Spatial Data Viewer (SDV) Training

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Welcome & Introductions

- Greeting
- Introductions
- Incidentals
- Ground rules

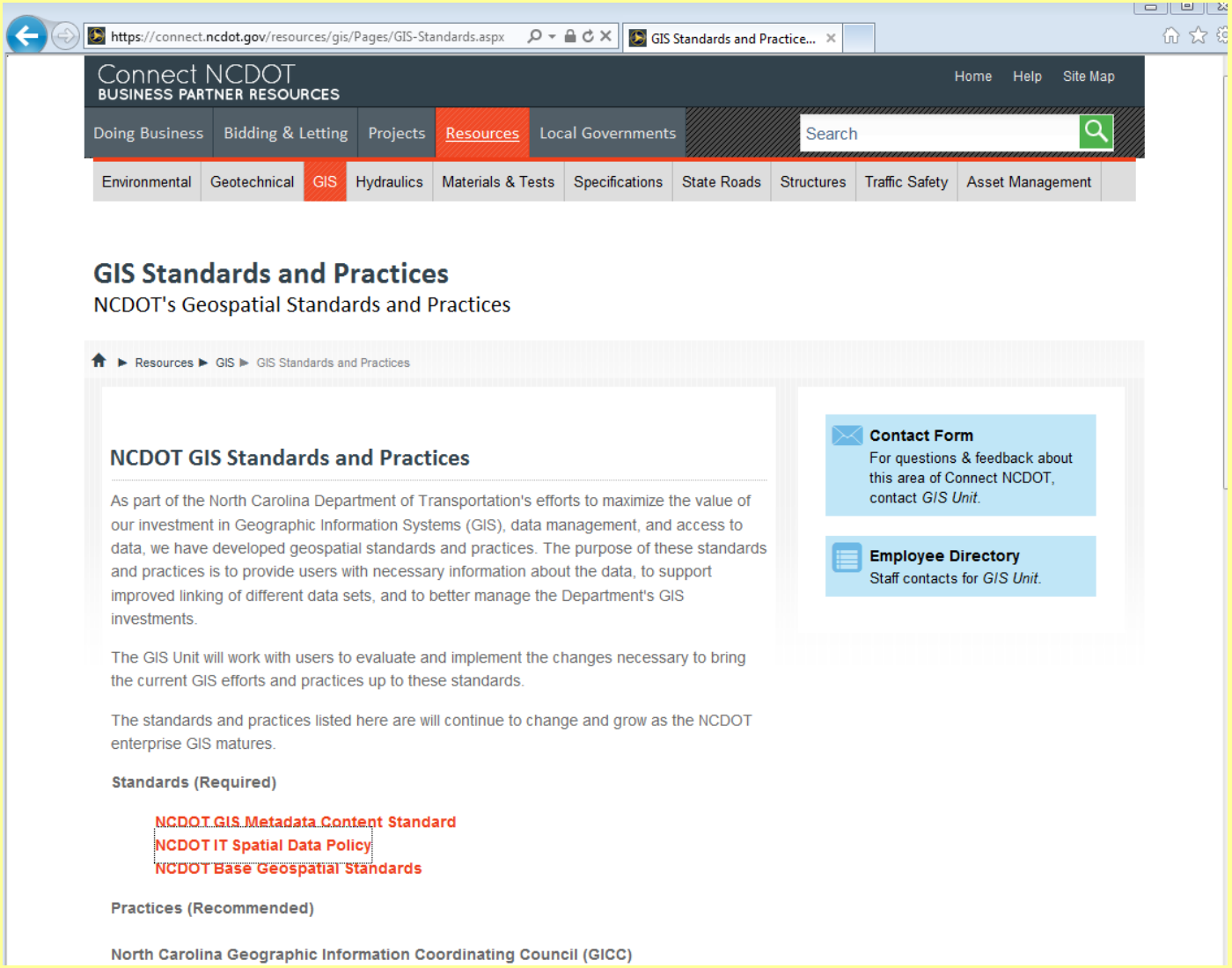
SDV Training Schedule

- Objectives
  - Provide Hands-on training for SDV
- Estimated Time
  - Approximately 4 hours
- Method of Instruction
  - Show & Tell
  - FAQ
- Materials
  - PowerPoint
  - SDV Tool

Training Expectations

- Learn about SDV development
- Geographic Information Systems standards
  https://connect.ncdot.gov/resources/gis/Pages/GIS-Standards.aspx
- Workshop demonstration of SDV
- SDV “hands-on” Training workshop
- Become SDV spokesperson
- Network

SDV Training

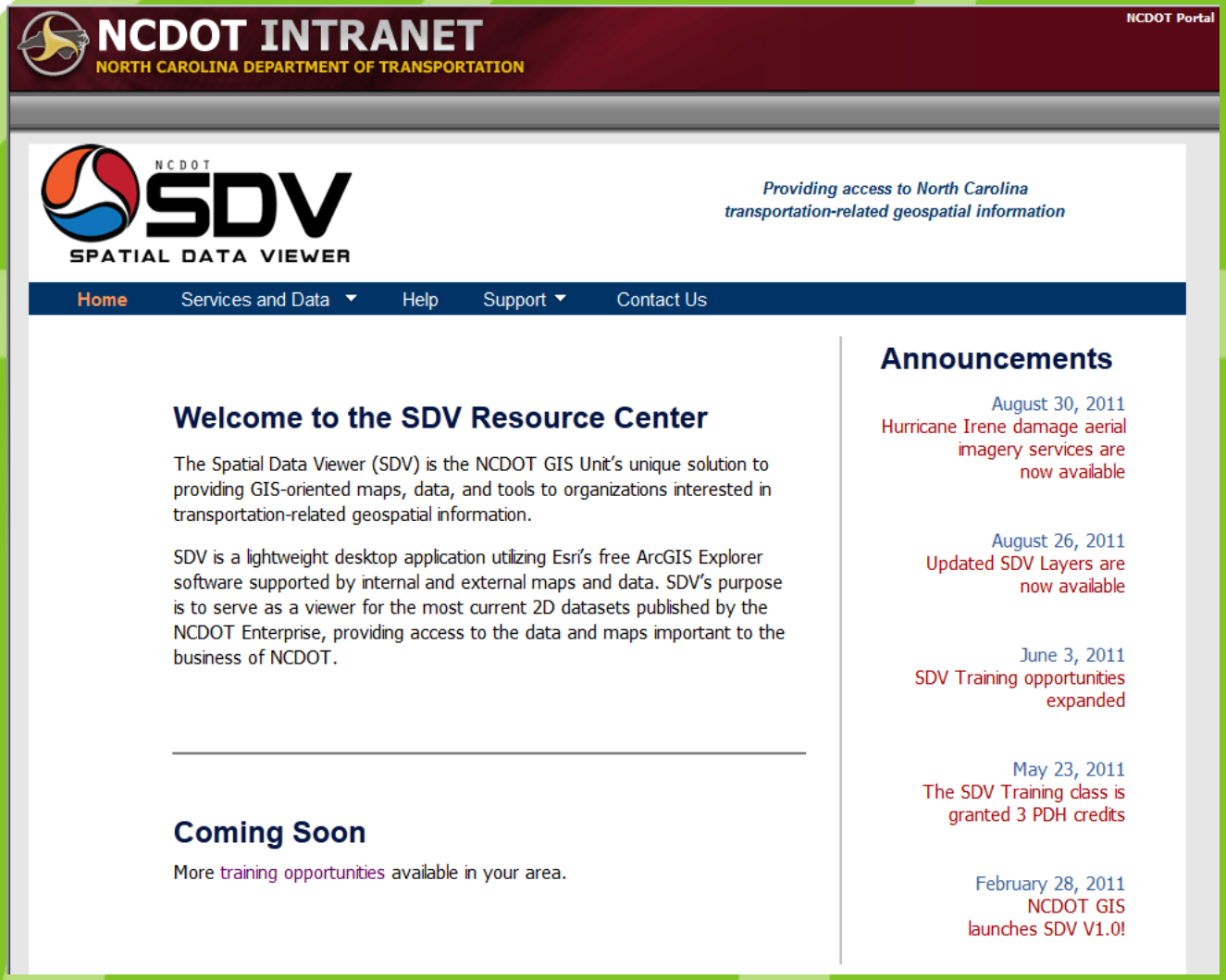


SDV Resource Center

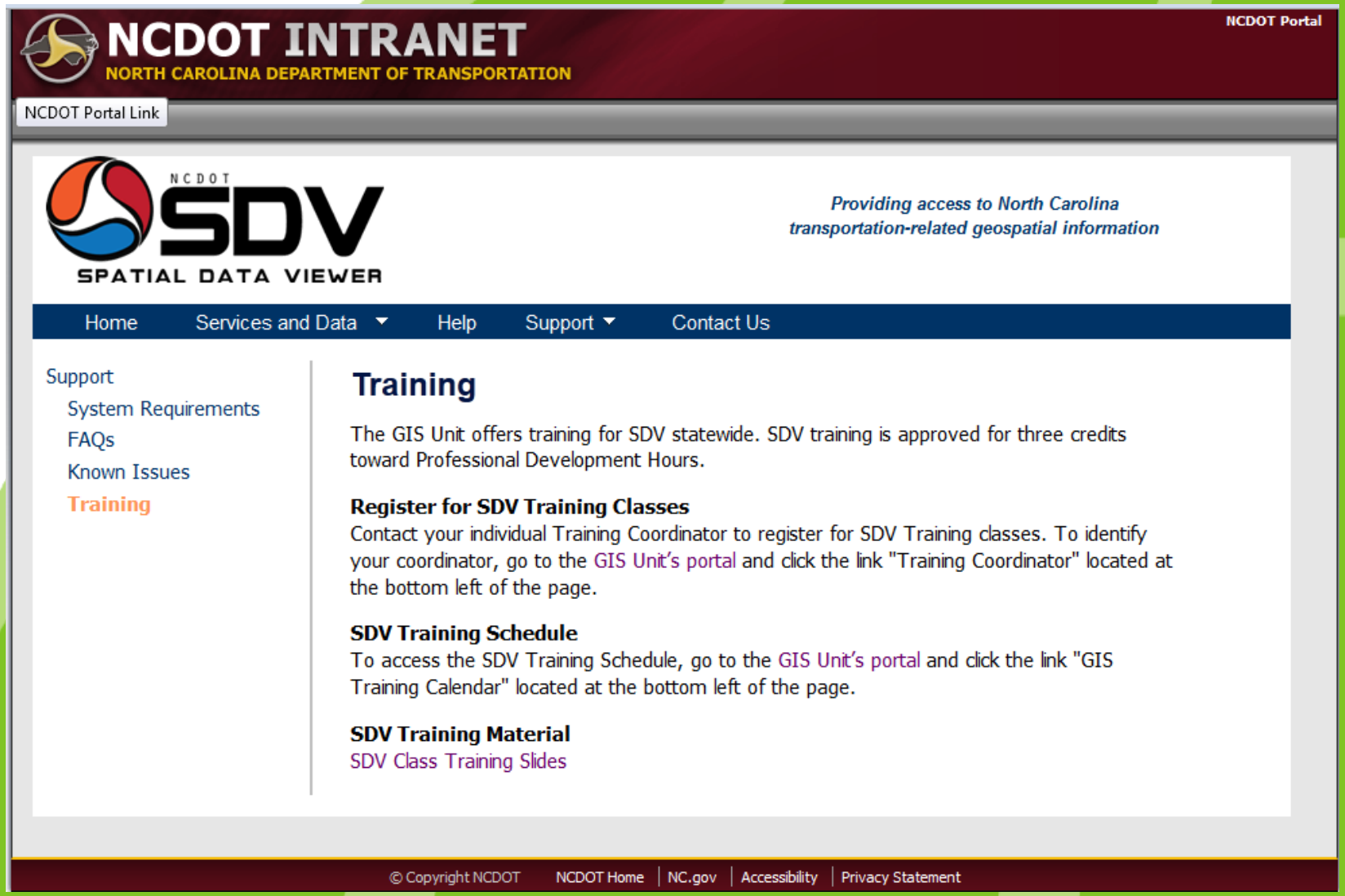
SDV Resource Center

SDV Help

- Hover over tool for description



SDV Resource Center



SDV Resource Center

SDV Resource Center

Map Services

and

Map / GIS Service
Layer type served out to users via ArcGIS Server; based on potentially several different layers containing specific feature symbology, labeling, and scaled views that cannot be changed by the user.

Data Layers

- Map Service layers
- Shapefiles
- Geodatabase feature class
- ArcGIS layers

ect..

Map Service	Description	Data Layers**
AADT Linear Segments	Statewide AADT Volume Groups segments	ROAD_AADT_EST_ARC
AADT Count Stations	Statewide average daily traffic count stations	ROAD_AADT_CNT_STATION_POINT
Airports	Statewide airport locations	AIRPORT_POINT
Bare Pavement (Snow Removal)	Represents priority routes for road treatment and snow removal	ROAD_BARE_PVMNT_ARC
Bike Routes	Statewide bicycle routes and Local suitability/routes	ROAD_BICYCLE_ROUTE_ARC
Boundaries - City	Statewide municipal boundaries	BOUNDARY_MUNICIPAL_POLYGON
Boundaries - County Filled	Statewide county polygon boundaries	BOUNDARY_COUNTY_POLYGON
Boundaries - County Outlined	Statewide county line boundaries	BOUNDARY_COUNTY_ARC
Boundaries - County Shoreline	Statewide county polygon boundaries, with shoreline	BOUNDARY_COUNTY_SHRLN_POLYGON
Boundaries - District	Statewide NCDOT District boundaries	BOUNDARY_DOT_DISTRICT_POLYGON

SDV Resource Center

SDV Resource Center

Services and Data

Map Services

Data Layers hyperlink

Metadata

BOUNDARY_DOT_DIVISION_POLYGON

Data format: File Geodatabase Feature Class

File or table name: BOUNDARY_DOT_DIVISION_POLYGON

Coordinate system: Lambert Conformal Conic

Theme keywords: Boundary

Abstract: DOT Divisions (North Carolina)

FGDC and ESRI Metadata:

- Identification Information
- Data Quality Information
- Spatial Data Organization Information
- Spatial Reference Information
- Entity and Attribute Information
- Distribution Information
- Metadata Reference Information
- Geoprocessing History
- Binary Enclosures

Metadata elements shown with blue text are defined in the Federal Geographic Data Committee's (FGDC) *Content Standard for Digital Geospatial Metadata (CSDGM)*. Elements shown with green text are defined in the *ESRI Profile of the CSDGM*. Elements shown with a green asterisk (*) will be automatically updated by ArcCatalog. ArcCatalog adds hints indicating which FGDC elements are mandatory; these are shown with gray text.

Identification Information:

Citation:

Citation information:

Originators: The North Carolina Department of Transportation Geographic Information Systems Unit

***Title:**
BOUNDARY_DOT_DIVISION_POLYGON

***File or table name:** BOUNDARY_DOT_DIVISION_POLYGON

Publication date: Unknown
Publication time: Unknown
***Geospatial data presentation form:** vector digital data

Publication information:

Publication place: Raleigh, North Carolina
Publisher: The North Carolina Department of Transportation Geographic Information Systems Unit

***Online linkage:** Service=sde:oracle11g:/:LOCAL=TCCDQ26; User=sdv_public; Version=SDE.DEFAULT

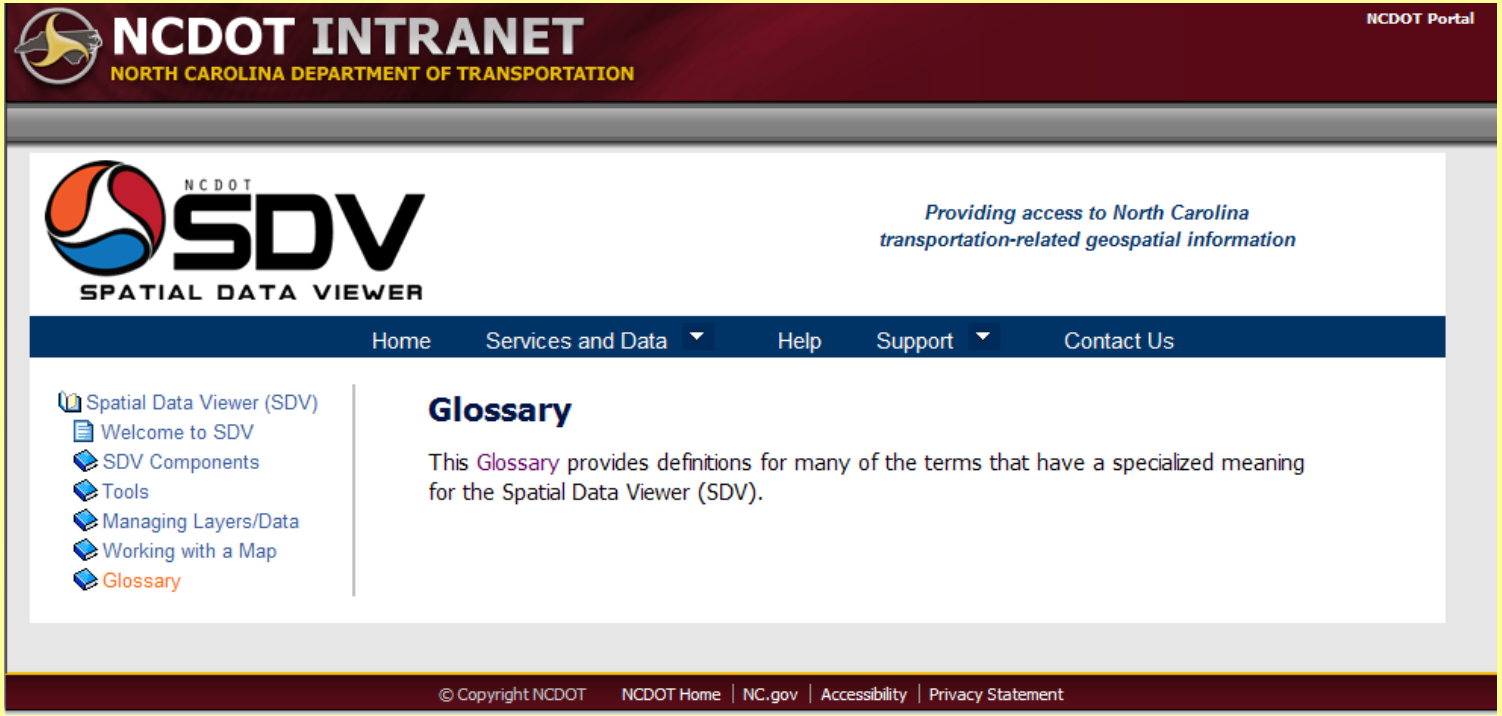
Description:

Abstract:
DOT Divisions (North Carolina)

SDV Resource Center

SDV Training Outline

Terminology



SDV Training
Introduction to SDV

SDV Training

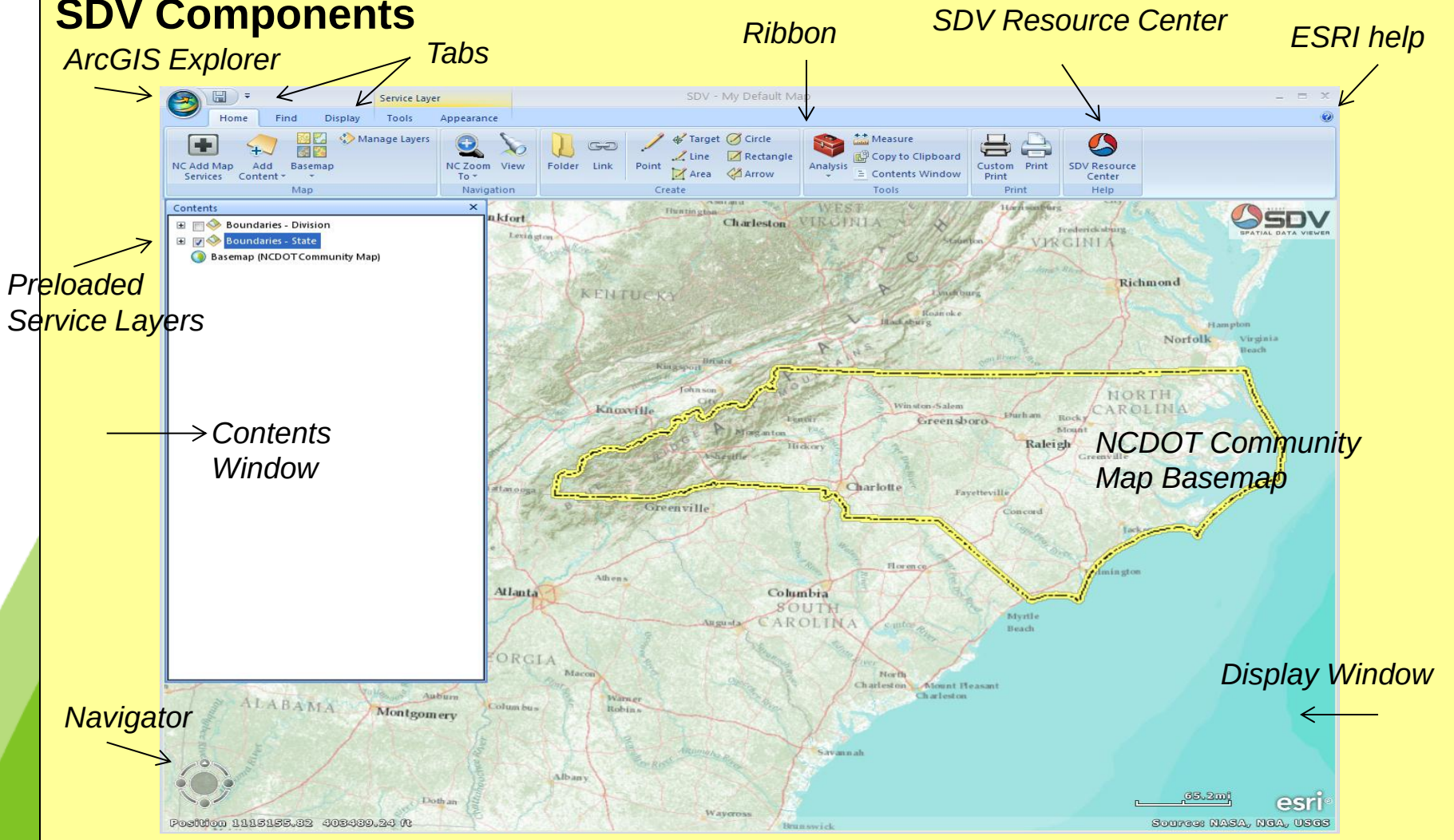
SDV Training Outline

Introduction to SDV

- Display Window
- Contents Window
- Ribbons
- ArcGIS Explorer button
- Map Groups
- Tools
- SDV Resource Center
- ESRI help

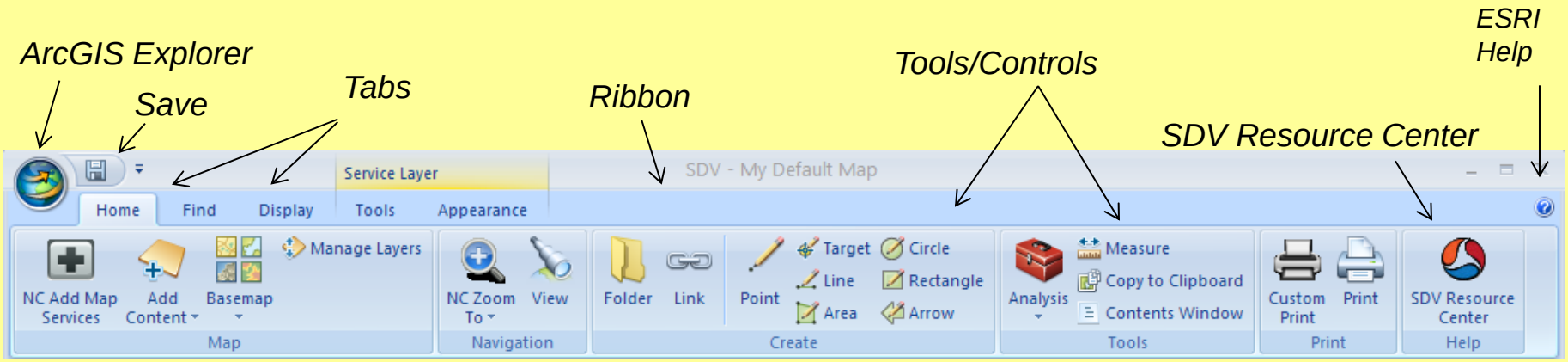
SDV Training

SDV Components

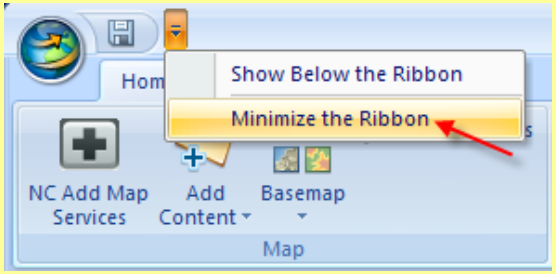


SDV Training

SDV Ribbon

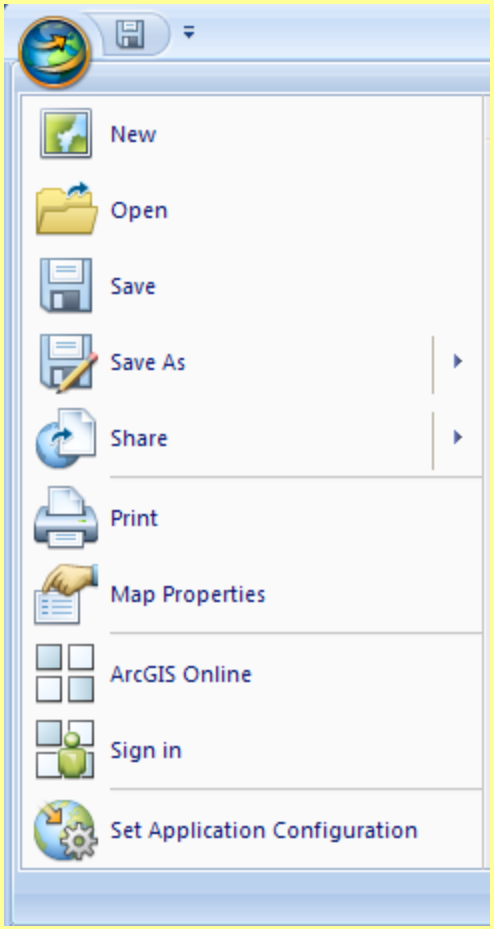


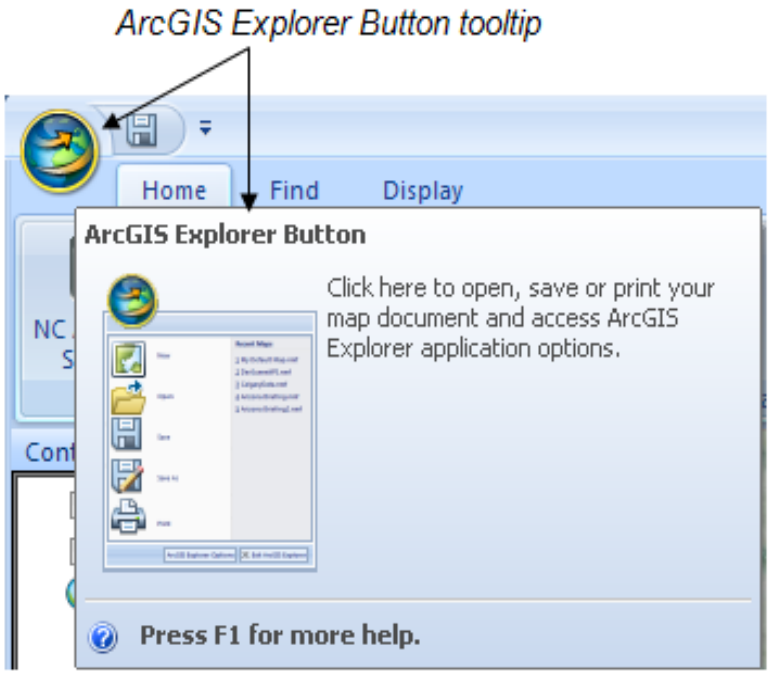
- To minimize The Ribbon right-clicking on it and select "Minimize the Ribbon," or select the “Minimize the Ribbon” option in the dropdown list to the right of the ArcGIS Explorer button and the save icon



SDV Training

ArcGIS Explorer Icon

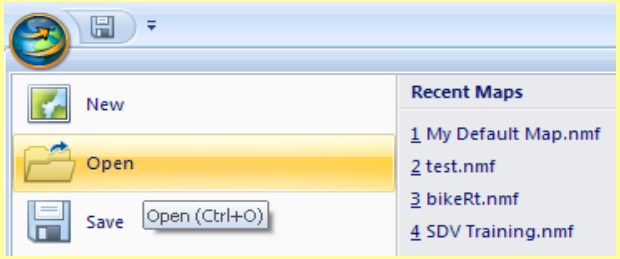


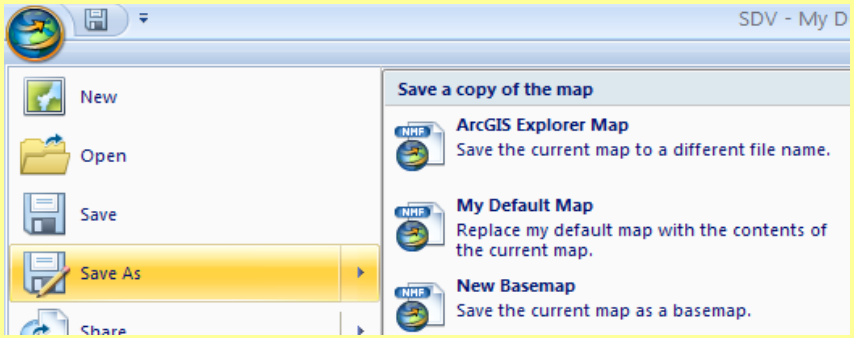


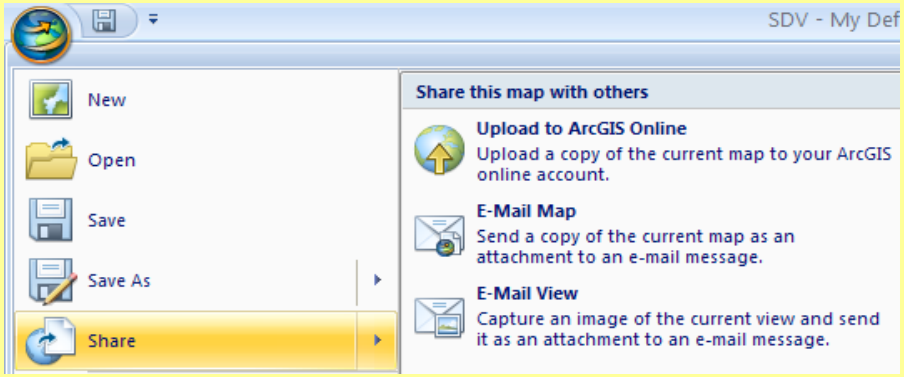
SDV Training

ArcGIS Explorer Icon

- Open
- Save As
- Share



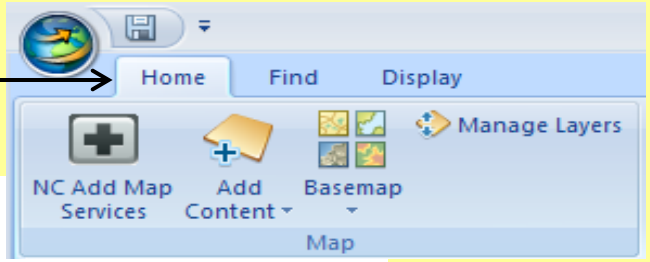




SDV Training

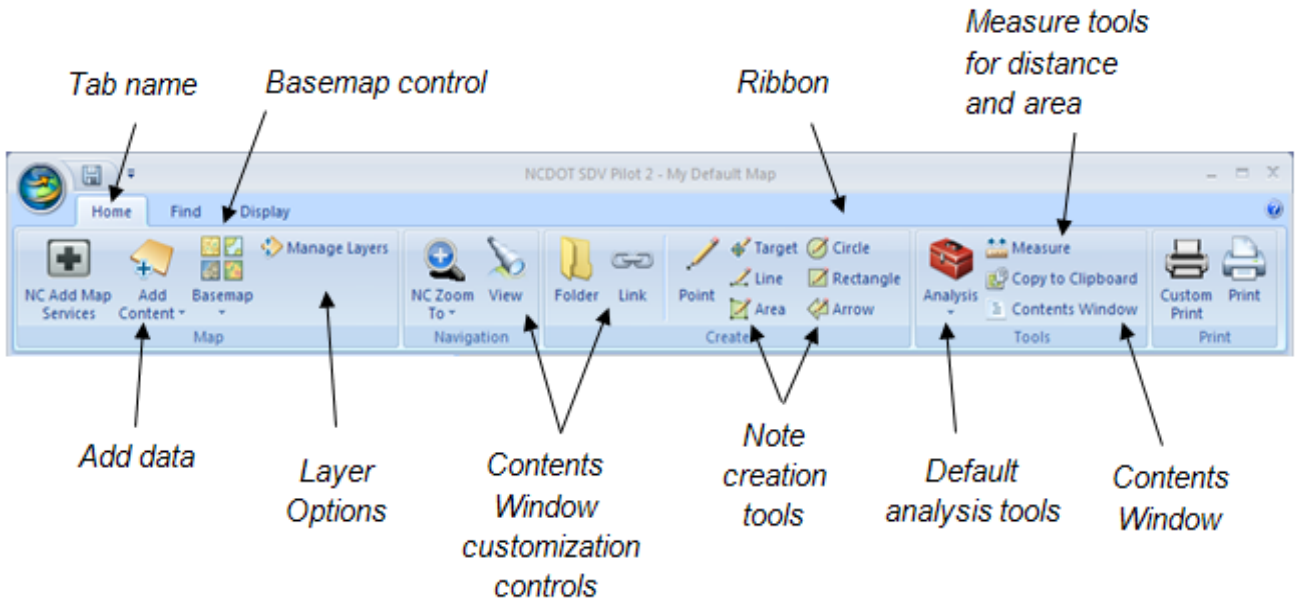
SDV Tabs

Home Tab



There are 3 initial tabs on the Ribbon:

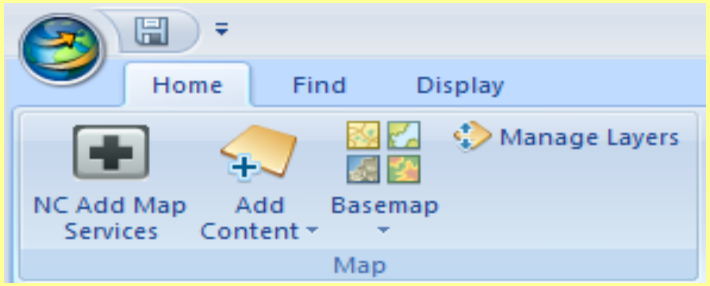
Home tab, which carries tools and functions common to all datasets:



SDV Training

SDV Tabs

Home Tab



Map Group

- NC Add Map Services
  - Add SDV map services to the Contents Window
- Add Content
  - ArcGIS online, layers, Map Content files, KML files, GIS Services, shapefiles, raster data, Geodatabase, text files, GPS data, Image overlays
- Basemap
  - NCDOT, ESRI's World Topo, Bing, My Basemap
- Manage Layers
  - Change layer position, remove, clear cache

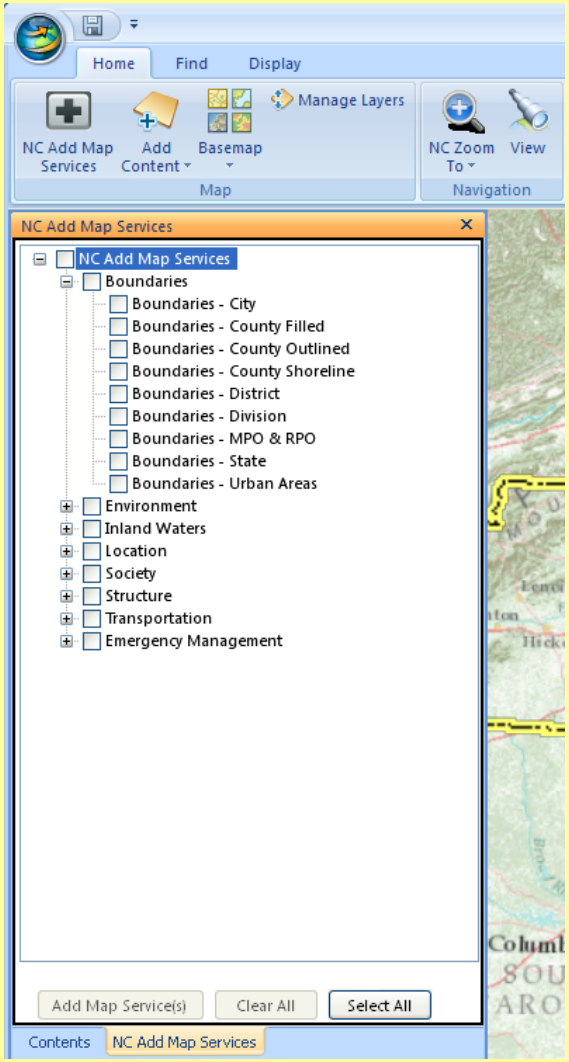
SDV Training

Home Tab

NC Add Map Services

- Over 40 map services
- Organized by type
- New ones under development
- Guided by Business Unit
- SDV Resource Center announcements
- Send suggestions to:

  gishelp@ncdot.gov

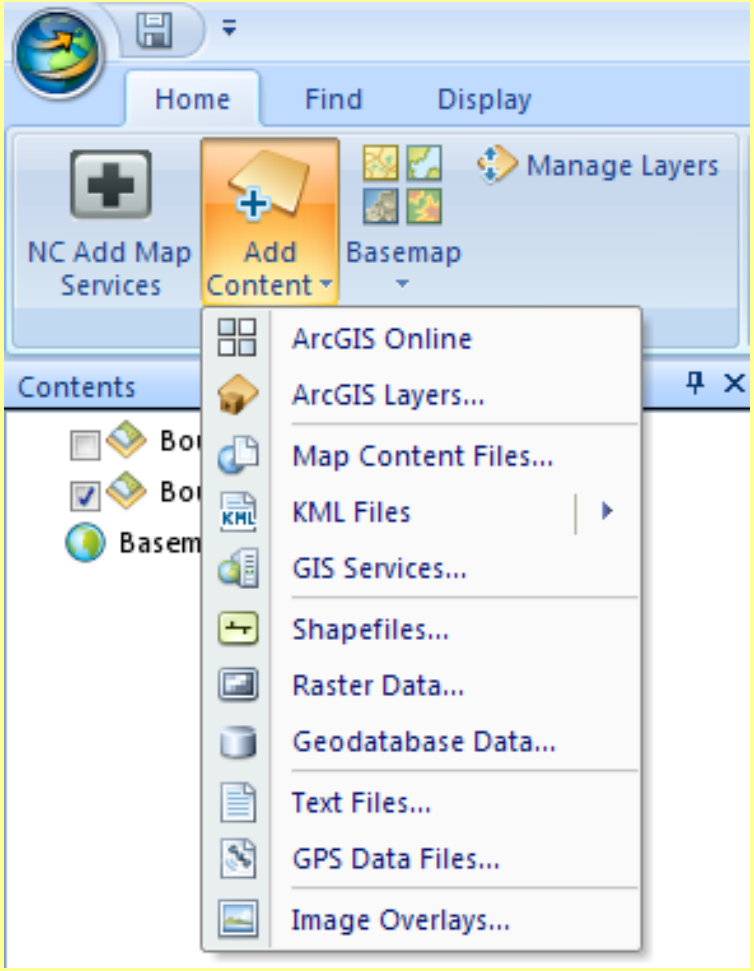


SDV Training

Home Tab

Add Content

- ArcGIS layers
- KML Files
- Shapefiles
- Geodatabase
- Rasters
- Text
- GPS data
- Image Overlays



