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# Conservation, Management and Monitoring of Forest Resources in India



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## Chapter 14

# Analyzing the Trend, Pattern, and Hotspots of Forest Fires Using Geospatial Techniques: A Case Study of Almora District, India



Shuaib Ahemed, Sk Mithun, Mary Tahir, and Haseena Hashia

**Abstract** Forest fire hotspot analysis is a widely applied tool for estimating biodiversity, wildlife, people, and property in danger. The present study aims to analyze the trend and pattern of forest fires and identify the forest fire hotspot region with the help of geospatial techniques in Almora district of Uttarakhand. The fire point data collected from the Forest Survey of India (FSI) was used to analyze the trends of forest fires annually, monthly, and day-wise. Kernel density was used to analyze shifting patterns of forest fires and identify the forest fire hotspot with the help of Getis-Ord Gi\* Method. The results reveal that the density of fire occurrences has increased considerably during the study period. During 2001–2018, a sum of 7380 fire incidents was recorded over 3150 sq.km. Moreover, most of the fires occurred in 2012 and 2016. Approximately 43% of the forest fires occurred in April and June, and about 41% of incidents occurred in May. However, the highest and lowest intensity of fire occurrences were found in the Takula block and Syaldey block of the district, respectively. These findings provide a systematic approach to understand forest fire patterns in light of historical forest fire incidents. This research emphasizes support and encourages more studies on forest fire assessment for monitoring and prevention policies and offers a preliminary especially explicit model of fire occurrence expectations in Almora district.

**Keywords** Forest fire · Kernel density · Getis-Ord Gi\* hotspot · Almora district · Remote sensing and GIS · Environmental monitoring · Sustainability

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