

Federal Waterways Engineering and Research Institute (BAW)
smile consult GmbH
Wadden Sea Forum
PlanGIS GmbH

TrilaWatt

Digital hydro-morphological twin of the Trilateral Wadden Sea

Wadden Sea Forum – Plenary 43

Harlingen, The Netherlands, 29th March 2023

The Research Team

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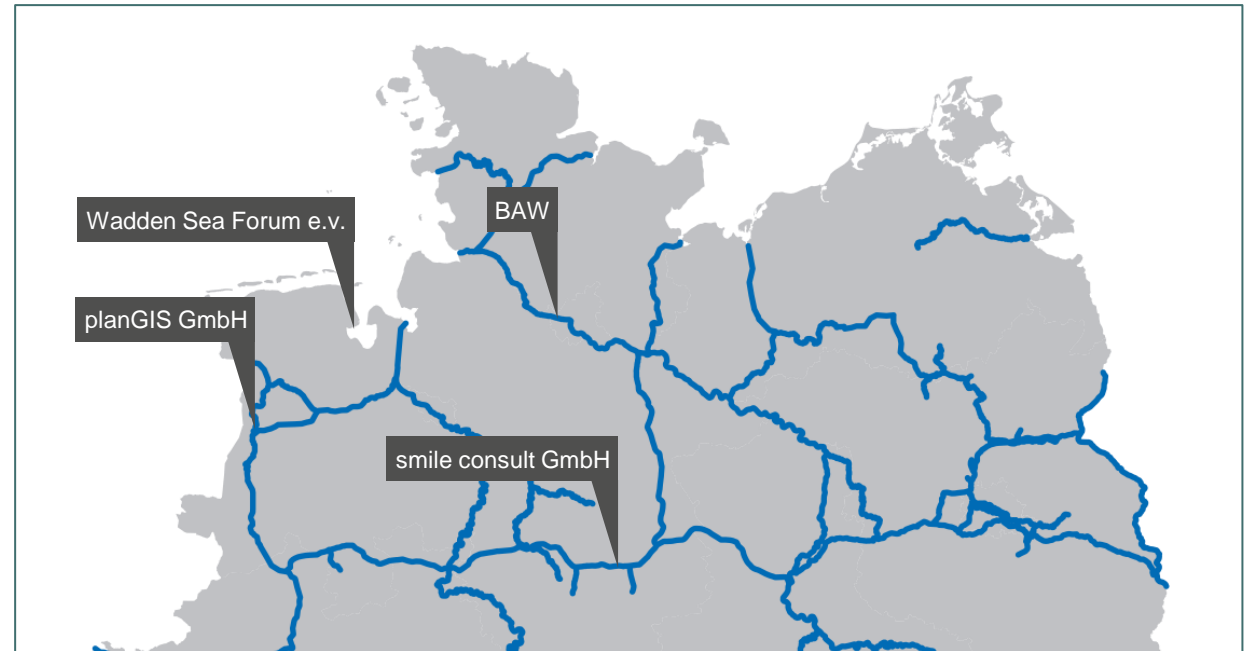


- **planGIS GmbH**

- Kastanienallee 4, 26789 Leer, Germany

- **Wadden Sea Forum e. V.**

- Virchowstraße 1, 26386 Wilhelmshaven, Germany



Research Objective and Work Packages

Research objective:

Our goal is the synthesis of scattered data (A-C) in the Trilateral Wadden Sea area to reliable, high-resolution data products for research, consulting, and governmental policy decision in the period of 2000 to 2020.

