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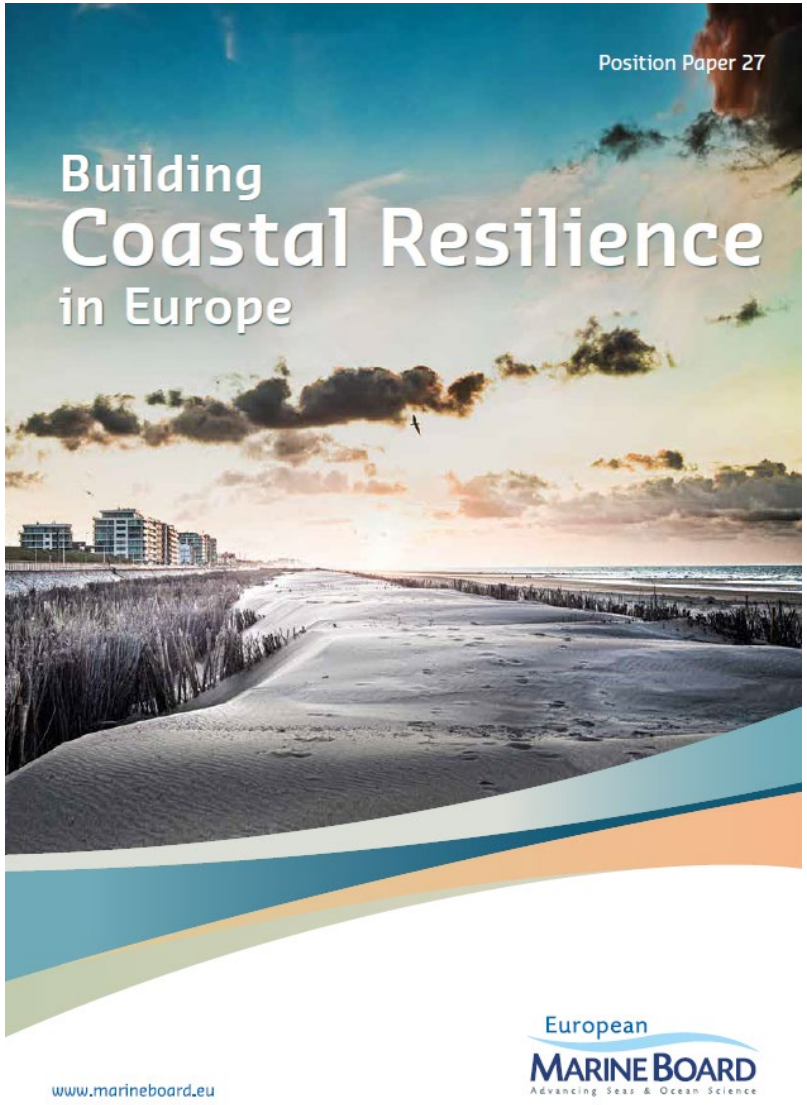


# EMB Position Paper N°27: Building Coastal Resilience in Europe

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# What is Coastal Resilience?

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Coastal resilience is: *"The capacity of coastal natural and socio-economic systems to **persist, adapt or transform when faced with disturbances** induced by factors such as sea-level rise, extreme events and human impacts, whilst maintaining their essential functions"*

The document covers:

- Concepts and frameworks to assess coastal resilience
- Pressures and impacts on the coast
- Tools, barriers, enablers to build coastal resilience
- Case-studies
- Future challenges and recommendations

