

Ship Observations Team

~ integrating & coordinating international ship-based observing programmes for JCOMM ~



PMO Support for Other Programs

PMO-IV and Support to Global Ocean Observations using Ship Logistics
8-10 December 2010, Orlando, FL, USA

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Outline

- **Drifting Buoys**
- **Profiling Floats - Argo**
- **XBT SOOP**
(eXpendable BathyThermograph)
(Ship Of Opportunity Programme)
- **ASAP**
(Automated Shipboard Aerological Programme)



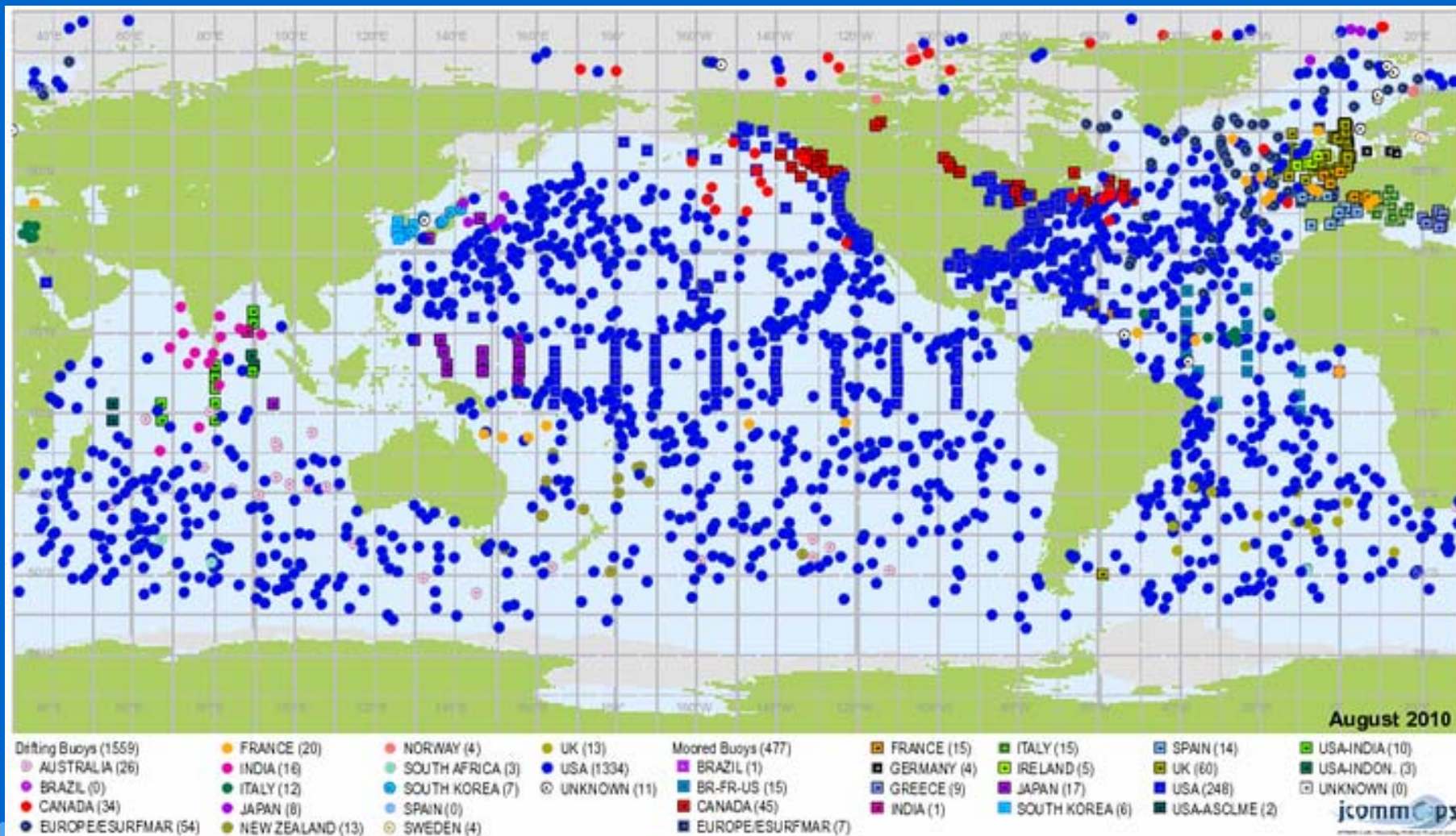
Drifting Buoys

Drifting Buoys

- Drifting buoys measure a range of parameters including:
 - » *atmospheric pressure,*
 - » *sea surface temperature,*
 - » *Lagrangian current,*
 - » *wind speed and wind direction, sub-surface temperatures.*
- Data are relayed via satellite (Iridium or Argos) for immediate use in forecasts and warnings.
- The Data Buoy Cooperation Panel (DBCPC) coordinates the use of autonomous data buoys to observe atmospheric and oceanographic conditions, over ocean areas where few other measurements are taken.

