R&D Webinar - NESTORE Project Outcomes | 26/05/2026

Towards cumulative impact assessment of offshore wind farms

With the financial support of:

Bridging the gap between governance and ecosystem modelling

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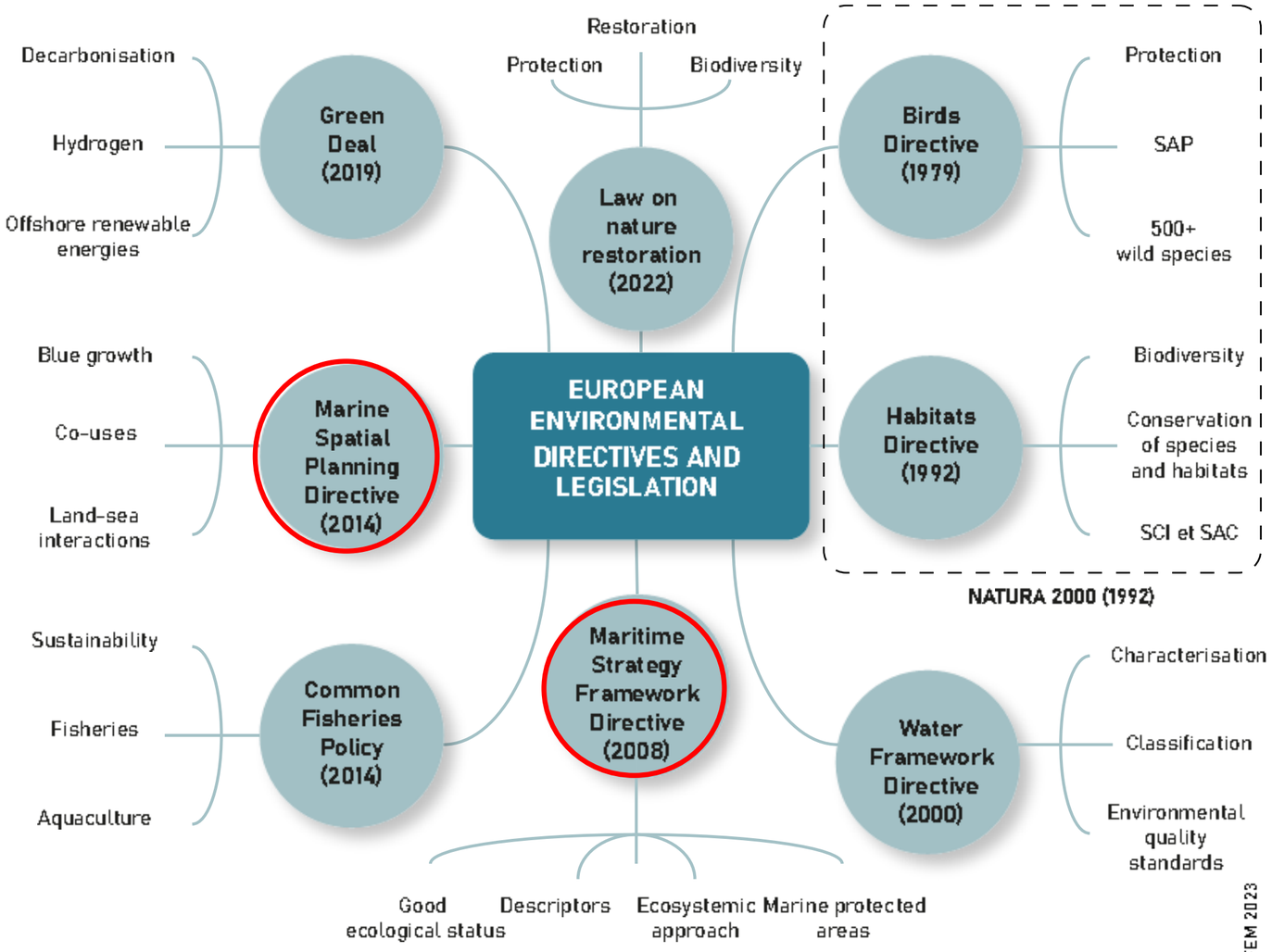
Context

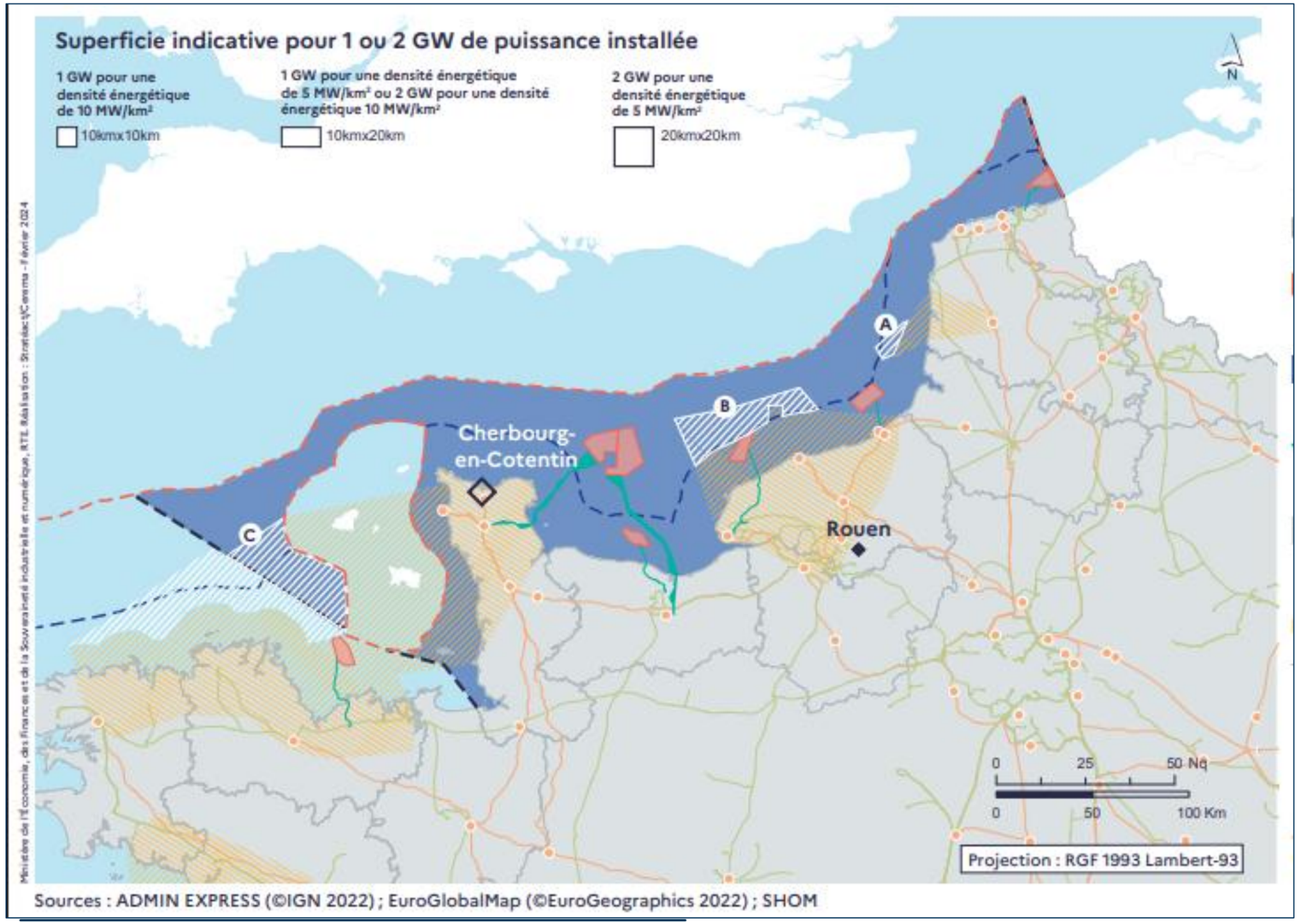
- Governance framework…
  - 2006 : UE Integrated Marine Policy
  - Two main pillars : MSFD (2008) & MSP (2014)
- … and French application
  - Integrated management of the sea and coastline
  - Cycle 2 merges MSFD & MSP into a unique **maritime seafront strategic document**
  - Treats OE & SOE equally with an alignment of different cyclical timeframes



SAP : special area of protection
SCI : site of communauty importance
SAC : special area of conservation

Adapted from marineboard.eu

Governance mechanisms for environmental & socio-economic issues in the MSP



- **Eastern English Channel and North Sea** case study
- Cycle 2 of the maritime seafront strategic document (published in 2019)

Research questions

- MSP challenges in France: how are environmental and socio-economic issues being addressed in the context of offshore wind acceleration?

- What regulatory and operational needs?

- How to link MSP governance issues and the assessment of cumulative effects using the ecosystem-based approach?

1. ANALYSIS OF A MERGING PROCESS

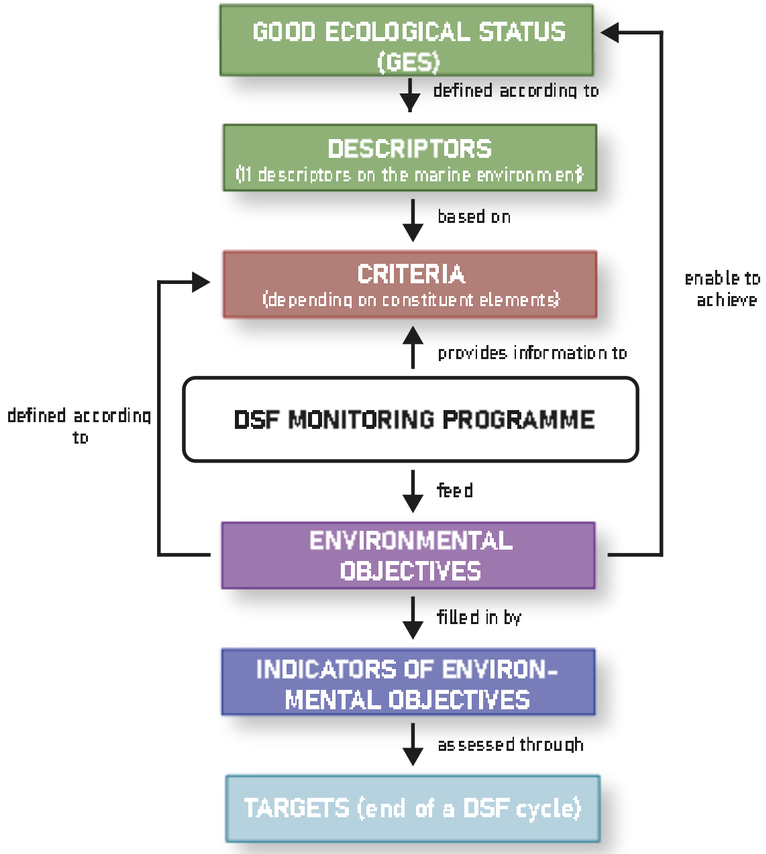
FROM REQUIREMENTS TO (IN)ACTION

2. ECOSYSTEM-BASED APPROACH TO ADDRESS CUMULATIVE EFFECTS IN MSP

3. CONCLUSION AND PERSPECTIVES.

Governance mechanisms for environmental & socio-economic issues in the MSP

- Method for analysis the **merging process** between MSFD and MSP EU directives
  - Interviews with stakeholders selected based on their role in implementing MSFD & MSP
  - 11 descriptors analyzed & 52 environmental objectives (EO)



