

Prevent climate risk in coasts, before it's too late.

As climate change brings more frequent and intense storms and rising sea levels, storm surge is a growing danger in many coastal areas for people, property and infrastructure, and countries are unprepared for the impacts, according to new research.

Research shows that coastal cities – especially in the [North Sea, the Atlantic Coast of the UK and Ireland, and the Baltic Sea](#) – face growing vulnerability to a combination of stronger and more frequent storms and sea level rise. And increasing urbanization only adds to the risk.

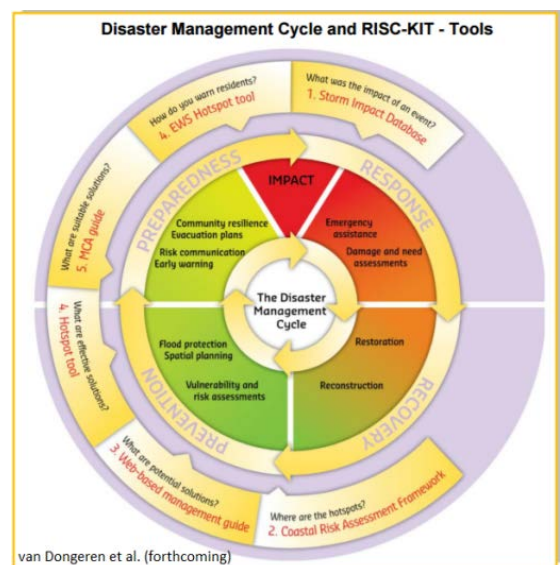
Storms could cost more lives than Cyclone Xynthia, which hit the coast of France in 2010 and resulted in 51 deaths and EUR 4 billion in damages, or Hurricane Sandy, which hit the coasts of the Caribbean and northeastern US in 2012, leaving 233 death and costing USD 71 billion.

As a result of climate change catastrophic events like these will be a more common experience for many Europeans, so it is critical to prepare and plan for more frequent storms and natural hazards. Policy relevant research on how to reduce disaster risk is essential in this work, as the EU-funded project RISC-KIT has demonstrated. RISC-KIT gathered evidence from 10 case studies in Europe.

Toolkit for practitioners and policy-makers

The EU-funded project [RISC-KIT](#), developed a toolkit to help coastal managers to reduce risk. This open-source freeware has [five tools](#) that were developed and tested in [10 European sites](#):

- A *storm impact database* that traces the impacts of previous events in a particular location.
- A *coastal risk assessment framework* that identifies hotspots especially at risk of hazards such as erosion or inundation.
- An *online management guide* with a comprehensive compilation of cases, examples and solutions to coastal hazards tailored for disaster risk reduction (DRR) practitioners.
- A *decision support system* which includes an *early warning system* that functions in real time, and a *hotspot tool*, which can be used to get detailed scenarios of risks and impacts linked to coastal hazards, and to model potential solutions to these risks.
- A *multi-criteria assessment guide* that instructs practitioners how to carry out a participatory assessment of solutions with a broad group of local stakeholders.



In each of the sites, RISC-KIT scientists collaborated with a [local stakeholder](#) responsible for local DRR work, some of them associated with local or regional governments and others with the private sector. This science-policy collaboration was crucial to gather data, spread information, obtain access to local networks, test the RISC-KIT tools, and engage with the people who will use the tools.

RISC-KIT views disaster risk reduction (DRR) as an integrated chain of actions (see figure above) that takes into account factors like past, present and future hazard probabilities, key hotspots, as well as plausible measures to reduce and mitigate risk.

Critical insights from our research

Evidence from RISC-KIT's 10 European case studies shows that no matter how effective a solution might be for mitigating coastal hazards, the solution is unlikely to be implemented if there is no support from civil society, if it is not economically or politically feasible at the local level, or is not sustainable in the short and long terms. So, if DRR is to be effective, it is crucial to build trust between scientists, policy-makers, and civil society to improve science uptake at local and regional levels; as well as improve understanding and perceptions of risk, and its implications in society at large.

Our case studies showed that local stakeholders – from civil society, municipalities, regions, and the private sector – did not select the most effective measure for mitigating coastal hazards, for example retreating or removing infrastructure. Instead, they ranked measures more highly if they involved less conflict, less investment, and were more closely aligned with political priorities and urban planning, such as improved communication, better training, evacuation plans, or beach nourishments (i.e. replacing eroded sand in a beach by mechanically and periodically replenishing sand).

Treating the symptom not the cause

The problem is such measures tend to treat the symptoms of flooding and erosion, but not tackle its causes or offer longer term solutions. In Praia de Faro in Portugal, there is a risk that hazards could lead to the collapse of houses and infrastructure. In the coast of Kristianstad in Sweden, long-term economic development, and private property is in jeopardy. In Tordera Delta in Spain, the tourist sector faces losses due to eroding beaches. Despite the clear risks, stakeholders across most of the cases were often not ready to take on the economic and social burdens implied by taking effective measures. Many people were also skeptical of climate change data and, or tended towards short term thinking and planning where climate change impacts and sea level rise were perceived as less relevant.

Crucial questions

Policy-relevant research must be promoted among decision-makers if we are to find answers to crucial questions such as, should municipalities invest in ecosystem-based solutions or hard infrastructure? Should municipalities or the private sector pay for investment? What solutions are feasible and sustainable in the short and long-term? Should we develop coasts further or start thinking about retreat?

These and other questions need to be taken seriously in policy and research to prevent citizens taking matters into their hands like in Kristianstad, where placing stones to break waves and prevent erosion seemed like a quick-fix solution that in reality caused increased erosion in other parts of the shore. Addressing coastal risks is detrimental for the success of cities' plans to mitigate and adapt to climate risk, and to prevent our coasts from washing away. Today, decisions in many of Europe's coastal cities are being taken without an understanding of present and future coastal dynamics, and this is threatening the human-marine environments that we rely upon.

Written by: Karina Barquet, Research Fellow at the [Stockholm Environment Institute](#), Oscar Ferreria, Associate Professor at the [University of Algarve](#), Ap van Dongeren, Project leader for RISC-KIT at [Deltares](#). Edited by [Tom Gill](#) Senior Editor and [Ylva Rylander](#) Press Officer at the Stockholm Environment Institute.

Read the policy brief [Disaster Risk Reduction strategies in EU coastal areas – recommendations for EU, national, and regional policy makers](#)

Read more about the [RISC-KIT project](#)

See [presentations and posters from 10 EU-countries](#)