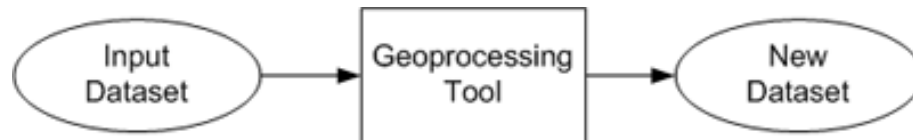


# GEOPROCESSING & ENVIRONMENTS

GIS Analysis | Winter 2016

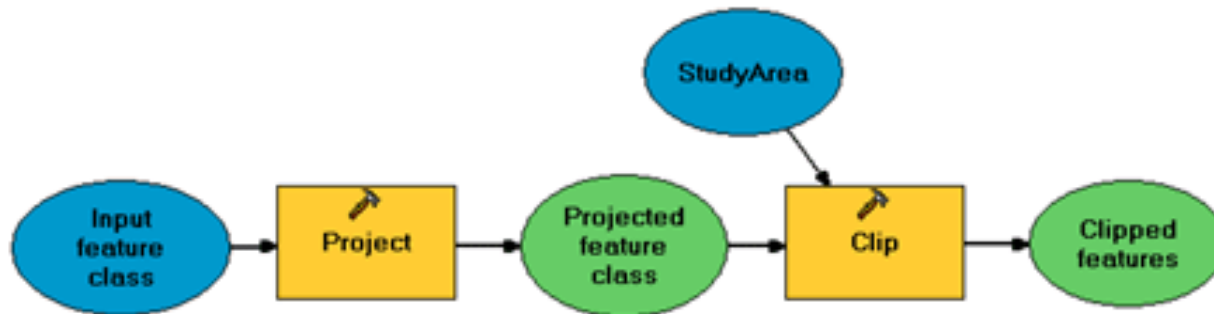
# What is Geoprocessing?

- Process of applying an operation (with a *tool*) to manipulate an *input* GIS dataset
- Many geoprocessing tools are found in ArcToolbox
- Results in an *output* GIS dataset (often new, but not always)



# Why Geoprocess?

- Task automation and modeling
- Common types of Geoprocessing
  - ▣ Data management
  - ▣ Spatial Analysis



# What is Spatial Analysis?

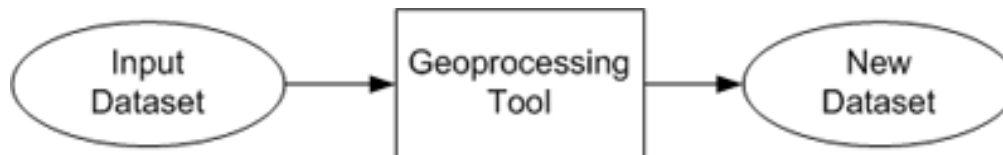
- Operations performed on spatial data that add value
- Can reveal things that might otherwise be invisible -  
-- it can make what is implicit, explicit
- Effective spatial analysis requires an intelligent user  
(not just a powerful computer)



