



Partnership between the Marine Industry and the Marine Meteorological & Oceanographic Communities



Prepared by the
JCOMM Ship Observations Team
(Task Team on VOS Recruitment & Programme Promotion)



Version 3, 2008



Version History

Version	Released	Updated by
1	2003	Steve Cook, Chair of SOOPIIP
2	May 2005	Steve Cook, Chair of SOOPIIP
3	June 2008	Graeme Ball, Chair of SOT, for the SOT Task Team on VRPP
4		
5		
6		
7		
8		
9		
10		

(slide does not show)



Outline

- Why Take Marine Observations ?
- The Global Framework.
- Ship-based Observing Programmes.
- Complementary Marine Programmes.
- More Information.

Global Framework

- International Co-ordination
- The Global Marine Programme
- Global Observing System (GOS)
- Using the data you collect
- An Integrated Marine Observing Network
- Impact on the ship & crew
- Looking Ahead

Ship-based Observing Programmes

- VOS
- ASAP
- SOOP

Complementary Marine Programmes (deployed from ships)

- Drifting buoys
- Profiling floats

More Information

- Contact details
- Website links

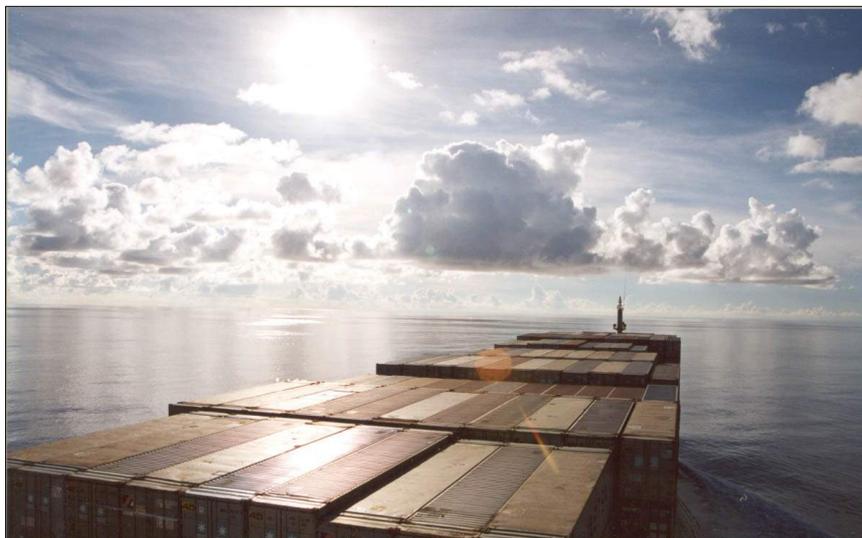


Why Take Marine Observations ?

Setting the Scene – Why Take Marine Observations ?



Perfect World – Smooth Sea & Full Load





Real World – Dangerous Weather & Rough Sea



A typhoon hit the APL China en-route from Taiwan to Seattle, Nov. 1998. Approximately 406 containers were lost overboard and 1000 damaged.



Perfect World – Abundant Water & Crops





Real World – Climate Variability & Drought





Why are the Oceans Important ?

- Oceans cover about 70% of the Earth's surface.
- The oceans serve many functions, including influencing the weather & temperature:
 - The oceans moderate the Earth's temperature by absorbing incoming solar radiation which is stored as heat energy.
 - The stored heat energy is distributed around the globe by ocean currents.
 - Oceanic phenomena, such as El Nino & La Nina, impact on vast areas of the Earth, often with serious consequences.



Marine Observations are Vital !

- Observing the state of the oceans & atmosphere enables us to predict the weather and to detect long-term climate variability & climate change.
- In-situ observations from ships & autonomous marine platforms remains the only way to observe & monitor some oceanographic & atmospheric parameters.
- Marine observations supplement & assist in calibrating satellite-derived observations.



- International Co-ordination
- Global Marine Programme Framework
- Global Observing System (GOS)
- Using the data you collect, with El Nino example
- Impact on the ship & crew
- Looking ahead – SOT proposal for generic ship design with dedicated scientific sampling infrastructure



International Coordination

- The **S**hip **O**bservations **T**eam (SOT) coordinates three enduring global ship-based observing programmes:
 - The **V**oluntary **O**bserving **S**hip (VOS) Scheme.
 - The **S**hip-of-**O**ppportunity **P**rogramme (SOOP).
 - The **A**utomated **S**hipboard **A**erological **P**rogramme (ASAP).
- The SOT is co-sponsored by WMO & IOC through JCOMM.



