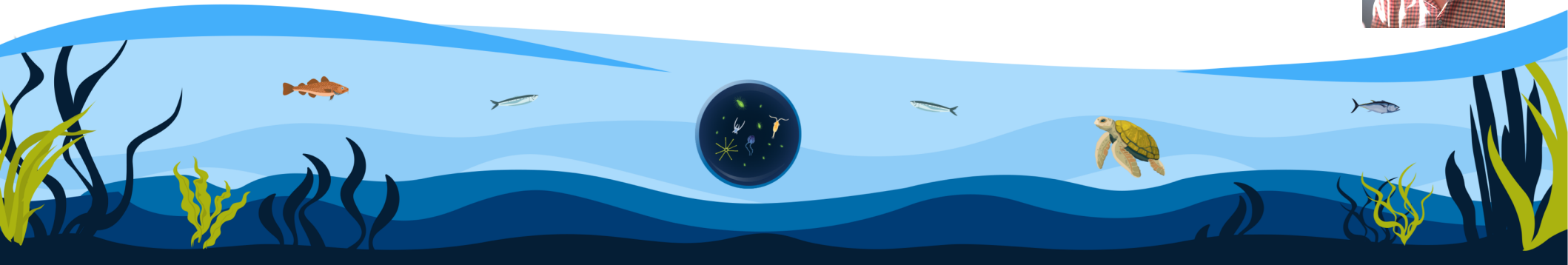


11th EuroGOOS International Conference, 19 May 2026, Session C4

The Fantastic Baltic Four: A field sampling approach for four Biology and Ecosystem Essential Ocean Variables (EOVs)

*Florian Lüskow & Lina Mtwana Nordlund
Uppsala University, Campus Gotland, Sweden*





Marginal sea of the Atlantic

Very young and shallow sea

Steep salinity gradient and strong stratification

Challenges for biodiversity

Heavily exploited and eutrophicated

Measuring everything at all times is just not possible

- too expensive
- too time-consuming



Baltic Sea Living Lab is part of the EU Horizon project BioEcoOcean

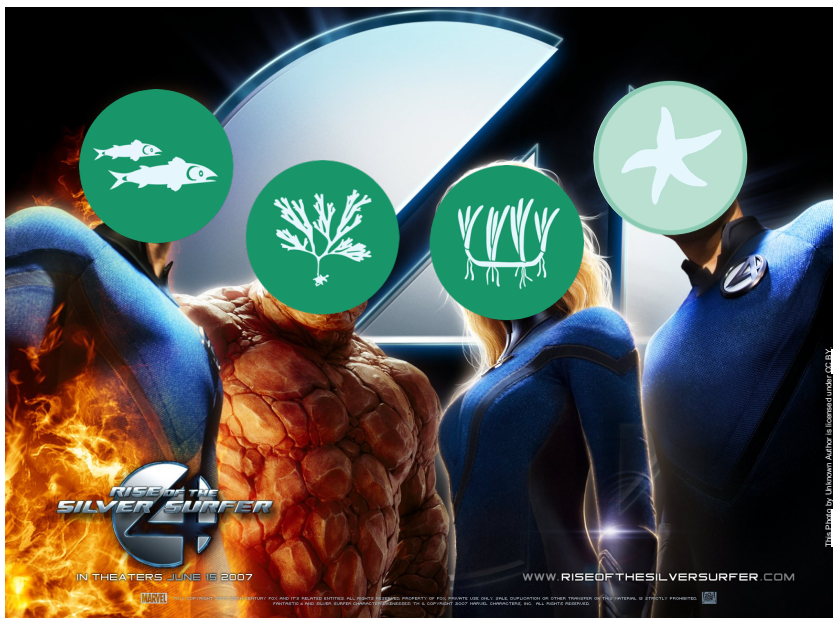
Integrated coastal monitoring – aiming to **Replace, Refine, and Reduce (3R)** the impact

