Abstract

Biomass burning and resulting fire regimes are major drivers of vegetation changes and of ecosystem dynamics. Understanding past fire dynamics and their relationship to these factors is thus a key factor in preserving and managing present biodiversity and ecosystem functions. Unfortunately, our understanding of the disturbance dynamics of past fires is incomplete, and many open questions exist relevant to these concepts and the related methods. In this paper we describe the present status of the fire-regime concept, discuss the notion of the fire continuum and related proxies, and review the most important existing approaches for reconstructing fire history at centennial to millennial scales. We conclude with a short discussion of selected directions for future research that may lead to a better understanding of past fire-regime dynamics. In particular, we suggest that emphasis should be laid on (1) discriminating natural from anthropogenic fire-regime types, (2) improving combined analysis of fire and vegetation reconstructions to study long-term fire ecology, and (3) overcoming problems in defining temporal and spatial scales of reference, which would allow better use of past records to gain important insights for landscape, fire and forest management.

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