DANISH MARITIME AUTHORITY

A DANISH CIA TOOL
PROJECT STATUS, CONTEXT, USER PROFILES AND CHALLENGES

July 2nd 2026

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INTRODUCTION TO THE TOOL

BACKGROUND – DANISH MSP & THE MARINE NATURE FUND

Political Agreement on Denmark's Maritime Spatial Plan (2023)

The agreement specifically mentions ecosystem-based planning

EBA in a Danish MSP context is defined by:

- Based on internationally recognised principles (the HELCOM Guideline for EBA implementation)
- Use of best available knowledge
- Alignment with the Marine Strategy Framework Directive (MSFD)

Political Agreement on the Marine Nature Fund (2024)

- Allocation of DKK 500m (2024-2030) to strengthen data, knowledge, and digital infrastructure
- Approx. DKK 120m allocated for data and DKK 65m for a digital tool
- Of this DKK 16m for the CIA tool

Consultation responses from the MSP, showed a need for a more data-based approach, i.e. a need for a CIA tool.

INTRODUCTION TO THE TOOL

ORGANIZATIONAL SETUP

Cross sectoral working group

- The Danish Environmental Protection Agency
- The Danish Maritime Authority
- The Danish Energy Agency
- The Danish Environmental Portal

Scientific Advisory Group

- Researchers from different universities, institutions and companies tied to environmental research

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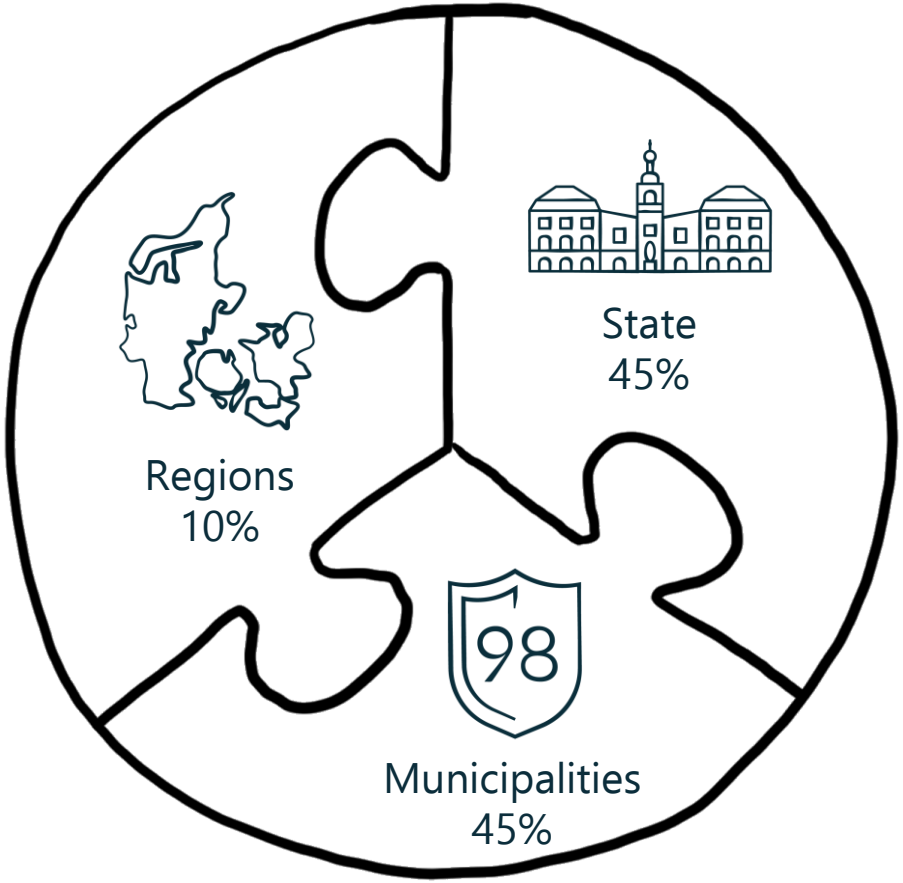
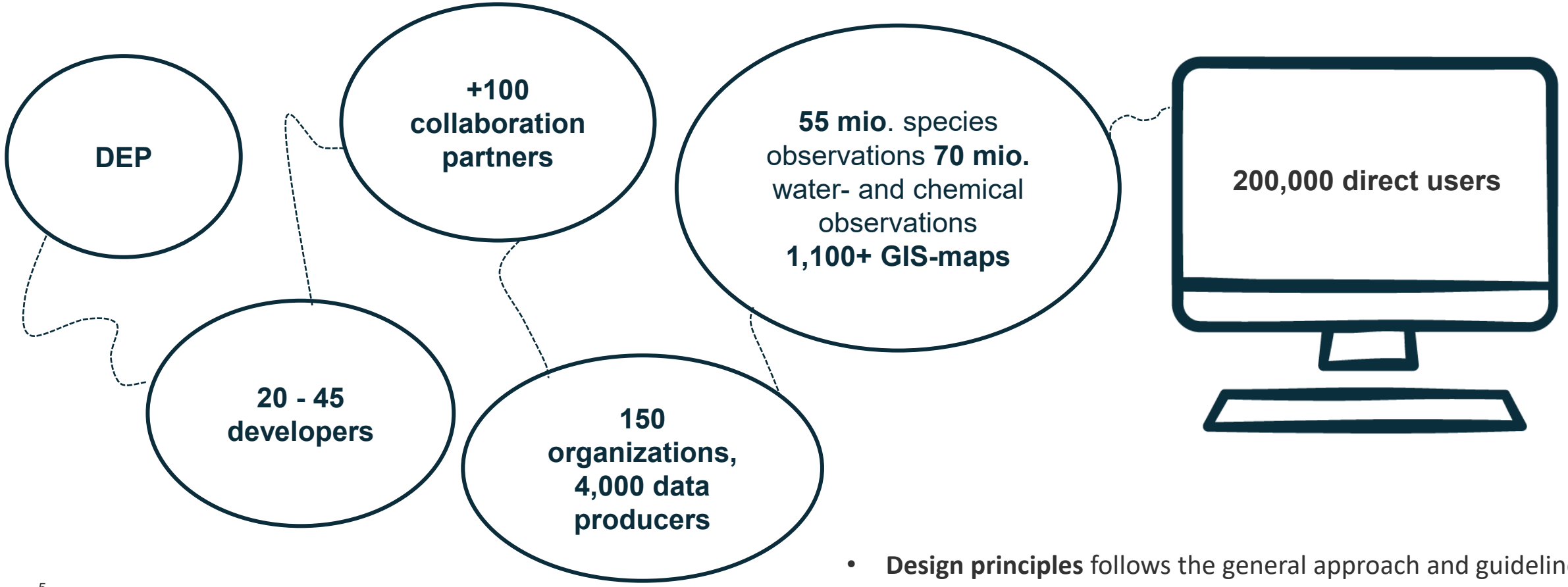
DANISH ENVIRONMENTAL PORTAL
A JOINT PUBLIC PARTNERSHIP



