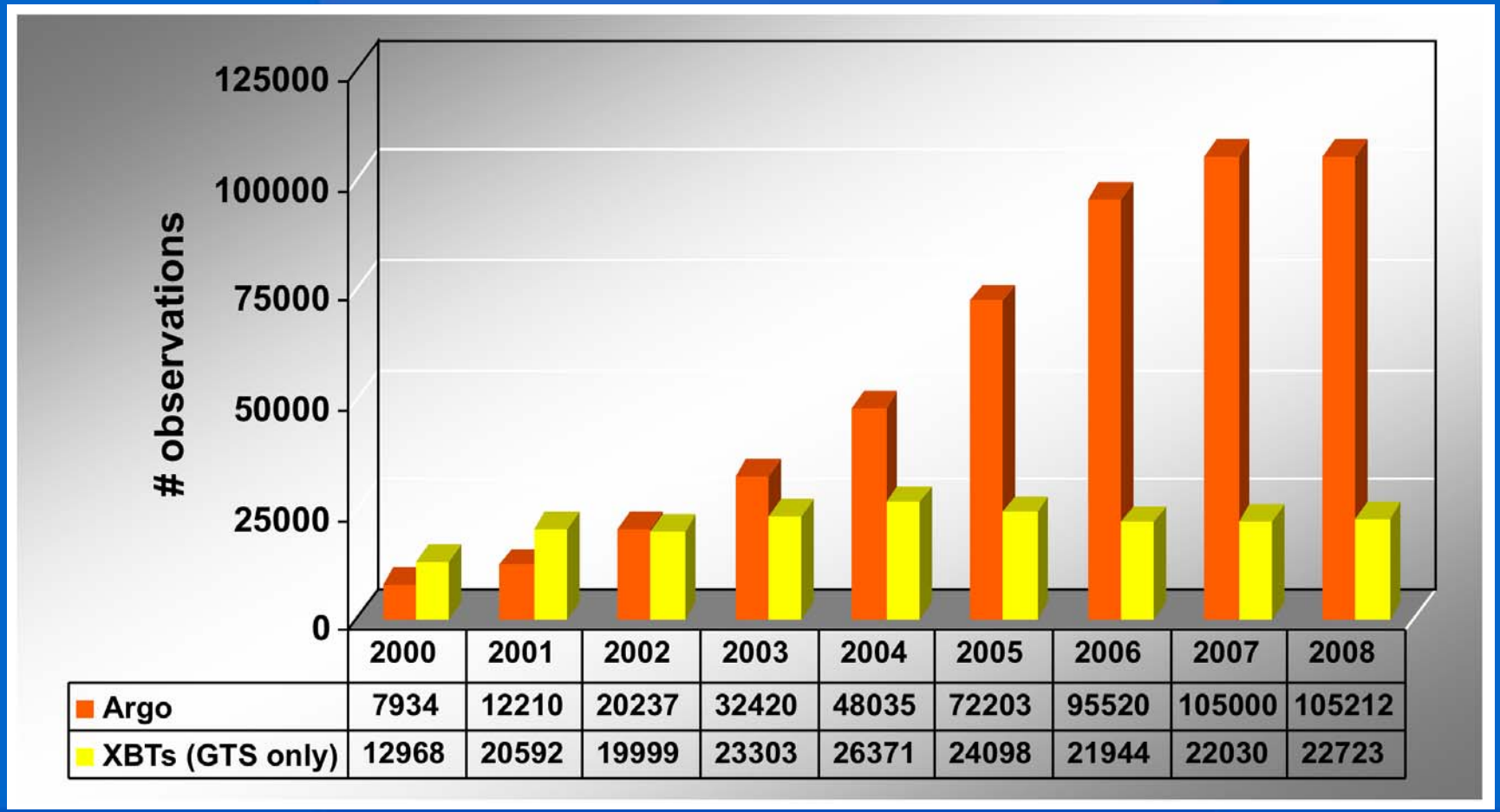
Approx 23,500

XBT and Argo floats observations





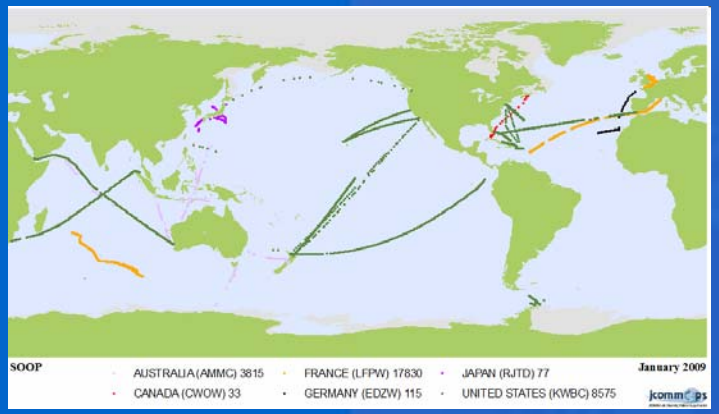
XBT and Argo floats observations



	2000	2001	2002	2003	2004	2005	2006	2007	2008
Argo	7934	12210	20237	32420	48035	72203	95520	105000	105212
XBTs (GTS only)	12968	20592	19999	23303	26371	24098	21944	22030	22723

