The Kongsfjord Cabled Underwater Observatory
- KOL 07abc... -

3 rd SIOS Workshop on
Marine Infrastructure in Svalbard

P. Fischer and many other colleagues
Alfred-Wegener-Institute, Helmholtz-Center for Polar- and Marine Research, Germany

Photo: Gregory Tran

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A year-round operated shallow water observatory in front of the Old Pier in Ny Ålesund.

- FerryBox system pumping seawater from 12m water depth to a sensor system at land.
- Cabled underwater sensor carrier system profiling between the ground (12m) and the surface.

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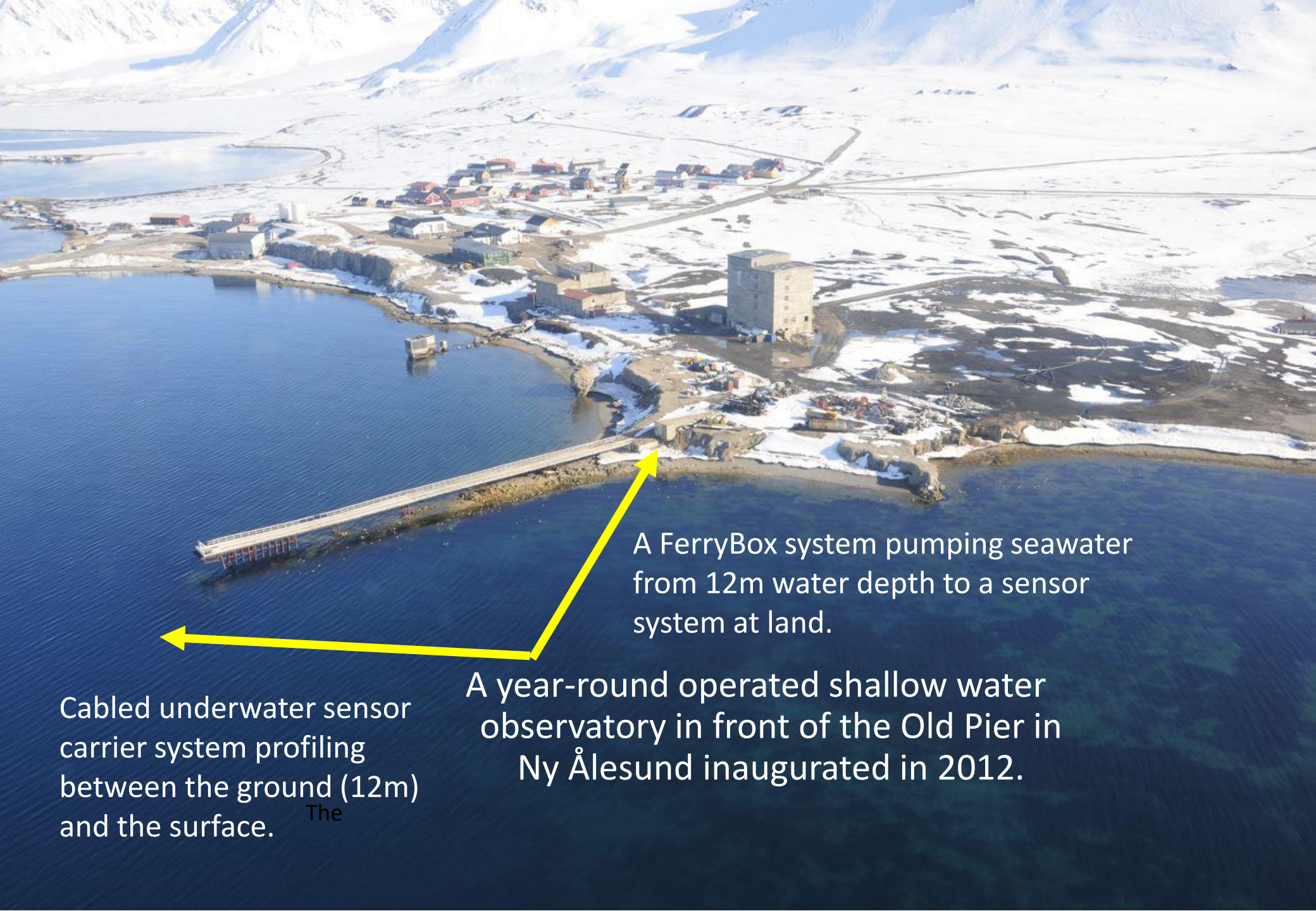
A FerryBox system pumping seawater from 12m water depth to a sensor system at land.
A year-round operated shallow water observatory in front of the Old Pier in Ny Ålesund inaugurated in 2012.
Cabled underwater sensor carrier system profiling between the ground (12m) and the surface.
The