Explore multiple drivers/impacts that contribute to change (both +/-)

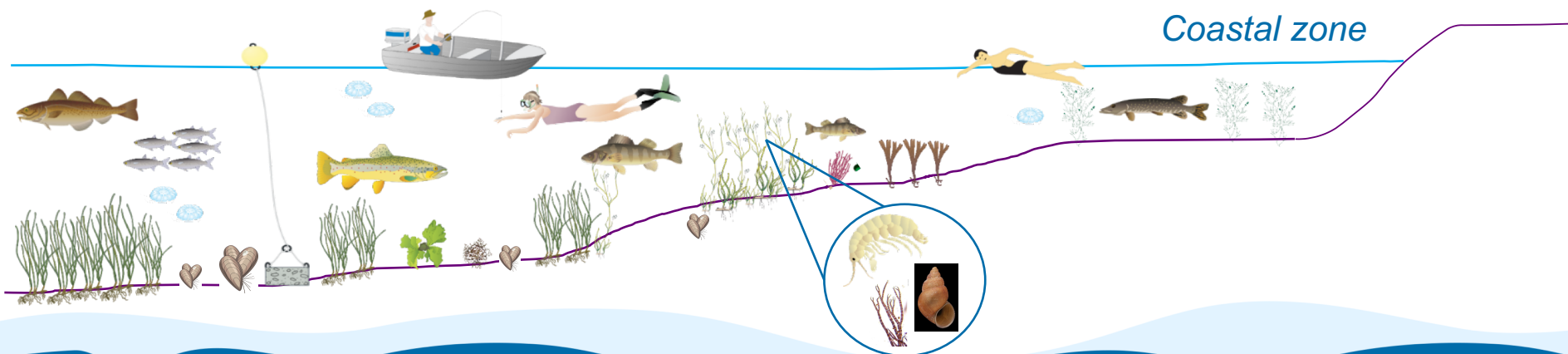
Develop the BioEco EOVs through the inclusion of socio-economic variables and the integration of more environmental variables

Validate **emerging and least-invasive technologies**









Fish Abundance and Distribution
Macroalgal Canopy Cover and Composition
Seagrass Cover and Composition
Benthic Invertebrate Abundance and Distribution



EOV

Sub-variable

	Benthic invertebrate abundance and distribution	Number of individuals per unit area
		Biomass per unit area
		% living cover
		*Presence/absence
	Fish abundance and distribution	Fish abundance
		Fish length frequency distribution
		Fish biomass
		Fish ID/species composition
	Macroalgal canopy cover and composition	Canopy percent cover
		Macroalgal stipe density
		Canopy species diversity
		Areal extent
	Seagrass cover and composition	Seagrass percent cover
		Seagrass species composition
		Seagrass areal extent
Sum-Total		





*ways of sample/data collection that can be either tasked with invasive, minimally invasive, or non-invasive methods

Last update of Specification Sheets in March 2026

Methodological approach

EOV

Sub-variable

EOV		Sub-variable		Methodological approach																
		Near-bottom eDNA sampling Sub-surface eDNA sampling Surface drone mapping Drop camera Grab sampling Pelagic fishing net Snorkeling* SCUBA diving* BRUV Remote sensing Acoustics ROV and AUV Drone and arial platform mapping Community science Bottom trawl/sledge/rake Sum-Non-Invasive Sum-Invasive																		
	Benthic invertebrate abundance and distribution	Number of individuals per unit area				x				x						x	1	3		
		Biomass per unit area					x				x					x	1	3		
		% living cover					x				x					x	1	3		
		*Presence/absence	x	x		x	x			x	x	x			x	x	6	4		
	Fish abundance and distribution	Fish abundance				x			x		x			x	x		x	2	4	
		Fish length frequency distribution								x					x		x	1	2	
		Fish biomass								x					x	x		x	2	2
		Fish ID/species composition	x	x	x	x				x				x		x	x	6	3	
	Macroalgal canopy cover and composition	Canopy percent cover				x				x	x				x	x		4	2	
		Macroalgal stipe density					x				x	x				x		2	2	
		Canopy species diversity	x			x	x		x		x	x	x			x	x	x	7	4
		Areal extent				x	x				x	x			x	x			5	2
	Seagrass cover and composition	Seagrass percent cover				x				x	x				x	x		4	2	
		Seagrass species composition	x			x	x			x	x	x			x	x	x	x	7	4
		Seagrass areal extent				x	x				x	x			x	x			5	2
Sum-Total			4	2	7	10	6	4	8	12	4	2	2	15	6	4	10	54	42	

