

Lab VII ENVR 4305 Fall 2019 (18 pts) Name _____

Integrate and Organize GIS Data for Geodatabase

Part I: From the “Getting to Know ArcGIS” book provided in lab, work through the Chapter 7 **Exercises 11a**.

Part II: Go through the attached exercise “Integrate and organize GIS data.”

The data files for part I should be in the C drive under folder EsriPress/GTKarcGIS/

The data files for part II should be in the C drive under folder EsriTraining/ARC2/

Ask the TA or Instructor for help if you are confused at any time.

Each student should sign their own lab and turn it in at the end of lab.

40 minutes



Integrate and organize GIS data

Numerous oil and gas wells are in production throughout the state of Louisiana. You will determine whether these wells are located within oyster harvesting areas and other protected areas.

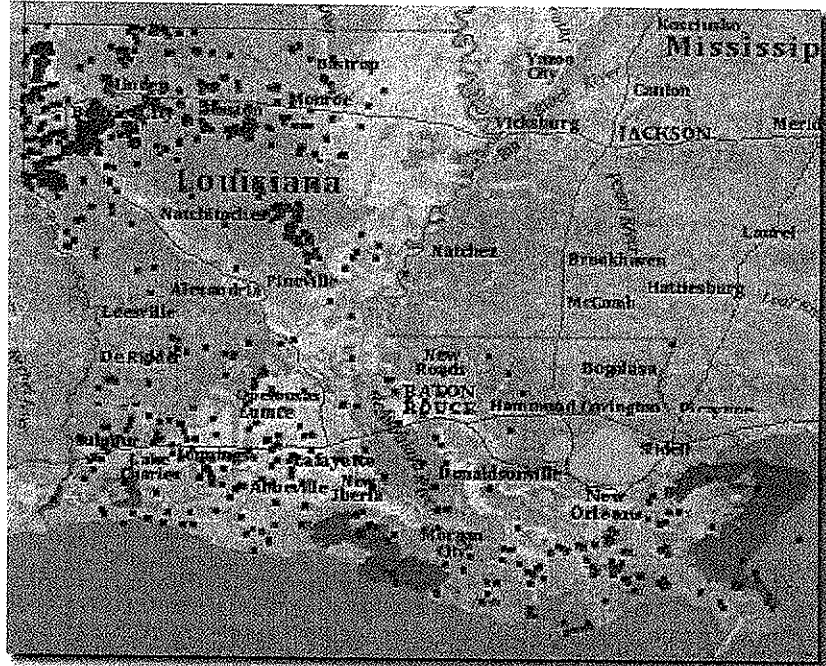
In this exercise, you will:

- Search for data locally and online.
- Display data.
- Select and organize data.

In this exercise, you will search for data that helps you to determine the oil and gas wells that may pose a risk to oyster harvesting areas. To organize your data, you will create file geodatabase and new feature classes.

Figure

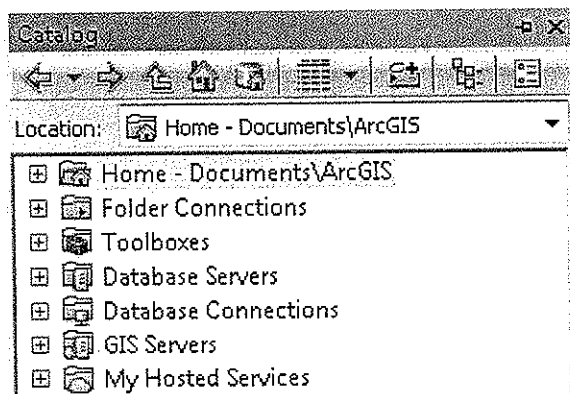
Oil and gas wells with oyster harvesting areas, shown on top of a basemap from ArcGIS Online.




Step 1: Create a folder connection

In this step, you will create a folder connection to the GIS data that you will use in this course. Folder connections save you time by allowing you to browse directly to a local folder or network location without navigating a folder tree from the top level.

- a Start ArcMap, if necessary.
- b From the File menu, click New to open a blank map document, if necessary.
- c Open the Catalog window.



- d On the toolbar at the top of the Catalog window, click the Connect To Folder button .

