Exercise 2: Map Views and Layouts

Exercise 2A – Working with the Map View

Step 1: Setting up Exercise 2A

1. Start **ArcGIS Pro** and sign in using your ArcGIS Online organizational account credentials.
2. On the left side of the screen, click **Open Another Project**.
3. In the Recent Projects section, click **Browse**.
4. Browse to ***C:\Esri\ArcGIS Pro\Projects*** and select **Exercise2.ppkx**.

The project package will unpack. Packages are unpacked in the **<User Documents>\ArcGIS\Packages** folder rather than the C:\Esri\arcGIS Pro\Results\ folder. You will save this Project in the correct location.

5. On the ***Project*** tab, click **Save As**.
6. In the Save Project As window, browse to ***C:\Esri\ArcGIS Pro\Projects*** and save the project as **Exercise2**.

For this earthquake project, you will use data that is not contained in the ArcGIS Pro project structure. You will create a connection to its location so that you can work more efficiently.

7. In the ***Project*** pane, right-click **Folders** and click ***Add Folder Connection***.
8. Create a folder connection to ***C:\Esri\ArcGIS Pro\Data\Exercise2***

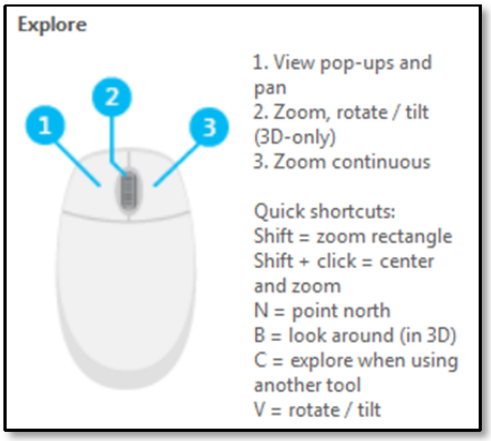
This folder contains the data you will use throughout this Exercise. You are now ready to start the exercise.

Step 2: Navigate the map

You can navigate a map in ArcGIS Pro in a number of ways. You will explore a few of them in this step.

1. On the ribbon, click the ***Map*** tab.

The default tool in ArcGIS Pro is the **Explore** tool. When you point to the **Explore** tool, you see a brief list of mouse buttons and quick shortcuts for navigating a project. You will learn more about the Explore tool later.



2. Make sure that the **Explore** button  is active.
3. Click a location in the southeast area of the map, and then drag the map to the left.
4. On the ***Map*** tab, in the **Navigate** group, click the Previous Extent arrow  to return to your original extent.
5. On the **map** view, roll your mouse wheel forward.
6. The map zooms in, centered on the location of your cursor.
7. In the ***Navigate*** group, click the Full Extent button  .
8. The map zooms to the full extent of the basemap data.
9. In the ***Contents*** pane, right-click the **Earthquakes** layer and choose ***Zoom To Layer***.
10. Turn on the **Earthquakes** layer.

Step 3: Create a 3D view of the data

All the aftershocks are displayed on the surface of the earth because this is a two-dimensional map. But the large number and concentration of aftershocks on the map make it difficult to interpret. To make the map easier to read, you will create a 3D view of the data.

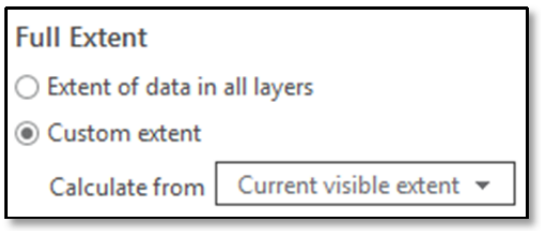
1. On the ***View*** tab, click **Convert**.
2. A new map (called a scene) opens in 3D. The earthquake layer is turned on, but a visibility range has been automatically created. You will remove it.
3. Click the **Earthquakes** layer in the ***Contents*** pane.
4. Click the ***Appearance*** tab.
5. In the **Visibility Range** group, click ***Clear Limits***.

The default name is not what you want for your 3D map so you will rename it.

6. Right click the Northridge2D_3D map in the ***Contents*** pane and then click **Properties**.
7. In the **General** tab, change the name to **Northridge3D**
8. On the **Map** tab, click the Full Extent button  .

Currently, the map is shown on a globe in a local UTM Coordinate system. But in the project, you need to see only the San Fernando Valley in California. You will change the view to a more appropriate scale for the project.

