



## **SIGNAL – European gradients of resilience in the face of climate extremes**

Meadows and pastures encountered in Europe provide various ecosystem services which have a crucial influence on the human well-being. However, extreme weather events and the presence of invasive species can act as pressures threatening biodiversity, resilience and ecosystem services of semi-natural grasslands and can suddenly drive them beyond thresholds of system integrity (tipping points and regime shift). On the other hand, biodiversity itself may buffer against change. Potential stabilising mechanisms include species richness, presence of key species, and within species genetic diversity. These potential buffers can be promoted by conservation management and political decisions.

SIGNAL will investigate mechanisms of resilience in European grassland prone to novel climate extremes and identify early warning signals of thresholds and regime shifts by installation of replicated experimental manipulations of climate extremes at eight grassland sites across Europe (Belgium, Bulgaria, France, Germany, Hungary, Italy, Switzerland and Turkey). Thus, the central aim of the SIGNAL project is to create a basis to test prospective implementations in environmental management and nature protection on their efficiency. In view of changing forecasts for climate and weather, new instruments for the protection of ecosystem services of open space have to be generated.

SIGNAL investigates the interaction of three major research directions which have not yet been combined: biodiversity experiments, climate impact research, and invasion research. The specific question is how droughts change the biodiversity and ecosystem service provision of grassland with the focus on invasive species and their settling. On this basis, science-based policy recommendations are to be developed, for example for European or national authorities, non-governmental organizations (NGOs) or for agriculture and forestry. The platform of National Consortia (PNC) plays an important role in this process. This forum consists of the national consortia of the countries, which are engaged in national biodiversity goals. At each consortia, there are not only representatives of politics and ecological practice but also scientists participating in SIGNAL. They will be responsible for the transfer of the research results.

### **Partners:**

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