SDV Training

Home Tab

Add Content

- ArcGIS layers
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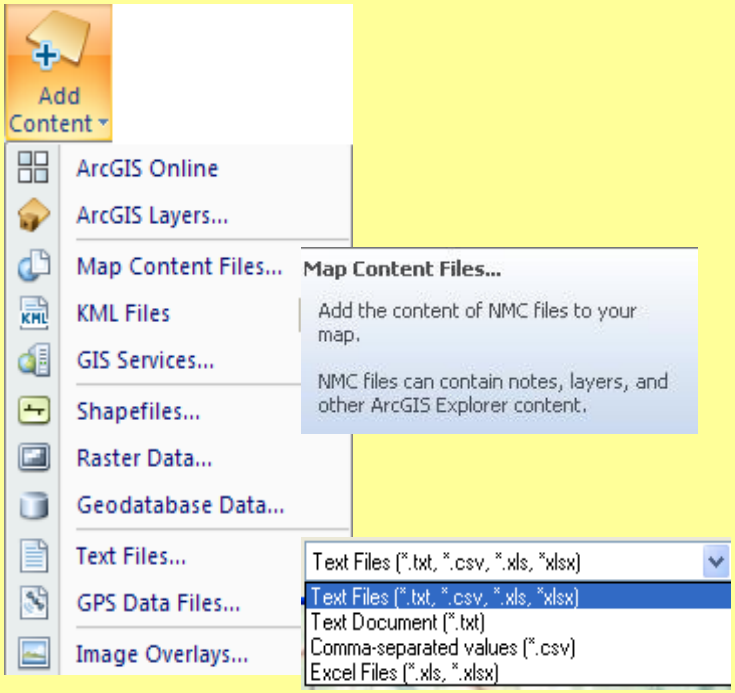
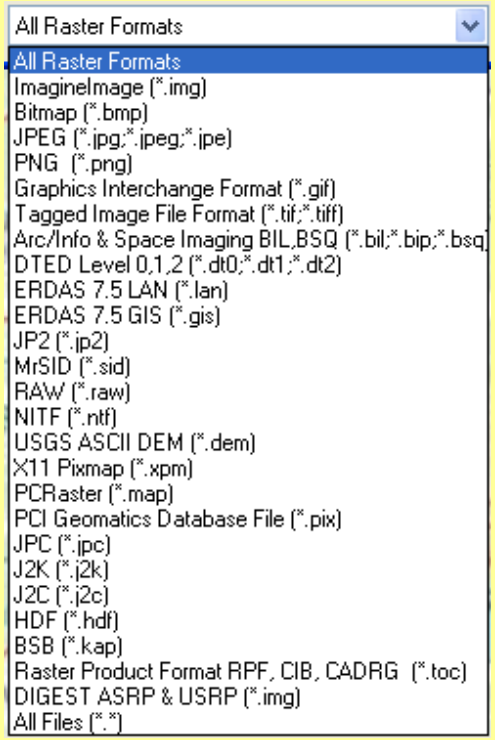
- Geodatabase
- Rasters
- Text
- GPS data
- Overlays



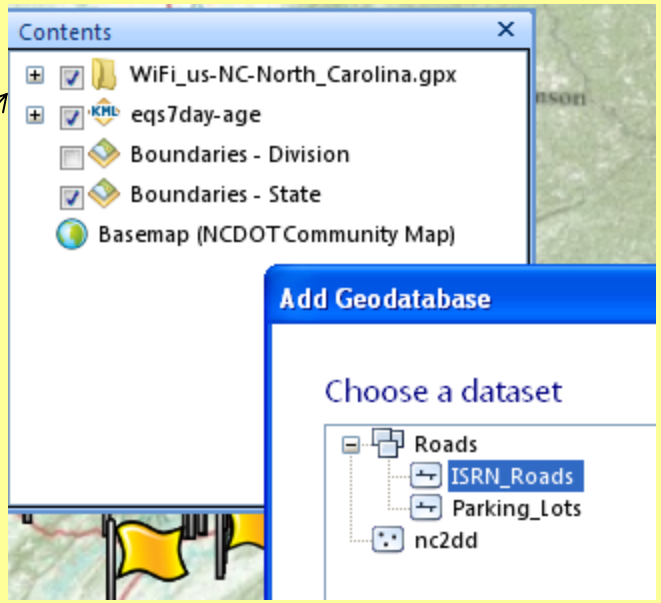


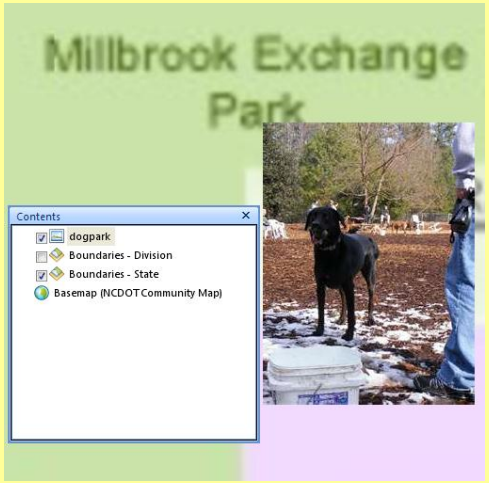
SDV Training

Home Tab

Add Content

- ArcGIS layers
- KML Files (http://earthquake.usgs.gov/earthquakes/shakemap/)
- Shapefiles
- Geodatabase
- Rasters
- Text
- GPS data
- Overlays



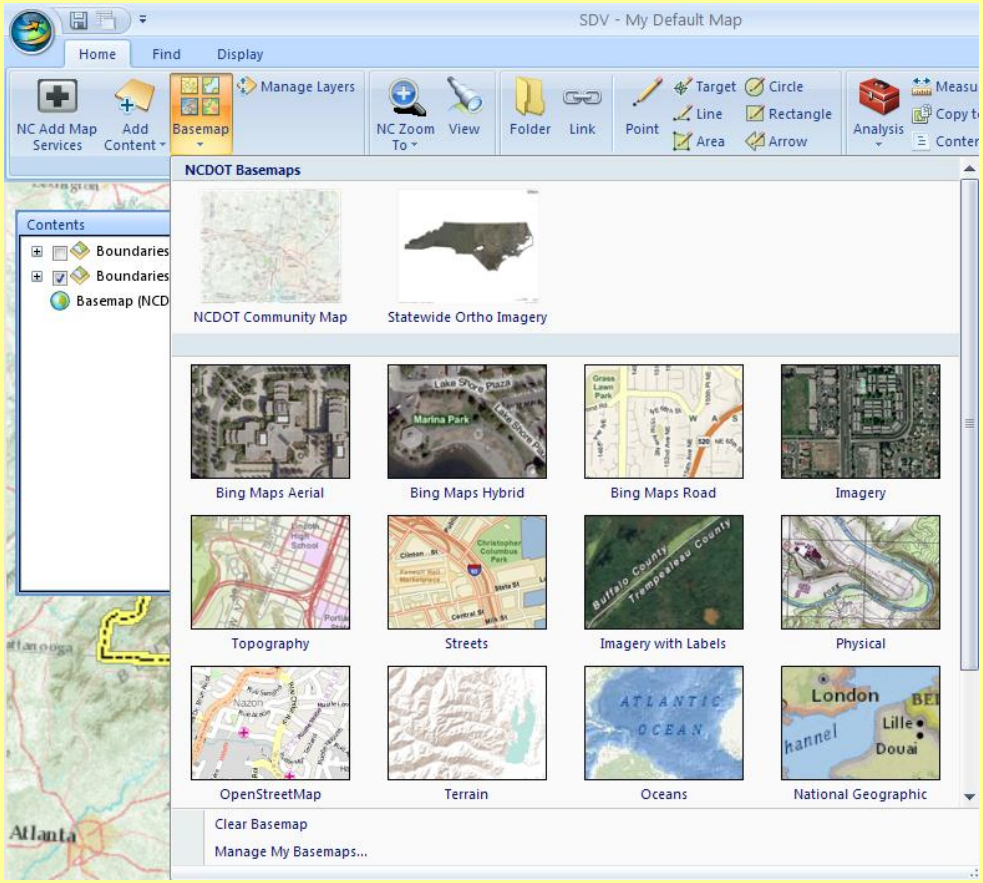


SDV Training

Home Tab

Basemap

- Reference data
- Displays under GIS data

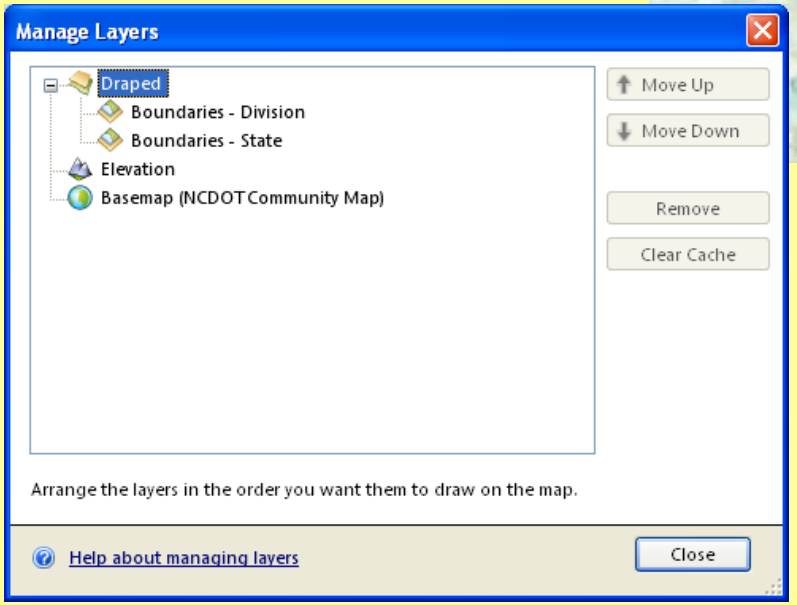


SDV Training

Home Tab

Manage Layers

- Change draw order
- Remove cache

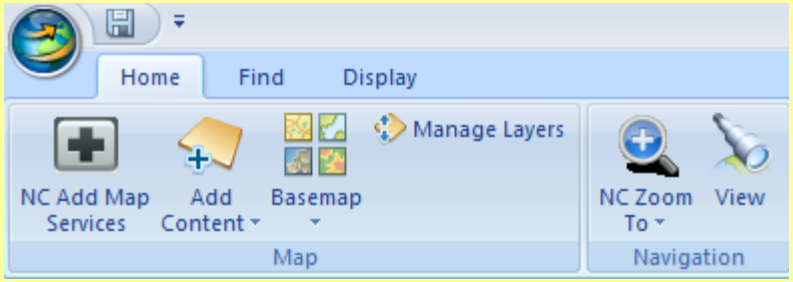


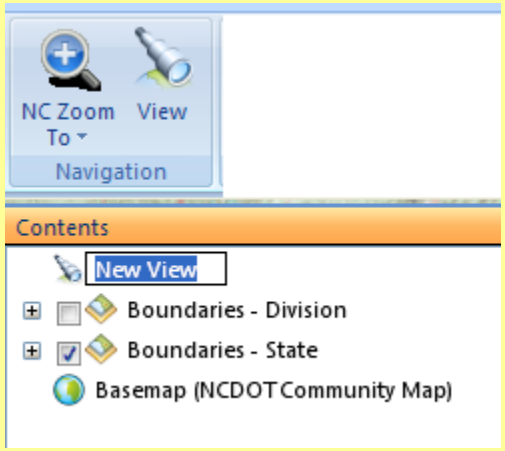
SDV Training

Home Tab

Navigation Group

- NC Zoom To
  - State, Division, County, City, Community, Street
- View
  - Create a view of map to return to



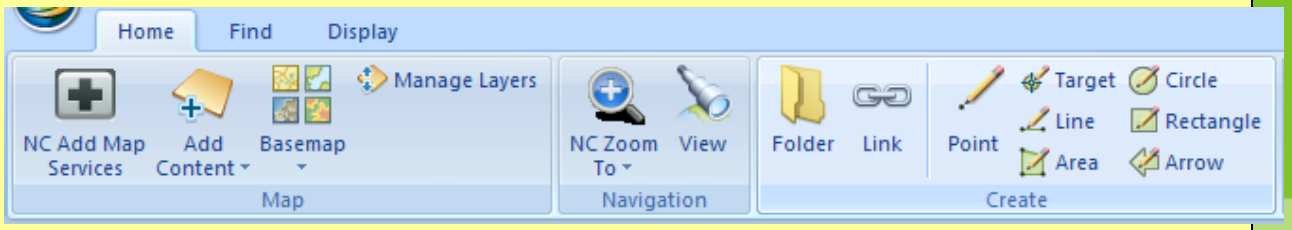


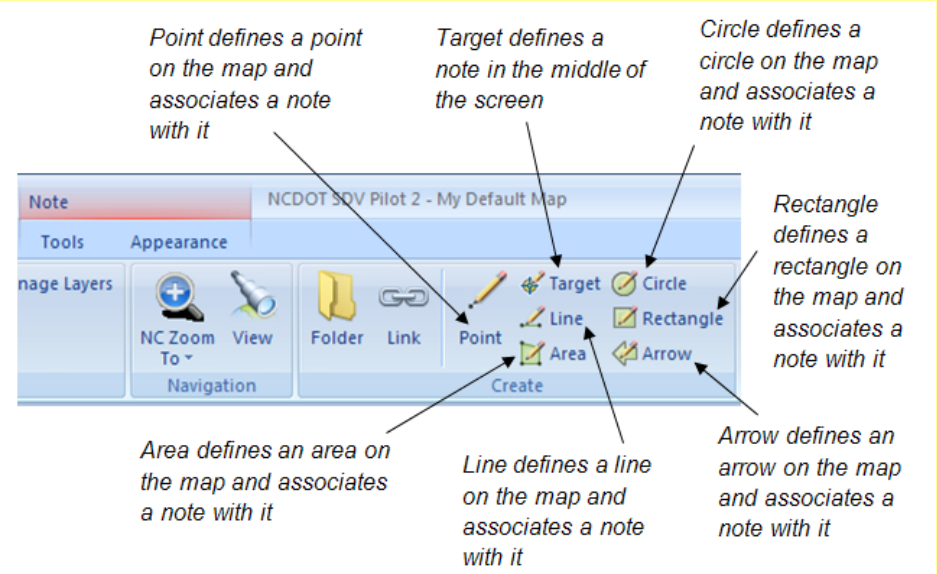
SDV Training

Home Tab

Create Group

- Folder
- Link
- Point
- Target
- Line
- Circle
- Rectangle
- Area



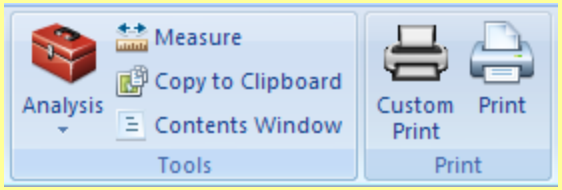


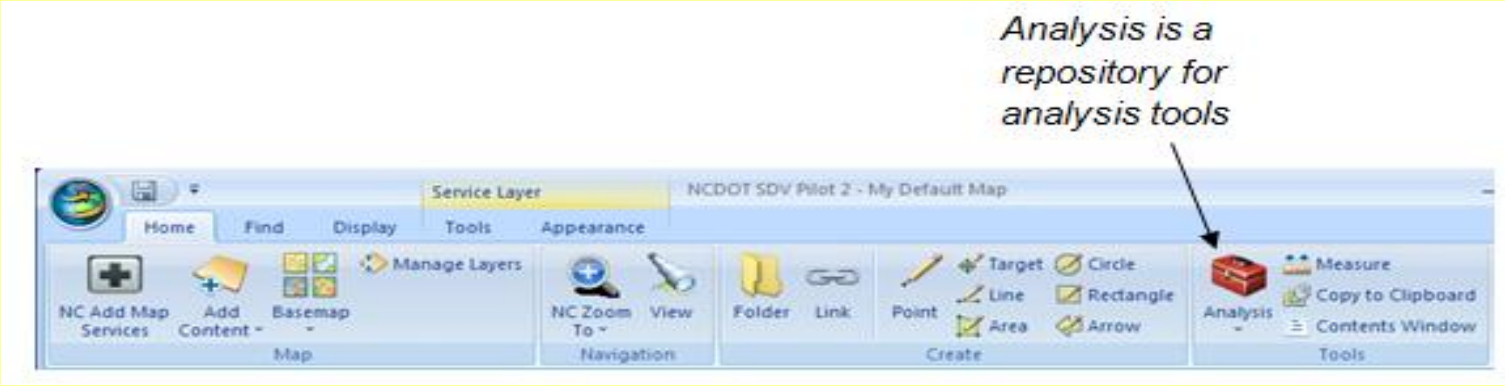
SDV Training

Home Tab

Tools Group

- Analysis
- Measure
- Copy to Clipboard
- Contents Window



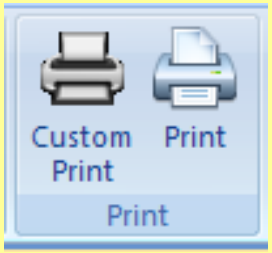


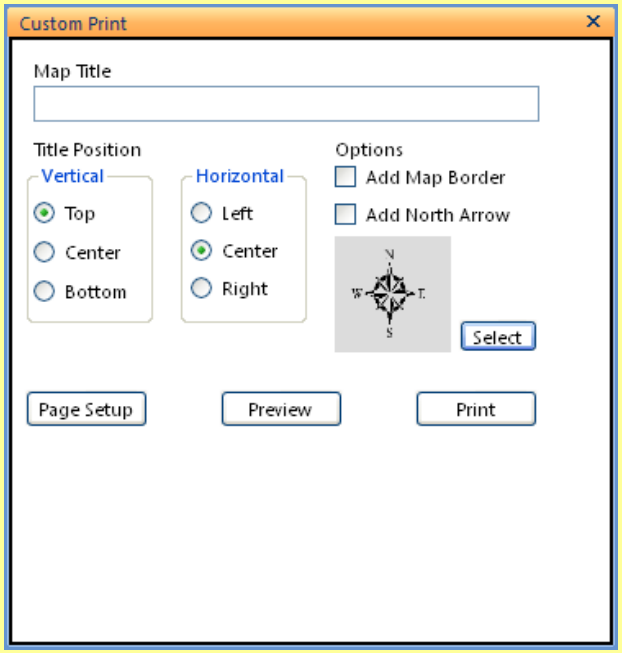
SDV Training

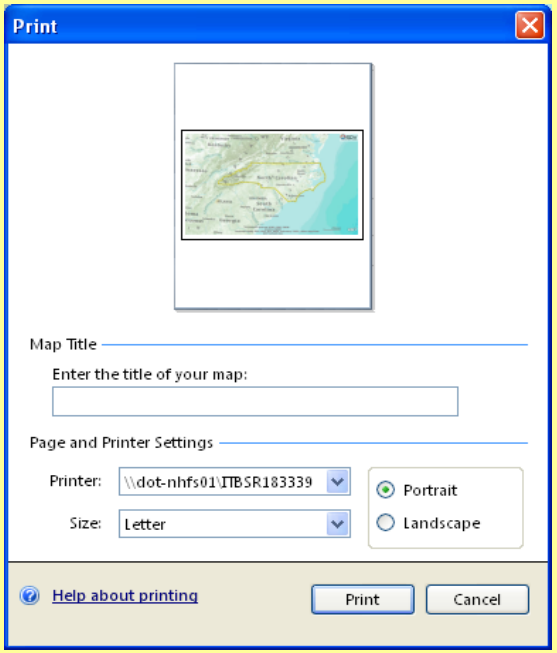
Home Tab

Print Group

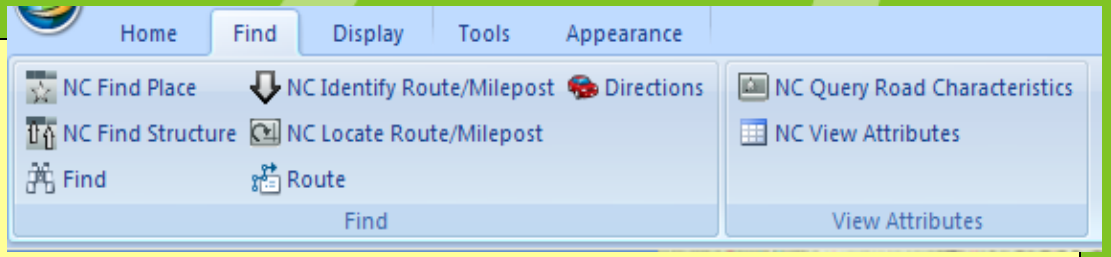
- Custom Print - Map title, border, North Arrow
- Print - Map title, printer, size, orientation







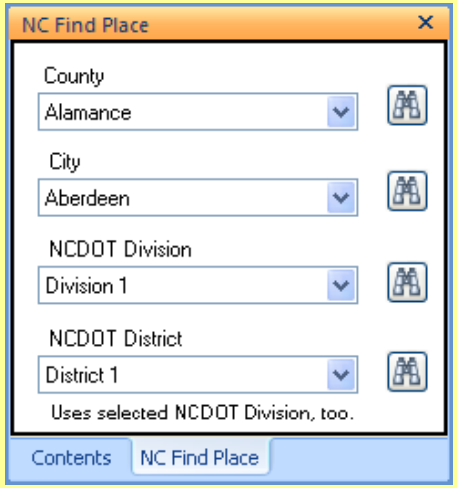
SDV Training

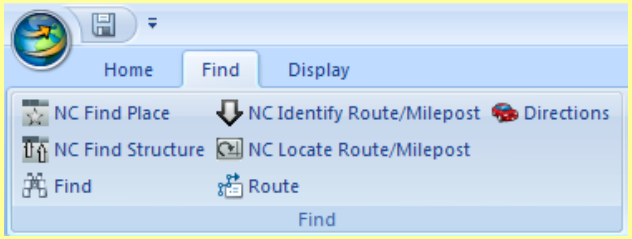


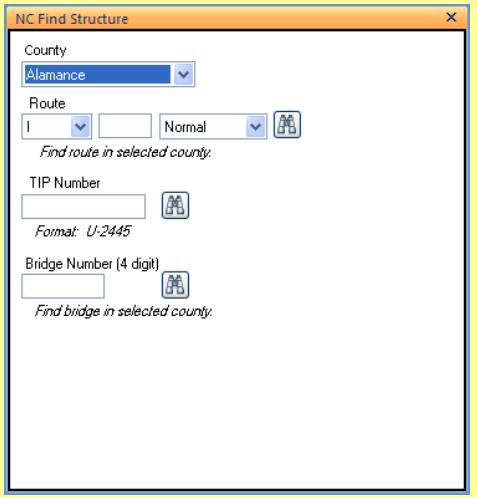
Find Tab

Find Group

- NC Find Place
  - County, City, NCDOT Division, NCDOT District
- NC Find Structure
  - County, Route, TIP Number, Bridge Number



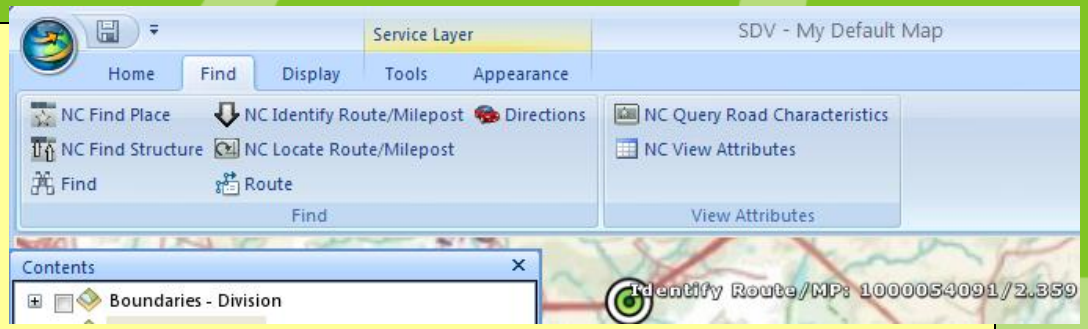




SDV Training

Find Tab

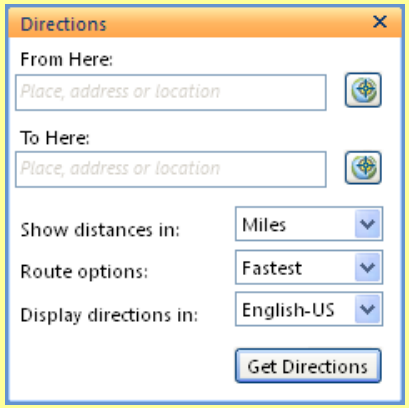
Find Group - continued

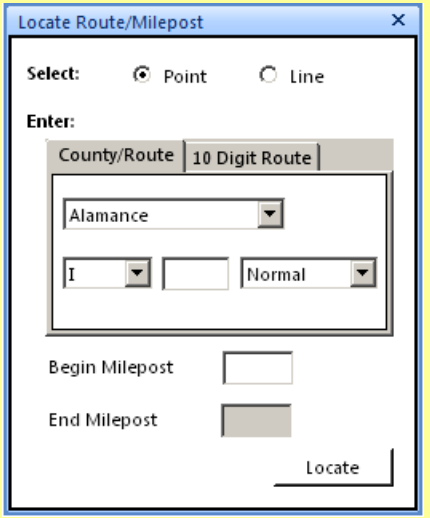


- NC Identify Route/Milepost

  provides a mechanism to identify a route and its milepost information at a specified point

- NC Locate Route/Milepost
- Directions



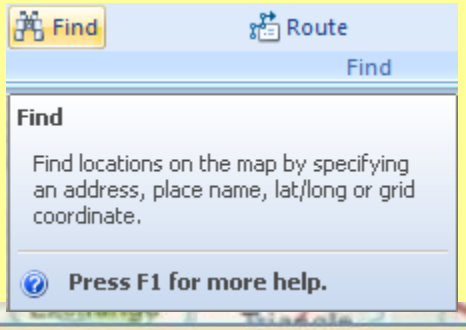


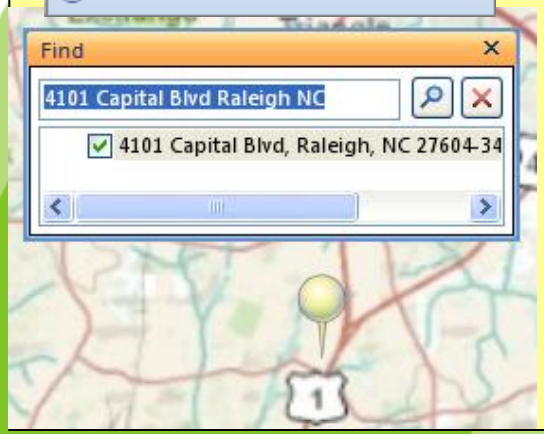
SDV Training

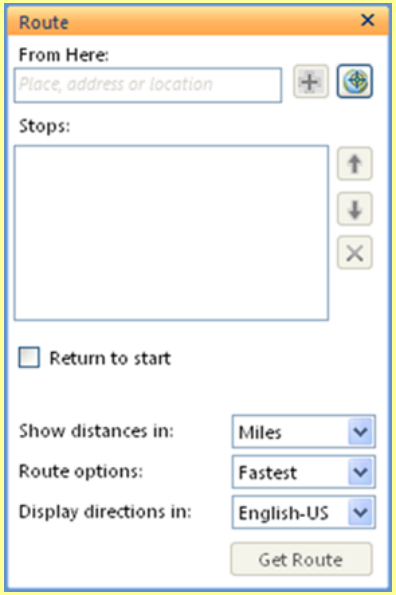
Find Tab

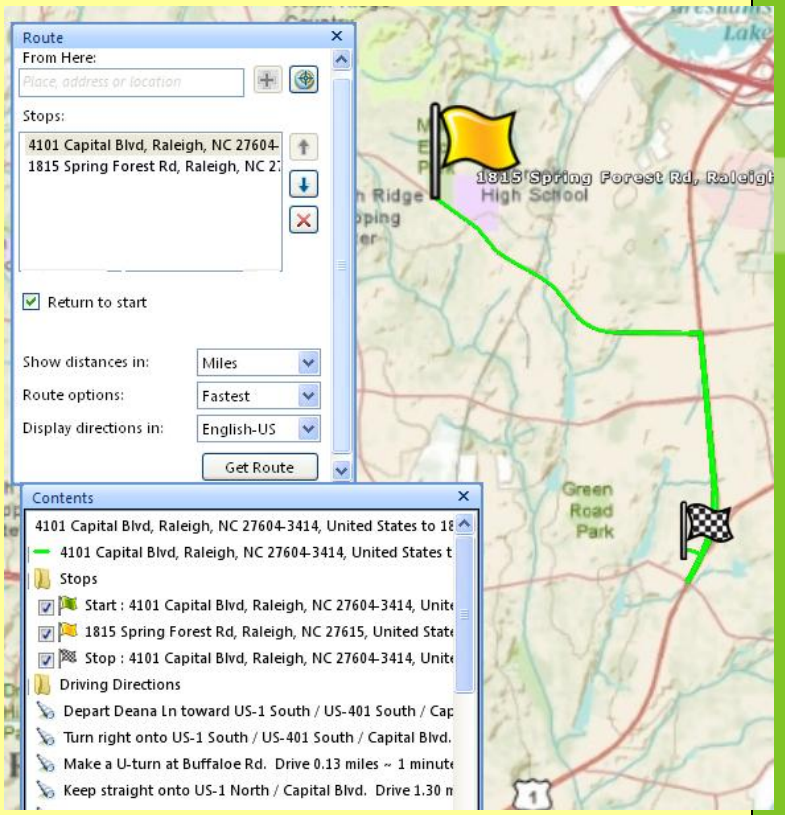
Find Group - continued

- Find
- Find Route







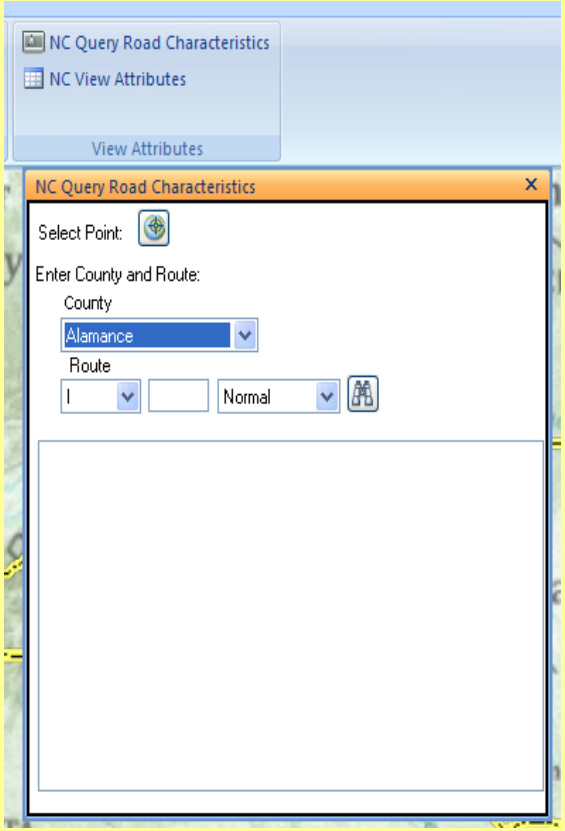


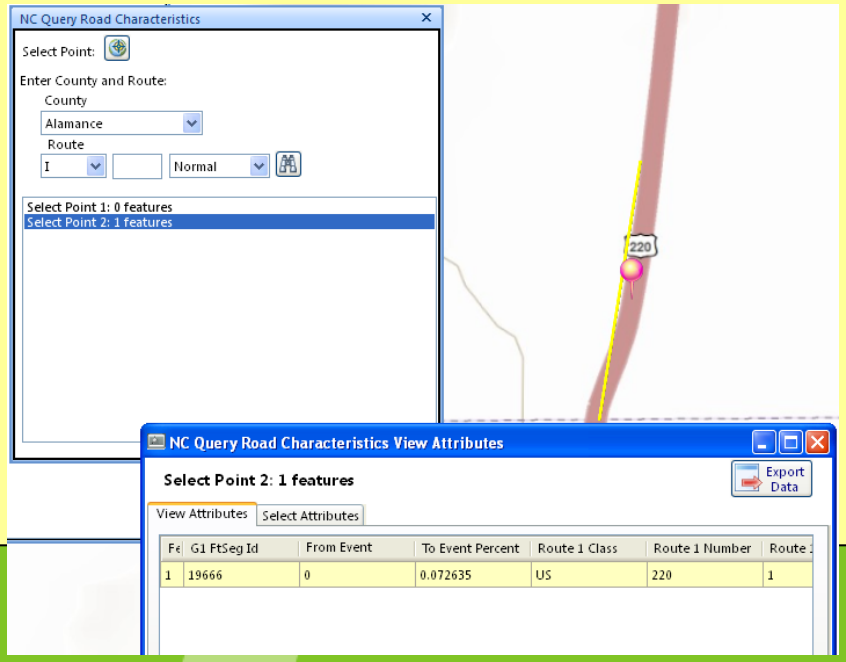
SDV Training

Find Tab

View Attributes Group

- NC Query Road Characteristics
  - Retrieve road characteristics
- NC View Attributes
  - View feature layer attributes



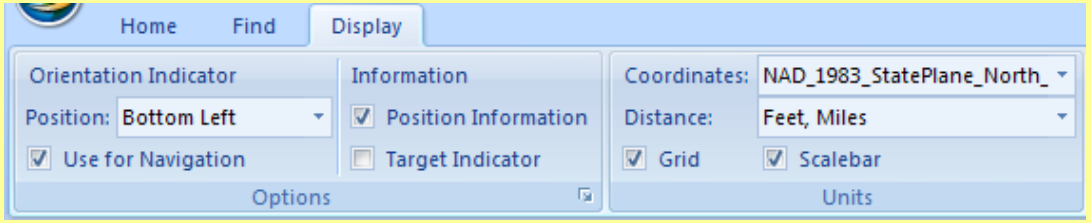


SDV Training

Display Tab

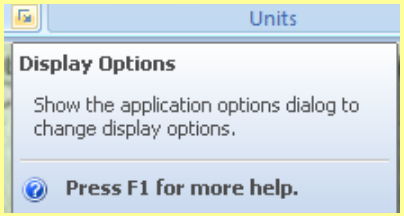
Options Group

- Orients the zoom/pan tool to move around the Display Window



Units Group

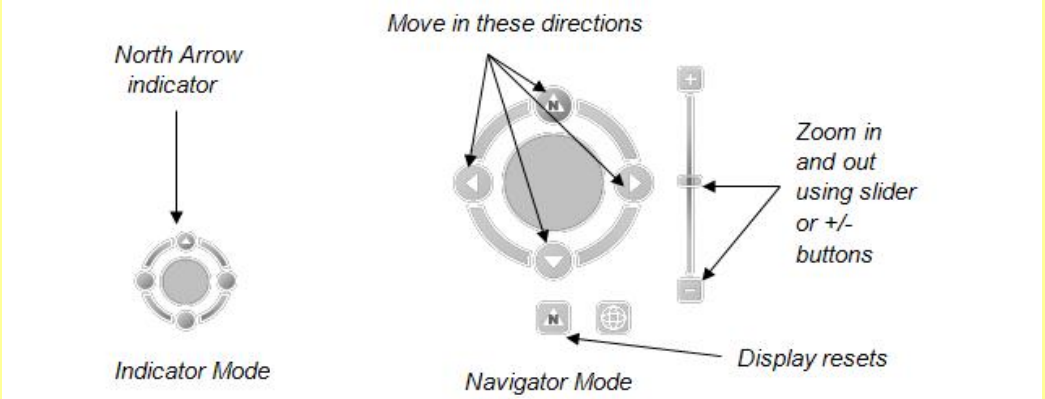
- Select coordinate system, units of measurement
  - Select Grid, Scalebar



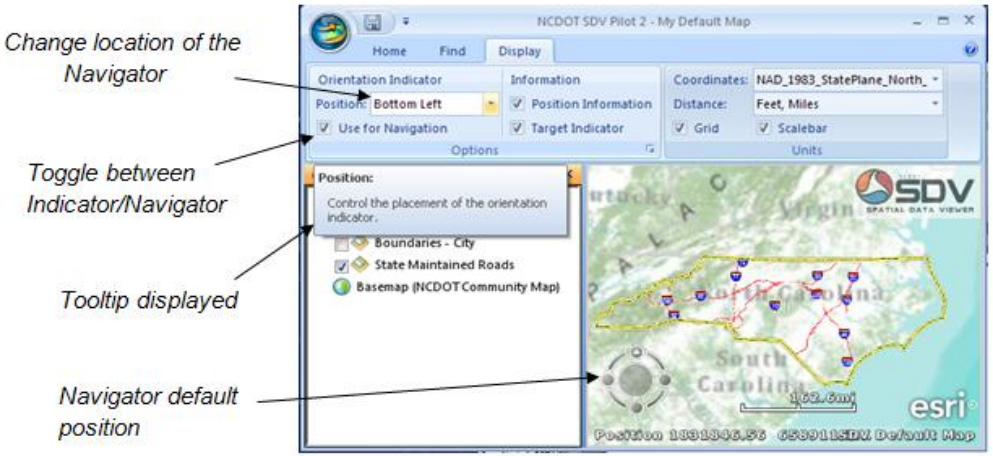
SDV Training

Display Tab

Navigator



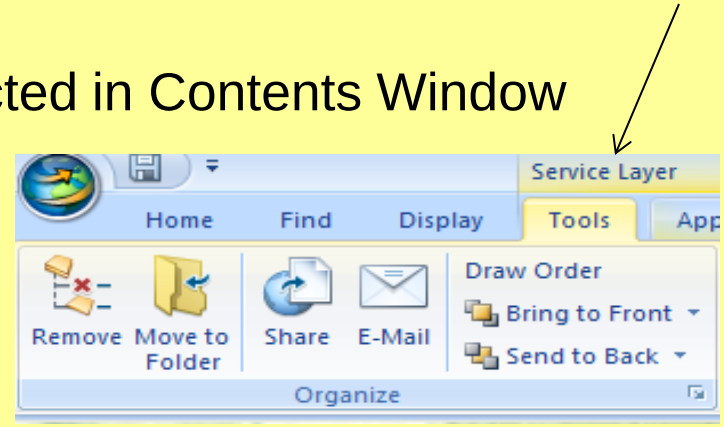
The Navigator can be repositioned and turned on or off using controls under the Display tab.



