

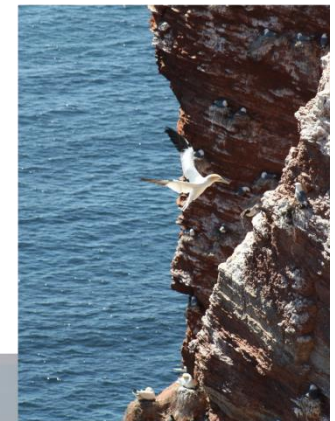


MARLIN: A large-scale/high resolution information system as a backbone for marine management



Agenda

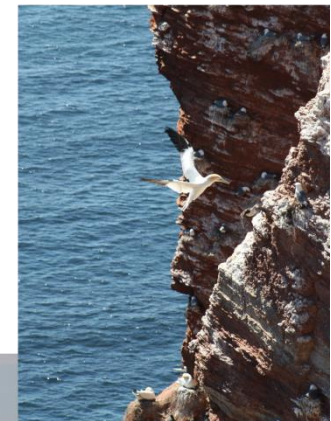
1. Background
2. Aims
3. Marlin components
4. Product example
5. Case study



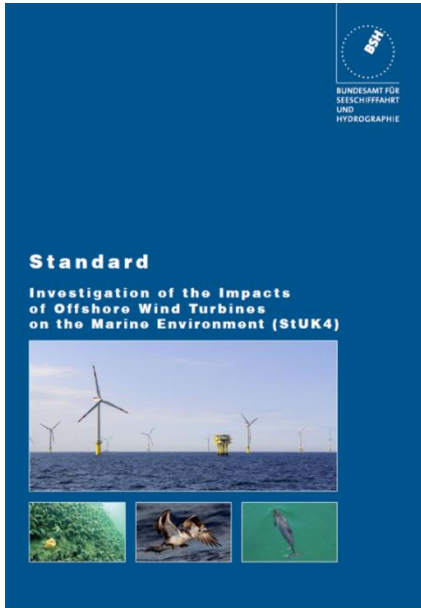
Background



- **MARLIN (Marine Life Investigator)**
- Information network for marine biological data from Environmental impact assessments (EIA) and monitoring
- Funded by the German Federal Ministry for Economic Affairs and Energy (BMWi) managed by Projektträger Jülich (PtJ)
- Operational phase starts end of 2019
- In 2019 MARLIN will be fully integrated into the geodata infrastructure of the German Federal Maritime and Hydrographic Agency (BSH)
- Dedicated team for support and development



Background



- According to BSH standard (StUK4) each offshore project has to undertake a defined amount of surveys per year
- The number of offshore wind farm and grid projects has increased
- Each survey needs to be quality checked
- Data need to be made available for environmental impact assessments
- There is a need for an effective network for sharing marine data gathered during EIA's and monitoring among all involved parties (e.g. Offshore Wind Energy Act (WindSeeG, 2017))

Animal Group	Average Surveys/Year
Benthos	41
Fish	41
Seabirds ship observer	Min. 168 Max. 216
Seabirds plane digital	120

Aims

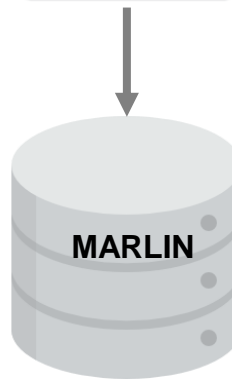


- Develop a **longterm, quality checked spatial information network** containing EIA/monitoring data of all offshore windfarm and grid projects
- Create tailor made **web apps** for biological **data loading, data sharing** and **data analysis** for all involved parties
- **Evaluate cost reduction potential** by reassessing the actual survey design concepts according to the BSH standard (StUK4) for future monitoring investigations
- **Assess possible impacts of wind turbines** considering the **interactions among species and groups** as well as the **influence of various environmental parameters** (e.g. sedimentology, salinity, temperature)
- Build the **foundation** for **marine ecosystem modelling** and evaluation of **cumulative effects**

