

# QUICK GUIDE

DEALING WITH SEA LEVEL  
RISE AND COASTAL  
FLOODS EU-WIDE KNOWLEDGE  
FOR LOCAL AND REGIONAL  
AUTHORITIES

This content was prepared by the projects REGILIENCE, IMPETUS, TransformAr, ARSINOË, Pathways2Resilience, and CoCLiCo, with the support of the EU Mission on Adaptation



# DEALING WITH SEA LEVEL RISE AND COASTAL FLOODS

## EU-WIDE KNOWLEDGE FOR LOCAL AND REGIONAL AUTHORITIES

### WHAT IS COASTAL FLOODING?

Coastal floods occur when seawater inundates the shore, usually due to rising sea level rise, storms and cyclones, and are worsened by high tide. Flood events can damage urban and industrial areas, infrastructure and natural ecosystems through physical destruction, erosion and salinisation.

As sea level rise is increasingly threatening human livelihoods or settlements along the coasts across Europe, the EU Strategy on Adaptation to Climate Change addresses this climate threat (in several aspects). The [EU Strategy on Adaptation to Climate Change](#) addresses sea level rise. In 2024, the [First European Report on Sea Level Rise](#) was published.

It includes a comprehensive assessment of the projected sea level rise, its impacts, adaptation strategies, and policy recommendations.



## KEY FACTS &amp; RECENT EVENTS



The average sea level of the Northeast Atlantic Ocean and adjacent seas is rising by about 3.2 mm every year.

Current annual damage from coastal flooding in the EU and the UK is estimated at EUR 1.4 billion per year, with about 100,000 people being exposed to it each year.

By the end of this century, damage associated with sea level rise and coastal flooding could amount to EUR 871.8 billion in Europe, estimated at a GDP loss of 1.26 % for the European Union.



## Recent events:

- **2019-2022**, Venice, Italy continues to experience regular coastal flooding known as “acqua alta”, attributed to a combination of high tides, rising sea levels, and extreme weather, bringing attention to the effectiveness of its [MOSE barrier system](#).
- **2023-2024**, Severe coastal flooding due to intense winter storms impacted [the UK](#), [the Netherlands](#), [Denmark](#), and [Germany](#). These storms caused storm surges, high tides, and breaches of coastal defenses, resulting in evacuations and infrastructure damage.
- Other intermittent coastal flooding occurred in the [North Sea region](#) (including Belgium and northern France) and parts of the Baltic Sea coastline.



## Key Impacts on Your Community

Sea-level rise can have long-lasting direct and indirect effects on various economic sectors, and borders, especially:



### Infrastructure:

Property devaluation and damage to physical assets such as buildings, transport and energy infrastructure can have cascading effects on sectors like tourism, fishery and agriculture.



### Public water supply:

The rising risk of saltwater intrusion into groundwater threatens the fresh water supply in many coastal regions.



### Ecosystem and biodiversity:

Erosion and damage to salt marshes, beaches, lagoons, dunes and estuaries lead to loss of provisioning, regulating, habitat and cultural ecosystem. Coastal ecosystems face increasing threats from erosion, flooding and permanent inundation, while estuarine ecosystems are particularly vulnerable to environmental changes caused by saltwater intrusion.



## HOW TO TAKE ACTION

### Understand your risks that come with sea-level rise: data, maps and tools

[ThinkHazard!](#) allows you to quickly assess the risk of coastal flooding within your area by simply typing the name of your location.

The IPCC/NASA [Sea Level Projection Tool](#) allows users to explore sea level projections through to 2150 for many coastal cities.

The [Sea level rise and coastal flood risk map](#) is an interactive tool that highlights areas at risk from sea level rise and coastal flooding.

The [Risk Zone Map](#) shows when different coastal cities are expected to reach specific sea level rise thresholds.



## IMPLEMENT CONCRETE ACTIONS

Adaptation will be more successful if timely measures consider the [long-term sea level rise](#).

This EU [database](#) contains 18 approaches to reduce the impacts of sea level rise, including a cost-benefit analysis, implementation-related legal considerations, and case study examples, such as:



[Storm surge gates and flood barriers](#) are permanent structures that normally allow water to flow through under normal circumstances but gates or bulkheads can be closed during storm surges or high tides to prevent flooding.



