The impact of forest fires on biodiversity

Could we have predicted this terrible climatic event using data from past climates?

Introduction

An estimated 10 million hectares have burned since July 1st. This could have terrible consequences on endemic australian species and add to the climate change problem because of CO2 and black carbon emissions.
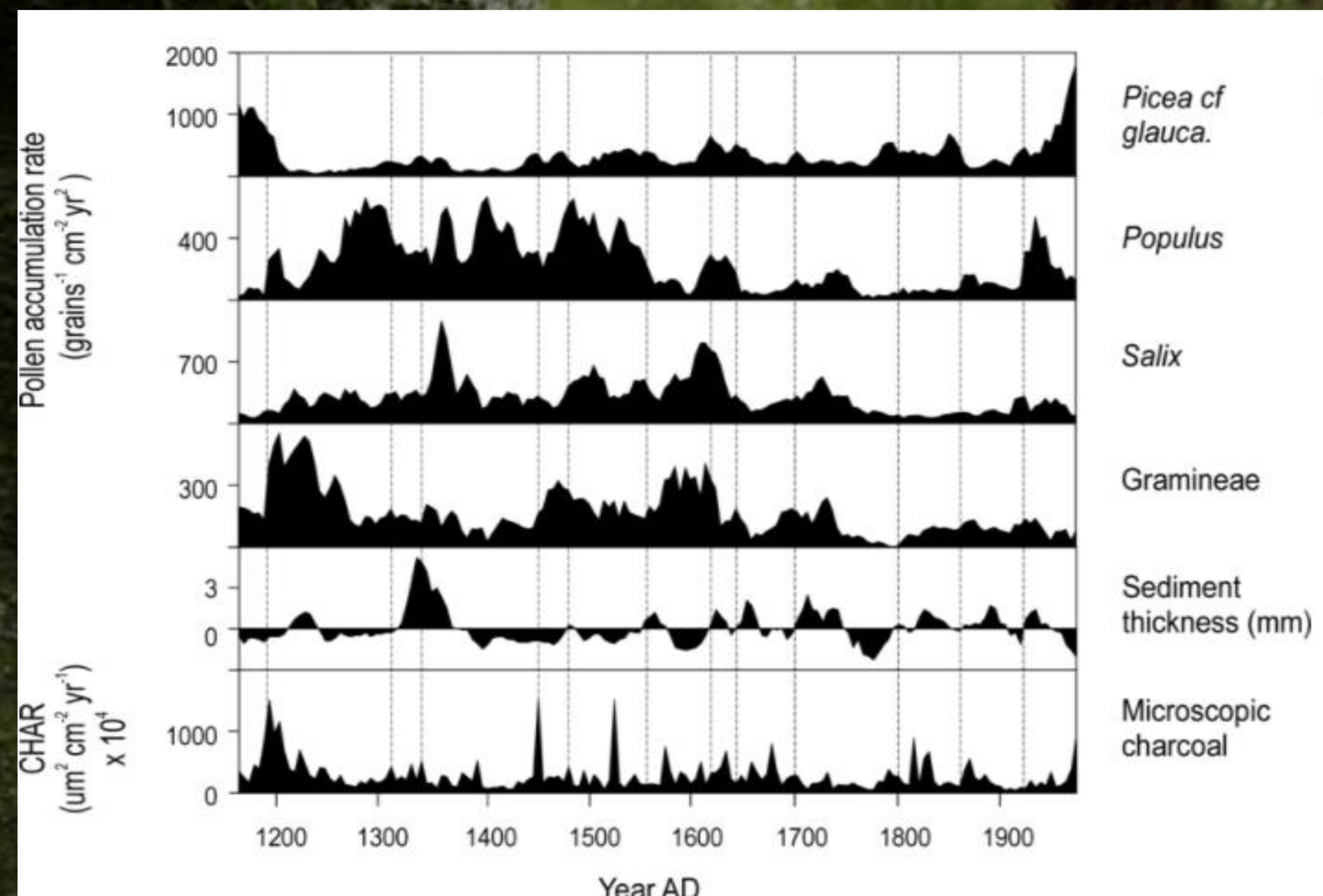

Fig 1. Analysis of pollen assemblages as a fire proxy at Rainbow Lake in the Canadian boreal forest (after Larsen & MacDonald, 1998a). (.

