

Advantages and disadvantages with drones in determining the erosion of a fire zone

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The impact produced by the fire and the subsequent sensitivity of the soil, is very variable, depending on factors such as geology, soil composition, slope, exposure to wind and vegetation cover among others. Therefore, optimizing the use of limited resources is necessary, by identifying priority areas to apply corrective measures. The criteria for selecting the most vulnerable area after a fire should include a monitoring of the evolution of the affected areas including different variables such as the soil loss. But the trace of erosion flows often requires not only a high economic effort due to people working in field, but also adverse effects on the sensitive soil, because of the footsteps in vulnerable areas with steep slopes or areas that have lost their original structure after fire. For these reasons, monitoring of burnt soils is normally reduced to the minimum.

Drones or UAVs can be used as an aerial measurement technology useful in different soil recovering studies. High-resolution digital terrain models and high-resolution orthophotos obtained from UAV can be used to achieve a continuum or unlimited number of measurements anywhere in the field test. As an aerial technique, this technique has some advantages. For example, excessive walking over burnt soils is avoided. Besides, due to the relatively low cost of the technique, the frequency of sampling may be higher than traditional sampling works.

In recent years drones have been used to monitoring and measuring the recovery of the vegetation cover. In this work the capabilities of this technique as an erosion measurement tool will be explored. Two field area test, which were burnt on 8 August 2015, have been flown with a multicopter. The surface of each area is about 1500m² and the aim is to measure the winter erosion with a precision and an accuracy better than 1 cm, demonstrating that drones are a very appropriate technique to study:

- Burned hillsides in highly sensitive situations, requiring not invasive methods on the field
- Areas with steep slopes that lacks vegetable cover.
- To study the vegetation recovery and the soil aggregates movement on slopes.
- To study small changes in river basins and riverbeds

During the presentation, the methodology for data collection will be explained and the raised models of the areas studied will be shown. In addition, the main advantages and disadvantages encountered during the use of the technique and how to solve them will be discussed.