



# Batch Geocoding with ArcGIS

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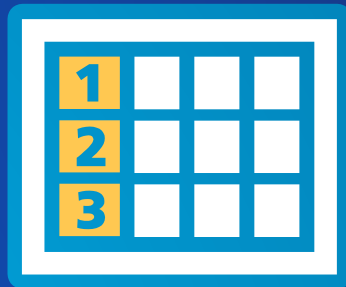
SEE  
WHAT  
OTHERS  
CAN'T

**Goal: Turn a spreadsheet of  
addresses and place names  
into points on the map using  
ArcGIS**



# What is Batch Geocoding?

- Turns a spreadsheet of addresses into points on the map
- Requires:
  - Your spreadsheet or table
  - An ArcGIS Application such as ArcGIS Pro or Map Viewer
  - And a locator

A screenshot of the 'Geocode Locations from Table' tool interface. It shows four numbered steps: 1. Choose an input table (Address380-Address380), 2. Choose a locator (Esri World Batch Geocoder, Country: World), 3. Choose an output format (CSV), and 4. Result layer name (Geocoded Results for Address380-Address380). A table for 'Locator Inputs' and 'Data Fields' is visible, showing fields like Address, Neighborhood, City, Subregion, and Region. A 'RUN ANALYSIS' button is at the bottom.

Locator Inputs	Data Fields
Address	address
Neighborhood	Not Used
City	city
Subregion	Not Used
Region	state



# Locator options

## Batch Geocoding Overview

- Use Esri-provided locators
  - World Geocoding Service
  - World Geocoder for ArcGIS
  - Street Map Premium locators
- Build your own locators using the CreateLocator tool in ArcGIS Pro

The screenshot shows the 'Create Locator' tool in the ArcGIS Pro Geoprocessing environment. The interface is divided into several sections:

- Country or Region:** A dropdown menu set to 'United States'.
- Primary Table(s):** A dropdown menu set to 'streets'.
- Role:** A dropdown menu set to 'Street Address'.
- Field Mapping:** A section with multiple dropdown menus for mapping fields to locator fields:
  - \*Left House Number To: L\_I\_ADD
  - \*Right House Number From: R\_F\_ADD
  - \*Right House Number To: R\_T\_ADD
  - Left Parity: <None>
  - Right Parity: <None>
  - Prefix Direction: <None>
  - Prefix Type: <None>
  - \*Street Name: NAME
  - Suffix Type: <None>
  - Suffix Direction: <None>
- Output Locator:** A text field containing 'streets\_CreateLocator'.
- Language Code:** A dropdown menu set to 'English'.
- Optional parameters:** A section with additional options:
  - Alternate Name Tables:** A dropdown menu.
  - Role:** A dropdown menu.
  - Alternate Data Field Mapping:** A text field.
  - Custom Output Fields:** A text field.

At the bottom right, there is a 'Run' button with a play icon. The bottom of the window shows the 'Catalog' and 'Locate' tabs, with 'Geoprocessing' selected.

# Where can I do Batch Geocoding?

- ArcGIS Online & Enterprise Map Viewer
- ArcGIS Pro
- Custom Applications via API's and SDK's



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# ArcGIS Online Map Viewer

## Batch Geocoding

- Drag & Drop
  - Adds CSV layer to Web Map
  - Limited to 1000 Features
    - 250 anonymously
- Upload CSV as an Item
  - Creates a feature layer
  - Unlimited feature count

**Add CSV Layer**

Locate features using: ☐ Latitude/Longitude ☒ Address

Country:

Review the location fields

Field Name
OBJECTID
Singleline

### Item from my computer ?

Add an item from your computer.

File:  TestData.csv

Title:

Tags:

☒ Publish this file as a hosted layer  
(Adds a hosted layer item with the same name.)

