

# Offshore Activities and Seabed Evolution

## The North Sea Foundation

6 November 2018

Christiaan van Sluis

Stichting  
**De Noordzee**

# Mission and themes



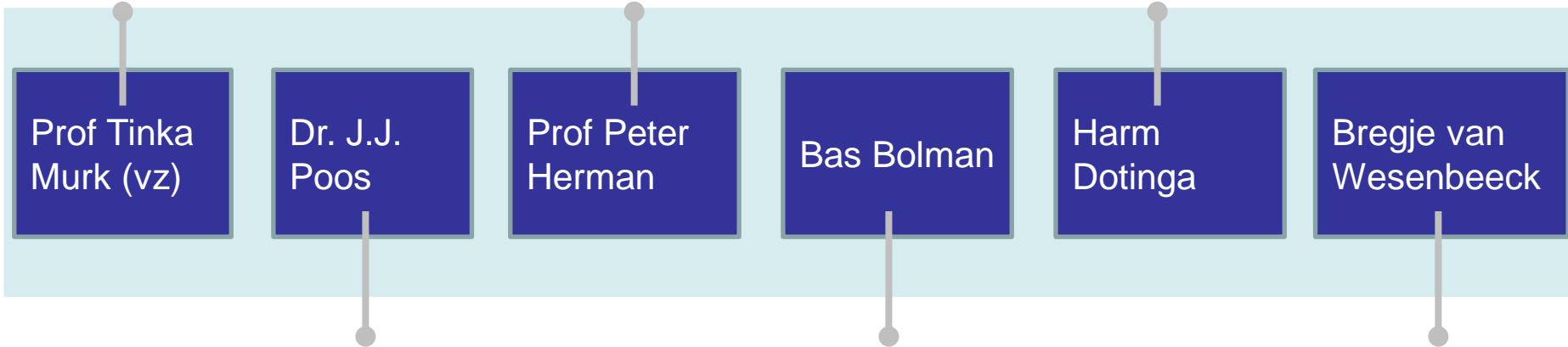


# Scientific council NSF

- Prof Marine Animal Ecology  
WU, ecofisiologische adaptatie aan veranderende omstandigheden, ecosystem-based approaches
- Oud bestuurslid SDN
- <https://www.wageningenur.nl/nl/Personen/Tinka-Murk.htm>
- Werkzaam bij Deltares
- Prof Spatial ecology, estuaria, geofysica bij NIOZ en Radboud
- <https://www.linkedin.com/in/peter-herman-776a4642>
- NILOS & Vogelbescherming NL;
- Voormalig bestuurslid SDN
- Expertise op het gebied van Recht van zee en natuurbescherming
- <http://www.uu.nl/medewerkers/HDotinga/0>

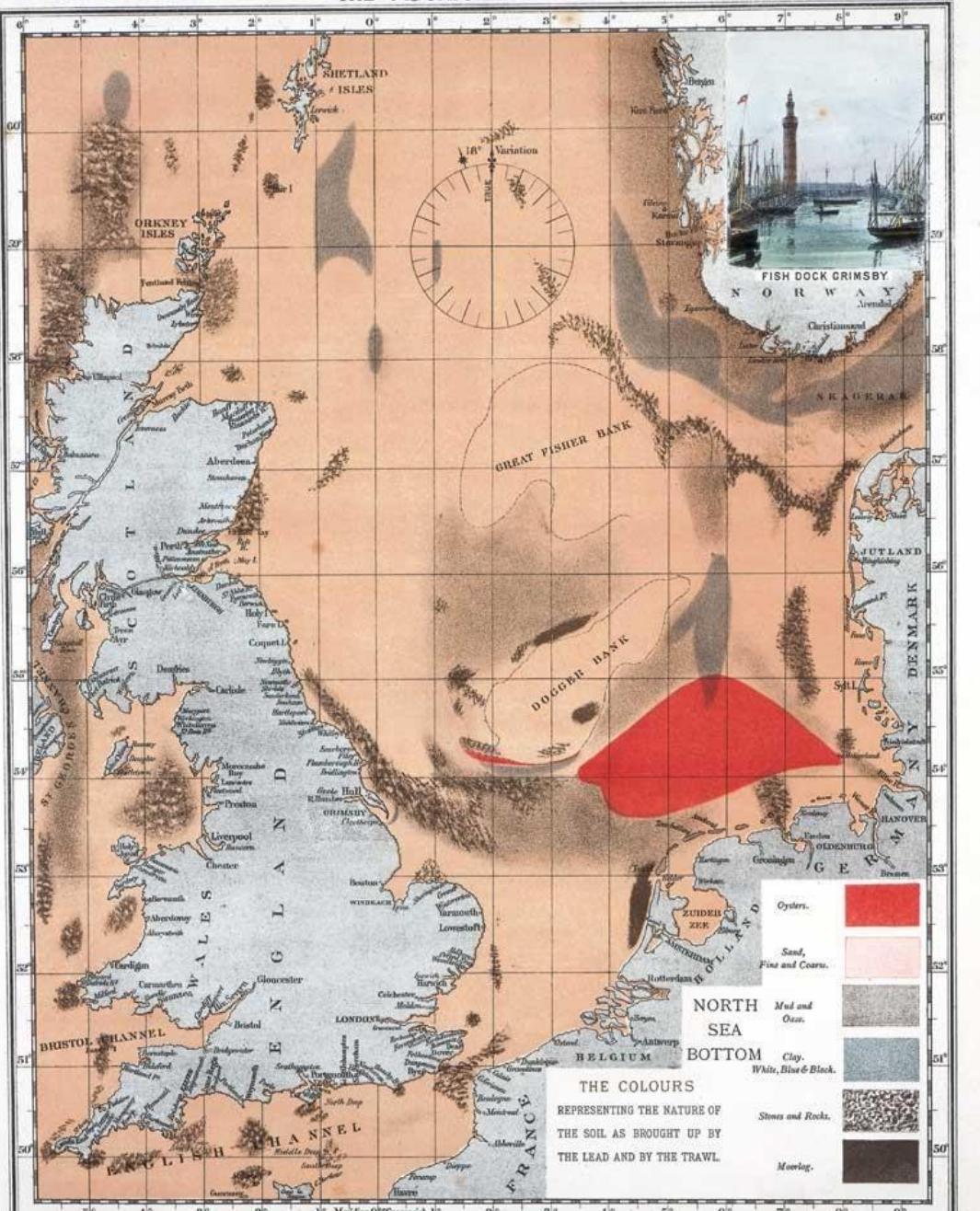
## Key values:

- Science based
- Collaboration
- Problem-solving
- Independent



- Visserijspecialist focus op NoordZee
- IMARES
- <https://www.wageningenur.nl/en/Persons/dr.-JJ-Jan-Jaap-Poos.htm>
- Senior advisor Marine and Coastal Management - Deltares
- <https://www.linkedin.com/in/bas-bolman-2873ba17>
- Building with nature, Nature-based flood risk mitigation and ecosystem assessment
- <http://experts.deltares.nl/bregje.vanwesenbeek>