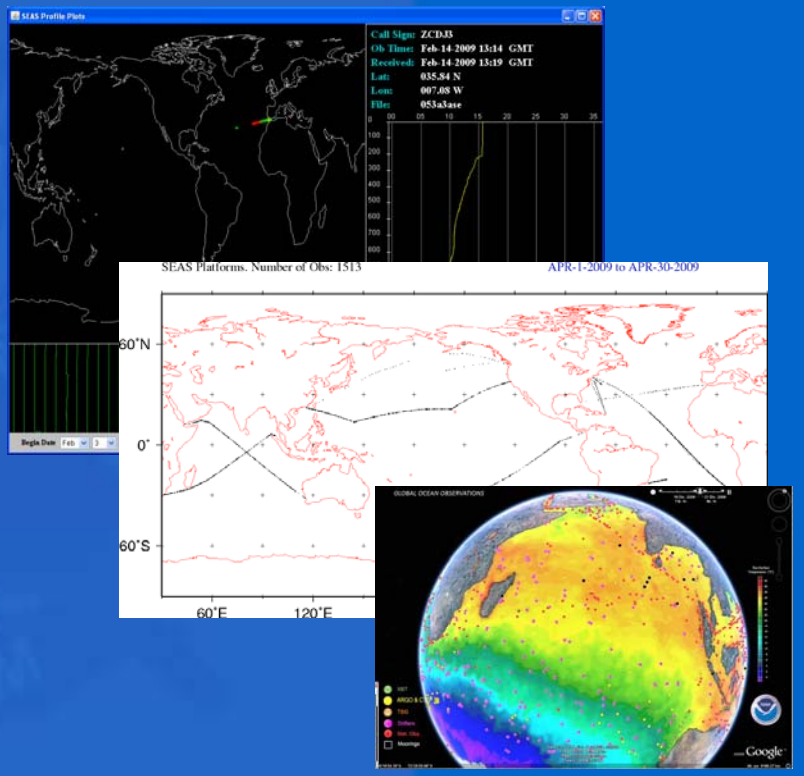
XBT deployment Monitoring Tools

IOC(M. Belbeoch) status reports on SOT



Meds reports

AOML monitoring tools



GE: http://www.aoml.noaa.gov/phod/goos.php

XBT Data Collection

Controller Software

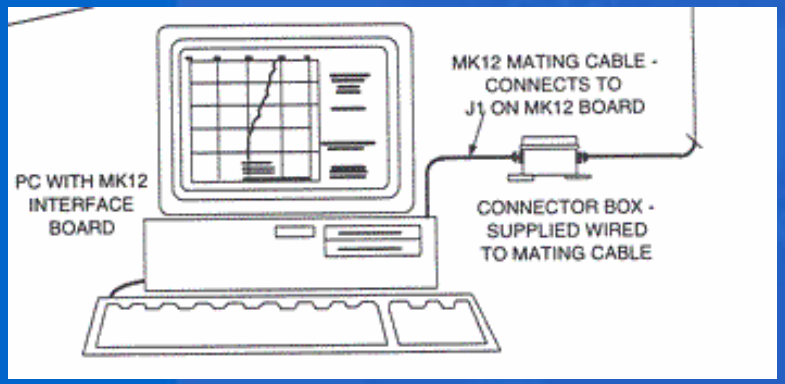
1. SEAS2000
2. CSIRO Devil

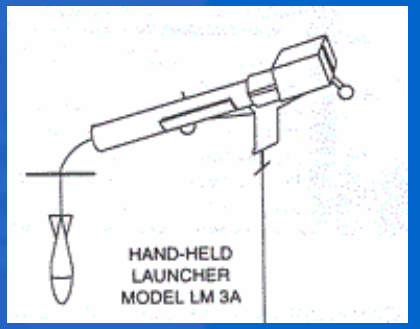
Digitizer/Recorder

1. MK21
2. CSIRO Devil

Launchers

1. AOML Autolauncher
2. Scripps Autolauncher
3. Sippican LM3A Hand launcher





TSG Data Collection

SBE-21
SBE-45

SCS
SEAS2000

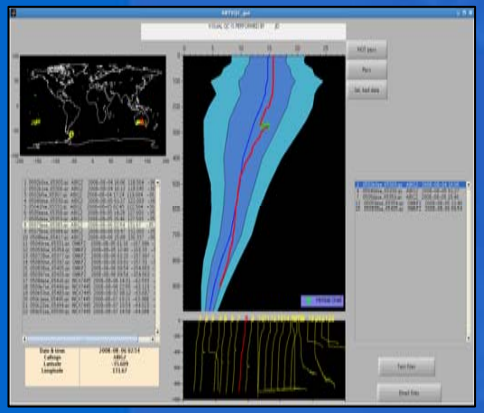
Data Quality Control

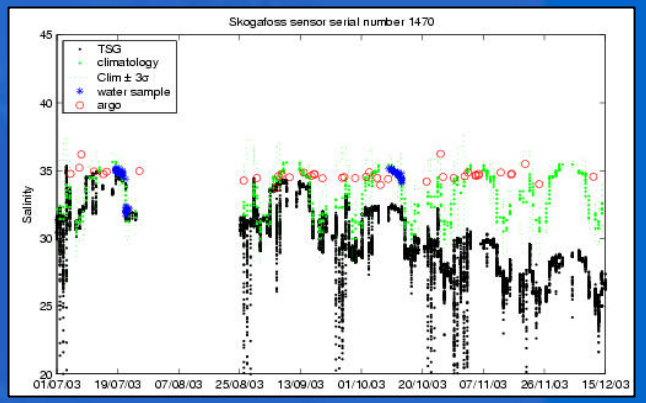
XBTs:

Auto QC: identical to Argo temperature profiles (RT)

Visual QC: several procedures (RT and DT)

GTSPP





TSGs:

Auto QC: identical to Argo SSS and SST (RT)

Visual QC: Coriolis (DT data)