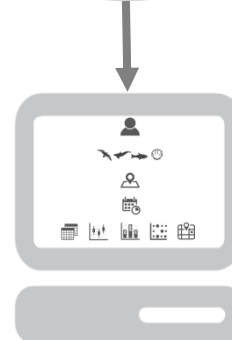
Marlin Components



**Upload via
web app**

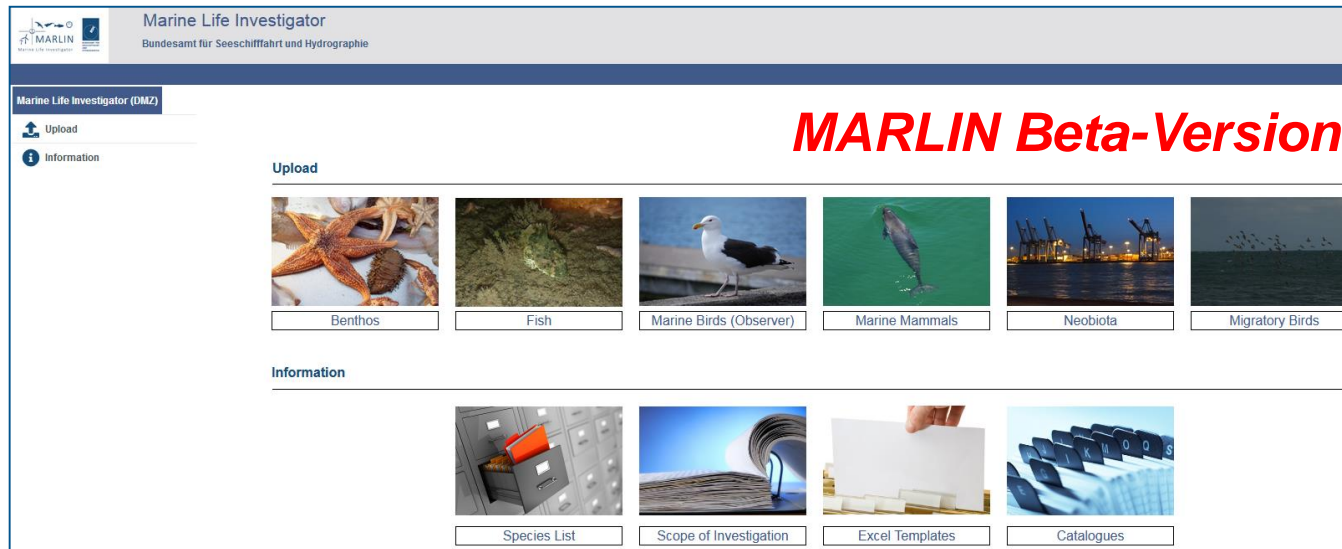


**Spatial
DB**

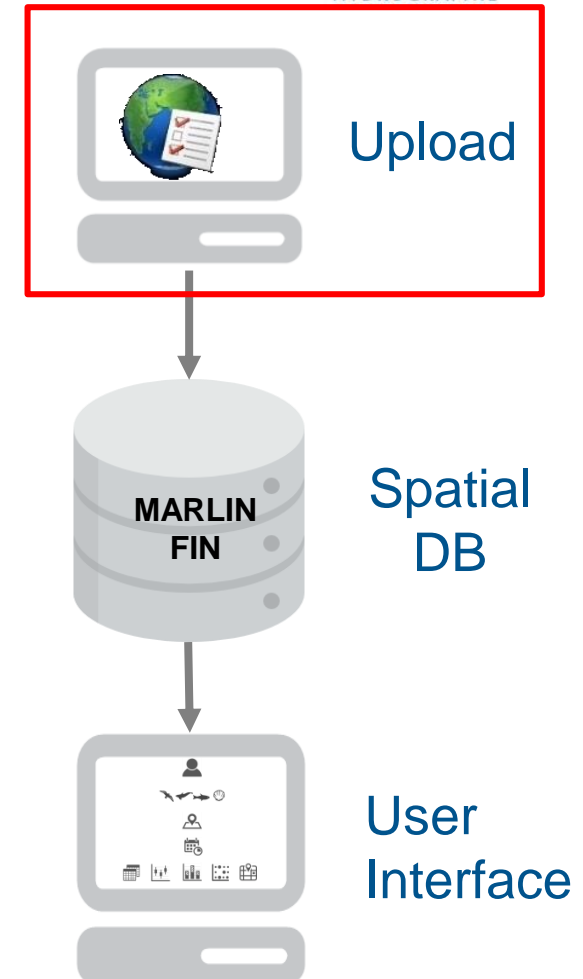


**User
interface with
tailor made
products**

Import Web App for EIA / monitoring survey data



- Automatic consistency and plausibility checks
- Automatic error and warning report generation
- Email notification
- Special download area