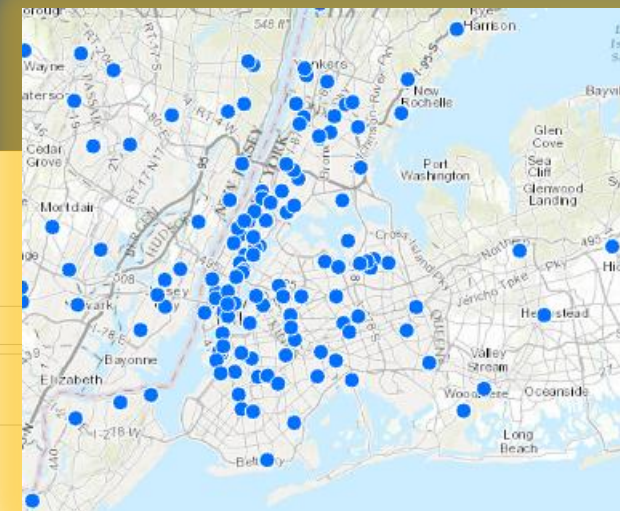
Use: ☐ Latitude/Longitude ☒ Address ☐ Table

Country:

Review the field types and location fields. Click on a cell to change it.

Field Name	Field Type	Location Fields
ADDRESS	String	Street
CITY	String	City
STATE	String	State
ZIP	String	ZIP

Time Zone:



# ArcGIS Enterprise Map Viewer

## Geocode Locations from Table

- Supports multiple Portal item input formats
  - CSV, XLSX, Portal table
- Geocoding jobs run asynchronously in the background
  - Optimized for performance
  - Behind your own firewall
- Supports multiple output formats and writes geocoding results to the portal
  - CSV, XLS, Feature Layer

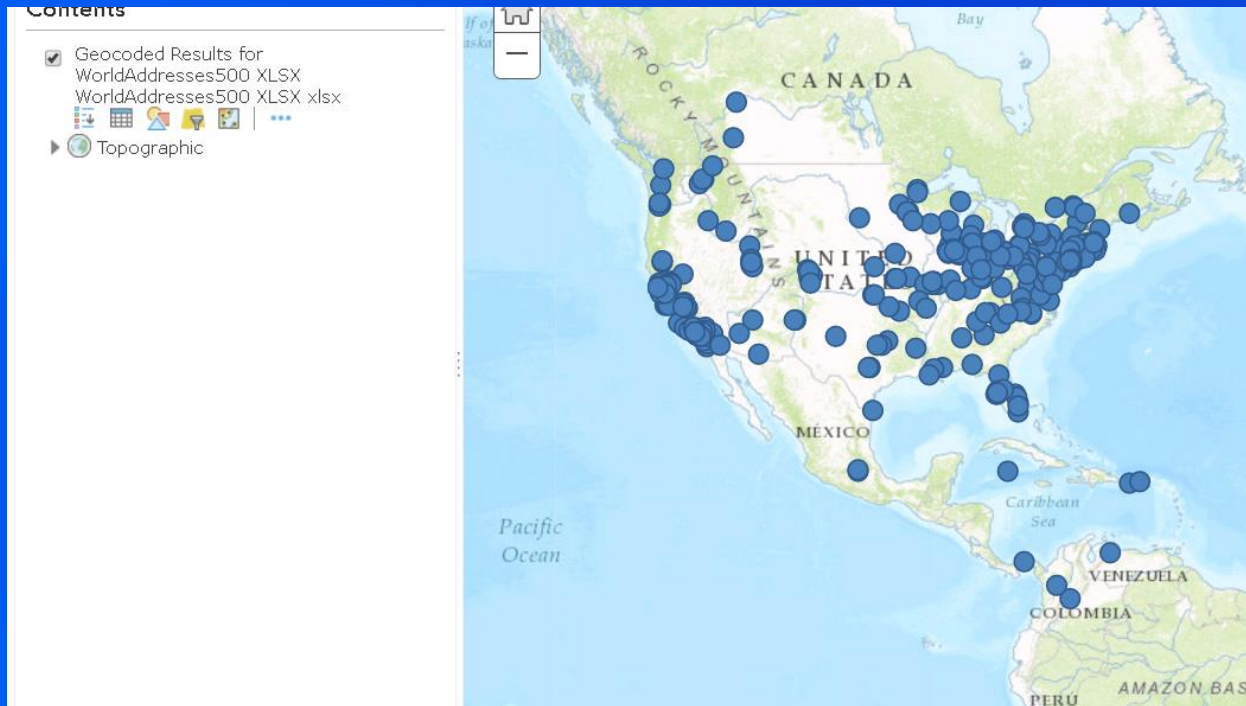
The screenshot shows the 'Geocode Locations from Table' tool interface. It is divided into four numbered steps:

- 1 Choose an input table**: A dropdown menu shows 'Address380-Address380'.
- 2 Choose a locator**: A dropdown menu shows 'Esri World Batch Geocoder'. Below it, a 'Country' dropdown shows 'World'. Under 'Select Data Fields', there are two buttons: 'Single Field' and 'Multiple Fields' (which is highlighted in blue). Below these is a table mapping locator inputs to data fields.

Locator Inputs	Data Fields
Address	address
Neighborhood	Not Used
City	city
Subregion	Not Used
Region	state
- 3 Choose an output format**: A dropdown menu shows 'CSV'.
- 4 Result layer name**: A text box contains 'Geocoded Results for Address380-Address380'. Below it, a 'Save result in' dropdown shows 'publisher'.

At the bottom of the interface is a large blue button labeled 'RUN ANALYSIS'.





# Batch Geocoding in the Map Viewer

# Where can I do Batch Geocoding?

- ArcGIS Online & Enterprise Map Viewer
- ArcGIS Pro
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# Geocode Table

ArcGIS Pro

- Guided workflow steps you through batch geocoding
- More batch geocoding options
  - Location Type
  - Category filtering
  - Country filtering
- Works with local locators and Portal geocoding services (including the World Geocoding Service)
- Geocode Addresses can be used for automation

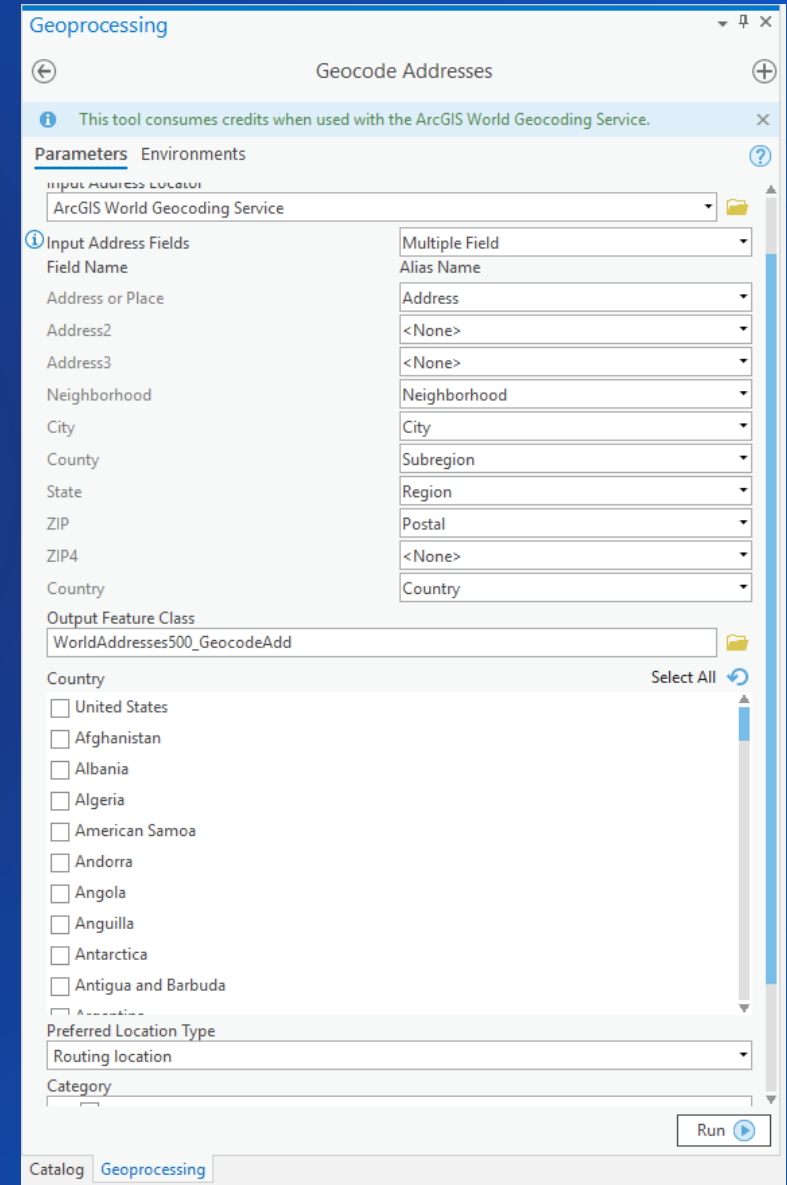
The screenshot shows the 'Geocode Table' tool window in ArcGIS Pro. The interface is organized into several sections:

- Input Table:** A text box containing 'usa\_4k.csv'.
- Input Locator:** A dropdown menu showing 'Esri World Batch Geocoder'.
- Input Address Fields:** A section with an information icon and a 'Data Field' dropdown set to 'Multiple Field'. Below this are several address field dropdowns: 'Address' (selected), '<None>', '<None>', 'Neighborhood', 'City', 'Subregion', 'Region', 'Postal', 'Postal Extension', and 'Country'.
- Output:** A text box containing 'usa\_4k\_Geocoded'.
- Options:**
  - A checked checkbox for 'Add output to map after completion'.
  - A 'Preferred Location Type' dropdown set to 'Routing Location'.
  - A 'Country' dropdown set to 'United States'.
  - A 'Category' dropdown set to 'All types'.
- Run:** A blue button with a play icon.
- Status Bar:** A green bar at the bottom with a checkmark icon and the text 'Geocode Table Success.'.
- Bottom Panel:** A tabbed interface with 'Catalog', 'Geoprocessing', and 'Geocode Table' (the active tab).

# Automating Batch Geocoding: Geocode Addresses

ArcGIS Pro

- Automate Geocoding on Desktop using Geoprocessing
- Run a GeocodeAddresses job and right-click “Copy Python command” to get started
- Jobs can be scheduled and used in ModelBuilder



The screenshot shows the 'Geoprocessing' window in ArcGIS Pro, specifically the 'Geocode Addresses' tool. The window has a title bar with standard window controls. Below the title bar, there is a message: 'This tool consumes credits when used with the ArcGIS World Geocoding Service.' The 'Parameters' tab is selected, showing the following configuration:

- Input Address Locator:** ArcGIS World Geocoding Service
- Input Address Fields:** A table with two columns: 'Field Name' and 'Multiple Field'.

Field Name	Multiple Field
Address or Place	Address
Address2	<None>
Address3	<None>
Neighborhood	Neighborhood
City	City
County	Subregion
State	Region
ZIP	Postal
ZIP4	<None>
Country	Country
- Output Feature Class:** WorldAddresses500\_GeocodeAdd
- Country:** A list of countries with checkboxes, including United States, Afghanistan, Albania, Algeria, American Samoa, Andorra, Angola, Anguilla, Antarctica, and Antigua and Barbuda. A 'Select All' button is visible.
- Preferred Location Type:** Routing location
- Category:** (Empty)

A 'Run' button is located at the bottom right of the tool configuration area. The bottom of the window shows the 'Catalog' pane with 'Geoprocessing' selected.