Global Drifting Buoy Network

Global target is 1250 buoys (5° x 5°)



Deploying a Drifter



Drifting Buoys

The range of PMO duties for Drifting Buoys include....

- » **Sourcing suitable deployment ships on required routes**
- » **Storage of drifters prior to deployment**
- » **Checking drifting buoy transmission prior to deployment**
- » **Trans-shipment of drifters to deployment ship**
- » **Preparation of deployment instructions for ships staff**
- » **Providing training and instruction to ships staff on correct deployment procedures**
- » **Checking deployment details are correctly recorded (e.g. in TurboWin) and sent to Met Services**
- » **Providing feedback to ships staff on successful/unsuccessful deployments**

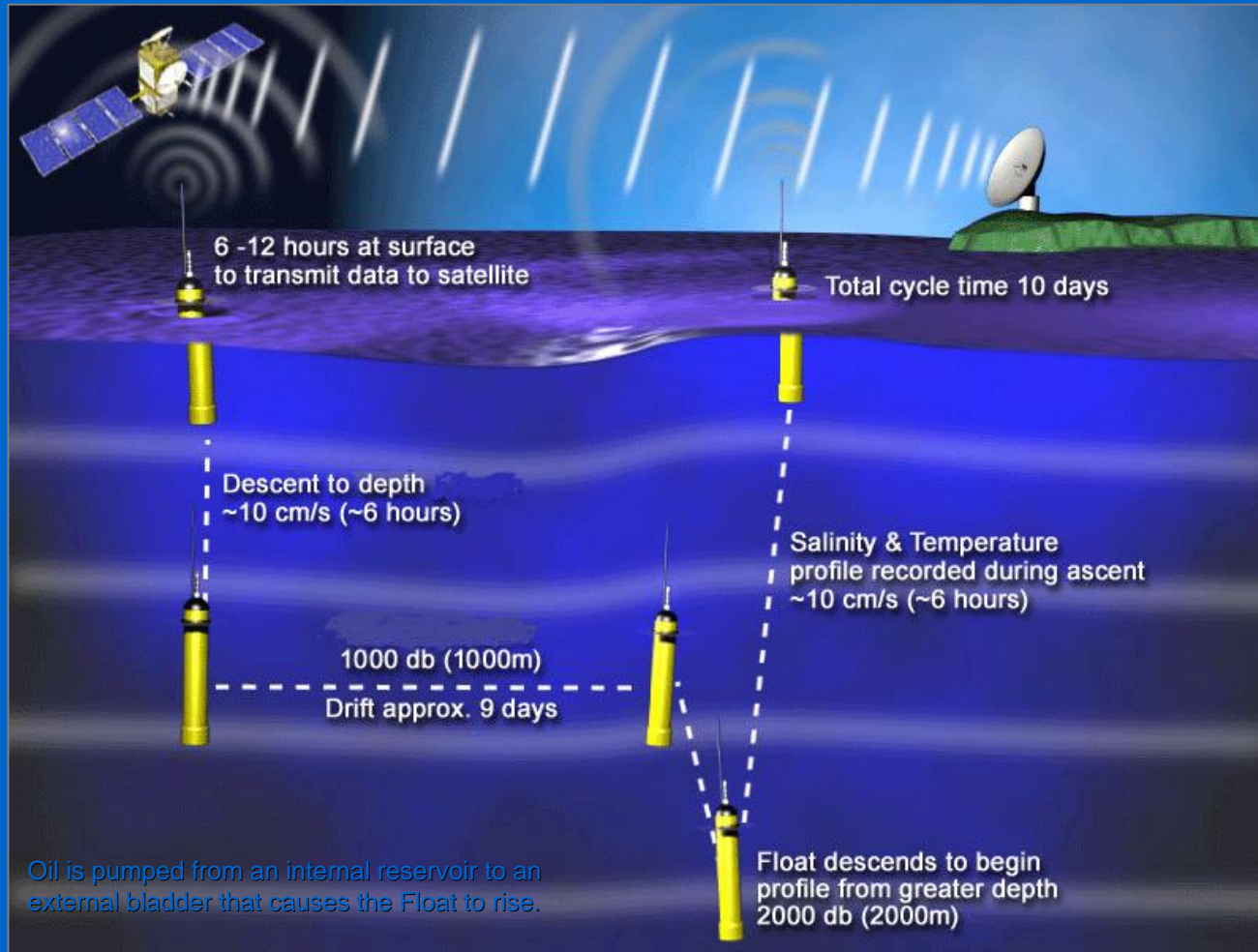


Profiling Floats

What is Argo

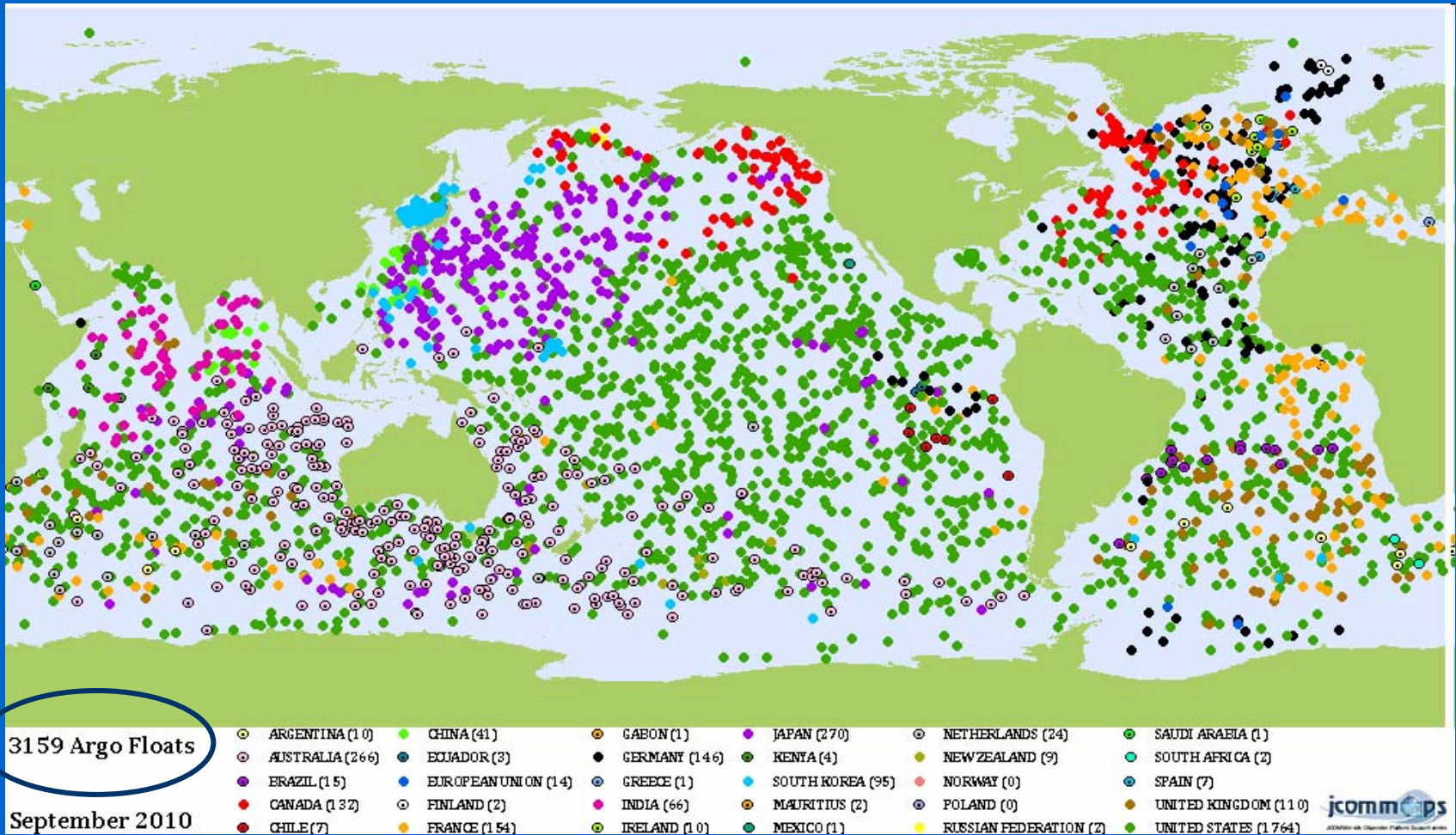
- Argo is an international project to collect information on the temperature & salinity of the upper part of the oceans.
- Argo uses robotic floats that spend most of their life drifting below the ocean surface.
- Every 10 days the float ascends and profiles the salinity and temperature.
- The profile data are transmitted via satellite then the cycle repeats. Currently, there are roughly 3000 floats producing 100,000 temperature & salinity profiles per year.

Profiling Float Operating Cycle



Profiling Float Array

Global target is 3000 floats ($3^\circ \times 3^\circ$)



Argo Floats

The range of PMO duties for ARGO Floats include....

- » **Sourcing suitable deployment ships on required routes**
- » **Storage of floats prior to deployment**
- » **Trans-shipment of floats to ship**
- » **Providing training and instruction to ships staff on correct float deployment procedures (e.g. VOS deployment video)**
- » **Checking deployment details are correctly recorded (e.g. in TurboWin) and details sent to Met Services**
- » **Providing feedback to ships staff on successful/unsuccessful deployments**



XBT SOOP

XBT SOOP

- Before Argo, the routine sampling of the upper 1000m in the oceans was made by the eXpendable BathyThermograph Ship Of Opportunity Programme.
- The XBT samples the temperature of the water at regular intervals and relays the data to a computer on the ship.
- The XBT is a small expendable projectile launched from the side of the ship.

