

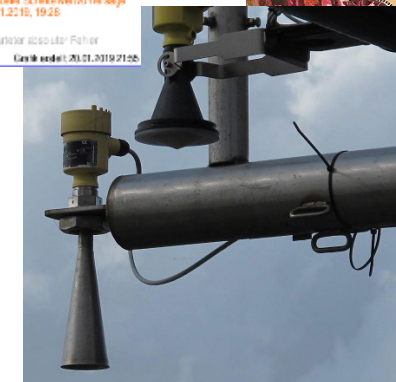
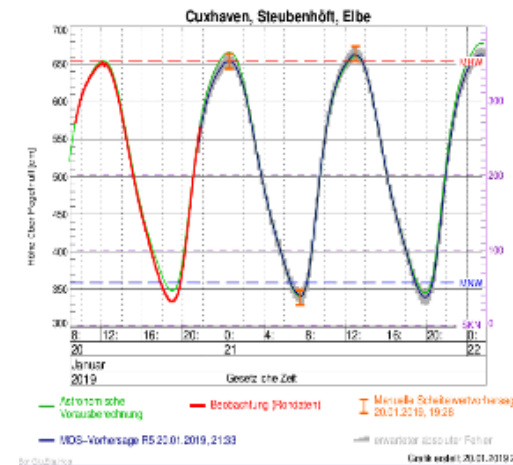
German National Report to GLOSS-XVIII

