Data Management - Applications

Lecture	eCoastal Applications
Exercise A	Loading the eGIS Data Viewer Tools
Exercise B	Indexing a New Layer
Exercise C	Using the Data Picker tool
Exercise D	Using the Tools of the Data Viewer Toolbar
Exercise E	Creating a Raster Index

Module Introduction

Overview

This module will explain the data access procedures used to retrieve and view data stored in the geodatabase. We will also cover the steps necessary for indexing layers stored in the eCoastal system, and demonstrate some of the tools available in the custom toolbars.

Tools and Technology

ArcGIS Components

- ArcMap
- eGIS: Data Viewer Toolbar

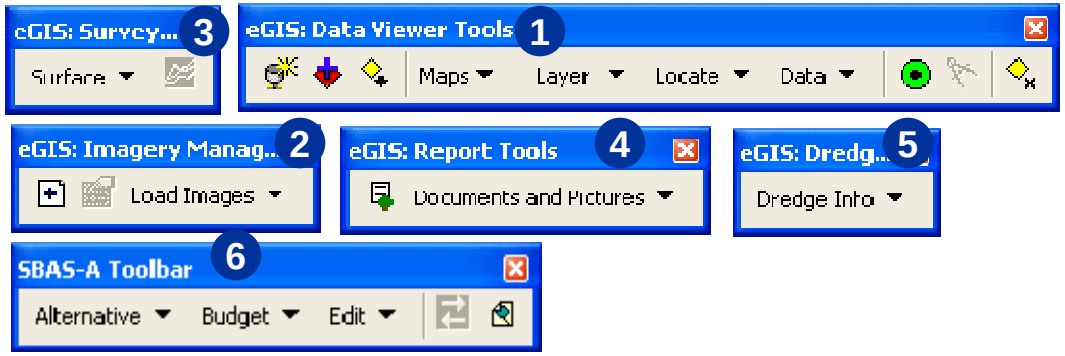
Skills Learned

- Understanding the purpose of the GIS Management Database
- Index a new layer in the geodatabase
- Ability to locate and retrieve data from the geodatabase using the project name, category or keyword.

Lecture: eCoastal Applications

The eCoastal's eGIS Toolbox was created as a comprehensive set of applications that enable stakeholders in management decisions to explore the broad spatial and temporal impacts of potential management actions. In the U.S. Army Corps of Engineers (USACE), these tools have emerged as necessary components for effective planning and prediction of regional and local coastal processes. A geographic information system with specialized applications was developed to provide baseline information for regions including hydrographic and topographic data, shoreline position, aerial and oblique photography, hyperspectal imagery, dredging records, nautical charts, and other data regarding regional utilities, infrastructure, and land use.

In this module we will discuss the Data Viewer Tools and Imagery Manager toolbars.



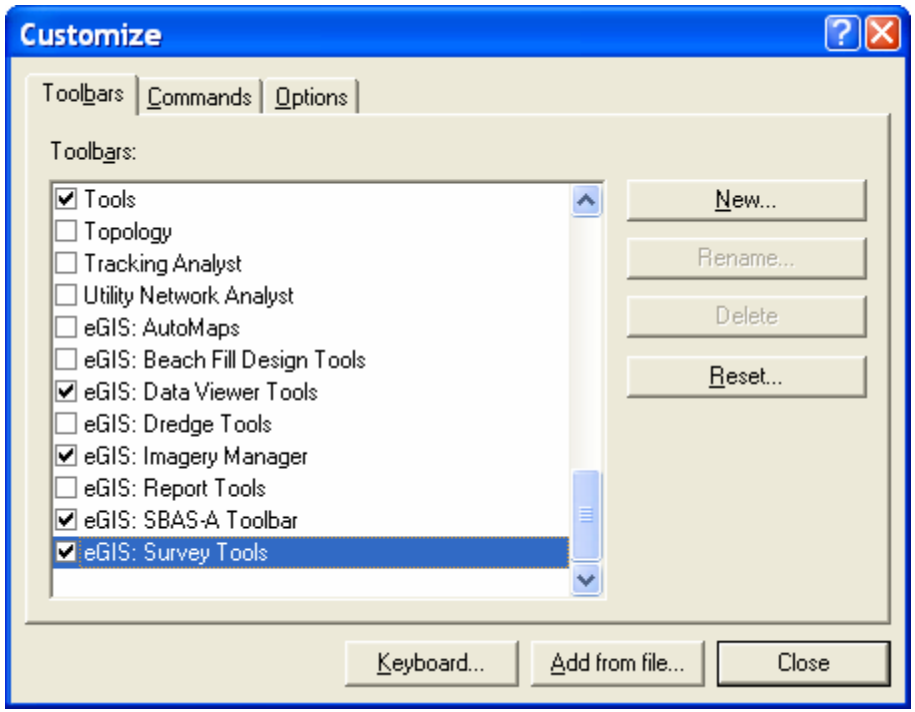
eGIS Toolbox

1. Data Viewer Tools
2. Imagery Manager
3. Survey Tools
4. Report Tools
5. Dredge Tools
6. SBAS-A Toolbars

Exercise A: Loading the eGIS Data Viewer Tools

eGIS Toolbox has been created to assist GIS users in data analysis and access to the geodatabase through the ArcGIS ArcMap interface.