(A) Geomorphology

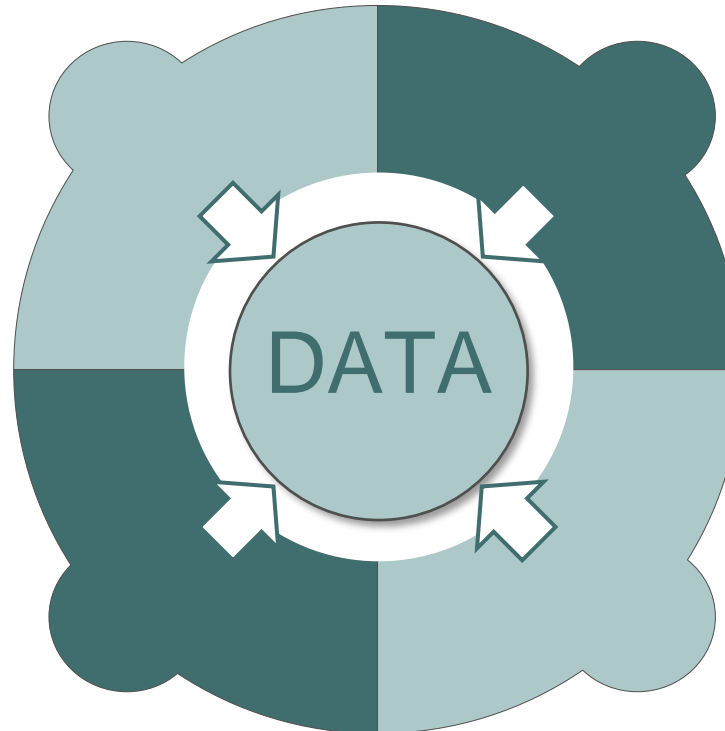
Consistent, annual high-resolution bathymetry data.

(B) Surface Sediments

Information about likely surface sediments using sediment samples and numerical modeling.

(C) Physical Oceanography

Numerical simulations of the entire North Sea to describe tides, salinity, heat flux, and sediment transport.

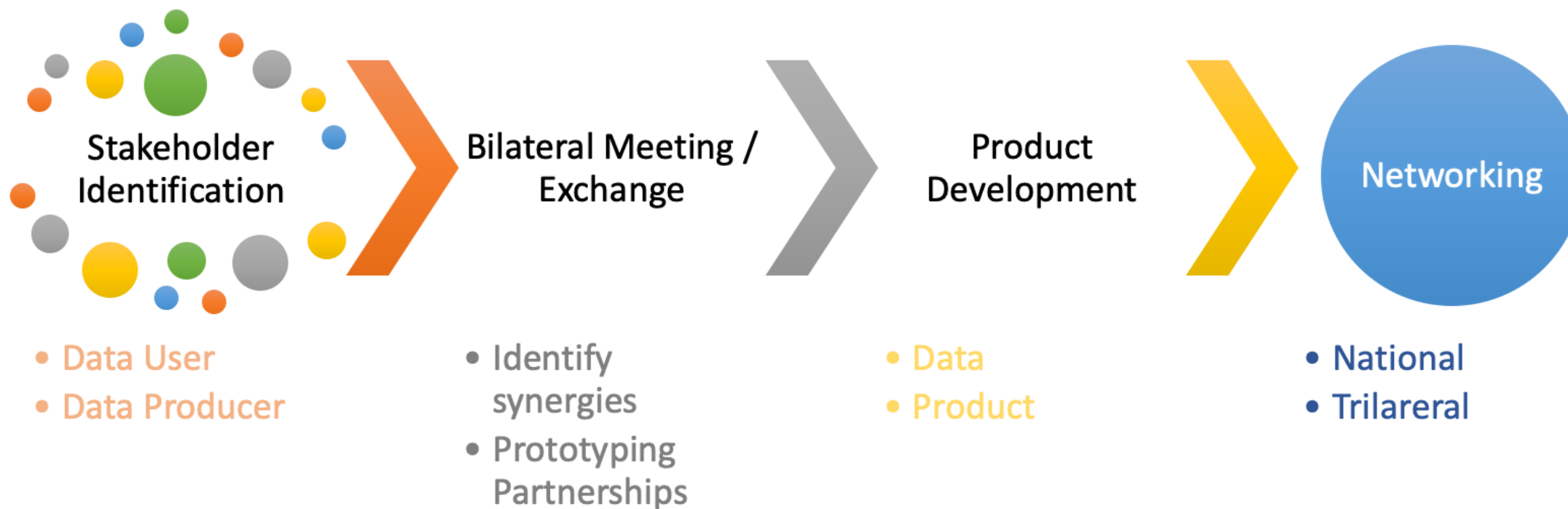


(D) Interactive Webviewer

Enabling users from different background to move efficiently through our big data collection.

