Streamlining Geoprocessing with ModelBuilder

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ESRI – St. Louis
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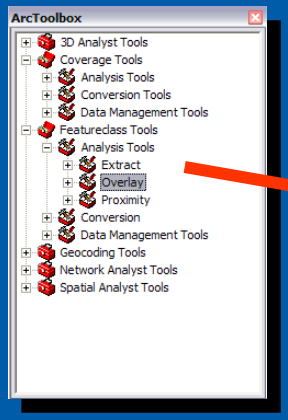
Topics

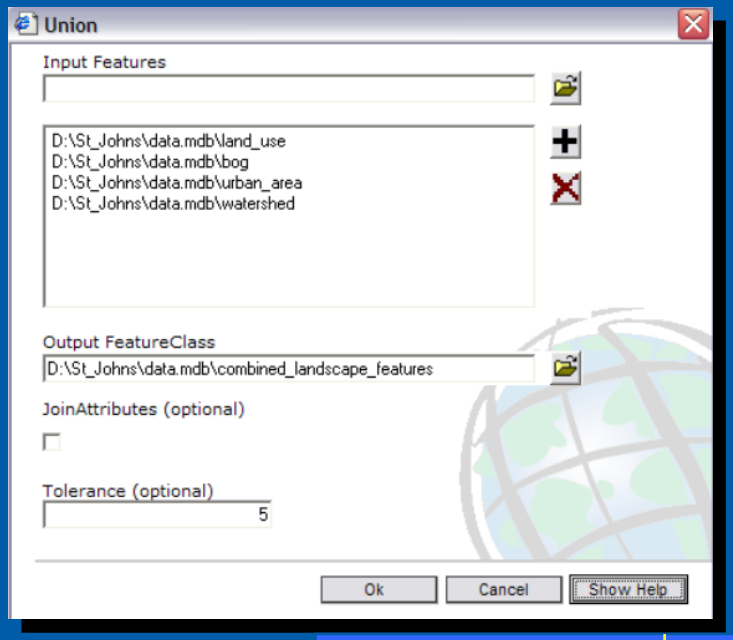
- Geoprocessing
- Navigating ArcToolbox
- Using ModelBuilder
- Learning More

Geoprocessing

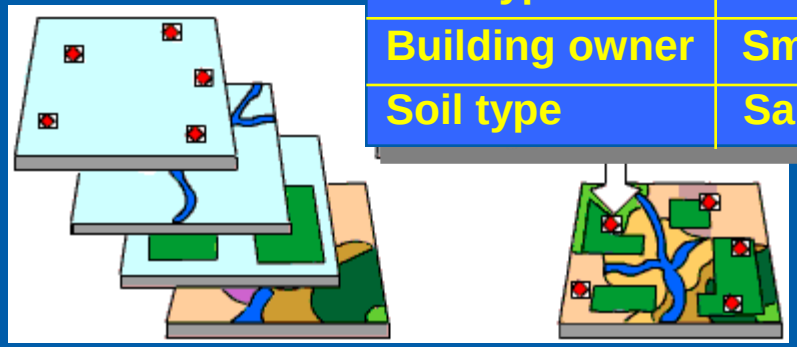
Geoprocessing

Data + Function = Data





Input



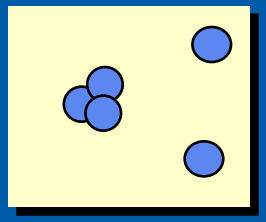
Well type	Drilled
Building owner	Smith
Soil type	Sandy

Output

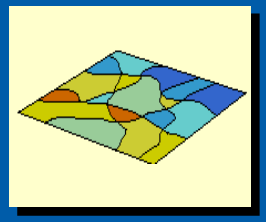
An Operation Used to Manipulate GIS Data

Analysis capabilities in ArcGIS Desktop

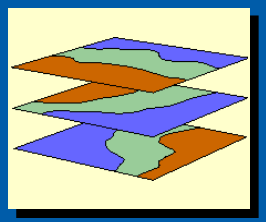
Point pattern analysis



Single-layer operations



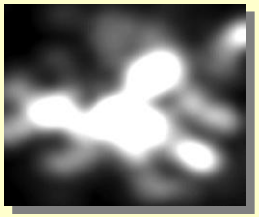
Multiple-layer operations



Core Functionality

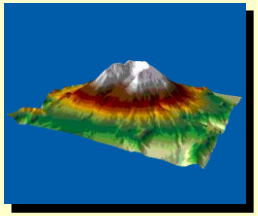
Extensions

Raster analysis



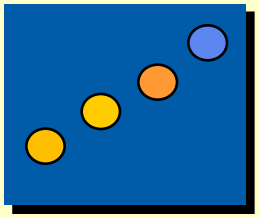
Spatial Analyst

Surface analysis



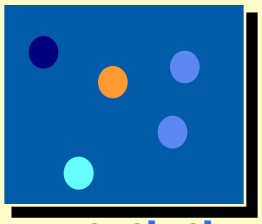
3D Analyst

Temporal analysis



Tracking Analyst

Geostatistical analysis



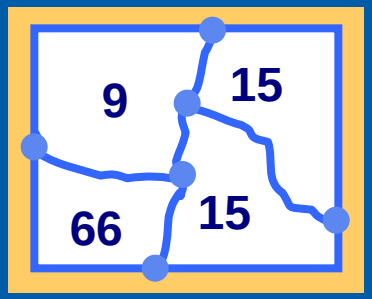
Geostatistical Analyst

Business analysis

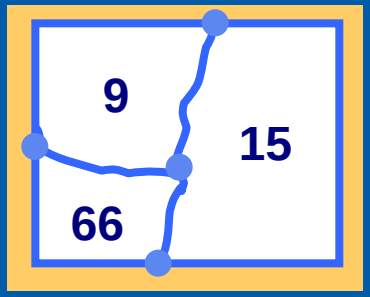
Business Analyst

Dissolving Features

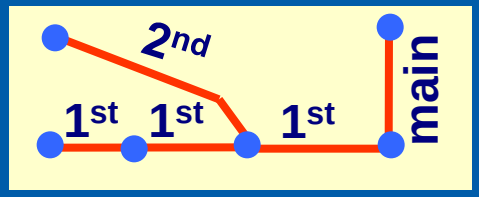
- Simplify data based on common attribute values

