

Voluntary Observing Ship (VOS) Data and the VOS Climate Project (VOSCLIM)

- VOSClim
 - Aims
 - Data Collection
 - Analysis
 - Outstanding Problems
- VOS Climate Data
 - Metadata
 - Automated Systems
 - VOS Data Quality
- Recommendations?

VOSClm: Aims

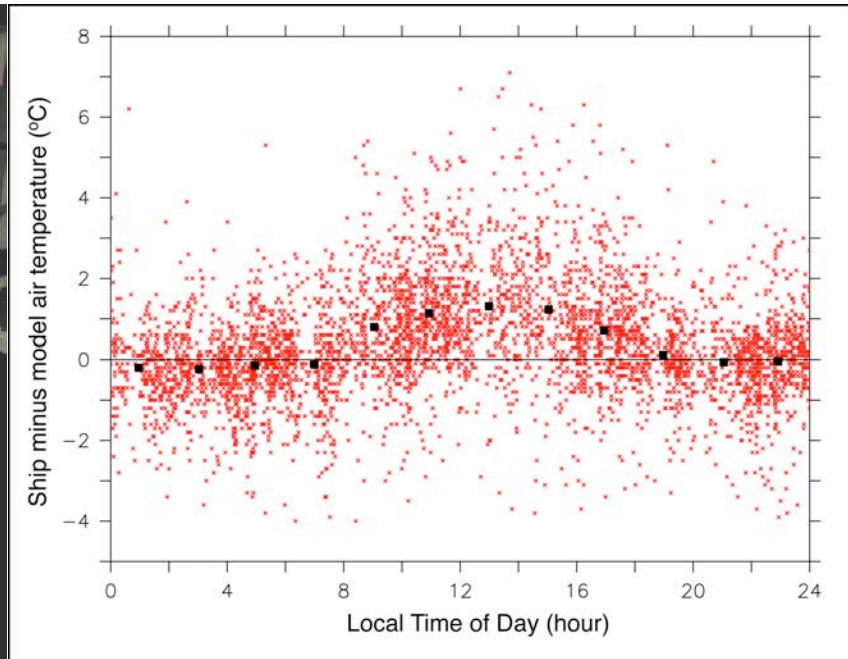
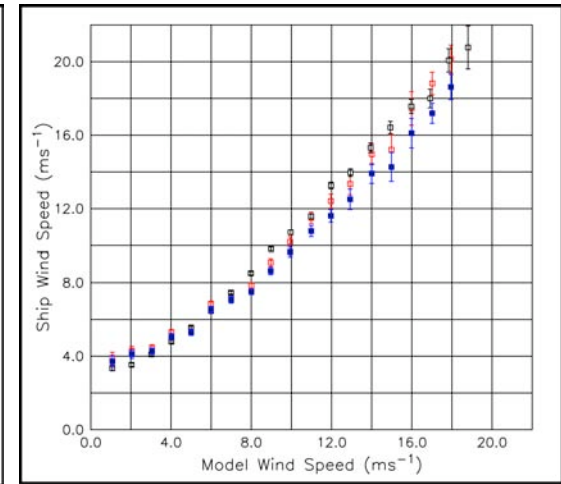
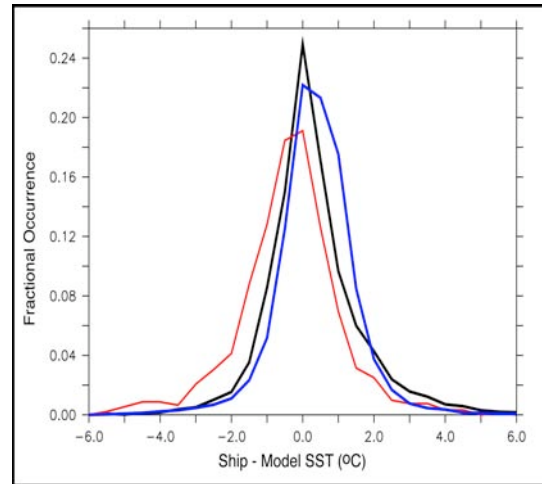
- Produce a high-quality VOS dataset suitable for climate research
- Improved understanding of biases and errors in VOS data

VOSClm: Data Collection

- 7 participating countries, nearly 100 ships
- Metadata collected and photographs taken
- Realtime data: merged GTS report and NWP output
- Delayed mode data: extra parameters to help assessment of bias
- Data now available from VOSClm website:

<http://www.ncdc.noaa.gov/oa/climate/vosclim/vosclim.html>

VOSclim: Analysis of Bias

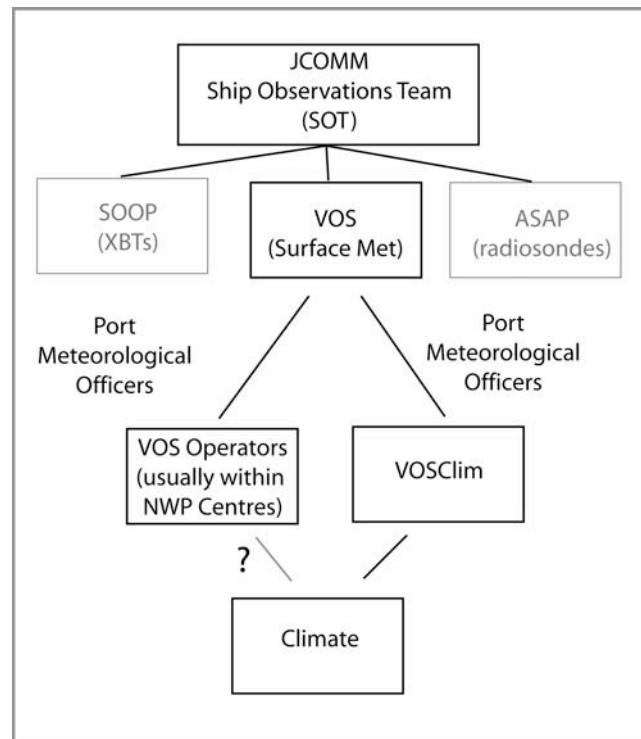


VOSClim: Outstanding Problems

- WMO metadata not available (big problem for VOS as well)
- TurboWin and 10 metre winds
- VOSClim needs a healthy VOS: but VOS operations are under pressure
- Need to promote wider research using the dataset (not just at Southampton)
- *Now move on to talk about VOS in more general terms - but problems for VOS are problems for VOSClim as well*

VOS Operational Overview

- The WMO VOS Program is overseen by the VOS Panel which is a constituent of the JCOMM Ship Observations Team (SOT)
- <http://www.jcommops.org/sot/>



VOS Metadata

- WMO Publication No. 47 metadata (List of Selected, Supplementary and Auxiliary Ships) urgently needs to be made available
- The VOS operators need up-to-date information
- Climate researchers need the full metadata record (sporadic since 1999)
- Good news: Project by NCDC underway to digitise historical VOS metadata (1954 -1973)

Automated Systems on VOS

- We are seeing the introduction of more automated systems on VOS, if done well this can be a good thing - we want:
 - Climate-quality data (good quality instruments, well exposed)
 - All variables for fluxes (manual cloud cover or possibly radiation)
 - To manage the transition (understand old systems before they disappear and make sure the new systems work properly and fully replace the old systems)

VOS Status

- VOS are perceived by NWP centres as poor quality - they would rather have data from drifting buoys
- Resources are therefore being moved away from VOS support
- Emphasis on 'cut-down' systems measuring only a subset of variables (typically pressure and possibly SST, air temps or winds) such as drifting buoys or mini-automated systems
- Although these systems give fairly reliable information they cannot replace data from the best of the VOS which report all the variables required to calculate surface fluxes
- We are often just told how many observations are being made - but hourly reports containing only pressure can't replace a similar number of distributed synoptic ship reports containing the full range of variables
- We might also worry about large quantities of biased data from a single platform in data-sparse regions

Conclusion: VOS is being let down by a significant minority of very poor quality data - NWP don't make assessments of the quality of individual reports so they can't make efficient use of what good-quality VOS data they do get.

Result: VOS data are seen as unreliable and not very useful, operational support for VOS therefore diminishes and the data quality declines.

Solution: Assess data quality of the entire VOS system and focus resources on the parts shown to give good value for money. Continually monitor system.

NWP can then assimilate VOS data with varying weights making sure the best reports have a higher impact.

Climate researchers get the quality flux data they want - but may have to contribute to the cost

VOSClm isn't currently big enough to do this - but could show the way.

Potential Problem if we concentrate on a subset

- We need to make sure we don't overload individual VOS - once a ship gets a reputation for making good observations, everyone asks for XBTs, radiosondes, etc.
- We therefore need to minimise input by the observer
- But automated systems need maintaining in port and some ships only have a few hours turnaround. The ship can be overrun with scientists when at it's busiest - loading cargo and changing crews.
- Need to be sensitive to the ship's workload and try to maintain motivation and commitment to make observations

Possible Recommendations

- WMO to raise priority of production of current and historical VOS metadata
- Both VOS and VOSCLim should be promoted as part of the Global Climate Observing System
- Urgent need for VOS monitoring against climate requirements
- Promote high quality through VOSCLim and transfer to (a smaller than present?) VOS
- Promote dialogue between climate researchers and forecasters/VOS operators to build on areas of common interest (good quality data from VOS)
- Discourage decline in operational support for VOS - provide climate resources for high-quality observations?
- Encourage the managed introduction of high-quality automated systems and improved instrumentation on VOS
- Provide resources to widen pool of scientists analysing VOS data
- Feedback information on scientific and climate studies to observers/operators