



The VOSClim project and the WMO ship catalogue (WMO-No.47)

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Voluntary Observing Ship (VOS) Climate (VOSCLim) Project

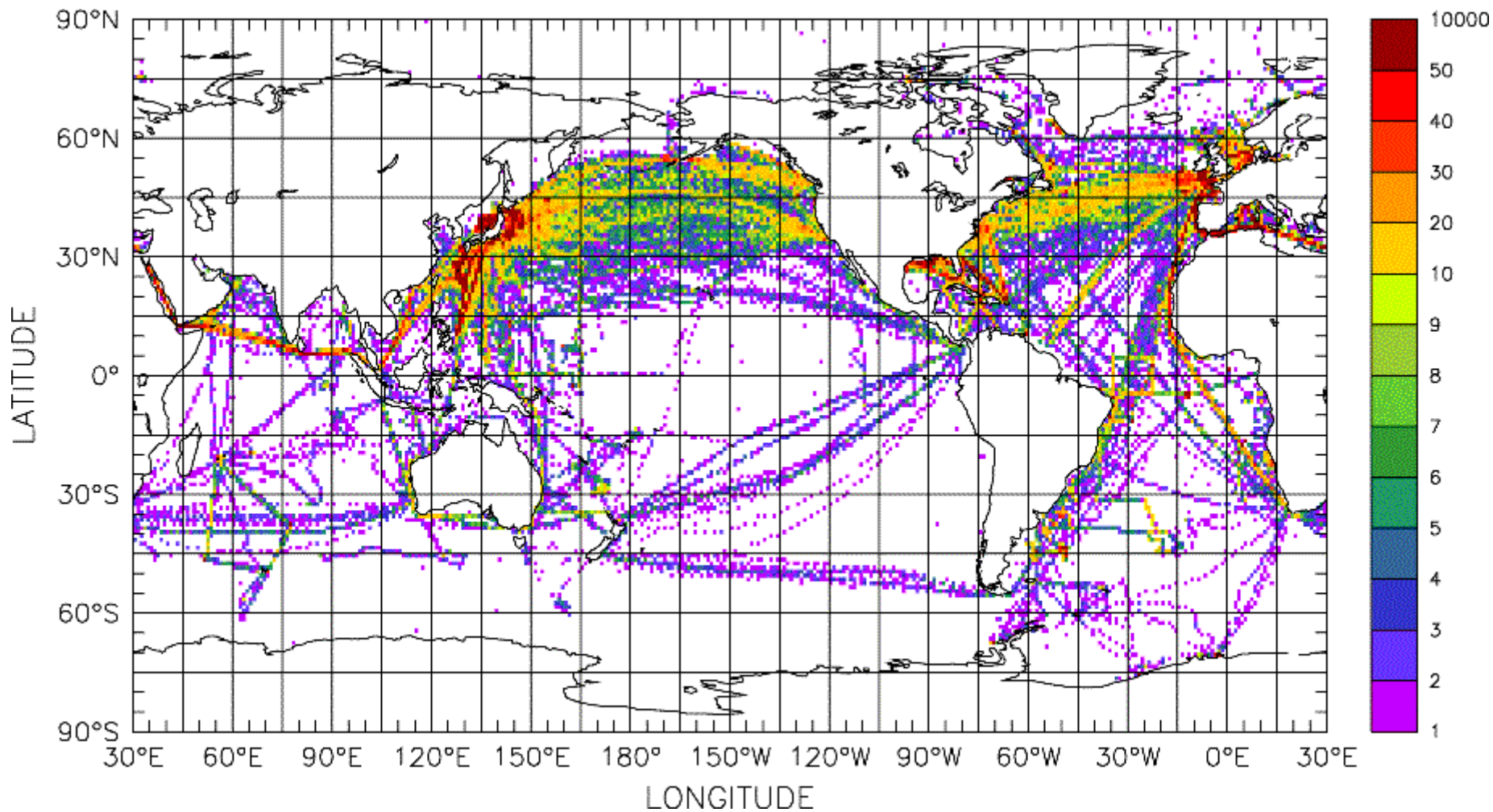
- Background
- A natural extension of the VOS Special Observing Programme for the North Atlantic (VSOP-NA) in 1990-1991, which was initiated to try to establish the effects in the quality of VOS data of different ship instrumentation and observing practices
- VSOP-NA demonstrated that the quality of observed measurements depends significantly upon
 - the types of instruments used and their exposures and
 - the observing practices of shipboard person



VOSCLim project

- The primary objective is to
 - provide high quality marine meteorological data and associated metadata, available both real time and in delayed mode, to serve as a reference data set to support global climate studies and for satellite ground truth verification
- It is planned to recruit a total of 200 ships for this project in the world.





