Geoprocessing made easy with ESRI's Modelbuilder

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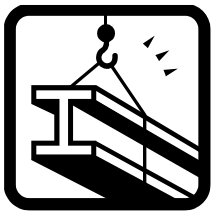
Creating a script tool with Python

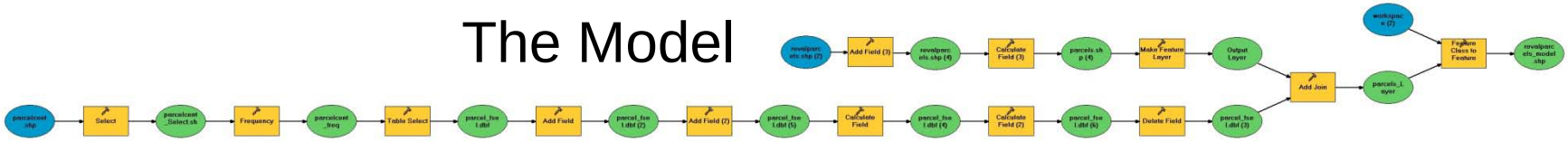


Geoprocessing?

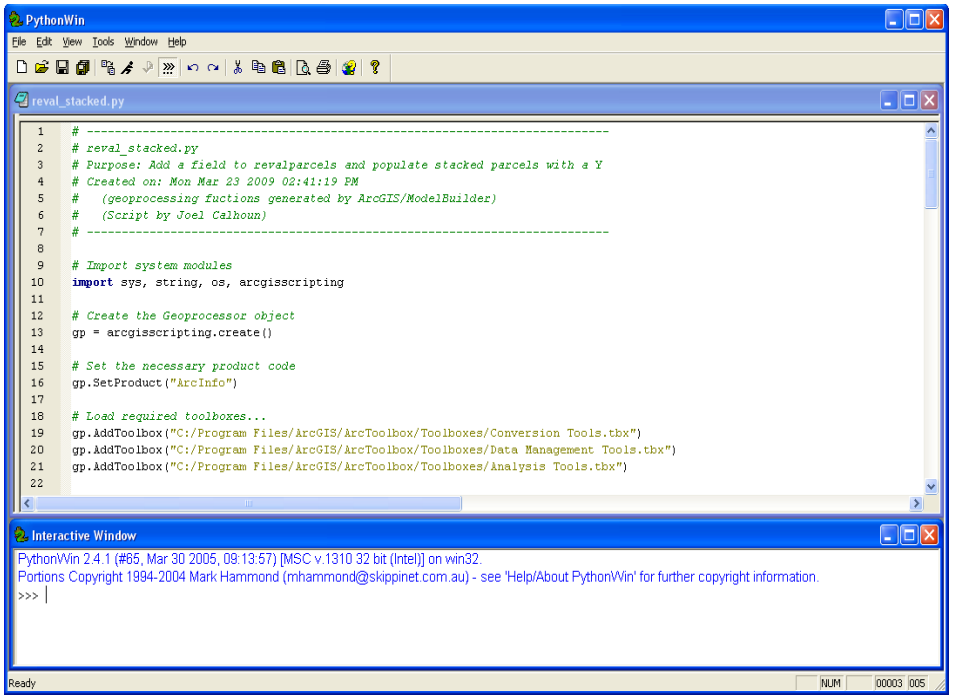
- ESRI Definition:
  - A GIS operation used to manipulate GIS data.
    - A typical geoprocessing operation takes an input dataset, performs an operation on that dataset, and returns the result of the operation as an output dataset.
    - Common geoprocessing operations include geographic feature overlay, feature selection and analysis, topology processing, raster processing, and data conversion.
    - Geoprocessing allows for definition, management, and analysis of information used to form decisions.

Geoprocessing approaches:

The Model



The Script



Modelbuilder?

What is it?

ESRI's application to build geoprocessing models.

What is a Modelbuilder model?

The graphical display for a geoprocessing workflow.

Why use it?

Save time on repetitive geoprocessing tasks.

Where is it?

Modelbuilder is accessed from ArcToolbox  in either ArcMap  or ArcCatalog. 

Pilot Project

- Objectives

  Modelbuilder

  - Clip parcels to pilot area extent.
  - Clip additional feature classes to pilot area extent.

  Python

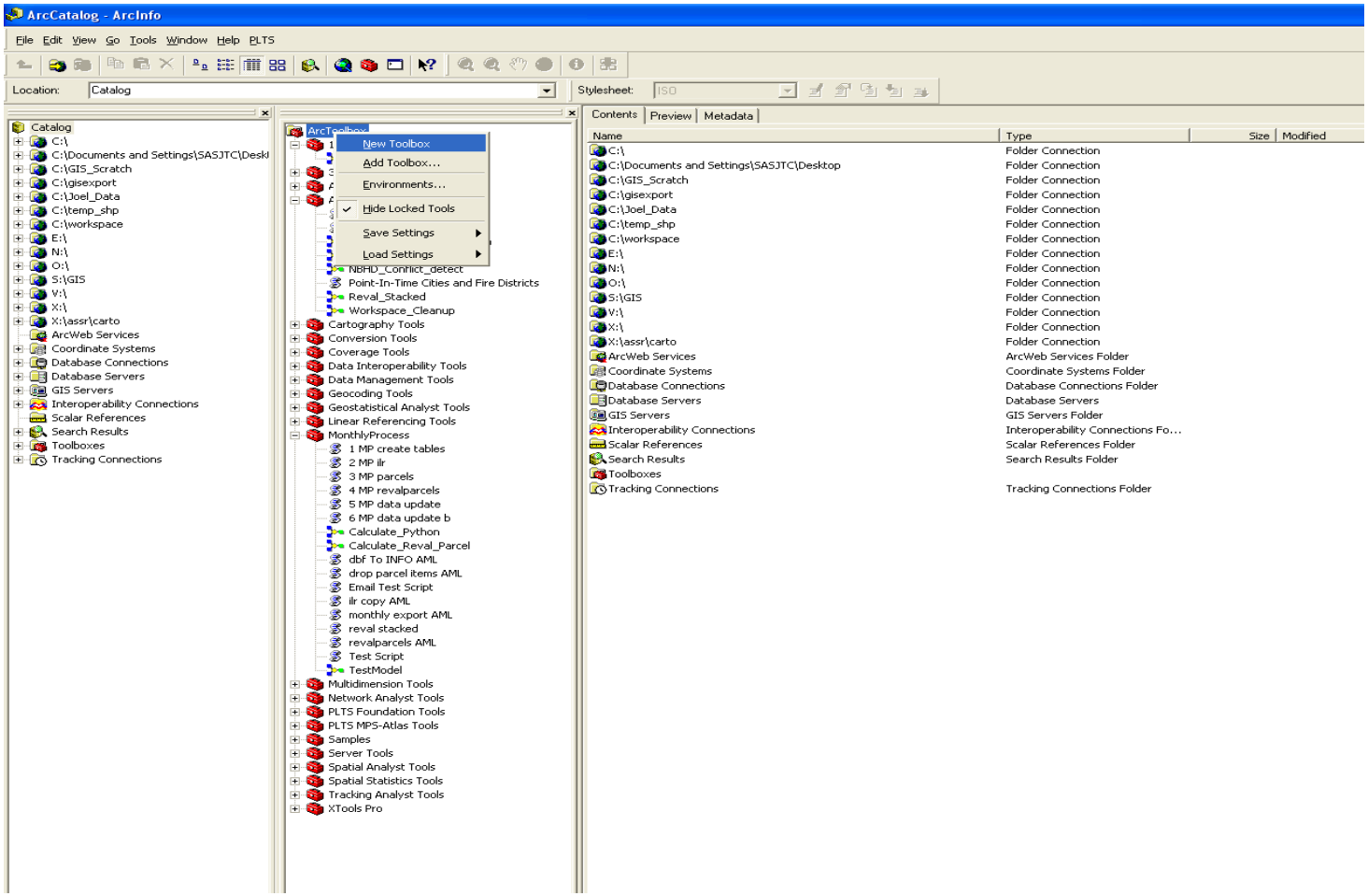
  - Clip parcels to pilot area extent with Python
  - Clip additional feature classes to pilot area extent.

  ArcToolbox

  - Create a script tool from a Python script.

