**Results from updated resistance model**

Following the updates on the slice sampler and the inclusion of two new environmental covariates (avg daily temperature and rainfall) and the removal of lunar illumination, I re-ran the resistance models. All models showed convergence (per the updates to the sampler) and resulting beta coefficients varied by behavioral state (foraging/transit) and study site (N/S Pantanal).

Below, I will show ridgeline plots for the beta coefficients (without the intercept) ansd will also display the resistance surface for each State x Site combination only for pixels that were used by the armadillos.

North Pantanal

*Foraging*

For the foraging state, distance to road, slope, and NDVI appear to show the greatest influence on armadillo movement. Distance to road and NDVI display negative relationships with time spent per pixel, whereas slope shows a positive relationship.

A close up of a logo

Description automatically generated

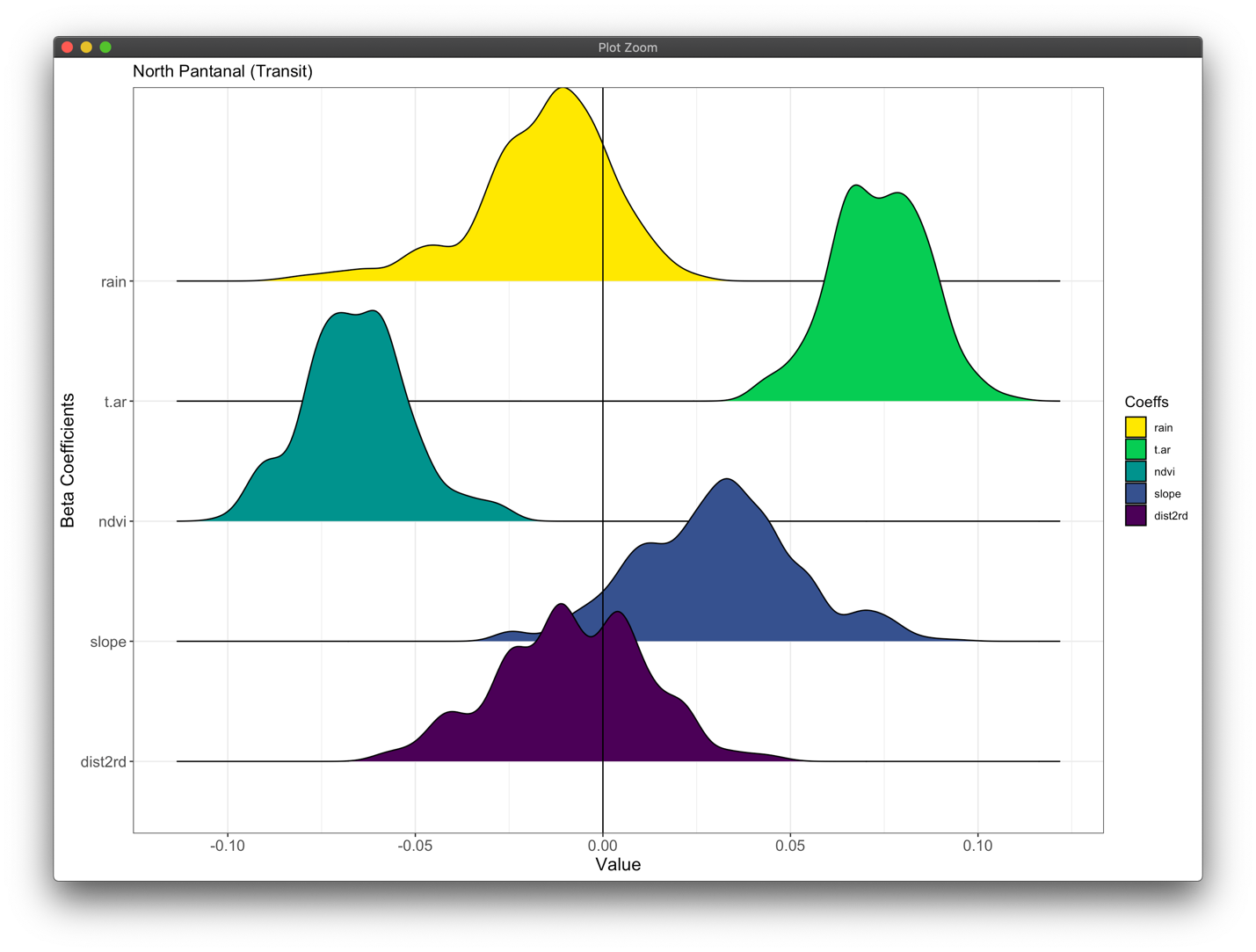
The effect of temperature (“t.ar”) is shown in this facet plot of landscape resistance, where the effect based on the minimum, mean, and maximum temperatures are displayed. In general, there does not appear to be a strong effect of temperature on foraging movement as was also found in the previous plot.