1. Click the Previous Extent button  .
2. On the ***View*** tab, click **Local** to change the 3D scene view.
3. Re-open the Northridve3D map properties page. On the ***Extent*** tab, set the **Full Extent** to **Custom extent** Calculated from **Current Visible Extent**.



Despite being displayed in 3D, the map still appears flat. In the next step, you will change how the elevation of the scene is displayed.

Step 4: Set the elevation surface for the 3D view

The map is now draped over a 3D framework, but the elevation is not at a high enough resolution, and the data is still displayed on the surface. First, you will set a new, more accurate elevation surface.

1. In the ***Contents*** pane, right-click **Northridge3D** and click **Properties**.
2. In the **Map Properties: Northridge3D** dialog box, click **Elevation** Surface.
3. You will locate the **earthquake** and **aftershocks** under the surface of the scene, so you must enable the scene for subsurface display.
4. Check the box to *Allow Navigation below ground*.
5. Click the **Ground** entry to expand it.
6. Click the **red X** to the right of the default surface to delete it.

Now you will designate the elevation layer as the elevation surface.

7. Click the **Add Elevation Source** button .
8. Click **Folders**, and then browse to ***C:\Esri\ArcGIS Pro\Data\Exercise2\Database\Northridge.gdb***.
9. Click **Elevation**, and then click **Select**.
10. Click **OK** to close the window.

The elevation of the scene has now been set to a source with a higher resolution.

11. **Save** your project.

Step 5: Add a 3D layer to the scene

The earthquake layer has a depth field. The data can be displayed in 3D under the surface of the earth. But the symbolization process might take too much time. To save time, you will add a 3D layer file that has already been set up correctly.

1. In the **Project** pane, browse to **Folders** > **Exercise2** > **MapsAndLayers**.
2. Drag the ***Earthquakes.lyrx*** file onto the map.

The new layer is automatically added to the Contents pane under 3D Layers.

3. If necessary, use the same method you used earlier to clear the Visibility Range limits (in ***Contents*** pane select **Earthquakes** in 3D Layers > ***Appearance*** tab > **Clear Limits**).

You can now remove the original 2D Earthquakes layer.

4. In the ***Contents*** pane, right-click the **Earthquakes** layer under 2D Layers and click **Remove**.
5. **Save** your project.

Step 6: Navigate the 3D scene

Navigation controls in 3D scenes are slightly different from those in 2D maps. Some of the actions are the same, but others have been changed to make navigation in 3D easier.

1. On the **Map** tab, make sure that the Explore button is active.
2. Left-click and drag the scene in any direction.
3. Left-clicking will pan the scene, much like in a 2D map.
4. If necessary, click the **Previous Extent** button.
5. Right-click the scene and drag the mouse forward and back.
6. Roll the center mouse wheel back and forth.

Right-clicking the scene and dragging—or rolling the mouse wheel—will zoom the scene in and out.

7. Click and hold down the center mouse wheel, then move the mouse forward and backward.

Holding down the mouse wheel and dragging the mouse forward and back will rotate the scene up and down.

8. Click the center mouse wheel again and move the mouse to the left and right.

Holding down the mouse wheel and dragging the mouse from side to side will rotate the scene around the point that you originally clicked.

Take a few minutes to investigate the data by navigating around the area, particularly at the **earthquake symbols under the surface of the scene** (hold the center mouse wheel down and move forward past horizontal to view below ground).

You can see two planes created by the points: a horizontal plane represents a default depth value that was assigned to aftershocks when an actual depth value was not available, and a diagonal distribution of aftershocks represents the plane of the earthquake fault under the San Fernando Valley.

Step 7: Link 2D and 3D views

Now you will explore the 2D map and the 3D scene at the same time by linking your 2D and 3D views.

1. Click the ***Northridge3D*** tab and drag it to the center of the ArcGIS Pro GUI
2. A docking icon appears.
3. Dock the window on one side or the other by dragging the window and then releasing it.
4. On the ***View*** tab, click the **Link Views** down arrow and choose **Center And Scale**.

Note: the chain **icons** on the **title** tabs, which indicate that the two views are linked.

Using the skills that you learned earlier, pan around either the map or the scene.

When you change the extent on one linked view, the other linked view will automatically update to match it.

5. Close the Northridge3D map by clicking the X on the map tab. 

6. **Save** your project.

