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# Introduction to Model Builder

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Version 1.3

# Seminar Content

## 1 – Model Builder Basics

What the heck is Model Builder anyway?

## 2 – Geoprocessing Tools

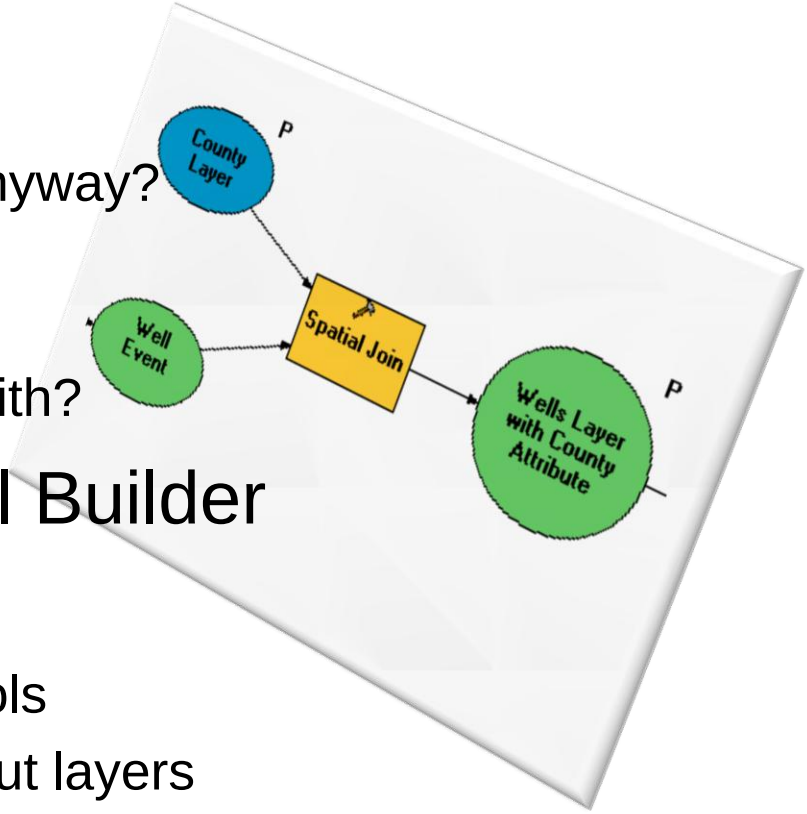
What tools do you have to work with?

## 3 – Getting Started with Model Builder

-Creating a model

-Adding tools and inputs to the tools

-Setting display properties of output layers



# What the heck is Model Builder anyway?

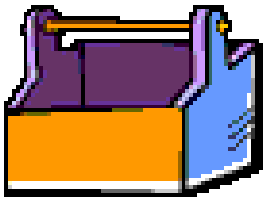
# What is Model Builder?

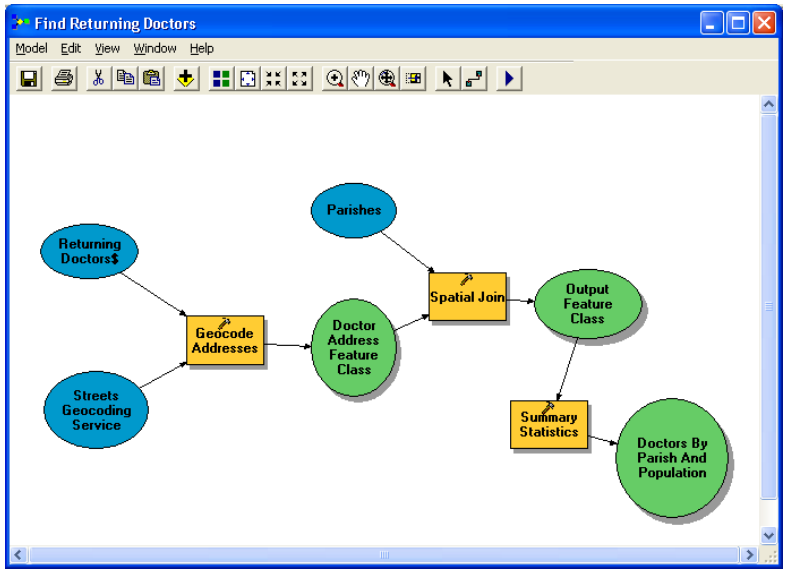
A way to create your own tools in ArcToolbox.

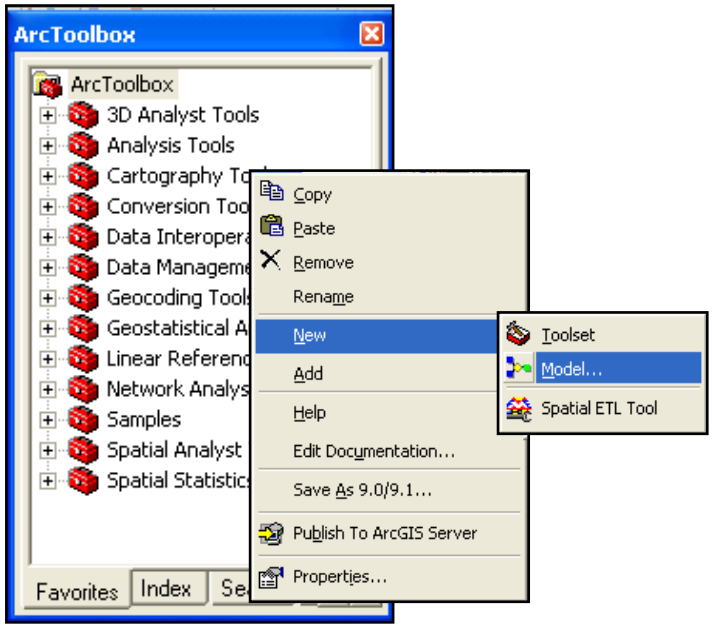
-automate tasks

-easily test alternate scenarios

-document work flows





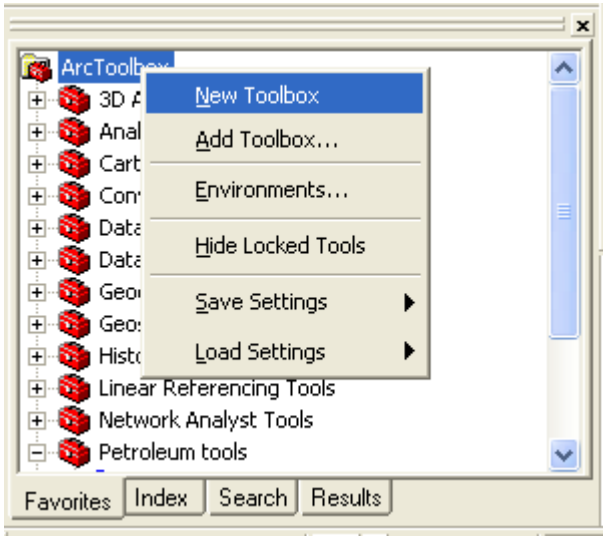
# The big easy button?

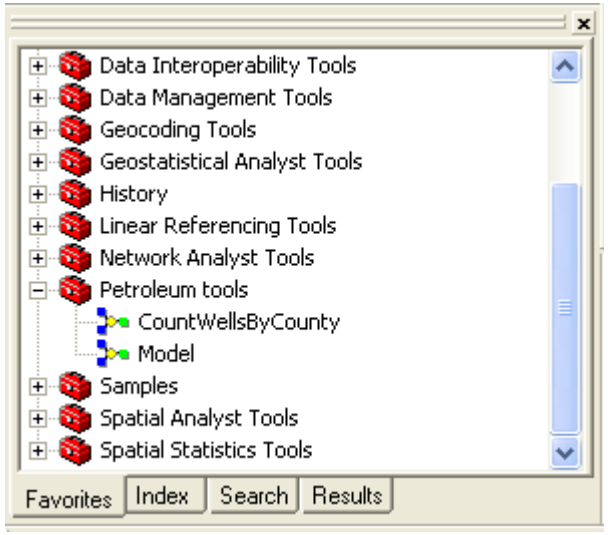
Uhmm…not exactly.

But you can make it look that way to your friends.

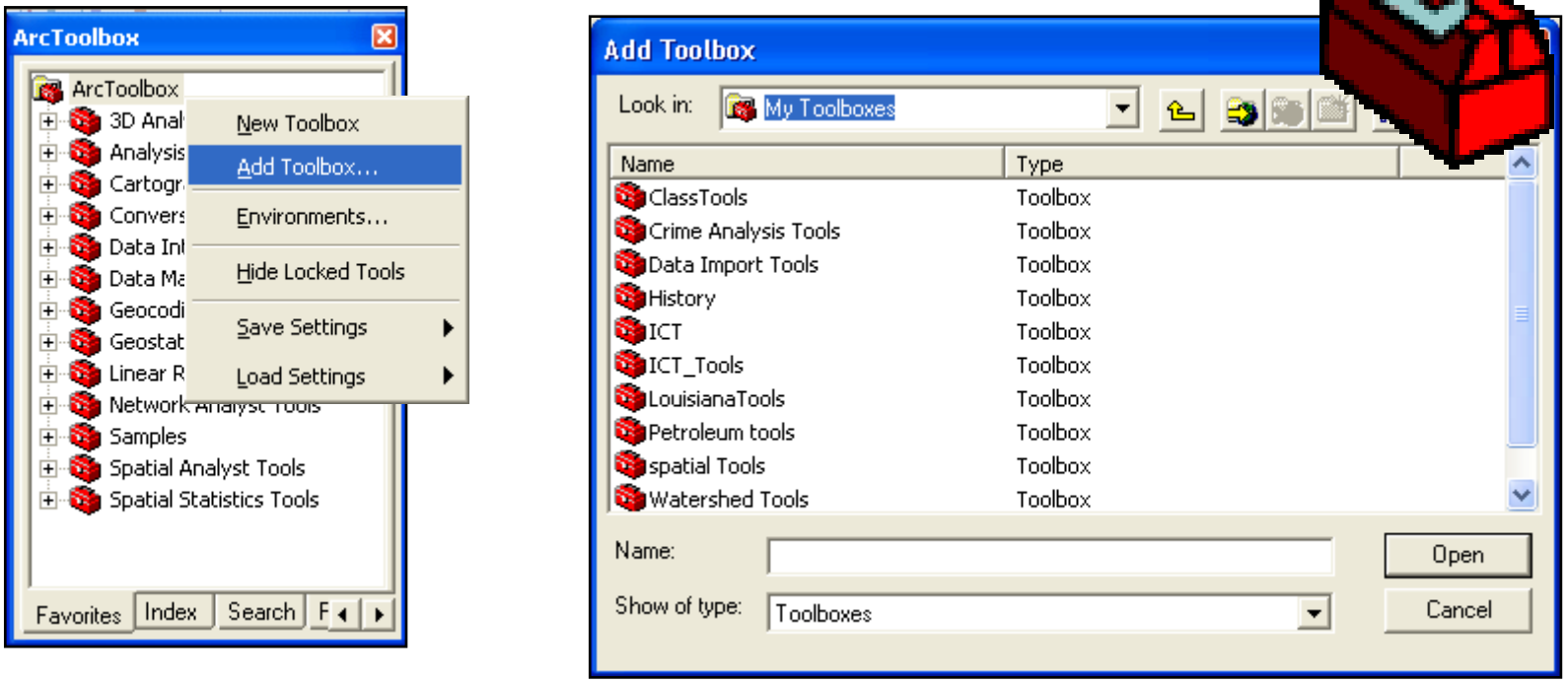
# What is Model Builder?

- Model Builder lets you create tools in ArcToolbox..
- First, you create a new toolbox. And then, you create a model in that toolbox.