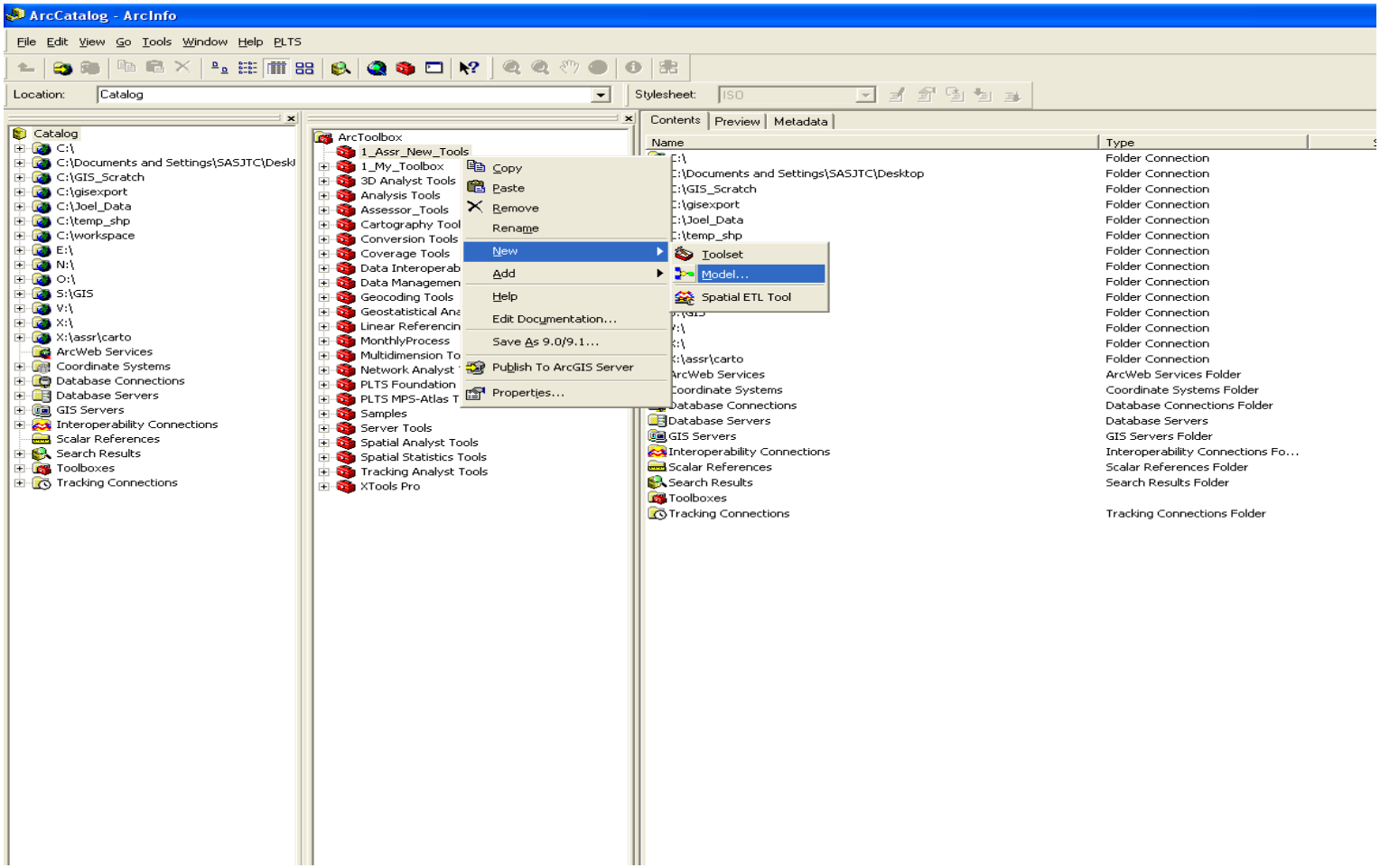
Getting Started: Modelbuilder

Open ArcCatalog and create a new toolbox to store your model



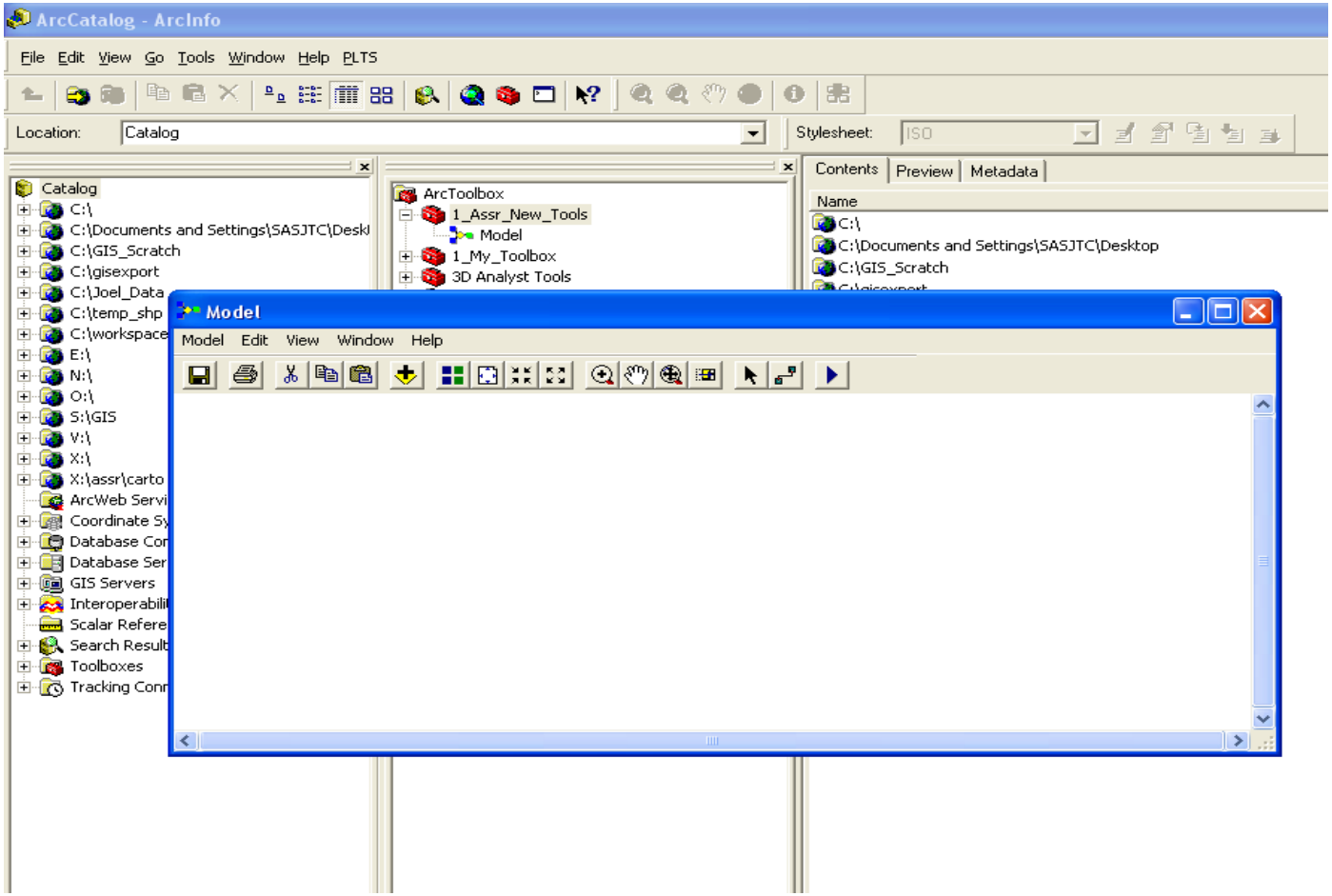
ArcToolbox

Add a new model to your toolbox



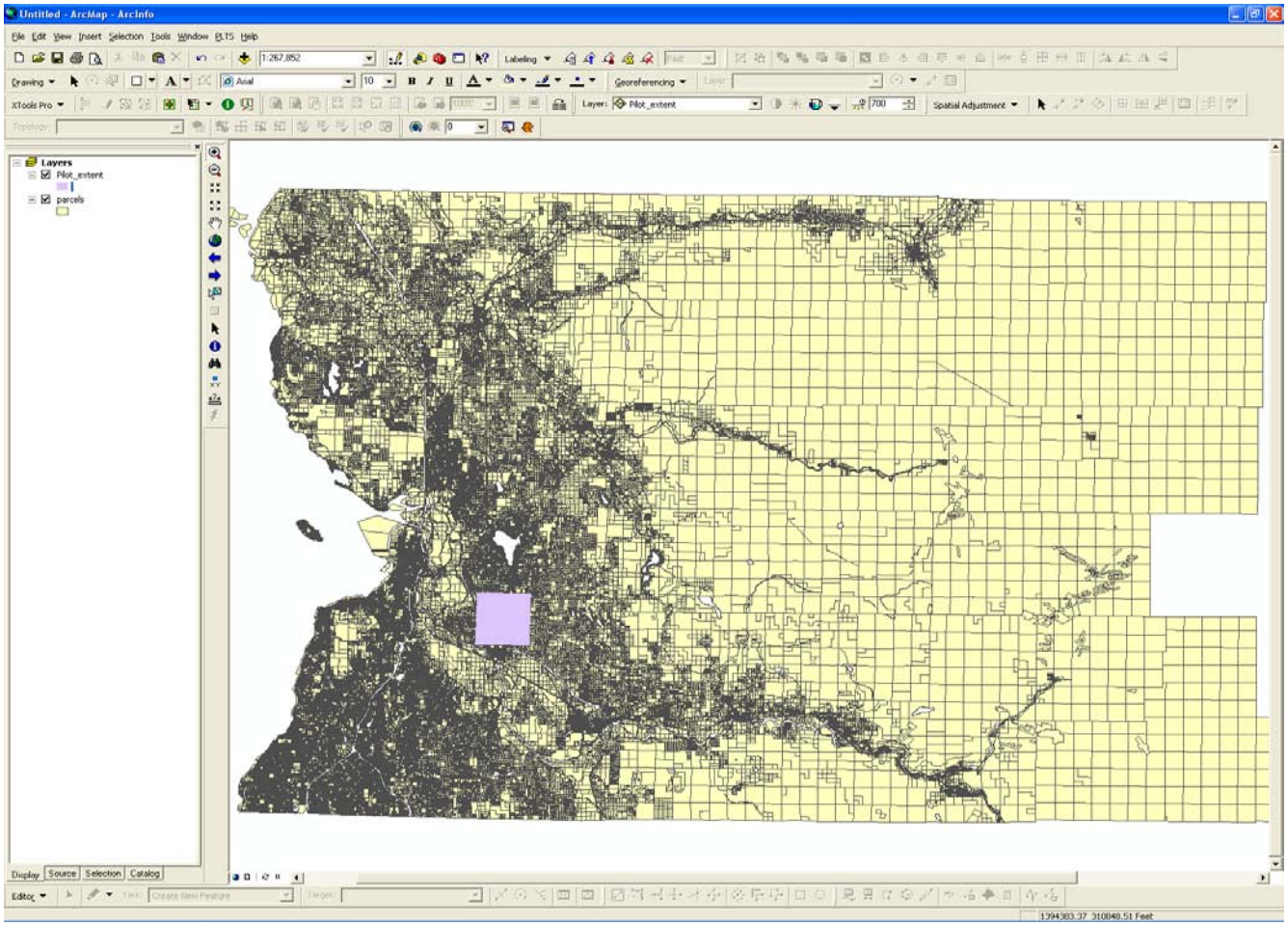
Modelbuilder Approach

The Modelbuilder window



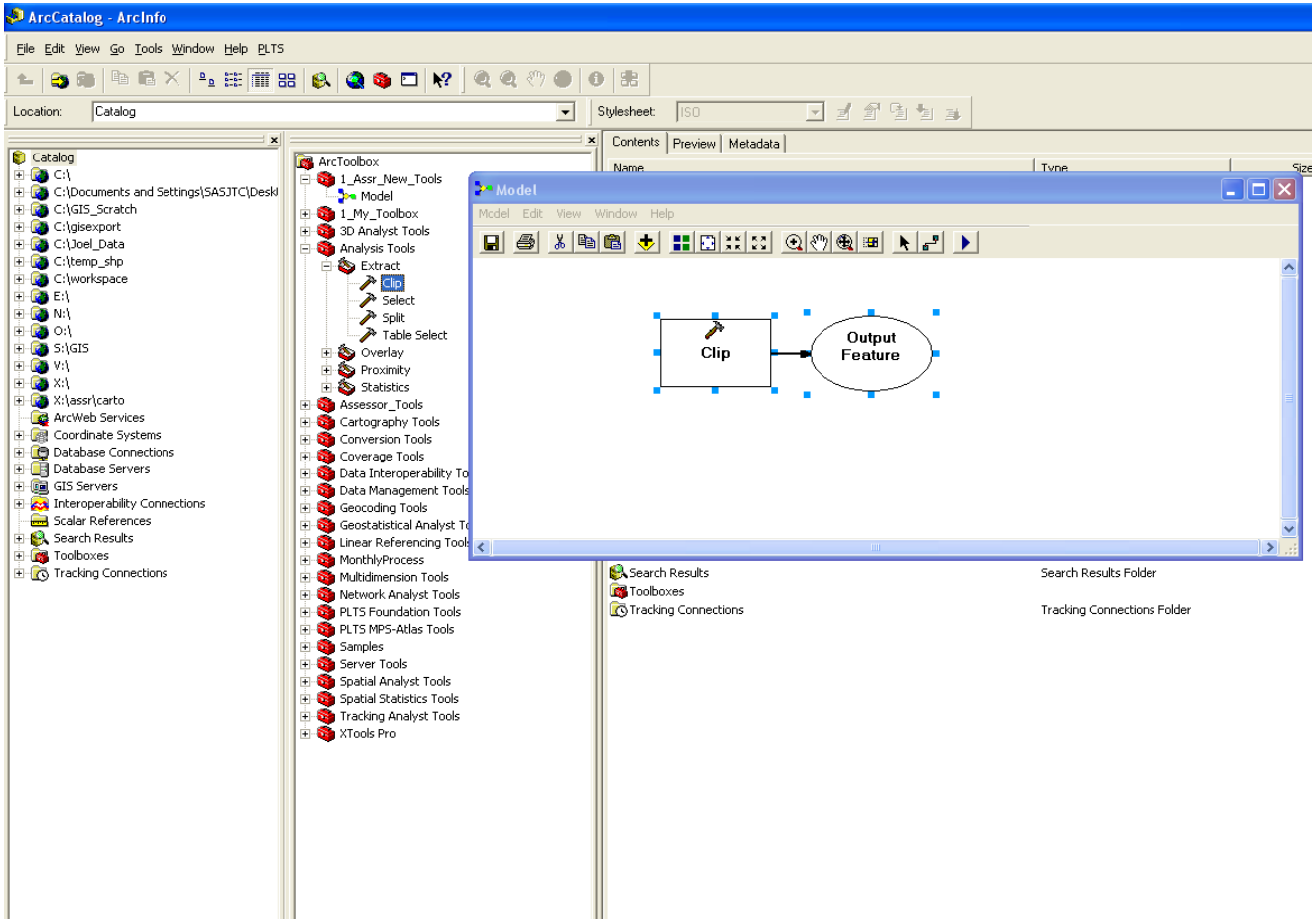
Features

Parcels to be clipped by pilot study extent



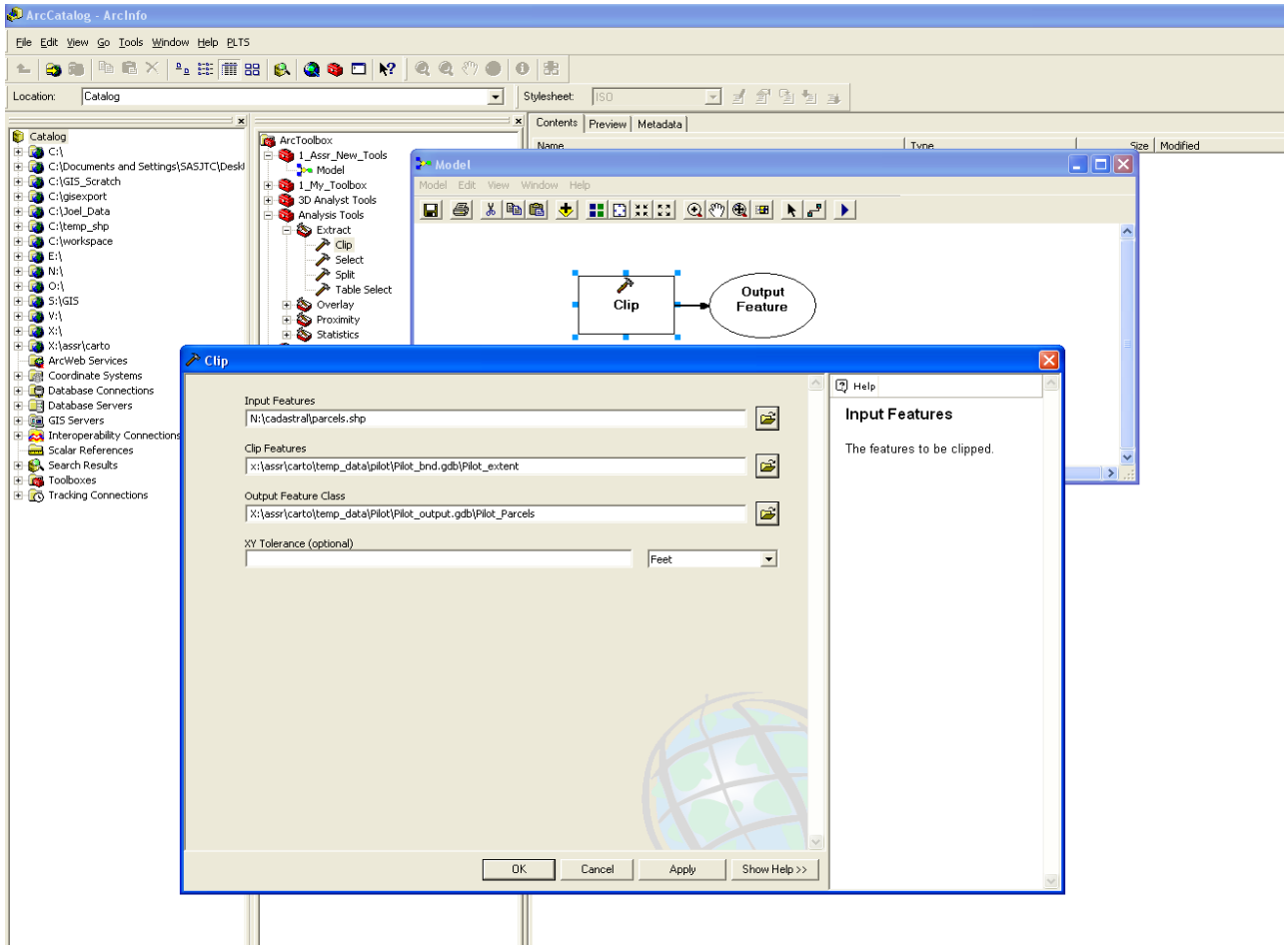
Clip Tool