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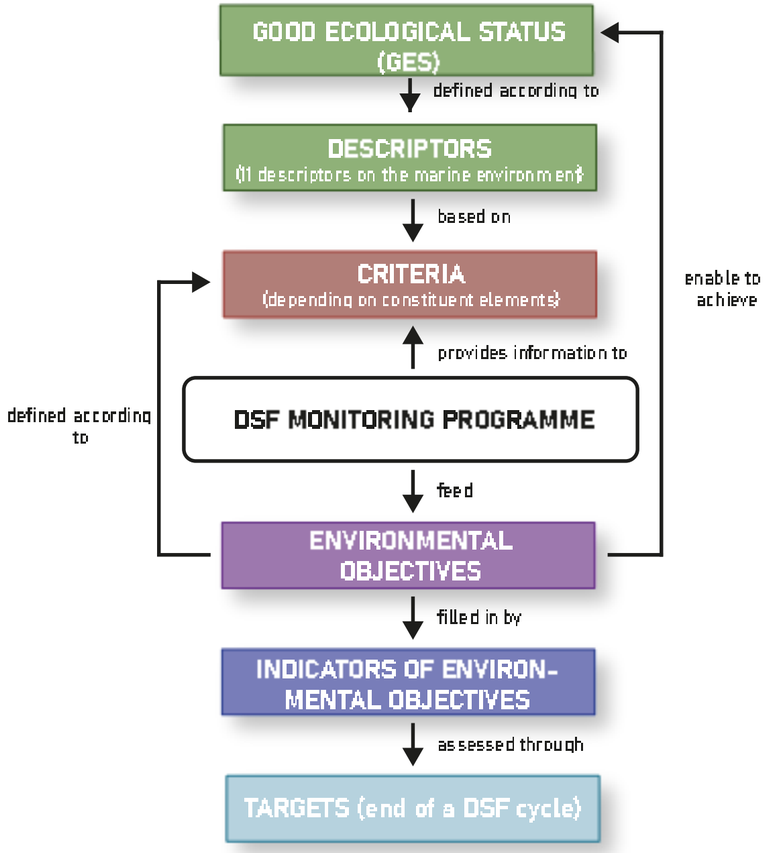
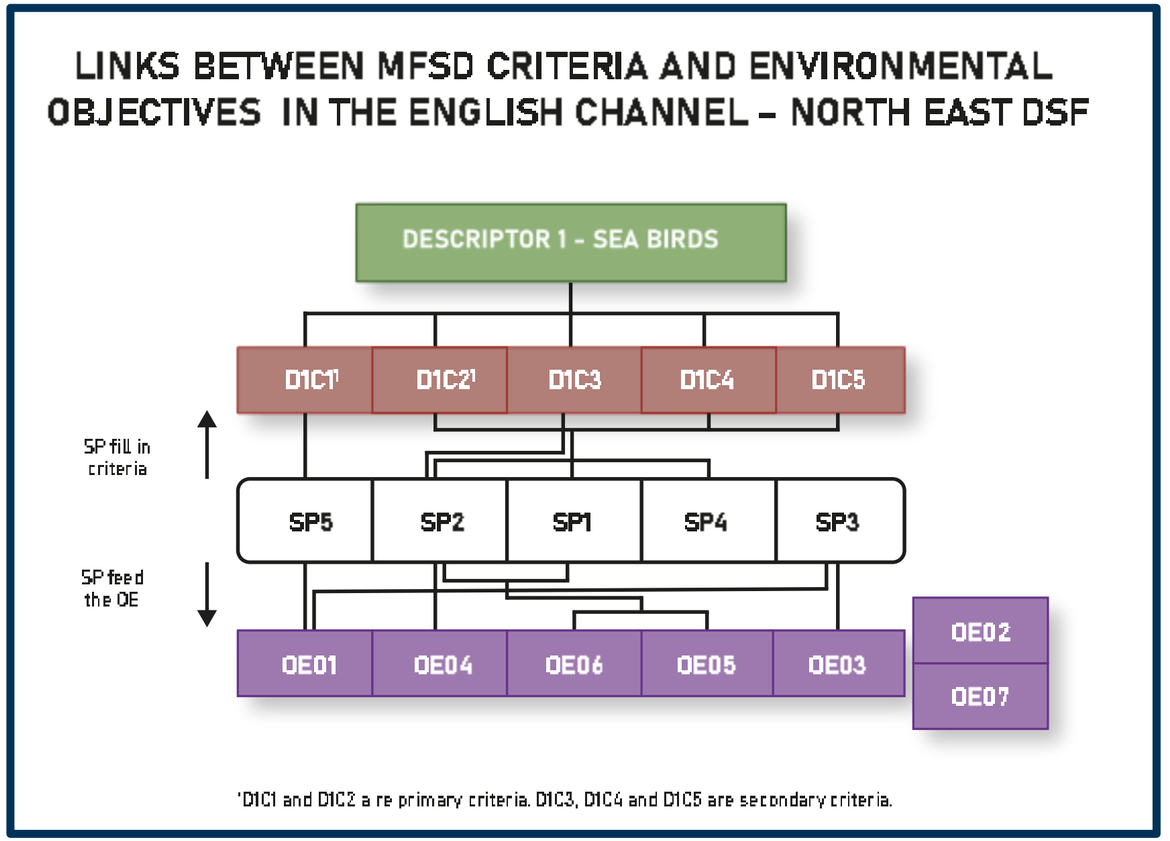