*ways of sample/data collection that can be either tasked with invasive, minimally invasive, or non-invasive methods

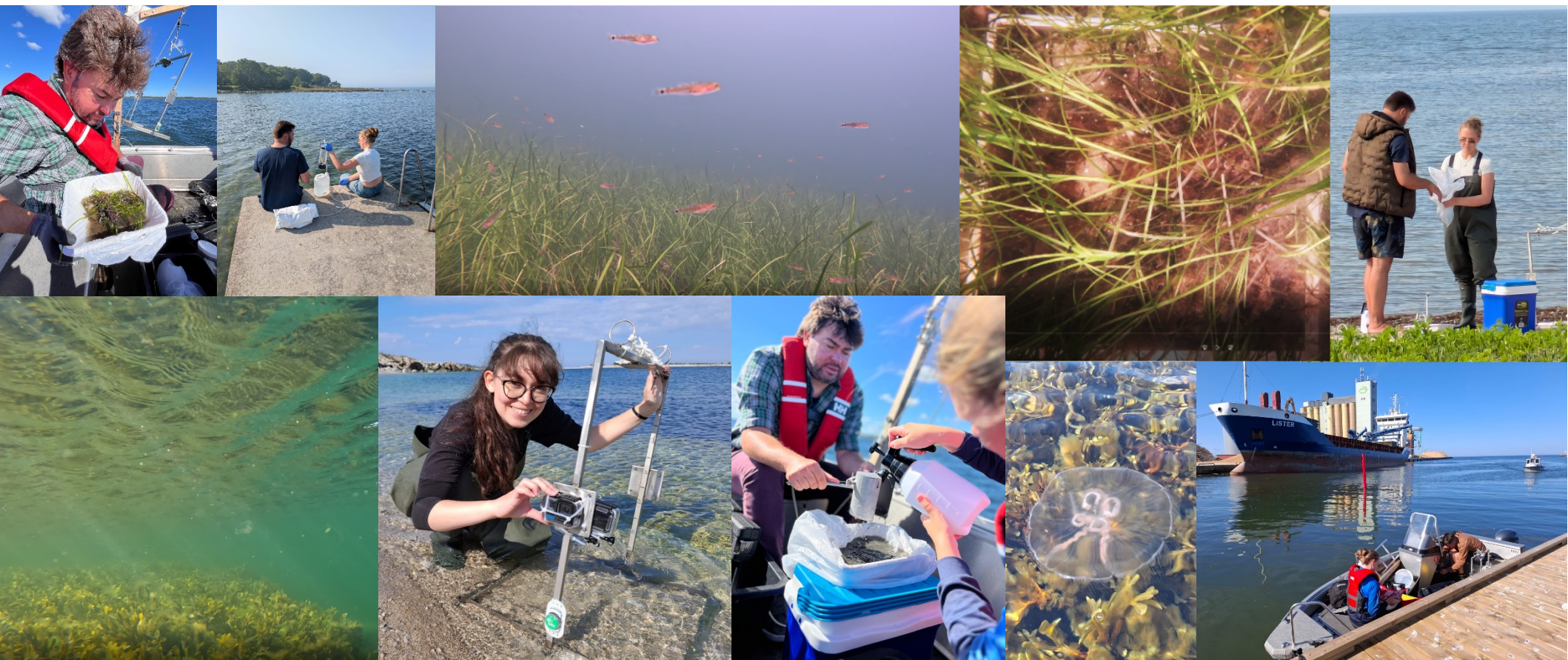
Last update of Specification Sheets in March 2026