Drag a tool from toolbox to the Modelbuilder workspace



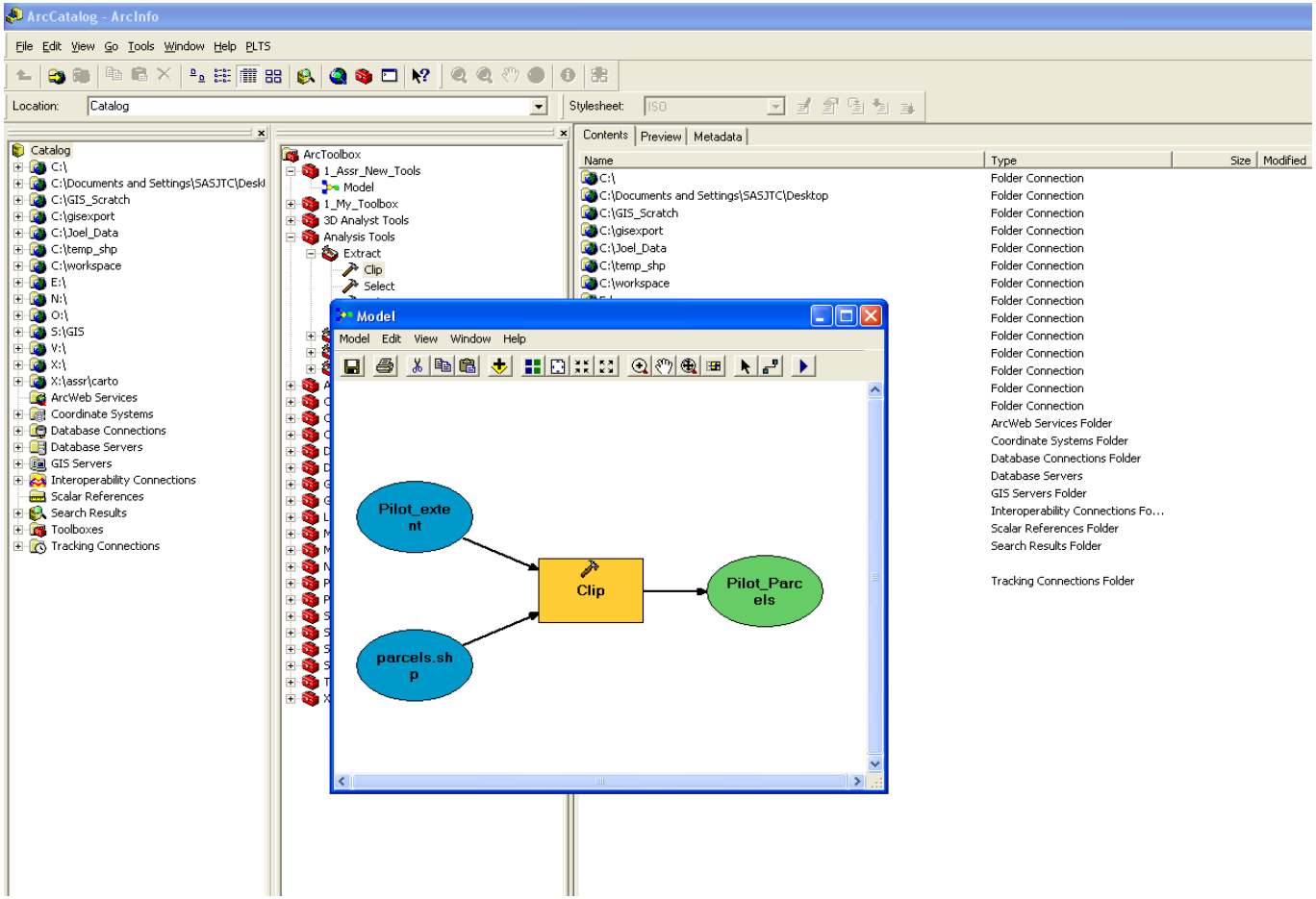
Clip Parameters

Double click on the tool to bring up the parameter dialog



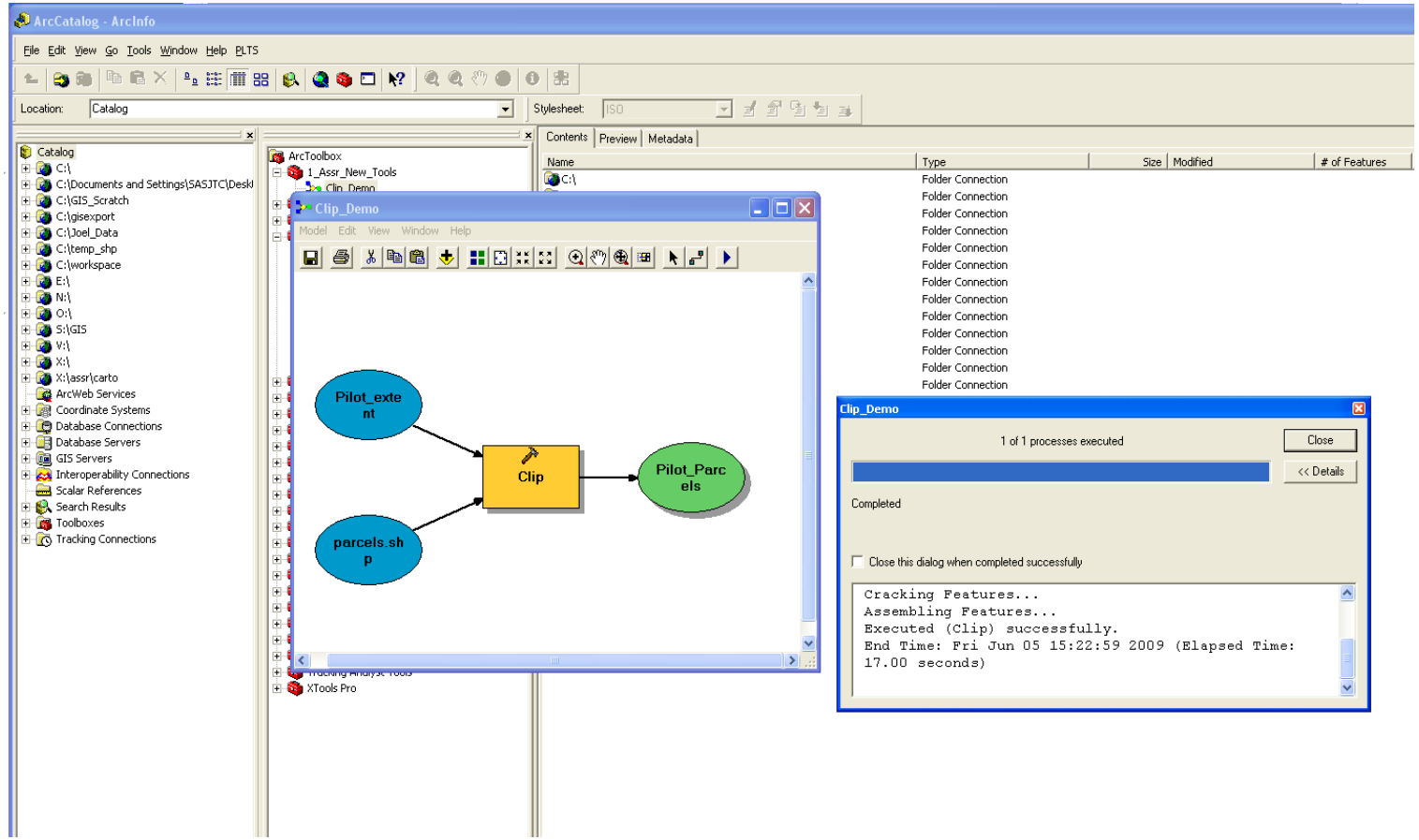
Clip Model

The completed model



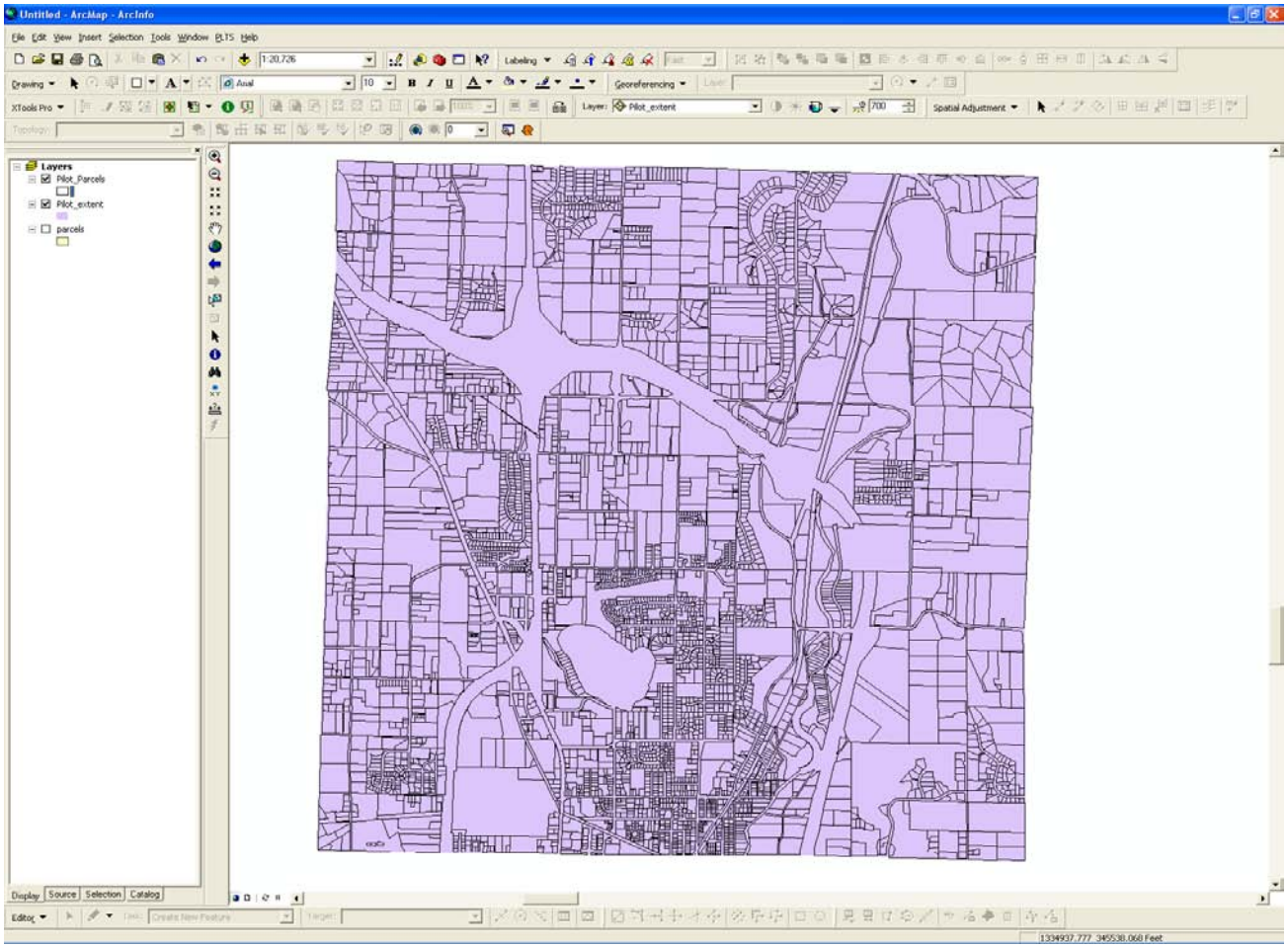
Clip Model Successful

3D shading indicates that a component of the model ran successfully



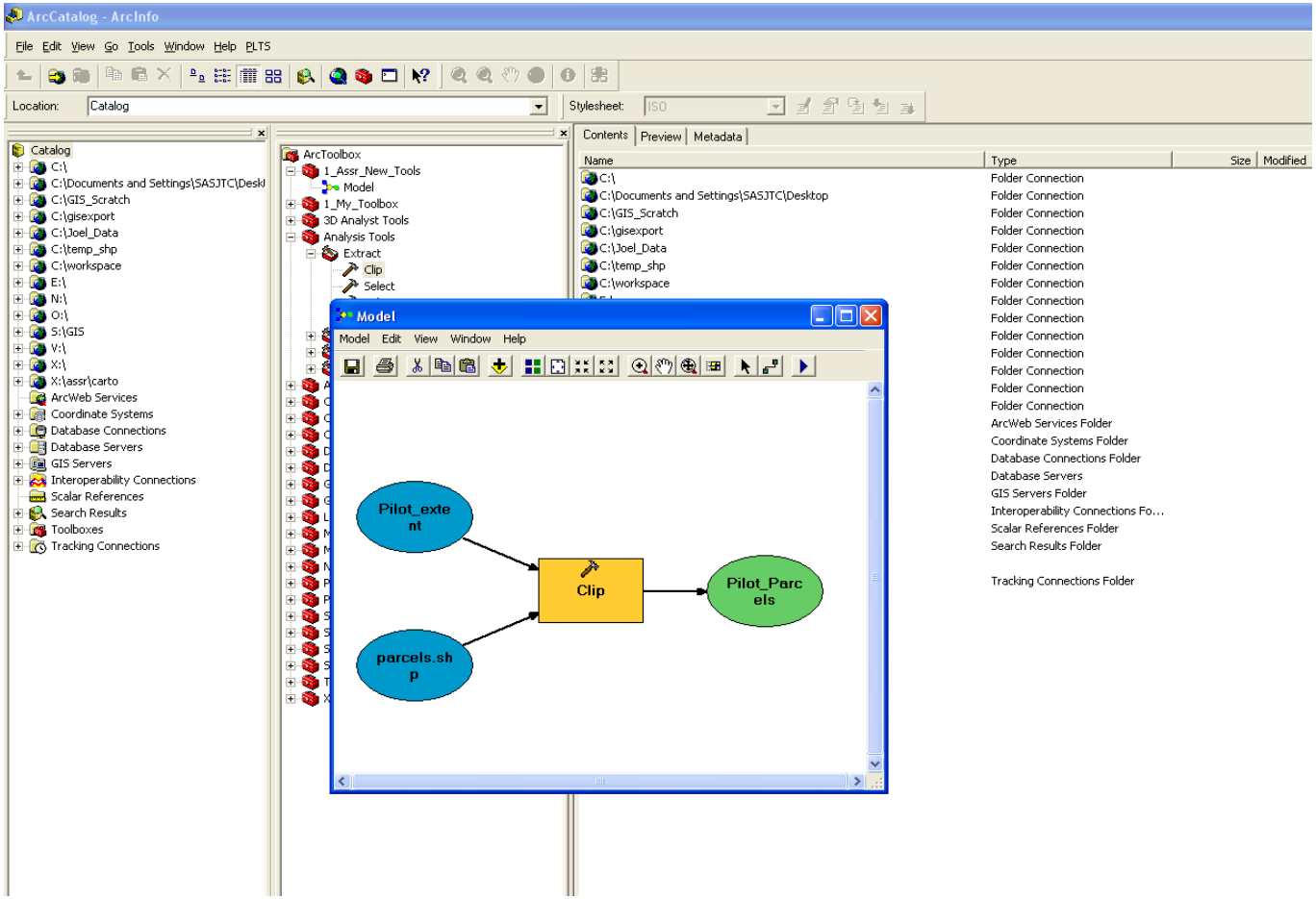
Clip Result

The new clipped parcel dataset



