

## GeoDev Summit

### Pre- Event Technical Training

Tuesday March 8, 2022

**In-Person at HU Attendance ONLY**

#### **Schedule:**

8:15-9:00 AM: **Registration**

9:00 – noon: **JavaScript**

**Description:** This workshop will introduce attendees to writing modern JavaScript using ECMAScript 6 standards. Attendees will learn how to make websites interactive, as well as learn the basics of creating web mapping applications.

Noon – 1 PM: **Lunch Break (On Your Own)**

1:00 – 4PM: **Python for ArcGIS**

**Description:** This workshop will focus on the ArcPy Python site package in ArcGIS with hands-on exercises designed to provide the essential skills to use Python in ArcGIS more effectively.

### Day of Event

Wednesday March 9, 2022

**Hybrid- In-Person and Virtual Attendance**

#### **Schedule:**

8:15 – 9:00 AM: **Registration**

9:00 – 9:15 AM: **Opening, Welcome**

9:15 – 10:00 AM: **Keynote**

Becoming a Geospatial Data Scientist

#### **Speaker:**

- James Whitacre

10:00 – 10:15 AM: **BREAK**

10:15-11:00 AM: **Breakout Sessions 1**

#### **Track 1: Beginner (In-Person)**

How To Read Python Like a Nerd (Without Having To Be One)- Part 1

ArcGIS is powerful software that allows for data collection, manipulation, and analysis. However, this can be a largely manual, repetitive, and prolonged process. And ain't nobody got time for that! Python is the primary language used to automate these processes, interact with geodatabases, and integrate data with tools and libraries. Learning to create code takes a lot of practice but learning to read Python will allow you to understand and alter previously created codebases. This workshop will introduce many of the basic concepts and principles of Python and will help you to understand what a piece of code does and how it works.

- **Speaker:** Brian Grey, Lecturer in Computer & Information Sciences, Harrisburg University

## **Track 2: In-Person**

### Python Scripting for ArcGIS Pro Projects

Learning to automate workflows in ArcGIS Pro using Python is essential in today's fast paced environment. This presentation will introduce the Esri's Arcpy Mapping module and how to use it to interact with ArcGIS Pro. Common workflows covered will include accessing your projects and data, correcting broken data sources, working with layers, maps, and layouts, exporting maps, and publishing maps to ArcGIS Online

- **Speaker:** Joel Rogers, *GIS Analyst*, GeoDecisions

## **Track 3: Virtual**

### Getting Started with the Census Data API in R Using Tidycensus

In this session, we will learn how to query, download and format data from the US Census Bureau's API (Application Programming Interface) using Dr. Kyle Walker's 'tidycensus' library. We will save the results to CSV, to a formatted Excel file and to a shapefile - all using R! Attendees may participate using RStudio on their desktop or with RStudio Cloud online. All files & instructions will be provided in advance for attendees to review prior to the live session.

- **Speaker:** Catherine Tulley, Transportation Planning Data Analyst, Southwestern Pennsylvania Commission

11:00-11:15 AM: **BREAK**

11:15-12:00: **Breakout Sessions 2**

## **Track 1: In person**

### How to Read Python like a Nerd (without having to be one)- Part 2,

ArcGIS is powerful software that allows for data collection, manipulation, and analysis. However, this can be a largely manual, repetitive, and prolonged process. And ain't nobody got time for that! Python is the primary language used to automate these processes, interact with geodatabases, and integrate data with tools and libraries. Learning to create code takes a lot of practice but learning to read Python will allow you to understand and alter previously created codebases. This workshop will introduce many of the basic concepts and principles of Python and will help you to understand what a piece of code does and how it works.

- **Speaker:** Brian Grey, Lecturer in Computer & Information Sciences, Harrisburg University

## **Track 2: Virtual**

### Utilizing Survey123 and Python Script to Standardize the Production of Project Deliverables

Initial assessment, due diligence and preliminary engineering tasks make up a significant portion of CEC project tasks. The deliverables for these tasks are standardized, either through CEC quality policies and standards, or by government regulators. Even though each site is different and presents its own set of challenges, the workflow to create an initial deliverable is generally consistent. Depending on the deliverable, these processes, when done by hand, can range in a time commitment from a few hours to multiple days of work. These tasks being handled by staff not only take time, but involve human interaction, which can lead to inconsistencies in format, as well as the possibility for error, especially when these tasks can be monotonous or complex. ArcMap and ArcPro, GIS software produced by Environmental Systems Research Institute (ESRI), are utilized here at CEC to process all GIS requests,

including producing the standardized deliverables required in a project. Through various Python libraries developed by ESRI in conjunction with their software products, custom scripts can be written to automate the production of project deliverables, completing the task in a fraction of the time with no variation in formatting and with no chance for error. In order for a script to apply to multiple situations, data needs to be able to be input in a format that the script expects. Survey123, a custom form production software product also offered by ESRI, allows users to create specific web based forms that can be shared over the internet with their target audience. These forms can be built to validate all submitted data to ensure that all information input is in a format that a python script expects, allowing python scripts to take data entered into a Survey123 form and process any requests that have been submitted.