Map of all last years reports from those ships that will be approached to participate in VOSCLIM.(prepared by Dr E. Kent (SOC, UK))



Instruments

- It is essential to the project to ensure that observing instruments, their physical exposure and the associated observing practices conform to high standards and that up-to-date instrument records are maintained and catalogued.
- Recommendations by VSPO-NA
 - Accurate and well-exposed thermometers with precision to 0.1°C
 - SST measuring instruments from hull contact sensors
 - Permanently mounted, well-exposed anemometers to 0.1m/s precision
 - Precision marine barometers to 0.1hPa precision, preferably connected to a static head
 - Electronic logbook facility, to include true wind computation, QC checks and updated encoding in the revised code forms



Metadata

- WMO ship catalogue (WMO-No.47)
International List of
Selected, Supplementary and Auxiliary Ships
 - metadata such as routes and types of meteorological observations on VOS.
 - WMO DDB (Distributed Databases) FTP Servers
 - <http://www.wmo.ch/web/ddbs/ftpsvr.html>



Metadata archived in the present WMO-No.47

- Ship's name
- Call sign
- Vessel dimensions (length, breadth, freeboard)
- Routes
- Barometer (type, height)
- Thermometer (type, conditions of exposure)
- Hygrometer (type, conditions of exposure)
- SST (method of obtaining SST, depth of SST measurement)
- Barograph (type)
- Anemometer (height)



Necessity of detailed metadata

- Details of metadata including instrument exposure and data of any changes are also necessary to achieve the accuracy required by the VOSClim project.

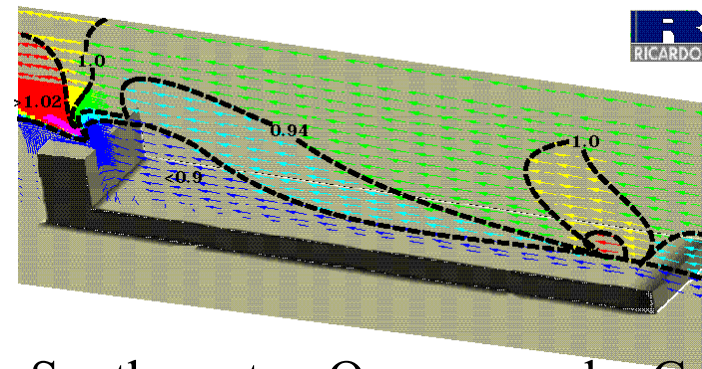
Ex.

The ship disturbs the airflow. The anemometer does not measure the true value that the wind would have if the ships were not there.

↓
Dimensions of the ship

ship type

position of the anemometer



By Southampton Oceanography Centre



Metadata newly introduced for VOSCLim

- Vessel digital image
- Position of bridge
- Barometer
 - location, model (brand), calibration date
- Thermometer
 - location, height
- Anemometer
 - location, height, instrument type, calibration date
- recruitment/inspection form for the VOSCLim project



New electronic database for WMO ship catalogue (WMO-No.47) International List of Selected, Supplementary and Auxiliary Ships

- Modification of the contents of WMO-No.47 to include such new detailed fields was introduced and an upgraded database has been prepared.
- The new database will be very shortly available on the WMO web site, for search, downloading and updating.
- Also, metadata of the project participating VOS will be available in the WMO-No.47 format on the project web site.