XBT SOOP

- Since Argo, the low-density or broad scale XBT sampling has transitioned into more targeted sampling to resolve:
 - » Spatial structure of mesoscale eddies, fronts & boundary currents,
 - » Seasonal to inter-annual thermal variability & small scale features.



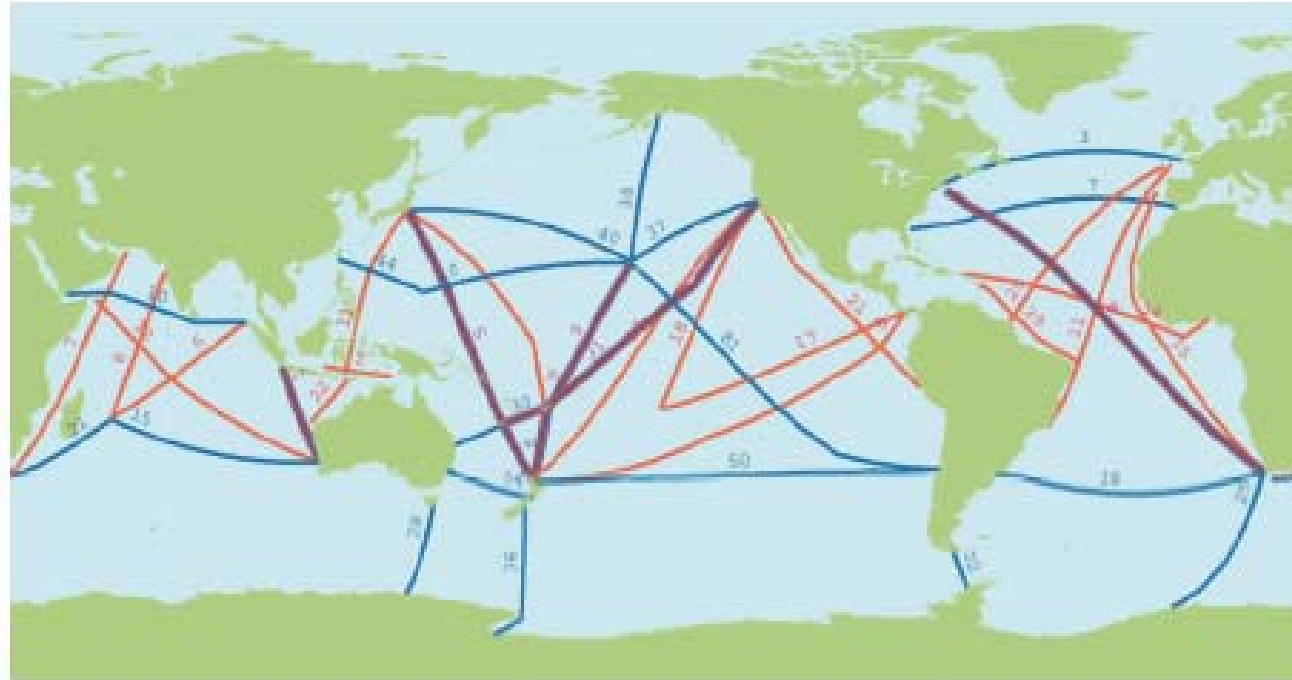
Launching an XBT



Devil XBT System used by ABOM

Global XBT Sampling Lines

Global requirement is about 24000 profiles p.a.



High-Density (HDX) Frequently-Repeated (FRX) Both



XBT SOOP

The range of PMO duties for SOOP include....

- » Helping to source & recruit host ships on suitable routes
- » Ongoing encouragement, training and support for operators
- » Collect paperwork and the diskettes of high-resolution delayed-mode profile data.
- » Re-supply of consumables (probes, disks, stationery etc).
- » View the XBT drops and provide immediate feedback to ship's staff
- » Provide QC feedback to the operators
- » Checking equipment operation (e.g. laptop computer, launcher, transmitter etc)
- » Confirm the crews understanding of the sampling instructions (transect start & end points, frequency of XBT drops, criteria for repeat drops etc).