# THE PISCATORIAL ATLAS.



# Seabed habitats

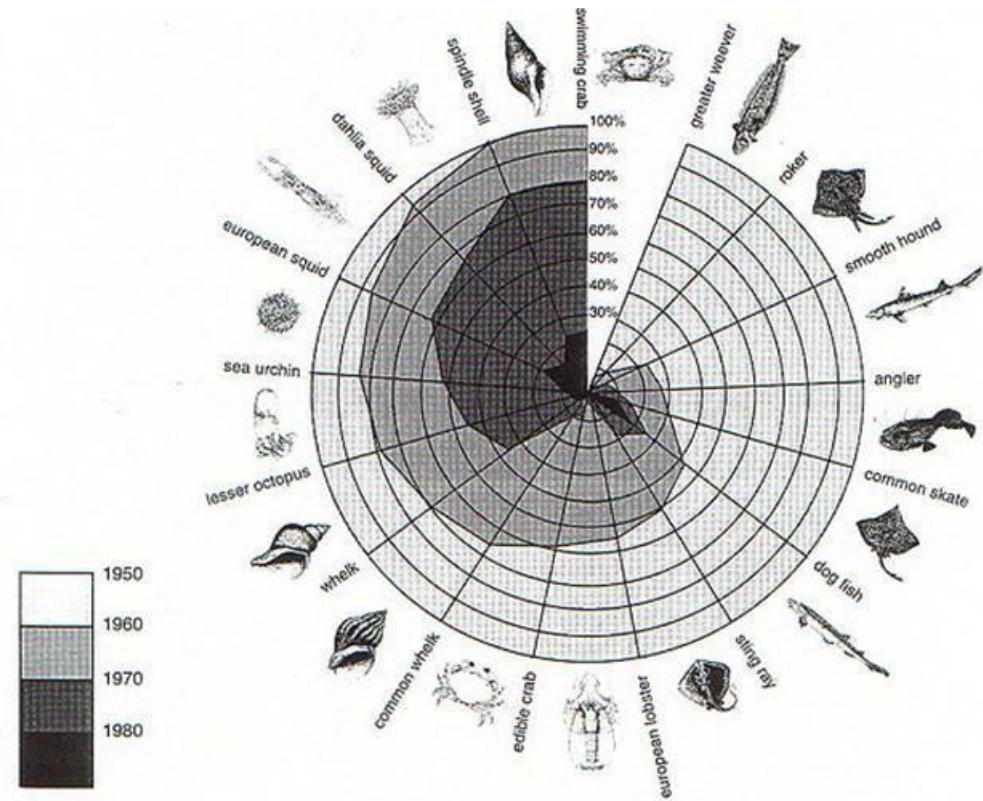
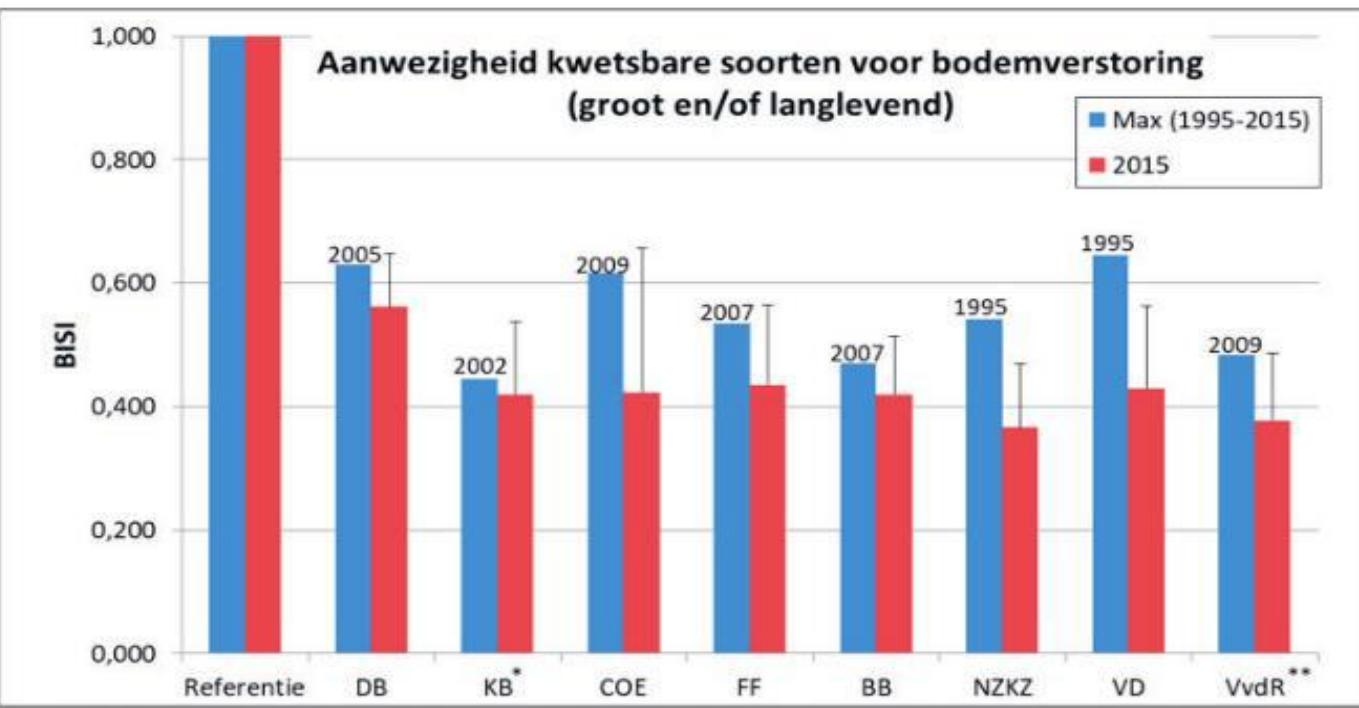
- Stones
- Peat
- Clay
- Wood
- Sand and silt
- Less habitat variation