Additional observational parameter

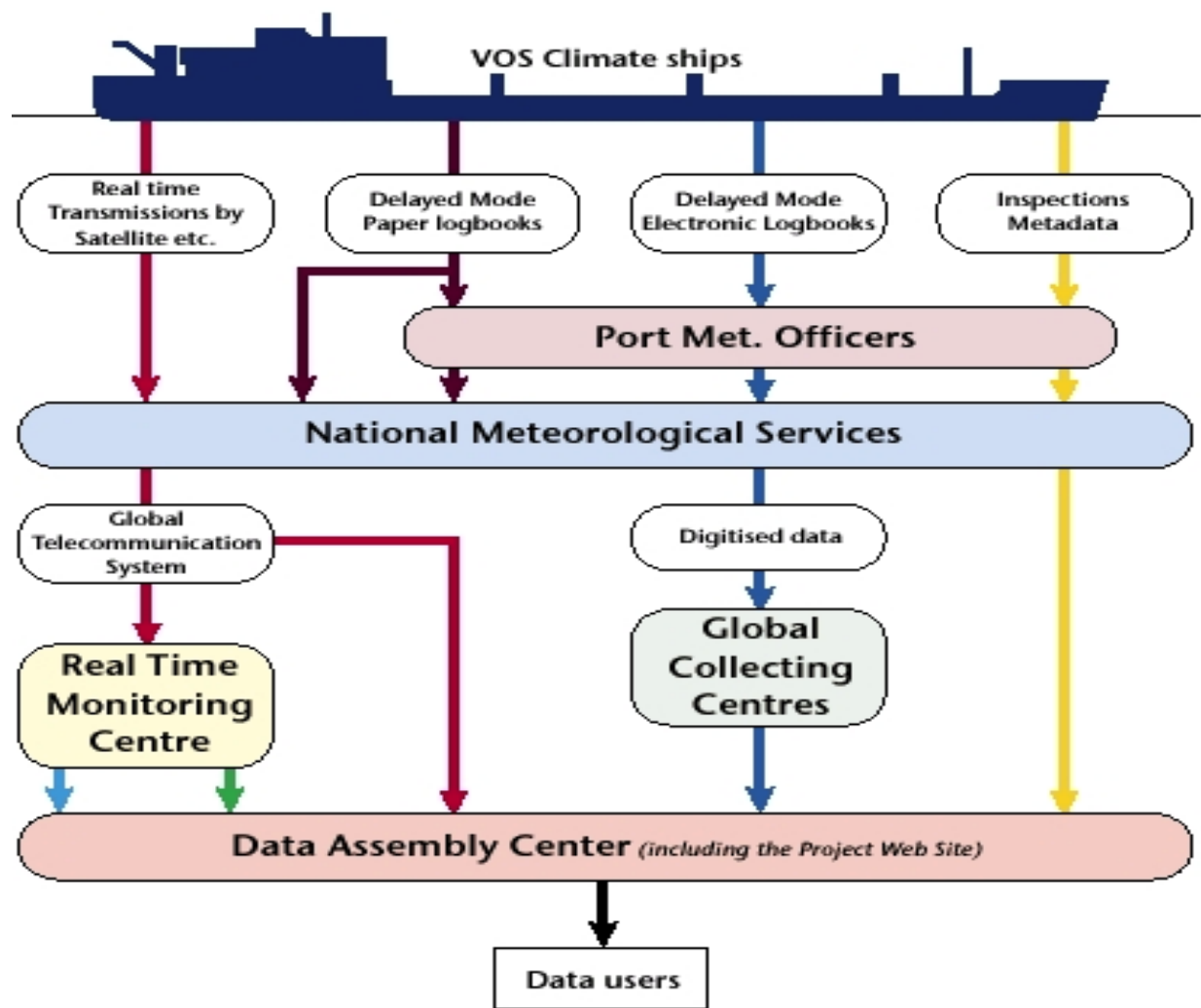
- Ship' parameters
 - Ship's speed over ground at time of observation
 - Ship's heading at time of observation
 - Height of deck cargo above summer maximum load line
 - Departure of summer maximum load line from actual sea level
- Wind
 - Uncorrected (i.e. relative) speed and direction



VOSCLim project

- Participating ships
- National focal points/Port Meteorological Officers
 - Ship recruitment
 - Ship inspection (every 3 month) of instruments
- Real Time Monitoring Centre (Met Office, UK)
- Data Assembly Centre (NCDC, USA)





- Ship code
- BUFR Code + Model Data
- IMMT Code + Additional code groups
- Ship Code + Additional code group
- Metadata – Inspection/Survey Reports
- Monitoring Statistics



Figure 3: Simplified flow diagram showing the routing of data for the VOS Climate Project.

By Ms Sarah North (Met Office)



Real Time Monitoring Centre (RTMC) (Met Office, UK)