Tools have been grouped by common categories and stored on a series of toolbars: Data Viewer, Survey, Report, Dredge, Imagery Manager, and the SBAS-A Toolbar.



1. Open the **eCoastal_Basemap.mxd** file from the C:\Training directory.

2. To turn on all eGIS toolbars:
   - ☐ From the Tools menu in ArcMap, select 'Customize'.
   - ☐ Check the desired toolbar.

     Select the **Data Viewer, Imagery Manager, SBAS-A, and Survey Tools toolbars.**
   - ☐ Click **Close**. This will make the selected toolbar visible.

END OF EXERCISE A

Exercise B: Indexing a New Layer

Background

In order for layers to appear in the Data Picker tool, the layer must first be created and indexed into the GIS Management Database. Once the layer is indexed, all users of the system can access the data.

Goal

After this exercise you will be able to index layer files for feature classes stored in the geodatabase.

Objectives

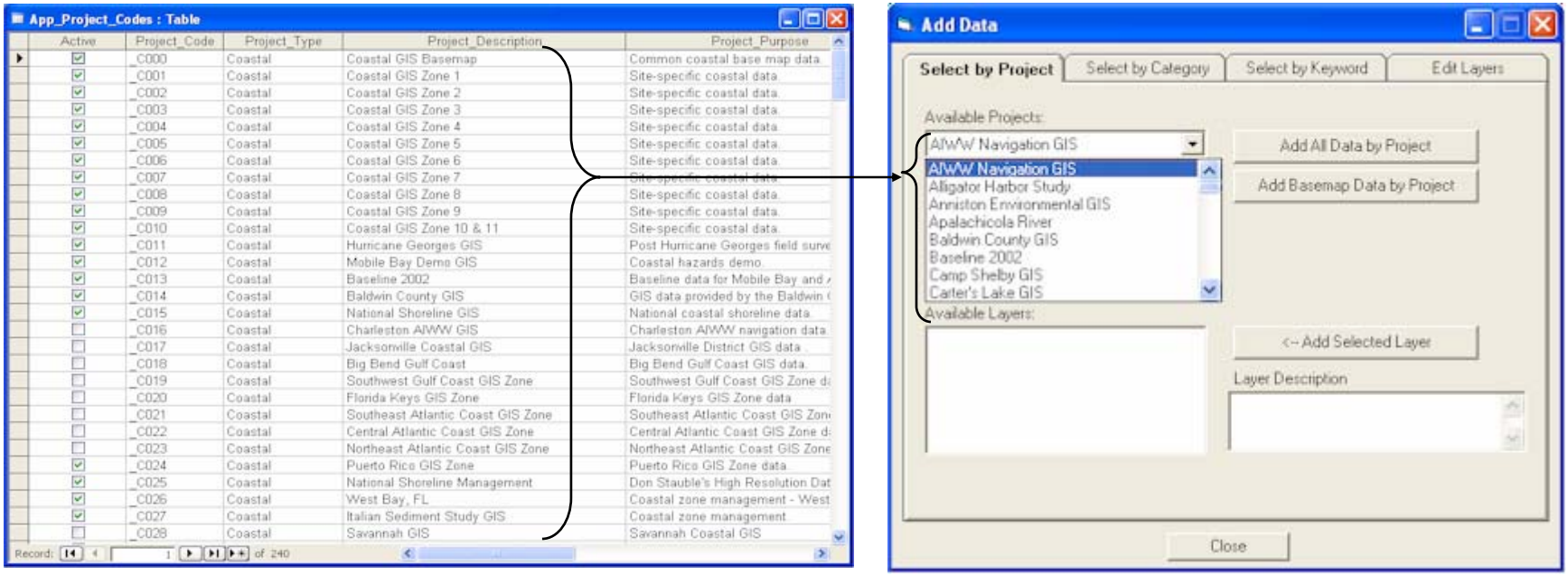
1. Access the geodatabase
2. Use the GIS Management Database to index the layer file
3. Use the Data Picker Tool

Exercise B: Indexing a New Layer

The GIS Management Database was created as a repository for indexing non-spatial data, such as reports, photos, spreadsheets, as well as managing all layers stored in the geodatabase. The contents of the GIS Management Database fuel the desktop and web applications. The main function of this database is to index and categorize each layer stored in the geodatabase.

The GIS Management Database exists in 2 formats – Microsoft Access and SQL Server. Two versions were created to allow this system to be transferable to those districts who do not have access to SQL server.