Panama, 11.-14.03.2025

Dr. Anna von Gyldenfeldt
Federal Maritime and Hydrographic Agency (BSH)
Germany



BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE



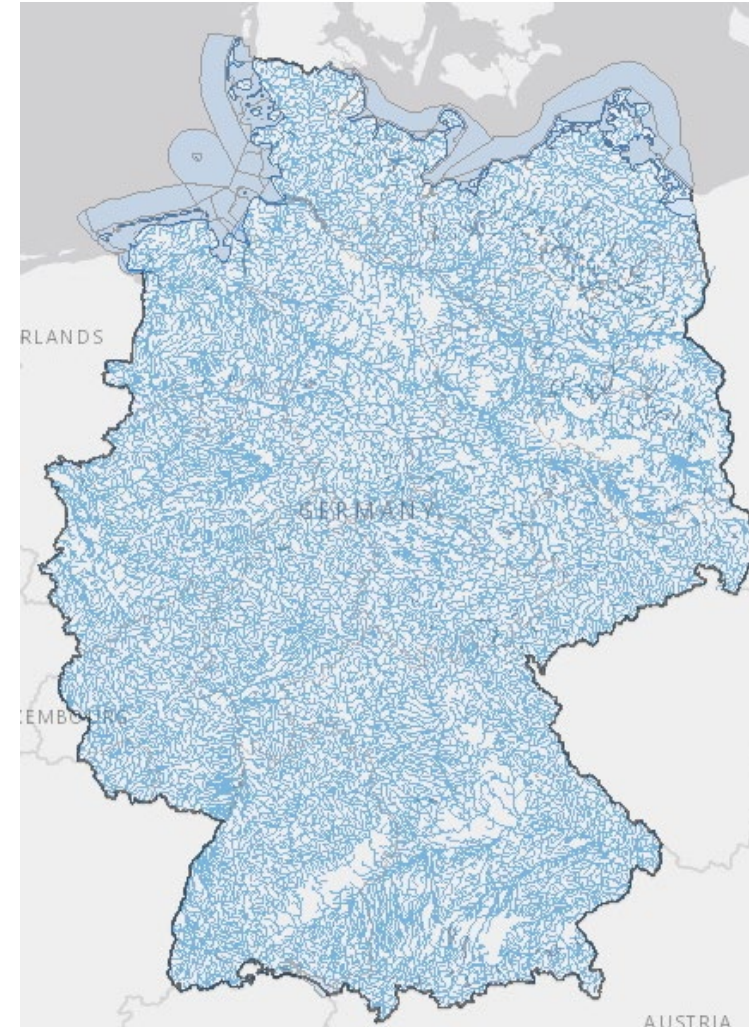
Hydrological Background



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A lot of water

- ~9000 bodies of water
- water course length ~130000 km



Source: Federal Environmental Agency

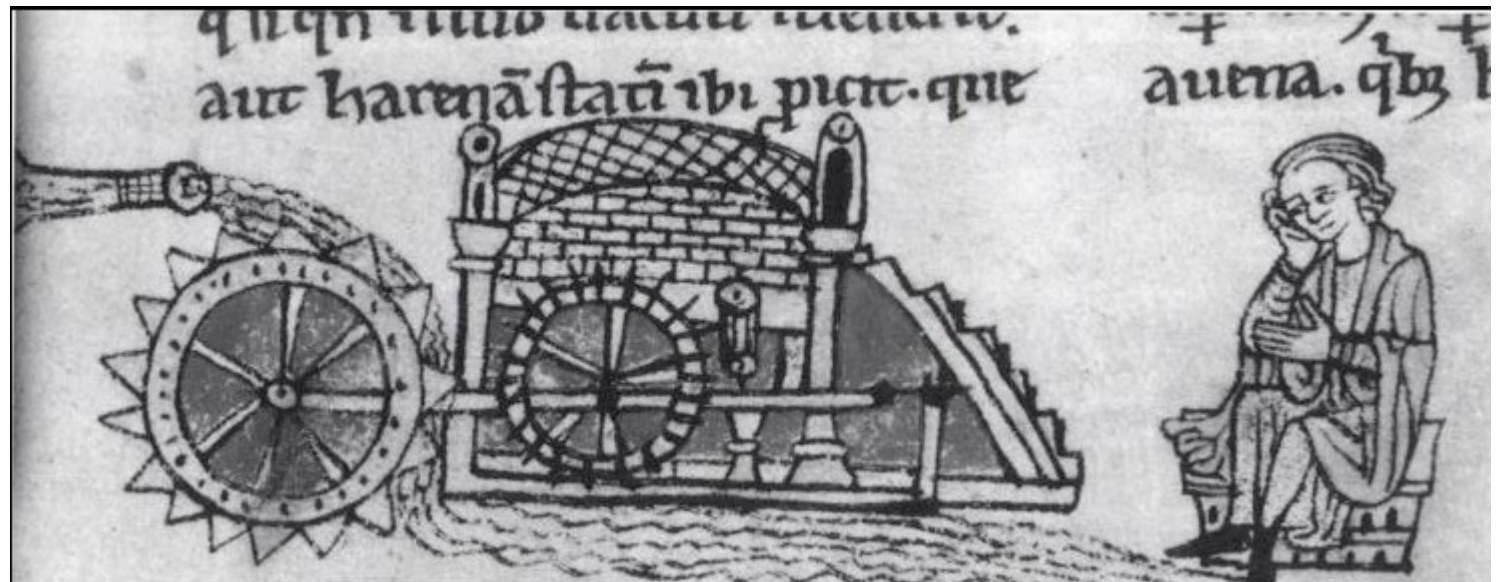
Historical Background I

Reasons for Water Level and Tide Gauges



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By the High Middle Ages water mills were very common. Increasing use of water needed a legal basis. Additionally, it meant tax income for territorial lords.



Historical Background II

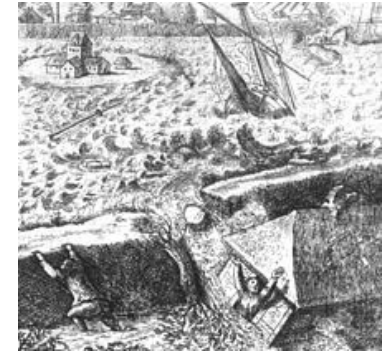
Reasons for Water Level and Tide Gauges



K. Behre: 2003, Nacheiszeitliche Küstenentwicklung, Nationalatlas Bundesrepublik Deutschland, Relief, Boden, Wasser, Band 2, pp 76-77



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Between 1200 and 1300:
31 historical records of heavy storm surges.

