BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

Ferrybox chlorophyll a measurements in context of the Eutrophication assessment

iMonEP

Annika Grage & Karin Heyer

FerryBox Workshop iMonEP-Project
29.09.2022

Pilottest for an innovative Monitoring focussing on Eutrophication and Pelagic habitats (BSH/UBA)
iMonEP

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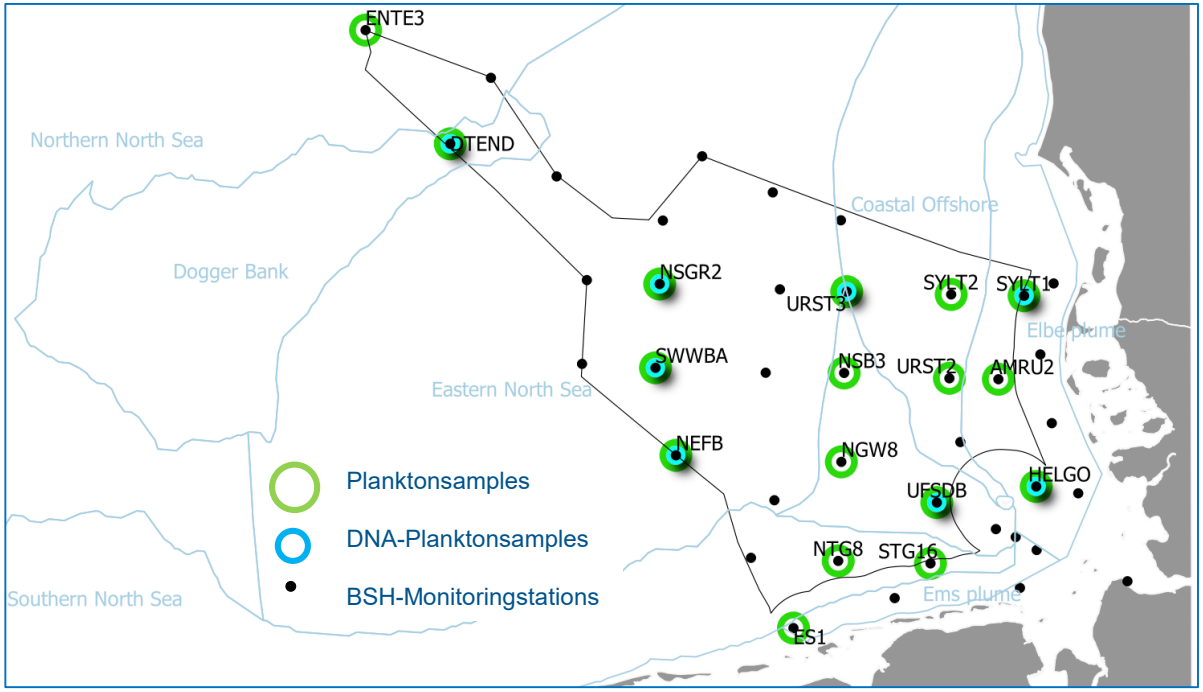
Goal:

Proposal for a **comprehensive** and **cost efficient Mon**itoring concept for monitoring and assessment of **Eutrophication** and **pelagic Habitats** in frame of the **MFD** and **OSPAR**

- in-situ samplings
- connection with data from further sources e.g. FerryBox-Data
- Tests with innovative methods for the analysis of Plankton-samples

iMonEP-Stations for Planktonsamplings



Which data are needed for Eutrophication assessment?

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- **Nutrients**
- **Chlorophyll a**
- **Oxygen bottom**
- **Harmful algae blooms**
- **Plankton**

Which data are needed for Eutrophication assessment?

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Methods	in-situ			Remote sensing	Models
	Laboratory	Automatic analysis	FerryBoxes, sensors		
Nutrients	X	X	X		X
Chlorophyll a	X		X	X	X
Oxygen bottom	X	X			X
Harmful algae blooms	X	(X)	(X)	(x)	
Plankton	X	(X)		(x)	(x)

Which data are needed

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Methods	in-situ			Remote sensing	Models
	Laboratory	Automatic analysis	FerryBoxes, sensors		
Nutrients	X	X	X		X
Chlorophyll a	X		X	X	X
Oxygen bottom	X	X			X
Harmful algae blooms	X	(X)	(X)	(x)	
Plankton	X	(X)		(x)	(x)

Usefulness of FerryBox data for Chorophyll a

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- Comparability of data from other Chlorophyll a measurements

- Temporal and spatial variation of Chlorophyll a along the route (Magnolia)
- detection of plankton blooms (Magnolia)
- high temporal resolution (Funny Girl).

FerryBox-Routes by HEREON in the German Bight

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Magnolia Seaways

- the whole year
- approx. one day one direction

Funny Girl

- April to September
- each day roundtrips:
  in the morning to Helgoland
  in the afternoon from Helgoland

Chlorophyll a Data from different sources:

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In-situ Data:

- Laboratory measurements

Comparability of Chlorophyll a data from different sources,
March 2021

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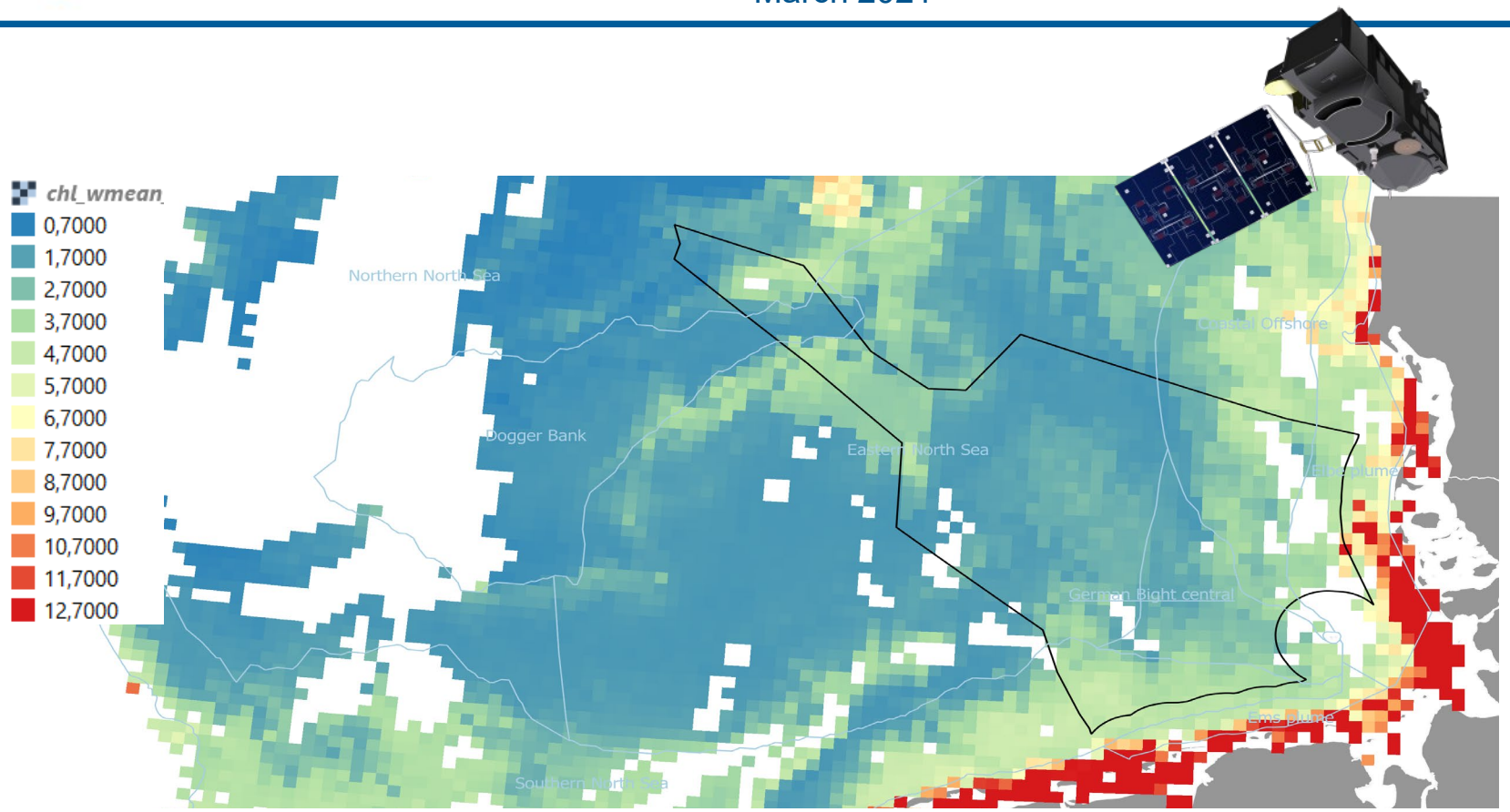

Remote sensing
BSH

Eefke van der Lee
Benjamin Schumacher
BrockmannConsult

Mean
16.03.-22.03.2021

Comparability of Chlorophyll a data from different sources,
March 2021

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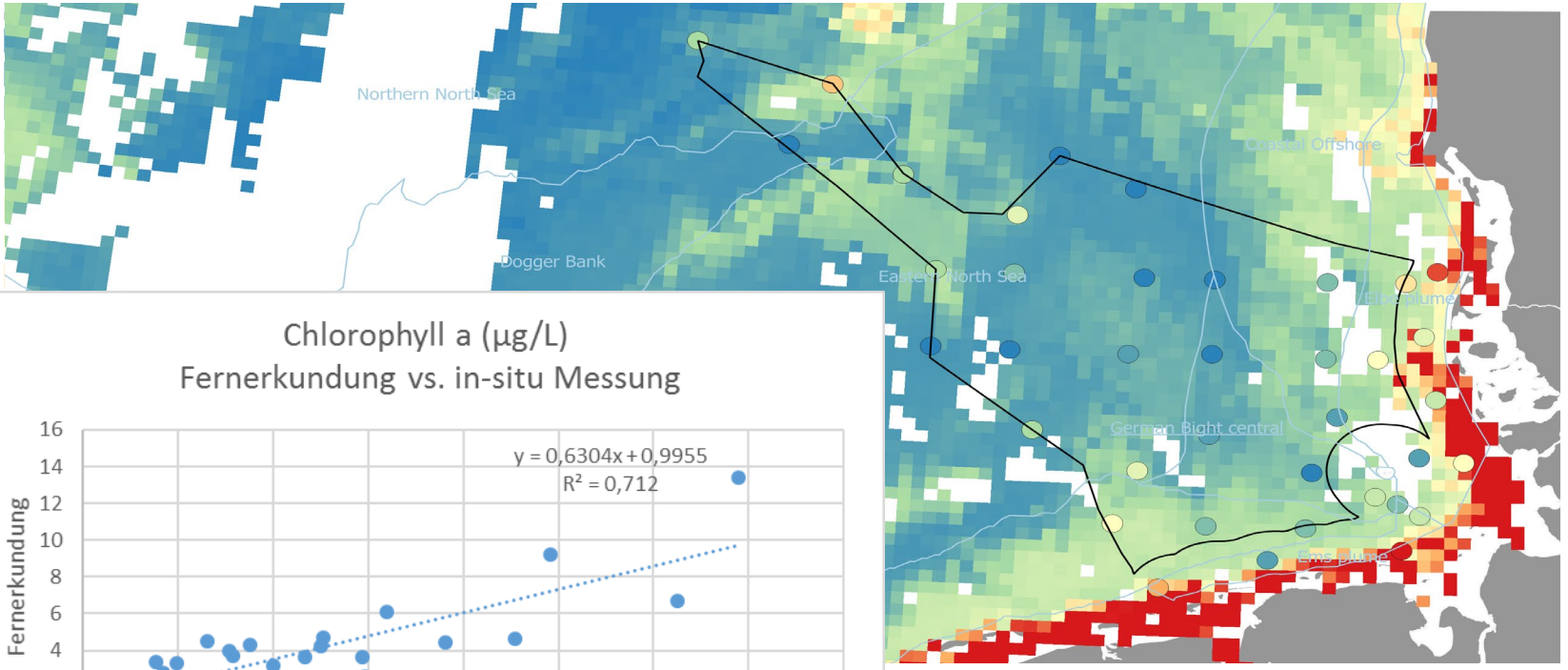


Remote sensing
BSH

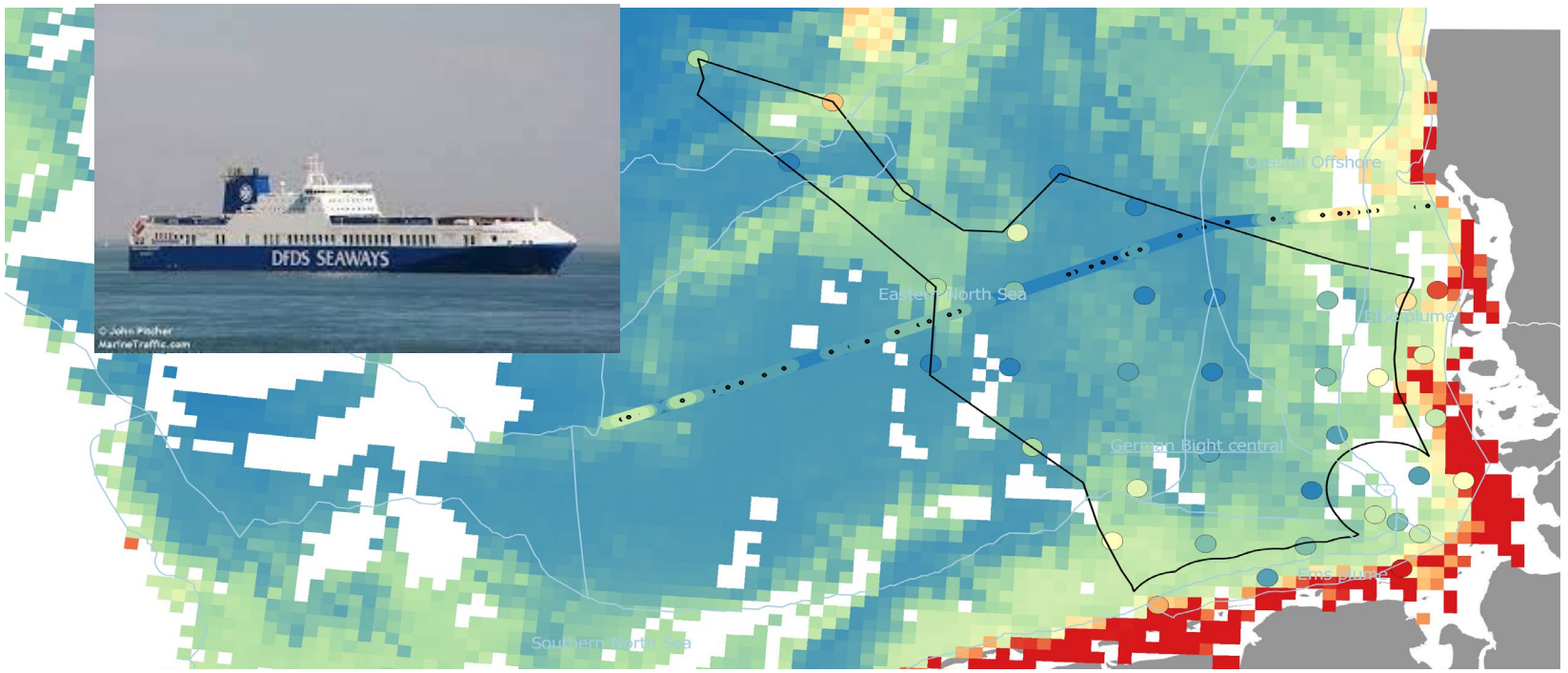
+

Laboratory (in-situ)-measurement

Annika Grage
Roswitha Velten

Comparability of Chlorophyll a data from different sources,
March 2021

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE



Remote sensing
BSH

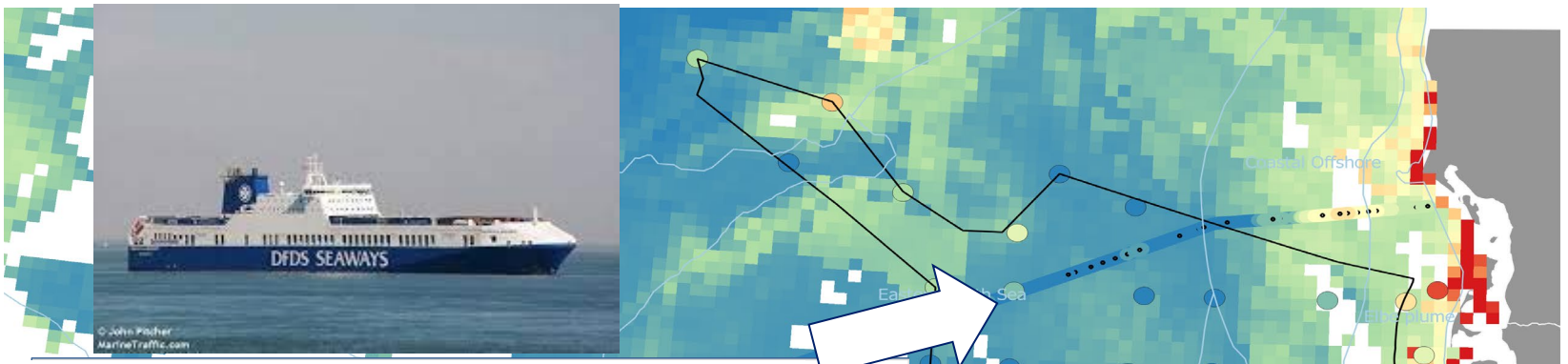
+
in-situ Measurement
+
Ferry-Box
Magnolia Seaways

Hereon-Institut
Yoana Voynova

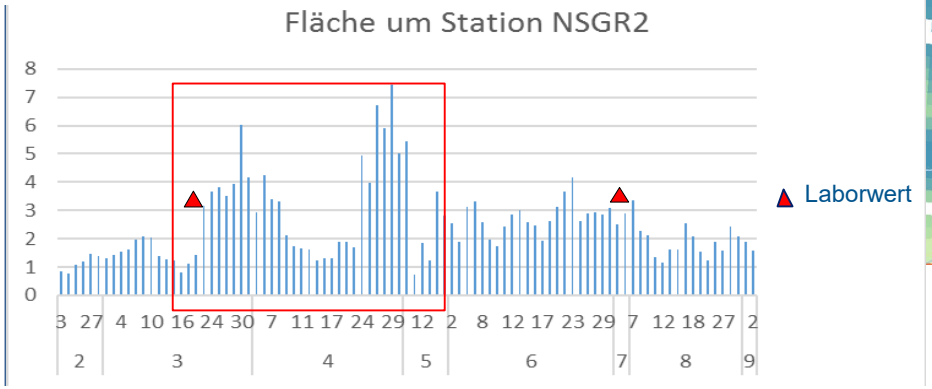
Comparability of Chlorophyll a data from different sources,