SDV Training

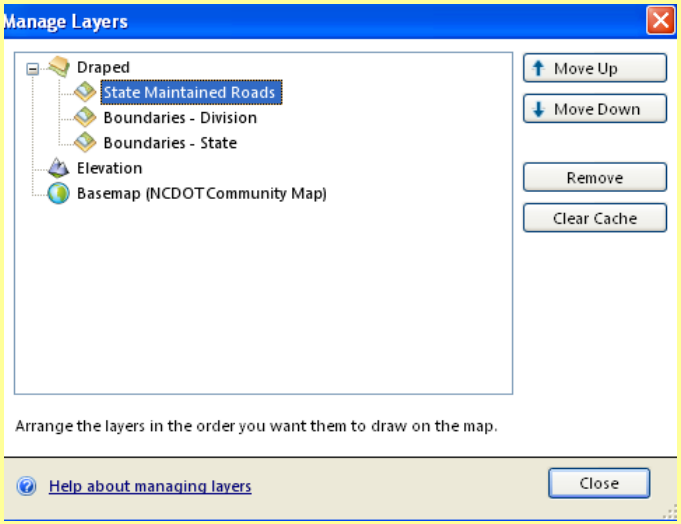
Tools Tab

Visible when Layers or Notes are selected in Contents Window



Organize Group

- Remove
- Move to Folder
- Share
- E-Mail
- Draw Order
  - Bring to Front
  - Send to Back

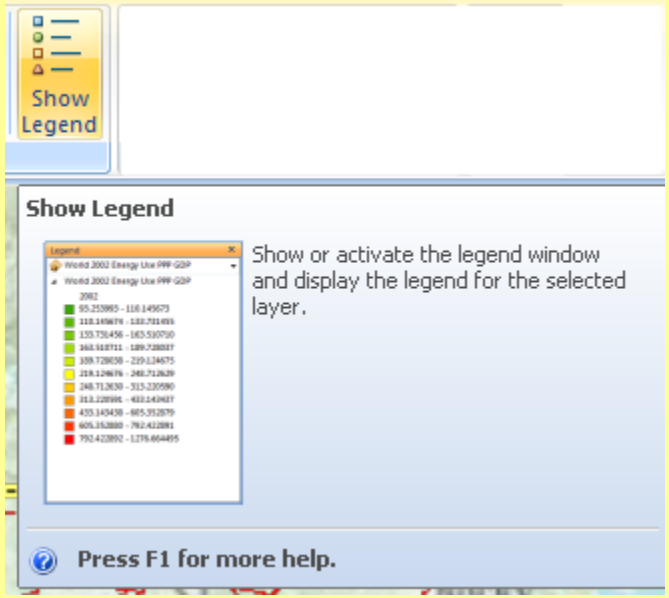


SDV Training

Tools Tab

View Group

- Go To
  - Zooms to selected content layer
- Set Default View
  - Bookmarks the map
- Show Legend
  - Shows features of selected content layer

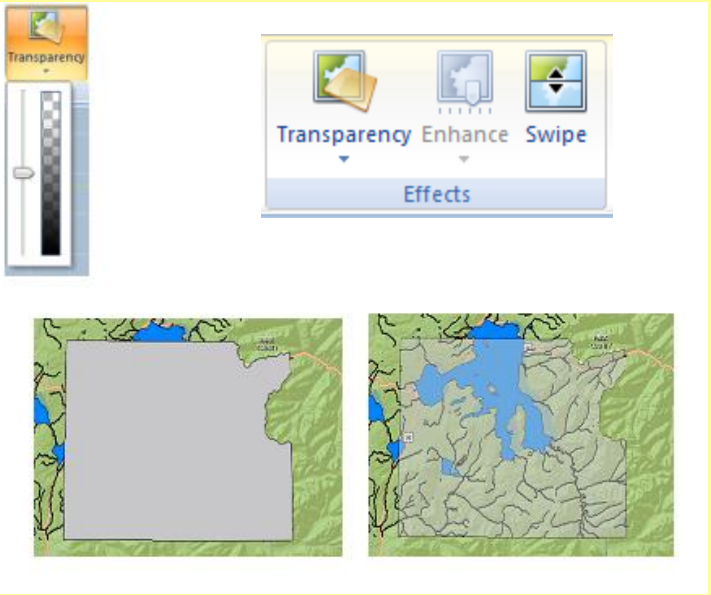


SDV Training

Tools Tab

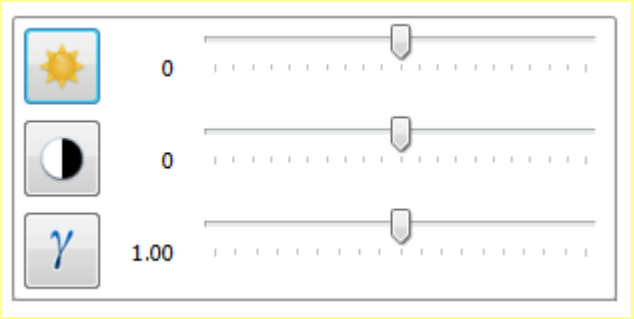
Effects Group

- Transparency
  - For selected layer



(Also accessed from Appearance tab)

- Enhance
  - For image



SDV Training

Tools Tab

Effects Group

- Swipe
  - For selected layer

Swipe

Use Swipe to reveal layers beneath the layer you chose to swipe and, depending on how you've set the Layers options, the layers above it. This button makes it easy to quickly see what is underneath a particular layer without having to turn it off in the *Contents* window or reorder layers.

To reveal layers beneath the layer you've selected

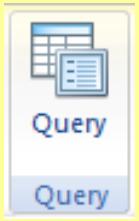
Choose the layer or group layer you want to swipe from the *Contents* window, then move the cursor over the map. You'll notice that the cursor changes based on whether you are resting the mouse pointer on the top, bottom, left, or right of the map. This lets you choose the direction in which you want to swipe the layer. Hold down the left mouse button and drag in the direction indicated by the mouse pointer.

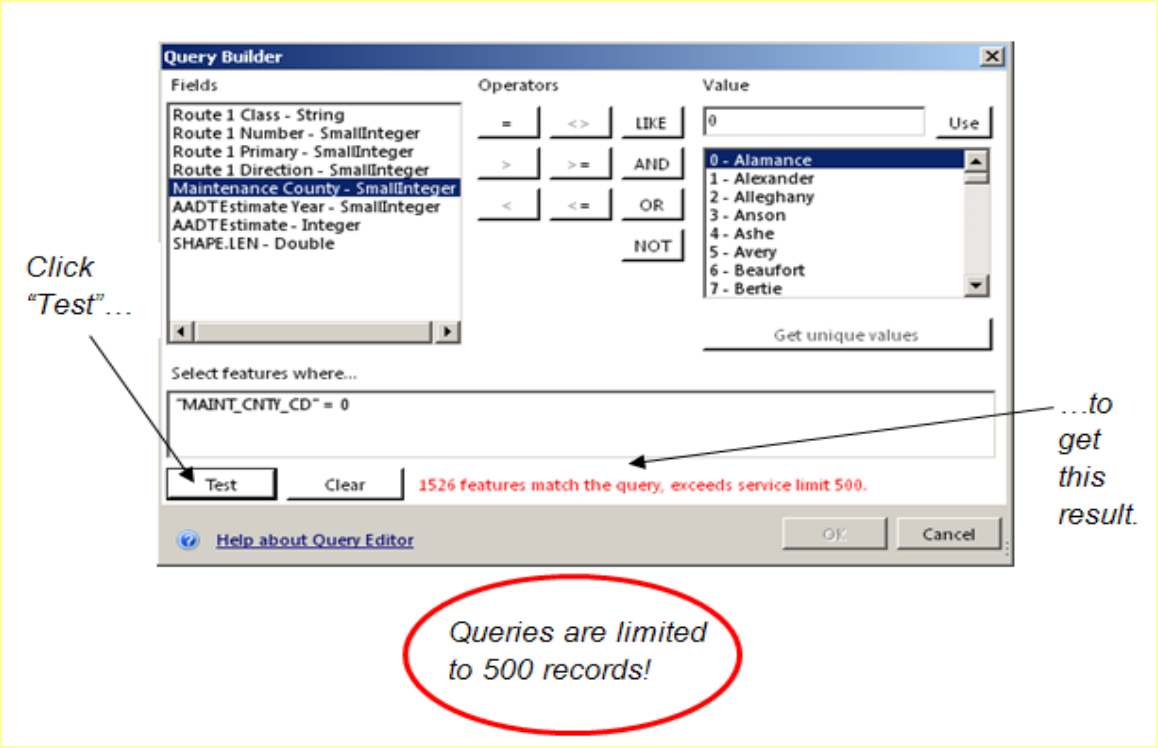
SDV Training

Tools Tab

Query Group

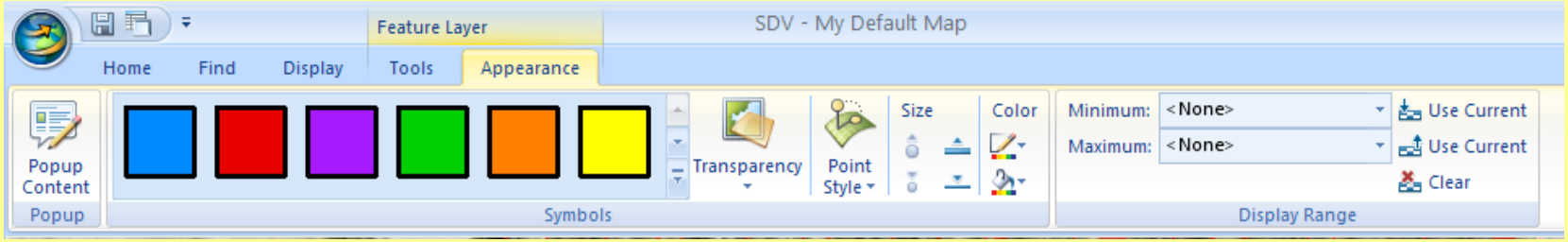
- To query a selected layer from the Contents Window
- Access SDV Resource Center for Help





SDV Training

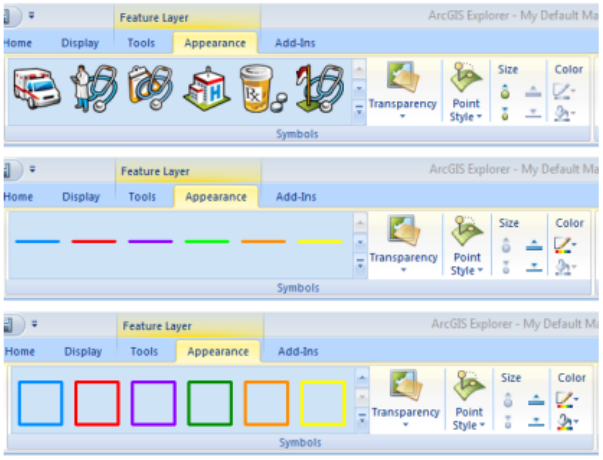
Appearance Tab



Symbols Group

- Change the display options
- Notes
- Symbols
- Labels

The *Appearance* tab includes a *Symbol* group that contains various controls for selecting symbols to draw the GIS data with and controls for modifying properties of the symbol. Notice the different galleries for points, line, and areas (polygons):

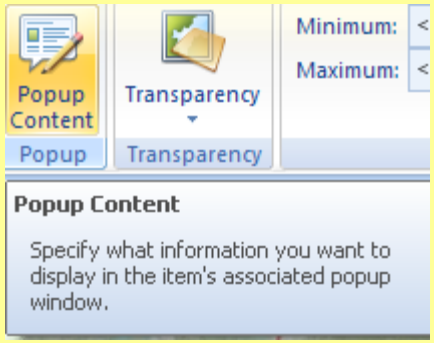


SDV Training

Appearance Tab

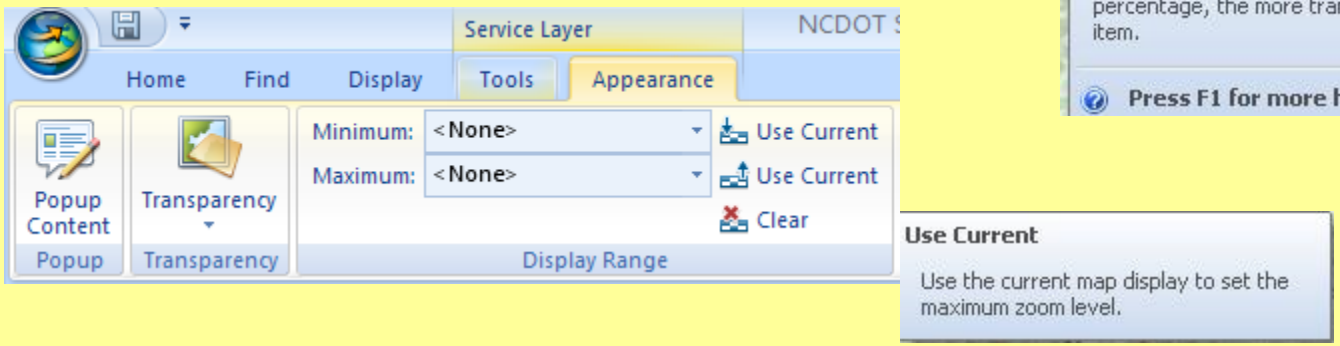
Popup Group

- Provides information about item selected



Transparency Group

Display Range Group



SDV Training

FACILITATE

- Access NC and NCDOT data
- Share information

FUNCTIONALITY

- More NC map services, tools
- Flexibility
- SDV Resource Center - http://gisi01.dot.nc.net/SDVResourceCenter/

FUTURE

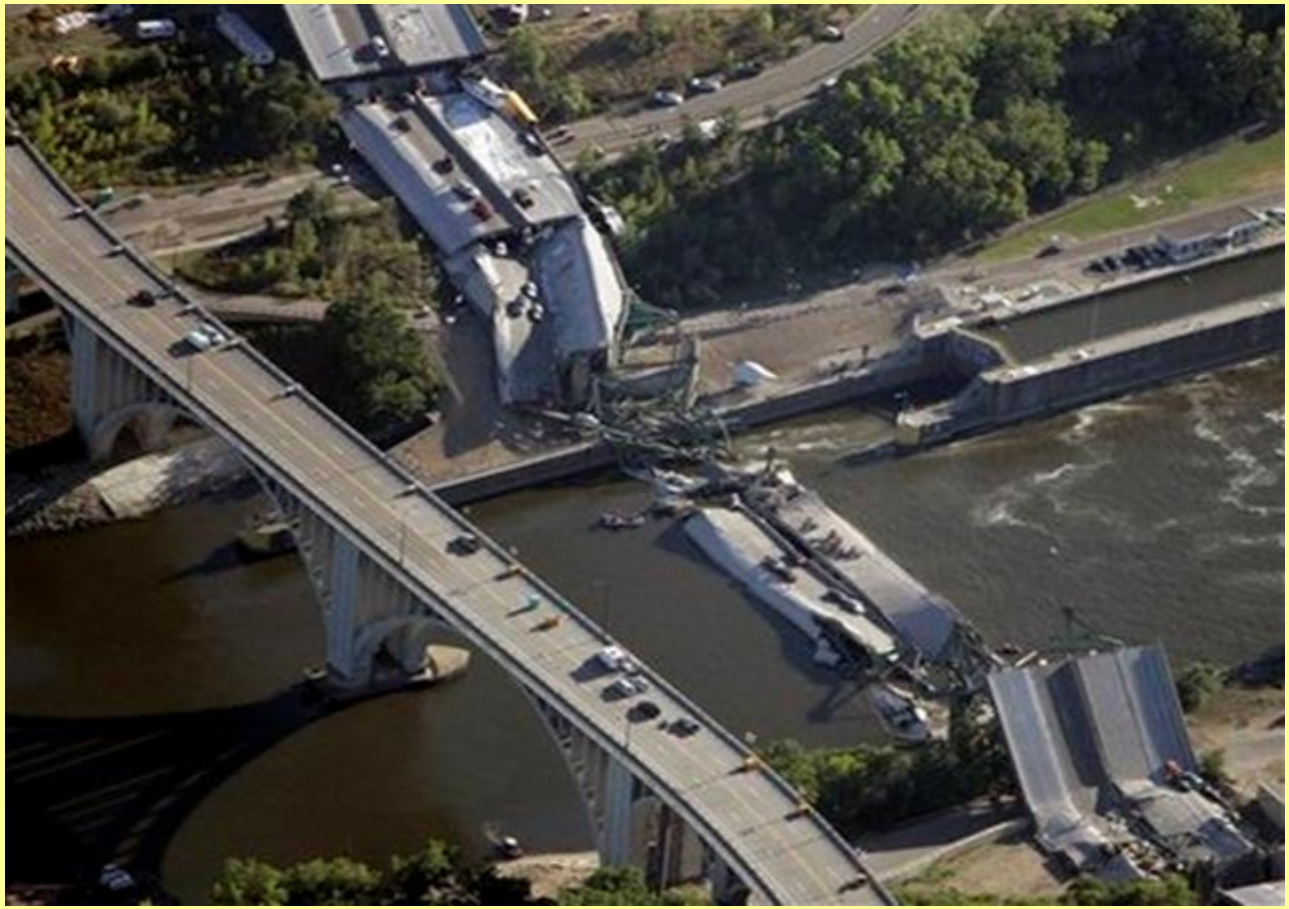
- Suggestions/Help emails go to gishelp@ncdot.gov

TRAINING

- Contact your Training Coordinator to sign up for training or
- Cathy Cole – ccole@ncdot.gov 919-707-2110

SDV Training

Collapsed Bridge Scenario

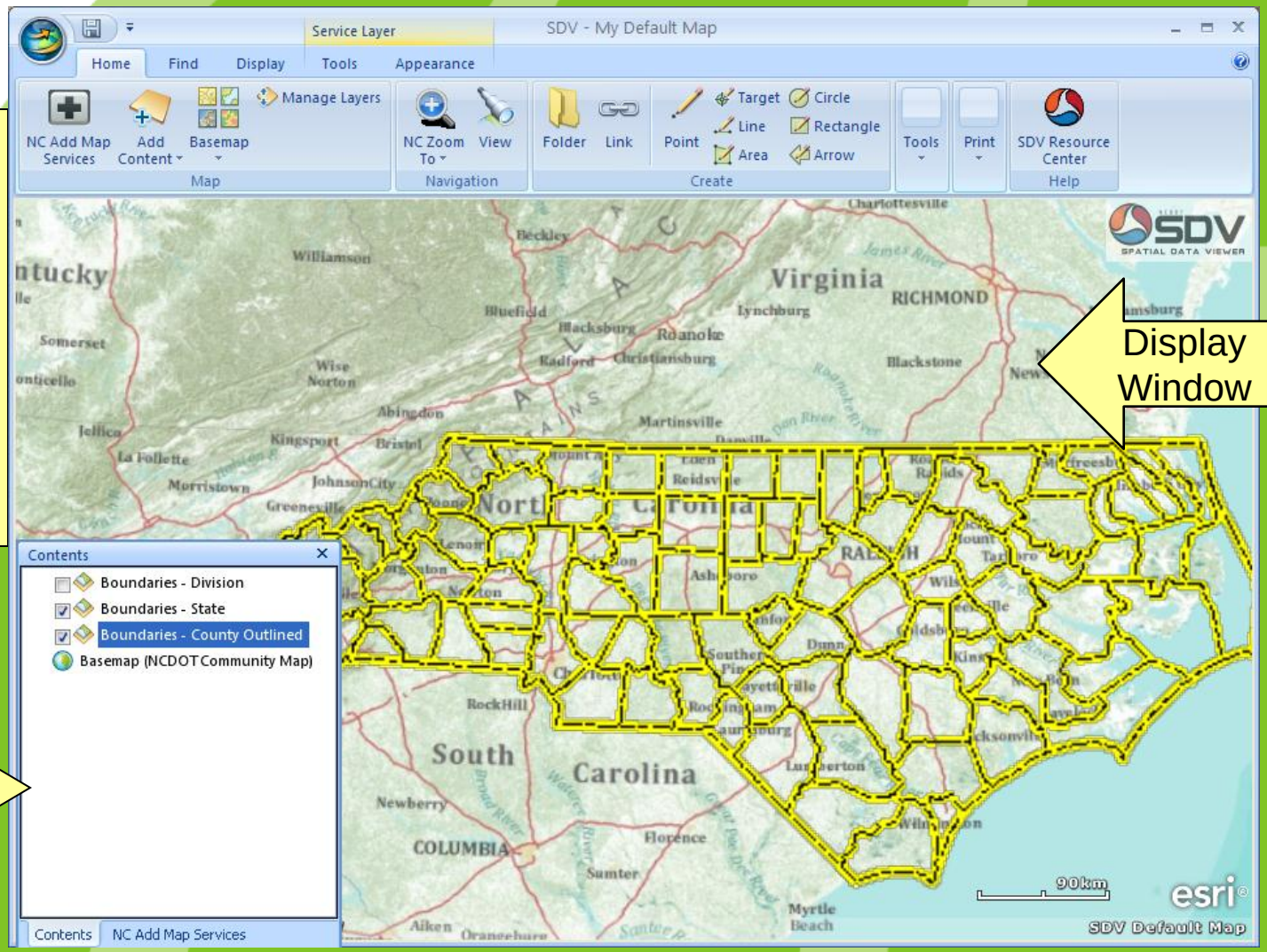


SDV Training

- **Collapsed Bridge Scenario**
  - Add Map Services
  - SDV Resource Center
  - NC Find Tools
  - Query Tools
  - Zoom to incident area (mouse, NC Zoom, navigation tool)
  - Change Basemap
  - Find road characteristics, bridge, pavement, & fatal accident data
  - View attributes of collapsed section
  - Create note for area in question
  - Email the map
  - Add external data to the map
  - Measure area around collapsed bridge, distance to alternate route
  - Add North Arrow, Print preview Map, save as PDF

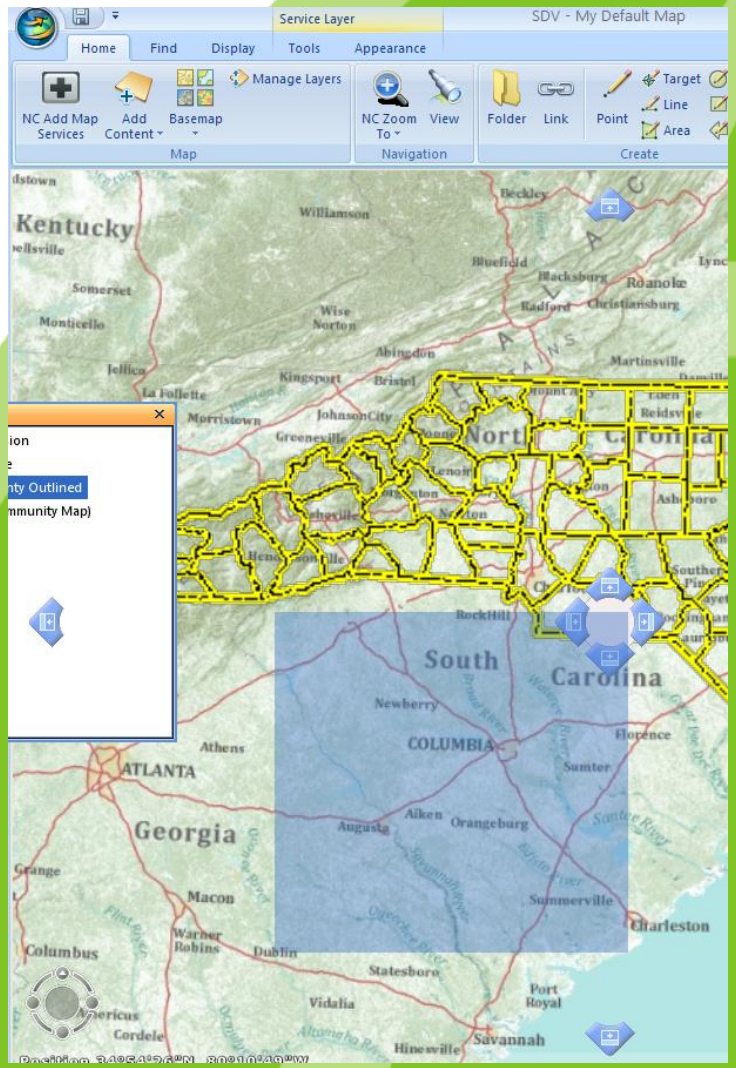
SDV Training

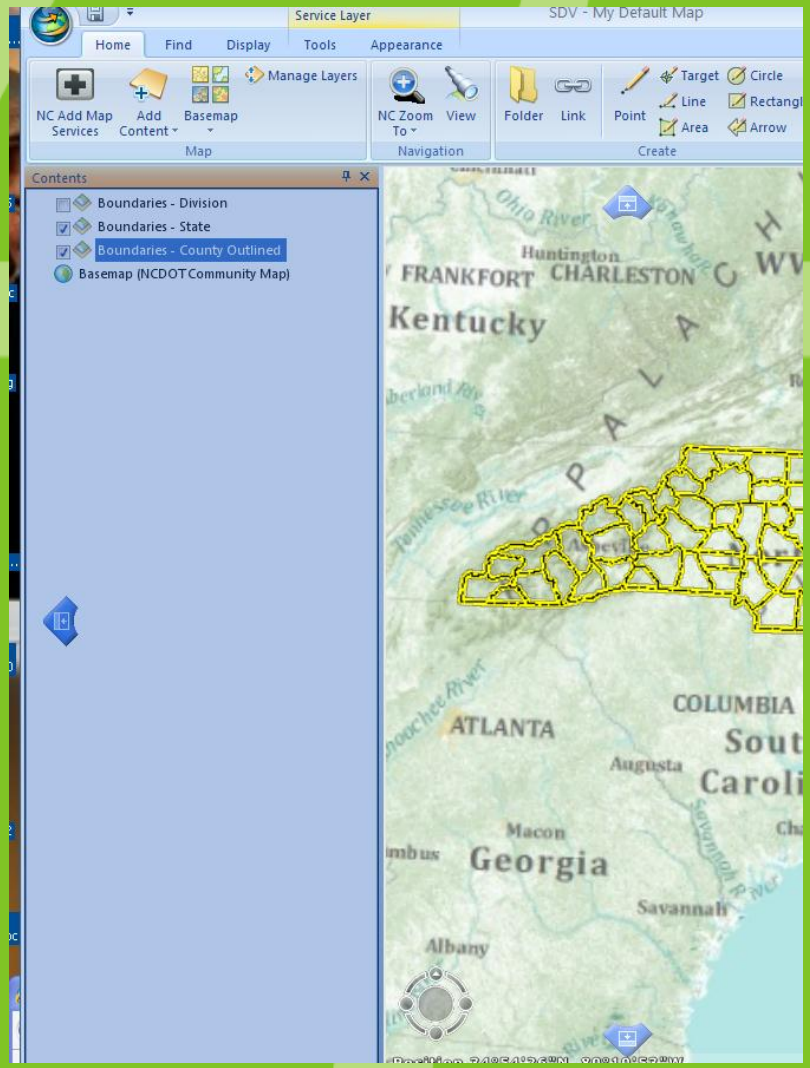
- Open SDV
- Add NC Map Service
- Select layer



SDV Training

Docking





SDV Training

Coordinate Systems

Feedback | E-mail this topic | Print this topic

About Coordinate Systems

A coordinate system is a fixed reference framework superimposed onto the surface of an area to designate the location of features within it. The positions of objects on the earth's spherical surface are measured in geographic coordinates. While latitude and longitude can locate exact positions on the surface of the earth, they are not uniform units of measure; only along the equator does the distance represented by one degree of longitude approximate the distance represented by one degree of latitude. To overcome measurement difficulties, data is often transformed from three-dimensional geographic coordinates to two-dimensional projected coordinates.

Learn more about Map Projections

Coordinate systems (either geographic or projected) provide a framework for defining real-world locations. In ArcGIS Explorer, the coordinate system is used as the method to automatically integrate the geographic locations from different datasets into a common coordinate framework for display and analysis.

To work with coordinate systems in ArcGIS Explorer

ArcGIS Explorer provides two property sheets that allow you to work with coordinate systems and geographic transformations, one for 2D Coordinate Systems and the other for 3D Coordinate Systems.

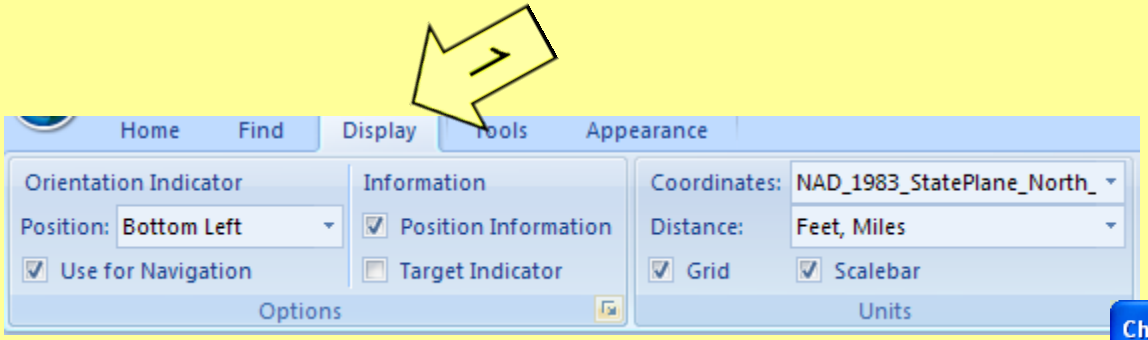
In the 2D Coordinate System property sheet you can choose the coordinate system as well as the geographic transformation(s) to use when projecting layers to the map coordinate system when your map is in 2D Display mode. In the 3D Coordinate System property sheet you can select the geographic transformation(s) to use when projecting layers to the map coordinate system when your map is in 3D Display mode.

To display the Coordinate System properties

1. Click the *ArcGIS Explorer Button* .
2. Click *Map Properties*.
3. Choose *3D Coordinate System* or *2D Coordinate System*.

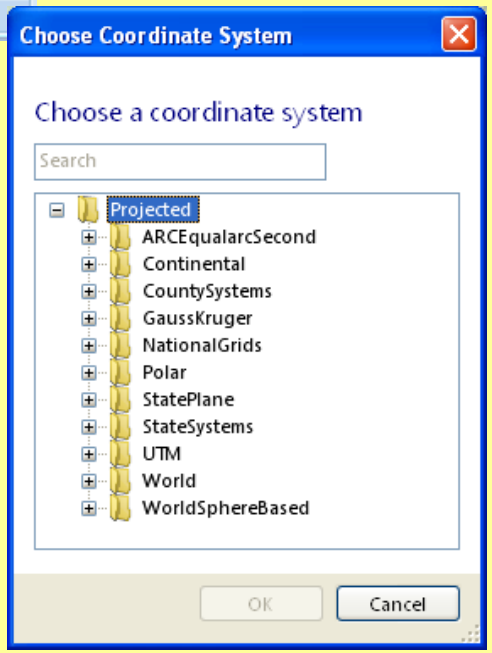
SDV Training

To change the map coordinate system:



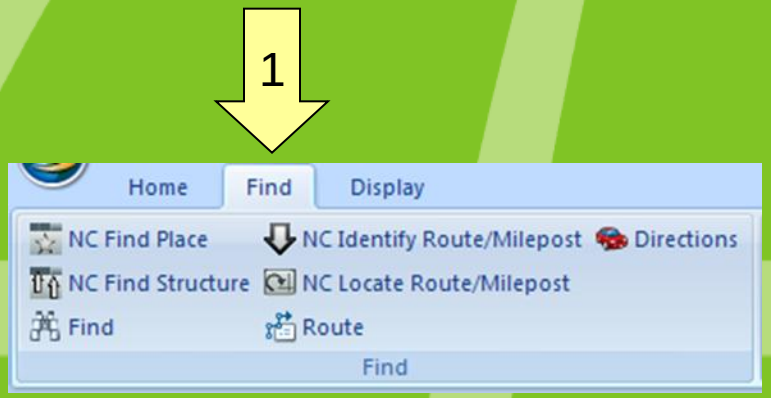
1. Click Display tab
2. Click the coordinates dropdown
3. Click <More>
4. Choose the coordinate system

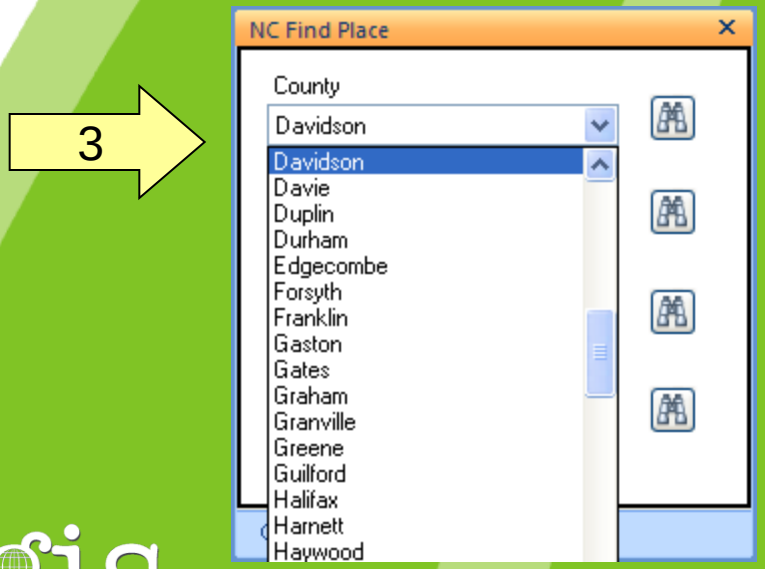
4

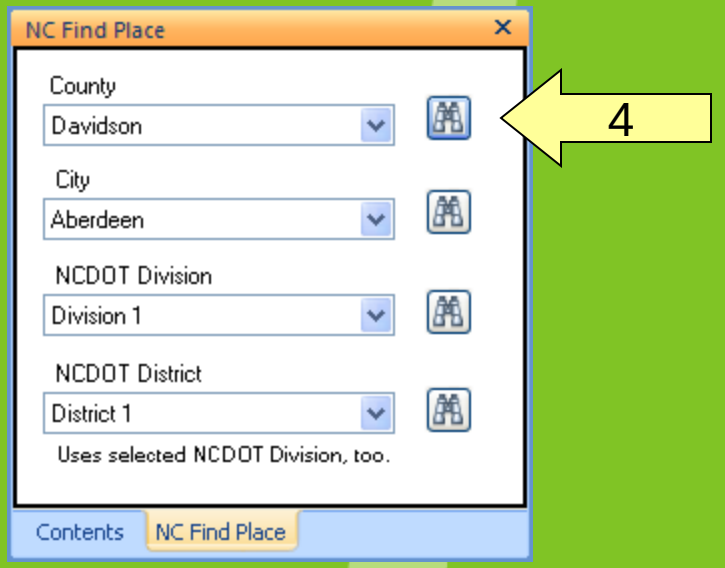


SDV Training

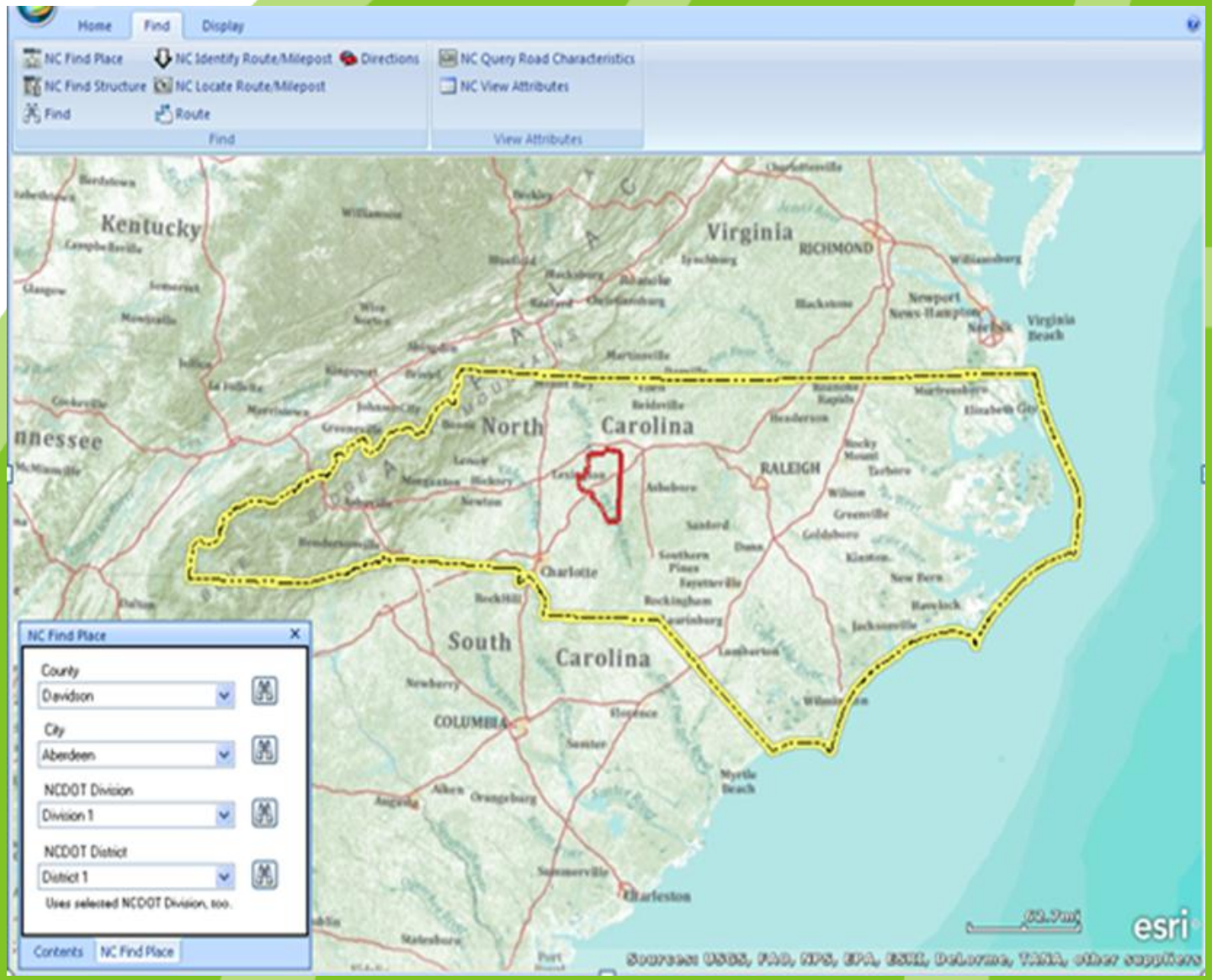
Find Davidson County
1. Click Find tab
2. Click NC Find Place
3. From the County drop down list choose Davidson County
4. Click the search button





