Since the 1970s, a growing share of European wheat production areas has been affected by either extreme heat or drought (Fig. 1, left). The fraction of total area with at least a 25% chance of experiencing adverse climatic conditions has increased from less than 0.2 in the 1970s to about 0.5 in the 2010s. This increase is most pronounced in Eastern and Central Europe and over the Iberian Peninsula.

At the national scale (Fig. 2, right), we found contrasting results, i.e. a marked increase of the area affected by heat stress in many of key producing countries, including Spain, Germany, Poland and Ukraine, with no clear tendency in France.

This work is a contribution to the EU FP7 project MODEXTREME (http://modextreme.org/), whose overarching goal is to improving the capability of biophysical models to simulate vegetation responses to climatic variability and extremes.