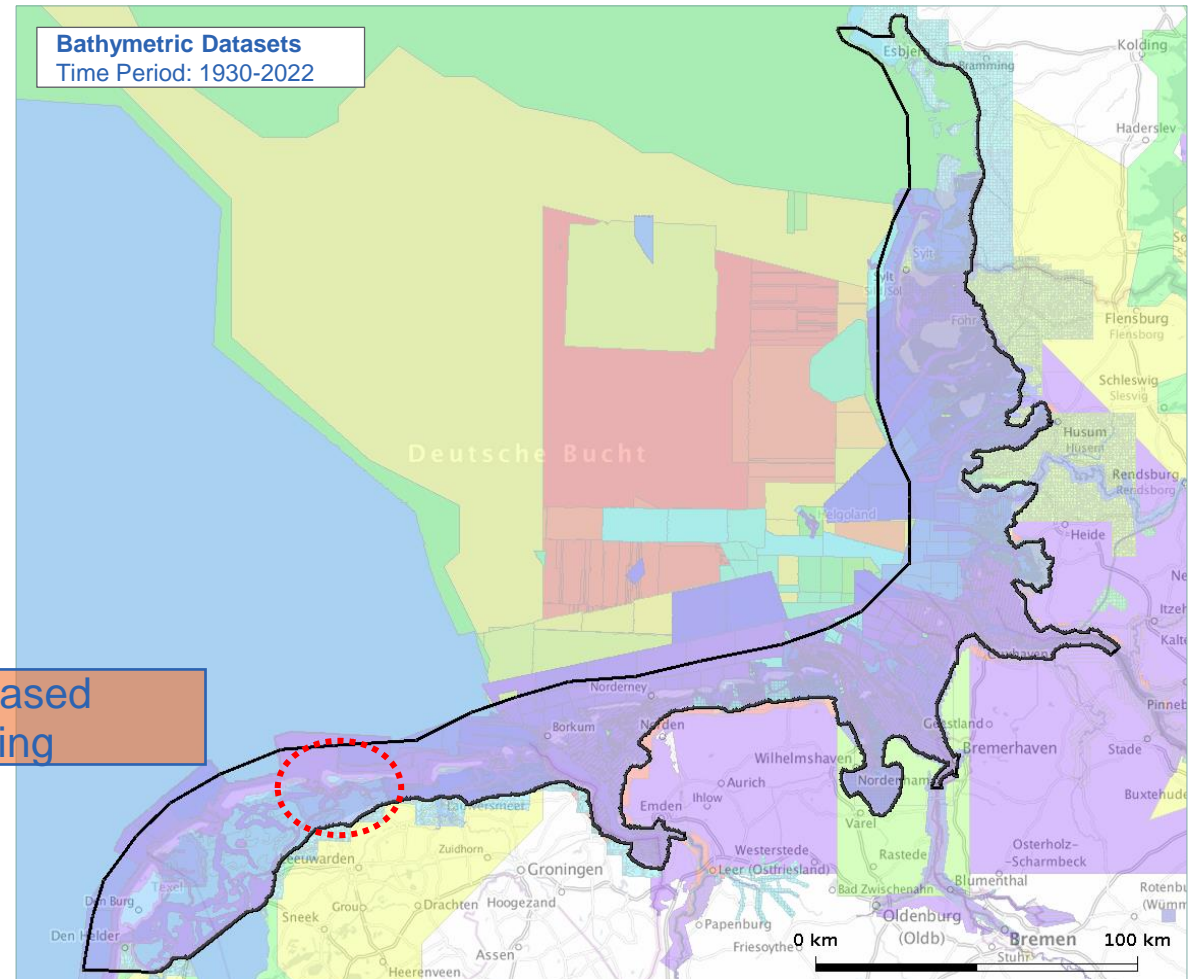
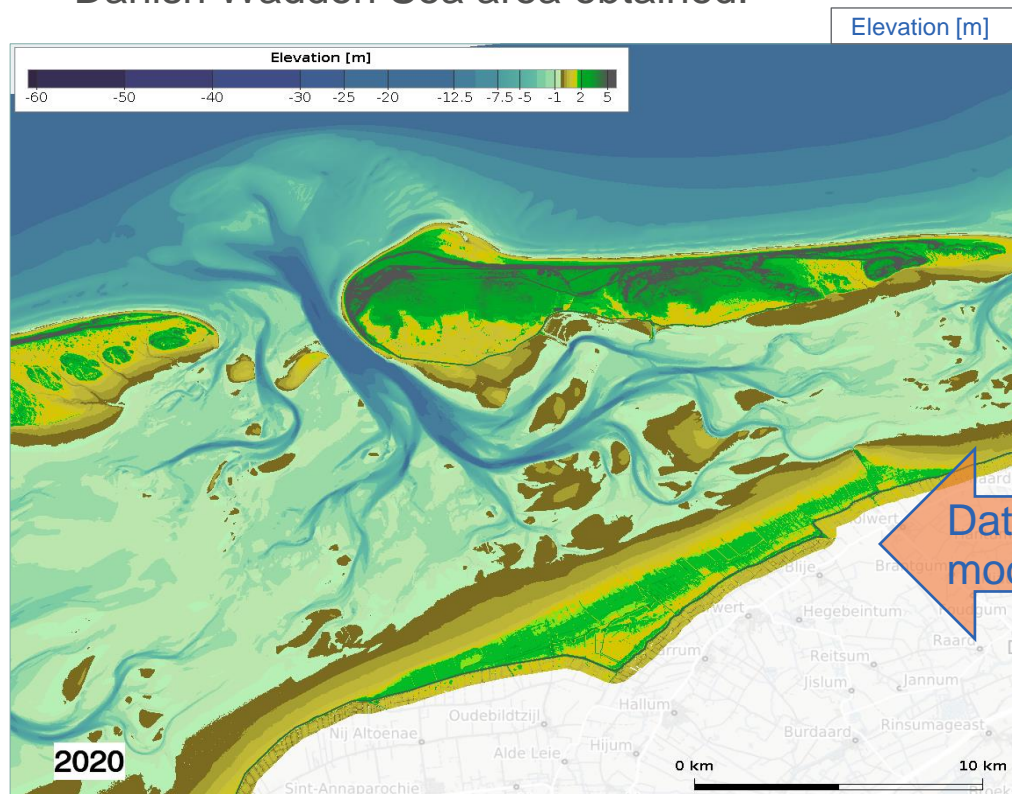
Stakeholder engagement

