

# DWD's project to make historical data available

## Overseas

## Digitization of data from overseas' stations

### A treasury of data from long ago

The archive of overseas stations of Deutsche Seewarte, the German Marine Observatory in Hamburg, comprehends handwritten climate observation records from 1,500 sites from all over the world (Fig. 1).

The records containing detailed metadata and daily values of precipitation, temperature, humidity and pressure as well as other weather details are mainly from the German colonial era between 1900 and 1914. A second peak encloses the period from 1929 to 1939 (Fig. 2).

The lengths of the time series vary from a few months up to 49 years.

In 2008, the digitization of these data started at the Marine Climatological Monitoring Center of Deutscher Wetterdienst in Hamburg. All data are quality checked, integrated in the data bank of Deutscher Wetterdienst and transferred to the countries of origin on electronic data processing media. Till April 2011, data of about 90 of 1,500 stations were digitized.

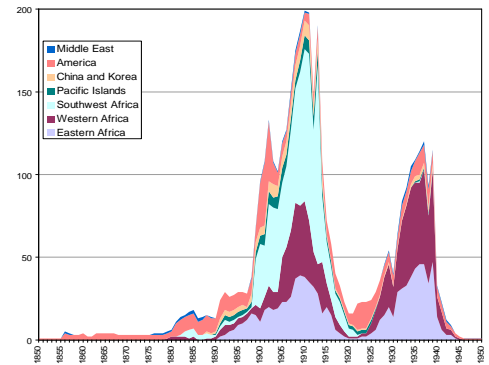


Fig. 2: Annual numbers of stations with observations in different regions of the world

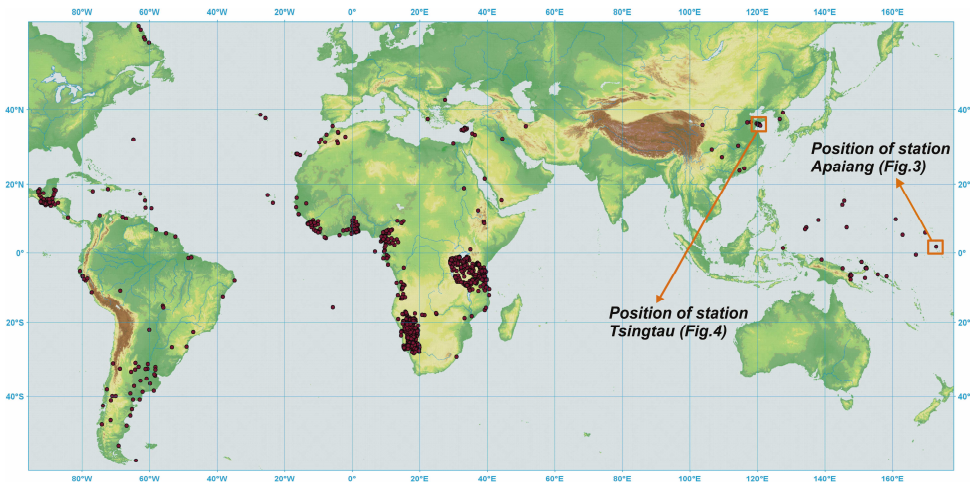


Fig. 1: Geographical position of the historical stations

### The database

The data are available in form of handwritten journals. Air pressure, air temperature, vapour tension, wind speed and direction, clouds and precipitation are observed/measured three or four times a day. Precipitation stations (partly with measurement of temperature) complete the network. Observatories collected the data from the surrounding stations.

### Weather observations subject to difficult circumstances

The stations were equipped with instruments and the observers coached by staff members of the German Marine Observatory. Fig. 3 shows a weather station, exotic, as we see it today.

The observers were mainly missionaries, doctors and officers. Again and again, tropical diseases like malaria and yellow fever or warlike conflicts aggravated the work.



Fig. 3: A historic weather station in Apaiang, Gilbert Islands

### Future benefit

In addition to digitization and quality checking, statistical analyses shall be executed. By comparing historical data to actual values it is possible to detect regional climate change. Among others, historical ENSO events or heavy volcanic eruptions can be traced.

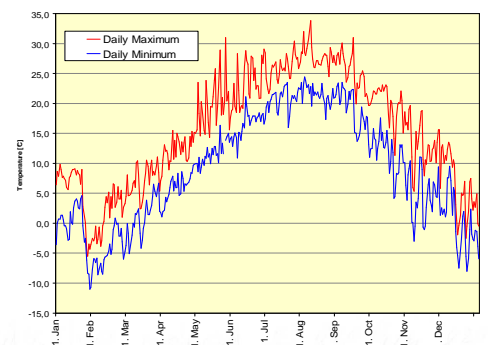


Fig. 4: Daily course of minimum and maximum temperature (2 m above ground) in Tsingtau in 1905. The station is situated in Eastern China at the Yellow Sea. The climate is characterized by pronounced differences between cold and dry winters and warm and wet summers as well as large diurnal variations and a high variability from day to day.