At the German Meteorological Service (Deutscher Wetterdienst, DWD) in Hamburg, marine-meteorological data, measured by ships, buoys or other platforms from all parts of the world’s oceans are operationally quality checked.

An important tool for the error diagnostics is the climate comparison test. This has been done by checking the recorded parameters against the appropriate climate extremes basing on ship’s and buoy’s measurements. Up to now, these ranges have been defined for 5° x 5° grid boxes by the maximum and minimum values of in situ data stored in the DWD archives. As the data base is unevenly distributed in space and time, this method is not feasible in many sea areas. However, for standardized quality checks, a defined climatology is a basic prerequisite.

Consistent climatologies can better be deduced from reanalyses data which are evenly distributed in space and time. Therefore tests have been made with the ECMWF 40 Year Reanalysis (ERA-40). As first step, for each month and parameter absolute minima and maxima were determined for 1° x 1° grid boxes. The climate ranges are defined by the extremes enlarged by one standard deviation taking 1961 to 2000 as reference period. The use of these ranges for quality control gives good results for air temperature checks by showing an increased number of erroneous data, see Fig. 1.

The air temperature checks are improved by using ERA-40-data. However, minima of sea surface pressure data are insufficiently reproduced.

New ranges basing on the higher resolved ERA Interim output for the period 1981 to 2010 have been tested. As the examples in Figure 3 show, the extremes of ERA Interim deviate obviously less than those of ERA-40 from measured pressure minima. The correctness of each minimum was individually confirmed.

Consequently, ERA Interim extreme value ranges will be used for the operational quality control of marine-meteorological in situ observations in future.