

Interactive comment on “Modelling post-fire vegetation recovery in Portugal” by A. Bastos et al.

Anonymous Referee #2

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The manuscript presents an interesting exercise of exploring the use of NDVI to characterize post-fire vegetation recovery, as a continuation of a previous paper. The dataset is quite large, and this is a strong point of the paper. A weak point is the use of fire damage to partially interpret vegetation recovery. Fire damage is defined as the difference in NDVI value between pre-fire (May before fire) and one year later, that is May of the following year. This one-year difference includes the impact of fire severity, the erosion processes that may be produced short after fire, and the recovery of vegetation in autumn and part of spring during this first post-fire year. As this early recovery of vegetation can be very diverse depending on the ecosystem type (and other factors), the concept of "fire damage" includes early plant regeneration in a way that is difficult to interpret. It is not surprising that fire damage relates to recovery time (section 5.2) as high fire damage itself includes low initial vegetation recovery. I would suggest trying to

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get an index of fire severity immediately after fire. Specific comments: page 4561, line 4: Why "agriculture mechanization" could have contributed to the increase of wildfires? I don't see the direct relationship. p. 4562, l. 7: Nutrient losses probably do not reduce plant cover in most of the cases, by the contrary the lack of plant cover facilitates nutrient losses (and soil erosion). p. 4562, l. 24-26. The finding of decreasing trend in precipitation in inland areas (De Luís et al. 2001) do not necessarily apply in general, this was just demonstrated in Eastern Spain. p. 4567, l. 15. Please explain how do you estimate GY. p. 4576, l. 16-18. It is surprising that the lowest NDVI is found 3 months after fire in RVII. The interpretation that delayed mortality would be the reason is unlikely. Right after fire, brown needles could remain in the pine canopy if fire severity was not very high, and these needles fall down during next months, probably changing the reflectance of the burned forest. During these 3 months, a large part of the blackish ashes on the ground are leached out or incorporated into the soil, and there is some plant regeneration, mostly through resprouting. Therefore, all together makes difficult to interpret the decrease of greenness in the burned forest several months after the fire. This deserves further analysis. p. 4576-4577, on the spatial variability of regeneration. It would be very interesting to complement this analysis with the incorporation of topography (using GIS) and some field work. Formal aspects: English should be improved. The conclusions section is too long, it is an extended summary of the paper. I suggest making it more synthetic.

Some specific comments: *Pinus pinaster* (not *Pinus Pinaster*). "Respecting" is used several times and apparently means "corresponding".

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