Stakeholder Engagement Process



Status on Data: Coverage of the bathymetric data collected up to date

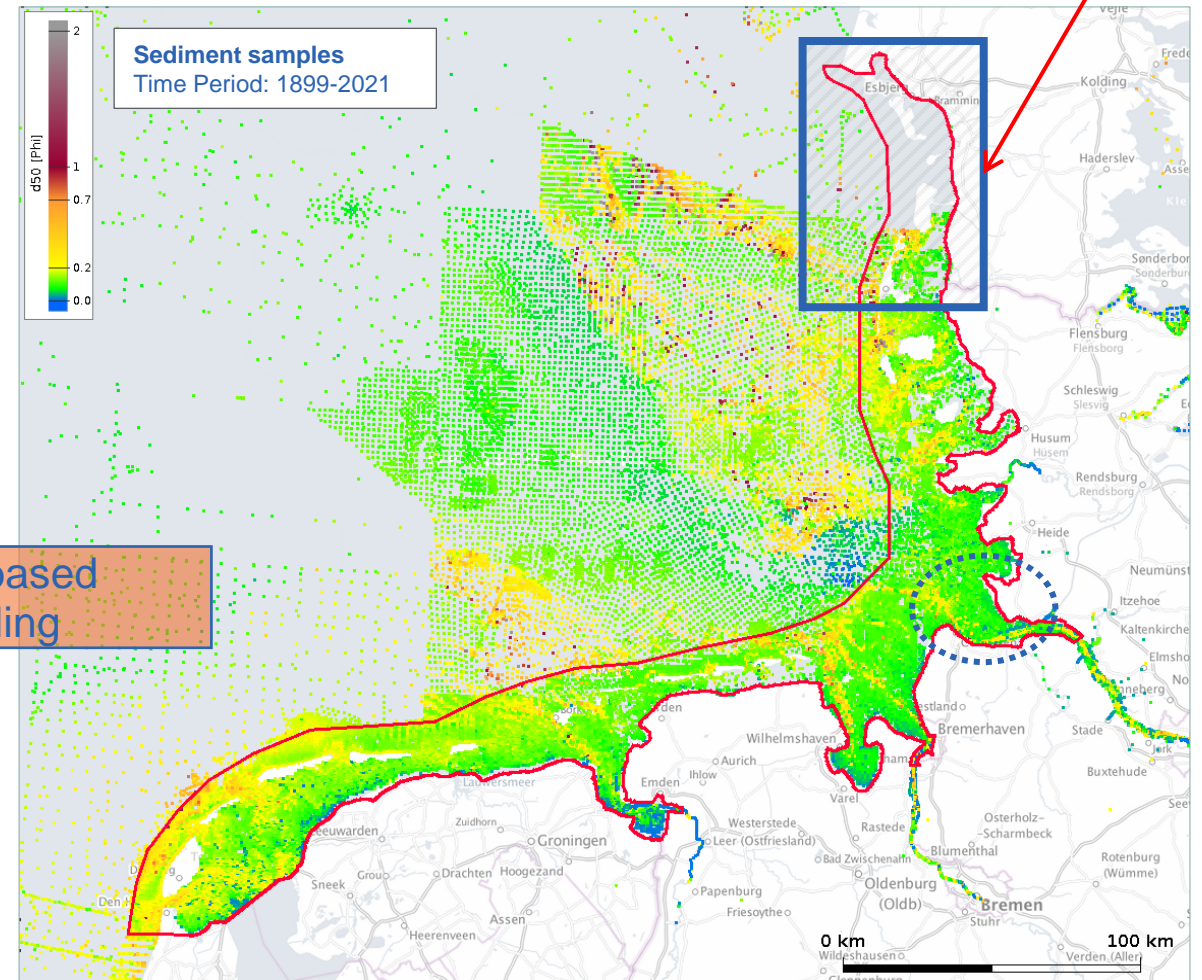
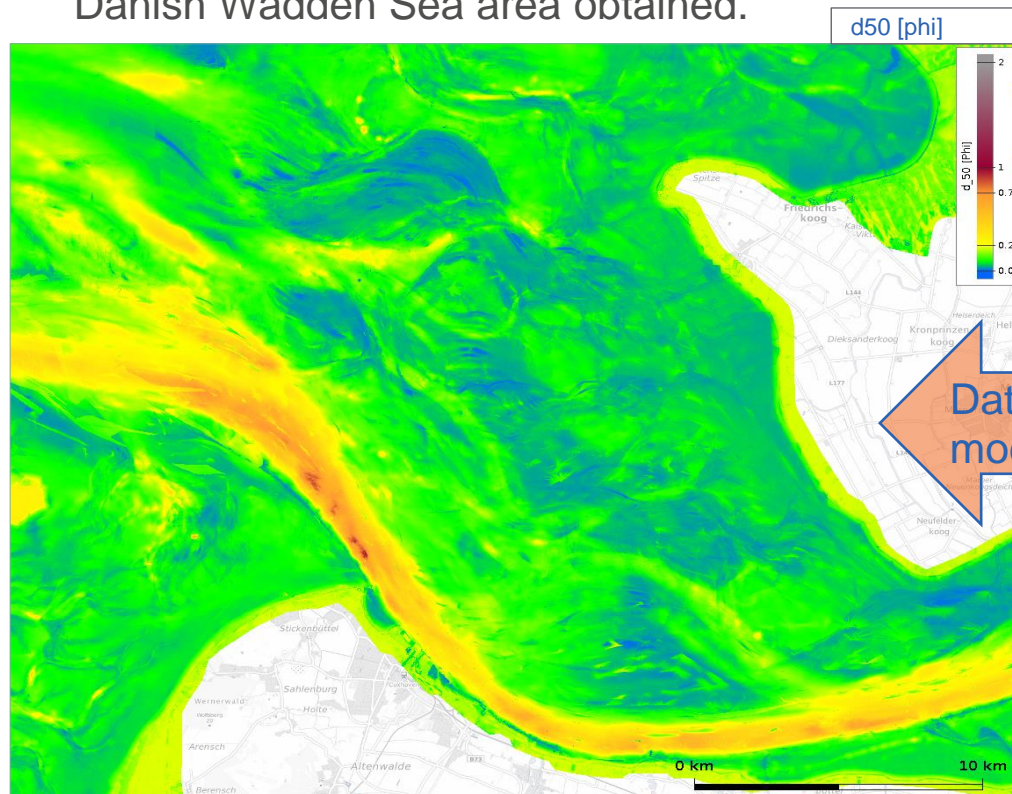
- ~144.000 bathymetric surveys and Open-Source products intended as final product (~370 Billion points with elevation data)
- Up to date insufficient data covering the
- Danish Wadden Sea area obtained.



Data-based modelling

Status on Data: Coverage of the sedimentological data collected up to date

- ~45.000 surface sediment samples collected for the project area.
- Up to date insufficient data covering the
- Danish Wadden Sea area obtained.



Insufficient data

Data-based modelling

Source: Smile Consult

Status on: Potential Pilot Cases

Bilateral Meetings

- Hereon Institute (CoastalFutures Project)
 - Potential Pilot case → Habitat Type Identification

Close cooperation between the TrilaWatt and LTER-LIFE project.

