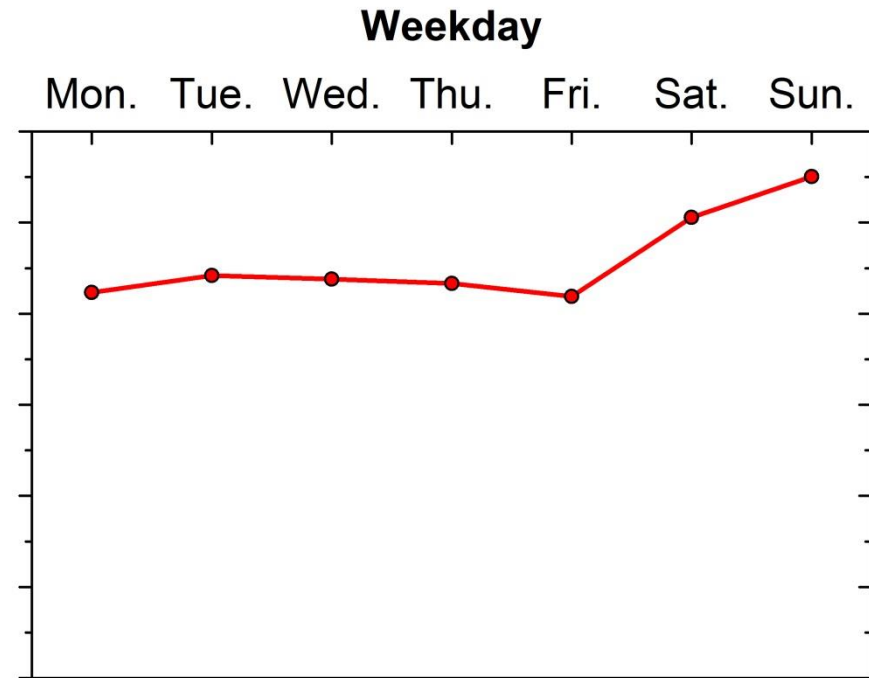
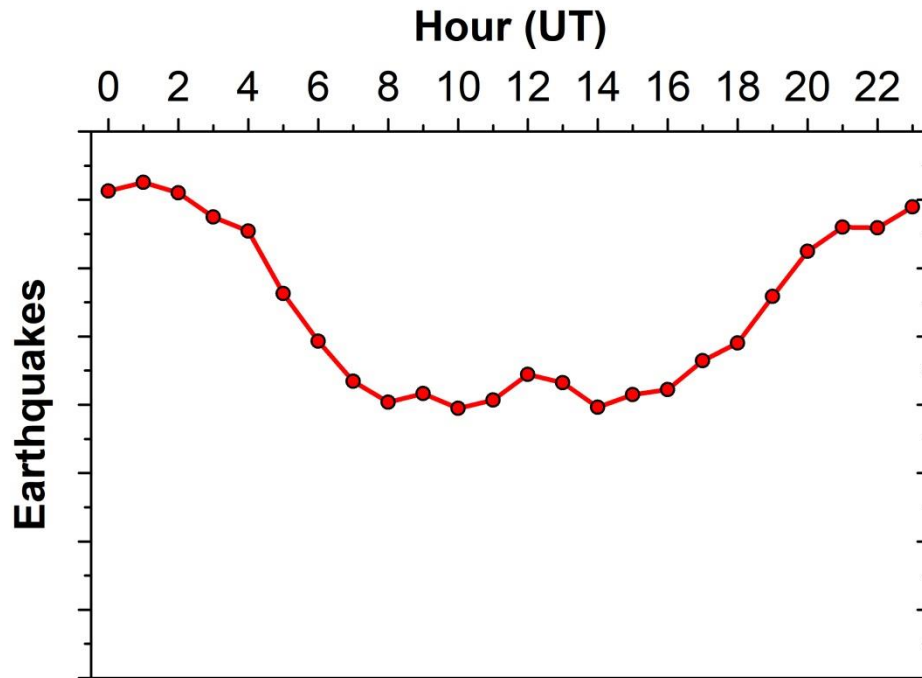


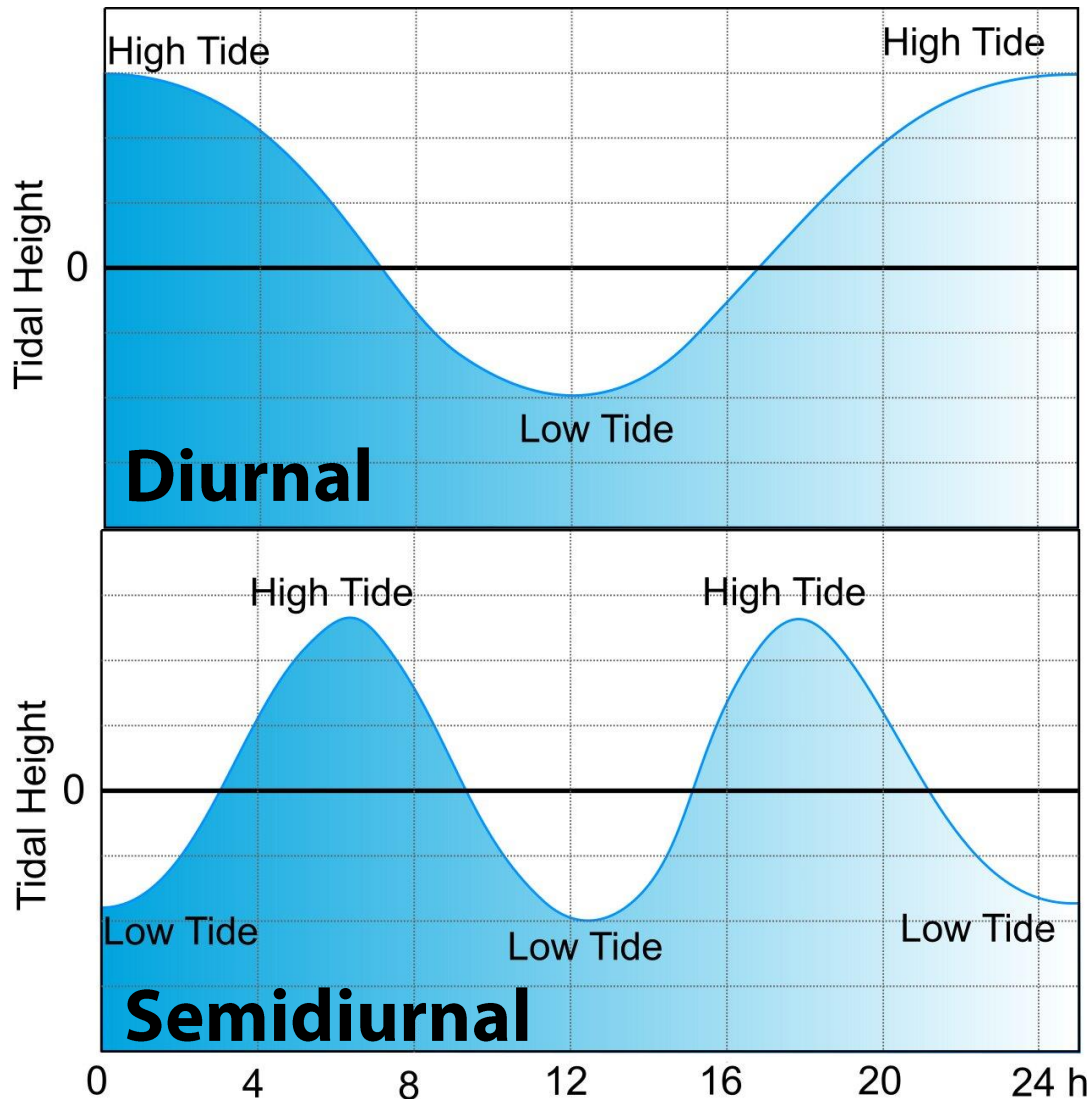
On artificial daily and weekly periodicities of earthquake frequencies