- Authorities (national)
- Authorities (regional)
- Authorities (municipal)
- Universities
- Interest organizations / NGO’s
- Agriculture
- Construction sector
- Real estate
- Utility companies
- Industrial companies
- IT and data companies
- Consulting engineers
- Citizens

DANISH ENVIRONMENTAL PORTAL IN NUMBERS

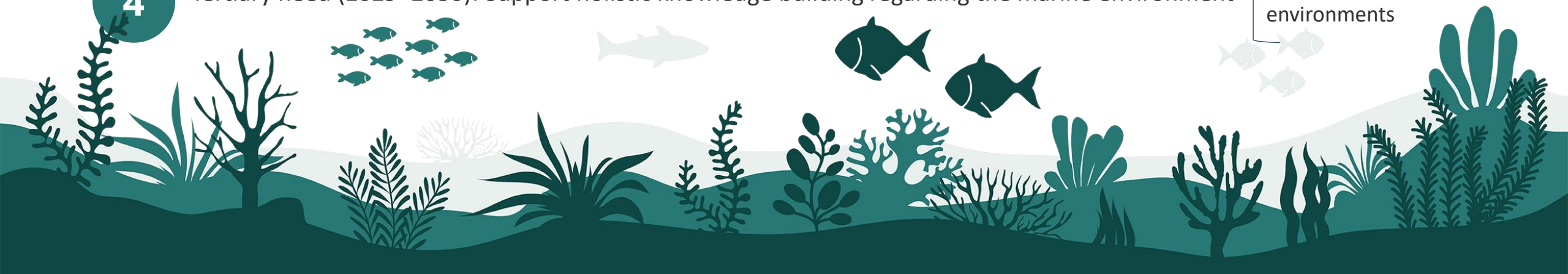


- **Design principles** follows the general approach and guideline known from other IT systems developed and managed by the Danish Environmental Portal for the Danish public sector.
- **Standardized design- and IT principles** allows for maximizing synergies and reuse between systems

INTRODUCTION TO THE TOOL

PROJECT: MARINE NATURE FUND, ANALYSIS TOOL

1. Primary need: A management tool to improve the decision-making basis for marine spatial plans — Danish Maritime Authority
2. Secondary need (2027–2030): Support environmental assessments and renewable energy expansion, as well as the designation of nature restoration initiatives — Danish Maritime Authority; Danish Energy Agency; Danish Environmental Agency
3. System architecture: Development should enable expansions and replacements within the tool
4. Tertiary need (2029–2030): Support holistic knowledge building regarding the marine environment — Knowledge environments



INTRODUCTION TO THE TOOL

PROJECT: MARINE NATURE FUND, ANALYSIS TOOL

Marine spatial planning must account for the ecosystem effects of planning.
Today: largely manual and case-by-case.
Need: a decision support tool.