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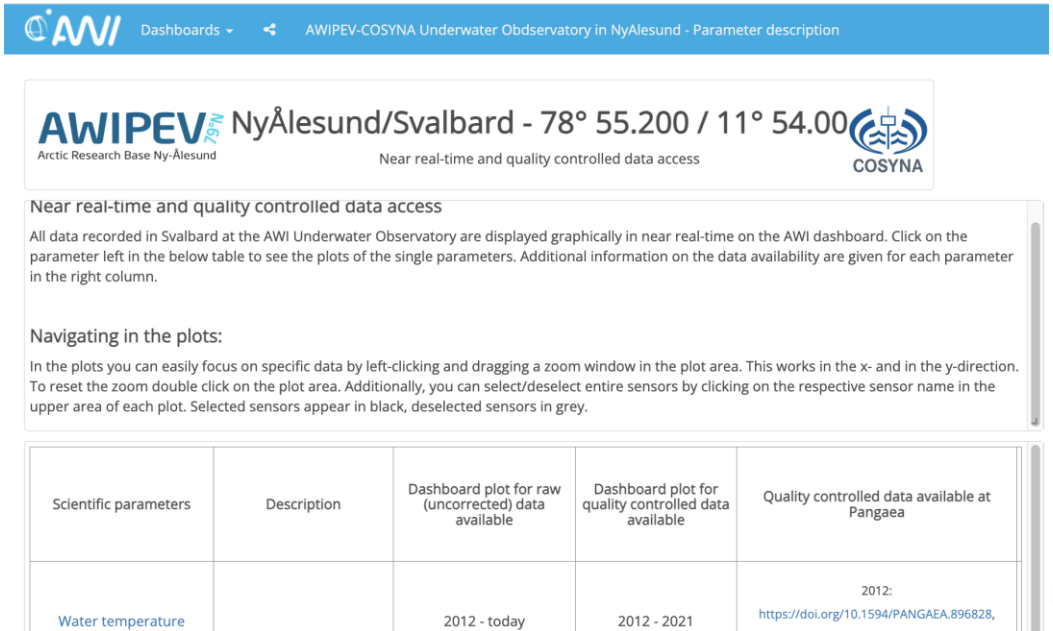
Daily routine measurements (incl. vertical profiles)

Continuous measurements of the main EOV (Essential Ocean Variables):

- Temperature
- Salinity
- Oxygen
- Turbidity
- Chl-A
- pH
- Tide cycle
- Current
- Underwater acoustic

Most data are available in realtime (delay 1h – raw) and qc (delayed) at https://www.awi.de/en/science/special-groups/scientific-diving.html -> Infrastructure -> Cosyna Underweater - > Svalbard



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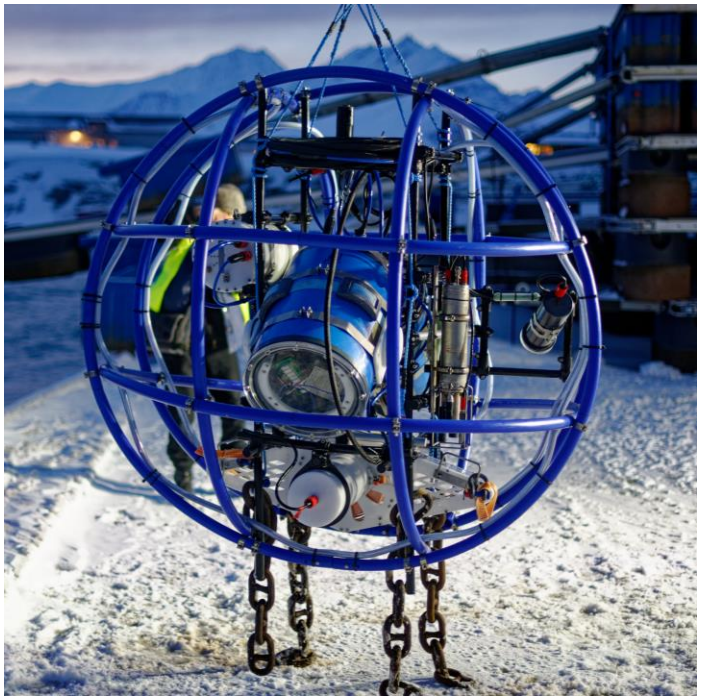
Infrastructure Updates

New Sensor Lift (Vertical Profiler):

In 2022, a modified sensor lift was installed.