March 2021

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE



Hereon-FerryBox Magnolia-Seaways 2021



Remote sensing

BSH

\+

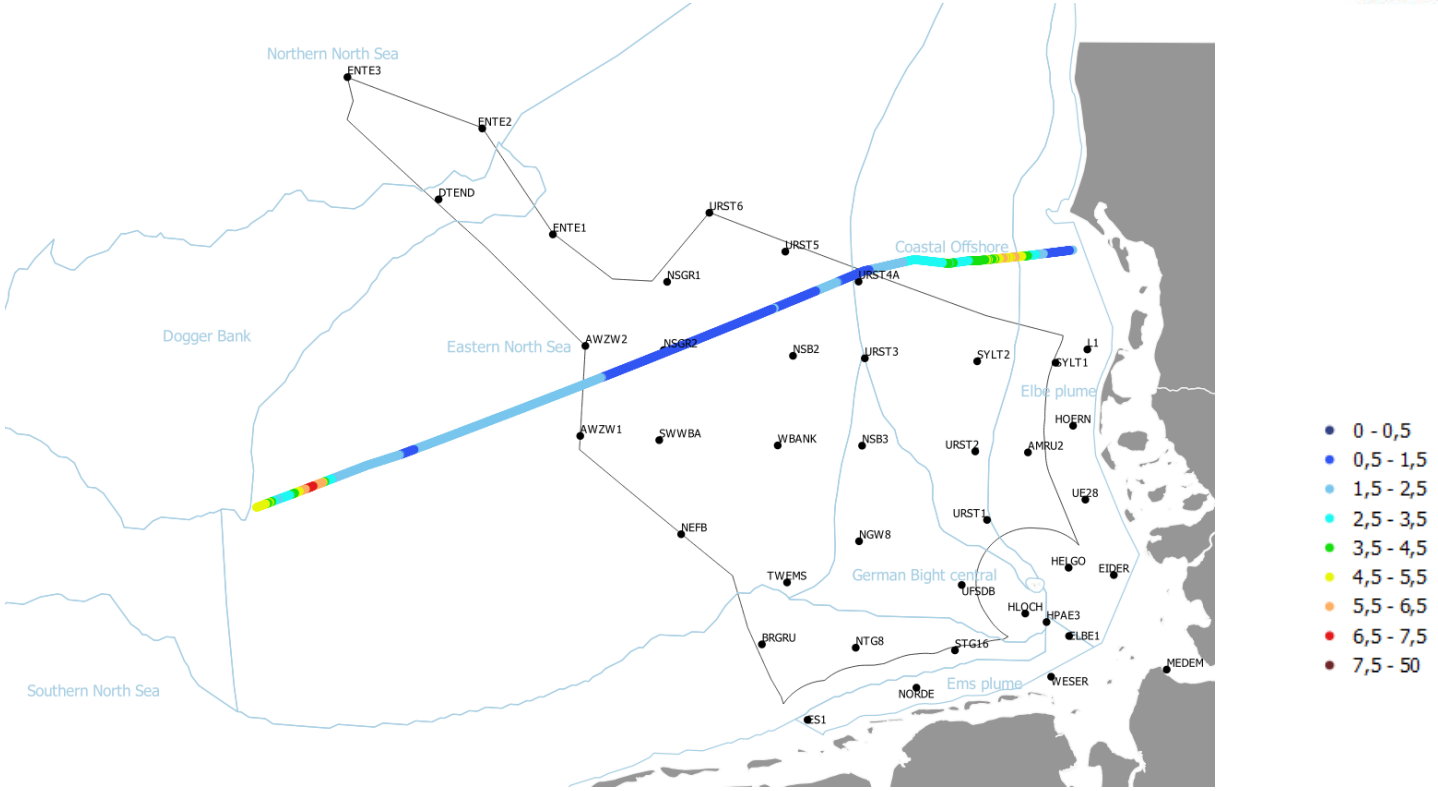
in-situ Measurement

\+

Ferry-Box Magnolia Seaways

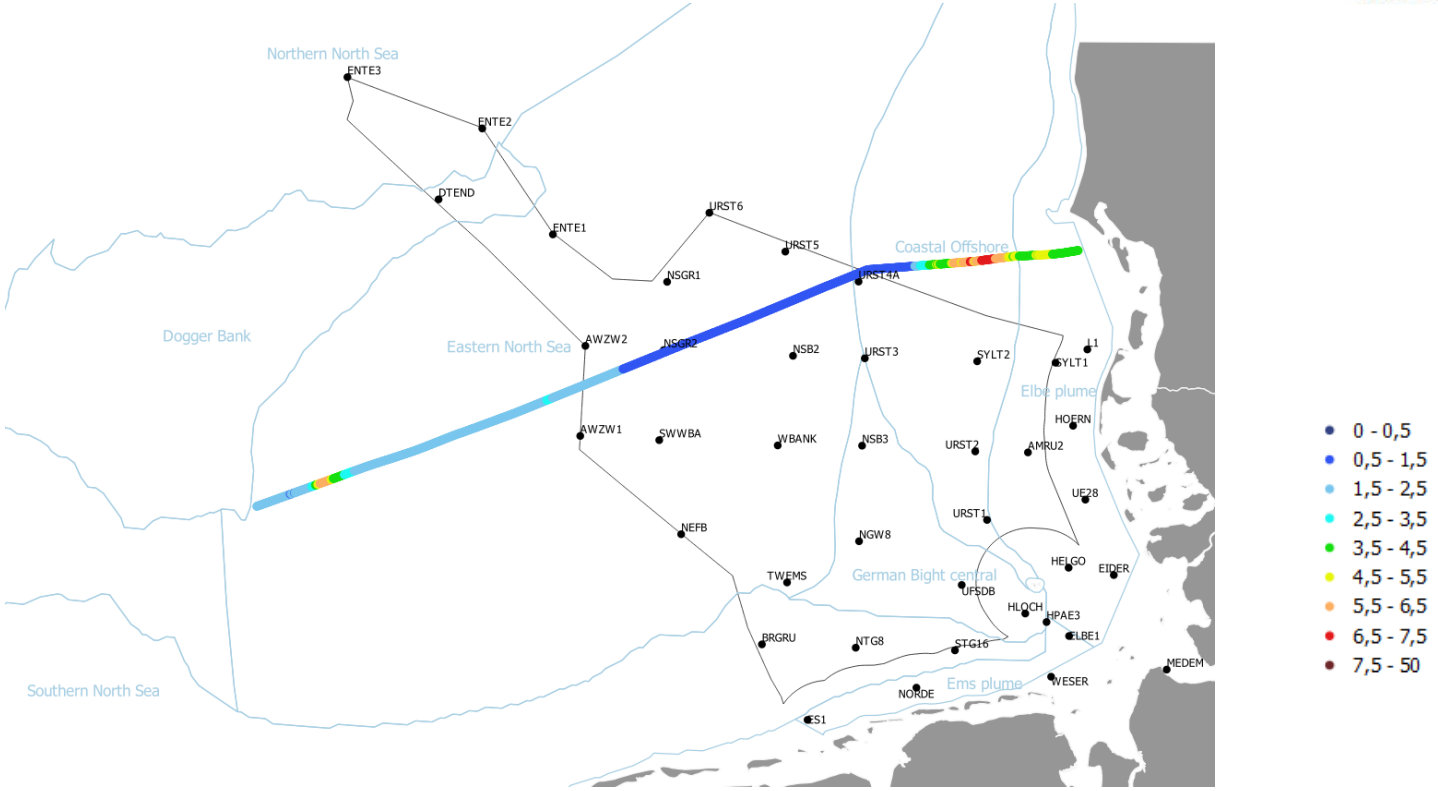
Hereon-Institut
Yoana Voynova

Temporal and spatial variability



14.3.2021

Temporal and spatial variability



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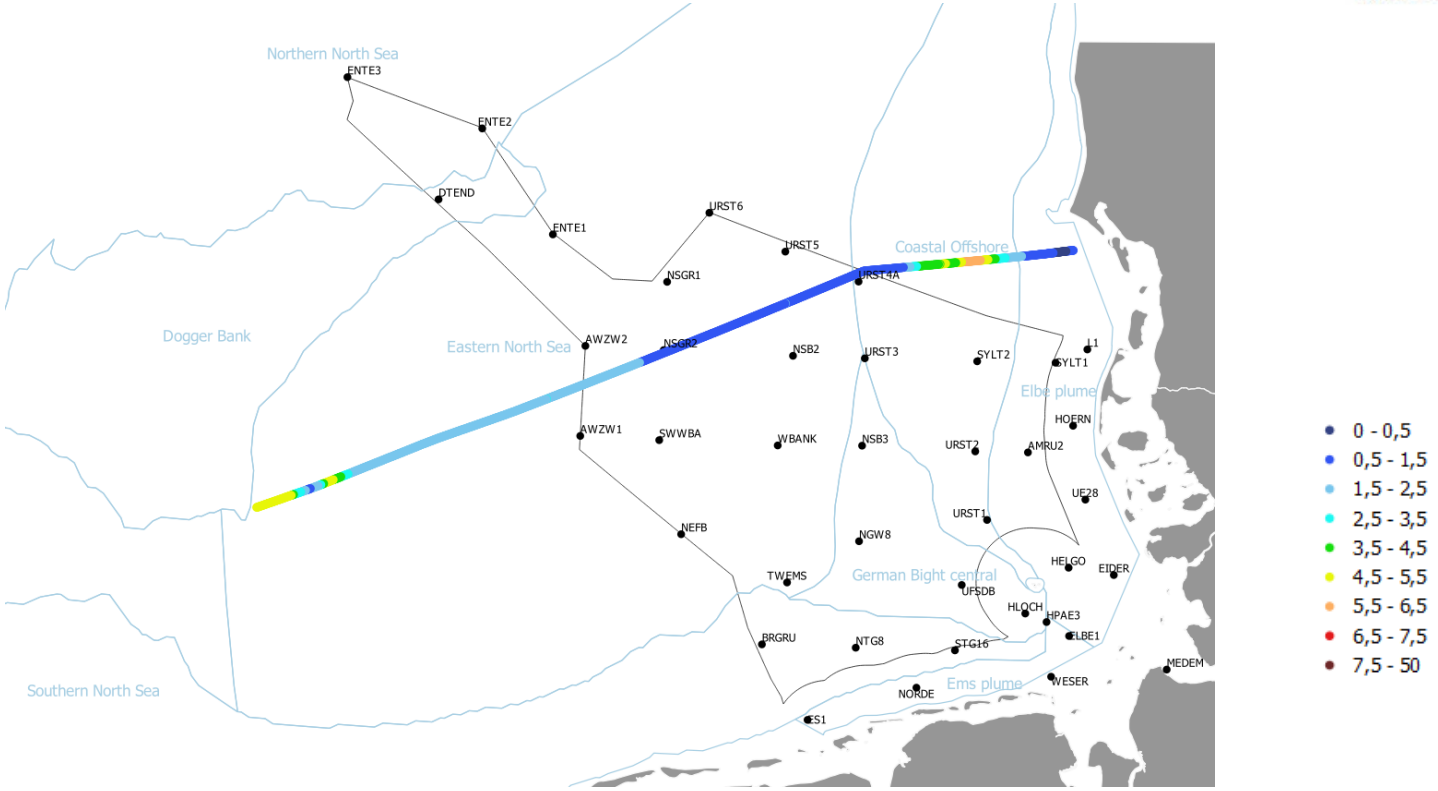
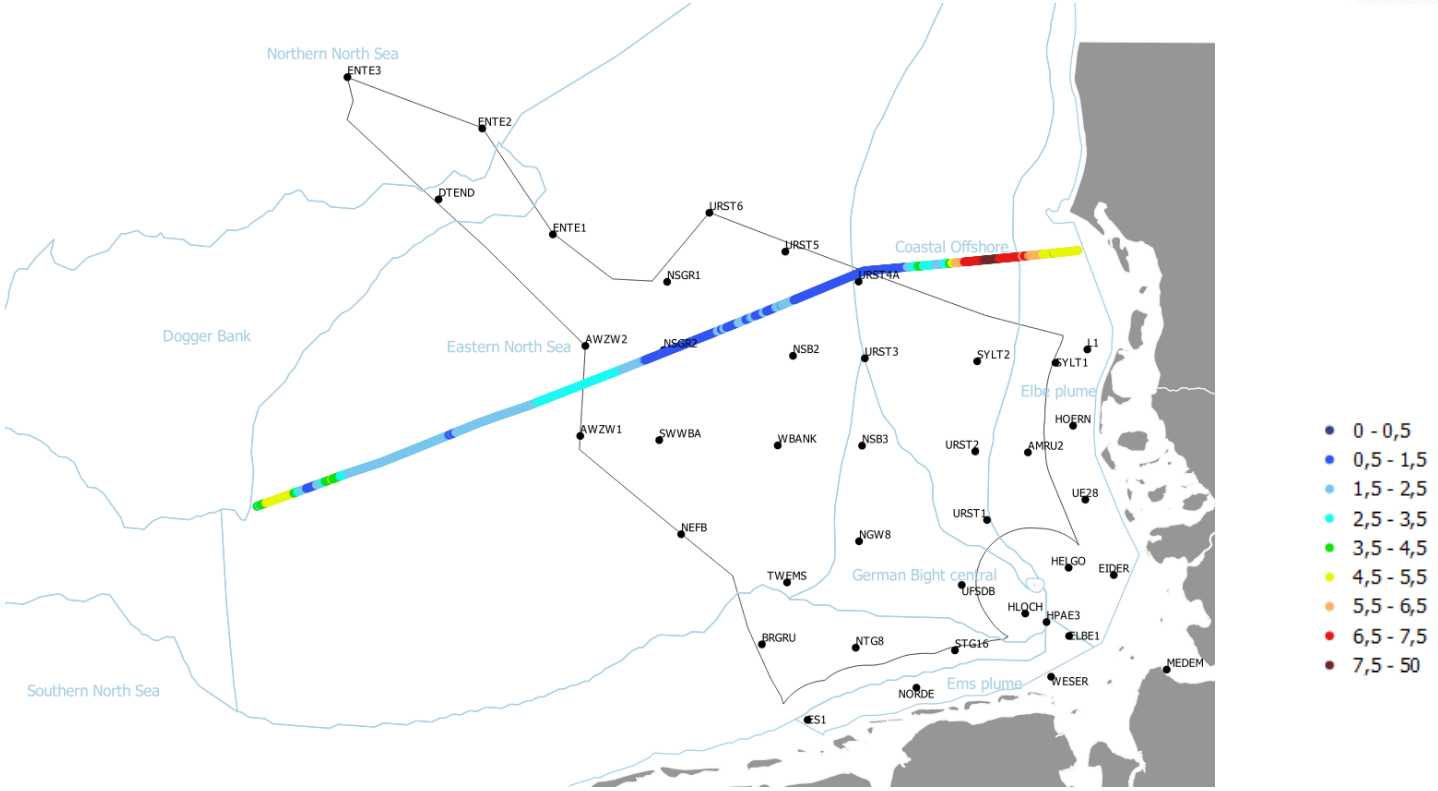
Temporal and spatial variability