The tool:
Based on an internationally recognized method: Halpern et al. 2008

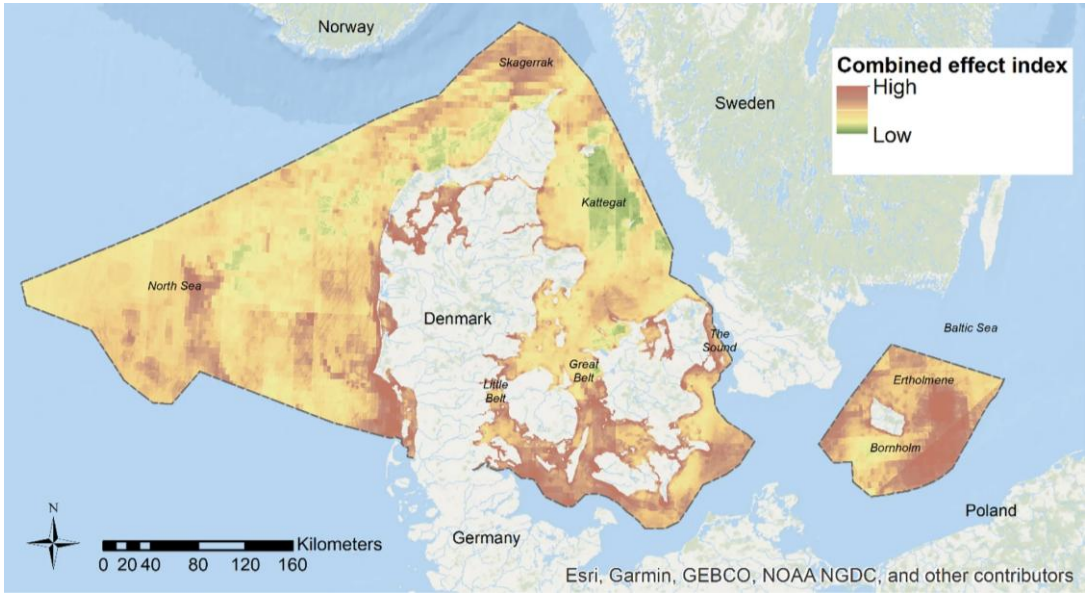
Possibility to change the computational engine if better methods appear

$$I_C = \sum_{i=1}^{n} \sum_{j=1}^{m} D_i \times E_j \times \mu_{i,j}$$

WHAT IS THE FUNCTION OF THE TOOL?

THE MSP PERSPECTIVE

- Strengthen the evidence base for marine spatial planning
- Compare scenarios and illustrate their impacts on the marine environment
- Map the cumulative pressures on the marine environment using a **relative scale**
- Account for both additive effects and synergies between pressure factors
- Incorporate positive impacts as well (e.g., nature restoration)
- Address uncertainties and seasonal variations throughout the year
- Make results accessible through a user-friendly interface



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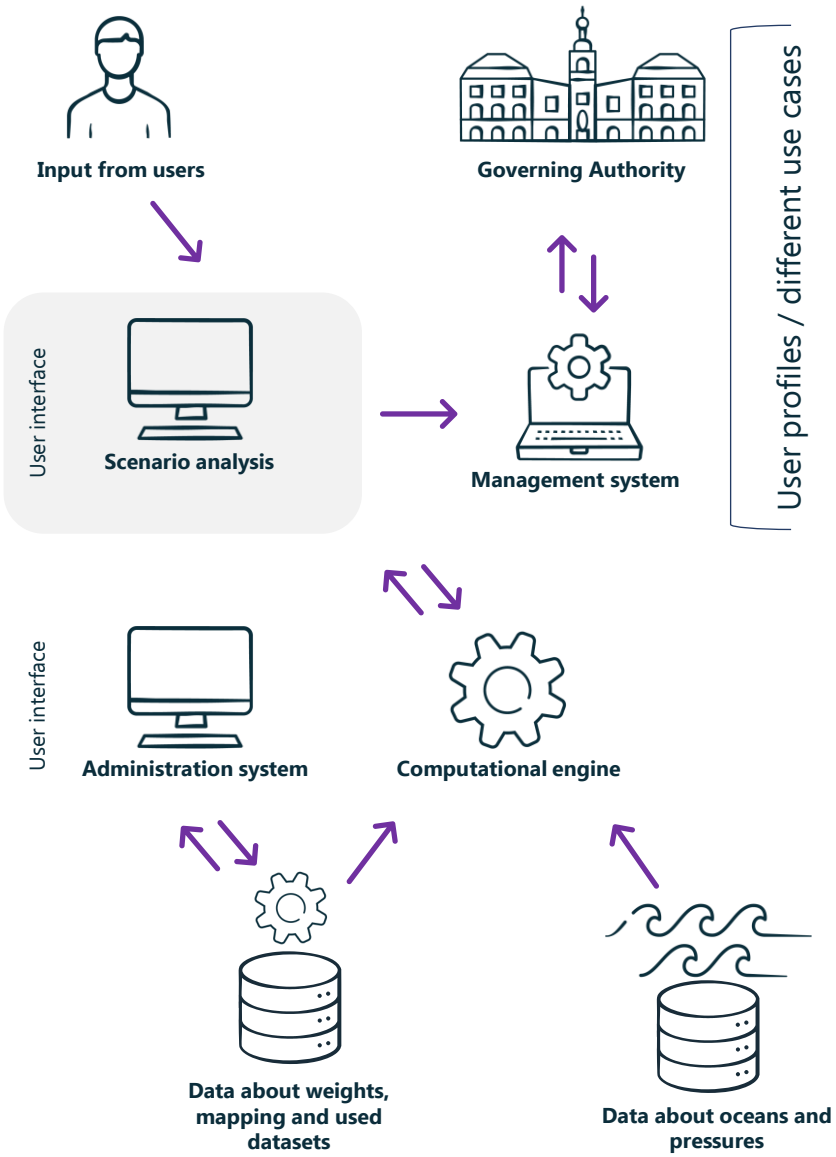
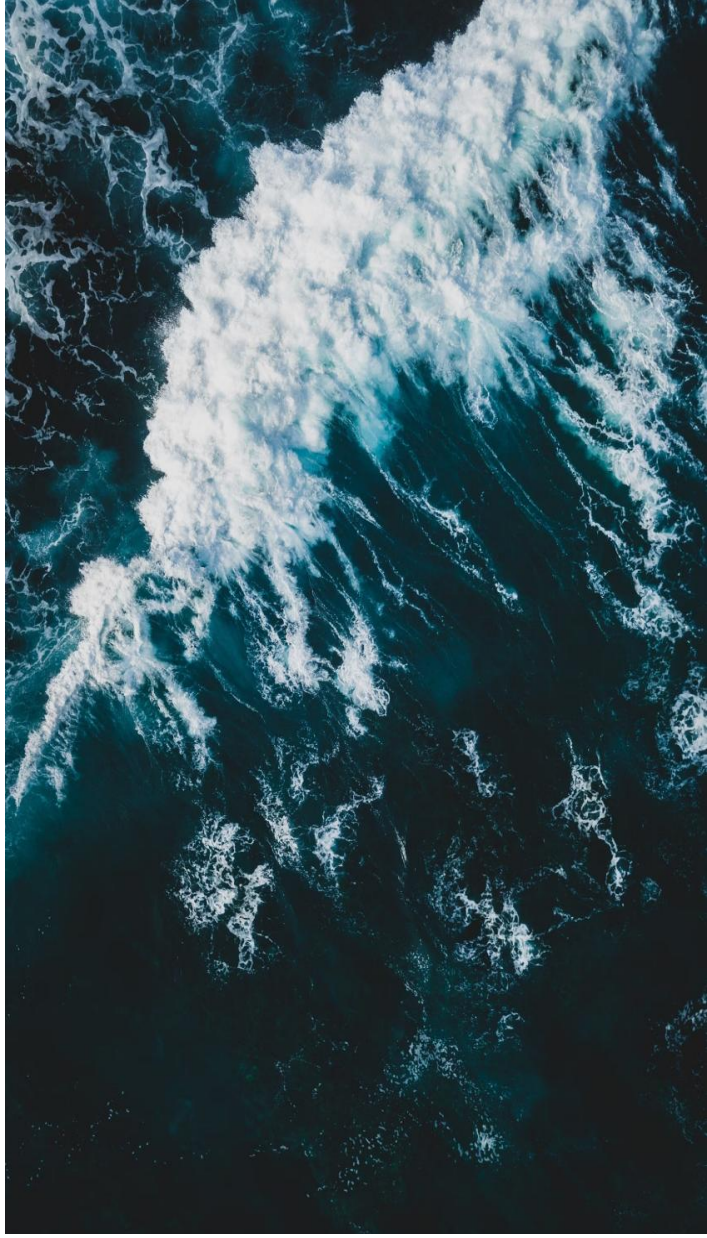
2026