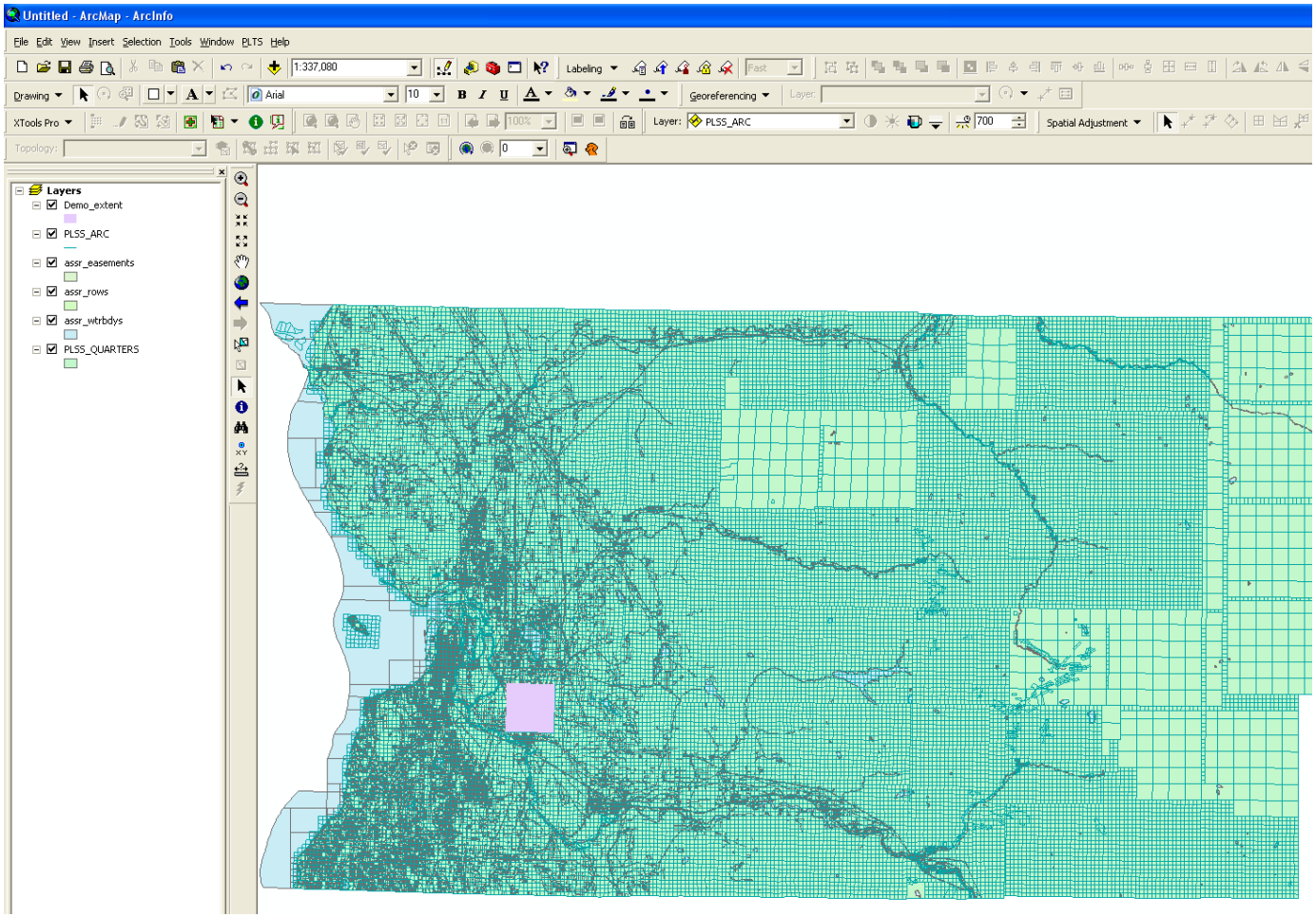
Clip Model

Single clip



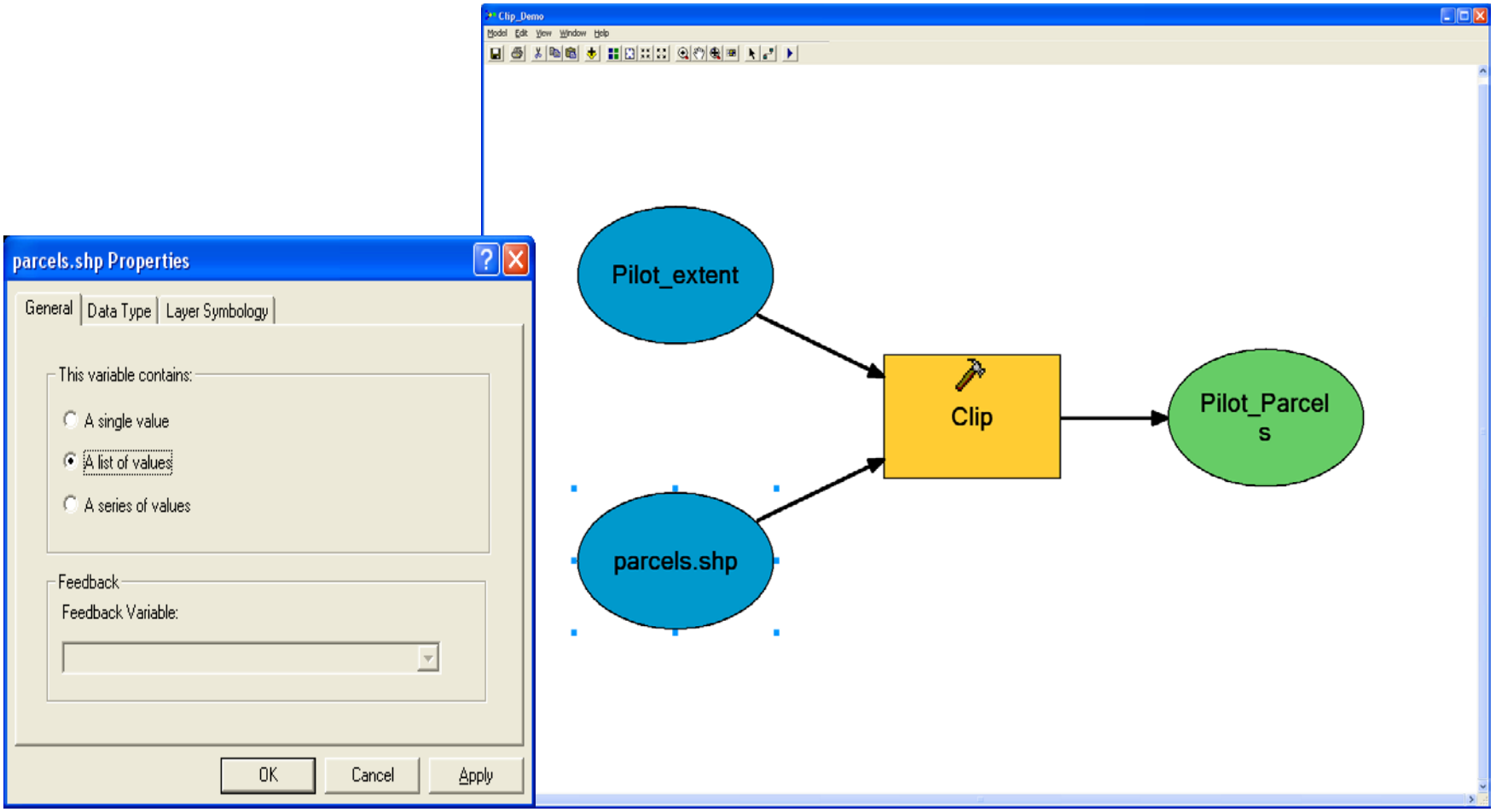
Features

The feature classes to be clipped



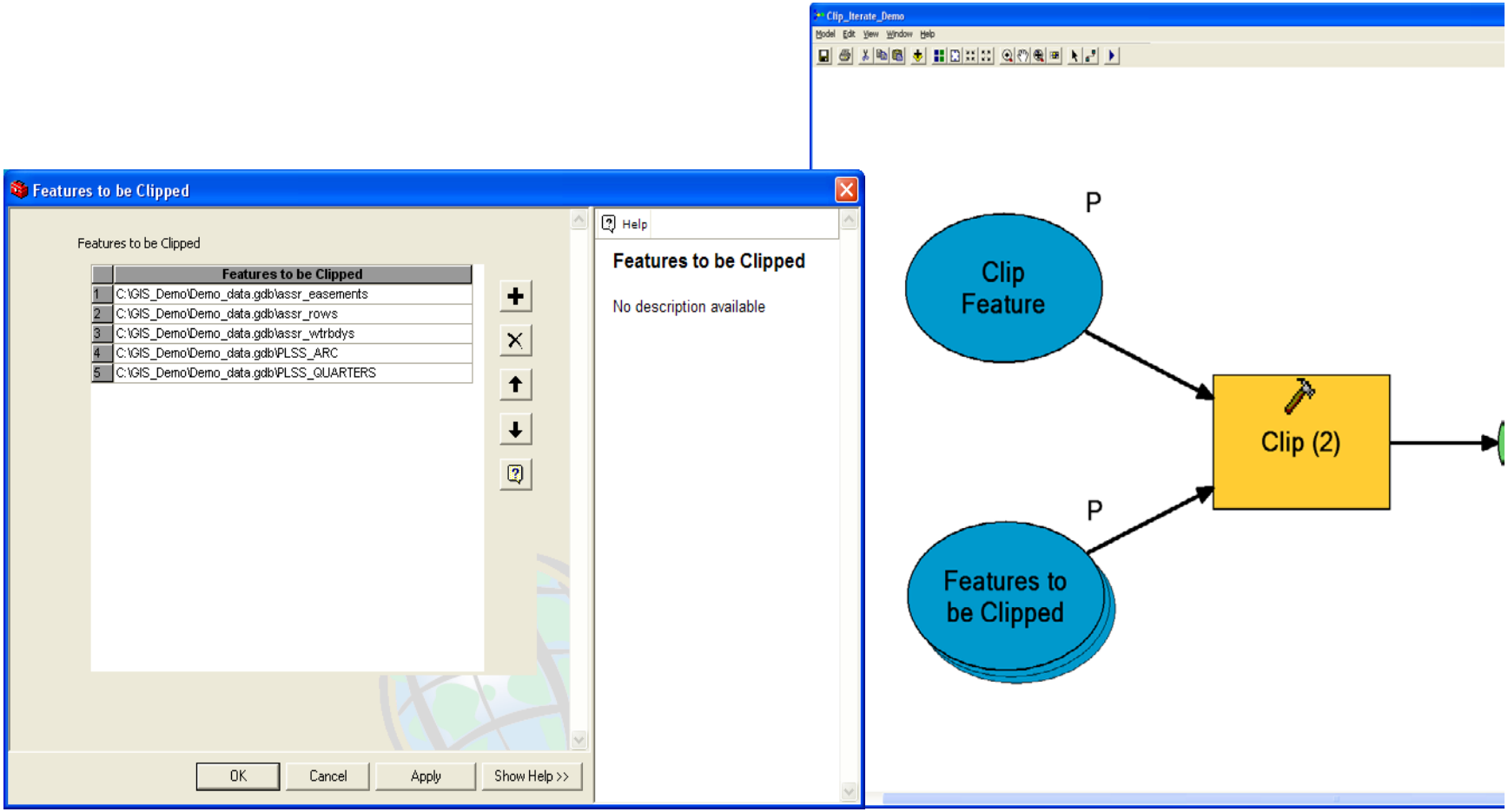
Multi Clip

Open the input data properties, select the list option



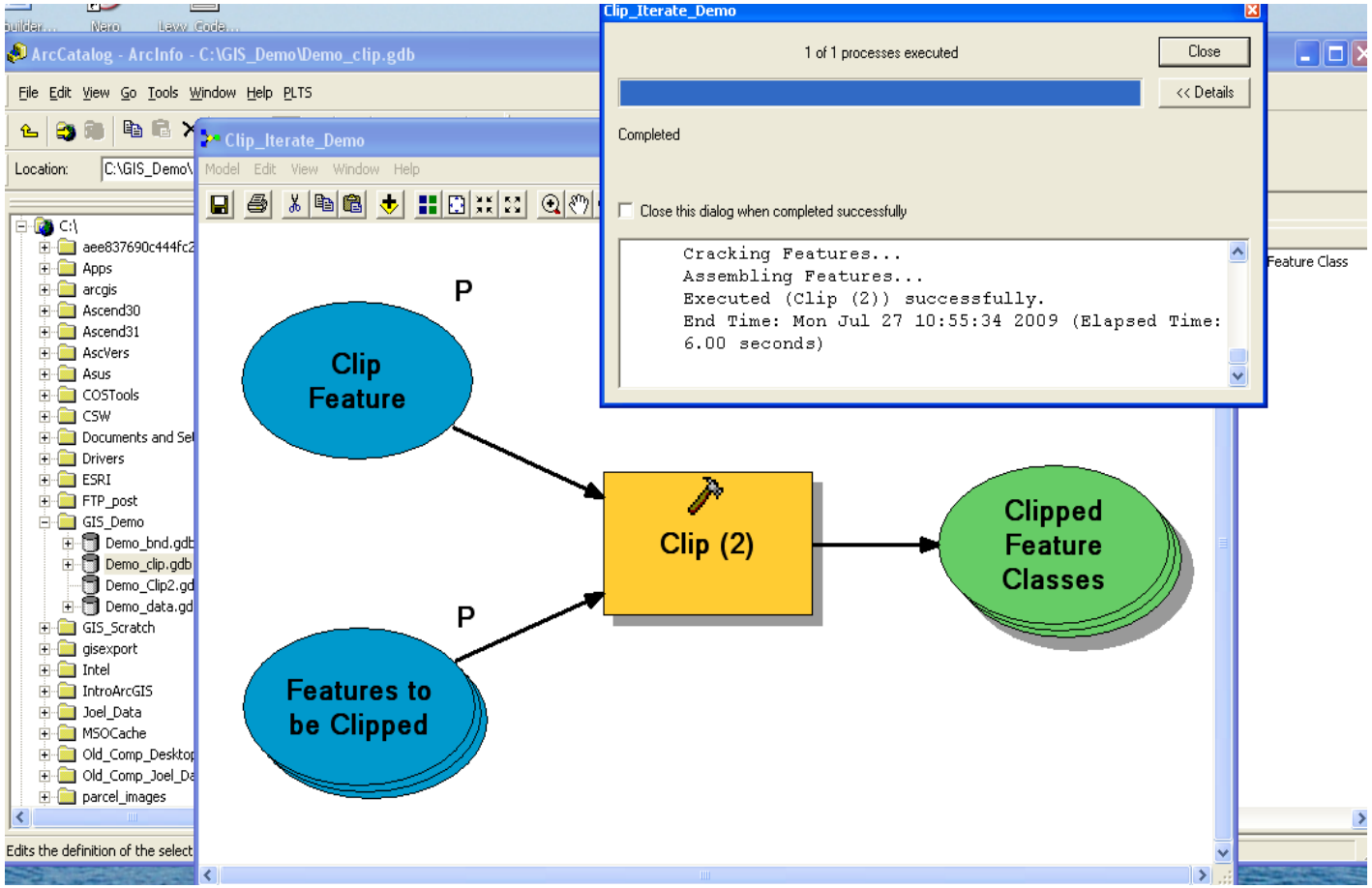
Clip Iteration

Add multiple feature classes to be clipped



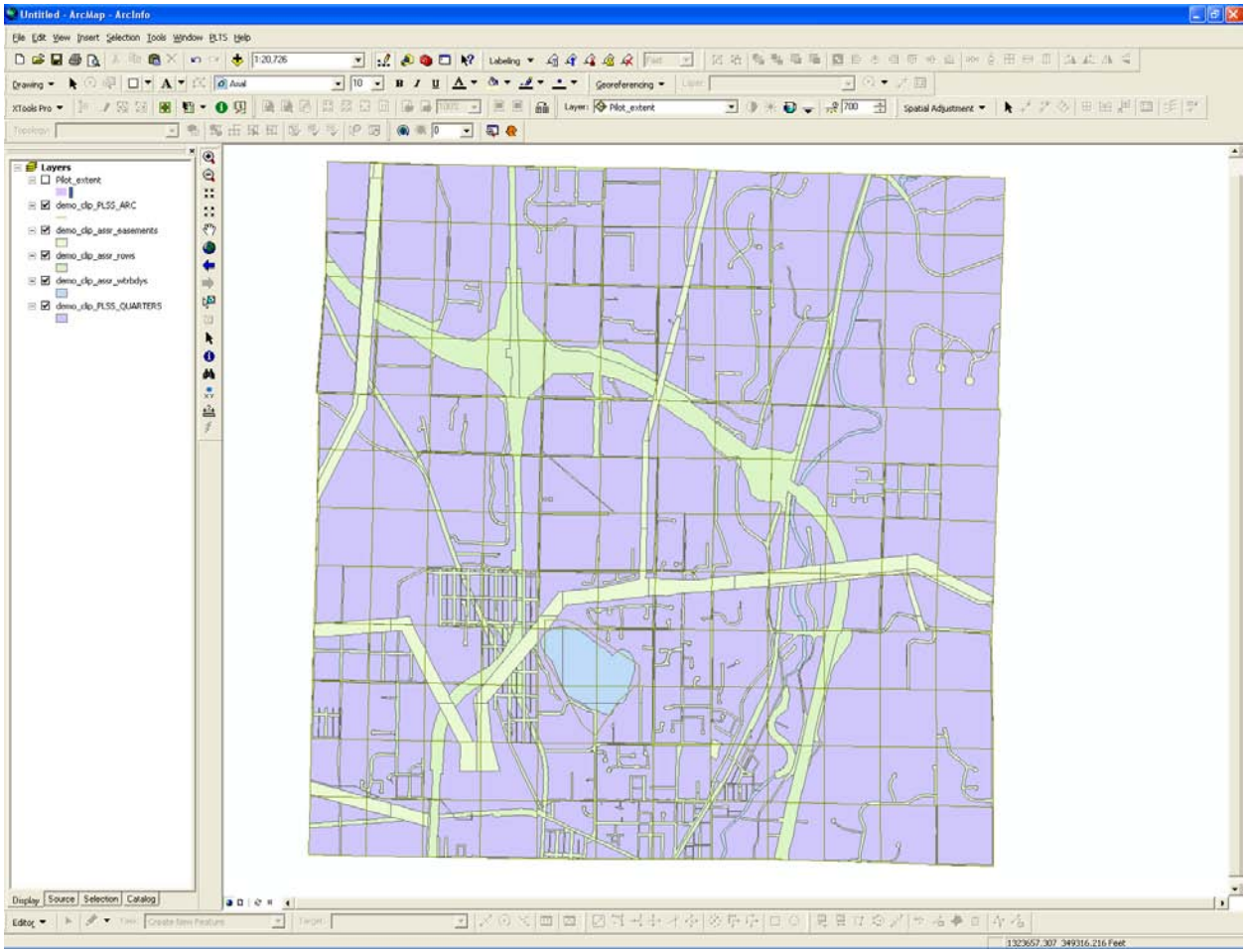
Multi Clip Complete

Clip iteration successful