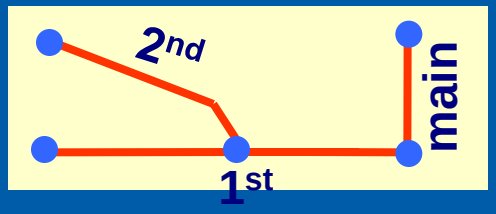


Input features with attribute values



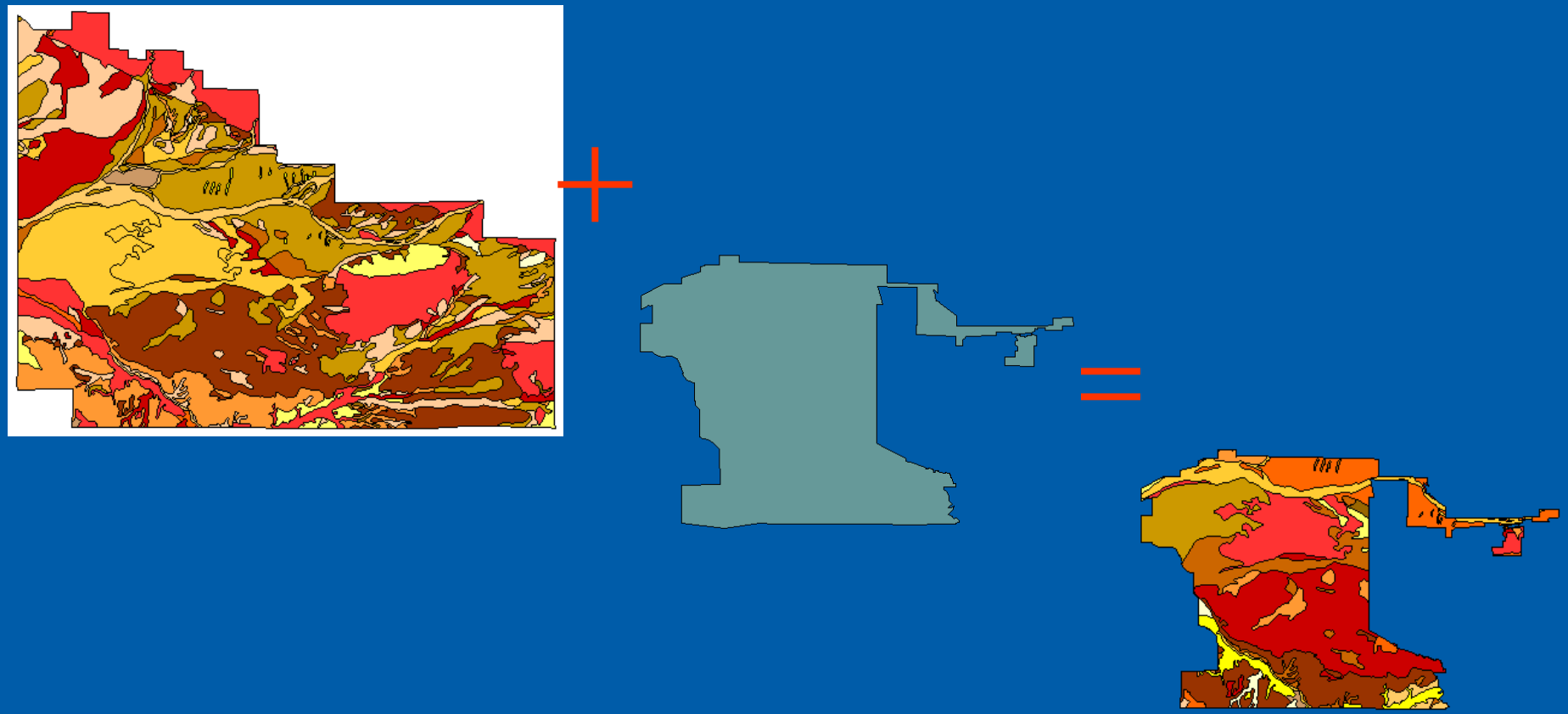
Fewer output features with attribute values





Clipping Features

- Use one feature class to define the boundary of another



Scalable Geoprocessing Functions

ArcInfo 269 Tools at 9.2

Plus more coverage tools

ArcEditor 208 Tools at 9.2

Can also write to all other GDB types

ArcView 183 Tools at 9.2

Write to file geodatabase, pGDB or .shp

Additional Extension Tools

3D Analyst Tools

Spatial Analyst Tools

Geostatistical Analyst Tools…

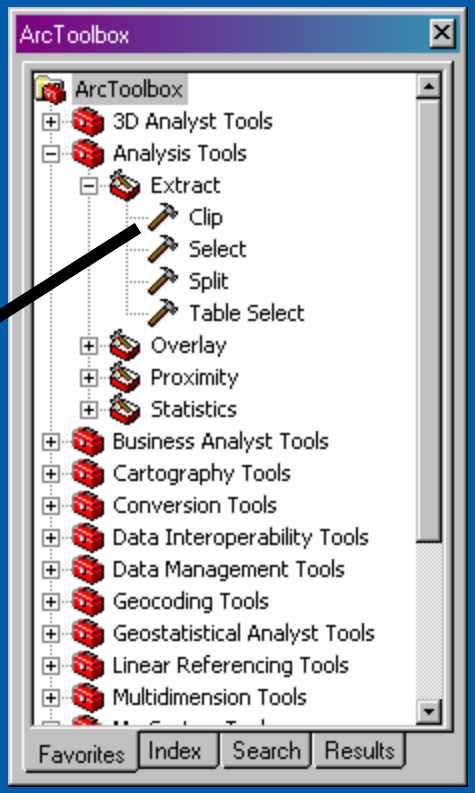
How Do I Know Which Tools Are Available to Me?

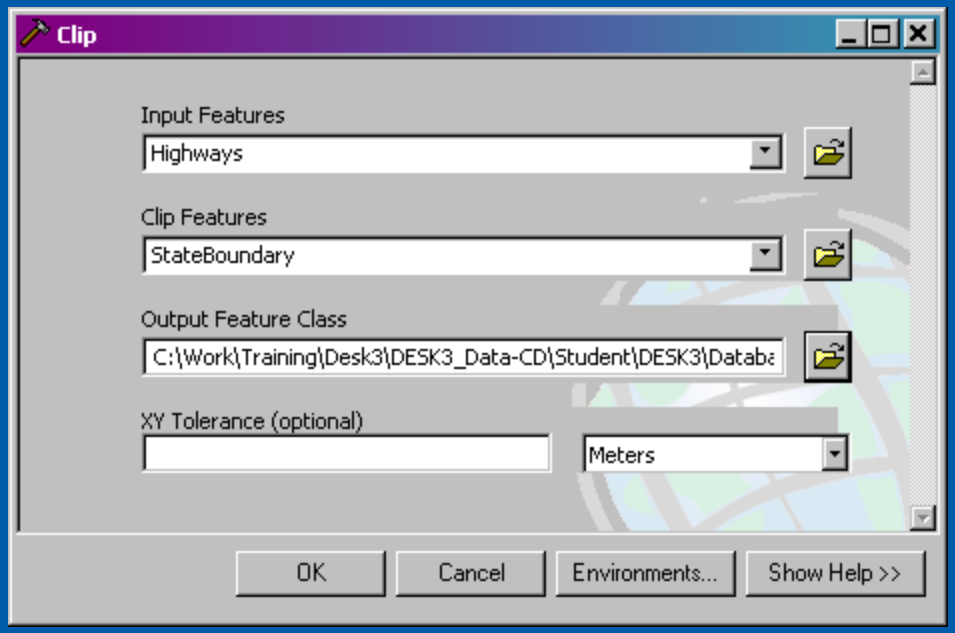
- ArcInfo licenses have access to all geoprocessing tools
- ArcView or ArcEditor users can choose to see only the tools available or to see “locked” tools
- ArcGIS Desktop Help
  - “Licensing for Geoprocessing Tools” topic
  - ArcGIS 9 Geoprocessing Commands Quick Reference Guide (.pdf)

Navigating ArcToolbox

ArcToolbox Window

- Available in ArcCatalog and ArcMap
- Geographic processing functions
  - Data management, analysis, and conversion
  - Your Custom Tools