Bron: "Piscatorial atlas of the North Sea", O.T. Olson 1883

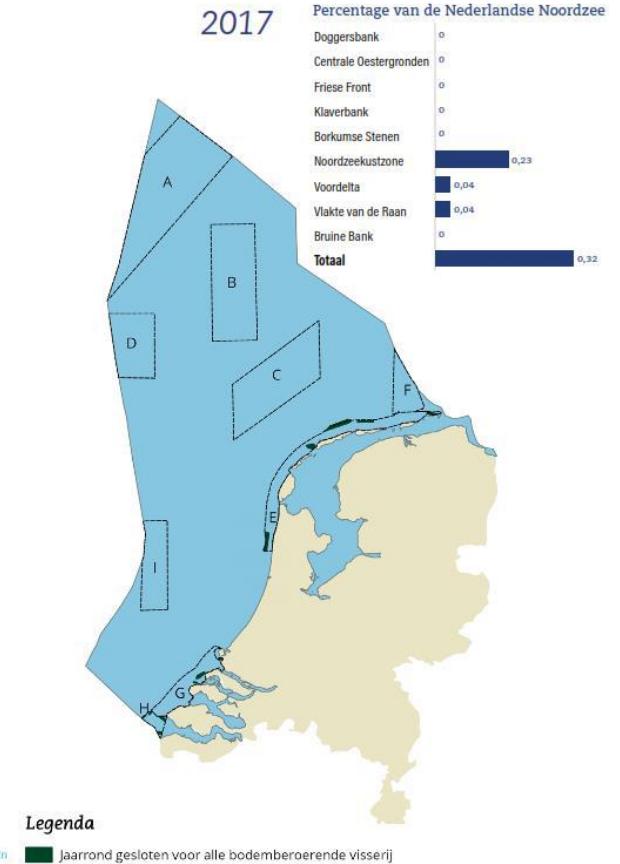
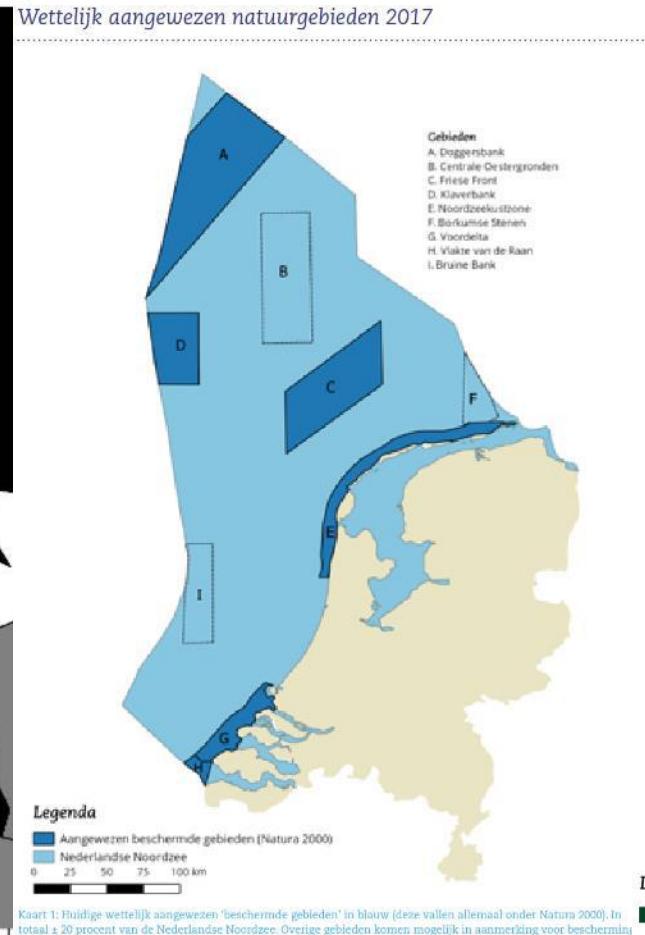
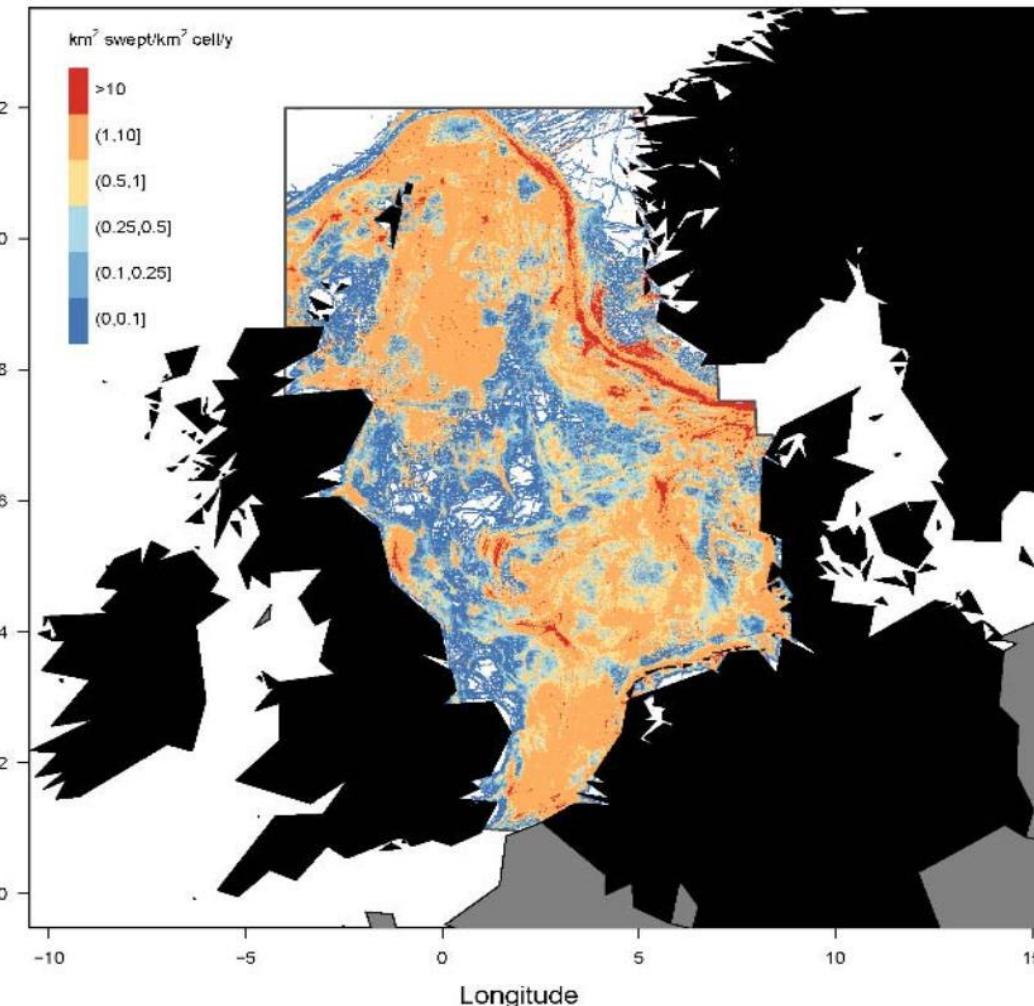
Schoolplaat 'In de Noordzee' van M.A. Koekoek

# Benthic fauna: shifting baselines



# Example: pressure and solution

All towed gears



Bron: [www.benthis.eu](http://www.benthis.eu)

Vrooman, J., van Sluis, C., van Hest, F., 2018. Gebiedsbescherming op de Nederlandse Noordzee. De stand van zaken in relatie tot visserij. Stichting De Noordzee, Utrecht

## TU Delft (PhD 1)

### Acoustic habitat mapping - Large scale (km)

Outputs:

- Higher resolution acoustic habitat mapping
- Sediment classification
- North Sea hotspots benthic organisms

## RUG (PhD 2)

### Habitat classification - Intermediate scale (<100 m)

Outputs:

- Video surveys
- Habitat classification
- Modelling habitat distribution
- Online GIS information system

## NIOZ (PhD 3)

### Resilience benthic communities - local scale (< 1 m)

Outputs:

- Actual species diversity
- Analysis functional traits spec. community
- Modelling species & functional trait distribution
- Link to disturbance – community resilience

## Publications on:

Distribution, structure, functioning and recovery potential of low-resilient benthic communities and habitats of the Dutch North Sea.

## SDN

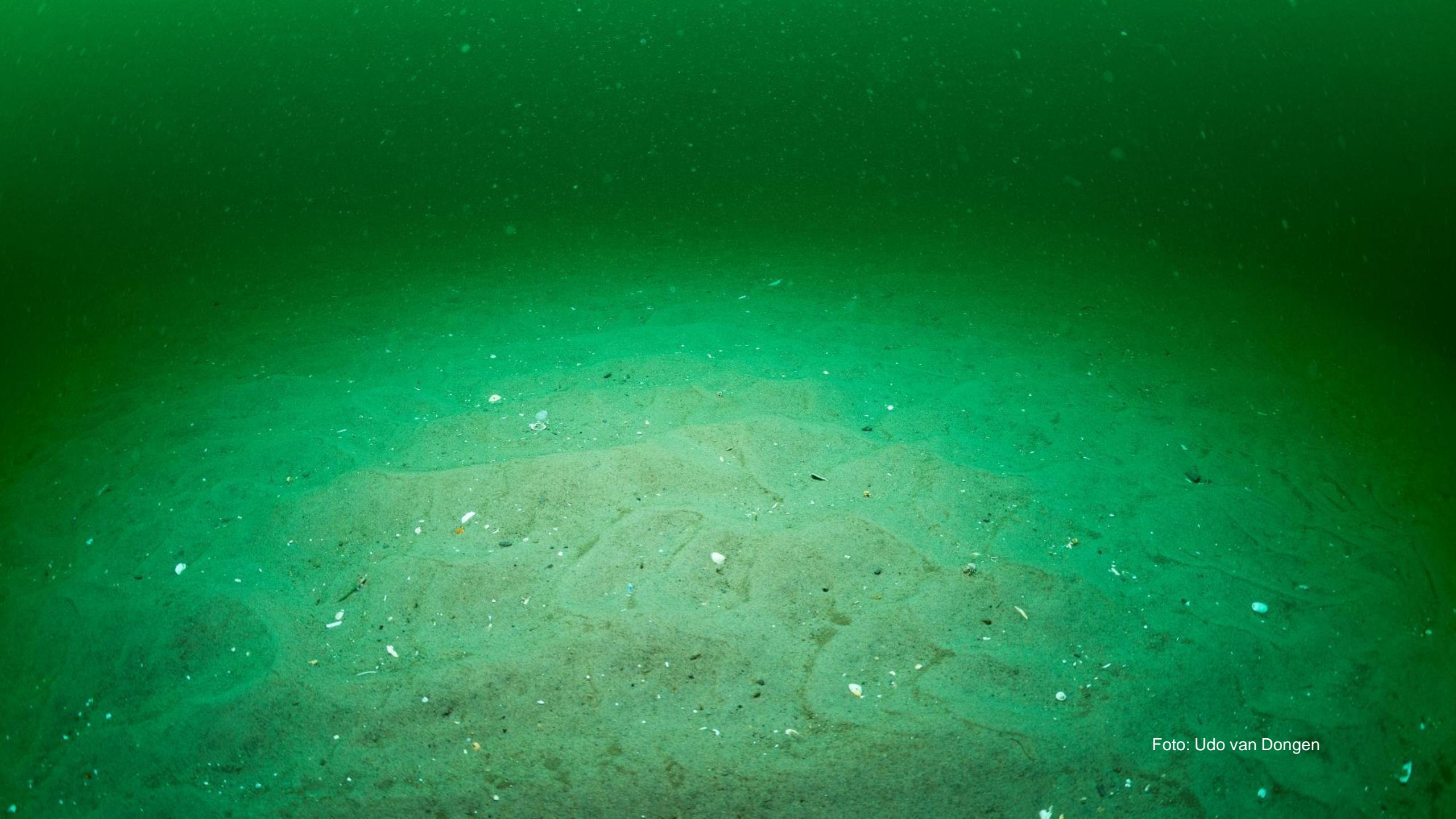
### Project communication and implementation