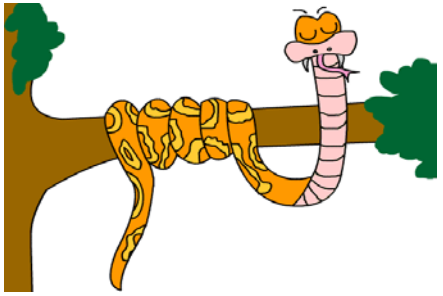
Results

Verify the results



Modelbuilder Demo

Python?



What is it?

An open-source object-oriented, scripting language.

Why use it?

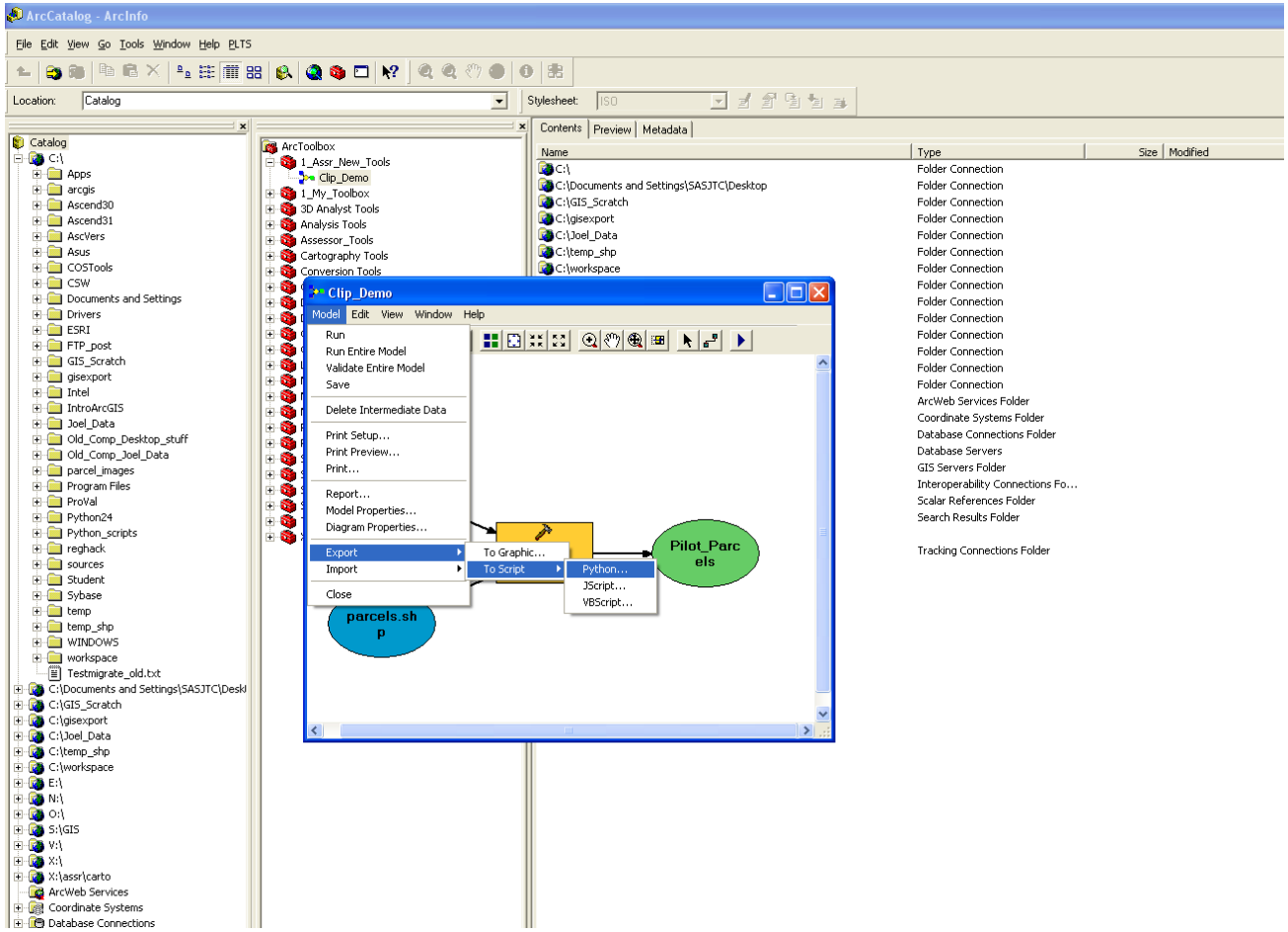
- It is free and comes bundled with ArcGIS.
- Most sample scripts and help documentation are written in Python.
- Modelbuilder models can be easily exported as Python scripts.
- It has an integrated development environment with debugging tools.