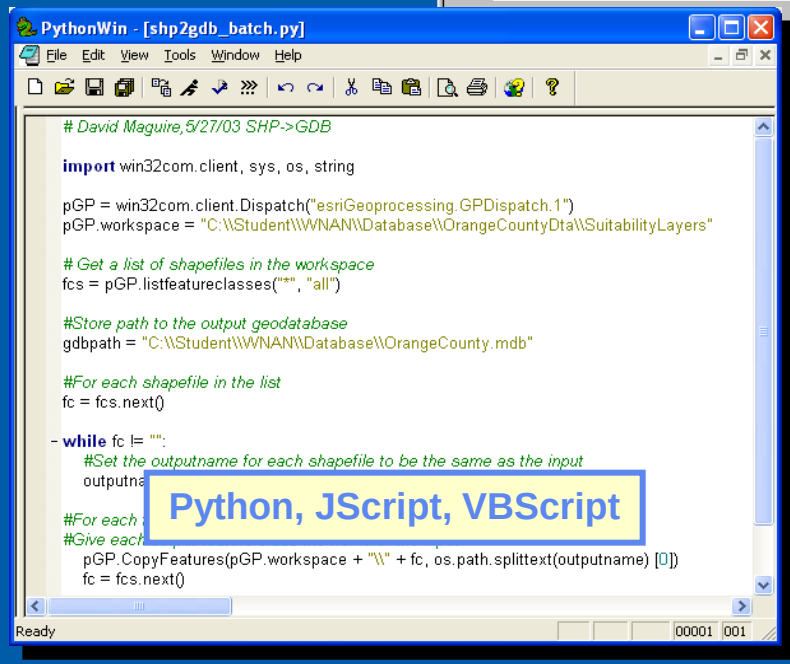




Geoprocessing Interfaces

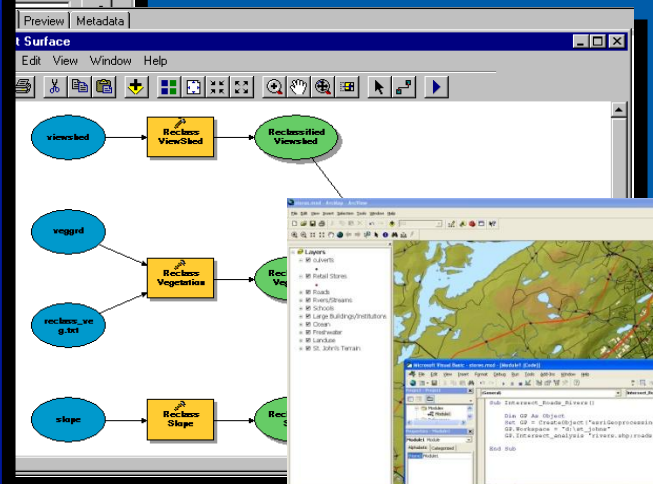
Dialogs

Scripting



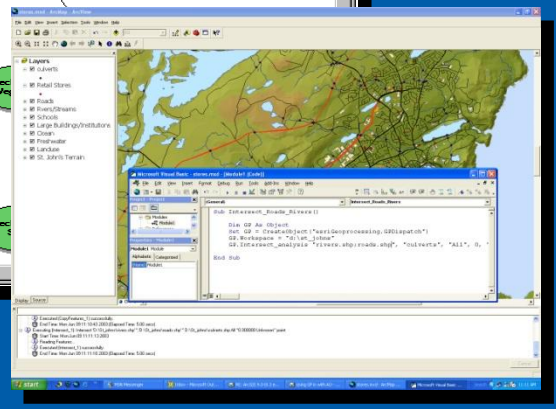
Python, JScript, VBScript

ModelBuilder

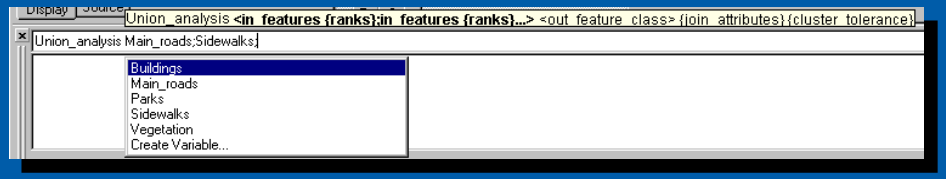


ArcObjects

.NET,VB, Visual C++



Commands



… Shared Tools, Scripts, and Models

Geoprocessing Tip:

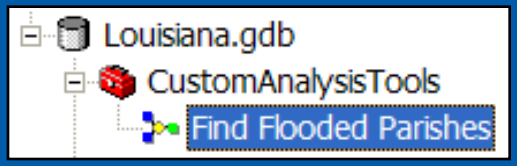
Sometimes it is faster to use a tool than it is to do a task through the User Interface!

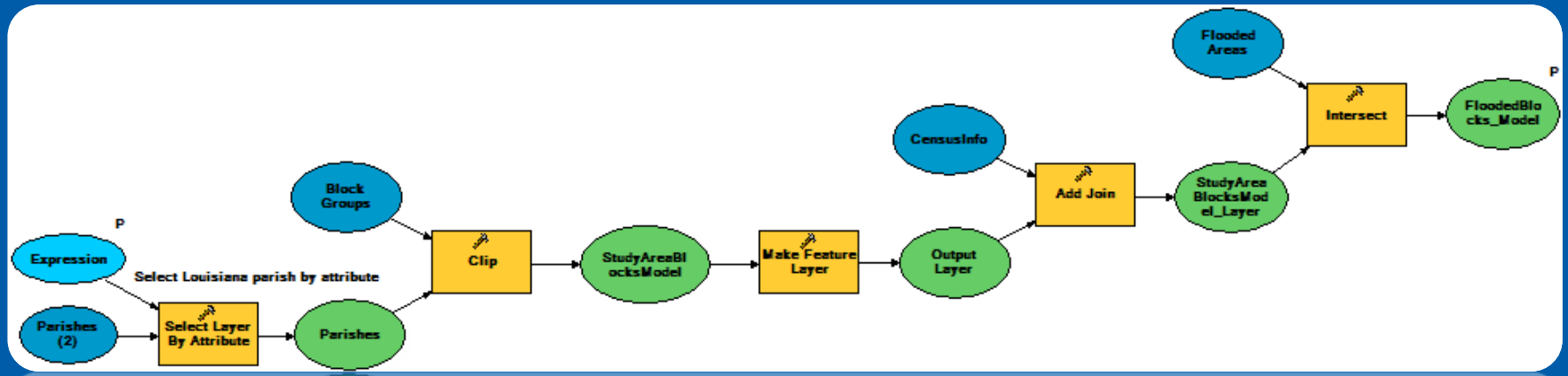
- Examples
  - Deleting Multiple Fields
  - Tagging Point Features with Attributes from a Polygon

Creating Models with Model Builder

What is ModelBuilder?

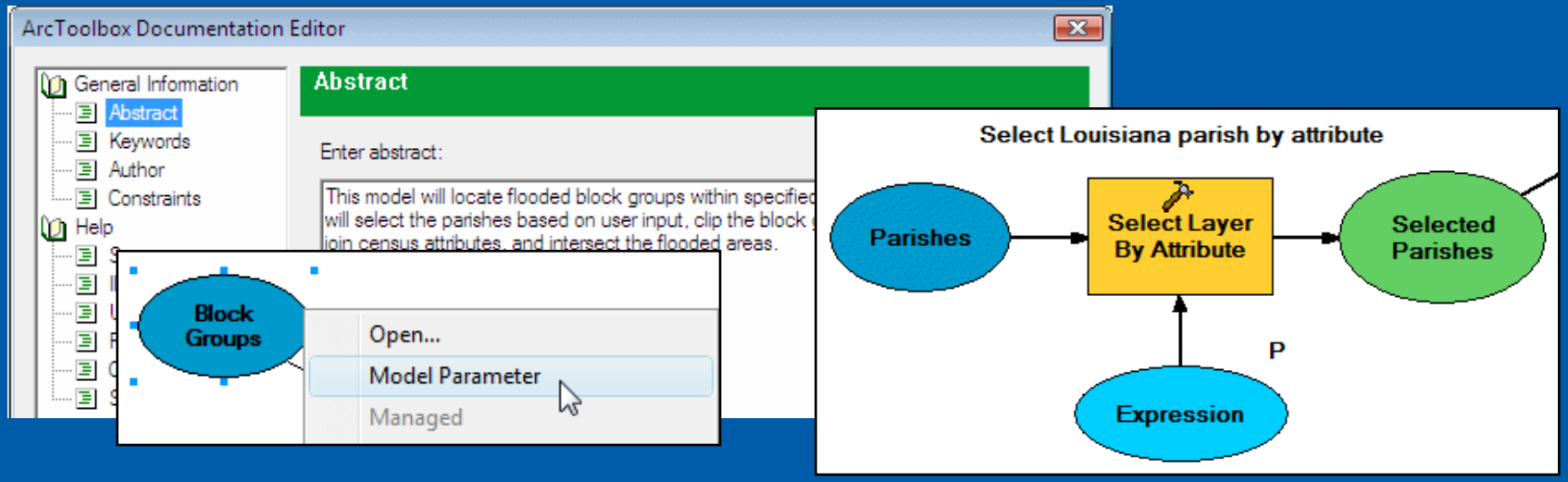
- Application for creating geoprocessing models
- Allows for creation of flowcharts you can process
- Streamlines and automates analysis workflows
- Models stored in custom toolboxes





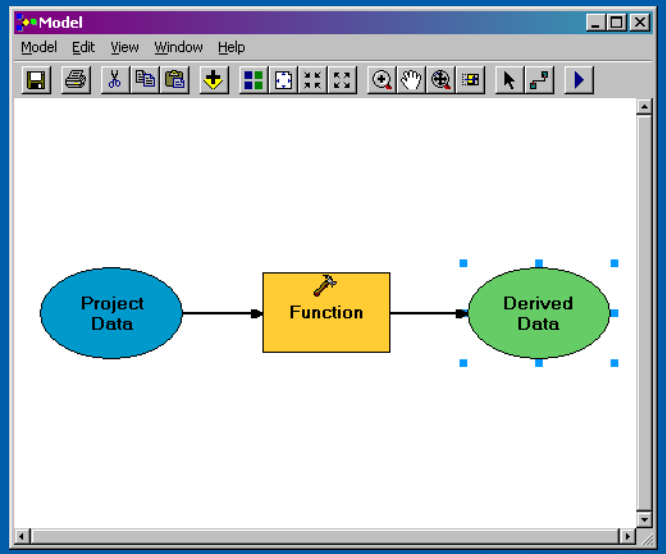
Why use ModelBuilder for analysis?