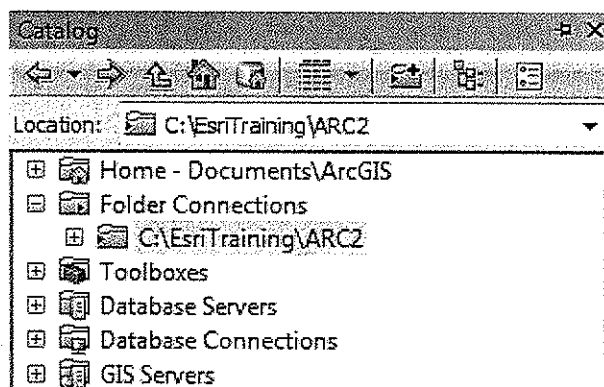
The Connect To Folder dialog box allows you to connect directly to a folder.

- e Expand Computer and browse to your C:\EsriTraining\ARC2 folder.

- 8 Click the ARC2 folder to select it in the folder tree.



- 9 Click OK.




Your folder connection is now shown in the Catalog window. Next, you will turn off background geoprocessing.

- h From the Geoprocessing menu, choose Geoprocessing Options.
- i In the Geoprocessing Options dialog box, under Background Processing, ensure that the Enable check box is clear, and then click OK.

When you disable background geoprocessing, you can view a progress dialog box that displays the status of a tool as it runs. Some geoprocessing operations may take a long time to run depending on the type and complexity of the operation. Running these tools in the background can allow you to continue using ArcMap while the tool is running.

Step 2: Add a basemap layer

To give your data some context and a frame of reference, you will add a basemap layer from ArcGIS Online.

- a On the Standard toolbar, click the down arrow next to the Add Data button .
- b Choose Add Basemap.

The Add Basemap window lists several basemaps.

- c Click the Oceans basemap and then click Add.
- d If you see a prompt for enabling hardware acceleration, click No.



This layer may take a few moments to appear.

The basemap layer shows the entire world. In the table of contents, notice that several sublayers are grouped within the main basemap layer.

Next, you will search for data. You will then zoom in to the extent of your data and see how the basemap shows more detail and provides a reference for your operational layers.

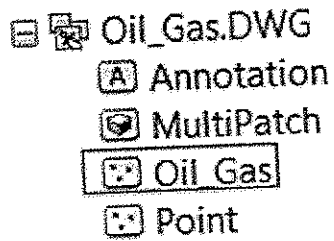
Step 3: Add CAD data to the map

In this step, you will add oil and gas well sites to your map.

- a Open the Catalog window.
- b Pin the Catalog window so that it stays open.
Hint: Click the Auto Hide push pin  at the top right of the Catalog window so that it points down .
- c Under Folder Connections, expand the ..\EsriTraining\ARC2 connection.
- d Double-click the Integrating_data folder.
- e Expand Oil_Gas.DWG.

This CAD file contains the point locations of oil and gas wells.

- 7 From the CAD file, drag the Oil_Gas points data into your map.



The Oil_Gas points layer is added to your map, and the basemap layer remains at the bottom of your layer list. This CAD file shows point locations for active oil and natural gas wells in Louisiana that have started production within the past five years.

Next, you will rename the layer to make the name more descriptive and easier to understand.

- 8 Confirm that your new layer is selected in the table of contents.

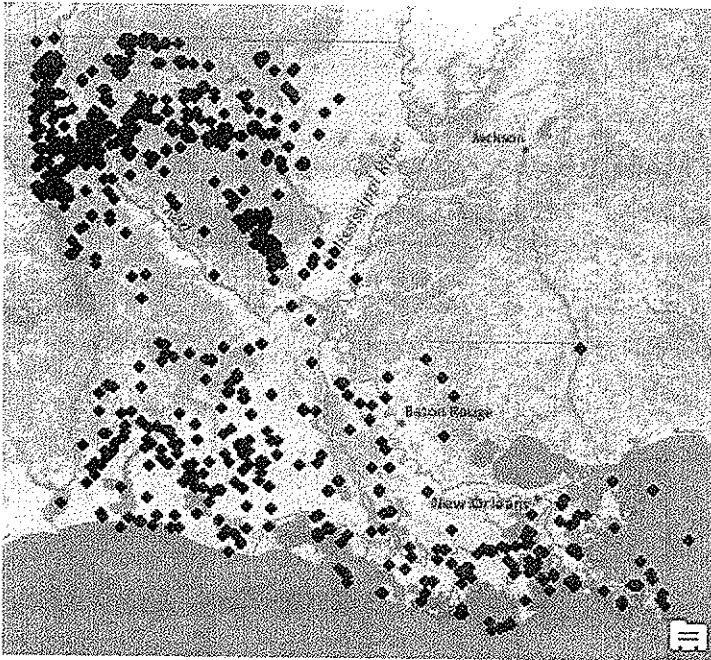
- 9 Click the layer name to edit the text.