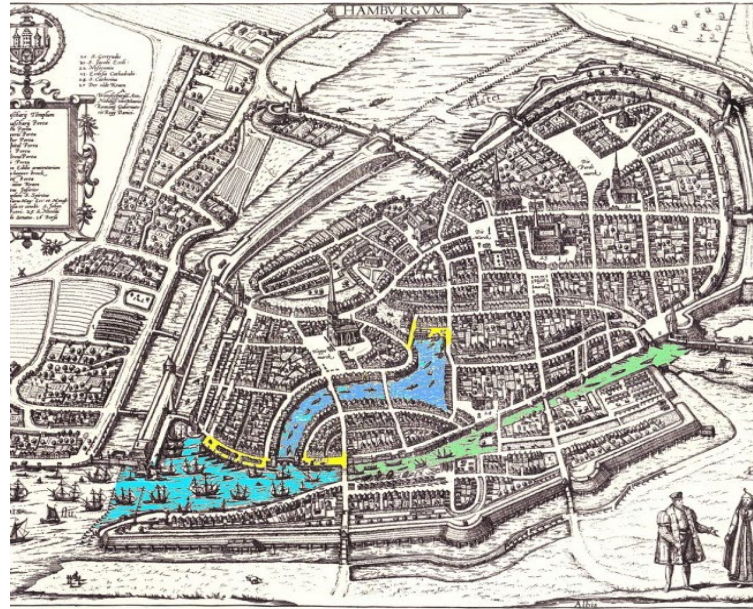
January of 1362:
„Grote Mandränke“ with up to 100,000 victims, let alone loss of property and life stock.

Inundations:
Bad harvests, impoverishment, depopulation (plague!), lessman power to reconstruct dwellings, infrasructure or damaged dikes.

Sea level rise in combination with occasional heavy inundations due to storm surges, lead to land loss and strong changes of the coast lines.

Historical Background III

Reasons for Water Level and Tide Gauges



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Trade:

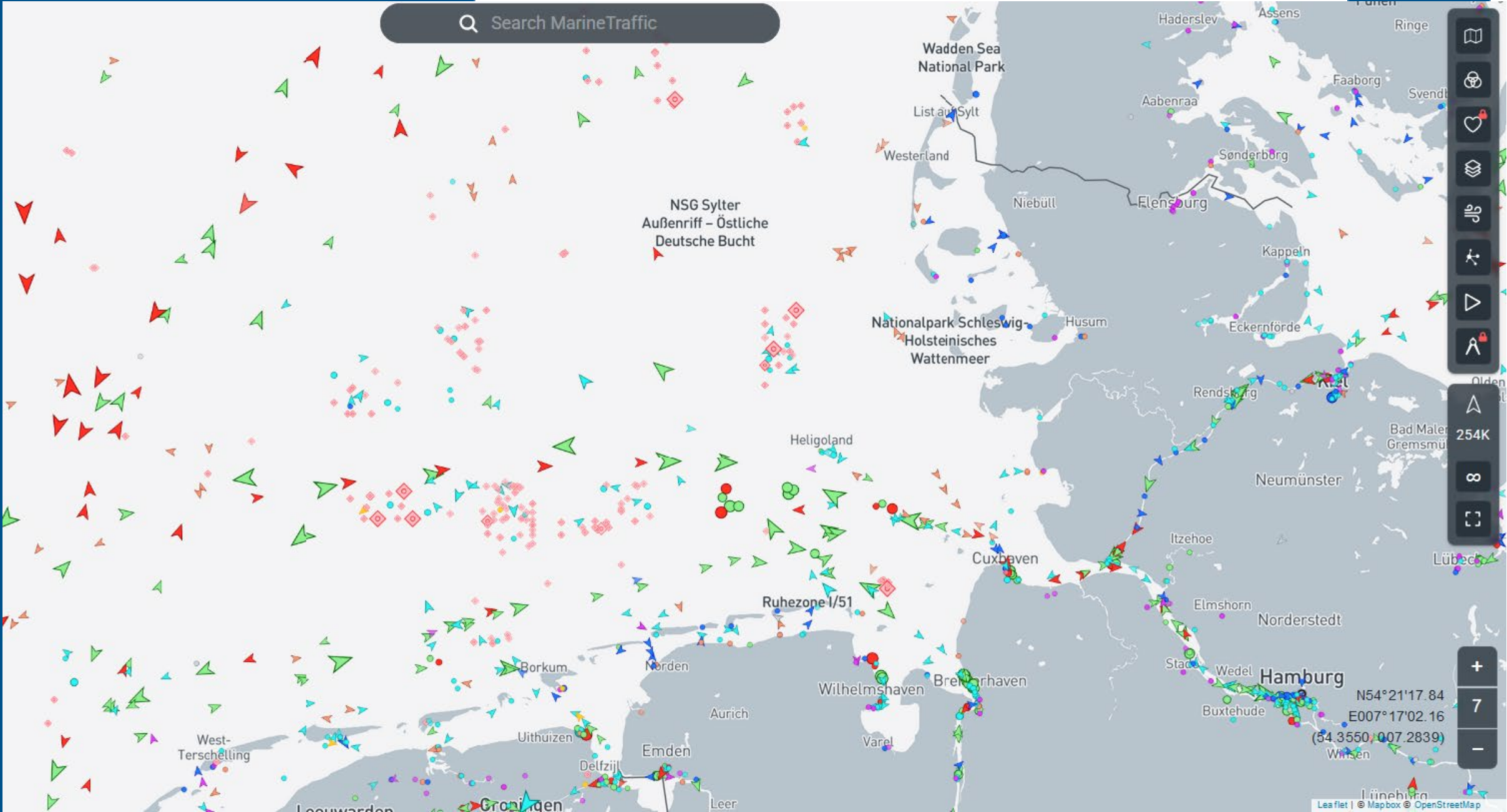
First harbour built in Hamburg in the 9th Century
(destructions due to storm surges)

