



## **Quantification of vegetation stress on agriculture during Europe's 2018 drought and legal implications for yield compensation schemes**

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We linked estimation of hazards by citizen science and remote sensing time series to the legal framework of the European Union (EU). Societies capable of rapid and just responses to environmental hazards can effectively decrease their vulnerability and sustainably adapt to accelerating climate change. Agricultural economic revenues were most affected during the 2018 European drought crisis. Vegetation stress resulted in loss of yield at large, raising the question of drought related compensation payments for those affected. Currently the European Drought Observatory (EDO) is Europe's most important information source to estimate drought severity and eventually links to drought specific legislation.

For this century, we monitored vegetation stress across the agricultural land of the EU member states highlighting the record summers of 2003 and 2018, using openly available time series and citizen science. We provided the legal framework of EU law connected to compensation payment mechanisms on various levels (EU wide, nationwide, statewide) caused by these droughts, with the focus on "de minimis aids" directly provided by the EU. Drought information from citizen observatories can complement the EDO and thus improve the accuracy and effectivity of compensation schemes.

Legal frame work on environmental hazard compensation are well described and environmental time series rich in data and openly available. We concluded that European climate change resilient societies can benefit from transparent information on the latest trends of environmental developments supporting economical responses and increasing long term sustainability and resiliency.