- 10 Type Oil and Gas Wells and press Enter to rename the layer.



- 1 Right-click the Oil and Gas Wells layer and choose Zoom To Layer.




Step 4: Add a shapefile to the map

In this step, you will add oyster harvesting polygons to your map.

- a Open the Catalog window, if necessary.
- b From the Integrating_data folder, drag the Oyster_harvest_areas.shp into your map.

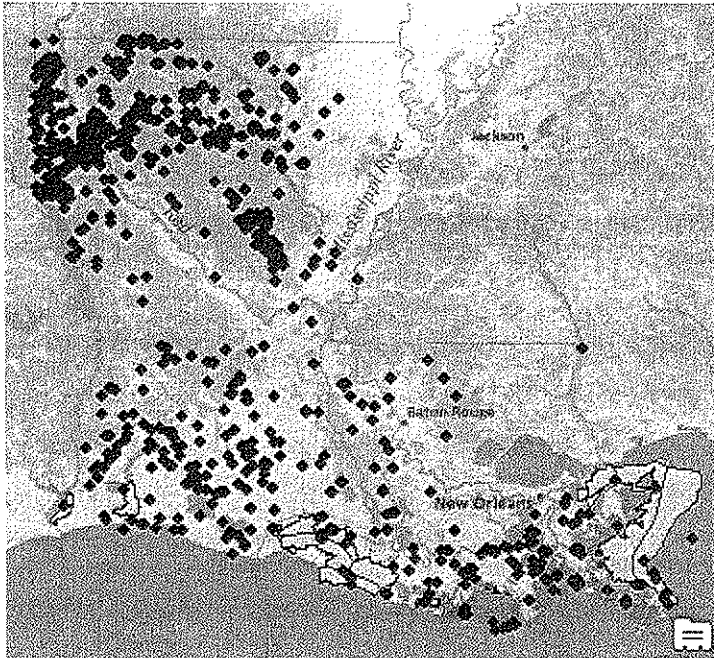
A warning appears telling you that the oyster harvesting polygons have a different geographic coordinate system from the one currently used by your map document. You should always address this warning to ensure data alignment.

 You will learn more about these warnings later in this course.

- c In the Geographic Coordinate Systems Warning dialog box, click the Transformations button.
- d Change the Using option to the one transformation that is available.




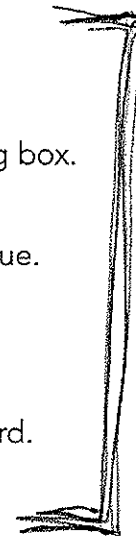
- e Click OK, then close the warning.




Step 5: Search for ArcGIS Online data and add it to the map

You do not have protected areas available on your local computer, so you will search online for data you can use. You will search for PAD-US 1.1 (CBI Edition): Coastal Gulf of Mexico protected areas. This will contain the data needed within the state of Louisiana. You will begin by signing in to ArcGIS Online.

- a From the File menu in ArcMap, click Sign In.
- b In the ArcGIS Sign In dialog box, click Enterprise Account.
 -  If you do not see this option, scroll down to the bottom of the dialog box.
- c For the organization's URL, type **trainingservices**, and then click Continue.
- d Click Using Your Course Account.
- e Type your ArcGIS Online organizational account user name and password.
- f Click Sign In.



g On the Standard toolbar, click the down arrow next to the Add Data button  and choose Add Data From ArcGIS Online.

h At the top of the ArcGIS Online window, in Search type **Louisiana protected areas** and then press Enter.


There will be no search results because the search was limited to the Esri Training Services organization. Thus, you will force it to search the broader ArcGIS Online community.

i Clear the Only Search In Esri Training Services check box.

This will show ArcGIS Online results related to protected areas in Louisiana.

j In the search results, locate the coastal Gulf of Mexico protected areas (as shown).

PAD-US 1.1 (CBI Edition): coastal Gulf of Mexico



Protected areas within 1 mile of the Gulf shoreline, or that intersect with NHD waterbodies that intersect the 1 mile coastal boundary. These protected areas are most

Layer Package by *corbio* 9/9/2010 [Details](#) [Add](#)

k Click Details to read a description about this data.



It is important to read about data you access from ArcGIS Online and other Internet sources. You must have permission to use other data at times. In this case, the data is available in the public domain, as stated in the properties.