Formation of the Hanseatic League (12th to 17th Century),
protect the guilds' economic interests and diplomatic
privileges

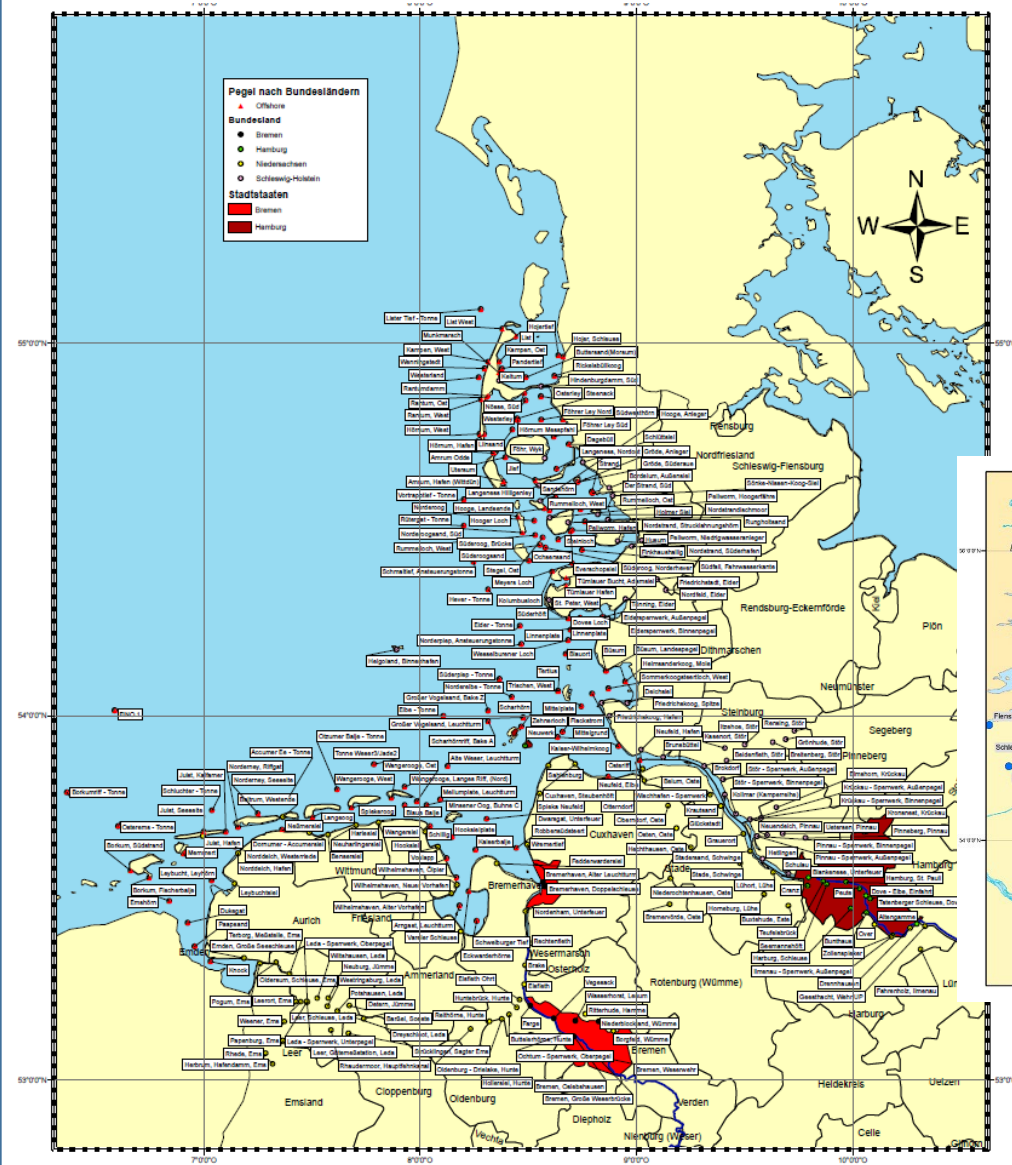
Harbours at the North Sea coast and river estuaries are
tidaly influenced.

