



# 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

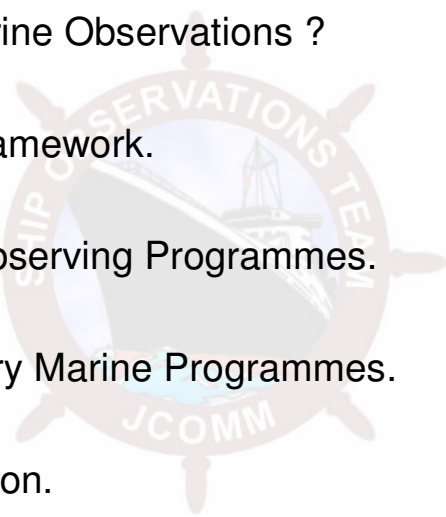
Version	Released	Updated by
1	2003	Steve Cook, Chair of SOOPIP
2	May 2005	Steve Cook, Chair of SOOPIP
3	June 2008	Graeme Ball, Chair of SOT, for the SOT Task Team on VRPP
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## Outline

- 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

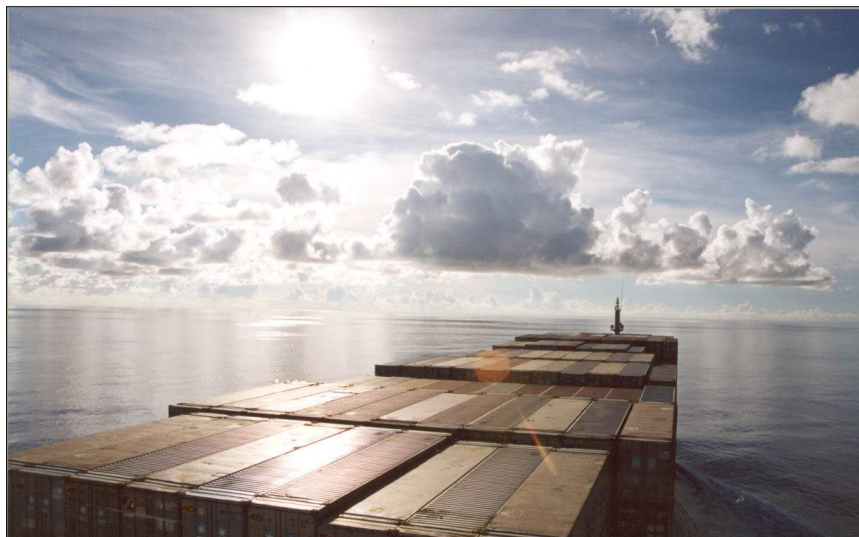
- Contact details
- Website links



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**pportunity **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

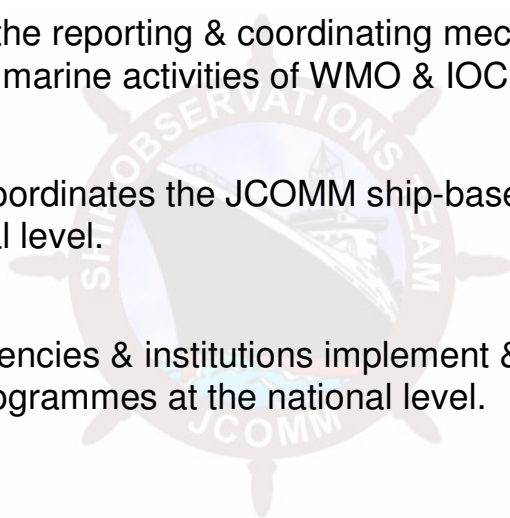
IOC = Intergovernmental Oceanographic Commission of UNESCO

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



## The Global Marine Observing Programme

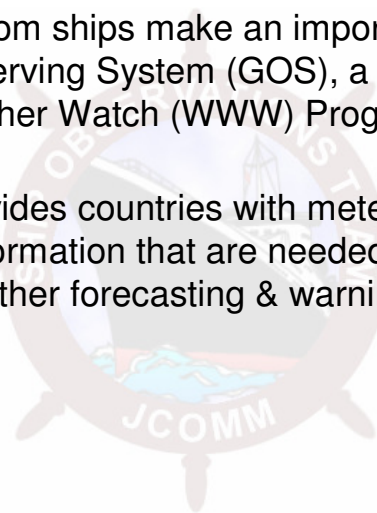
- JCOMM is the reporting & coordinating mechanism for the operational marine activities of WMO & IOC.
- The SOT coordinates the JCOMM ship-based programmes at the global level.
- National agencies & institutions implement & operate the JCOMM programmes at the national level.