- Automate and manage geoprocessing tasks
- Run complex succession of processes as one tool
- Plug in additional tools and parameters as needed
- Manage intermediate data
- See visual representation of analysis operations



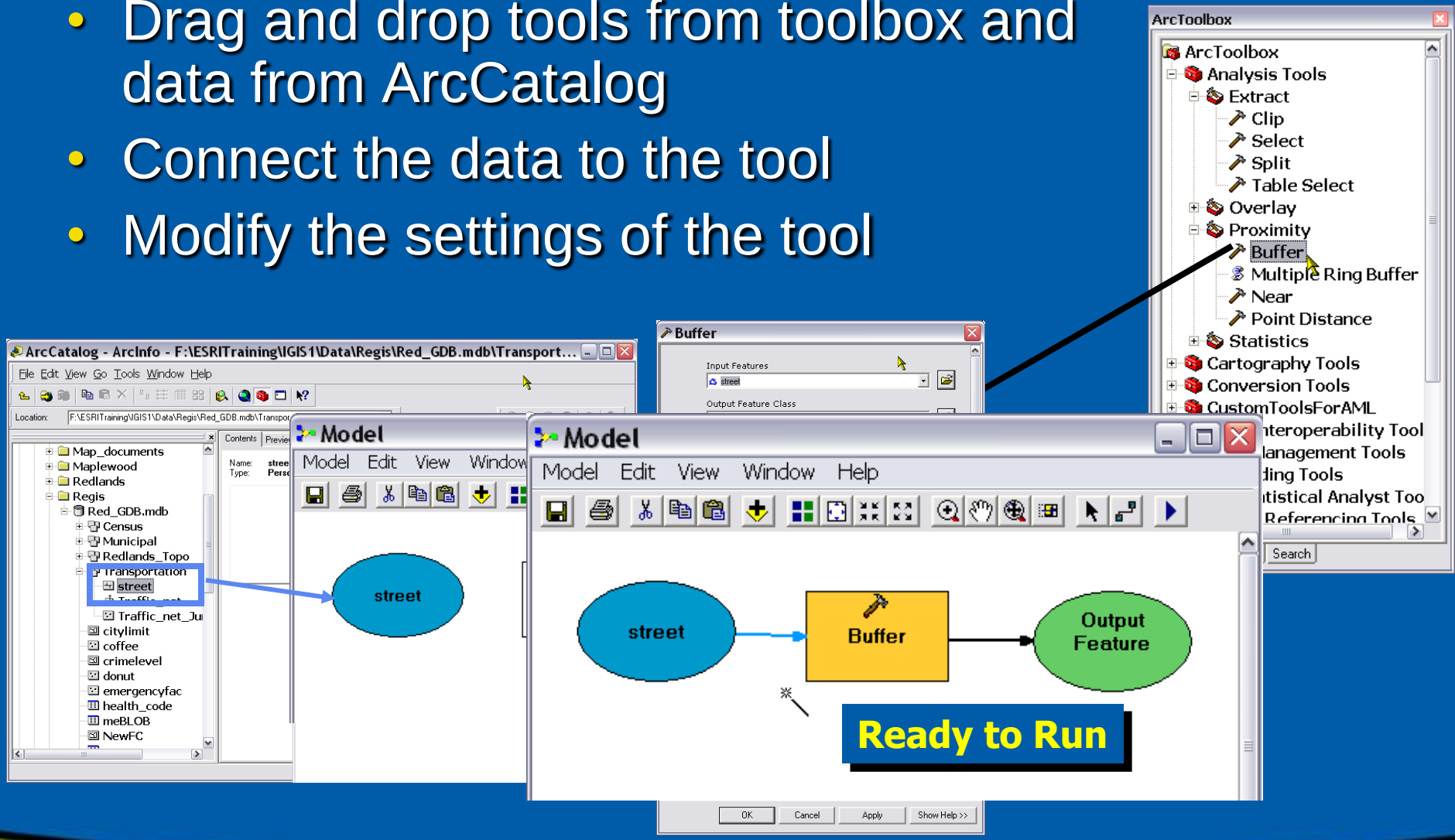
Model Elements

- Input Data: data that exists before model is run
  - Blue Oval
- Tool: operation performed on input data
  - Yellow-orange Rectangle
- Derived Data: output data created by a function
  - Green Oval
- Process: Set of elements
  - Run one process at a time or all at once



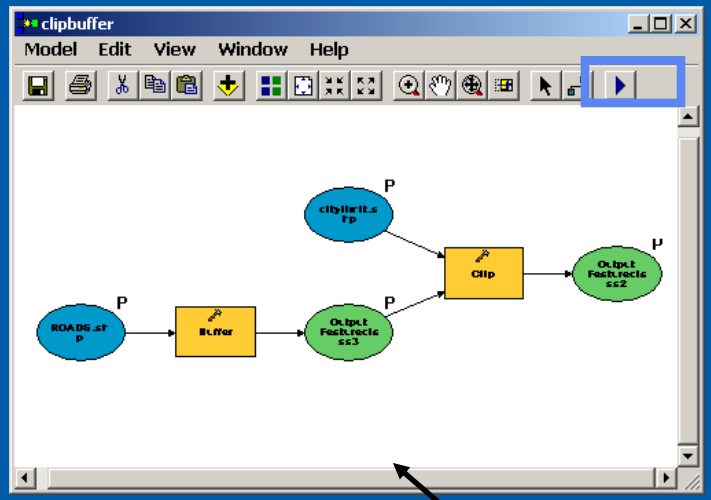
Constructing a Model

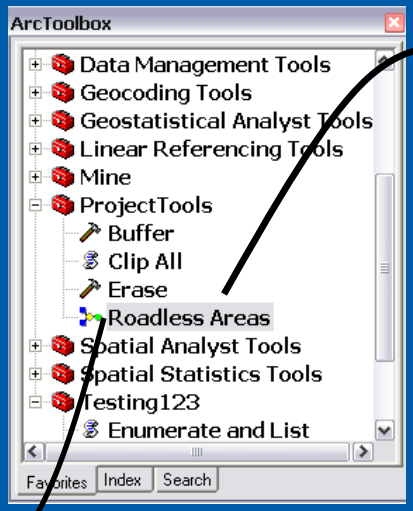
- Drag and drop tools from toolbox and data from ArcCatalog
- Connect the data to the tool
- Modify the settings of the tool

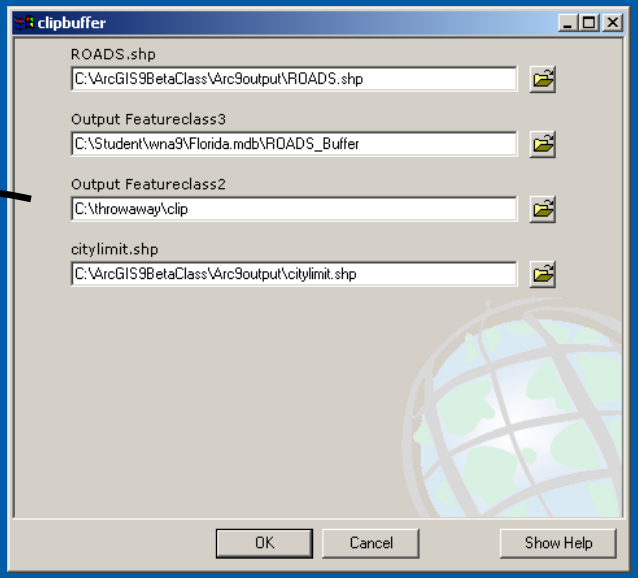


How to Execute Models

- Run from Model Builder
- Run a single process from Model Builder
- As a tool from toolbox