WMO = World Meteorological Organization

IOC = Intergovernmental Oceanographic Commission of UNESCO

JCOMM = **J**oint WMO/IOC Technical **C**ommission for **O**ceanography and **M**arine **M**eteorology



The Global Marine Observing Programme

- JCOMM is the reporting & coordinating mechanism for the operational marine activities of WMO & IOC.
- The SOT coordinates the JCOMM ship-based programmes at the global level.
- National agencies & institutions implement & operate the JCOMM programmes at the national level.



The Global Observing System

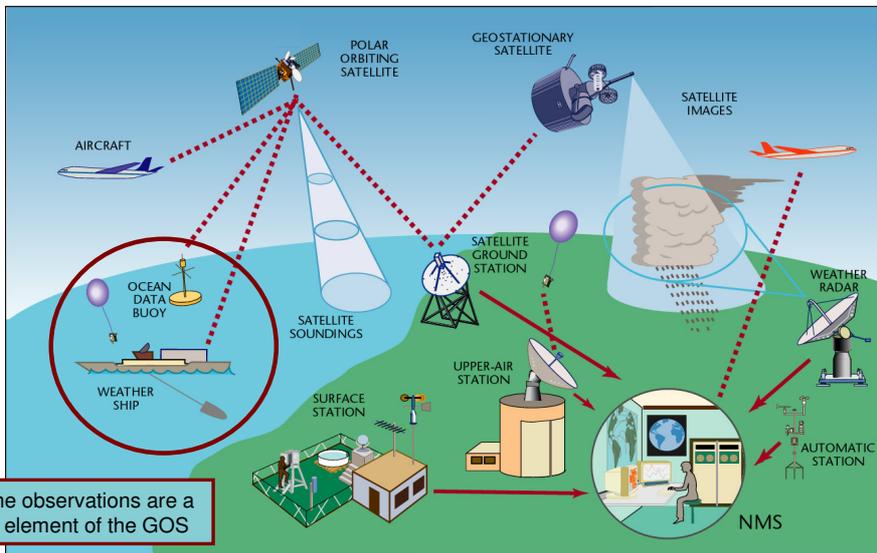
- Observations from ships make an important contribution to the Global Observing System (GOS), a key component of the World Weather Watch (WWW) Programme of WMO.
- The WWW provides countries with meteorological & related geophysical information that are needed for the operation of an efficient weather forecasting & warning service.

Components of the WWW:

- GOS, Global Observing System
- GTS, Global Telecommunications System, and
- data-processing & forecasting centres - operated by Members



The Global Observing System (cont)



Marine observations are a core element of the GOS



Using The Data You Collect

- Improves the analysis of weather systems & storm tracking.
- Improves numerical weather prediction, leading to better marine forecasts & ship routing.
- Assists with climate research, modelling & forecasts.
- Assists with the prediction of El Nino & other phenomena.

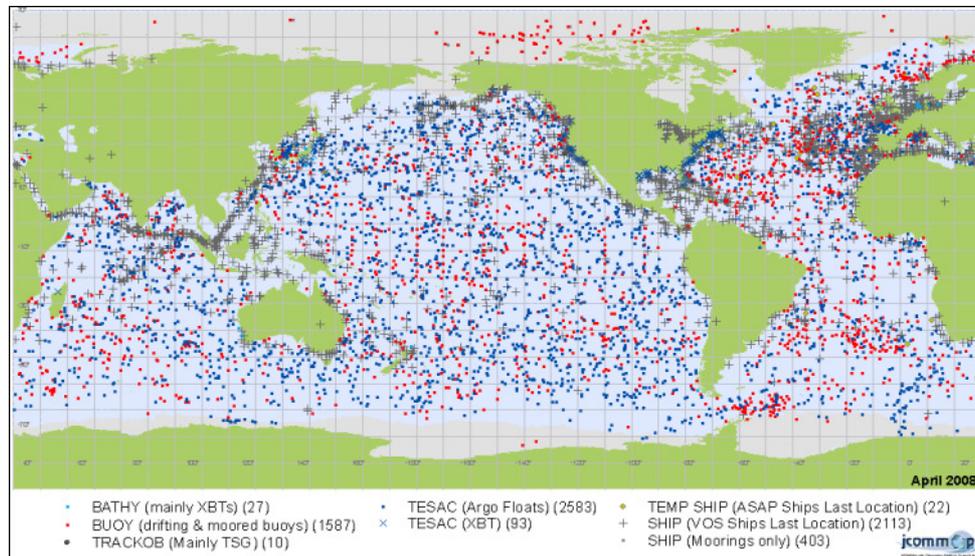
Other phenomena includes:

North Atlantic Oscillation research

Indian Ocean Monsoon Onset



An Integrated Marine Observing Network

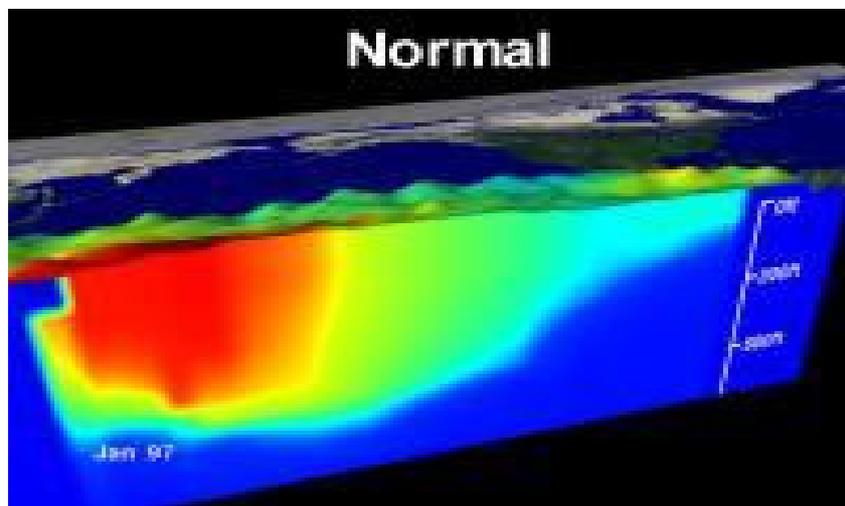


Integrated marine observing network, combining the observations from all marine platforms.

Observations from profiling floats and XBTs combine to provide a detailed vertical structure of the oceans. Detecting changes in the vertical structure, e.g. across the Equatorial Pacific Ocean (next 2 slides), are crucial for analysing and forecasting events such as El Nino.