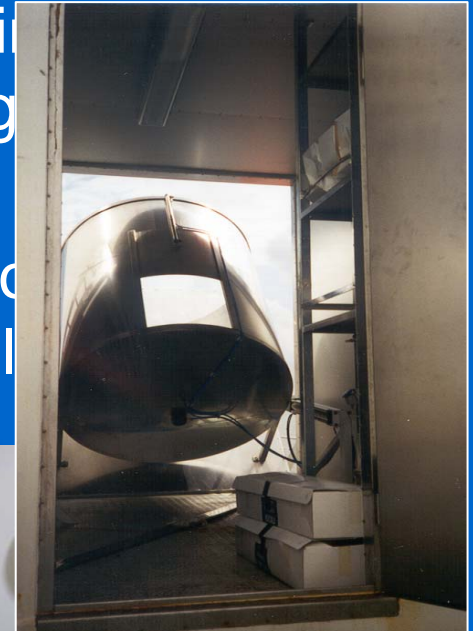
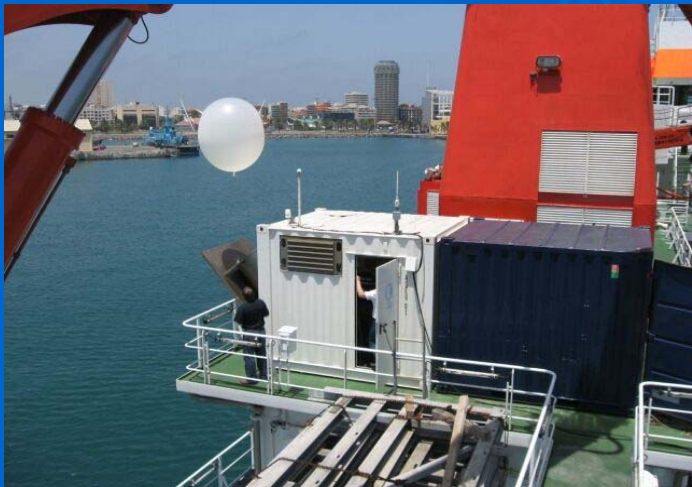


ASAP

ASAP

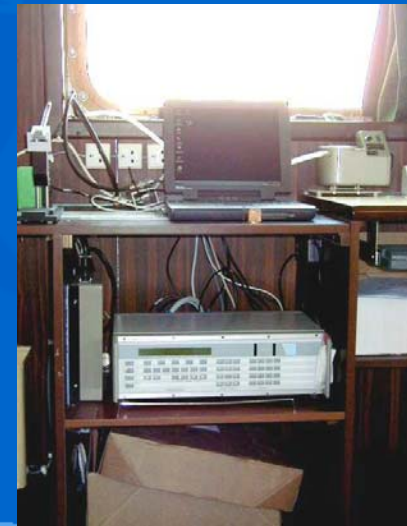
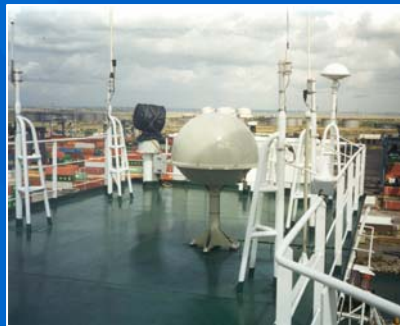
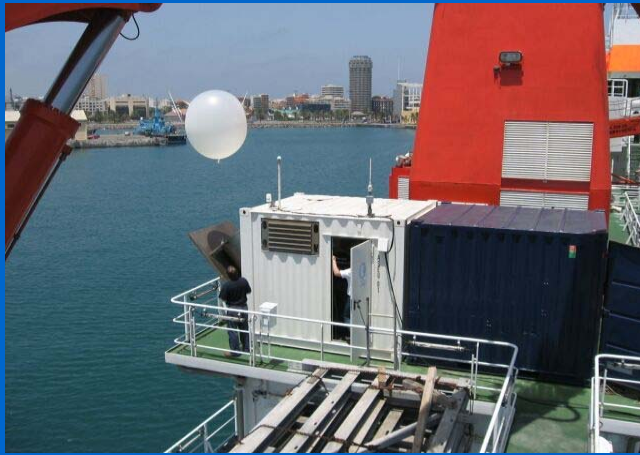
Automated Shipboard Aerological Programme

- The vast majority of soundings are performed in the Atlantic on behalf of the Eumetnet ASAP programme (ASAP) using merchant ships
- Research ships also perform a lesser number of soundings (eg for Japan, South Africa, and other national meteorological institutions)