Notice that this data is available as a layer package.

l Click Add to download the layer package and display the data in ArcMap.

The layer package will take a few moments to download and will then appear as a new layer in ArcMap.

m Complete the transformation process using the transformation called NAD_1983_To_WGS_1984_5.

- n If necessary, expand the width of your table of contents to see the full names of your map layers.
- 6 Click the plus sign (+) next to the new layer to see the different categories of protected areas.



Step 6: Identify the location of downloaded data

In this step, you will determine the location of the data that you downloaded from ArcGIS Online.

- a Right-click the Gulf_Coastal_ProtectedAreas layer and choose Properties.

The Layer Properties dialog box opens. You will learn to use many of these properties as you work through this course.

- b Click the Source tab.

1. Under Data Source, what is the data type?

2. What is the name of the top-level folder where the data is located? (This is the folder in the path directly after the C:\ drive.)

- c Click Cancel to close the layer properties.

Step 7: Export a layer's data to a geodatabase

You now have three layers in your map document. But the source data for these layers is all in different formats and locations. In many GIS projects, organizing your data in the same format and

location is the most efficient method. In this step, you will create a file geodatabase and then create feature classes from your three layers.

You can move your data into a geodatabase in several ways. You will use a different method for each of your three layers so that you can try the different options provided by ArcGIS.

First, you will create a file geodatabase to store your new feature classes.


- a In the Catalog window, right-click the Integrating_data folder, point to New, and choose File Geodatabase.

The new geodatabase appears in the Catalog tree but has a nondescript name (New File Geodatabase.gdb).

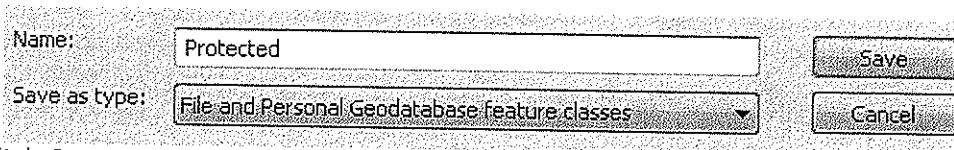
- b Right-click the New File Geodatabase.gdb and click Rename.
- c Rename your file geodatabase **Protected_Areas** and press Enter.

 Protected_Areas.gdb

Now you will create feature classes from your ArcMap layers.

- d In the ArcMap table of contents, right-click the Gulf_Coastal_ProtectedAreas layer, point to Data, and choose Export Data.
- e In the Export Data dialog box, click the Browse button .
- f In the Saving Data dialog box, set the following values:

- Browse to ..\EsriTraining\ARC2\Integrating_data\Protected_Areas.gdb.
- Double-click the geodatabase.
- Ensure that the Save As type option is set to File And Personal Geodatabase Feature Classes.
- For Name, type **Protected**.



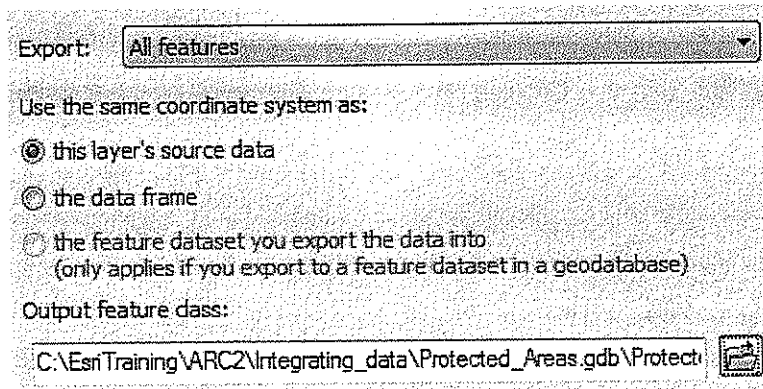
Name: Save

Save as type: Cancel

- Click Save.

Your Export Data dialog box should include the following parameters:

- Use The Same Coordinate System As: This Layer's Source Data
- Output Feature Class: C:\EsriTraining\ARC2\Integrating_data\Protected_Areas.gdb\Protected



- Click OK to export your data.
- Click Yes when prompted to add the exported data as a layer.

A new layer named Protected is added to the map and table of contents.

Step 8: Export data using the Catalog window

You have created your first feature class. You could create feature classes from the other two layers in this same way. However, you will use two other techniques in the Catalog window.