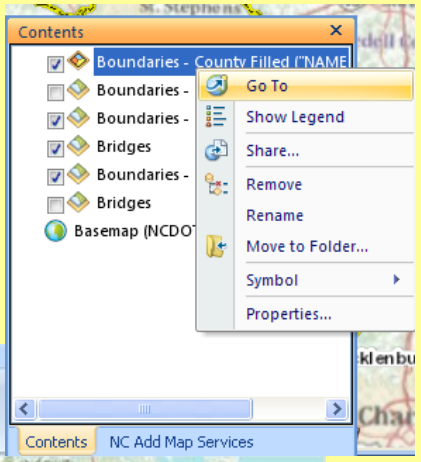


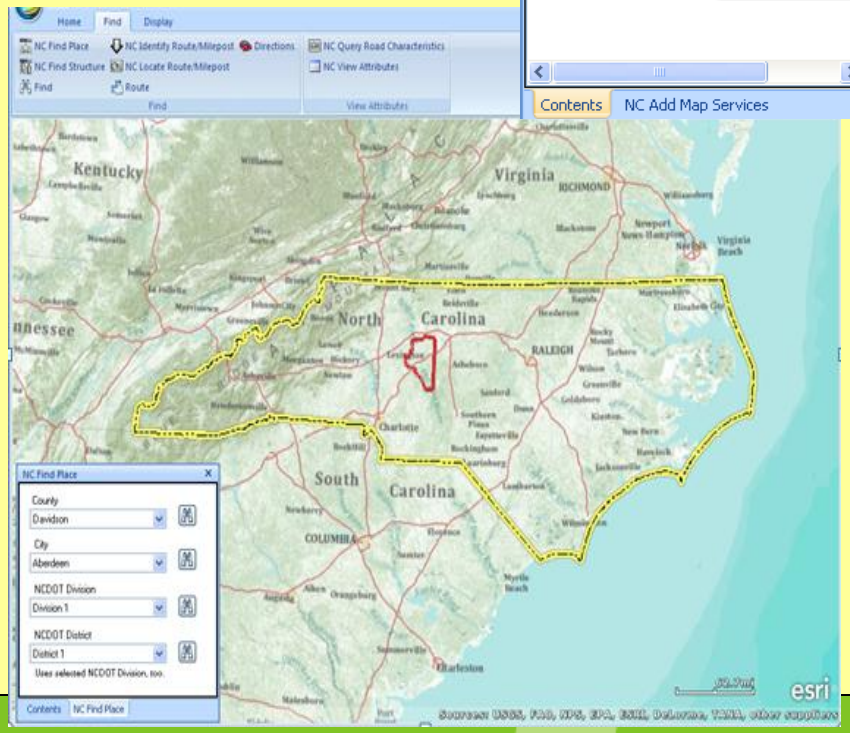
SDV Training



SDV Training

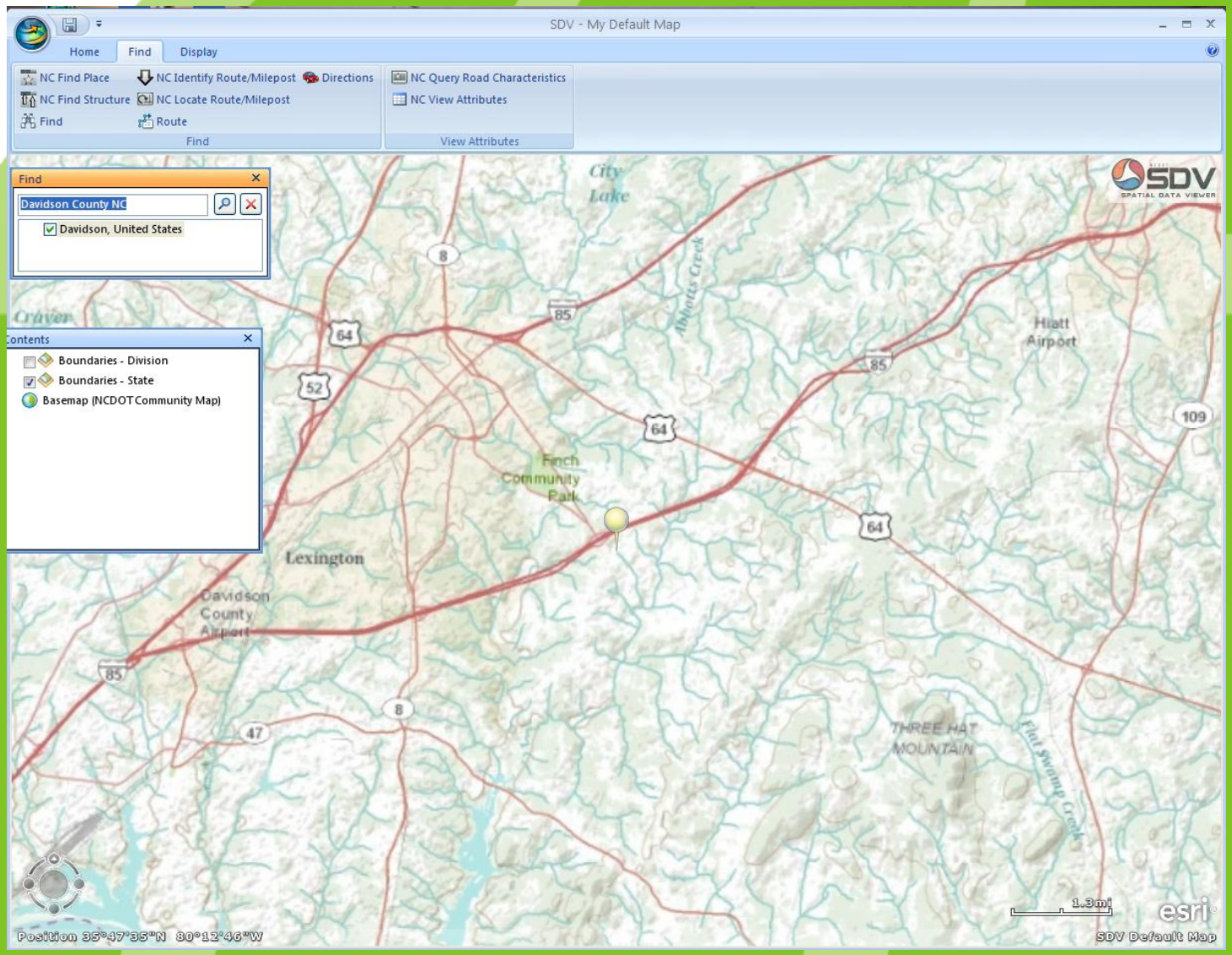
- County is located, Zoom in by
  - Right Click, Go To
  - Scroll button on mouse
  - Using Navigator zoom
  - Double Click item in Contents Window
  - Go To Icon under Appearance tab



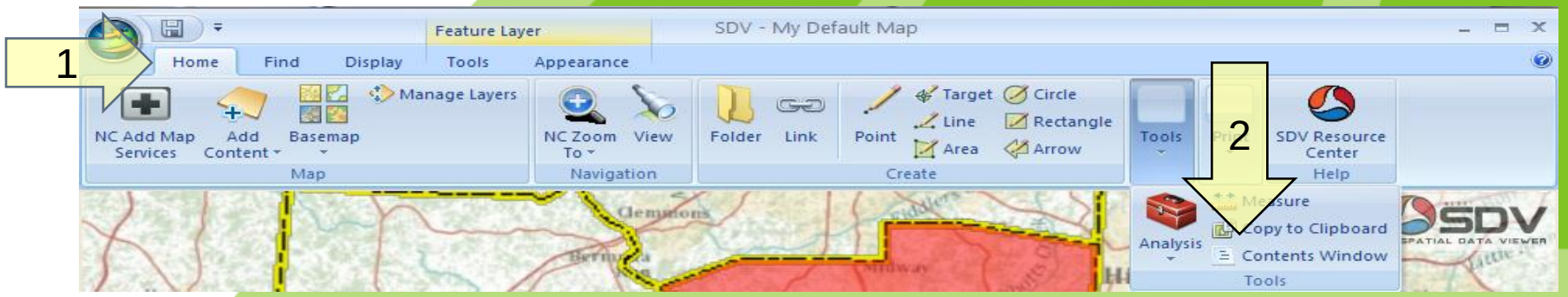


SDV Training

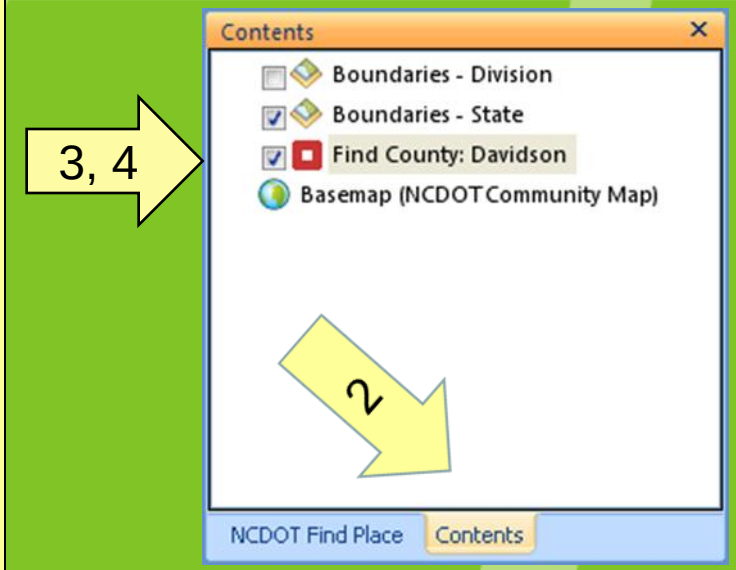
You can also use the FIND option to get to general area



SDV Training



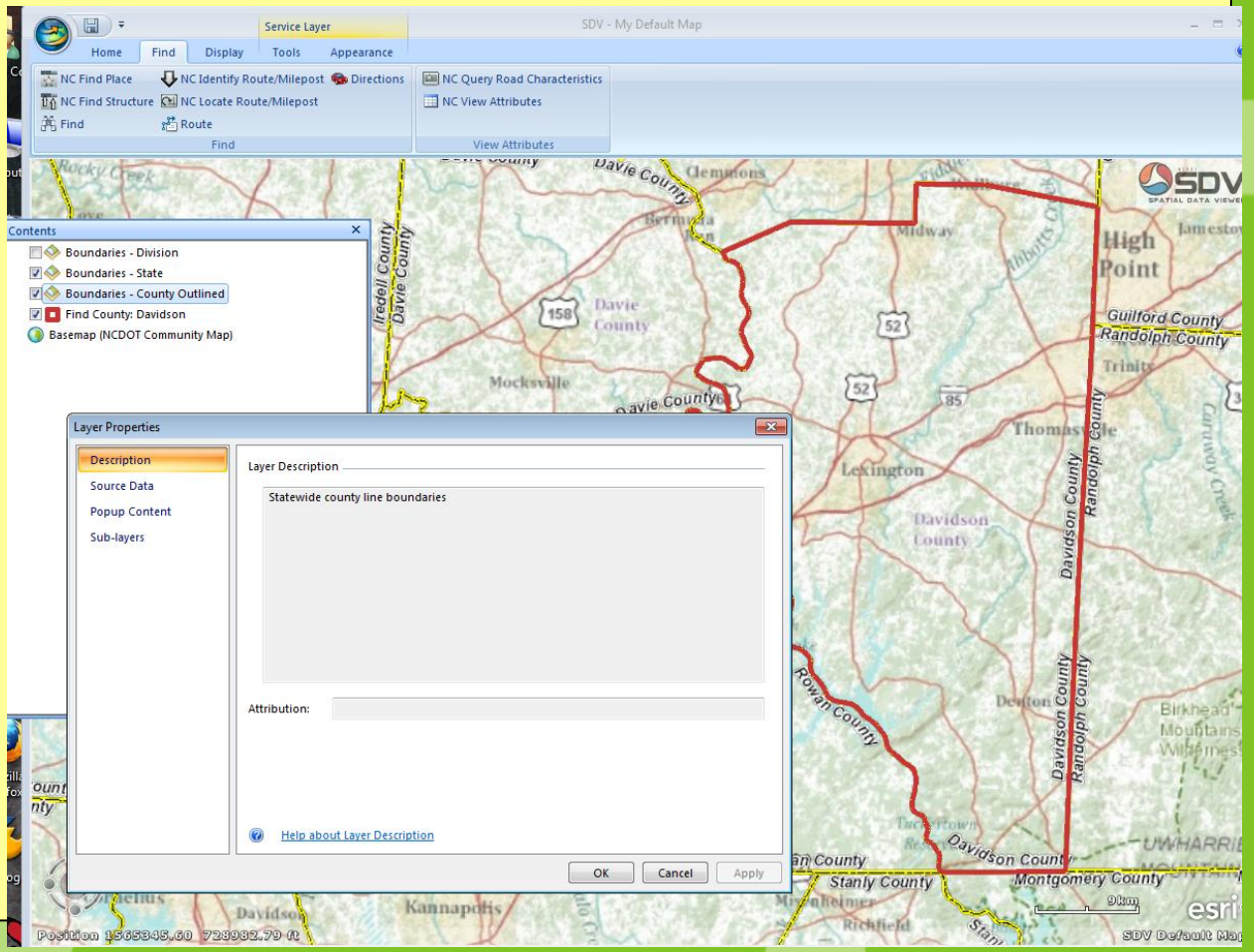
1. Click Home tab
2. Click Contents Window (there are 2 ways to get there)
3. Check the Find County: Davidson option box
4. Right click on Find County: Davidson
5. Click “Go to”
6. Or Double Click Find County: Davidson
7. SDV zooms in to county



SDV Training

- To view Layer Properties
  - Right Click Layer

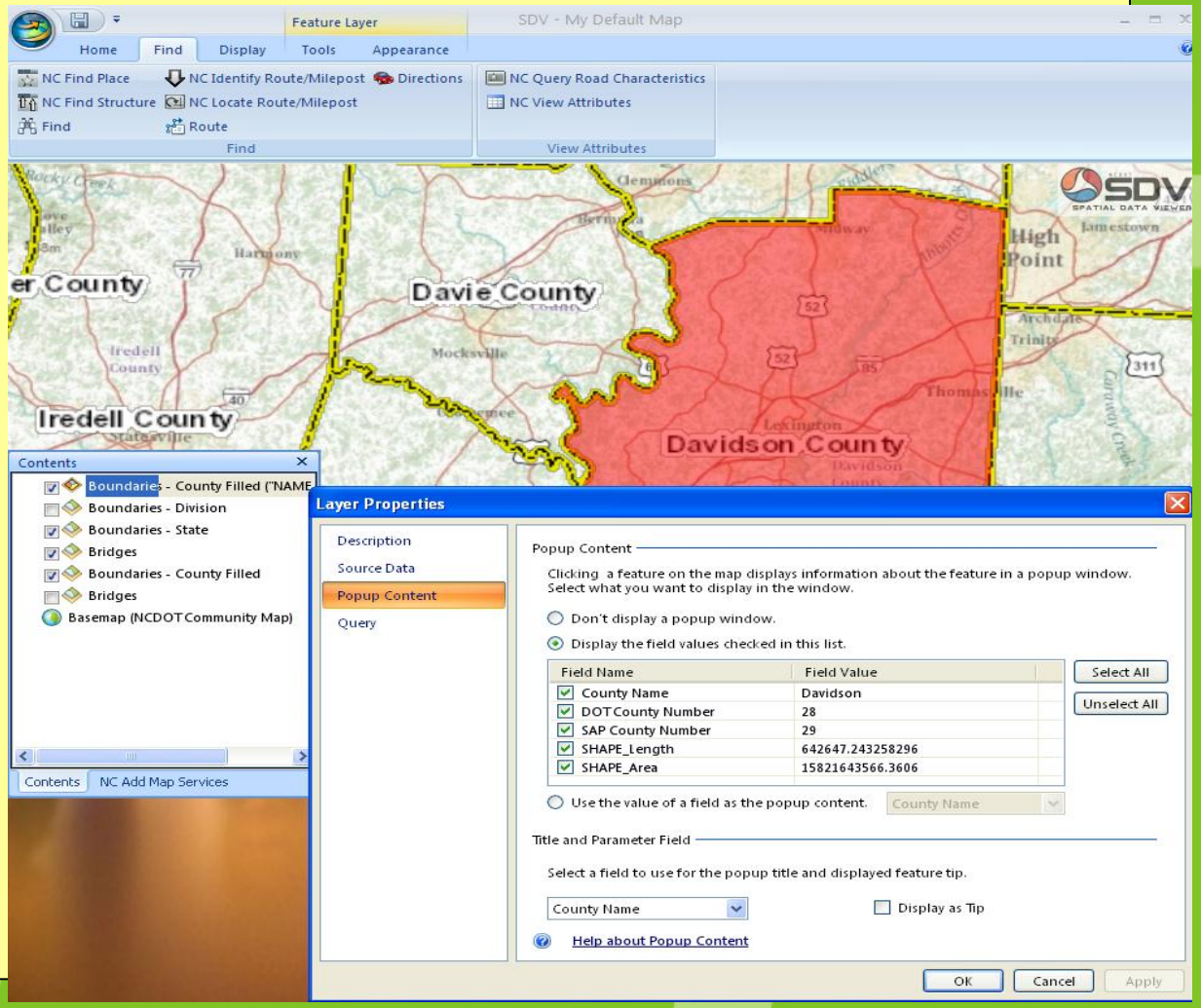
Layer Properties
- Description
- Source Data
- Popup Content



SDV Training

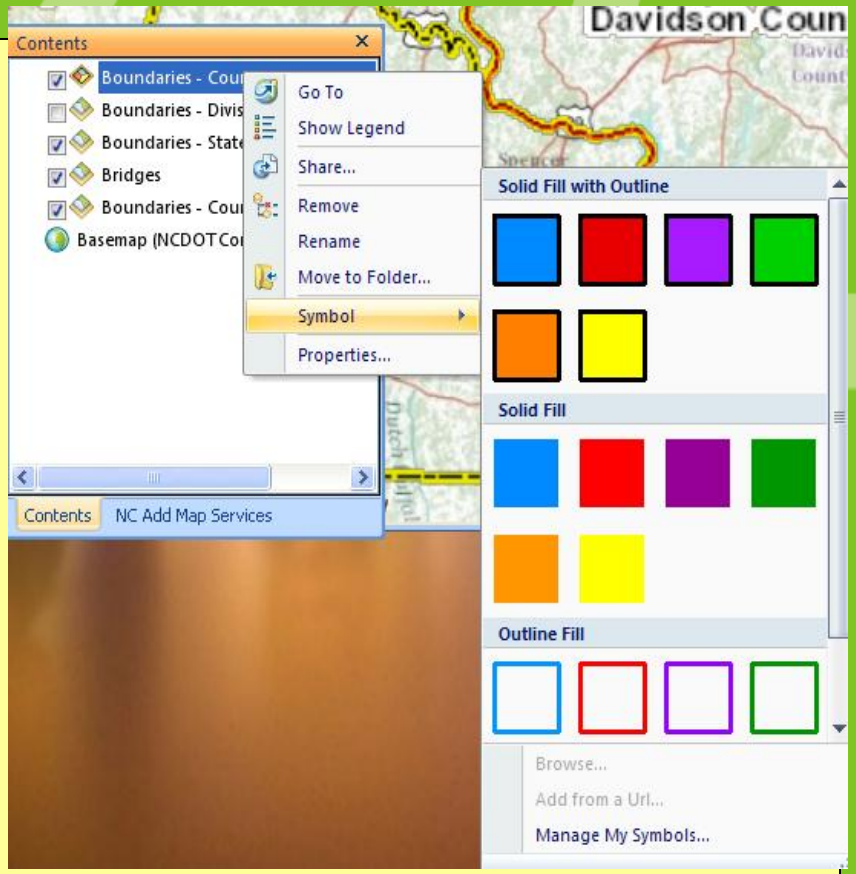
- To view Layer Properties
  - Right Click Layer

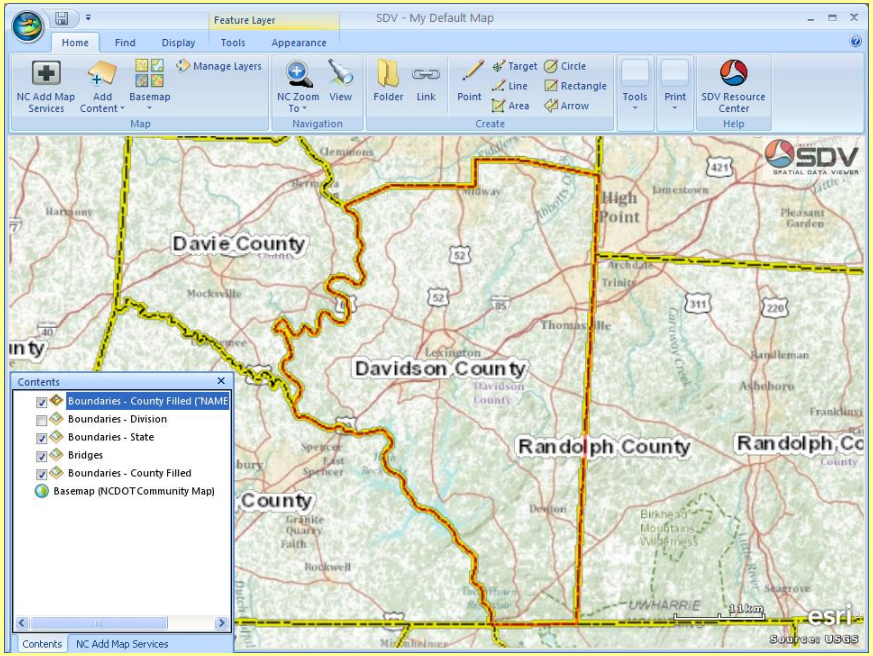
Layer Properties
- Description
- Source Data
- Popup Content



SDV Training

- To Change appearance of layer
  - Right Click Layer
  - Scroll to Symbol
  - Select from options





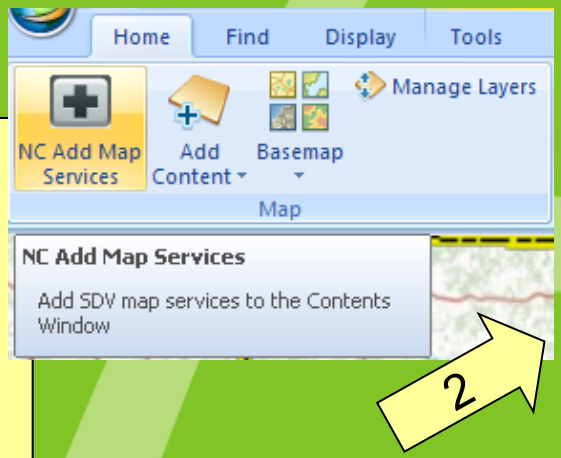
SDV Training

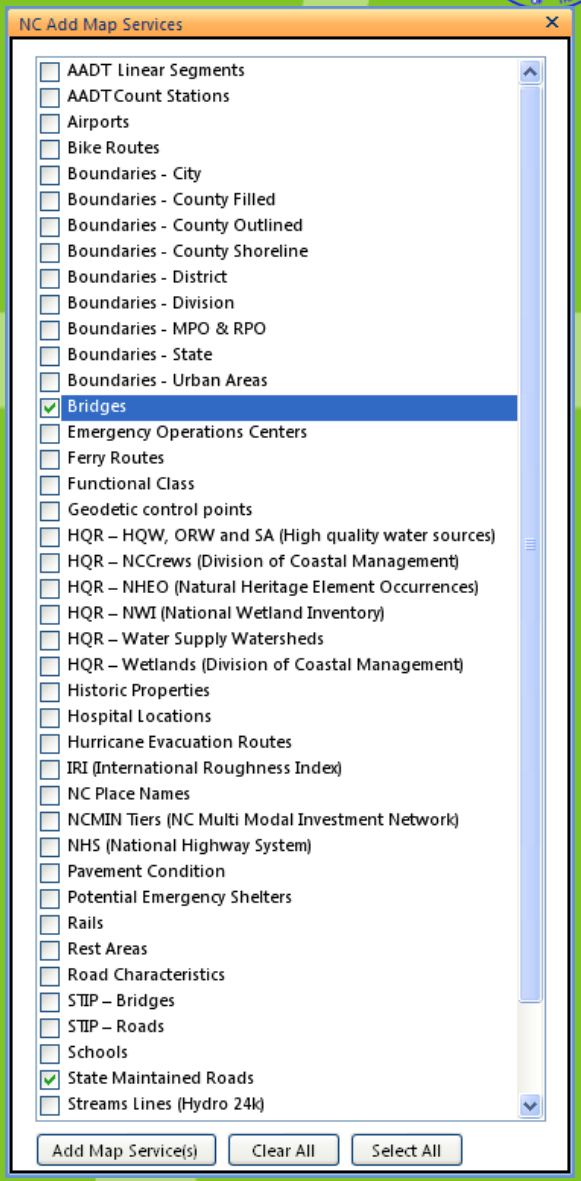
1.NC Add Map Services

2.Click box for layers of interest

3.Click Add Map Service(s) button

4.Click the map service checkbox in the Contents Window
(con't on next slide)

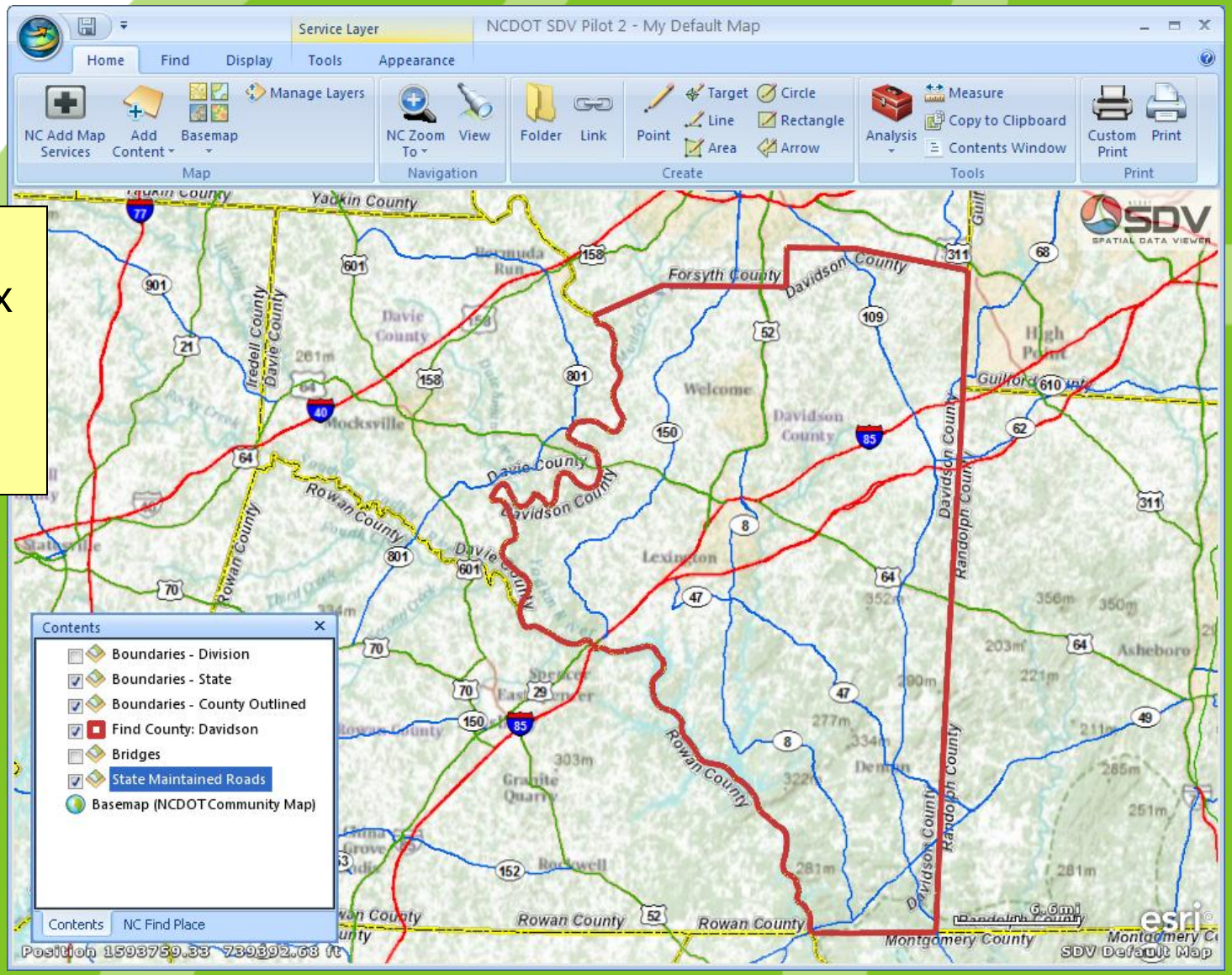




SDV Training

4. Click the map service checkbox in the Contents Window to turn layer on

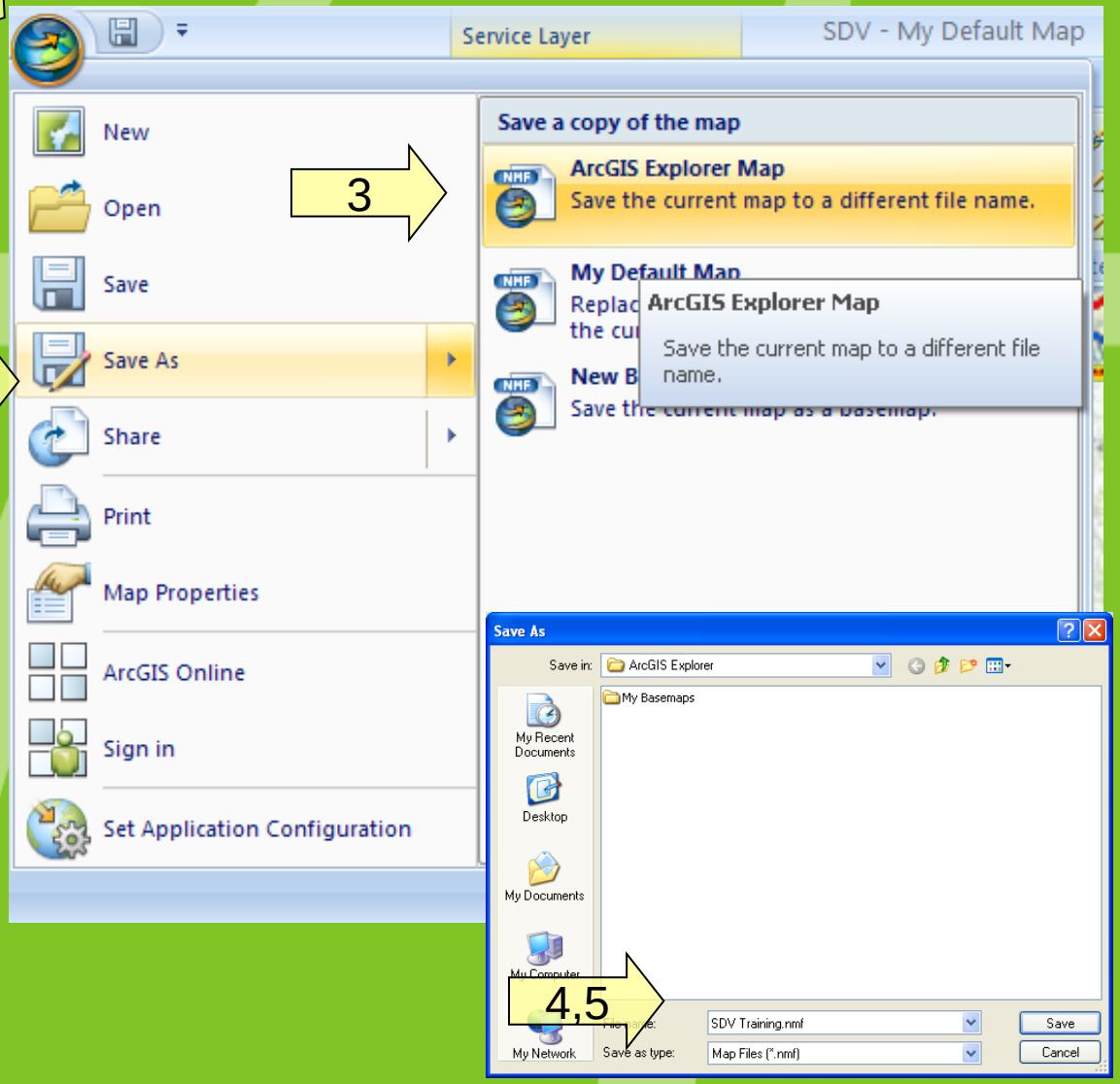
4



SDV Training

Save Map

1. Click ArcGIS Explorer Icon
2. Click Save As
3. Click ArcGIS Explorer Map
4. Navigate to folder
5. Name map
6. SDV map name changes



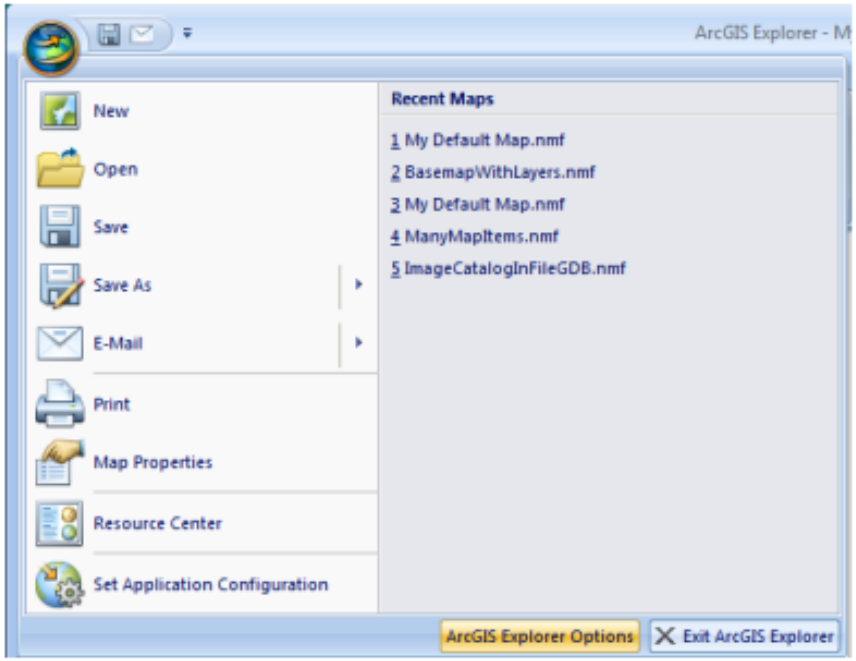
SDV Training

About ArcGIS Explorer Options

Feedback | E-mail this topic | Print this topic

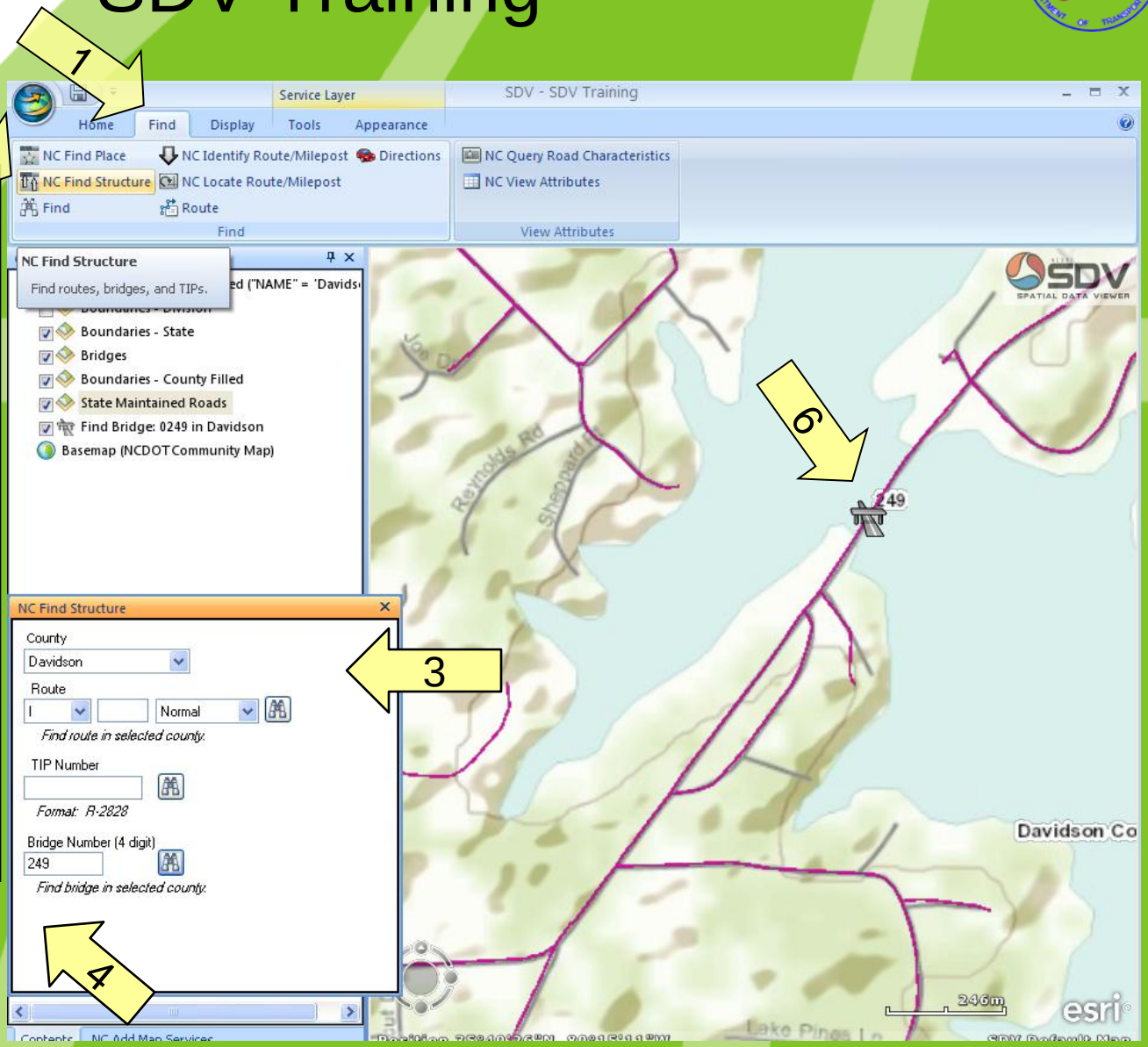
You can set options that apply to the application and are retained from session to session.

