

Stratospheric Precursors of European Vegetation Growth and Crop Yield

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	FSW	SPV	SSW
1982	early	neutral	yes
1983	early	strong	no
1984	neutral	strong	yes
1985	early	weak	yes
1986	early	strong	no
1987	late	weak	yes
1988	neutral	neutral	yes
1989	neutral	strong	yes
1990	late	strong	no
1991	neutral	neutral	no
1992	early	neutral	no
1993	neutral	strong	no
1994	early	neutral	no
1995	neutral	neutral	no
1996	neutral	strong	no
1997	late	strong	no
1998	early	weak	no
1999	late	weak	yes
2000	neutral	strong	yes
2001	late	weak	yes
2002	late	weak	yes
2003	neutral	neutral	yes
2004	late	weak	yes
2005	early	strong	no
2006	late	weak	yes
2007	neutral	neutral	yes
2008	late	neutral	yes
2009	late	weak	yes
2010	late	weak	yes
2011	early	strong	no
2012	neutral	neutral	no
2013	late	weak	yes
2014	early	strong	no
2015	early	neutral	no
2016	early	strong	no
2017	neutral	neutral	no
2018	neutral	neutral	yes
2019	neutral	weak	yes
2020	late	strong	no
2021	neutral	weak	yes
2022	early	strong	no

Figure 1. Characterization of the analysed years into strong, neutral, and weak winter-mean SPV, as well as early, neutral, and late FSWs. Years are also characterized depending on the occurrence of a SSW in December-February.

