

Shifts in the frequency of sequentially occurring late-spring frost and drought in European beech ecosystems

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Background:



Late-frost induced canopy damage induces mobilization of carbon reserves to ensure survival



Similarly, such reserves also play a role in mitigating drought related stress and damage

Method:

Data

E-OBSv23.1 (1950 - 2021)
LFU Bayernensemble (2021 - 2100, regionally downscaled EURO-CORDEX)
Daily values at 5km x 5km resolution

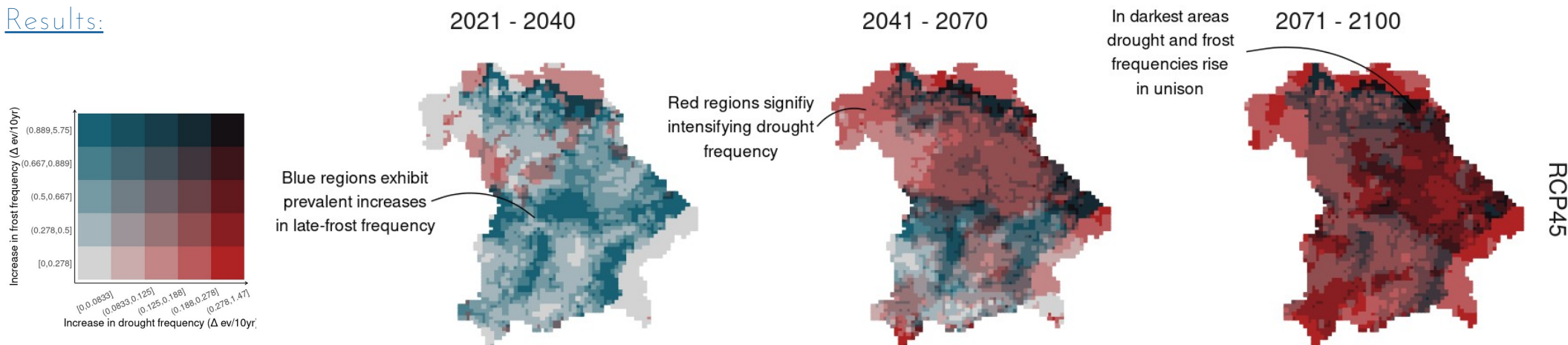
Indicators

European beech specific phenology model
(Kramer et al 2017)
Minimum temperature after leaf-out
Growing season SPEI 6

Metrics

Change in the number of events per decade for imminent-, near-, and far-future compared to historic period