Case study



Governance mechanisms for environmental & socio-economic issues in the MSP

- Main results

→ **Effectiveness and relevance of environmental objectives**

  – Disconnection between EO and the good environmental status

  – Sub-monitoring programs not associated with an EO

  – No operational /administrative criteria for assessment throughout the cycle

→ **Integrated maritime approach**

  – Integrated planning undermined by the unbalance between OE and Socio-economic objectives (SEO)

15

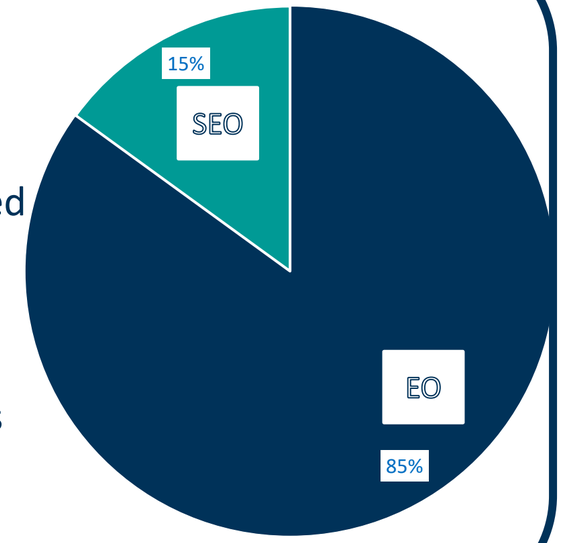
General strategic issues

400+

Strategic objectives defined (very few OSE)

16 OE (ie 30%)

Dealing with interactions between environmental issues and ORE



→**A regime shift in the governance**

- Multi-scale and temporal uniformization of timelines
- Acceleration of offshore wind deployment: from cost-based challenges to zoning-based issues

Establishing links between MSP governance and ecosystem modelling

- Which **method** should be chosen for linking MSP **governance issues** and the **assessment of cumulative effect**s using the **ecosystem-based approach** ?
  - Review of the main methods for Cumulative Effects assessment