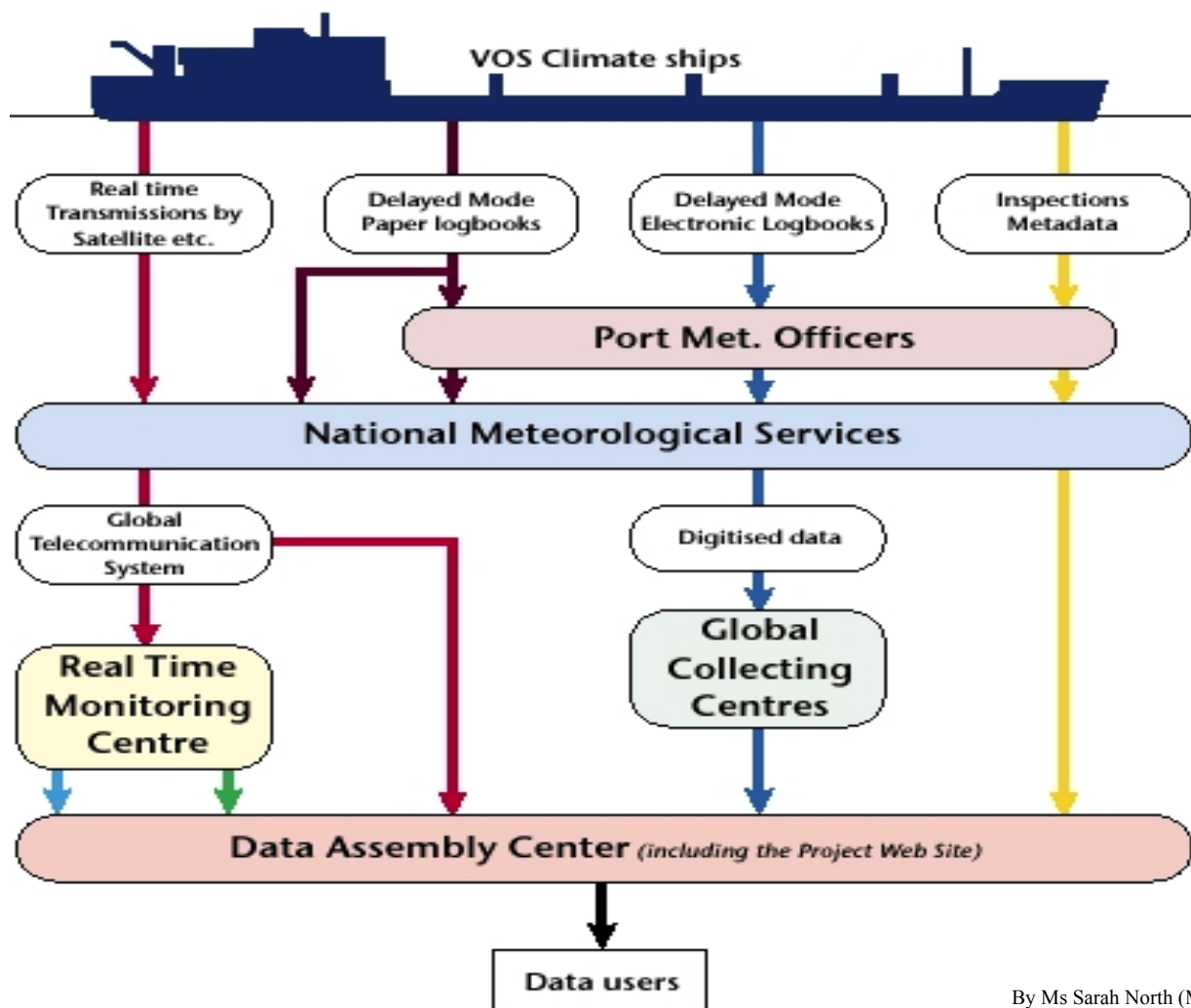
- Priority will be given to **wind direction and speed, sea level pressure, SST, air temperature, and humidity**
- Ship monitoring statistics
 - statistics on the fit of the observed variables to the numerical model forecasts will be used to produce lists of suspect ships
- Compile datasets of observations and associated model field values
 - extract the six observed variables for each project ship received in real time from GTS and associate them with the co-located model field value



Project Monitoring Criteria

(1) Variable	(2) Mean o-b limit	(3) Std. Dev. o-b limit	(4) Gross error limit
Pressure (hPa)	2.5	5.0	15.0
Wind speed (m/s)	5.0	10.0	25.0
Wind direction (deg)	30.0	60.0	150.0
Air Temperature (deg C)	3.0	6.0	15.0
Relative humidity (%)	30.0	60.0	95.0
Sea surface temp. (deg C)	2.0	4.0	10.0





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Data Assembly Centre (DAC) (NCDC, USA)

- Receive the real time report from the RTMC
- Collect delayed mode reports of project ships
- Merge real time observation reports with the delayed mode reports, eliminate any duplications and compile complete project data set.
 - (IMMT-2 and IMMA)
- Collect metadata and recruitment reports for project ships and compile a complete dataset.
- Make project data sets available to users on request



- Maintain the project web site.



Project web site

<http://www.ncdc.noaa.gov/VOSCLim.html>

- [Project document](#)
- [Metadata catalogue of participating ship](#)
- [Monitoring and data application results](#)
- [Project newsletter](#)
- [project focal points and other contact details](#)
- [Monthly data](#)
- [ship information](#)

- [instrument details](#)



