

# SEISMIC RISK ASSESMENT AND DAMAGE ESTIMATION OF THE AXIS CARAVACA-CEHEGÍN-BULLAS AREA, MURCIA REGION, SPAIN

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## Introduction

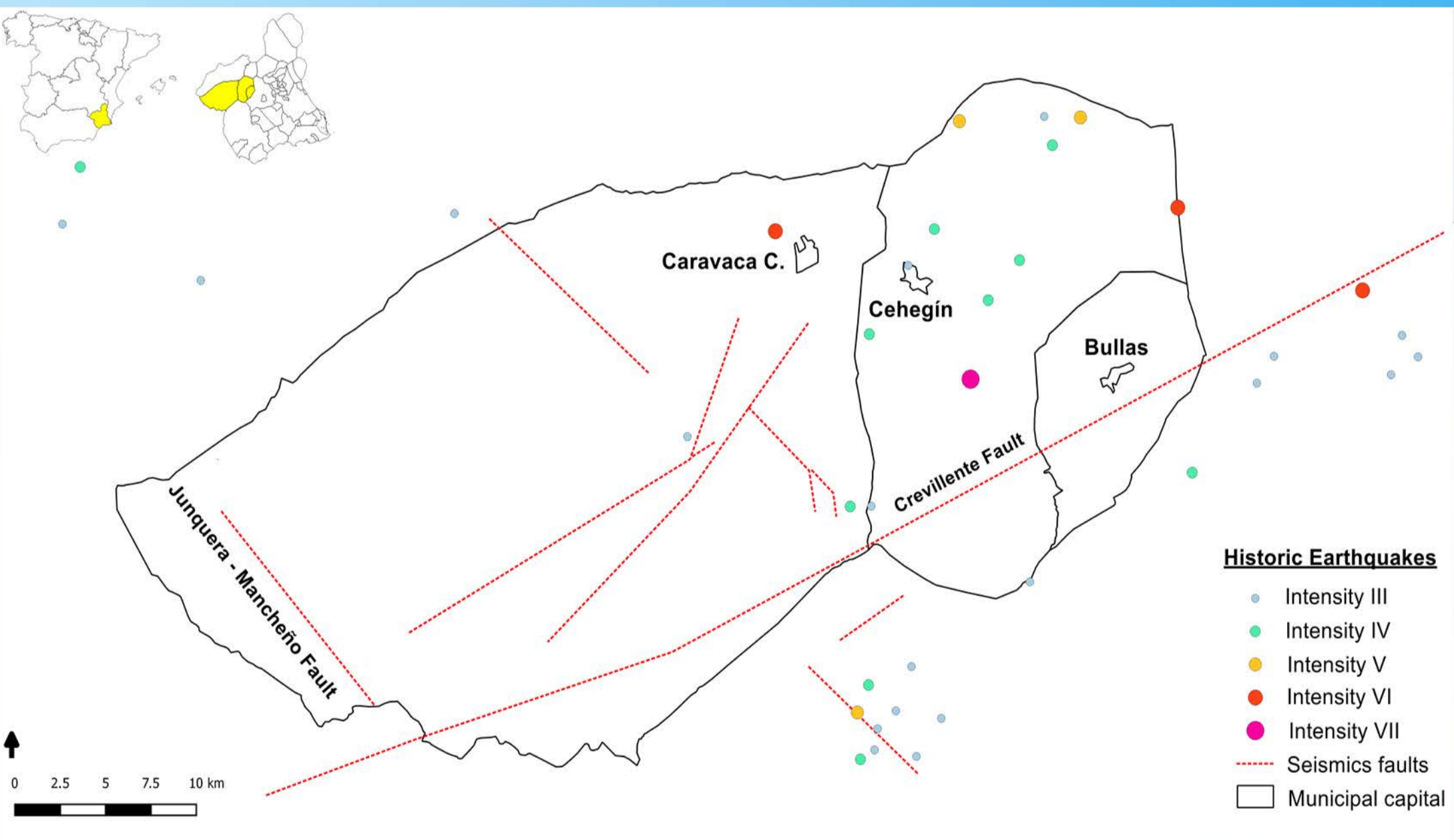
**Seismic risk** it is the probability that the social or economic consequences produced by an earthquake will be equal to or exceed predetermined values for a particular place, based on the vulnerability and exposition of the building structures, the population density, the cost of repairs and the seismic hazard.

## Objetives

The principal objective in this paper is to perform **high-resolution seismic mapping** that can be the basis for future municipal plans for seismic risk emergencies, complementing the different Municipal Emergency Plans (PEMUs).

## Study Area

This study is based on the **Caravaca-Cehegín-Bullas** axis (Region of Murcia, southeast of Spain). This is one of the areas with the most dangerous seismic activity on the Iberian Peninsula due to the existence of active faults like the Crevillente Fault, whose seismogenetic zone has very considerable seismic potential (6,7 Mw for a return period of less than 10,000 years).



## Methodology

**Zonified probabilistic** was used to calculate of hazard seismic. The methodology to calculate the potential economic consequences and risk of personal harm were calculated based on five different types of buildings. As a result, several damage parameters were obtained, including the total number of deaths due to collapsed buildings according to Coburn.