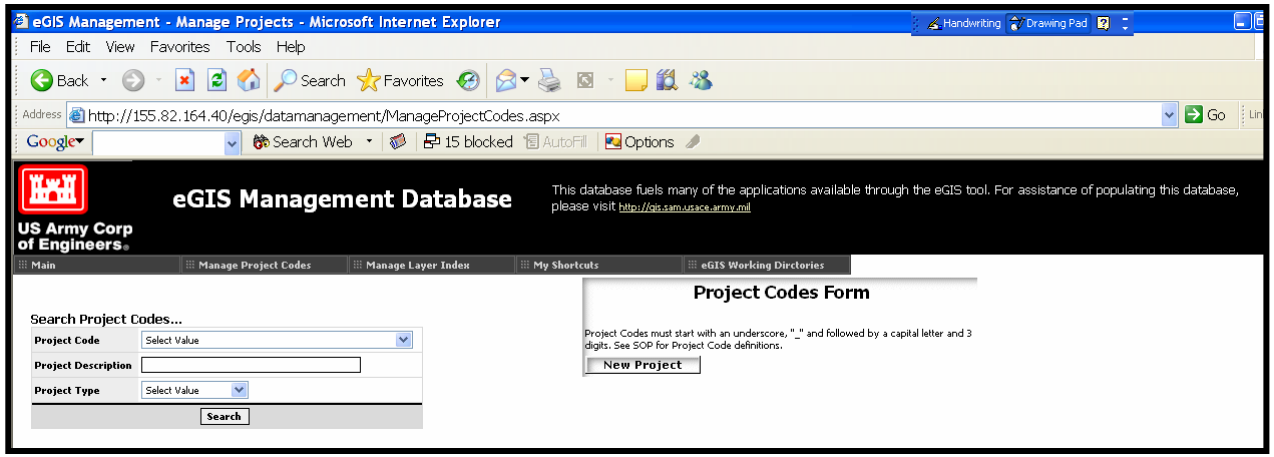
Here, the App_Project_Code table in the GIS Management Database populates the Available Projects list in the Data Picker Application.



Exercise B: Indexing a New Layer

The GIS Management Database is used to manage projects contained within the enterprise GIS. This database contains forms to manage project codes and all layers created for the eCoastal system. The online interface allows users, outside of a GIS environment, to quickly query and view the details of the data and projects.

This data is accessed by the Power Users of your GIS system. Users with authorized access can add, edit, or delete GIS projects or references to data layers. Contents of this database are used to fuel some of the web and desktop applications of eCoastal.



Indexing a New Layer – Instructor Demonstration

Notes:

END OF EXERCISE B

Exercise C: Using the Data Picker Tools

Background

All data that has been indexed in the GIS Management Database can be easily accessed using the Data Picker tools available on the eGIS: Data Viewer Toolbar. This GUI interface allows all users the ability to quickly search available layers and directly add items to the Table of Contents in ArcMap.

This custom interface allows the novice user, without prior knowledge of the Spatial Data Standards, to browse the geodatabase with little introduction to the system architecture.

Goal

After this exercise you will be able to connect and browse the contents of the geodatabase using the Data Picker tool.

Objectives

1. Access the eGIS: Data Viewer Toolbar
2. Browse data stored in the database
3. Add data into the map display of ArcMap

Exercise C: Using the Data Picker Tools

The Data Picker form allows you to search for geospatial data currently available in the database. To load data from the geodatabase using the Data Picker tool, use the following steps:

1. Click the **Data Picker** Tool, , from the Data Viewer Tools. This will open the following *Add Data* dialog:

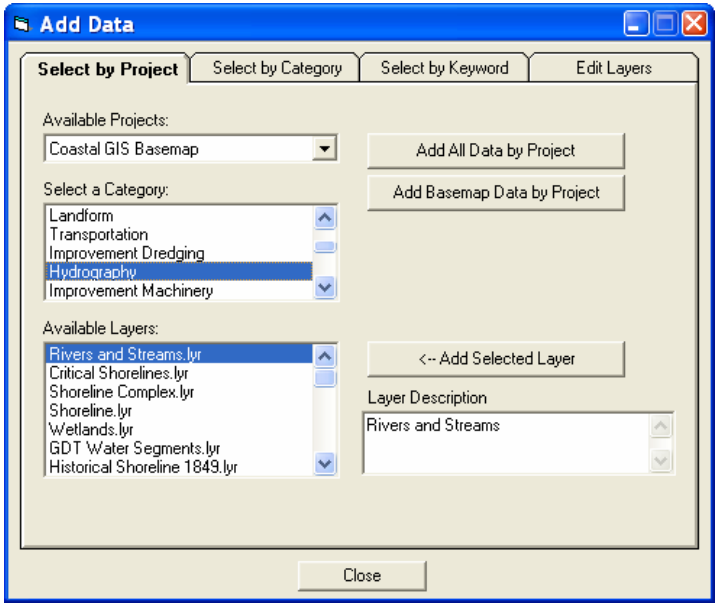
2. The *Add Data* dialog allows you to search for data by Project, Category or Keyword.

3. To search by one of these topics, select the respective tab.

4. To search for data by Available Projects, from the 'Select by Project' tab, and select the desired project from the **Available Projects** list. Upon selection, this will populate the Category list.