Connection to:

- Marine experts
- Other North Sea projects
- NL & INT NGO's
- Dutch public
- Industry
- Policy

Level of detail studied

1. *Provide detailed maps of the North Sea bottom*
2. *Assess the boundary conditions under which rich communities can grow*



A wide-angle underwater photograph showing a sandy seabed. The sand is light brown and covered with numerous small, scattered pieces of debris, including white plastic fragments and dark organic material. The water above is a deep, murky greenish-blue, with visibility limited to about 10 meters. The overall scene is one of marine pollution.

Foto: Udo van Dongen



Foto: Udo van Dongen



Foto: ROV Oceana



Foto: ROV Oceana

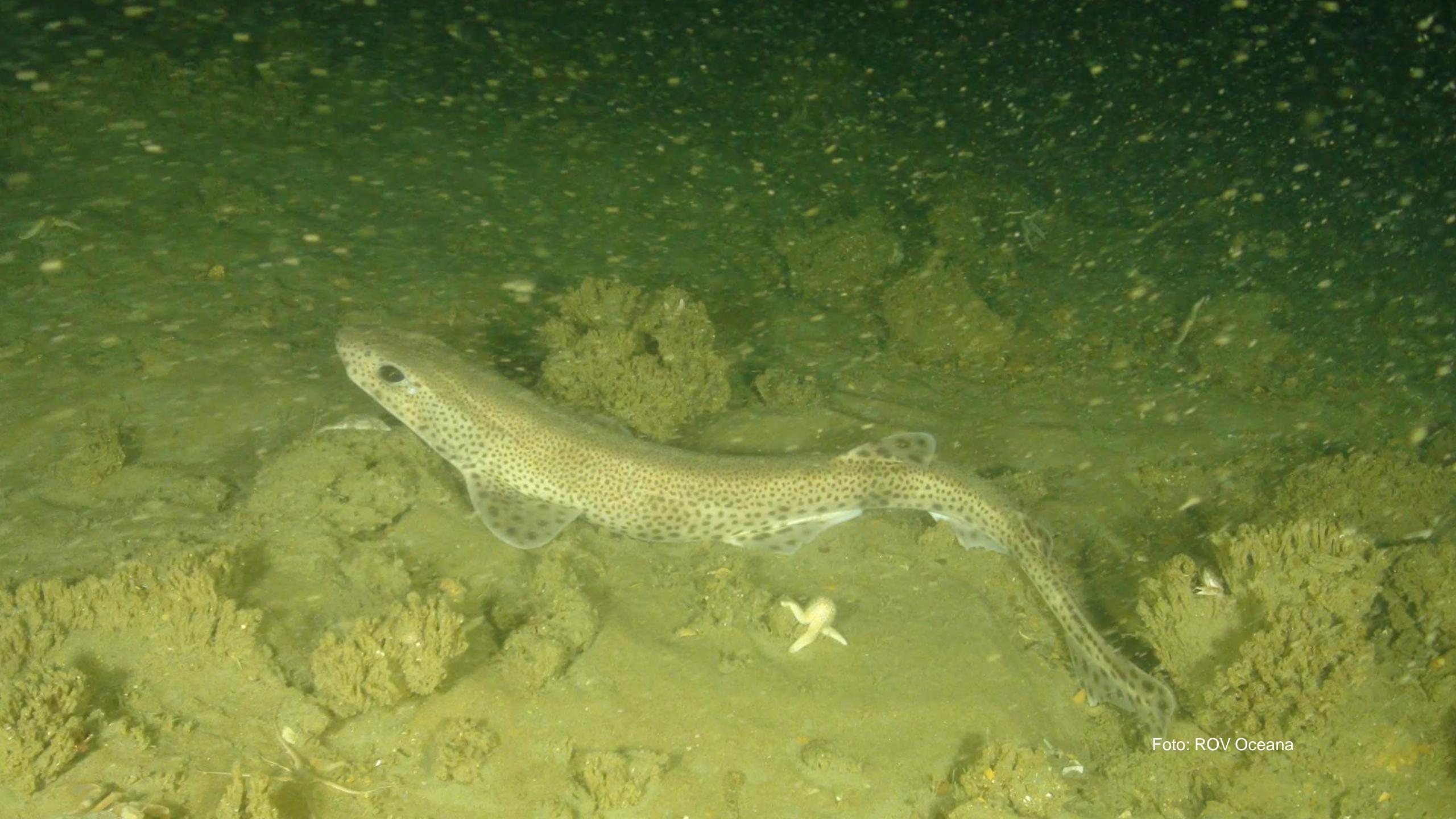