## 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.

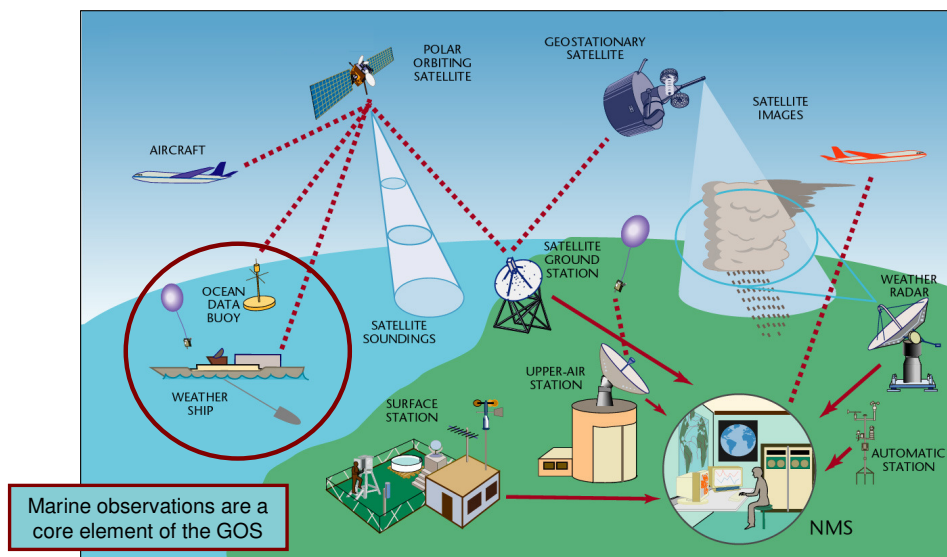


Components of the WWW:

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



## The Global Observing System (cont)





## 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:

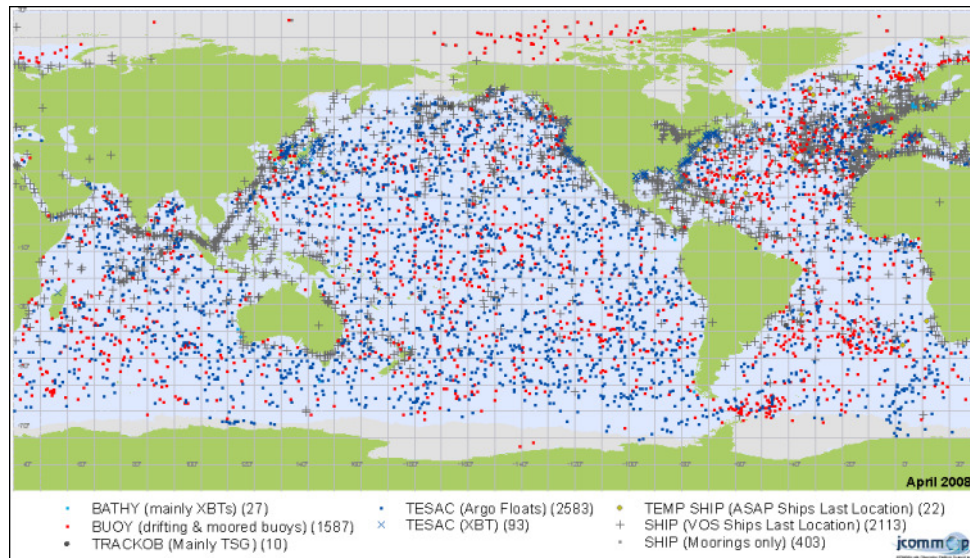
North Atlantic Oscillation research

Indian Ocean Monsoon Onset





## An Integrated Marine Observing Network

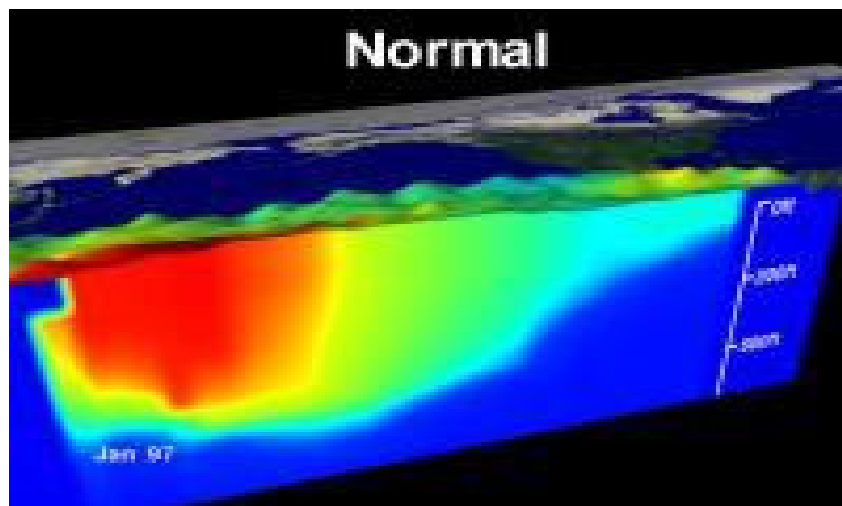


Integrated marine observing network, combining the observations from all marine platforms.

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.

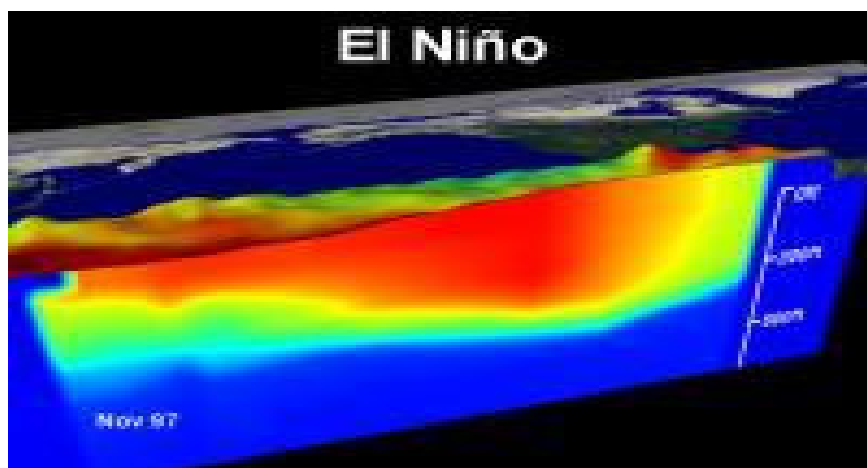


## Equatorial Pacific Ocean





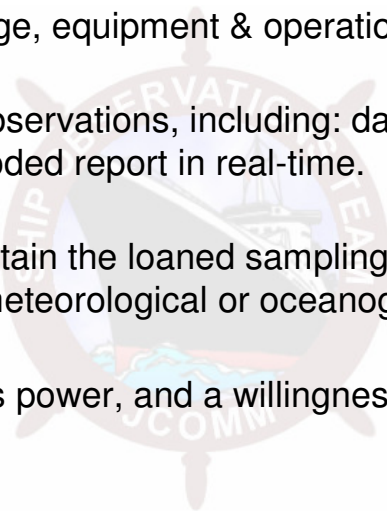
## Equatorial Pacific Ocean





## 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.





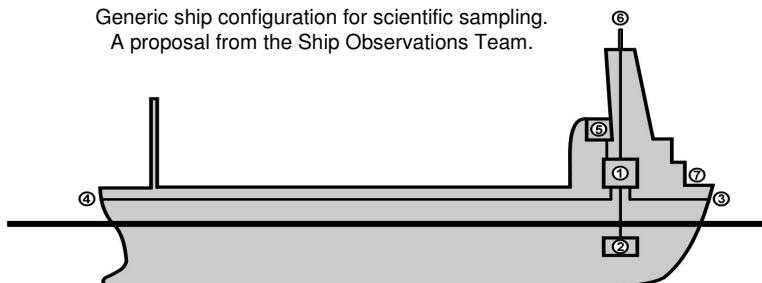
## Impact on the Ship & Crew (cont)