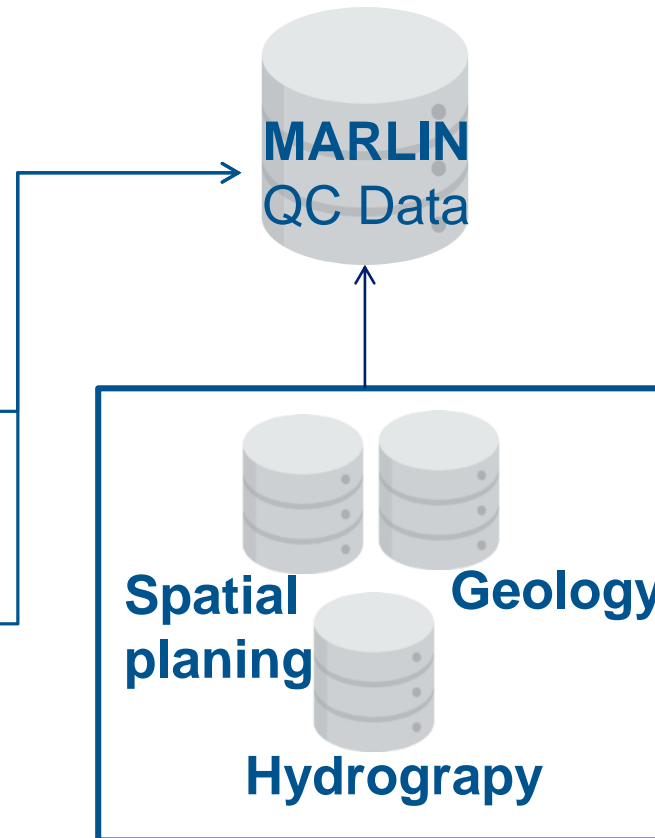


Datastorage in a Spatial Database

Long term, large scale
scientific survey data
from our cooperation
partners



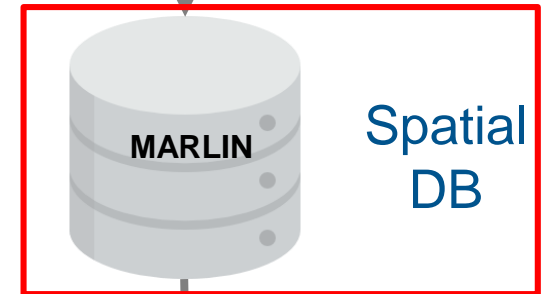
Top Predators



Linked BSH
information
systems



Upload

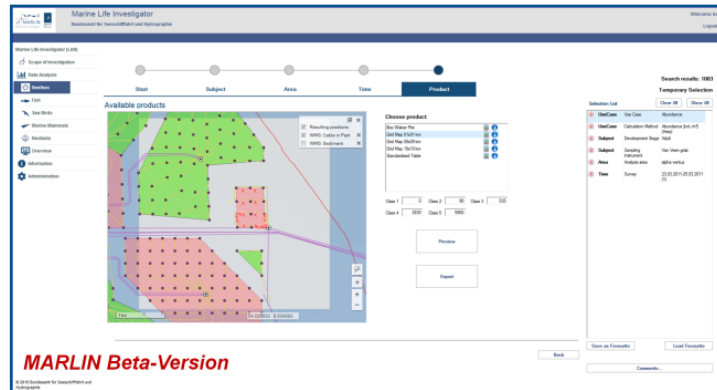


Spatial
DB



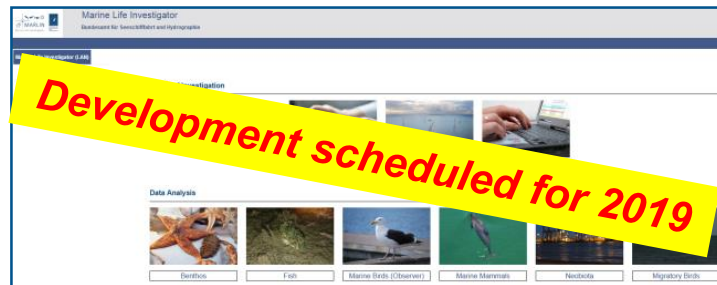
User
Interface

Web Apps for data access, export and analysis



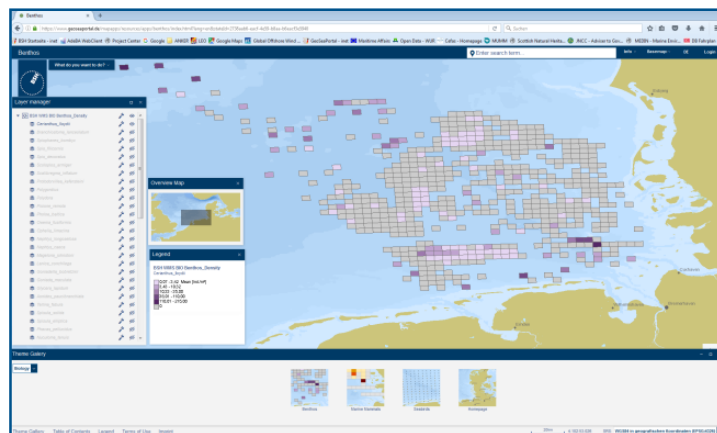
BSH Web App

*Full access to all
quality checked data*



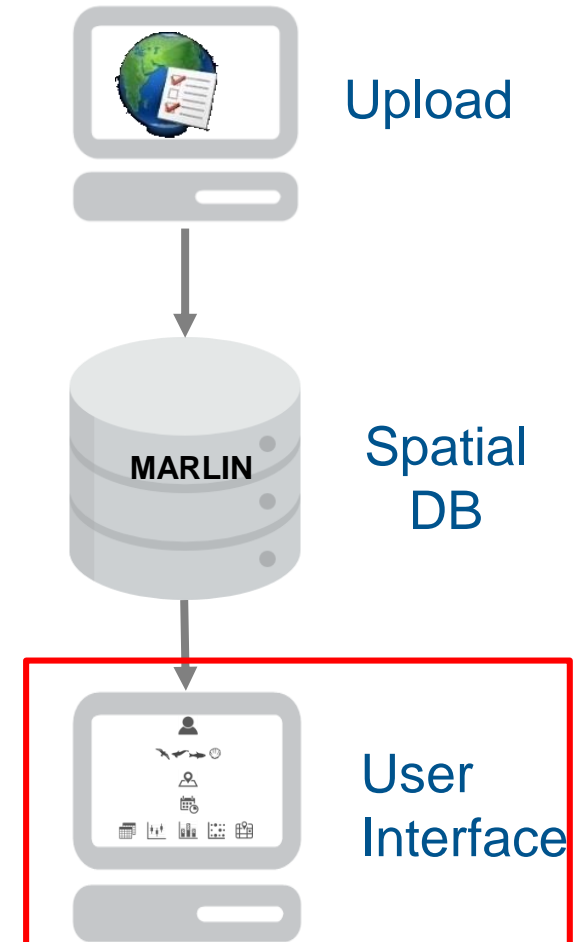
Industry / Agencies Web App

*Access to user relevant
quality checked data*



Public www.geoseaportal.de

*Aggregated data sets
(e.g. 10x10km raster maps)*



Product Example: Red List Species Abundance – Infauna Project Area vs. Reference Area

Marine Life Investigator (LAN)

Scope of Investigation

Data Analysis

Information

Administration

Scope of Investigation



Data Entry



Scope Review



Show Comments

MARLIN Beta-Version

1.

Data Analysis



Benthos



Fish



Marine Birds (Observer)



Marine Mammals



Neobiota



Migratory Birds

Please note: The shown analysis is based on fictitious test data
with no relation to any windfarm project

Product Example: Red List Species Abundance – Infauna Project Area vs. Reference Area



Marine Life Investigator
Bundesamt für Seeschifffahrt und Hydrographie

Welcome: biouserbil

Logout

Marine Life Investigator (LAN)

Scope of Investigation

Data Analysis

Benthos

Fish

Sea Birds

Marine Mammals

Neobiota

Migratory Birds

Overview

Information

Administration



Choose type of selection

☒ Use Case ☐ Individual

1. 1) Select Use Case:
Abundance

Biodiversity
Biomass
Distance analysis

2. 2) Select calculation method:
Abundance [ind./m²] (Area)

Abundance [ind./m²] (Station)
Abundance [ind./m²] per grain size
Group dominance relations [%] (Station)
Species dominance relations [%] (Area)
Species dominance relations [%] (Station)

MARLIN Beta-Version

Temporary Selection		
Selection List		
Clear All Show All		
<input checked="" type="checkbox"/> UseCase	Use Case	Abundance
<input checked="" type="checkbox"/> UseCase	Calculation Method	Abundance [ind./m ²] (Area)

Add to selection

Save as Favourite

Load Favourite

Next

Comments...