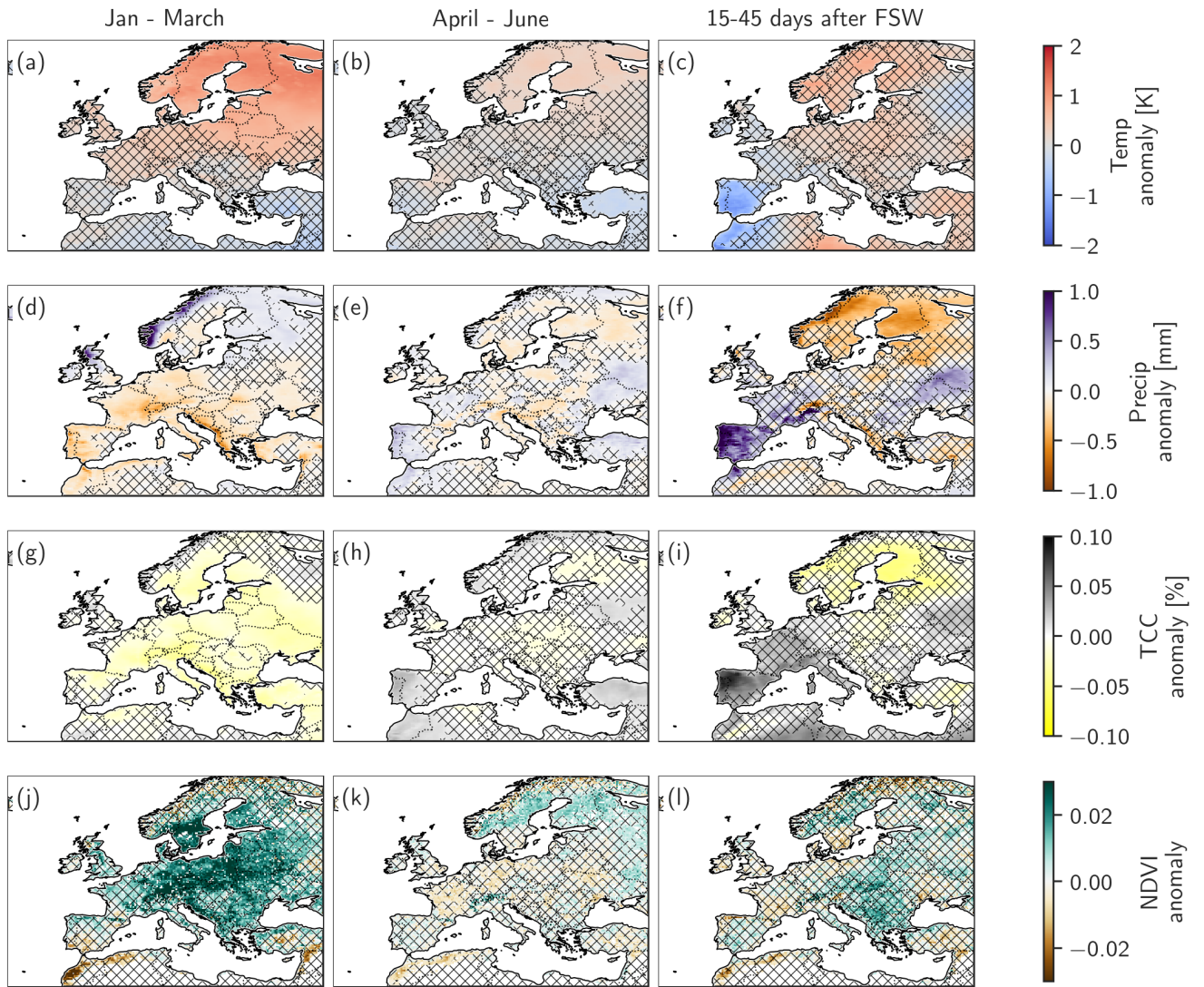


Figure 2. Same as Fig. 3 in the main text, but now stippling regions where anomalies are not significant on a 90% level.