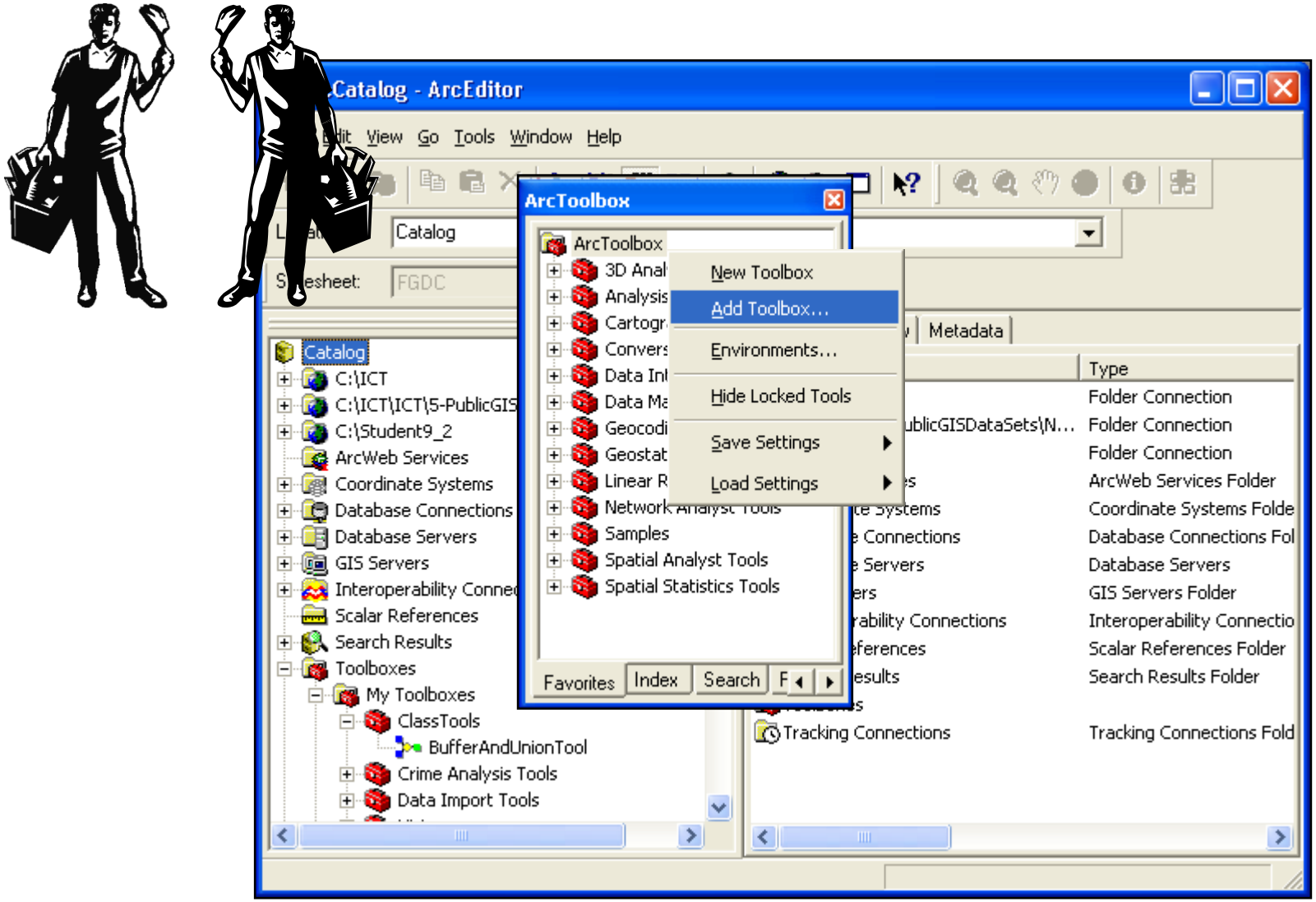



# Finding your toolboxes



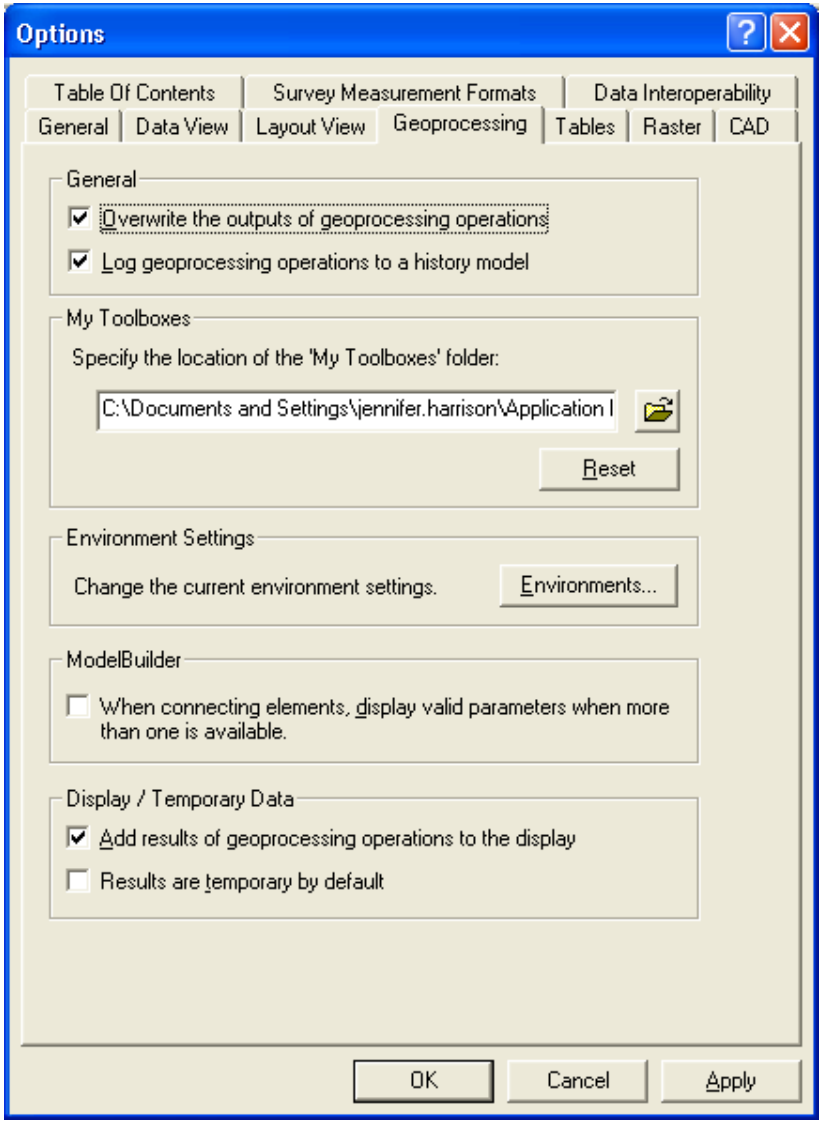

By default, your created tools (models and scripts) are stored in custom toolboxes that are maintained in .tbx files in the user profile: *Documents and Settings\<user profile>\Application Data\ESRI\ArcToolbox\My Toolboxes*.

# Sharing your toolboxes



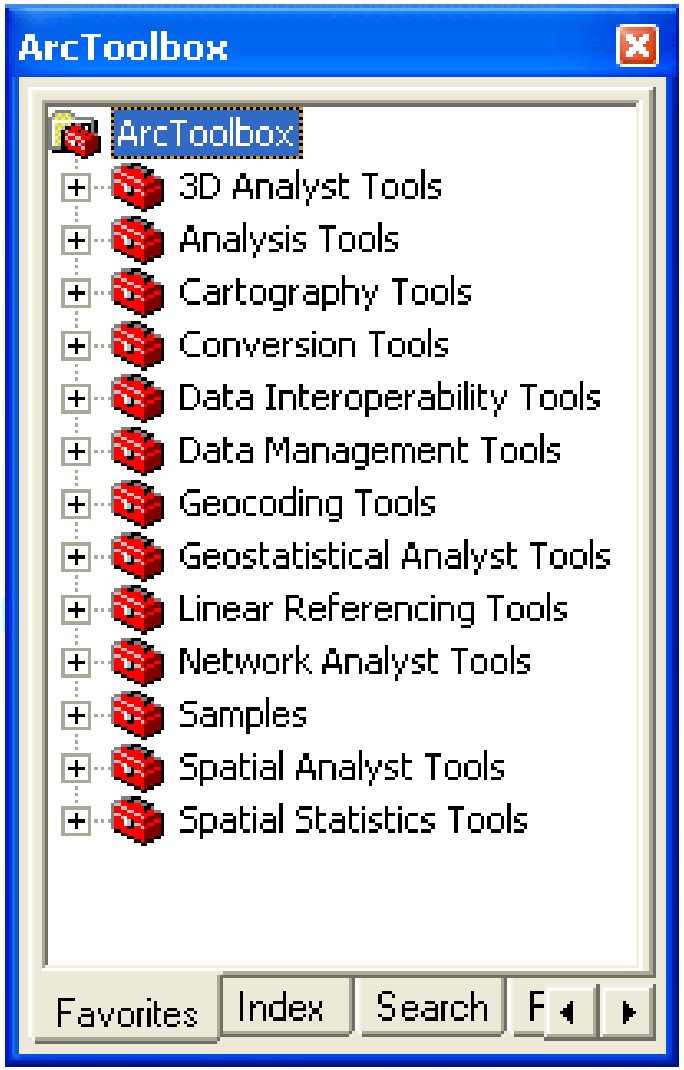
# Geoprocessing Settings

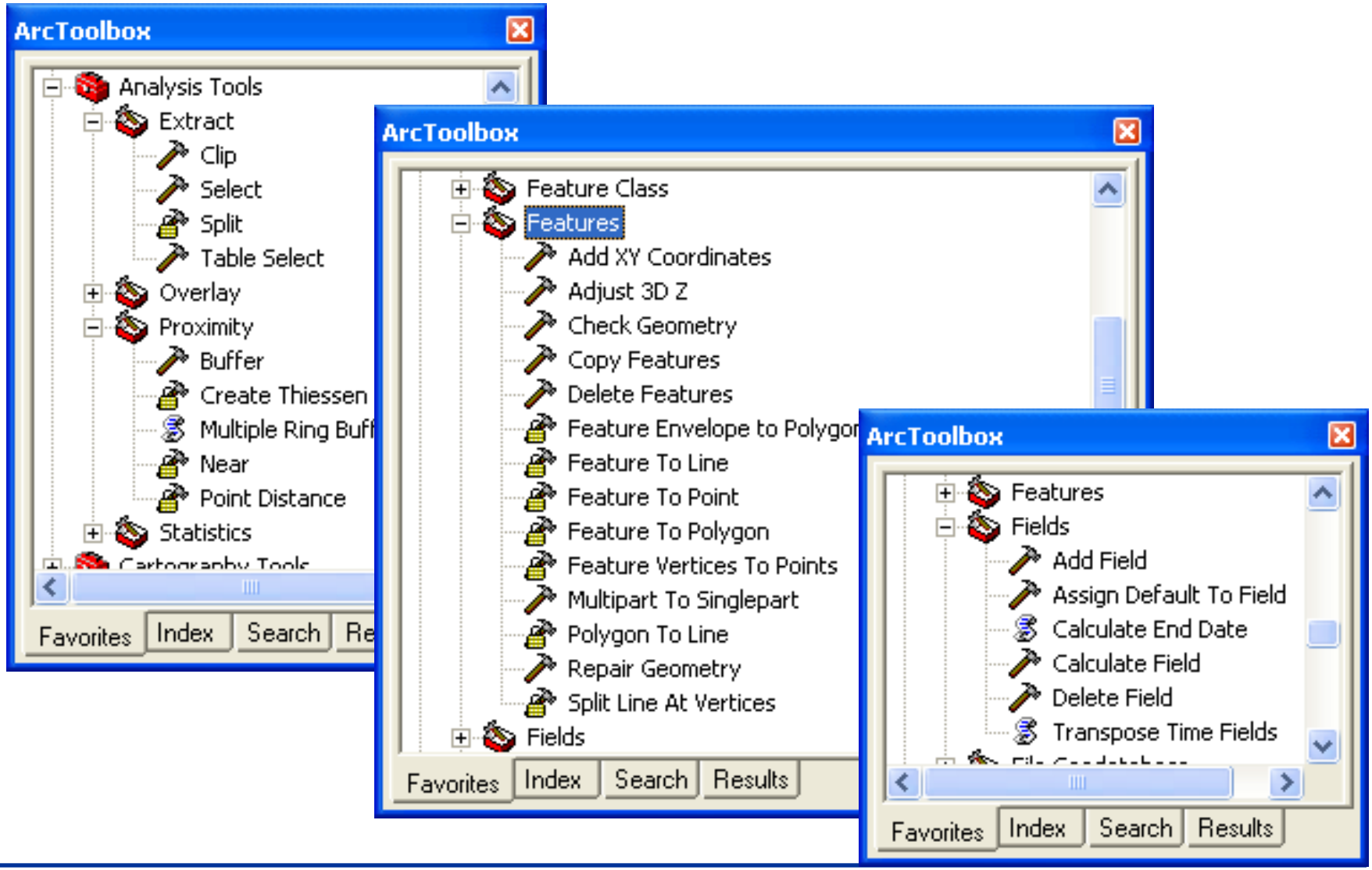
-overwrite existing data
-add results of geoprocessing to display



# Geoprocessing Tools

- What tools do you have to work with when building your models?