Si

Product Example: Red List Species Abundance – Infauna Project Area vs. Reference Area

Marine Life Investigator (LAN)


 Scope of Investigation

 Data Analysis

 Benthos

 Fish

 Sea Birds

 Marine Mammals

 Neobiota

 Migratory Birds

 Overview

 Information

 Administration



Choose subjects

1. Choose Development Stage: *

Filter by...

- ☒ Adult
- ☐ Juvenile
- ☐ Larvae

2. Choose Sampling Instrument: *

Filter by...

- ☒ Beam trawl
- ☐ Boxcorer
- ☐ Dredge
- ☐ Scrape sample
- ☒ Van Veen grab
- ☐ Video

3. Choose Protection State:

Filter by...

- ☒ OSPAR Species
- ☒ Red List
- ☐ Signature Species according to Biotope

Choose Scientific Name (Accepted):

Filter by (name or group)...

- ☒ Abietinaria
- ☐ Abietinaria abietina
- ☐ Abludomelita
- ☐ Abludomelita gladiosa
- ☐ Abludomelita obtusata
- ☐ Abra

Choose Type Group:

Filter by...

- ☒ Algae
- ☐ Amphipoda
- ☐ Annelida
- ☐ Anthozoa
- ☐ Arachnida
- ☐ Ascidiacea

Show species list

Add to selection

* required

Back

Next

MARLIN Beta-Version

Search results: 1865

Temporary Selection

Selection List

Clear All

Show All

UseCase	Use Case	Abundance
UseCase	Calculation Method	Abundance [ind./m²] (Area)
Subject	Development Stage	Adult
Subject	Sampling Instrument	Van Veen grab
Subject	Protection State	Red List


Save as Favourite

Load Favourite

Comments...

Product Example: Red List Species Abundance – Infauna Project Area vs. Reference Area

Marine Life Investigator (LAN)

 Scope of Investigation

 Data Analysis

 **Benthos**

 Fish

 Sea Birds

 Marine Mammals

 Neobiota

 Migratory Birds

 Overview

 Information

 Administration



Choose an Area (optional)



MARLIN Beta-Version

Search results: 707

Temporary Selection

Selection List

Clear All

Show All

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<input checked="" type="checkbox"/>	Subject	Development Stage	Adult
<input checked="" type="checkbox"/>	Subject	Sampling Instrument	Van Veen grab
<input checked="" type="checkbox"/>	Subject	Protection State	Red List
<input checked="" type="checkbox"/>	Area	Analysis area	vorhabensgebiet_test_v
<input checked="" type="checkbox"/>	Area	Reference area	referenzgebiet_test_wgs

Scope of Investigation

Borkum_West_II_Urahmen_HiPo_...
Flaech_N-03-07_V20180716_wgs
Hilfsgeometrie_Untersuchungsflaech...
Referenzgebiet_Fische_Benthos_W...
URahmenB3_Meerwind_Benthos_R...
URahmenB3_Meerwind_Benthos_V...
Untersuchungsgebiet_Fische_Benth...
Vorhabensgebiet_Test_wgs
dantysk_referenzgebiet_wgs
dantysk_referenzgebiet_wgs_Hilfsge...
dantysk_vorhabensgebiet_wgs_Hilfs...
meerwind_ost_gd
meerwind_ost_gd
meerwind_sued_gd
meerwind_sued_gd
n37Referenzflaech_wgs
referenzgebiet_test_wgs
vorhabensgebiet_test_wgs

Add as analysis area

Add as reference area

Back

Next

Save as Favourite

Load Favourite

Comments...