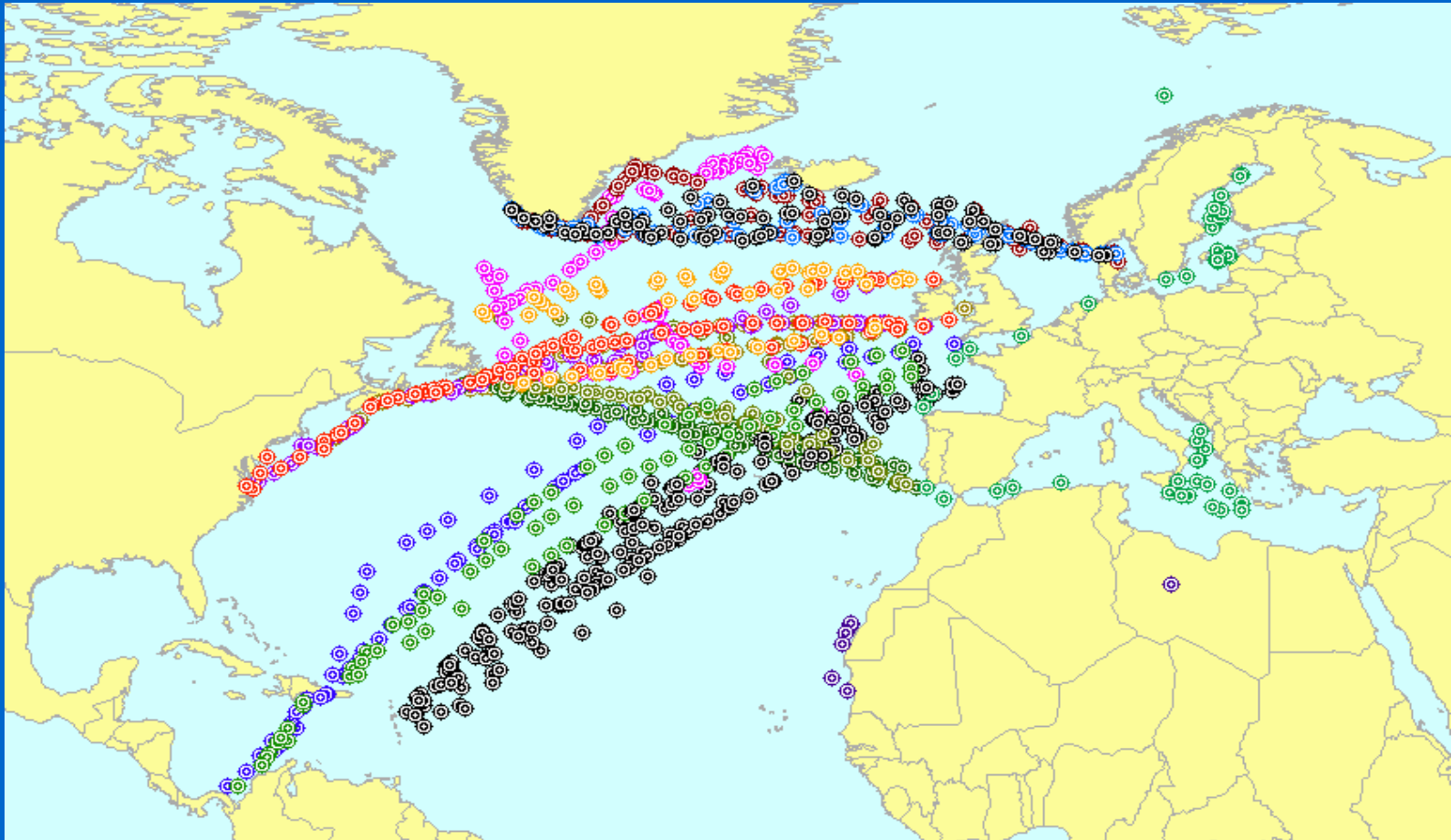
ASAP

Automated Shipboard Aerological Programme



ASAP

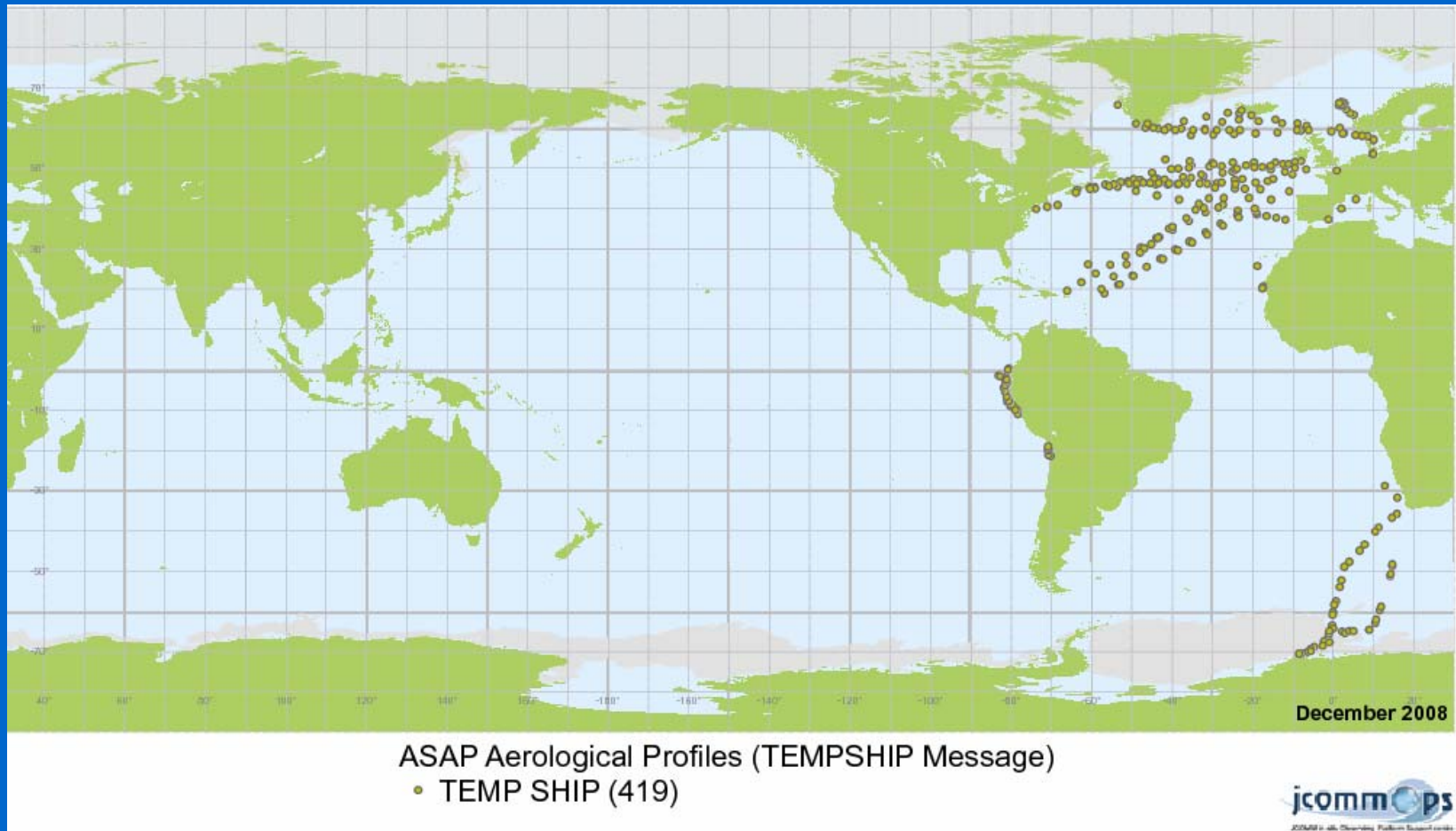
E-ASAP network coverage – Q3 2010



ASAP ID	Total ascents Jan till Sep 2010
ASDE01	285
ASDE02	233
ASDE03	278
ASDE04	227
ASDK01	275
ASDK02	273