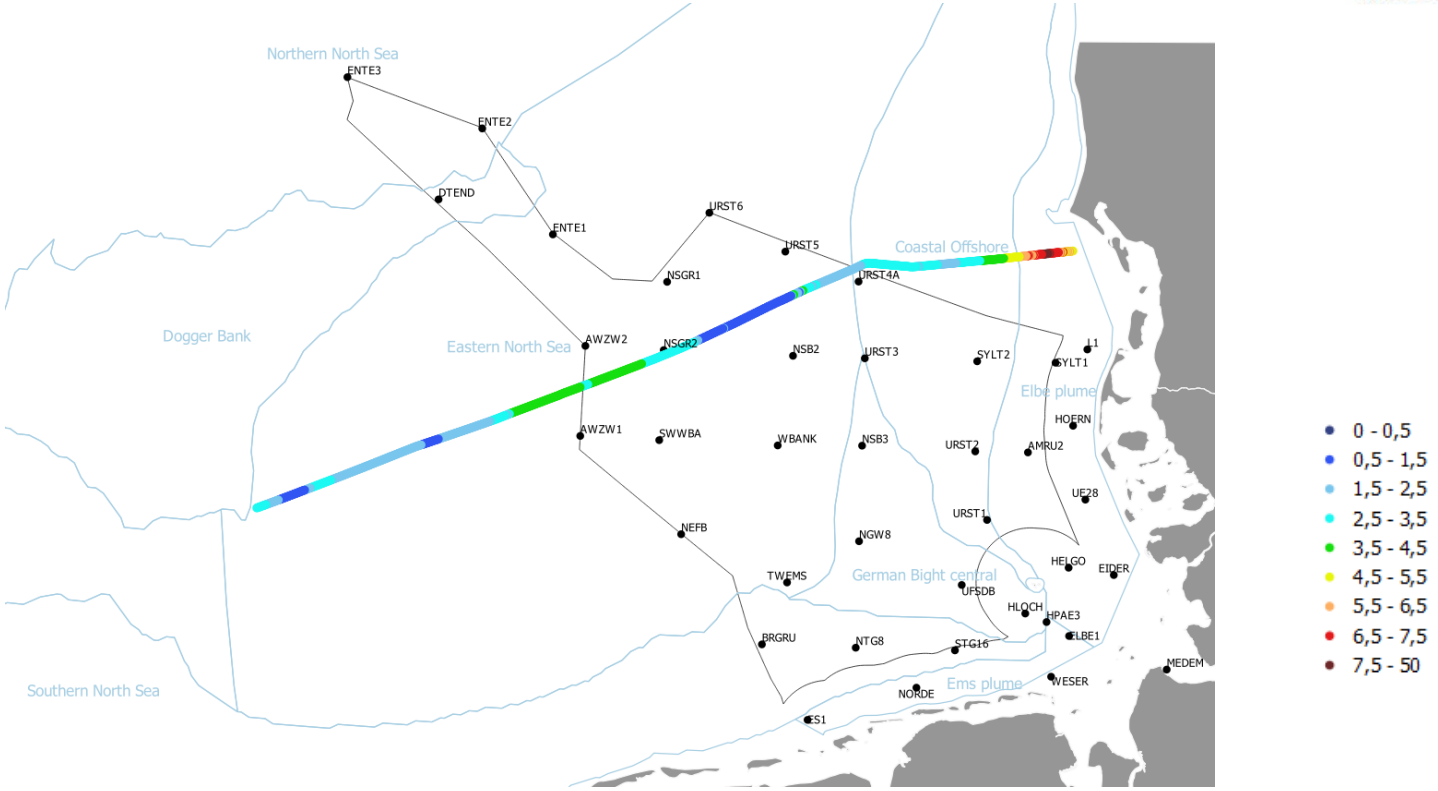
16./17.3.2021

Temporal and spatial variability



18.3.2021

Temporal and spatial variability



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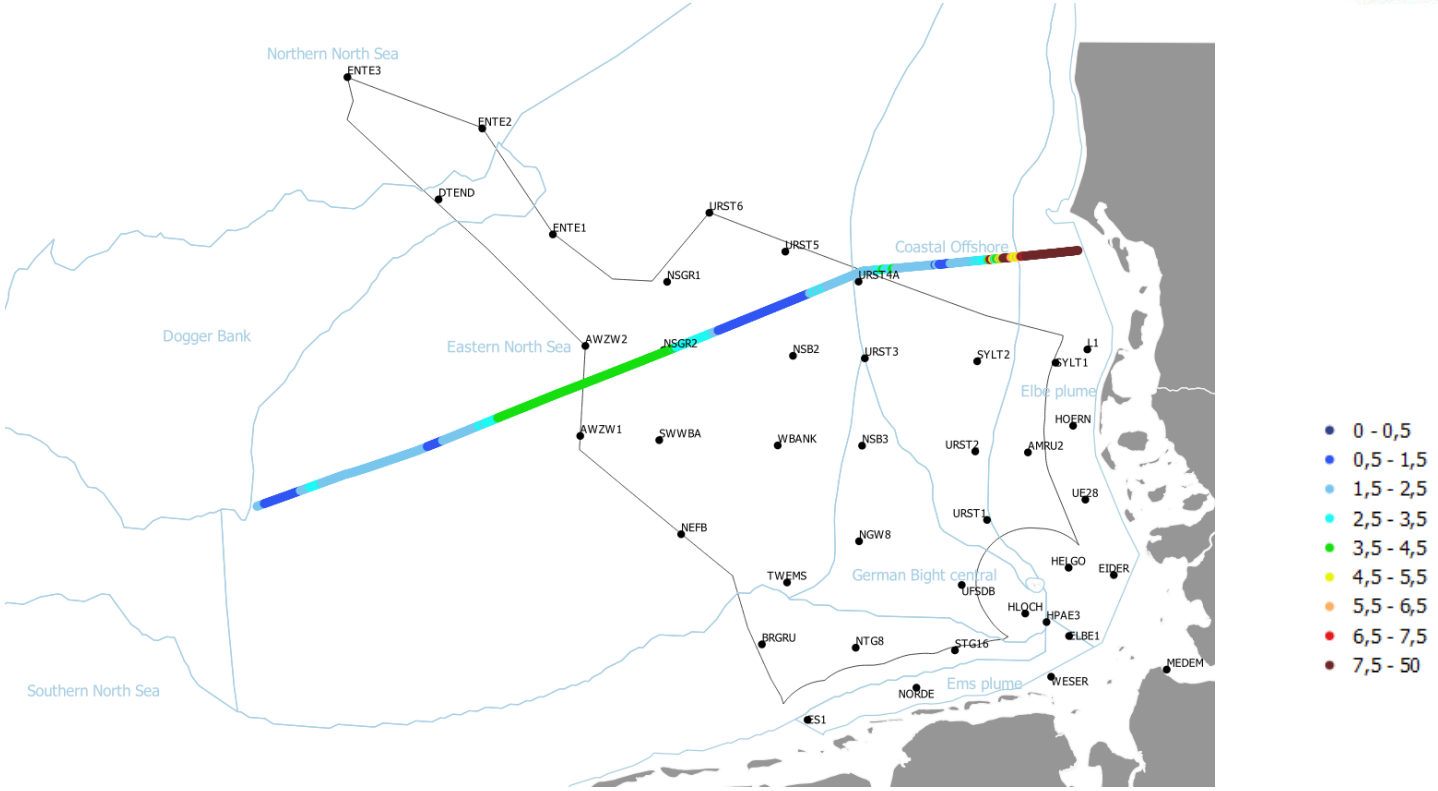
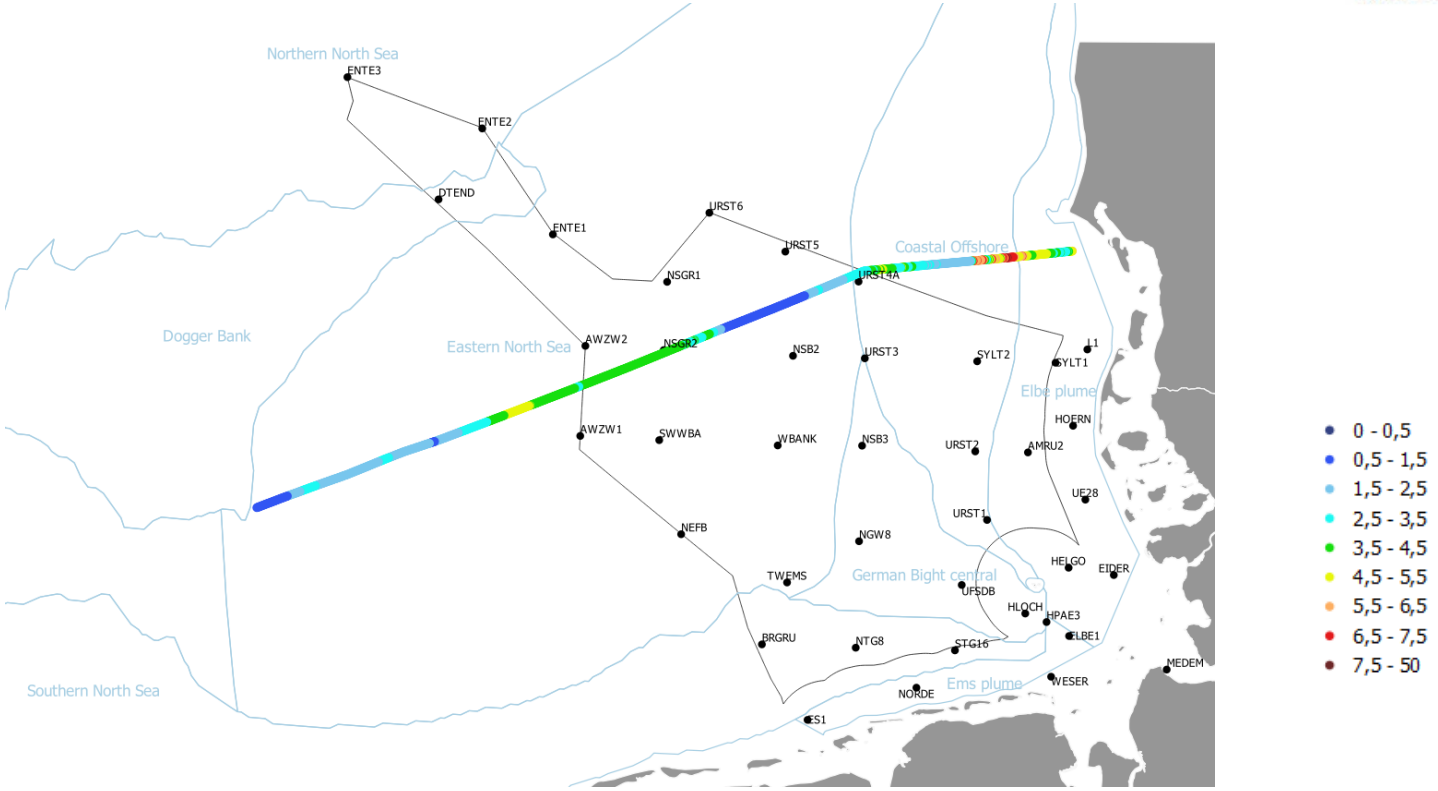
Temporal and spatial variability