Where can I get further information?

- www.python.org (official website)
- ArcGIS Desktop Help

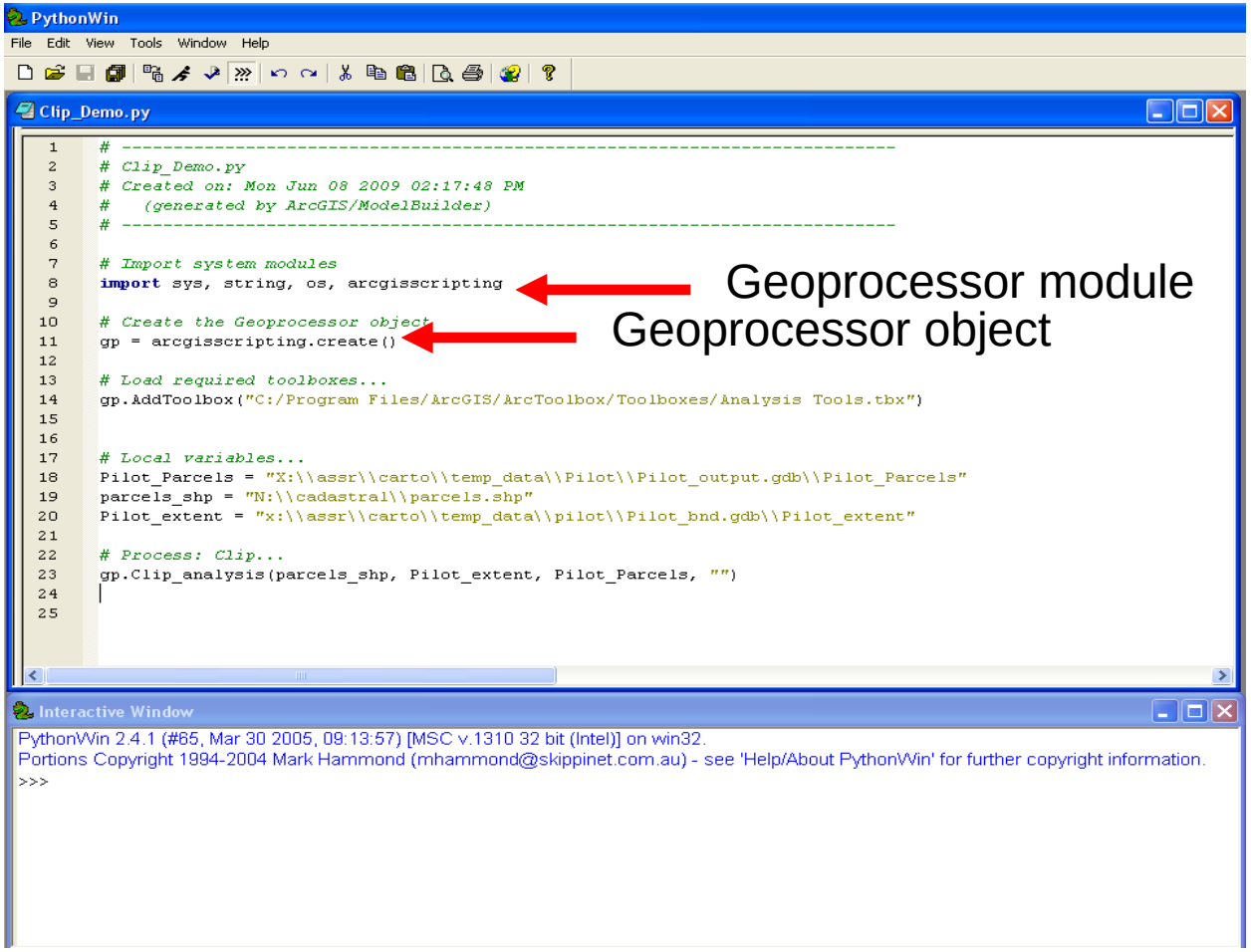
Python Approach

Export the single clip model to a python script



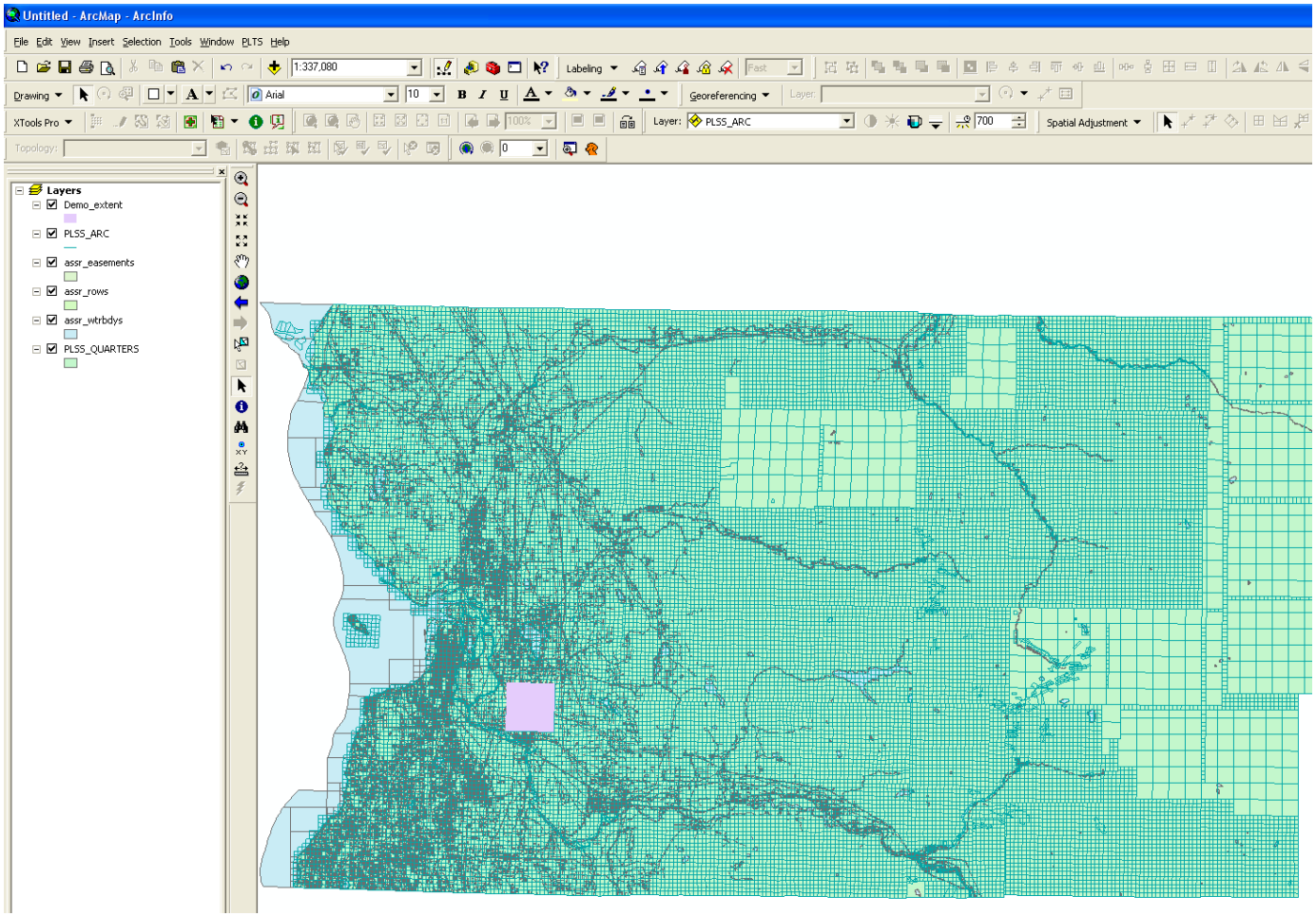
Getting Started: Python

Open the script in PythonWin or IDLE



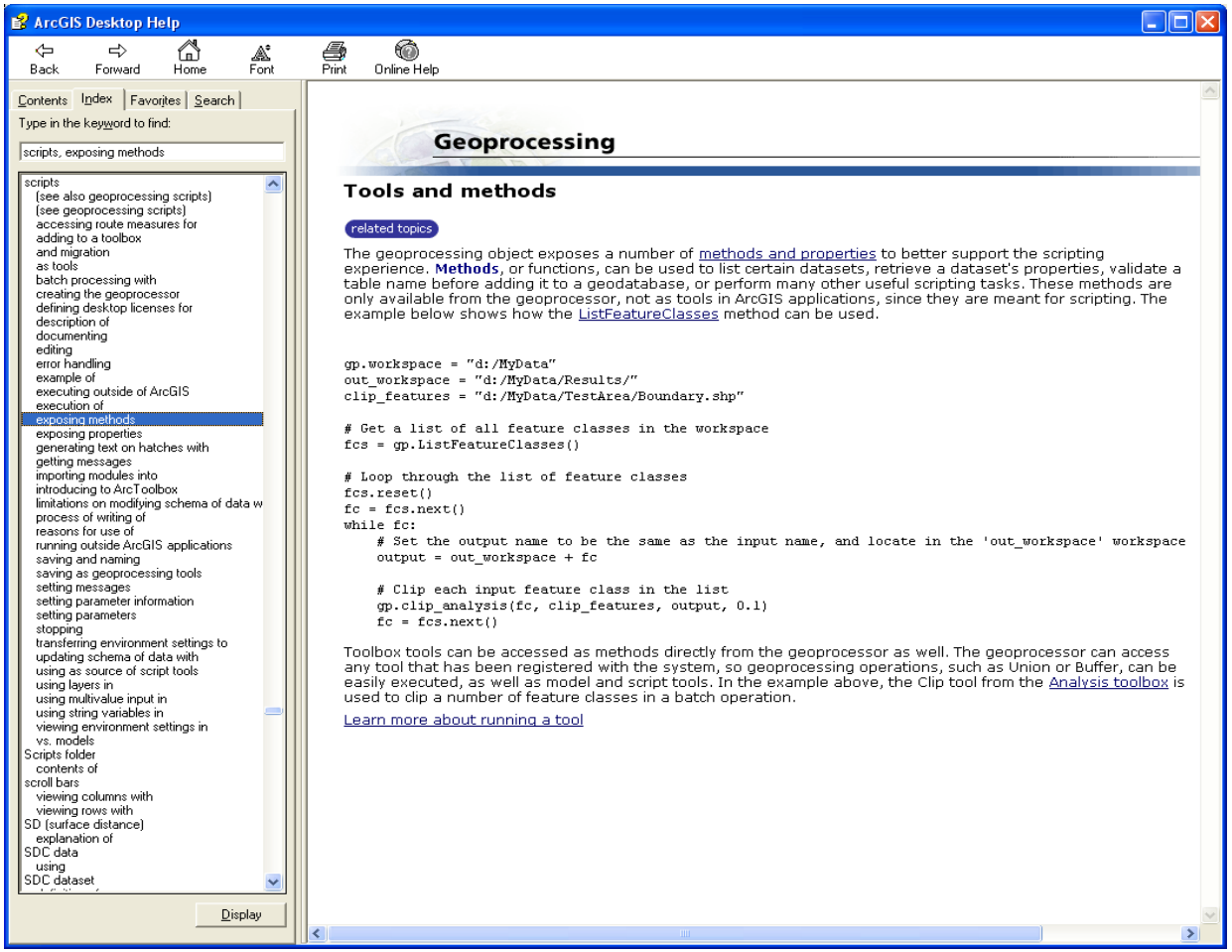
Features

The feature classes to be clipped