System architecture for primary needs



Decision-support, not EIA-method



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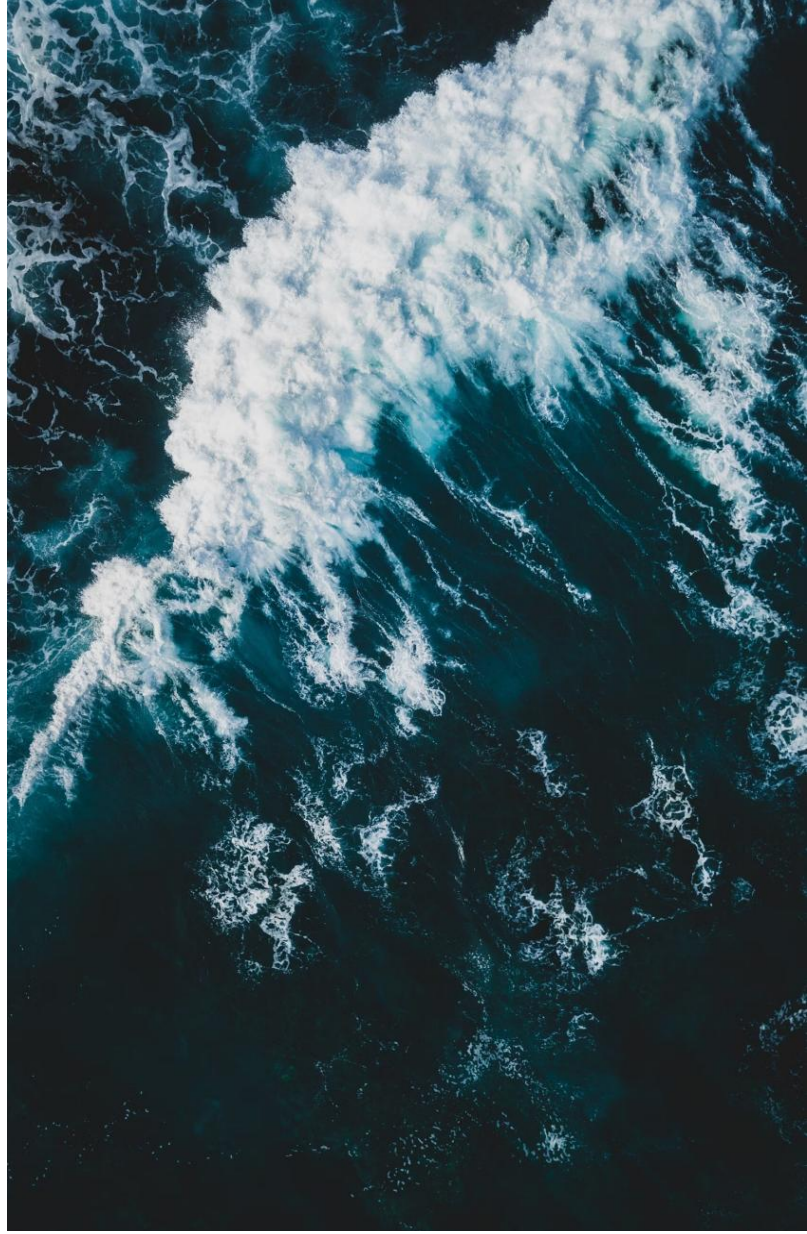
USER PROFILES
PRIMARY & SECONDARY NEEDS