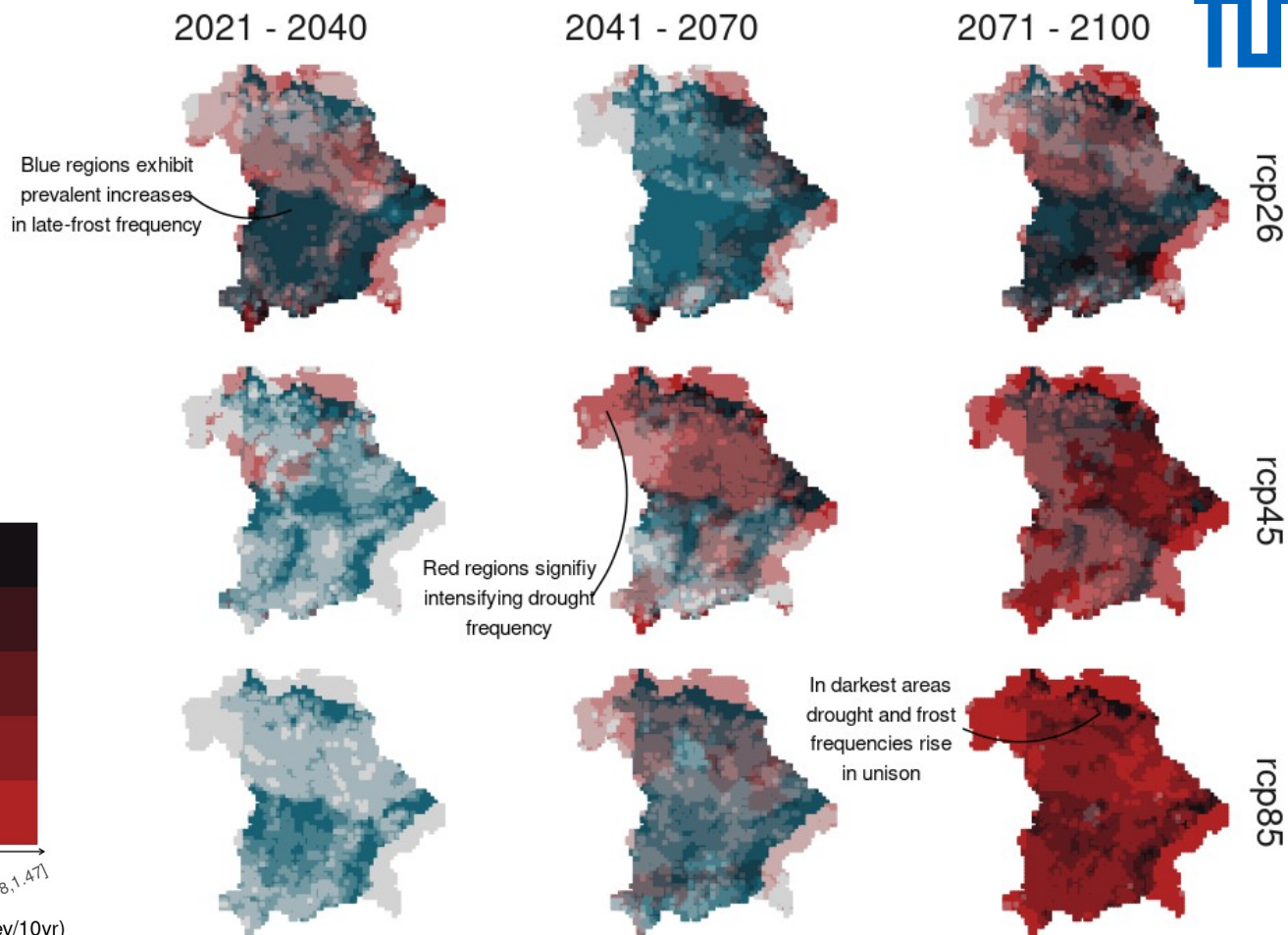
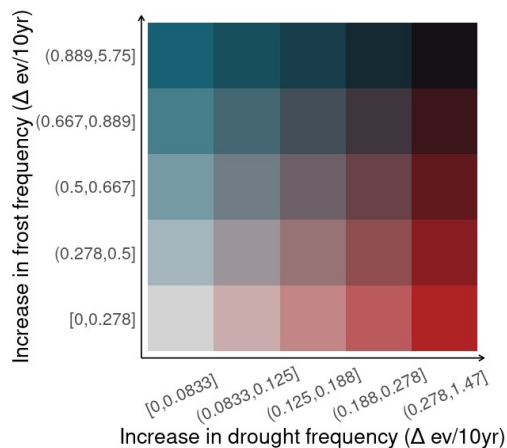
Results:



Frost and drought frequencies vary across multiple RCPs

- Highest increases in frost and drought frequency do not necessarily match the most severe scenario (RCP85)

- Even under a relatively favorable RCP 26 scenario, many regions across Bavaria will experience increases in both drought and frost frequency



Frequency of sequentially occurring extremes across multiple RCPs



- Extremes are counted as sequential when an event year is preceded by another event year
- Agnostic concerning which extreme follows another
- Compound extremes occurring in the same year are not counted
- Especially in the northern regions of Bavaria, areas which experience an increase in sequential extremes match the regions for which the highest concurrent increases in drought and frost frequency are projected