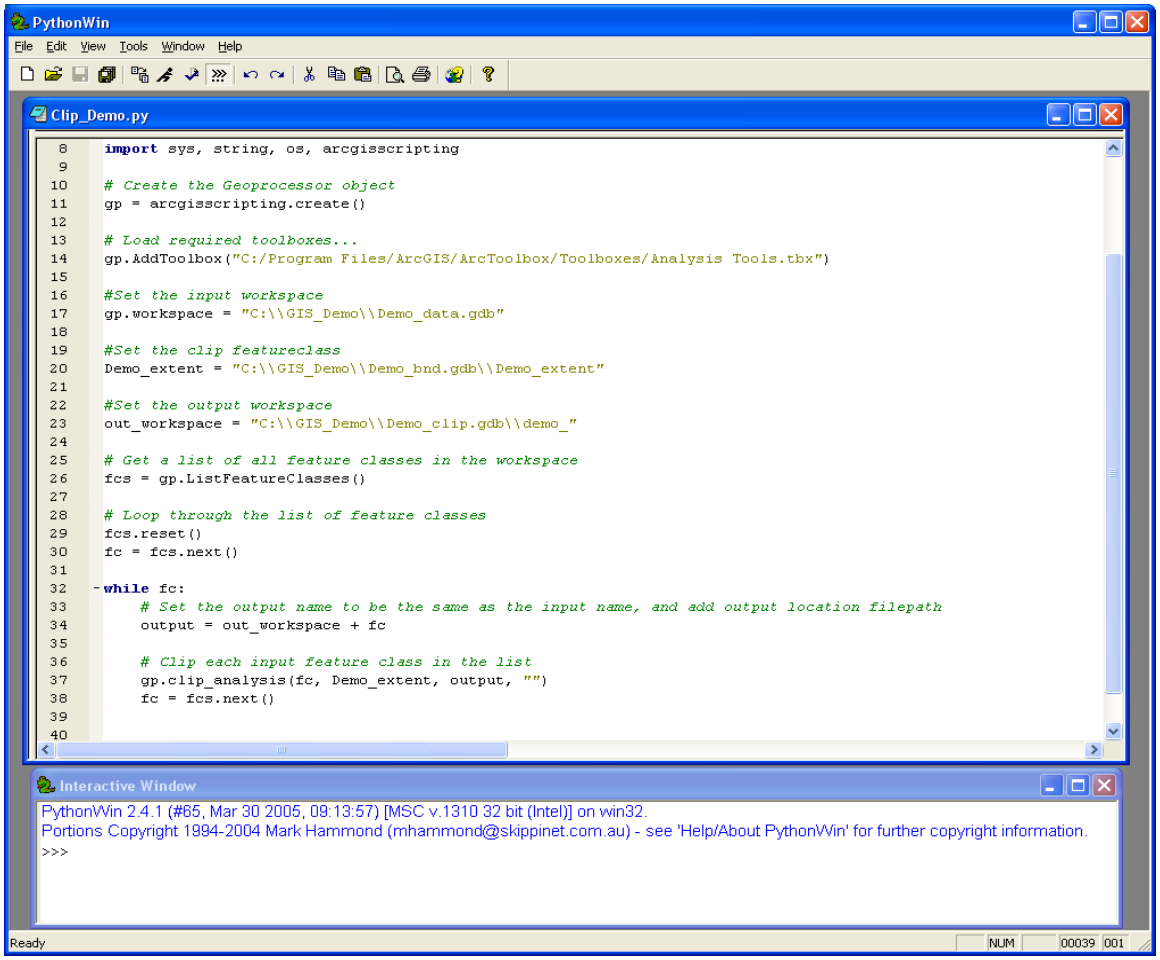
ArcGIS Help

Clip multiple feature classes



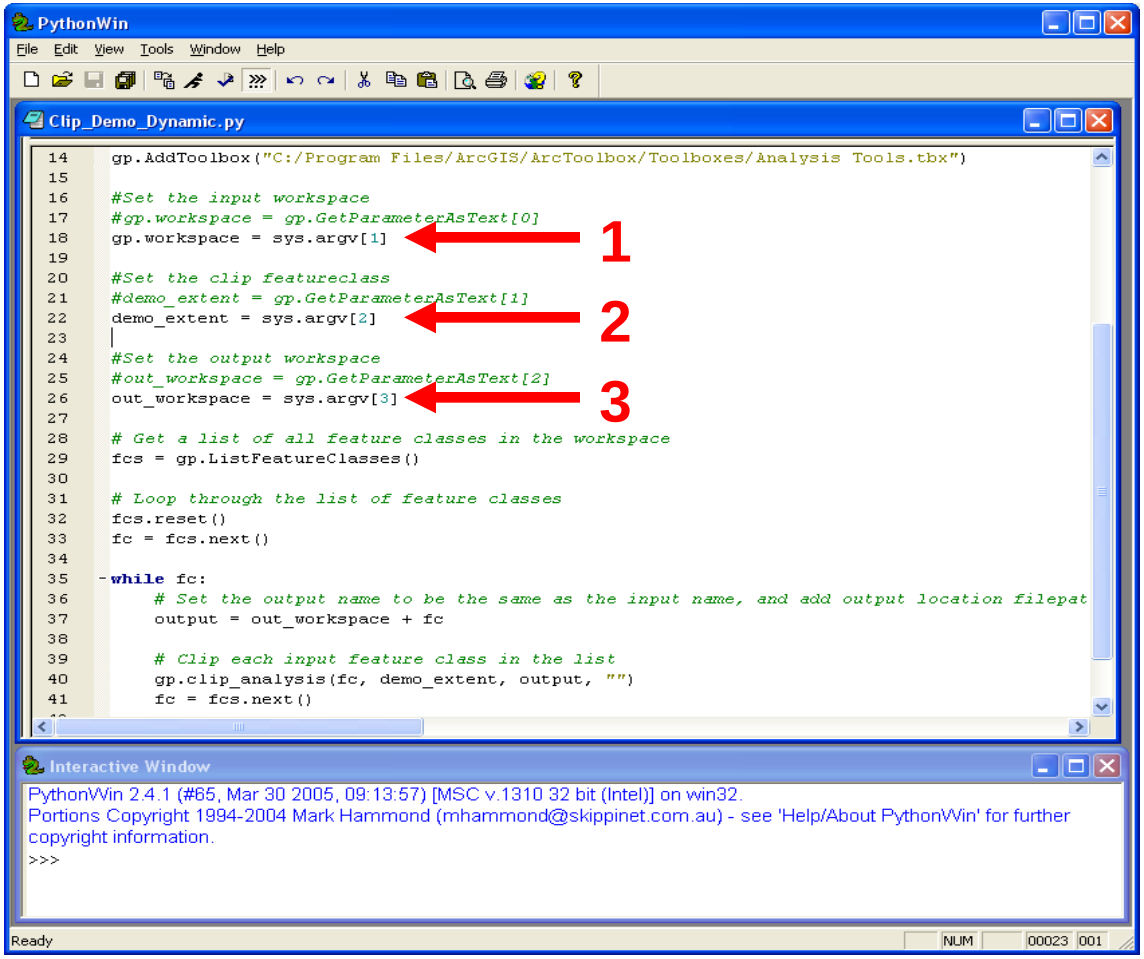
Enhanced Script

Loop through feature classes



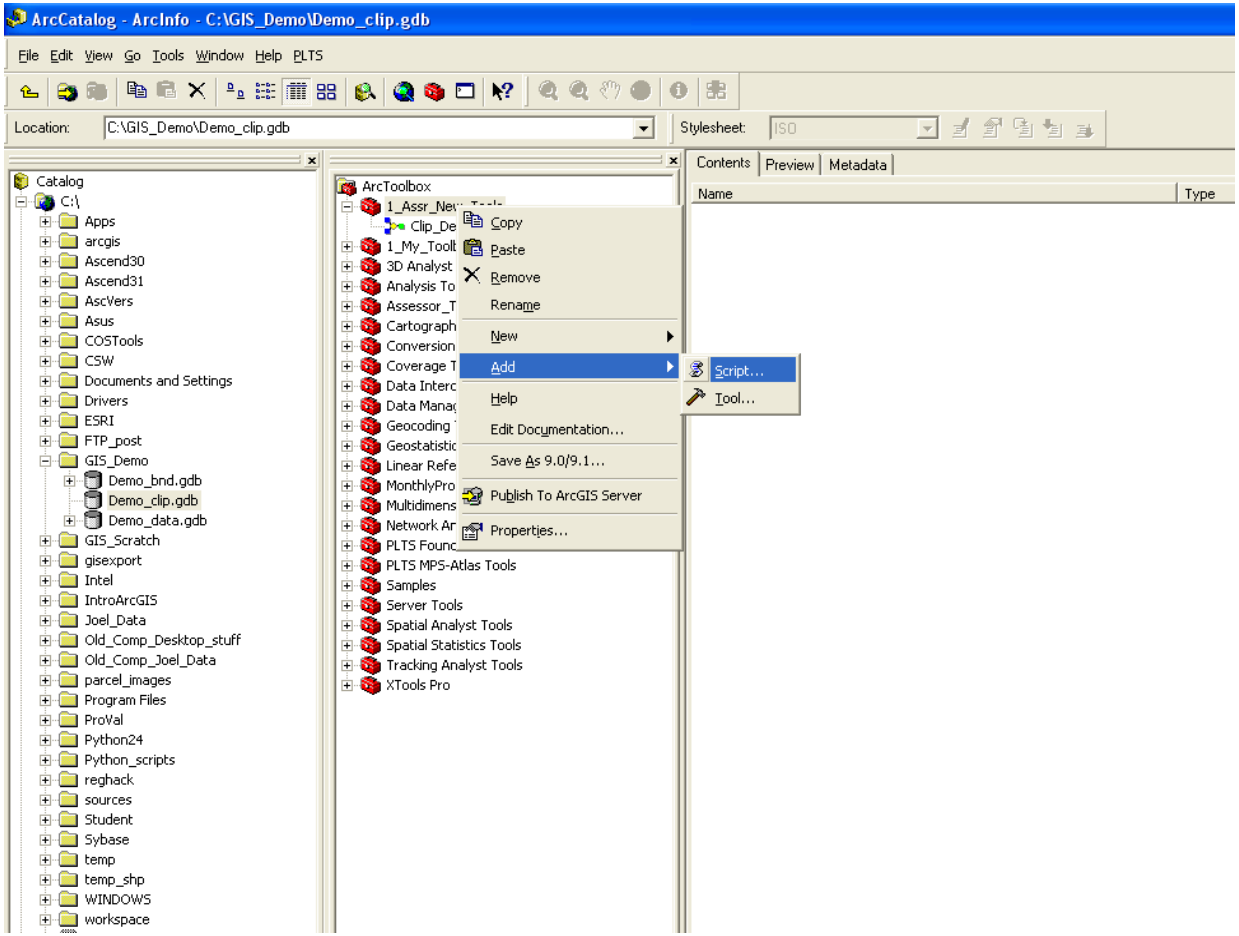
Dynamic Scripts

Use arguments to make your scripts dynamic



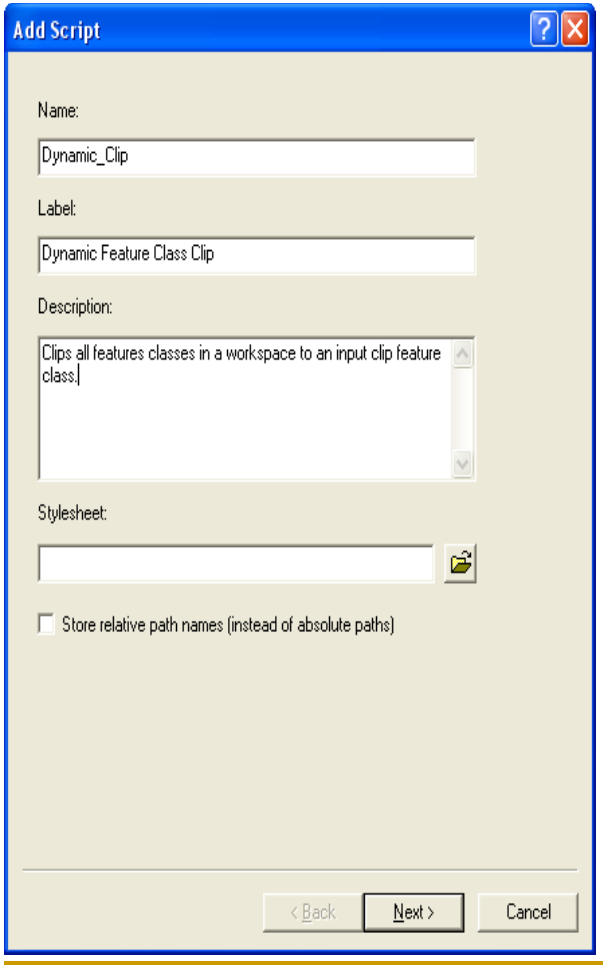
Creating a script tool from a script

Add the script to your new toolbox

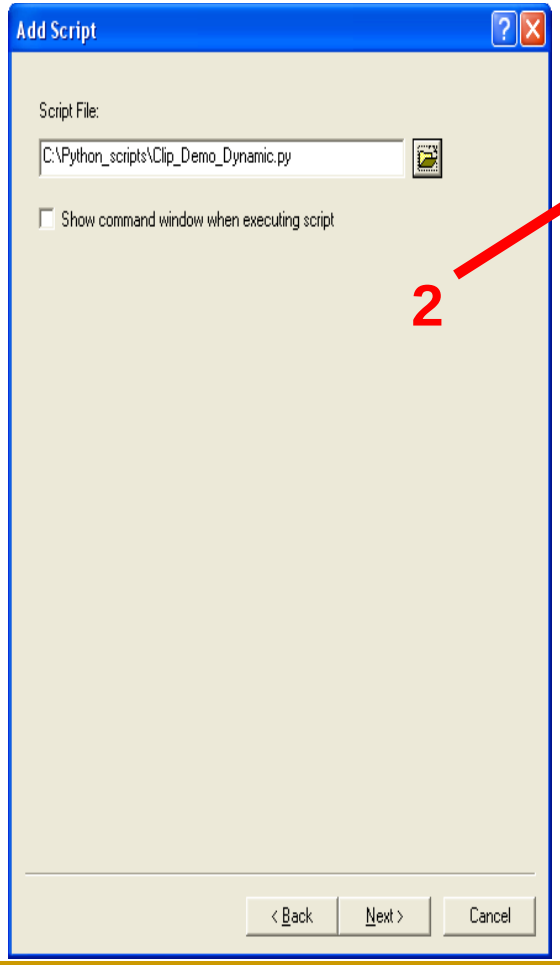


