The ‘Prod\_Forecast\_Model’ folder contains code that creates a forecast for herbaceuous productivity based on data downloaded from Google Earth Engine over the desired spatial extent. It also creates spatial maps of residuals by model by year, a time series comparing model residuals by year, and the correlation and mean residuals over time of the ‘forecast’ model we use in the final forecast. All scripts used can be run in the “run\_everything.R” script.

We include figures and model outputs for the extent of the model referenced in Ensley-Field et al. Areas of interest to run this model can be modified by editing the ‘gb\_region’ FeatureCollection in the imports within Google Earth Engine, or drawing new polygon and changing the ‘region’ argument in the’ export.image.toDrive()’ function. We reduced the resolution from 4000m to 10000m in hopes that this analysis can be run on most computers without. You can increase and reduce the resolution by editeing the ‘scale’ argument in the ‘export.image.toDrive()’ function.

While the extent and resolution included as the default in this folder run on our computer, we are using a windows 10 workstation with an i7-7700 Intel Core Processor, CPU @3.6GHz, NVIDIA Quadro P600, 16 GB of RAM @2400MHz, and an SSD. Reducing the spatial extent and increasing the spatial resolution will help this run faster and use fewer computational resources.

In theory; if you run these scripts they should download into the prod\_4cast\_tiffs folder, but you may need to put them there directly from your google drive. You may need to directly copy and paste the links into your web browser.

RAP\_gee\_tiffs: <https://code.earthengine.google.com/78f96e064a76d0272239cc06213d7810>

Spatial\_gee\_tiffs: <https://code.earthengine.google.com/8b80d2da195ca424158c951363411a4f>

Temporal\_gee\_tiffs: [https://code.earthengine.google.com/5b627dcc46d4fbd54ccaad7a54693c2f](https://code.earthengine.google.com/5b627dcc46d4fbd54ccaad7a54693c2f%20)

(the last GEE script takes >20 minutes to run and export)

Sign up for a free account here: <https://earthengine.google.com/new_signup/> and for a quick intro that should allow you to run and make basic edits to our script we recommend: <https://www.youtube.com/watch?v=BUo-8I0peuI>