Álvaro González

www.geonaut.eu



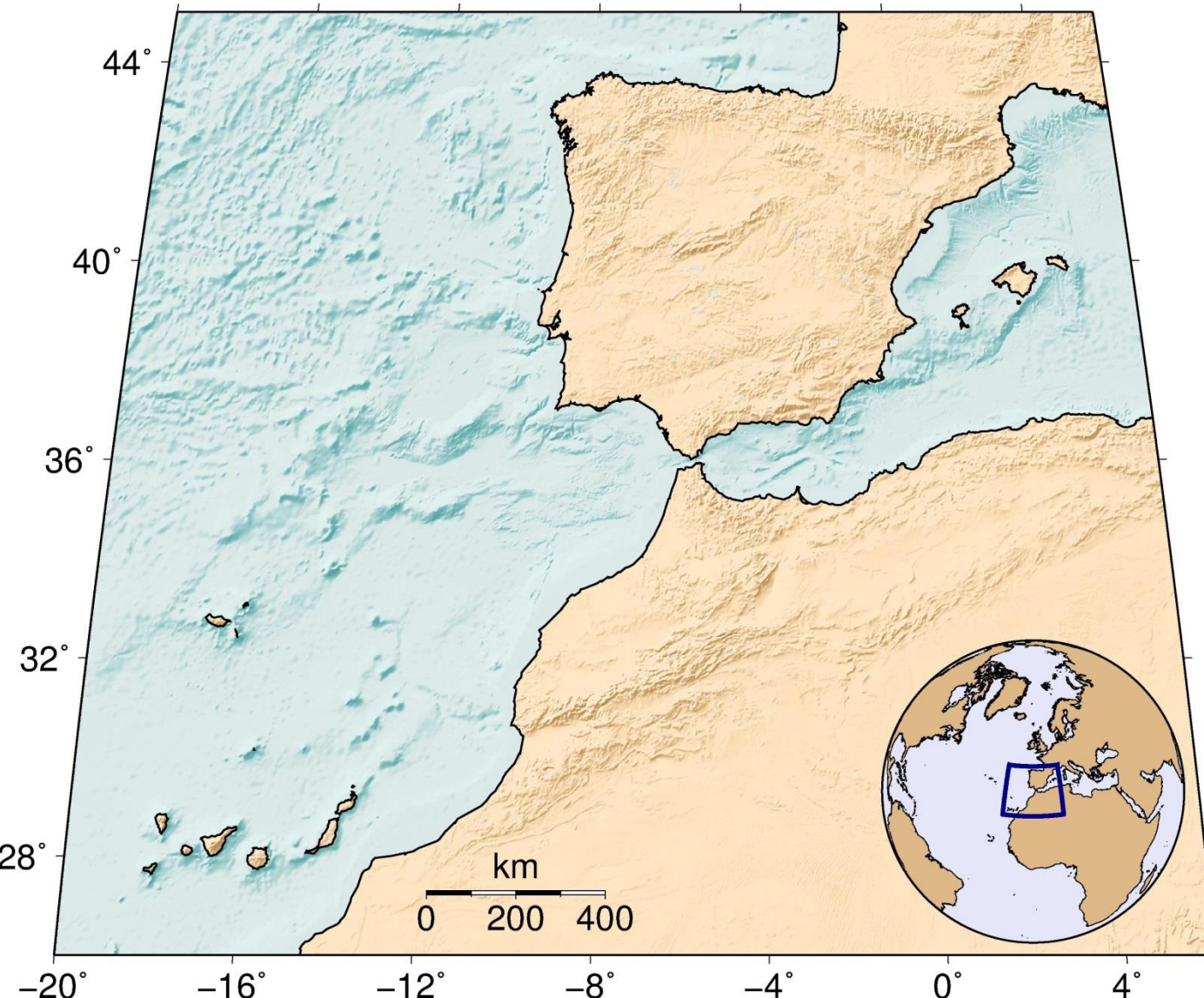
Be careful when searching, e.g. for correlations with tides.



Small earthquakes are preferentially recorded during nights and weekends, due to the lower artificial noise.

This may lead to spurious correlations.

Let us consider the catalogue of the Spanish National Geographic Institute.