ASDK3	188
ASES01	109
ASEU01	190
ASEU02	207
ASEU03	195
ASEU04	231
ASEU05	223
ASFR1	153
ASFR2	224
ASFR3	125
ASFR4	110
ASGB01	159
ASIS01	157
Total	3842

ASAP

Global network coverage – Dec 2008



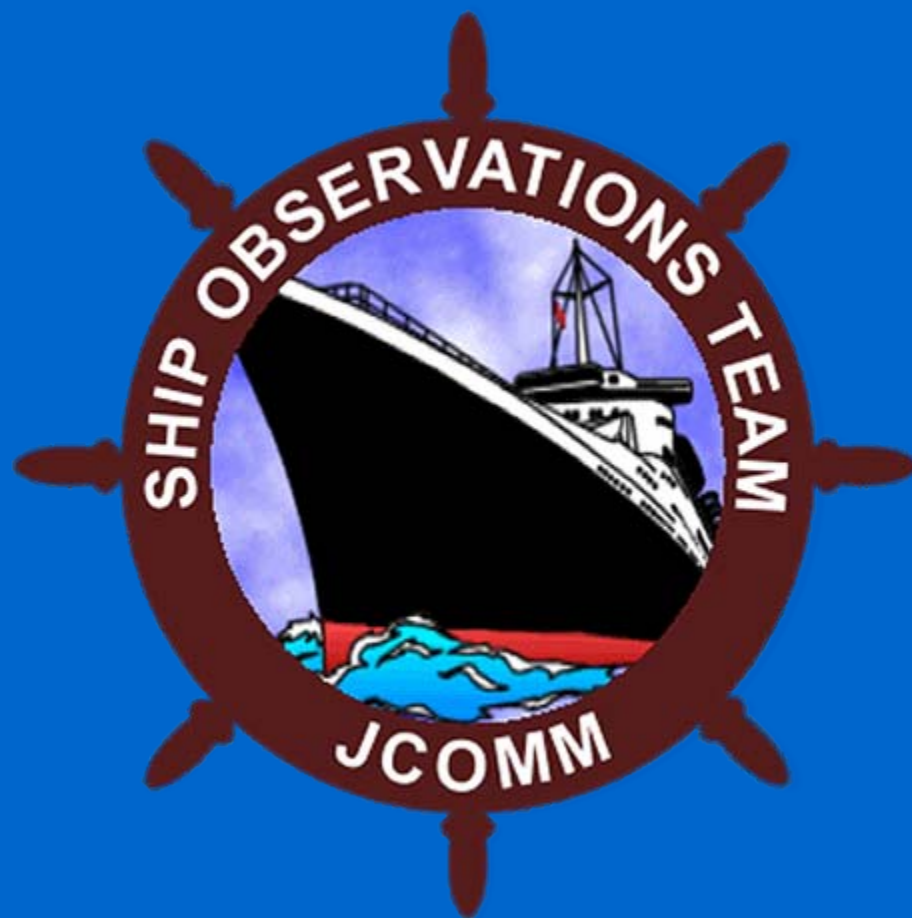
ASAP

The range of PMO duties for ASAP include..