- **Speaker:** Matthew Kramer, GIS Analyst, CEC

### **Track 3: Virtual**

#### Quality Control, GIS, and Python

A look into practical python and how it can be used to automate QC tasks with GIS data.

- **Speaker:** Michael Mulford, Lead GIS Analyst, Cumberland County

12:00-1:00 PM: **LUNCH BREAK**

1:00-1:45 PM: **Breakout Sessions 3**

### **Track 1: In Person**

#### Analyzing Habitat Suitability using ArcGIS Notebooks

As the Pennsylvania Game Commission looks at the feasibility of a species reintroduction documentation, ease of modification, and presentations are all considered in the development of python code. ArcGIS Notebooks has proven to be a great option for workflows like this project and many others within the agency. Creating python code to be powerful yet understood by all individuals involved is pertinent for these projects which is why ArcGIS Notebooks was utilized and will be in the future. This presentation will go over a practical approach to python code.

- **Speaker:** Emily Kerstetter, Geospatial Specialist II, Pennsylvania Game Commission

### **Track 2: Virtual**

#### Microservice ETL with JavaScript, ArcGIS REST, and AGOL

Using AWS Lambda functions and Node JS to ETL data from an application database, perform geospatial analysis using Turf.JS, and update/load those data into an AGOL feature service to be consumed in an ArcGIS Dashboard. This session aims to demonstrate how to leverage lightweight and cost effective geospatial microservices into your workflow in order to enhance COTS products with custom development in JavaScript. Real world examples of how and why you might use such services will be provided as well as a focused overview of the code and deployment tools used. Examples are provided using AWS Lambda, but the pattern can be extended to any FaaS platform (such as Azure Functions or Google Cloud Functions).

- **Speaker:** Chaz Mateer, Software Engineer, Timmons Group

### **Track 3: Virtual**

#### Converging Visual and Geospatial Analytics with Tableau

- **Speaker:** Sarah Battersby, Principal Research Scientist, Tableau

1:45- 2:00 PM: **BREAK**

2:00-2:45 PM: **Breakout Sessions 4**

**Track 1: In Person**

An Introduction to Esri Arcade Expressions

Arcade is an expression language that can be used across the ArcGIS platform to create custom pop-ups, complex label expressions, and visualizations. It contains common components from other programming languages, such as conditional statements and flow control. This presentation will provide an overview of the Arcade language, and then focus on walking through several examples of practical expressions. Those new to programming or who have never used Arcade expressions are encouraged to attend.

- **Speaker:** Patrick McKinney, GIS Architect, PA Department of Health

**Track 2: Virtual**

Creating Multiprocessing Python Scripts ArcGIS

“My script takes too long!!” Do you find yourself making this complaint too often? Well, maybe your script would benefit from multiprocessing! If you’re not sure, this session will dive into what multiprocessing is, the different scenarios where multiprocessing workflows can help speed up processing, and how to practically utilize multiprocessing in ArcGIS. You will learn how to move from, “This is so slow...” to “WOW! That was fast!”.

- **Speaker:** James Whitacre

**Track 3: Virtual**

Making Maps Accessible with Adobe Acrobat Pro-CC

- After you design a great visually accessible map the next step is to post it online for the public. This usually includes an exported PDF. You want it available to the widest audience possible, so this means making it electronically accessible. And it is the law. This session will show you how to tag an exported map PDF with the professional versions of Acrobat, give ideas for appropriate alt text, and troubleshoot some common issues.
- The first part will be a beginner introduction of tagging steps with Acrobat: proper export, tagging, and troubleshooting. It will also include some tips on layers, scans, and pdfs vs. images.
- The second part will show examples of using alternative text in different settings, integrating it with the surrounding information. This will hopefully give ideas of how to approach your own situations.
- The plan is to keep the presentations short enough to allow time to answer accessibility questions about any situation or program.
  - **Speakers:**
    - Ruth MacDonald, Editor- Groundwater Atlas Program, Minnesota Department of Natural Resources
    - Ellen Strom, Accessibly Officer, Commonwealth of Pennsylvania

2:45-3:00 PM: **BREAK**

## 3:00-3:45 PM: Breakout Session 5

### Track 1: In Person

#### Is Spatial SQL Special?

Geospatial data is becoming more commonplace in our everyday lives. This data powers dashboards, web maps, and applications which are integral into our daily lives. In the past few years, there's been a greater variety of spatially enabled data available. Datasets are not only becoming more available, but they're growing in size. As data grows in size, we will need tools that are capable of scaling with the data. One geospatial tool for analyzing large datasets is spatial databases, and more specifically spatial SQL (Structured Query Language) databases. These SQL databases serve as the backbone of enterprise GIS infrastructure, but can also be used by the individual to crunch through "big data." With a little bit of knowledge of SQL and some foundational knowledge of GIS concepts, more users can answer questions about the world around them. This presentation primarily will be exploring the use of PostgreSQL/PostGIS software for exploratory spatial analysis. Basic concepts of SQL implementation and spatial functions will be the primary focus of this presentation to give the audience a better understanding of the power and versatility of spatial SQL.

- **Speaker:** Kyle Snyder, Planner, Tri-County Regional Planning Commission

### Track 2: Virtual

#### Creating Multiprocessing Python Scripts ArcGIS

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