To display the *ArcGIS Explorer Options* dialog, click the *ArcGIS Explorer Button* , then click the *ArcGIS Explorer Options* button:



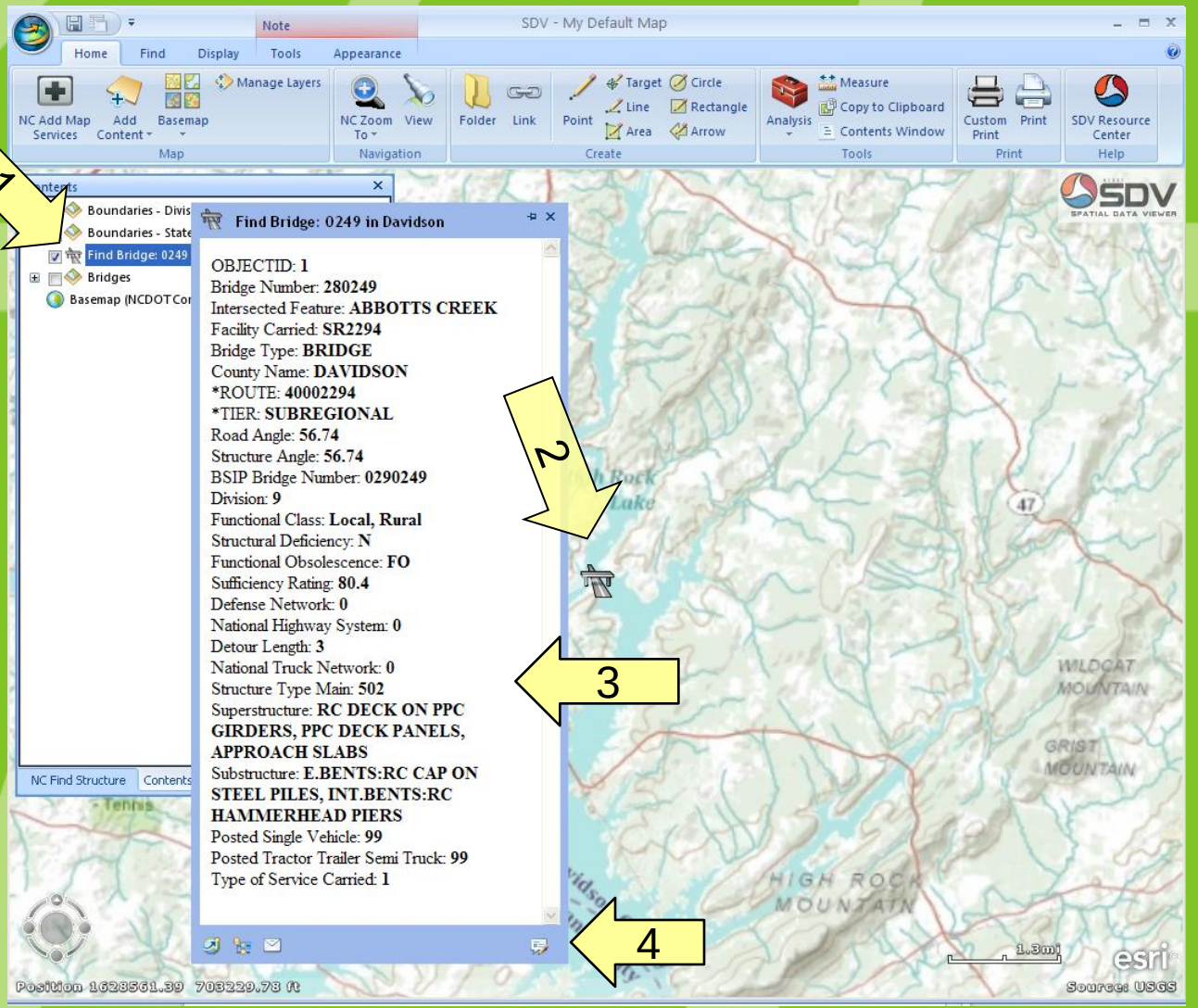
SDV Training

1. Click Find Tab
2. NC Find Structure
3. Enter County
4. Enter Bridge Number
5. Click Find symbol
6. Point is symbolized on map
7. Double Click to zoom to result



SDV Training

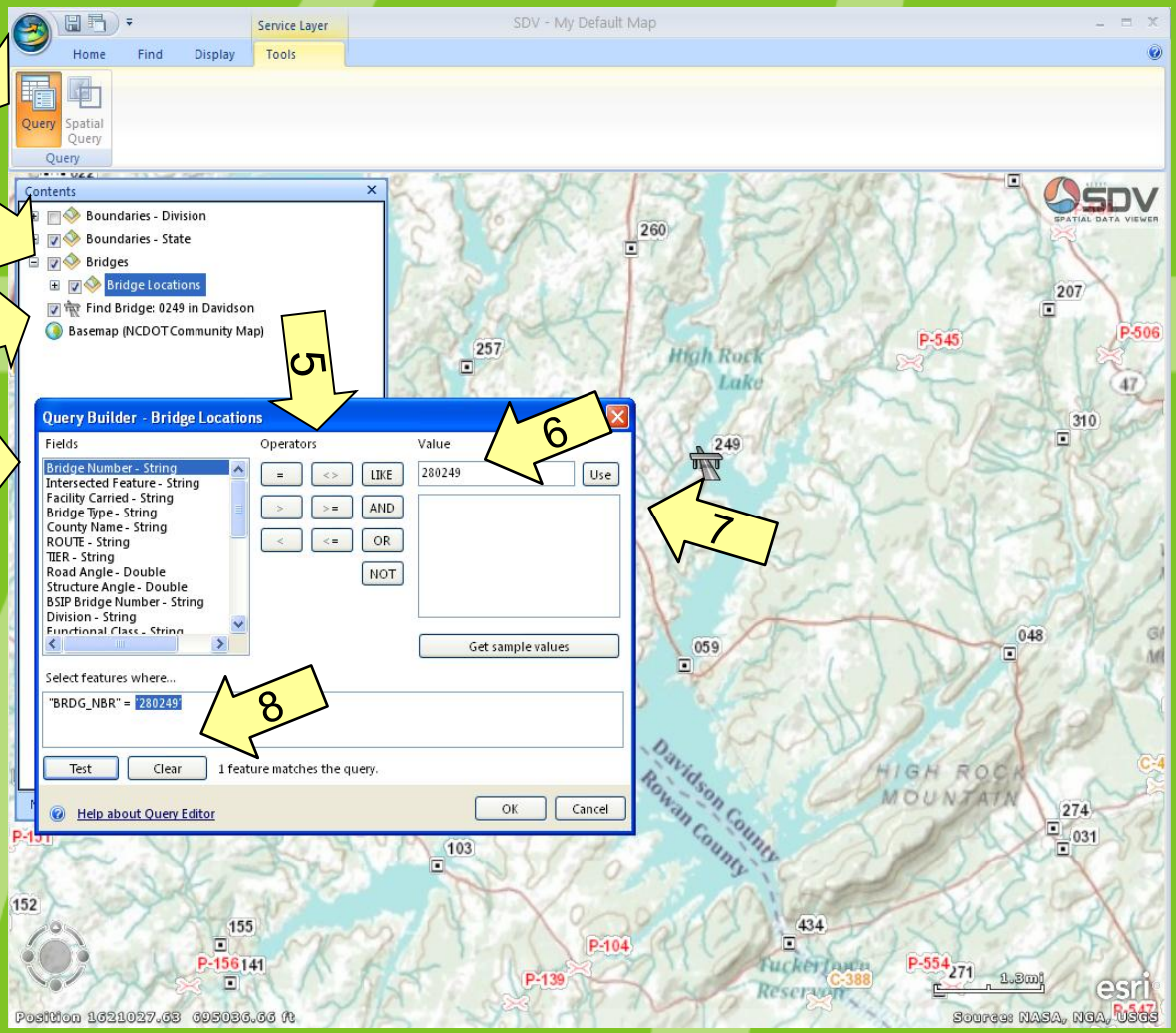
1. Double Click Bridge info in Contents Window
2. Double click bridge symbol
3. Bridge Attributes pop up
4. Edit results by clicking edit icon



SDV Training

To Query Bridge Attributes

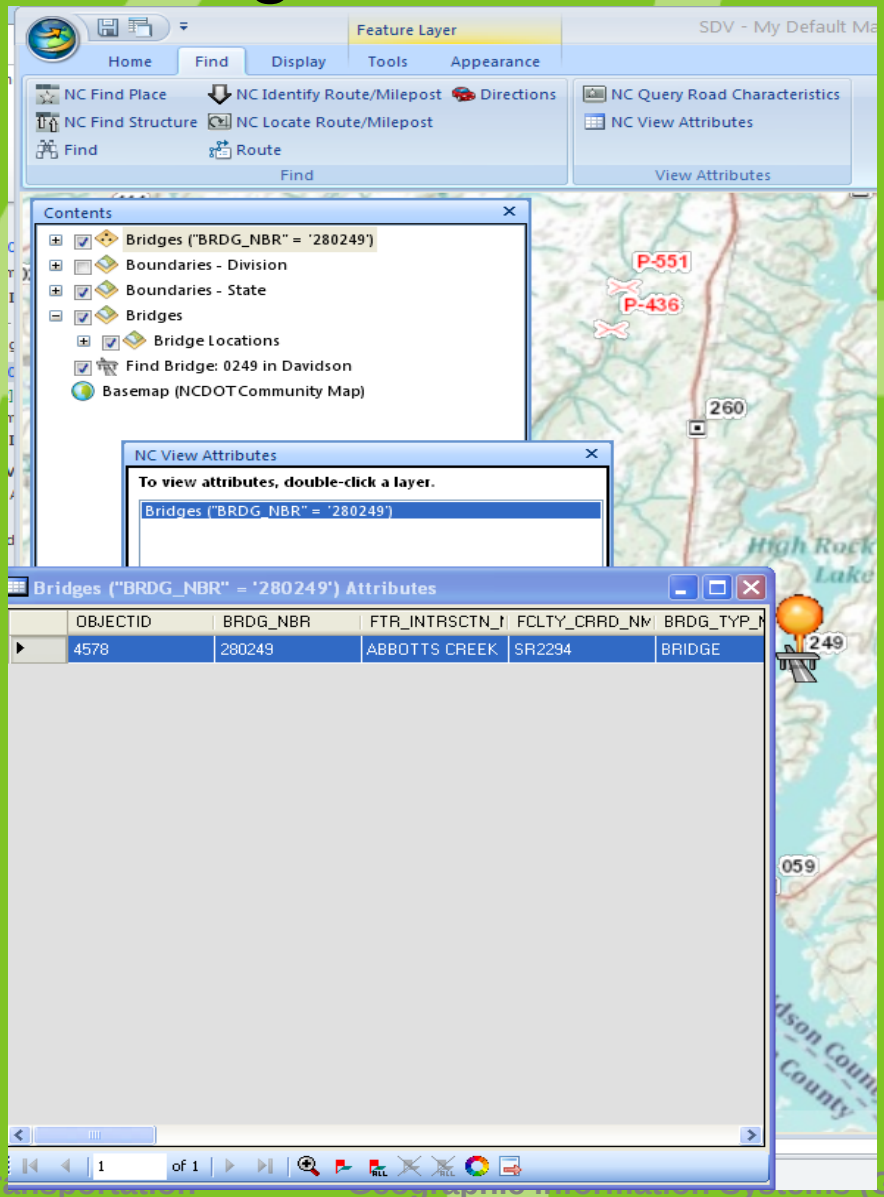
1. Click plus sign beside layer in Contents Window
2. Click layer from Contents Window
3. Click Query icon
4. Click field
5. Click operator
6. Type in Value
7. Click Use
8. Click Test



SDV Training

View Bridge Attributes

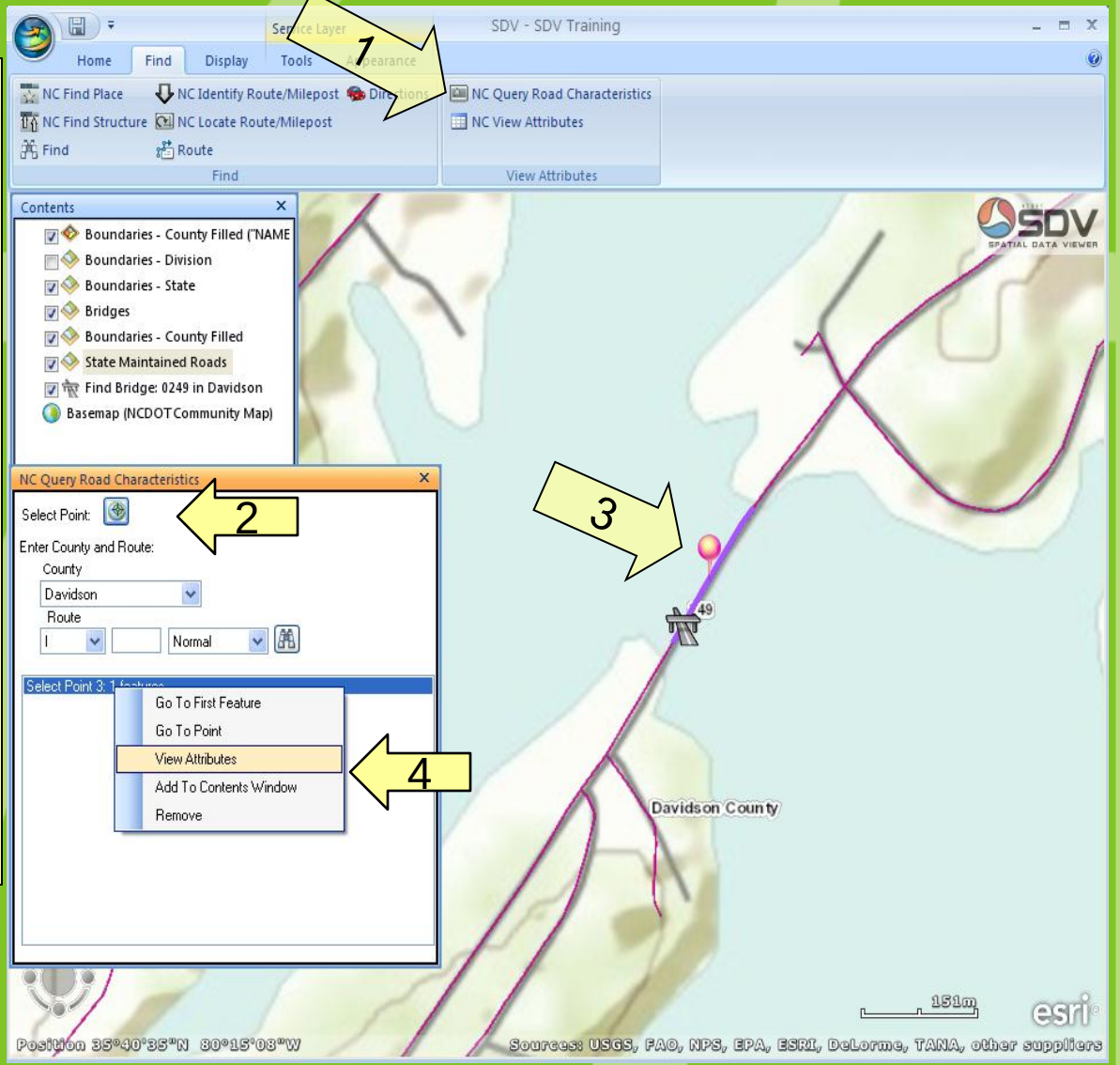
1. Click query results in Contents Window
2. Double Click NC View Attributes
3. Scroll through Attributes



SDV Training

NC Query Road Attributes

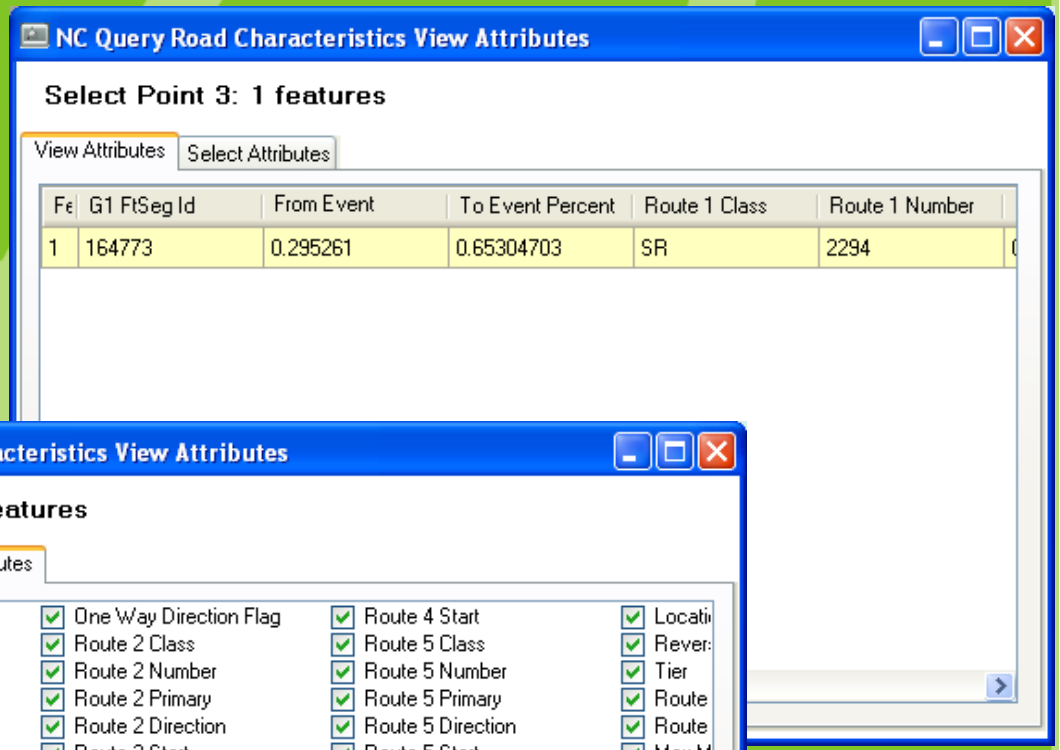
1. Click NC Query Road Characteristics
2. Select Point
3. Click on Road where bridge collapsed
4. When feature is selected, right click feature, View Attributes

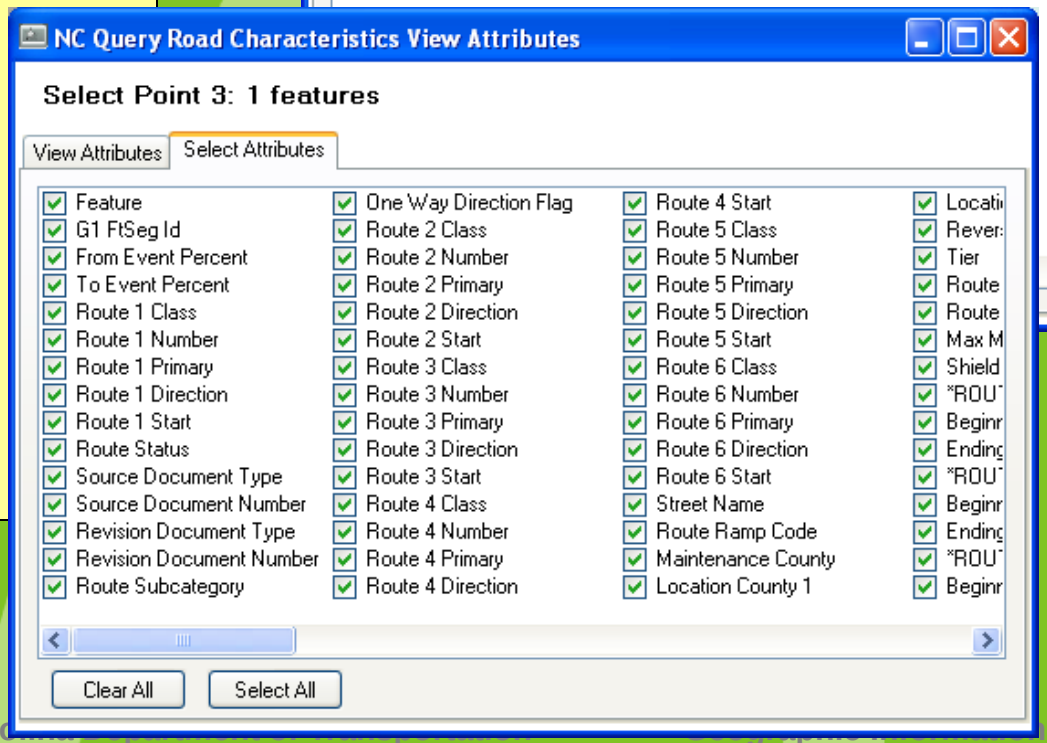


SDV Training

View Attributes

- Feature Selected
- Or, Select Attributes from the database and view only fields needed

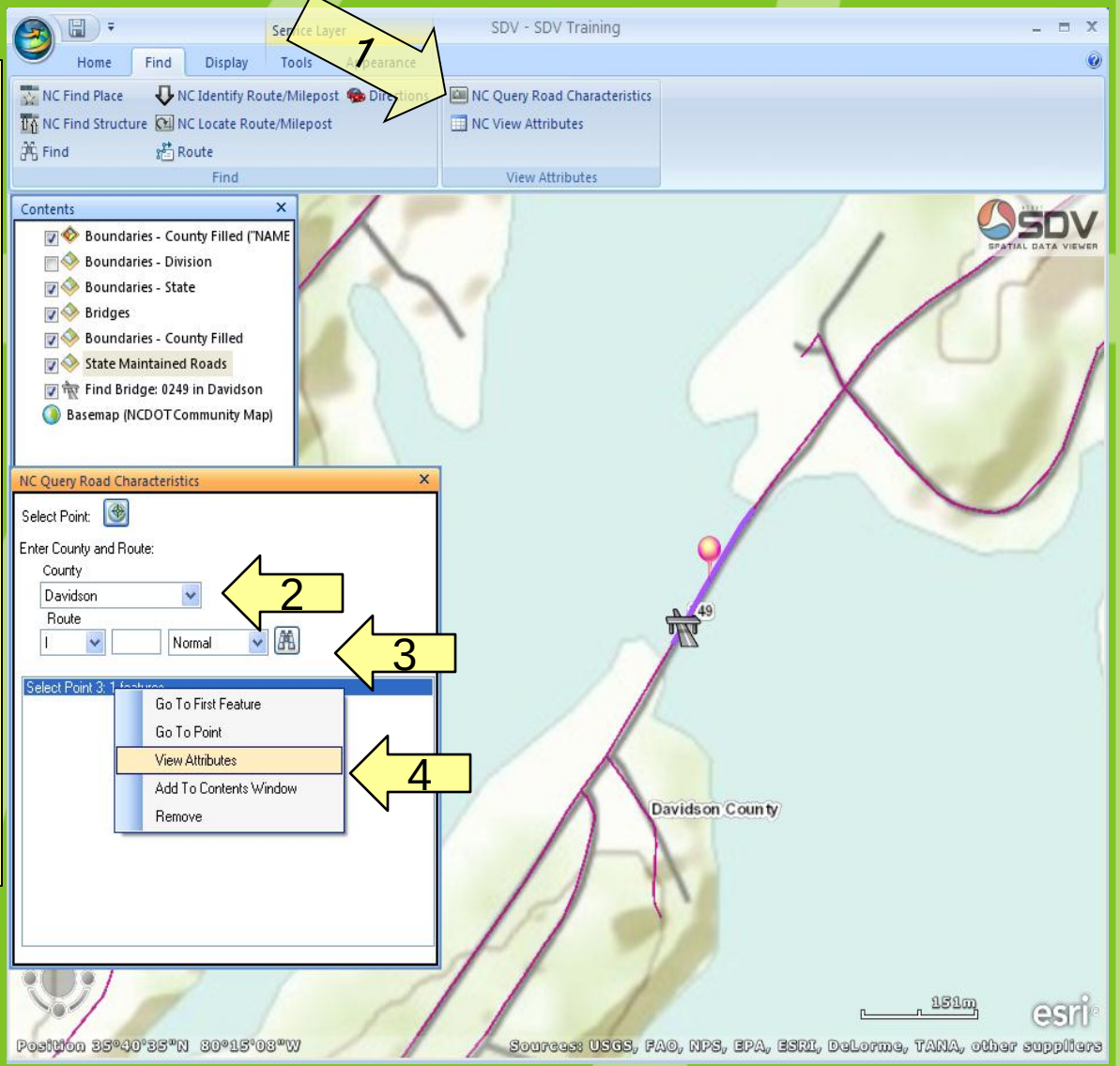




SDV Training

NC Query Road Attributes

1. Click NC Query Road Characteristics
2. Select County from drop down menu
3. Select road information from drop down menus
4. When feature is selected, right click feature, View Attributes



