Creating New ArcGIS Locators

Jeff Rogers and Brad Niemand

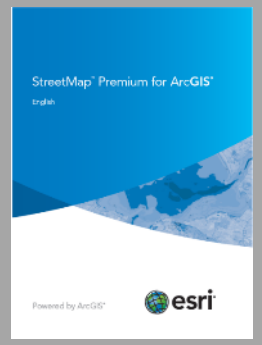
Introduction

Products

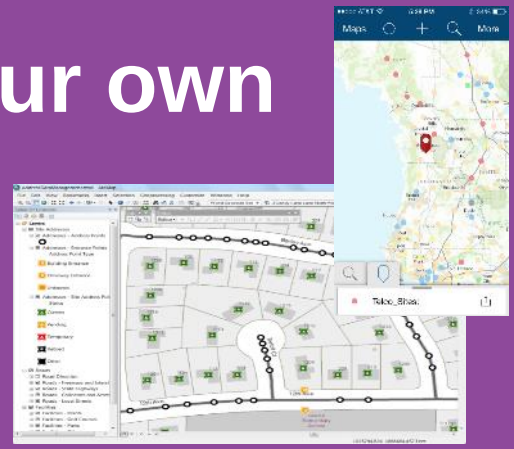
ArcGIS World Geocoding Service

World Geocoder for ArcGIS

StreetMap Premium



Build your own



Goals

- Introduce you to new locators and why they are recommended
- Show you where to find helpful information about building new locators
- Introduce you to the tools and workflow to create locators
- Provide key information, strategies and best practices
- Illustrate how and where the new locators can be used

New Locators

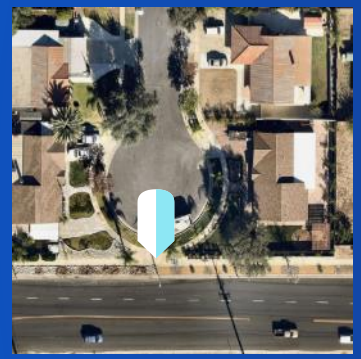
New Locators

- We reached the limits of classic locators (style based locators)
- Project to develop a new locator from everything we learned
- New locators first deployed to ArcGIS Online in May 2017
  - https://developers.arcgis.com/rest/geocode/api-reference/whats-new-world-geocoding-service.htm

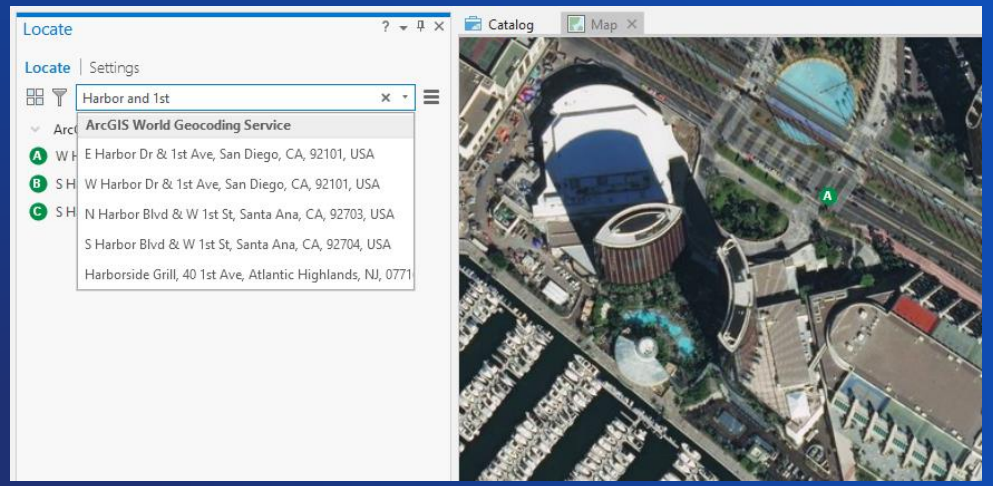
Why New Locators?

Find for more types of places

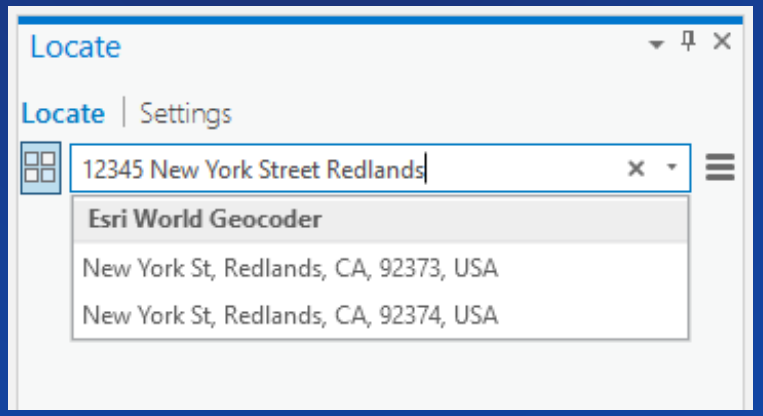
Logical Intersections



Suggestions for Intersections



Suggestions match valid house numbers as you type



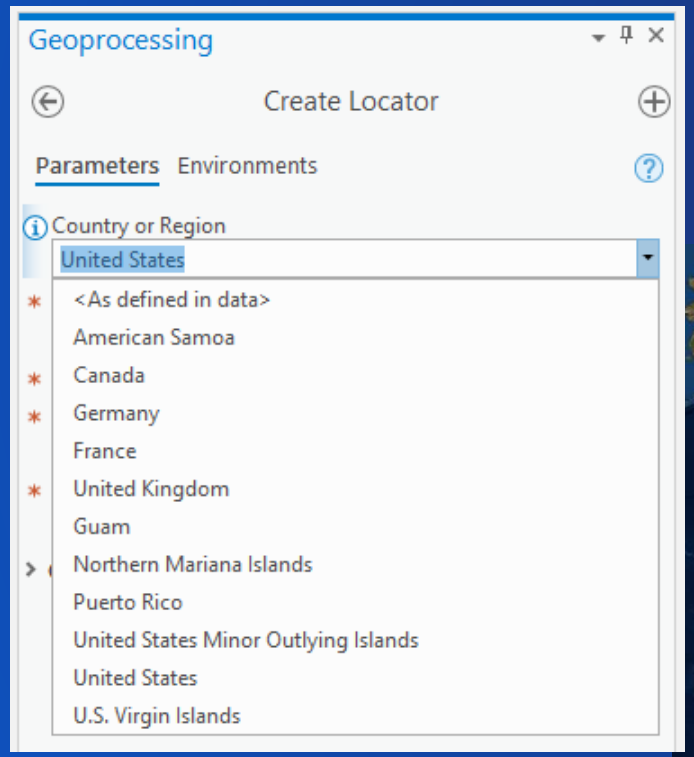
Batch Geocode POIs

Esri New York St
Esri Vienna VA
Prospect Park Redlands
Marina Park San Diego

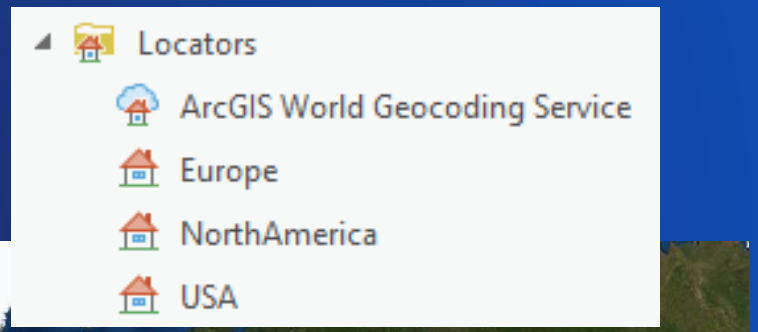
Why New Locators?

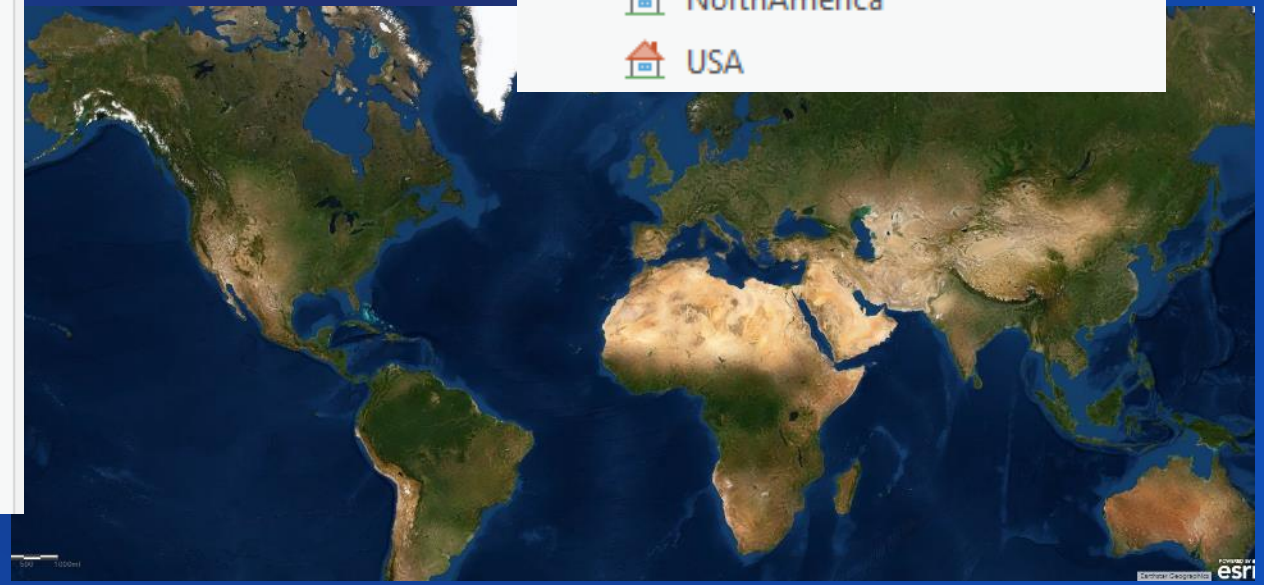
Enhanced international support

Build Custom Locators for More Countries



Build a single locator for Multiple Countries





Goals for New Locators

Enhanced quality, performance and deployment

- **Optimized match quality**
- **Higher performance and scalability**
- **Faster build times (Up to 10x)**
- **Smaller locator footprint for offline deployments (4x to 10x smaller)**
- **And more…**