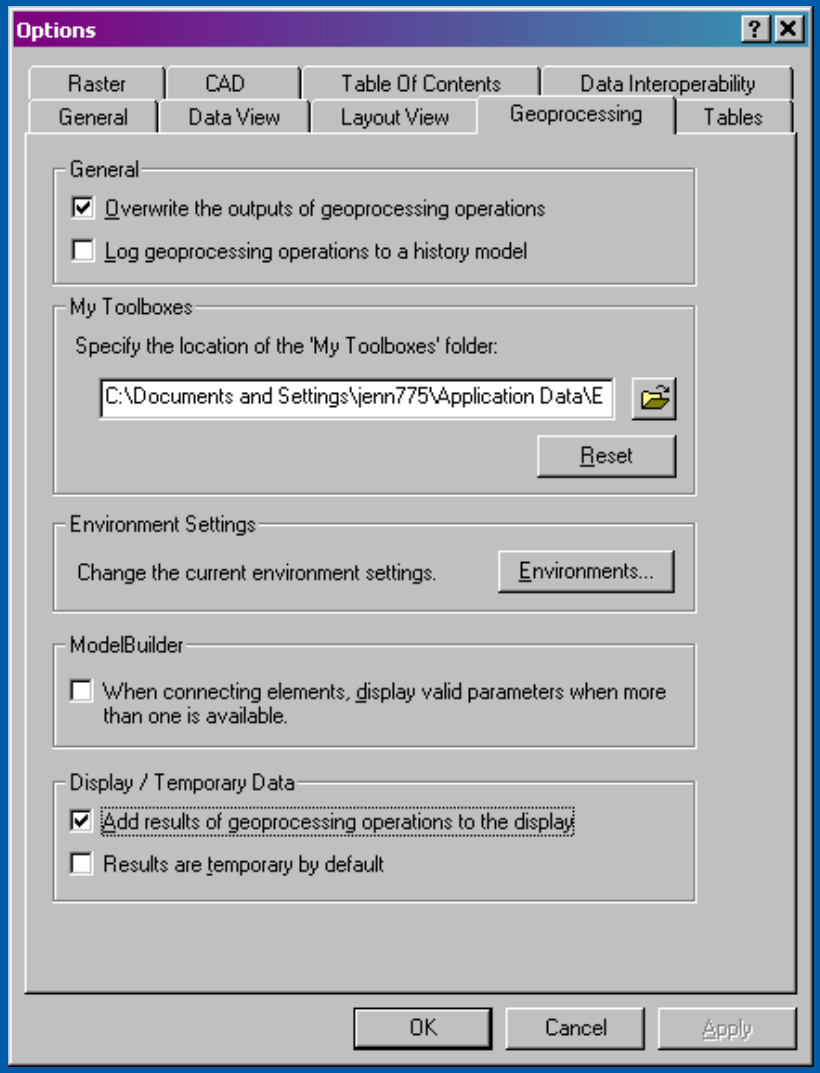
Edit

Execute

Geoprocessing Tip:

You can control whether ArcGIS Desktop allows overwriting of geoprocessing outputs.

(Tools > Options)

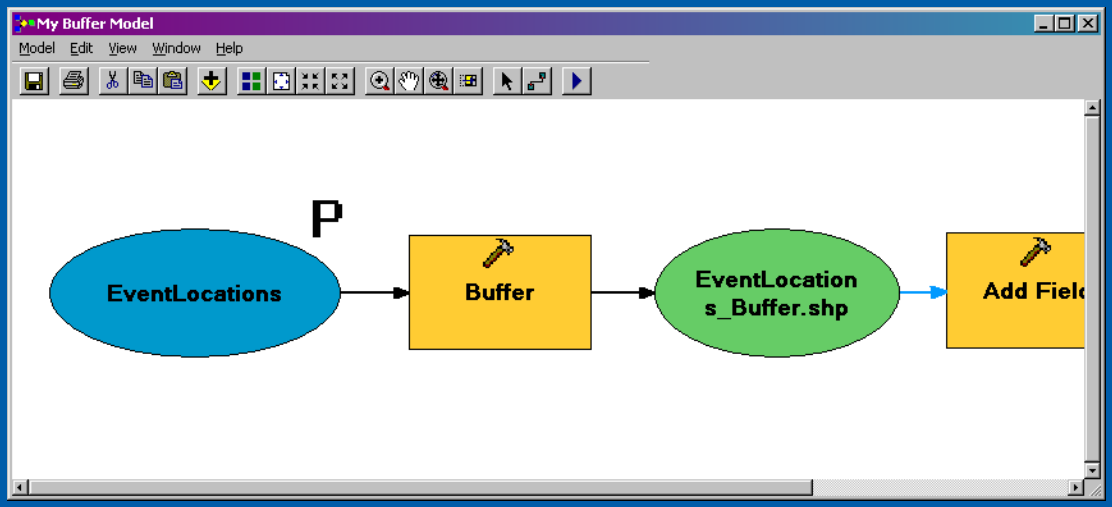


Demonstration:
Building a Model – the Basics

Enhancing a Model

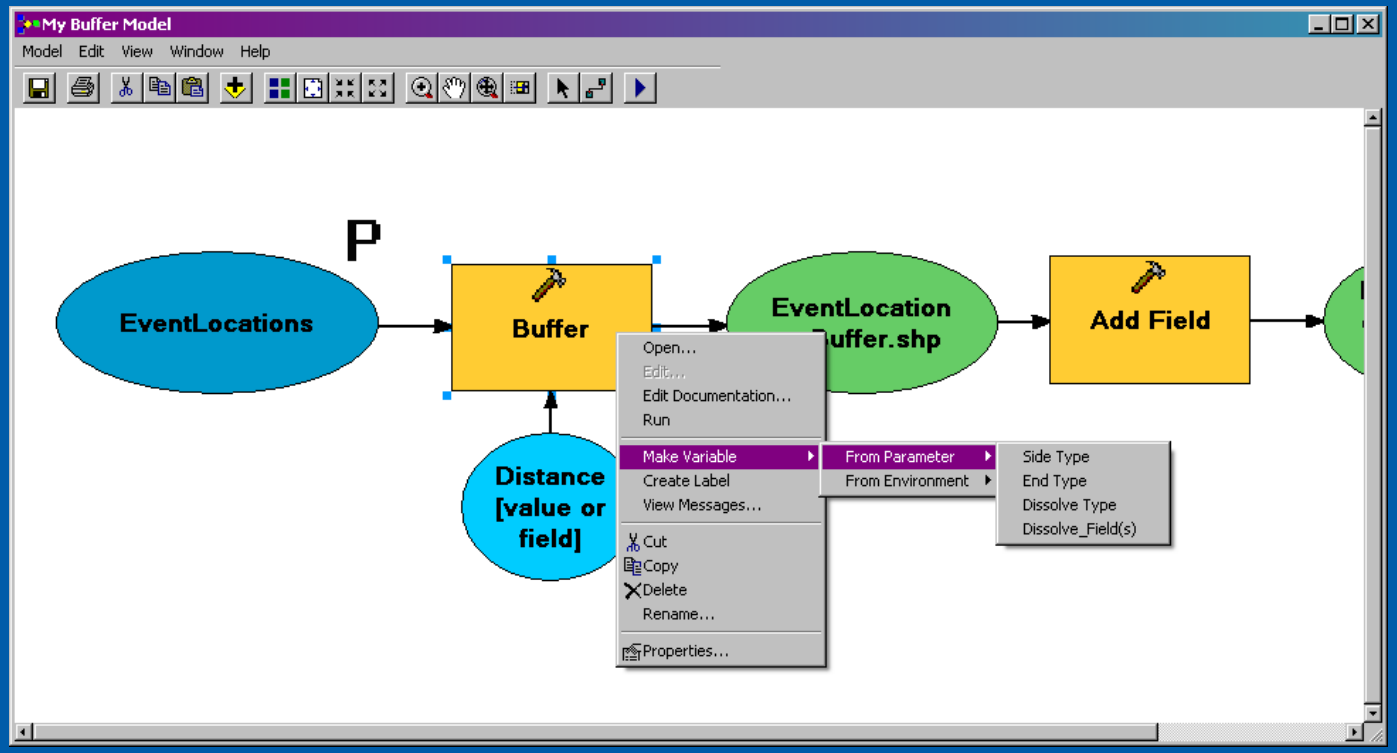
Model Parameters

- Allow for User Input
- Are Used when Running Model as Dialog
- Can Create a Data Independent Tool