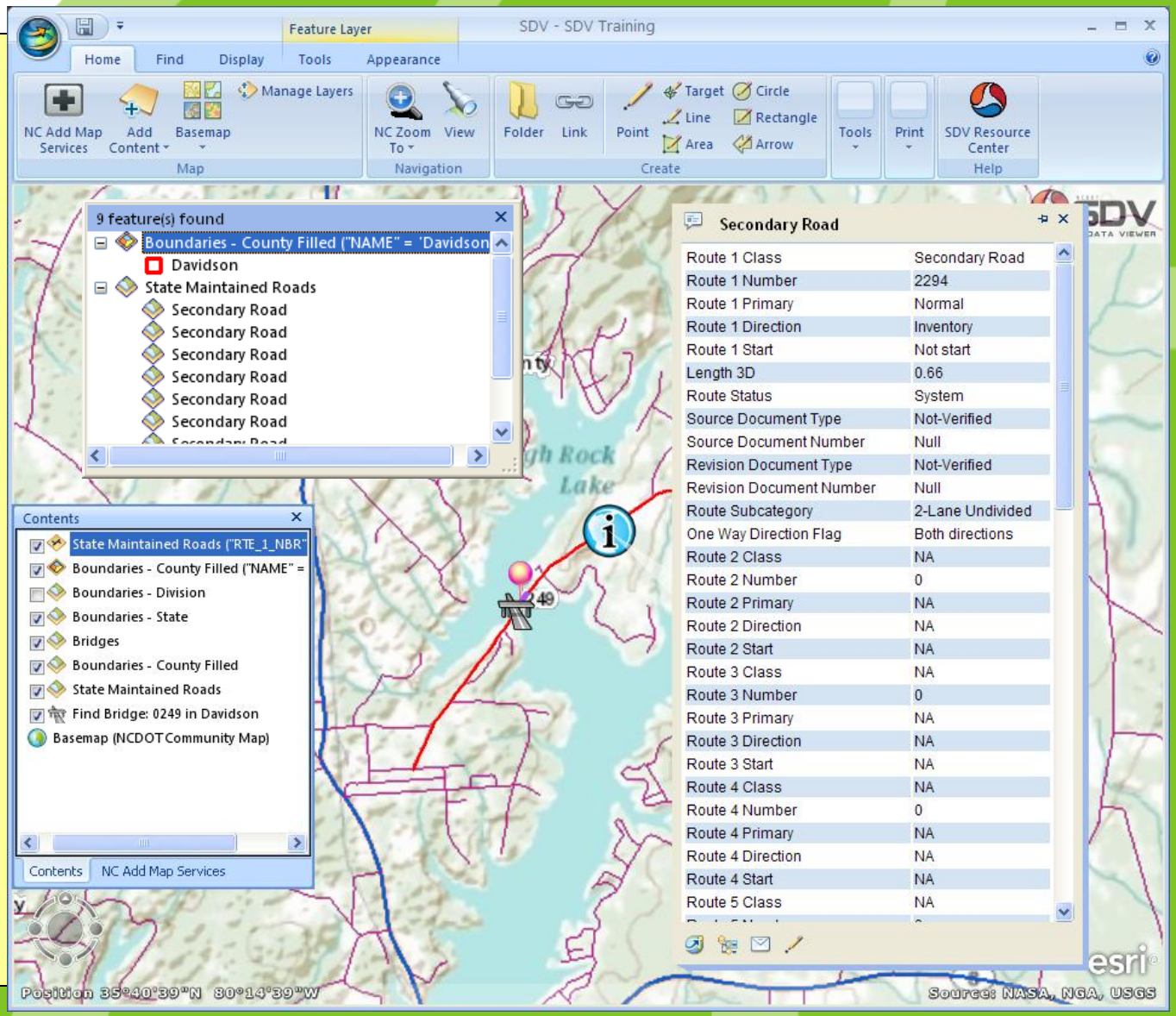
SDV Training

Click Selected Road

icon pops up

Select SR option

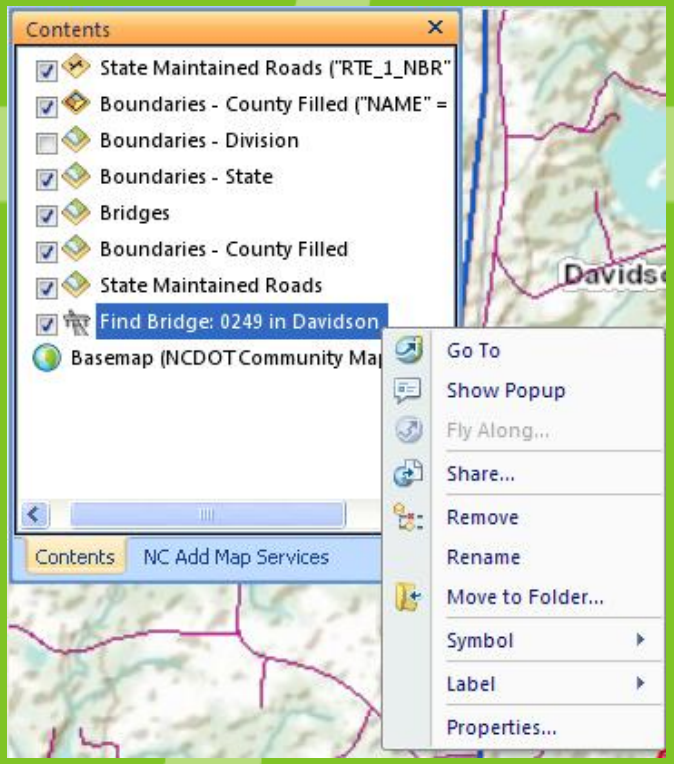
View Attributes

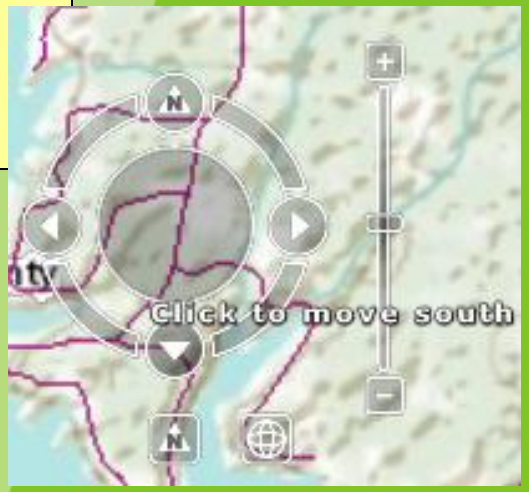


SDV Training

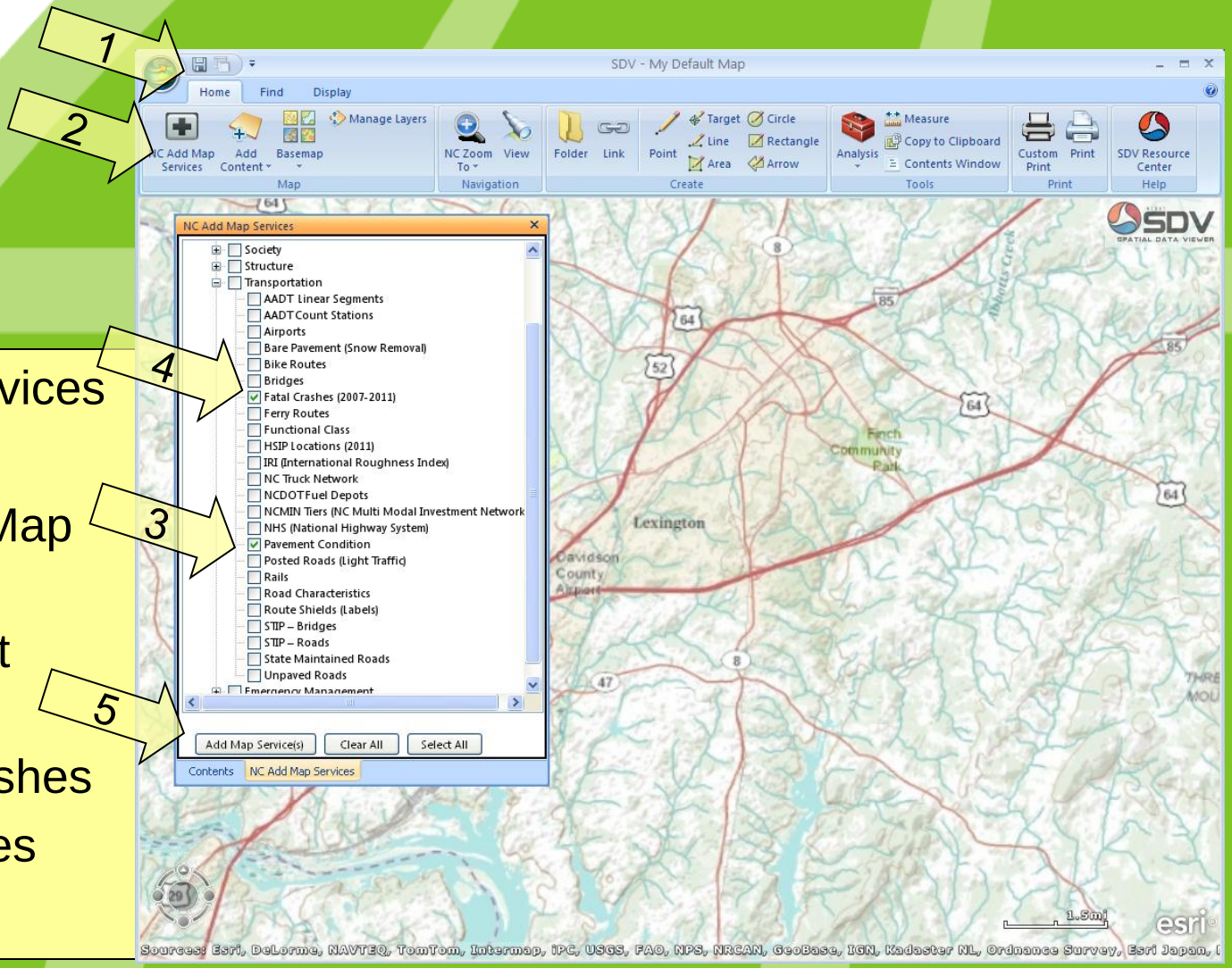
Zoom Tools

1. NC Zoom To Street
2. Mouse -Scroll
3. Go To option
4. Orientation Indicator
5. Double click layer in Contents Window





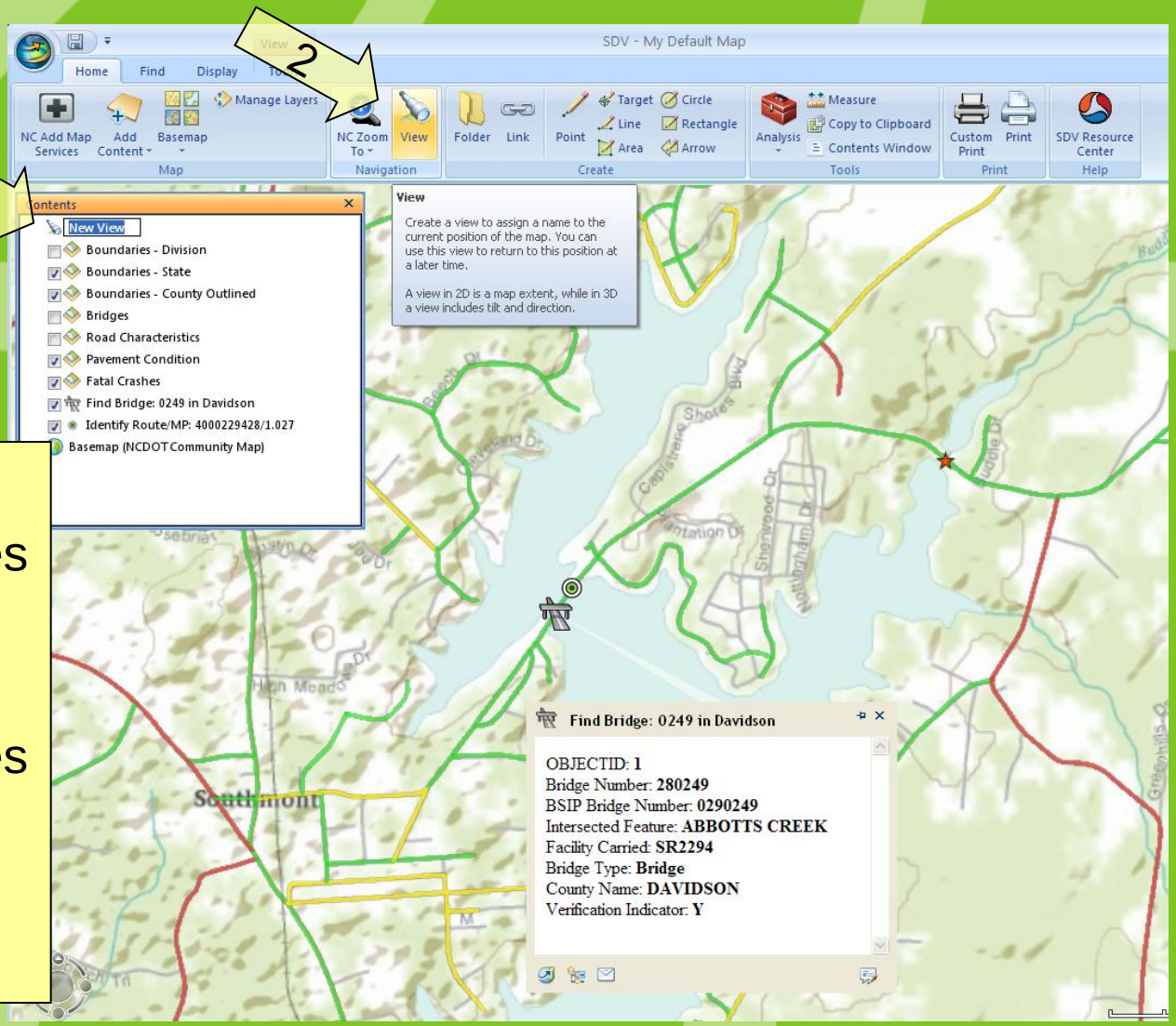
SDV Training



Add more Map Services

1. Home tab
2. Click NC Add Map Services
3. Select Pavement Condition
4. Select Fatal Crashes
5. Add Map Services

SDV Training



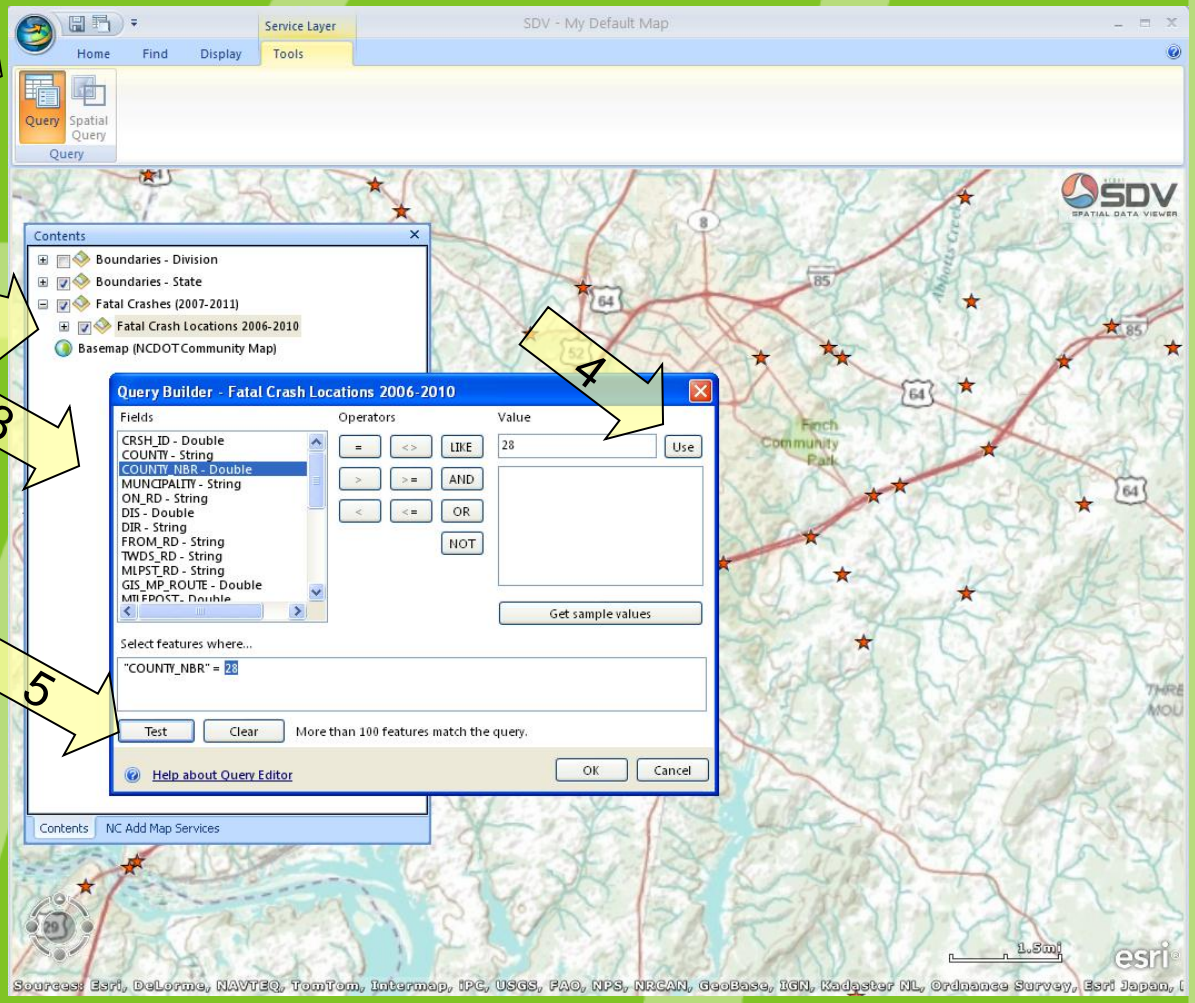
Perform more analysis

1. Click on Fatal Crashes
2. Select View in Navigation Group
3. Save View as Crashes

SDV Training

Perform more analysis

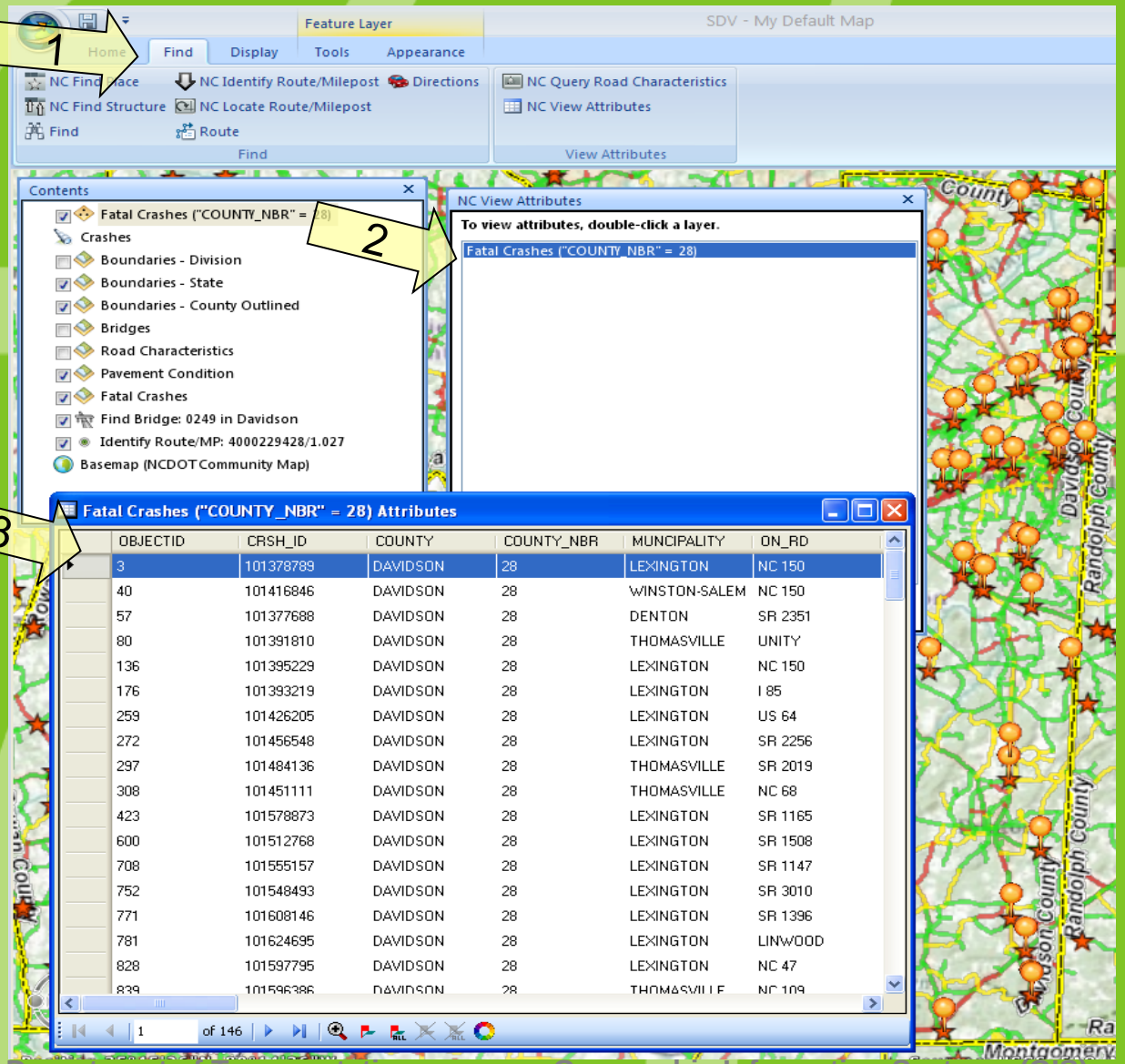
1. Click on Fatal Crashes sub-location
2. Click Query in Tools tab
3. Double click field, click operator, write value (or search unique values)
4. Click Use
5. Click Test
6. Click OK



SDV Training

Review Attributes

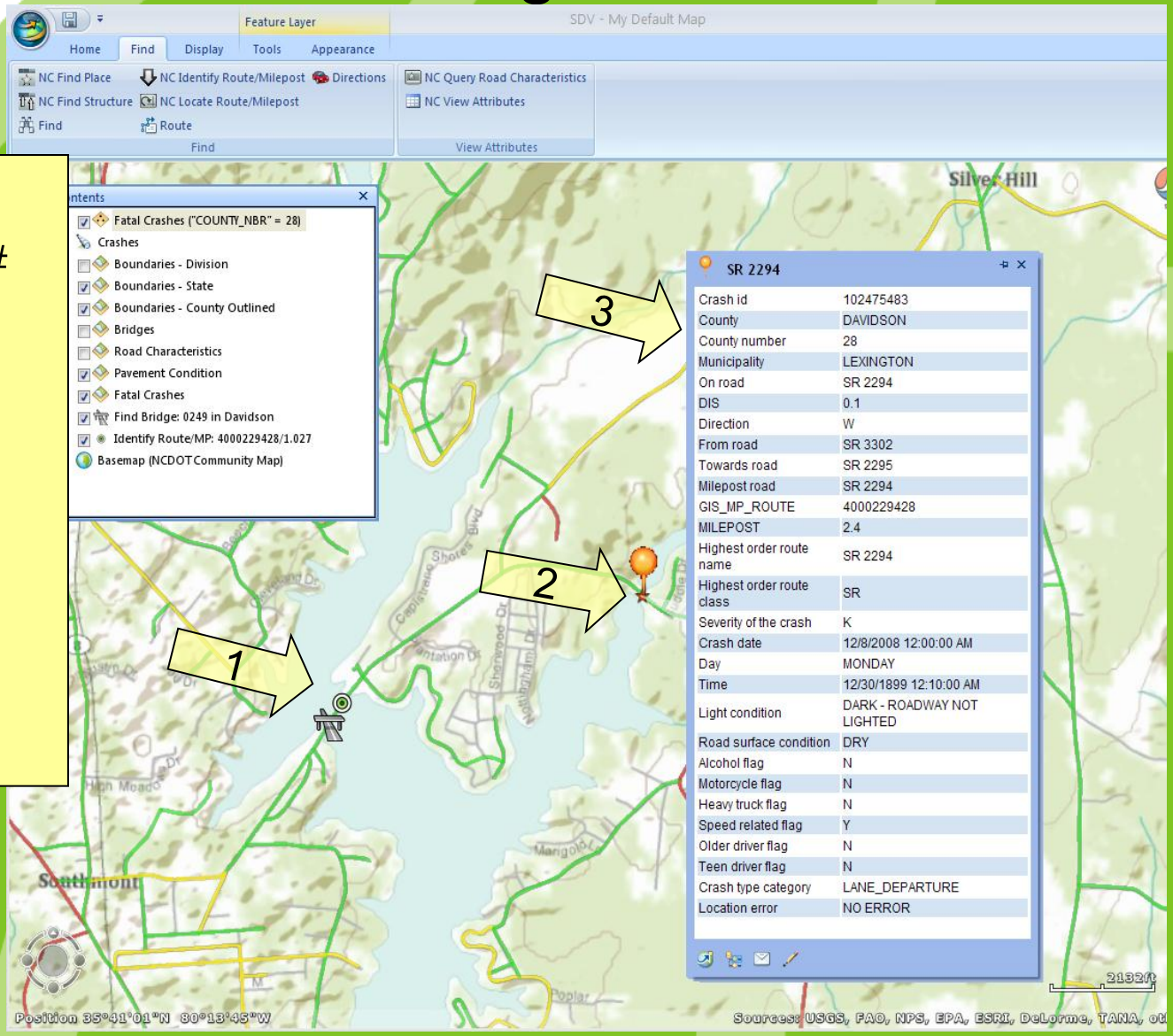
1. Click Find tab
2. Double-click the results from the query
3. Attributes table becomes available
4. Check fatal crashes on SR-2294



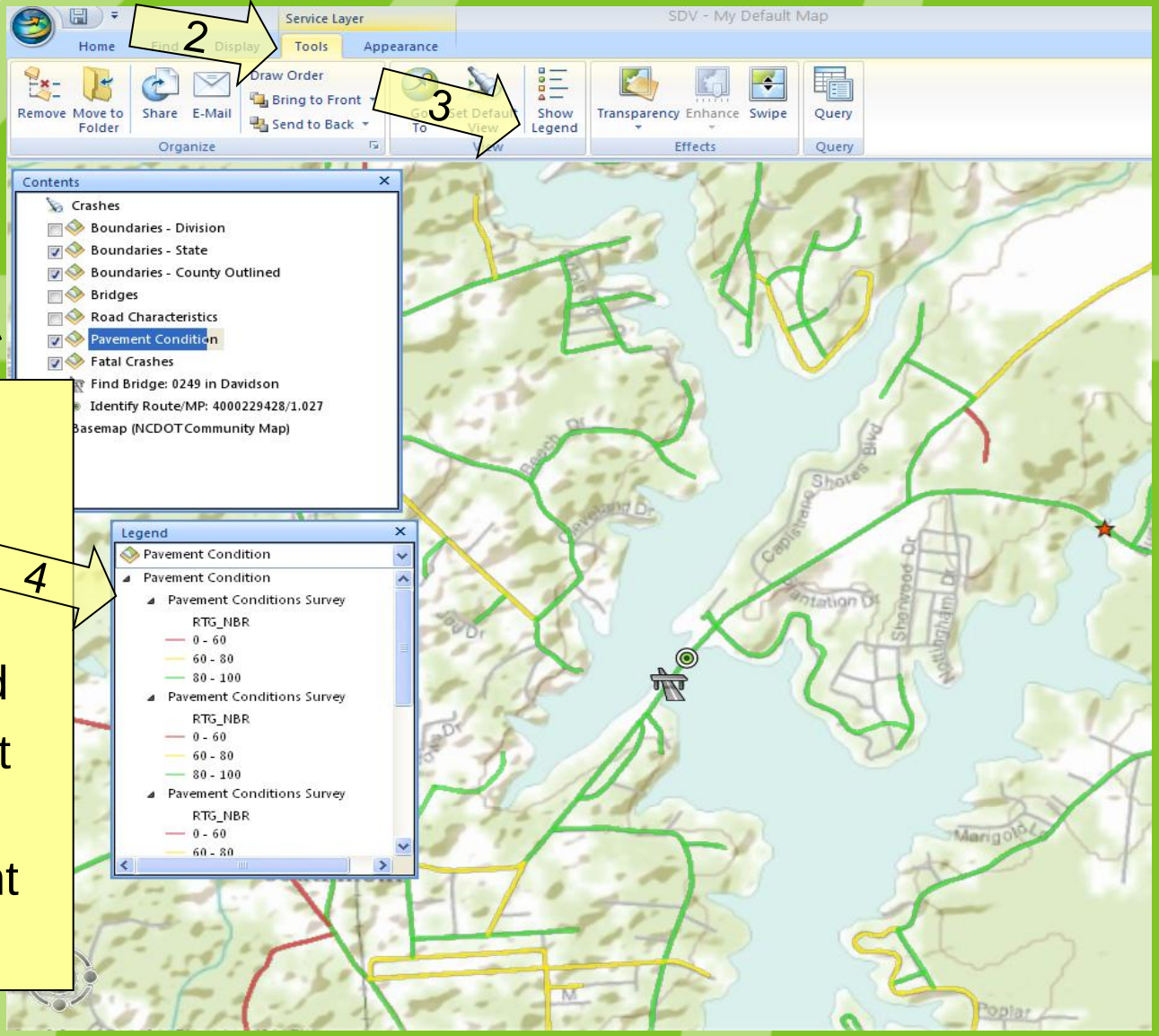
SDV Training

Review Attributes

1. Zoom in to bridge # 249
2. Double-click the closest fatal accident symbol
3. Attributes table becomes available
4. Review crash data



SDV Training



Perform more analysis

1. Click on Pavement Condition
2. Click Tools Tab
3. Select Show Legend

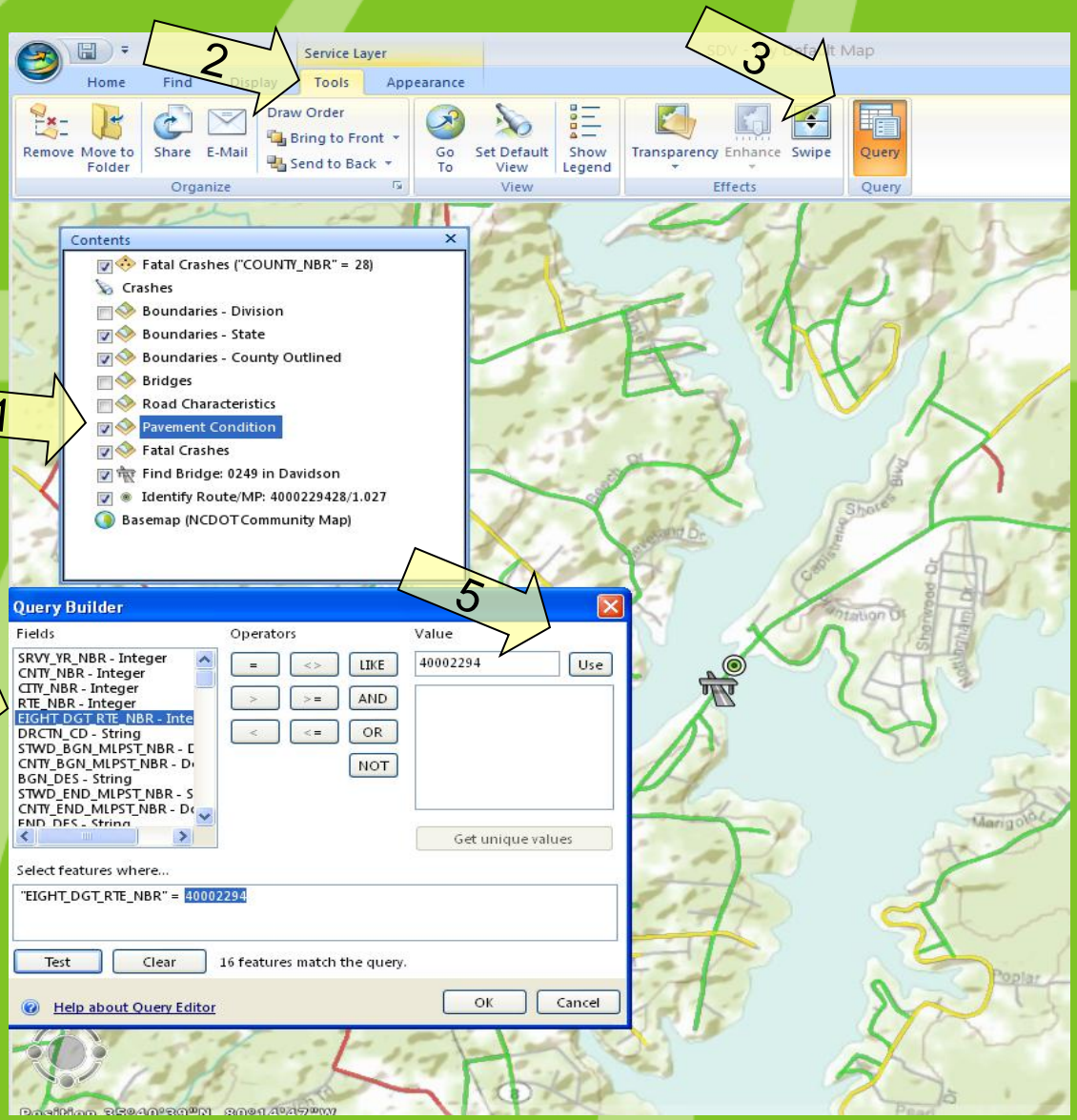
(or right click pavement condition)

4. Determine Pavement Condition

SDV Training

Perform more analysis

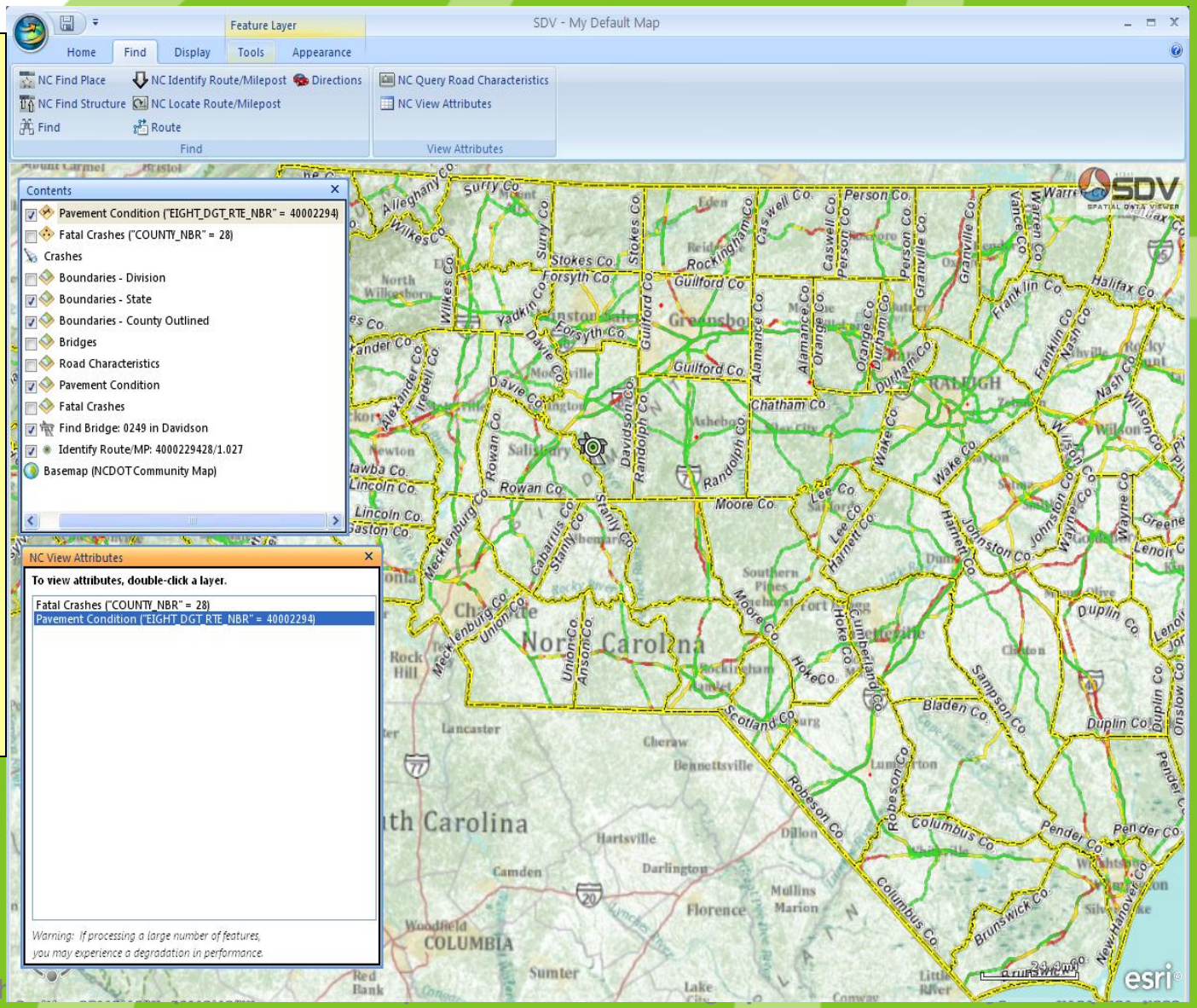
1. Click on Pavement Condition
2. Click Tools Tab
3. Query
4. Use the EIGHT_DGT_RTE_NMR to write SQL (hint – the number is already in Contents Window)
5. Click Use
6. Click Test
7. Click OK



SDV Training

Map Zooms out

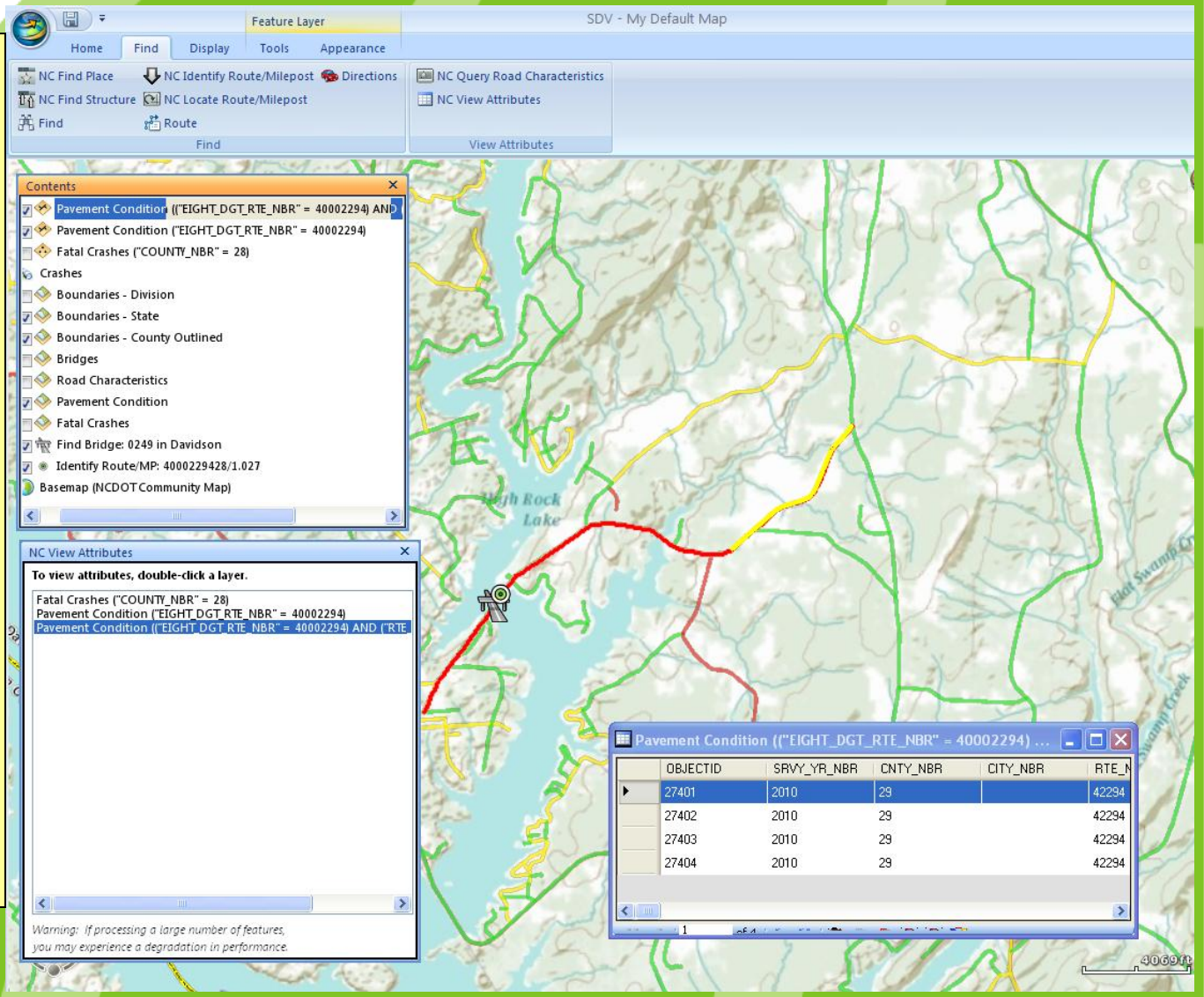
1. Click on Find
2. Click NC View Attributes
3. Double-Click Pavement Condition
4. Notice the CNTY_NBR field



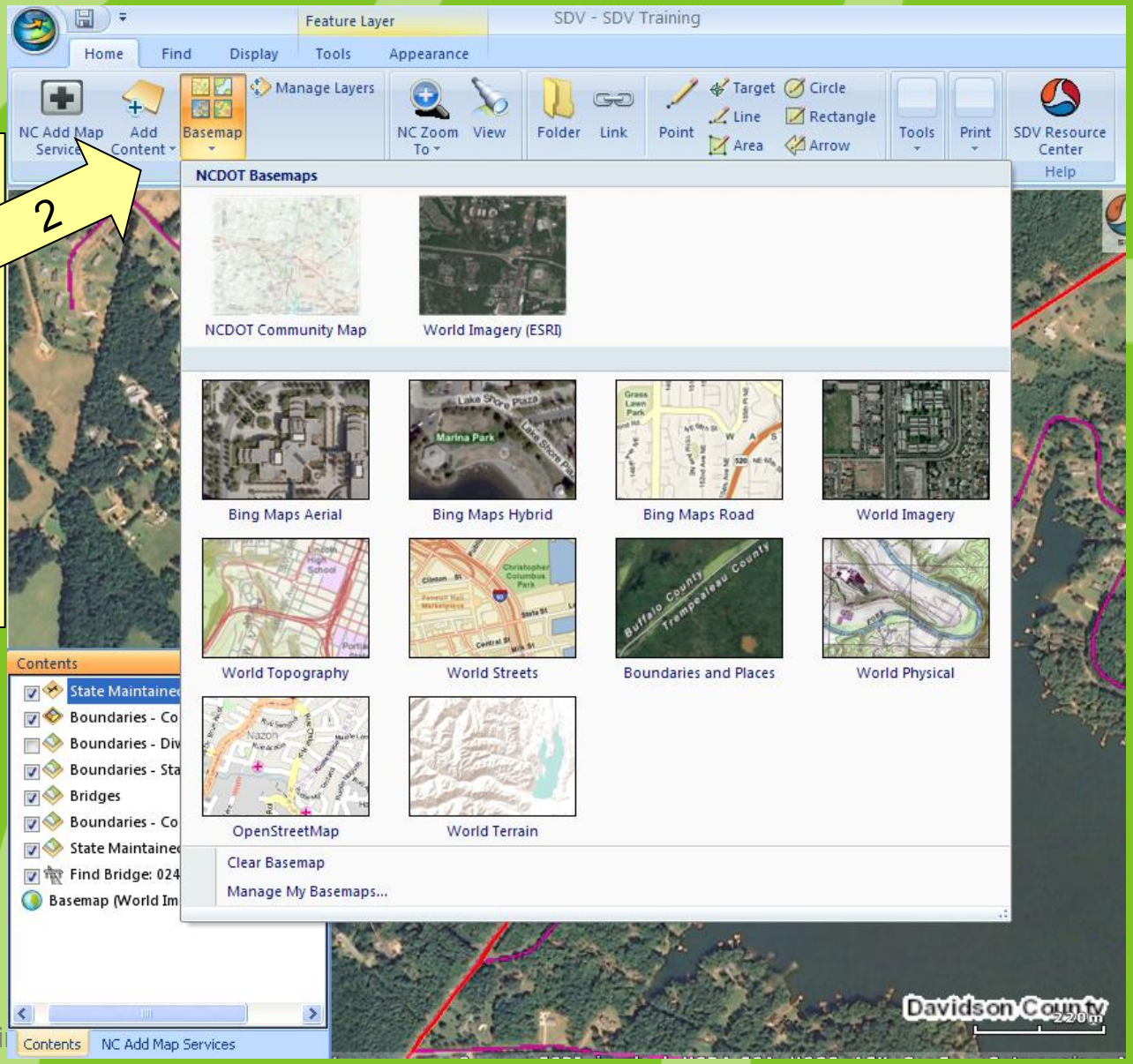
SDV Training

Query the query

1. Click on Pavement condition results
2. Find Tab, Query
3. Use RTE_ID and string
4. Use & Test
5. Click Find
6. Double-click NC View Attributes
7. Examine results- Symbology & data



