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MONITORING AIR POLLUTANTS AND THE DAMAGE DURING RHODES WILDFIRE

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Abstract

Forests, which are intricate ecosystems primarily populated by trees, are facing a significant threat in the form of forest fires. These fires represent one of the most catastrophic natural and anthropogenic disasters worldwide. The consequences of such fires are manifold and far-reaching. They result in ecological degradation, economic setbacks and disruptions to the social fabric of life. Furthermore, they act as a significant source of gases and aerosols that disrupt the equilibrium of the atmosphere. Geographic Information Systems (GIS) and Remote Sensing (RS), which are frequently employed in disaster management and monitoring, offer indispensable tools for data collection and analysis. This study uses GIS techniques and Sentinel 2 and 5P remote sensing images to analyze the fire that occurred in Rhodes Island on July 18, 2023. The analysis's results showed that a total of 17.773.5 hectares –a wide range of Land Use / Land Cover categories– were affected by the fire. It is noteworthy that the forests and agricultural lands within this territory were the most severely impacted. Moreover, the study monitored air pollution parameters, including formaldehyde (HCHO) and nitrogen dioxide (NO₂), and quantified their concentrations through satellite imagery. On July 22, the highest HCHO and NO₂ concentrations ever measured were 2.529 mol/m² and 0.294 mol/m², respectively.

Key words: air pollutants, GIS, forest fire, image processing, sentinel 5P TROPOMI

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