   ☐For this example, select the "**Coastal GIS Basemap**" project and the "**Hydrography**" category.

   Available layers appear once a Category is selected. A short description for the layer will be displayed in the 'Layer Description' once a layer name is clicked.



Exercise C: Using the Data Picker Tools

5. Click the "**Add Selected Layer**" button to add the desired layer into the Table of Contents.

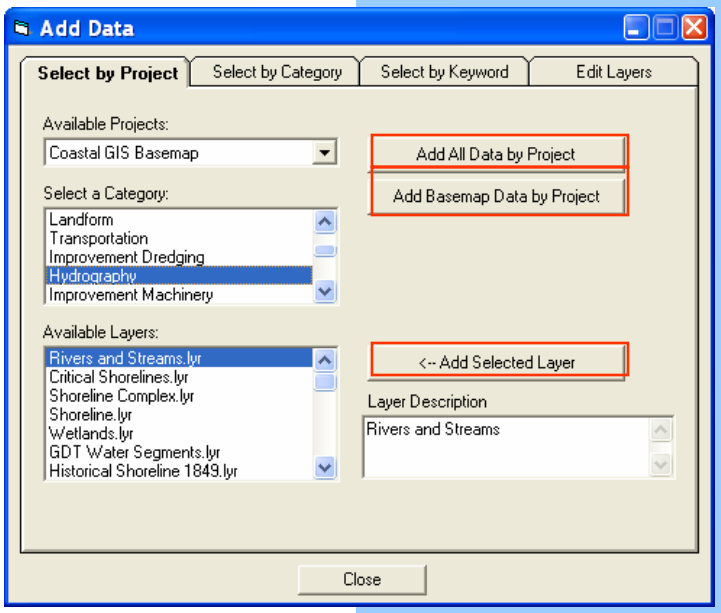
   ☐ For this example, select the "**Wetlands.lyr**"

   Layer files are a reference to a data source such as a coverage, geodatabase feature class, raster, and so on that defines how the data should be displayed on a map. Layers can also define additional properties, such as which features from the data source are included. Layers can be stored in map documents (.mxd) or saved individually as layer files (.lyr). Layers are conceptually similar to themes at ArcView 3.x.

   For eCoastal, layer files (.lyr) have been created and saved into the standard directory structure for all geospatial datasets available in the geodatabase. These layer files are then indexed using the GIS Management Database. Once indexed, the layers files are available in the Data Picker tool.

Did You Know?

Instead of individually adding in layers to the table of contents, once a Project is selected you can either "Add all Data by Project" or "Add Basemap by Project".



Exercise C: Using the Data Picker Tools

6. In some cases, you may not know the Project Name or the Category for your desired dataset. If this is the case, you can locate data by clicking the "**Select by Keyword**" tab.

7. Type in the desired keyword in the search textbox.

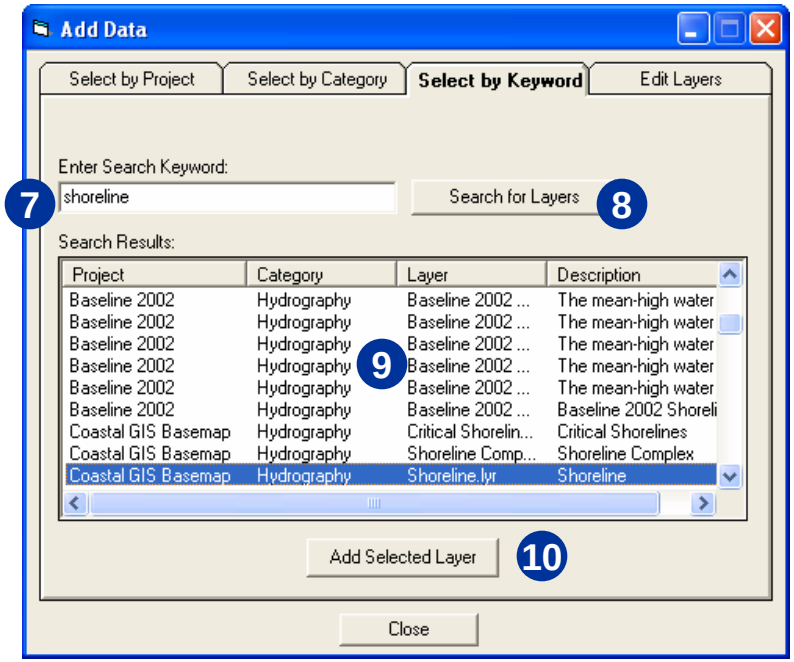
   ☐ For this example, type in the keyword "**shoreline**".

8. Click the "**Search for Layers**" button to query the database.

9. The query will search the Project Name, Category, Layer Name, Description and Keywords fields from the database. The results appear below. Use the scroll bars to locate the desired dataset.

   ☐ Locate the **Shoreline.lyr** from the Coastal GIS Basemap Project, and click to select.

