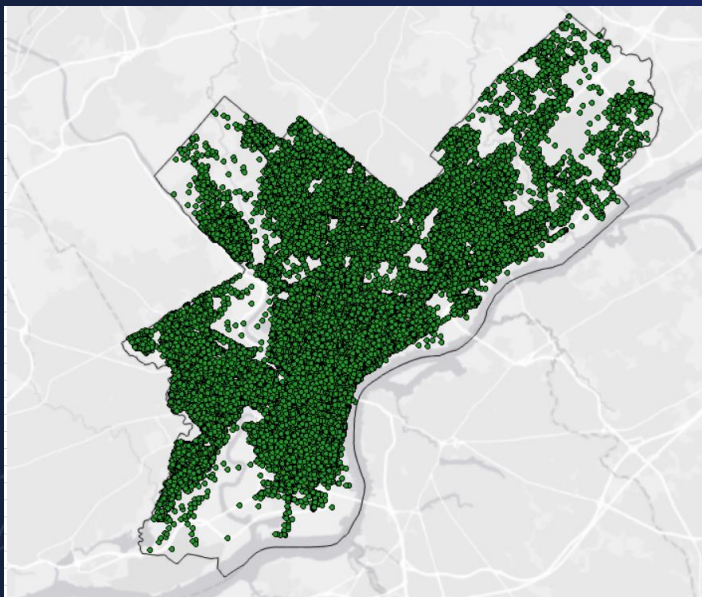




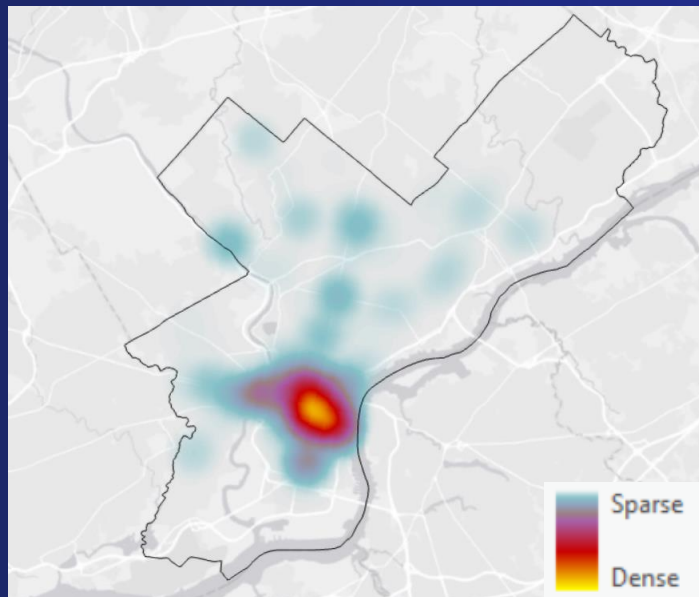
# Spatial Data Science and ArcGIS Notebooks

Nicholas M. Giner

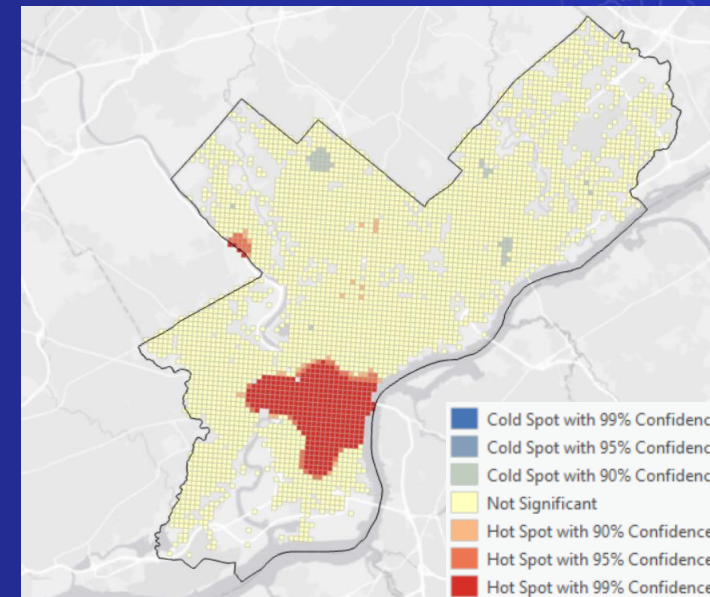
# What is Data Science?



Raw data



Initial understanding



Actionable information



# What is *Spatial* Data Science?

coincidence

orientation

area

adjacency

proximity

direction

connectivity

distance

length

# The building blocks of spatial data science



## Data Integration & Engineering

- Data frames
- Geocoding
- Enrichment
- Creating/editing layers



## Visualization & Exploration

- Open source libraries
  - Matplotlib
  - Seaborn
  - Plotly
  - Plotnine
  - Bokeh
- ArcPy.charts



## Spatial Analysis

- Standard Analysis Tools
- Geoprocessing (ArcPy)
- Raster Analytics



## GeoAI

- Spatial Machine Learning
- Deep Learning
  - Imagery
  - NLP
  - Time-Series
  - 3D Point Cloud



## Big Data Analytics

- GeoAnalytics



## Modeling & Scripting

- Automation
- ArcGIS API for Python
- Built-in scheduling
- Webhook triggering
- Import existing notebooks
- Notebook code snippets