# Concepts and frameworks to assess coastal resilience

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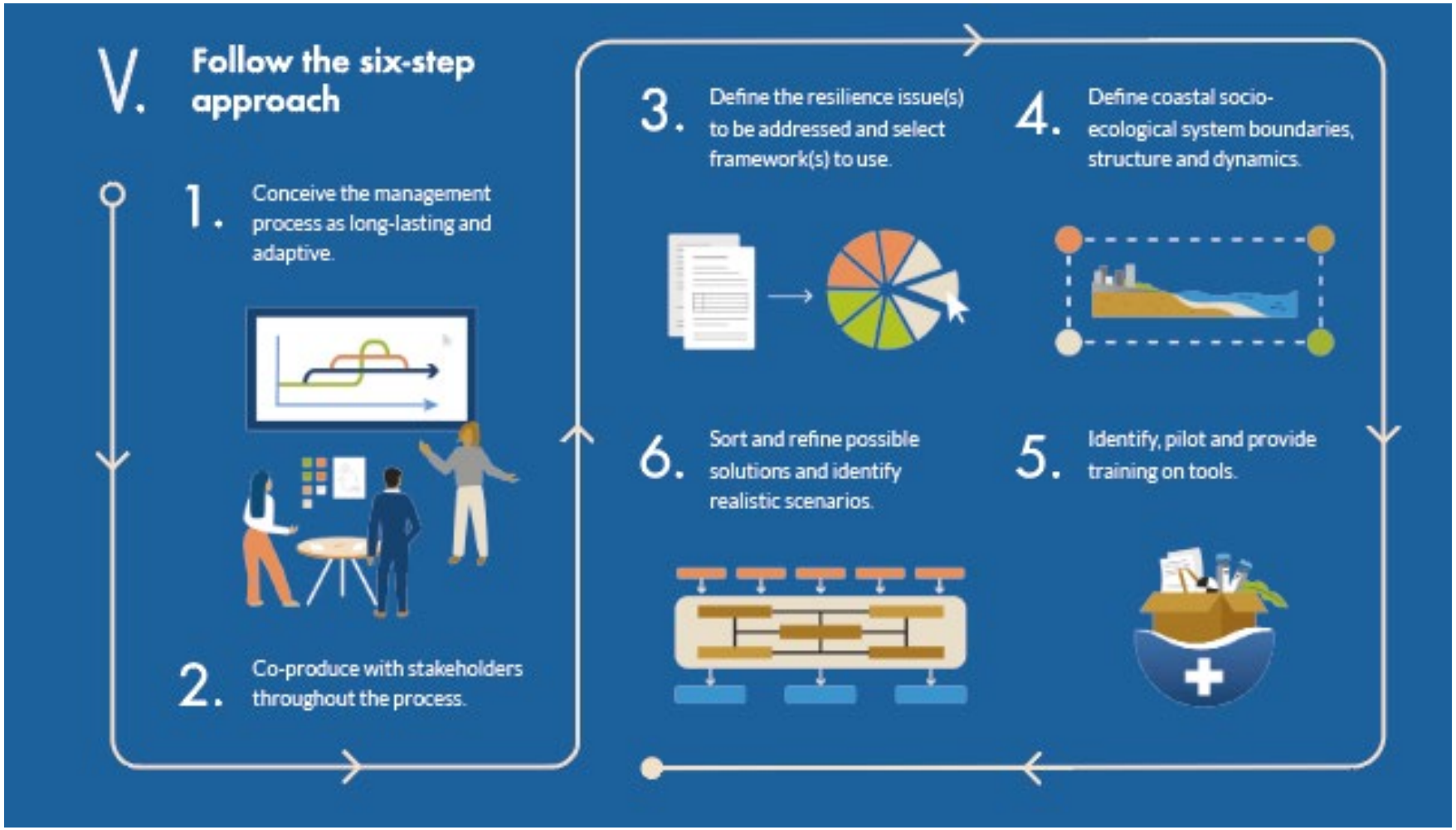
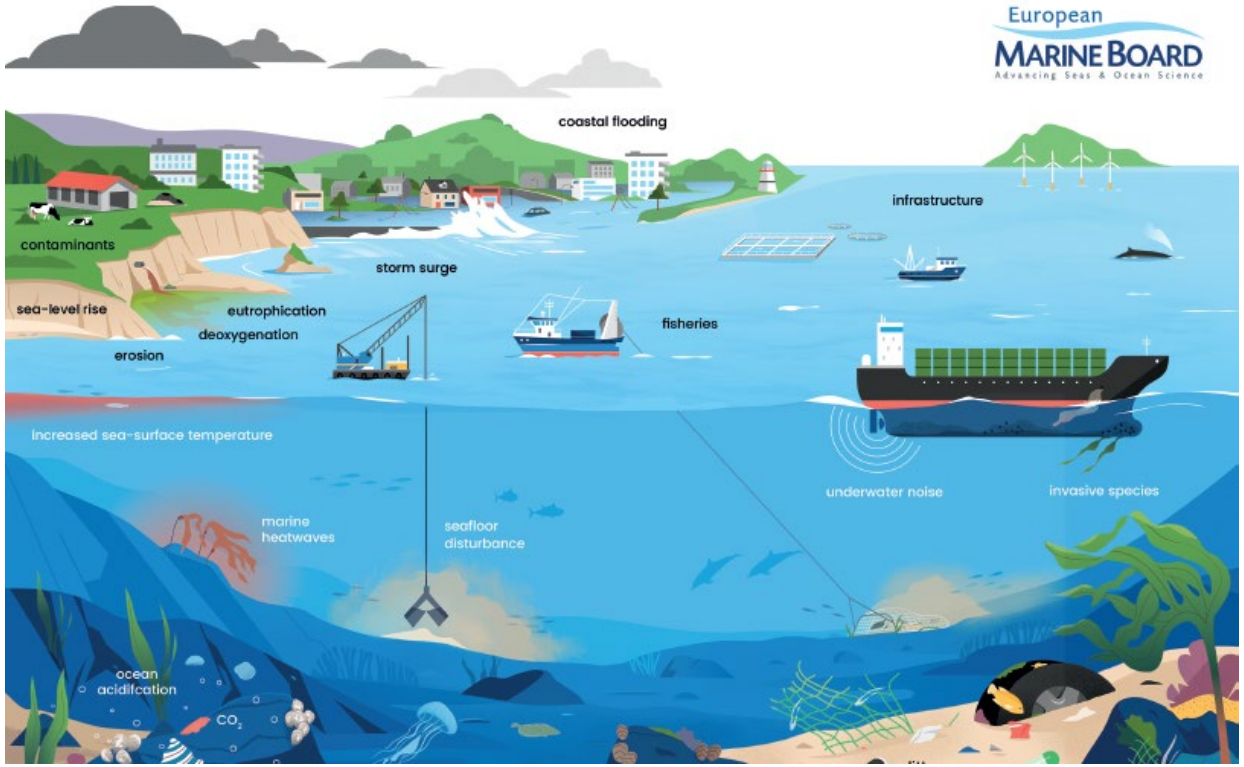