In this portion of the exercise, you explored 2D and 3D views, and learned how to navigate in both modes.

Exercise 2B – Working with Layouts

Step 1: Setting up Exercise 2B

1. From the **Projects** tab, click **Open**.
2. On the **Recent Projects** panel, browse to ***C:\Esri\ArcGIS Pro\Project\Exercise2BStart.aprx*** and then click **Select**.
3. On the ***Projects*** tab, save your project to **Folders** > **ArcGIS Pro** > **Projects** and name it ***Exercise2B.aprx***
4. If necessary, click the **Northridge2D** tab to activate the map.
5. In the Contents pane, make sure that only the following layers are turned on:
   - Epicenter
   - BuildingDamage
   - MajorFaults
   - QuakeBuffer_SWave
   - PGV
   - Hillshade
   - Basemap

Now you will adjust the view of the 3D scene.

6. Click the **Northridge3D** tab.

7. In the ***Contents*** pane, make sure that only the following layers are turned on:

    - Earthquakes
    - BuildingDamage
    - Basemap

Step 2: Create a layout

A layout is separate from a map or 3D scene, so it must be created independently.

1. On the ***Insert*** tab, in the **Project** group, click **New Layout**.
2. A menu appears with options for layouts based on paper sizes.
3. Choose **ANSI – Landscape** > **Letter**.

A new layout is created; you can see it in the Project pane under Layouts. A blank page layout has been added to the view area.

Step 3: Add a 2D map to a layout

You will add a 2D map to the layout and then adjust its placement and extent.

1. On the ***Insert*** tab, click the **Map Frame** down arrow.
2. Under **Northridge2D**, choose ***Northridge2D***.

The Northridge2D Map Frame is added to the ***Contents*** pane. But you are going to add more elements to the layout, so you must resize the map frame to make room.

3. In the ***Contents*** pane, right-click the ***Northridge2D Map Frame*** and choose **Properties**.
4. The ***Element*** pane opens.
5. In the ***Element*** pane, under **Properties**, click the **Placement** button. 
6. Change the **Size** entries to the following values:

    - Width: 5.5 in
    - Height: 6.5 in

7. Change the **Position** entries to the following values:

    - X: 0.33 in
    - Y: 0.33 in

Finally, you will adjust the view of the map so that you can see all the relevant information.

8. In the ***Contents*** pane, expand the **Northridge2D** Map Frame.
9. Zoom to the extent of the **QuakeBuffer_SWave** layer.

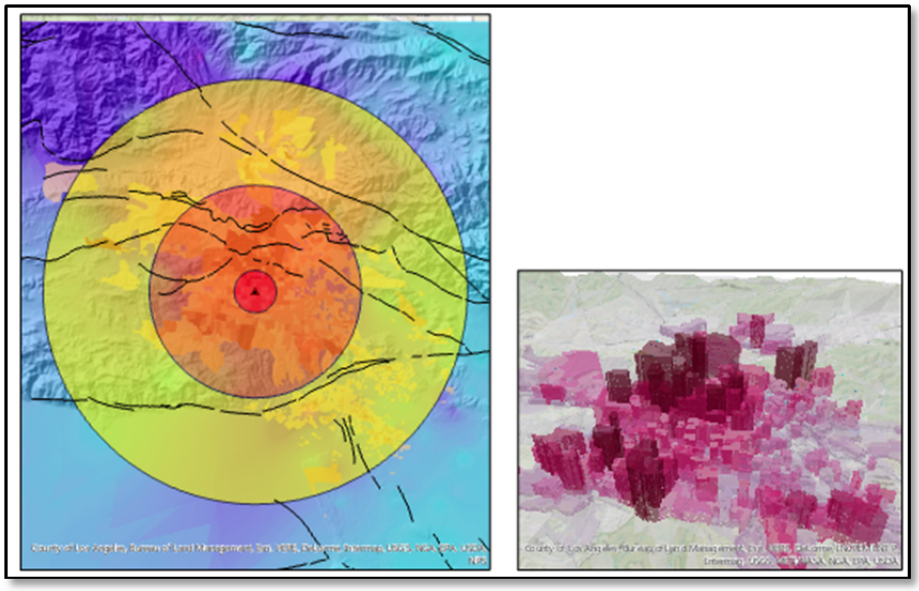
Step 4: Add a 3D scene to a layout

In this step, you will add a 3D scene to the layout, showing a different perspective of the data.