10. Click the "**Add Selected Layer**" button to add the layer into the Table of Contents.



Exercise C: Using the Data Picker Tools

Authorized users have the option to edit layer descriptions and keywords. These changes allow the Power User to make modifications to the indexed layers to make it easier to locate data in the future. To modify existing settings, use the following steps:

11. Enter in the Power User password and click the "Enter" button.

    ☐ **Enter in "editpriv" as the password.**

12. Select "Coastal GIS Basemap" as the Project Name.

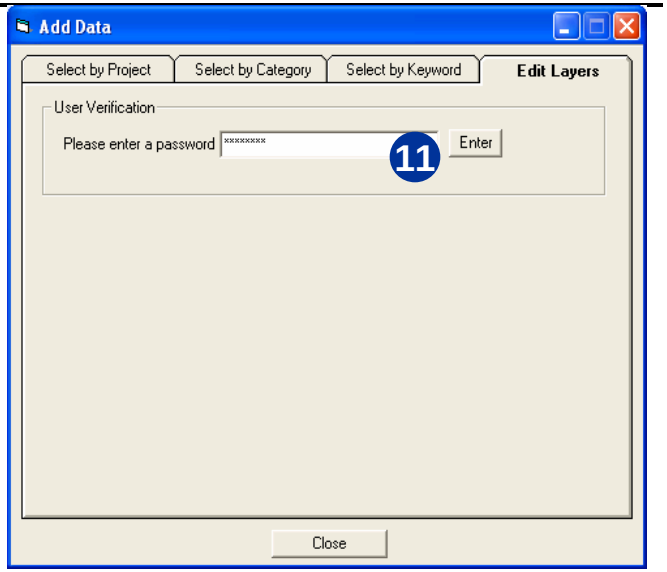
13. Select "Disposal Area.lyr" as the Layer. Upon selection, this will filter the form to show the details for this layer.

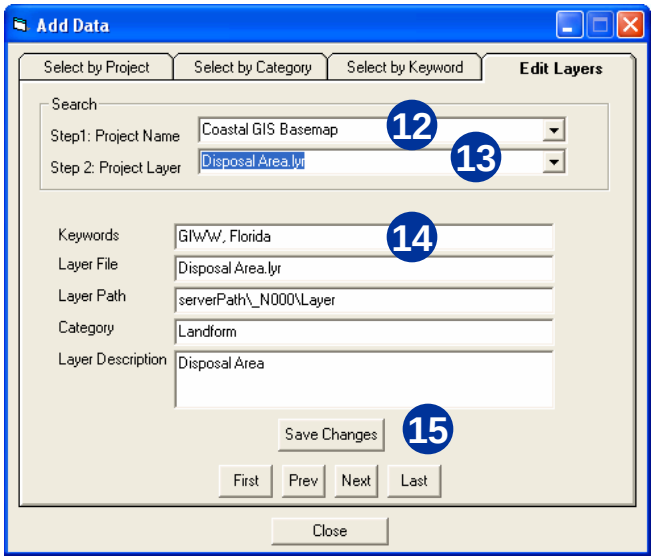
14. You have the option to add, edit or delete values in the Keywords and Layer Description Field.

    ☐ **Add your last name as one of the Keywords.**

15. Click the "Save Changes" button.

    To see the results and benefits of your modification, go to the "Select by Keyword" tab and type in your last name as the search criteria. Does the Disposal Area.lyr appear in the search results?





Exercise C: Using the Data Picker Tools

Individual Exercise

1. Using the Data Picker toolbar, create a map for the Mobile, AL that includes the following types of layers:

   Counties, Zip Codes, Shoreline, Places of Interest, Sediment Transport Rates, Water and a NOAA chart.

2. Save the ArcMap project file as MyMap1.mxd into the C:\Training directory.

Exercise C: Using the Data Picker Tools

Exercise Summary

This exercise introduced you to the user interface created for ArcMap that allows you to browse the geodatabase without having a prior knowledge of Spatial Data Standards. You can search for data by project name, category, or keyword. To assist in locating layers of information more quickly, authorized users have the option to edit layer description or keywords.

END OF EXERCISE C

Exercise D: Using the Tools of the Data Viewer Toolbar

Background

The eGIS Data Viewer Toolbar was created to give the user quick tools for working with spatial data. For this exercise you will launch and use a number of tools on the toolbar.

Goal

After this exercise you will be familiar with the tools available on the eGIS: Data Viewer Toolbar

Objectives

1. Access the eGIS: Data Viewer Toolbar
2. Make a Quick Map
3. Browse to available Data Viewer Tools.

Exercise D: Using the Tools of the Data Viewer Toolbar

1. Make a quick layout of the map display. From the Data Viewer Toolbar, select Maps → Create Map.

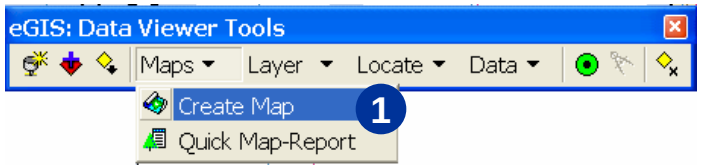
2. Enter **eCoastal Training** as the Project Name.

