

Revision Review for bg-2019-194:

Comparing Stability in Random Forest Models to Map Northern Great Plains Plant Communities in Pastures Occupied by Prairie Dogs Using Pleiades Imagery

### Overview

Thanks for the revised manuscript and for your care and consideration of peer review comments. I find this revised manuscript to be much clearer and that the analyses now support the objectives and purpose laid out in the introduction. These changes have notably improved the manuscript and have removed confusion in the interpretation of findings. I have mostly clarification and technical comments that I feel will aid readers in understanding this work.

### Specific Comments

Line 101 – If I understand the conclusions from Juel et al. 2015, then one logical extension would be that we also need to consider having spatially relevant training data (i.e. to address your issue that models may not transfer in space and time). Consider adding some additional possible solutions and implications of classification schemes (e.g. cover amounts of functional groups vs. community type)

Line 133 – I find the connection between “signatures on imagery” and plant community response to the timing and progression factors underdeveloped. Add a sentence or two expanding what specifically will change within your communities (with relatively uniform composition) within and between years. Maybe a specific example would help here too.

Line 288 – Any spatial consistency on where these are? I.e. do they represent edges of the community where precip changes may lead to this finding? Would support next few sentences.

Line 317 – Talk about what this this means in terms of changes in or between your community types

Line 329 – Need some discussion about how the selection of your community types leads to some heterogeneity within types, but this is a needed tradeoff (to lead into next paragraph)

Line 393 – You have assessed the accuracy based on your 2016 data. So additional years helped you accurately predict your training sites from 2016 (relatively homogeneous areas). Be specific about what accuracy you have measured, which really is model performance here.

Line 398 – Do you also mean here that the selection of community types to map is an important consideration. I know you did not explore this specifically but seems to be an important theme in your discussion and results. Add some discussion and concluding statements about this aspect.

Line 610 – Here and throughout the Tables and Figures please check and revise for acronym consistency. You switch between On-PDG and On-Grass, and On-PDF and On-Forb, within and between figures and tables

### Technical Comments

Line 93 – Need parentheses around 2015

Line 99 – Parentheses around 2018(check rest of document for formatting of refs too)

Line 111 – Do you mean prairie systems worldwide or specifically mixed grass prairies of the U.S. Northern Great Plains? I think you need to be specific here of the geographic region this paragraph addresses.

Line 125 – If you have a ref to send readers to about the larger study, please add.

Line 171 – Add the specific station used and check citation info (I found/used ref below).

South Dakota Mesonet, South Dakota State University. (2019). *South Dakota Mesonet Database* [database].

Line 179 – Last sentence probably not needed. Also consider moving sentences (lines 225-227) about removing these areas and mapping prairie dog colonies up to this spot for reader clarity.

Line 270 – For consideration, is “error” the best term here? For the message in your manuscript maybe use “instability?” You have the common problem of heterogeneity in your pixels/plots which makes it hard to classify to a specific type and your analysis shows that the year used can switch these mixed pixels between classes (the stability issue you are covering).

Line 298 – Nice discussion in this paragraph

Line 301 – Need reference

Line 400 – Clarify that this is transition “zones” between communities (and not through time)

Line 621 – The locations of the on plot labels were confusing to me at first. Consider making these the same color as the community points and in the figure legend discuss what the +’s in the plot represent (this may also help folks identify the labels go with these centers)

Line 667 – Check acronyms for consistency (see comment on 610)

Line 683 – Check plot labels (see comment on 610)