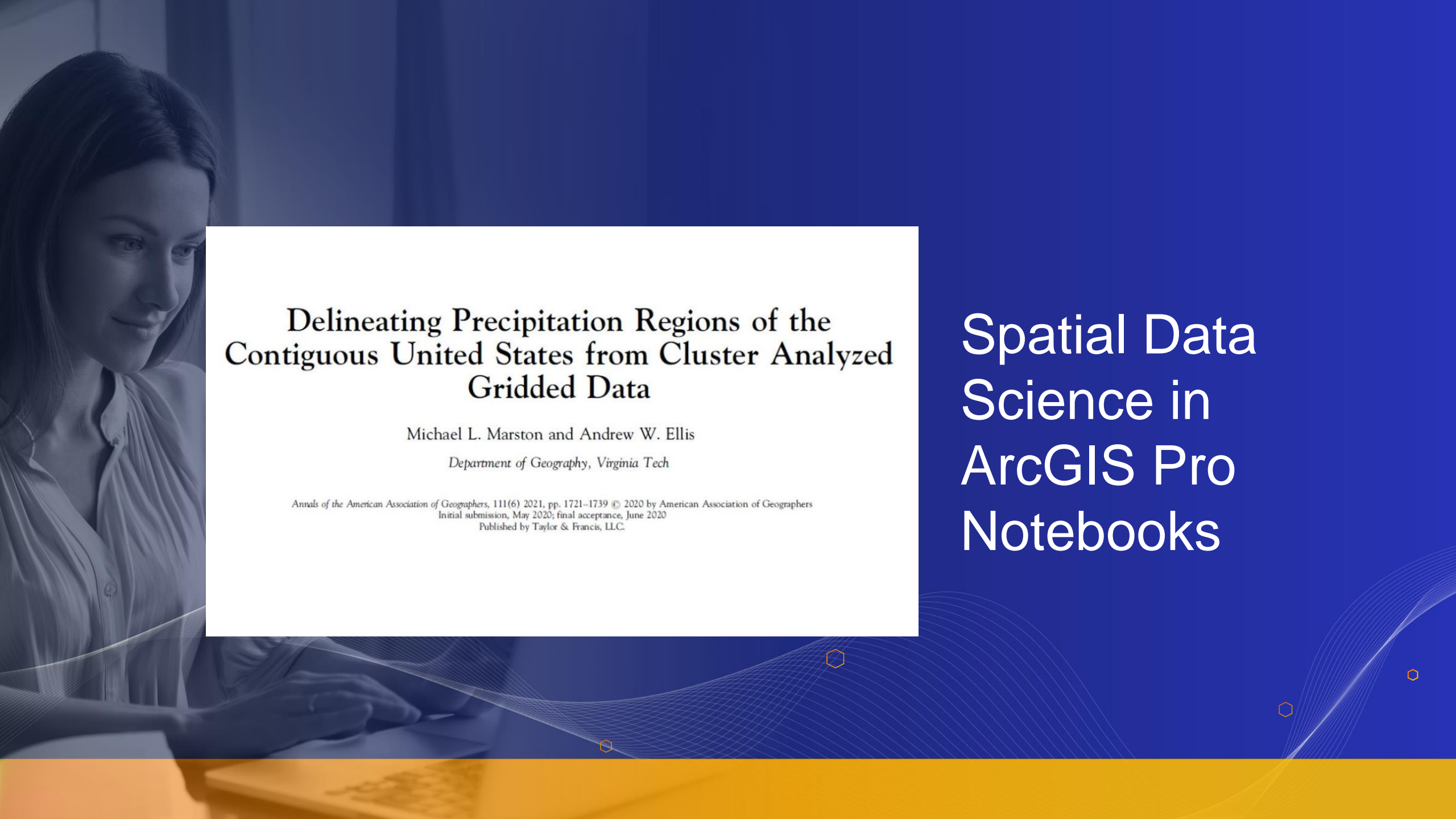


## Sharing & Collaboration

- Share IPYNB files
- Notebooks as web tools

# What is ArcGIS Notebooks?

- Built within ArcGIS rather than sitting beside it
  - **ArcGIS Enterprise, ArcGIS Online, ArcGIS Pro**
- Leverages an integrated UI
  - Single sign-on experience using gis = GIS(“home”)
  - Easily search for and add data, services, and analysis tools as Python code snippets in your notebook
- Notebooks as Items in the portal
  - Share and collaborate with other users
  - Easily import existing .IPYNB files
- Pre-defined notebook environment (“Runtime”) with hundreds of Python libraries
  - ArcGIS API for Python, ArcPy, and 450+ Python libraries
  - Use ArcPy without ArcGIS Pro
- Automation – Built-in scheduling, webhooks, notebooks as web tools
- Access to Esri Sample Notebooks



# Delineating Precipitation Regions of the Contiguous United States from Cluster Analyzed Gridded Data

Michael L. Marston and Andrew W. Ellis

*Department of Geography, Virginia Tech*

*Annals of the American Association of Geographers*, 111(6) 2021, pp. 1721–1739 © 2020 by American Association of Geographers  
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## Spatial Data Science in ArcGIS Pro Notebooks



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