Reports of tidal observations in Hamburg in 1353 (C. Kroog, 1978)

Search MarineTraffic



Tide Gauges at the German Coasts



1:1.800.000
 WGS 84 Mercator-Projektion
 Jan Siebert
 N12 Azubi07
 04.02.2014
 Quelle: Gezeitendatenbank



BfG



**BUNDESAMT FÜR
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 UND
 HYDROGRAPHIE**



Radar sensors within the MARNET network and RAVE



BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

Das BSH. Schifffahrt. Klima. Daten. Und viel Meer. Kontakt BSH-Lo



BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

Themen Daten Publikationen



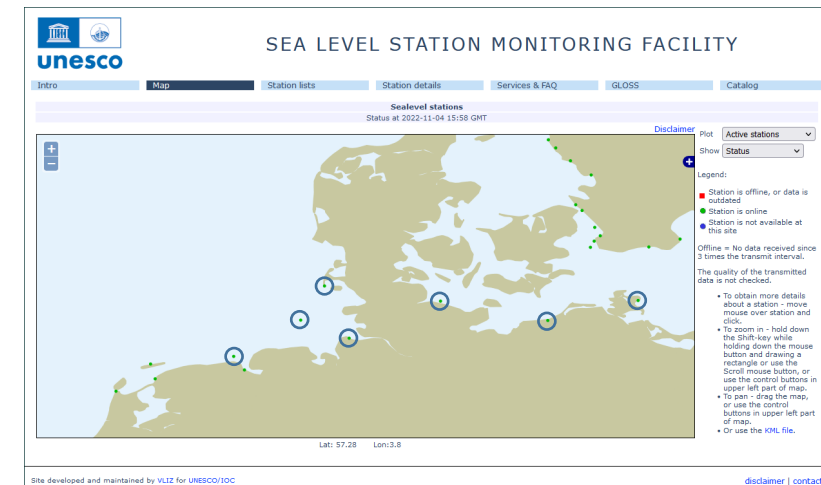
Alpha Ventus
 BARD Offshore
 Butendiek
 Deutsche Bucht
 Nordergründe
 Nordsee One
 NordseeOst

Data Delivery to International Databases

Data Type	Stations	Institution	Resolution
NRT Raw Data	Borkum Cuxhaven Helgoland Hörnum LT Kiel Warnemünde Sassnitz	Sea Level Station Monitoring Facility VLIZ, Oostende	1 Minute
High Frequency Fast Mode	Cuxhaven	University of Hawaii Sea Level Center UHSLC	Hourly Values Daily Values
High Frequency Delayed Mode Research Quality	Borkum Cuxhaven Helgoland Hörnum Kiel Holtenau Warnemünde Sassnitz	British Oceanographic Data Centre BODC, Liverpool	6-Minutes Hourly Values
High Frequency Research Quality	Cuxhaven	Joint Archive for Sea Level, UHSLC	Hourly Values Daily Values
Research Quality	Borkum Cuxhaven Wittdün Kiel Holtenau Travemünde Wismar Warnemünde Sassnitz Koserow	Permanent Service for Mean Sea Level Liverpool	Monthly Mean Annual Mean