Primary need: The Danish Maritime Authority

- Fully MSP oriented
- Should run scenarios on MSP
- Essentially a decision-support tool
- We are not IT-experts
- We are not marine biologists
- We are planners!

Secondary need: Other Authorities

- Plan and project oriented
- E.g. energy projects or nature restoration
- Contribute to SEA and EIA



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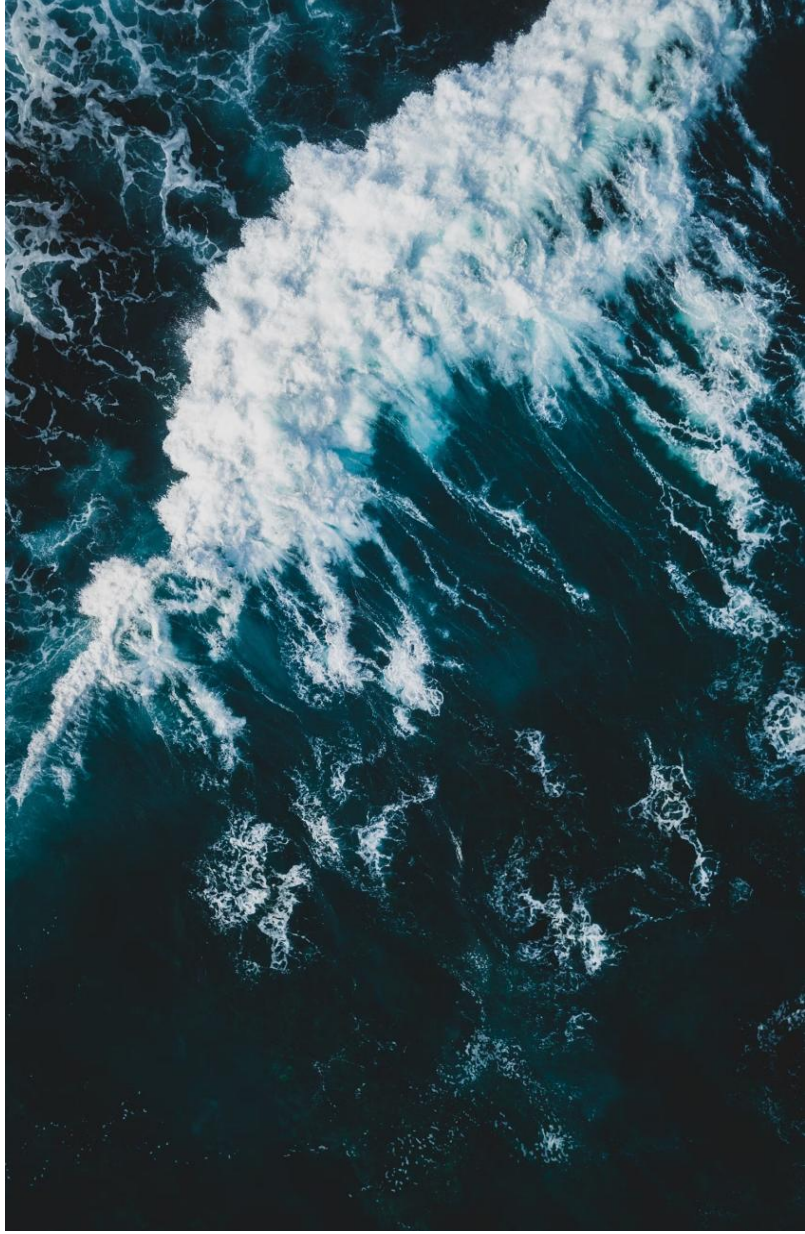
ADMINISTRATION SYSTEM

EXPERT-USERS

- Small group tasked with managing the administration system
- Setup of different configurations
- Assign activities, pressures and ecosystem components
- We don’t expect to have too many configurations and we also need to decide how frequently the expert group should meet / update configs



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Sensitivitymatrix

Ecosystem components

Excisting press factors

Zonetypes

0 of 4 steps validated

Excisting press factors

Validate

Presfaktorer som er tilstede for et havområde, uden at medregne de planlagte aktiviteter som arealudlæg og konkrete aktiviteter medfører.