- Bringing together Physical Twin and Biological Twin of the Wadden Sea

TrilaWatt Application : Habitat Identification

Planning

Data Evaluation

Habitat Identification

Objectives + Data Gaps

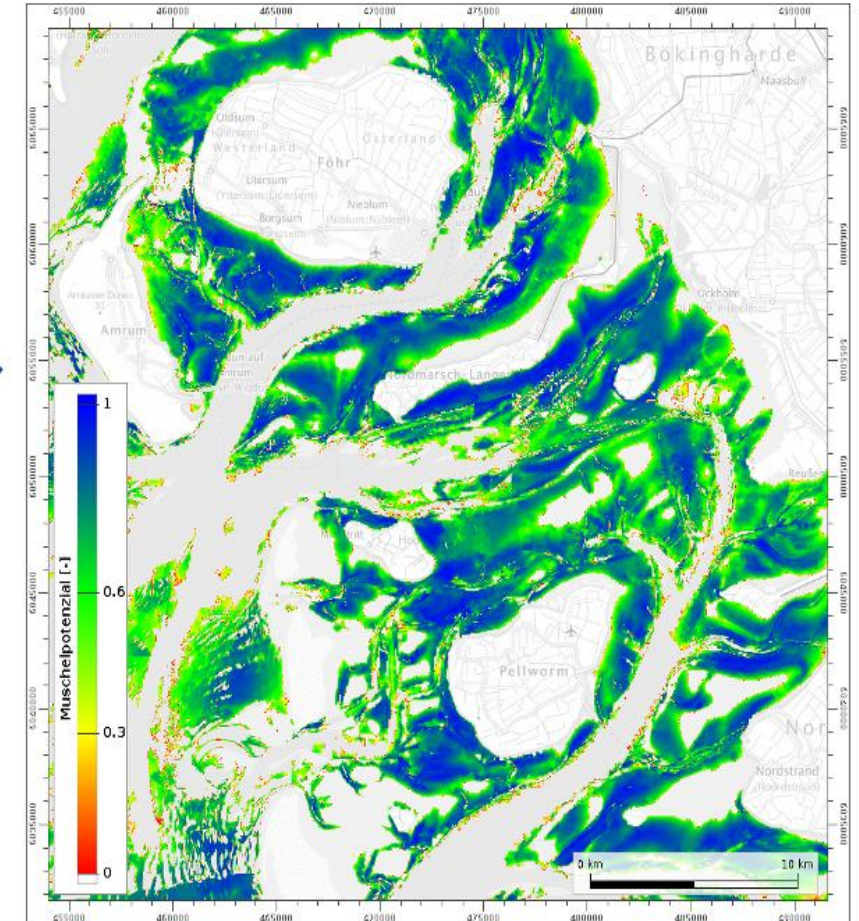
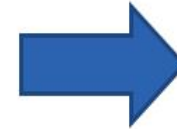
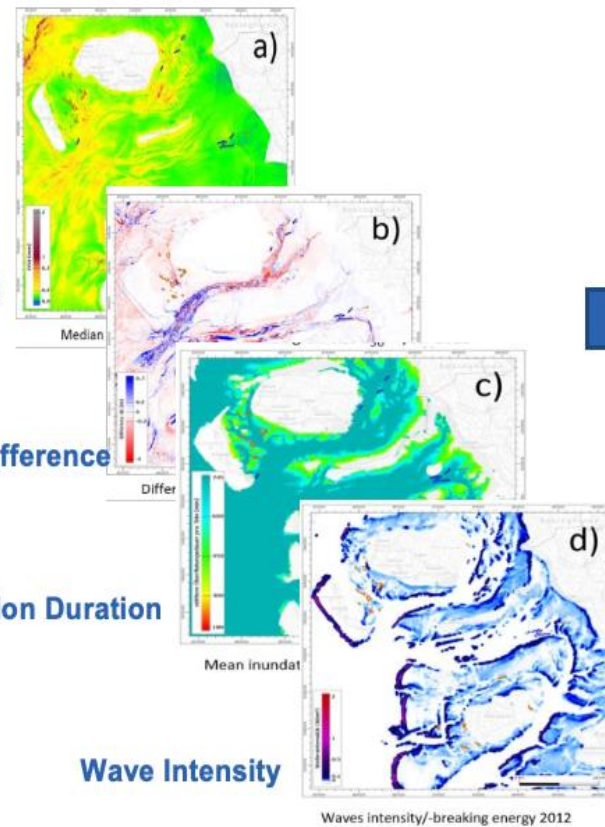


