Quality Control of VOS Data in Hong Kong

CLIMAR II

17 – 22 November 2003, Brussels

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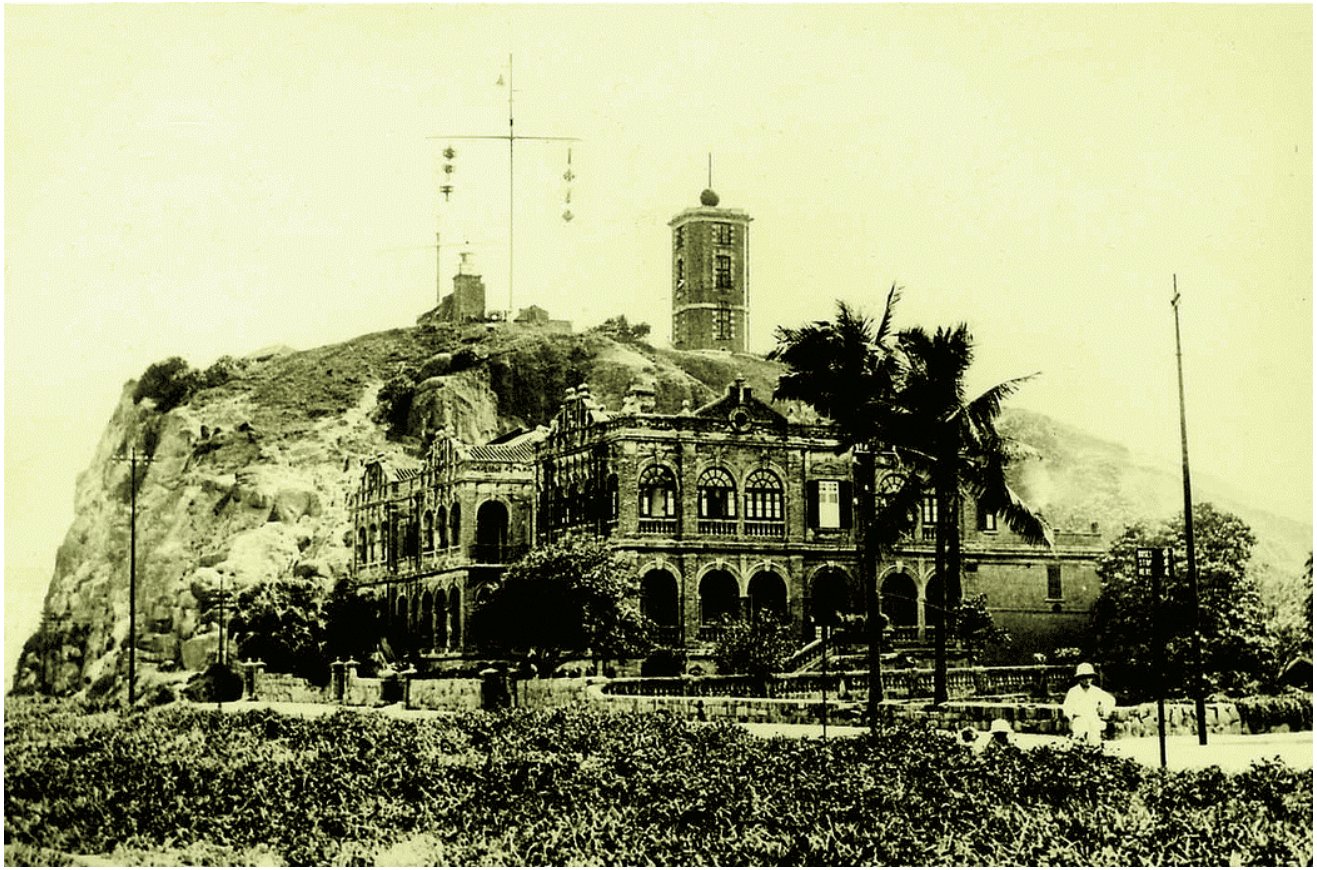
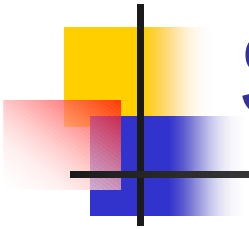
Hong Kong Observatory