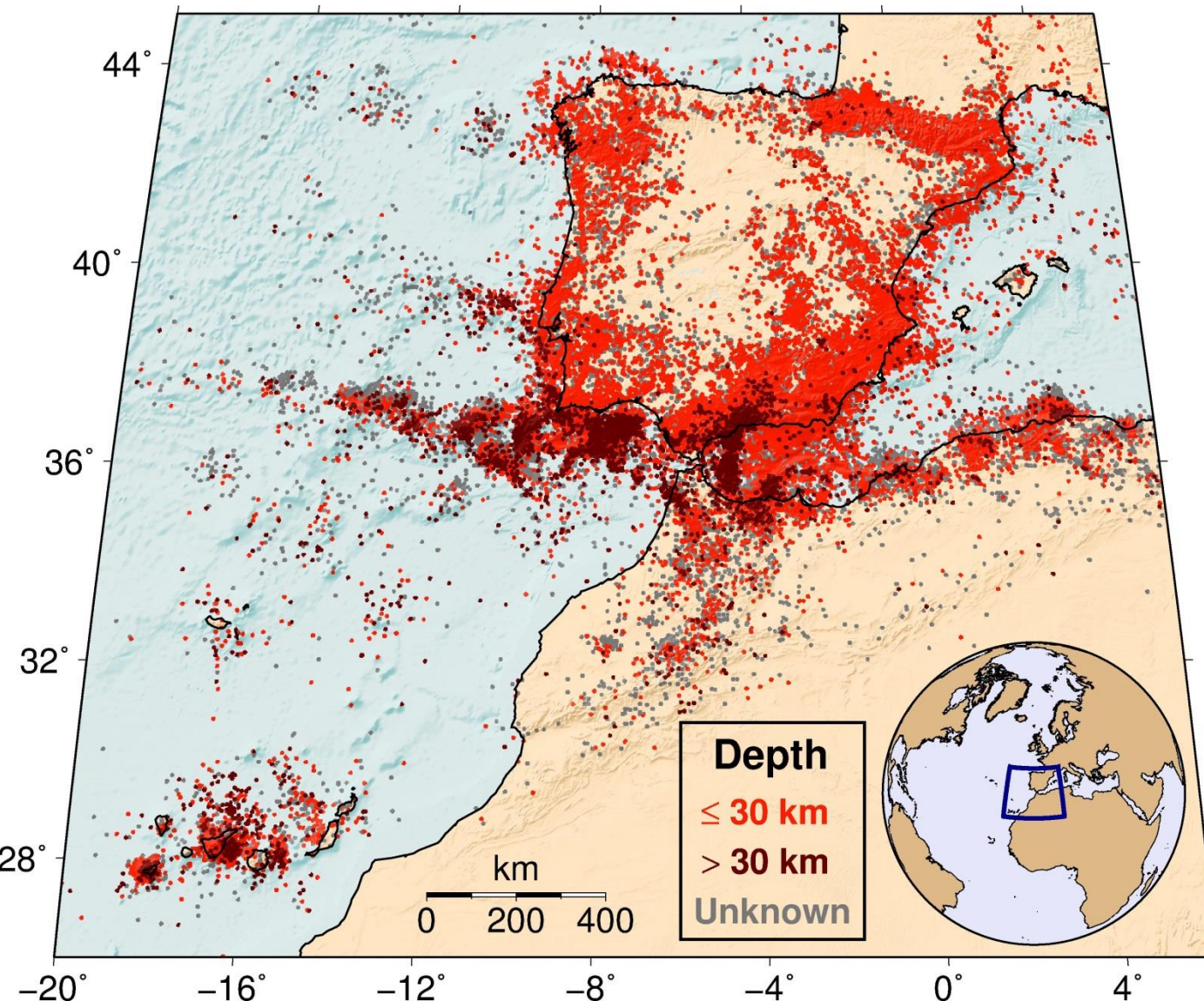


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**Analysed in
detail by
González
(*Journal of
Seismology*,
2017)**

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Let us consider the catalogue of the Spanish National Geographic Institute.

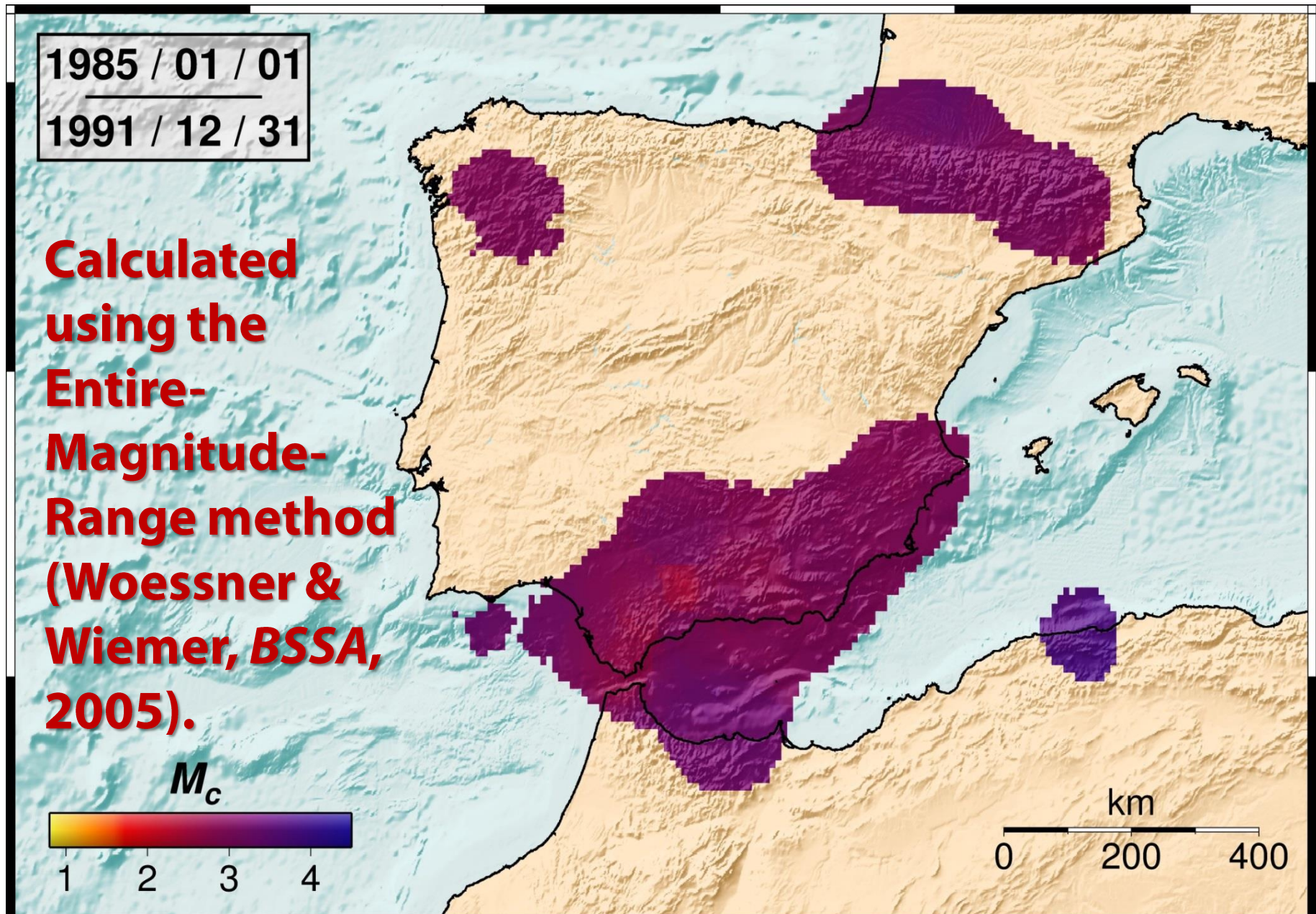


www.ign.es

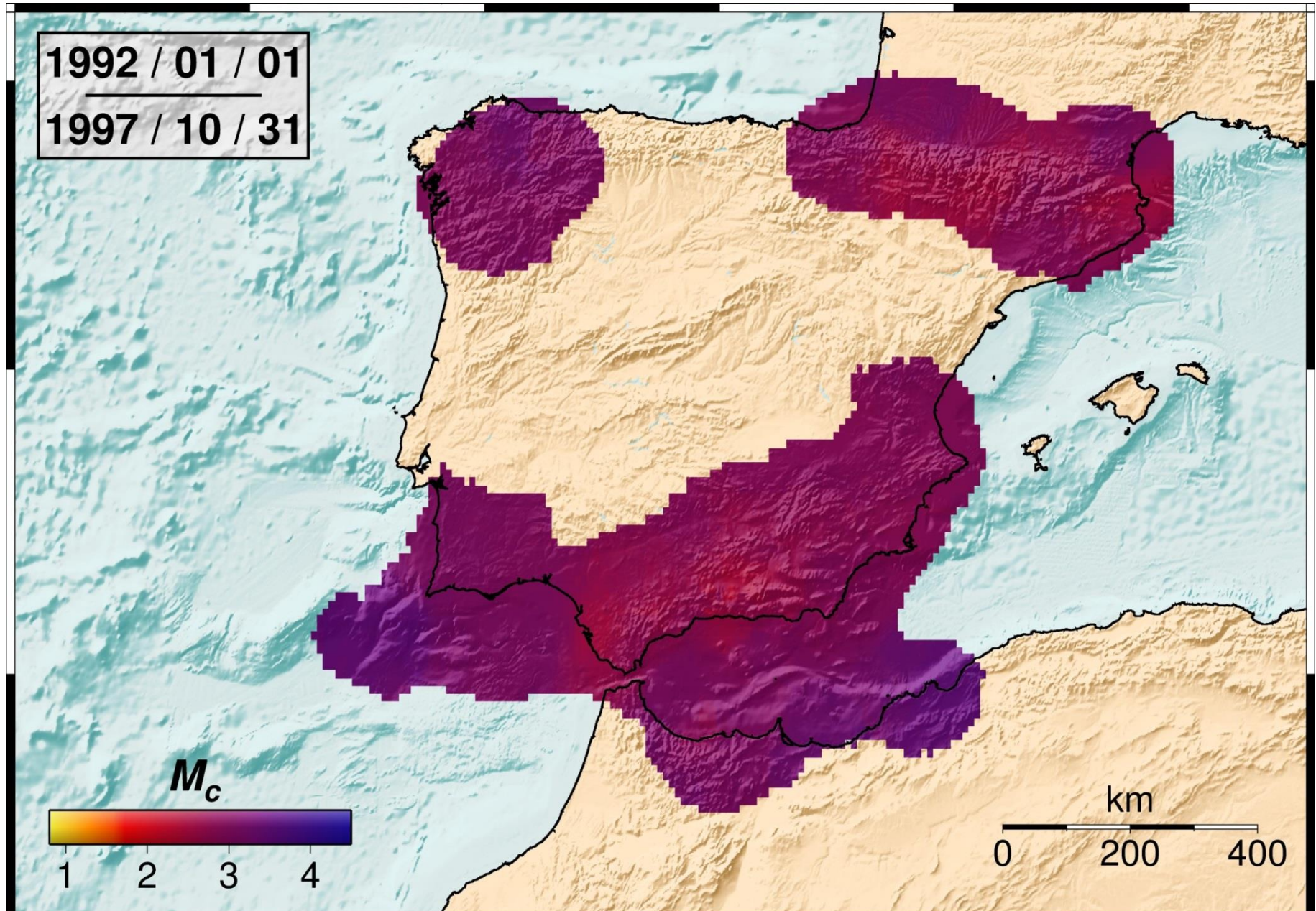
Analysed in
detail by
González
(*Journal of
Seismology*,
2017)

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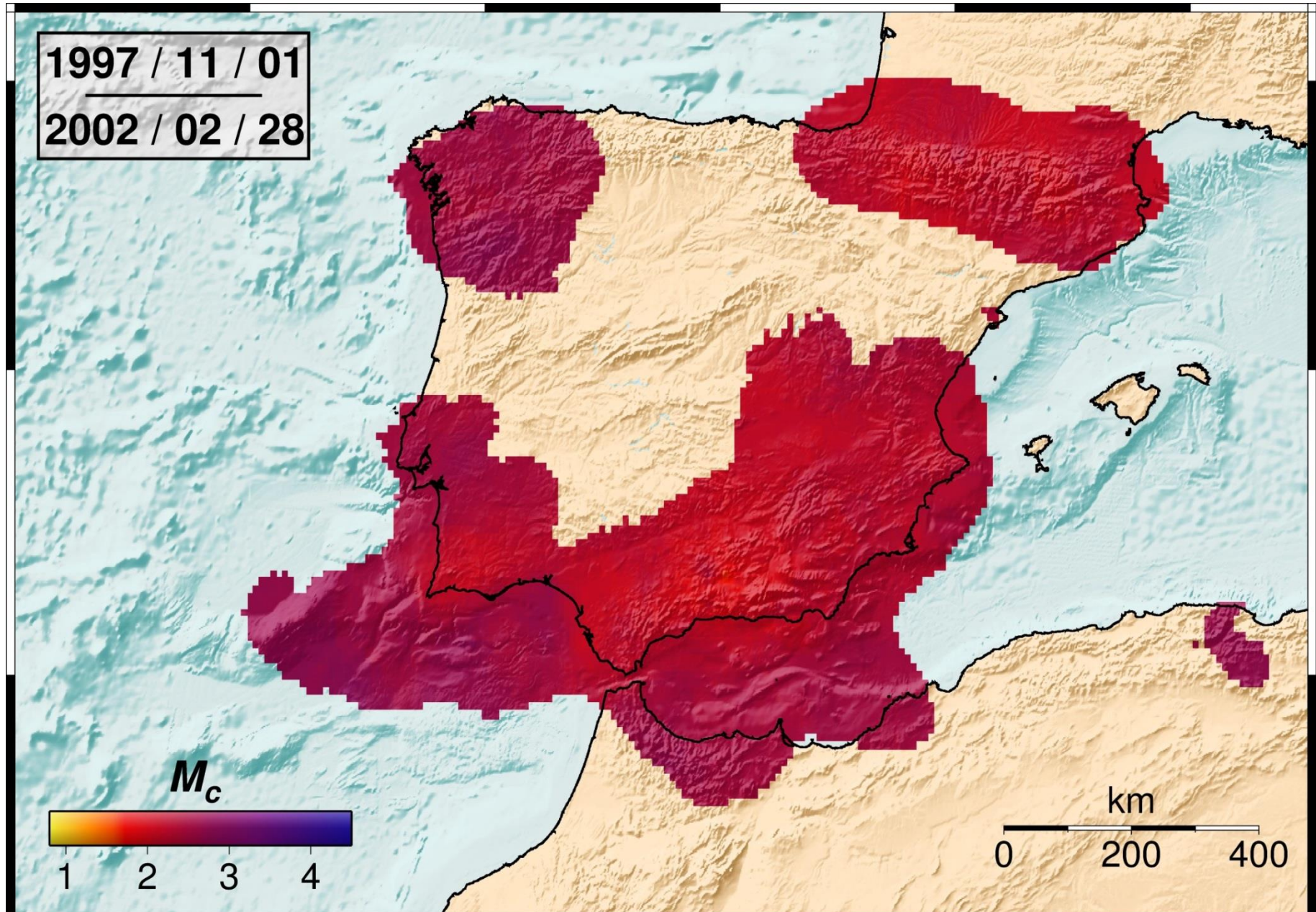
Magnitude of completeness in Iberia.



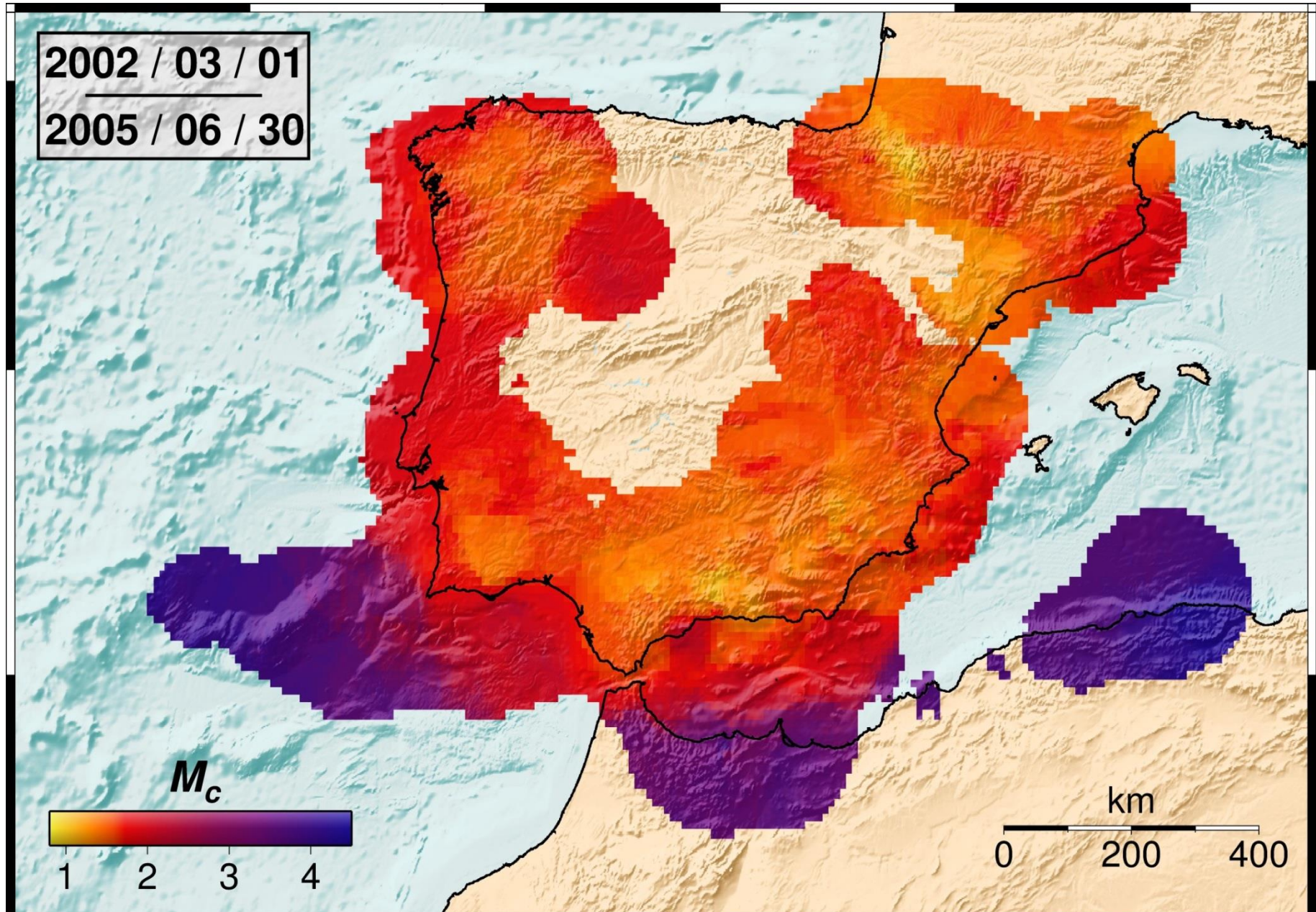
Magnitude of completeness in Iberia.



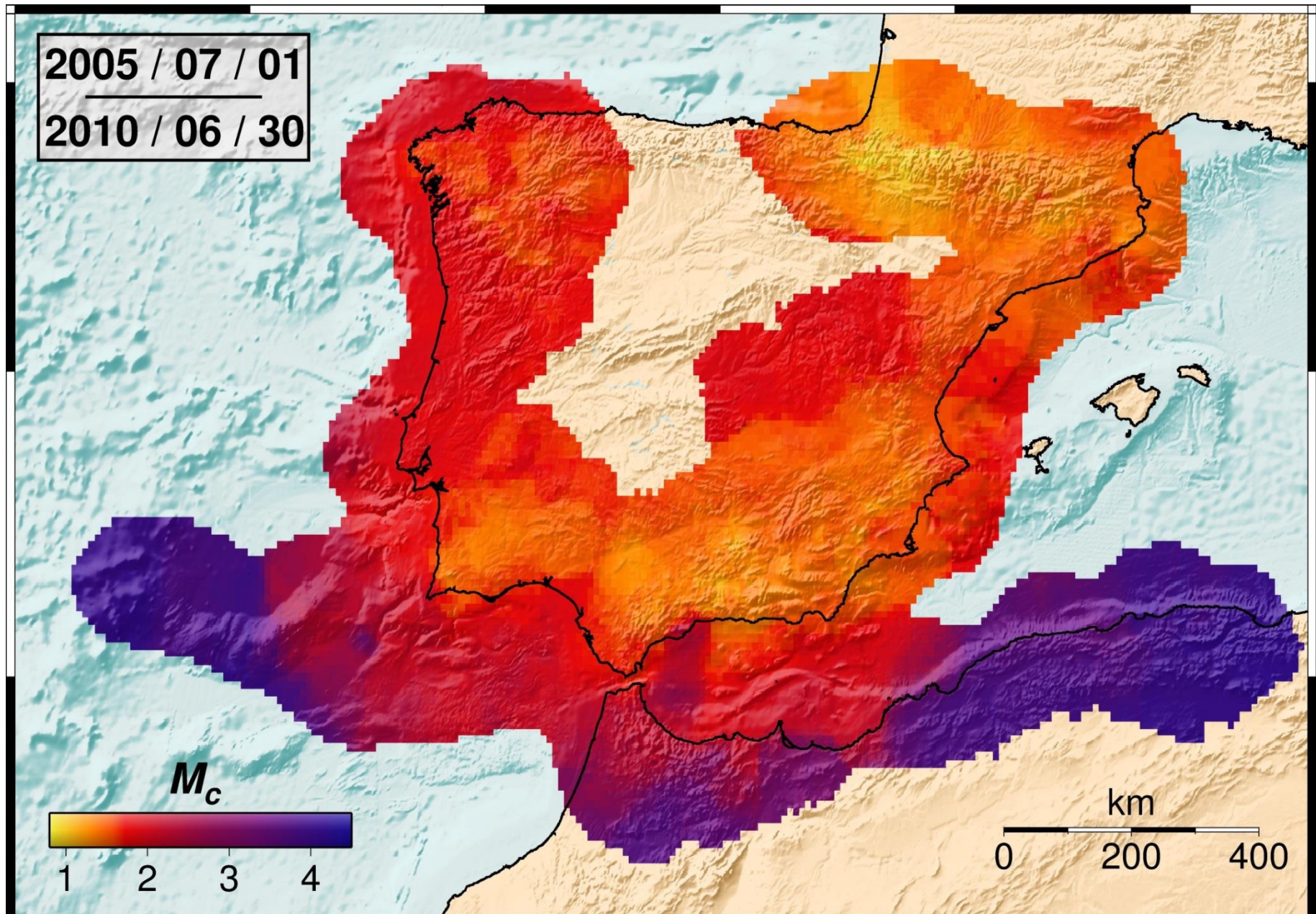
Magnitude of completeness in Iberia.