Foto: ROV Oceana

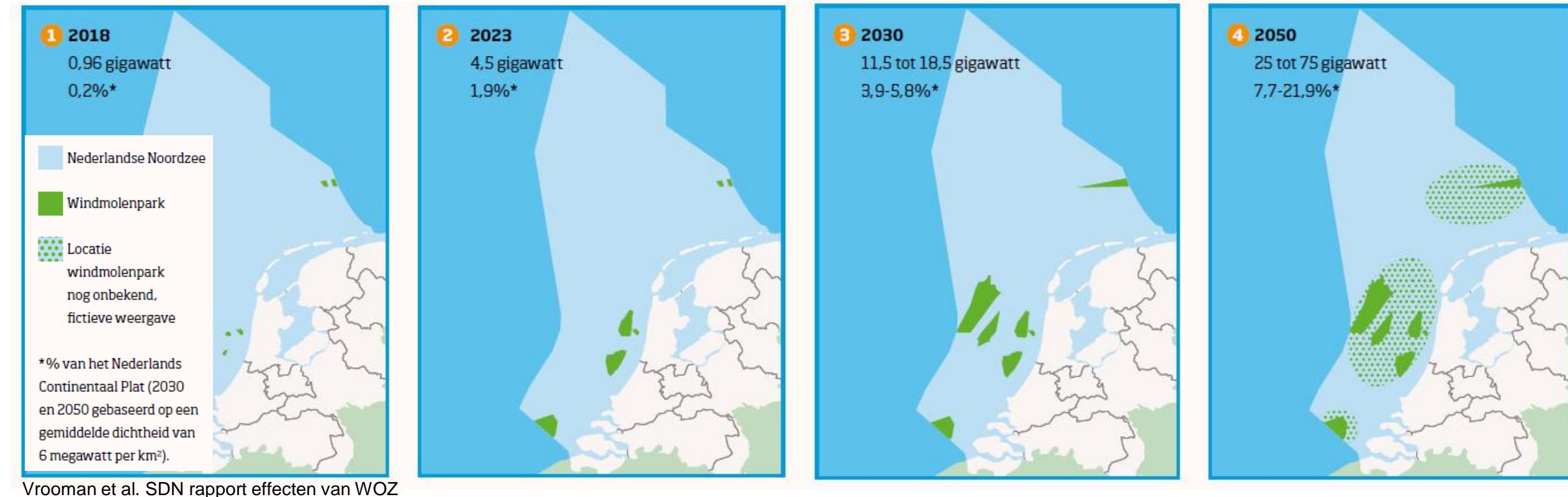


Oscar Bos



# Offshore Wind Opportunities and threats

# Current choices define the future



Offshore wind is key in Marine Spatial Planning

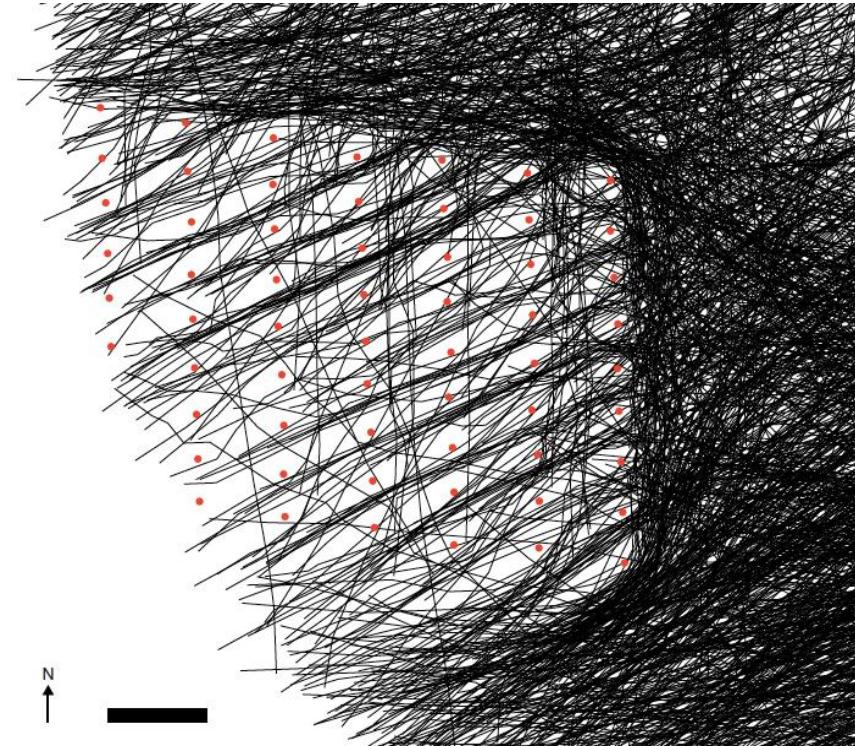
# Combining offshore wind and a healthy sea

Aim: Natura 2000 and Marine Strategy Framework Directive:  
Protect and restore NS nature

- 2018-2020 appropriate budget for ecological research
- 2020 wind areas designated based on ecological research & adaptive management



NASA's Earth Observation



Desholm, M. (2006).

## RISKS

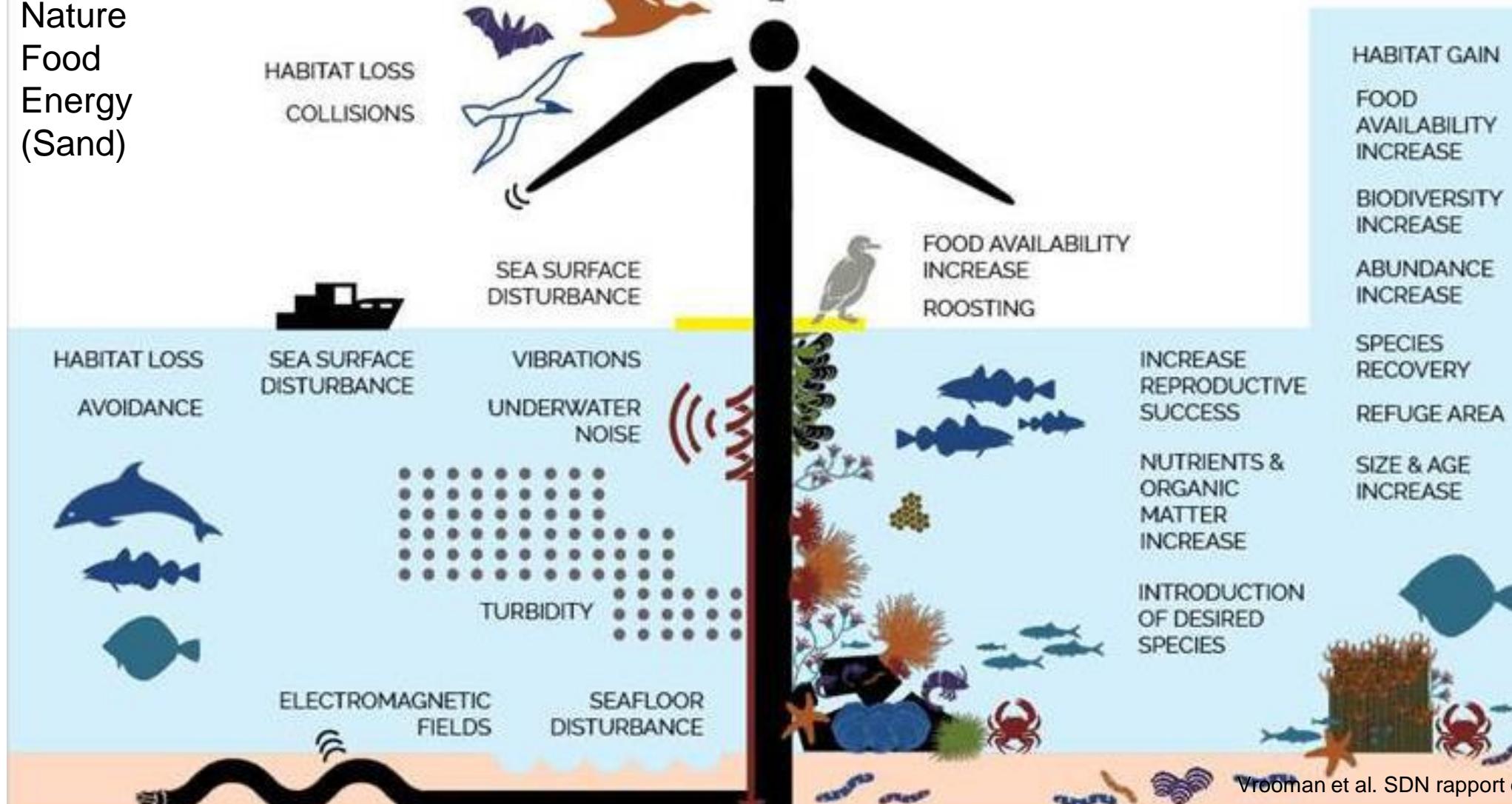
Reduce impacts:

- Best available techniques
- Obliged innovation NZ2030:
  - Nature
  - Food
  - Energy
  - (Sand)