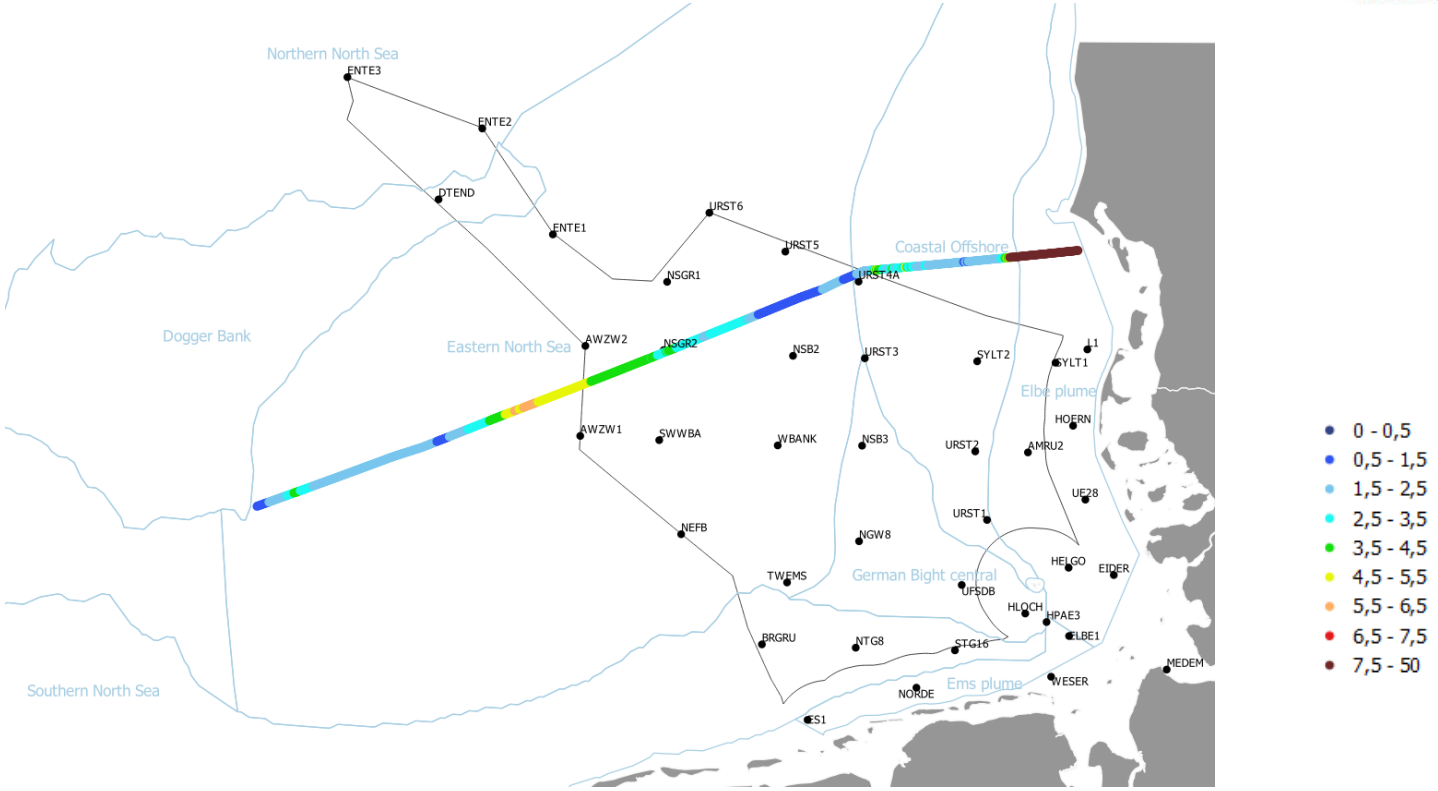
24.3.2021

Temporal and spatial variability



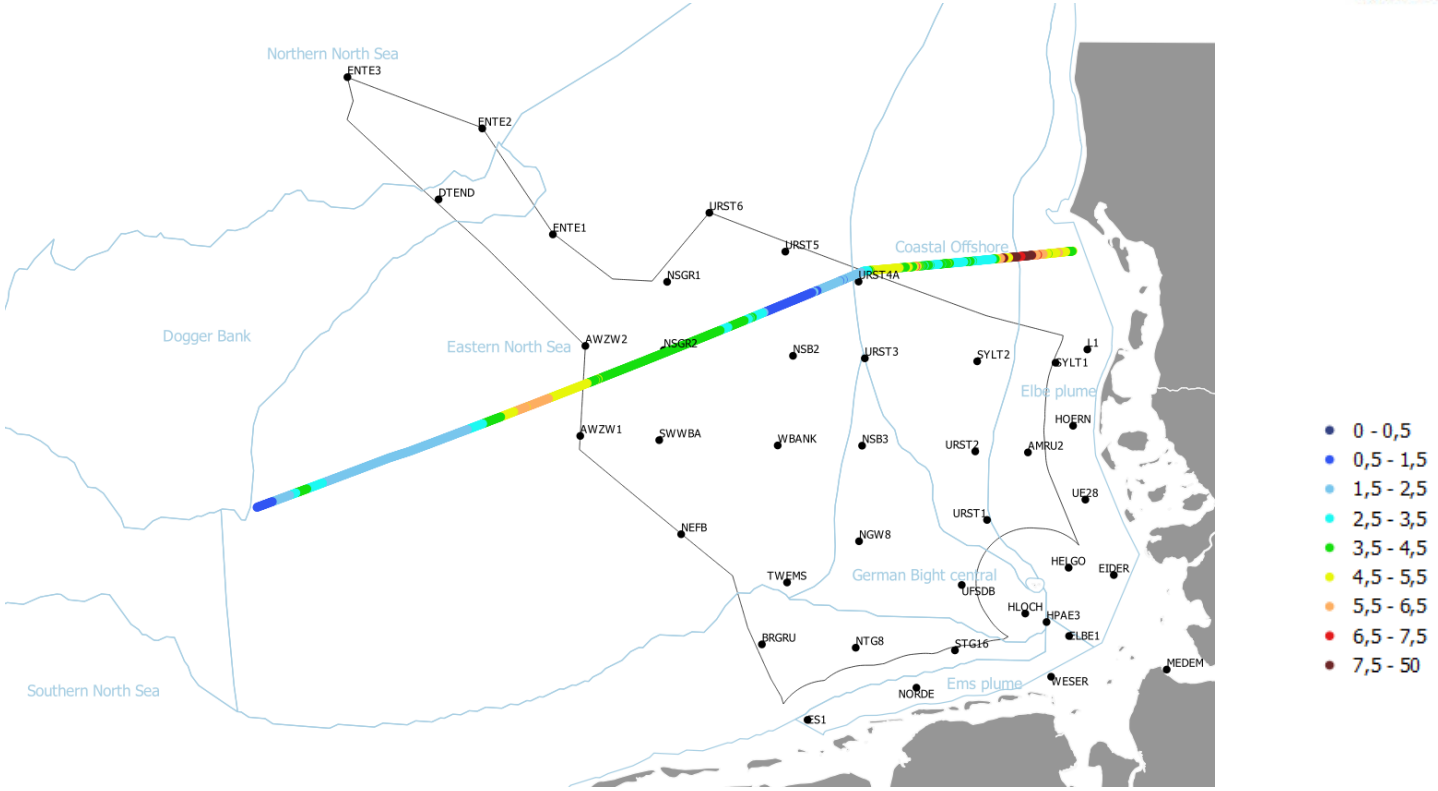
24./25.3.2021

Temporal and spatial variability



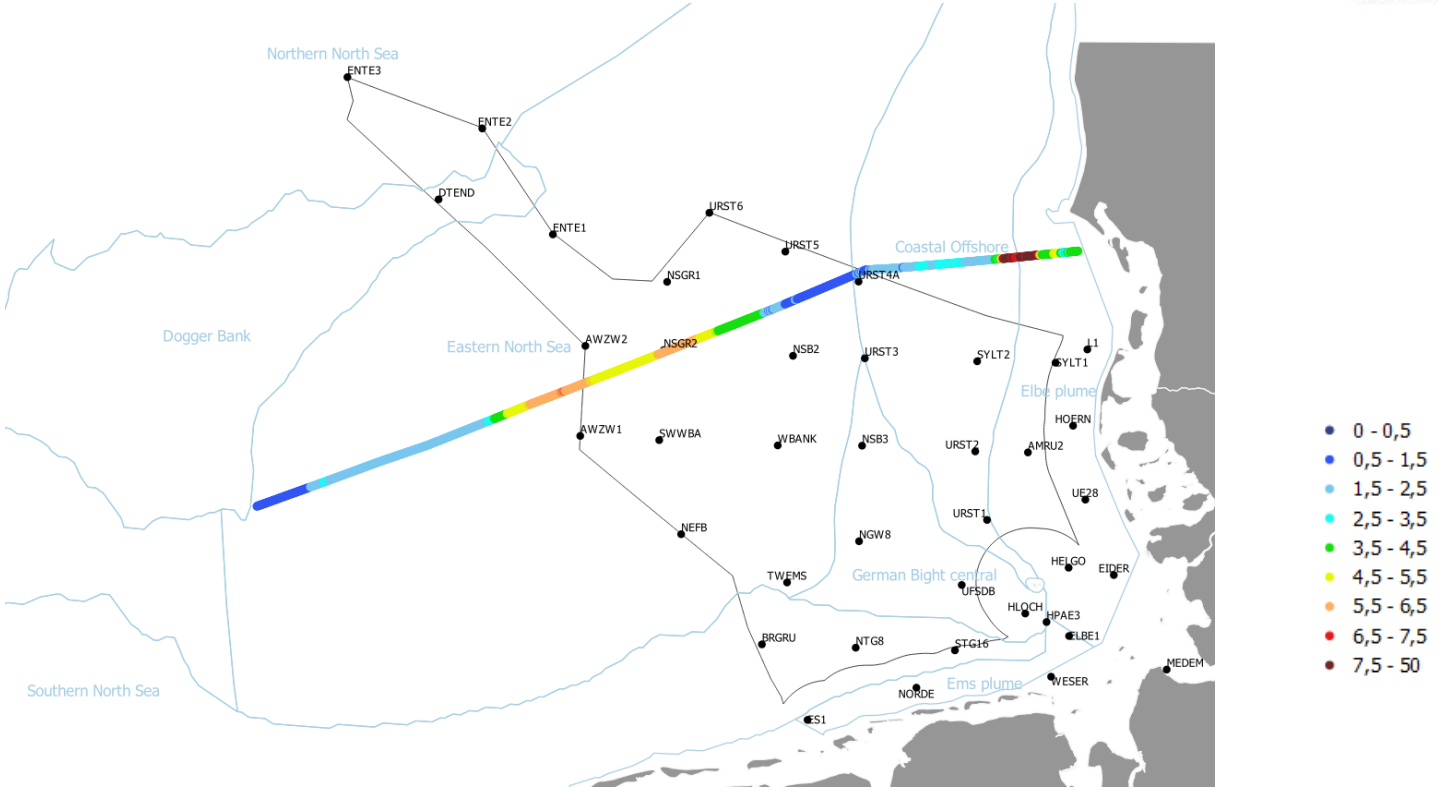
27.3.2021

Temporal and spatial variability



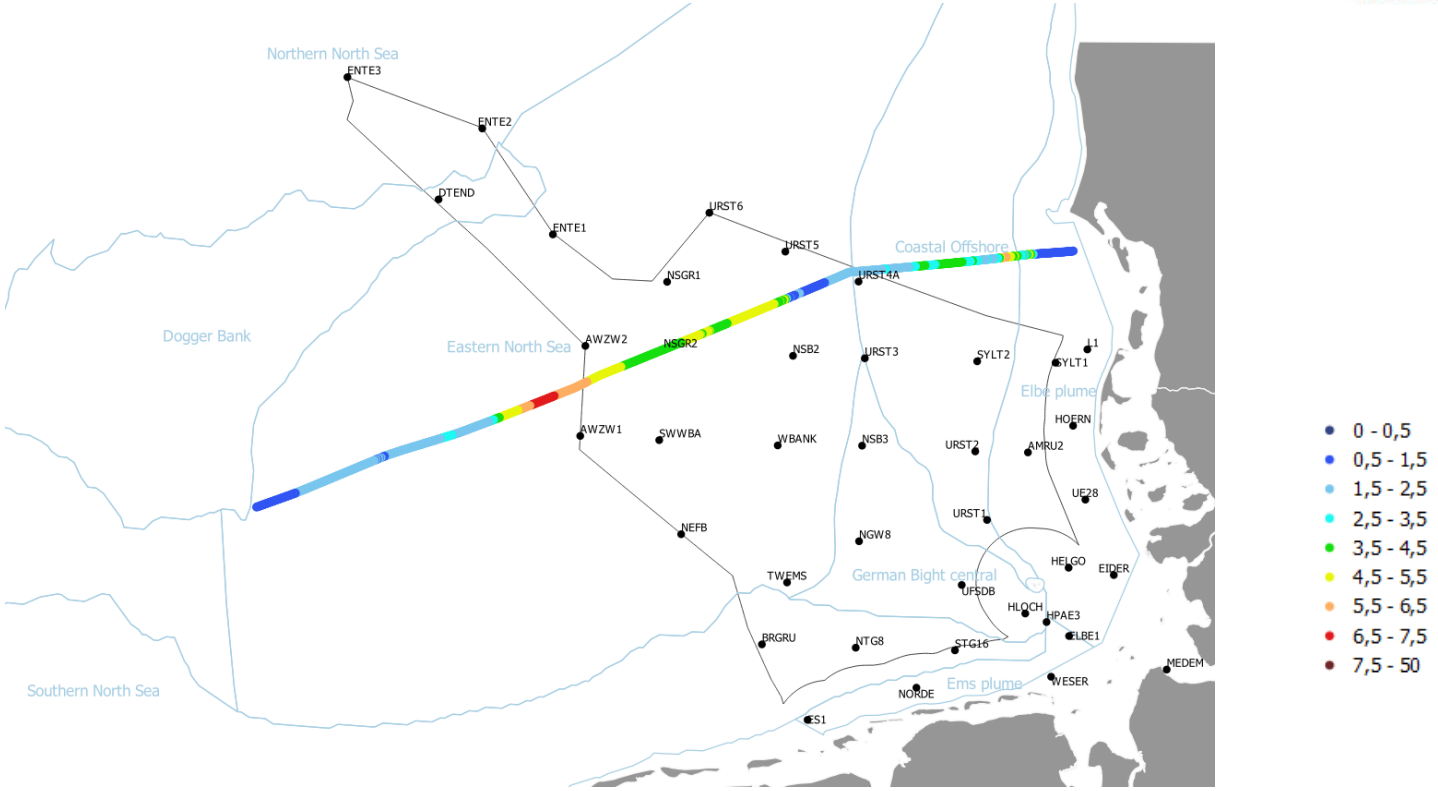
28.3.2021

Temporal and spatial variability



30.3.2021

Temporal and spatial variability



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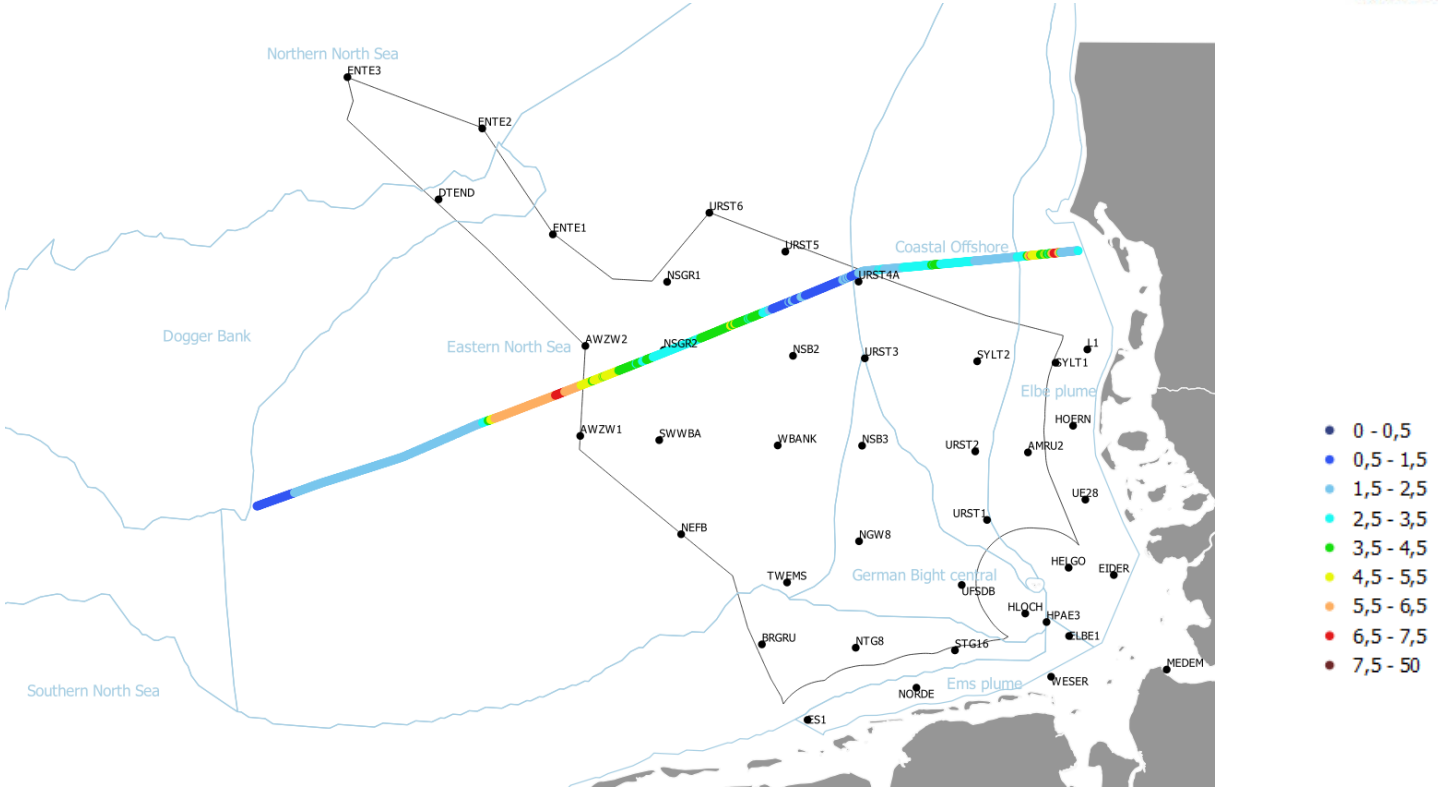
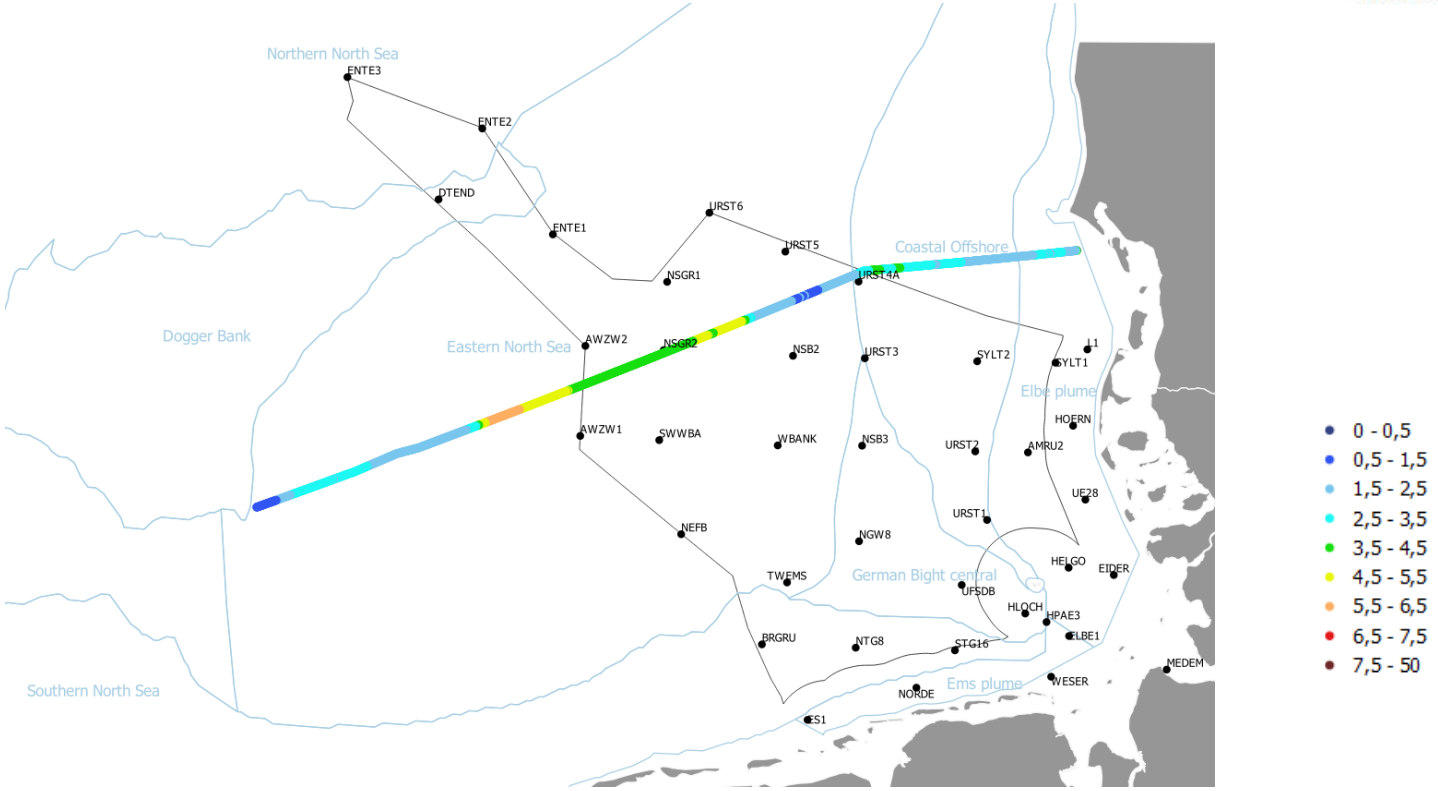
Temporal and spatial variability



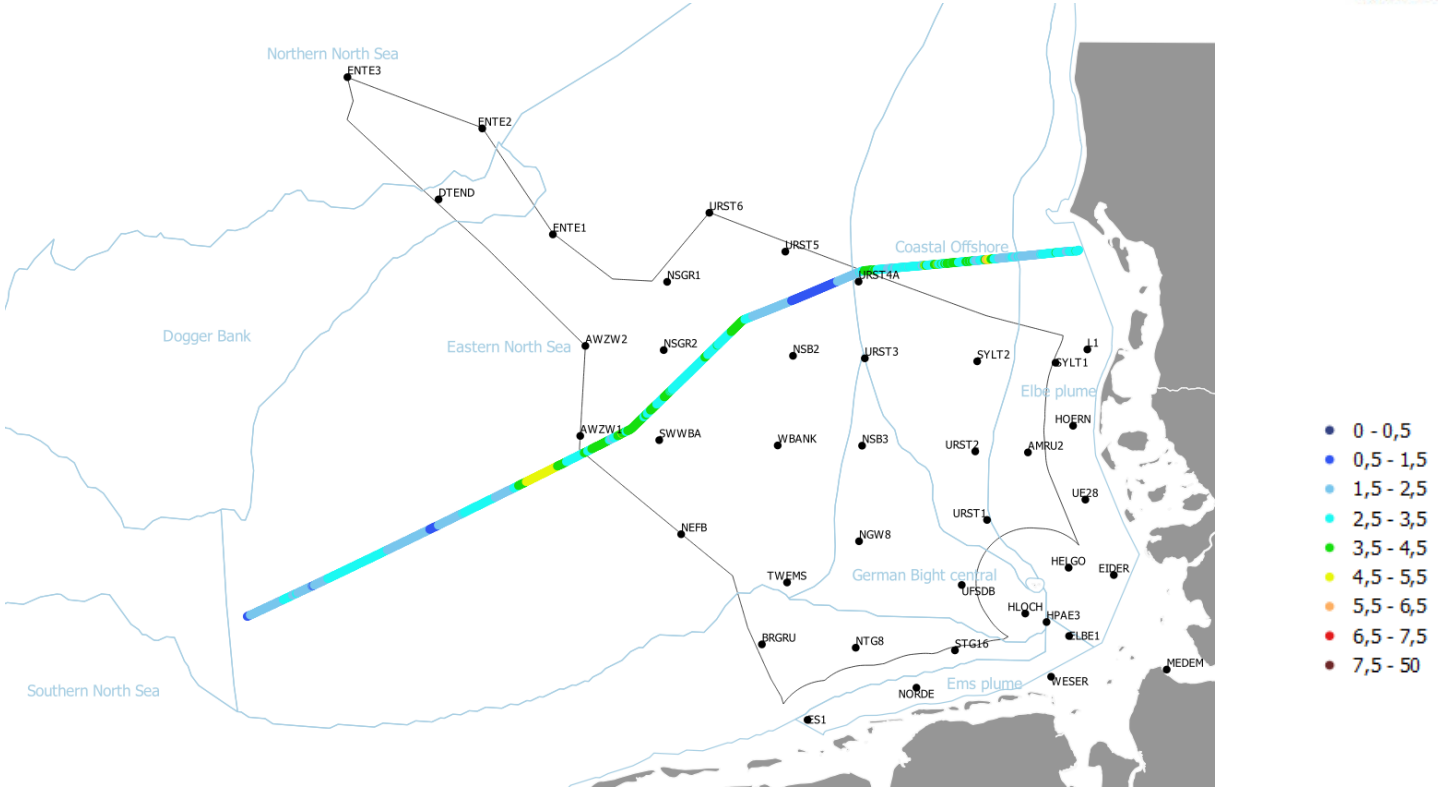
1.4.2021

Temporal and spatial variability



3.4.2021

Temporal and spatial variability



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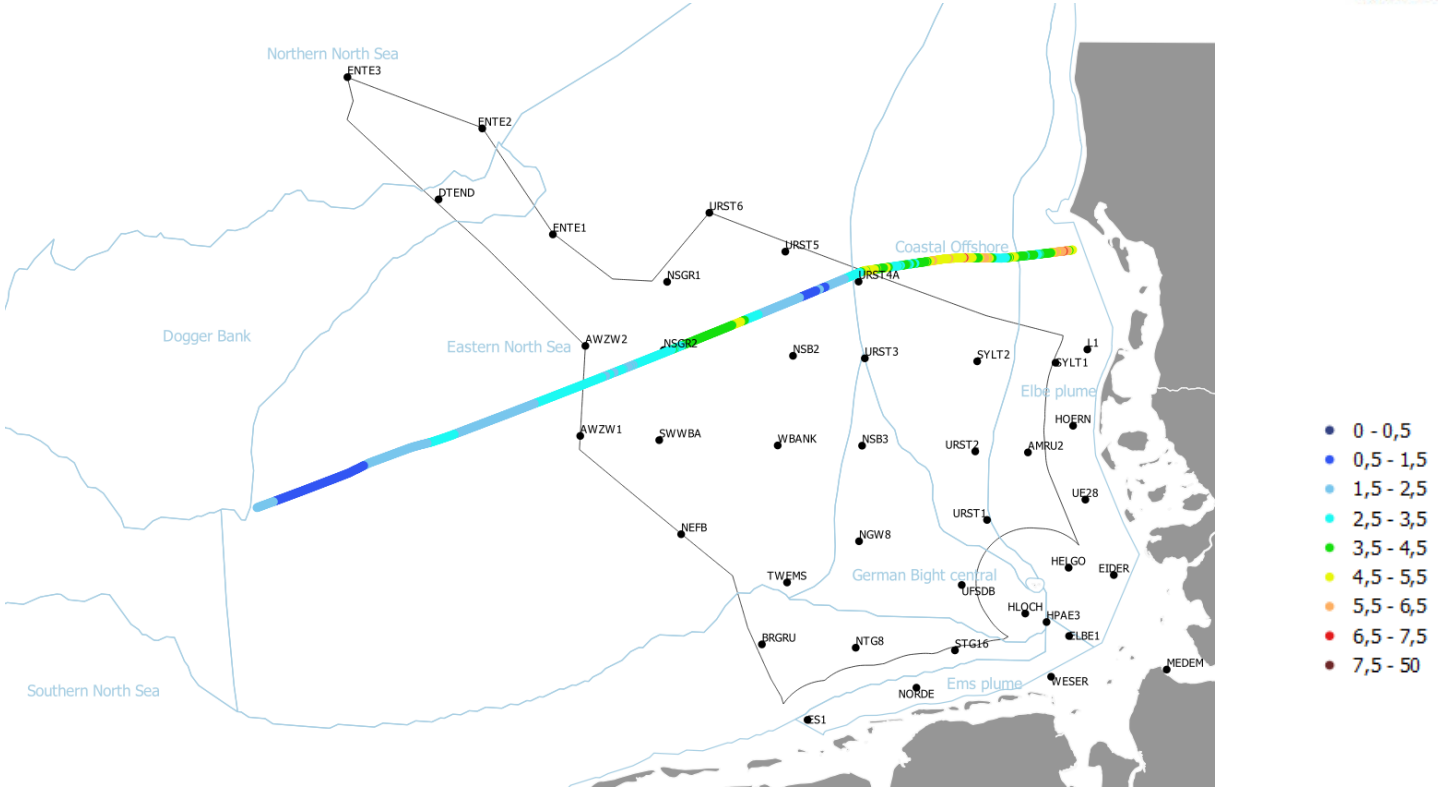
Temporal and spatial variability