Other topics

International Collaboration
Problem transects
XBT biases (FRE)
Communications
Review of network
pCO_2 transects
Software development
Transect responsibilities
BUFR and Metadata

Science and Operations

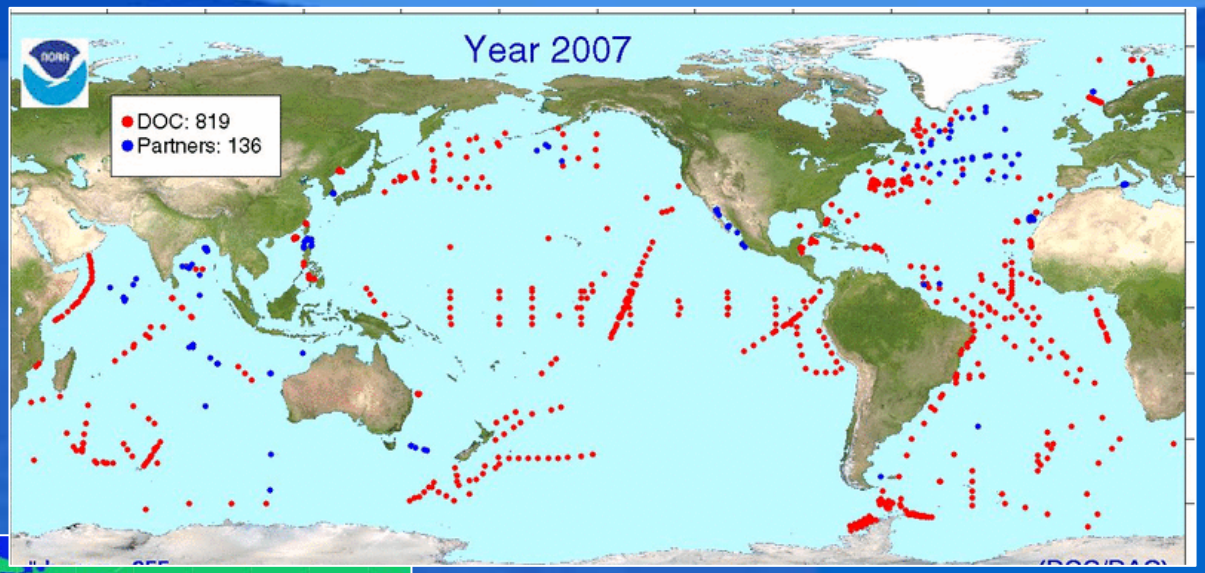
Originally designed to investigate ENSO, SI variability

Science uses (Mostly HD and FR modes)
Eddy resolving, Identification of surface, subsurface currents, compute their mass transports,
Meridional heat transport,
Strength of gyres,
Validation of models,
Water mass formation,
Heat budget.

Operational uses (all modes):
Data assimilation into models (significant improvement of models)
Validation of models.

Recruiting

Deployment opportunity for other platforms



www.aoml.noaa.gov/phod/dac

www.aoml.noaa.gov/phod/argo/opr

Future Work

BUFR and Metadata from testing to implementation.