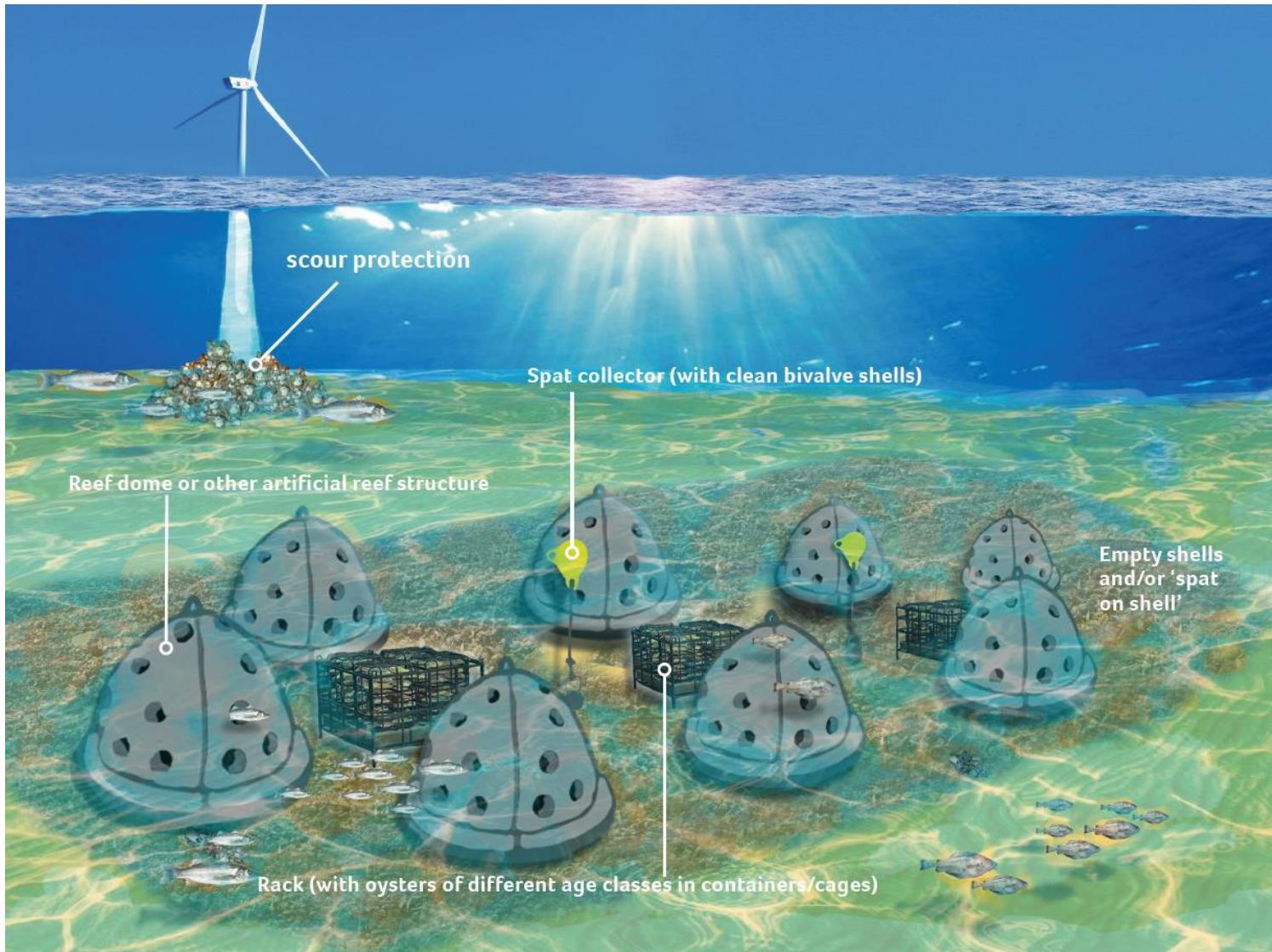
## OPPORTUNITIES

Maximize opportunities:

- Nature enhancement is status quo
- Regulations on multi-used areas



# Project: Rijke Noordzee



Aim: feasibility study nature enhancement with Flat Oysters in offshore wind farms

The North Sea Foundation &  
Natuur en Milieu  
Van Oord  
Eneco  
WMR  
Bureau Waardenburg  
Hein Sas Consultancy



*Installed on 5 November in LUD Wind Park*

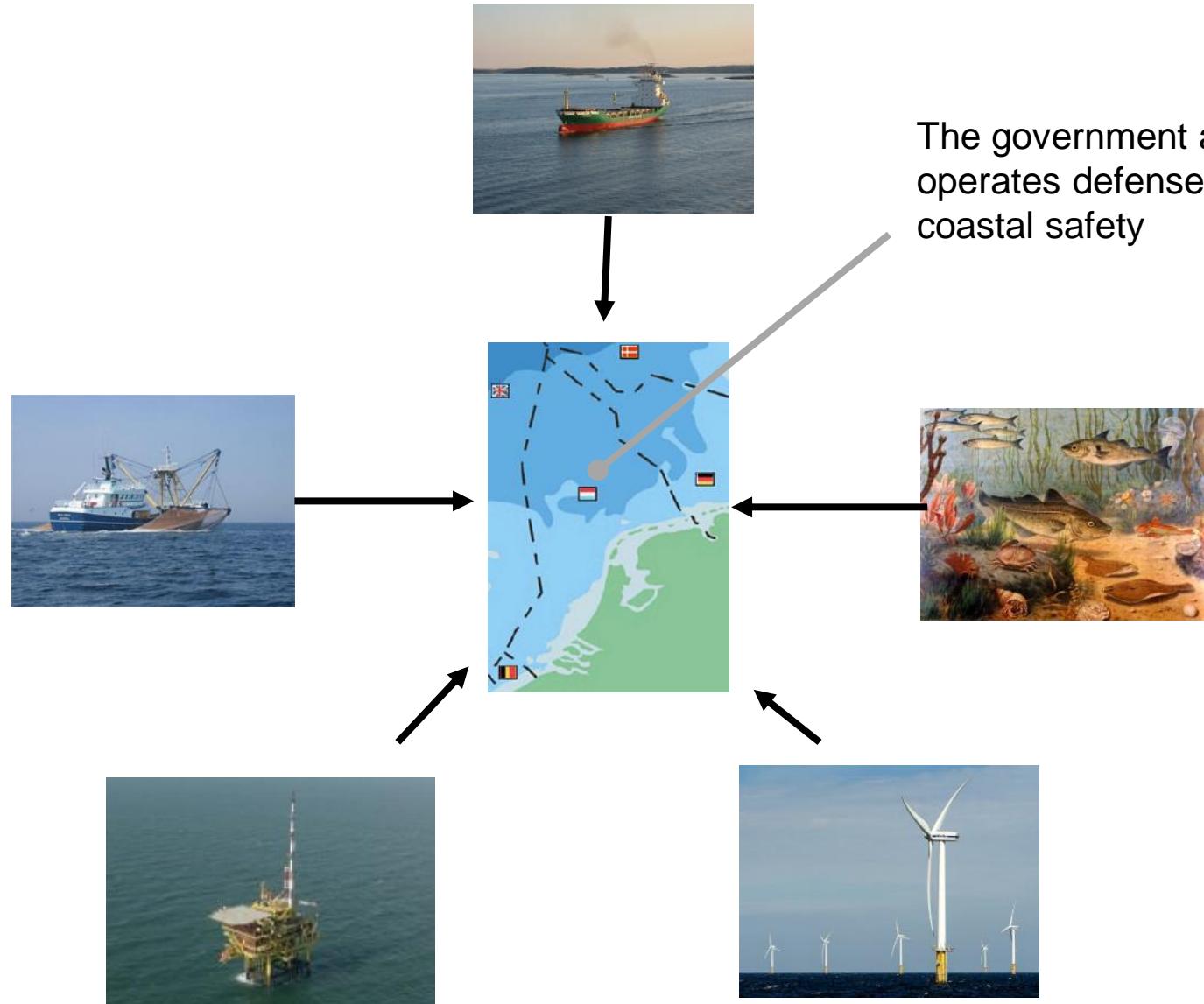
- *Settlement*
- *Growth*
- *Reproduction*
- *Survival*

# The unknowns

## Probability, scale and severity of effects

- Impact on ecosystem processes: sediment transport, primary production, water flows, stratification etc.
- Which bird, bat and other populations under pressure due to expansion OW?
- Vulnerable species:
  - Where are they and when?
  - Expected impact in different OW scenarios?
  - Which specific factors put species under pressure?
- Which protection measures and which nature enhancement measures to support populations (inter)nationally

# Combining offshore activities



# Sand extraction and nourishments



# Future scenarios

- 2018: 12M cubic meters
- 2100: 50 of 100M cubic meters?
- 2200: ?

How do we guarantee opportunities for rich seabed communities?



