

# QUICK GUIDE

**DEALING WITH STORMS**  
EU-WIDE KNOWLEDGE FOR  
LOCAL AND REGIONAL  
AUTHORITIES

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



# DEALING WITH STORMS

## EU-WIDE KNOWLEDGE FOR LOCAL AND REGIONAL AUTHORITIES

### WHAT ARE STORMS?

A storm is defined as a violent disturbance in the atmosphere that involves severe weather conditions, such as strong winds, heavy rainfall, lightning, thunder, hail or snow. It is typically characterised by rapidly changing atmospheric pressure, temperature, and moisture levels, leading to turbulent conditions.

Storms range in severity from showers with strong winds to intense, dangerous events like hurricanes, tornadoes, or blizzards, often resulting from the interaction of different air masses or extreme variations in temperature and moisture.

In short, it is an extreme weather event that disrupts normal weather patterns, posing potential hazards to life and property.



## KEY FACTS & RECENT EVENTS

According to the [European Environment Agency](#) storms including lightning and hail caused damages estimated at



**215 billion (2023 prices) between 1980 and 2023 in the EU.**

High Tatra mountains, Slovakia: rescue worker at destroyed forest as an effect of strong storm.  
©Getty images



## Recent major storms:

- January 2022: Storm Malik** (Czechia, Denmark, Estonia, Finland, Germany, Ireland, Latvia, Lithuania, Norway, Poland, Sweden, United Kingdom): EUR 382 million in damages and 7 fatalities.
- February 2022: Storm Eunice** (Belgium, Czechia, Denmark, France, Germany, Ireland, Lithuania, Netherlands, Poland, United Kingdom): EUR 1.83 billion in damages and 17 fatalities.
- October 2023: Storm Ciarán** (Belgium, Channel Islands, Czechia, France, Italy, Luxembourg, Spain, United Kingdom, Ireland): EUR 2.1 billion in damages and 21 fatalities.





## Key impacts on your community



### Infrastructure:

Damage to buildings, street lights, vehicles, power lines, farming infrastructure, among others. Find more information [here](#).



### Environment:

Damage to trees and other ecosystems; flying debris can cause widespread pollution of natural areas. Find more information [here](#).



### Health:

Risk of injuries from falling and flying objects, risk of exposure due to damaged homes, reduced access to critical services such as healthcare due to damaged infrastructure and inaccessible roads. Find more information [here](#).



Espinho, Portugal: flooding after torrential rains. ©Getty images

## HOW TO TAKE ACTION

### Understand your storm risks: data, maps and tools

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

Gather information on storms in your area from various sources such as the European Severe [Weather Database](#) on storms in your area to better understand their severity and potential impacts.

Use weather forecast tools and information as those provided by the [European Centre for Medium-Range Weather Forecasts](#) (ECMWF) to identify potential weather extremes and prepare yourself and your community to react to them.

[The Copernicus EMS](#) provides free mapping services depicting the location of natural hazards, including storms. Satellite imagery and other geospatial data build detailed maps to assess the extent and impact of disasters. These maps are invaluable for understanding storm impacts and planning response strategies.



Vlissingen, Netherlands during Storm Eunice in February 2022. ©Hilbert Simonse, Unsplash

## Implement concrete actions

Find more than 20 recommended **actions** for reducing the impact of storms in this [database](#), each of them describing costs and benefits, legal aspects for implementation and referring to implemented case studies. Some of the actions which can be implemented at the urban or municipal level are:

Establishment of effective [early warning systems](#) for extreme weather events.

[Enhancing the safety of off-shore](#) (for example fishing and naval navigation) and inshore (for example operation of ports) operations against storms.

Definition and implementation of climate-proofing [standards for road design, construction and maintenance](#) to ensure transport infrastructure better withstands storms and other extreme weather events.

Assess your planned actions with this [self-assessment tool](#) to avoid negative effects which increase vulnerability, diminish well-being or undermine sustainable development. It's available in 10 languages!

Picture above: Adaptation of French standards for design, maintenance and operation of transport infrastructures. ©Olivier Malassingne, CEREMA

Picture below: The REGILIENCE self-assessment tool to spot risks of maladaptation





## Find funding opportunities

Access EU and national funding options via [MIP4Adapt](#) to support your storm 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 river floods.

You can also use specific tools like the [TransformAr Playbook](#) to plan participatory workshops, which has been applied by the French [Guadeloupe archipelago](#).



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## PRACTICAL EXAMPLES FOR LOCAL AND REGIONAL AUTHORITIES

### For inspiration from practical examples

Find and read some short [adaptation stories](#), such as about [Climate Adapted Transport Facilities in Vienna](#), or the [Resilience Index for assessing the adaptive capacity of Galicia's aquaculture](#).

Find more detailed information by selecting one of the over [30 "climate impacts - Storms" case studies](#) - e.g. about [Large-scale forest restoration solutions for resilience to multiple climate stressors in North Rhine-Westphalia, Germany](#) or the [Replacement of overhead lines with underground cables in Finland](#).



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Picture above: Interactive Climate-ADAPT Case study explorer.

Picture below: Large-scale forest restoration solutions for resilience to multiple climate stressors in North Rhine-Westphalia. ©Marcus Lindner (EFI)

## NEED HELP?



**Contact us:**  
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