Non-invasive/minimally invasive methods
 Invasive methods

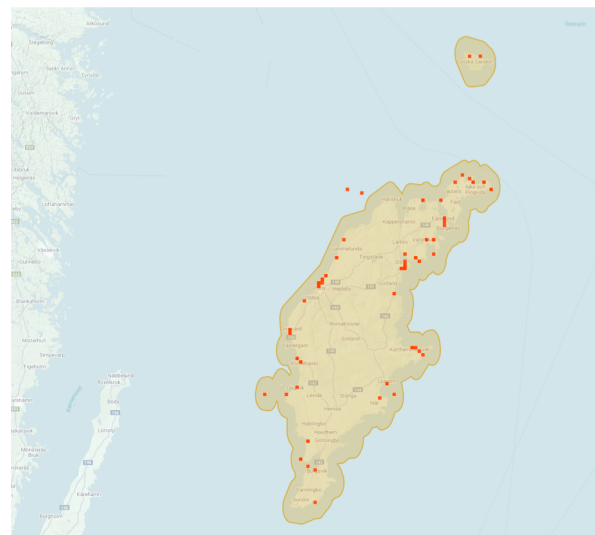
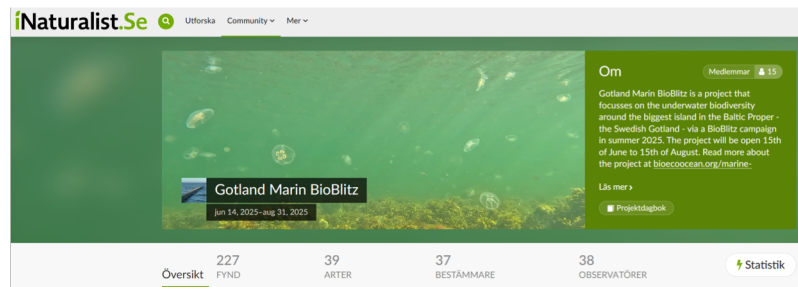
Which methods cover the most Fantastic Baltic Four EOV (15) sub-variables?

ROV and AUV	15
SCUBA diving	12
Bottom trawl/sledge/rake	10
Drop camera	10
Snorkeling	8
Surface drone mapping	7
Drone and arial platform mapping	6
Grab sampling	6
BRUV	4
Community science	4
Near-bottom eDNA sampling	4
Pelagic fishing net	4
Acoustics	2
Remote sensing	2
Sub-surface eDNA sampling	2

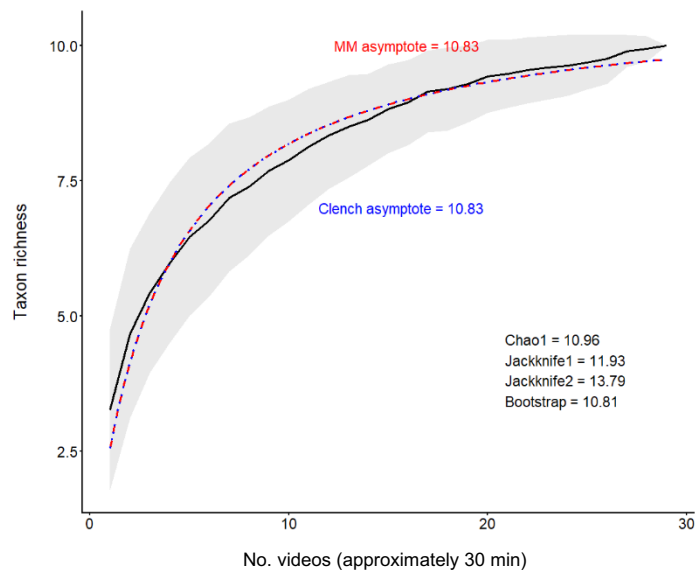
Baltic Sea Living Lab field season 2025



Marine BioBlitz Gotland 2025



Complementary methods or silver bullets?