[Dune construction and reinforcement](#) involve techniques such as planting dune grass, applying dune thatching, and installing dune fencing to stabilise and protect coastal areas.



Grey and green measures can be used for reinforcing and stabilising [coastal cliffs](#).



[Integrating climate change adaptation into coastal zone management plans](#) is an important measure as part of policymaking.

The [Coastal Hazard Wheel](#) is a map to classify coastal locations and suggest suitable management measures for the selected location.

You can also access it via the [Catalogue of Hazard Management Options](#).

The [first European Assessment Report on Sea Level Rise](#) provides more information on the projected sea level rise, its impacts, strategies, and policy recommendations, including an [overview table](#) with 17 measures to adapt to sea level rise.



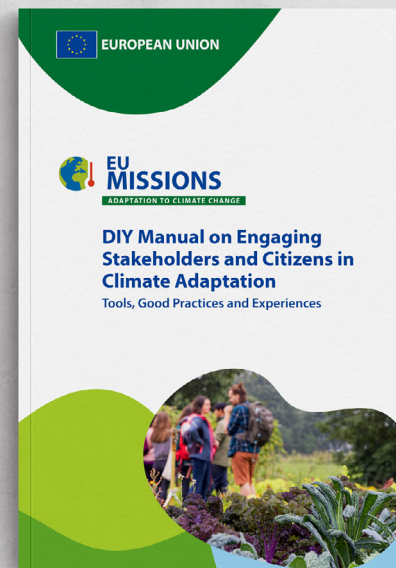
## FIND FUNDING OPPORTUNITIES

Access EU and national funding options via [MIP4Adapt](#) to support your sea level rise and coastal flooding adaptation strategies.

Engage stakeholders and citizens in decision-making and action

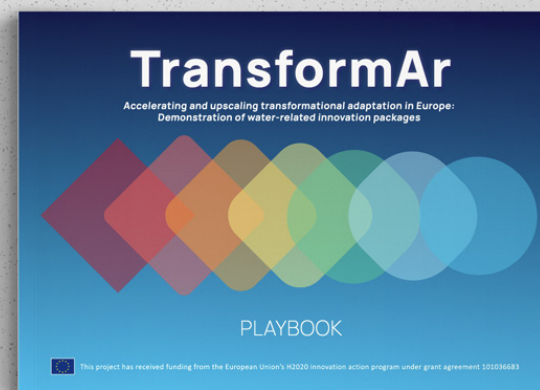
Check the MIP4Adapt [Do-It-Yourself Manual on Engaging Stakeholders and Citizens in Climate Adaptation](#) to learn how to involve communities in preparing for and mitigating the effects of sea level rise and coastal flooding.

You can also use specific tools like the [TransformAr Playbook](#) to plan participatory workshops.



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## PRACTICAL EXAMPLES FOR LOCAL AND REGIONAL AUTHORITIES

For inspiration from practical examples, check the [EU Climate Adapt Resource catalogue](#) (selecting the filter “sea level rise” for climate impacts and “case study” for type of item). Here you will find examples and case studies, such as:

A [flood risk decision support tool](#), which has been developed for the Dutch province of Zeeland to help visualise flood risks and the effectiveness of adaptation measures through a digital twin. The [software](#) displays an interactive 3D environment that allows non-expert users to compare local flood risks and impacts.

The [Hedwige-Prosper Polder project](#) is a cross-border initiative between Belgium and the Netherlands to protect coastal cities from rising storm surge risks. The project implemented dikes, quay walls and open spaces for controlled flooding by removing outer defences and relocating dike protection further inland to create more room for tidal surges.

The [redevelopment of Bilbao’s Zorrotzaurre district in Spain](#) demonstrates how cities can combine housing needs and flood risk. To create a flood-resilient residential area, the city implemented five key measures: reopening the [Deusto canal](#), building a flood protection wall, raising the ground level by 1,5 meters for new constructions, installing stormwater tanks, and creating green public spaces.



Above: Aerial picture of Zorrotzaurre peninsula.  
Below: Impression of Zorrotzaurre island after the redevelopment. ©Comisión Gestora de Zorrotzaurre

## NEED HELP?

 **Contact us:**  
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