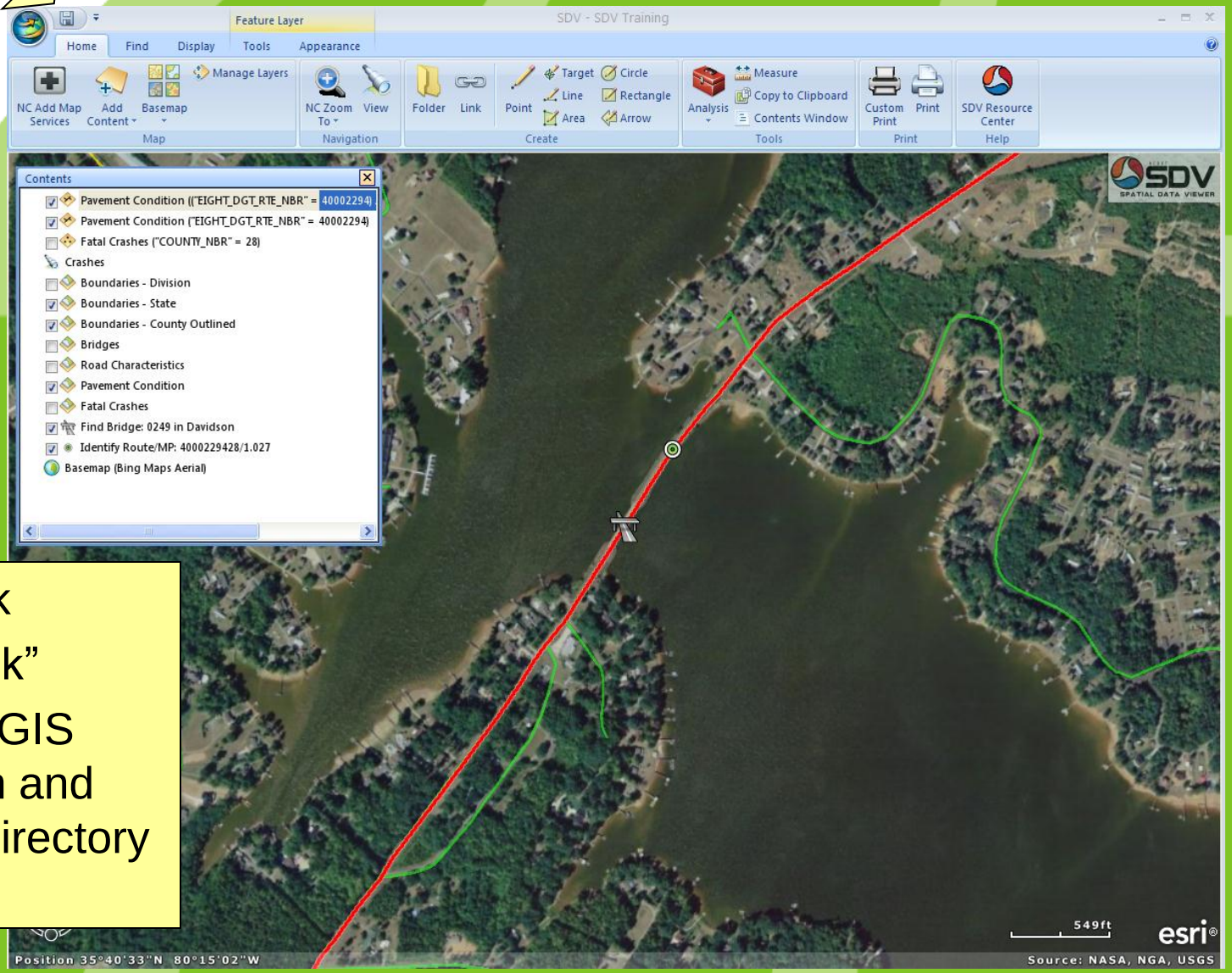
SDV Training



Change Basemap

1. Click Home tab
2. Click Basemap button
3. Click ESRI World Imagery

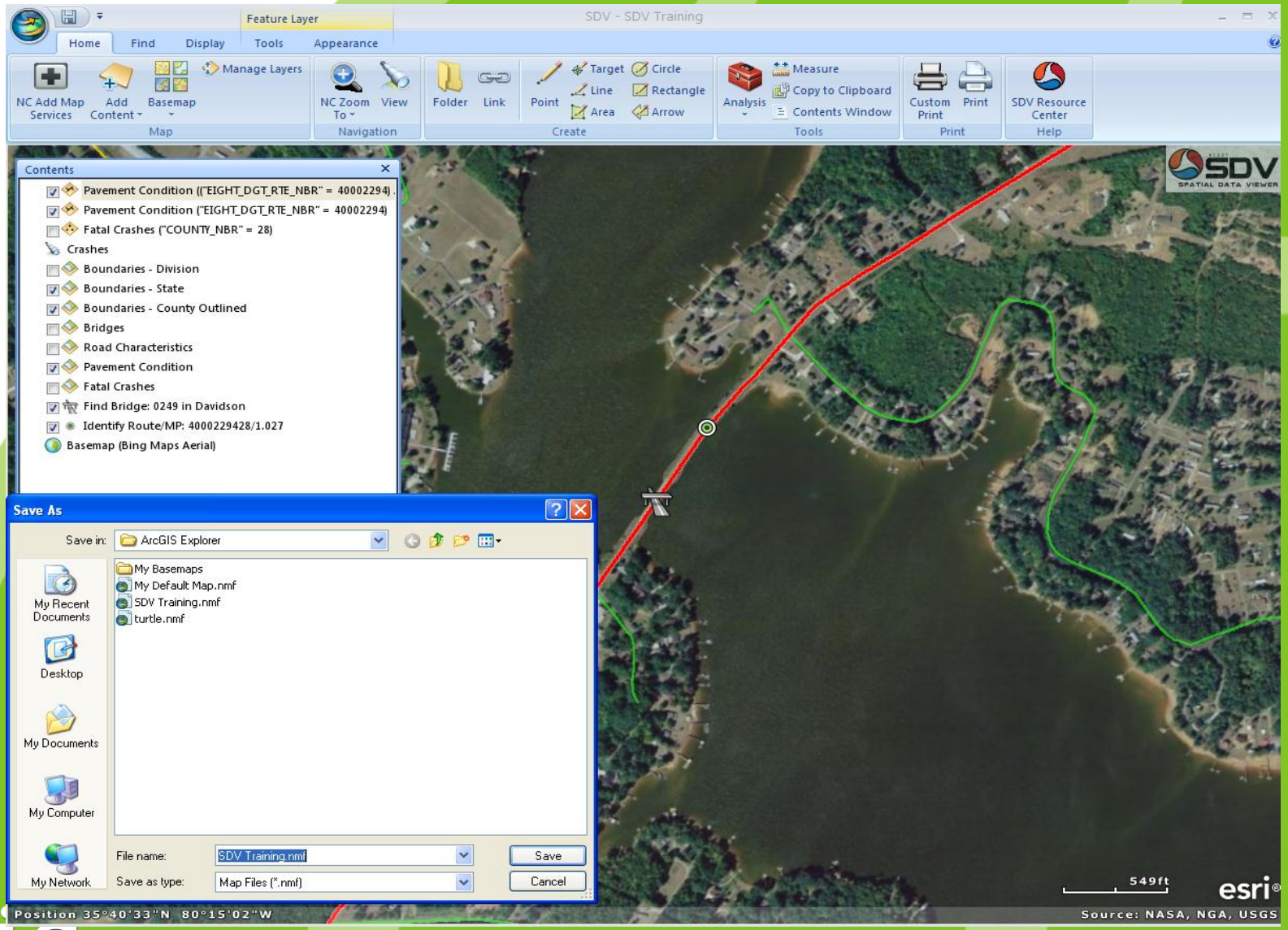
SDV Training



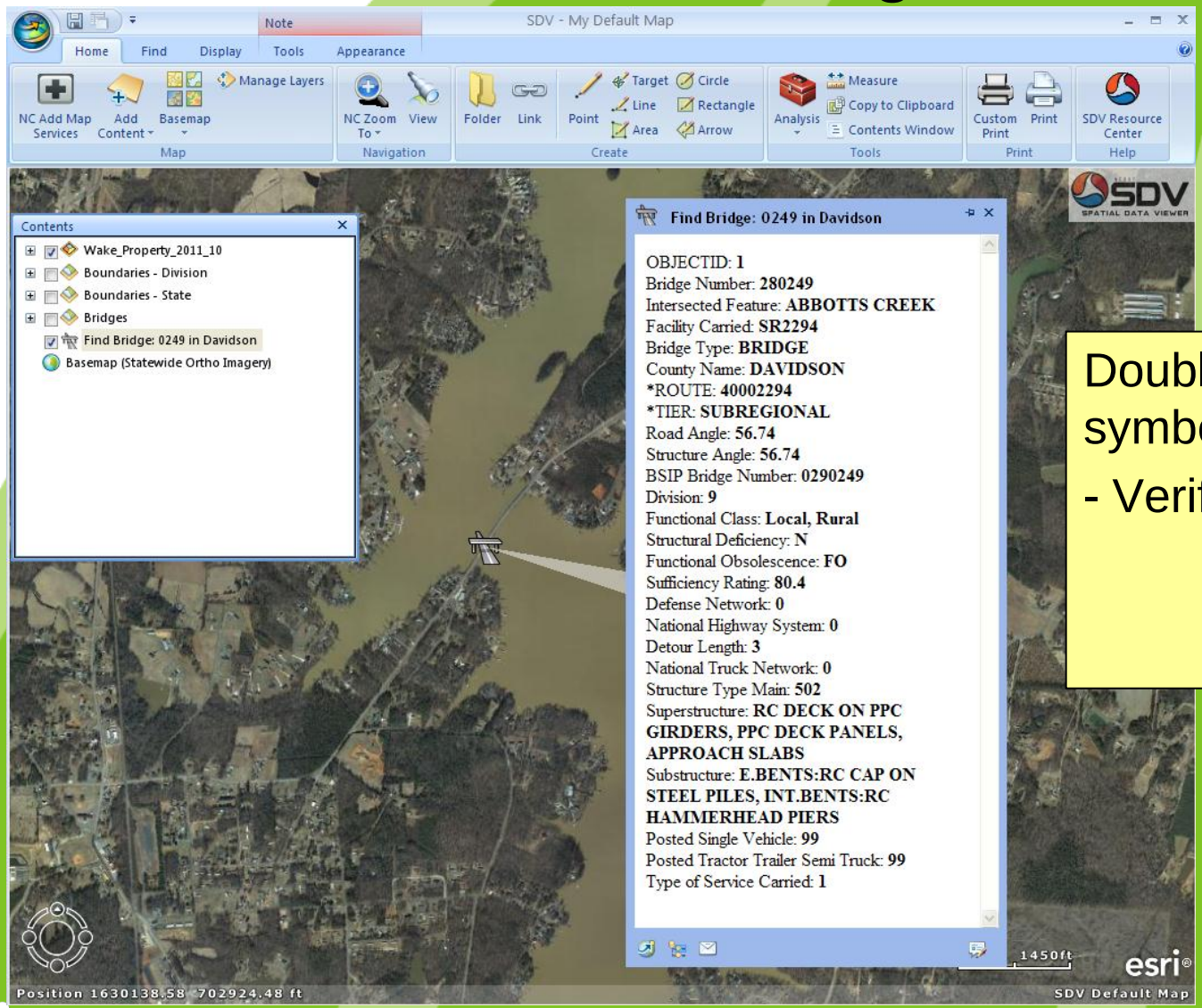
Save Your Work

1. Click on “disk”
2. Click on ArcGIS Explorer icon and navigate to directory

SDV Training



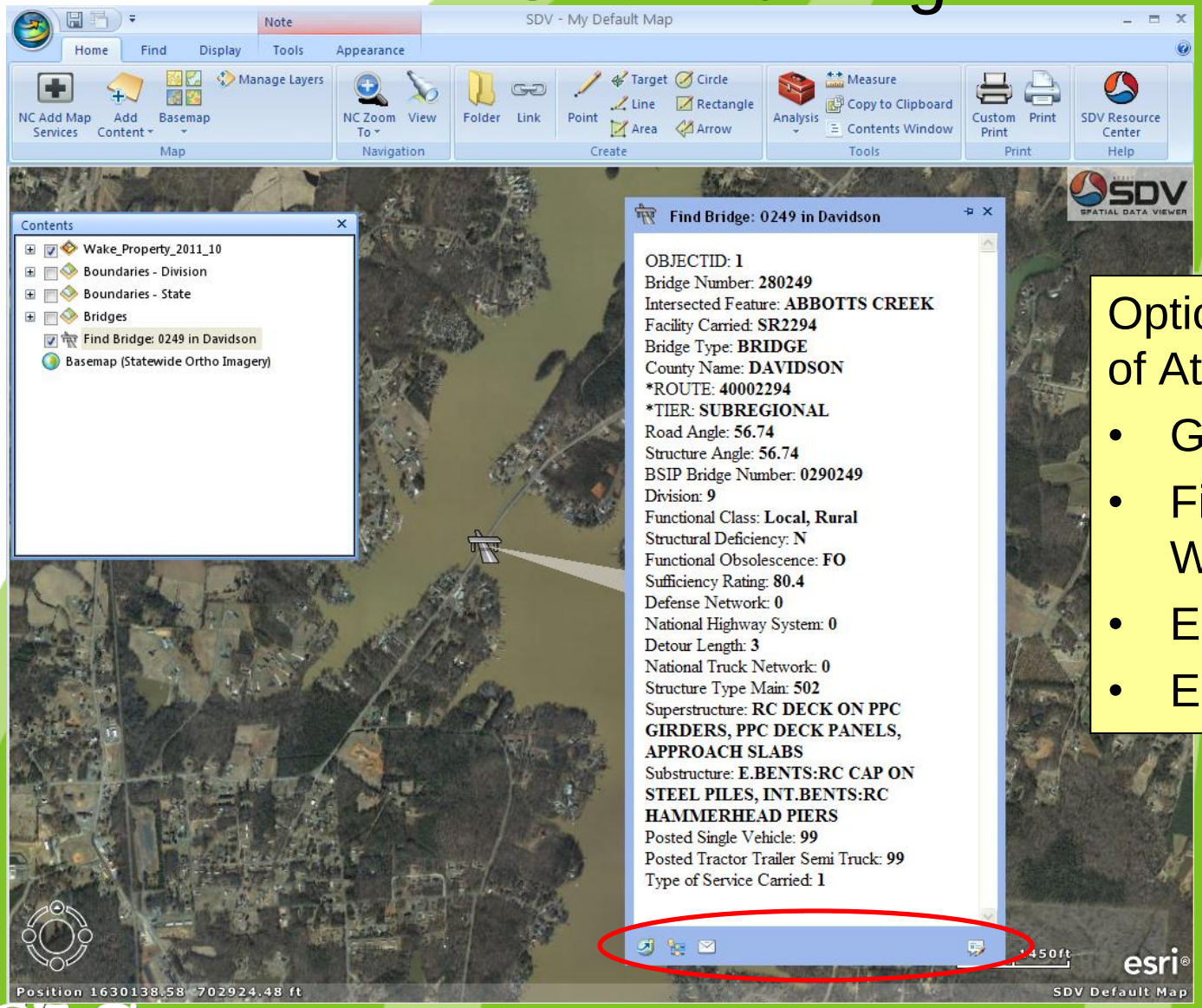
SDV Training



Double Click bridge symbol

- Verify attributes

SDV Training



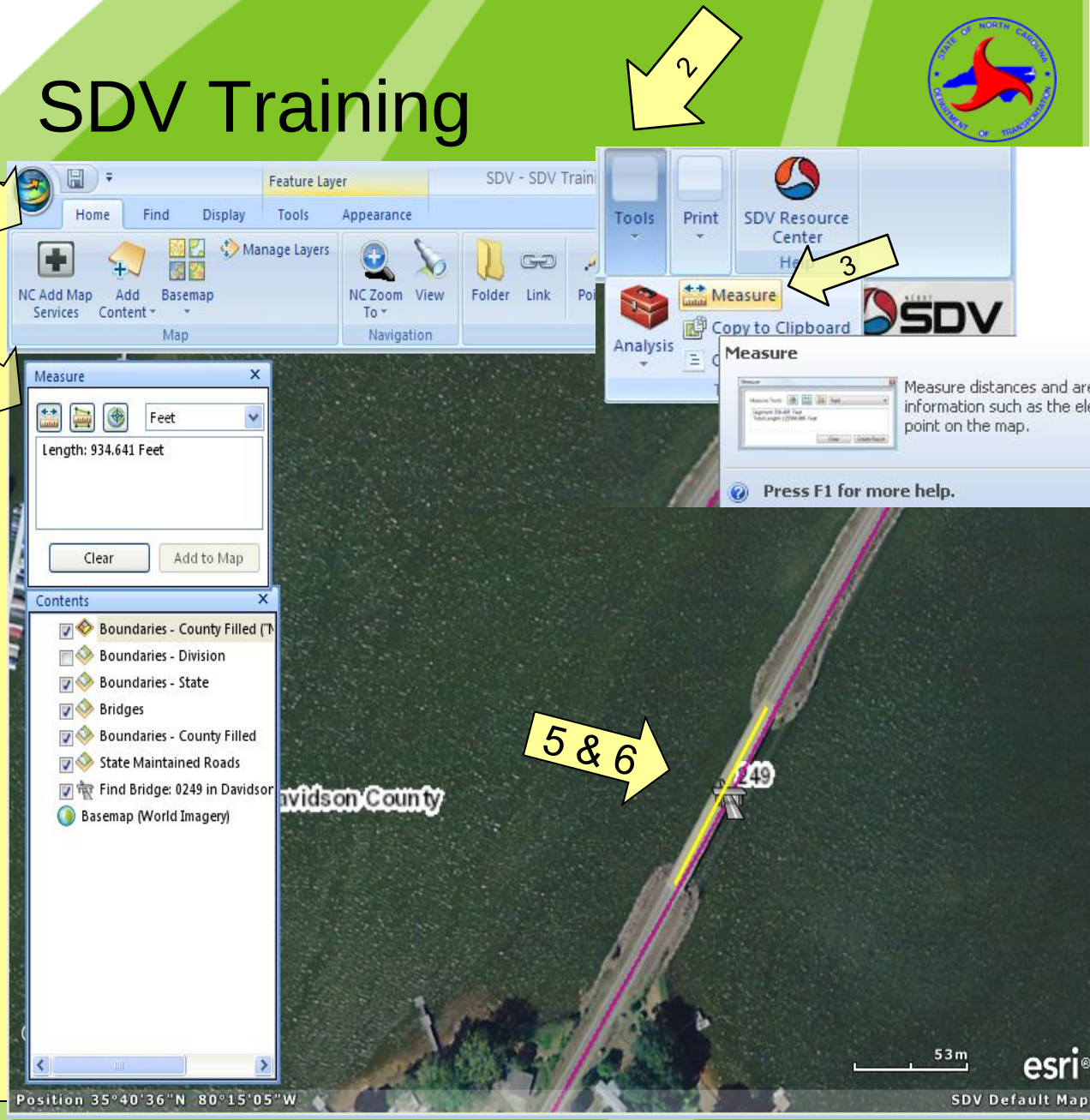
Options on bottom of Attributes list

- Go To Map
- Find in Contents Window
- Email as .nmc
- Edit

SDV Training

Measure Collapsed Bridge

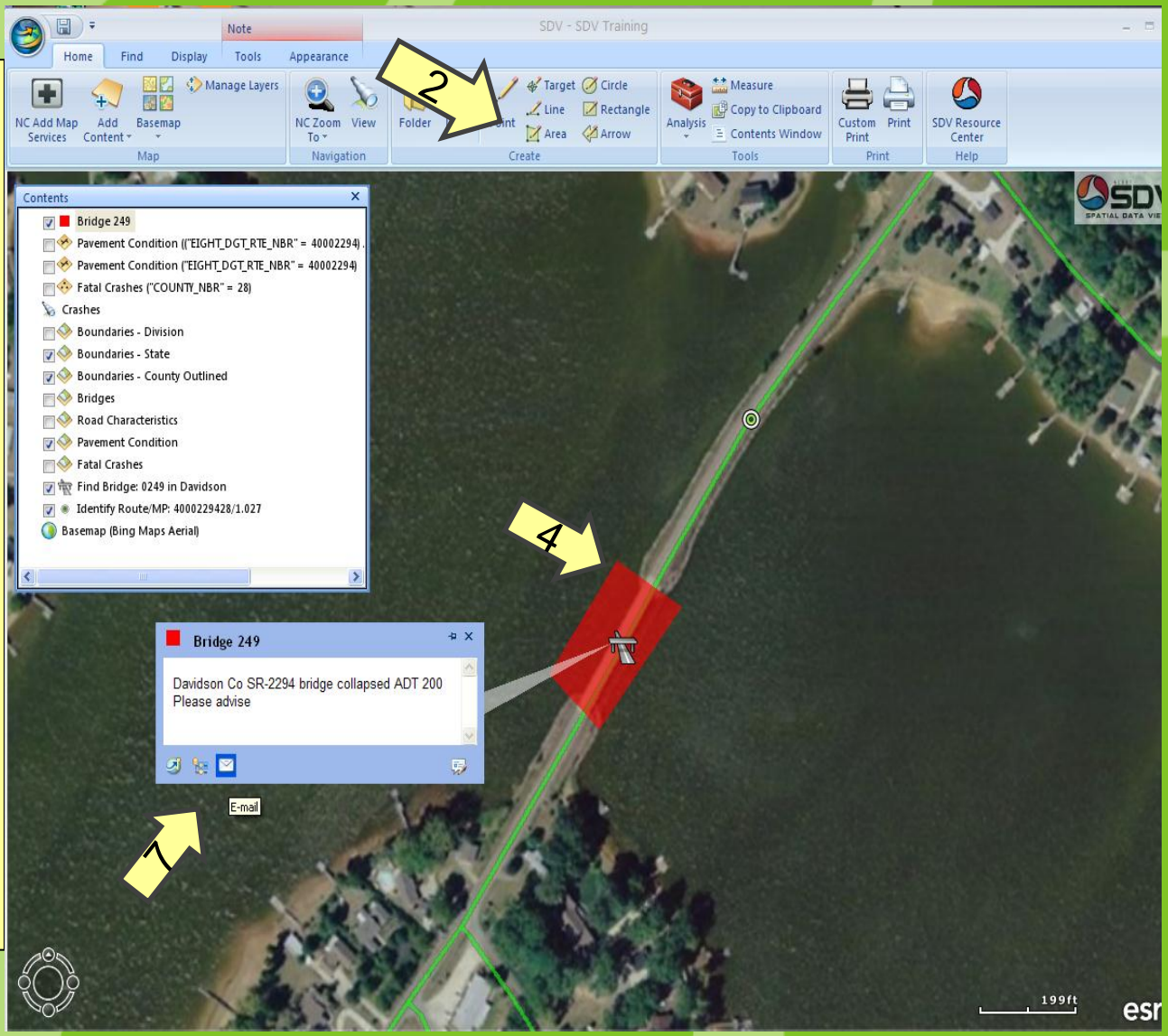
1. Click Home tab
2. Click Tools
3. Click Measure tool
4. Click the first button for length and the middle button to measure area and select unit of measurement
5. Click, draw line, then double click to finish
6. Measured area gets hi-lighted



SDV Training

Create a Note

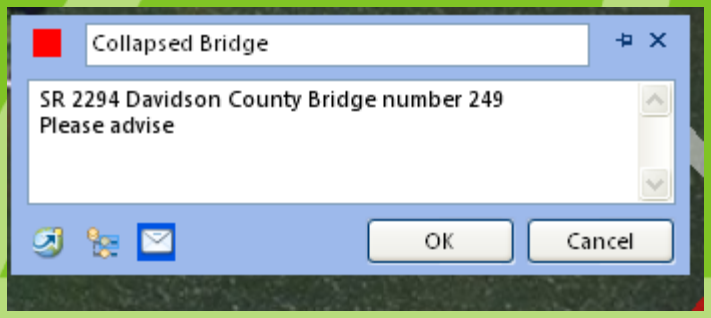
1. Click Home tab
2. Click Area in Tools section
3. Click on the map to outline the area of concern
4. Finish the area by double clicking
5. Add information to the note window
6. OK
7. Click Email

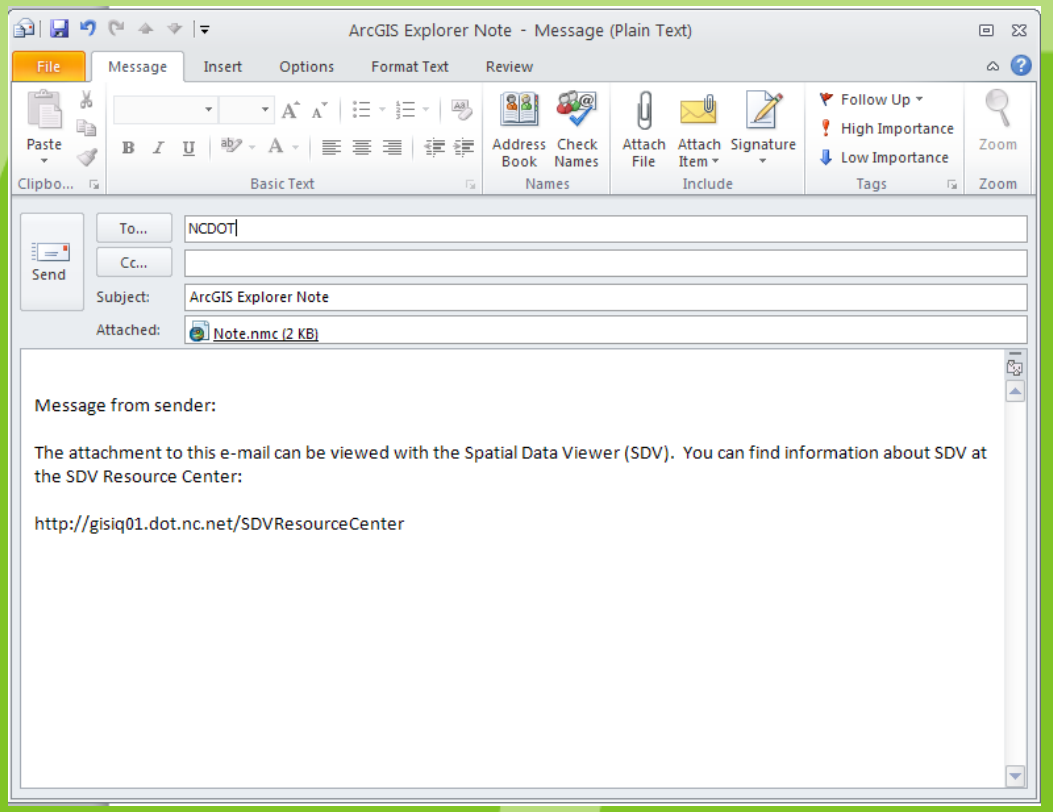


SDV Training

Sending E-Mail Options

1. Click E-Mail icon on note
2. ArcGIS Explorer button
3. Click Share
   - E-mail Map sends a map package, others will need the same access to the data
   - E-mail View sends a jpg
   - You can also right click the mouse and select Share option

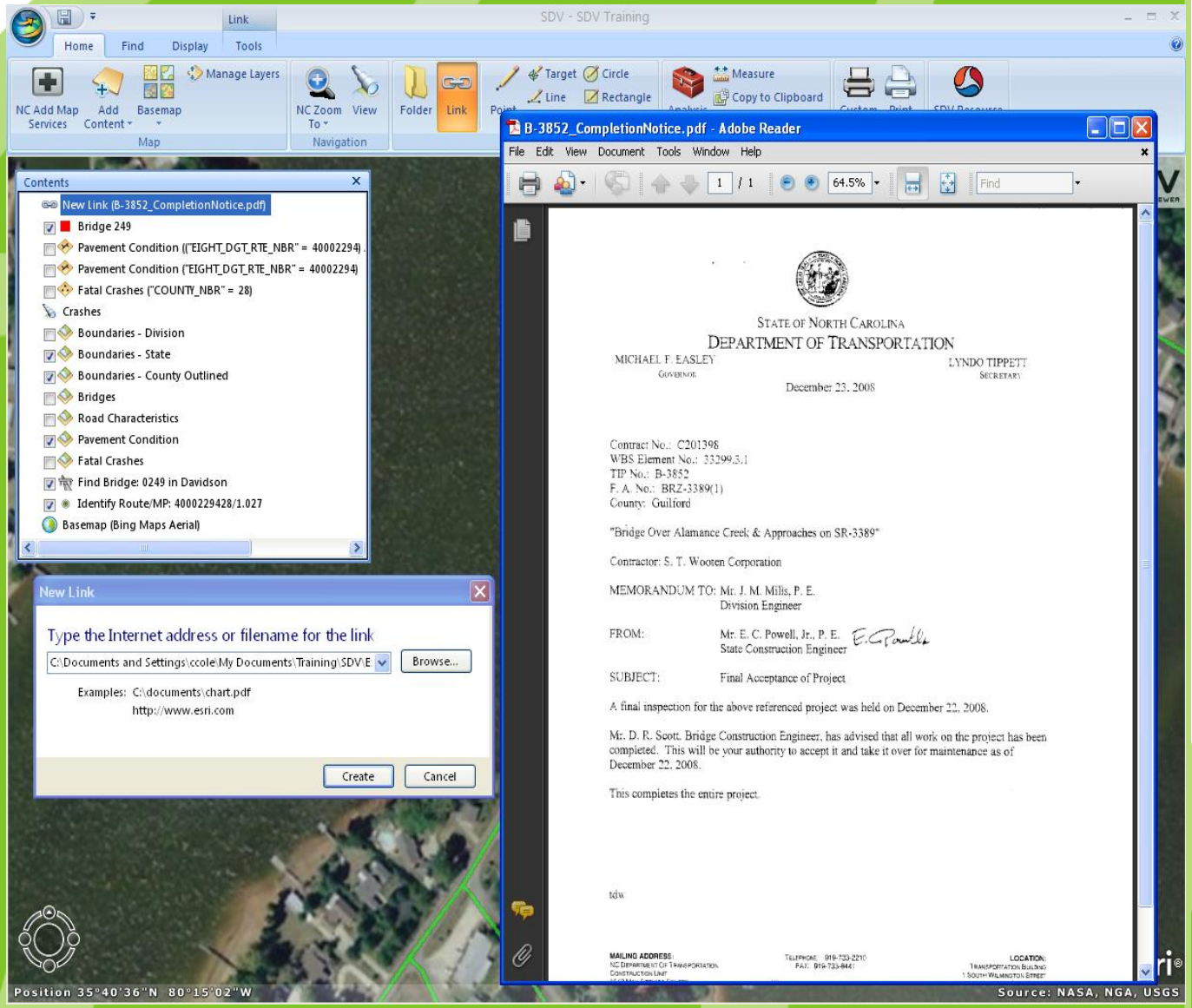




SDV Training

Add a link to documents

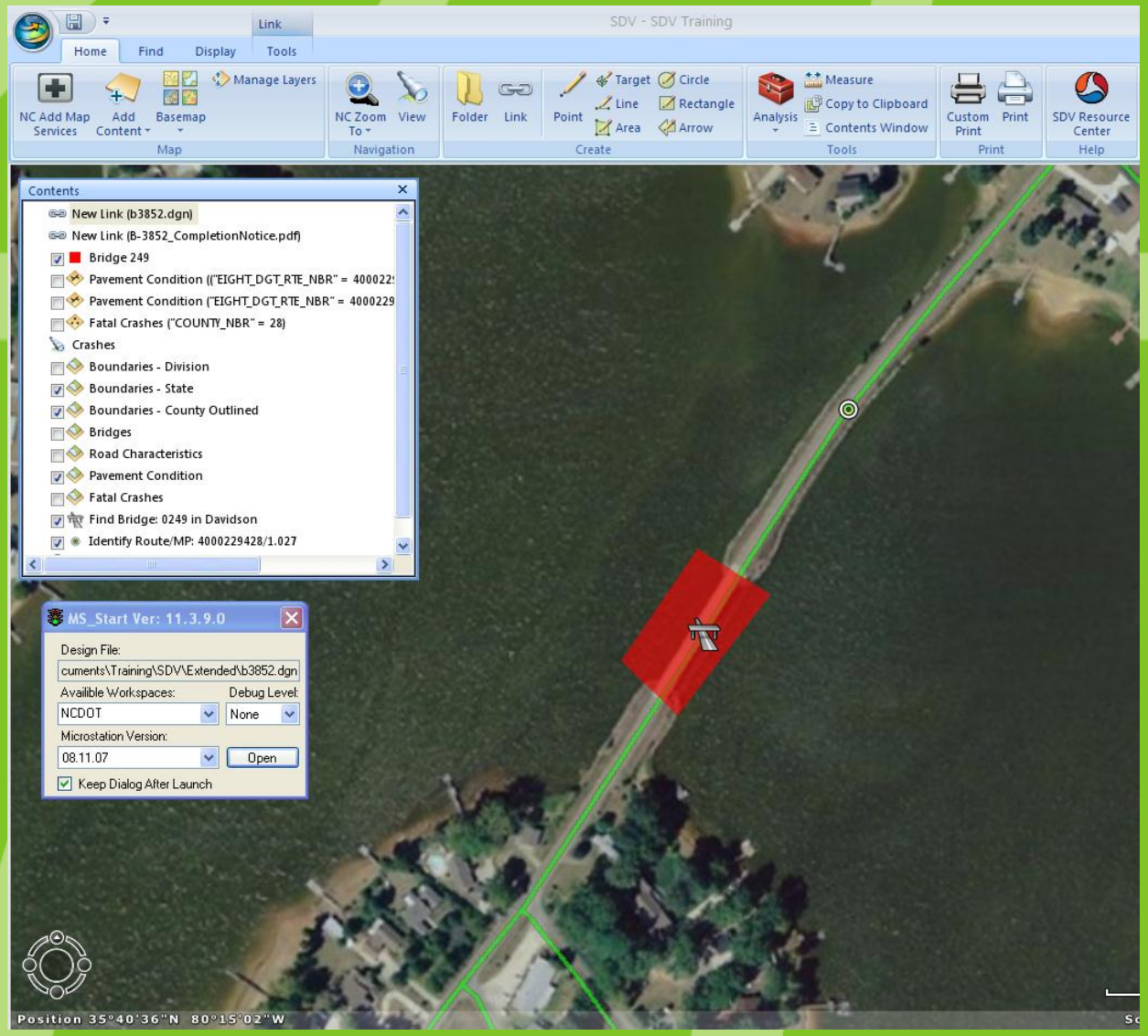
1. Click Link icon
2. Navigate to correct directory
3. Click on the new link in the Contents Window
4. Rename link



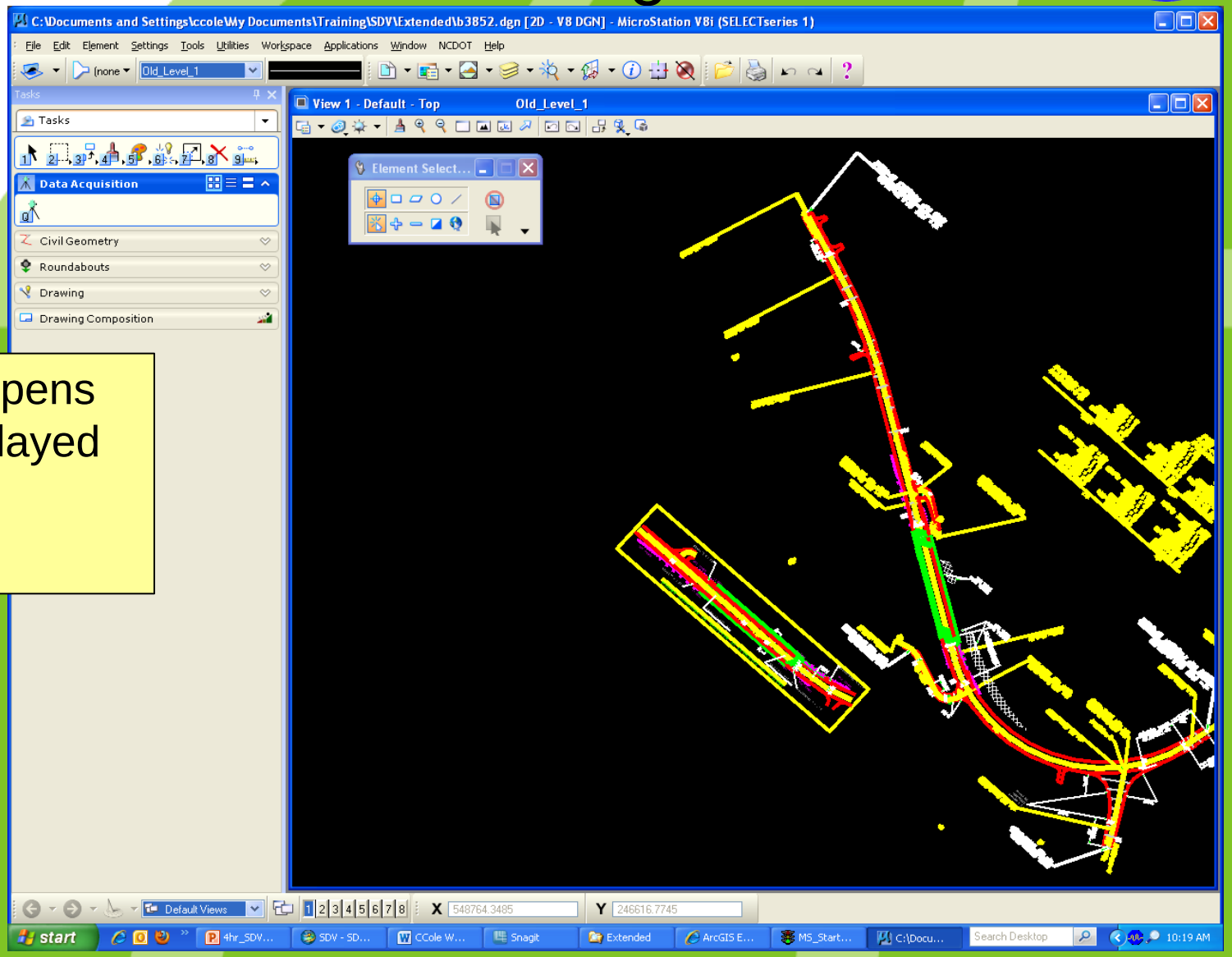
SDV Training

Add Link to .dgn

1. Click Home Tab
2. Click Link
3. Navigate to directory for .dgn
4. Double-click link to .dgn in Contents Window
5. Open new dialog