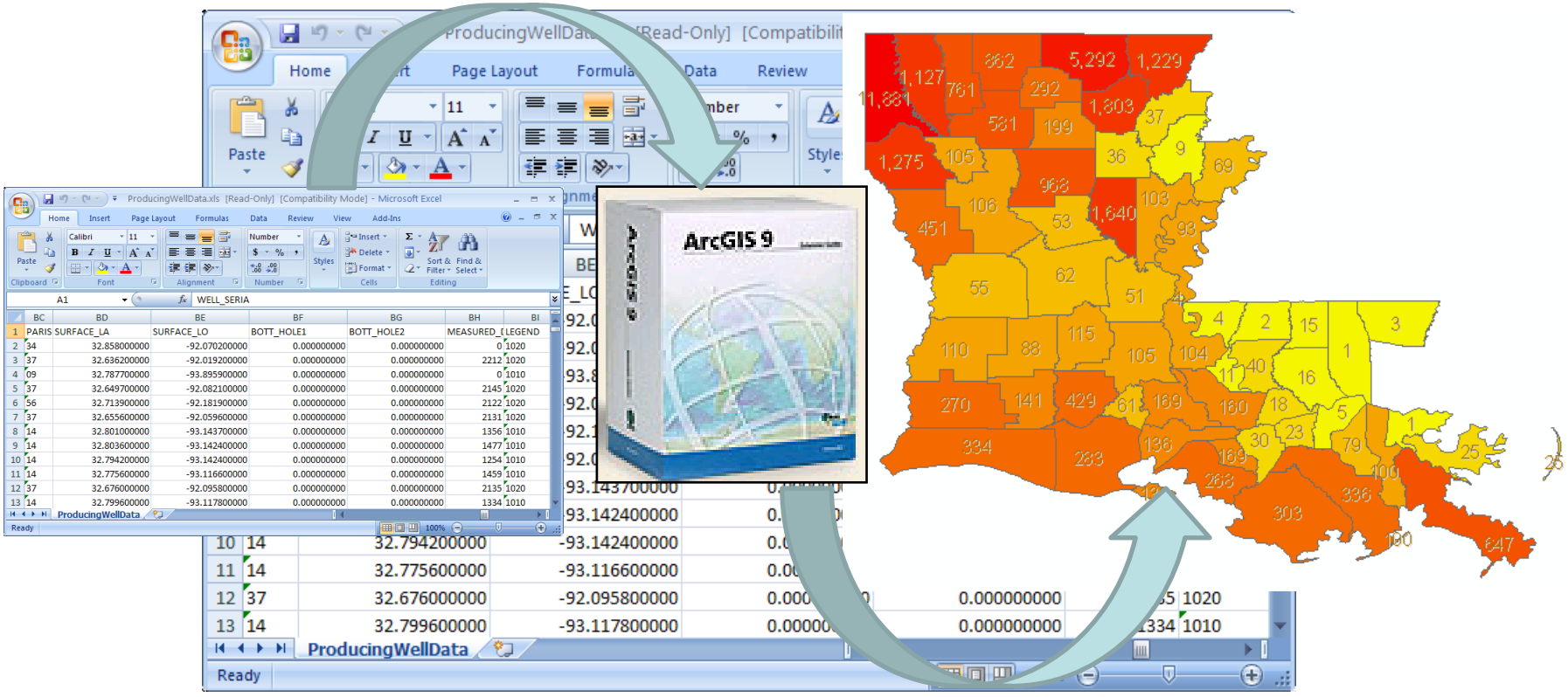



ArcToolbox
Analysis Tools
Extract
Clip
Select
Split
Table Select
Overlay
Proximity
Buffer
Create Thiessen
Multiple Ring Buff
Near
Point Distance
Statistics
Favorites
Index
Search
ArcToolbox
Feature Class
Features
Add XY Coordinates
Adjust 3D Z
Check Geometry
Copy Features
Delete Features
Feature Envelope to Polygon
Feature To Line
Feature To Point
Feature To Polygon
Feature Vertices To Points
Multipart To Singlepart
Polygon To Line
Repair Geometry
Split Line At Vertices
Fields
Favorites
Index
Search
Results
ArcToolbox
Features
Fields
Add Field
Assign Default To Field
Calculate End Date
Calculate Field
Delete Field
Transpose Time Fields
Favorites
Index
Search
Results

# An Example

In which parishes in Louisiana does our company have a lot of wells?

What do you have to work with?
-just a spreadsheet with well locations

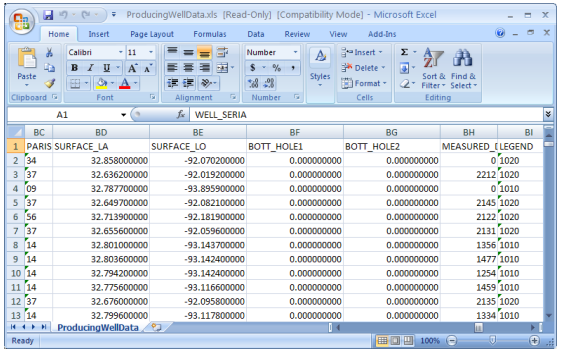


# The Process

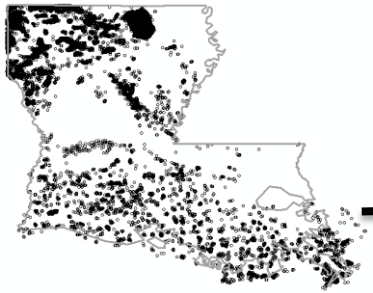
**1.** Import the points from the spreadsheet

**2.** Spatially join the parish attributes to the wells

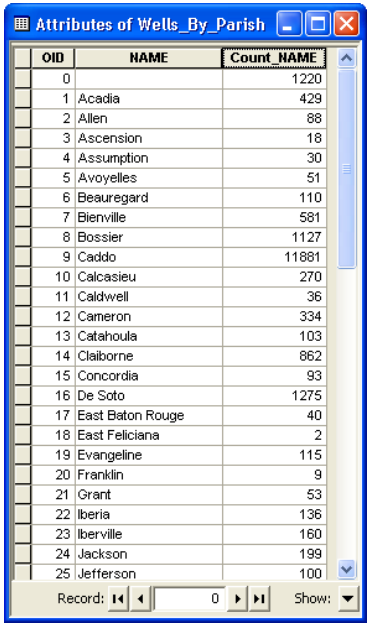
**3.** Summarize the well table by parish