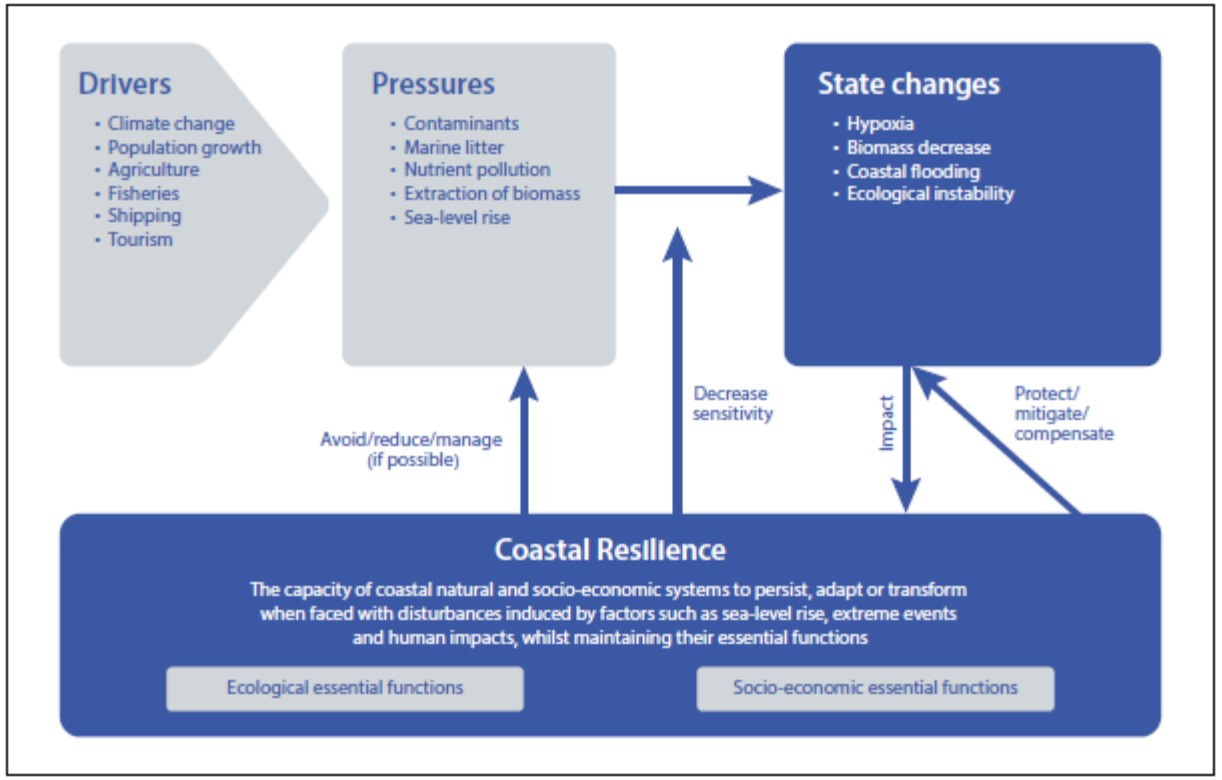
Highlights various **frameworks** and their **operationalisation**
Presents a **six-step approach** to building coastal resilience



