



Uncertainty in mapping phenology – how do we proceed with decreasing numbers of observations in Germany?

Stefan Härer, Tobias Ottenheim, Alissa Lüpke, and Annette Menzel
Technical University of Munich (TUM), Germany

Phenology can serve as a major indicator of ongoing climate change. Long-term phenological databases are therefore of high importance to assess, analyze and convey these changes. In Germany, the German Meteorological Service (DWD) operates a large phenological network based on observations of volunteers. However, the number of observers has strongly decreased in the last decades. This complicates any spatial interpolation of the data and may lower its accuracy. In order to keep the uncertainty level comparable between historical and future phenological maps, a promising strategy seems to be determining the representativeness of sites. This may allow identifying sometimes redundant historic observation sites, focussing on spatially more representative sites in the future when recruiting new observers and most importantly demonstrating the value of their contributions as citizen scientists. In this study, we therefore generated uncertainty maps for various plant species and phenological stages in Germany based on DWD data. We systematically analysed the maps to extract regions with high uncertainties as well as areas with high spatial representativeness. The results are eventually applied to actively promote observations in the critical regions within our citizen science project BAYSICS – Synthesis-Information-Citizen Science Portal for Climate Change Research and Science Communication in Bavaria (southern Germany).