Variables in Models

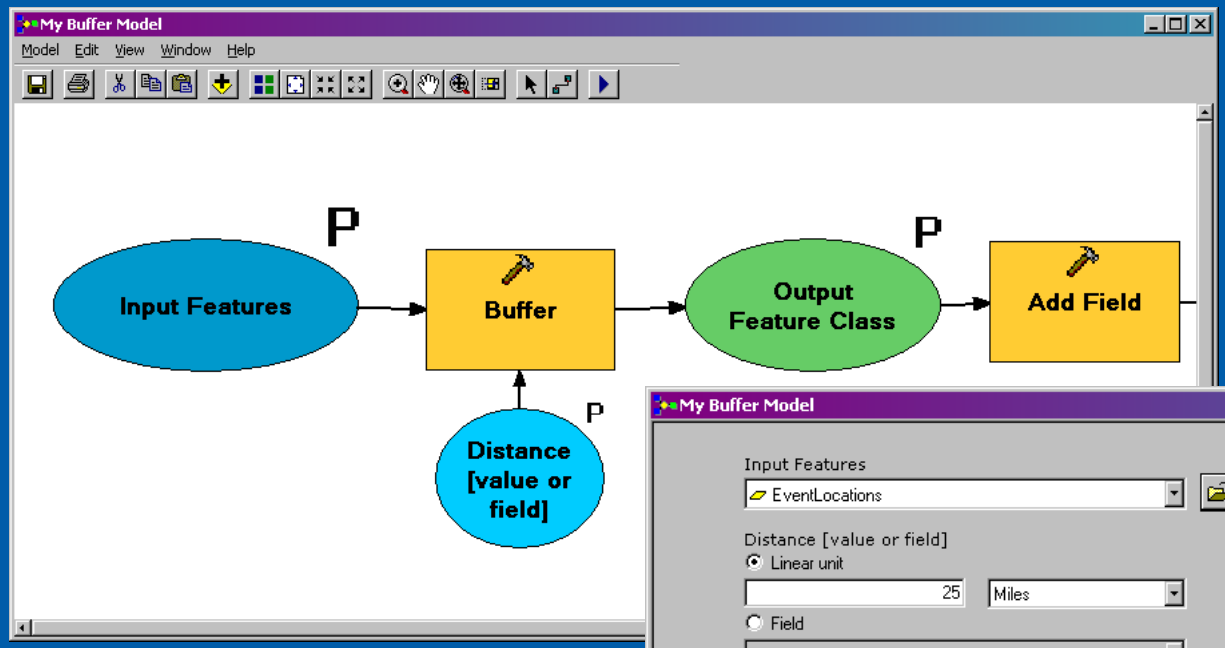
- Can be Parameters or Environment Settings
- Share Value between Processes
- Allow for User Input

