

Spring NEARC May 19, 2020

Session: Data Analytics

Q: What are the recommended workflows for stitching together Python- and R-based analyses?

A: Look at the R-bridge resources and how to clone virtual environments in your ArcGIS Pro project. Both are quick processes with less than 5 steps.

Q: Are these spatial techniques available with the standard Arcpro license?

A: Generally, yes and in multiple ways. ArcGIS Pro has a library of spatial analysis functions built in and it can access additional analytics tools via resources like ArcGIS Online or ArcGIS Enterprise. Some of the open source integrations are also available via ArcGIS Pro.

A: Extensions spatial analyst and network analyst would be needed for some of the techniques Andrew presented

Q: Resources for Data Analytics?

A: All, here is an excellent starting point for exploring the topics Andrew just covered:

<https://www.esri.com/en-us/arcgis/products/spatial-analytics-data-science/overview>

Q: You mentioned two licenses required to do this work; one was Network Analyst extension. What was the other?

A: spatial analyst license

Q: I am interested in your thoughts about which methods of interpolation in Arc GIS would be best for decision making of site selection using Sparrow Model data for an embayment to look at nutrient loading.

A: It is tough to answer without looking at the relationship between data, but one thought is to start out simple with something like IDW and then expand with a more complicated model if you have the proper data.

Q: Follow-up... interpolation using a network I would think would need to be leveraged in some form. Something like a Kriging model would give me a continuous raster over land and water correct? Is there a way to restrict that more to a network flow structure?

A: If you are talking about determining stream networks then I would point you to the hydrological tools.

Q: I am assuming there are helpful classes offered for Data Science on your resources page?

A: Absolutely. There are excellent learning plans available. Also, spatial analysis MOOCs have been offered See the Esri training site here: <https://www.esri.com/training/>

Q: I would love to see some example of the analytics being used in projects your Boston office is working on if possible.

A: Great idea. Perhaps we can share some via the Boston Hub. Let us discuss this.

A: Here is a blog deploying a model for selecting Covid-19 testing sites developed by a Solution Engineer in the Boston Office. You can even download the model and run it if you have Business Analyst. Link:

<https://www.esri.com/arcgis-blog/products/bus-analyst/decision-support/using-bridging-locations-site-location-automation/>

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Q: Just to be sure my original question was clear: I have used the Bridge and worked with Python scripts in ArcMap. My question was more specific to **combining** Python and R in the same geoprocessing workflows. Are there workflows or recommended procedures for calling R and Python analyses in a single tool? Like, the reticulate package, stitching through model builder, etc. I am wondering what Esri folks who use both are doing, i.e., the 'best practice'

A: I would say that you could call both scripts in one modelbuilder workflow. You could also run a batch file that calls the two scripts if you create it in a way that if one depends on the other then you structure the batch file properly. Generally, I would say you stay in one environment. Usually you can conduct the same type of analysis in R or Python, the script may look a bit different. Unfortunately, I have never run into this type of scenario.

A: Just to circle back per a colleague that works on the R-bridge: ModelBuilder and reticulate both works well with the R-ArcGIS Bridge. If you have a workflow which utilizes existing Geoprocessing tools or has separate workflows which use Python standalone scripts, then ModelBuilder is a good way of mixing those two using the discrete structure of ModelBuilder. If, on the other hand, your primary language that you're producing your code in is R, and you just need to call a few specific Geoprocessing tools or methods from ArcPy, then using reticulate would be simpler than creating a separate set of Python scripts and keep your code into a single logical flow.