A screenshot of a social media post

Description automatically generated

*Transit*

Transit movements were most influenced by temperature and NDVI, followed by slope. Temperature and slope both showed positive relationships with time per pixel, whereas NDVI displayed a negative relationship.



For the transit state, the strong effect of temperature is observed over the landscape of used pixels, for which there is approximately a 50% increase in time per pixel when comparing minimum vs maximum temperature conditions. This resistance surface also appears to show more gradual changes in time per pixel.

A screenshot of a cell phone

Description automatically generated

South Pantanal

*Foraging*

None of the covariates had a strong impact on landscape resistance (all very low beta coefficients), but distance to road, slope, and NDVI were the most influential among these. Distance to road displayed a negative relationship while slope and NDVI showed a positive relationship with time per pixel.

A close up of text on a black background

Description automatically generated

As can be seen in this figure, there is only a difference of ~0.25 min between the pixels showing greatest vs least resistance. Additionally, the relatively small effect of temperature can also be observed across each facet.

A screenshot of a social media post

Description automatically generated

*Transit*

Transit movements of southern Pantanal armadillos was very strongly influenced by NDVI, as well as temperature and rainfall. NDVI exhibited a negative relationship with time spent per pixel, whereas temperature and rainfall both displayed positive relationships.

A picture containing drawing

Description automatically generated

This resistance surface for transit movements shows a relatively large amount of variability in time spent per pixel, which is only realized in the changing of temperature. Specifically, resistance increases ~1.5-fold from the minimum to the maximum temperatures experienced.

A screenshot of a social media post

Description automatically generated

**Conclusions**

Based on the results from both sites, it appears that foraging “resistance” (or possibly more apt is foraging time/investment) does not show strong differences at this given spatiotemporal scale. Variability in “foraging investment” only ranged at most by 30 s per pixel and 15 s per pixel at the North and South sites, respectively. These surfaces were primarily influenced by distance to road, slope, and NDVI.

Resistance of the transit movements exhibited a much greater range in time spent per pixel and was particularly influenced by NDVI and temperature (and to a lesser extent by rainfall and slope depending on the site). These results show that lower NDVI values (or vegetation cover) and lower temperatures result in faster movement across the landscape, which is in line with expectations based on communications with Nina.

Overall, time spent foraging per pixel is not strongly influenced by these abiotic covariates, which makes sense if none of these variables are strongly tied to termite mound location and phenology. It also appears that there is no effect of distance to road on resistance in a transit behavioral state, which is opposite of our original hypotheses. This may be mopped up by NDVI since they are describing similar landscape characteristics, although no strong correlations were found when checking initially for collinearity in explanatory variables.

Next steps will be to attempt to access/calculate spatiotemporal estimates of temperature, rather than just temporal estimates for each site. Additionally, we may wish to modify which of these covariates are retained and whether it would make sense to include any non-linear terms based on ecological understanding.