New Locator Support

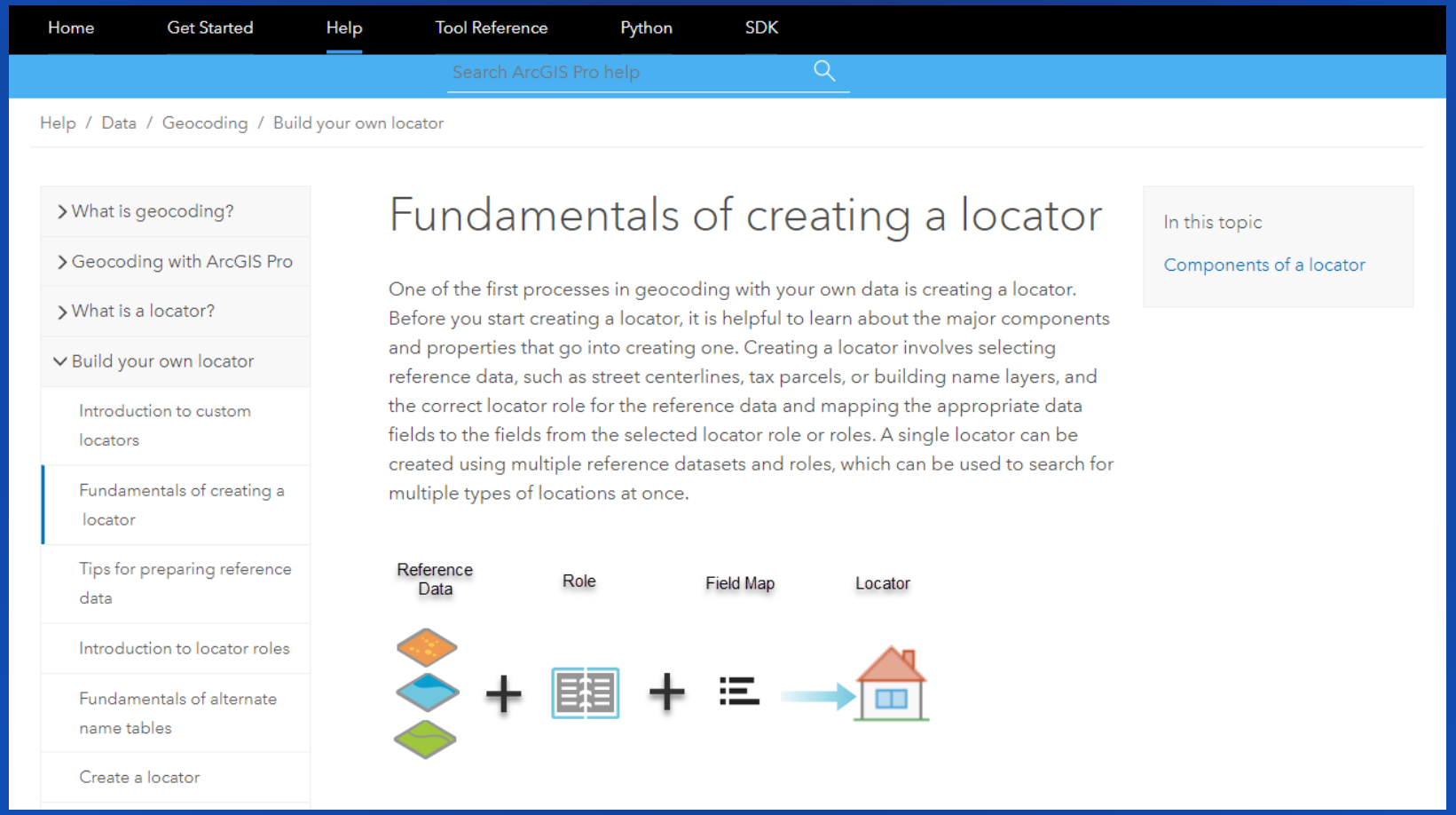
- Created with Create Locator Tool introduced at Pro 2.3
  - Recommend using the latest Pro for best results
- New locators supported in Pro 2.2+ and Enterprise 10.6.1+
- Supported in Runtime Update 5+
  - Author in Mobile Map Packages (Pro 2.3)
- Available as part of Esri Solutions including World Geocoder and StreetMap

Build Your Own Locator

Create Locator Tool

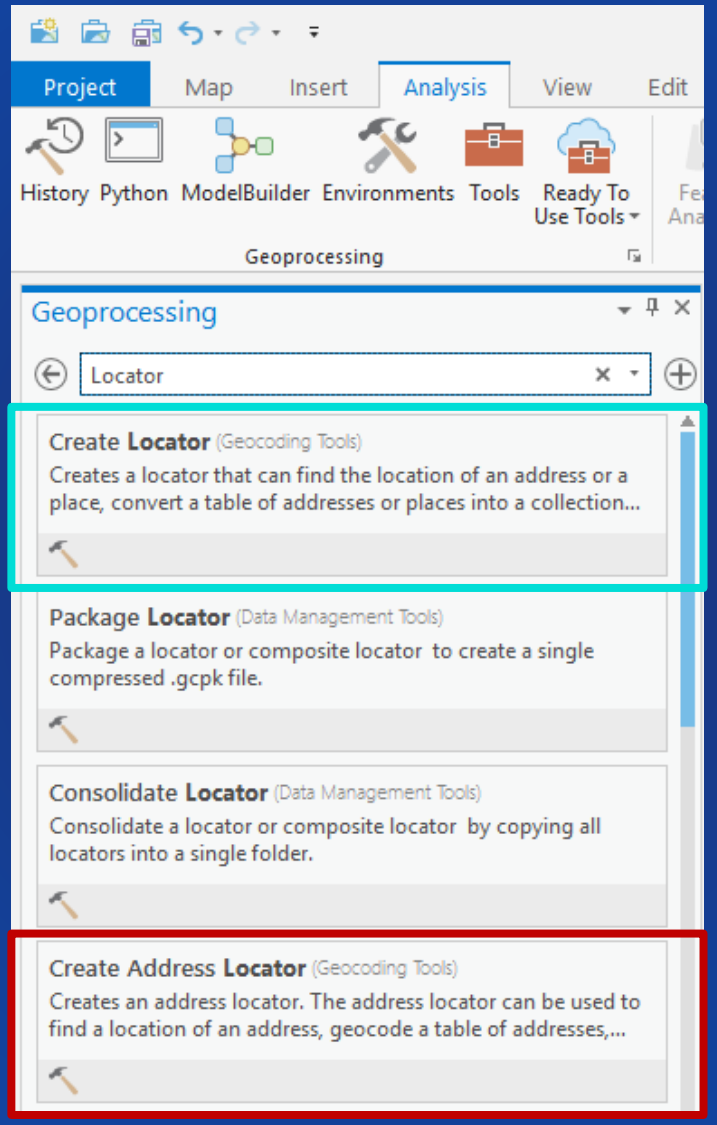
Resources

- **ArcGIS Pro help: https://pro.arcgis.com/en/pro-app/help/data/geocoding/**



“Create Locator” Tool

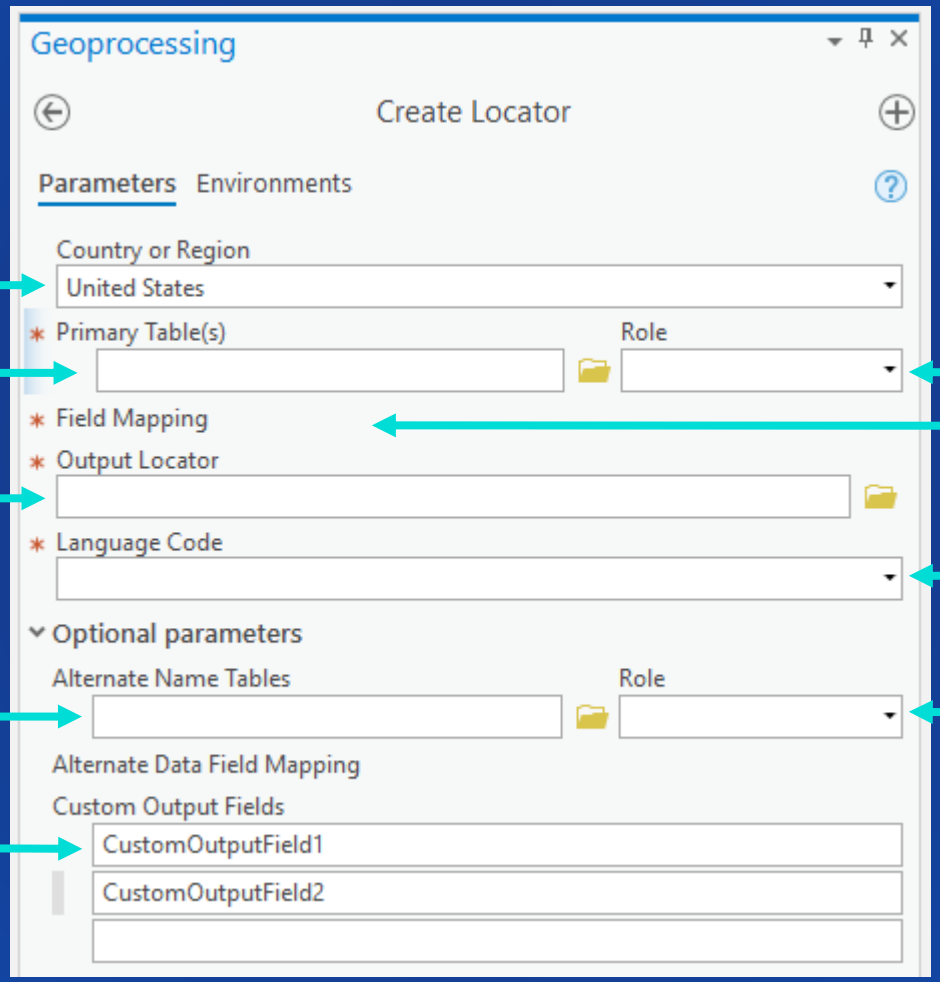
Create Locator Geoprocessing Tool



Create Address Locator (Classic Tool)

Tool Workflow:

Create Locator Tool



1: Select a Region

3: Select data for the Role

5: Define the output locator location and name

8: Select data for the Alternate Name Role

9: Define Custom Output Fields

2: Select a Role

4: Select fields in your data mapping to the expectations for the role

6: Select the default language

7: Select an Alternate Name Role

1) Select a Region

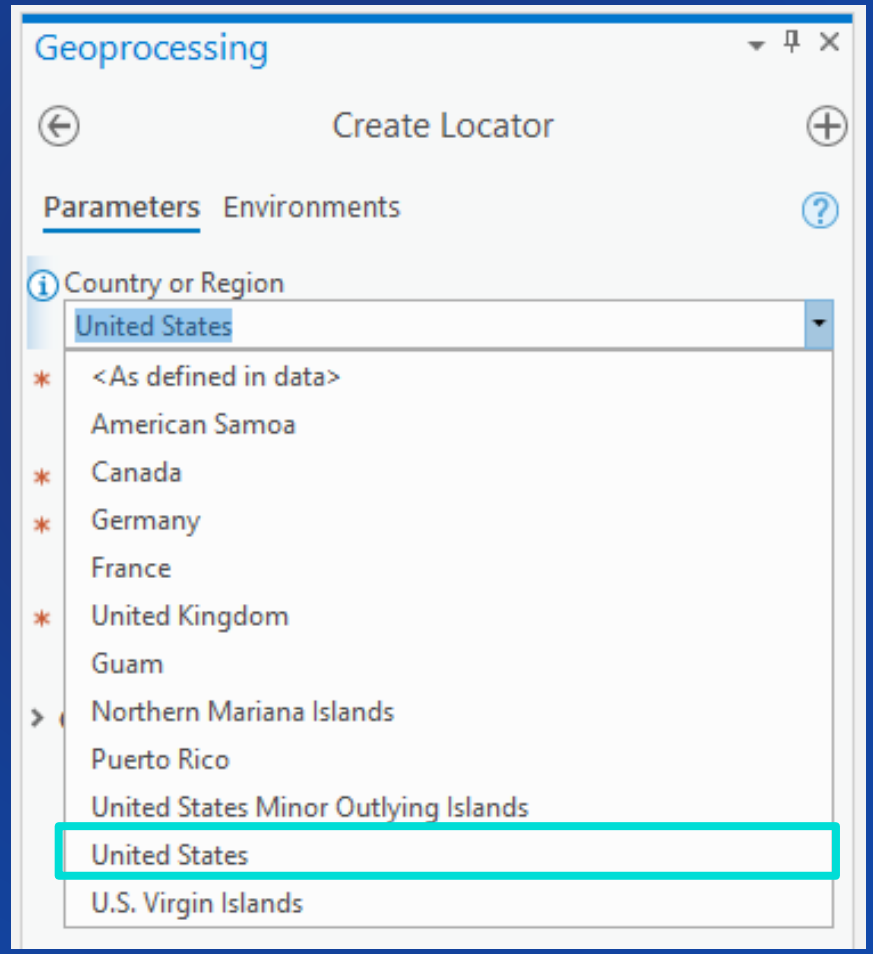
Create Locator Tool

Option 1: Select a specific Region

Use when you are building a locator for a single region

More regions added in future releases

1

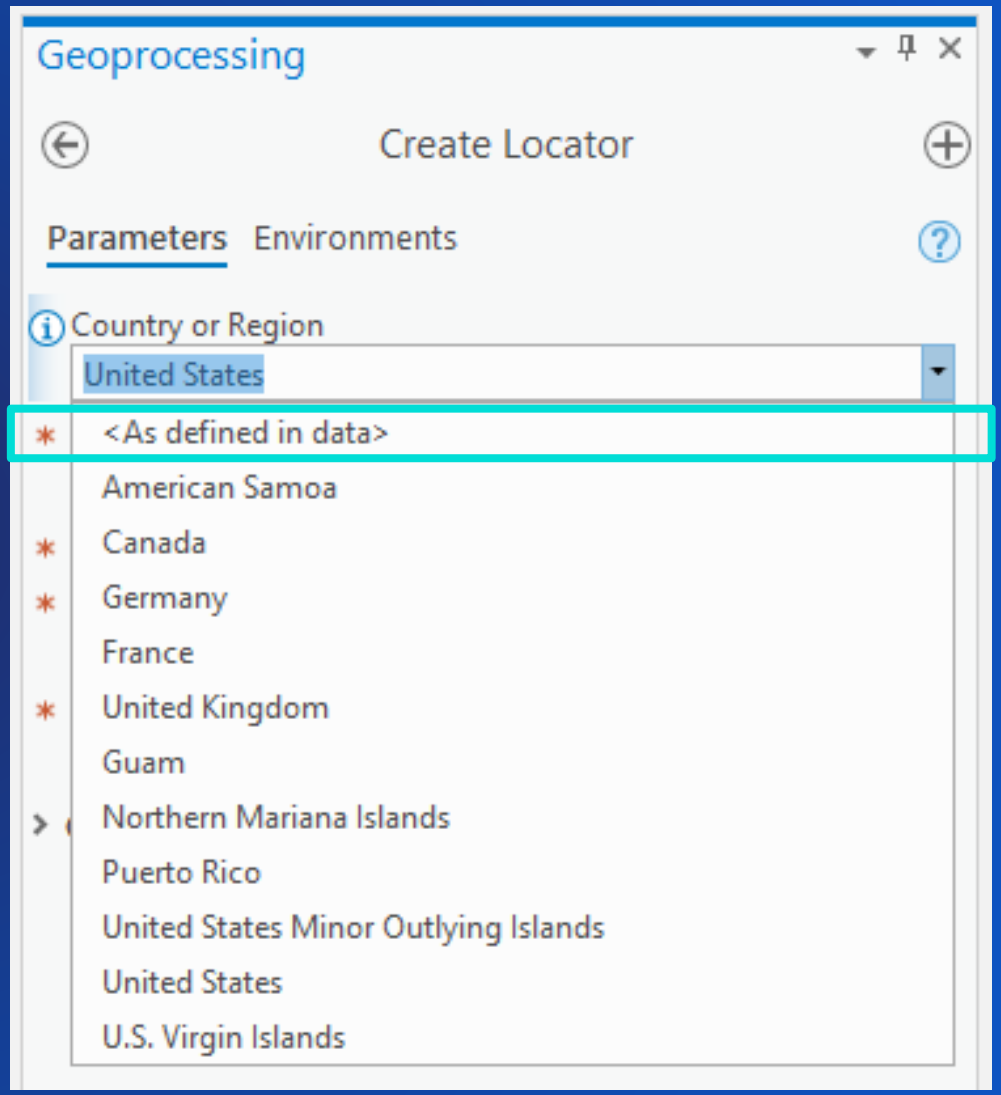


1) Select a Region

Create Locator Tool

- Option 2: <As Defined in Data>
  - Use when you are building a locator that includes data for more than one region
  - Data must have a Country field with individual records coded by country example (USA or CAN)
- Note: Multiple region locators must have all records in a single feature class for each Role

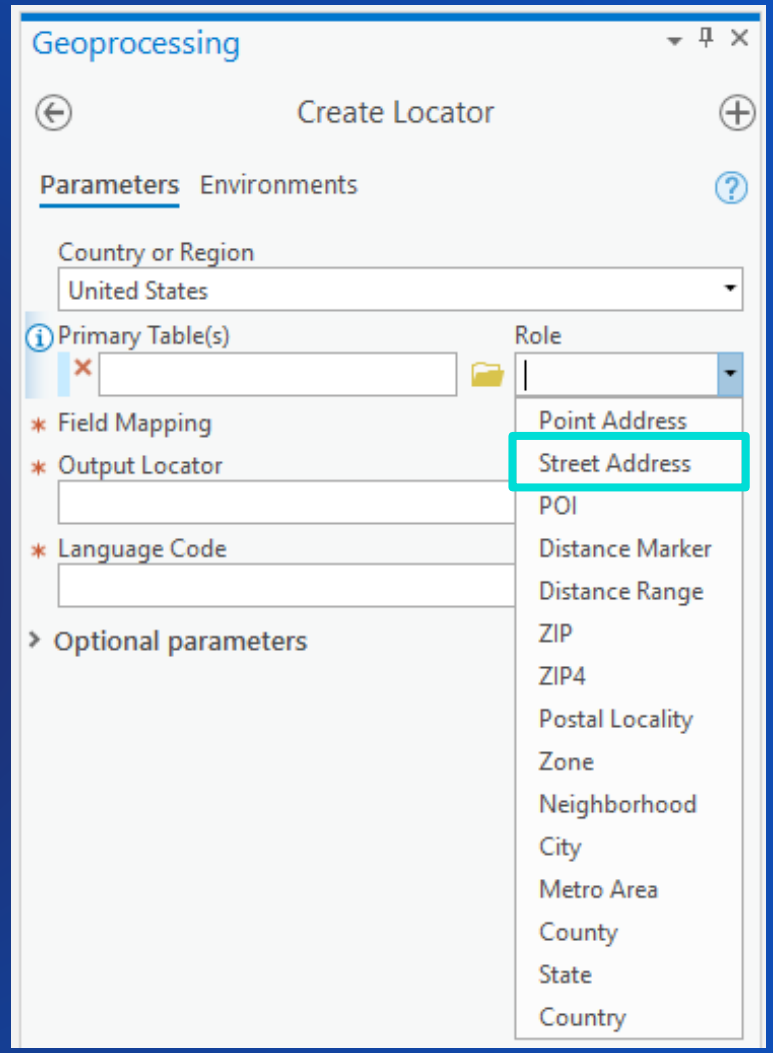
1



2: Select a Role(s)

Create Locator Tool

- Roles (similar to styles for classic locators)
- Select one or more Roles
- Point Address
  - Rooftops, Parcels, Side of Street points
  - Also supports Sub Addresses in a single role
- Street Address
  - Street Ranges, Street Names, Intersections
- POI
  - Points of interest, places, assets
- Zone, an area not part of an administrative hierarchy



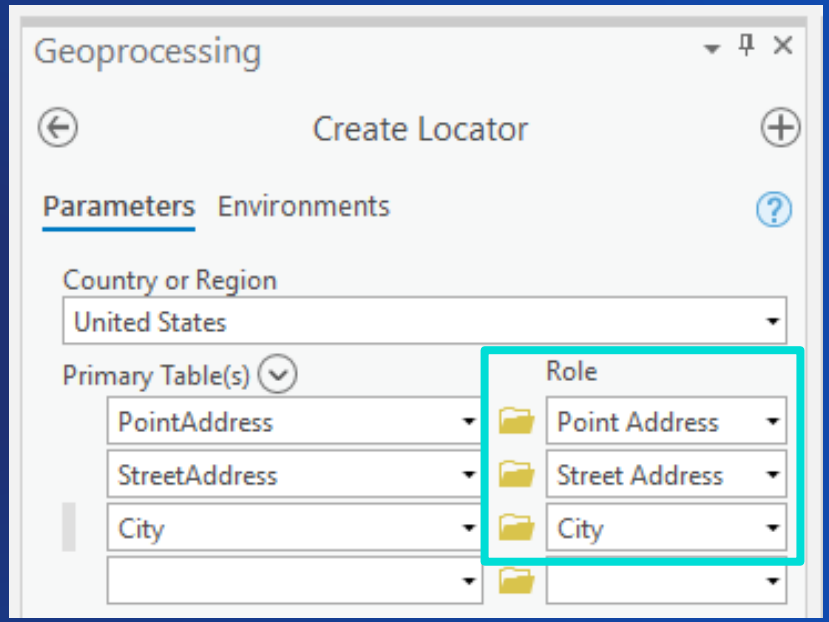
2

https://pro.arcgis.com/en/pro-app/help/data/geocoding/introduction-to-locator-roles.htm

2: Select a Role(s) - Multiple Role Locator

Create Locator Tool

- When you choose multiple roles
- Multiple roles are built into a single output locator
- What are some of the benefits:
  - Reduce redundant information and candidates
  - Locators will be Smaller
  - Locators can be Faster



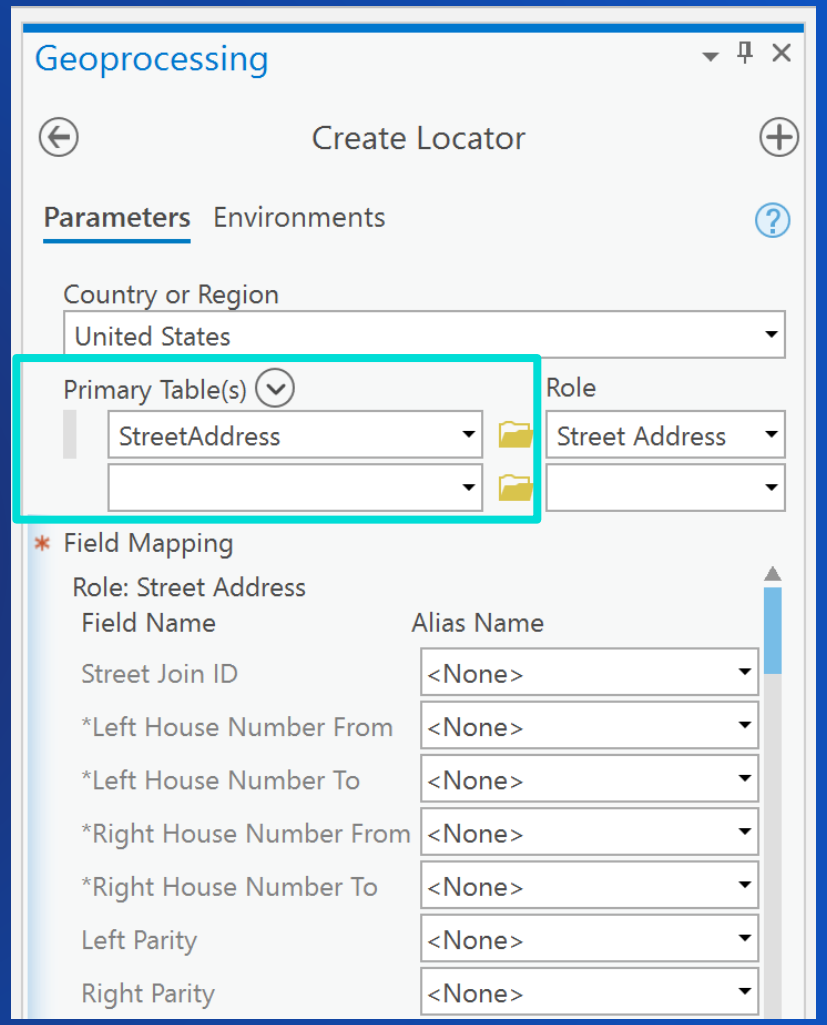
2

3: Select data for the Role

Create Locator Tool

- Select Table(s) - Feature Classes supporting each role
  - Address features such as rooftop points
  - Street features with address ranges and street names
  - Administrative boundaries and attributes