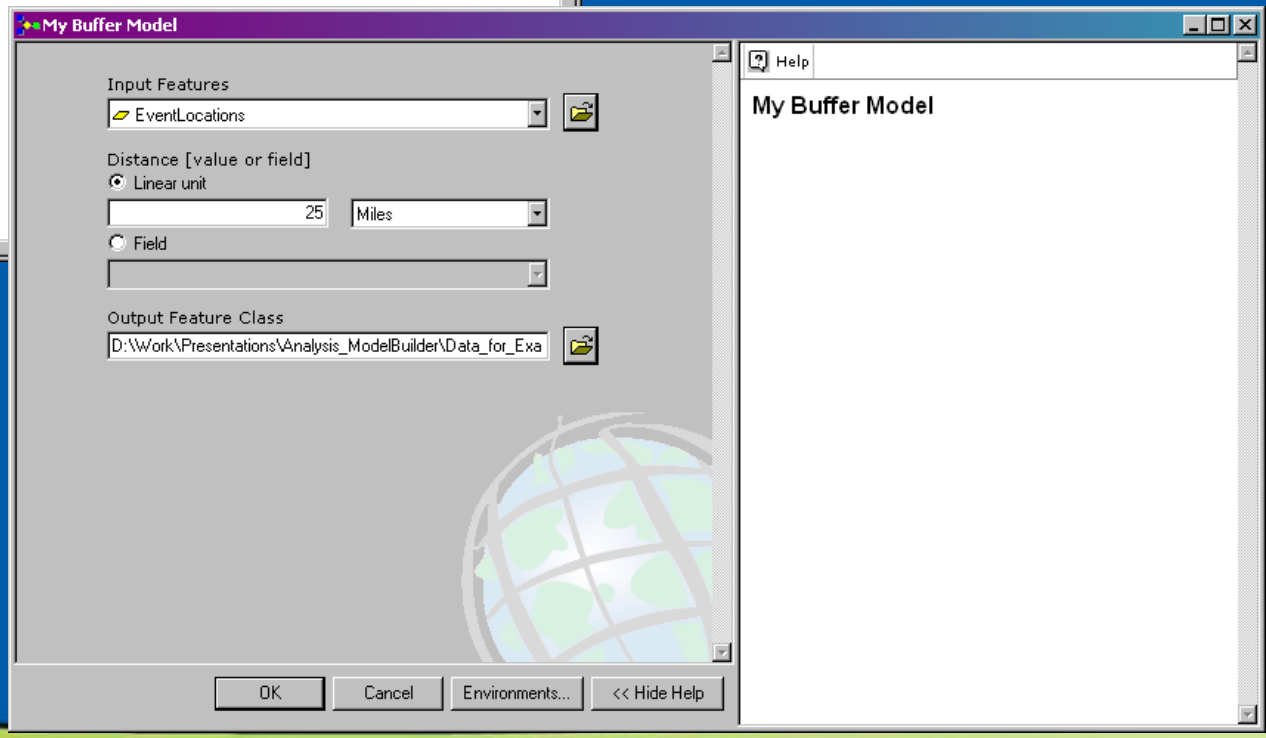


Intermediate Data

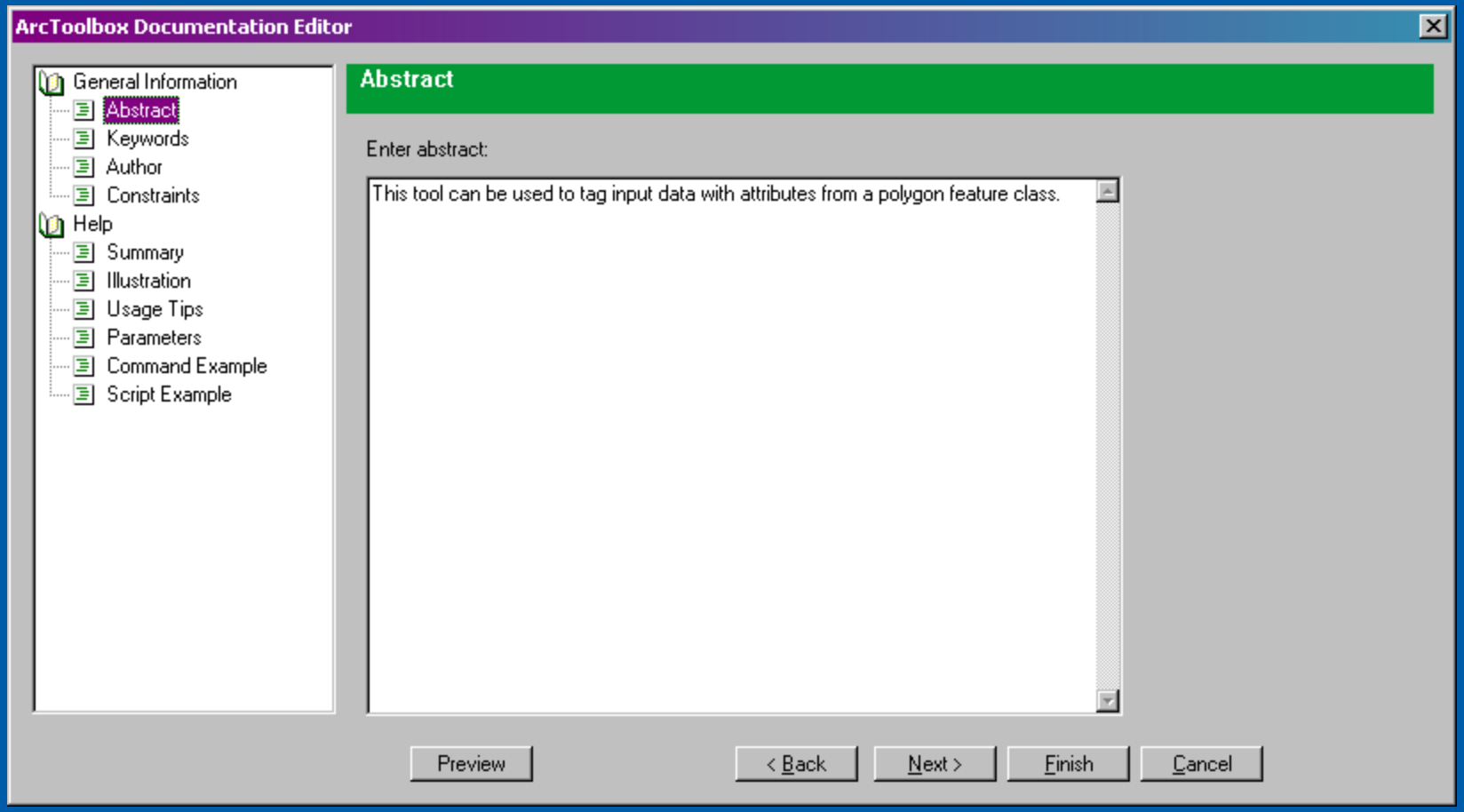
- Outputs are set to Intermediate by Default
- Use context menu to change setting
- Intermediate data is not deleted when models are run from ModelBuilder window
- Intermediate data is deleted when models are run from a dialog box or the command line

Edit Text on Model Elements to Control Text on Dialog





Documenting a Model



Sharing a Model

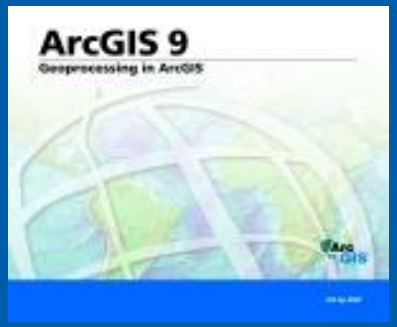
- Toolboxes are stored in .tbx files

  C:\Documents and Settings\<User_Name>\Application Data\ESRI\ArcToolbox\My Toolboxes
- List appears in ArcCatalog
- Be sure recipients have access to all data
- Can set data paths as relative to toolbox (Model Properties)