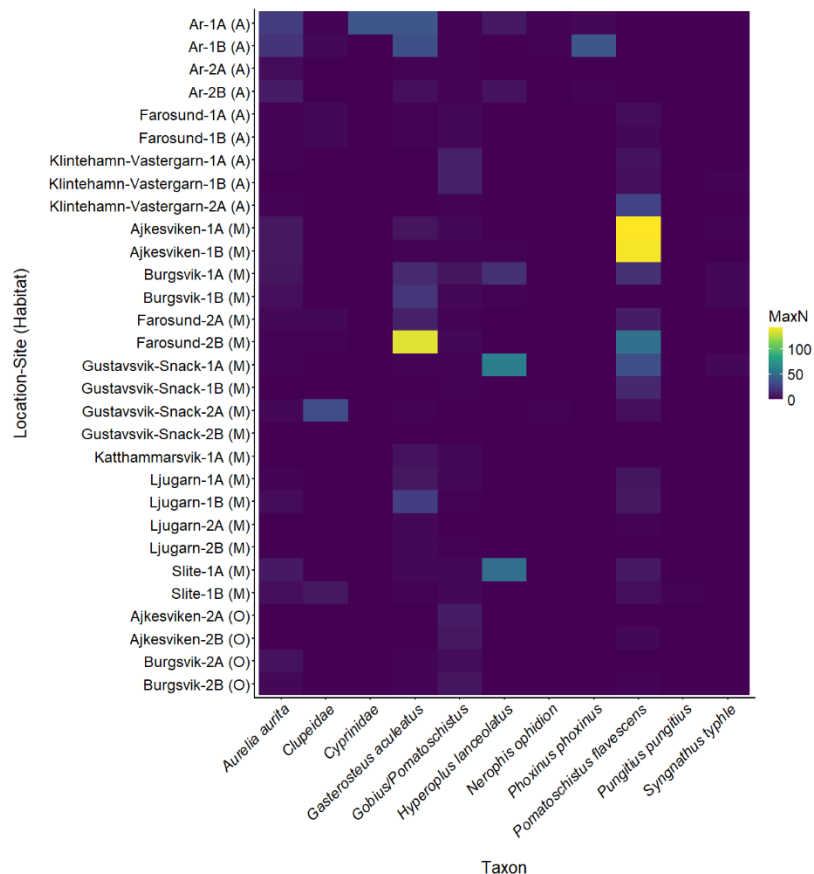
Algae-dominated



Macrophyte-dominated



Other



Local (FAIR) Data



Integrating GZ Data in EOVs

1

Data Collection

Collecting data with FAIR principles in mind is easier than you might think, and will ultimately lead to more GZ observation data becoming available. You can start by including the following in your data collection:

EOV Sub-variables

- Biomass
 - Total and/or per taxon, per unit volume or per unit area of water
- Abundance
 - By taxon, per unit volume per unit area water

FAIR data

- Date YYYY-MM-DD
- Time HH:MM:SS
- GPS Coordinates: decimal degrees
- Record sampling methods & devices

Go a step further by including EOVS Supporting Variables and Environmental Variables!
See EOVS specification sheets for details

2

Data Formatting

After data collection consider formatting data according to international biodiversity standards (e.g., Darwin Core). See some general guidelines below

Formatting

- Steps to **organise** data can include:
- Use standard names for data columns
 - Arrange species presence in rows (instead of columns)
 - Separate data into thematic tables
 - Location information (coordinates, depth, location name, country, etc.)
 - Species presence
 - Variables measured, sampling devices, protocols