Involvement of North Sea Foundation:

1. “Ecologische Gericht Suppleren”
2. EIA’s “Kustlijnzorg”

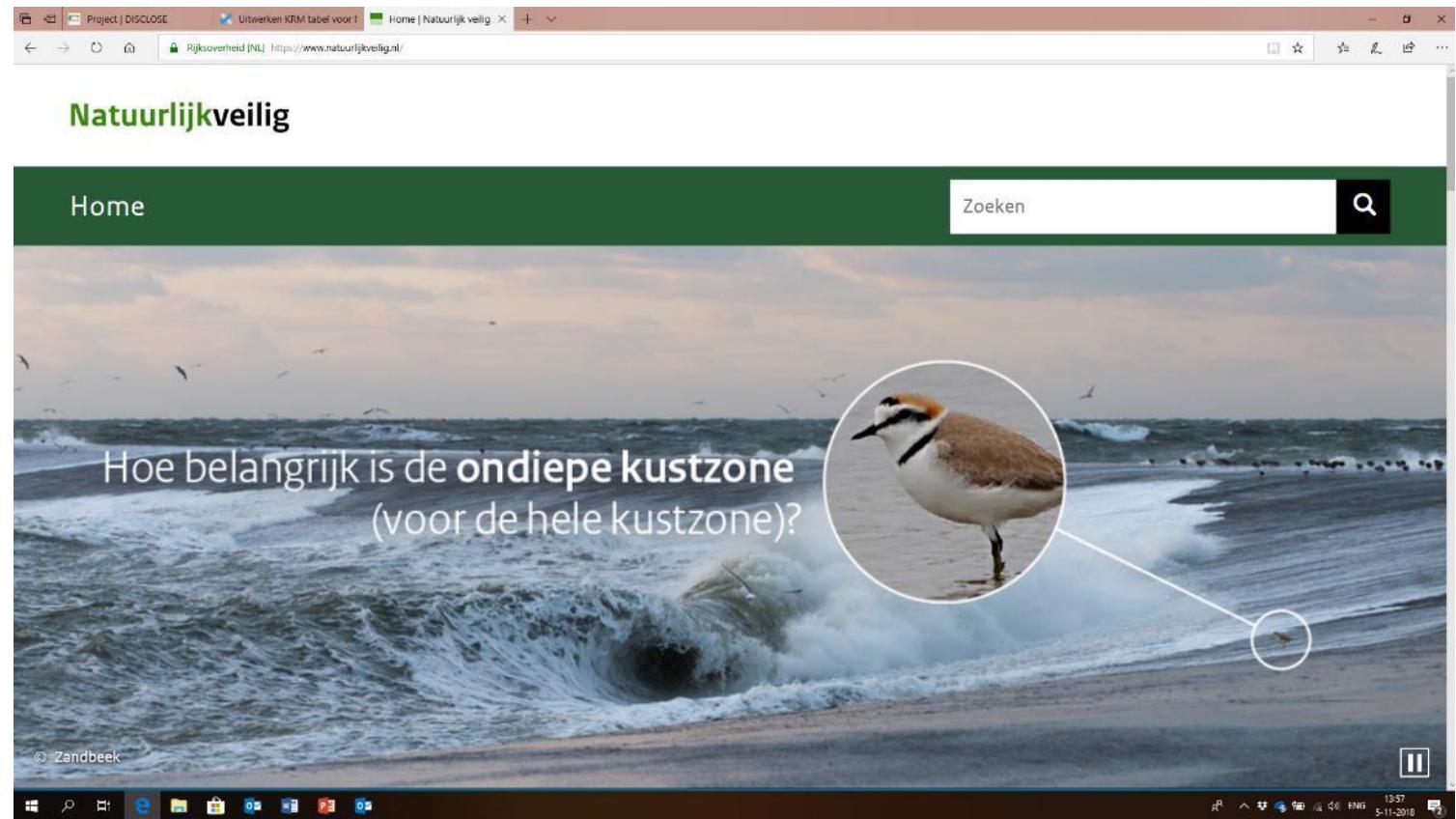
# Ecologisch Gericht Suppleren

Innovation based on:

- Existing data
- Research
  - Wadden
  - Dunes
  - Foreshore

Goal NSF:

- Clear communication progress on Natuurlijkveilig.nl
- Applicable design criteria



# EIA's “ophoog- en suppletiezand”

Well structured process with proper feedback

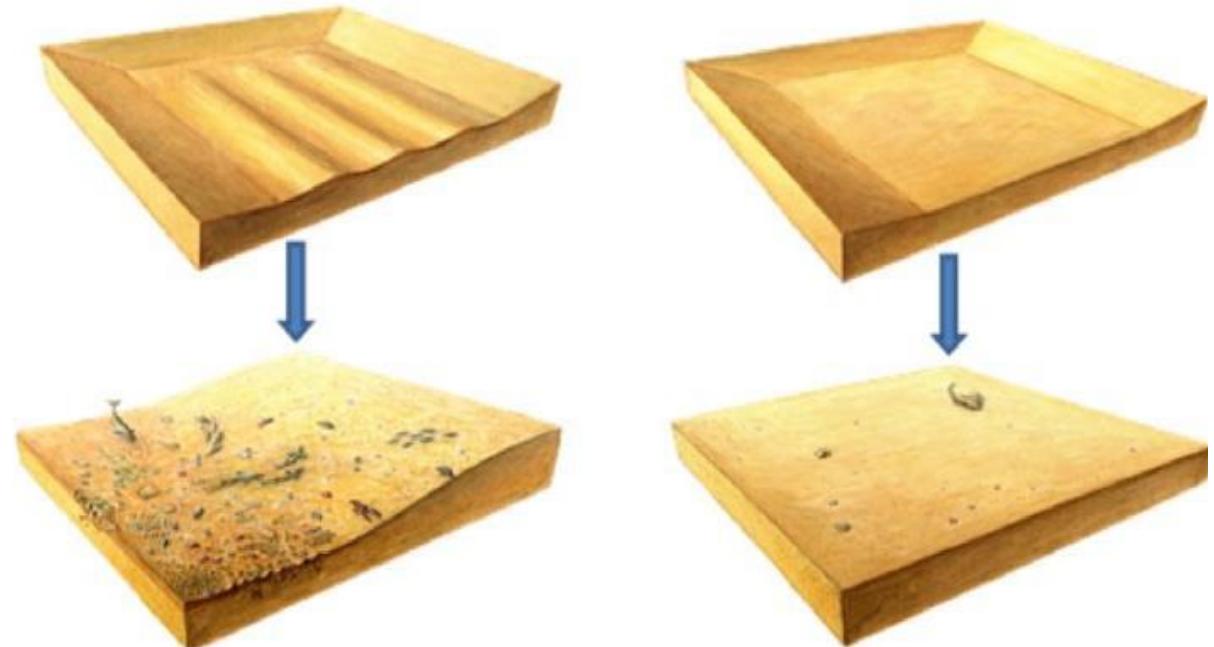
Some concerns remain:

- Shifting baselines: EIA uses natural system that already includes licensed activities
- Distribution bottom fauna and shellfish banks at small scales  
→ full area monitoring
- Shellfish banks & importance for ecosystem functioning & birds  
→ good definition shellfish banks & additional research
- Nocturnal behavior in relation to activities and their effects  
→ additional research
- Silt effects: primary productivity, food web, sea grass, shellfish banks and trophic interactions as well as spawning and nursery grounds

Not all conclusions are in line with the precautionary principle  
MEP focus constrained by budget?

# Ideas on combining sand extraction

- Sand extraction to diversify the seabed?
- Concentrated fisheries in deep sand extraction pits?



