



[Ocean Acidification Data Stewardship \(OADS\) Project](#)

FerryBox pCO₂ measurements in the North Sea

INVESTIGATOR(S):

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ABSTRACT: A flow-through membrane pCO₂ sensor is integrated with the FerryBox installed on the Lysbris Seaways commercial vessel. The vessel sailed in the North Sea with the main serviced ports being Hamburg/Germany, Cuxhaven/Germany, Skogn/Norway, Sheerness/UK, Belfast/UK, Glasgow/UK, Amsterdam/Netherlands. The most recent calibration of this sensor happened in Septmeber 2021, and the calibration was made for a pCO₂ range between 0 and 2300 µatm. Therefore, for this submission, we decided to leave in many of the high values recorded near coastal areas or in the Elbe Estuary, as well as many of the low values in the Norwegian fjords. We believe these measurements are real - they are consistent between multiple journeys, and we only selected arriving journeys so that the initialisation of the measurement system does not influence the results. These are valuable data in seldomly measured regions. The mean difference between the intake temperature sensor and the FerryBox temperature sensor was 0.32 °C.

CITE AS:

IDENTIFICATION INFORMATION FOR THIS DATA PACKAGE:

NCEI ACCESSION:
NCEI DOI:
EXPCODE: 58LY20221108;
CRUISE ID:
SECTION/LEG:

TYPES OF STUDY:

Surface Underway;
 underway;

TEMPORAL COVERAGE:

START DATE: 2022-11-08 END DATE: 2022-12-27

SPATIAL COVERAGE:

NORTH BOUNDARY: 63.7292
 WEST BOUNDARY: 0.7408 EAST BOUNDARY: 11.1437
 SOUTH BOUNDARY: 51.4141

GEOGRAPHIC NAMES:

PLATFORMS:

Lysbris Seaways (ID (ICES): 58LY);

RESEARCH PROJECT(S):

VARIABLES / PARAMETERS:

N/A

Name: N/A
Dataset Variable Name: N/A
Units: null
Observation type: Surface Underway
Sampling instrument: water collection with pump
Analyzing instrument: 4H-Jena HydroC CO₂-FT membrane-based sensor; CO₂ analysed with an NDIR
Equilibrator type: No equilibrator - membrane based sensor
Equilibrator volume: N/A
Water flow rate: N/A, but flow rate past the membrane is usually 4 L/min
Uncertainty: 1% manufacturer provided uncertainty. During calibration, 2.6 ppm regression error was achieved compared to the standard gases. Expected in field uncertainty <10µatm. Suggested flag: E
Quality flag convention: yes

pCO2_at_SST_calculated

Name: pCO2_at_SST_calculated
Dataset Variable Name: pCO2_at_SST_calculated
Units: µatm

fCO2_at_SST_calculated

Name: fCO2_at_SST_calculated
Dataset Variable Name: fCO2_at_SST_calculated
Units: µatm

Depth

Dataset Variable Name: N/A - all samples are surface samples (0)
Units: m

Temperature

Dataset Variable Name: Tequ
Units: Celsius
Observation type: underway
Sampling instrument: water collection with pump
Analyzing instrument: FSI
Uncertainty: ±0.005°C manufacturer uncertainty
Quality flag convention: No

Salinity

Dataset Variable Name: Salinity
Units: PSU
Observation type: underway
Sampling instrument: water collection with pump
Analyzing instrument: Teledyne

In-situ sea-surface temperature

Dataset Variable Name: T_Intake
Units: Celsius
Observation type: underway
Sampling instrument: water collection with pump
Analyzing instrument: E-H TSM187
Uncertainty: Class A according to IEC 60751 - equates to ±0.15 °C manufacturer uncertainty

DATA PACKAGES RELATED TO THIS ONE:**PUBLICATIONS DESCRIBING THIS DATA SET:**

Reference for method: <https://doi.org/10.1175/JTECH-D-13-00083.1>

ADDITIONAL INFORMATION:**FUNDING Information:**

- *PROJECT TITLE:*
PROJECT ID:

SUBMITTED BY: Vlad A. Macovei (vlad.macovei@hereon.de)

SUBMISSION DATE:

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PREVIOUS VERSIONS: