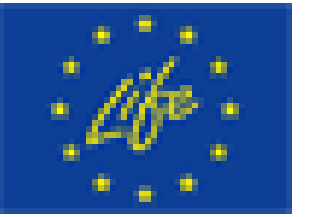


Can the mobility of grapevine cultivation be an adaptation to climate change?

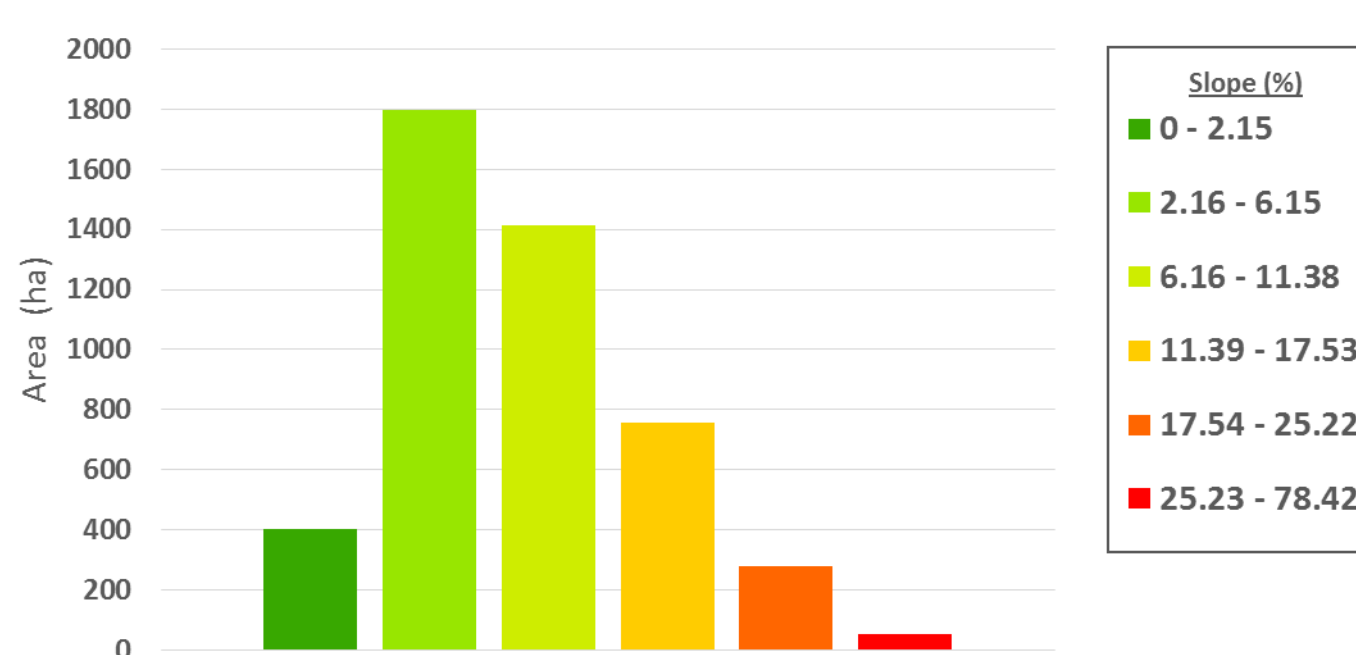
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Due to its geographical situation, Catalonia is a land of wide bioclimatic variability: mountains (the Pyrenees), plains and valleys (such as the Ebro Valley) and coast (the Catalan shoreline). This wide climatic variability allows the growth of both red and white grapes that results in the production of red, rose and white wine, as well as *cava* (sparkling wine), which represents half of Catalonia's wine production. Vineyards in Catalonia take up around 55.000 ha that supply wines to twelve different Protected Designations of Origin (PDO).

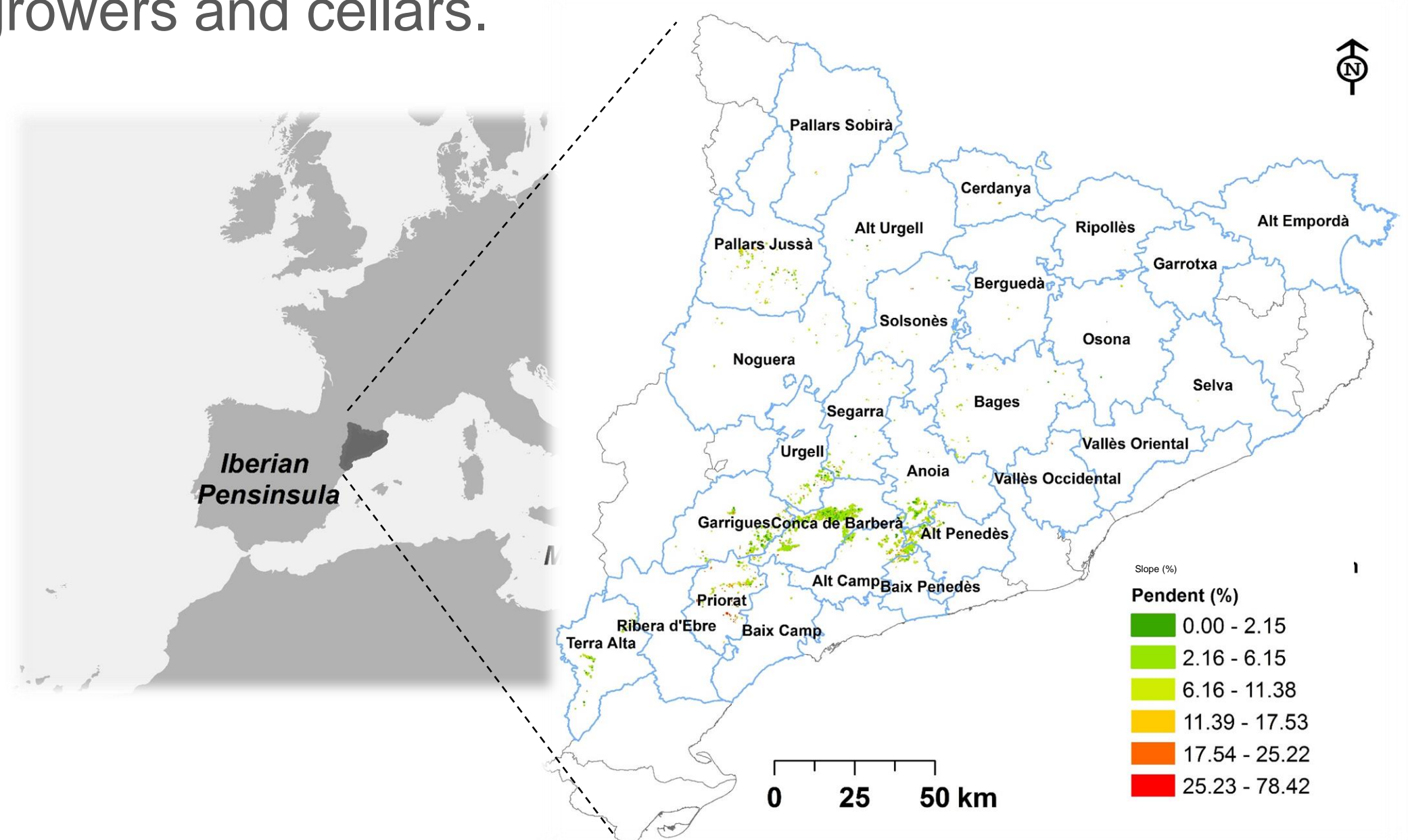
Agriculture and consequently the world of the vineyard is not strange to climate change impacts affecting productivity and wine quality (EEA, 2008). Adaptation measures have been partly influenced by an article appeared in PNAS (Hannah et al., 2013), discussing the effects of climate on the wine sector and proposing the displacement of the crop, to maintain production and quality of product. The displacement of vineyards to greater altitudes can be seen as a grower-managed escape mechanism to stress, or more generally, to non-optimal situations.



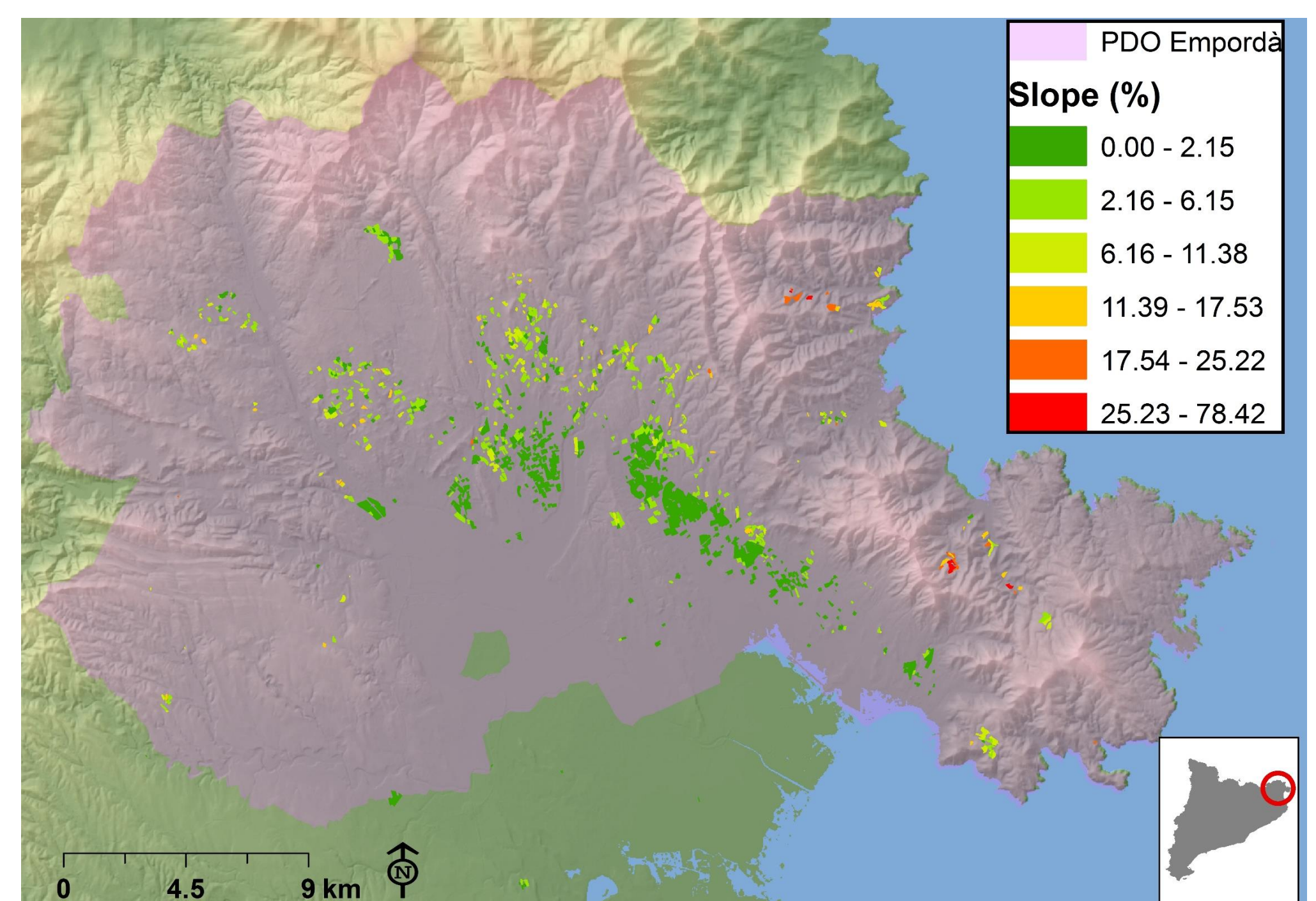
Histogram of the surface of vineyard at more than 500 m asl by slope classes (%) in Catalonia.

In mountain vineyards are producing 40% less and the variability of yield is double than in non-mountain areas, which is attributable to phenological changes associated to different temperatures and to several single or combined abiotic stresses such as drought, chill or even frost (Savé et al., 2017 a, b)

This work is centered in Catalonia (NE Iberian Peninsula), where near 10% of total vineyards area (5182.49 ha) are located at more than 500 m above sea level (asl) presenting different slopes. The main goal was to show that there aren't general options in vineyard cultivation, which must be regionalized to each zone, always according to the interests of growers and cellars.



Location of Catalonia and spatial distribution of slope classes of vine plots located at more than 500 meters asl in Catalonia. The counties bounded by blue are those counties with a vineyard surface of 500 m asl.



In PDO Empordà there is an important combination of high slopes, low altitude and very windy weather.

Take Home Message

The escape mechanism (vineyard displacement to new geographical places, particularly in altitude) is important to resist but not to produce, at least in the quantity and quality of the current locations. Mobility could be a good and interesting tool to improve the wines or to make them new, but always from an integral and holistic evaluation of the production.

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