

Interactive comment on “Mapping the suitability of groundwater dependent vegetation in a semi-arid Mediterranean area” by Inês Gomes Marques et al.

Anonymous Referee #1

Received and published: 4 July 2018

General Comments

Gomes Marques et al. present an analysis of the spatial distribution of groundwater dependent vegetation across the Iberian Peninsula. While the method used is perhaps not as novel as suggested in the text, the paper's main strength lies in the validation of the maps created against a fairly robust external dataset. The text is generally well written, although it is not as clear as it could be when discussing how the "model" was parameterized and validated. In general, the paper is a solid contribution to the literature on phreatophytes, but needs revision to enhance its clarity and address some lingering questions about the work.

Specific Comments

C1

1. Throughout: What exactly is meant by a "suitability map"? Suitability for what? Or do you mean suitability of the terrain for hosting phreatophytes? The concept is fine, but the word choice seems odd.
2. Line 147 - 149: How heavily managed are these forestry systems? What species are harvested? And with what methods?
3. Line 170: Cite ASTER GDEM data in the manner requested on the NASA webpage (https://lpdaac.usgs.gov/citing_our_data).
4. Line 172: What is meant by superficial water use? Shallow groundwater? Surface water in streams? It's used several places but isn't well defined.
5. Line 179: What were the three classes? How did soil parameters influence in classification?
6. Line 187-202, Figure 2: The location of piezometer data and well data are quite biased. What is this attributable to and how might it affect the results? It seems like the kriging in the south-central region could be quite problematic. Also, what is the distinction between a well and a piezometer here? This is also concerning because the most dense of the GDV species are roughly in this corridor as well.
7. Line 199 -202: I disagree with this method - the groundwater elevations should be determined by first determining the groundwater elevation at the piezometers and then interpolating that through kriging. This should introduce fewer errors and be more realistic.
8. Line 303 - 312: The rationale for this validation method is a bit shaky and could use more explanation. If the presence/absence of these trees is a good indicator, why is the rest of the analysis necessary? Is it more expensive? Precise? Also, how is this not a bit autoregressive, given that it sounds like kernel density was derived from the tree data. It starts to make more sense as the results are discussed, but it needs more clarity here. What about using a remote sensing method for validation instead (e.g.,

C2

Munch et al. 2007, Barron et al. 2012, Gou et. al 2014)? How would that compare?

9. Line 389-397: What soil types were the most likely to host phreatophytes? What does "soil type 3" represent?

10. Line 480-484: This paragraph seems to be saying that there must be some threshold by which no woody species can be supported, even if they are GDVs. These species get replaced by shortlived grasses and forbes, converting savanna to grassland. Is this correct? If so, this seems to contradict the next line about woody vegetation being replaced by shrublands. Wouldn't that presume shrubs are less susceptible to drought than trees? Please clarify.

11. Line 495-511: This part of the discussion is problematic, because, as the authors note, the factor expected to be most key is poorly mapped. Regardless, they still say that soil type, as opposed to groundwater depth, is the most influential and claim that soil type defines the capacity for "groundwater storage". This appears to be overreach.

12. Figure 7: This figure needs more color variation. It is difficult to tell moderate, good, and very good apart.

Technical Corrections

13. Line 88: Replace "genders" with genre

14. Line 102: Replace "5m" with "5 m". Noticed number/unit spacing issues in several other locations as well.

15. Lines 132 - 135: Replace "chapters" with "sections". But really, this whole paragraph isn't necessary, as the format doesn't deviate from standard expectations.

16. Line 154: "Proxy for" not "proxy to".

17. Line 175: Is the copyright symbol here a typo?

18. Line 201: Don't need to repeatedly cite Spatial Analyst and its version so frequently.

C3

Can this be converted to one mention at the beginning of the section?

19. Line 295: Put equation right after first mention.

20. Line 306: Replace "to a" with "of a".

21. Line 434, Line 454: Delete first names of authors.

22. Line 450: Pinpoint is one word.

23. Lines 451-453: Awkward wording makes the sentence hard to parse.

24. Line 466: Delete stray "s".

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., <https://doi.org/10.5194/hess-2018-208>, 2018.

C4