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Assessing the conditions before during and after fire events over Mediterranean region using LSA-SAF Climate Data Records from SEVIRI-MSG

Célia Gouveia (1,2) and Isabel Trigo (1,2)

(1) Instituto Portugues do Mar e da Atmosfera, LISBOA, Portugal (cmgouveia@fc.ul.pt), (2) Instituto Dom Luiz, Faculdade Ciências Universidade de Lisboa, Portugal

Extreme hot events are increasing in frequency and intensity worldwide. Europe was particularly affected by unprecedented mega heat waves during the last decades, namely the events that have struck Western and Eastern Europe in 2003 and 2010. The occurrence of extreme high temperatures and drought episodes also plays a crucial role in fire risk management, as they promote large fires. The 2017 fire season has been catastrophic in Portugal, with more than 110 reported human fatalities and over 500 000 ha of estimated burnt area, which corresponds to the maximum record since 1980. The extreme character of the wildfires that affected Europe during the summer of 2017 and their socioeconomic impact regarding human losses and economic damage, together with the required new strategies for combat and assistance from European and National Services, have awaken Europe for new challenges. In this context, there is a strong necessity of monitoring the pre-fire conditions during late winter and spring, as well as during the fire season together with the assessment of the impacts of fires on vegetation and its recovery.

LSA-SAF generates a large set of products for land surface characterization derived from SEVIRI on board Meteosat Second Generation (MSG), available from 2004 to present that despite the low spatial resolution (3km at nadir), have a very high temporal sampling (15 minutes), allowing a better characterization of the surface, as the probability of having free-cloud images is higher. The availability of such datasets in Near Real Time (NRT) allows a continuous monitoring of the situation before, during and after wildfire. The analysis of the pre-fire conditions relies on the analysis of the land surface temperature (LST) and real and reference evapotranspiration extremes over Europe and their impacts on vegetation, using Fraction of Absorbed Photosynthetically Active Radiation (FAPAR) and Gross Primary Production (GPP). The monitoring of the situation during the fire season relies on the fire risk masks disseminated daily and with 5 days in advance. The severity of the occurred events is assessed by means of Fire Radiative Power. Post fire conditions over burned areas and the assessment of the impact of fire events on vegetation regeneration is assessed by means vegetation products.

Results from the described satellite applications to monitor conditions before, after and during fire events were already tested over Portugal during the last extreme fire seasons of 2017 and 2018 and some of the describe applications was also used over countries such as Greece, Italy and Bulgaria. We are confident that the whole set of applications or part of them could be easily adapted for all the countries over Mediterranean basin with very satisfactory results.

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