8.4.2021

Temporal and spatial variability

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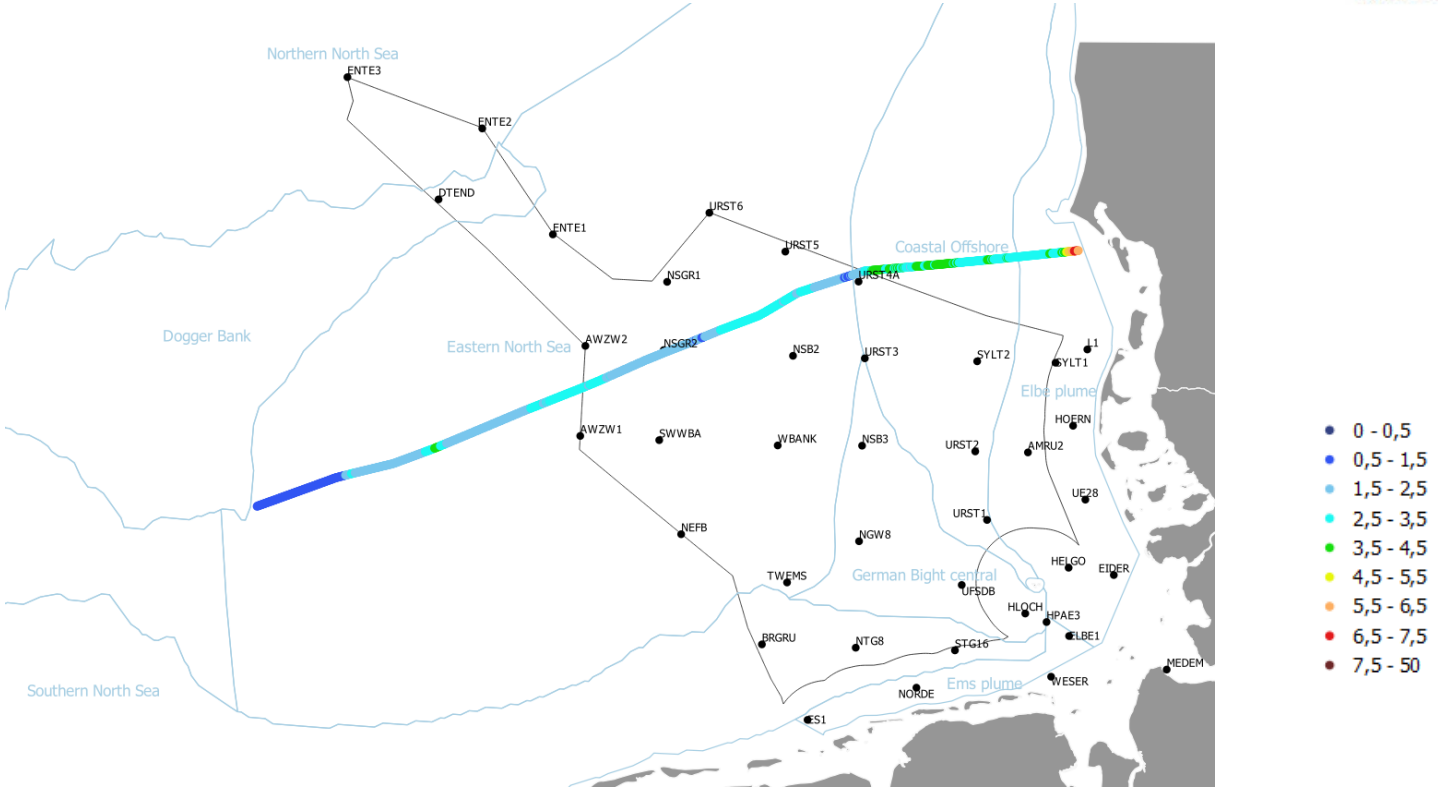
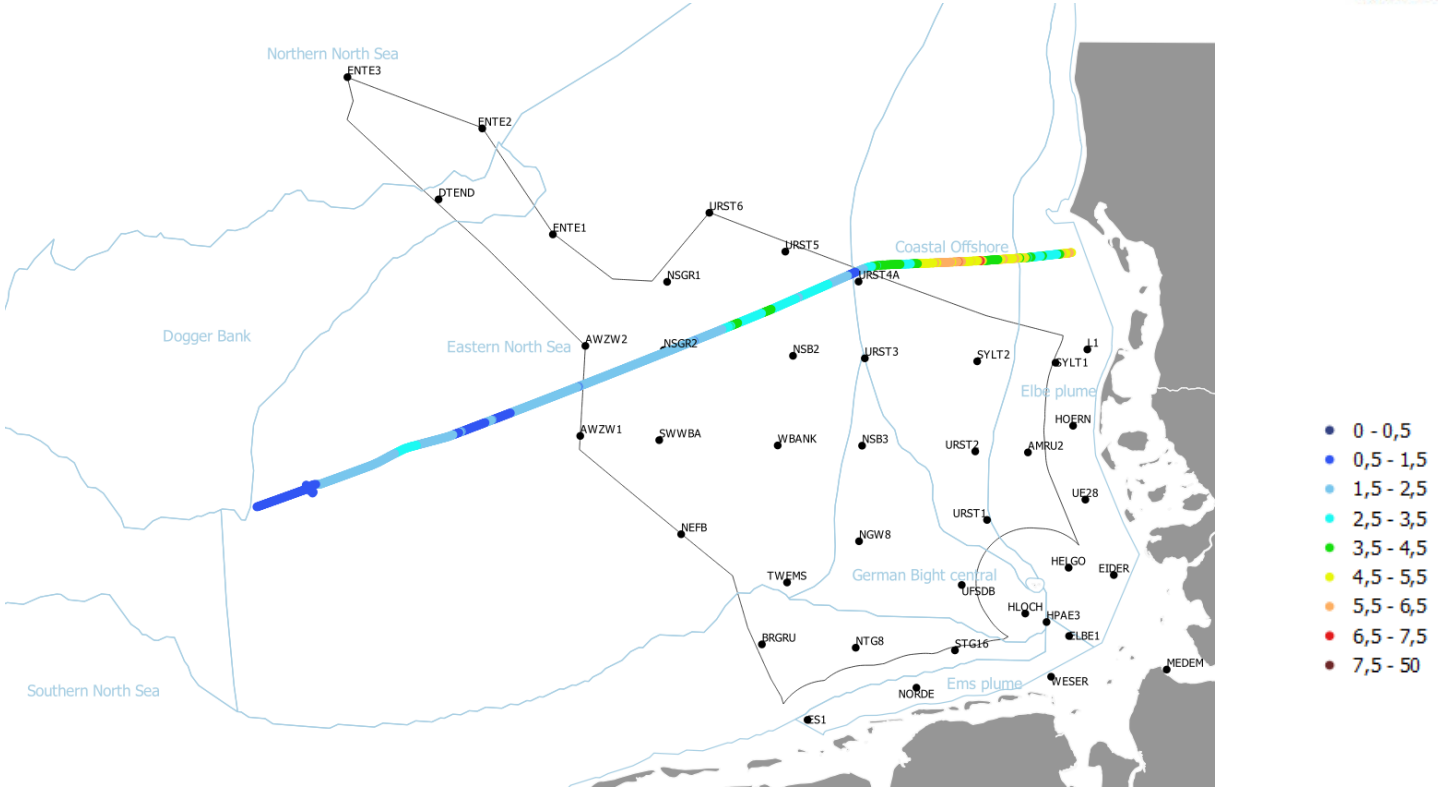