# Automating Batch Geocoding: Geocode Addresses

Best practices for local geocoding

- Run Geocode Addresses GP Tool in ArcGIS Pro
- Right-click -> “Copy Python command”
- Paste into your favorite IDE

```
import arcpy

table = r"C:\data\WorldAddresses500.csv"
locator = r"C:\data2\USA_SMP"
field_mapping = "'Address or Place' Address VISIBLE NONE;Address2 <None> VISIBLE NONE;Address3 <None> VISIBLE NONE;Neighborhood Neighborhood VISIBLE NONE;C"
output_location = r"C:\data2\outputs.gdb\World_output"
country = None
rooftop = "ROUTING_LOCATION"
category = None

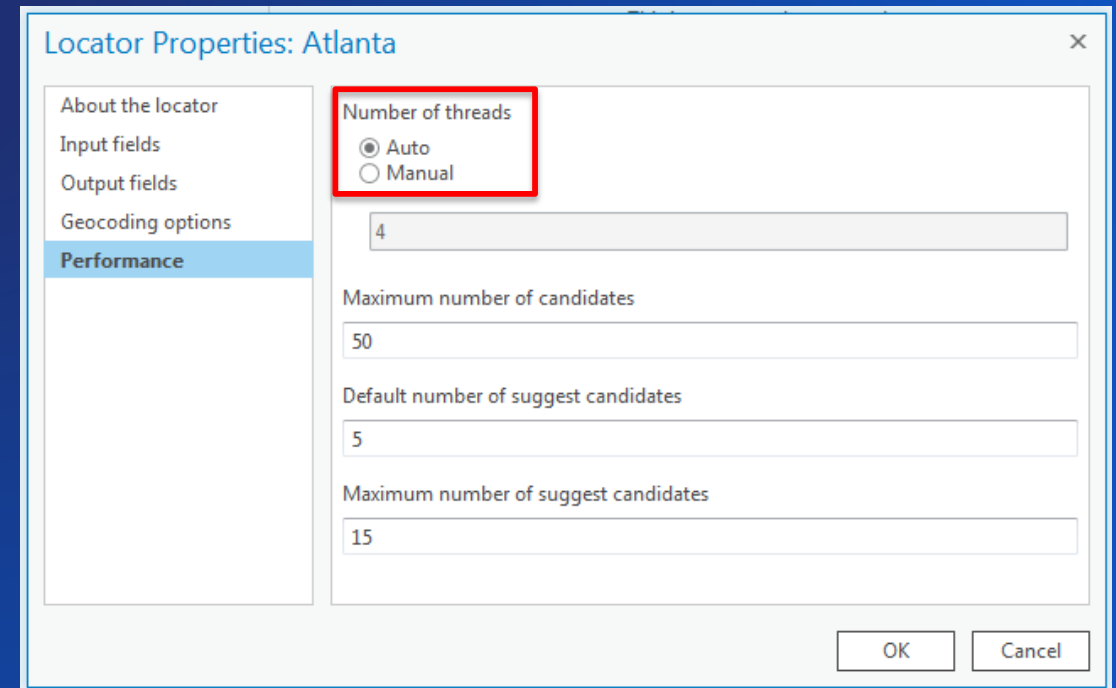
arcpy.geocoding.GeocodeAddresses(table, locator, field_mapping, output_location, country, rooftop, category)
```



