Introduction to ArcGIS

جامعة المستقبل / كلية العلوم
قسم الانظمة الطبية الذكية
المرحلة الثالثة

Overview

- What is GIS?
- Common uses
- Software
- Interface & navigation
- Adding layers
- Customizing & displaying layers

- Select features by attribute
- Select features by location
- Buffer features tool
- Layout view
- Datums & projections
- File management
- Data sources

What is GIS?

- Geographic Information Systems (GIS) is a computer-based methodology for collecting, managing, analyzing, modeling, and presenting geographic or spatial data.

- Allows you to overlay datasets and query them in terms of their spatial relation to each other

Two Types of Spatial Data

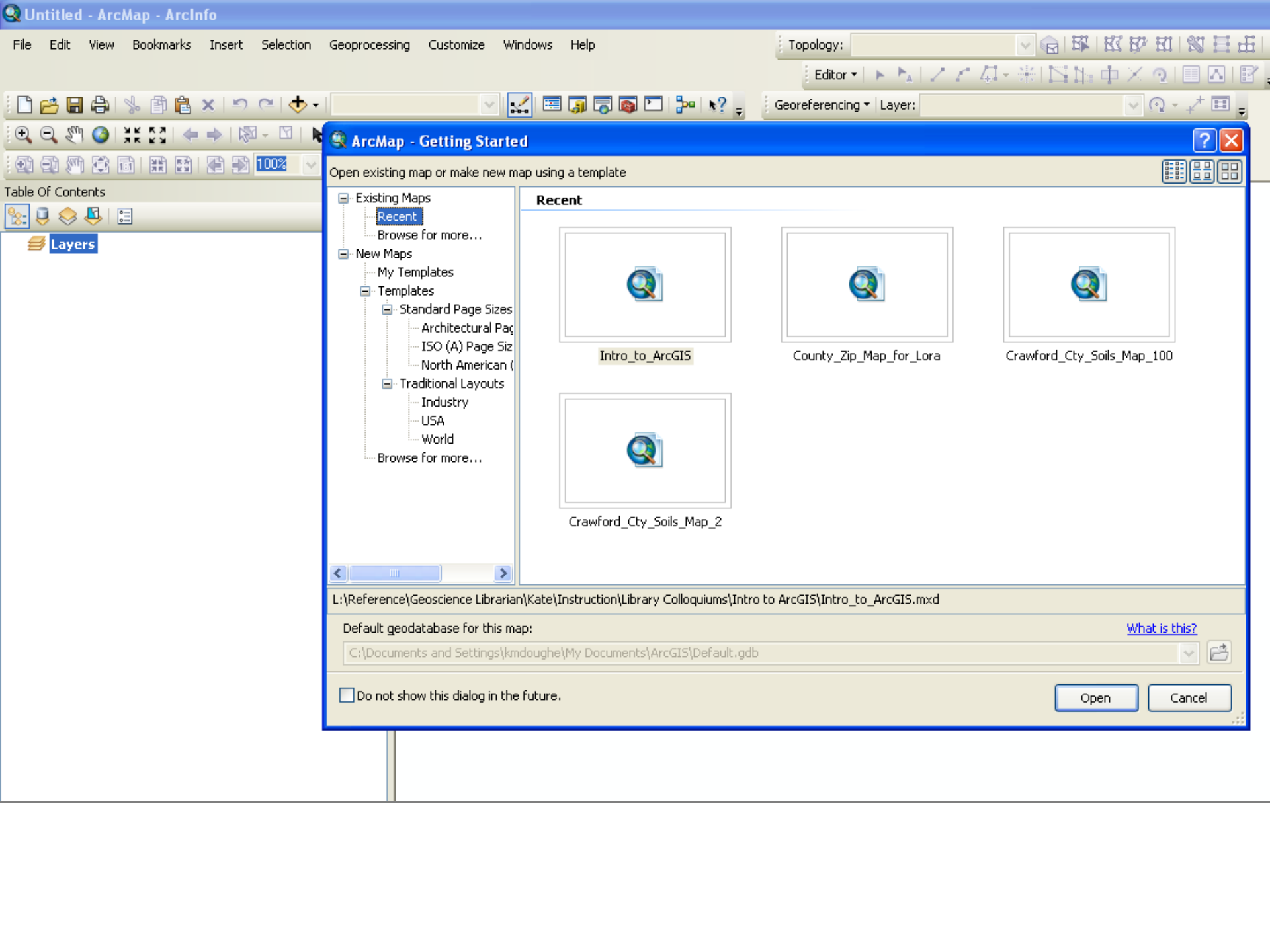
- Raster - continuous data
  - E.G., air photos, scanned maps, elevation layers
  - Most remote sensing data is raster data
- Vector - discrete features
  - A layer comprised of individual points, lines or polygons (e.g., roads or states)
  - This presentation focuses on vector data

Common Uses

- Analyzing potential environmental hazards
- Emergency services planning and routing
- Siting new facilities:
  - wind farms
  - power plants
  - vineyards
- Identifying food deserts in urban areas
- Much more!

Esri

- Environmental Systems Research Institute
- ESRI is now Esri
- Industry leader for GIS software
- Program is ArcGIS/ArcMap
  - Now up to version 10.1.
  - (This presentation done with V. 10)


