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Annual burned area across a precipitation gradient in northwestern patagonia steppe

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Fire is one of the most important disturbances on the Earth affecting most terrestrial ecosystems. Evidence suggests that since the last glaciations there has been a substantial interaction among climate, vegetation and fire. In fact fire is recognized as an emergent property of climate and vegetation type, which determine that distinct regions are differently affected by wildfires. For instance, it has been suggest that relative roles of weather/climate and fuel on fire activity change along the global productivity/aridity (intermediate fire-productivity hypothesis). At one extreme of the gradient we find dry-unproductive regions (deserts) where fire is absent owing to very low fuel loads, while at the other extreme we have wet-productive environments (rain forest) with fire being unlikely due to high fuel moisture. Environments located around middle of the gradient, such as Mediterranean ecosystems, have a high fire activity but is difficult to predict if the fuel moisture conditions are a stronger constrain on the fire regime or it is constrained by biomass production (i.e. fuel load). The intermediate fire-productivity hypothesis has been tested in recent works at global scale. However, data resolution at global scale is coarse and thus is not possible know the fire variability occurring at scales of more spatial detail. Therefore, it is necessary to complement the information obtained at global scale with studies at finer scales exploring fire-productivity/aridity relationships in particular portions of the gradient. We elaborate fire cartography from Landsat temporal series (1973-2011) for a portion (560250 ha - regional scale) of northwestern Patagonian steppe. The study zone corresponds to a Mediterranean environment and is part of a gradient defined by a sharp drop in the precipitation regime (600mm to 280mm). This environmental gradient predisposes a change in fuel load and fuel moisture and therefore could be affecting the fire regime. We divided the study area in relation to precipitation gradient establishing two zones (wet and xeric). To delimit area of wildfires on Landsat scenes we used the NBR index. Then, we calculated the annual burned area in each zone, compared the annual burned area between zones and also explored relationships between that variable of the fire regime and precipitation/temperature data. We expect to contribute to the discussions about the importance of drought/fuel on the fire activity across the productivity/aridity gradient, specifically on Mediterranean environments. Finally, with this work we expect to improve future management and conservation practices in Northwestern Patagonia grasslands.