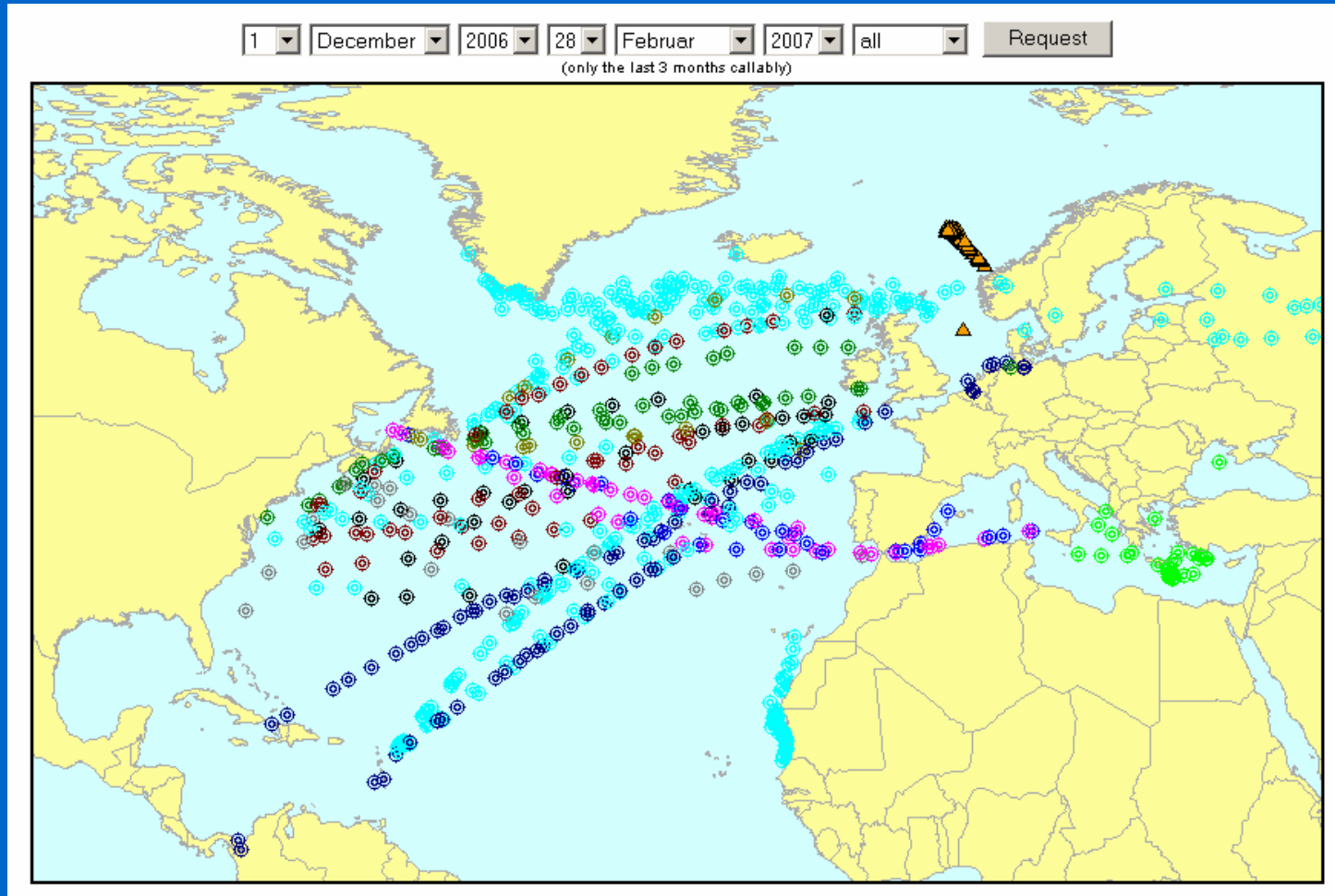
- **Helping to source host ships on suitable routes**
- **Assisting with initial survey of host ship and installation of ASAP system**
- **Routine Maintenance visits when in service**
- **Ongoing encouragement and training for ASAP operators**
- **Resolution of any observation monitoring problems**
- **Assisting with resolution of any equipment/transmission problems**
- **Downloading of raw data**
- **Collection of sounding logs**
- **Inventory of sondes & balloons to make sure ship has sufficient stocks for upcoming voyage**
- **Arranging re-supply of consumables (Helium, sondes and balloons)**
- **Visual Checks of Hardware - Computer, Sounding unit, Iridium Transmitter, Antenna, Cable connections etc)**
- **Open & close the launcher to check pneumatics**
- **Check helium levels, hose, pressure reducer & pressure (200bar is Full)**

E-ASAP Maintenance Visits





E-ASAP Routes



E-ASAP Routes December 2006 to February 2007
PMO-IV | Other PMO Activities

ASAP

International activity