3

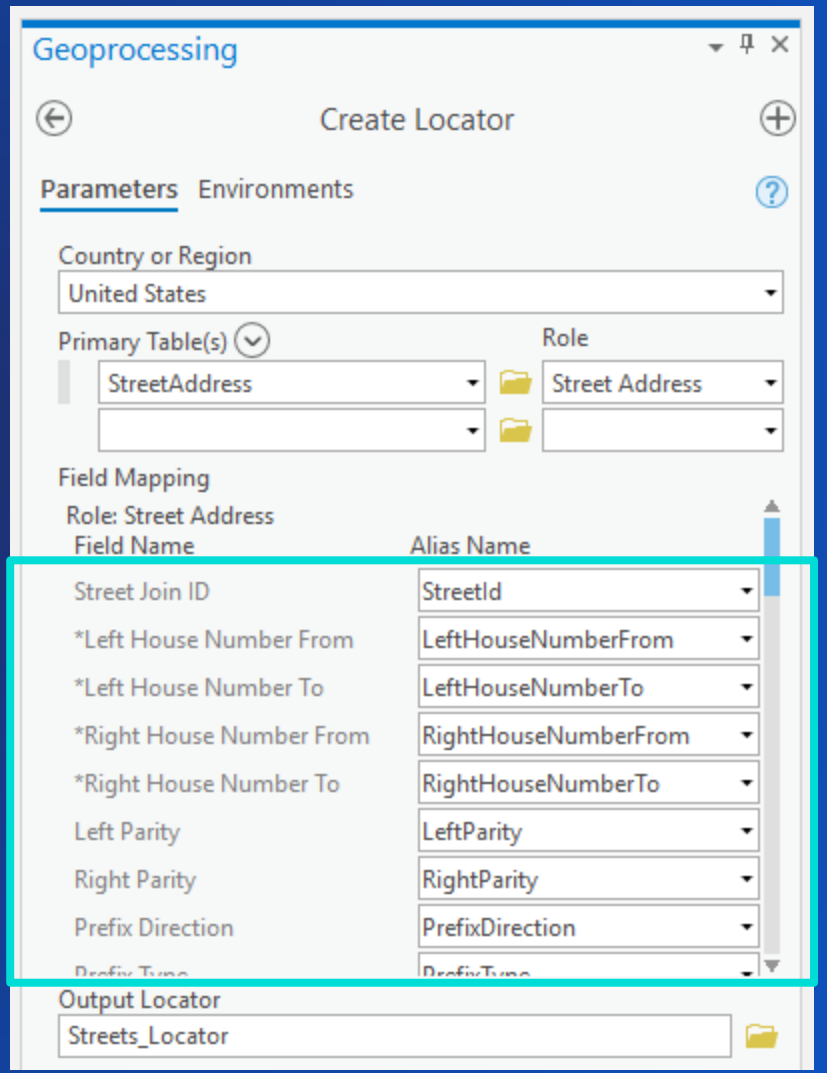


4: Select fields in your data mapping to the expectations for the role

Create Locator Tool

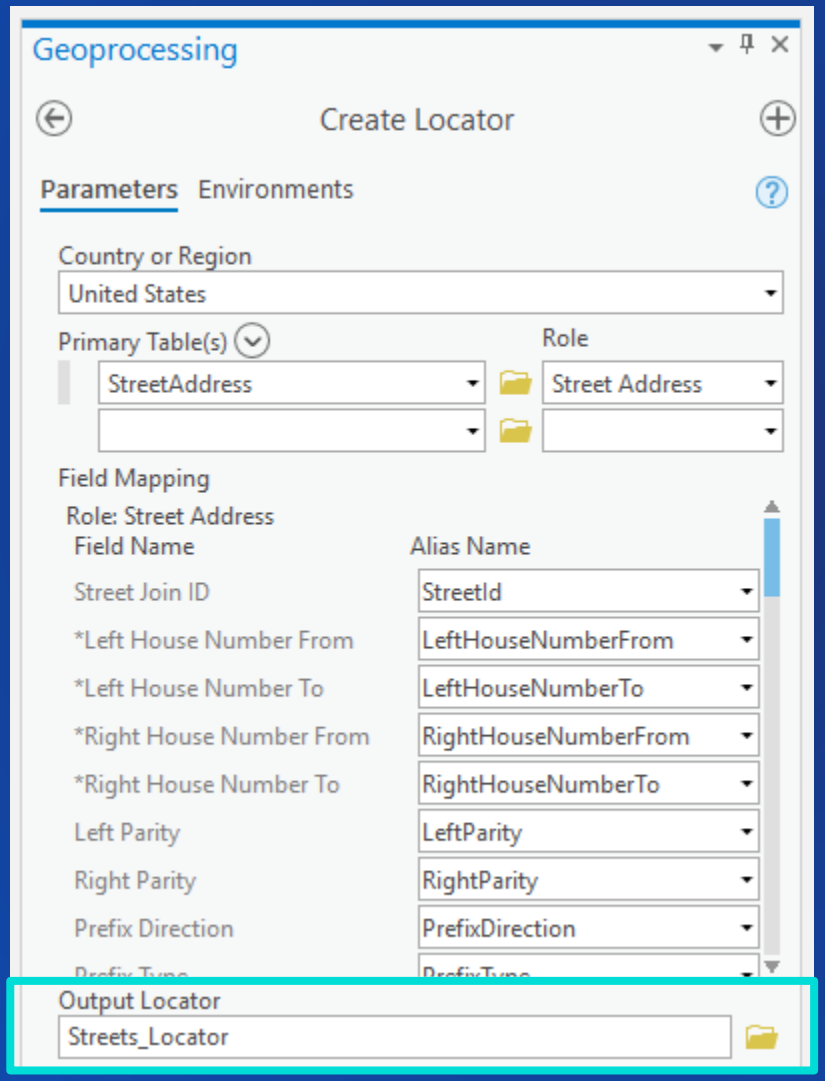
- Chose the fields in your data that meet the expectations for the role
- Note: there are required fields for each role
- Fields do not auto map, you need to select them
- More on the specifics of expected field content later…..

4



5: Define the output location and locator name

Create Locator Tool



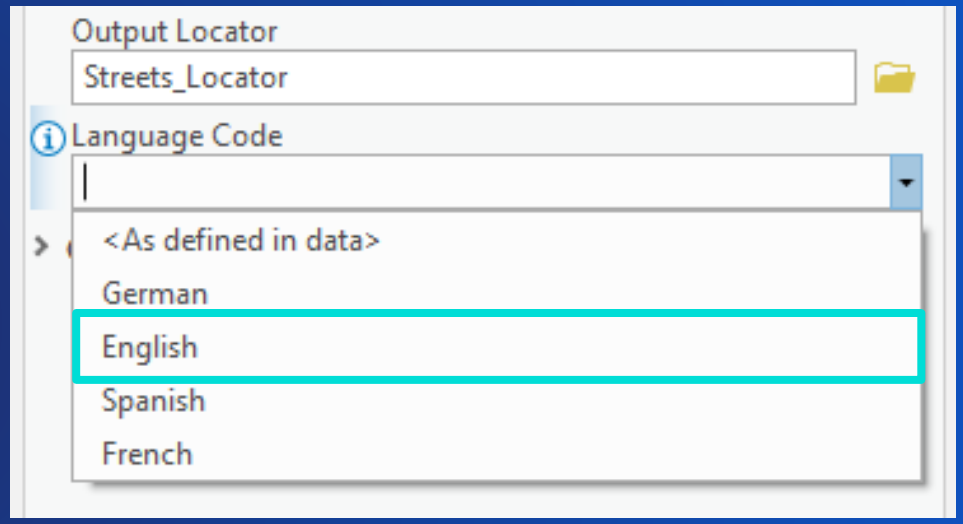
5

6: Select the default language

Create Locator Tool

- In some regions there is an expectation that results are formatted uniquely based on language
- If you know your data is for a specific language select the language from the list
- If you don’t set this value a default language will be used for that region

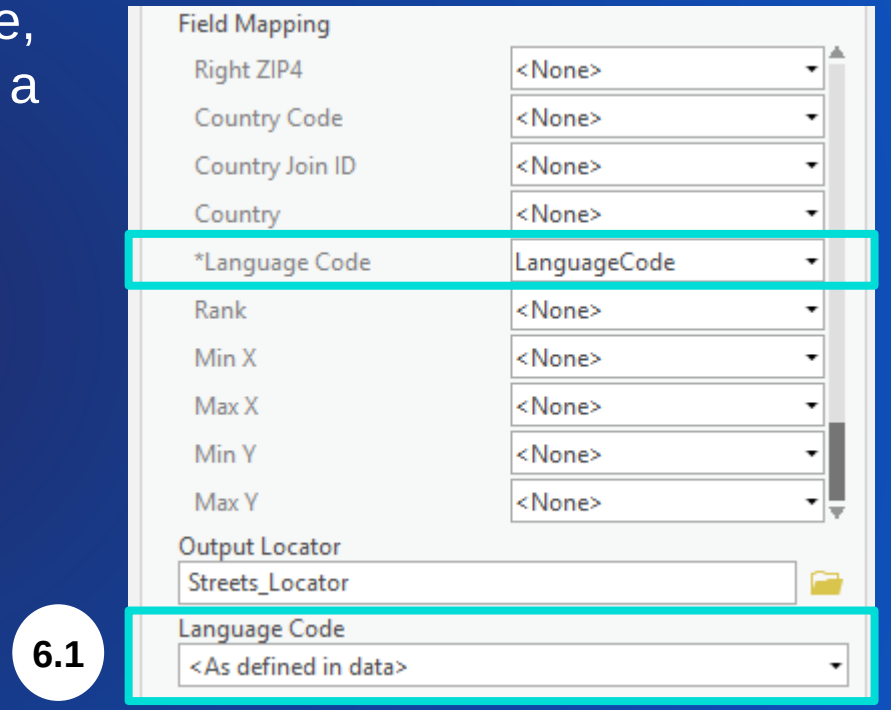
6



6: Select the default language

Create Locator Tool

- If your data has records for more than one language, you can use a language value for each record from a language field
- To use this information select <As Defined in Data>
- Then map the language field in each role

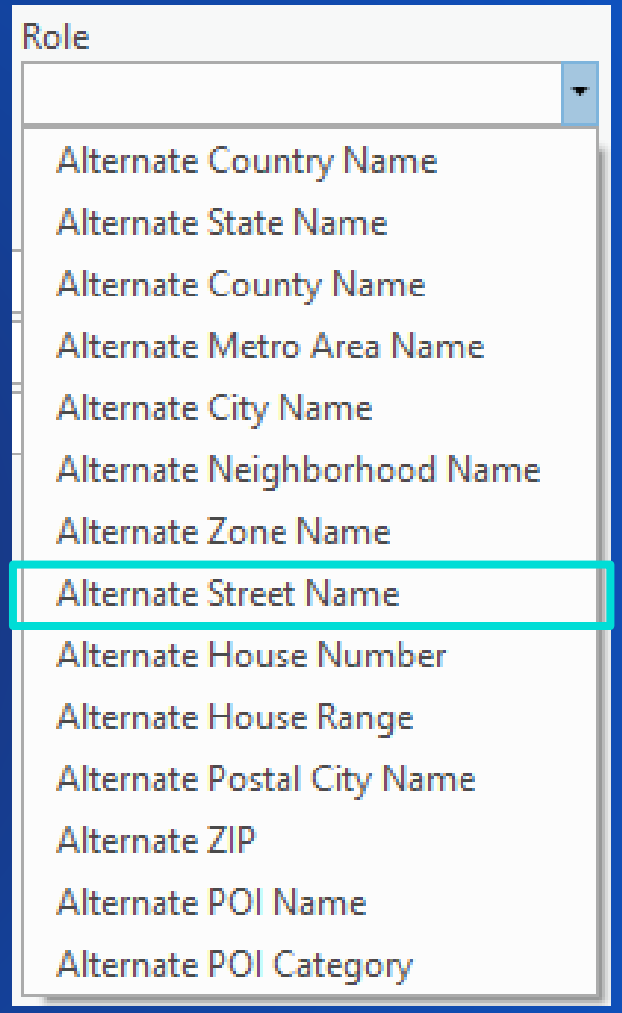


For more information about supported languages and values see:
https://developers.arcgis.com/rest/geocode/api-reference/geocode-coverage.htm

7: Select an Alternate Name Role

Create Locator Tool

- Attributes of an address can have more than one name
  - Main St = US Hwy 60
- To model and use these additional names when geocoding you can use alternate name tables that are linked to each feature by a role and ID
- Select an alternate names Role that links to a Primary Role



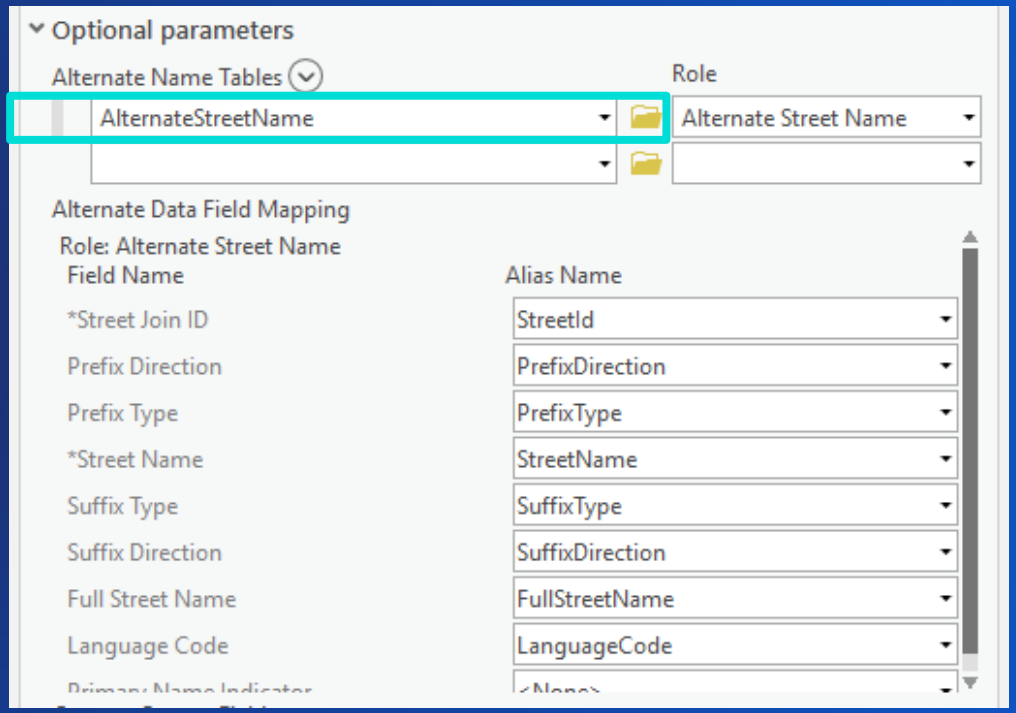
https://pro.arcgis.com/en/pro-app/help/data/geocoding/fundamentals-of-alternate-name-tables.htm