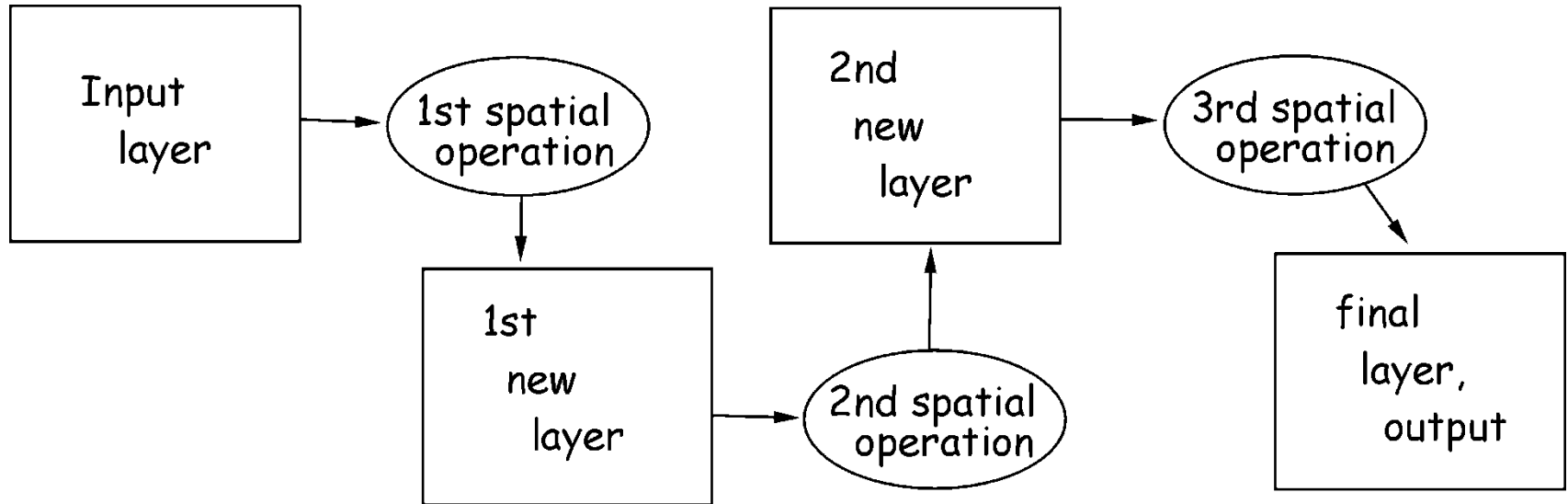
# Geoprocessing Workflows

# Workflow Diagram Components

- **ArcGIS Modelbuilder notation** for workflow diagrams:
  - ▣ Input datasets (Ovals)
  - ▣ Output/New datasets (Ovals)
  - ▣ Geoprocessing tools (Rectangles)
  - ▣ Parameters used for each tool (Notation next to tool)



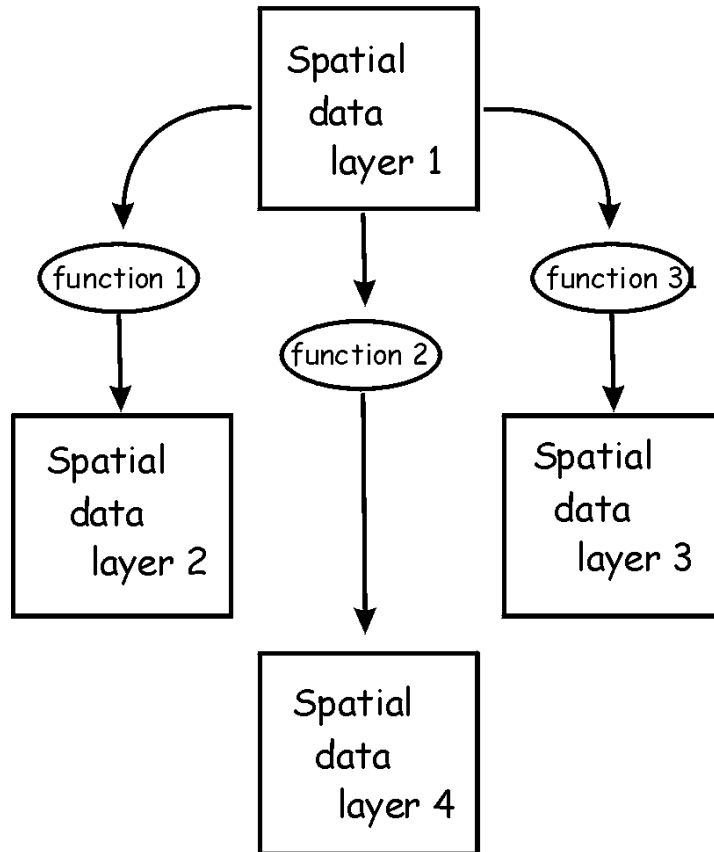
# Workflow - Linear Sequence\*



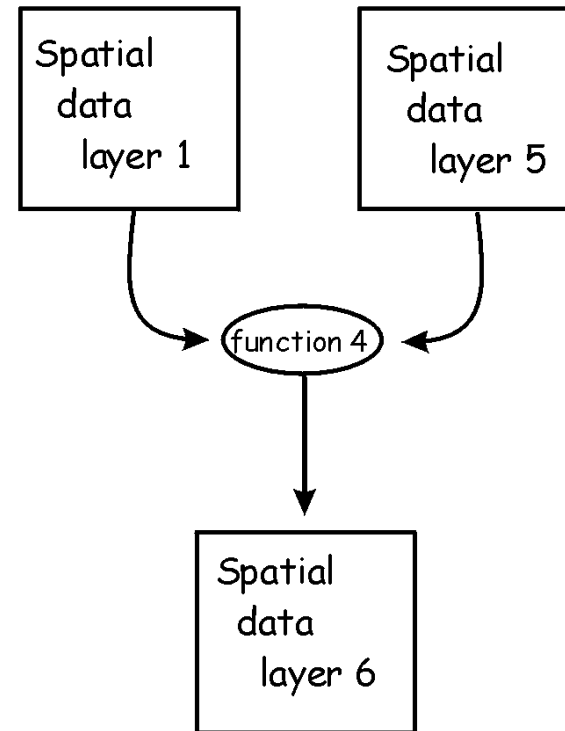
\* Textbook notation shows datasets using squares, and tools using ovals. For this course, we'll be using notation that matches ArcGIS Modelbuilder.

