

# Germany: National Developments

## NSHC Tidal Working Group 27

04-05 February 2025

Taunton, UK



BUNDESAMT FÜR  
SEESCHIFFFAHRT  
UND  
HYDROGRAPHIE



# Content

- 100 years storm surge warning service
- Websites
- Update of Chart Datum Surface 2026
- Artefacts in 2D-tidal predictions

# 100 Years Storm Surge Warning Service North Sea

## History:

- Autumn 1924: Start of public warning service with warnings via radio and permanently manned telephone line

## Activities last September:

- Press conference and reception with the mayor of Hamburg
- Public exhibition
- Workshop with expert users

# 1924-2024







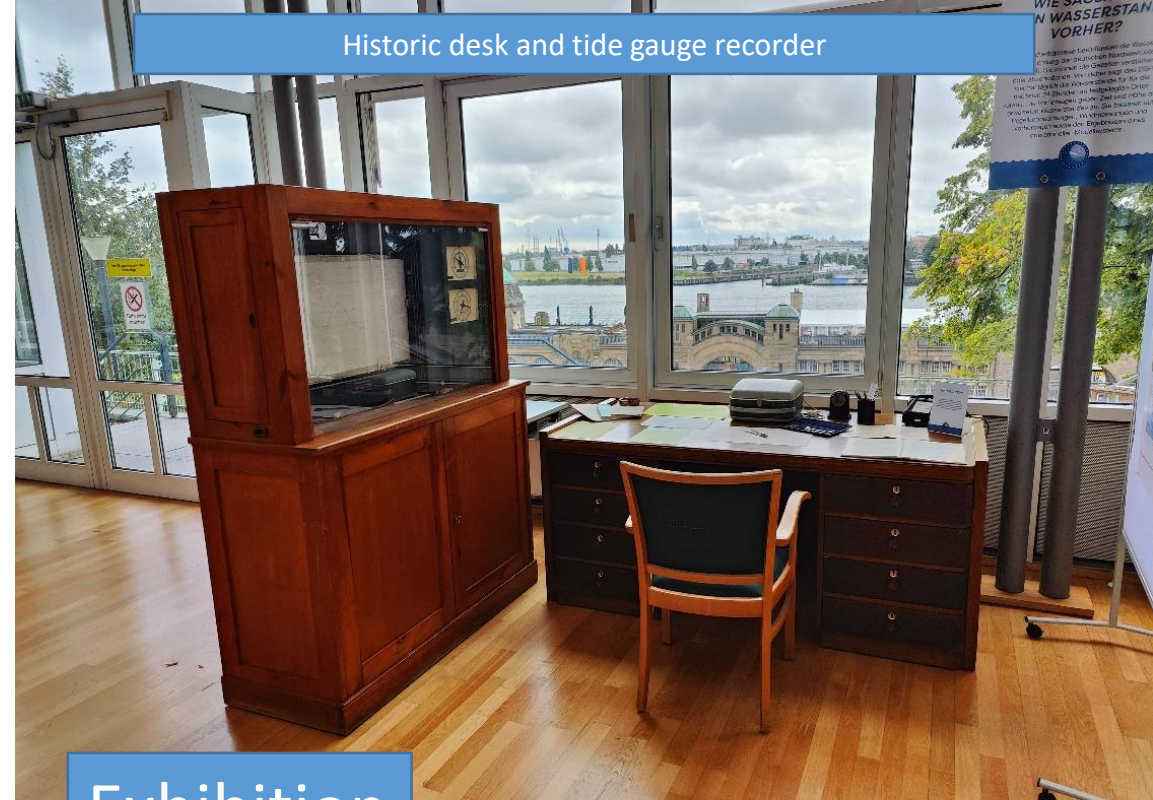
## Reception



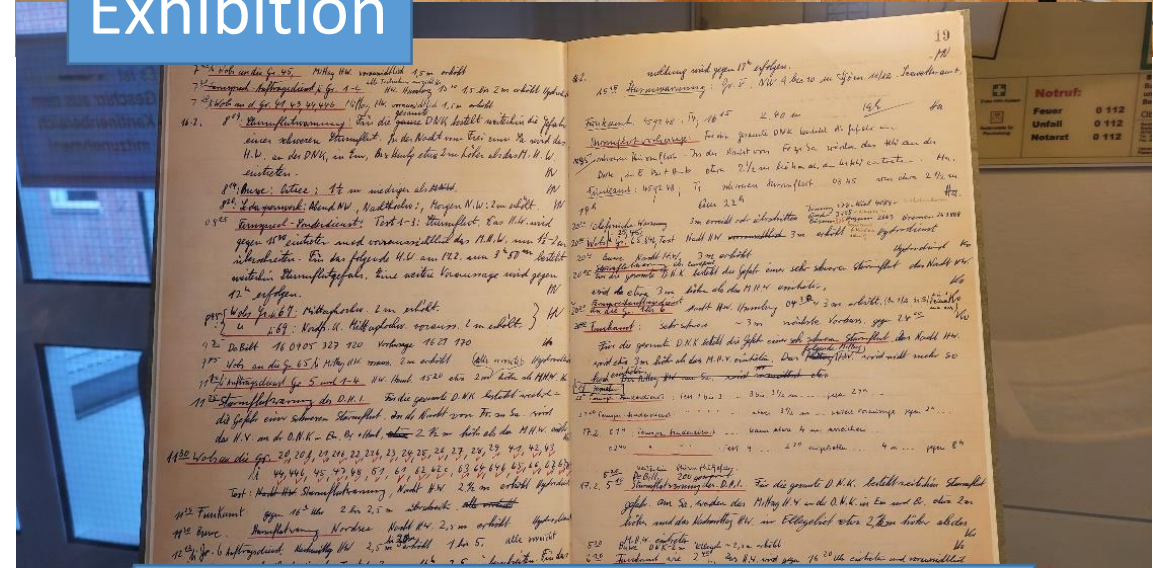
## Workshop



100 JAHRE  
WASSERSTANDS-  
VORHERSAGE- und  
STURMFLUTWARN-  
DIENST Nordsee



## Exhibition



Storm surge 16 February 1962



# Websites

- Waterlevel forecasts and storm surge warnings:  
<https://wasserstand-nordsee.bsh.de>  
English translation available soon
- Tidal predictions:  
<https://www.bsh.de/tides>  
[new website](#) under construction
- Tide gauge observations:  
<https://pegelonline.wsv.de>  
Federal gauges operated by WSV
- Chart Datum (North Sea & Baltic Sea):  
[https://www.bsh.de/DE/THEMEN/Vermessung\\_und\\_Kartographie/Seekartennull/seekartennull\\_node.html](https://www.bsh.de/DE/THEMEN/Vermessung_und_Kartographie/Seekartennull/seekartennull_node.html)  
English translation available soon
- OpenCode:  
<https://gitlab.opencode.de/bsh/>  
Plan: new code will be added here gradually

# Update of Chart Datum Surface 2026

First step: definition of chart datum at tide gauges based on latest LAT-values (2025)

