Digitalization of station Warnemünde at the German Baltic coast

Dr. Jürgen Holfort

IOC Data archaeology, Paris, 10.-12.3.2020
Sea level Stations after 1955
Count lines and write down.

In parts microfiche backups.

Normal problems (curve flipping, silting, no-data, ink spots, temporal/level shifts, …) and quality control (continuos in time, similar to stations nearby,…)

Scan mareograms with A1 sheetfeed scanner.

Digitize with engauge (semi-automatic).

Paper deformation
Sea level stations before 1945
### Term observations

<table>
<thead>
<tr>
<th>12h</th>
<th>6,12,18,24h</th>
<th>7,13,19h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**WARNEMÜNDE 2**

**Station Information**

- Station ID: 11
- Latitude: 54.169722
- Longitude: 12.103333
- Coastline code: 120
- Station code: 12
- Country: GERMANY
- Time span of data: 1855 – 2015
- Completeness (%): 100
- Frequency Code: 24
- Date of last update: 01 Sep 2016

**Tide Gauge Data**

- [Link to larger image of monthly data plot](#)
- [Download monthly mean sea level data](#)
- [Link to larger image of annual data plot](#)
- [Download annual mean sea level data](#)

**NOTE:** In many cases, the station position in our database is accurate to only one minute. Thus, the tide gauge may not appear to be on the coast.

---

Download metric sea level data. Use only with extreme caution.
Term observations and monthly means

Without tidal correction

With tidal correction
Warnemünde mareograph from 1897

Often colors are very fainted with the need of strong contrast enhancement.

Paper is brittle and needs (also for archival reasons) to be scanned contactless.

Fewer neighbouring stations for quality control.

Coordinate system (time/sea level) is not so clear.
Tidal analysis
Tidal analysis

![Graph showing tidal analysis](image)
Conclusion

At current pace, the digitalization off all mareographs will take at least 20-30 years.

+ it is very likely, that in 2 years all known mareographs are scanned
Many thanks!