Untitled - ArcMap - ArcInfo
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Topology:
Editor
Georeferencing Layer:
Table Of Contents
Layers
ArcMap - Getting Started
Open existing map or make new map using a template
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Recent
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New Maps
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What is this?
C:\Documents and Settings\kmdoughe\My Documents\ArcGIS\Default.gdb
Do not show this dialog in the future.
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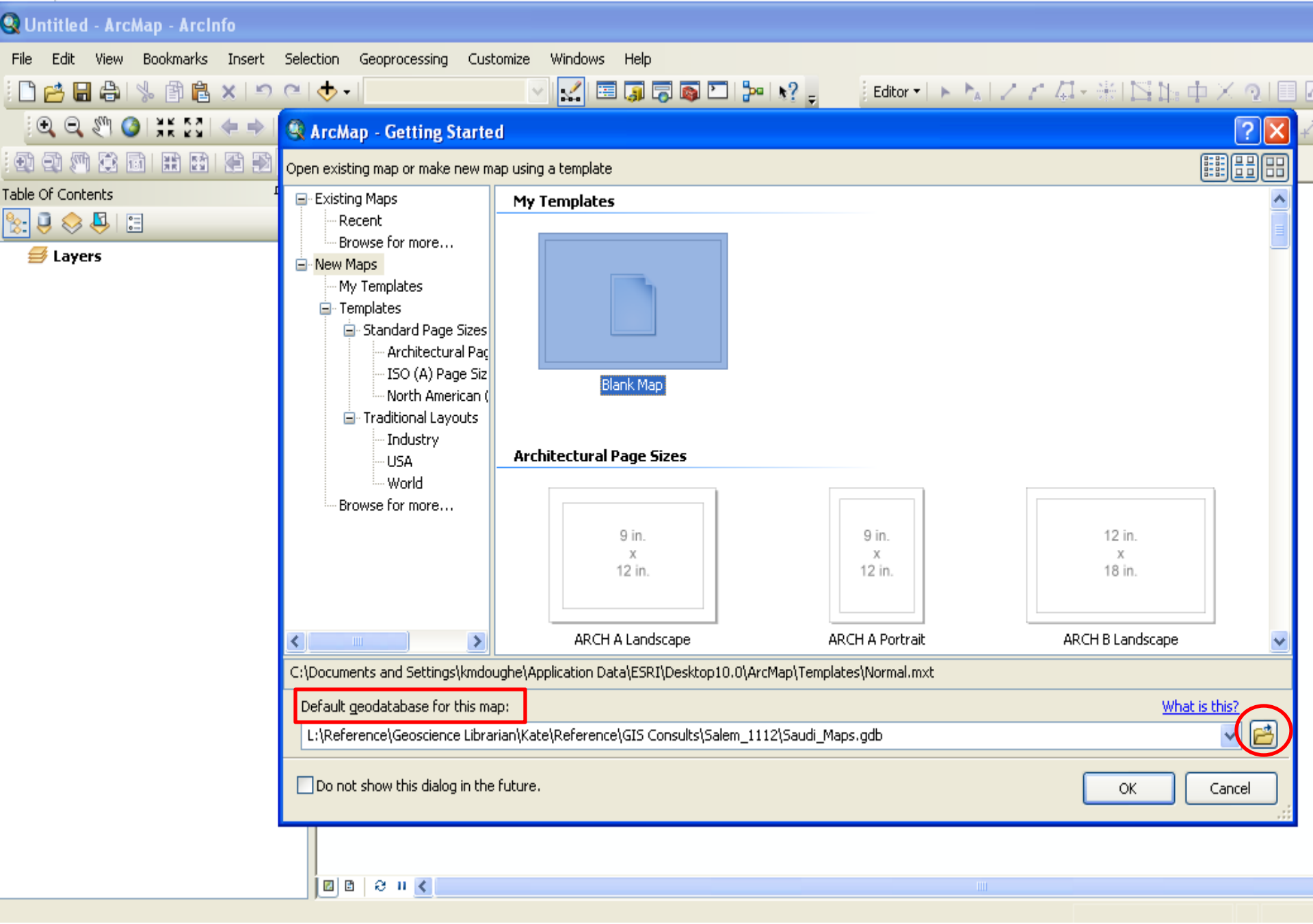