8: Select data for the Alternate Name Role

Create Locator Tool

- Select the table that has the alternate names information
- Repeat field mapping steps (same as step 4) to define ID and Names fields
- Note: Street Join ID field is the field that links the alternate name to a feature in the Primary table

8

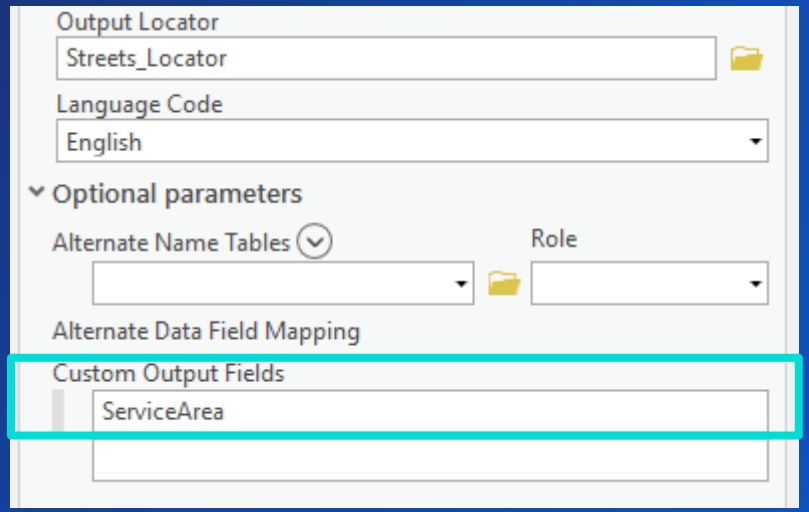


9: Define Custom Output Fields

Create Locator Tool

- New locators support output of additional fields not used in searching
- These fields could be useful metadata associated with the feature such as a local zone or name etc.
- Custom Output fields can be configured under Optional Parameters

ServiceAreaLeft	ServiceAreaRight
Depot 1	Depot 1
Depot 1	Depot 1
Depot 1	Depot 1
Depot 1	Depot 1
Depot 1	Depot 1
Depot 1	Depot 1
Depot 1	Depot 2
Depot 1	Depot 2
Depot 2	Depot 2
Depot 2	Depot 2
Depot 2	Depot 2
Depot 2	Depot 2
Depot 2	Depot 2
Depot 2	Depot 2
Depot 2	Depot 2



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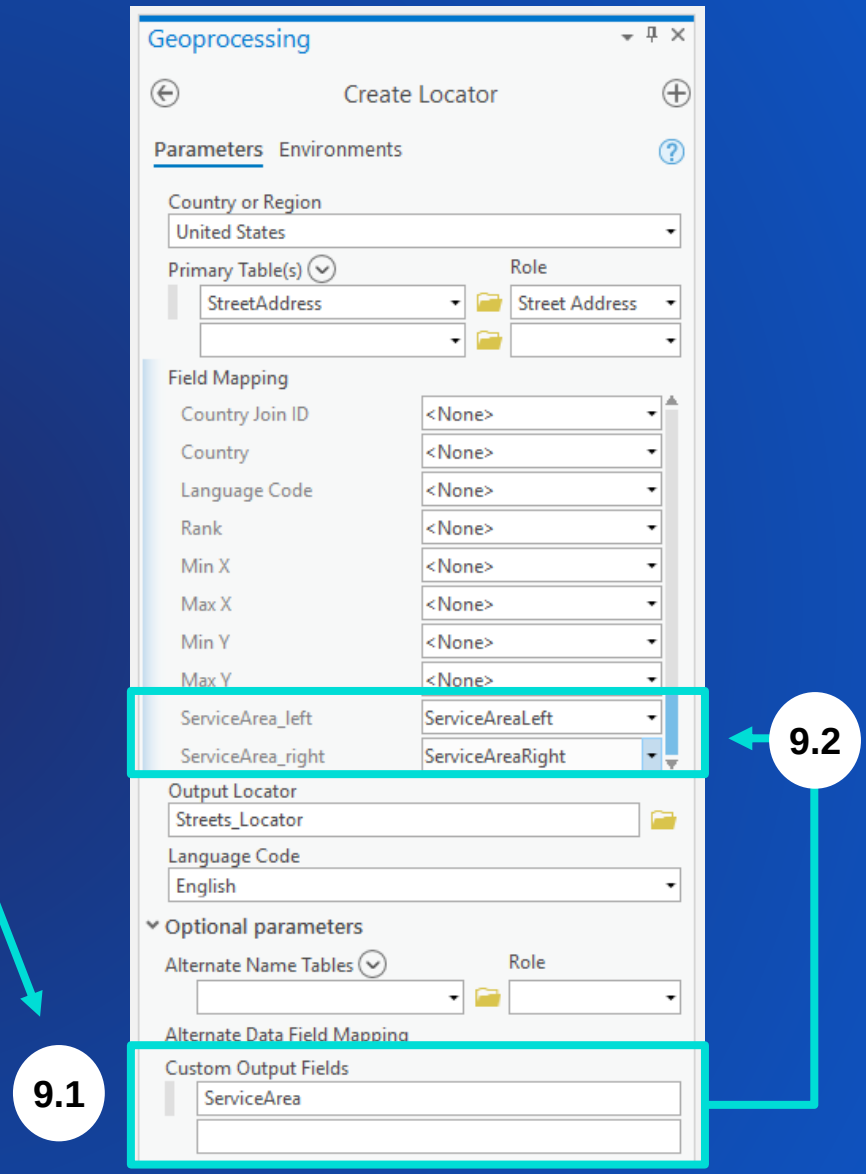
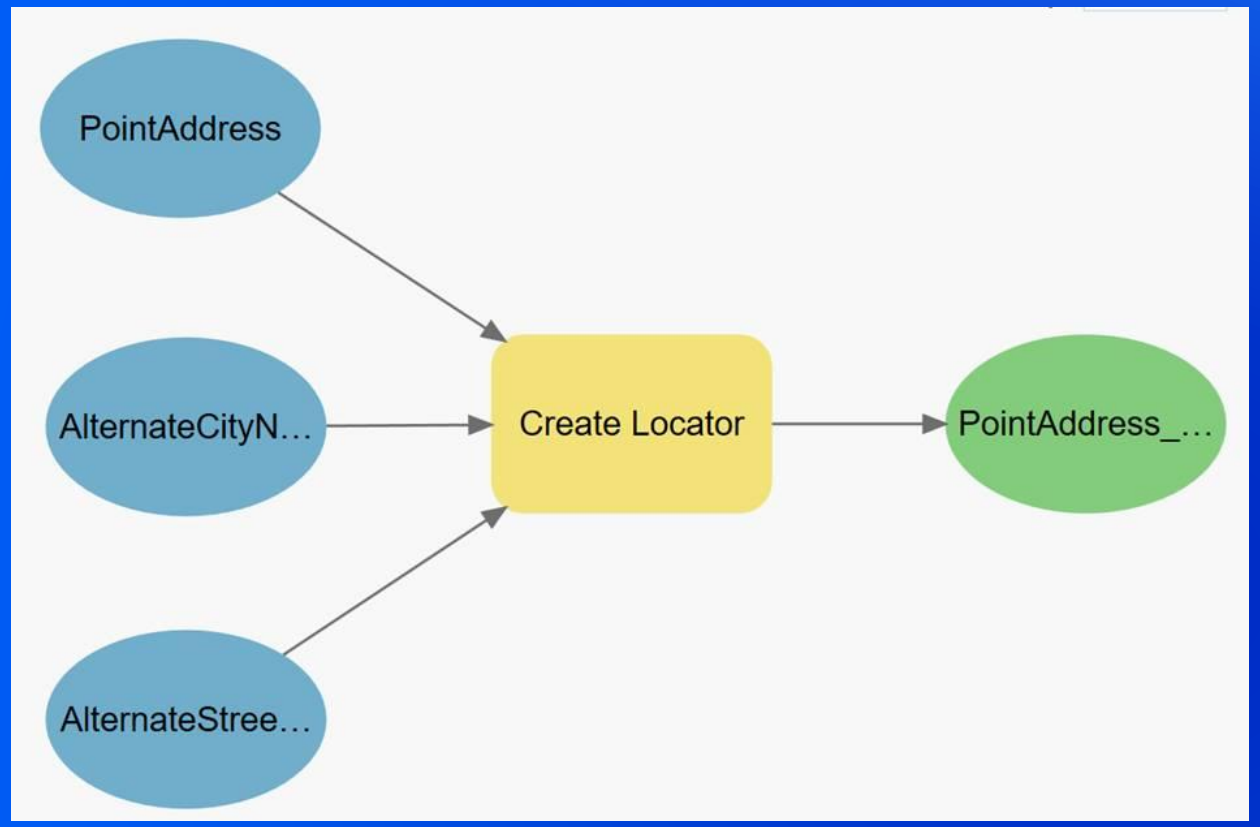
9: Define Custom Output Fields

Create Locator Tool

- 9.1: Type a name (ServiceArea) in the Custom Output Fields box and hit enter
- Keep adding custom fields until you have all the expected fields entered
- 9.2: Now you can go back to the field mapping for the Roles and map these additional custom fields from your data





Locator with Alternate Names

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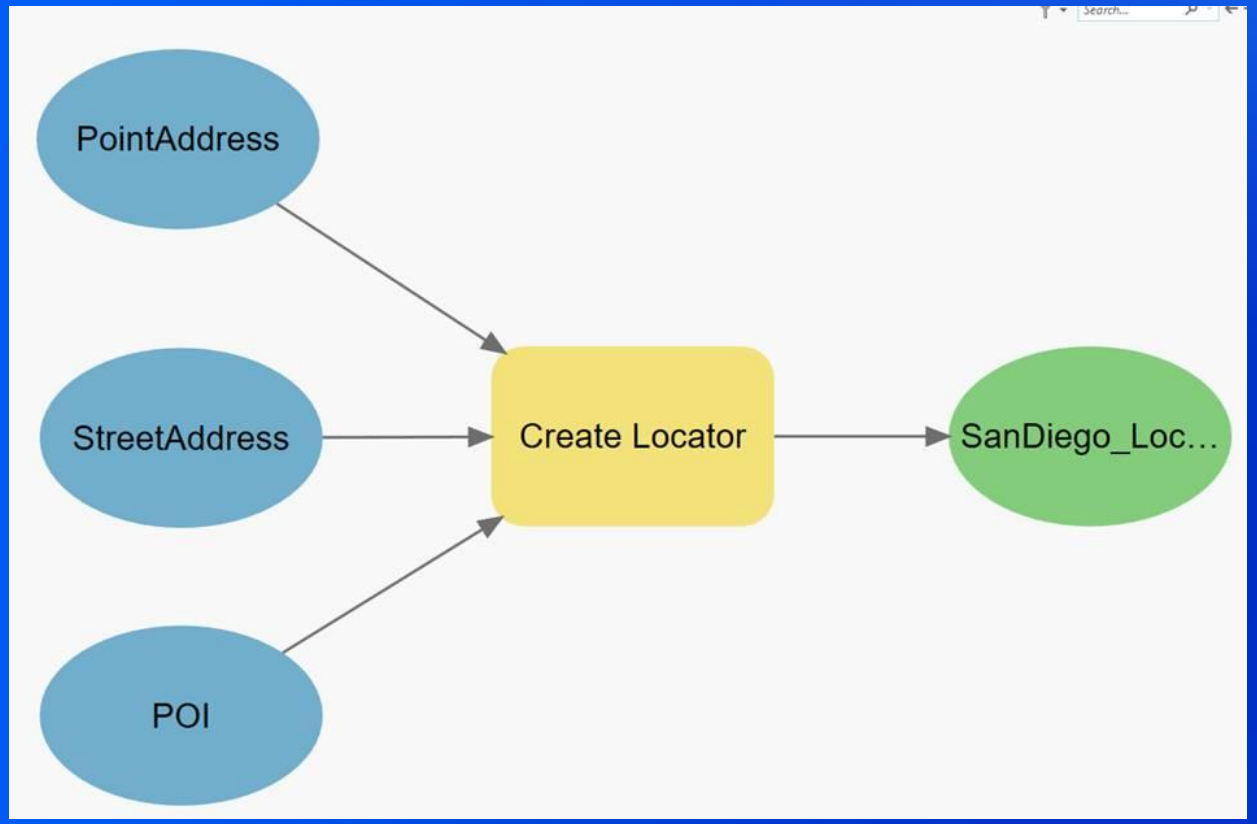