# Workflow - Multiple Layers\*

One Input - Many Outputs



Many Inputs - One Output



\* Textbook notation shows datasets using squares, and tools using ovals. For this course, we'll be using notation that matches ArcGIS Modelbuilder.





# Setting Environments

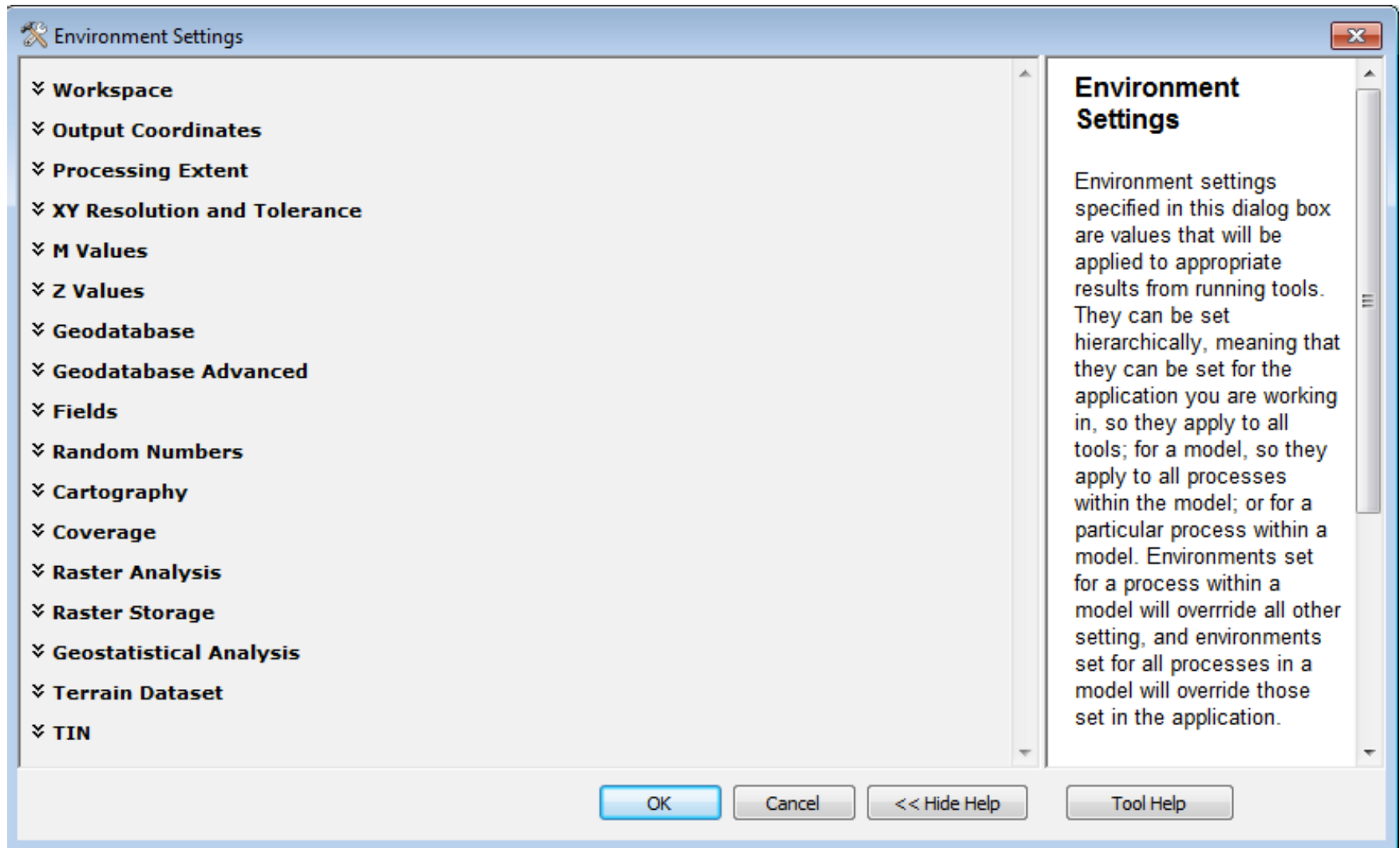
# Geoprocessing Tool Environments

- Geoprocessing > Environments
- Allows you to set additional parameters that affect a tool's results
- They are values you set once and are interrogated and used by all tools when run

