



# Using insurance data to improve resilience to climate change in Barcelona

## Barcelona, Spain

### IN A NUTSHELL

*The city of Barcelona partnered with Cetaqua (Water Technology Centre) and 15 other institutions in the RESCCUE project to use insurance data in the development of a methodology that prioritises the adaptation measures to take and contributes to the updated version of the Barcelona Climate Plan.*

### Context

With 54% of the world population living in urban areas, the consequences of climate change significantly threaten urban living and the essential daily services – water supply, wastewater treatment, solid waste, energy supply, etc.- that cities provide to society. Barcelona, due to its geographic position, is prone to experiencing urban flooding, combined sewer overflow during heavy storm events, drought, heatwaves, and sea level rise. The occurrence of these hazards is expected to increase due to the influence of climate change. In 2008, the Spanish city suffered its worst drought in the last 70 years. This was one of the triggers for Barcelona to consolidate its data with private partners’ to develop innovative tools for building urban climate resilience.

The main focus of Barcelona in this project was the water sector, since water-related risks can have a significant impact on the correct functioning of the city’s urban services and its energy supply. Barcelona facilitated general communication and sharing of climate related data between the project partners and five institutions: the Spanish Meteorological Agency, Catalan Meteorological Service, Meteogrid, Spanish State Ports and Barcelona Cicle de l’Aigua. The last of these organisations was created by the City Council to manage the entire water cycle in Barcelona.



BARCELONA

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<p><b>Population:</b> 1.6 million</p>	<p><b>Area</b> 101 km<sup>2</sup></p>
<p><b>Signatory to the Covenant of Mayors since:</b> 2008</p>	<p><b>CO<sub>2</sub> emission reduction target:</b> -45% by 2030 based on 2005 levels</p>

## First step is data sharing and consolidation

Barcelona decided to go beyond urban resilience approaches to deliver a multi-scale, multi-sectorial and multi-hazard methodology. To evaluate risk exposure, it was important to define which areas of Barcelona are particularly sensitive according to their land occupation. This was made possible by combining data collected by the City Council and the Spanish Insurance Compensation Consortium.

The assessment of the economic damage for properties requires three different types of data: Flood maps, land use information and depth-damage functions. The two first gather the information about hydraulic variables and land parcels for the whole municipality. The third one, depth-damage functions, plays a central role in the methodology used in this project. Indeed, these data have been developed in analysis of previous flood claims in Barcelona and some other Spanish cities. The Spanish Insurance Compensation Consortium has collaborated by providing the historical compensations data, from 1996 to 2018, related to pluvial floods in Barcelona.

## Project main results

There is a huge challenge and gap in sharing information among water operators, public authorities and the private sector to help Barcelona decision makers. Therefore, assessing, planning and monitoring urban resilience calls for a more cooperative and integrated approach. In this regard, RESCCUE has developed flood depth-damage curves tailored for Barcelona. The curves indicate the permeability of buildings to help determine the vulnerability of elements at risk in Barcelona. These curves help the Spanish city to estimate the economic impact of floods, as well as resilience assessment, planning and management. These results helped identify the most vulnerable areas and revealed that improving the city resilience translates into potential economic savings.

Another example of the RESCCUE results is the development of a model to identify the stability of waste and recycling containers during floods. This model allowed the city to estimate the required investment in adaptation measures to avoid the containers' instabilities, therefore limiting the probability of contamination of flood water by the spilling of debris.

## Implementation of outcomes

The tools described above, and some others, have provided the city of Barcelona with the knowledge and necessary information to update and enhance the Barcelona Climate Plan. One of the most important results is the better understanding of the links between city services in their efforts to tackle climate events. As part of the project's results, a set of Geographical Information System (GIS) maps showing flood risks to Barcelona city services will be made publicly available in the resilience platform of the city council. Additionally, the data analysis carried out within RESCCUE has been used to update and confirm Barcelona's climate projection dataset. These results will be used to plan climate adaptation actions such as retention tanks to absorb the greatest amount of rainwater in future weather events. Finally, the prioritisation method of adaptation measures to deal with climate impacts, proposed by Cetaqua, has been a useful tool to facilitate decision making processes within the city council.

### KEY FIGURES

Pluvial flood damages in Barcelona from 1996 to 2018 accounted for **€34 million** insurance compensation pay-outs

Depth-damage curves developed for **14** types of properties

**17** collaborating partners



### FINANCING THE PROJECT

- + **Financing source(s):**  
EU H2020 programme
- + **Total project budget:**  
€8 million

### USEFUL LINKS

- ▶ Project coordinated by Aquatec, SUEZ Group:  
<http://www.resccue.eu>



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