Make XY Event Layer

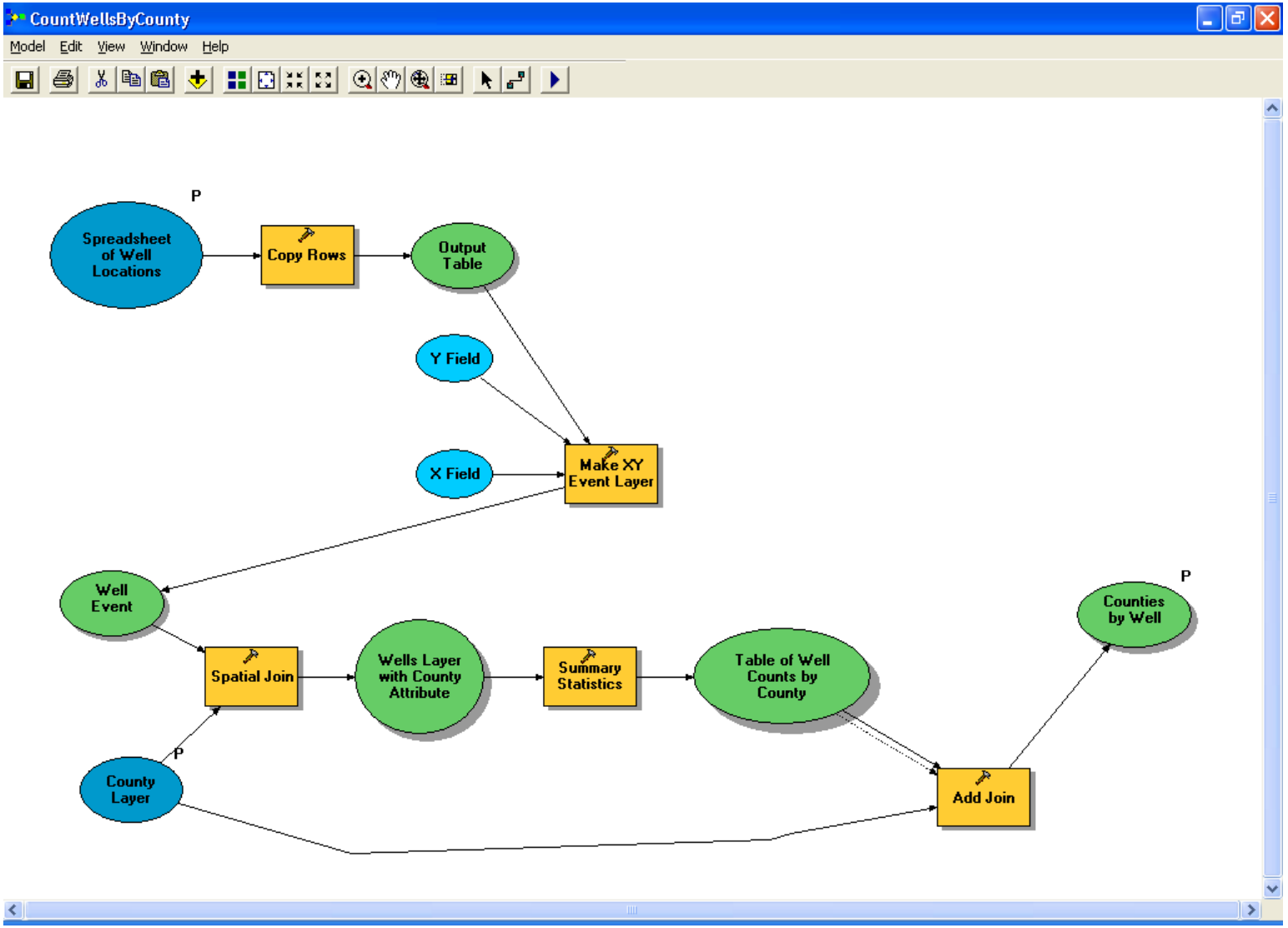


Spatial Join

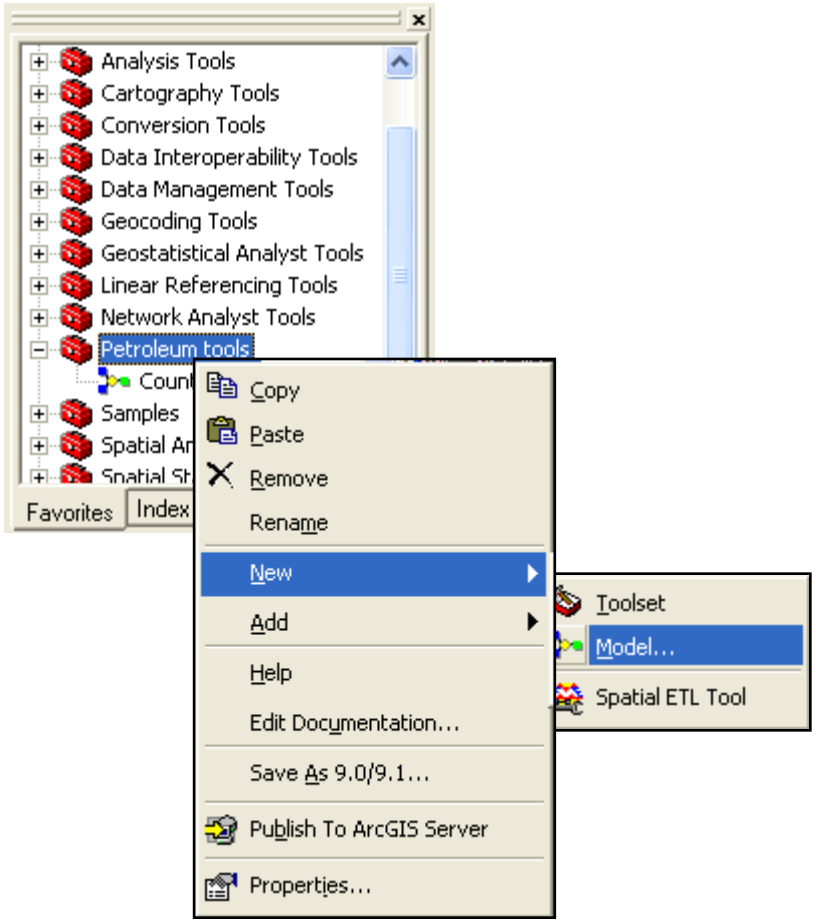


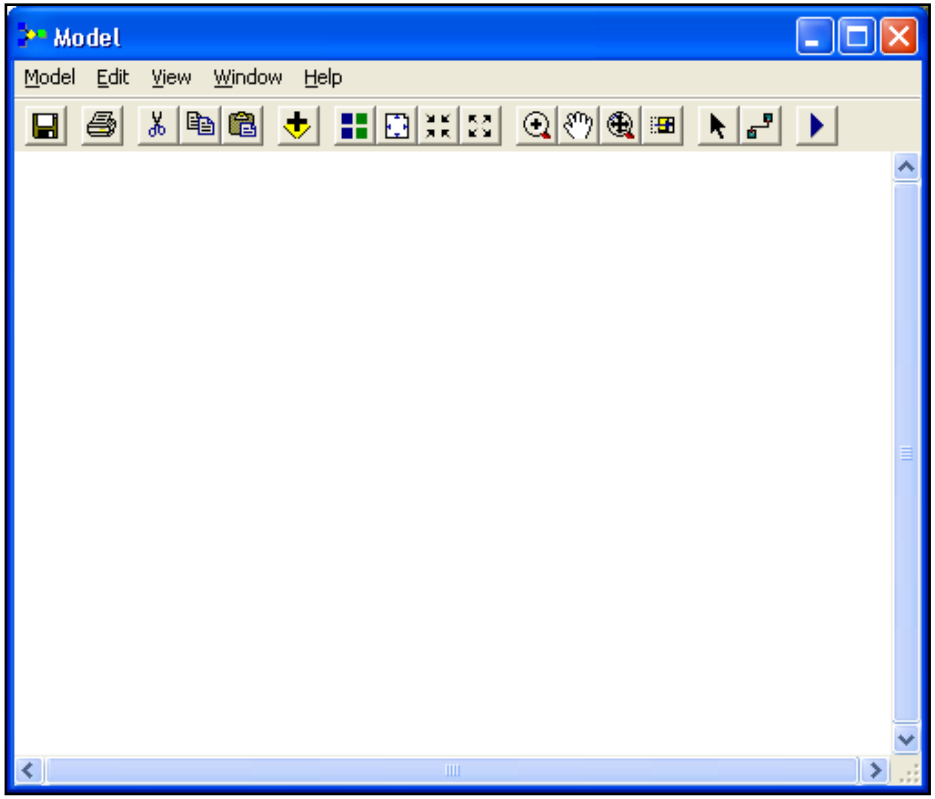

Summary Statistics

# The Model

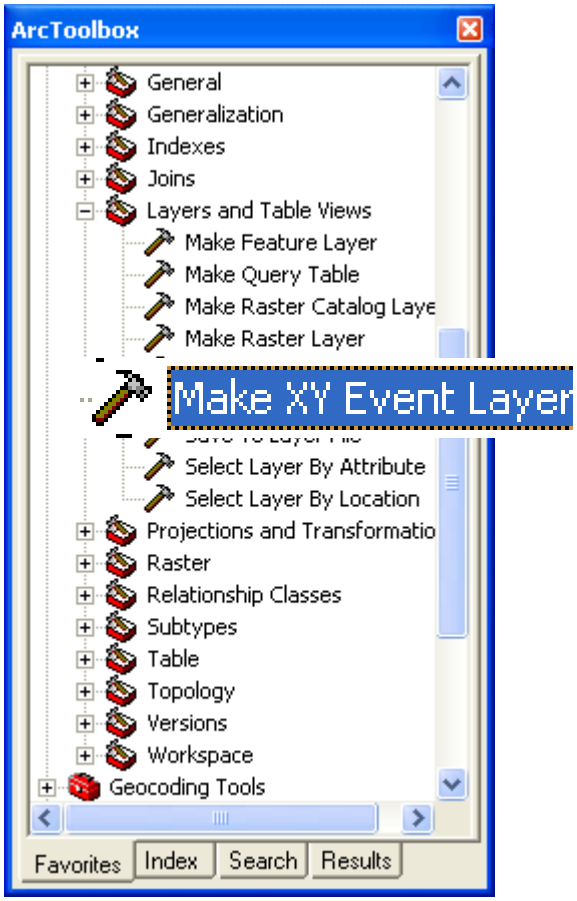

CountWellsByCounty
Model Edit View Window Help
P
Spreadsheet of Well Locations
Copy Rows
Output Table
Y Field
X Field
Make XY Event Layer
Well Event
Spatial Join
Wells Layer with County Attribute
Summary Statistics
Table of Well Counts by County
P
Counties by Well
P
County Layer
Add Join