- Better more stable profiling system.
- Underwater Gbit link for highspeed camera (Video-) system.
- Higher payload.
- Better iceberg collision protection.



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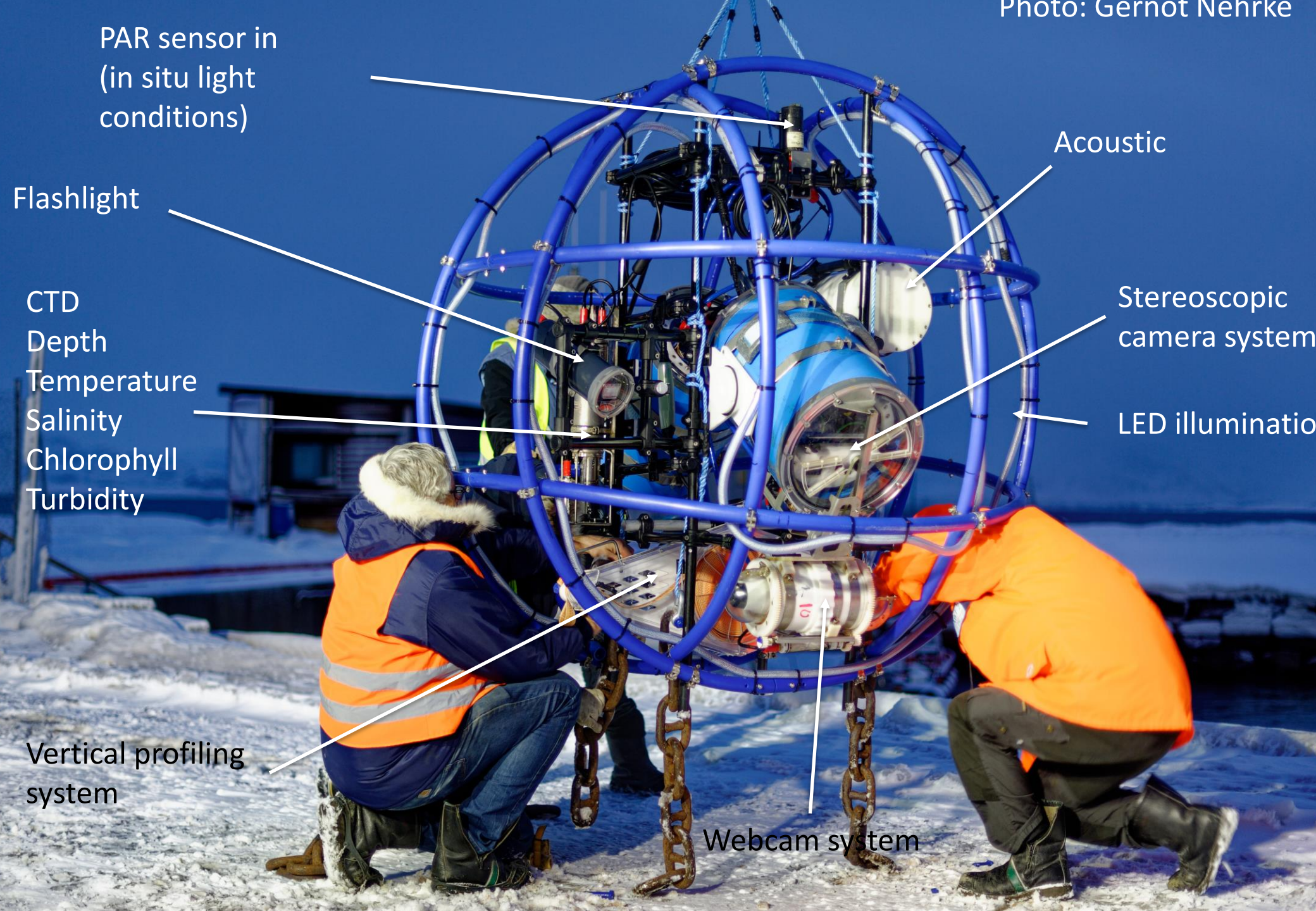
Photo: Gernot Nehrke
PAR sensor in (in situ light conditions)
Acoustic
Flashlight
CTD
Depth
Temperature
Salinity
Chlorophyll
Turbidity
Stereoscopic camera system
LED illuminatio
Vertical profiling system
Webcam system