# Geoprocessing Tool Environments

- A prerequisite to performing geoprocessing tasks
  - ▣ Current and Scratch workspace allow you to set workspaces for inputs and outputs.
  - ▣ Extent environment setting allows your analysis to be limited to a specific geographic area
  - ▣ Output Coordinate System environment setting defines the coordinate system for new data.

# Geoprocessing Tool Environments





# General Tips for Spatial Analysis

# Documenting Spatial Analysis

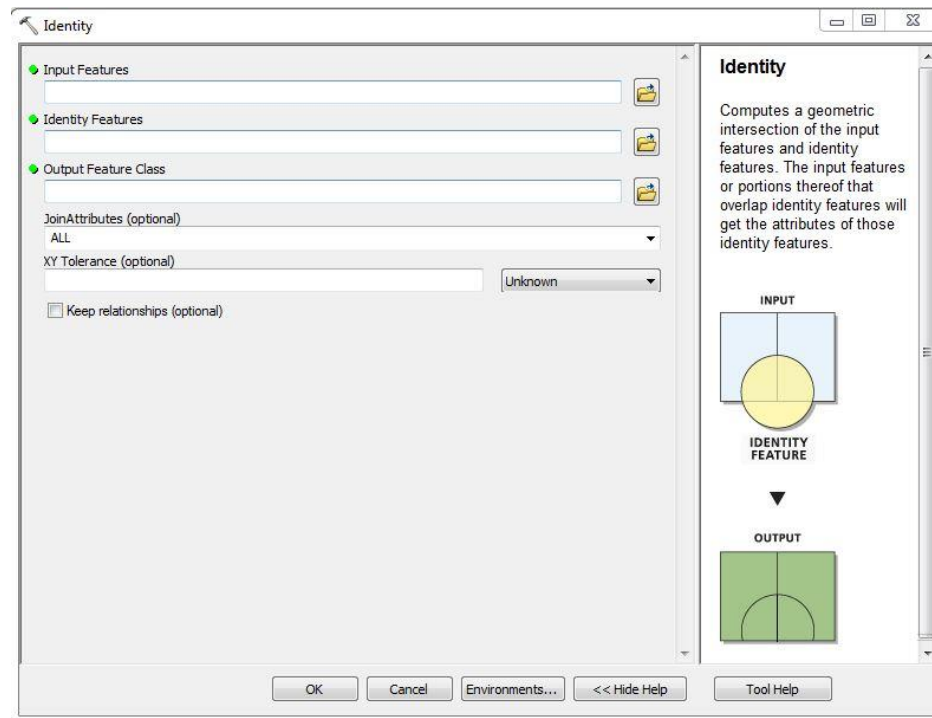
- In ArcMap, check Geoprocessing ***“Results” window***
- Create ***Metadata***
  - ▣ Go to “Description” tab, “Edit” tool
  - ▣ Change Metadata display style using Customize > ArcCatalog Options > Metadata
  - ▣ FDGC is a common display style
- Create a **workflow diagram**

# Where are my ArcToolbox Tools?

- **Geoprocessing** menu
- **Search for Tools**
- ArcCatalog window > Toolboxes > **My Toolboxes**
  - ▣ Create new toolsets
  - ▣ Copy/paste tools into toolsets

# Use ESRI Resources for help

- <http://desktop.arcgis.com/en/desktop/>
- Tool help within ArcMap





# ArcGIS Desktop License Levels

- **ArcReader** (Lightweight map viewer, free download)
- ArcGIS for Desktop Basic
- ArcGIS for Desktop Standard
- ArcGIS for Desktop Advanced

Functionality matrix available online at:

[www.esri.com/library/brochures/pdfs/arcgis10-desktop-functionality-matrix.pdf](http://www.esri.com/library/brochures/pdfs/arcgis10-desktop-functionality-matrix.pdf)