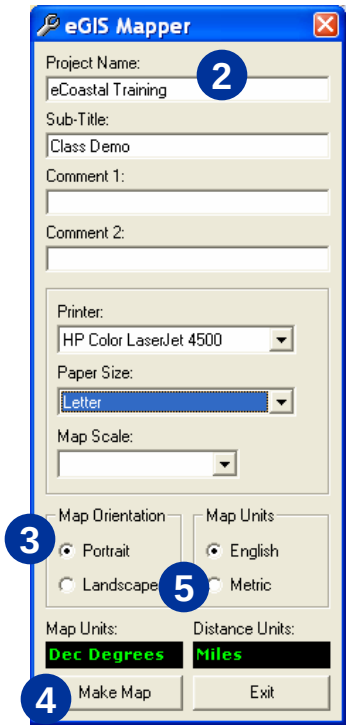
3. Select a **Portrait Map Orientation**. This tool will automatically build a map that is printer-ready.

4. Click the **Make Map** button when finished. Notice that a Layout has automatically been generated. At this point you can change any of the layout elements prior to sending the layout to the printer.

5. Change the Map Orientation size to **Landscape**. Notice the maps automatically reformats and resizes the layout controls.

6. Click **Exit**.





Exercise D: Using the Tools of the Data Viewer Toolbar

7. A tool was created to automatically import and plot points currently stored in an MS Excel Spreadsheet. From the Data menu of the Data Viewer Tools, select '**Import Excel as Point**'.

8. Click the **Open Workbook** button and browse to C:\Training\Import_Excel.xls.

9. Select the sheet name '**Sample**' in for the Table option.

10. Select **POINT_X** as the X Item attribute.

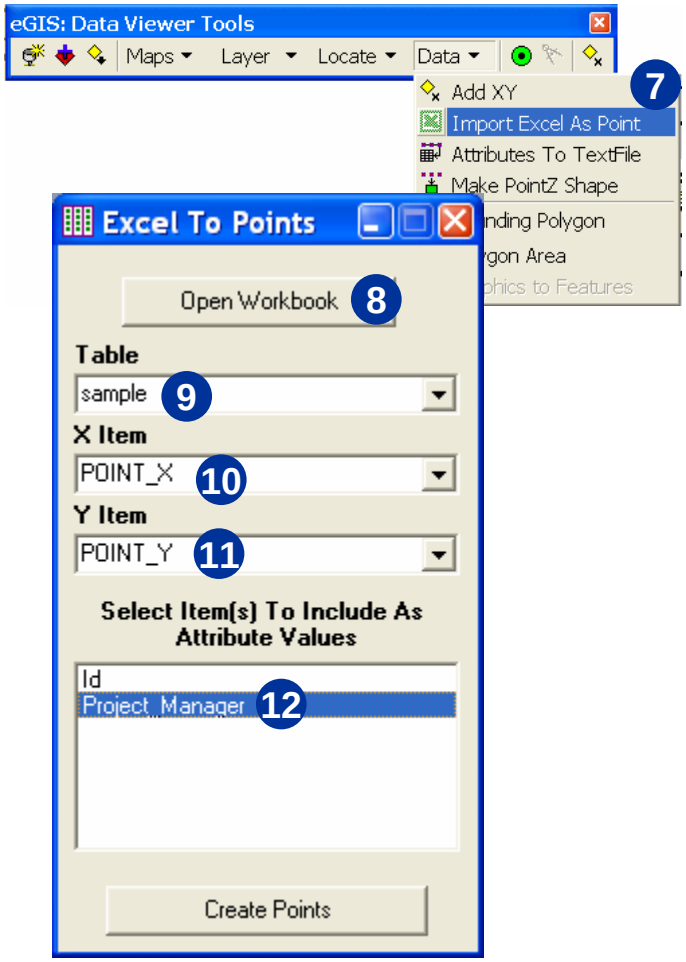
11. Select **POINT_Y** as the Y Item attribute.

12. You can select any additional attributes to add to your new feature class. Select **Project Manager** and click the **Create Points button**.

13. When prompted, select 'Yes' to set the spatial reference for this layer. Select **Geographic Coordinate System → World → WGS 84**.