Product Example: Red List Species Abundance – Infauna Project Area vs. Reference Area

Marine Life Investigator (LAN)

 Scope of Investigation

 Data Analysis

 Benthos


 Fish

 Sea Birds

 Marine Mammals

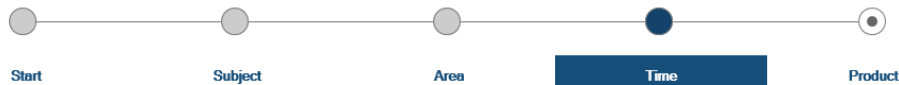
 Neobiota

 Migratory Birds

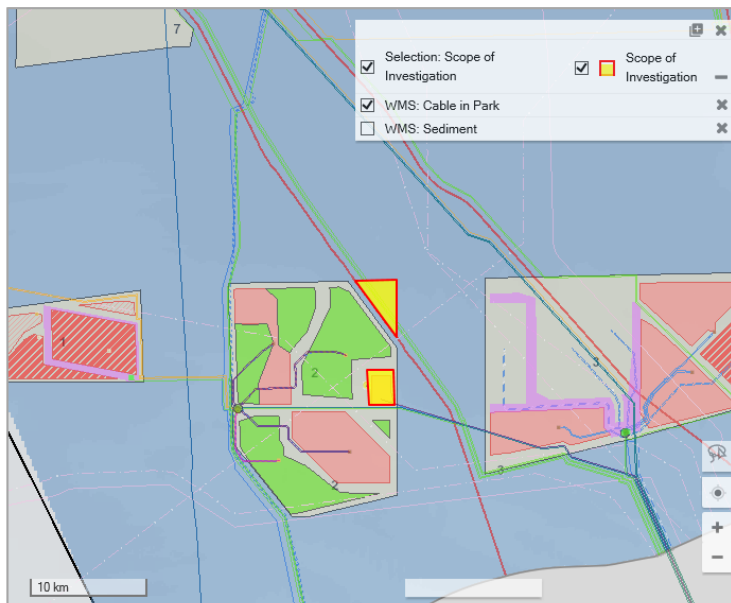
 Overview

 Information

 Administration



Choose a Time Period (optional)



☒ Existing

Assessment periods

Baseline study 1. year
Baseline study 2. year
Baseline study 3. year
Operation phase 2. year
Operation phase 3. year

Surveys

23.03.2011-25.03.2011 (1)
16.04.2011-19.04.2011 (2)
04.05.2011-07.05.2011 (3)
30.09.2011-03.10.2011 (4)
12.10.2011-17.10.2011 (5)
28.10.2011-01.11.2011 (6)

☐ Individual

Individual period

Date from:

Date until:

Or

Season period

From:

Year... Season...

Until:

Year... Season...

Add to selection

Back

Next

MARLIN Beta-Version

Search results: 146

Temporary Selection

Selection List

Clear All

Show All

<input checked="" type="checkbox"/>	UseCase	Use Case	Abundance
<input checked="" type="checkbox"/>	UseCase	Calculation Method	Abundance [ind./m²] (Area)
<input checked="" type="checkbox"/>	Subject	Development Stage	Adult
<input checked="" type="checkbox"/>	Subject	Sampling Instrument	Van Veen grab
<input checked="" type="checkbox"/>	Subject	Protection State	Red List
<input checked="" type="checkbox"/>	Area	Analysis area	vorhabensgebiet_test_v
<input checked="" type="checkbox"/>	Area	Reference area	referenzgebiet_test_wg
<input checked="" type="checkbox"/>	Time	Survey	23.03.2011-25.03.2011 (1)

Save as Favourite

Load Favourite

Comments...

Product Example: Red List Species Abundance – Infauna Project Area vs. Reference Area

MARLIN Beta-Version

Search results: 146

Temporary Selection

Selection List

Clear All

Show All

<input checked="" type="checkbox"/>	UseCase	Use Case	Abundance
<input checked="" type="checkbox"/>	UseCase	Calculation Method	Abundance [ind./m²] (Area)
<input checked="" type="checkbox"/>	Subject	Development Stage	Adult
<input checked="" type="checkbox"/>	Subject	Sampling Instrument	Van Veen grab
<input checked="" type="checkbox"/>	Subject	Protection State	Red List
<input checked="" type="checkbox"/>	Area	Analysis area	vorhabensgebiet_test_v
<input checked="" type="checkbox"/>	Area	Reference area	referenzgebiet_test_wgs
<input checked="" type="checkbox"/>	Time	Survey	23.03.2011-25.03.2011 (1)

Save as Favourite

Load Favourite

Comments...