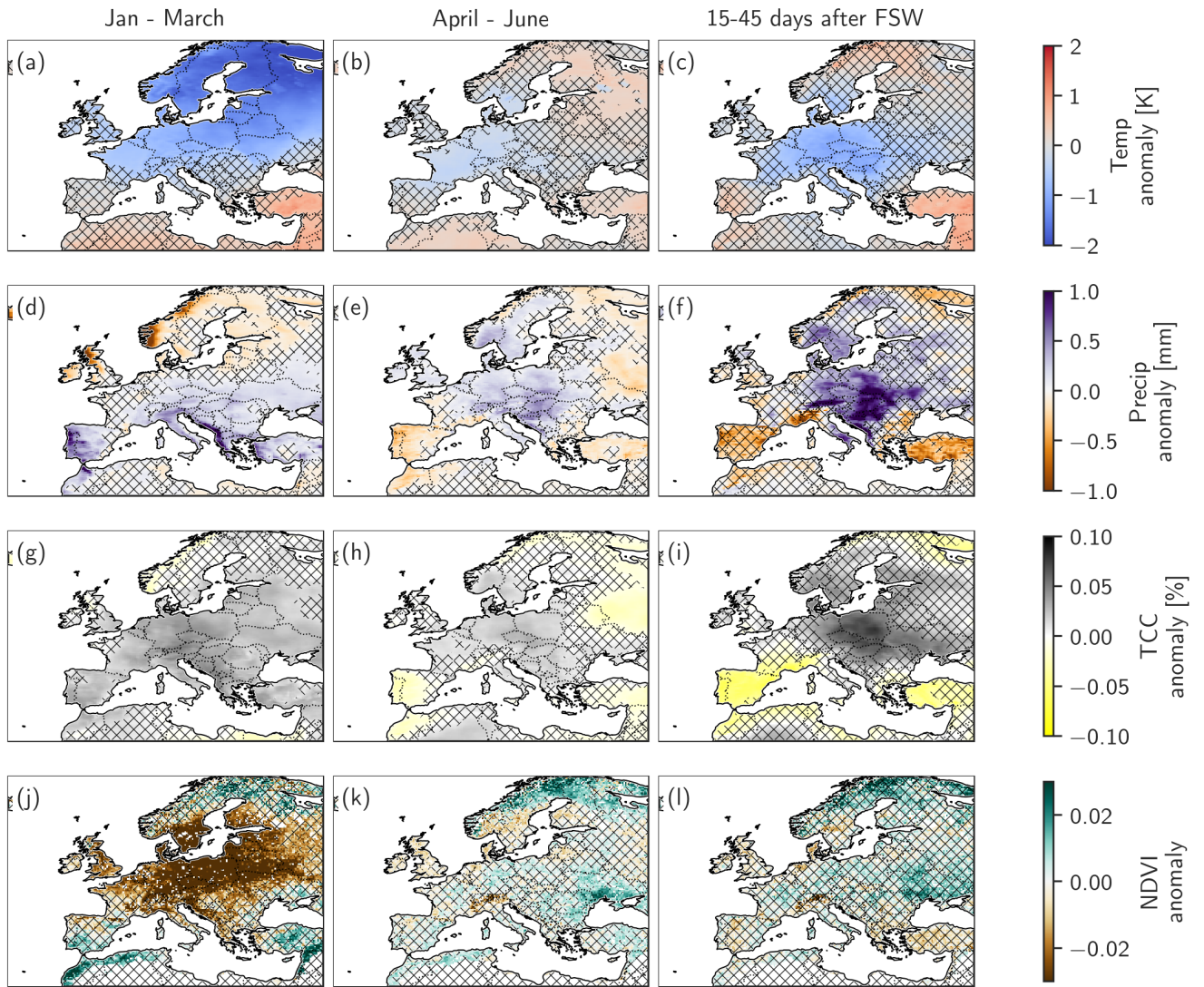


Figure 3. Same as Fig. 4 in the main text, but now stippling regions where anomalies are not significant on a 90% level.

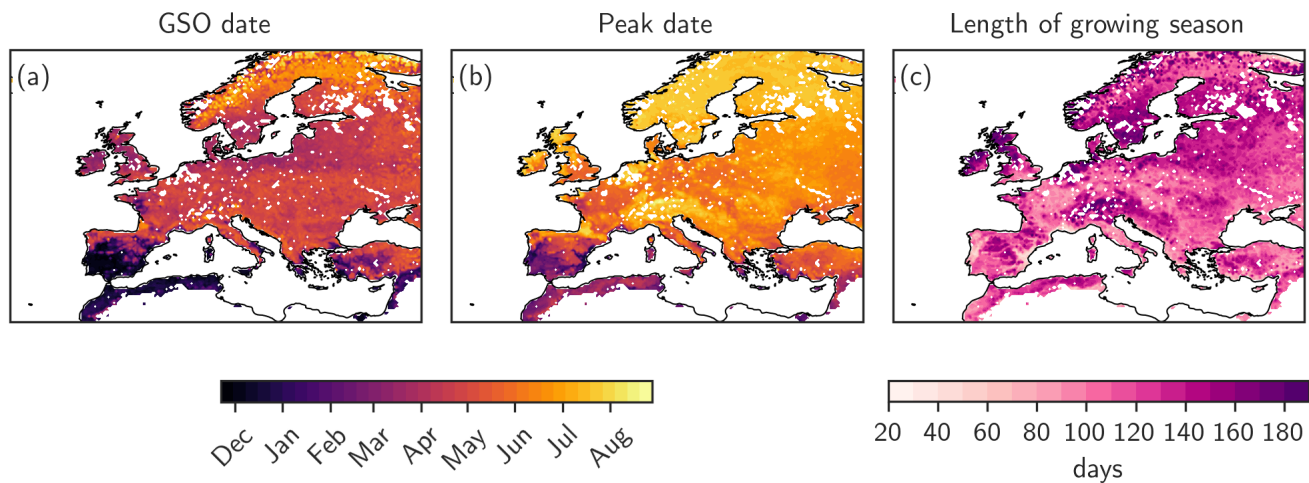


Figure 4. Climatologies for the growing season onset date (a) as well as the timing of the growing season peak (b). Panel (c) shows the days between the growing season onset and peak, and therefore the length of the early growing season in each grid cell. The length of the time periods shown in panel (c) are the number of days included in the analysis of vegetation hazards.