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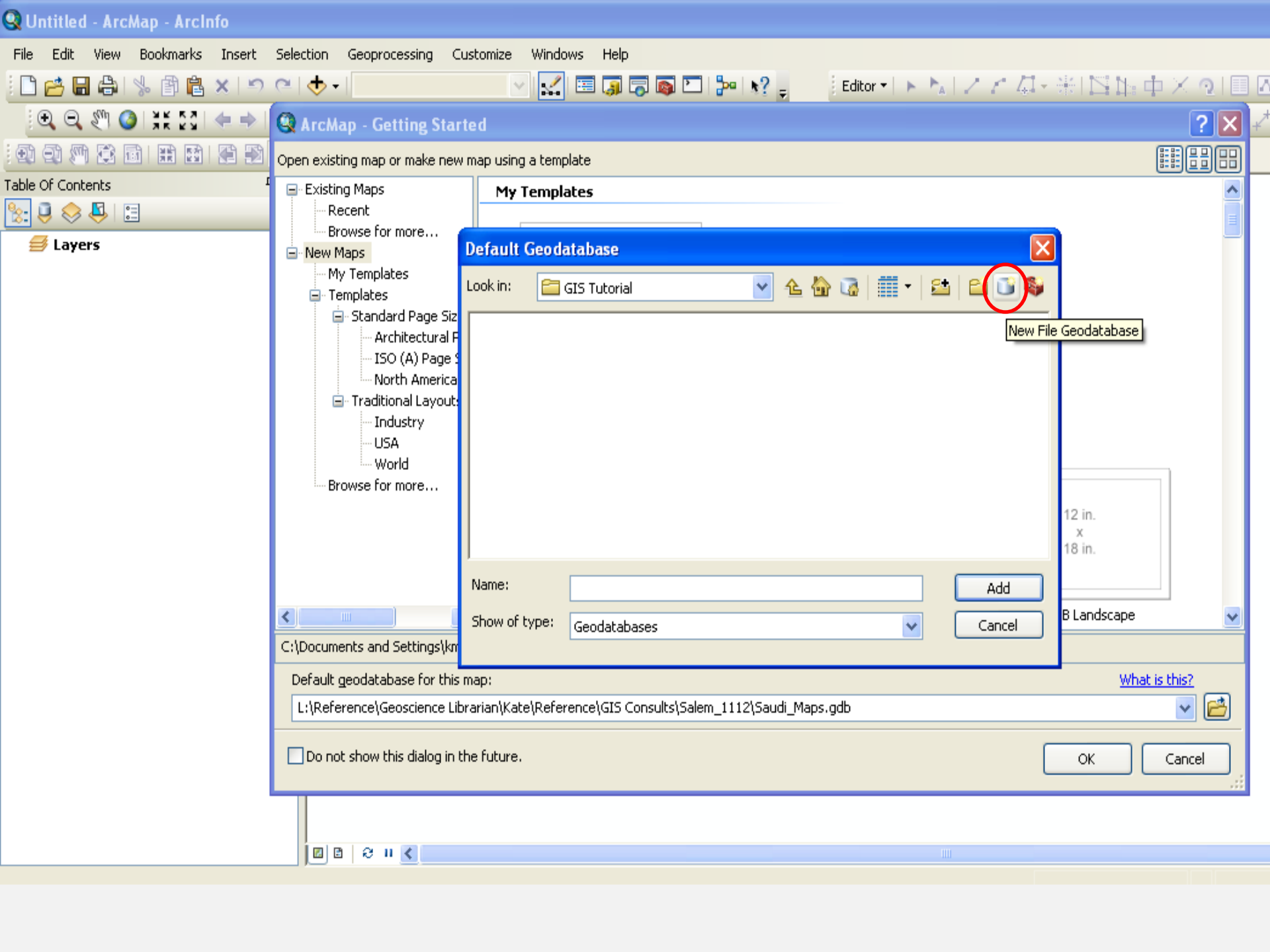
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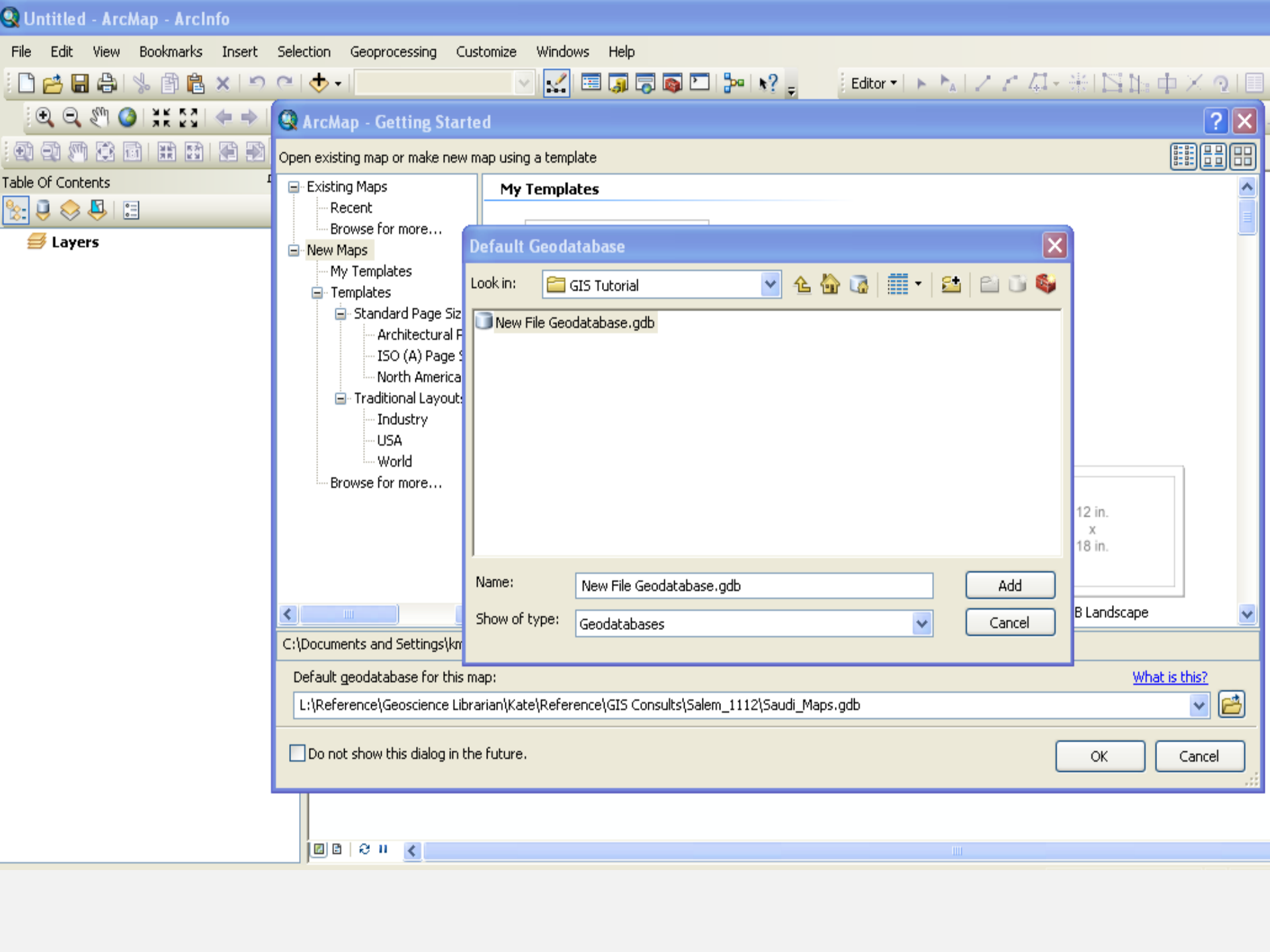
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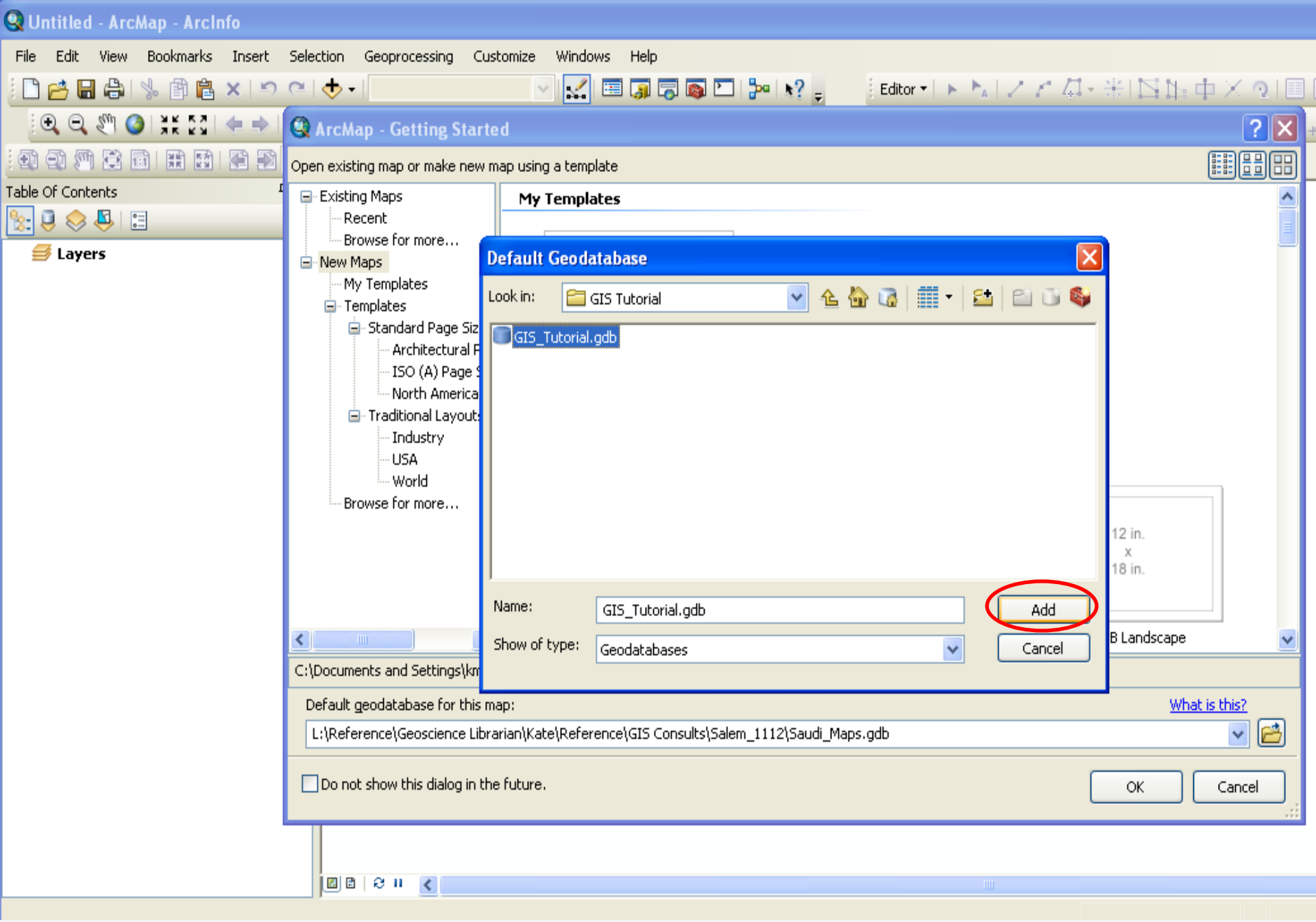
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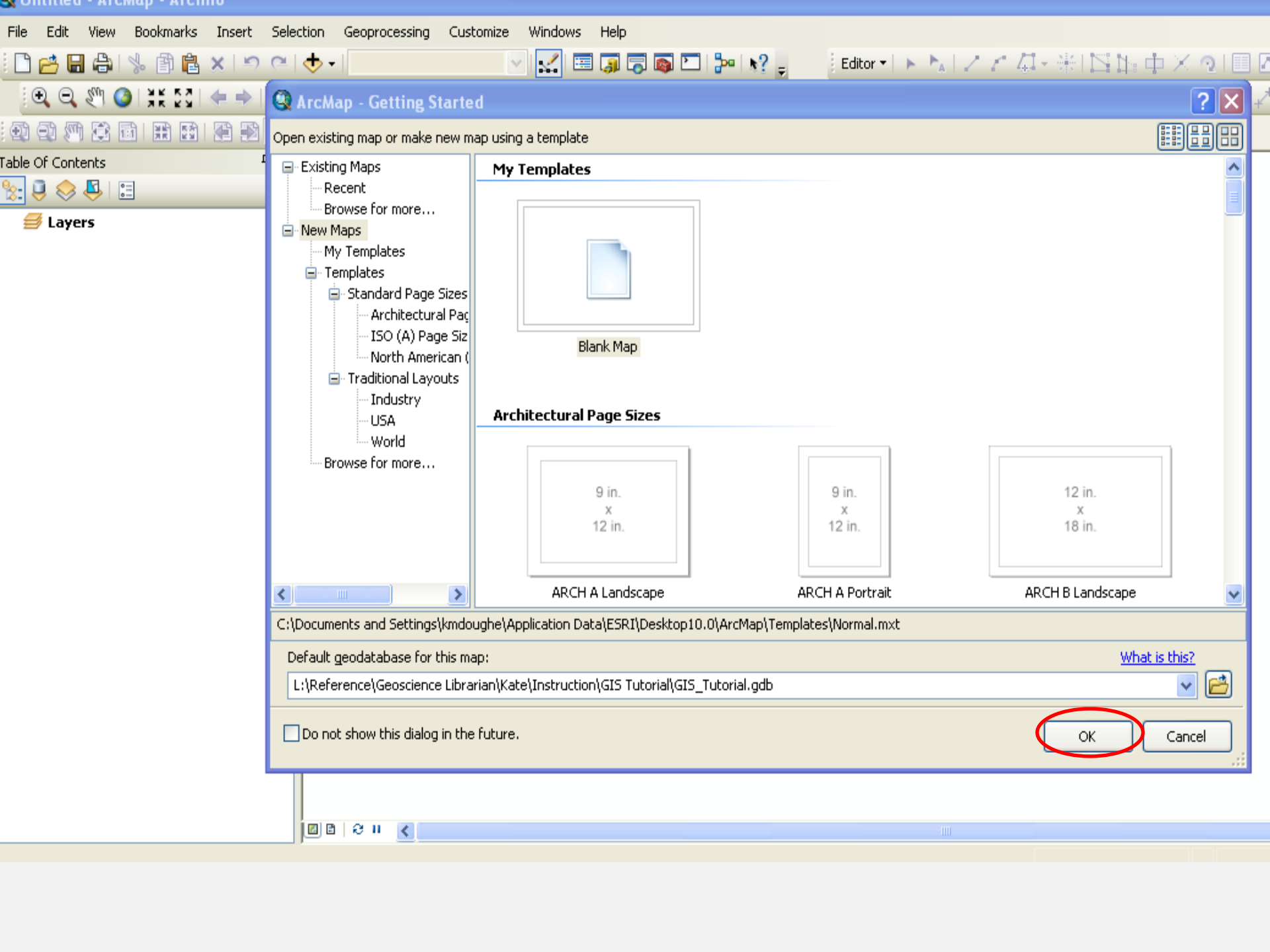
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Do not show this dialog in the future.
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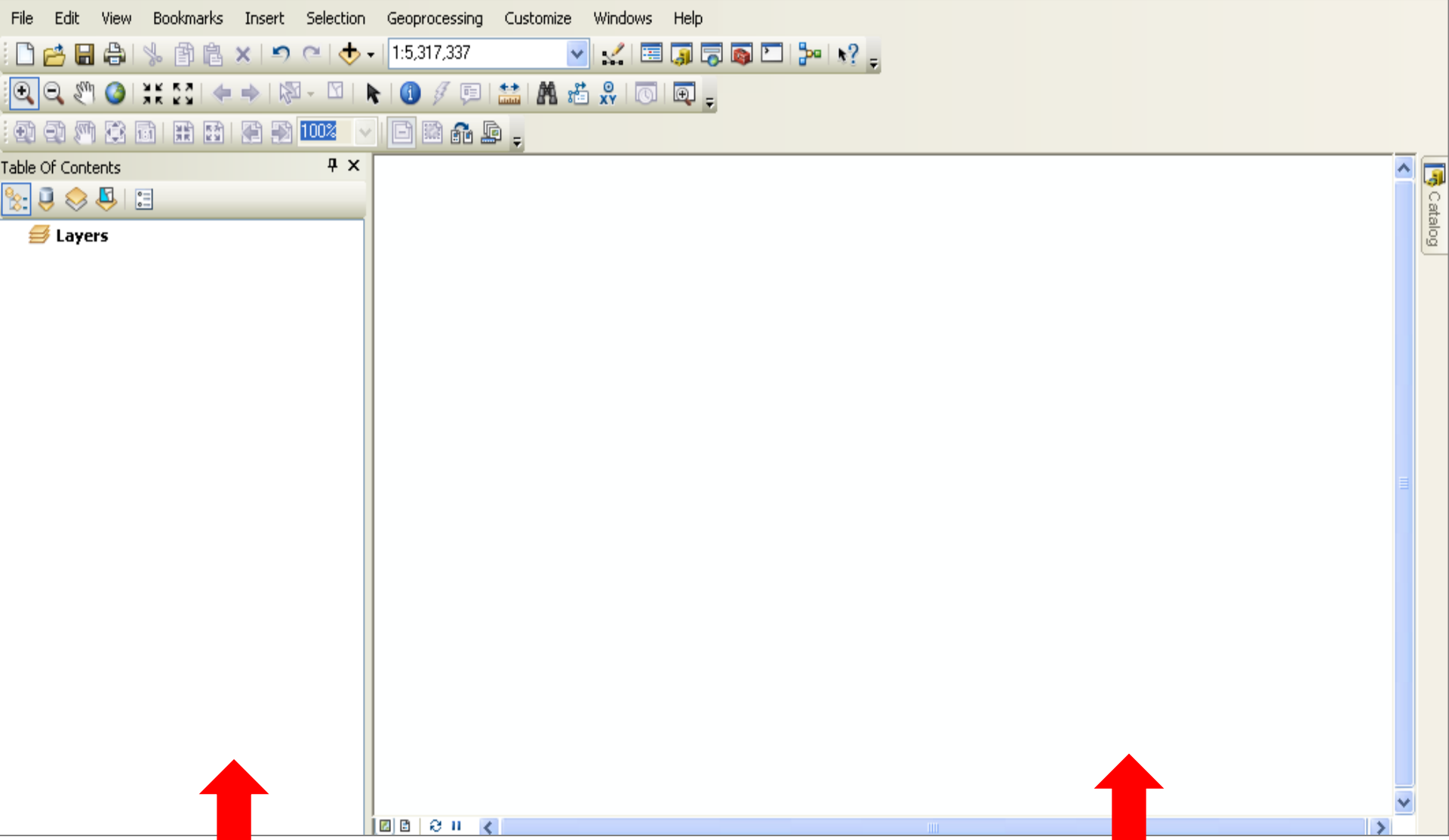
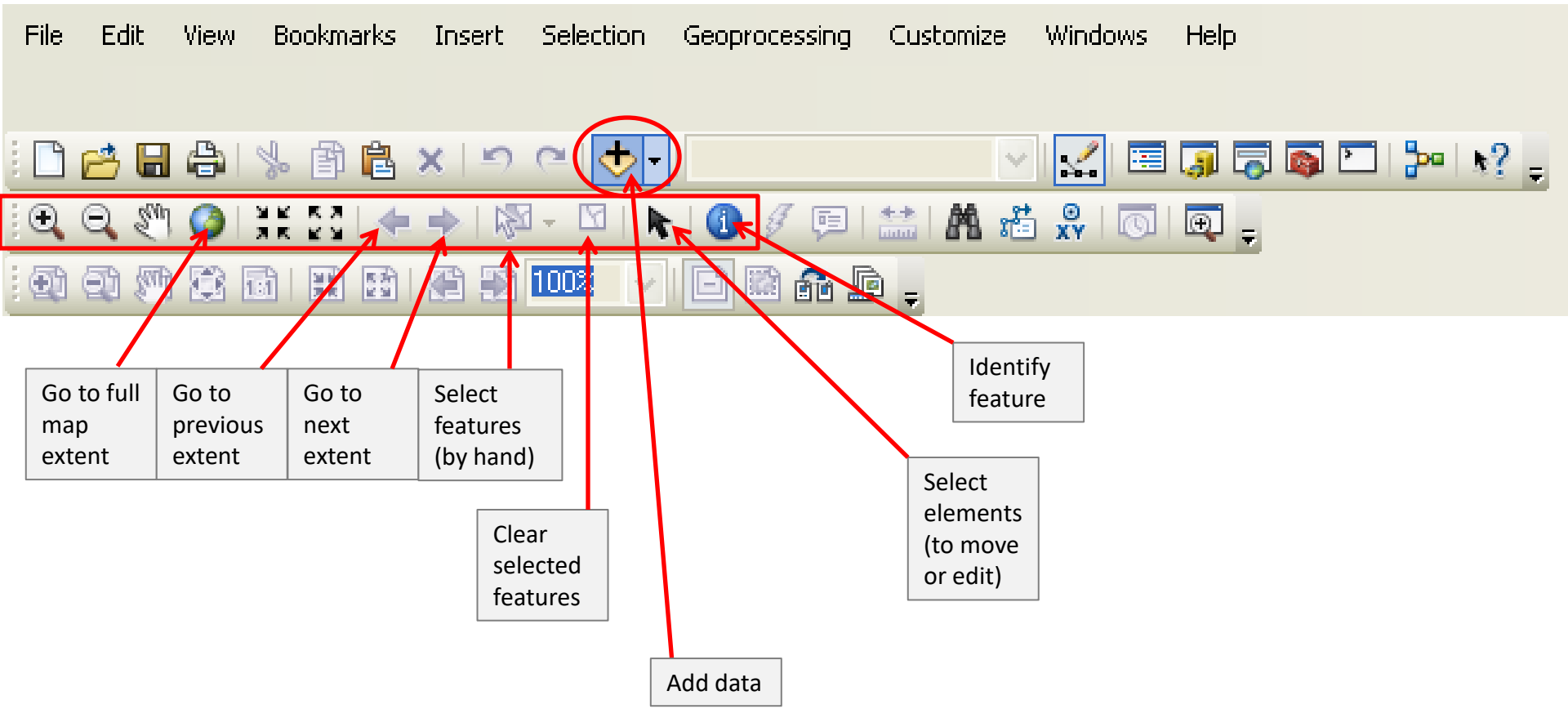