Added 4 press factor groups

Add group +

Shipping

2 datasets

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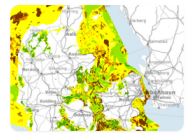

Press factor

Deep Sea Compression

↪ Matrix 2026 - Kattegat og østersen

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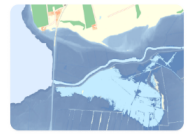
Databutik | Styrelsen for Grøn Arealomlægning og Vandmiljø (SGAV) | 22.04.2024 kl. 11:23



Press factor

Abyssal Pressure Zones

↪ Matrix 2026 - Kattegat og østersen

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Databutik | Miljøstyrelsen (MST) | 30.07.2024 kl. 10:09

Costal development

0 datasets

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No data added

+

Title

Konfiguration 2026

Description

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi ac venenatis elit, ultrices cursus sapien. Aliquam hendrerit odio ac neque sodales.

Calculation model

Halpern, 2026

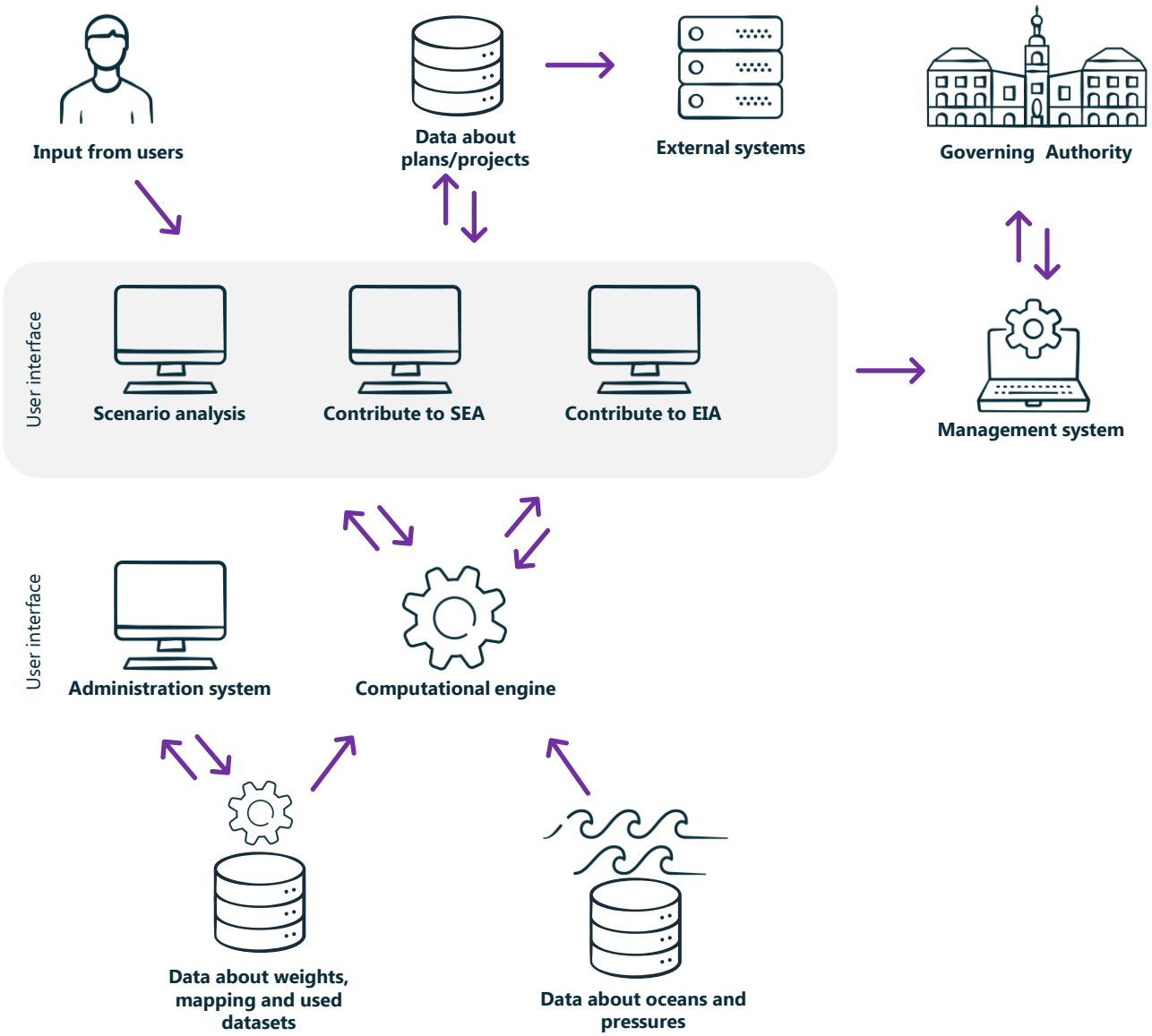
Edit

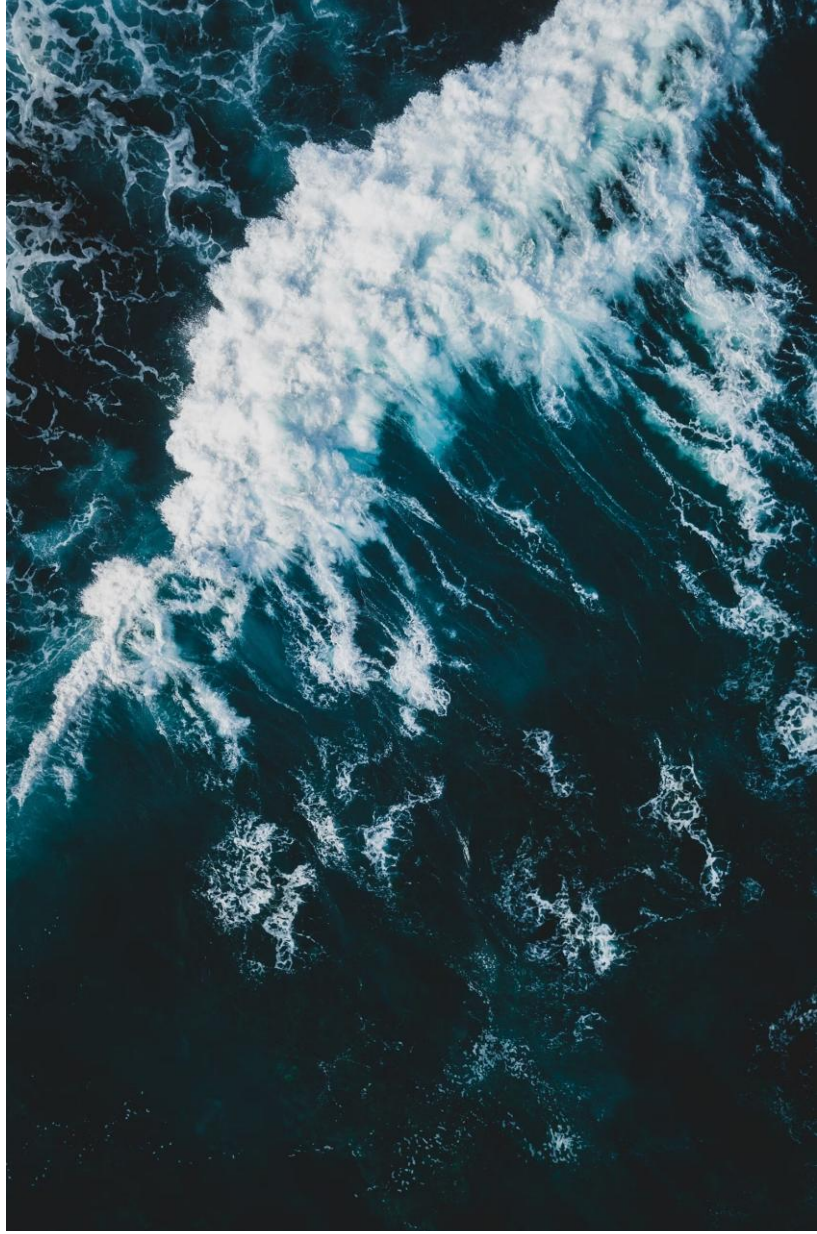
Status

Draft

2027-2030

System architecture for secondary needs





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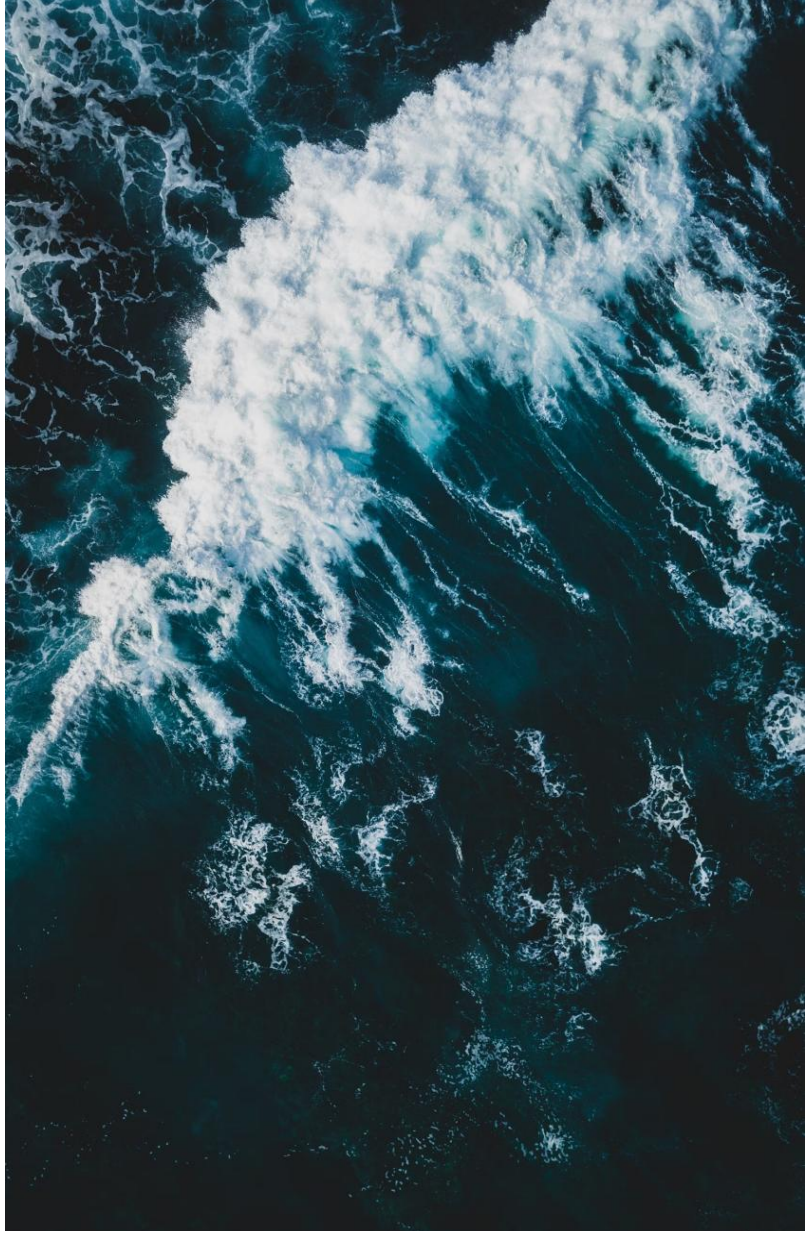
TRANSPARENCY IN THE PROCESS