# Pressures and impacts on the coast

Describes key **pressures and impacts** that influence coastal resilience and key **knowledge gaps** to address to build and enhance resilient coasts.



# Tools, barriers, enablers to build coastal resilience

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Focusing on:

- **Governance and finance pathways** to build coastal resilience, including enhancing the **resilience of human communities**
- The **observations**, **monitoring**, **data** and **modelling** needs
- **Infrastructure for coastal protection** i.e. grey/blue-green/hybrid
- **Context-specific planning** for coastal protection
- Landward and seaward **Nature-based Solutions**

# Policy recommendations

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## POLICY RECOMMENDATIONS

### I. Adopt a systems approach to coastal management

This should be based on adaptive, cross-sectoral and coherent policies. All aspects of the land-sea interface should be included in the Integrated Maritime Policy and links between marine- and land-based policies should be improved.

### II. Include nature and people from the beginning of the design process

An ecosystem-based management approach should be adopted and an inventory developed of coastal management solutions and their impacts.

### III. Build adaptive capacity at multiple scales

This should be across local communities, and national, regional and EU governance.

### IV. Reflect the values of natural capital

The multiple social and economic values of natural capital should be reflected in our public policies and decision-making processes.

### V. Follow the six-step approach

1. Conceive the management process as long-lasting and adaptive.

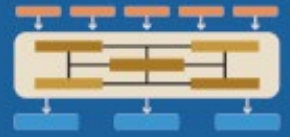
2. Co-produce with stakeholders throughout the process.

3. Define the resilience issue(s) to be addressed and select framework(s) to use.

4. Define coastal socio-ecological system boundaries, structure and dynamics.

5. Identify, pilot and provide training on tools.

6. Sort and refine possible solutions and identify realistic scenarios.



# Scientific recommendations

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## SCIENTIFIC RECOMMENDATIONS

**I** **Establish integrated transdisciplinary research on coastal social-ecological systems**

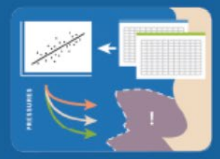
This should address knowledge gaps for single pressure and site-specific multiple, cumulative pressure-response relationships, and tipping points.

**II** **Develop sufficient observational, monitoring and data capacity**

Increased investment in observations, monitoring, Big Data and artificial intelligence is needed. Data should be integrated into aninterdisciplinary platform with resilience indicators.

**III** **Develop and operationalise standardised coastal resilience indicators for Europe**

A pan-European framework to develop clarity and standardisation in the definition and practice of coastal resilience is needed to operationalise indicators in practice.



**IV** **Improve model prediction capacity**

This is needed to forecast and develop future scenarios on the magnitude, timing, location and impacts of multiple, cumulative pressures.

**V** **Invest in research on nature-based and hybrid solutions**

The environmental and socio-economic co-benefits, site specific feasibility, and impacts of various combinations of seaward and landward Nature-based Solutions should be identified.

### Examples of Nature-based Solutions

**HYBRID** Marsh-levee systems; artificial beaches in front of seawalls; dune-dyke systems.

**SEAWARD** Conservation and restoration of marine coastal habitats; vertical ocean farming; marine protected areas; low trophic aquaculture.

**LANDWARD** Conservation and restoration of landward coastal habitats; vegetated dunes and marshes; 'green' structural engineering.

# Community recommendations

- Obtain **systematic natural and social scientific knowledge that is useful to individual communities** and share this among all interested parties with clear messages;
- Develop and adhere to **coherent national coastal plans** to coordinate community actions with the regional priorities of local authorities;
- **Co-design citizen science initiatives** that support communities to collect and understand coastal data and resilience issues; and
- **Enhance the adaptive capacity** of local communities.

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# Download from the EMB website:

https://www.marineboard.eu/coastal-resilience