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HYDROGRAPHIE



Data Access

The screenshot shows the PEGEL ONLINE website interface. At the top, there are navigation links: Hilfe, Links, Impressum, Nutzungsbedingungen, Datenschutzhinweise, and Einstellungen. The main header includes the PEGEL ONLINE logo and the WSV.de logo. Below the header, there are several sections: 'Gewässerkundliches Informationssystem' with a description, 'Start', 'Pegelauswahl über Karte', 'Pegelauswahl über Tabelle', 'Abo', and 'Downloads'. A 'Newsletter' section is also present. The main content area is titled 'Willkommen' and contains several paragraphs of text, including a 'Willkommen' section and a 'Niederschlagsradar' section. On the right side, there is a 'Aktuelle Lage' section with a map of Germany and a 'WebCam Deutsches Eck' section with a video feed. At the bottom, there is a 'PEGELONLINE im Fokus' section with a list of services.



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Hilfe Links Impressum Nutzungsbedingungen Datenschutzhinweise Einstellungen



The screenshot shows a detailed view of a gauge on the PEGEL ONLINE website. The main content is a line graph showing the water level (Wasserstand) and astronomical tide calculation (Astronomische Gezeitenvorausberechnung) for the ELBE CUXHAVEN STEUBENHÖFT gauge. The graph displays the relative water level in cm (Relativ zum PNP in cm) and the absolute water level in m. ü. NNH (Absolut m. ü. NNH) over time. The x-axis shows dates from 05.02 to 07.03. The y-axis ranges from 300 to 700 cm. Below the graph, there are statistics: MTnw = 363 cm, MThw = 655 cm, HThw = 966 cm, NTnw = 193 cm, PNP = -5,033 m. ü. NNH. The page also includes a 'Niederschlagsradar' section and a 'WebCam Deutsches Eck' section.

<https://www.pegelonline.wsv.de/gast/start>

Data Access

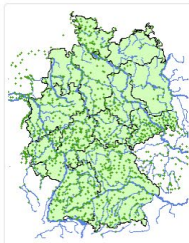


Länderübergreifendes Pegelportal Wasserstands- und Abflussinformationen

Bitte wählen Sie:



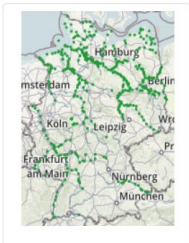
Gewässerkinde
Jahrbücher und Pegeldaten
des Bundes und der Länder



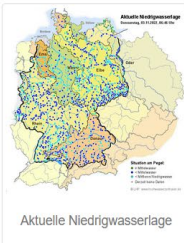
Hochwasser-Warnlage und
Pegeldaten der
Bundesländer



Datendownload der
Bundesländer



Pegeldaten des Bundes
(WSV)
(ungeprüfte Rohdaten)



Aktuelle Niedrigwasserlage

Impressum | Datenschutz

Unsere App



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UND
HYDROGRAPHIE

Data Access



BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

Das BSH. Schifffahrt. Klima. Daten. Und viel Meer.

Kontakt BSH-Lo

Themen **Daten** Publikationen



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Alpha Ventus
BARD Offshore
Butendiek
Deutsche Bucht
Nordergründe
Nordsee One
NordseeOst

instu Download Dokumente Info Nutzerhinweis Deutsch Abmelden

Stationen und Parameter Anfragen

ESH BE DE DK FR GB
alle IE NL NO

Filter: slev

- Alpha Ventus
 - SLEV_H1 - Average height over last 1 minute [m]
 - SLEV_H10 - Average height over last 10 minutes [m]
- BARD Offshore 1
- Butendiek
- Deutsche Bucht
- FINO1 Platform
- FINO2 Platform
- FINO3 Platform
- Nordergruende
- Nordsee One
- Nordsee Ost