Add Script

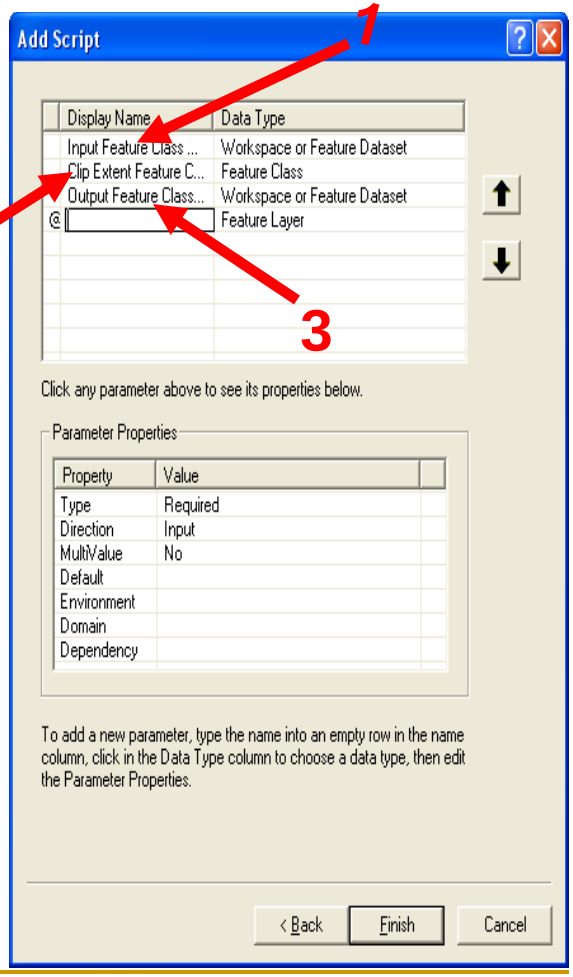
Set up the new tool



Associate your script

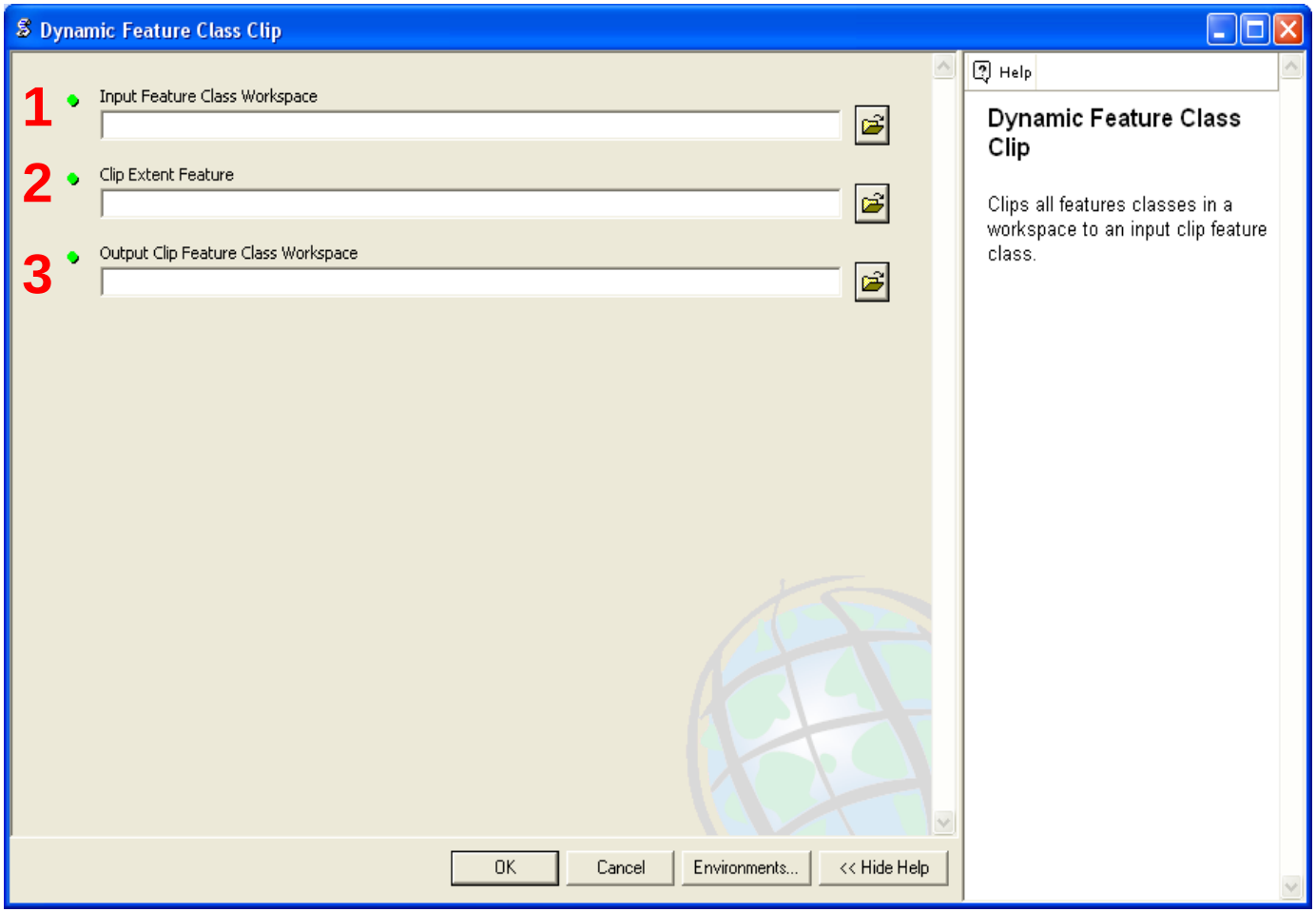


Set up your arguments



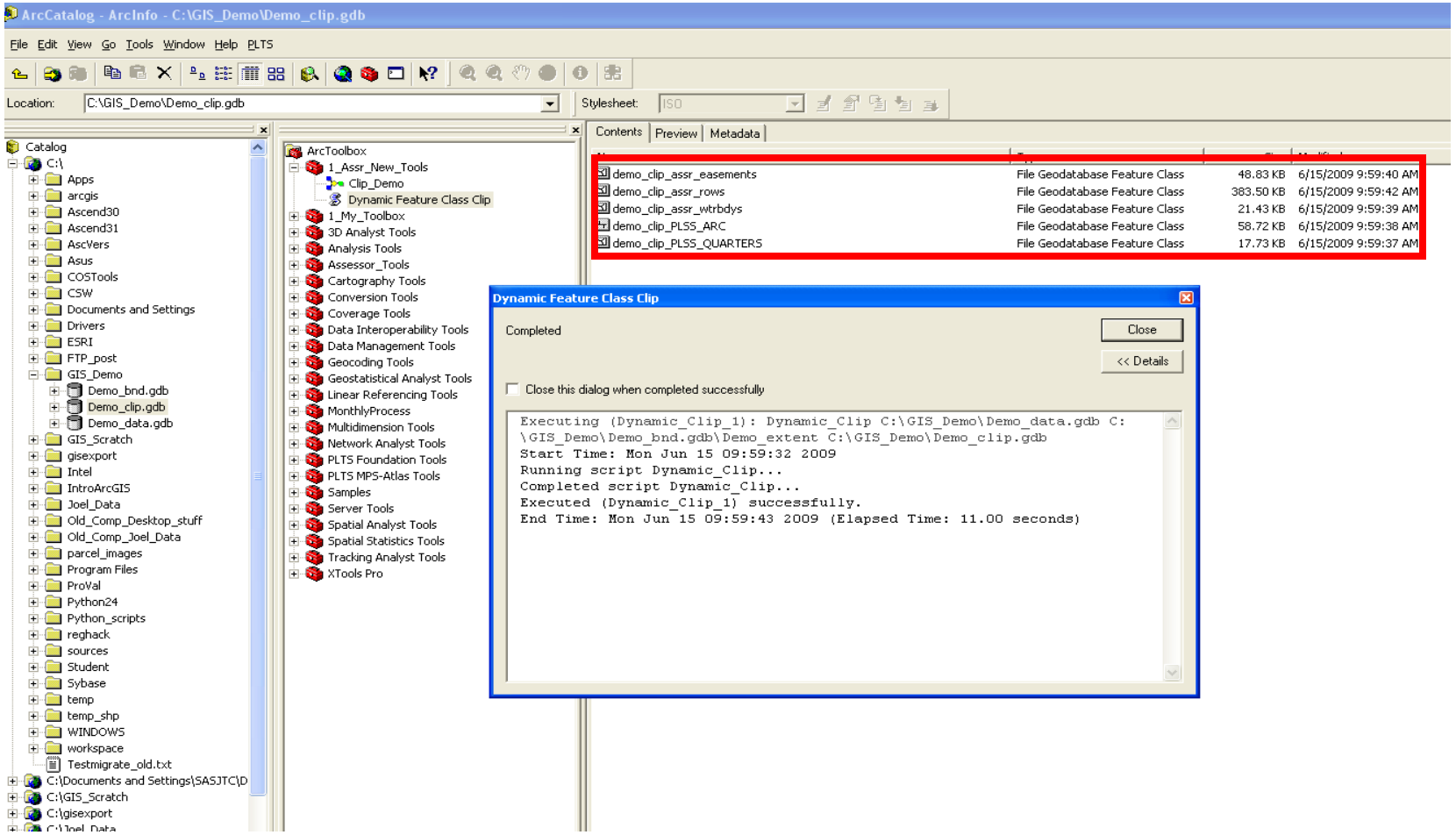
Custom Script Tool

The clip tool parameter dialog



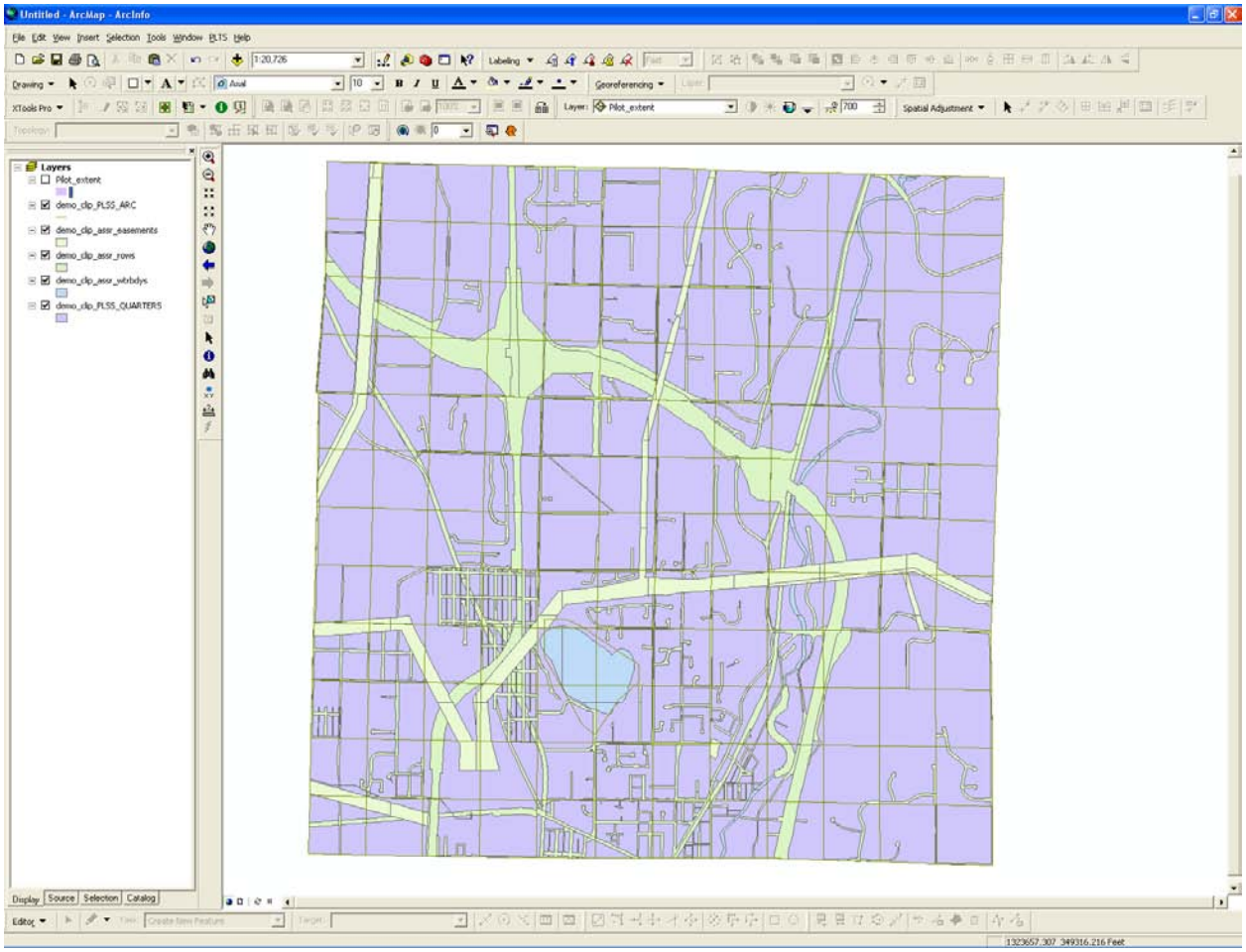
Script Tool Complete

New clipped feature classes in the red box



Results

Verify the results



Python Demo