Material and methods

- Sampling cores in australian lake sediments
- Dating the cores with C14 datation
- Counting and identifying pollen
- Sampling and counting macro and microcharcoal
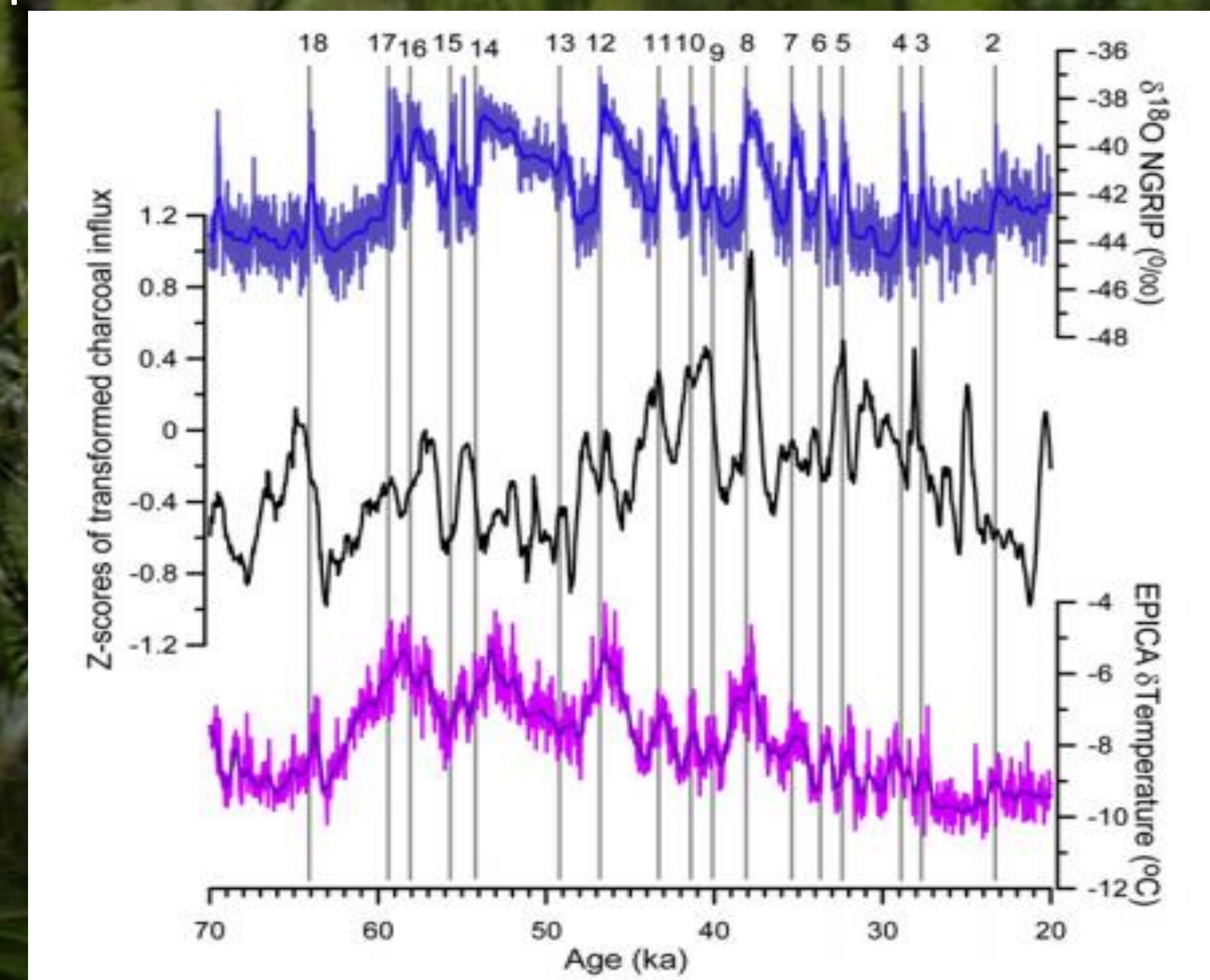- Look for fire scars in the lines of pyro-resistant trees such as eucalyptus

Fig 2. Millennial-scale variability in biomass burning during the glacial (70-20 ka) compared to temperature indices from the NGRIP and EPICA ice-core records. Charcoal data are summarized

Results / Discussion

- Variations in pollen data. The C14 datation gives and indication of when these variations occurred
- Peaks in charcoal records that are correlated with warming climate change
- Reduction of fire scars in eucalyptus

- The varying pollen data are an indicator of climate change. These variations happend simultaneously with the peaks in the charcoal records. This indicates that there was an increase in bush-fires every time warming climate changes happend.
- Additionally, the reduction of fire scars in eucalyptus indicates a decrease of bush-fires in the last 50 years. probably due to human fire-management. The reduction of fire means that there is an increase of biomass and so of fuel.

There is evidence that bush-fires occur every time climate changes happen. This is due to a shift in vegetation and a warmer climate. Humans have stopped natural bush-fires. Because of this, there was an increase of flammable biomass.
Adding to this, Australia has lost its herbivorous megafauna during the Last Pleistocene. The large mammals used to eat and trample on the juvenile trees reducing the flammable biomass. So the intense bushfires in Australia could have been predicted by using paleo datas.

Ressources :
« Late Quaternary fire regimes » Quaternary Science Reviews Volume 30, Issues 1–2, January 2011, Pages 28-46
 « Charcoal as a Fire Proxy » Tracking Environmental Change Using Lake Sediments: Terrestrial, Algal, and Siliceous Indicators (Vol. 3) (pp.75-97)
« Landscape development, forest fires, and wilderness management » New Series, Vol. 186, No. 4163 (Nov. 8, 1974), pp. 487-495 (9 pages)
Other sources were used.

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