Back

Product

1. Choose product:

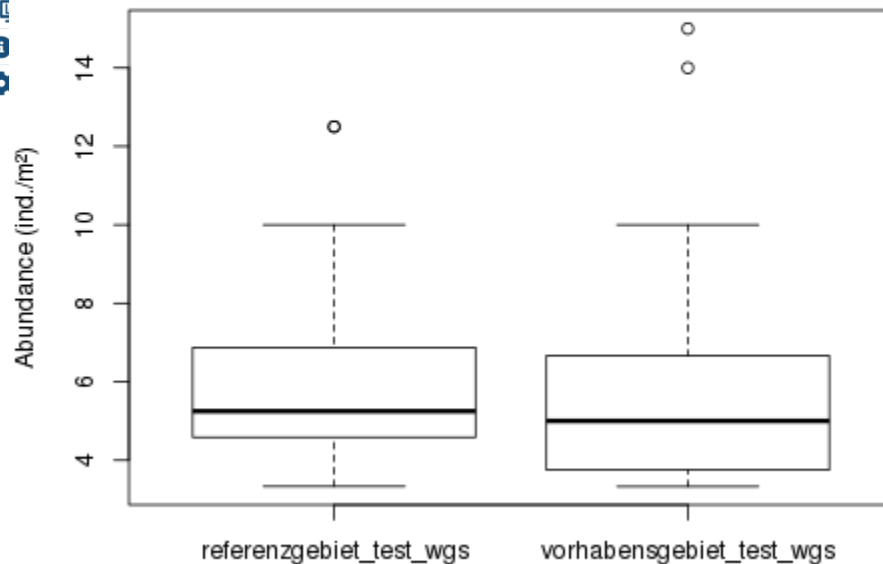
- ☒ Box Whisker Plot
- ☐ Grid Map 01x01 km
- ☐ Grid Map 05x05 km
- ☐ Grid Map 10x10 km
- ☐ Standardised Table

2. Preview

Export

Mean abundance (Ind./m²)

Protection State: Red List
Sampling Instrument: Van Veen grab
Development Stage: Adult



referenzgebiet_test_wgs

vorhabensgebiet_test_wgs

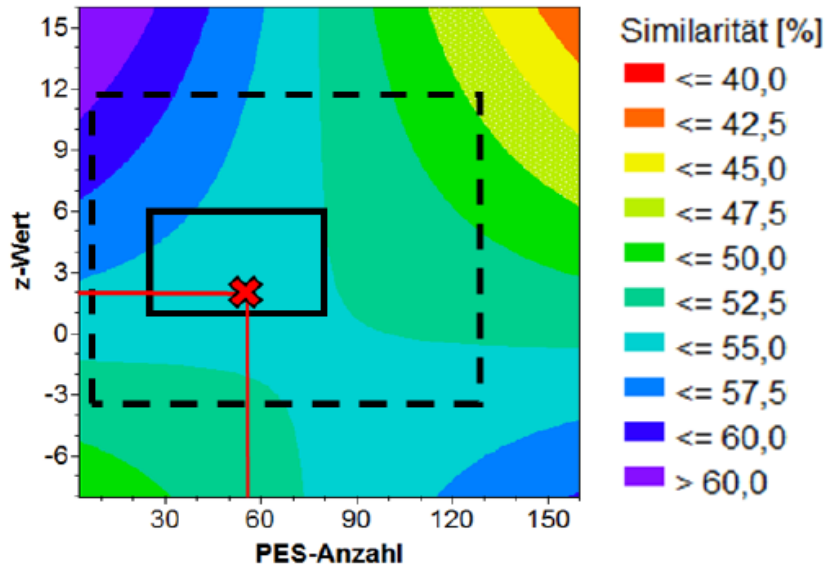
Mari



Si

© 20
Hydr

AWI Case Study: Evaluation of Macrozoobenthos Sampling Effort



Monitoring-Recommendation based on the „ideal“ combination of sampling effort and spatial distribution of samples. Window size: 376 km² (Stieler, 2016, AWI)

- Flexible monitoring recommendations
- Can be calculated for various spatial extents
- Optimization of sampling effort and sample distribution
- Provides potential cost savings by reducing sample numbers without sacrificing data quality

Supported by:

Thank you!

Supported by:



Federal Ministry
for Economic Affairs
and Energy

on the basis of a decision
by the German Bundestag

ptj
Projektträger Jülich
Forschungszentrum Jülich

