Trends of Wildfire Studies as a Support to Burned Area Monitoring

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ABSTRACT- Forests are threatened by a range of phenomena. Among them, fire is one of the most prominent due to its impacts, which are not limited by a swath of trees. Considering that during a fire the main gas emitted is carbon dioxide, which is the primary Greenhouse effect gas, the negative effects of fires extend beyond political borders. They influence global climate changes once surface radiative changes have occurred. In such a way, there is a constant international demand to avoid carbon emissions. For that, detecting and monitoring burned areas are essential processes. Due to its importance, there are several researches focused on wildfires human-induced or not. In a literature review search in the multidisciplinary research database Web of Science Core Collection based on the terms fire/wildfire and forest, the results returned almost 20,000 English articles in this thematic in the timespan of 1947-2019. The sum of articles per year surpassed a hundred just in 1991, and a thousand just in 2011. Although there is an increasing interest in such subject, remote sensing studies are mainly based on one or a couple of images, which makes the results hardly replicable in different places and along the time. In this manner, nowadays, it is possible to manually detect burned areas with high accuracy, for instance, through the Linear Spectral Mixture Model. Nonetheless, the bottleneck is regarding remote sensing approaches focused on continuous monitoring of large areas, which may present great uncertainties. In order to overcome this issue, the temporal perspective should be taken into account. This research area is still beginning, since the same brief review with the term "time series" incorporated in the search, the number of articles is reduced to less than 600. If it is filtered even more for study cases in Brazil, this number is reduced to 13. Considering that Brazil presents six main biomes, we could consider that there are less than 3 articles per biome according to the search in the database, making this subject of great importance in order to use remote sensing images continuously to monitor burned areas and fire processes.

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