



Impact of climate extremes on flowering dates of four shrub species

Jonatan Siegmund (1,2), Marc Wiedermann (1), Jonathan Donges (1), and Reik Donner (1)

(1) Potsdam Institute for Climate Impact Research, RD IV: Transdisciplinary Concepts and Methods, Potsdam, Germany (jonatan.siegmund@pik-potsdam.de), (2) Institute of Earth and Environmental Science, University of Potsdam, Karl-Liebknecht-Str. 24-25, 14476 Potsdam-Golm, Germany

Ongoing climate change is known to cause an increase in frequency and amplitude of local temperature and precipitation extremes in central Europe. While gradual changes in the climatological conditions are known to strongly influence plant flowering dates, the question arises if and how extremes specifically impact the timing of this important phenological phase. In this study, we systematically quantify simultaneities between meteorological extremes and the timing of flowering of four shrub species across Germany by means of event coincidence analysis, a novel statistical tool that allows assessing whether or not two types of events exhibit similar sequences of occurrences. Additionally we perform a superimposed epoch analysis in order to investigate the impact of different magnitudes of extremes and to assess possible long term influences. Our systematic investigation supports previous findings of experimental studies by highlighting the impact of early spring temperatures on the flowering of wildlife plants. In addition, we find statistically significant indications for some long-term relations reaching back to the previous year.