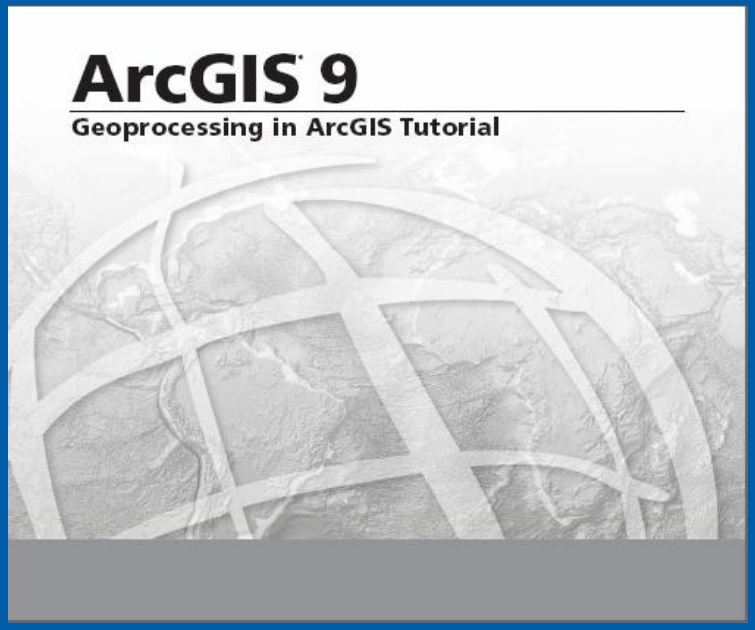
Demonstration: Enhancing a Model

Learning More

Geoprocessing

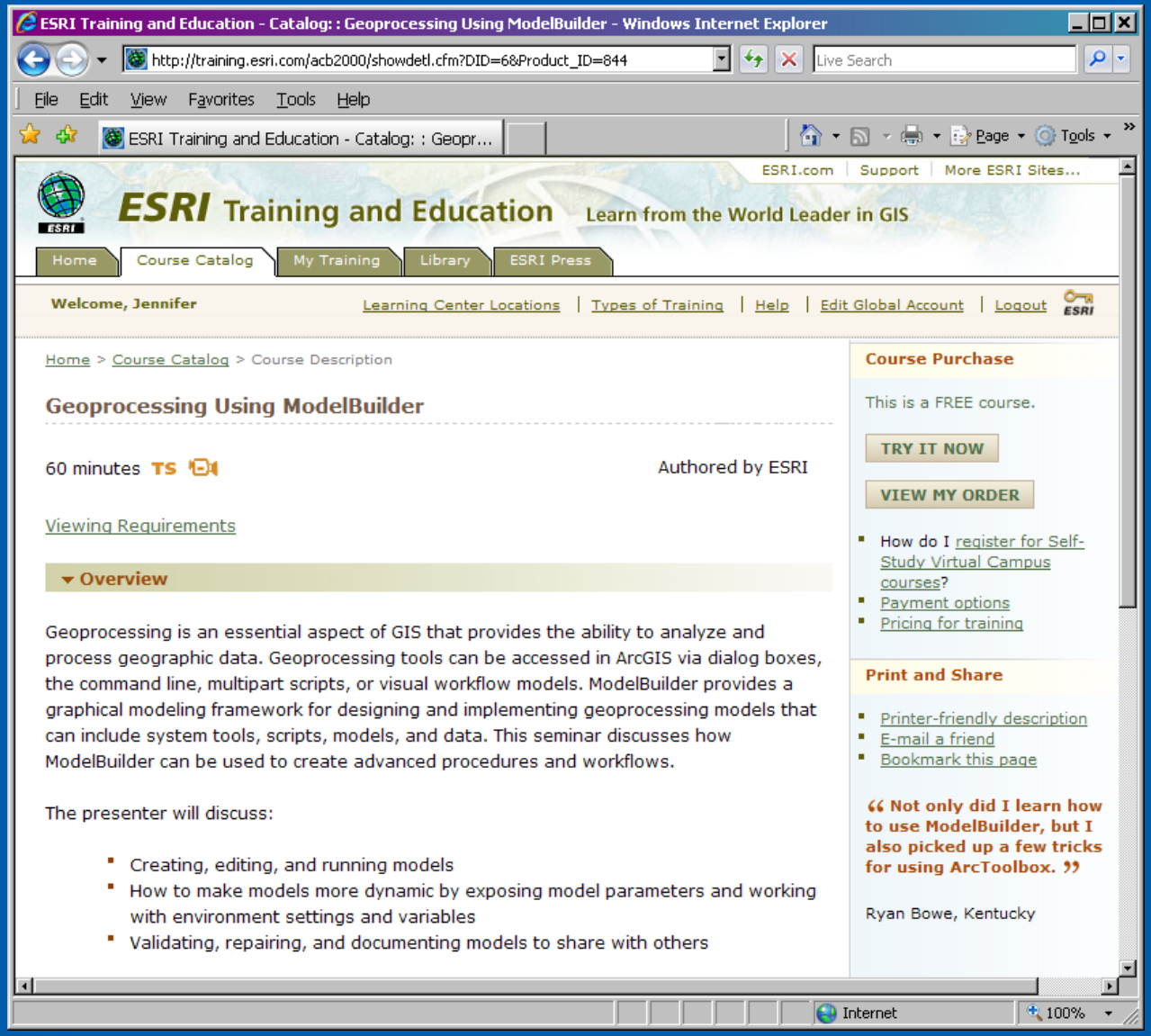


Book in the Box

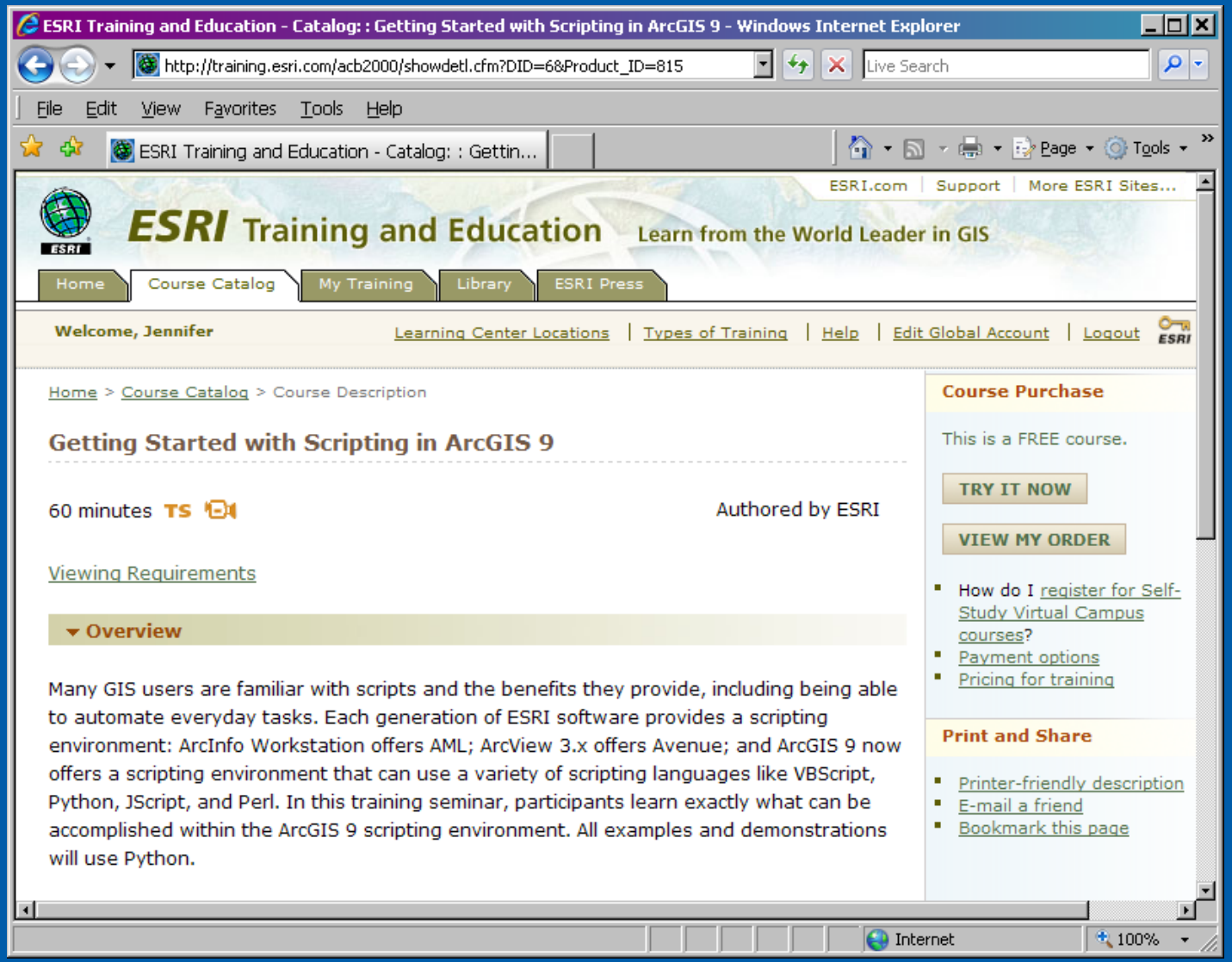


C:\Program Files\ArcGIS\Documentation

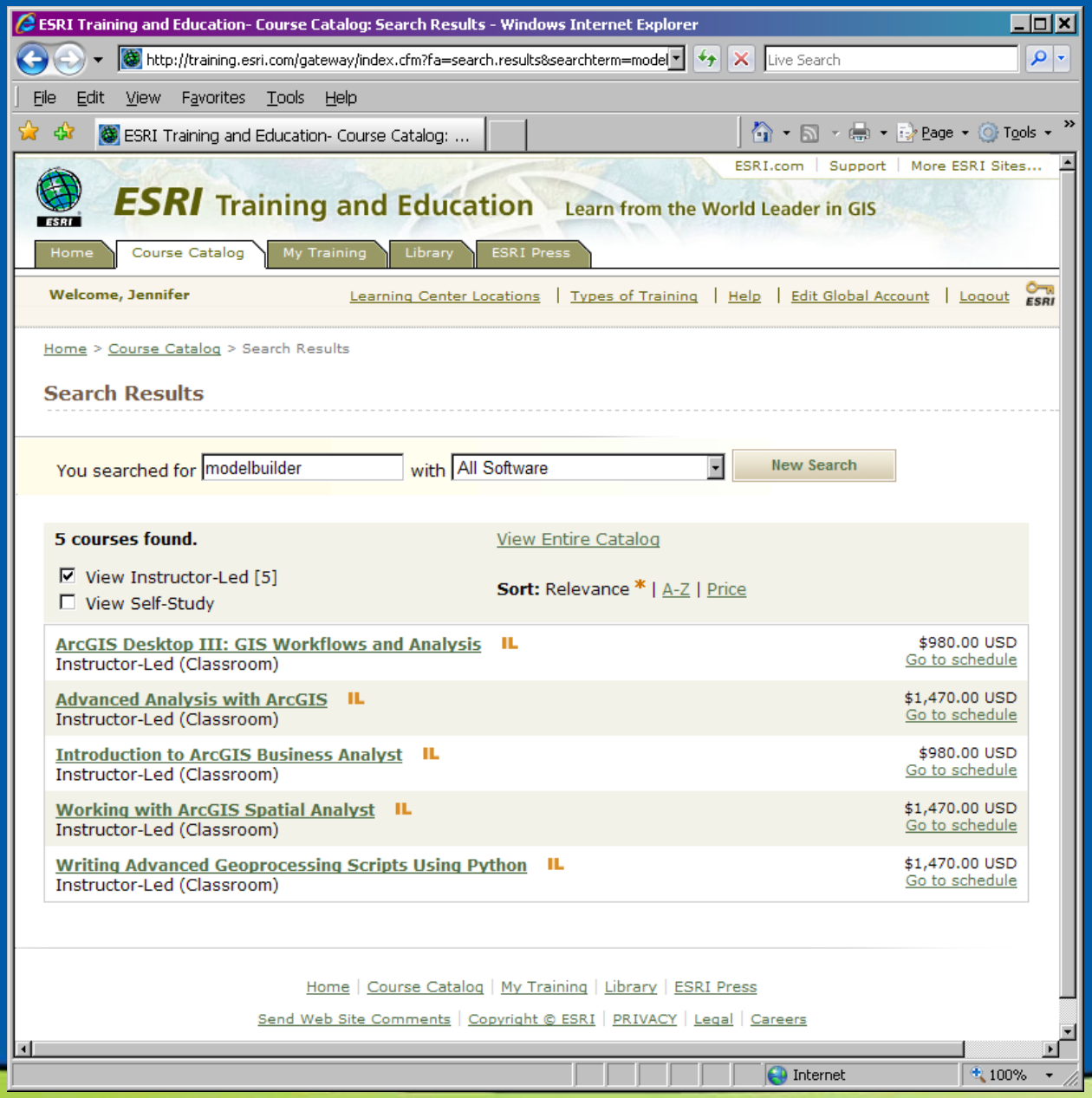
Geoprocessing Using ModelBuilder



Getting Started with Scripting in ArcGIS 9



Instructor-Led Training



Questions?