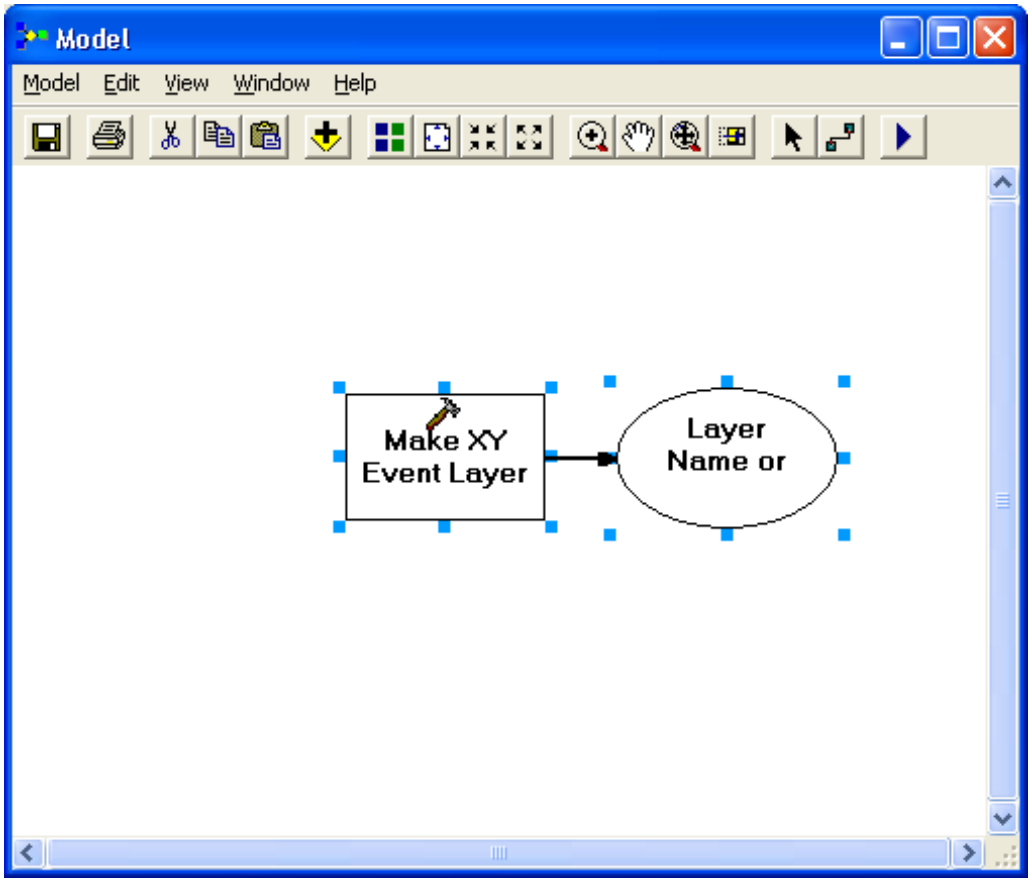
# Creating a new model



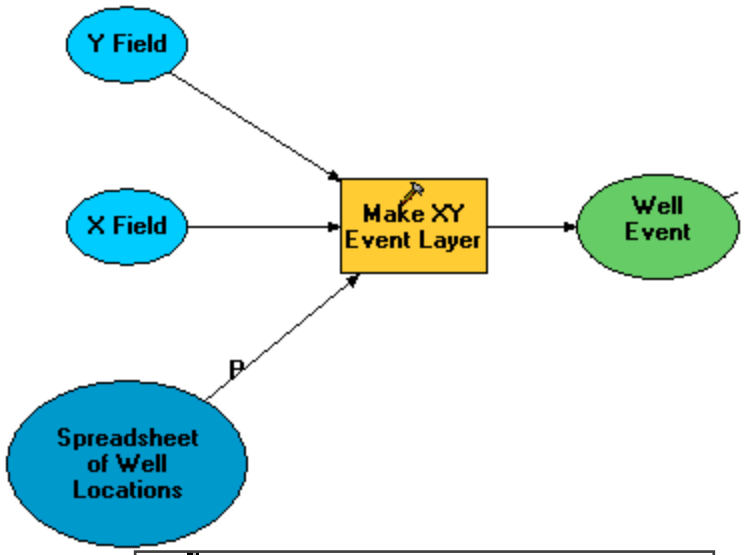



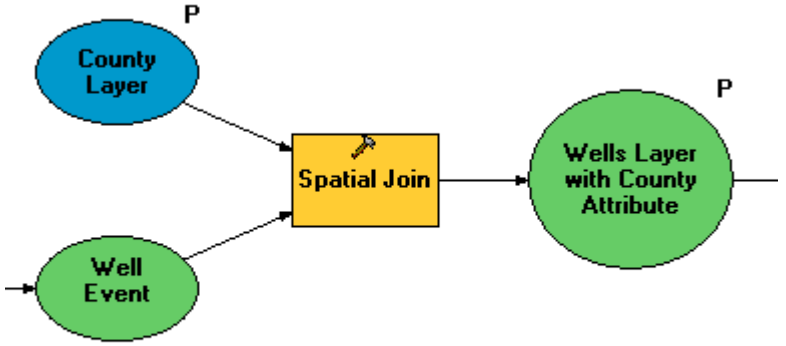
# Adding tools to the model

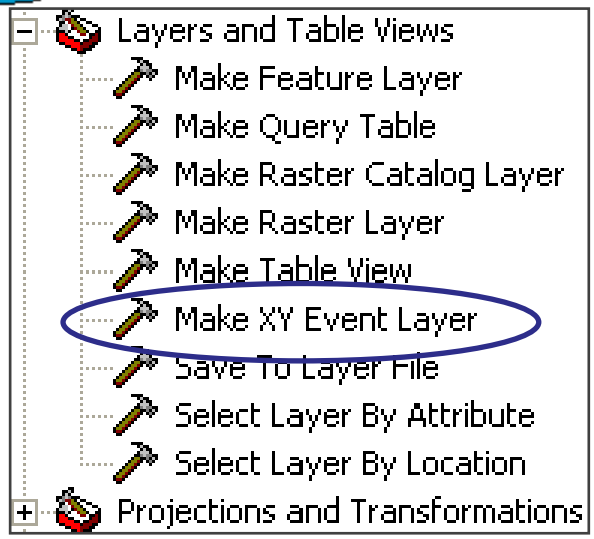


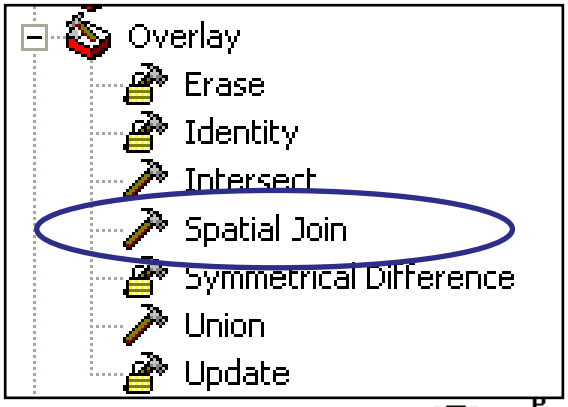



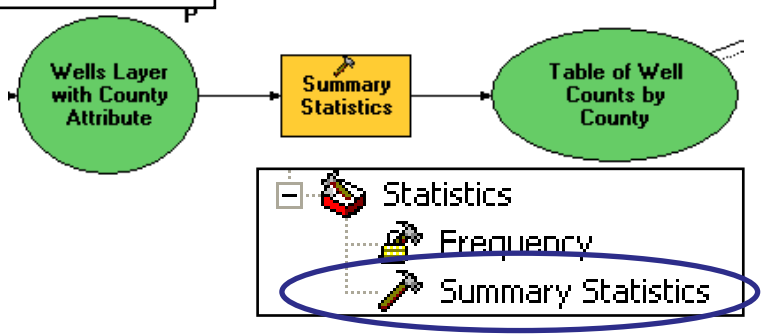
# Tools needed



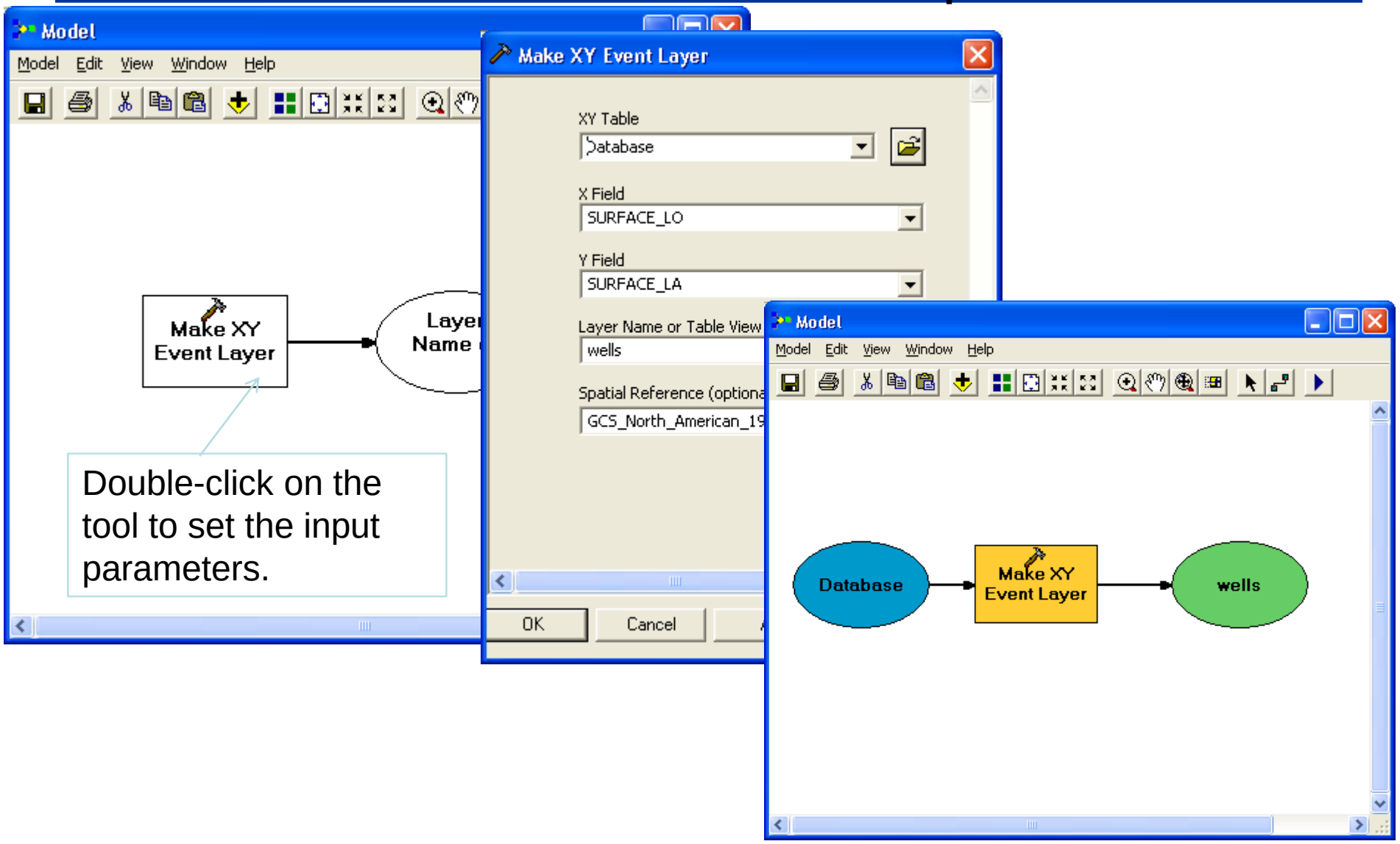



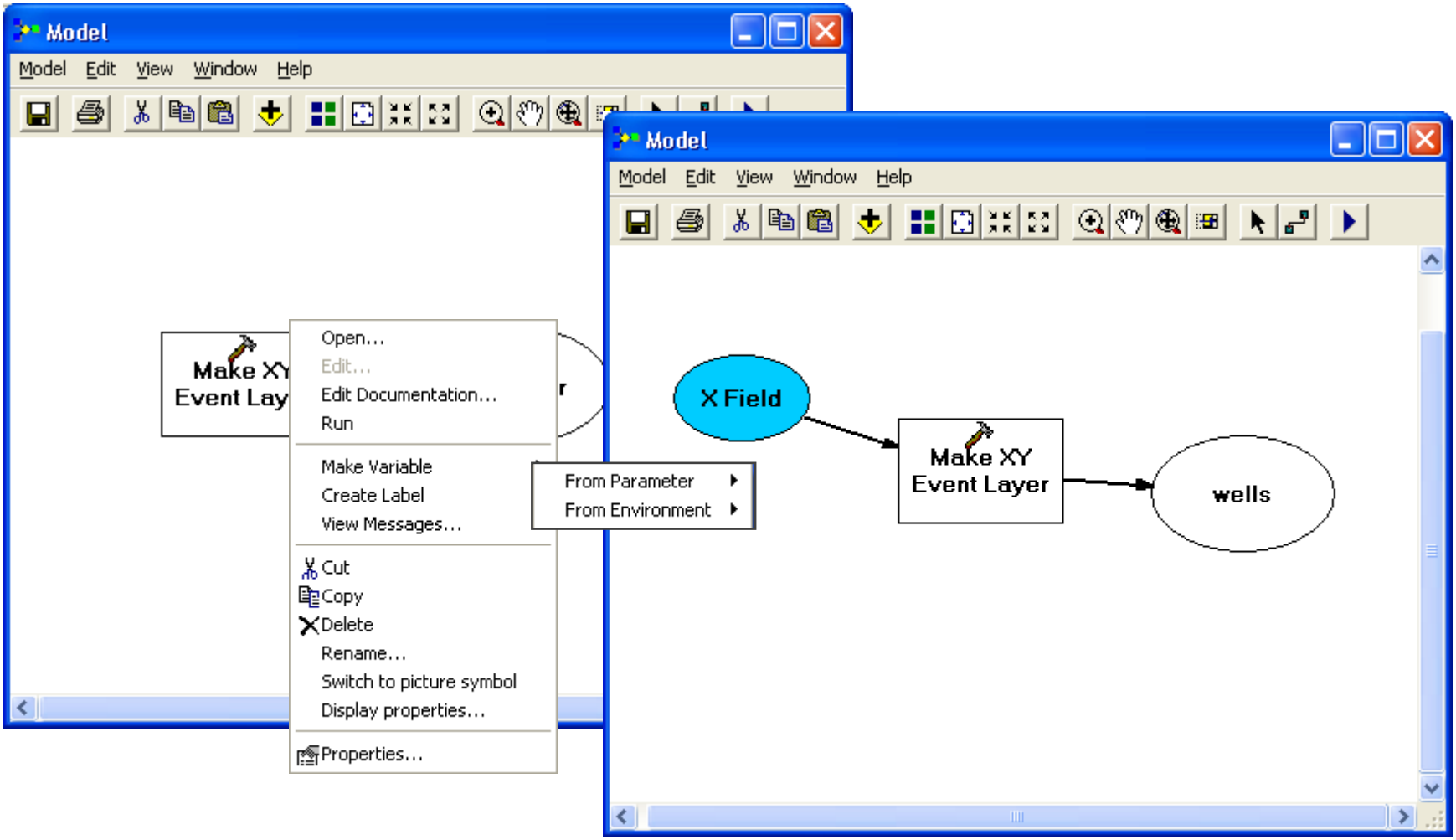



# Input to the tools

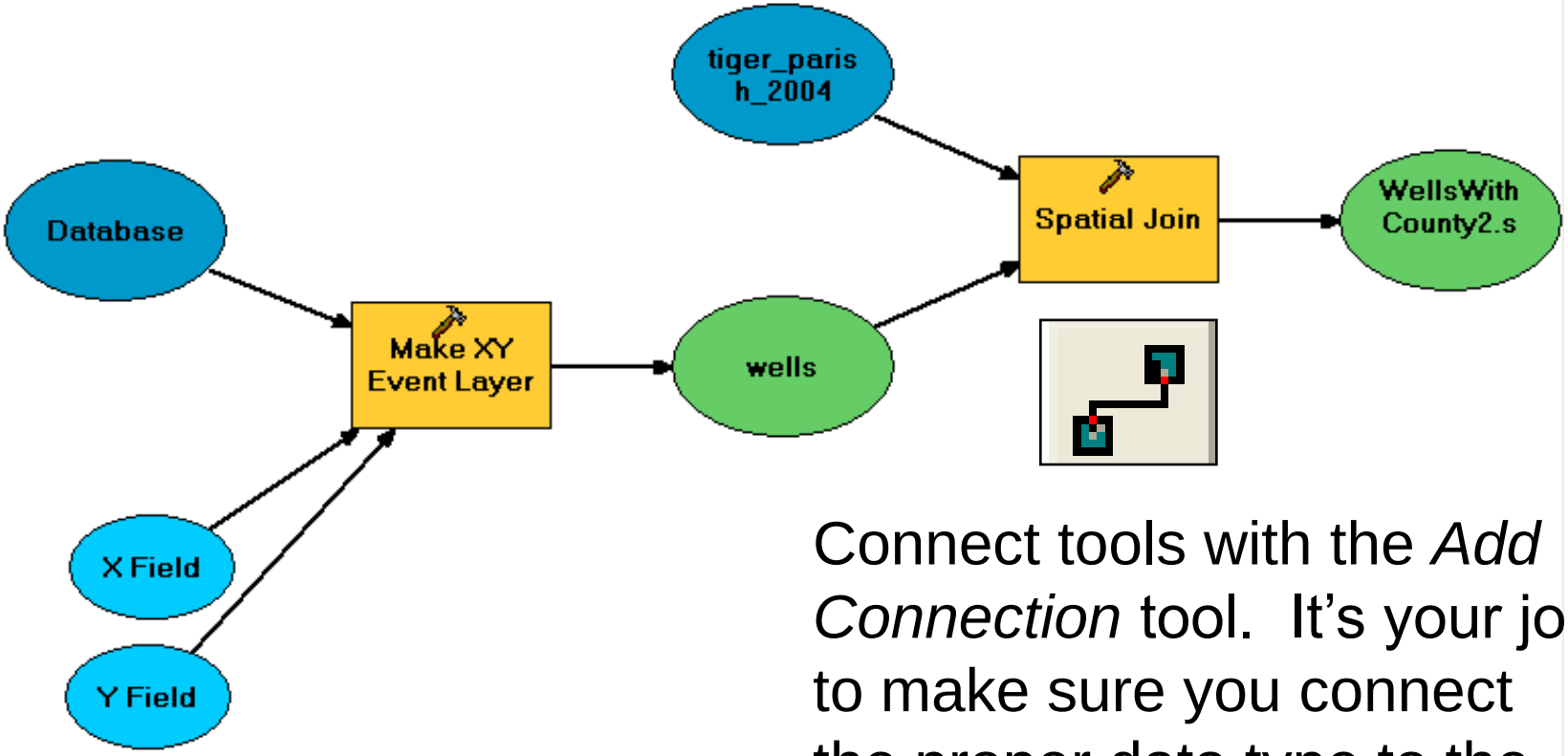


# Inputs to the tools




Or right-click to make variables for the inputs

# Connecting tools




Connect tools with the *Add Connection* tool. It's your job to make sure you connect the proper data type to the proper tool.

