

FIRE HISTORY OF CONIFER FORESTS OF CERRO EL POTOSÍ, NUEVO LEÓN, MEXICO

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INTRODUCTION

RESULTS

Fire is an important evolutionary force that influenced ecosystems for hundreds of millions of years and contributed to their distribution, structure and function. Almost all terrestrial ecosystems have a fire regime, that has shaped or affected the structure and composition of species within the ecosystem.

Composite fire history chart of Cerro El Potosí.



OBJECTIVE

The goal of this research was to determine the pattern of occurrence of forest fires and their relationship with precipitation and atmospheric circulation patterns for coniferous forests in northeastern Mexico.

MATERIALS AND METHODS

RESEARCH AREA





Horizontal lines represent samples, and vertical lines represent fire scars.

Characteristics of fire intervals in the coniferous forest of Cerro El Potosí, in the Sierra Madre Oriental, Mexico.

island.

Types of vegetation: pine, oak and mixed forests



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- To reconstruct the fire history, we took samples from trees with at least one fire scar.
- We collected total and partial sections of stumps, logs, snags and living trees.
- Sampled sections were air-dried and prepared for analysis. In order to improve visibility of tree rings and fire scars, we used a sequence of increasingly fine grits of sandpaper.
- Samples were cross-dated using standard dendrochronological technique. For the samples coming from dead trees we made skeleton plots that were cross-dated using a *Pinus hartweggi* ring width chronology made for Cerro El Potosí. The fire scars in each

Characteristics	All fires	25% scarred
Total no. Intervals	10	7
Mean Fire Interval (yr)	11	15.7
Weibull median Interval (yr)	10.1	14.5
Weibull modal Interval (yr)	7.8	11.5
Minimum Fire interval (yr)	4	4
Maximum Fire Interval (yr)	23	30

Intra-annual position of fire scars for all samples.



sample were dated to the year that each was formed.

- The seasonality of fire occurrence was identified by looking at where each fire scar was located within the annual growth ring.
- In order to create the master fire chronology and perform statistical analysis, we used the FHX2 software version 3.2.
- To analyze climate conditions related to fire occurrence in the study area, we used the Superposed Epoch Analysis (SEA).
- We used an annual precipitation reconstruction (1796-2010) from Pinus culminicula of the highest part of Cerro El Potosí.
- Additionally we related fire occurrence with the ENSO index NINO3 for the period 1856-2011.

Superposed epoch analysis for Cerro El Potosí. left: annual precipitation, right: El NINO3 index. The lines located above and below the mean represent confidence intervals of 95%, 99% and 99.9%, respectively.



CONCLUSIONS

The occurrence of fire in years that are not particularly dry may suggest that for our study area fire occurrence is mostly influenced by anthropogenic activities, with people tending to ignite fires under relatively controllable conditions.