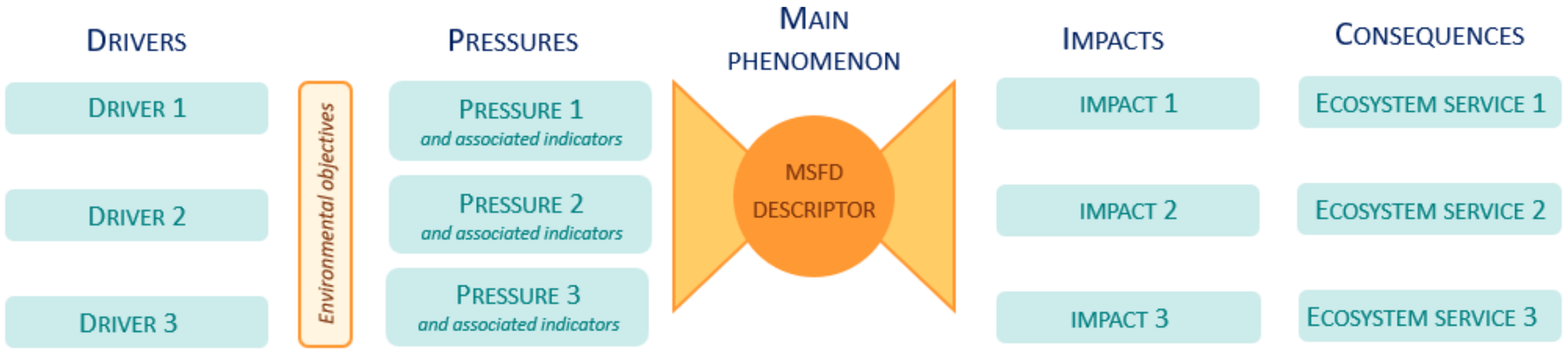
Methods		References
HARMONY	Define an impact level based on the intensity of pressures on target ecosystems	Gimard., 2018
CUMULEO	Estimate the importance of habitat based on the distribution of pressures and species diversity	Gimard., 2018
ODEMM	Estimate an impact level based on the occurrence of pressures on target ecosystems	Gimard., 2018
HELCOM	Define an impact index based on ecosystem sensitivity	Michel., 2019
SYMPHONY	Identify the most sensitive ecosystems	Michel., 2019
Carpe Diem	Identify areas with concurrent risks using an approach based on cumulative impact risks and cumulative pressure exposure	Michel., 2019
SCAIRM	Assess impact risks by evaluating changes in state of an ecological receptor in response to a stressor	Piet., 2023
GT ECUME	Estimate the expected cumulative impact for pressure-receptor pairs identified and prioritized by experts	Brignon., 2022
O'Hara	Assess of cumulative impacts using an approach based on species, habitats, functional traits through modeling of pressure intensity and the vulnerability of these parameters	O'Hara., 2024
Bow tie	Map the impact chain by identifying links for definition of potential pathways for cumulative exposure	OSPAR Commission., 2017

Establishing links between MSP governance and ecosystem modelling

- Selected method → **OSPAR Commission., 2017** with **Bow tie approach**

Bow tie	Map the impact chain by identifying links for definition of potential pathways for cumulative exposure	OSPAR Commission., 2017

  - Propose a draft assessment of cumulative effects using MSFD indicators
  - Understanding the causes and consequences of pressures that can have an impact on the state of marine ecosystems
  - Simple schematic representation to describe and analyze risk pathways from pressures to outcomes and examine controls



Establishing links between MSP governance and ecosystem modelling

- Defining scenarios
  - Governance-specific
  - Suitable for ecosystem-models

- Exploratory method for adapting “bow tie” approach and propose relevant scenarios
  - 9 workshops with researchers from ecological fields and ecosystem-based approach
  - 5 interviews with researchers from ecosystem-based approach

- Results
  - 18 scenarios, 8 in capacity to complete regulatory indicators

Habitat loss scenario

« Using data from the mapping of benthic habitats within high-protection zones, test different levels of habitat loss to assess the impact of this loss on the ecosystem : 0, x, y, z, 100% »

Ecological succession scenario

« Test the biofouling development by biomass assessment of relevant species : no biofouling, biofouling at 3, 5, 15, 25 and 50 years »

Bio colonization profiles scenario

« Test the development of two different types of bio colonization profiles : dominance of filterer-feeding communities, dominance of macroalgal communities »

Conclusion & perspectives

- Replicate the methods implemented in NESTORE across **all French seafronts**
  - **A comparison with other MSP governance mechanisms used for prioritization in Europe (e.g., Belgium)**
- Advance the analysis of cumulative effects by **connecting all results** obtained with the **OSPAR method to all environmental issues**
- **Engage stakeholders and seafront authorities** in the ongoing work to influence the regulatory framework
- Develop **multi-scale, scenario-based decision support tools**

FRANCE ENERGIES MARINES

Thank you for your attention!