Bron: Ecoshape.org



Foto: Roel van der Mast



Foto: Roel van der Mast



Foto: Roel van der Mast



Foto: Roel van der Mast



Foto: Cor kuyvenhoven

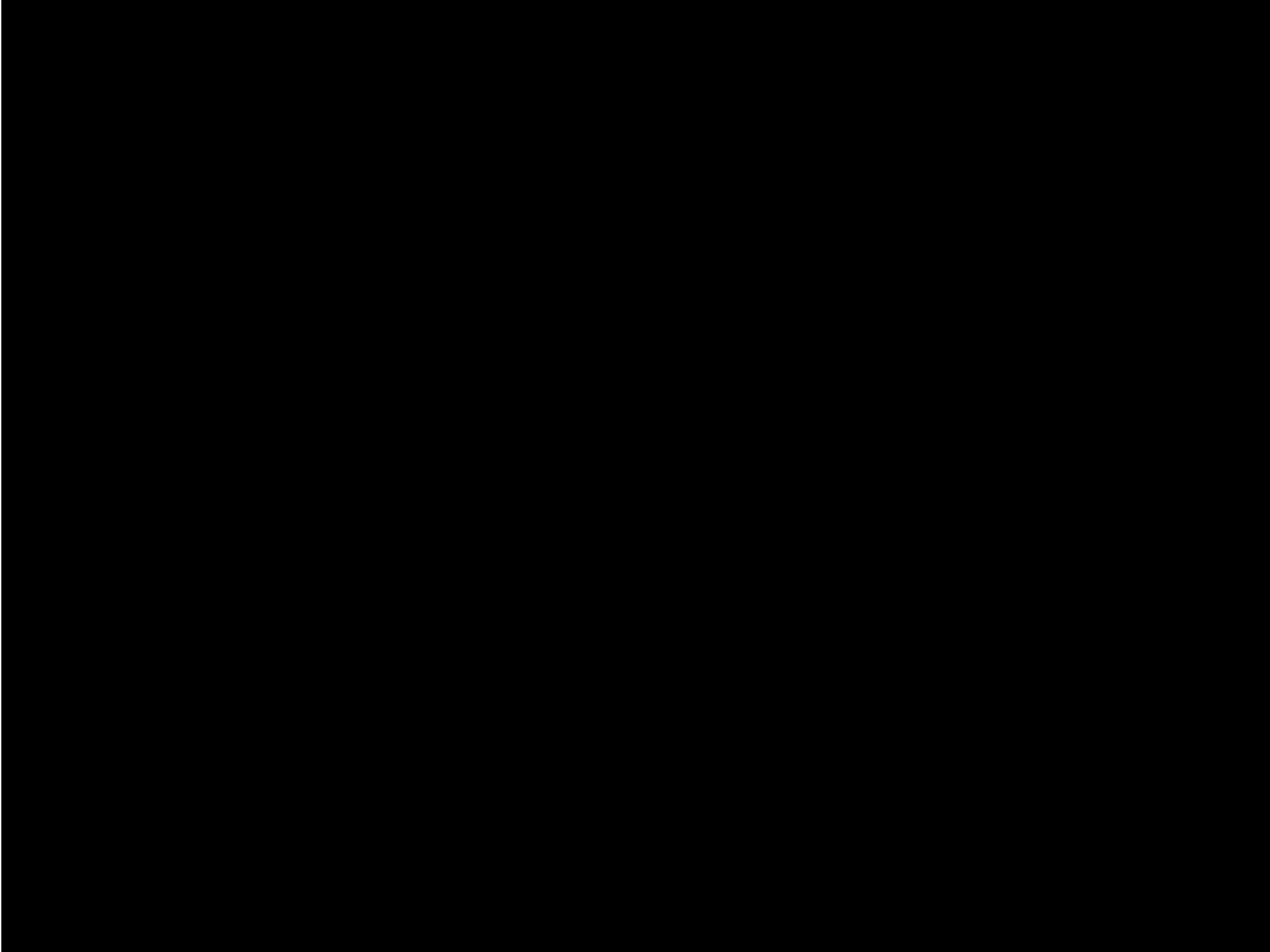
# NSF: sand extraction and nourishments

- Compiling existing knowledge:
  - Knowledge gaps, sand volumes needed, alternative extraction and nourishment methods, used “kustfundament”, relevant regulations and constraints regarding conservation goals
- Green watch dog
  - “Ecologisch Gericht Suppleren”: research coastal zone, goals of the convention, clear message [natuurlijkveilig.nl](http://natuurlijkveilig.nl)
  - “Regulier kustonderhoud”: minimize risks and maximize opportunities, reviewing EMVI criteria, Monitoring en Evaluation Program
  - Long term safety: Dutch Coastal Challenge, Building with Nature, offshore islands, estuarine systems & fresh and salt water interactions
- Stakeholder collaboration
  - Clear positions, meeting, public communication

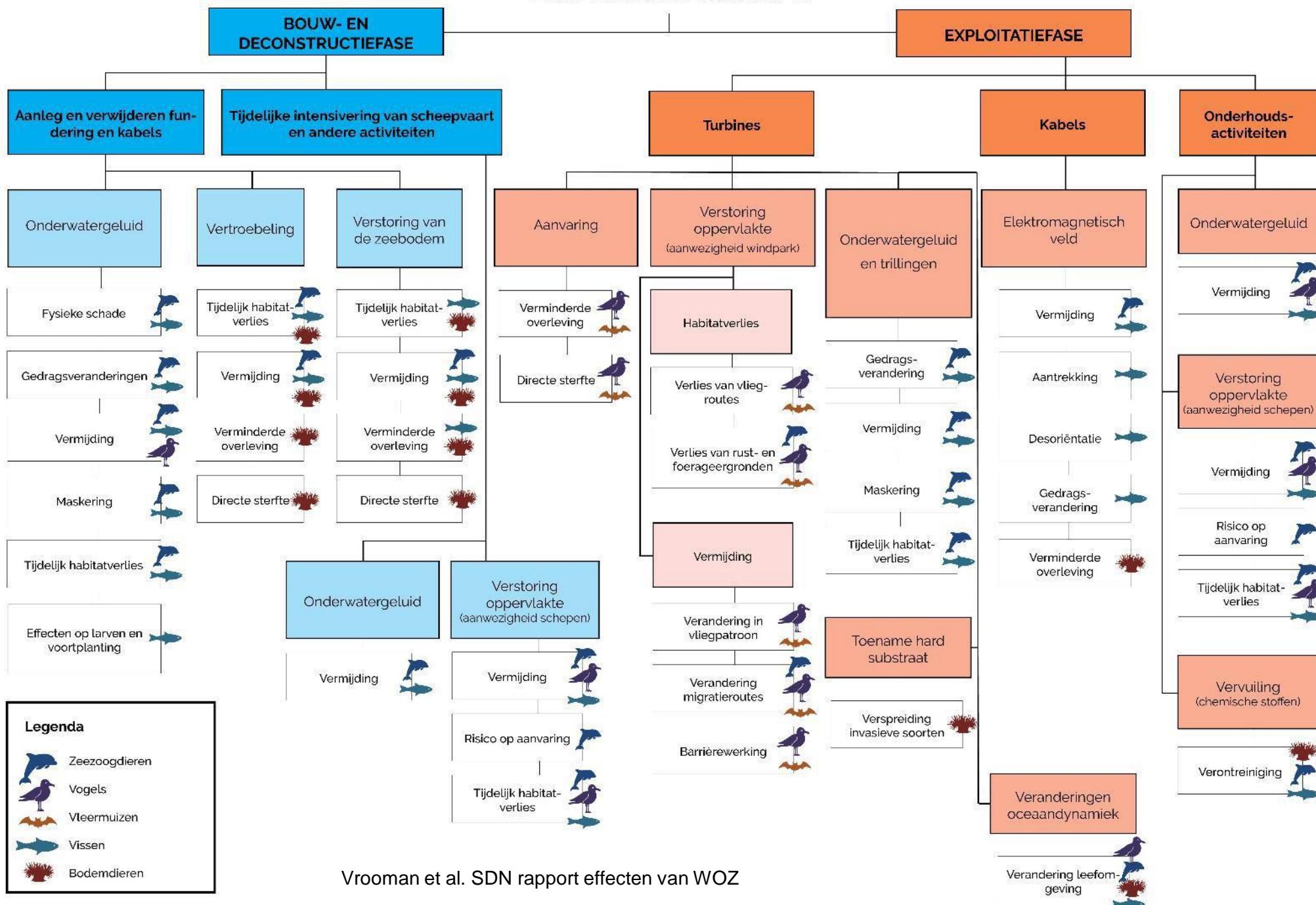
# Questions

1. Can North Sea nature be restored and protected despite increasing human activities? What are the boundaries of the ecosystem?
2. What is the potential of using sand pits for productive fisheries or nature enhancement?
3. What do we need to develop applicable design criteria on the integration of sand extraction, offshore wind and nature restoration?

Consensus: to reach sustainability we need properly enforced Marine Protected Areas next to the constant effort of sectors to minimize their footprint on the marine ecosystem



# ECOLOGISCHE RISICO'S



# ECOLOGISCHE KANSEN