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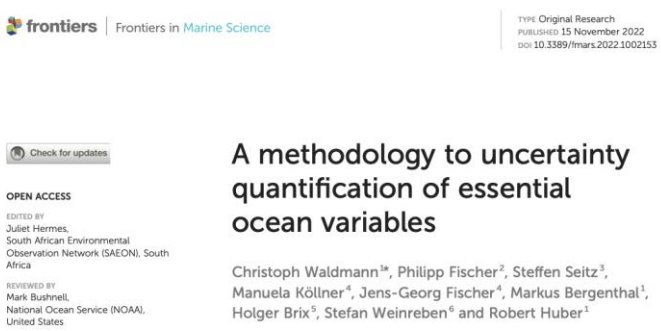
News and plans

Daily routine measurements (incl. vertical profiles)

- From September 2022 on, continuous *in situ* measurements of CH_4 as vertical profiles from 12 – 0 m.
- Integration and publication of quality control routines for single sensor CTD systems.
- Publication on the effects of sampling devices and sampling frequencies on the interpretation of marine monitoring data.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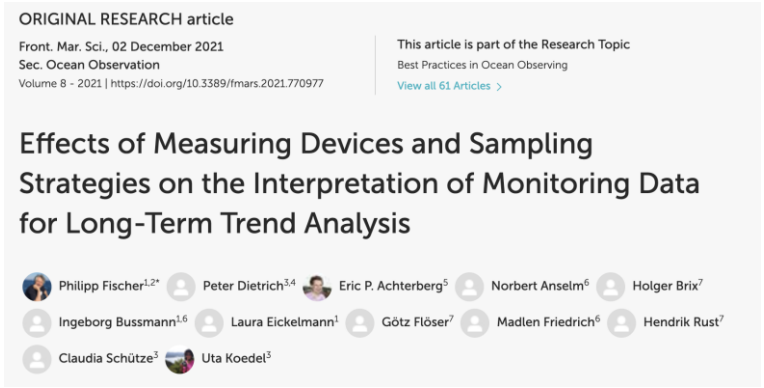
A methodology to uncertainty quantification of essential ocean variables

Christoph Waldmann[1*], Philipp Fischer[2], Steffen Seitz[3], Manuela Köllner[4], Jens-Georg Fischer[4], Markus Bergenthal[1], Holger Brix[5], Stefan Weinreben[6] and Robert Huber[1]


ORIGINAL RESEARCH article

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Sec. Ocean Observation
Volume 8 - 2021 | https://doi.org/10.3389/fmars.2021.770977

This article is part of the Research Topic
Best Practices in Ocean Observing
View all 61 Articles >

Effects of Measuring Devices and Sampling Strategies on the Interpretation of Monitoring Data for Long-Term Trend Analysis

Philipp Fischer[1,2*] Peter Dietrich[3,4] Eric P. Achterberg[5] Norbert Anselm[6] Holger Brix[7]
Ingeborg Bussmann[1,6] Laura Eickelmann[1] Götz Flöser[7] Madlen Friedrich[6] Hendrik Rust[7]
Claudia Schütze[3] Uta Koedel[3]

Art-Science Exhibition in Bremerhaven (Deutsches Schifffahrtsmuseum) „Daten lauschen“ with image and sound live stream from the AWIPEV underwater observatory (DSM, Galerie Bangert, 02.06. – 31.07.2022)

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News and plans

New cooperation projects

- **2022…: An Artic biogenic proxy-archive (KOL07b - Gernot Nehrke - AWI Marine BioGeoScience)**

  Corraline algea *Clathromorphum compactum* from the Kongsfjord area as proxy archive to reconstruct temperature, pH and land-based run-off for the last 200 year with annual to sub-annual resolution.