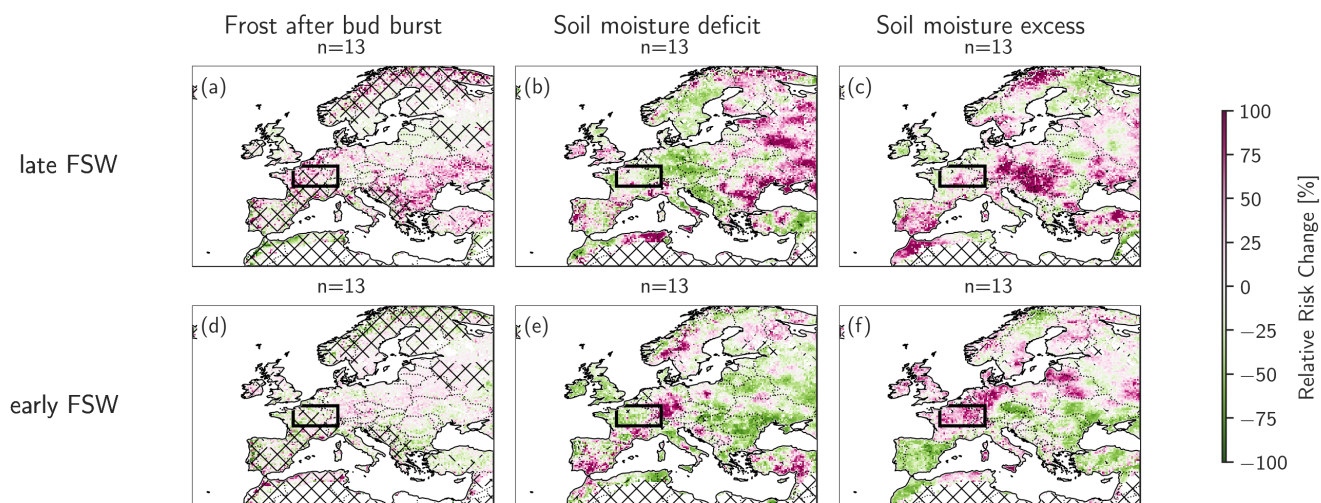


Figure 5. Vegetation hazards in years with early and late FSW: frost after bud burst (left column), water deficit (middle column), and water excess (right column). Numbers on top of each panel state the number of years in each composite. Stippling marks regions not significant on a 1.645 σ level following a bootstrapping test. The black box marks the location of the breadbasket of France.

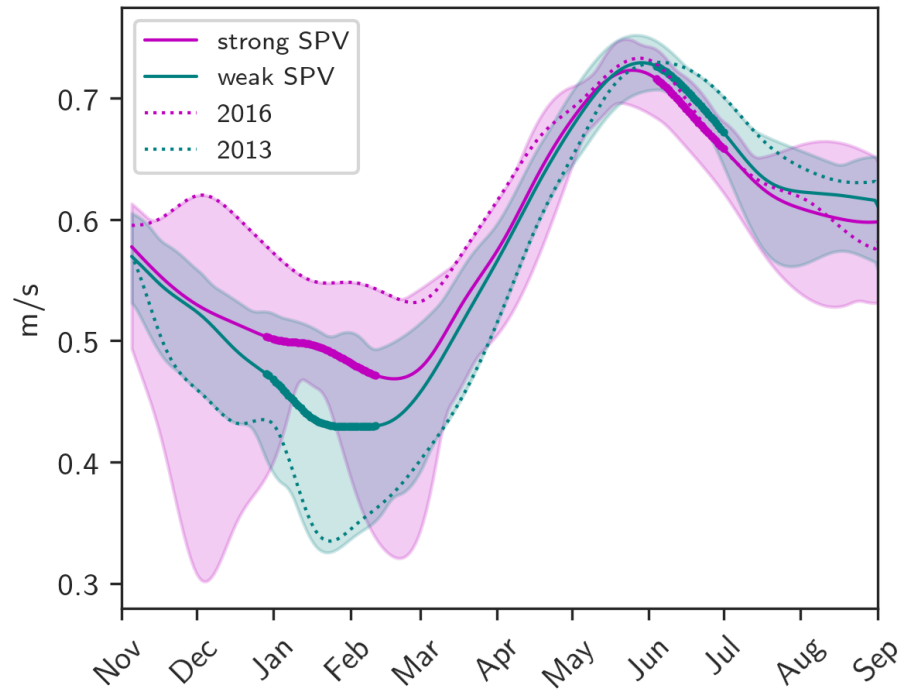


Figure 6. Absolute NDVI values averaged over Northern France for strong and weak SPV years. Shading marks the full observed range of anomalies in the respective years.