# Desktop Geocoding Recommendations

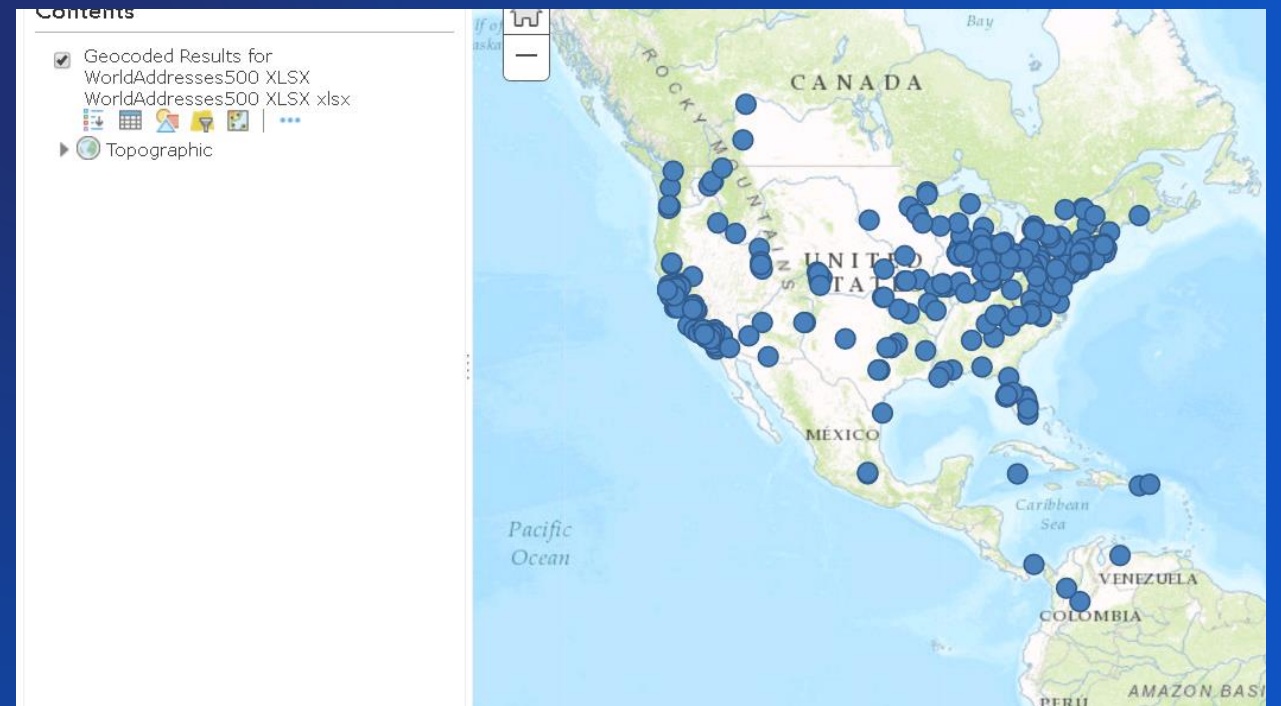
Best practices for local geocoding

- Use the latest version of ArcGIS Pro (2.4)
- Use new locators
  - Newest StreetMap Premium locators or locators built with the CreateLocator tool in ArcGIS Pro 2.4
- Set the number of threads on your locator to “Auto”
  - This uses 1 less than the number of cores on your machine
- Put the locator and input table on a solid state drive



# For even more info about Performance...

- Come to my talk!
- **High Performance Batch Geocoding**
  - 12:15pm-1pm Today in Demo Theater 11
- If you have millions of records, you'll want to swing by