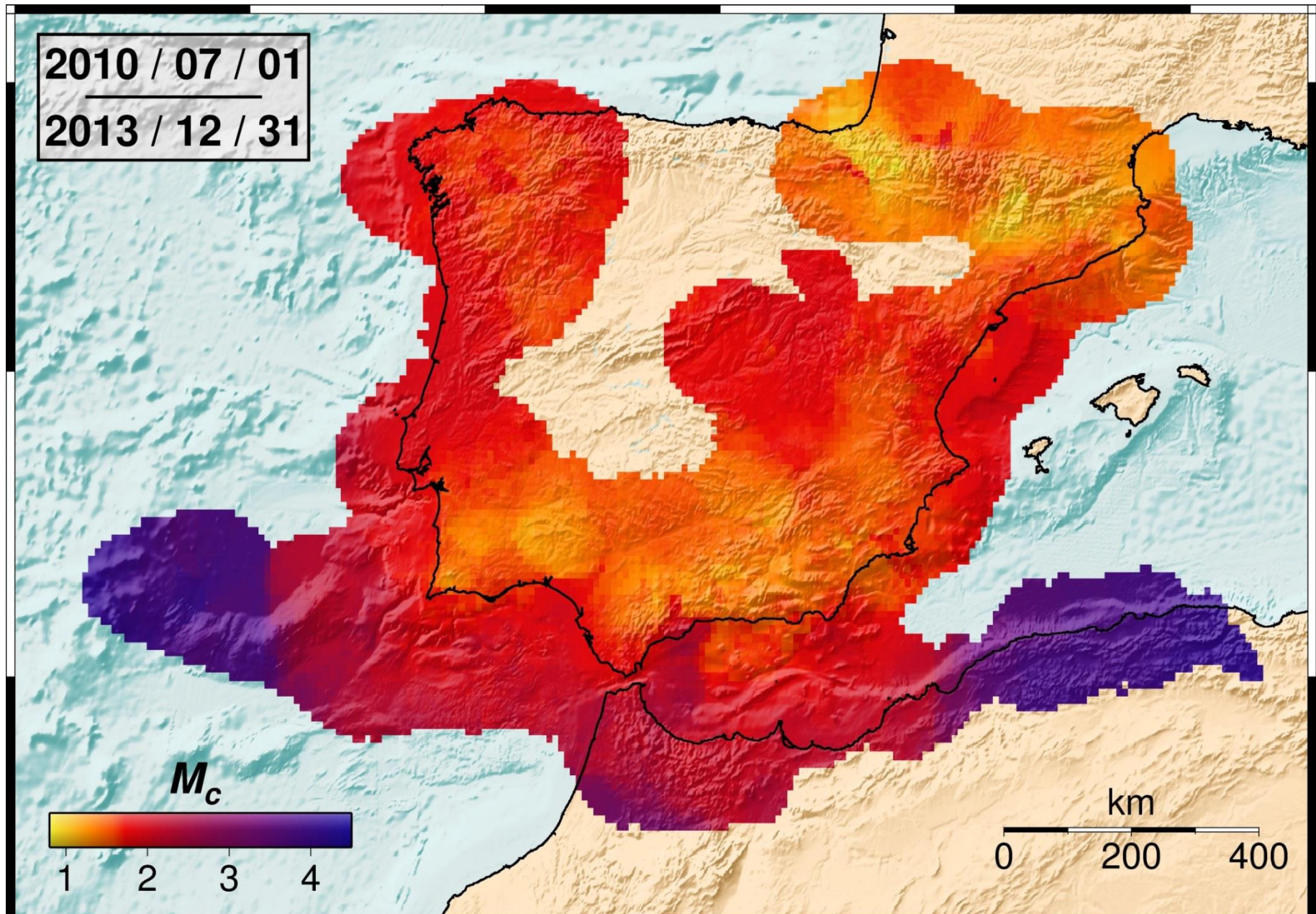
Magnitude of completeness in Iberia.

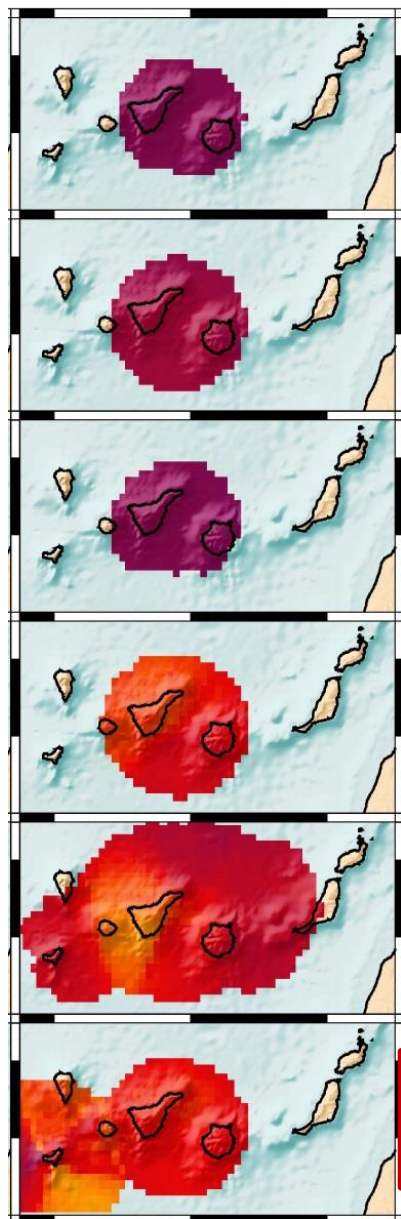


Magnitude of completeness in Iberia.