14. Browse to **C:\Training** and name the new point feature class '**MyPoints**'.

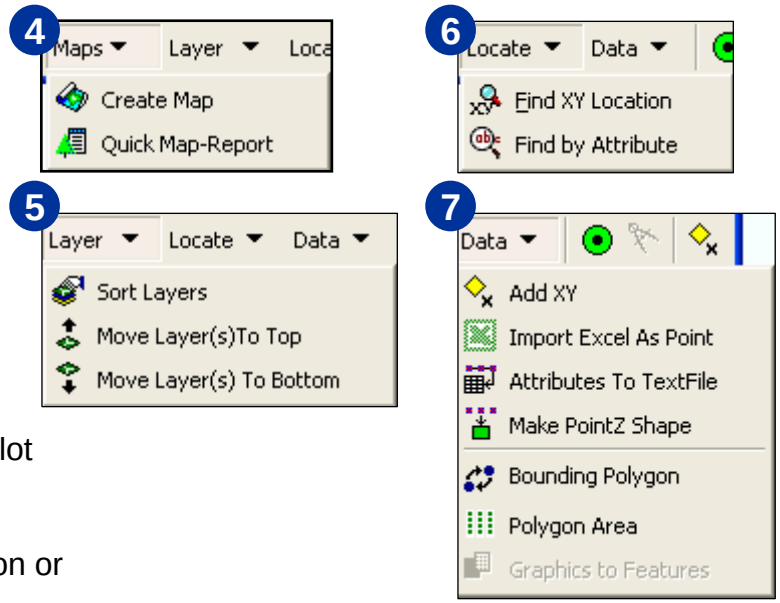
15. A new feature class will be created that represents points locations stored in the Excel spreadsheet. Right-click on the new layer and select 'Zoom to Layer' to see the contents of your new layer.



Exercise D: Using the Tools of the Data Viewer Toolbar

16. Take a couple of minutes and test out the remaining tools of the Data Viewer Toolbar. In the next module we will discuss the Data Picker tool.

Available Functions of eGIS: Data Viewer Tools



1. Database Connections
2. Data Picker
3. Zoom to Layer
4. Maps: Options allows users to quickly produce printable products through a GUI interface.
5. Layer: Basic Table of Content functions
6. Locate: Functions that allow users to find an XY location or feature attribute.
7. Data: A number of functions are located in the data menu. Here, users can add XY attributes to point feature classes, plot XY coordinates stored in Excel spreadsheets, Export feature attributes to a text file, Create a 3D enabled "PointZ" shape, Generate a bounding polygon, Calculate the area of a polygon or covert drawn features to a shapefile.
8. Get XY Coordinate
9. Draw Azimuth
10. Delete onscreen Graphics

Exercise D: Using the Tools of the Data Viewer Toolbar

Exercise Summary

This exercise introduced you to some of the tools available on the eGIS: Data Viewer Toolbar. These tools provide user-friendly interfaces to standard GIS tasks, such as Add Data, Import Excel Spreadsheets, or Building a Map Layout. Users with minimal GIS training can quickly access and use data stored in the eCoastal geodatabase.

Exercise E: Creating a Raster Index

Background

In some cases, managing a number of raster images within ArcGIS can be cumbersome and time consuming. The Imagery Manager toolbar was created to assist to the management of multiple raster images.

Goal

After this exercise you will be able to create a raster index from layers loaded in the table of contents or generated directly from world files.

Objectives

1. Access the eGIS: Imagery Manager Toolbar
2. Create an index from data loaded into the TOC
3. Create an index directly from World Files
4. Load images using the newly created index

Exercise E: Creating a Raster Index

1. Open the **Raster_Index.mxd** in C:\Training. Raster images have be already added into the Table of Contents. We will use the index tool to create an index of these layers.

2. Click on the '**Build Raster Index**' tool from the Imagery Manager toolbar.

3. Ensure that the '**Raster Images Currently in the Table of Contents**' is selected.

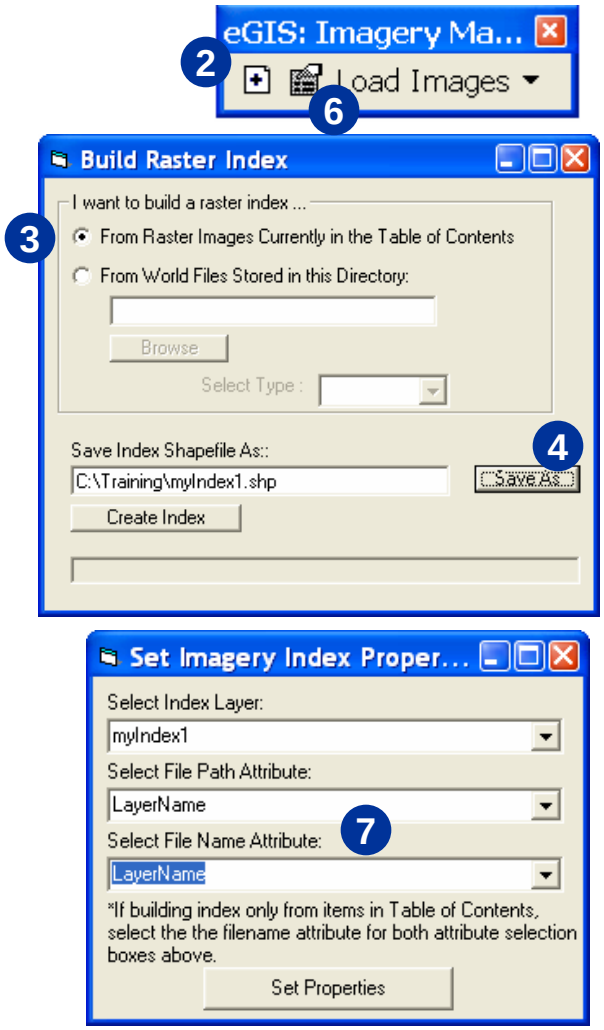
4. Click on the '**Save As**' button and name the new shapefile **myIndex1.shp**. Click Save.