# Locator Views of the World Geocoding Service: Filter Results

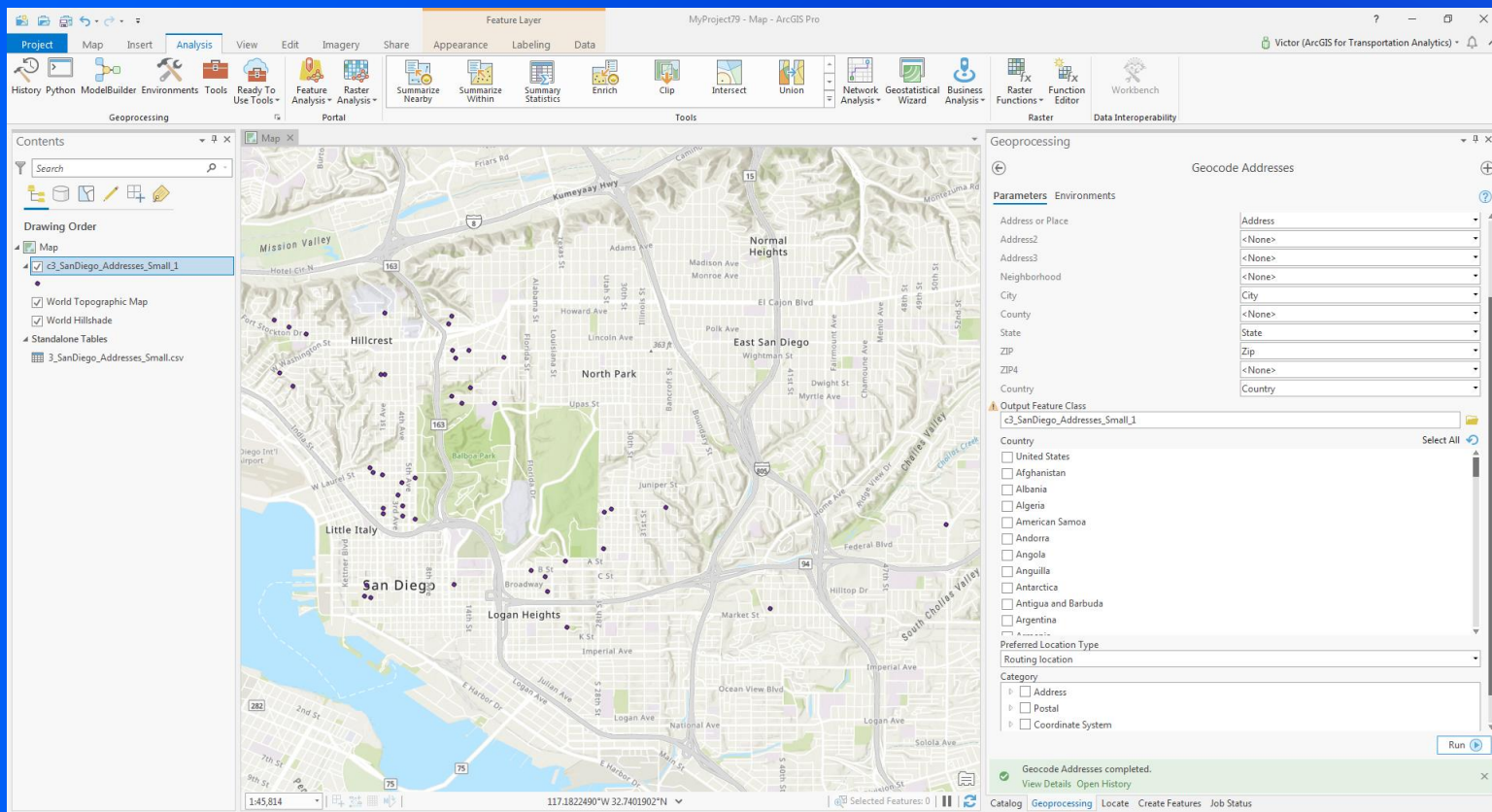
## What's New

- Filter results...
  - By country
  - By category
  - By extent
- Filter applies for...
  - Find
  - Suggest
  - Batch

Optionally, refine the location filter.

- ☒ Education
- ☒ Food
- ☒ Shops and Service
- ☒ Airport

 Create	
Feature Layer	
Tile Layer	
Map	
Scene	
Locator (view)	
App	
Using a Template	
Using the Web AppBuilder	
Using Operations Dashboard	



# Batch Geocoding in ArcGIS Pro: Locator Views, Categories, Rematch & more!





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# Batch Geocoding in Custom Applications: GeocodeAddresses API

A REST endpoint for Batch Geocoding

- Each REST request geocodes 150 to 1000 records at a time
- Demands input and output of JSON
- Requires a token for secure services
- Requires credits when geocoding against the World Geocoding Service



For more info:

<https://developers.arcgis.com/rest/geocode/api-reference/geocoding-geocode-addresses.htm>

# GeocodeAddresses API: A Closer Look

Custom Applications via API's & SDK's

- Synchronous API
- Tips & Tricks
  - Chunk up your addresses into batches of 1000
  - Retry failed requests with a smaller batch size
- Optional parameters to filter results
  - category
  - sourceCountry
  - locationType

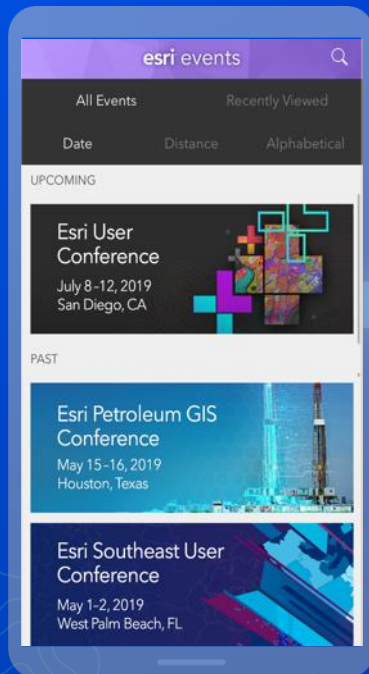
```
addresses=
{
  "records": [
    {
      "attributes": {
        "OBJECTID": 1,
        "Address": "380 New York St",
        "Neighborhood": "",
        "City": "Redlands",
        "Subregion": "",
        "Region": "CA"
      }
    },
    {
      "attributes": {
        "OBJECTID": 2,
        "Address": "1 World Way",
        "Neighborhood": "",
        "City": "Los Angeles",
        "Subregion": "",
        "Region": "CA"
      }
    }
  ]
}
```