- 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 \*\***



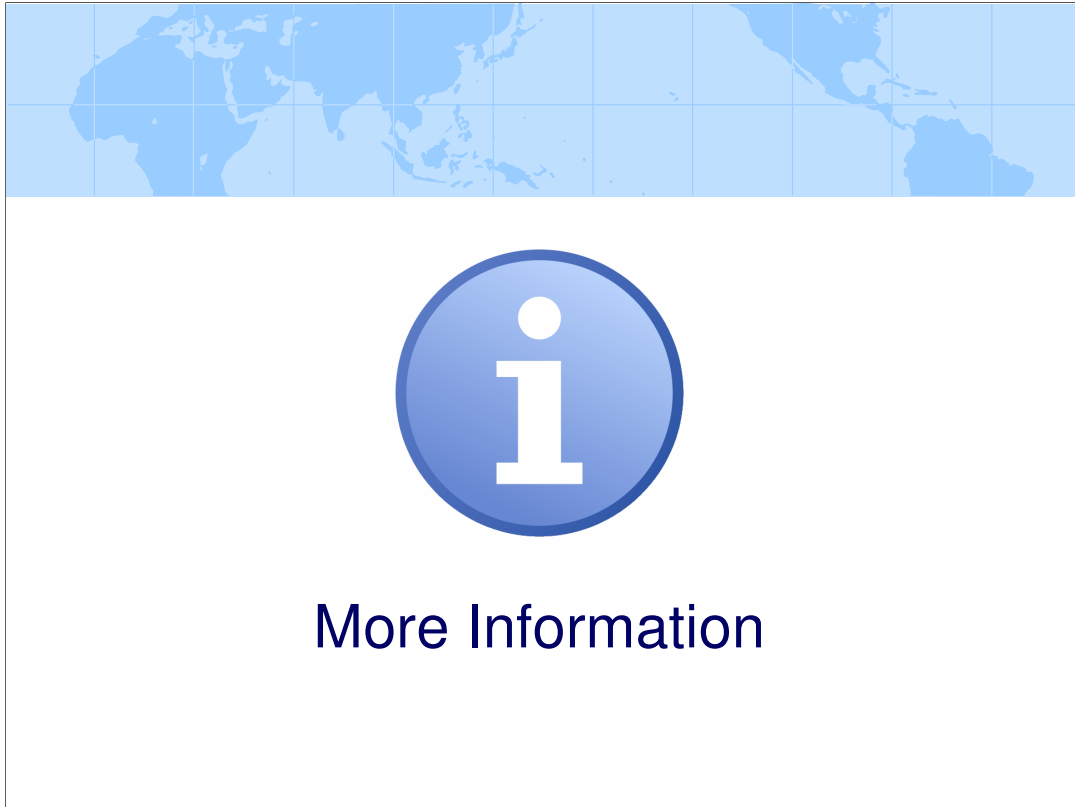
## Complementary Marine Programmes

drifting buoys & profiling floats

click logos to go to complementary programmes

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





- Contact details
- Website links



## Contact Details

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ASAP	Rudolf Krockauer	(DE)	<a href="mailto:rudolf.krockauer@dwd.de">rudolf.krockauer@dwd.de</a>
SOOP	Gustavo Goni	(US)	<a href="mailto:gustavo.goni@noaa.gov">gustavo.goni@noaa.gov</a>



## Website Links

SOT	<a href="http://www.jcommops.org/sot/">http://www.jcommops.org/sot/</a>
VOS	<a href="http://www.bom.gov.au/jcomm/vos/">http:// www.bom.gov.au/jcomm/vos/</a>
VOSClim	<a href="http://www.ncdc.noaa.gov/oa/climate/vosclim/vosclim.html">http:// www.ncdc.noaa.gov/oa/climate/vosclim/vosclim.html</a>
ASAP	<a href="http://www.jcommops.org/sot/asap/">http:// www.jcommops.org/sot/asap/</a>
SOOP	<a href="http://www.jcommops.org/soopip/">http:// www.jcommops.org/soopip/</a>