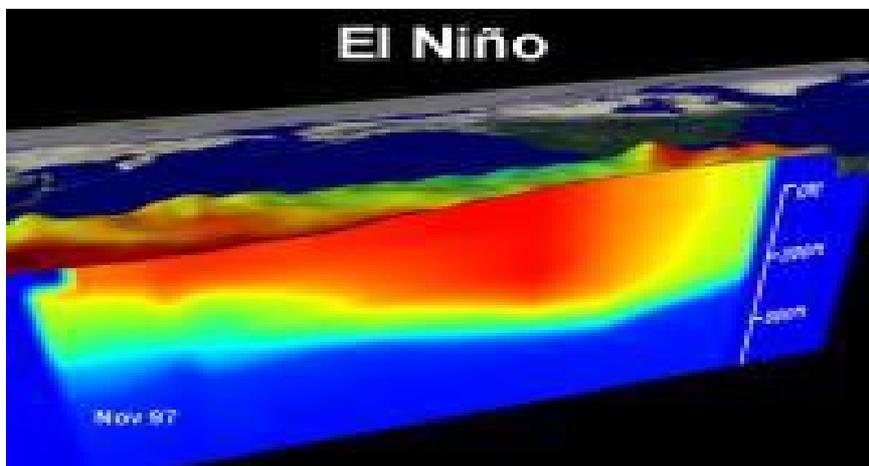


Equatorial Pacific Ocean





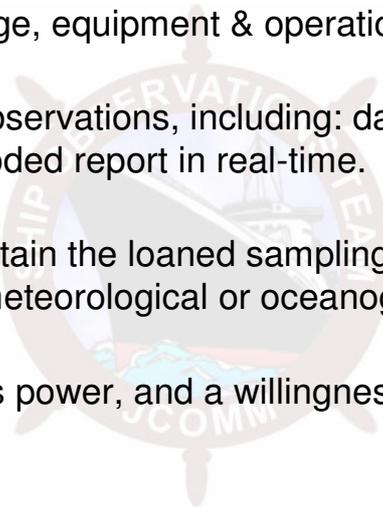
Equatorial Pacific Ocean





Impact on the Ship & Crew

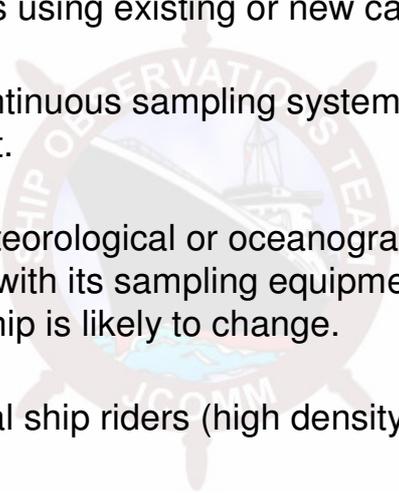
- Space for storage, equipment & operations.
- Make routine observations, including: date, time & position, and send the coded report in real-time.
- Care for & maintain the loaned sampling equipment provided by a meteorological or oceanographic agency.
- Access to ship's power, and a willingness to power on/off the equipment.





Impact on the Ship & Crew (cont)

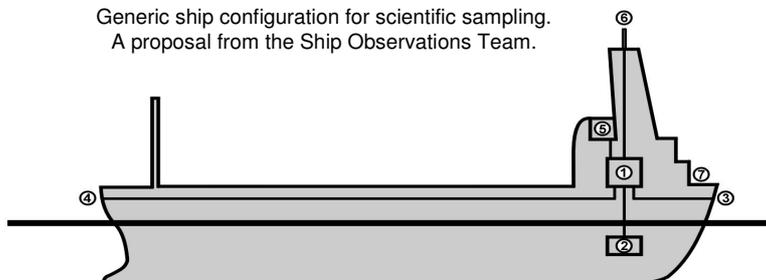
- Laying of cables using existing or new cable ducts.
- Plumbing of continuous sampling systems to a sea-water or air inlet/outlet.
- Contact the meteorological or oceanographic agency if problems arise with its sampling equipment, or if the trading pattern of the ship is likely to change.
- Allow occasional ship riders (high density XBT SOOP).





Looking Ahead ?

Generic ship configuration for scientific sampling.
A proposal from the Ship Observations Team.



- ① Dedicated scientific space for electronics & ship rider.
- ② Source & exit of sea & fresh water in engine room.
Power, LAN & antenna cable runs to scientific space.
- ③ Power, LAN & antenna cable runs to stern through scientific space.
- ④ Power, LAN & antenna cable & air tube runs to bow through scientific space.
- ⑤ Power, LAN & antenna cable & air tube runs to bridge through scientific space.
Bridge displays of appropriate sensors for ships use.
- ⑥ Antenna, GPS & power cable runs to bridge railing or stack area, for position
& real-time data transmission.
- ⑦ Deck or interior storage space for XBTs / Drifter / Floats.



 **VOS**
Voluntary Observing Ship Scheme

 **ASAP**
Automated Shipboard Aerological Programme

 **SOOP**
Ship-of-Opportunity Programme

Ship-based Observing Programmes

click logo to go to programme

**** Click on logo to go to programme ****



Complementary Marine Programmes

drifting buoys & profiling floats

[click logos to go to complementary programmes](#)

**** Click on logos to go to complementary programmes ****



More Information

- Contact details
- Website links



Contact Details

SOT	Graeme Ball	(AU)	g.ball@bom.gov.au
VOS	Julie Fletcher	(NZ)	fletcher@metSERVICE.com
VOSclim	Sarah North	(UK)	sarah.north@metoffice.gov.uk
ASAP	Rudolf Krockauer	(DE)	rudolf.krockauer@dwd.de
SOOP	Gustavo Goni	(US)	gustavo.goni@noaa.gov



Website Links

- | | |
|---------|--|
| SOT | http://www.jcommops.org/sot/ |
| VOS | http:// www.bom.gov.au/jcomm/vos/ |
| VOSClim | http:// www.ncdc.noaa.gov/oa/climate/vosclim/vosclim.html |
| ASAP | http:// www.jcommops.org/sot/asap |
| SOOP | http:// www.jcommops.org/soopip |



