GUI-GIS in ArcGIS Pro CSDE Workshop Lab – Spatial Data Analysis in R and ArcGIS May 20, 2025

Start ArcGIS Pro on CSDE's Windows Terminal Server

Only UW participants w/ a CSDE Computing Accounts can do the following:

- Remote Desktop into CSDE Windows Terminal Server
 - o Off Campus: Remember to first <u>Set up Husky On-Net VPN.</u>
 - How-to Connect to Terminal Servers: <u>https://csde.washington.edu/computing/tutorials/</u>
 - Computer:
 - Students: csde-ts4.csde.washington.edu or ts5
 - All Others: csde-ts1.csde.washington.edu or ts2
- Start ArcGIS Pro (Start Menu -> ArcGIS Pro)
- On the sign-in page select "Your ArcGIS organization's URL"

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• Enter uw (so the URL reads uw.maps.arcgis.com) and check the Remember this URL box

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• In the familiar UW NetID Login Page enter your UW credentials and Sign in.

Create a New Map and Project

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	New Project					
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- Name your project: "CSDE ArcGIS Lab"
- Choose New Project Location
 - Choose an easy to find location for today. I suggest you create a New (temporary) folder ("CSDE GIS Workshop") in the root of your H:\ drive on the CSDE Terminal Servers.
- ArcGIS will create a new folder using the name specified and will generate a set of additional project files automatically for you:
 - Geodatabase sub folder for storing project data,
 - Sub-folder for log files
 - Sub-folder for index files
 - ArcGIS Pro .aprx project file
 - ArcGIS .atbx toolbox file : This toolbox format stores tools, scripts, and models

Explore ArcGIS Pro and Map Navigation Basics



Acquire GIS Data

- Do this inside the Remote Desktop client (not your local computer)
- Start up a Google Chrome Browser Window

 Download 3 Data Files from CSDE Workshop Page (will automatically go to Downloads Folder)

(https://csde.washington.edu/workshop/spatial-data-analysis-in-r-andarcgis/)

Washington Census tracts:

2020 WA Census Tracts (zip) (Source)

Washington tract-level 2020 Census counts by Race:

2020 WA Census Population counts by Race (zip) (Source)

Sound Transit Open Transit Data GIS Data:

Sound Transit Open Transit Data GIS Data (zip) (Source)

- Open Windows File Explorer
 - Right Click "Extract All" for each .zip archive
 - Select All 3 new folders, right click, "Copy"
 - Navigate to your ArcGIS Pro Project Folder : "H:\CSDE GIS Workshop\CSDE ArcGIS Lab"
 - o Create a new folder "Original Data Files"
 - Right click, "Paste"
- Close down the file explorer and chrome browser. Return to ArcGIS Pro window.

Load Vector Shapefile (WA Census Tracts), Subset, and Symbolize

- Open ArcCatalog (similar to file explorer)
 - View (tab) -> Windows (section) ->Catalog Pane
 - Navigate to Folders->CSDE ArcGIS Lab
- Add Data File
 - Original Data Files -> cb_2020_53_tract_500k _ > cb_2020_53_tract_500k
 .shp
- Navigate around the map. Double click to query attributes of a census tract
- Open Attribute Table
 - Right Click on Layer -> Attribute Table
- Select all Tracts in King County (useful for data exploration or focused analysis)
 - In the Attribute Table, "Selection:" section, click on the first icon (Select by Attribute)
 - NAMELSADCO = 'King County'
 - View results, then Clear Selection
- Tell ArcMap to limit all operations to tracts in King County
 - Double-click tract layer in Contents to open up Layer Properties

- Definition Query -> NAMELSADCO = 'King County'
- Explore Basic Symbology Operations
 - Right click on Tract Layer -> Symbology
 - o Single Symbol
 - Gallery (pre-defined) or Properties (completely customize)
 - o Unique Values
 - Often used for Non-numeric Data Type Fields
 - Field 1 = NAMELSAD (Tract Name)
 - Color Scheme
 - o Graduated Colors
 - Only Numeric Data Type fields
 - Field = AWATER
 - Classes
 - Color Scheme

Add Census Variable Table and Join to Tract Shapefile

- Clean Census Data Table
 - Open in Excel: ("DECENNIALPL2020.P1-Data.csv")
 - Remove first row
 - Save as ("DECENNIALPL2020.P1-Data_EDIT.csv")
- Add Census Tabular Data
 - Catalog, drop file into map ("DECENNIALPL2020.P1-Data_EDIT.csv")
 - Open Attribute Table
 - Look at Metadata file
 - Variable to Use:
 - P1_001N : TOTAL POP
 - P1_003N : WHITE ALONE POP
- Join Tabular Data to Census Tract Shapefile
 - Input: cb_2020_53_tract_500k
 - Input Field: AFFGEOID
 - Join Table: DECENNIALPL2020.P1-Data.csv
- Symbolize
 - o Raw Population Count: P1_001N : TOTAL POP
 - Population Density: TOTAL POP Normalization ALAND
 - Method = Natural Breaks (Jenks) vs Quantile
 - o Raw White Alone Population Count: P1_003N : WHITE ALONE POP
 - Percent Total Pop that is White Alone: WHILE ALONE Normalize TOTAL POP
 - Adjust Layer Transparency: Feature Layer (tab) -> Transparency Slider



Add Other Vector Data Types

- Point: LINKStation
 - Attribute Table
 - Symbolize
 - Unique Value -> STATUS
 - "Complete" = Green & "CONST = Red
- o Line: LINKLine
 - Symbolize
 - Unique Value -> STATUS
 - "Complete" = Black Rail & "CONST = Red Rail



Sneak Peak - Data Analysis in ArcGIS Pro (GeoProcessing)

- Open Geoprocessing Toolbox
 - View (tab) -> Windows (section) -> Geoprocessing