Some Data Types to think about:

-Feature Class vs. Feature Layer

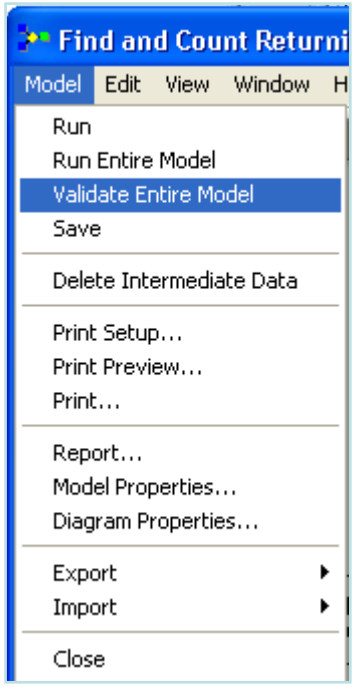
-Table vs. Table View

-Raster Dataset vs. Raster Layer

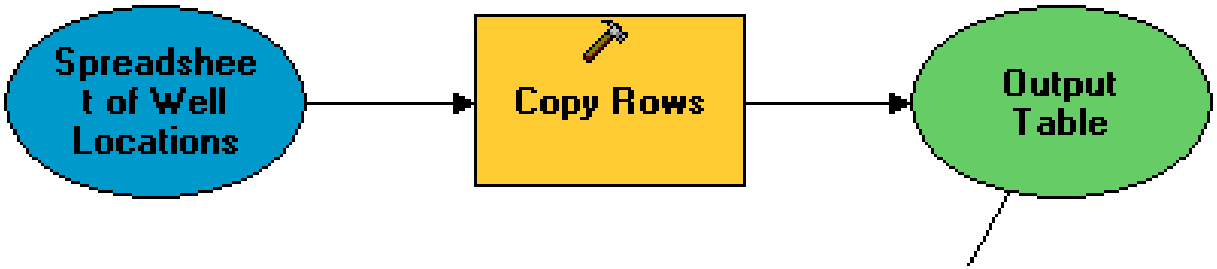
Validate the model to check that the proper input data types are passed to the tools.

For our model, it is important to note:

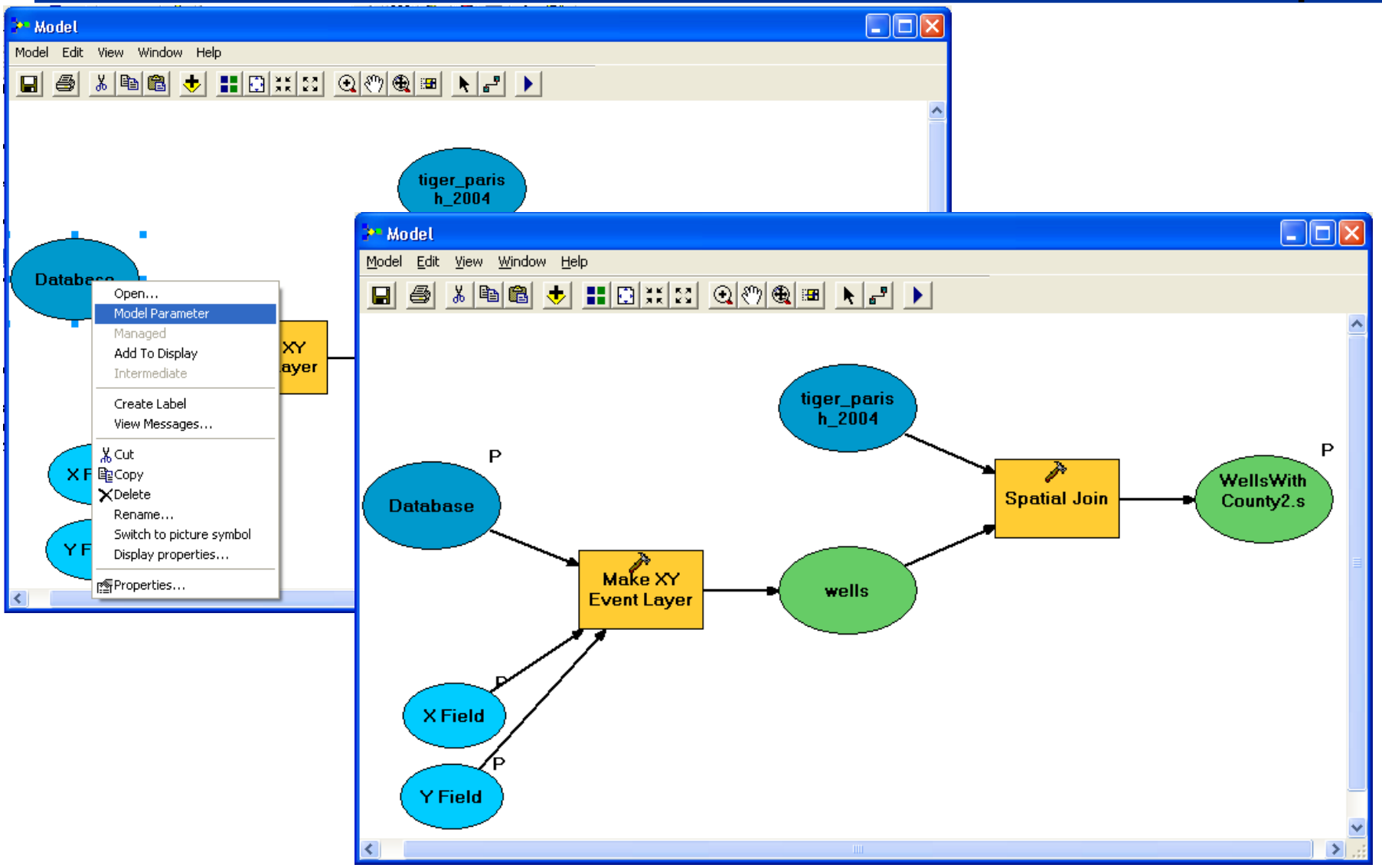
you can't do a spatial join on an excel spreadsheet. You have to convert the spreadsheet to a table first.