Table of contents that shows the doc's layers.

The "data frame" that displays the spatial data.


File
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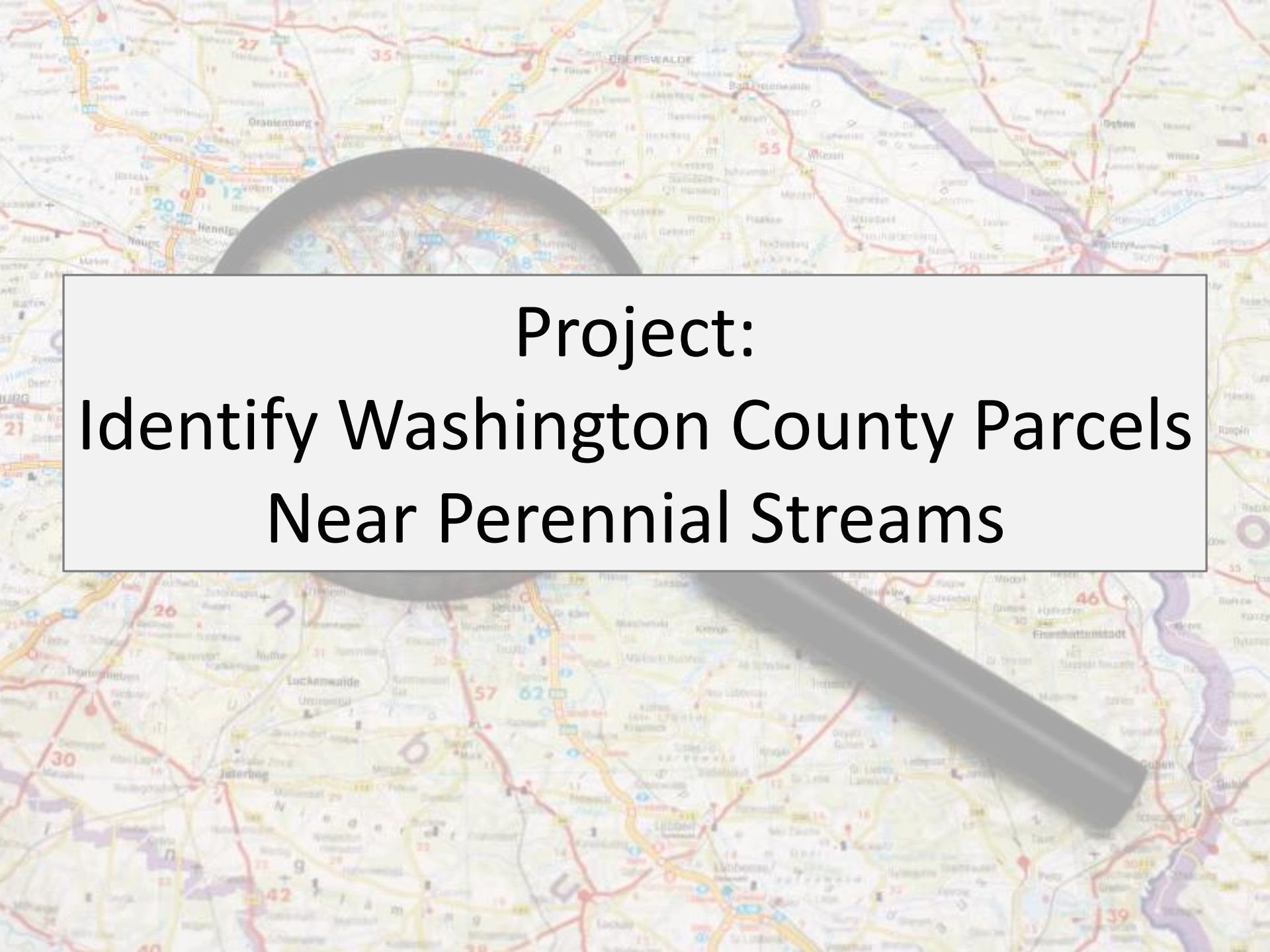
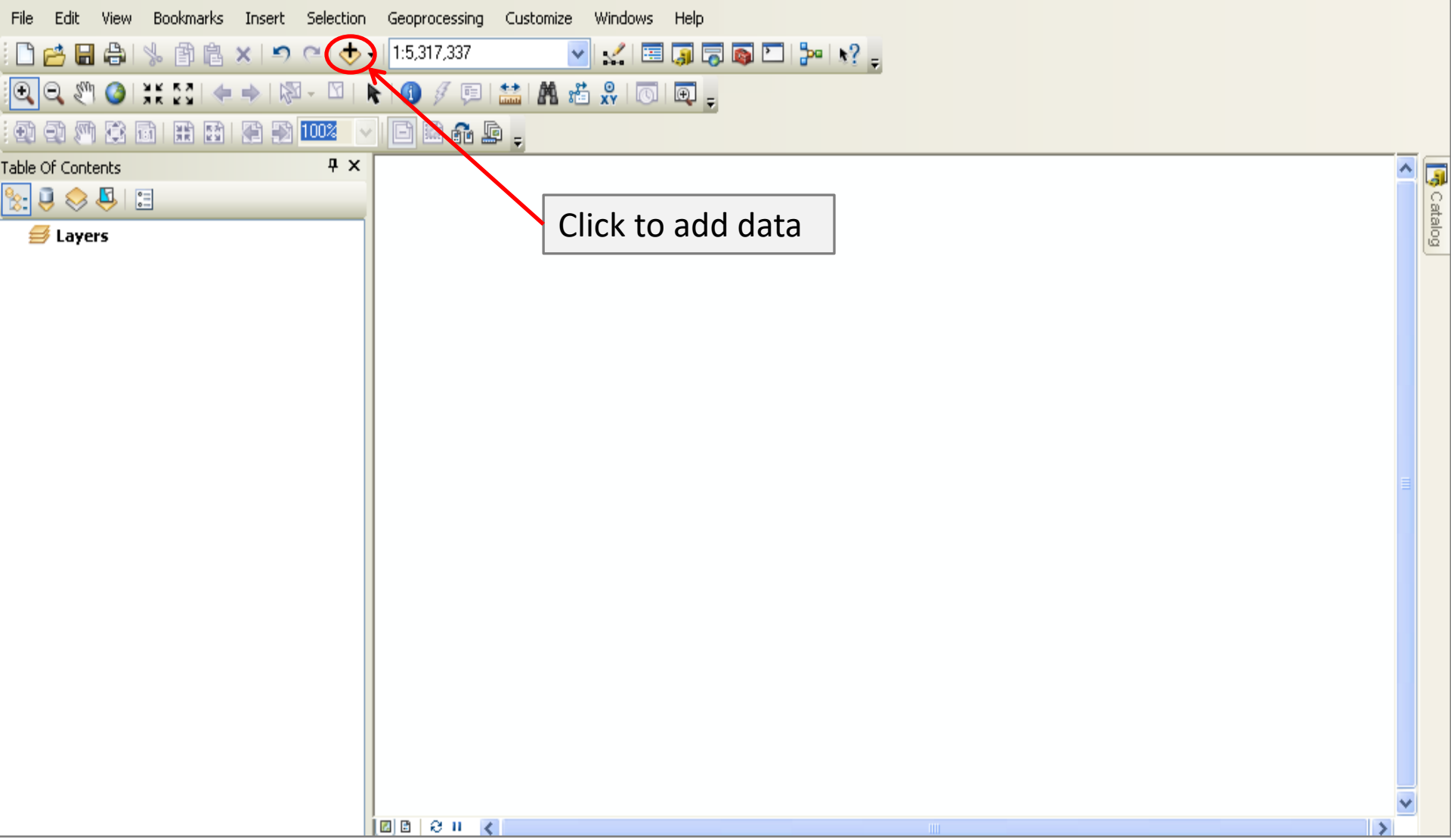
100%
Go to full map extent
Go to previous extent
Go to next extent
Select features (by hand)
Clear selected features
Add data
Select elements (to move or edit)
Identify feature


Project:
Identify Washington County Parcels
Near Perennial Streams

Add Layers

- States (Census Bureau)
- Counties (Census Bureau)
- Hydrography (Area - National Hydrography Dataset)
- Parcels (Washington County – Wash_Co_Data_Month_Year.zip)
- Public lands (GeoStor)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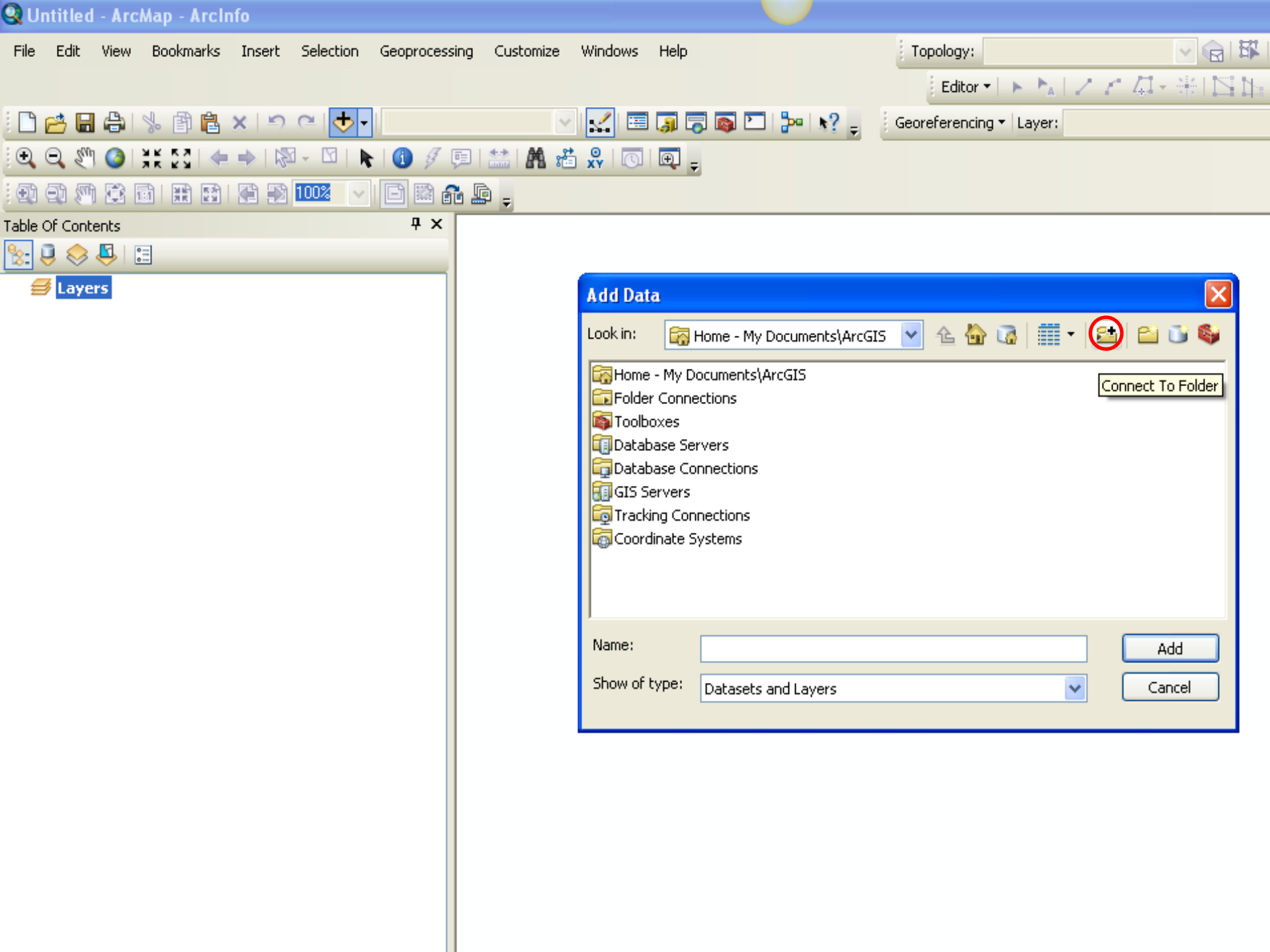
Click to add data
Catalog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Topology:
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Table Of Contents
Layers
Add Data
Look in:
Home - My Documents\ArcGIS
Connect To Folder
Home - My Documents\ArcGIS
Folder Connections
Toolboxes
Database Servers
Database Connections
GIS Servers
Tracking Connections
Coordinate Systems
Name:
Add
Show of type:
Datasets and Layers
Cancel