Multi Role Locator

Brad Niemand

Additional Concepts

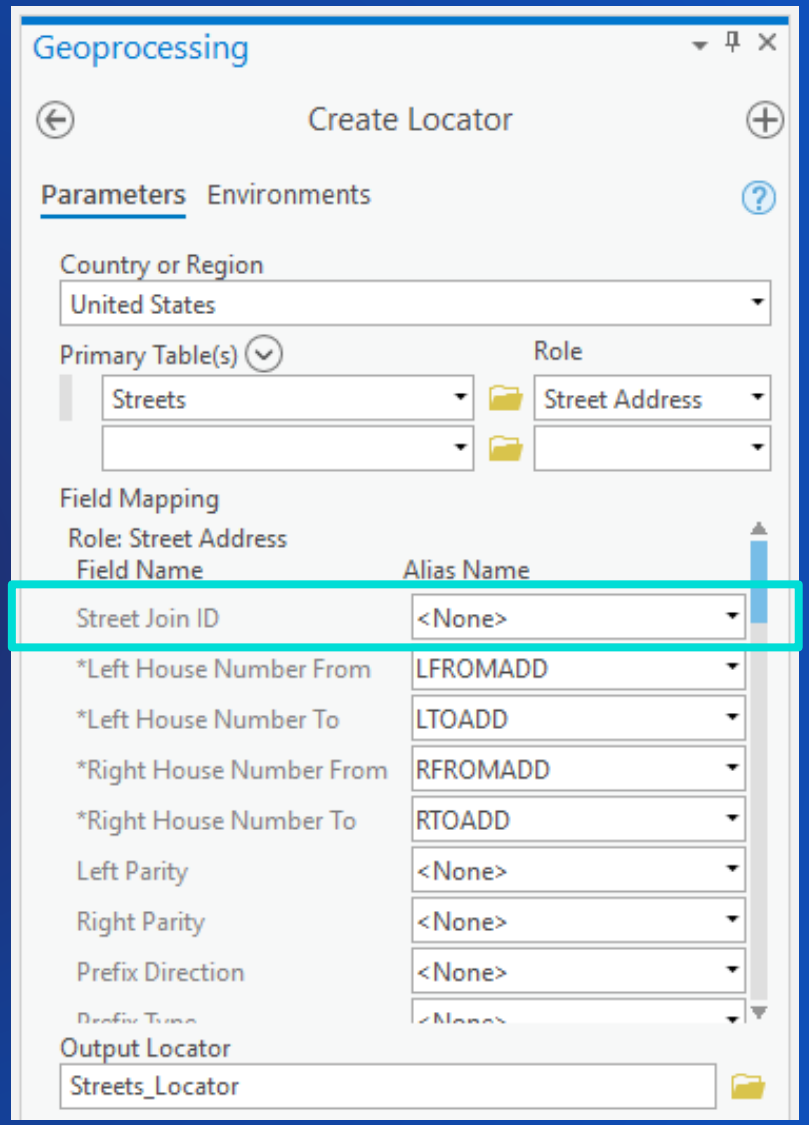
Create Locator Tool

ID Fields

Optimize geocoding results with content

- IDs can be used to link features and attributes across roles
  - Example: Street Join ID – Link Point Address, Street Address and POI data

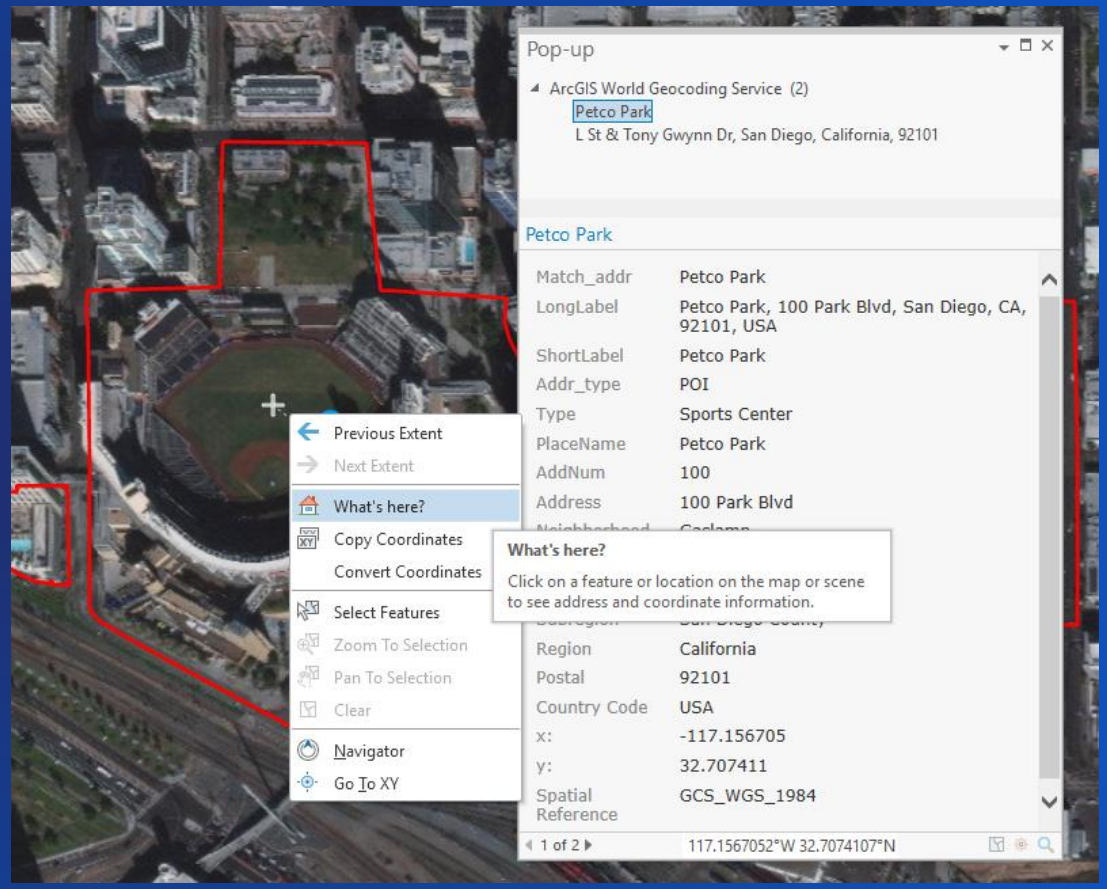
- IDs can be used to identify and store one instance of a geometry where duplicate geometries are used to represent alternate names
  - Reduces the size of a locator



Polygon Features and Reverse Geocoding

Optimize geocoding results with content

- Polygons can be built into a locator and used to answer "What's near me?"
- Use polygons instead of Points (when available) for Addresses, POI, Admin and Postal Areas



https://developers.arcgis.com/rest/geocode/api-reference/geocoding-reverse-geocode.htm

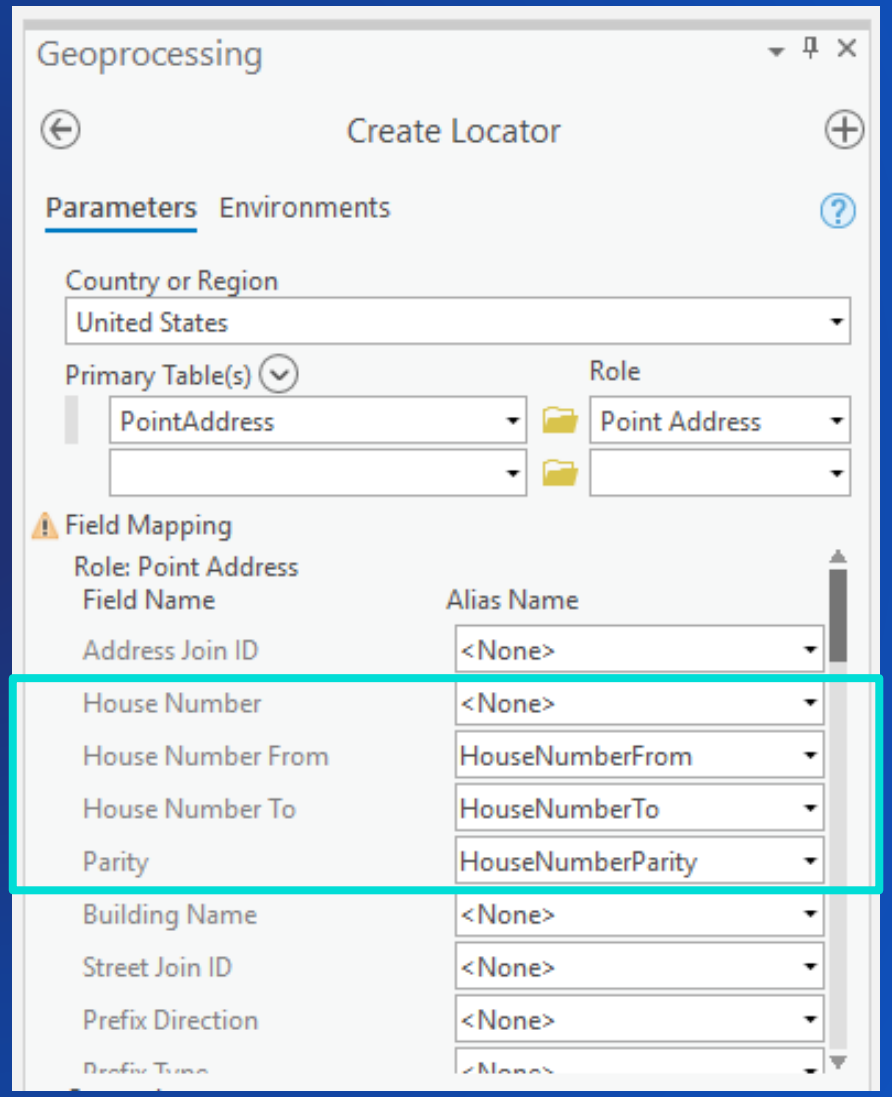
House Number Ranges (Point Address Role)

Optimize geocoding results with content

- Point Addresses Role supports modelling House Numbers as Ranges
- One location with a Range of Addresses
  - House Number From = 10
  - House Number To = 12