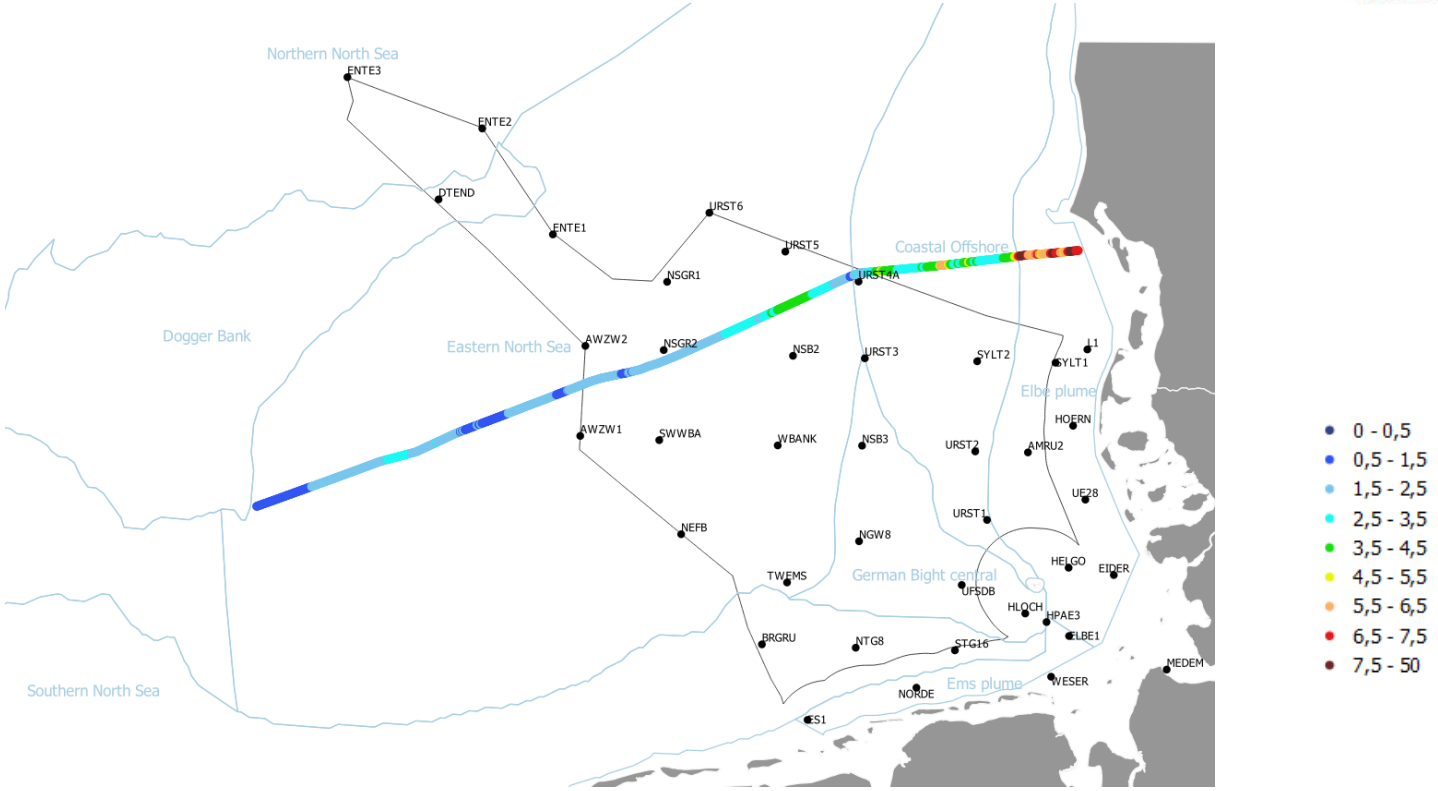
9.4.2021

Temporal and spatial variability



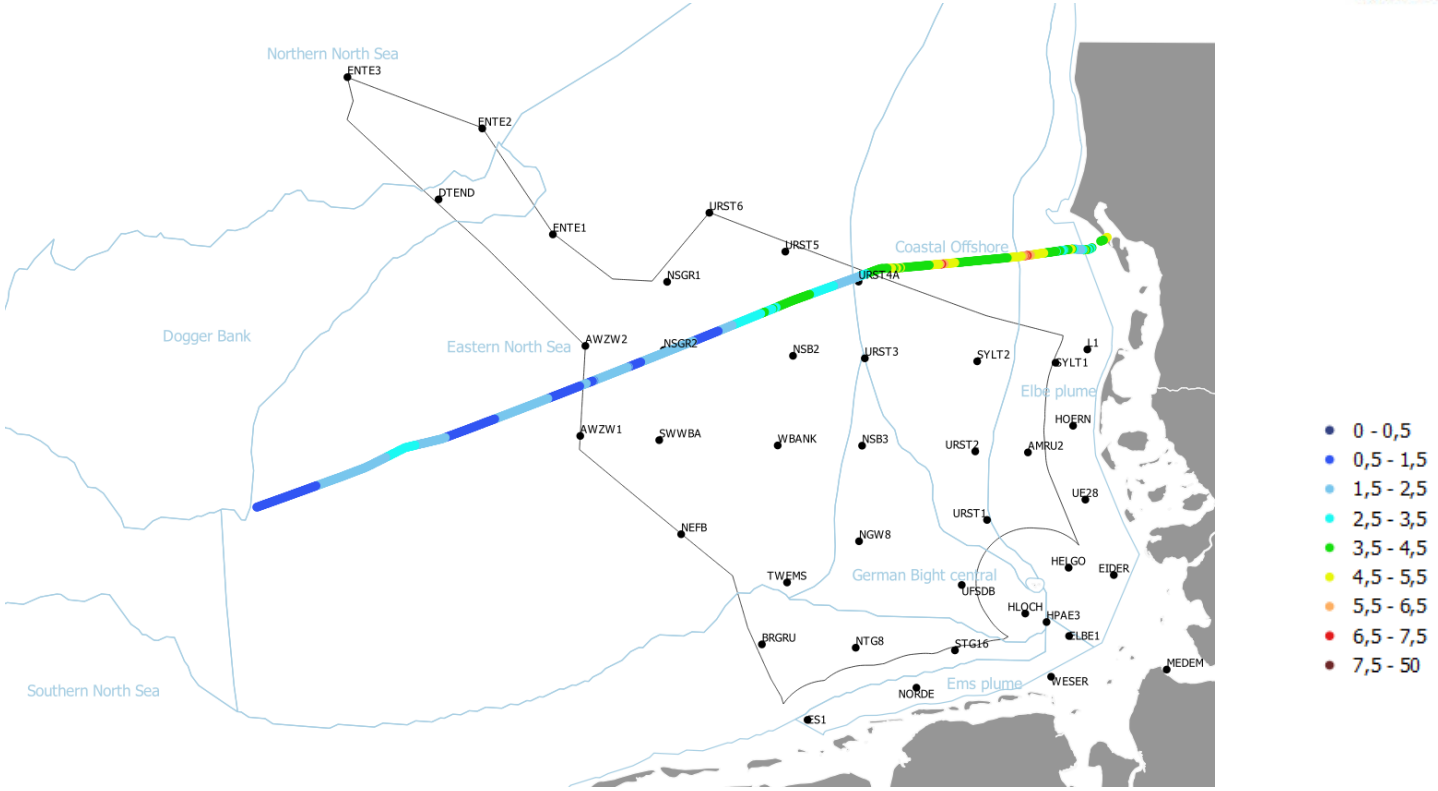
10.4.2021

Temporal and spatial variability



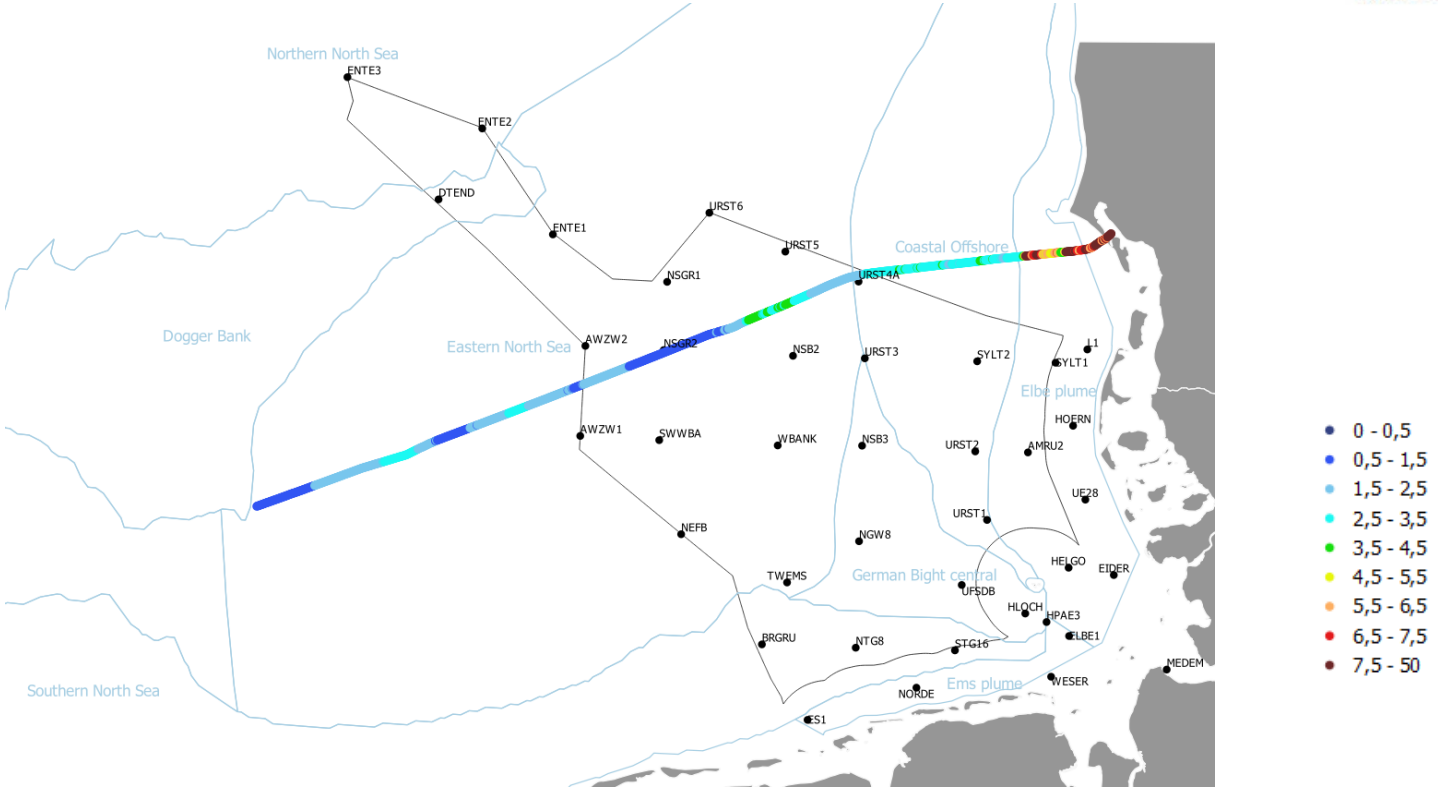
11.4.2021

Temporal and spatial variability



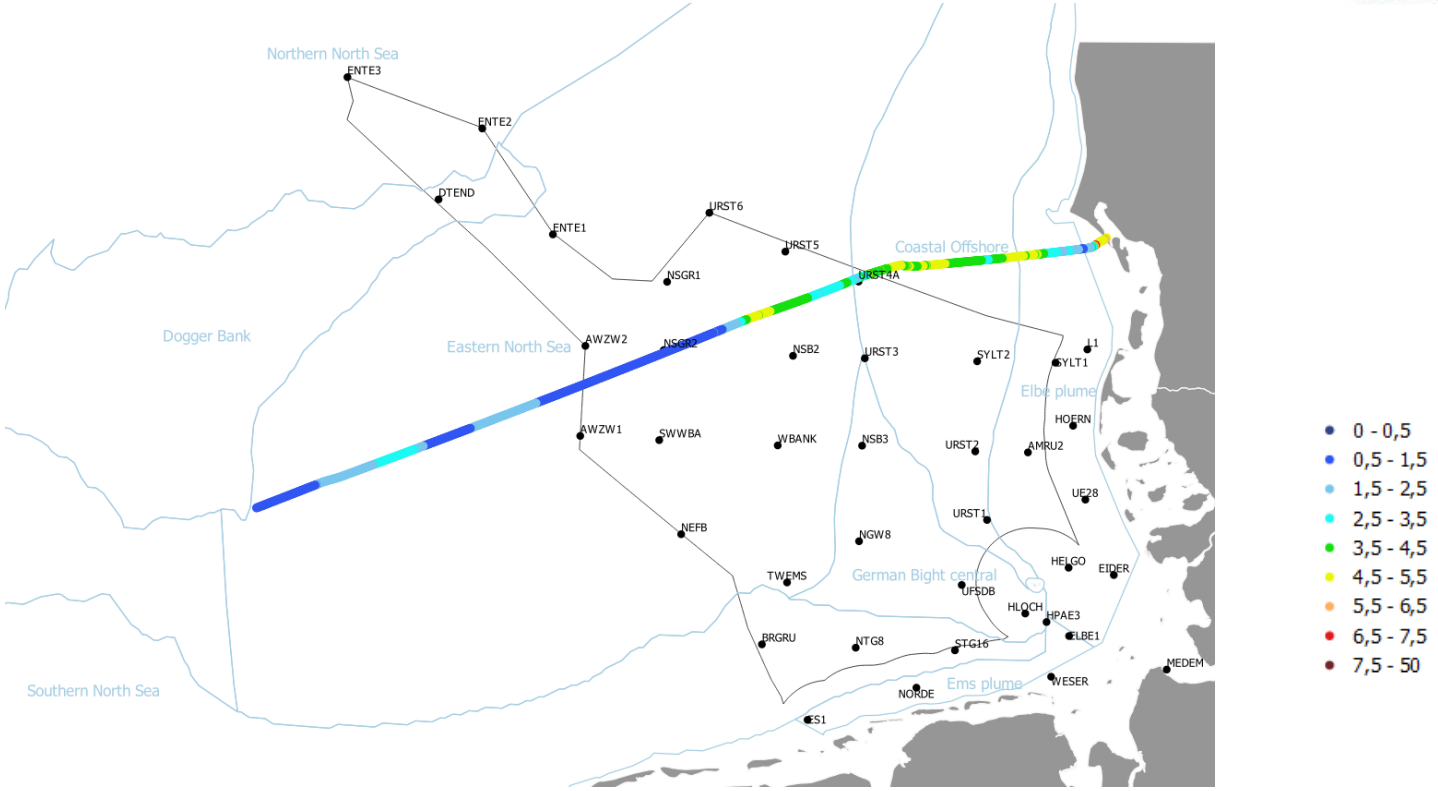
13.4.2021

Temporal and spatial variability



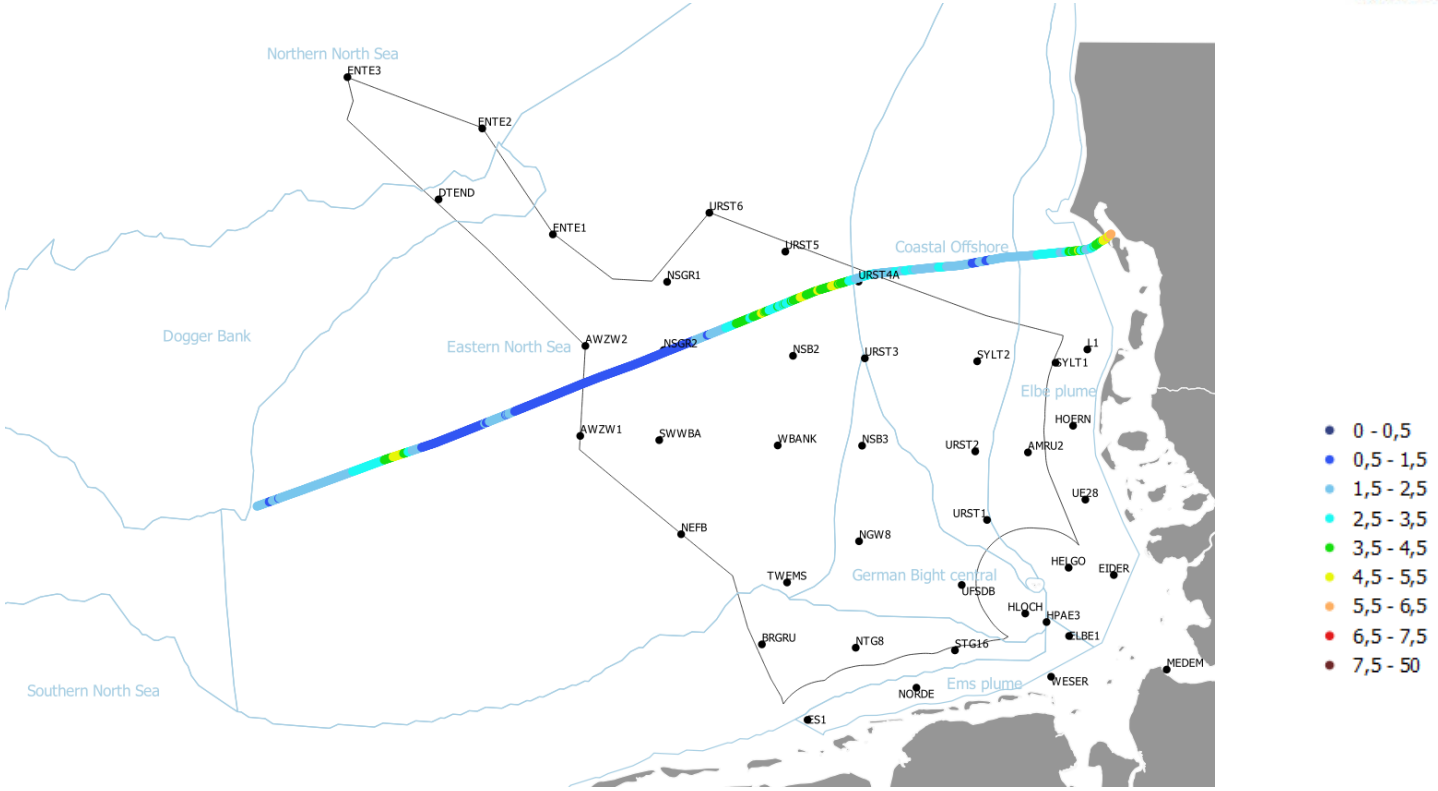
14.4.2021

Temporal and spatial variability



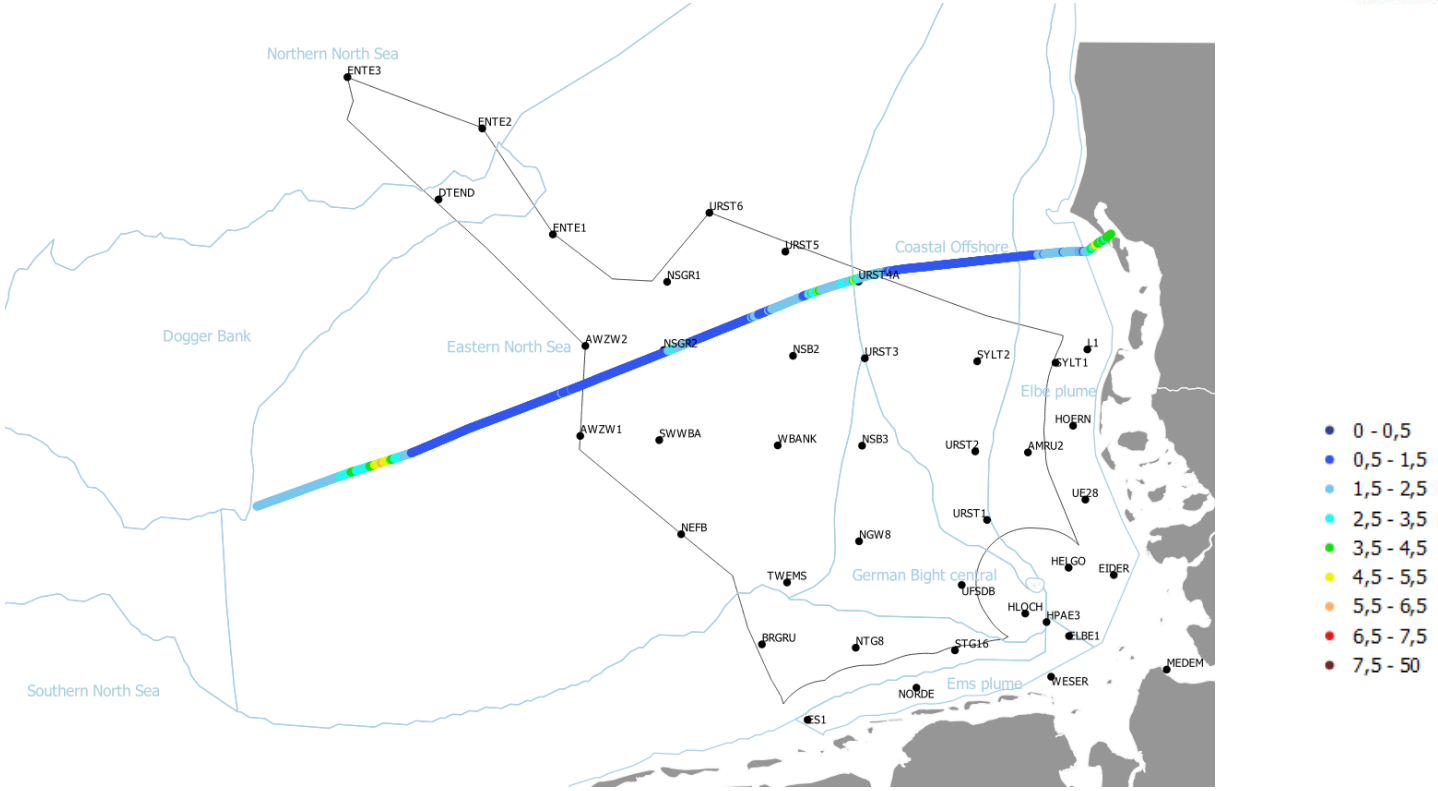
14./15.4.2021

Temporal and spatial variability



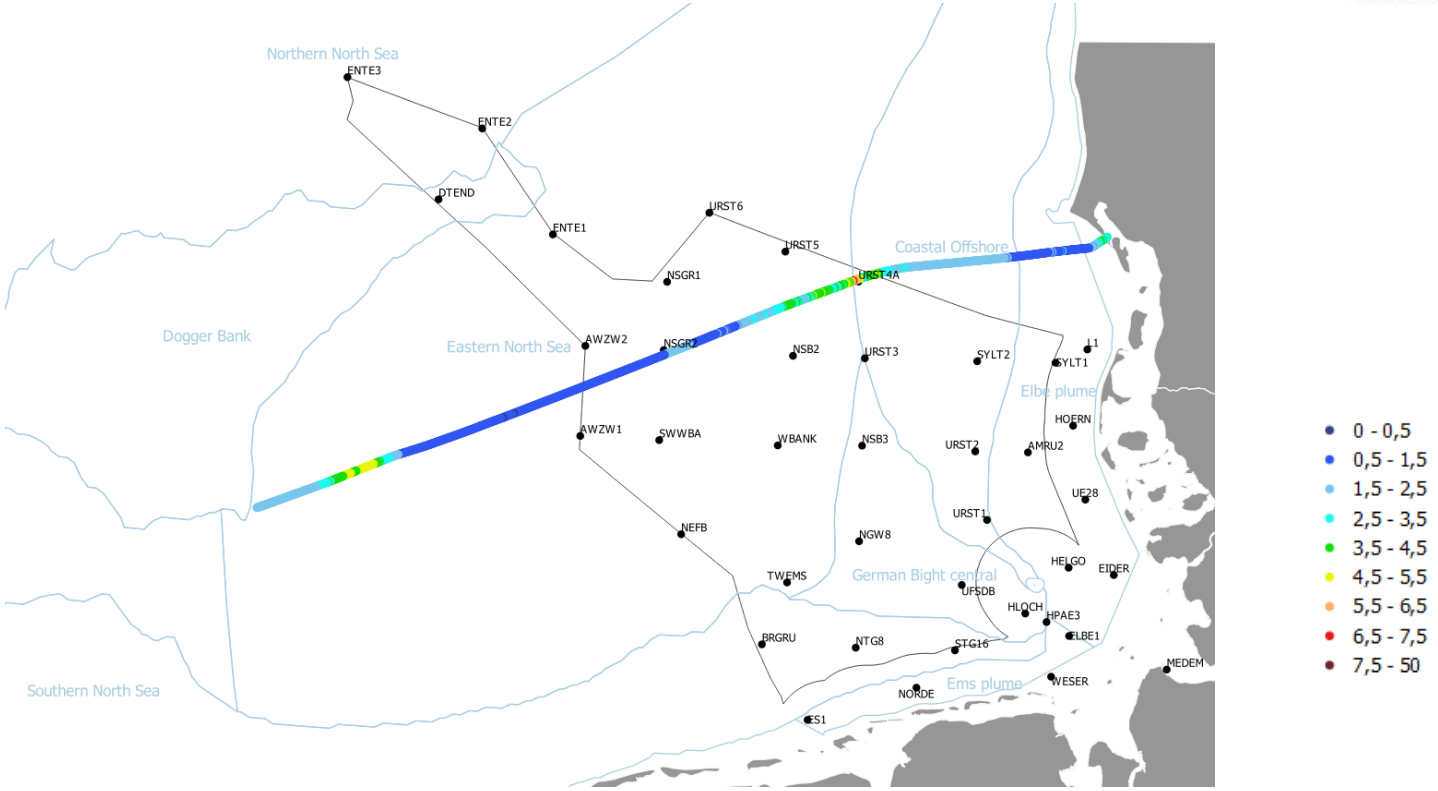
17.4.2021

Temporal and spatial variability



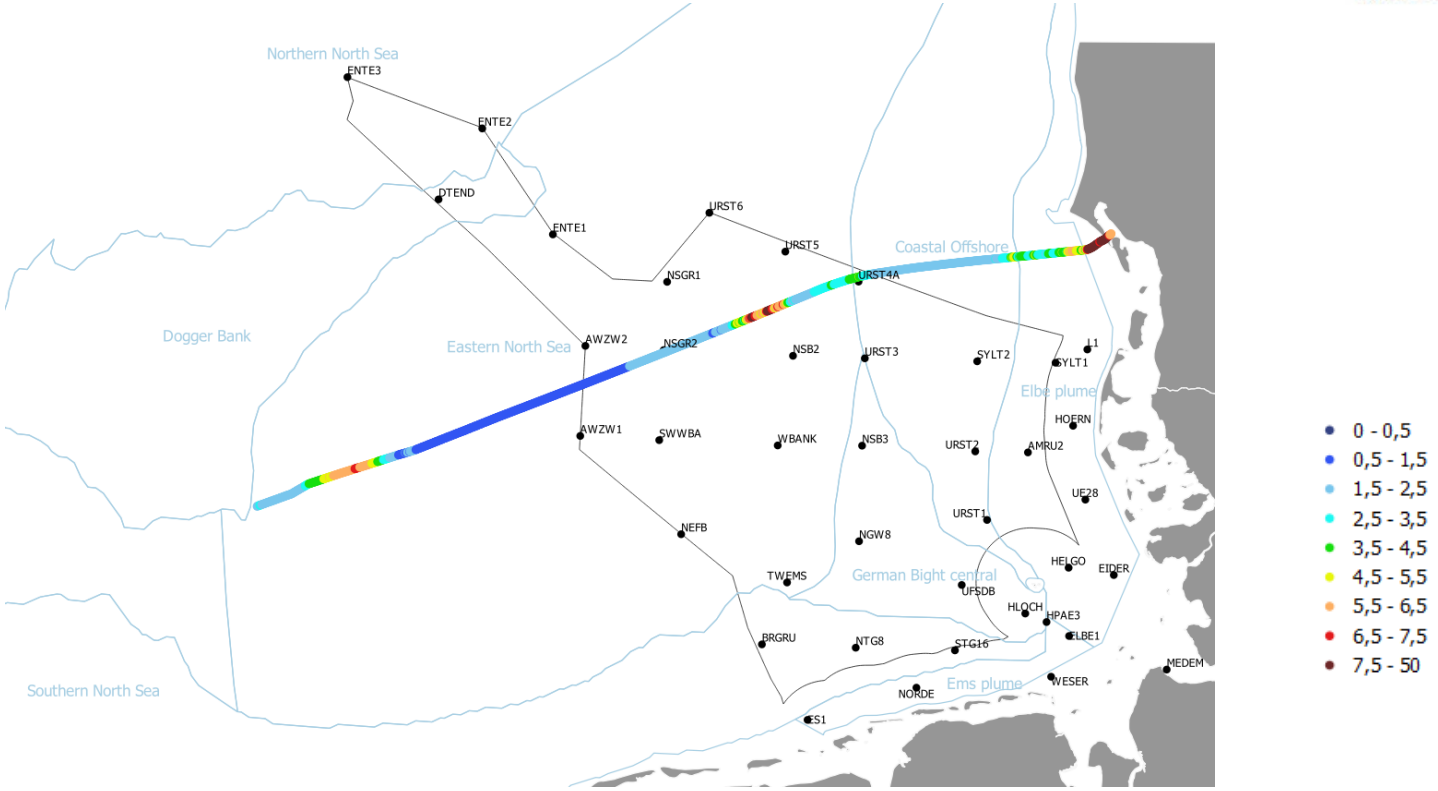
20.4.2021

Temporal and spatial variability



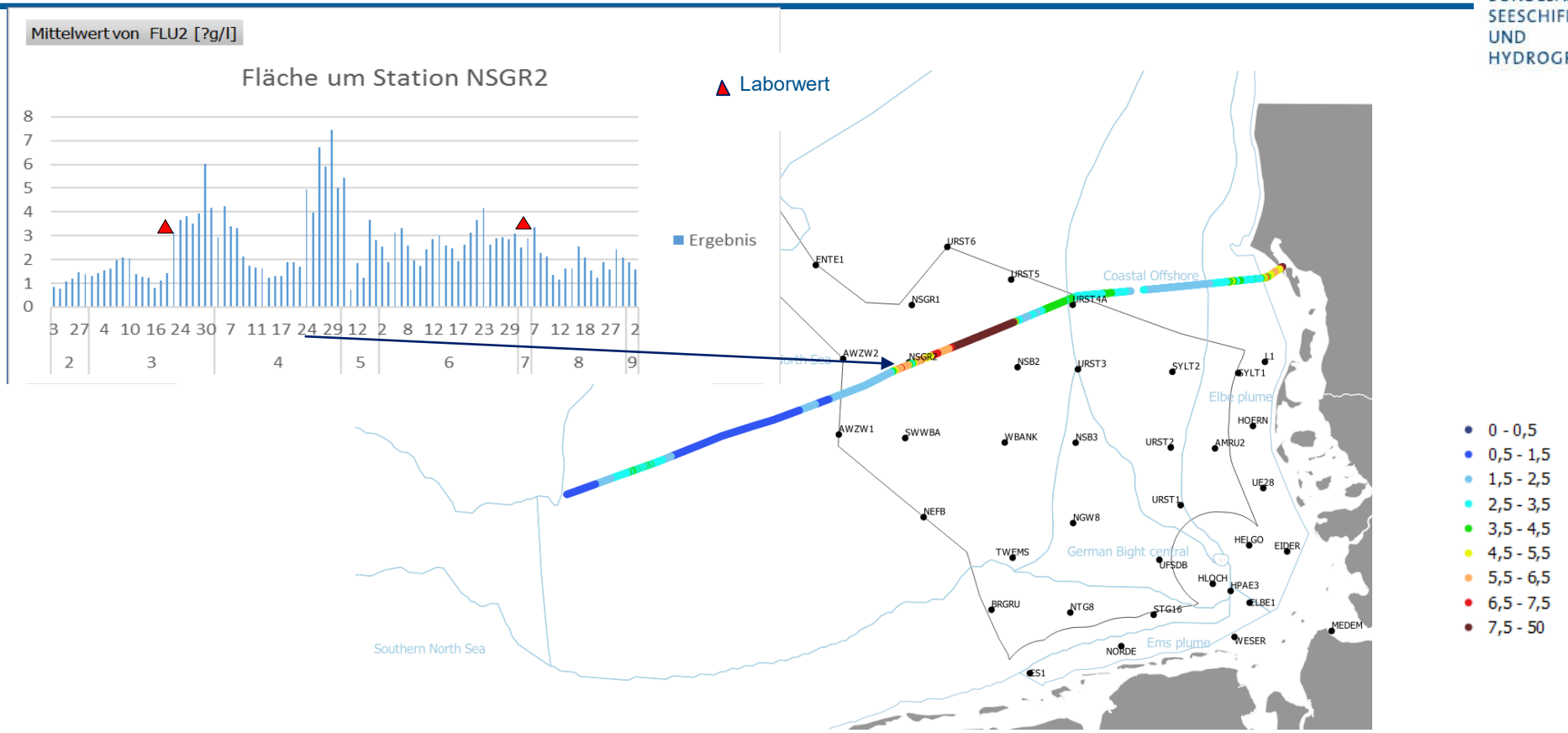
21.4.2021

Temporal and spatial variability



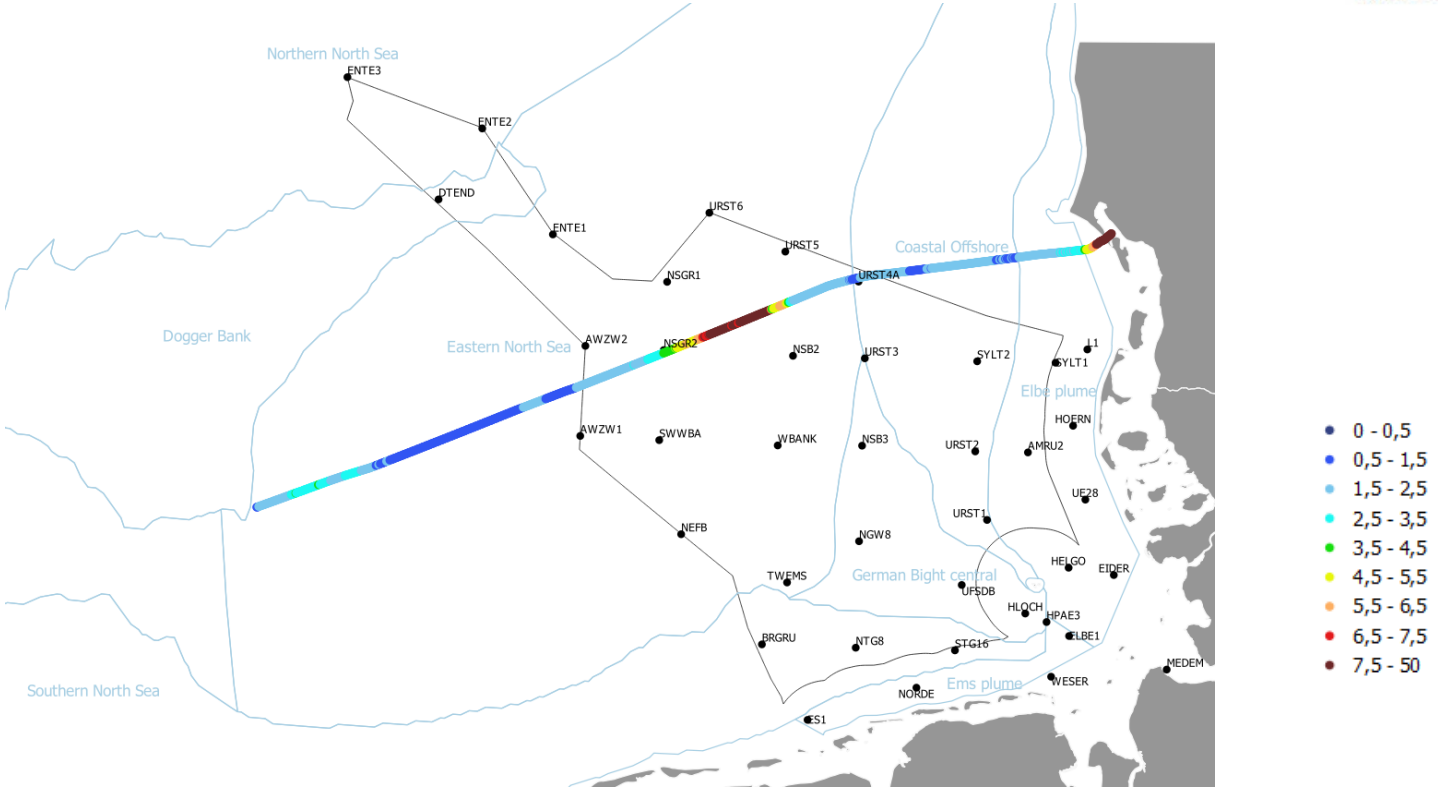
22.4.2021

Temporal and spatial variability



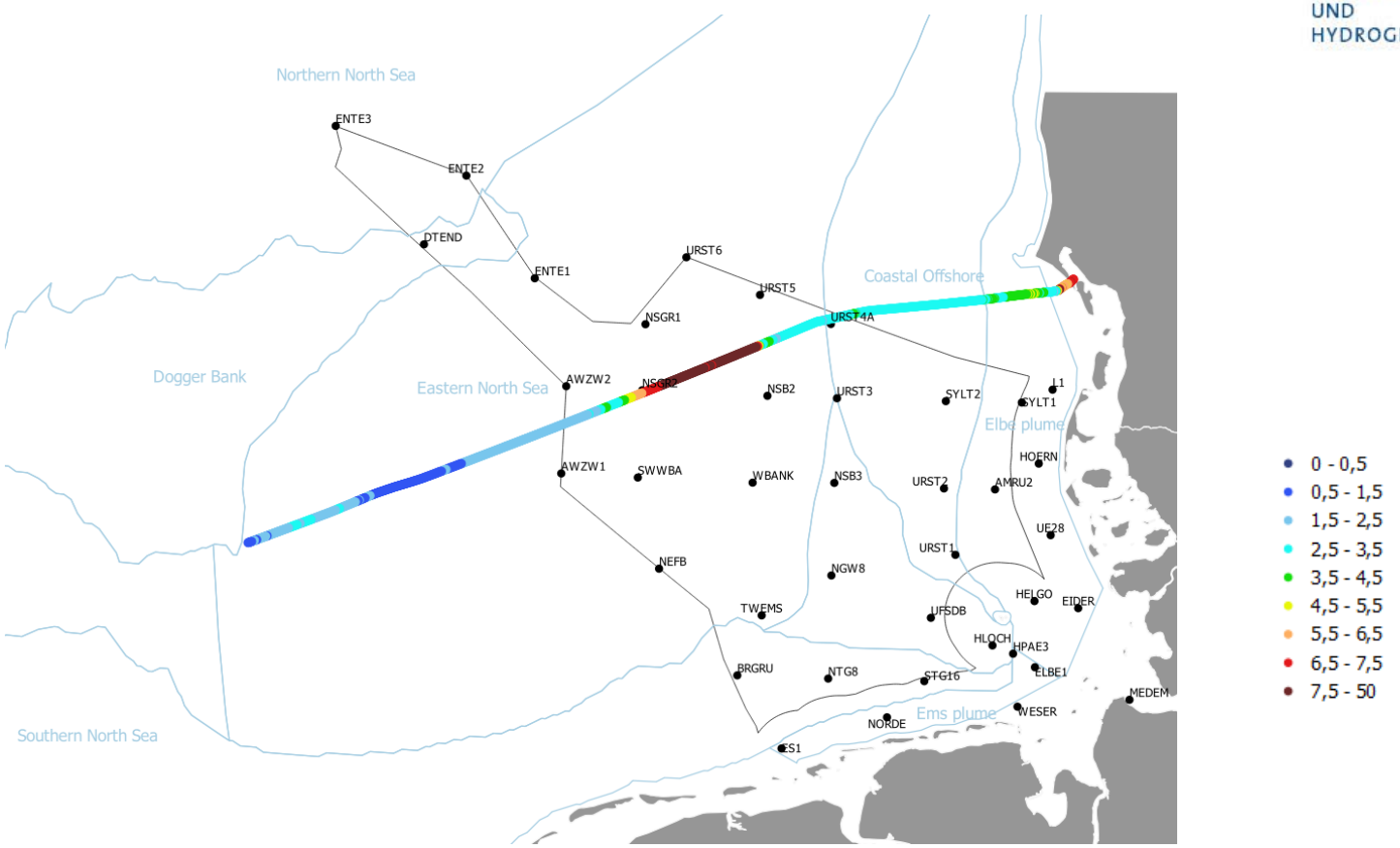
24.4.2021

Temporal and spatial variability



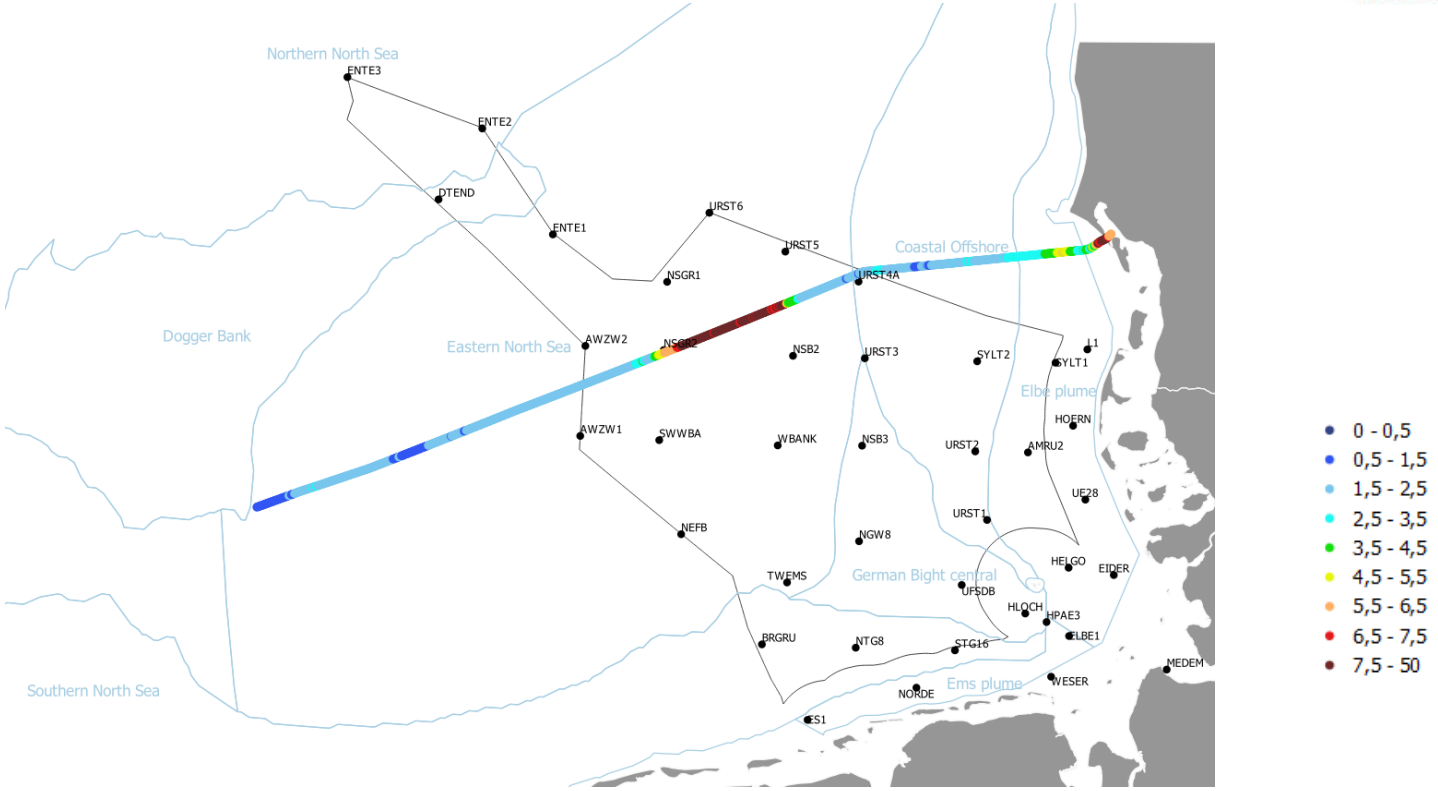
25.4.2021

Temporal and spatial variability



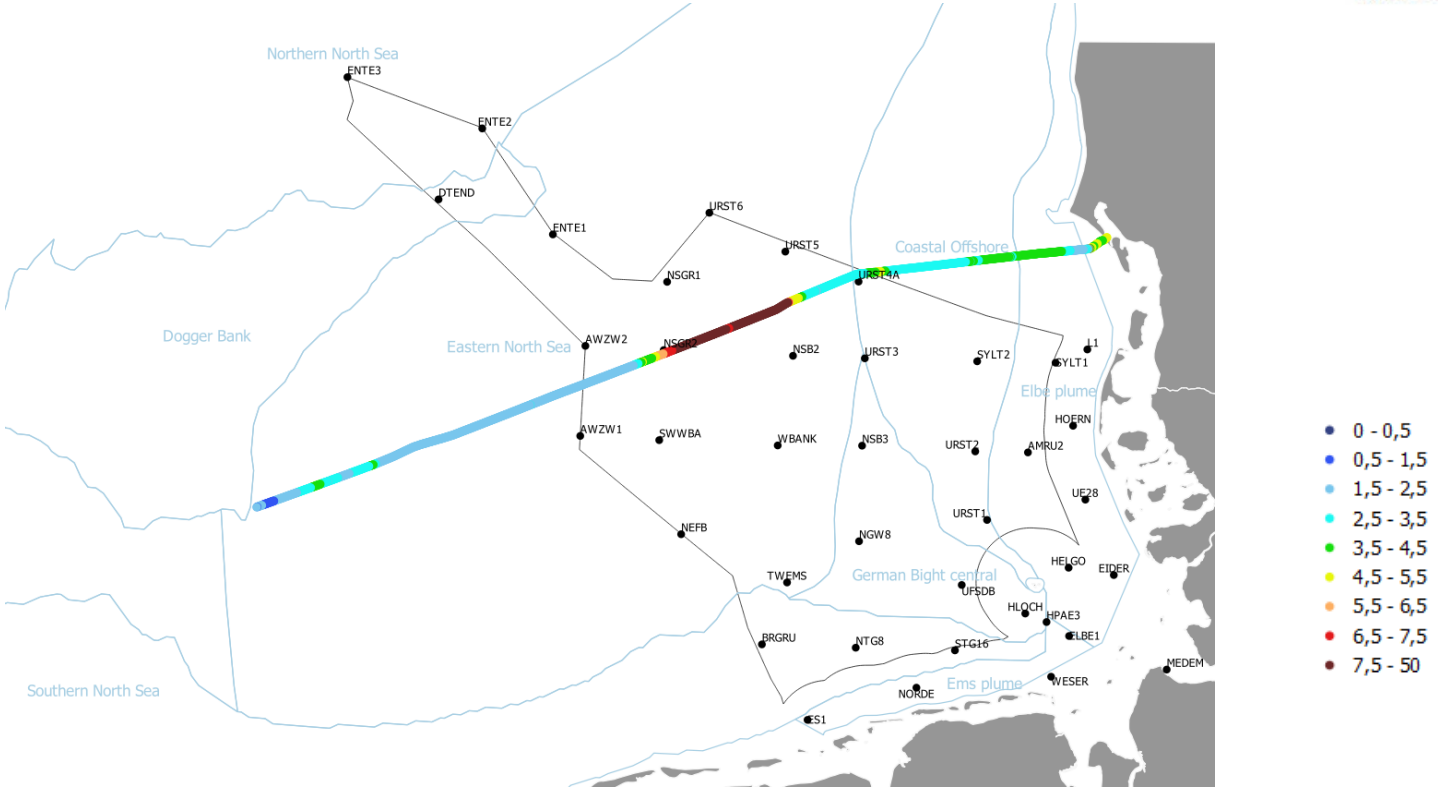
27.4.2021