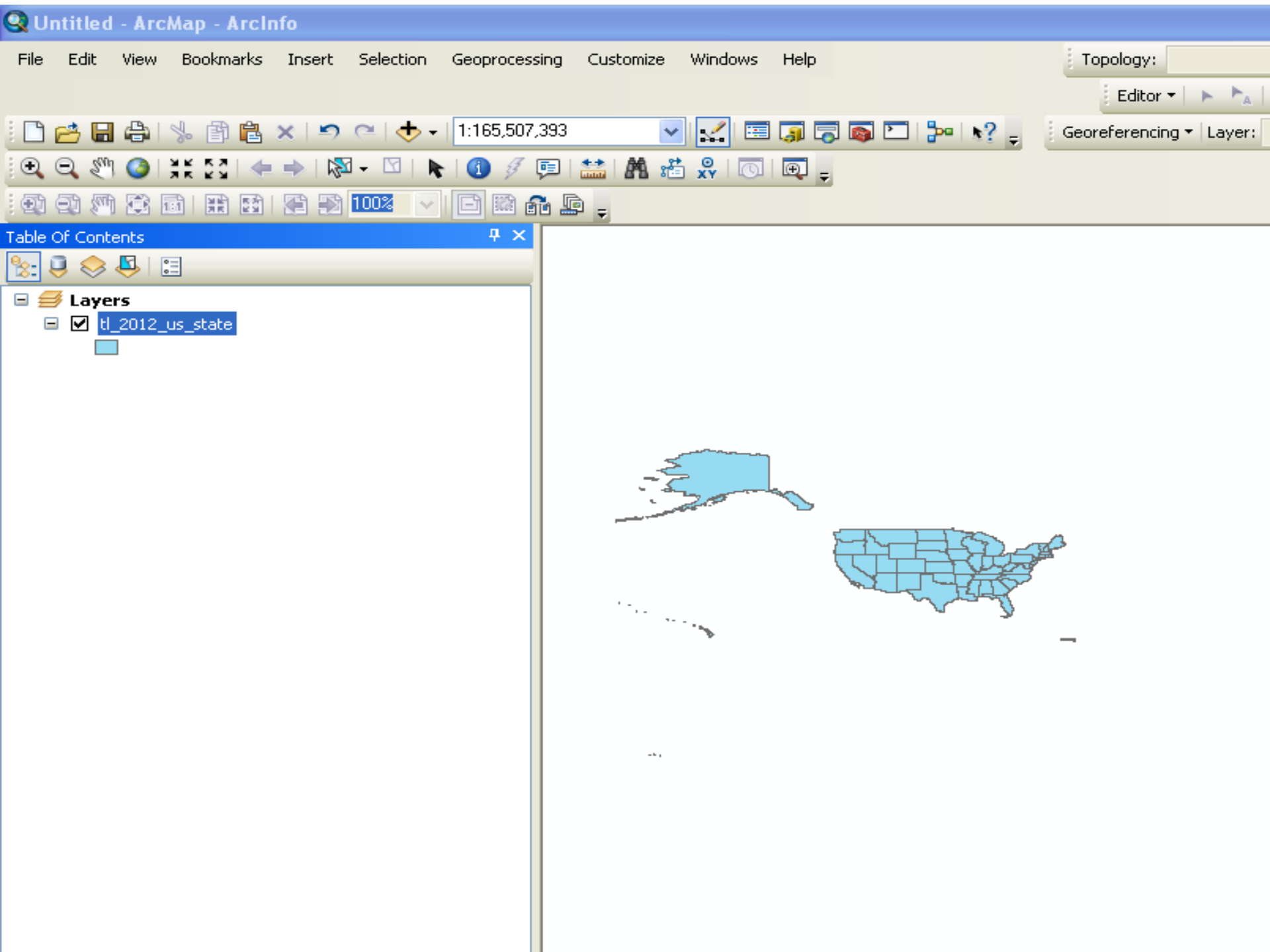
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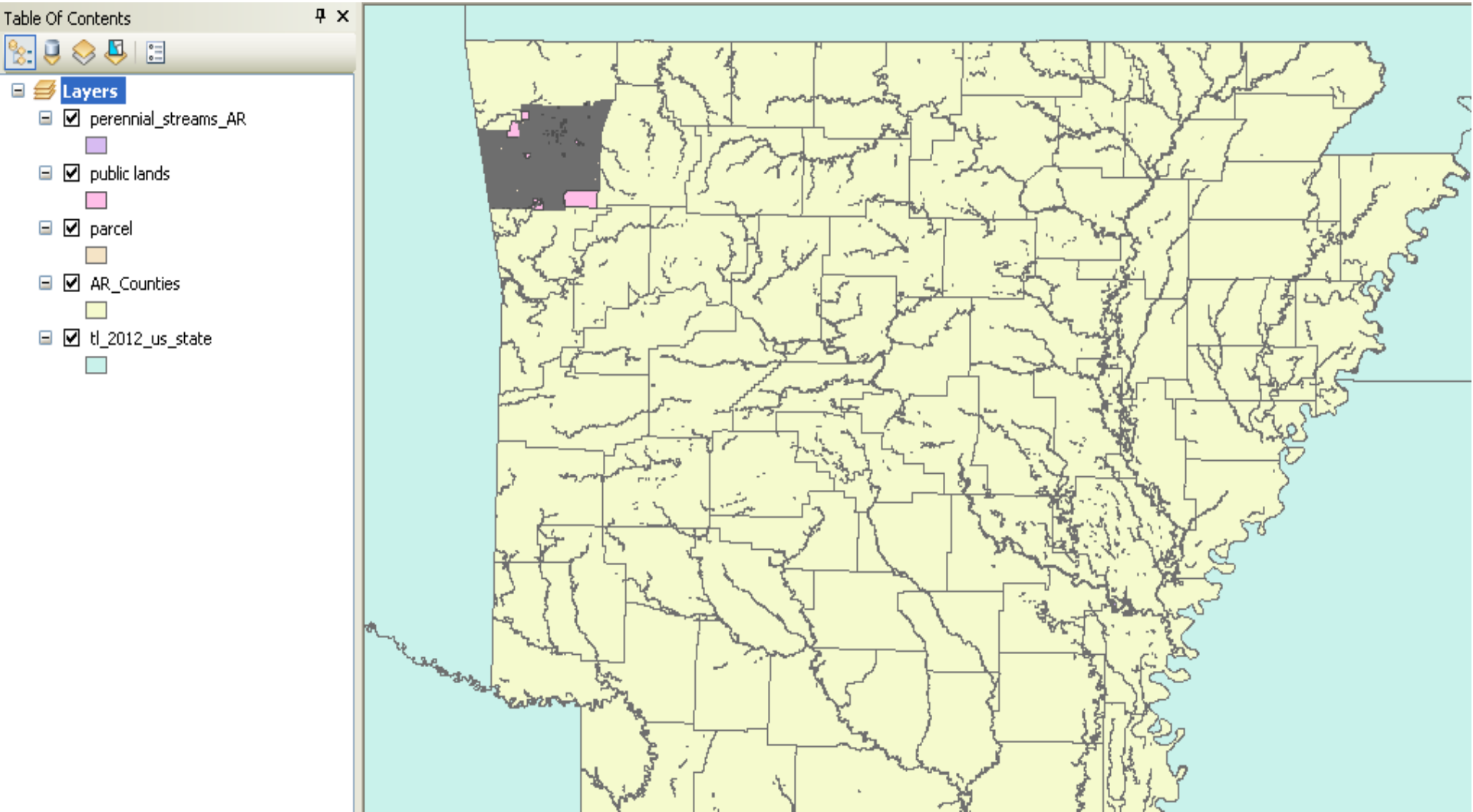
Table Of Contents
Layers
tl_2012_us_state