- If you have some House numbers that Are Ranges model all Addresses as Ranges

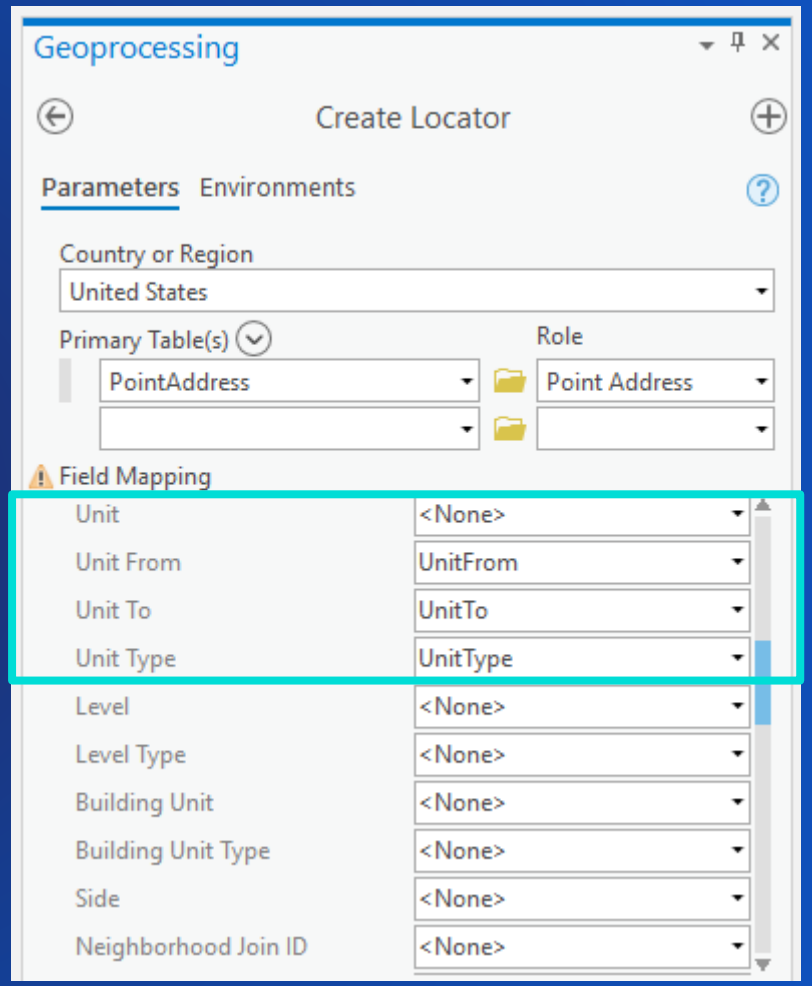
- For Addresses that do not range use “From” and “To” range values that are the Same
  - House Number From = 100
  - House Number To = 100
-
- Parity is supported



Sub Addresses (Point Address Role)

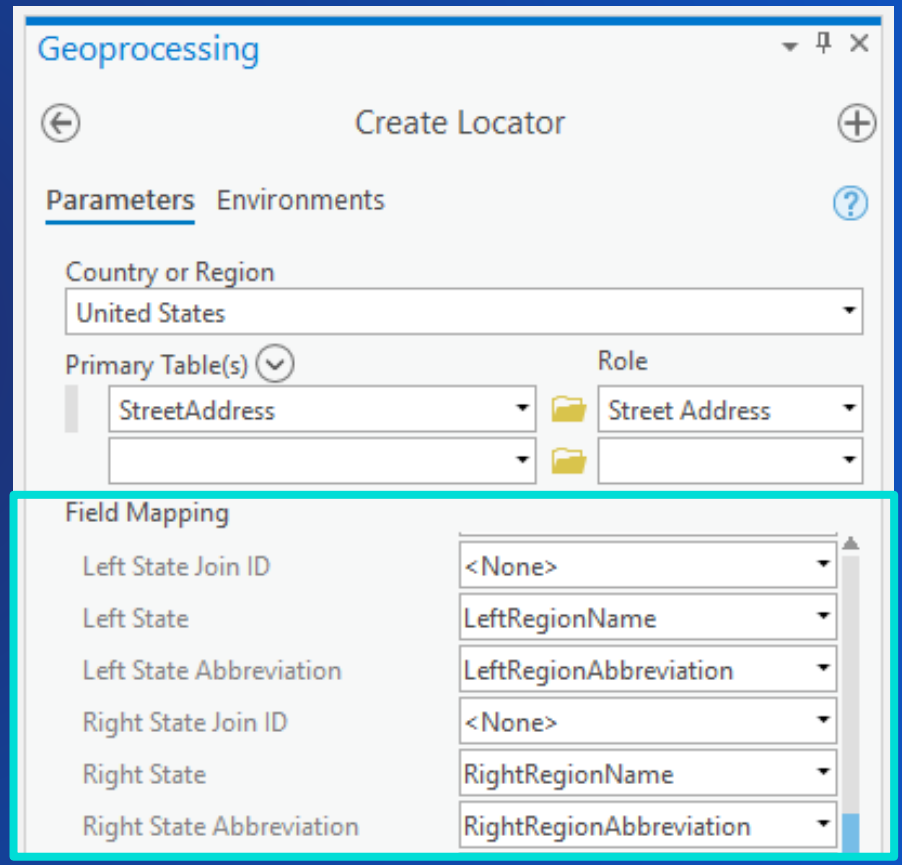
Optimize geocoding results with content

- Sub Address and Point Address Data can be modelled using the Point Address Role
- Store both Point Address and Sub Address data in a single feature class
- Records can include Optional Sub Address Attributes
- Units follow same logic as House Numbers for modelling unique values and ranges



Providing Regional Information

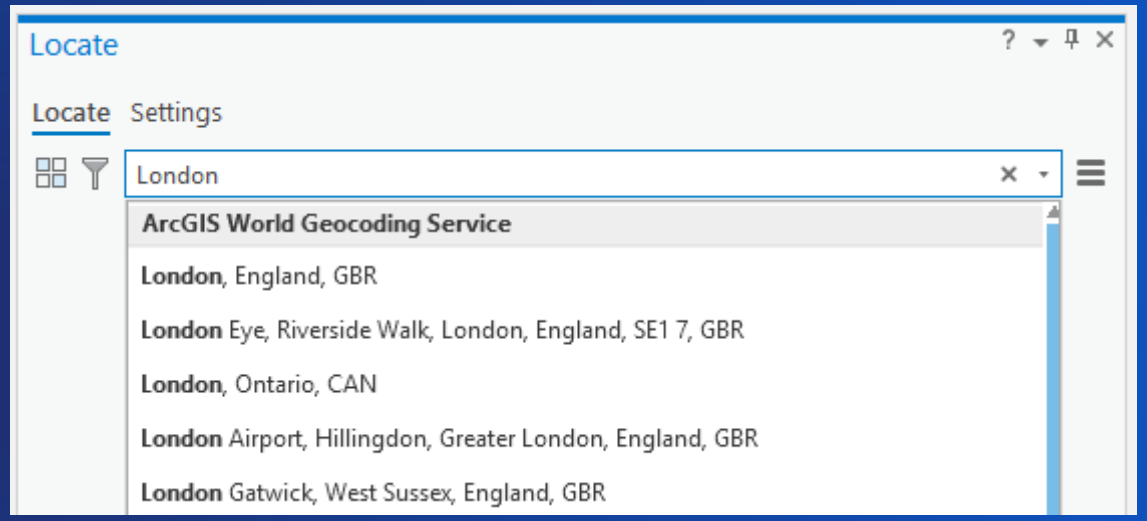
- If you are a local organization your geocoding quality can be improved by using information such as province or state in your data
- Province or state might be used to help identify appropriate highway conventions for your data CA-20 works for California but not for Alabama
- We encourage you to store and map these additional fields when building locators



Ranking Results

Optimize geocoding results with content

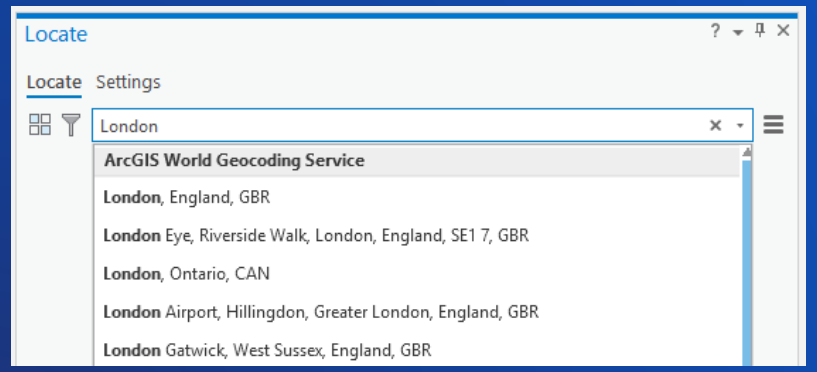
- Features that have the same name may need some context when ordering results
- Some of this context may come from location
  - Such as the center of the Map or a GPS location on a mobile device
- But it can also be important to consider something like population or category

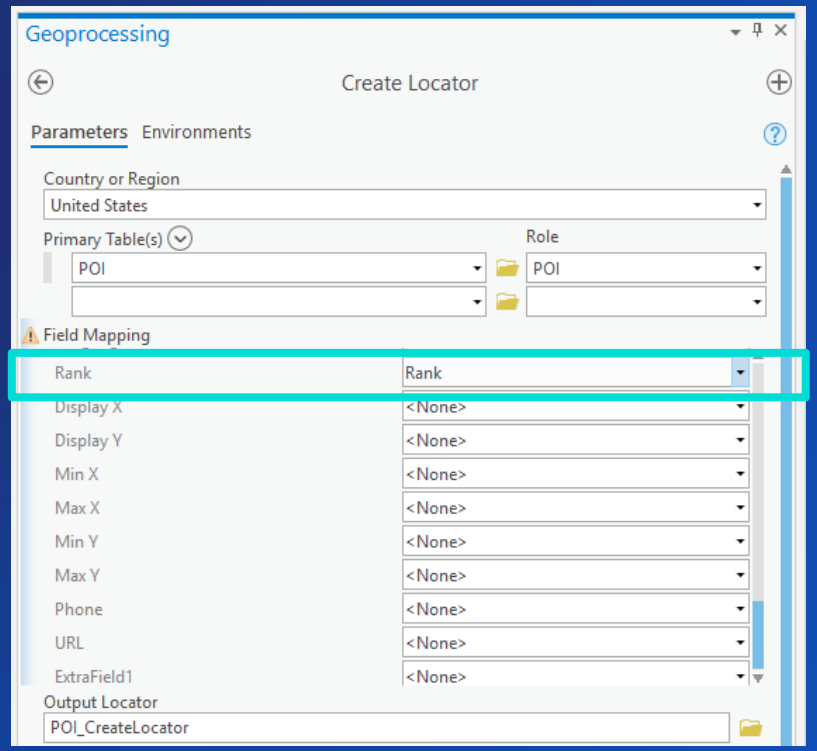


Ranking Results

Optimize geocoding results with content

- You can prioritize features for ranking by modeling a rank value in your data
- Small numbers associated with a record move a candidate higher in the list.
- Think of **1** being the top candidate and **99** being a minor candidate.
- In the London example a rank derived from relative population could be used
  - London, England, GBR = Rank 1.75
  - London, Ontario, CAN = Rank = 5.5
- Works for POI and Admin Role locators
- Ranking works across roles