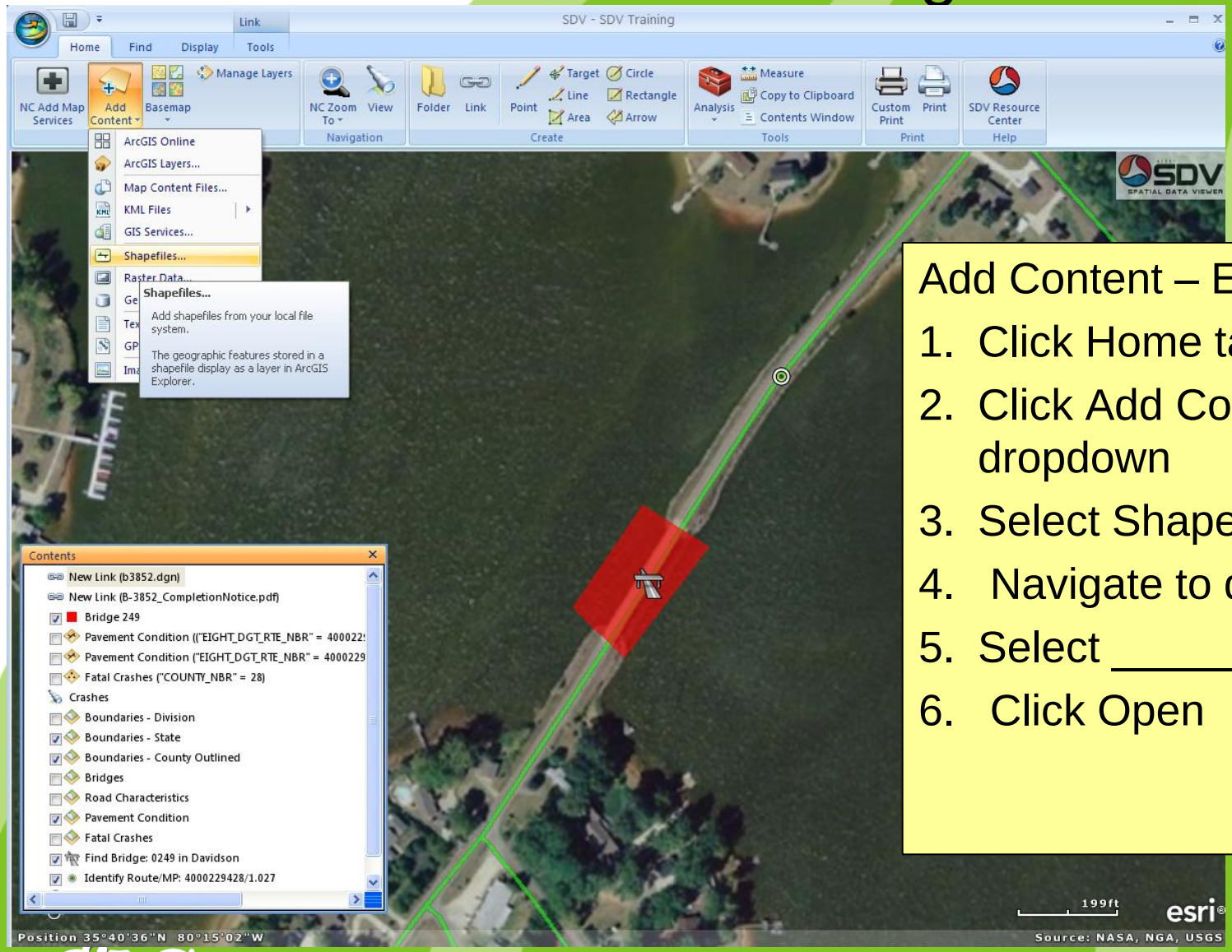


SDV Training



Microstation opens with .dgn displayed

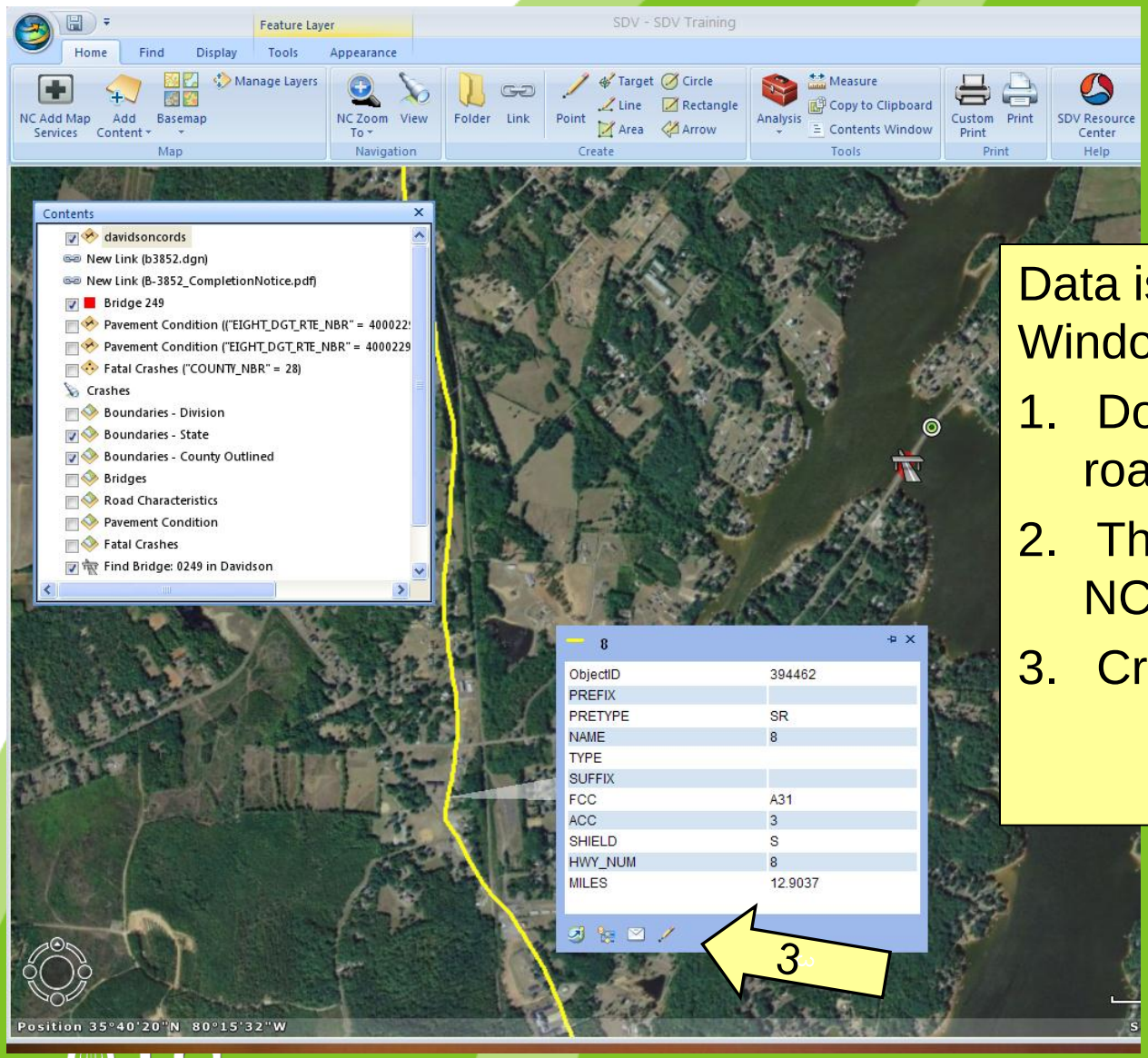
SDV Training



Add Content – External Data

1. Click Home tab
2. Click Add Content dropdown
3. Select Shapefiles option
4. Navigate to directory
5. Select _____.shp
6. Click Open

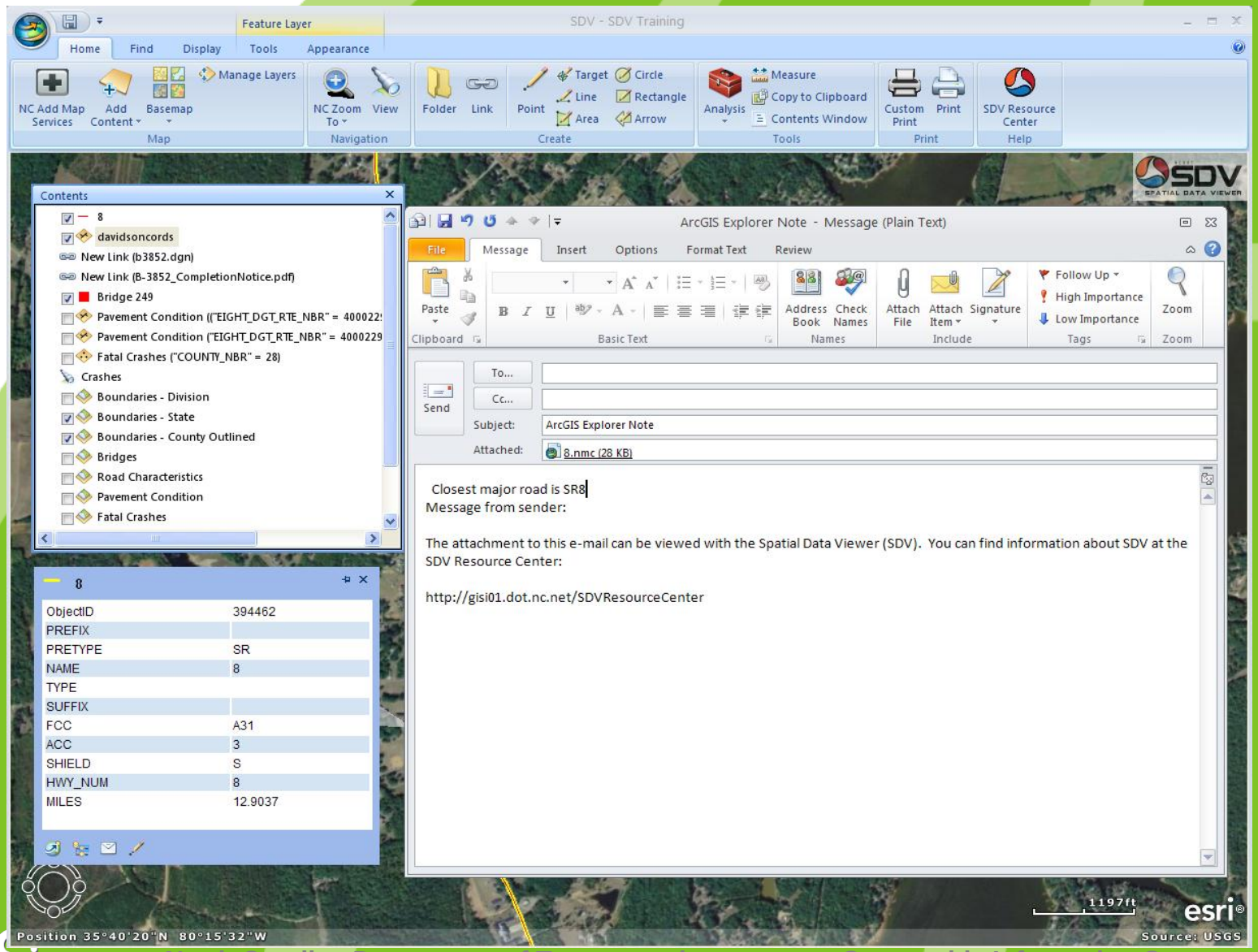
SDV Training



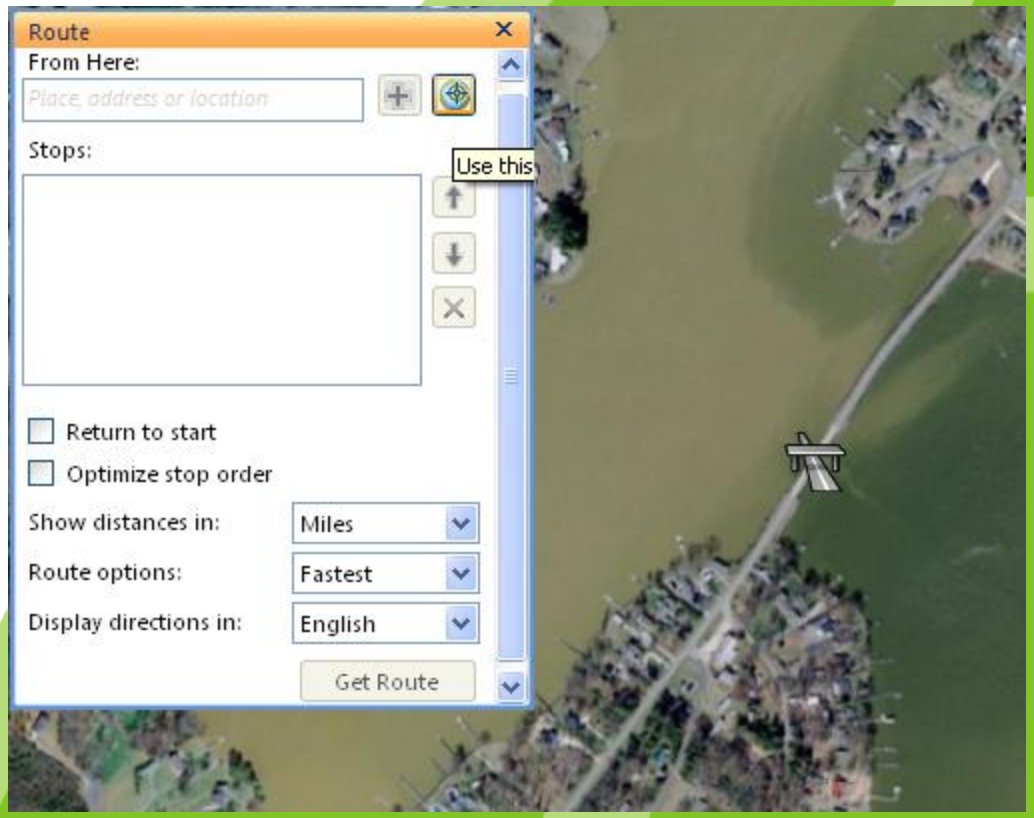
Data is added to Contents Window

1. Double-click the major road closest to bridge 249
2. The closest major road is NC-8
3. Create note, send email

SDV Training



SDV Training

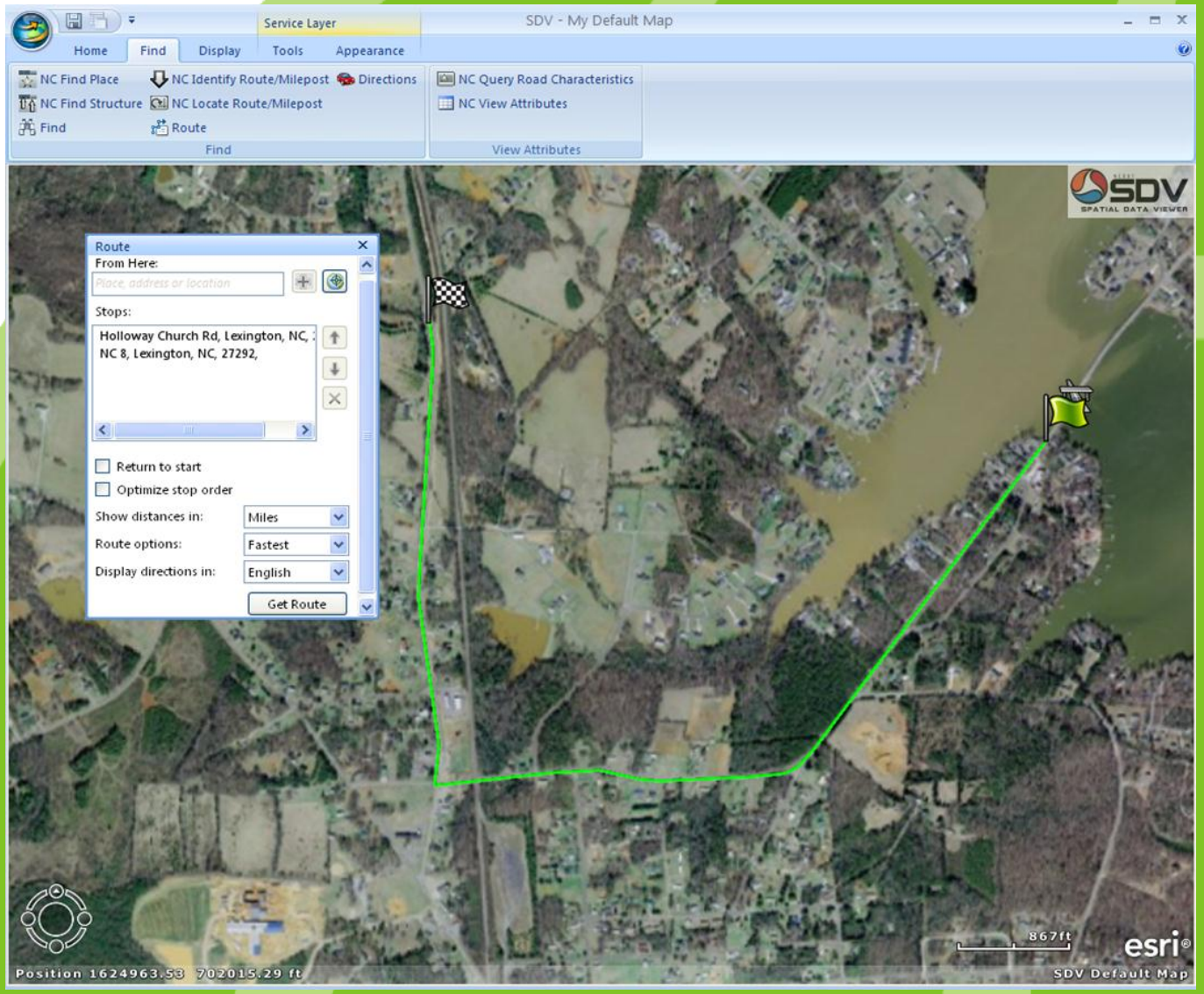


Create a Route

1. Click Find Tab, Route 

2. Click Select tool
3. Click on road near bridge
4. Click plus sign to add address
5. Click on NC – 8
6. Click to plus sign to add address as next stop
7. Click Get Route

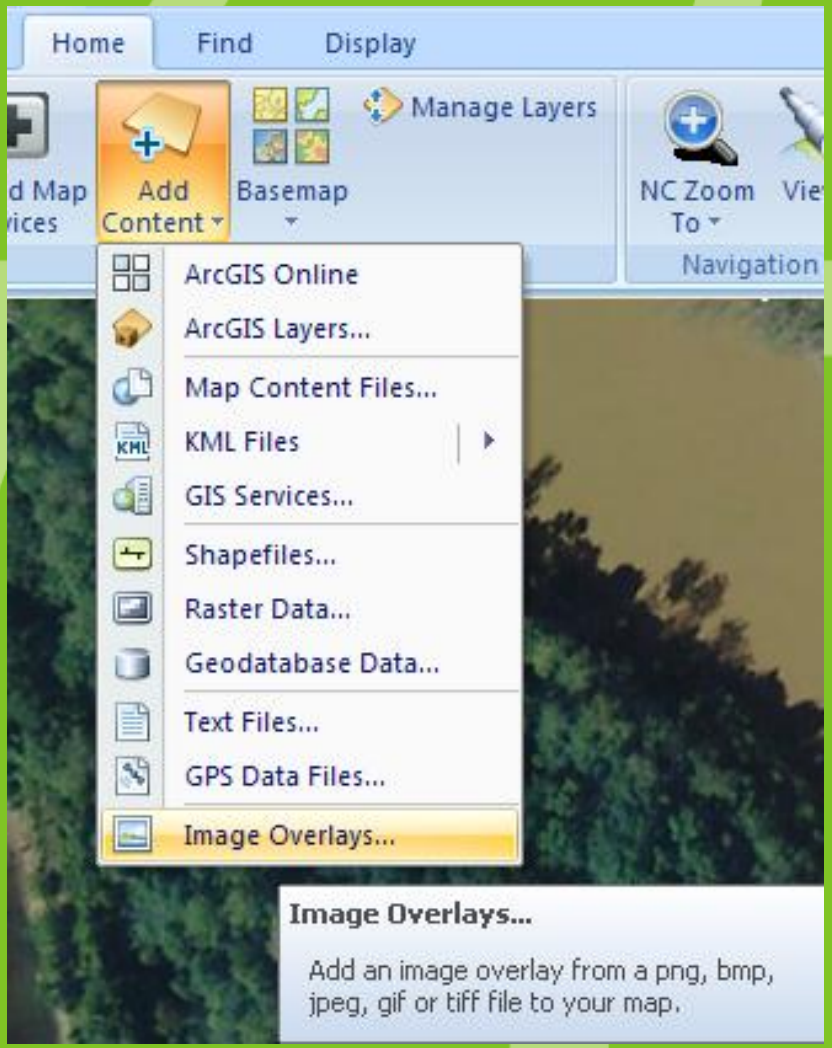
SDV Training



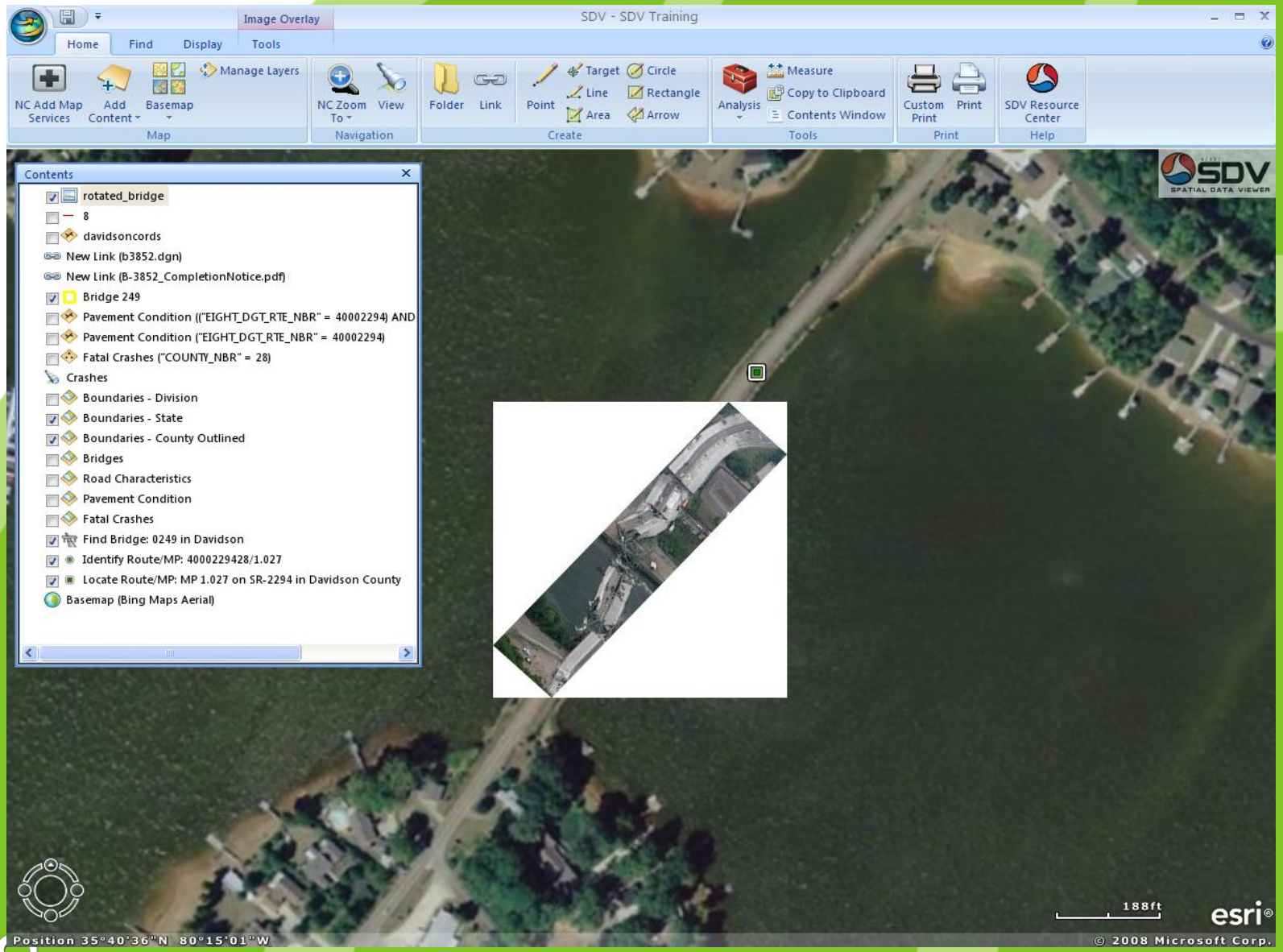
SDV Training

Add Content – External Data

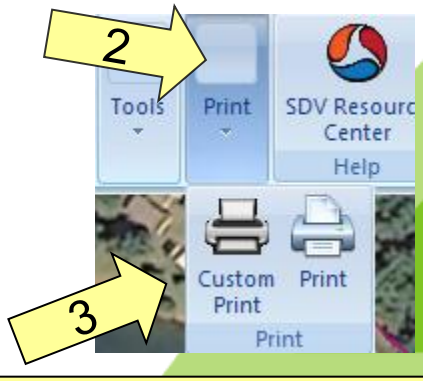
1. Click Home tab
2. Click Add Content icon
3. Select File type and path



SDV Training

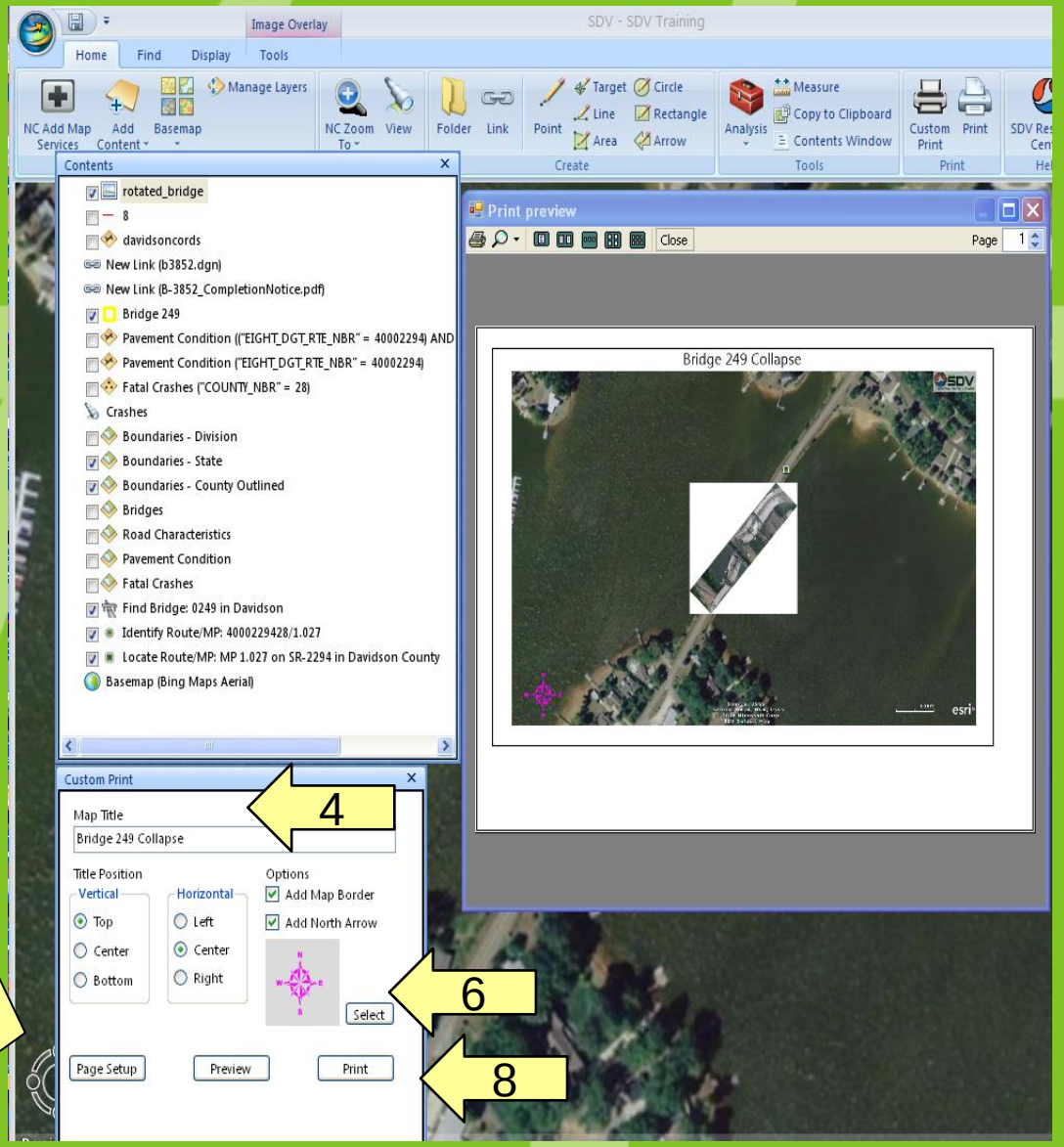


SDV Training

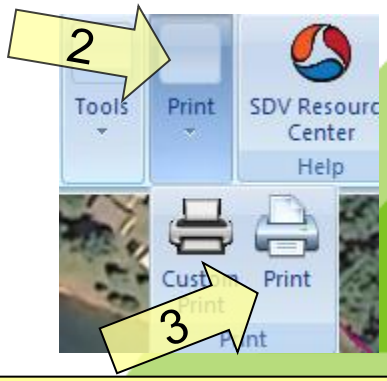


Print the Map using Custom Print

1. Click the Home tab
2. Click Print
3. Click Custom Print
4. Enter Map title
5. Select page options
6. Select North Arrow
7. Choose page settings
8. Click print preview or print

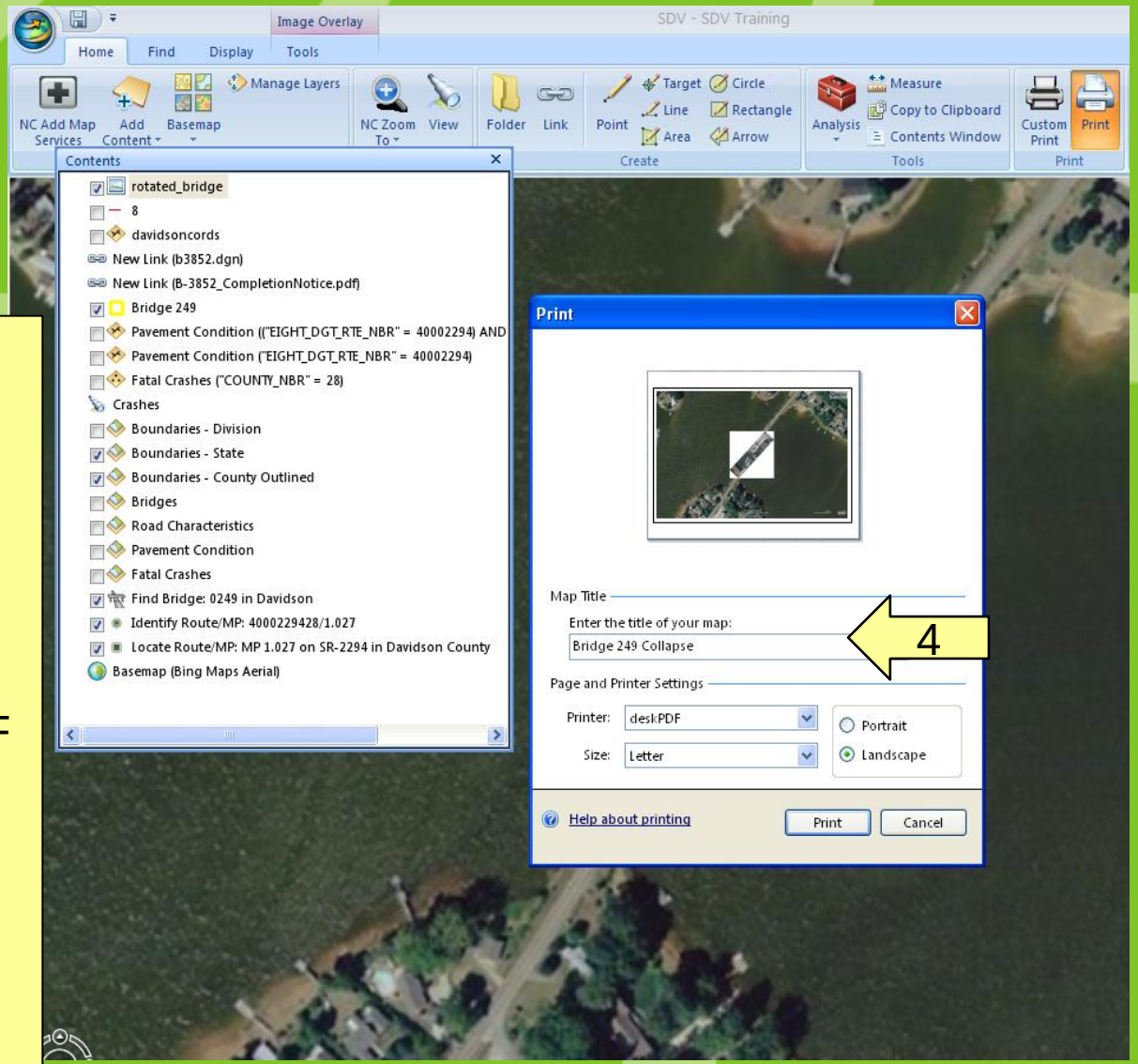


SDV Training

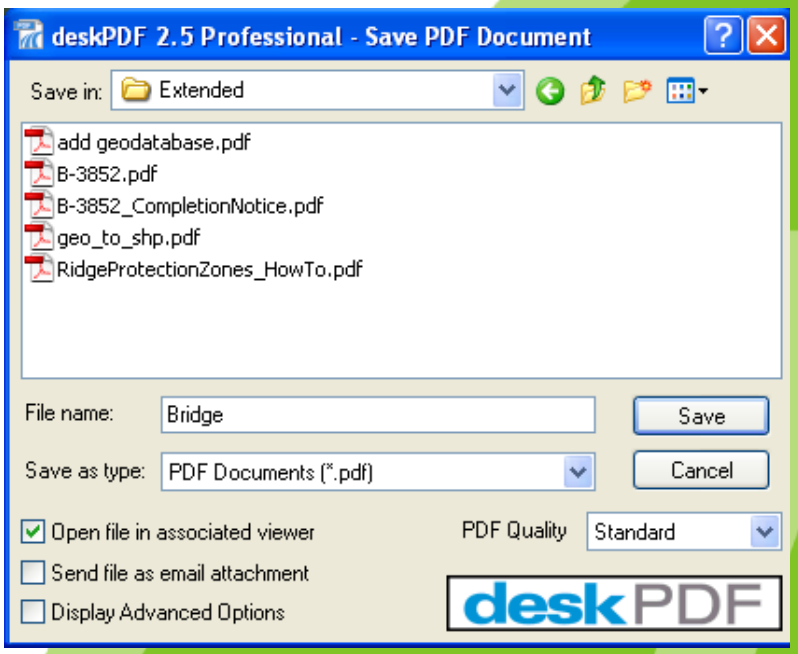


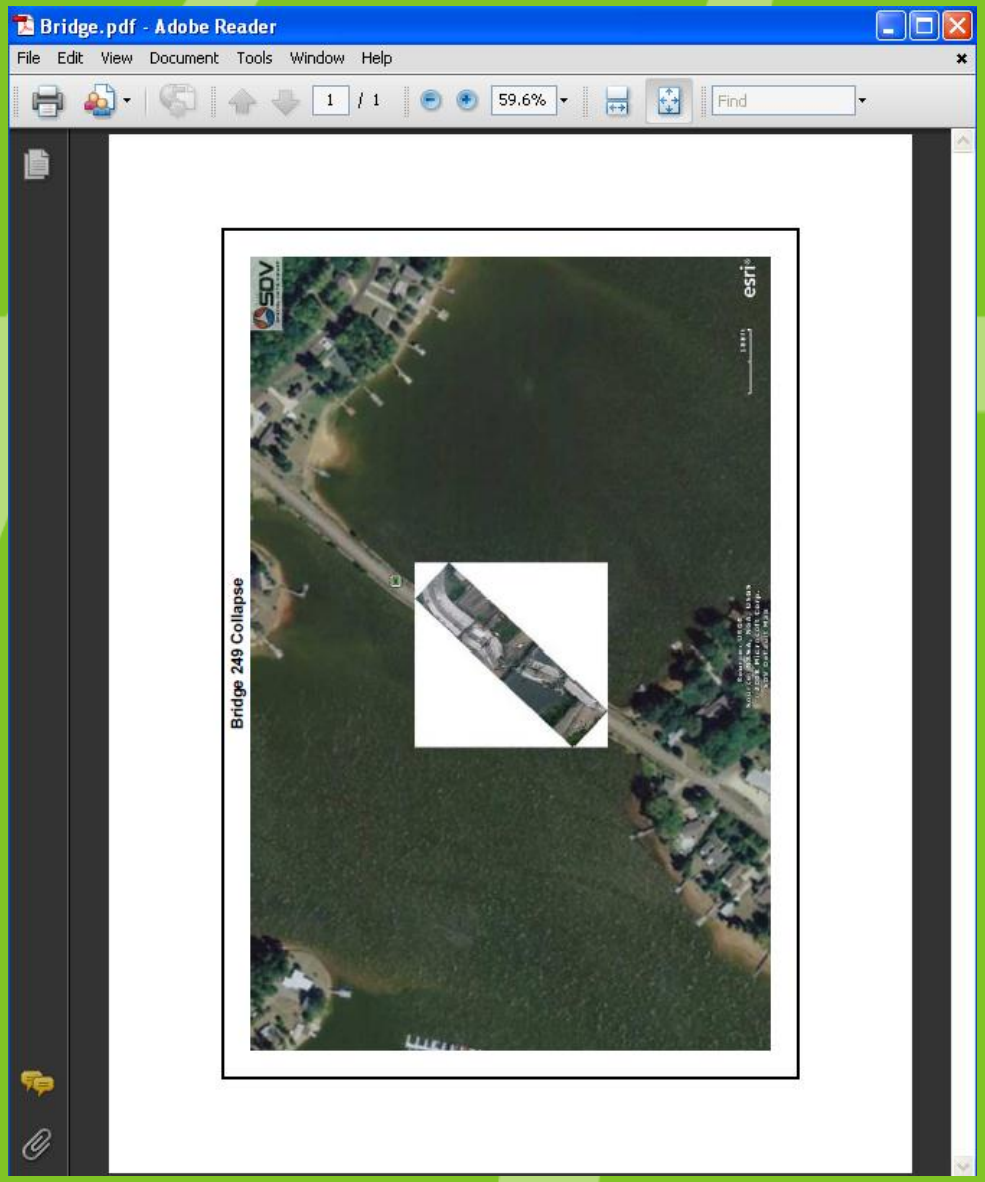
Print the Map using Custom Print

1. Click the Home tab
2. Click Print
3. Click Print
4. Enter Map title
5. Change printer to deskPDF
6. Select size
7. Choose page settings
8. Click print preview or print



SDV Training





SDV Training

Questions?

Thank you!

Thank you !

SDV Training brought to you by:

NCDOT GIS Unit

https://connect.ncdot.gov/resources/gis/Pages/default.aspx

Thank you !

To schedule training
ccole@ncdot.gov

To report an incident
dothelp@ncdot.gov

To request installation
gishelp@ncdot.gov

All other requests
gishelp@ncdot.gov