1. On the ***Insert*** tab, add the **Northridge3D – Northridge3D** map frame.
2. You will adjust the placement of the 3D map frame.
3. In the ***Contents*** pane, make sure that the 3D map frame is selected.
4. On the ***Element*** pane, change the Size entries to the following values:

    - Width: 4.5 in
    - Height: 3.5 in

5. Under **Position**, click the **bottom-right** square to set the anchor point. 
6. Change the **Position** entries to the following values:
    - X: 10.66 in
    - Y: 0.33 in
7. On the ***Layout***, right click the **Northridge3D** Map and then click **Activate**.
8. Use the mouse to pan/zoom the map centered on the building Damage.
9. Once you are satisfied with the appearance of your layout, on the ***Layout*** tab, click the **Close Activation** button.
10. Your Layout should look similar to below:



Step 5: Add a title to a layout

Now that you have added the most important element of a layout (the maps), you will add some other elements. First, you will add a title.

1. On the ***Insert*** tab, click the **Text** down arrow.
2. This menus shows the options available for adding text to the layout.
3. Choose **Text**.
4. Click anywhere on the layout.
5. On the ***Element*** pane, under **Properties**, click the **Options** button. 
6. In the **text** area, change the text to ***Northridge Earthquake Damage***.
7. Click **Apply**.
8. Click the **Placement** button.

11. Under **Position**, click the **Center** square to set the anchor point. 
12. Change the **Position** entries to the following values:
    - X: 5.5 in
    - Y: 8.0 in
9. On the ***Elements*** pane, click **Text Symbol**
10. Click the **General** button to set the text **Appearance** properties. 
11. Expand **Appearance** and set the following properties
    - Font Name: **Times New Roman** (hint start tying name in input box)
    - Size: **30 pt** (type in value)
    - Font Style: **Bold**
12. Expand Shadow and set the following properties:
    - Color: **Grey 50%**
    - X Offset: **1.5 pt**
    - Y Offset **-1.5 pt**
13. Click Apply

Step 6: Add dynamic text to a layout

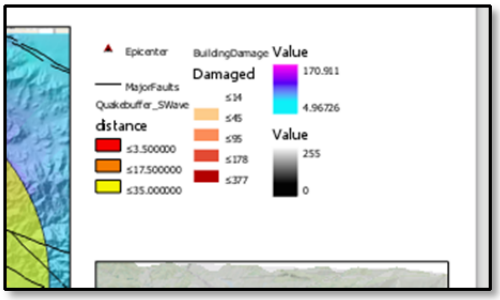
In some cases, text elements that are automatically generated supply valuable information to map layout users. Automatically generated text can include the map author, the map's latitude and longitude coordinates, or the map's storage location. In this step, you will add a dynamic text element that shows your map's creation date.

1. On the **Insert** tab, click the **Dynamic Text** down arrow.
2. In the menu, scroll down and choose **Project** > **Date Saved**.
3. Move the date text to the lower-left margin of the layout.

Step 7: Add elements to a layout

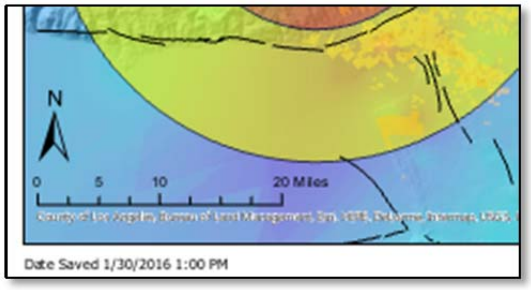
A legend will help map users interpret the information that they see on your layout. ArcGIS Pro allows you to quickly create a legend containing all the layers in your map.

1. In the ***Contents*** pane, click the **Northridge2D** Map Frame to select it.
2. On the ***Insert*** tab, click **Legend**.
3. Click and Drag box on your layout above the Northridge3D map
4. If you want, resize the legend.



Two more important elements to include in a map are the north arrow and the scale bar. These elements are simple to create and place on your layout.

5. Using the same procedure, add a **north arrow** and a **scale bar** to the 2D map.
6. On the Contents tab, right click ***Layout*** to open the properties page.
7. On the General tab, rename the layout: "***Northridge Earthquake Damage Map Layout***"
8. **Save** your project.



Step 8: Export a map layout

In this step, you will export your map layout from ArcGIS Pro to a PDF file so that it can be easily printed.