New thermal network: Emphasis on HD, continue with FR and HD transects.

Increase international collaboration.

Explore other means of transmission (Argos).

Support of GTSPP and other DT databases.

Increase GOSUD – SOOP collaboration.

New technology: Self-contained autolaunchers, Underway CTDs

New Action Items

Implementation

1) **Identify what OceanObs99 (and later OceanObs09) recommended transects are not being implemented (TC), identify reasons (CP), and explore how to help these institutions (TC and CP).**

2) **Continue efforts to accomplish recruitments in transects that not currently being carried out.**

3) **Define role of TC in SOOPIP (TC, CP).**

4) **Aid IRD/Noumea place data in RT into GTS.**

Transmissions

1) **Urge all institutions to transmit profiles in RT or NRT into GTS (TC).**

2) **Identify institutions, operators that are not currently transmitting XBT and TSG data into GTS (TC). Provide help, such as in equipment, expertise, etc. (CP).**

3) **Explore the possible use of Argo3 for data transmissions (CP, DS, JT).**

New Action Items (cont)

Monitoring

1) **Evaluate the differences of the currently available XBT monthly reports. Investigate if collaborative work would be more effective (TC).**

2) **XBT operators will implement the unique ID algorithm presented by C. Sun in RT and DT modes (CS, AOML, BOM, CSIRO, IRD).**

3) **Decide and discuss how goals are established (based on #transects, #probes, or both). (GG, TC)**

New Action Items (cont)

Data Management

1) **Establish homogeneous quality control steps in RT, probably similar to those used for Argo profiling floats, plus a few additional steps (CP, TC, CS, TB, LP).**

2) **Establish homogeneous quality control steps in DT, probably similar to those used for Argo profiling floats, plus a few additional steps (CP, TC, CS, TB, LP).**

3) **Determine the values of the GTSPP quality flag table to include global and depth specific entries to be used in BUFR tables (CP, TC, JT, DS, FB, LP).**

4) **Is there a need for a new date for BUFR implementation? (CP, TC).**

5) **Report on the first BUFR tests (JT, LP, FB, DS, TC).**

6) **Identify the different DT databases currently available and their differences to aid users on when to use them (TC, CS, TB, CP).**

New Action Items (cont)

Applications and Science

1) **Identify operational users of XBT and TSG observations (CP).**

2) **Identify operational centers that could be using TSG observations but that are not doing so (CP).** ***For example, these centers are those that are using TESAC observations but are not using BATHY and TRACKOB reports*.**

3) **Explore possibility of converting TRACKOBs into TESAC or into ZZYY to have TSG data used in operational models. Implications. (CP, JT, LP).**

4) **Identify if there are other ocean observations (pCO_2, CPR, ADCP, etc) that could benefit the operational community if they are transmitted into the GTS (CP).**

5) **Identify the exact role of GOSUD within the SOOP.** ***Is SOOP for implementation and GOSUD for data?*** **(CP, TC, LP, SM).**

6) **Operational models only use a few points and not full resolution XBT profiles. Some institutions are not transmitting full resolution profiles in RT, when this was actually a recommendation of OceanObs99. Investigate if FR profiles are really needed and if they are currently being used (CP, TC).**

New Action Items (cont)

Applications and Science (cont)

6) **Make sure that SOOP efforts are recognized by the appropriate OceanObs09 CWPs, and that SOOP is referenced as SOOP and not VOS (TC, CP).**

7) **Explore the connection between SCOR and SOOP (TC, CP, TR, LP).**

8) **Propose an XBT Science Panel, similar to the Argo Science Steering Team, to share and discuss scientific results in a periodic basis (CP).**

9) **Have an article about ocean obs made by the Oleander in BAMS (or similar publication) co-authored by each PI contributing to observations (CP).**

10) **Identify potential areas of collaboration with SeaKeepers and Ferryboxes (CP).**

11) **Obtain from Sippican the results of their FRE experiments (JH, TC, CP).**

12) **Encourage Sippican to donate XBT probes for FRE experiments (TC, CP, JH).**

New Action Items (cont)

New technologies

21) Identify how new technologies can aid SOOP. Example: self-contained XBT launcher, transmission options (CP, TC).

SOOP visibility

1) Update SOOPIP web page to contain SOOP activities (TC)

2) Finalize XBT bibliography and create a TSG bibliography and have them posted in the SOOPIP web page (CP).

New Action Items (cont)

CP = Chairperson
TC = Technical Coordinator (Mathieu Belbeoch)
DS = Derrick Snowden
JT = Joaquin Trinanes
FB = Francis Bringas
SM = Shawn Smith
LP = Loic Petit de Lavilleon
TR = Thomas Rossby