Magnitude of completeness in Iberia.



M_c 

1985 / 01 / 01

1989 / 12 / 31

1990 / 01 / 01

1997 / 10 / 31

1997 / 11 / 01

2002 / 02 / 28

2002 / 03 / 01

2004 / 05 / 16

2004 / 05 / 17

2011 / 07 / 20

2011 / 07 / 21

2013 / 12 / 31

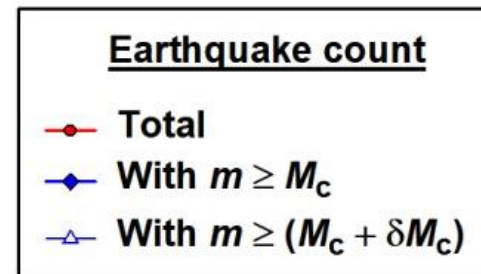
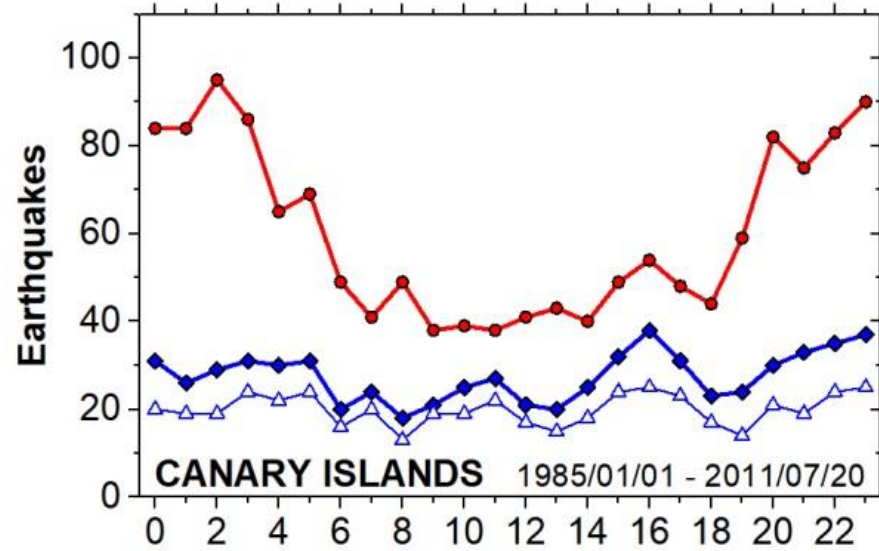
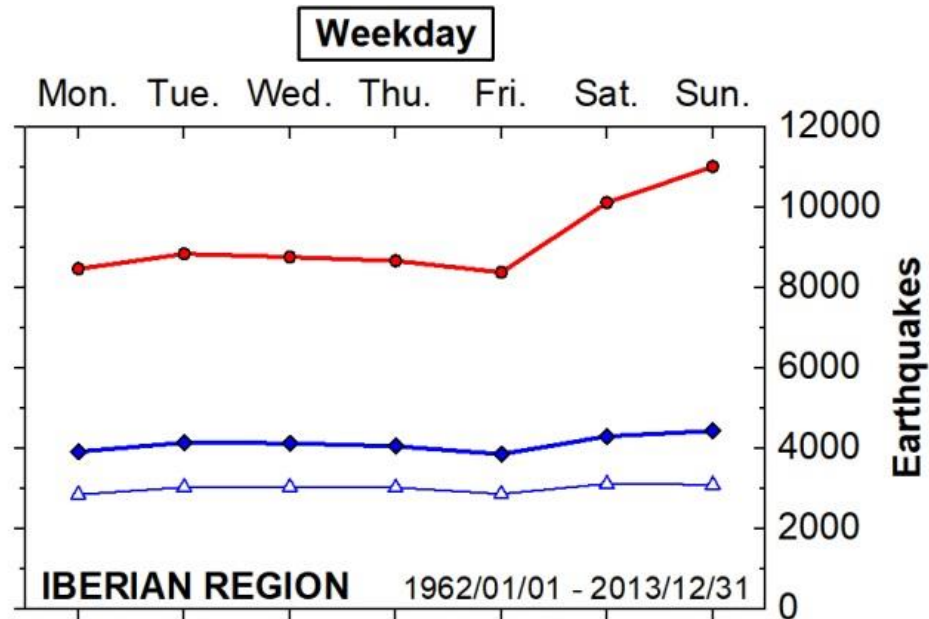
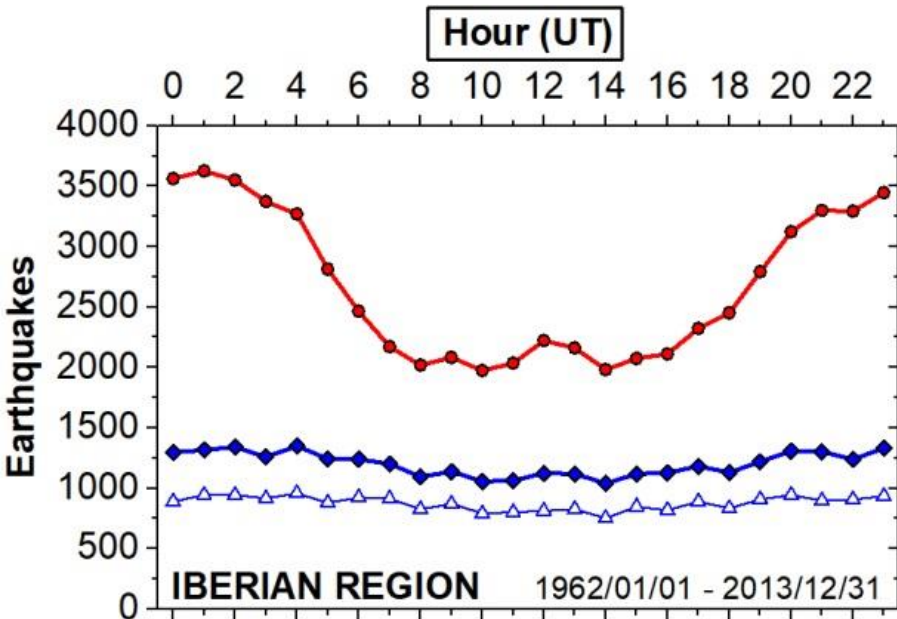
Magnitude of completeness in the Canary Islands.

Considered periods.

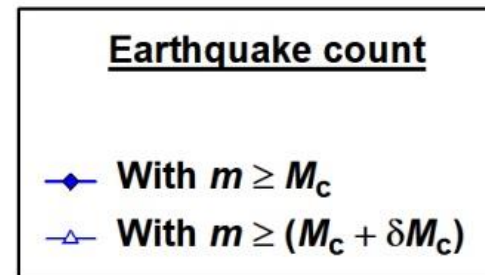
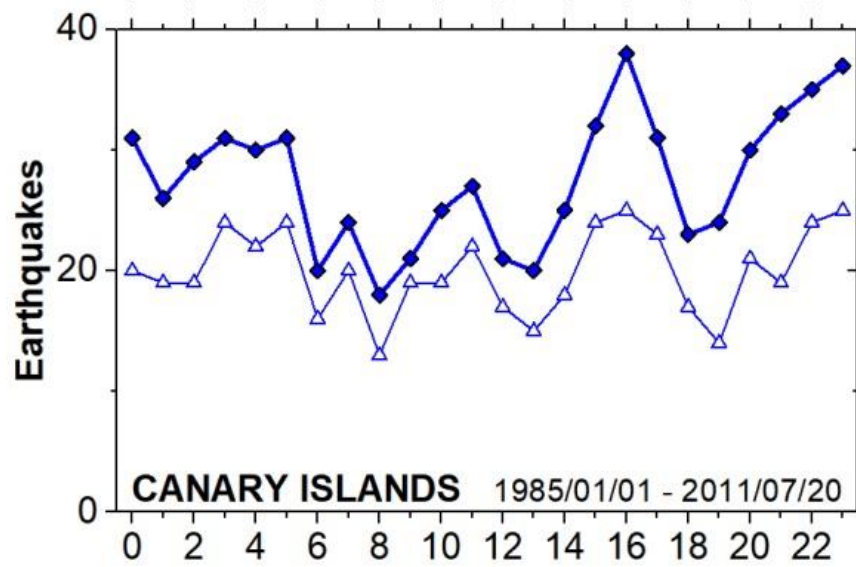
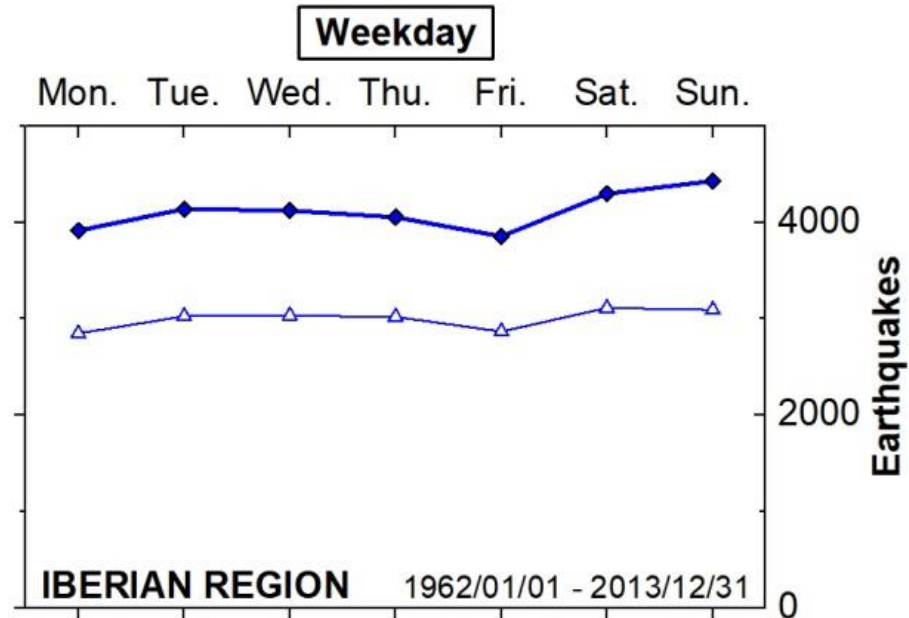
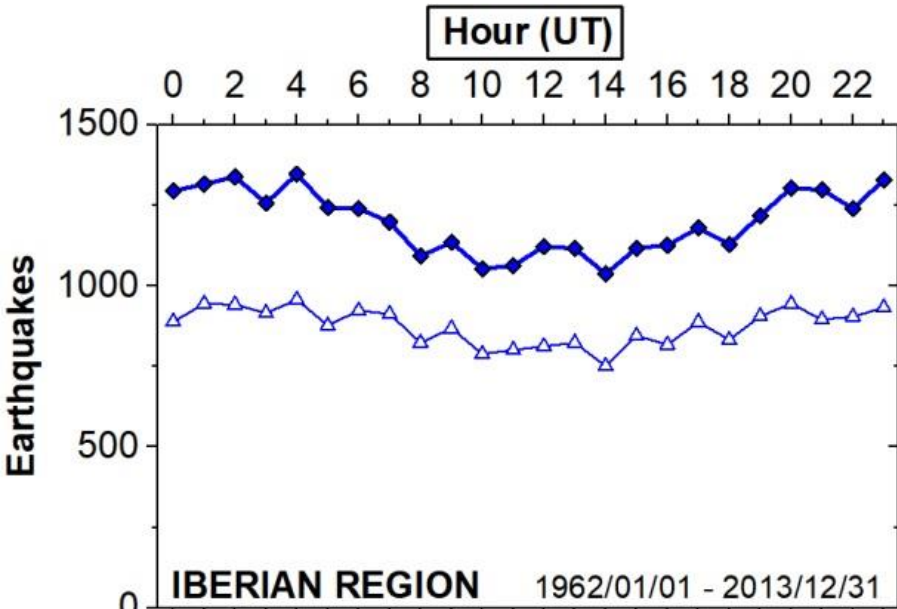
**Disregarded period
(non-stationary
seismicity rates of
El Hierro eruption).**



There are artificial daily and weekly variations of seismicity rates.



These variations do not entirely disappear if M_c is used as threshold.



Conclusions (1/2)

- **Daily and weekly periodicities are systematically reduced as larger magnitude thresholds are used, indicating that most likely they are artifacts.**
- **The weekend effect (e.g. Zotov, *Izvestiya*, 2007) can only be artificial. A magnitude threshold should be chosen large enough to remove it, so that differences between weekdays are not statistically significant (use a multinomial test).**

Conclusions (2/2)

- **These differences are better shown in periods with steady earthquake rates.**
- **The weekend effect may depend on the typical holy day of each country (Friday, Saturday or Sunday).**
- **Choosing a threshold equal to the magnitude of completeness does not suffice, as it is an average between day & night and between weekdays.**