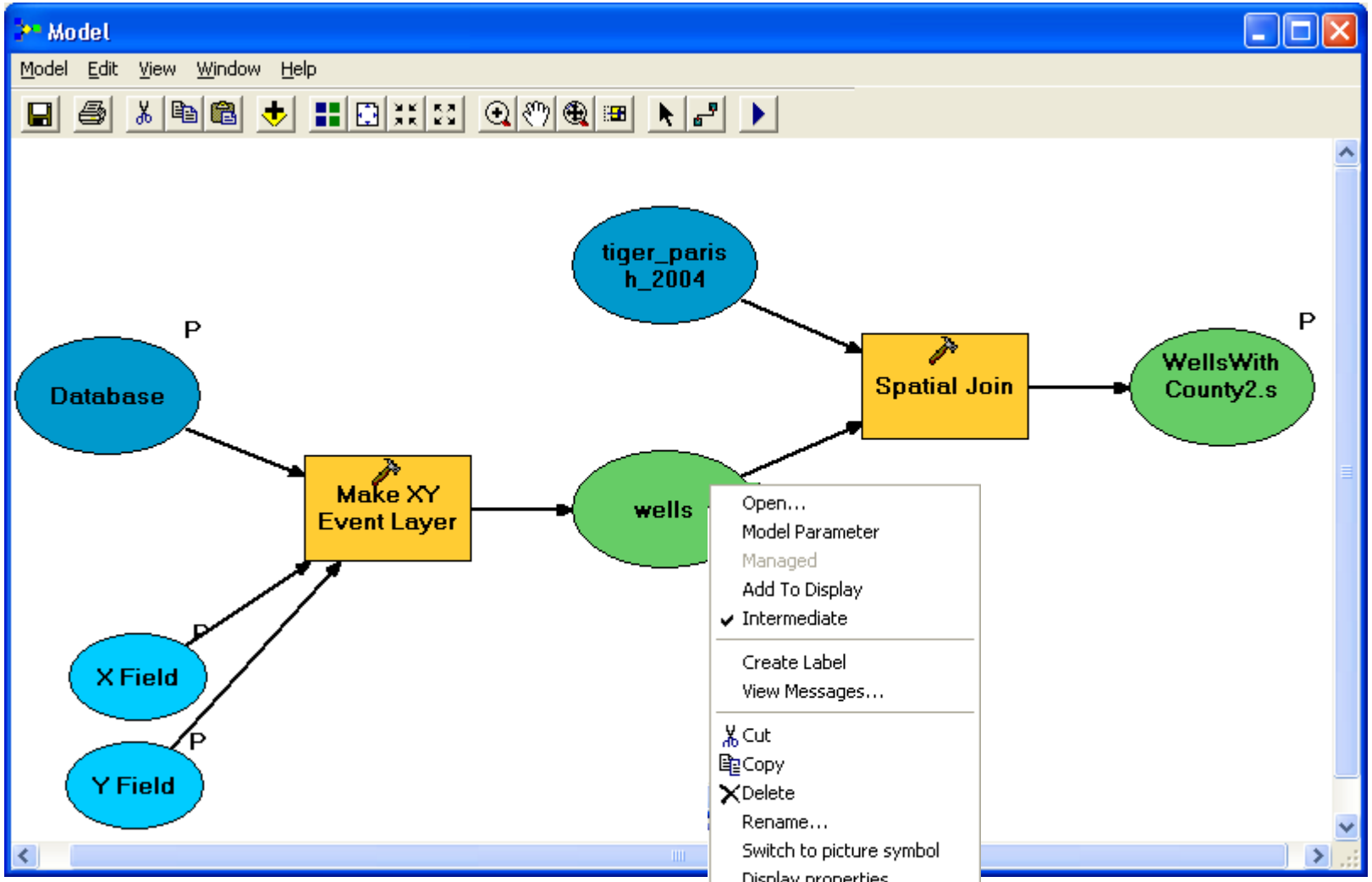
# Copy Rows



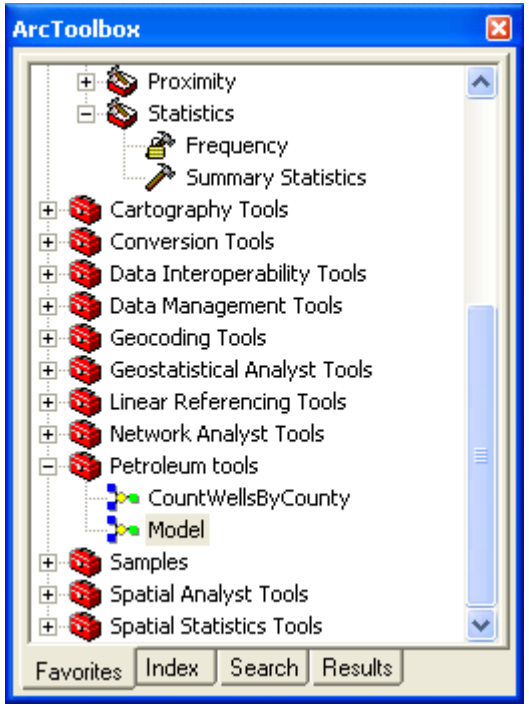
# Model Parameters as Input

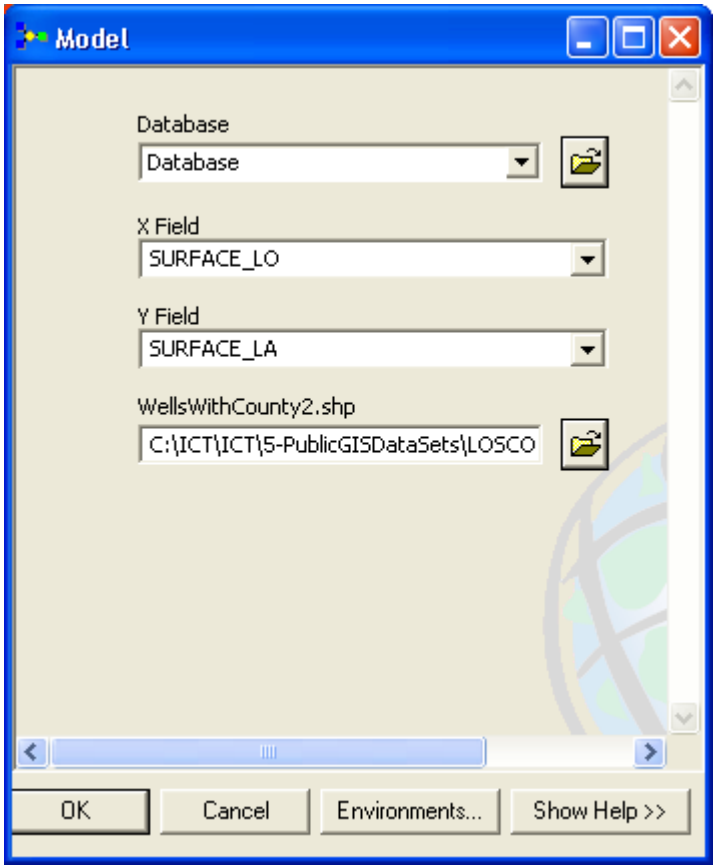


# Intermediate Datasets



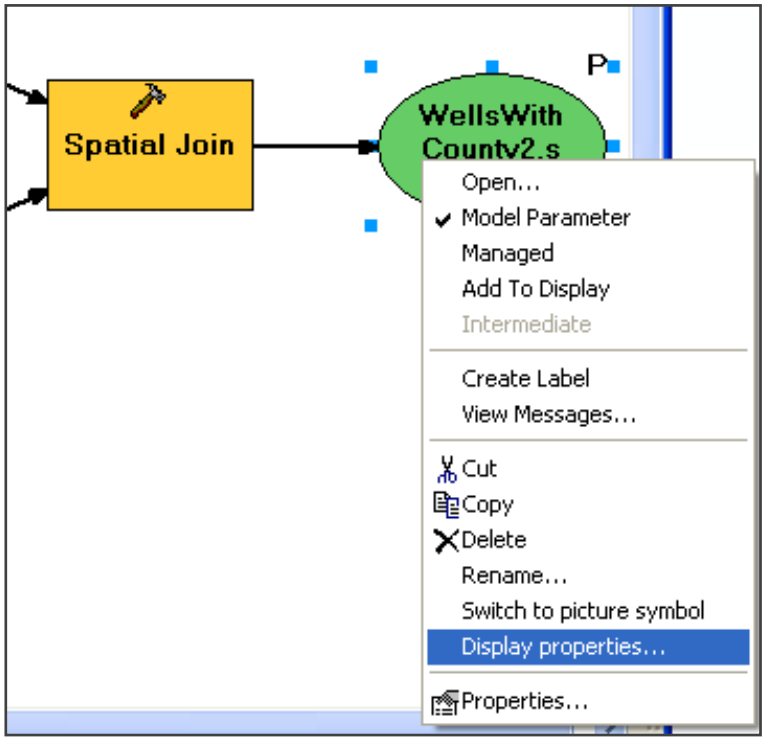
# Running The Tool

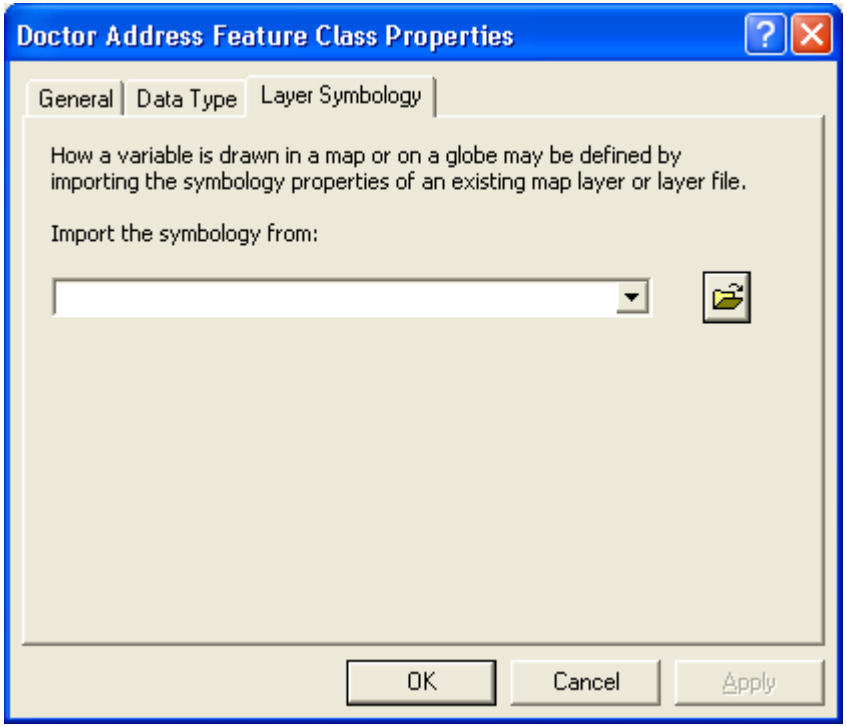


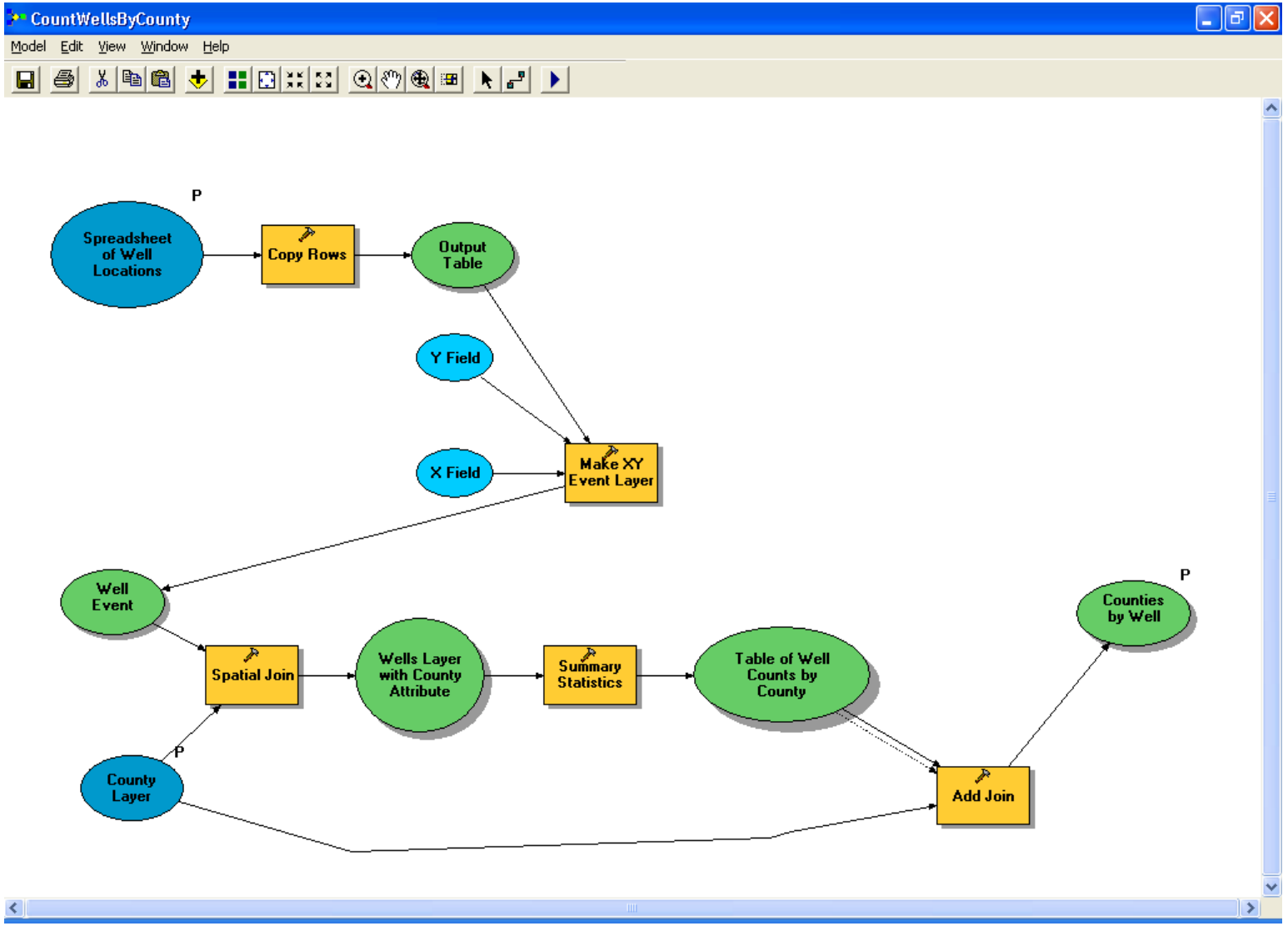
# Output Display Properties

-Import the display properties for derived datasets from existing layer files

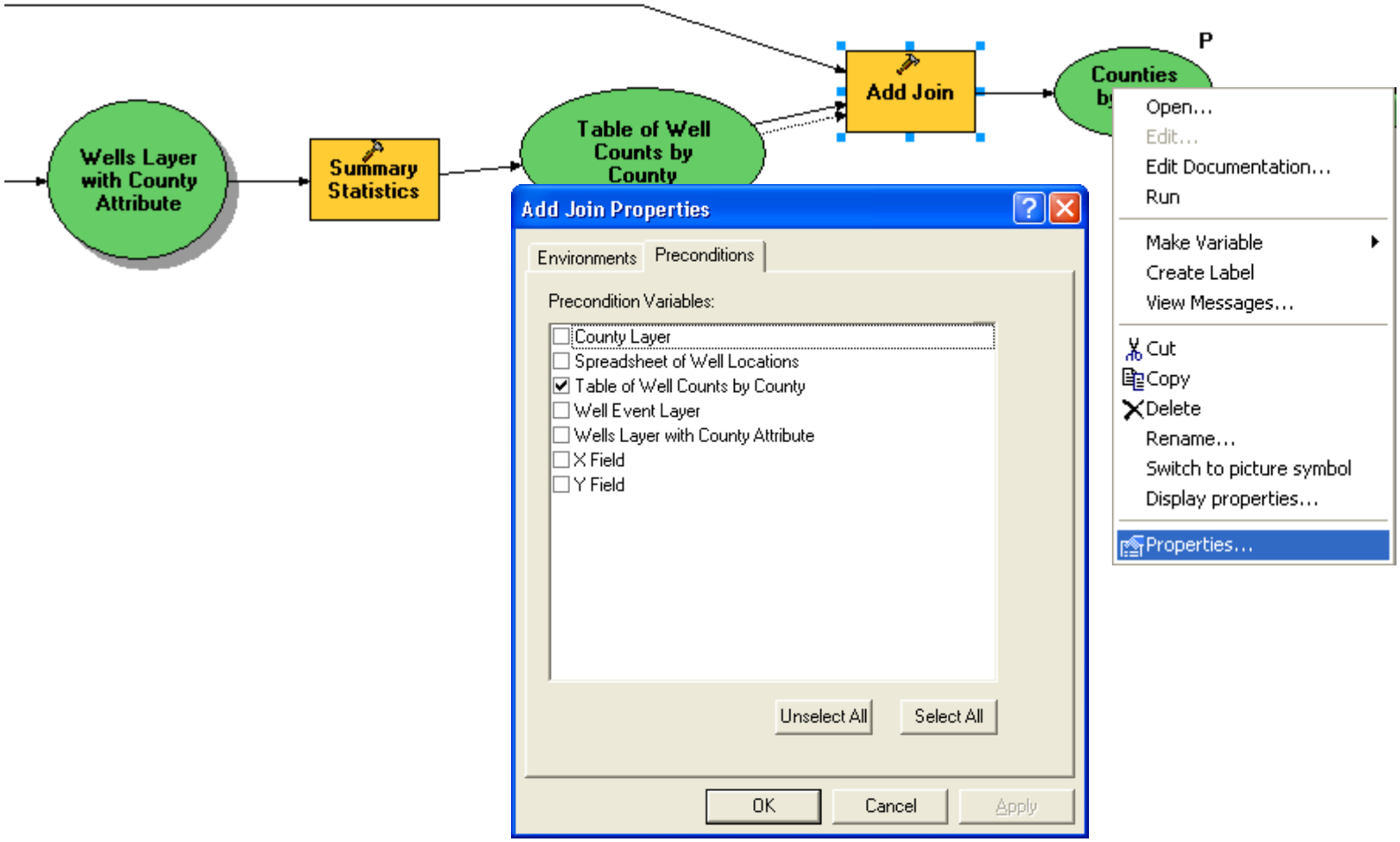


# The Model

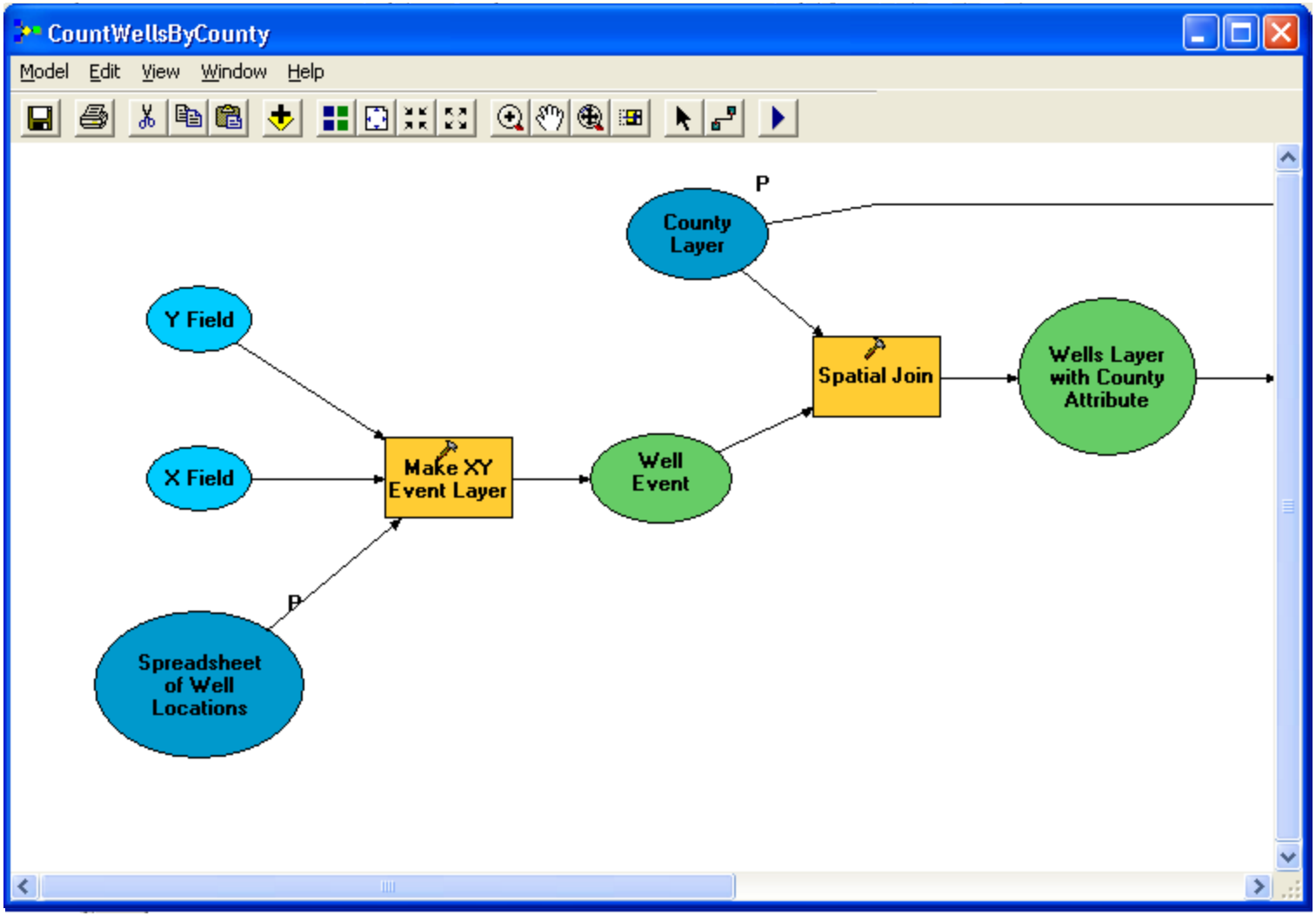

CountWellsByCounty
Model Edit View Window Help
P
Spreadsheet of Well Locations