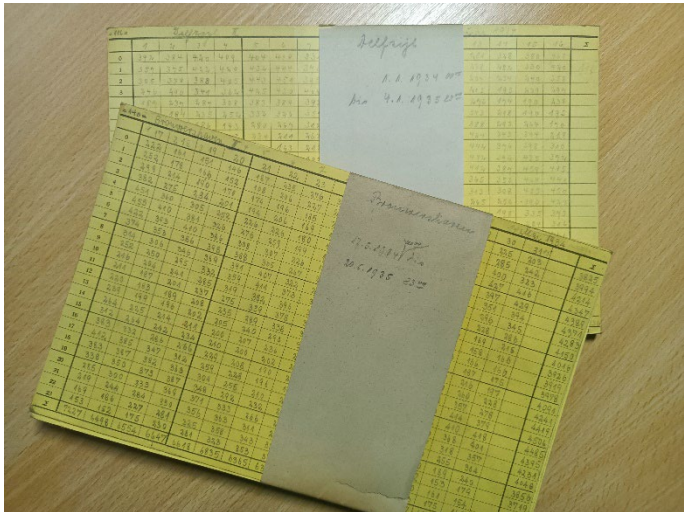
Startdatum: Enddatum:

Plot: Export:

Data Archaeology



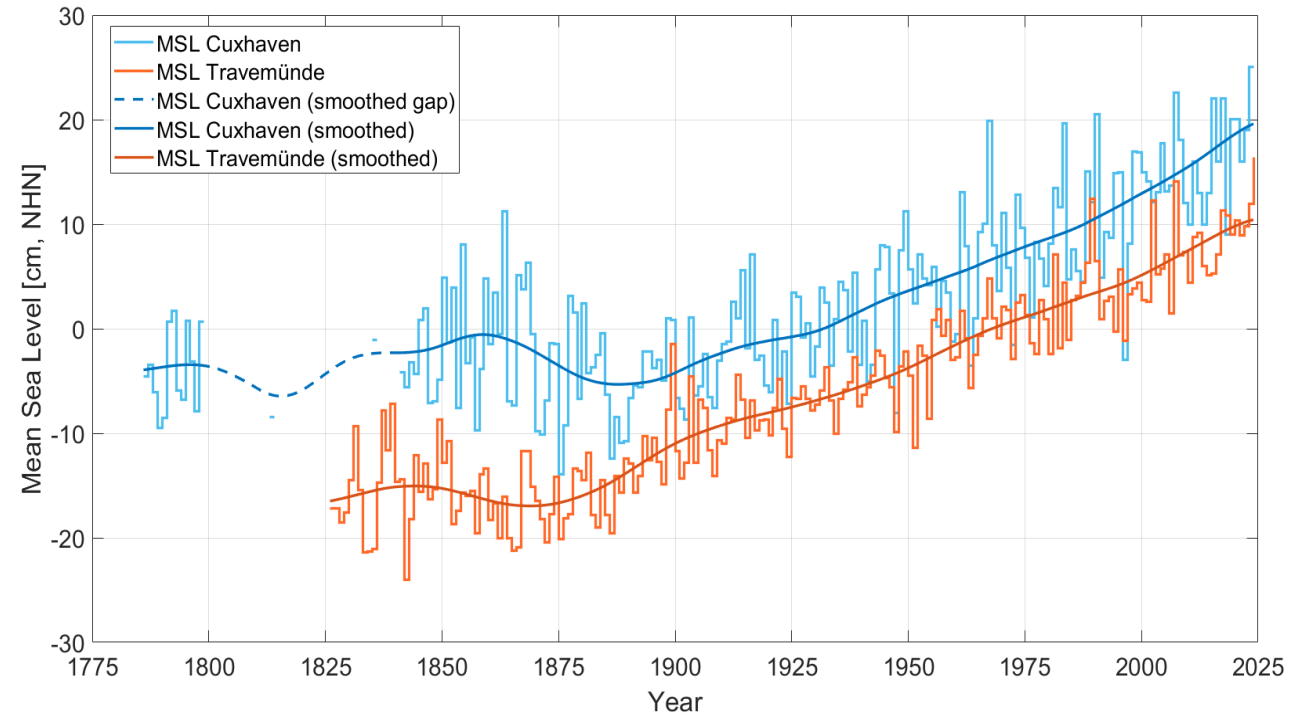
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The current situation of sea level rise on the German coasts



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HYDROGRAPHIE



Development of MSL at the Cuxhaven and Travemünde gauging stations since 1786