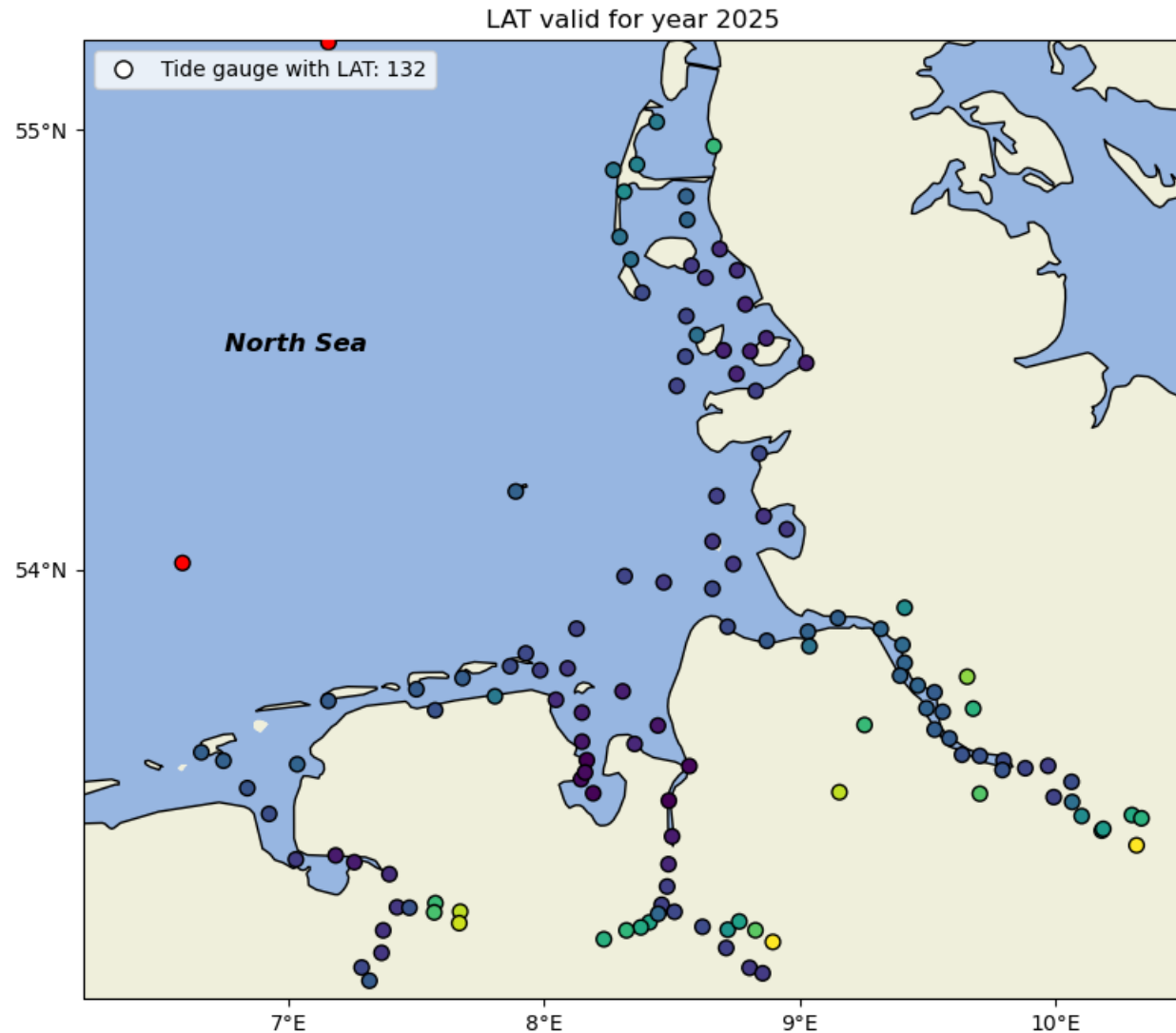
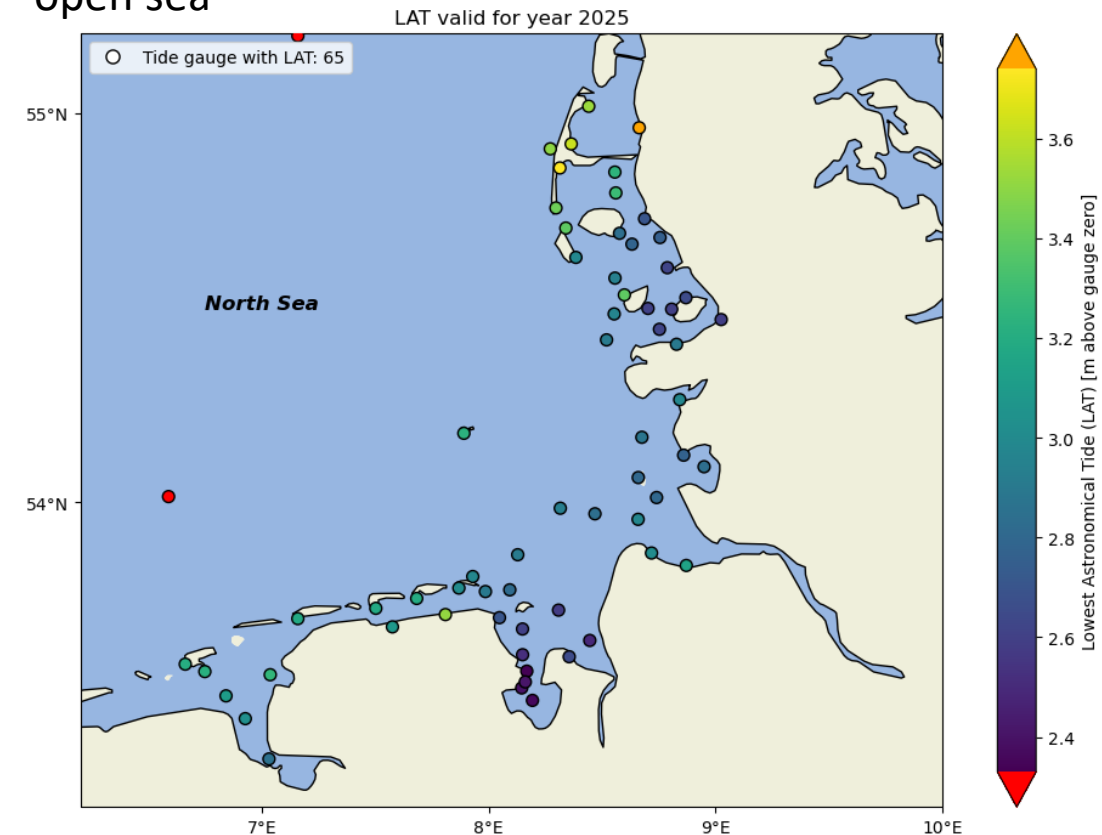