- **2023… : POLAR MOSES (by AWI, UFZ and HEREON)**

  Terrestrial and coastal CH4 and CO2 measurements for cross-compartment GHG flux measurements.

- **VPR Zooplankton community (KOL 07c - AWI, HEREON, Tünen): – planned for 2024**

  Year-round high speed measurements of coastal zooplankton in an Arctic fjord system.

Under discussion

MIMS (Membrane Inlet Mass Spectrometer) installation to analyse surface seawater from Kongsfjorden during August 2024 to August 2025 (AWI)

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Additional infrastructure supported by AWI

Professional scientific diving support in NyÅlesund (winter and summer, PI Max Schwanitz)

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Additional infrastructure supported by AWI

Professional scientific diving support in NyÅlesund (winter and summer)

- About 5000 scientific dives over the last 10 years
- Diving range between 0 and 30 m
- Installation of equipment
- Sampling
- Photo and video documentation
- Decompression chamber on site (Kingsbay)

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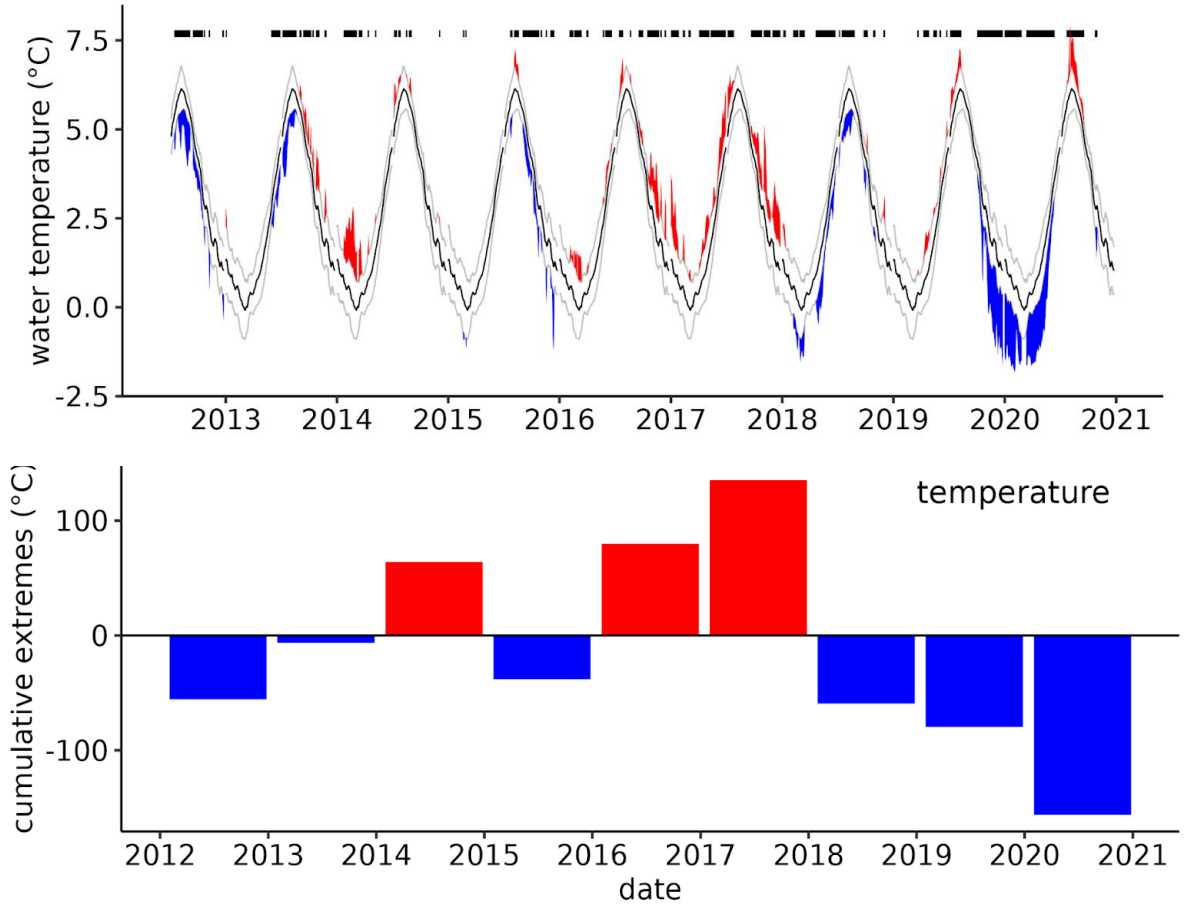
A glance to our own science projects