Marine meteorological service since 1884



Voluntary Observing Ships' Scheme

- Start recruitment of Voluntary Observing Ships in 1949
- One of the eight Responsible Members to collect marine meteorological data and compile climatological summaries under WMO Marine Climatological Summaries Scheme since 1963
- Decadal summaries for 1961-70, 1971-80, 1981-90



Sources of Errors

- Instruments
- Data handling
- Procedures

Objective of QC Procedures

- To improve the quality of data collected by:
  - flagging and/or amending suspicious data
  - identifying ships that may have problems in instruments and/or procedures

Quality Check Procedures

- Operational forecasting
  - consistent with synoptic charts
- Numerical models
  - agreement with model first guess
- Marine climatology
  - manual inspection
  - computer QC programs

Data Collection and Quality Control in Marine Climatology

- Manual inspection of logbook
- Correction for illegible data entries
- Correction for date time group
- Data digitization
- QC with computer programs
- Suspicious data flagged
- Manual correction if appropriate

Ship Liaison

Quality Control is an Entire Process

- Liaison with ship companies
- Regular ship visit
- Advice and training
- Newsletter for VOS
- Quality check of ship weather reports
- Data exchange with GCC

Minimum QC

- Manual inspection
  - date, time
  - wind speed indicator, pressure correction
- Time sequence checks
  - ship positions and movement
- Range check
  - meteorological parameters within range
- Consistency check
  - wind/wave
  - weather/visibility/cloud
  - temperature/dew point/web-bulb

6-monthly Monitoring Report from Global NWP Centers

Observation (O) against Background (B)

- Pressure
  - Mean O-B $\geqslant$ 3.5 hPa
  - Standard deviation of O-B $\geqslant$ 5.0 hPa
- Wind
  - Mean O-B $\geqslant$ 5.0 ms^{-1} (speed)
  - Mean O-B $\geqslant$ 30° (direction)
  - Standard deviation of O-B $\geqslant$ 6.0 ms^{-1} (speed)
  - Standard deviation of O-B $\geqslant$ 60° (direction)
- SST
  - Mean O-B $\geqslant$ 3.0 $^{\circ}$C
  - Standard deviation of O-B $\geqslant$ 5.0 $^{\circ}$C
- Percentage of gross errors $\geqslant$ 25
- At least 40 reports

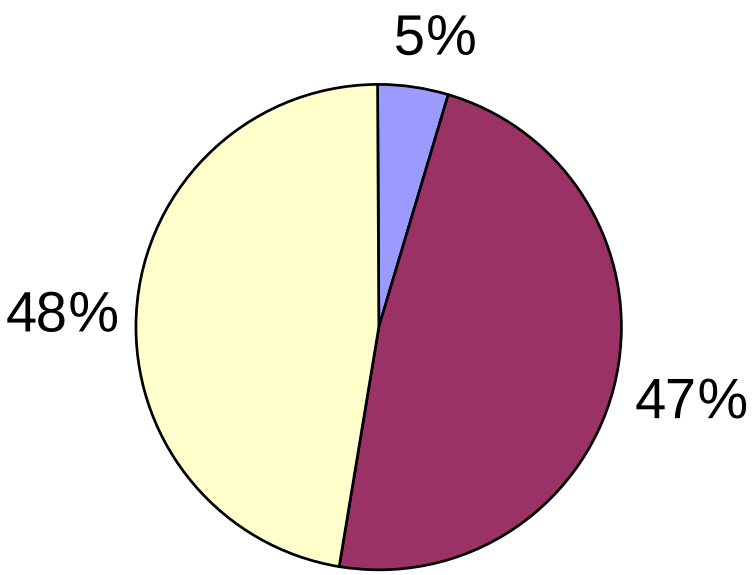
Limitations

- Logbook
  - Long lead time to obtain QC results
  - Less data
  - No comprehensive synoptic check
- Change of ship routes - not making port call for a long time
- Non-standardized installations of equipment on ships

Ship Anemometer

WMO No. 47 - Anemometer

Percentage of Ships with Anemometer Heights
in Specified Ranges

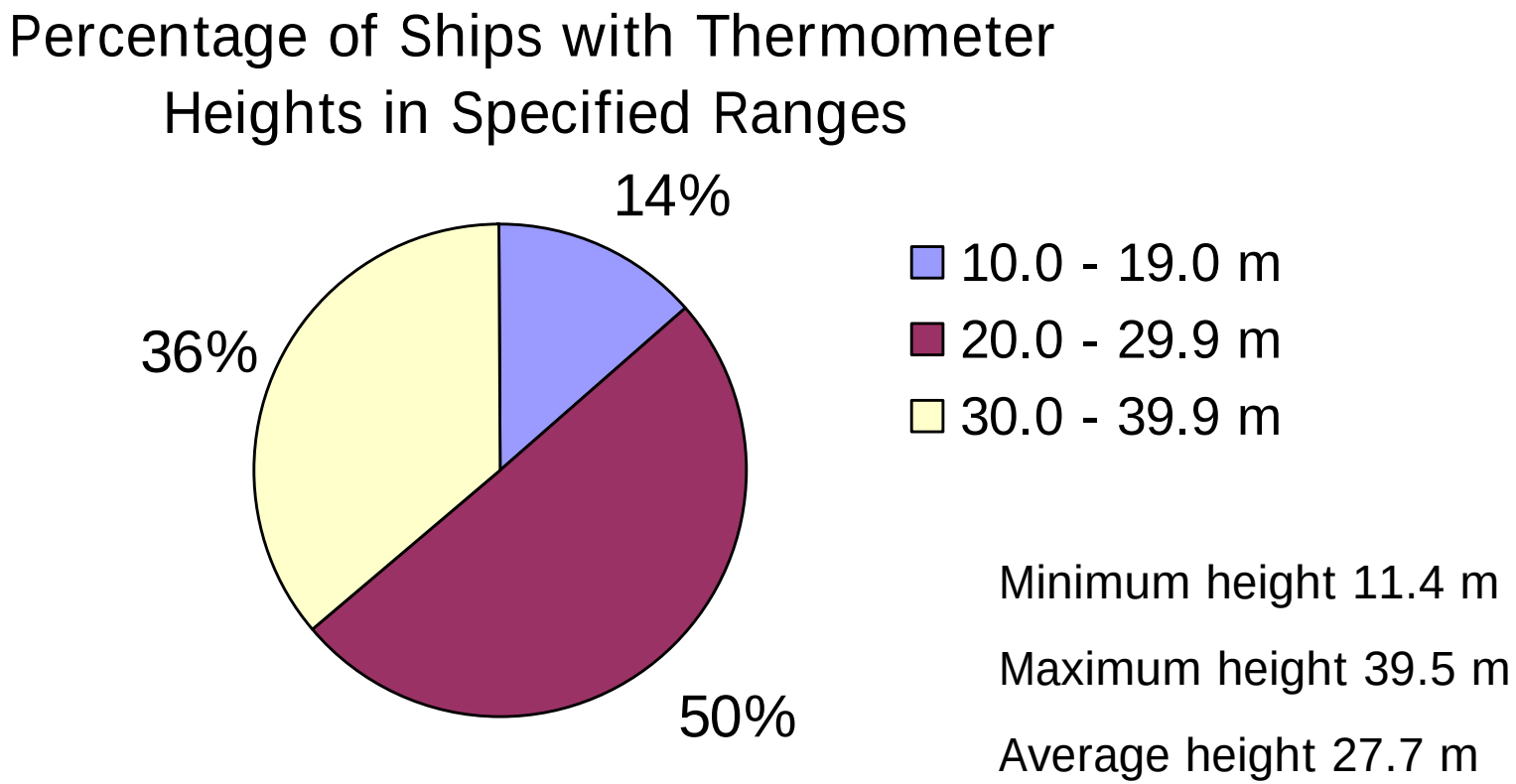


Minimum height 22.4 m

Maximum height 45.9 m

Average height 38.5 m

WMO No. 47 - Thermometer



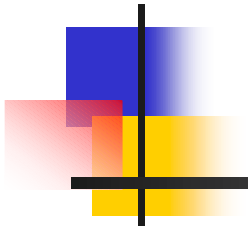
Minimum height 11.4 m

Maximum height 39.5 m

Average height 27.7 m

Future Improvements

- Better use of monitoring results from numerical models
- GTS against logbook data (?)
- Ship liaison
- Metadata consideration



Thank you !