Sediment Grain size

Bathymetry difference

Inundation Duration

Wave Intensity

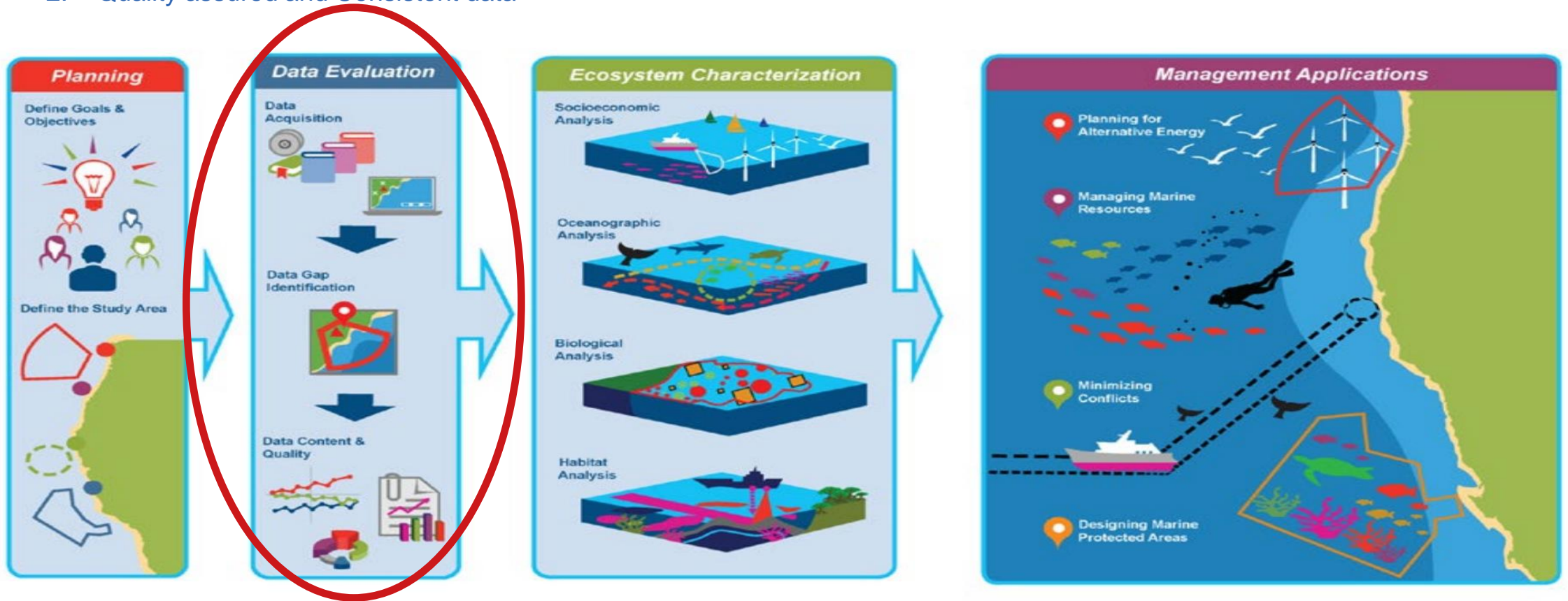


Source: EasyGSH-DB Final Scientific Report

TrilaWatt Application : A Tool To support Marine Spatial Planning

The assistance systems that facilitates:

1. Planning procedures for the development of Offshore Projects
2. Quality assured and Consistent data



Source : O'Hagan, Anne Marie. 2020 State of the Science Report, Chapter 11: Marine Spatial Planning and Marine Renewable Energy. United States: N. p., 2020. Web. doi:10.2172/1633204.