Temporal and spatial variability



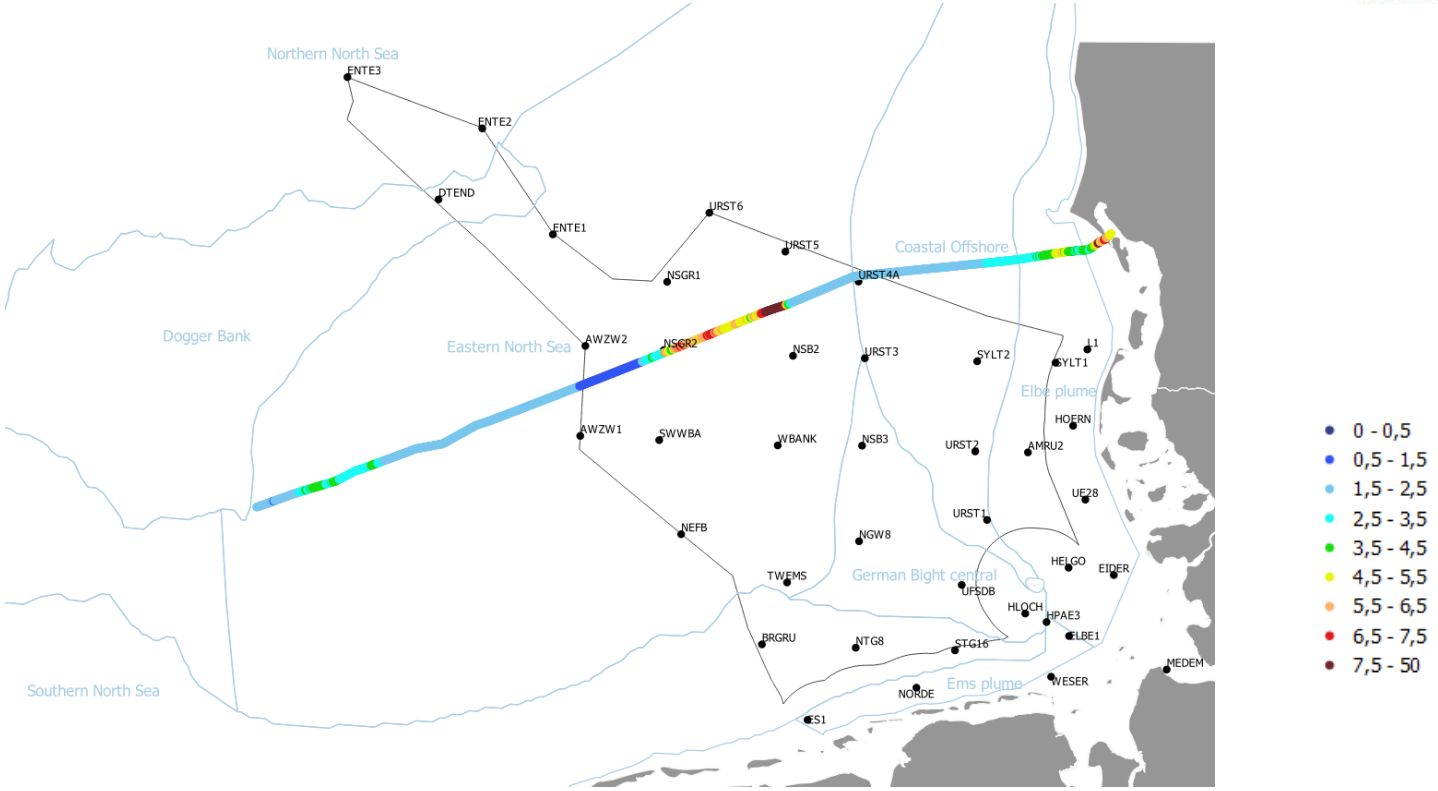
28.4.2021

Temporal and spatial variability



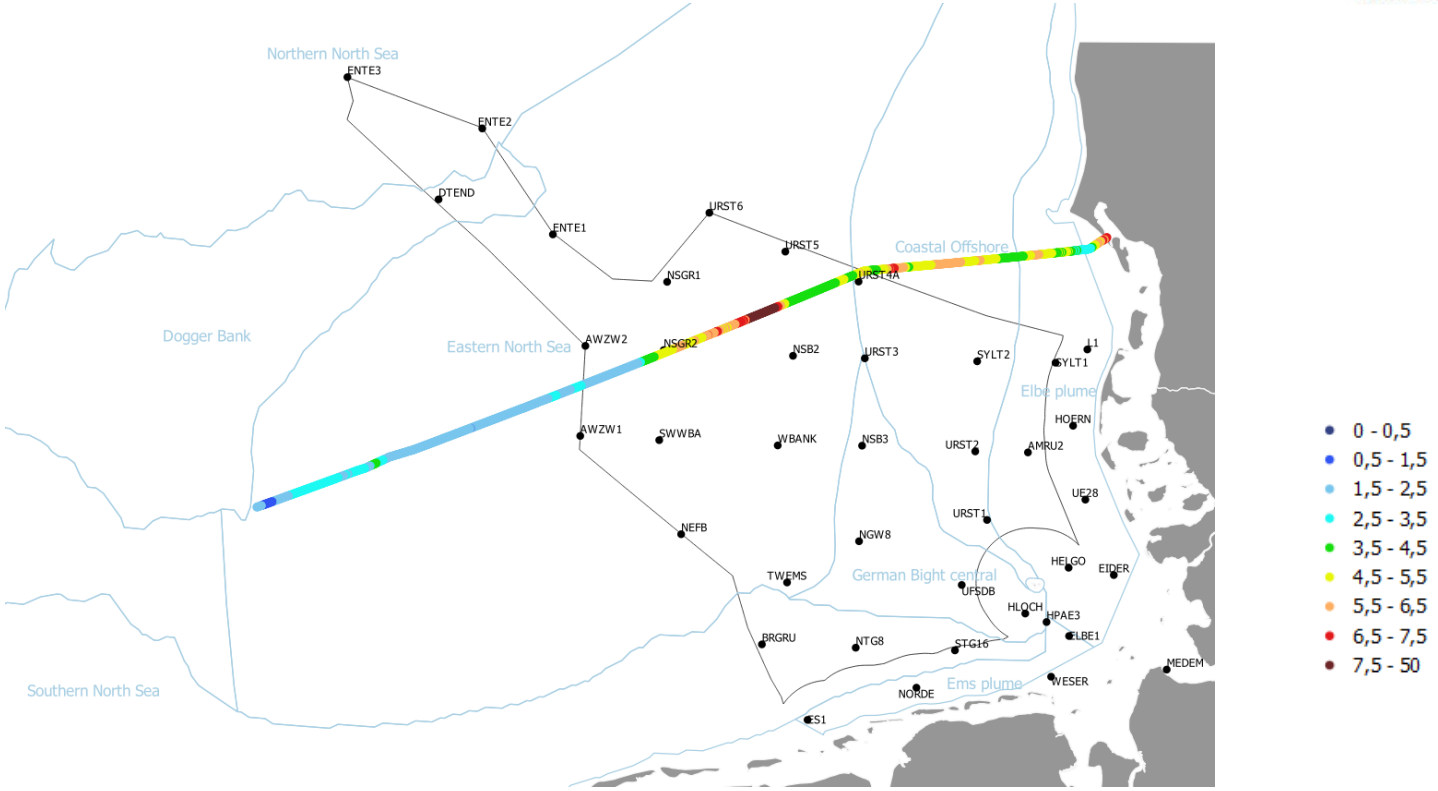
29.4.2021

Temporal and spatial variability



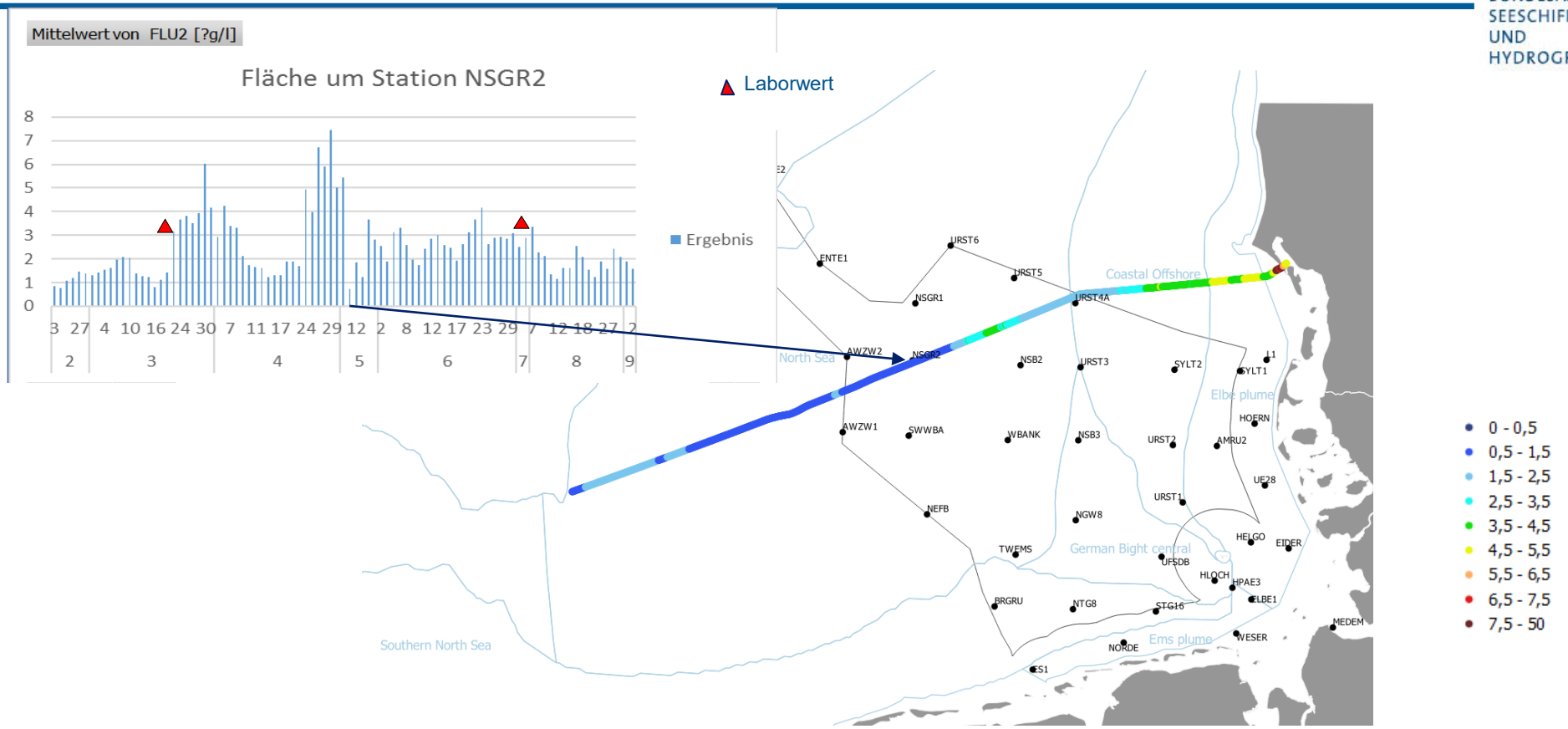
30.4.2021

Temporal and spatial variability



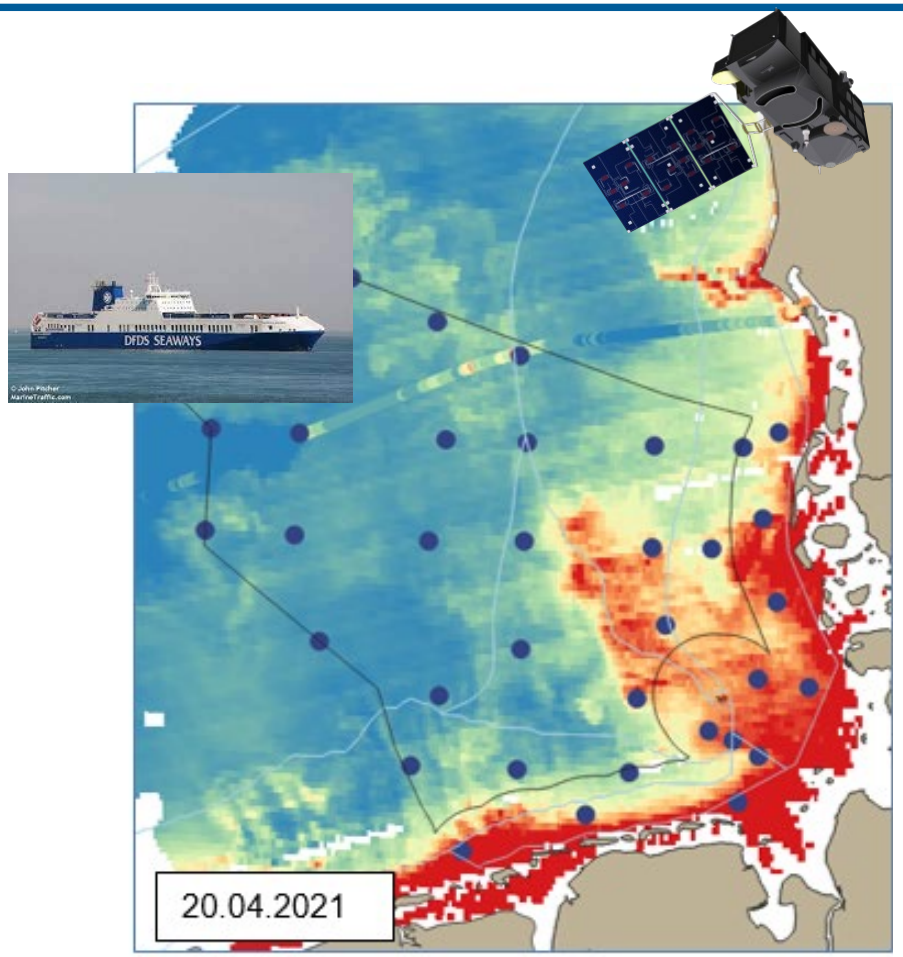
1.5.2021

Temporal and spatial variability



3.5.2021

Detection of Algae blooms – harmful ?



BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

High temporal resolution

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

Start 07:37 (UTC)

2nd August 2021 Funny Girl vs. BSH

µgChl a/L
- 0 - 0,5
- 0,5 - 1,5
- 1,5 - 2,5
- 2,5 - 3,5
- 3,5 - 4,5
- 4,5 - 5,5
- 5,5 - 6,5
- 6,5 - 7,5
- 7,5 - 70

High temporal resolution

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

2nd August 2021 Funny Girl vs. BSH

High temporal resolution

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

2nd August 2021 Funny Girl vs. BSH

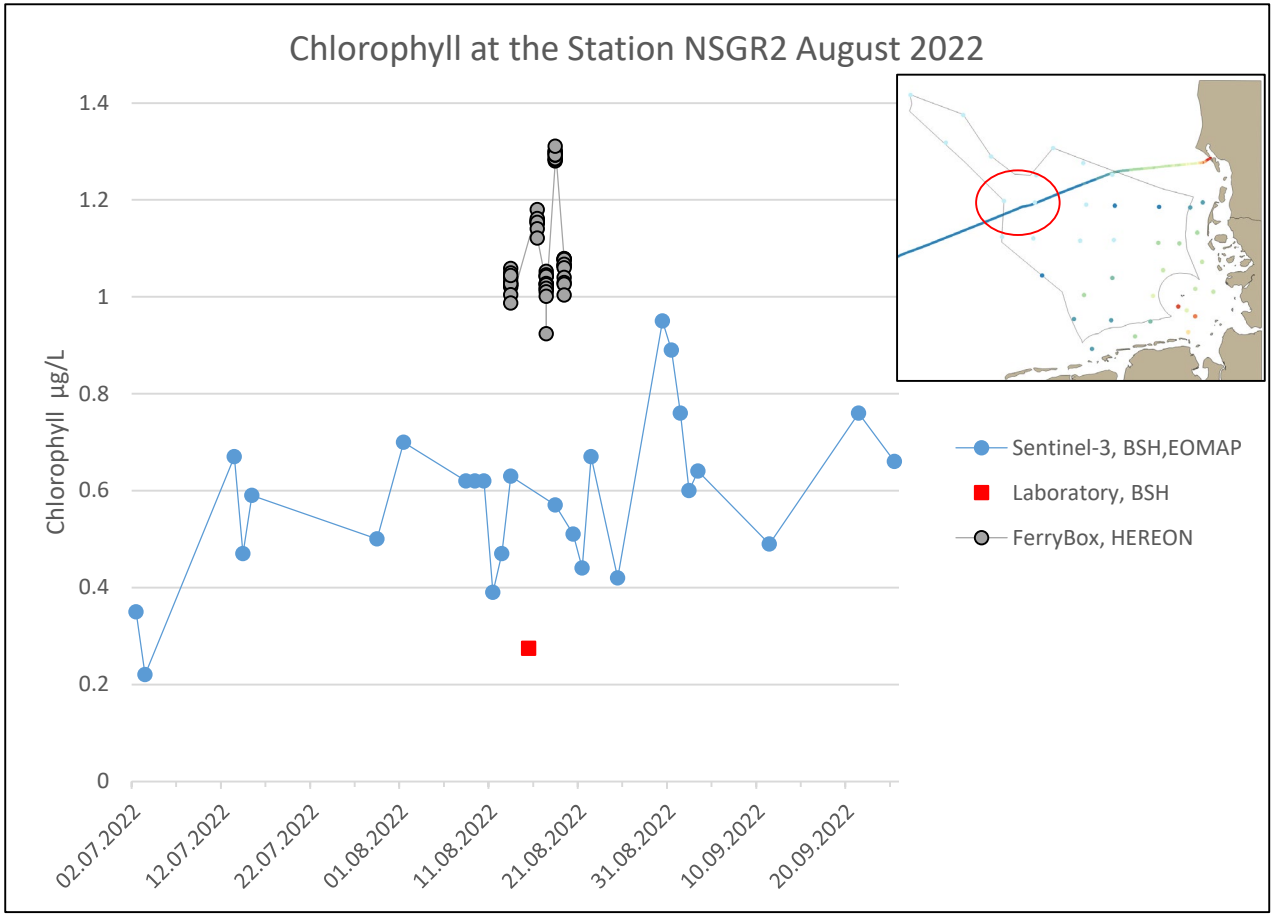
High temporal resolution

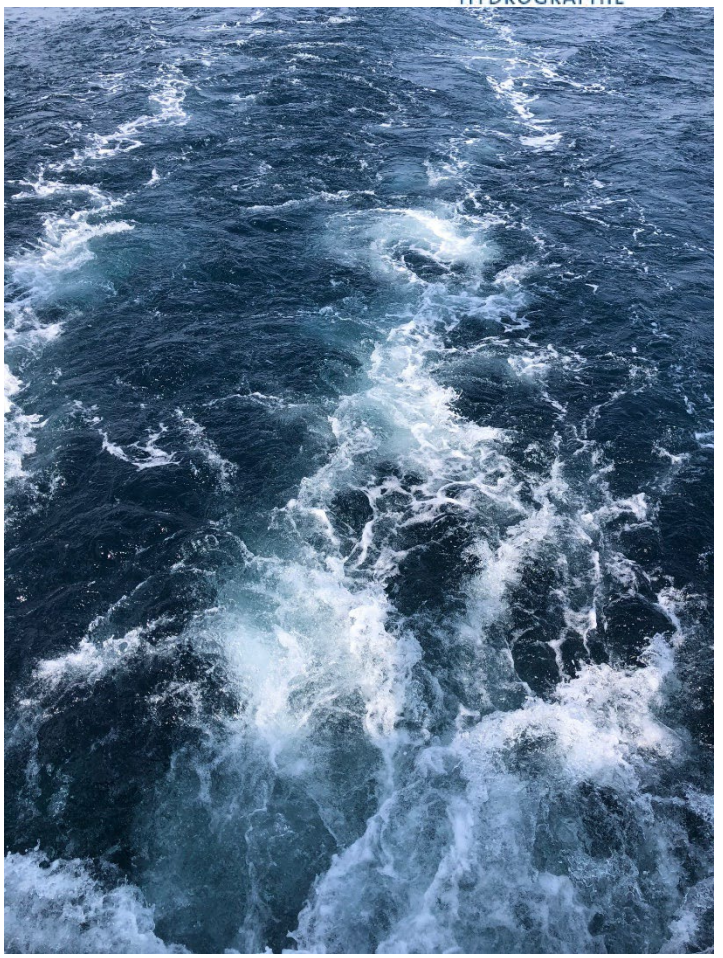
BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

2nd August 2021 Funny Girl vs. BSH

First results of our last trip August 2022

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE





Summary

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

FerryBox Chlorophyll a data

- are comparable with in-situ laboratory measurements and remote sensing, but should be calibrated from time to time.
- Useful as additional source for the assessment to enhance temporal and spatial resolution,
- and for the detection of algae blooms.

It would be helpful

- to sample directly and spontanous during the FerryBox route to have the ability for further analyses e.g. algae species analysis

The next step is

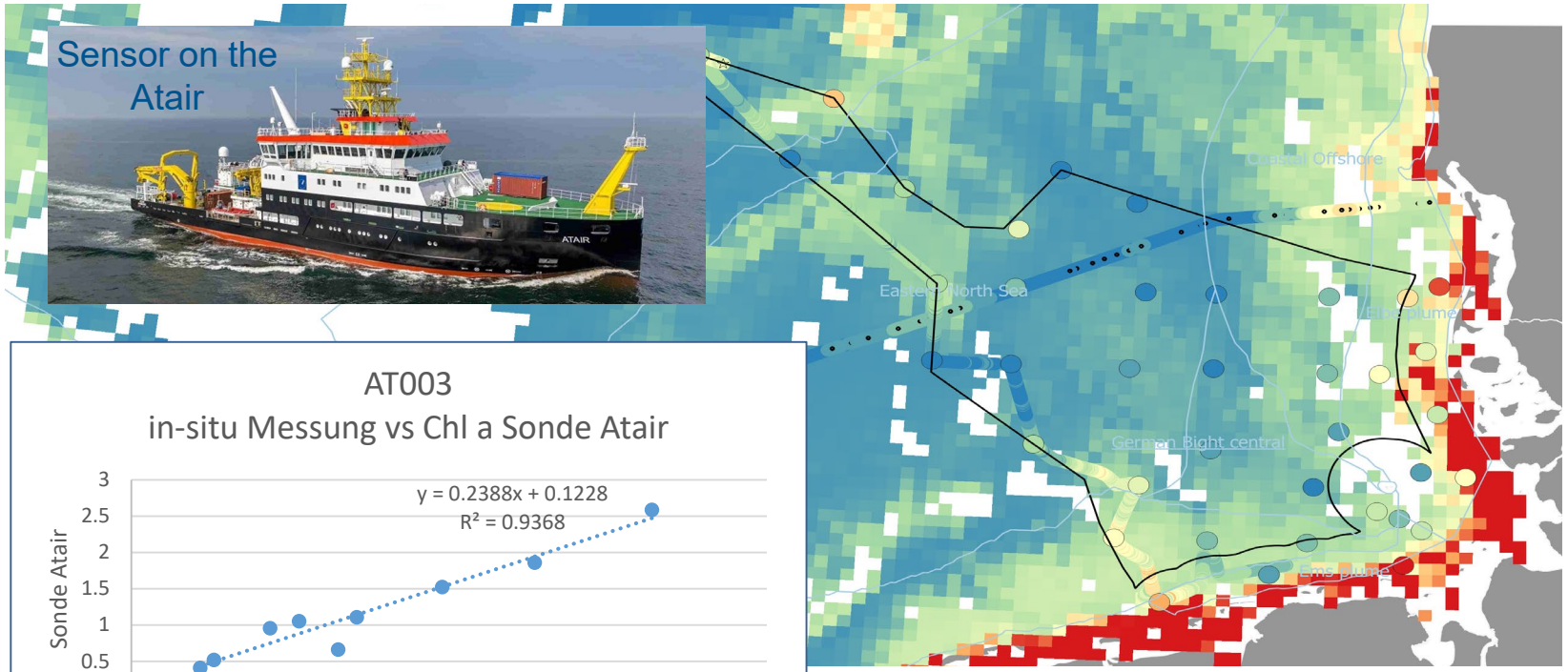
- to find a way to integrate all data from different souces to one comprehensive assessment.

Thank you!

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE

Connection of Chlorophyll a data from different sources March 2021

BUNDESAMT FÜR SEESCHIFFFAHRT UND HYDROGRAPHIE



Remote sensing
BSH

\+
in-situ Mearurement
\+
Ferry-Box
Magnolia Seaways
\+
Sonsor Atair