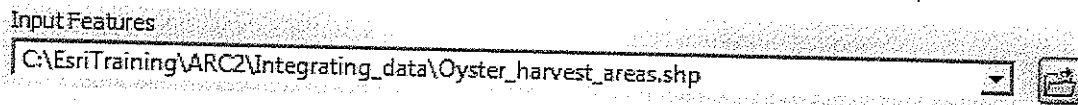
- Open the Catalog window and browse to your Integrating_data folder.
- In the Catalog window, right-click the Oyster_harvest_areas shapefile, point to Export, and choose To Geodatabase (Single).

The Feature Class To Feature Class geoprocessing tool allows you to convert from various formats to new feature classes in your geodatabase.

At the bottom of the tool window, you can click buttons to show or hide the tool help. In the help, you can read a general description of the tool and also receive specific help for each of the tool's input parameters.

The green dot next to a parameter indicates that it is required for the tool to run. Many tools have optional parameters.

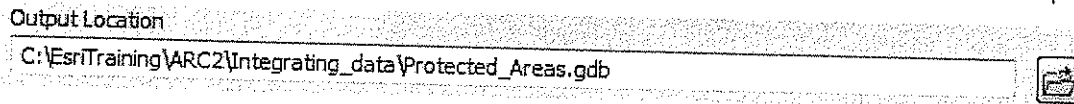
For the first parameter, notice that Input Features is already set to the shapefile.



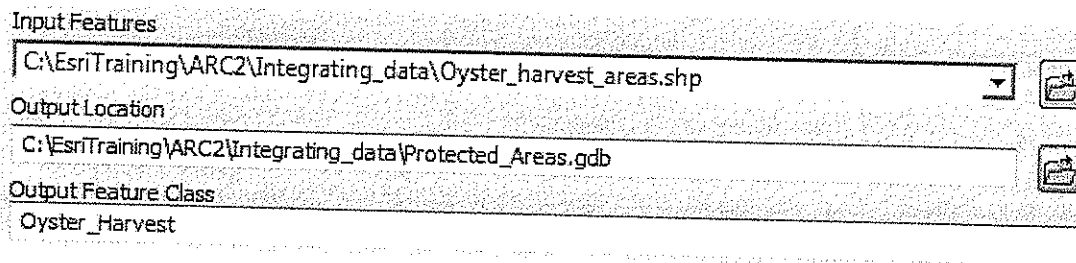
Next, you will set the Output Location.

When setting a tool's parameters, you can use the browse buttons on the tool, or you can drag from the Catalog window into the tool.

- c For Output Location, drag the Protected_Areas geodatabase into the tool's Output Location.



- d For Output Feature Class, type **Oyster_Harvest**.




Spaces are not allowed in names of database objects. Use an underscore (_) in place of a space to separate words when naming items.

All remaining parameters are optional.

- e Click OK to create your feature class.
- f When the process has completed, click Close, if necessary.
- g At the bottom of the ArcMap window is where scrolling text indicating that the tool is running would appear had you not disabled background processing earlier in the exercise.

The new feature class is added to your map as a layer.

- g In the Catalog window, expand your Protected_Areas geodatabase to see your new Oyster_Harvest feature class.

 If you do not see your new feature class listed, right-click the geodatabase and choose Refresh.

Next, you will create a feature class from your oil and gas wells CAD data.

h Right-click the Protected_Areas geodatabase, point to Import, and choose Feature Class (Single).

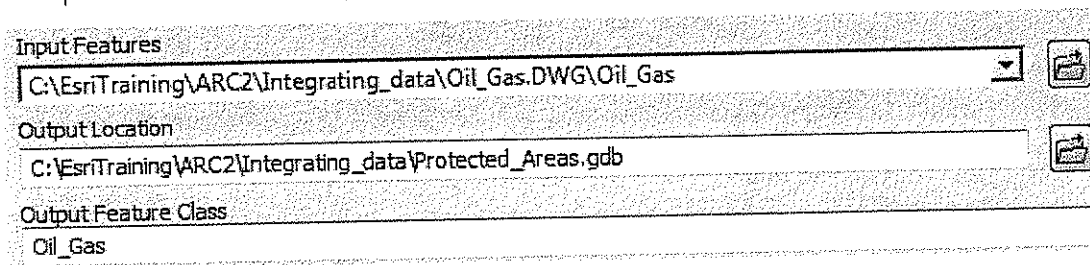
You are using the same tool that you used to export your shapefile.

i In the Catalog window, expand the Oil_Gas.DWG CAD file, if necessary.