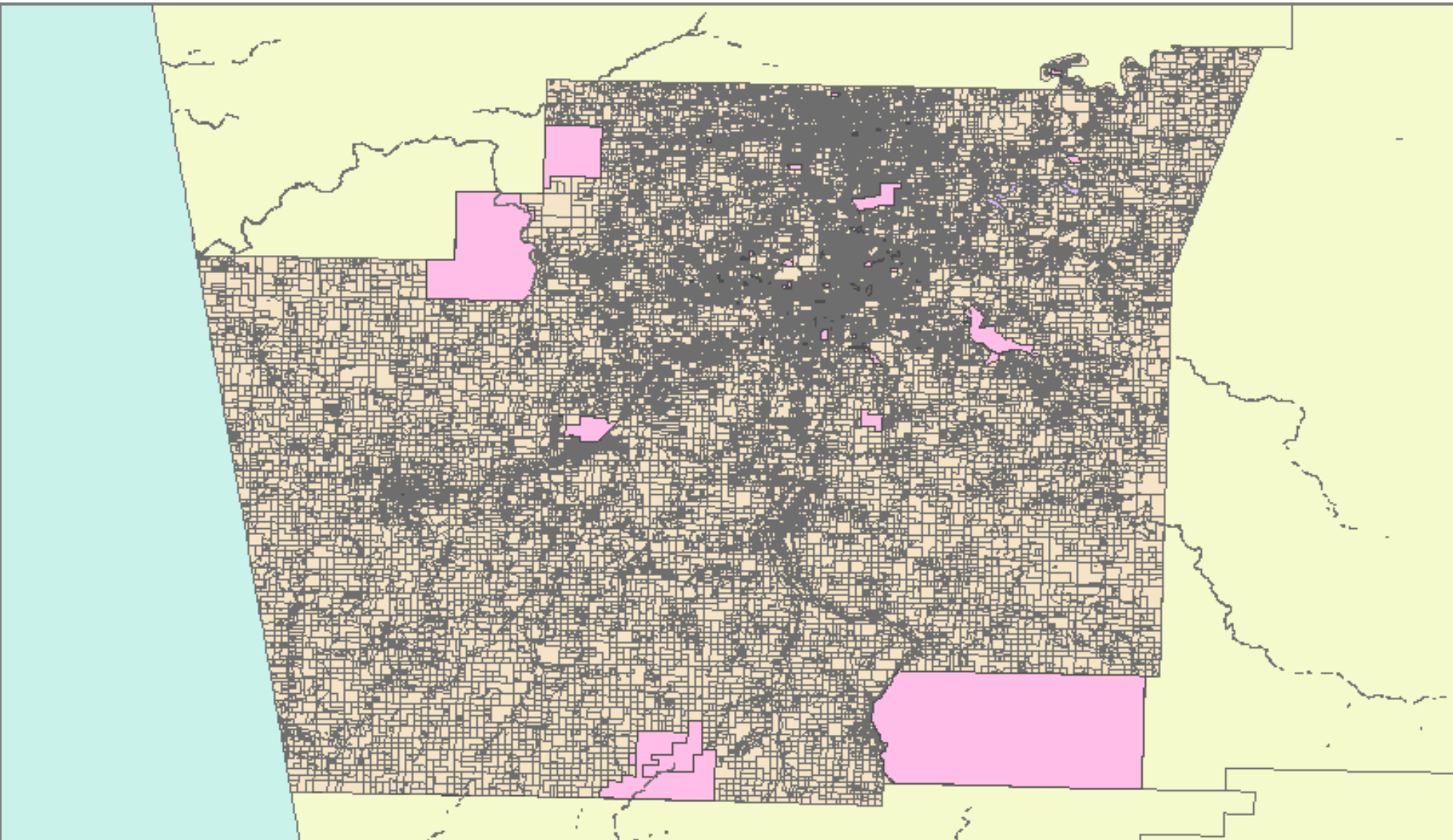
Coordinate Systems

- All your layers may not necessarily use the same coordinate system.
  - OK to draw and display
  - Not OK for detailed analysis (need to reproject layers – advanced step)
- Data frame will use the coordinate system of the first layer that's added
  - (displays feet, meters, or decimal degrees/lat/long of cursor location in bottom-right corner, depending on coordinate system)

