Learning Common GIS Workflows
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Agenda

• Common GIS Workflows
  - Building a geodatabase
  - Editing
  - Performing analysis
  - Mapping
  - Sharing
ArcGIS 10 — A Complete System

Easier
More Powerful
and Everywhere

• Discover
• Create
• Manage
• Visualize
• Analyze
• Collaborate

Cloud
Enterprise
Local

Web
Mobile
Desktop
GIS Workflow:

Building a geodatabase
What is a geodatabase?

- Core ArcGIS data model
- Repository of all geographic data
  - Feature classes, Raster datasets, Tables, Annotation, Relationships, Networks, Topology
- Ability to create behavior
- Scalable
Simple feature classes

- Table that stores geographic features and attributes
  - Point, line, and polygon geometry
  - Allows for XY coordinates and Z and M measures
  - Has associated spatial reference
  - Each record represents a feature

- Organize geographic entities into thematic layers
Feature datasets

- Element for storing spatially-related feature classes
  - Share same spatial reference
- Required for additional behavior
  - Geodatabase topology
  - Geometric network
  - Network datasets
Geodatabase workflow

- Create schema
- Import/load data
- Pre-process data to store geodatabase behavior
- Create and apply behavior
- Use and edit in ArcMap
- Feature and attribute validation
GIS Workflow:

Editing
Editing workflow

1. Select workspace and data frame to edit
2. Start an edit session
3. Set editing environment (i.e. snapping)
4. Edit geometry (choose feature template, construction tool)
5. Edit attributes
6. Save edits and exit
Authoring Maps for Editing

- Author geodatabase schema
- Author Map and layers
  - Basemaps
  - Set Field properties
- Author feature templates
Editing geometry

- Feature template editing
- Efficient feature construction
- Simplified snapping environment
- Enhanced productivity
Editing attributes

- Change values for newly digitized feature
- ArcGIS automatically populates OBJECT ID, Shape_Length and Shape_Area fields
- Edit existing values
- Copy and paste values between features
Editing with Geoprocessing

- Geoprocessing tools designed for editing
  - Tied to edit session
  - No new output generated
- Helps address many data integrity issues
Editing with geodatabase topology

- Topology layer
- Topology errors
- Error inspector
- Error fixes
Demonstration
Editing workflow
GIS Workflow:

Analysis
Geoprocessing

- Performing a task with geographic data
  - Simple or complex
- Examples:
  - Querying data
  - Performing analysis
  - Editing data
  - Converting data
  - Projecting data
Geoprocessing framework

ArcToolbox
Search for tools

ModelBuilder
Graphic documentation
Chain many tools together

ArcObjects
Automate tools with code

Python Scripts
Batch processing Branching
Easy access to geoprocessing options

Geoprocessing menu

Geoprocessing results

Geoprocessing options

Environment settings
Geoprocessing – ArcToolbox

Toolbox window for finding and managing tools

Enter parameters
Geoprocessing – Models

- Requires a custom toolbox
- Design in ModelBuilder
  - add data, set parameters, chain processes together
- Change model parameters and re-execute
Geoprocessing – Scripts

- Python window
  - Included in ArcGIS
  - Intellisense
  - Can access tools, environments
- ArcPy is a native Python site-package
Demonstration

Analysis workflow
GIS Workflow:

Creating maps
Data View

symbology
query
edit
analysis
Layout View

virtual page layout
rulers and guides
layout toolbar
map elements
Map elements

- Data Frame
- Neatline
- Scale
- Picture
- Legend
- Title
- Source text
Adding map elements

* Some map elements are dynamic
  Data Frame
  Legend
  North Arrow
  Scale Bar
  Scale Text

Drawing Toolbar
- for text and graphics
Exporting maps

- Export to common formats – pdf, jpeg, tiff, bmp, etc.
- Add to other documents

Map exported as TIFF file and added to word processing document
GIS Workflow: Sharing
Sharing options

- Local network (shared directory)
- Intranet
- Internet
ArcGIS Server and the Web

Sharing GIS resources over the Web

The Web as a GIS platform

Author  Publish  Use
ArcGIS Server – sharing GIS resources

<table>
<thead>
<tr>
<th>GIS resource</th>
<th>GIS service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Map document or Map service definition</td>
<td>Map service</td>
</tr>
<tr>
<td>Address locator</td>
<td>Geocode service</td>
</tr>
<tr>
<td>File geodatabase or Personal geodatabase or Database connection file</td>
<td>Geodata service</td>
</tr>
<tr>
<td>Toolbox or Map document with a tool layer</td>
<td>Geoprocessing service</td>
</tr>
<tr>
<td>Does not require a GIS resource</td>
<td>Geometry service</td>
</tr>
<tr>
<td>Globe document</td>
<td>Globe service</td>
</tr>
<tr>
<td>Raster dataset or Mosaic dataset</td>
<td>Image service</td>
</tr>
<tr>
<td>Folders &amp; geodatabases of GIS content that you want to search</td>
<td>Search service</td>
</tr>
</tbody>
</table>
ArcGIS Online

Maps
- Basemaps, maps, and layers
- Map templates

Apps
- Ready-to-use browser and mobile applications
- Configurable app templates (Flex, Silverlight)
- Developer APIs
  - JavaScript, Flex, Silverlight, iOS, WP7, Android
- Code and samples

Tools
- Geocoding, gazetteer, and geoprocessing services
- Add-ins

Additional hosted and on-premise capabilities coming soon....
ArcGIS.com

A new website, and a new component of the ArcGIS System

Like other components of the ArcGIS System, ArcGIS Online is built-in
When you visit ArcGIS.com you can

- Explore a gallery of featured maps and apps
- Use maps, and make your own
- Search for shared items and groups
- Login to ArcGIS Online to
  - Save and share maps you make
  - Join and create groups
What Can You Share Online?

• Layers
  - Layer packages (.lpk)
  - Layer files (.lyr)
  - Map and globe services

• Maps
  - Map packages (.mpk)
  - Desktop maps (.mxd, .3dd, .sxd)

• Tools
  - Services (geocoding, network analysis)

• Web Maps
  - Mashup Your Own Data with Online Data and Services
  - Share Your Custom Web Map
Summary

- **Building Geodatabase**
  - Feature dataset, feature class, annotation, raster data

- **Editing in ArcGIS**
  - Editing environment and tools

- **Geoprocessing**
  - Automate tasks and analysis

- **Creating and Using a map in ArcMap**
  - Design map layout and add map elements

- **Sharing**
  - Intranet and internet
Training resources

http://www.esri.com/training

• Instructor-Led or Online Courses
  – ArcGIS Desktop I: Getting Started with GIS
  – ArcGIS Desktop II: Tools and Functionality
  – ArcGIS Desktop III: GIS Workflows and Analysis
  – Building Geodatabases
  – Performing Advanced Analysis with ArcGIS
Questions