For more info:

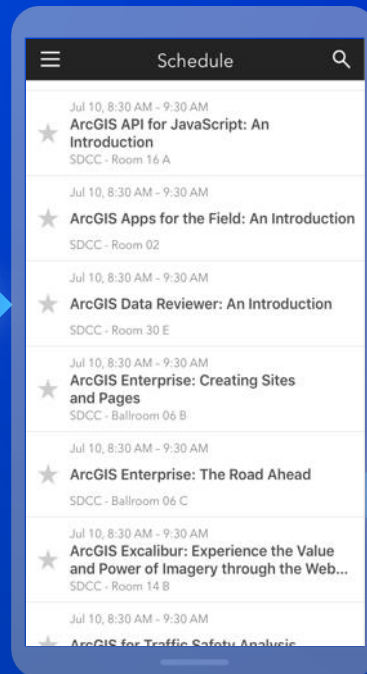
<https://developers.arcgis.com/rest/geocode/api-reference/geocoding-geocode-addresses.htm>

# Please Share Your Feedback in the App

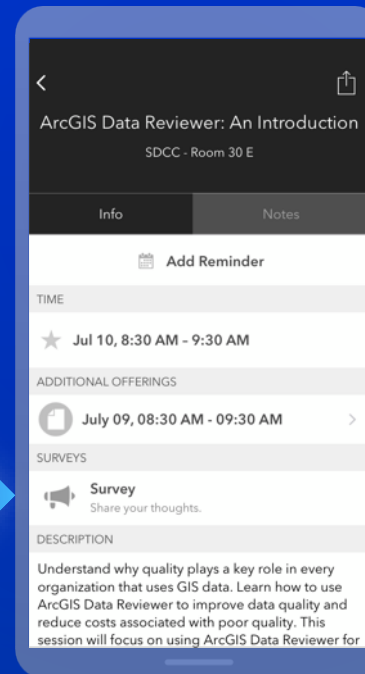
Download the Esri Events app and find your event



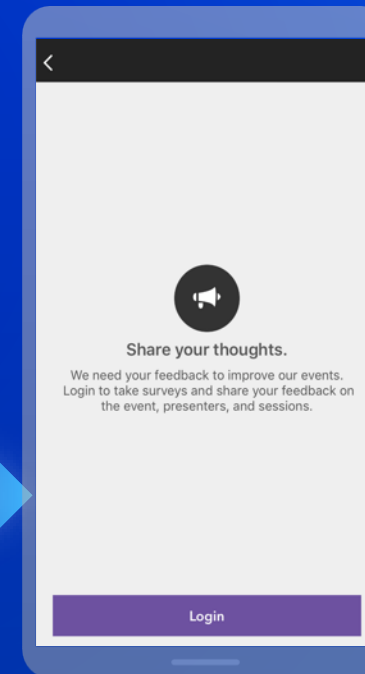
Select the session you attended



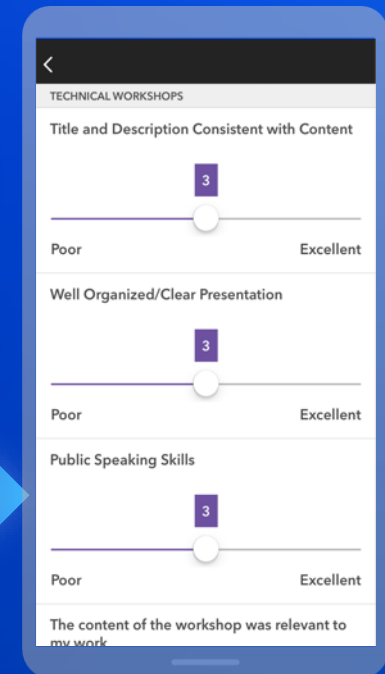
Scroll down to "Survey"



Log in to access the survey



Complete the survey and select "Submit"



Questions?