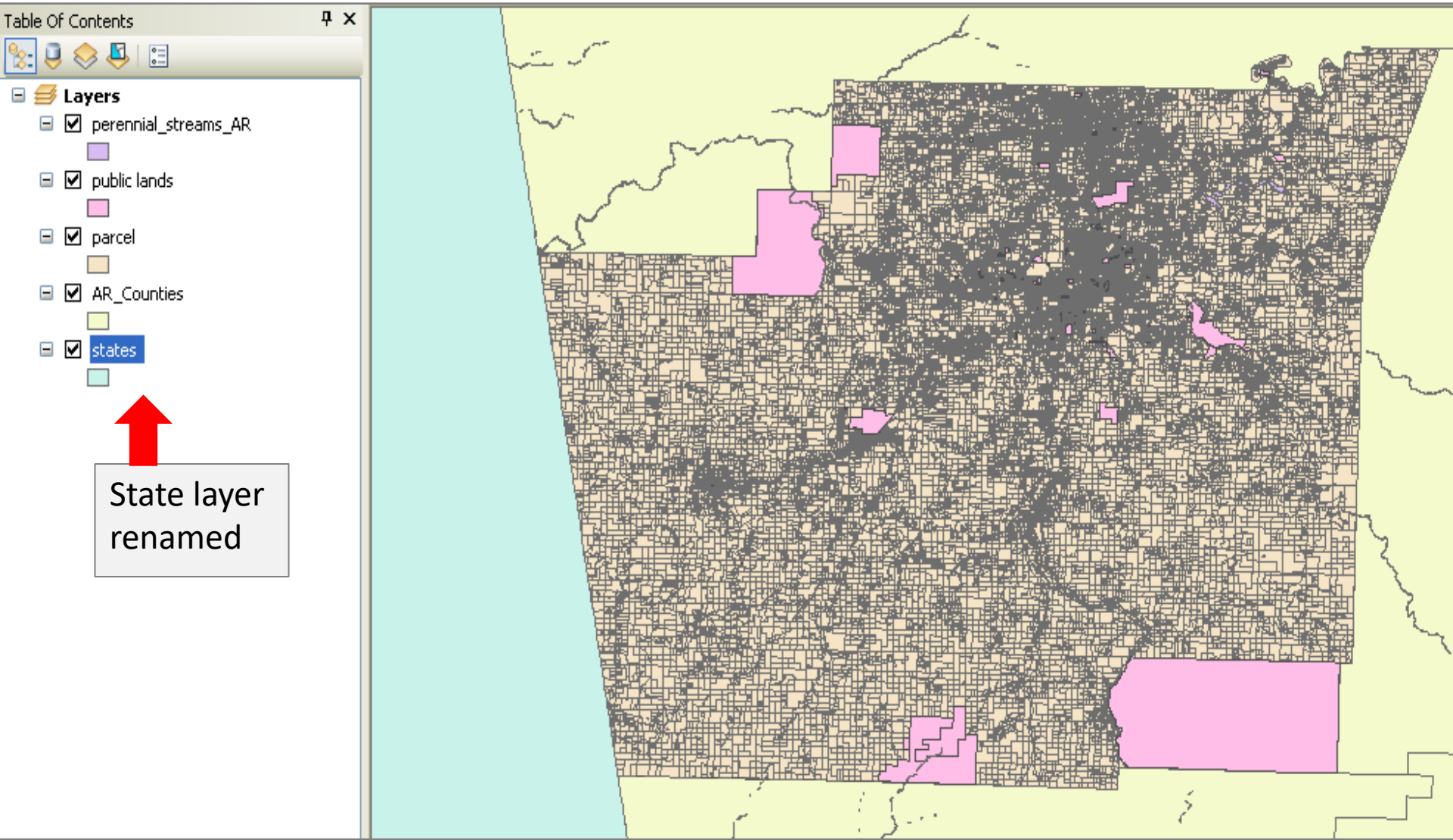
View With All Layers Added



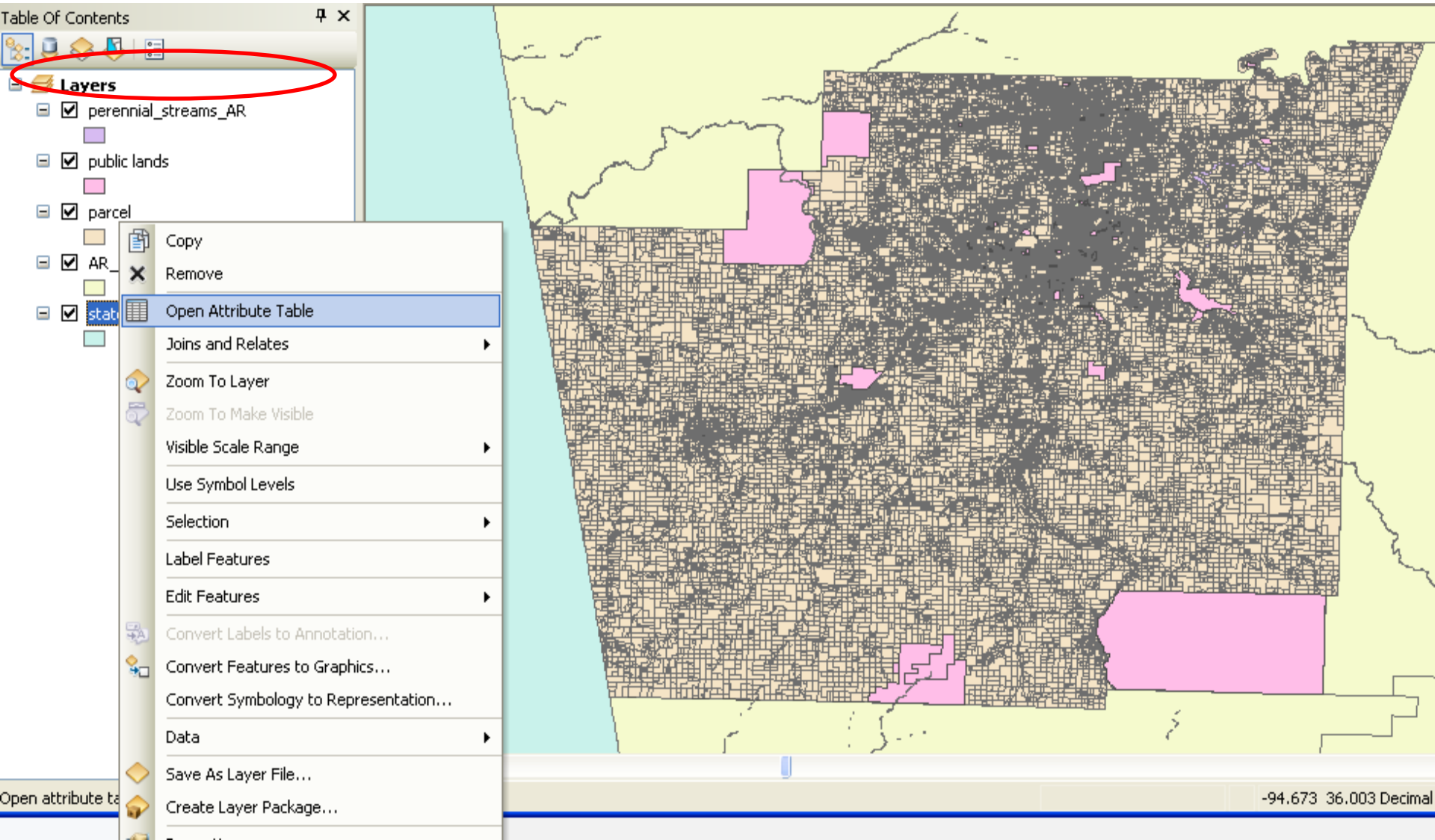
Zoomed to Washington County



Rename States Layer



Open the Attribute Table



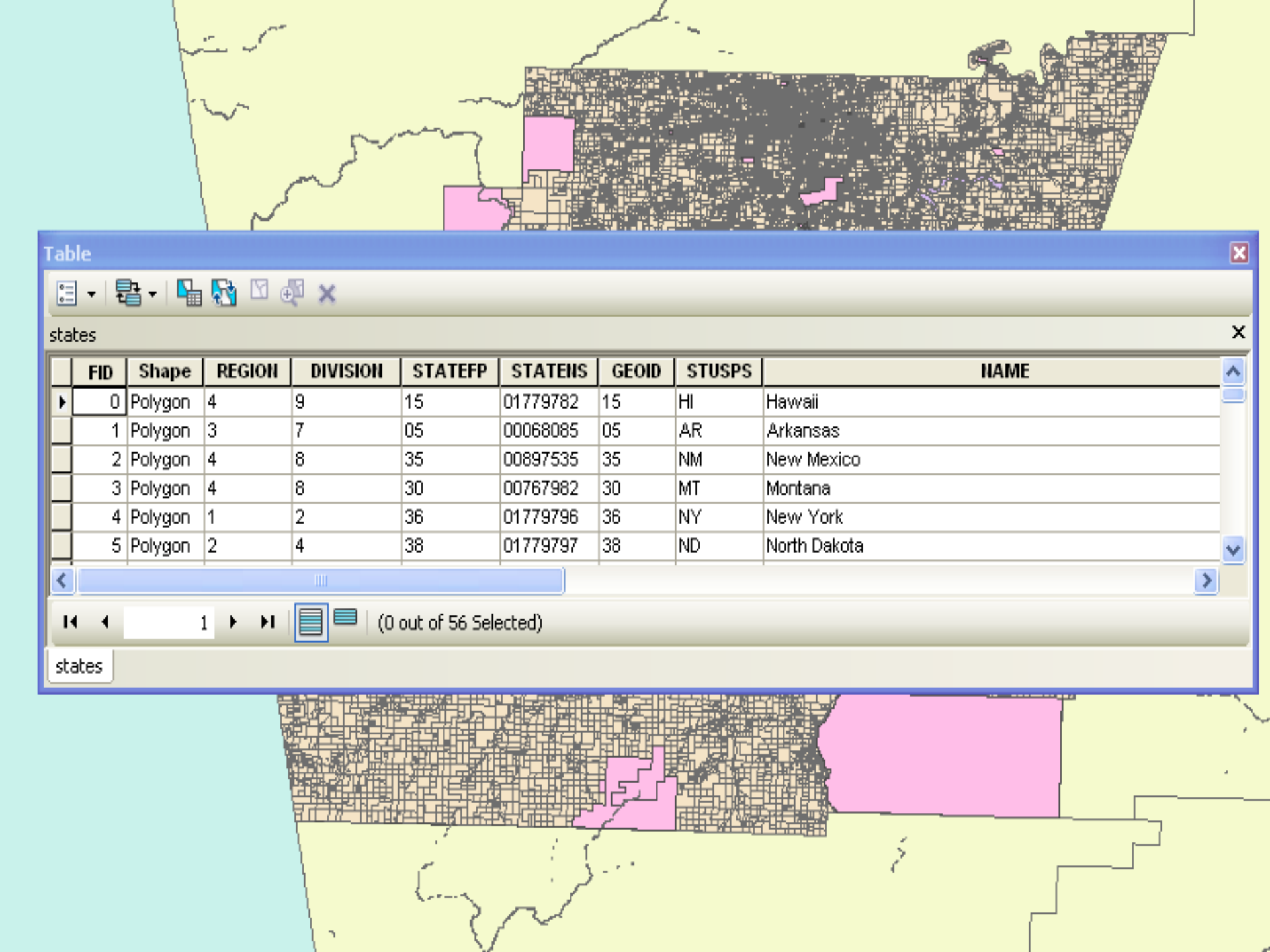


Table
states
FID
Shape
REGION
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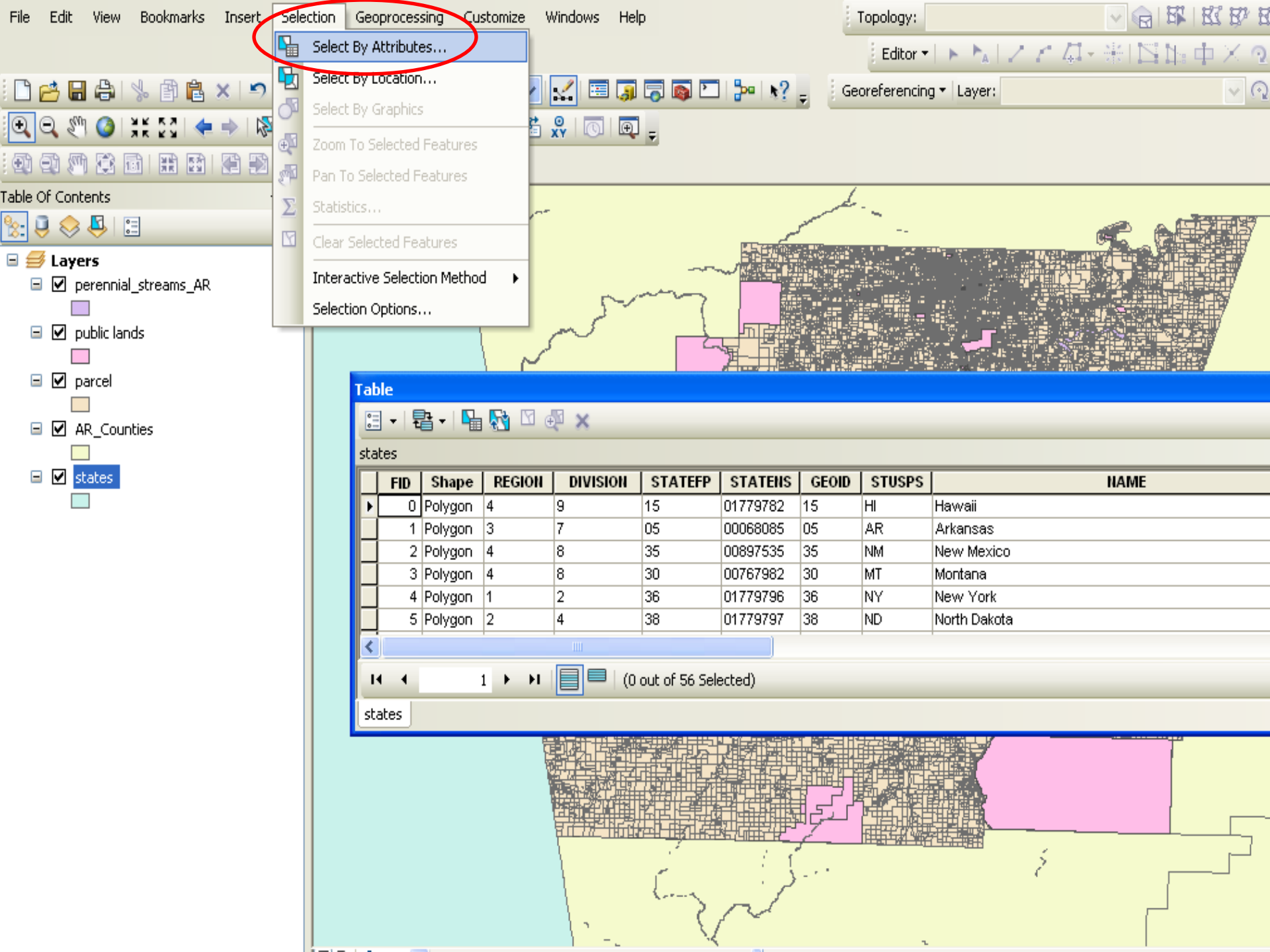
NAME
0 Polygon 4 9 15 01779782 15 HI Hawaii
1 Polygon 3 7 05 00068085 05 AR Arkansas
2 Polygon 4 8 35 00897535 35 NM New Mexico
3 Polygon 4 8 30 00767982 30 MT Montana
4 Polygon 1 2 36 01779796 36 NY New York
5 Polygon 2 4 38 01779797 38 ND North Dakota
1
(0 out of 56 Selected)
states