Zoom Extent

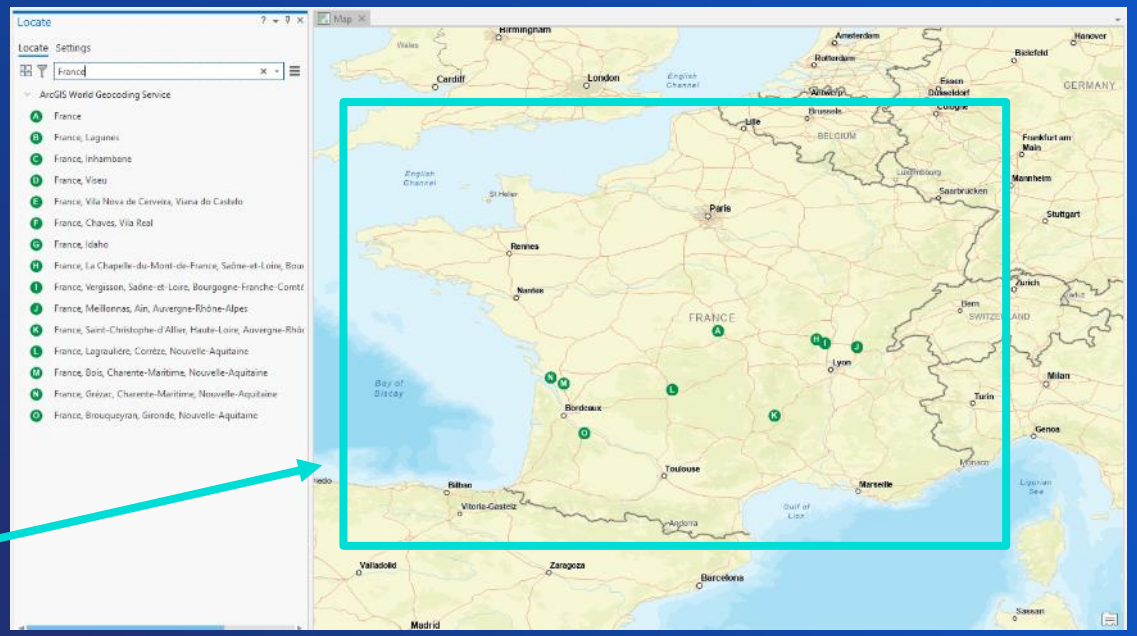
Optimize geocoding results with content

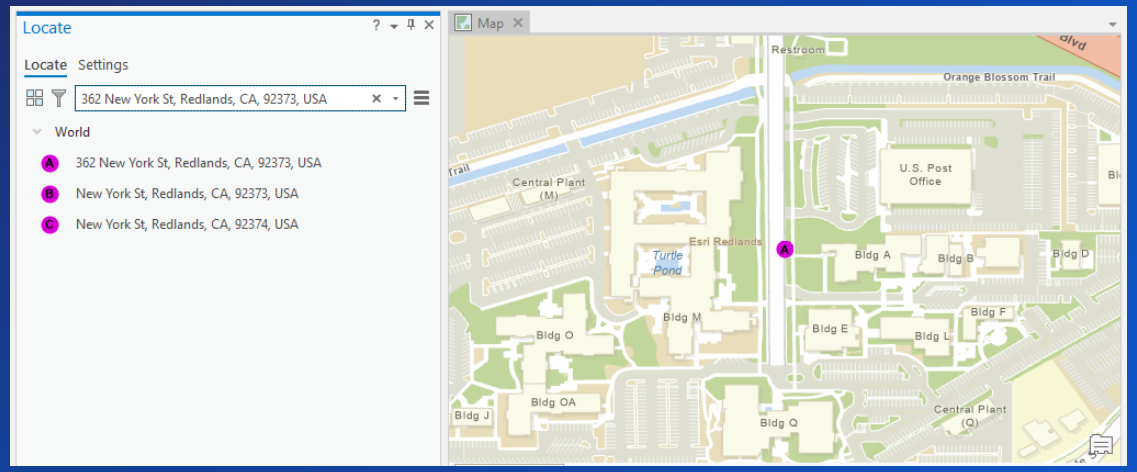
- When you search for and select a candidate how does an application know where to zoom?

- Geocode results provide extents which applications can use to zoom effectively

xmin: -3.563460
ymin: 40.445417
xmax: 8.664539
ymax: 52.673417

- *Extents are not always consistent with a bounding box for a feature may need to be edited to account for features with interesting shapes such as outlier Islands*



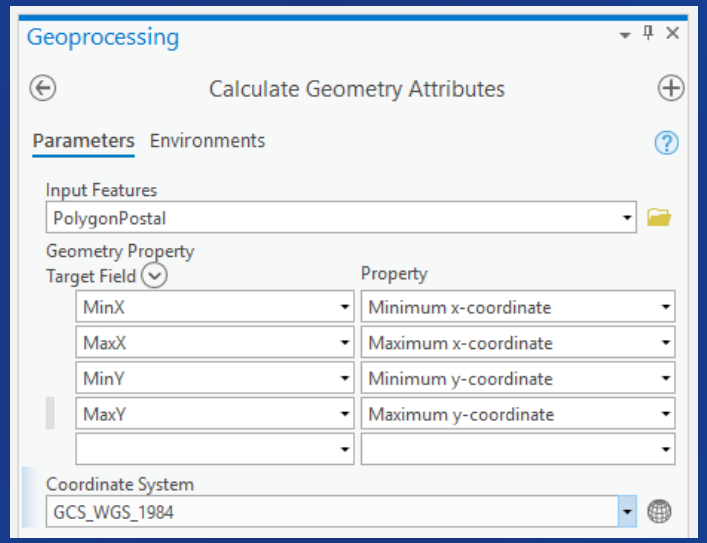


Zoom Extent

Optimize geocoding results with content

- You can model extent in your data and geocoding results will return it to applications
- 1: For line and polygon features you can use the “Calculate Geometry Attributes” tool to populate initial values
- You may want to adjust these values for some features
- Coordinates for the Extent should be in the same units as your data

1



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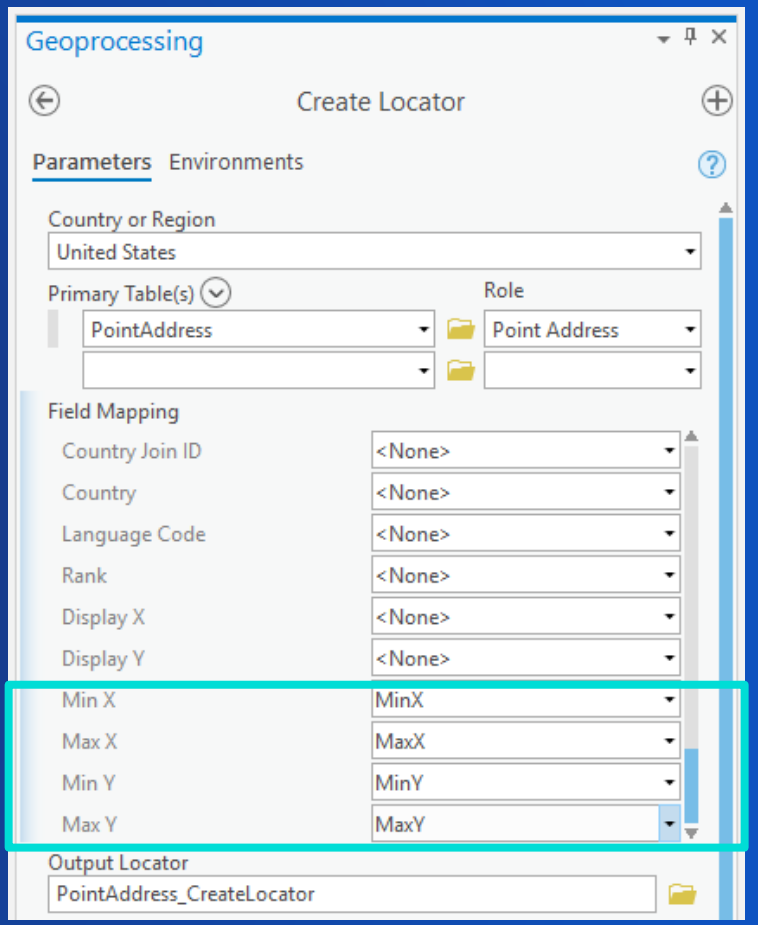
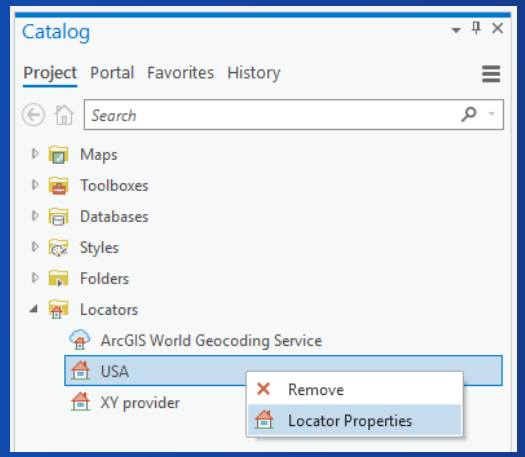


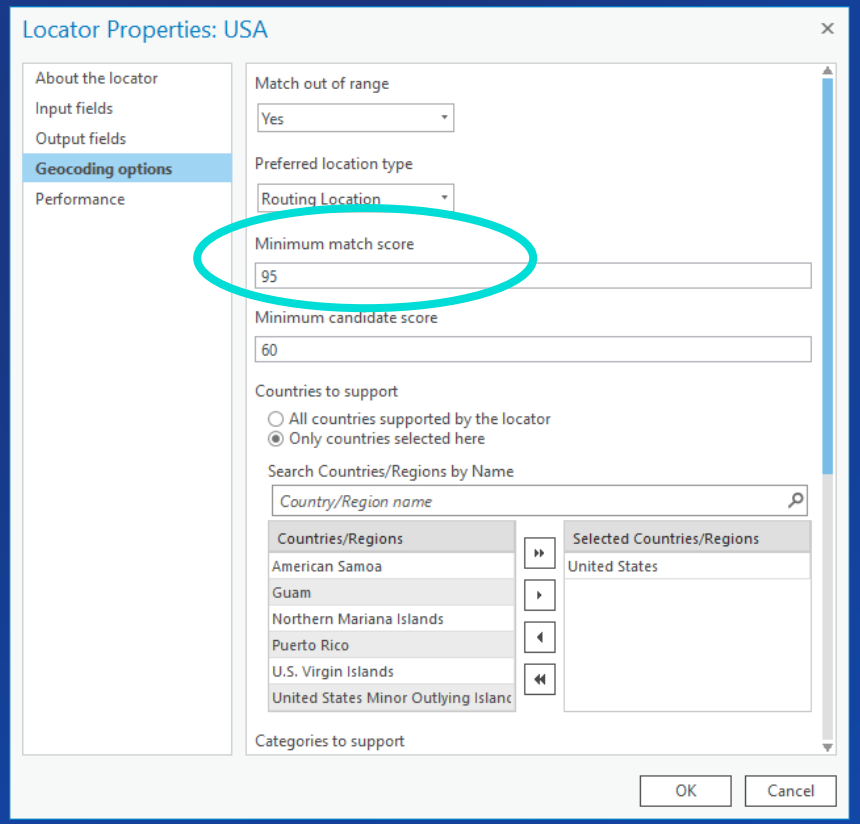
FAQ – Street Address Role

- Supports address ranges, intersections and **street names**
  - Records with and without addressees are used to find street name segments

FAQ – Adjusting Minimum Match Score

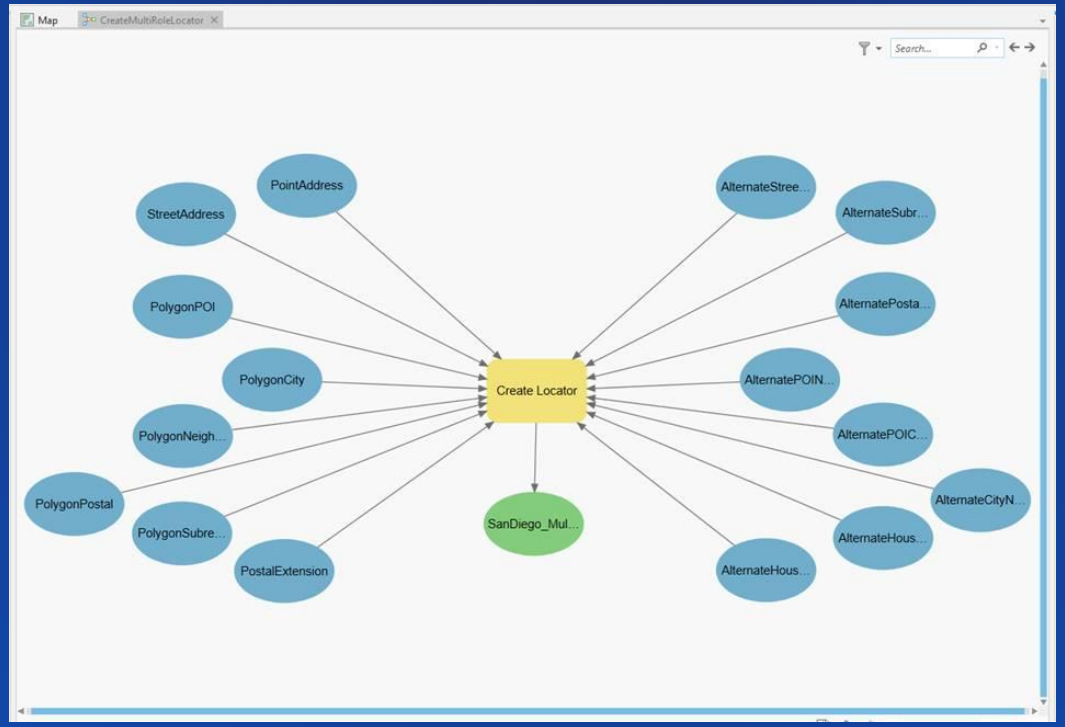
- Minimum match score is set by default for a multirole locator
- For single role locators set the match score to meet your needs





FAQ – Persisting tool settings and automation

- Create Locator history is saved after running the tool
- Use Model Builder to preserve your work and automate



Questions?

Jeff Rogers and Brad Niemand

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