## Bibliography

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## Results

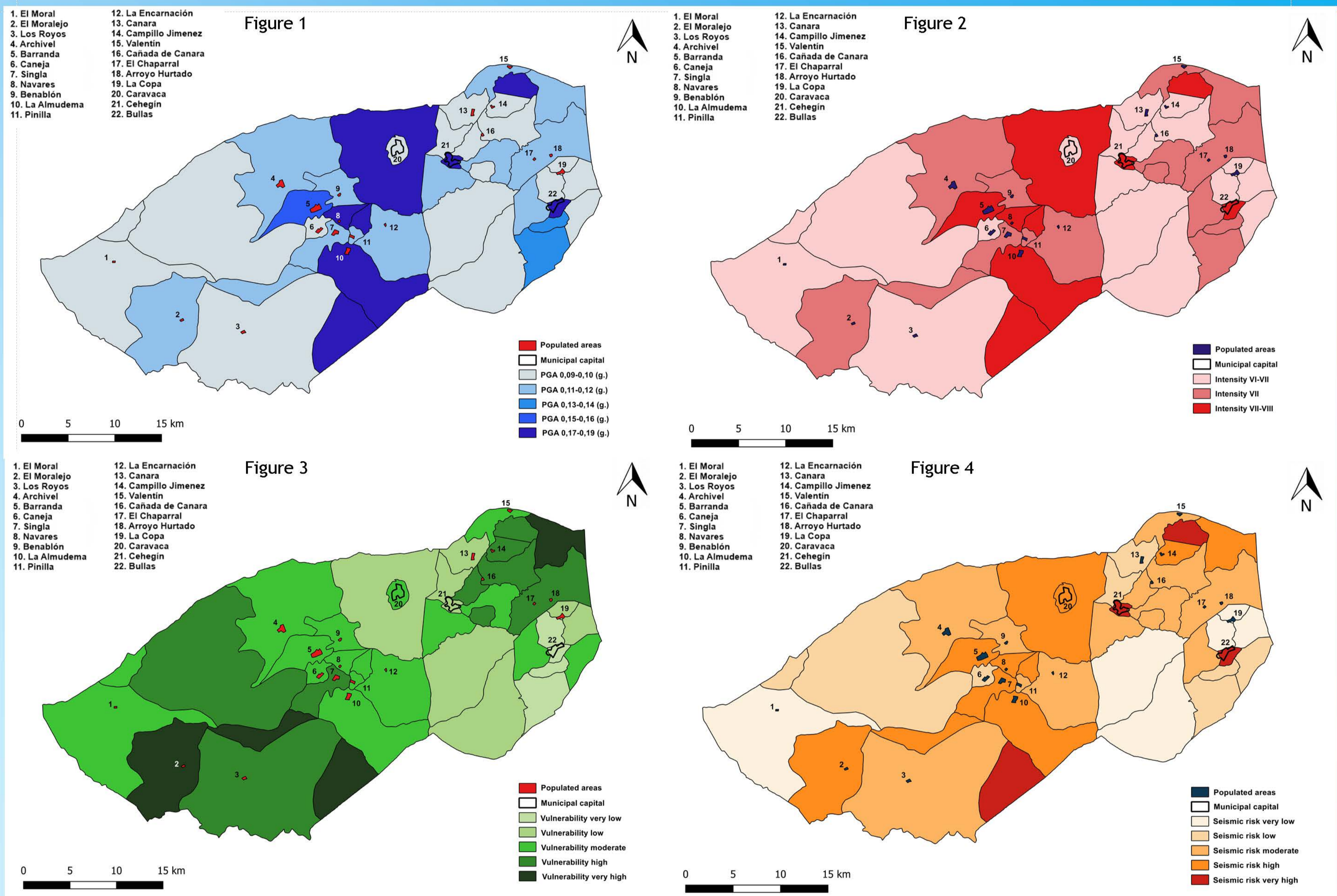


Figure 1. Peak ground acceleration (PGA)  
Figure 2. Maximum expected intensity seismic for 475 year return period  
Figure 3. Seismic Vulnerability  
Figure 4. Seismic Risk

## Discussion

Seismic risk has been estimated weighing a group of seismic parameters. This parameters has been calculated for a number of entities distributed in the studying area. The expected maximum intensity values obtained range from VI to VII-VIII for a return period of 475 years.

The highest value of PGA is the 0.19 g. and is located in the municipal capital of Bullas. In the municipals capitals, the vulnerability is low and moderate. Nevertheless, is in the municipal capitals, where is concentrate the greatest seismic risk, due to the majority of population lives in them. In the municipal capital of Cehegín and Bullas has been estimated a seismic risk very high.

According to the Coburn index the number of deceased, in case of occurrence a earthquake with the maximum expected intensity, would be of 147 people in Cehegín, and 74 people in Bullas. In this urban centres, it is essential to develop microzonation maps, where the areas of greater seismic risk will be delimited.

## Conclusion

The Crevillente Fault, whose seismogenetic zone has very considerable seismic potential (6,7 Mw).

-The expected maximum intensity values obtained (VI to VII-VIII) would be of 147 people in Cehegín, and 74 people in Bullas, in these municipal capitals, where is concentrate the greatest seismic risk.

It is essential to develop microzonation maps, where the areas of greater seismic risk will be delimited and necessary for future municipal plans for seismic risk emergencies (PEMUs)