- Transparency is important!
- User experience should not be overly complex
- We need to be able to communicate results and uncertainties
- Still figuring out how to visualize and describe uncertainties



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SUPPORT AND CHALLENGES

Raw data

- Data sources (potentially international) used for cumulative effect assessments.
- Data layers considered essential or high-priority in an ecosystem-based analysis tool.
- Experiences with handling seasonal variation in data. Recommended approaches? Annual/seasonal averages, means, worst-case scenarios, worst 10%, ...?

Modelled data

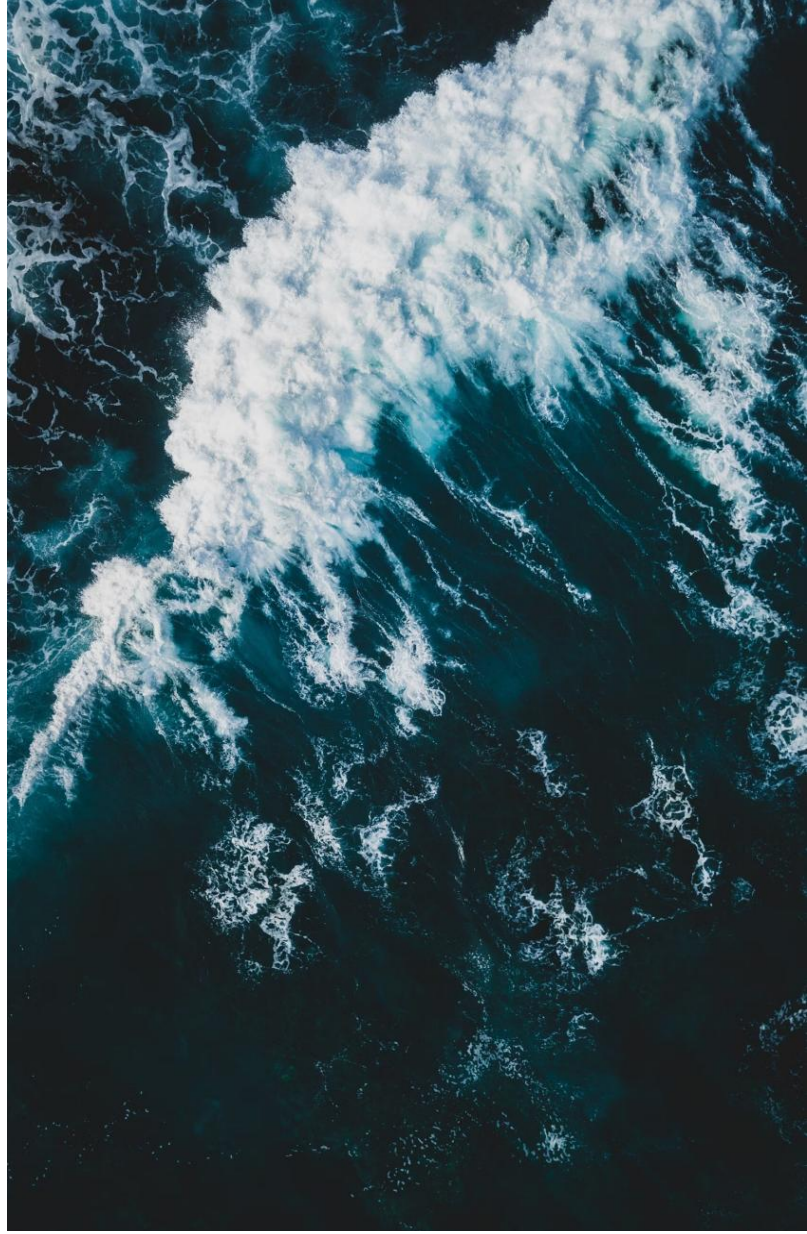
- Developed data layers (i.e. continuous surface) available for Danish use. What data formats?
- Description of method for point data to continuous surface described.
- Frequency used to update modelled data. Minimum update frequency?
- Implementation of pressure decay distances from point sources.

Spatial scale

- Experience using ecosystem-based analysis tools at smaller scales (e.g. project level), in addition to marine spatial planning applications.
- Importance of adopting a common grid alignment and cell size to facilitate cross-border data sharing and assessment tool interoperability.

Uncertainties

- Approaches to measure, document and visualize uncertainties. Based on quality of raw data, modelled data and the CEA model used in the assessment tool.



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CONTACT INFORMATION

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THANK YOU FOR YOUR ATTENTION

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