In situ temperature(and salinity) measurements and temperature extremes (after Hobday 2017) from the AWIPEV Underwater Observatory

Cumulative extreme values in water temperature

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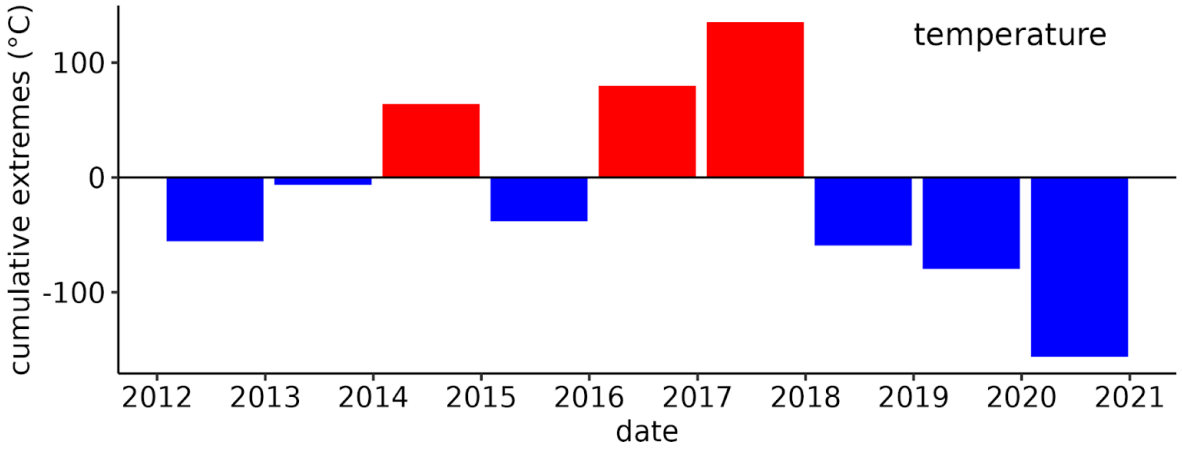

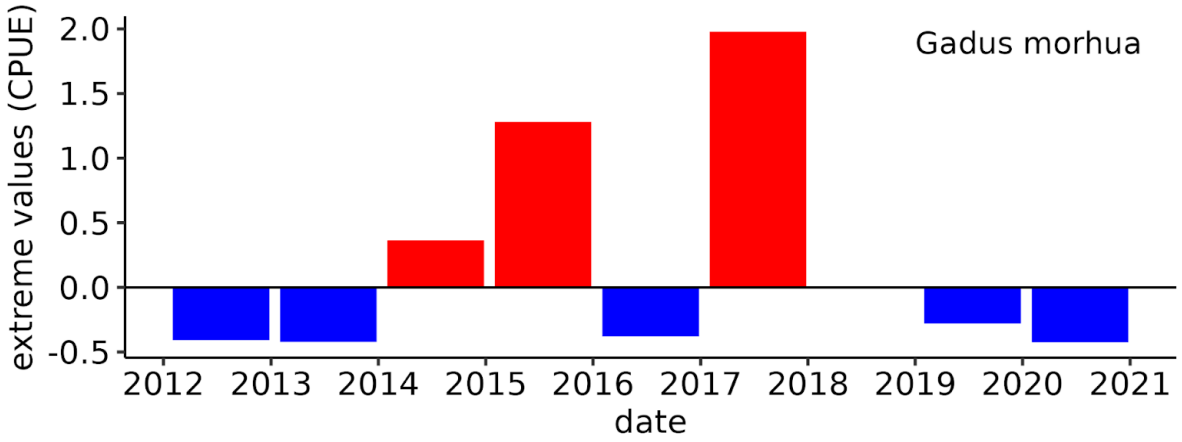

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Main questions

- Functional relationship between heat waves and cold spells on the local (fish) community?
- Effects of heat waves and cold spells on growth and survival of juvenile fish?
- How do hydrographic extremes affect the YOY abundance of Atlantic cod?

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Thank you for your attention