5. Click on the **Create Index** button. This will create a point shapefile and load the layer automatically into the Table of Contents.

6. To turn on raster images using the index, first set the Index Properties. Click the **Property** button on the Imagery Manager toolbar.

7. Select **myIndex1** as the Index Layer and select **LayerName** for **both** the File Path and File Name. Click the **Set Properties** button.

8. Using ArcMap's selection tool, select a point or group of points in the raster index.



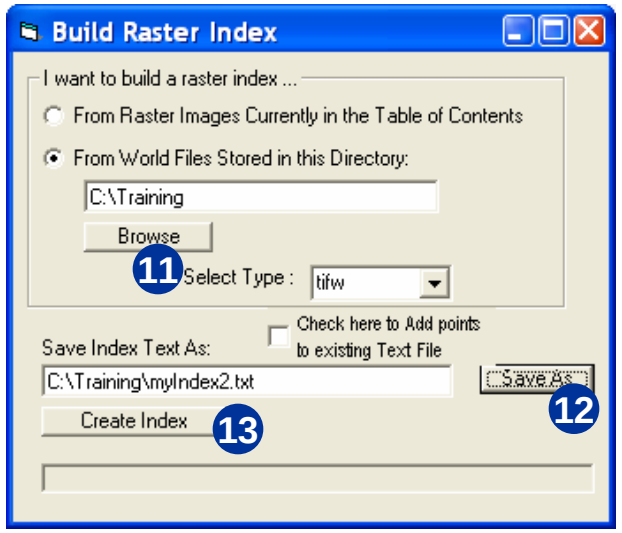
Exercise E: Creating a Raster Index

9. Click on the **Load Images** menu and select '**Turn Layers on by TOC Index**'. This will turn on and move the selected raster images to the top of the table of contents.

10. In some cases you may have far too many images to first load them in the table of contents. This tool also allows you to directly build an index from world files contained with your raster image.

    ☐ **Remove** all layers in the Table of Contents.

    ☐ To build an index from world files, click the '**Build Raster Index**' button.



11. Select the '**From World Files Stored in this Directory:'** option.

    ☐ Click the **Browse** button and browse to the **C:\Training directory**. Click OK.

    ☐Select the type of world file used. For this sample, select '**tifw**'.

12. Click the '**Save As**' button and save the index as **myIndex2.txt** in the C:\Training directory.

13. Click the '**Create Index**' button. Once this button is selected, this tool mines the world files stored in the directory you specified. The coordinates are extracted and an index file is generated.

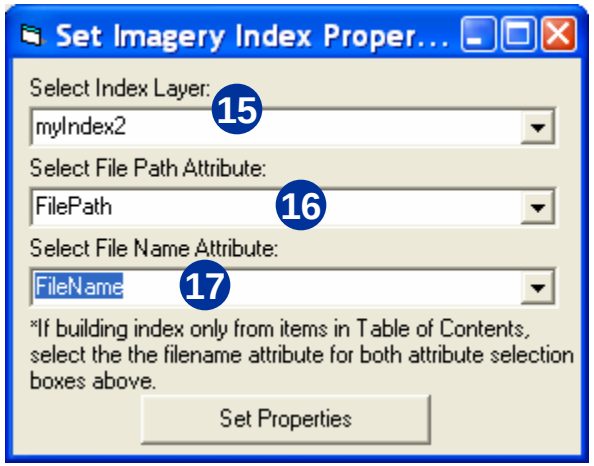
Exercise E: Creating a Raster Index

14. To load images indexed by this layer, click the Index Properties tool.

15. Select **myIndex2** as the Index Layer.

16. Select **FilePath** as the File Path Attribute.

17. Select **FileName** as the File Name Attribute.



18. Click the **Set Properties** button.

19. Using ArcMap's selection tool, select a point or group of points in the raster index.

20. From the Load Images menu of the Imagery Manager toolbar, select **Load by File Path/File Name**. Images will be pulled from the designated directory and loaded into the table of contents.

Exercise E: Creating a Raster Index

Exercise Summary

Managing a large number of raster images in ArcGIS can be a difficult task. Using tools provided in the eGIS: Imagery Manager toolbar you can quickly build an index of the raster images. Additional tools are provided to allow you to load and view the desired images.



END OF EXERCISE E

Module Overview

In this module we discussed the data access procedures used to retrieve and view data stored in the geodatabase. We also explored some of the tools available in the eGIS toolbars.

The custom tools were developed to enable all users to access and use data stored within the eCoastal system without having to be a GIS expert.