Customizing Layers

Select by Attribute Tool


File
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Help
Topology:
Editor
Georeferencing
Layer:
Select By Attributes...
Select By Location...
Select By Graphics
Zoom To Selected Features
Pan To Selected Features
Statistics...
Clear Selected Features
Interactive Selection Method
Selection Options...
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perennial_streams_AR
public lands
parcel
AR_Counties
states
Table
states
FID | Shape | REGION | DIVISION | STATEFP | STATENS | GEOID | STUSPS | NAME
0 | Polygon | 4 | 9 | 15 | 01779782 | 15 | HI | Hawaii
1 | Polygon | 3 | 7 | 05 | 00068085 | 05 | AR | Arkansas
2 | Polygon | 4 | 8 | 35 | 00897535 | 35 | NM | New Mexico
3 | Polygon | 4 | 8 | 30 | 00767982 | 30 | MT | Montana
4 | Polygon | 1 | 2 | 36 | 01779796 | 36 | NY | New York
5 | Polygon | 2 | 4 | 38 | 01779797 | 38 | ND | North Dakota
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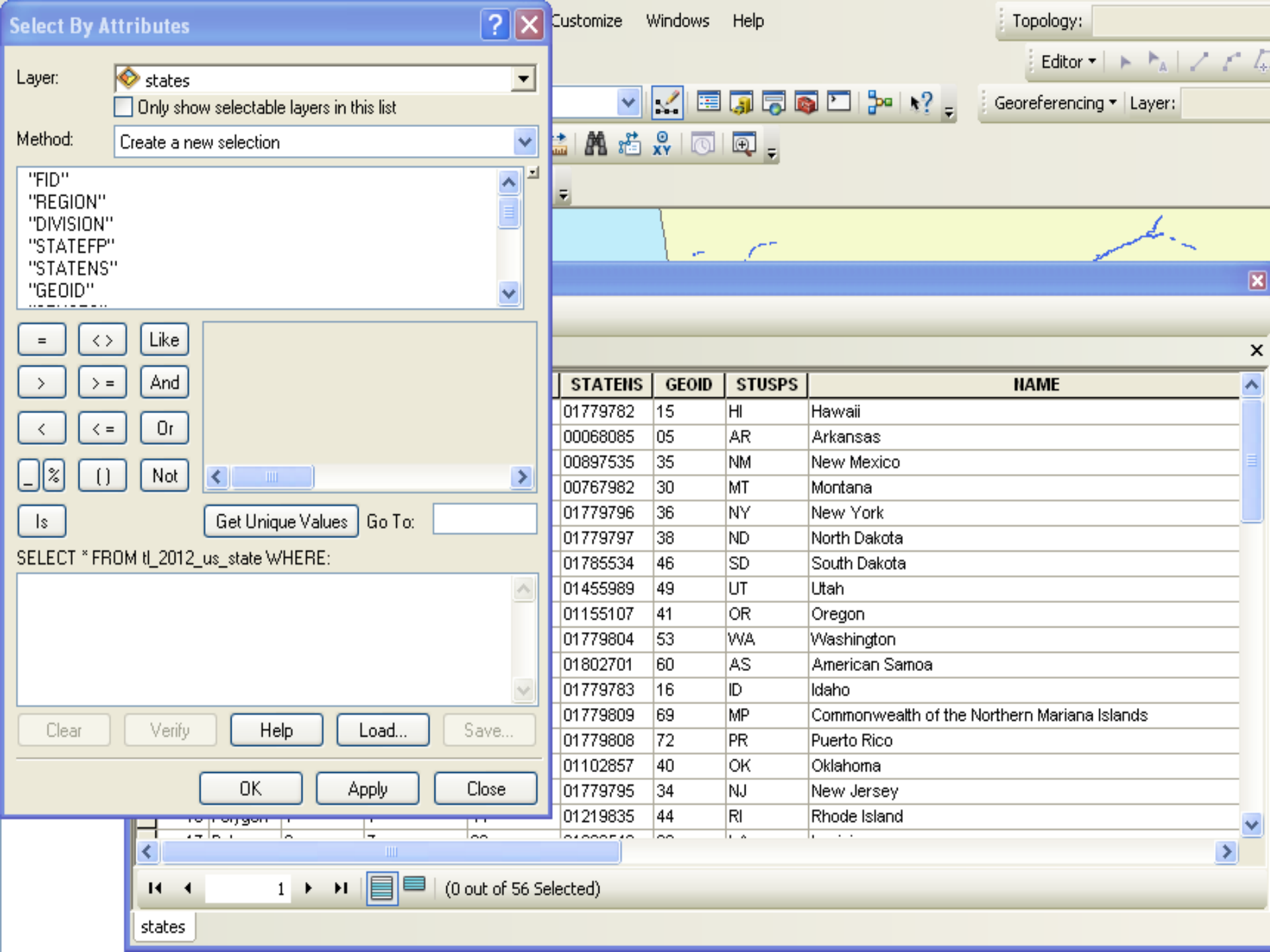
Select By Attributes
Layer:
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00767982 30 MT Montana
01779796 36 NY New York
01779797 38 ND North Dakota
01785534 46 SD South Dakota
01455989 49 UT Utah
01155107 41 OR Oregon
01779804 53 WA Washington
01802701 60 AS American Samoa
01779783 16 ID Idaho
01779809 69 MP Commonwealth of the Northern Mariana Islands
01779808 72 PR Puerto Rico
01102857 40 OK Oklahoma
01779795 34 NJ New Jersey
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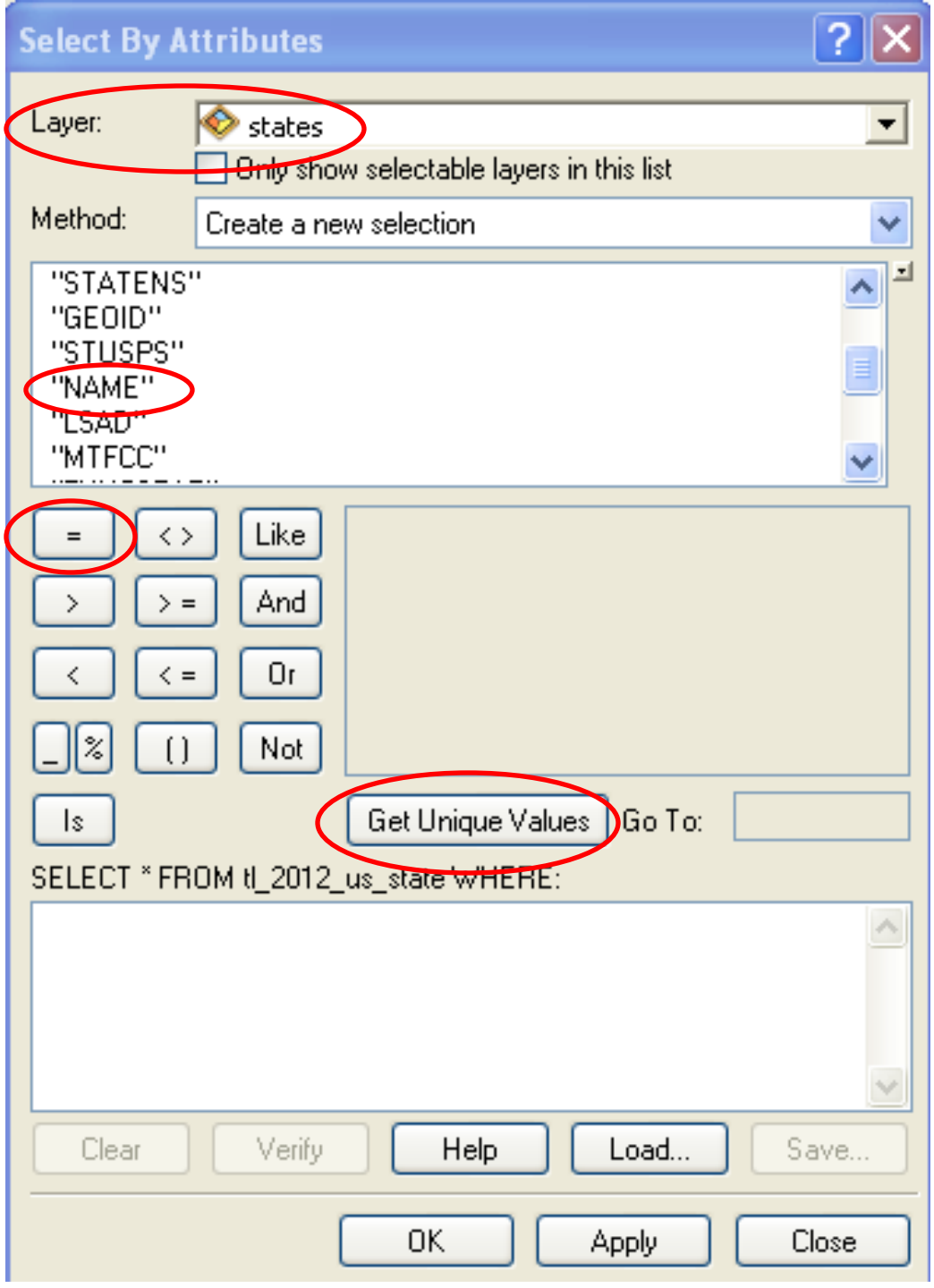
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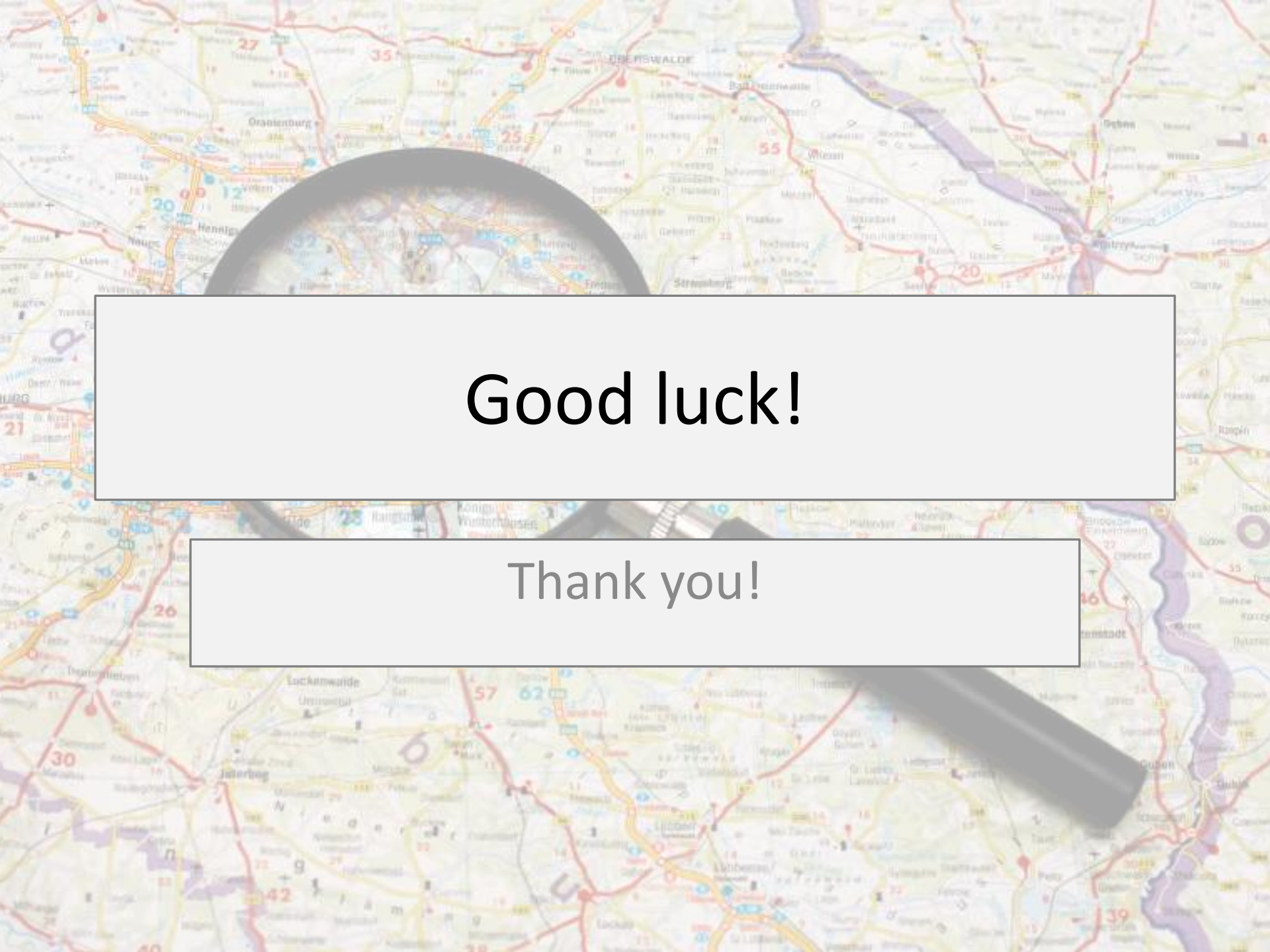

Good luck!

Thank you!