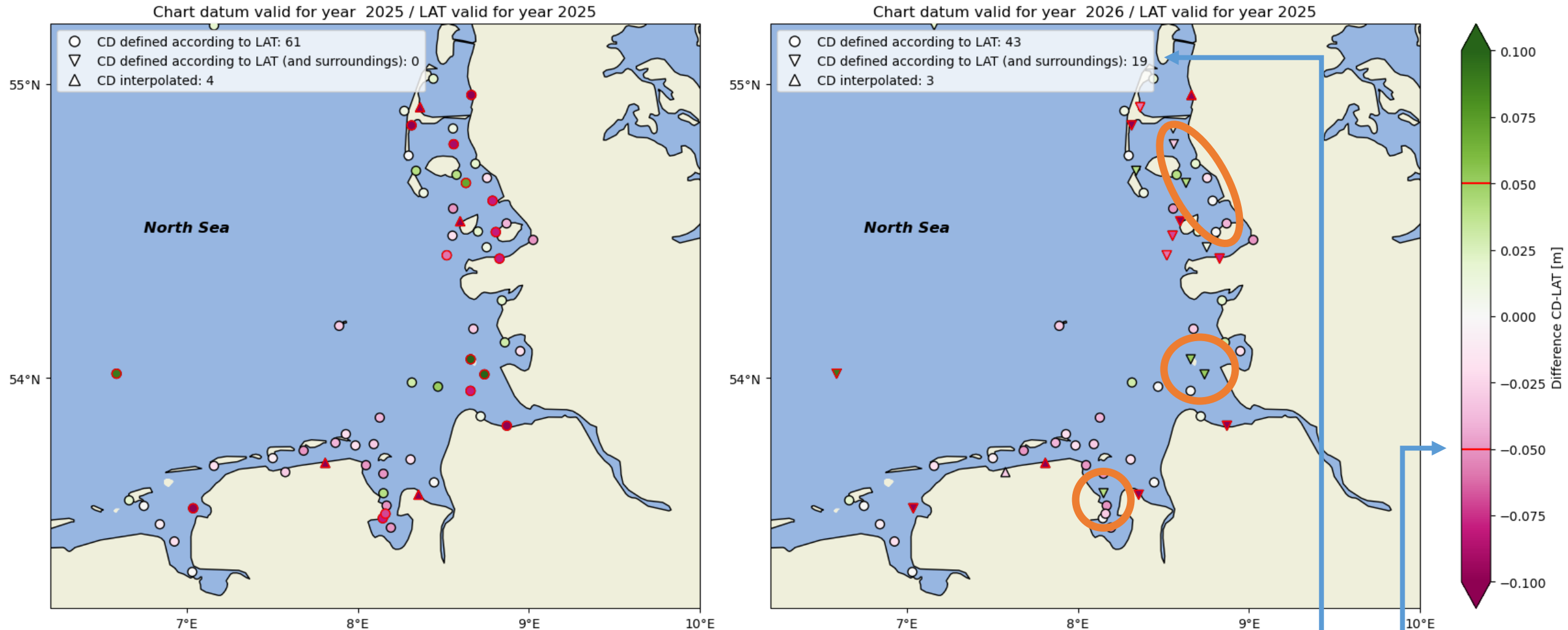