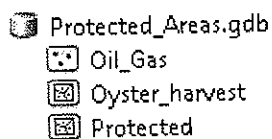
j Drag the Oil_Gas points into the Input Features of the tool.

Notice that the Output Location is already set to your geodatabase.

k For Output Feature Class, type **Oil_Gas**.



l Click OK to import your Oil_Gas CAD data.



m When the process has finished, click Close, if necessary.

Your Protected_Areas geodatabase now contains three feature classes.

Your original data still exists. By converting the data into a geodatabase, your data is now located in the same location and format.

n In the ArcMap table of contents, right-click the new Oil_Gas layer and choose Properties.

o View the layer properties and then close the dialog box.

Step 9: Locate features based on a spatial location

In this step, you will use your data to locate wells that may affect the protected areas, including the oyster harvesting areas.

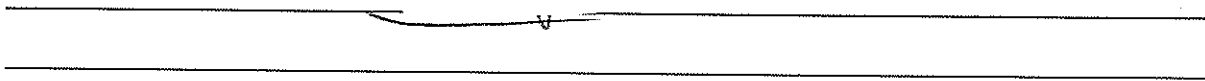
Before you perform your analysis, you will remove the original layers from your map.

- a In the table of contents, click the List By Source button .

Viewing the layers by their source allows you to see their storage location so that you do not accidentally remove the wrong layers. The two layers you want to keep are located in the Protected Areas geodatabase you just created.

- b Right-click the original Oil And Gas Wells layer and choose Remove.
- c Remove the Gulf_Coastal_ProtectedAreas and Oyster_harvest_areas layers.

3. When you remove a layer from the map, what happens to the associated data that the layer references?



Your map now shows the new geodatabase layers along with the basemap from ArcGIS Online.


- d From the Selection menu, choose Select By Location.

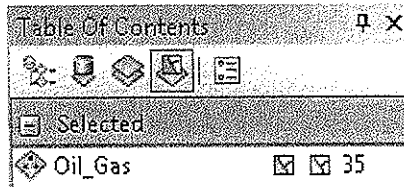
In this scenario, you want to locate wells that are within the oyster harvesting areas.

- e In the Select By Location dialog box, set the following values:
 - Target layer: Oil_Gas
 - Source layer: Oyster_Harvest
 - Spatial selection method for target layer features: Are Within The Source Layer Feature

- f Click OK.


Several points are selected in your map.

- g To see how many wells are within an Oyster_Harvest area, in the table of contents, click the List By Selection button .




Thirty-five features are selected in the Oil_Gas layer.

You have determined that there are 35 oil or gas wells that may affect the oyster harvesting areas.

- h At the top of the table of contents, click the List By Drawing Order button .
- i Export the selected Oil_Gas features to your new geodatabase, naming the new feature class **Oyster_Area_Wells**.

Hint: Use the same method that you used to export your Gulf_Coastal_ProtectedAreas layer earlier in this exercise. Make sure to export only the selected features, as indicated in the dialog box.

- j Add the new feature class as a layer to your map.
- k On the Tools toolbar, click the Clear Selected Features button  to clear the selected oil and gas wells.
- l To more easily see the new points, in the Symbol Selector dialog box change the symbology of the Oyster_Areas_Wells layer to one of the default symbols.

Step 10: Update the item description

It is important to create documentation for each dataset that you use in ArcGIS. These item descriptions are used by ArcGIS search to help you find datasets, layers, and other ArcGIS items. The item description is also part of the larger, more-comprehensive set of documentation known as metadata.

- a In the Catalog window, in your Protected_Areas geodatabase, right-click Oyster_Harvest and choose Item Description.

The Item Description window includes a thumbnail of the data at the top as well as tags that can be used when searching for this data (either locally or online). You can resize the window by grabbing the edge and expanding it.

4. Based on the information in the item description, what organization created this data?

There are currently four tags for this data: "Business and Economic," "North America," "Esri Training Services," and "ARC2." Tags are important because they allow your data to be located using the ArcGIS Search.

- b) At the top of the Item Description window, click Edit.
- c) In the Tags section, type tags (keywords) that might be useful when searching for this data. Separate each by a comma.



When adding tags, think about both the data theme and the spatial location that would be useful when searching for data.

- d) Click Save.

Do you see your new tags? You can edit other components of the item description in the same way.

- e) Close the Item Description window.
- f) From the ArcMap File menu, choose Exit.
- g) If you wish, you may save your map to the Integrating Data folder with a name of your choosing. Otherwise, click No.

In this lesson, you used several techniques to find and organize data within a geodatabase.