1. On the ***Share*** tab, in the ***Export*** group, click **Layout**.
2. Browse to ***C:\Esri\ArcGIS Pro\Outputs***
3. Save the file as ***EarthquakeDamage.pdf***.
4. Click **Export**.
5. To make sure that the layer exported correctly, you will verify the PDF file.
6. In Windows Explorer, browse to ***C:\Esri\ArcGIS Pro\Outputs*** and open **EarthquakeDamage.pdf**.
7. When you have verified that the PDF file was successfully exported, close the file.

Step 9: Create a second map layout

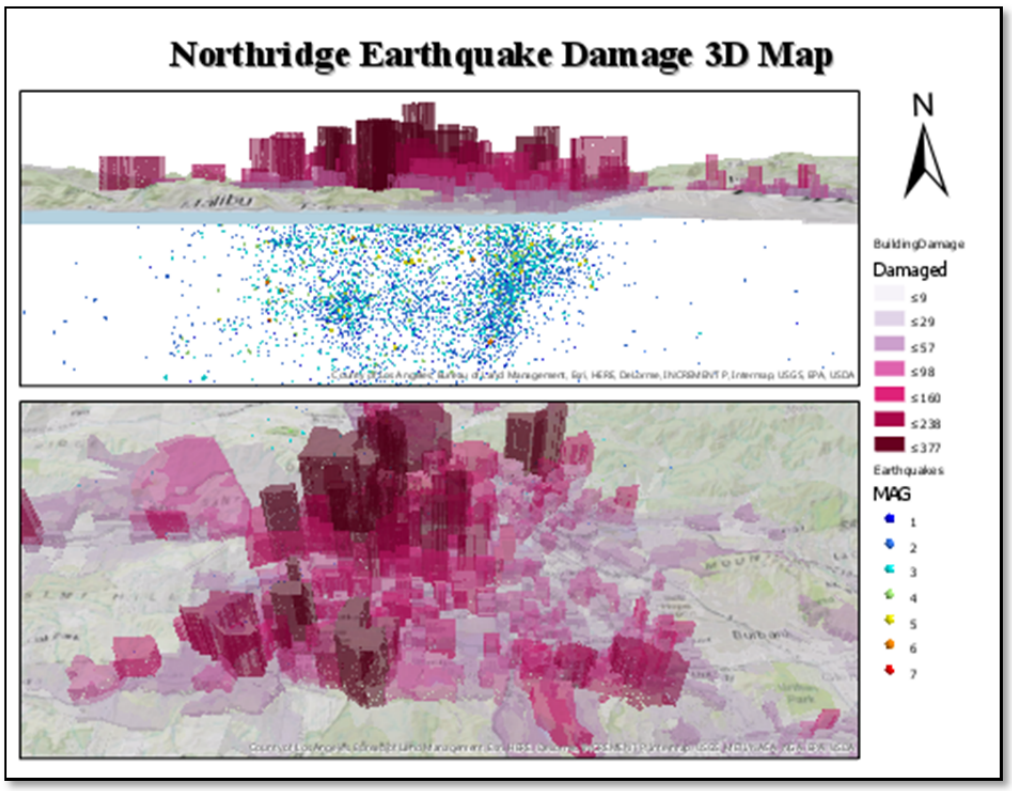
In ArcGIS Pro, you can create multiple layouts that reference the same data, even if you want to show a different view of that data. In this step, you will create a layout showing the subsurface earthquake points in the 3D scene.

1. Click **Insert** > **New Layout**, a new **ANSI – Landscape** > **Letter** layout.
2. Insert **Northridge3D** as a map frame.
3. Resize the Map frame to fit the lower half of the layout leaving room for a legend on the right side.
4. Activate the map, then rotate/zoom to show the above surface damage.
5. Close **Activation** on the map.
6. Insert the **Northridge3D** map frame again.
7. Positioned it above the previous map frame, **Activate** the map, then rotate/zoom the map to show the Eartquake occurrences below surface.
8. Close **Activation** on the map.
9. Rename the Layout: "***Northridge Earthquake Damage 3D Map Layout***"

Click the Northridge3D tab and verify that the view of the scene has not changed, even though the view changed in the layout.

10. Use the skills that you have learned to add a title, a legend, and a north arrow.
11. **Save** your project.

Your layout should look something similar to below:



End Exercise 2