Smile Consult

Use- Case : Cable - Route Planning

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Take-Home-Messages

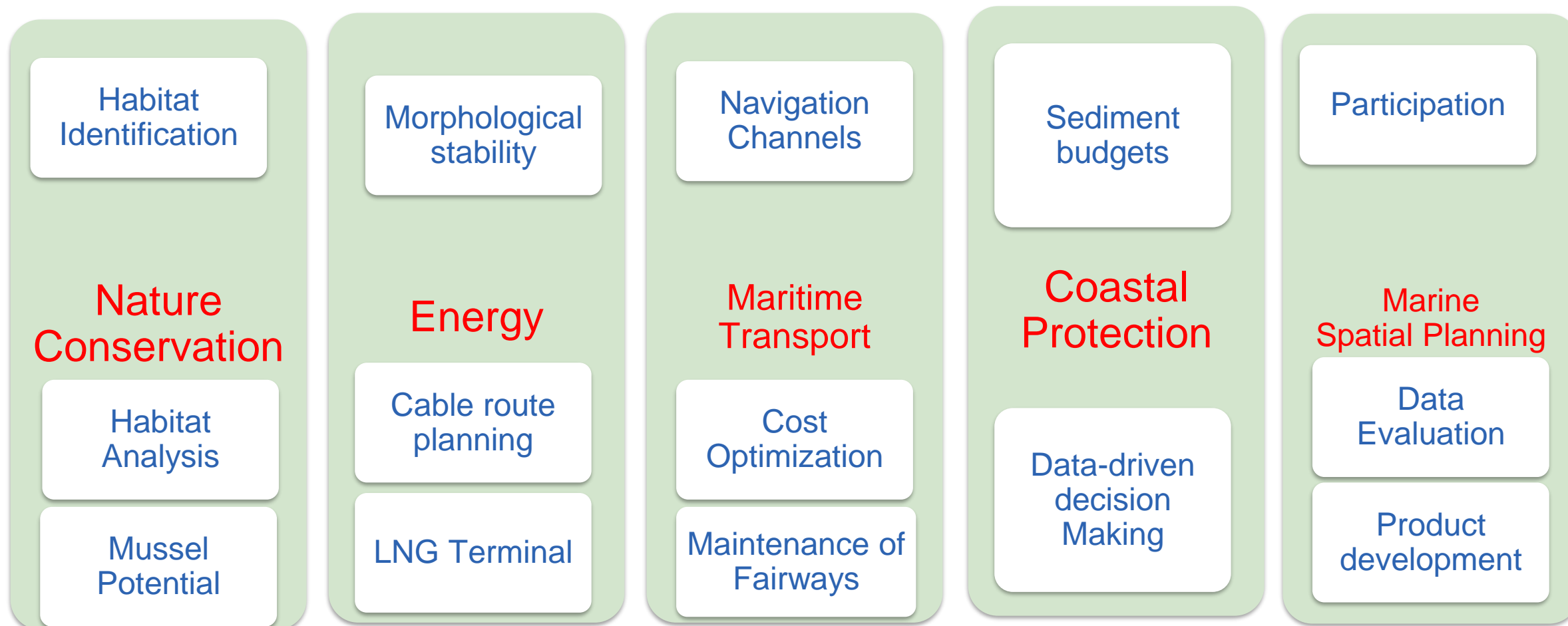
- (1) The availability of **consistent data** is imperative to sustainable, efficient decision making
- (2) We create **FAIR bathymetry**, **surface sediment**, and **hydrodynamic data** for the Wadden Sea
- (3) Navigation, data-processing and data science will be enabled **on-the-fly** in a **web environment**

END

Thank You

Product Development: Example Use-Cases

Sector Based Application of the TrilaWatt Data products

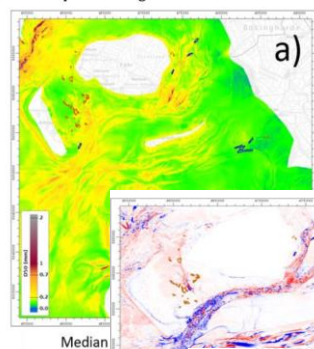


TrilaWatt Application : A Tool To support Marine Spatial Planning

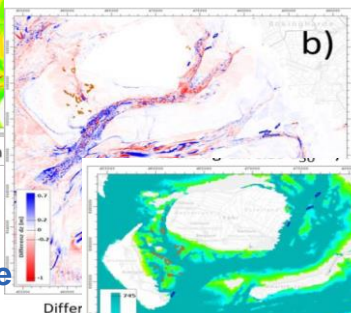
Objectives
+
Data Gaps



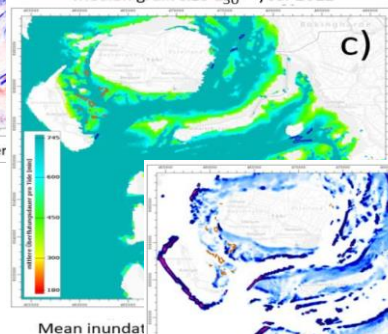
Sediment Grain
size



Bathymetry difference



Inundation Duration



Wave Intensity