Chart datum surface is calculated only for the open sea



# Update of Chart Datum Surface 2026



- differences up to +/-5 cm are accepted
- some tide gauges run dry or have other dependencies, depending on surroundings

# Artefacts in 2D-tidal predictions

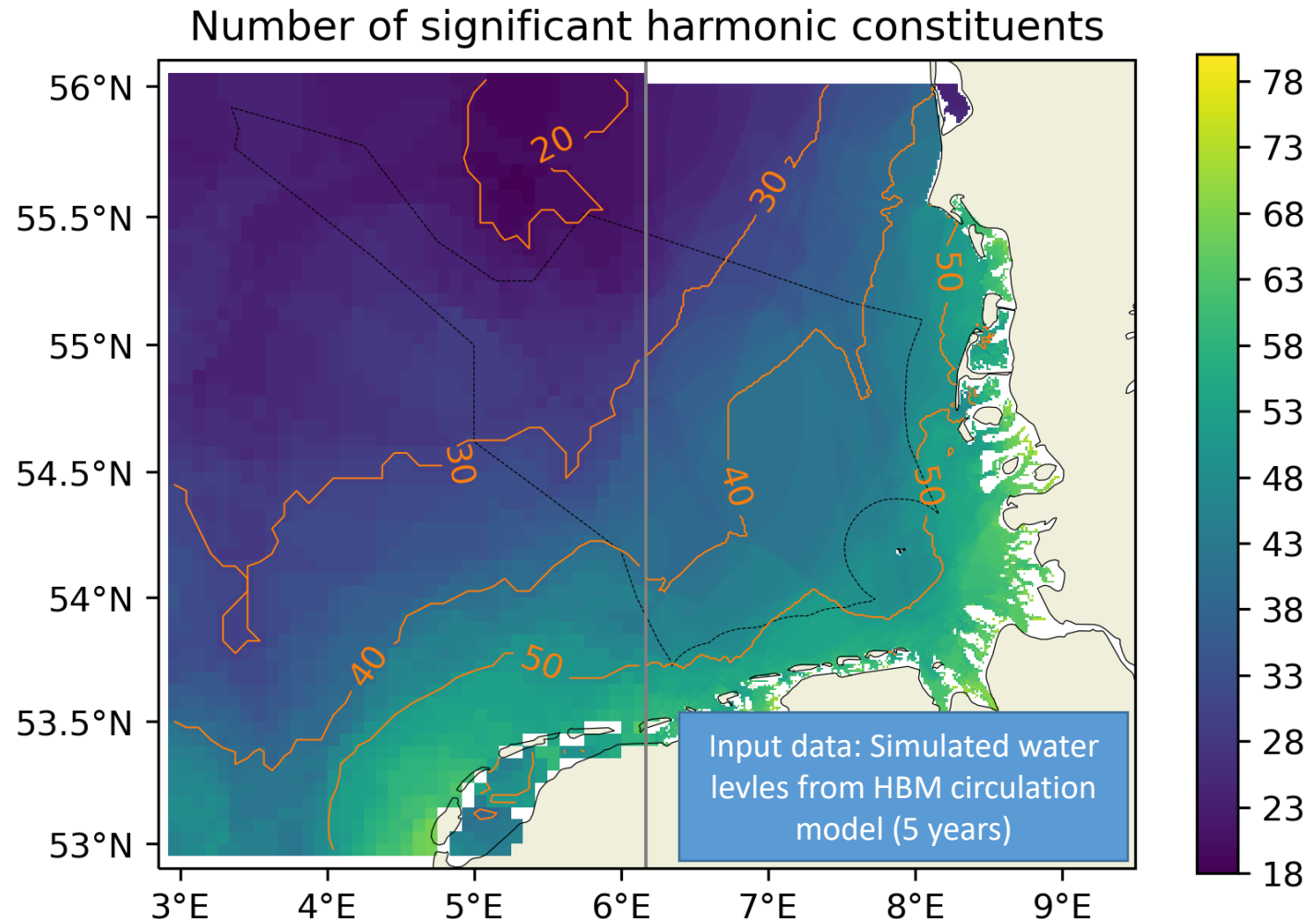
## Procedure for harmonic analysis:

### 1. iteration:

- use all water level data provided
- Use resolvable partial tides (depending on the length of the time series) from a master list of 104 partial tides

### 2. iteration:

- Apply a 3-sigma-clipping to observations
- Use only „significant“ partial tides with  $S/N > 2$

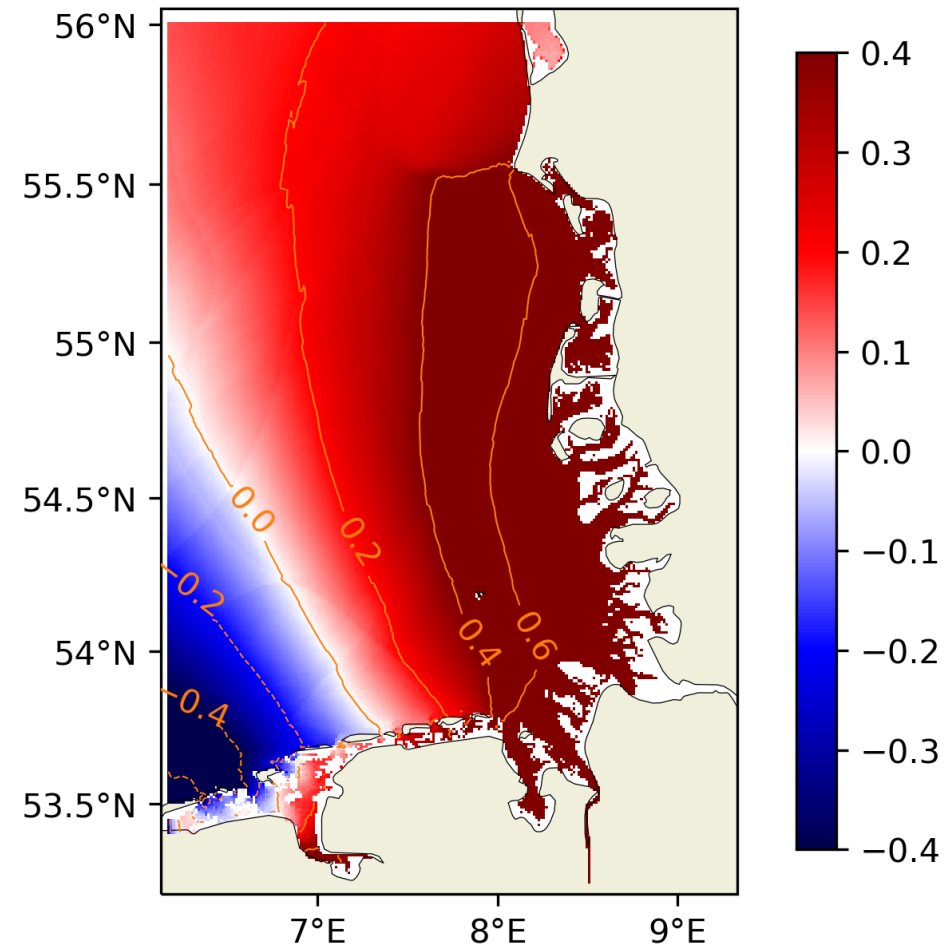




# Artefacts in 2D-tidal predictions

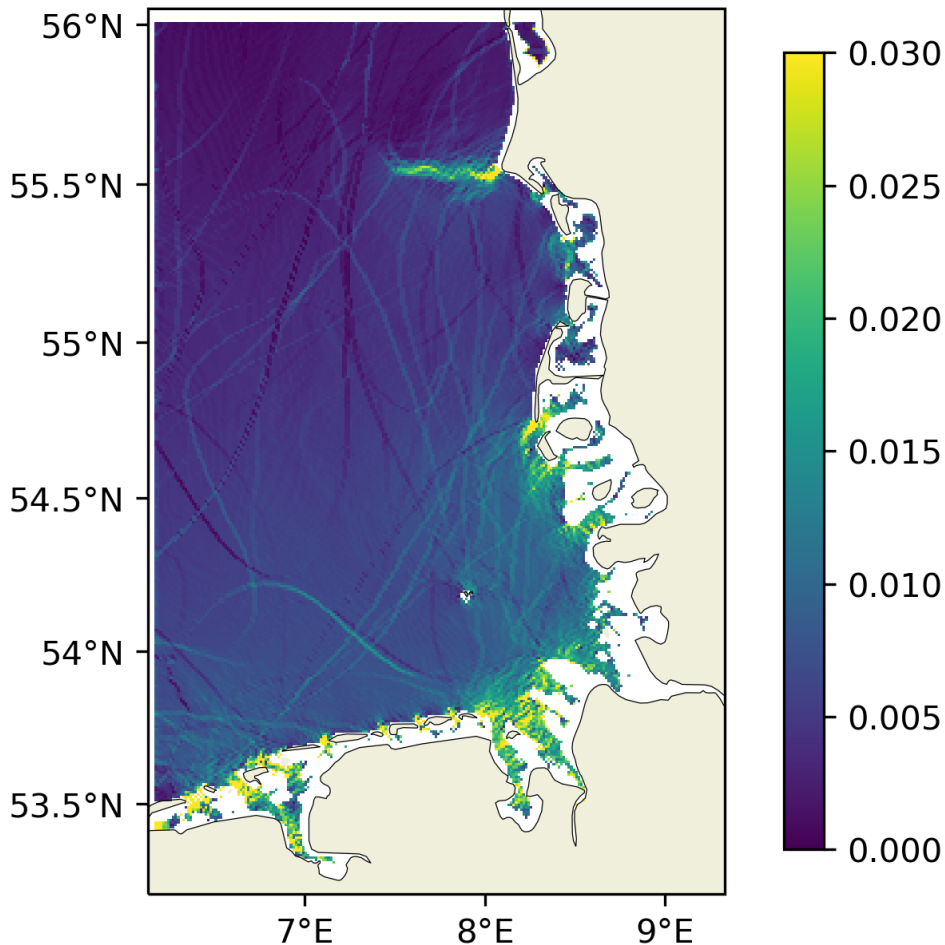
Tidal prediction

15.10.2024 23:45



Tidal prediction (Gradient)

15.10.2024 23:45



- Tidal predictions are not smooth in 2D
- Structure depends on distribution of the number of used partial tides
- No structure appears if the same number (101) of partial tides is used for all grid points

## Question:

Is it better to use „too many“ (insignificant) partial tides in the analysis or should the structure in the predicted surface be accepted?