Fern Bromley

STAT 574E

IRP Wave 1 Reviews

1. Sasha Berliner

As someone with little experience in (but much interest in) Bayesian approaches, I appreciate this extension of our class content in a Bayesian framework. I am also glad to see some modeling of ordinal data.

I don’t have experience with MCMC, so it would have been nice for that part to have some more background. Also, I know that this IRP was based on a paper, but it would have helped to have some more background details from the paper for context, like just stating the predictor variables instead of leaving us to surmise that from the code/plots. This could have helped with clarity/streamlining the tutorial.

I wonder if your method of splitting up the training data by date could be problematic. There could be differences in spatial dependence over time (for instance, topography might make more of a difference in evapotranspiration during the summer).

Overall, I appreciate the thoroughness of this project and all of the provided reproducible examples. The parallelization could be very helpful for my own research, since I often work with multidecadal time series at various locations within the same model/research question.

1. Caleb Miller

I love the background on vegetation monitoring and hearing how this class has helped with your research questions! I liked how you both showed your code and verbally described what it was doing, allowing us to follow along in multiple ways. Showing pictures also helped ground some of the sampling methods you described.

As someone who also dabbles in community ecology, I’m curious about how you would have approached these data assuming that they were continuously as opposed to discretely indexed. I also wonder how extensions of these analyses could be used to assess the effects of grazing and precipitation (or lack thereof) in a model that considers spatial dependence of vegetation composition/their impacts.

I think that your presentation was very clear, but it would have added some nice context/may be worth exploring to see distributions of DWR in different locations- since you were only mapping the means of DWR per each species in each pasture, it would be cool to see a representation of the species’ range or variance. I could see this being applicable for grazing management and seeding applications, such that places where the mean cover of a desirable forage species is high but that statistic is being “pulled” by a few very dense patches of that species.

1. Anu Sethuraman

I loved this combination of data censoring and spatial dynamics. I have censored data in one of my projects and have been grappling with this exact question of imputing censored values and how it might affect my inference and prediction. While I don’t have this exact issue within a spatial context, I will definitely be exploring the NADA2 package and potentially may use CenSpatial in the future. It’s also very interesting how this is an issue inherent to environmental data, and I would argue that most environmental data are inherently spatial, but that there is only one package integrating both of these.

It would have been cool to see some more descriptive comparisons between the different algorithms that you used in your code demonstration. For instance, for your model that didn’t converge, I would have liked to see how you might have adjusted your initial parameters to allow for convergence or what your thoughts were on why convergence was difficult. It also would have made your presentation clearer to see more of the intermediate steps in your code (for example, plotting the variograms that you mentioned). I was also a little confused about where the outliers came from. Were these values that had a lot of leverage in the model? But, overall, your interpretations of these methods were very helpful- I think you explained things really well. Thank you for introducing us to these packages!

1. Henry Wang

I was fascinated with hurricane track forecasting as a kid, so I am really grateful to be learning more in-depth about these methods. I can see how dynamical models would be particularly useful in this era of unprecedented climate conditions, but it is interesting how these statistical models become increasingly accurate as training/input data become more abundant (though I wonder about overfitting!).

I really appreciate how you showed the math as well as a conceptual figure behind some of the CLIPER5 specifications. I think you also did a pretty good job at distilling some of the concepts, like principles from physics, that were needed to help describe this model. Your visuals were overall very compelling and helpful.

Regarding the fitted models, it’s very interesting that the predictors and variance explained differed by region and dimension (latitude vs. longitude). As someone that’s been thinking about single vs. multi-model inference lately, I wonder how a single model for each coordinate dimension with region as a predictor would perform comparatively. Additionally, I think it would have been interesting to show some simulated or example data and predictions to show how the recursive vs. parallel methods differ, or how the different models lead to varying uncertainties in path predictions across the globe.