Interoperability

- Use **controlled vocabulary** with URLs to make data machine-readable. Include **identifiers** for taxa, biological observations, people, etc. when possible
- Ensure data are connected to standard definitions
 - Increase user understanding
 - Make data origins easily traceable
 - Allow other computers to connect to & read data

Data do not have to be perfectly organised
See manual.obis.org for detailed guidance

Get help from members of the OBIS network

3

Publish FAIR Data

Publishing your data in a FAIR way will:

1. Make it easily discoverable,
2. Make it easier to cite with e.g., DOIs
3. Contribute to our global understanding of marine life

How to do this?

There are a few ways to ensure data will be FAIR. The easiest is to connect with an OBIS Node who will help you.

Why publish with OBIS?

- User-friendly online publishing platform (IPT) for file uploads
- Built-in tools to map data columns to Darwin Core standard
- Simple form-based entry to record dataset metadata
- Once data are public, become part of the global OBIS database

4

Use & Access Open Data

OBIS data are freely accessible and offer:

- Standardised marine biodiversity data from thousands of datasets
- Species presence & absence data
- Data in point, polygon, or line transects
- Abundance, biomass, & other biotic information
- Information derived from DNA, tracking, acoustic, & imaging data
- Sampling information & metadata describing datasets

Access

- Access these data through:
- obis.org
 - R package [robis](https://rpackage.obis.org)
 - Full data exports



Article
Jellyfish and Ctenophores Around Gotland in the Baltic Sea—Local Data Contributing to Global Assessments
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Dataset

Gelatinous Zooplankton in Gotland, Sweden, 2022

[OBIS Secretariat](#) [MeasurementOfFact](#) [Open in mapper](#) [Explore occurrences](#)
[Overview](#) [Data quality](#) [Measurement types](#)

Video footage from seagrass meadows around Gotland, originally collected in 2022 to study seagrass-associated fish, was reanalyzed to estimate jellyfish (*Aurelia aurita*) abundance. Footage was obtained at six sites using a GoPro HERO 5 Black camera towed horizontally over seagrass-dominated soft bottoms at depths of 2.1–6.9 m. The camera, positioned 80–100 cm above the seafloor, captured transects 55 m in length during morning and evening sessions. Sixty transects were recorded, 10 transects per site, with video durations averaging 4 minutes. Jellyfish abundance was estimated by calculating the volume of water filmed, modeled as a triangular prism based on the camera's field of view and orientation (perpendicular or tilted 70°). Additional measurements included surface and bottom temperatures, as well as wind speed and direction, retrieved from external sources. Full calculation details are provided in the associated paper, Luskow et al. 2025.

Citation: Luskow F, Lawrence E (2025). Gelatinous Zooplankton in Gotland, Sweden, 2022. Version 2.0. OBIS Secretariat. Sampling event dataset. <https://doi.org/10.25607/skulof>

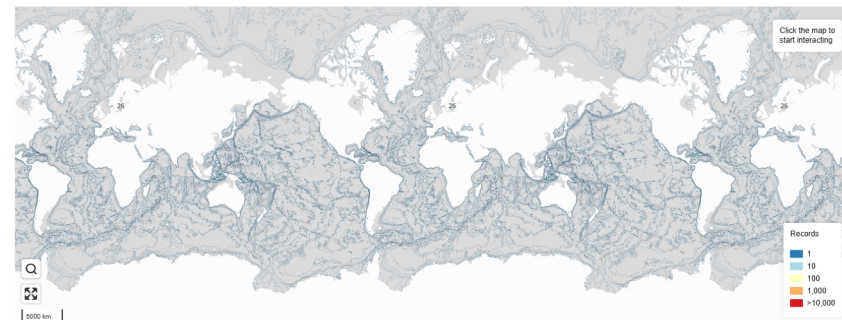
Published: May 08, 2025 at 17:49

URL: https://ipt.obis.org/bioecoccean/resource?r=gelatinous-zooplankton-gotland_2022

