

# Human impacts on the characteristics of fire in Africa - an analysis of burnt area, fire size, and fire number as determined from remotely sensed imagery

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When satellite data on fire activity first became available for the globe it confirmed perceptions that there is a great deal of burning in Africa. The striking number of active fires recorded in Africa - compared with other parts of the world with similar environmental characteristics - point to the importance of humans in altering fire regimes on this continent. Humans have been using fire in Africa for longer than any other continent, and current social and economic characteristics of Africa mean that the way that people view fire and manage fire regimes is likely to be quite different from other parts of the world. However, information on human ignition patterns, and human fire management is sparse.

The consequences of human fire management activities can be measured from space however. Remotely sensed satellite data and processing methods have improved to the extent that we are now able not only to describe the broad spatial and temporal patterns of burning, but also to quantify fire return periods, and aspects of fire such as fire intensity and fire size. In this study the eight year MOD43 burn scar product was used to quantify fire return period, fire size, number of fires, and variability in burn area between years for Africa south of the equator. This information was used together with regional level data on human population and land management to test which aspects of a fire regime are most sensitive to human activities in Africa. The results were compared to similar studies on other continents.

This analysis identified several noticeable departures from the current theory in fire ecology. Contrary to studies in California and Spain burnt area did not increase with increasing population density in Africa. Similarly, fire size-frequency relationships in southern Africa were very different from those in similar fire systems in Australia - large fires contributed less to total burnt area. These results were discussed with reference to social and environmental conditions in Africa, and highlight the importance of caution when generalising about fire regimes at global scales.