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Lessons from the exceptional: remote sensing of the impact of the 2003 heat wave in SW Europe

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The analysis of the response of the surface during periods of extraordinary meteorological conditions provide insight on the relationships between regional-scale vegetation variables and the atmosphere. Summer 2003 in W Europe is a particularly interesting case of study of the response of vegetation to a dry and hot summer because some scenarios predict these conditions to be normal in summer by the latter decades of the 21st century. We have analyzed a monthly series of regional fields of normalized difference vegetation index (NDVI) from the VEGETATION instrument onboard SPOT-5. Our results indicate strongly negative anomalies of NDVI: a 25% of the area covered by herbaceous vegetation had a relative anomaly of NDVI in August lower than -17%, while the equivalent value for deciduous forests was -11%. We also collected climatic and meteorological information to produce monthly fields of mean temperature, precipitation and precipitation deficit and their anomalies and use this information to discuss the relationships between atmospheric conditions, land cover types and vegetation activity.