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UNESCO-IOC Project Office for IODE

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Uppsala University

Florian Luskow
Uppsala University



60

occurrence records

510

measurements and facts

1

taxa

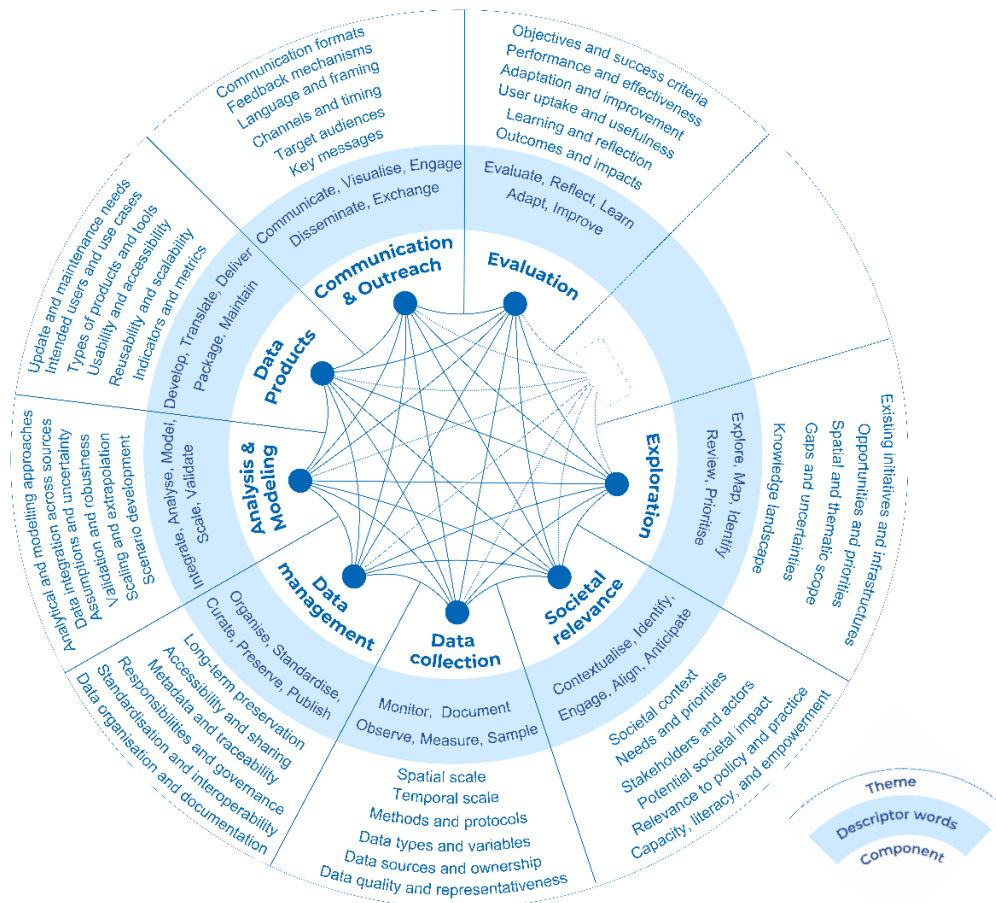
1

species

Where to go from here?

- Continuation of sample analysis (eDNA, sediment grabs, drop videos) from summer 2025
- Lessons learned and preparation of 2026 marine BioBlitz
- Inclusion of socio-economic variables and ecosystem services in data analysis and result interpretation for a **holistic understanding of the coastal zone**
- Local **FAIR data** can (and should) contribute to global assessments
- Inspiration for a **systematic way of thinking** about marine biodiversity and environmental assessments

OCEANIS – a support framework



Lina M. Nordlund *et al.*
Poster #126

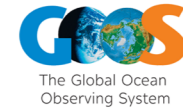


Said Hashim *et al.*
Poster #102





Partners



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