Copy Rows
Output Table
Y Field
X Field
Make XY Event Layer
Well Event
Spatial Join
Wells Layer with County Attribute
Summary Statistics
Table of Well Counts by County
P
Counties by Well
P
County Layer
Add Join

# Preconditions

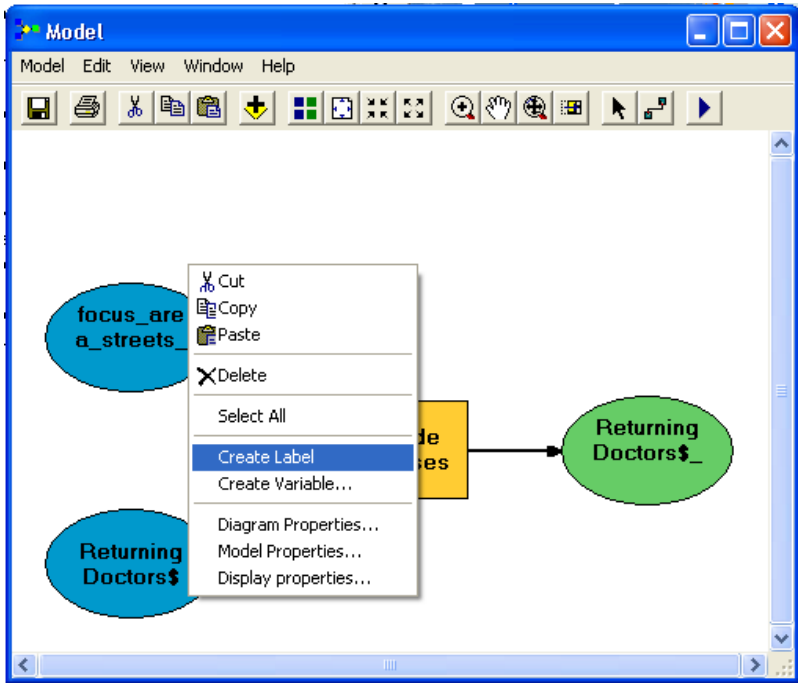


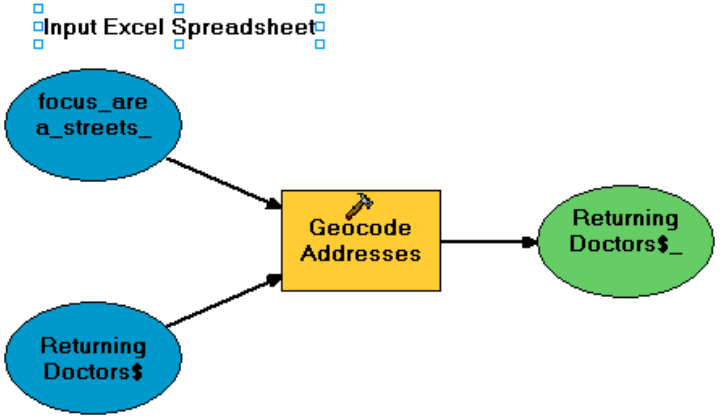
# Show Movie

# Testing the Model

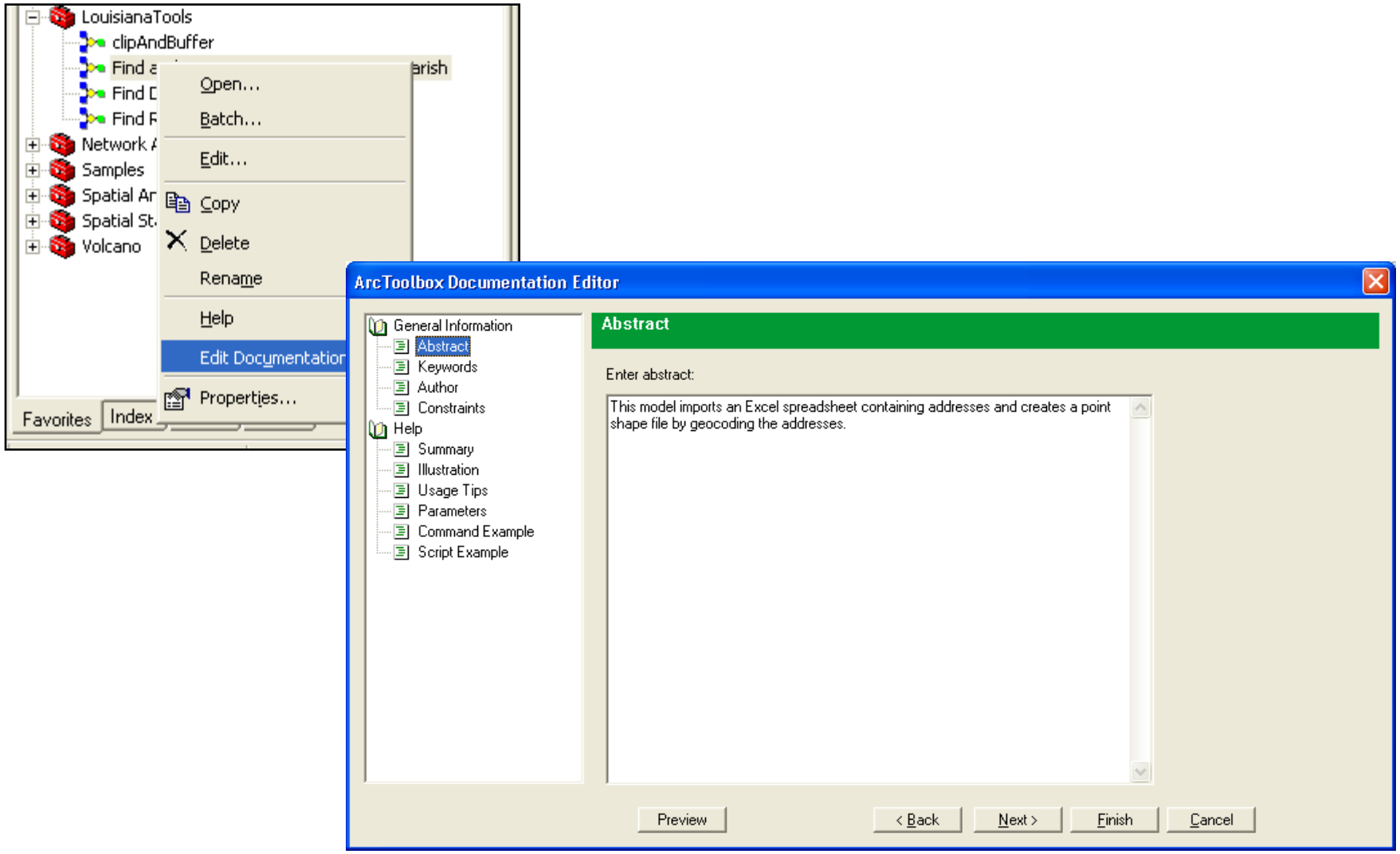


# Documenting Your Model



# Documenting Your Model



# Another Example

-Creating well spots and well paths from a text file.

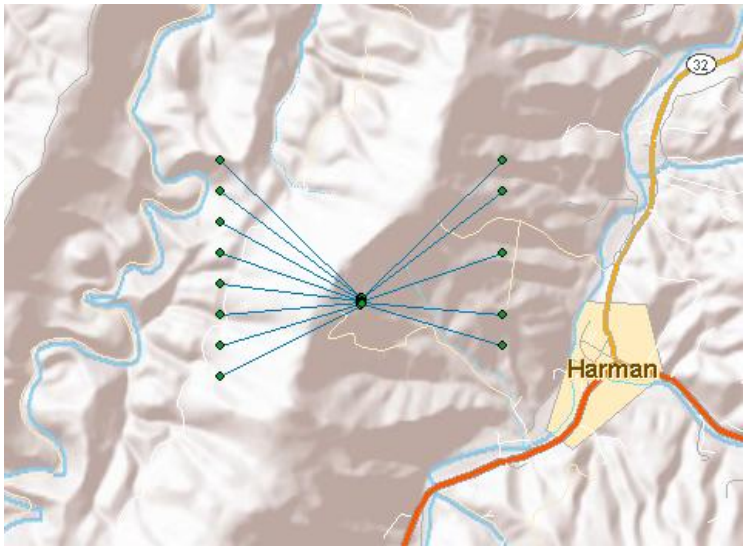
What do you have to work with?

-just a text file that looks like this:

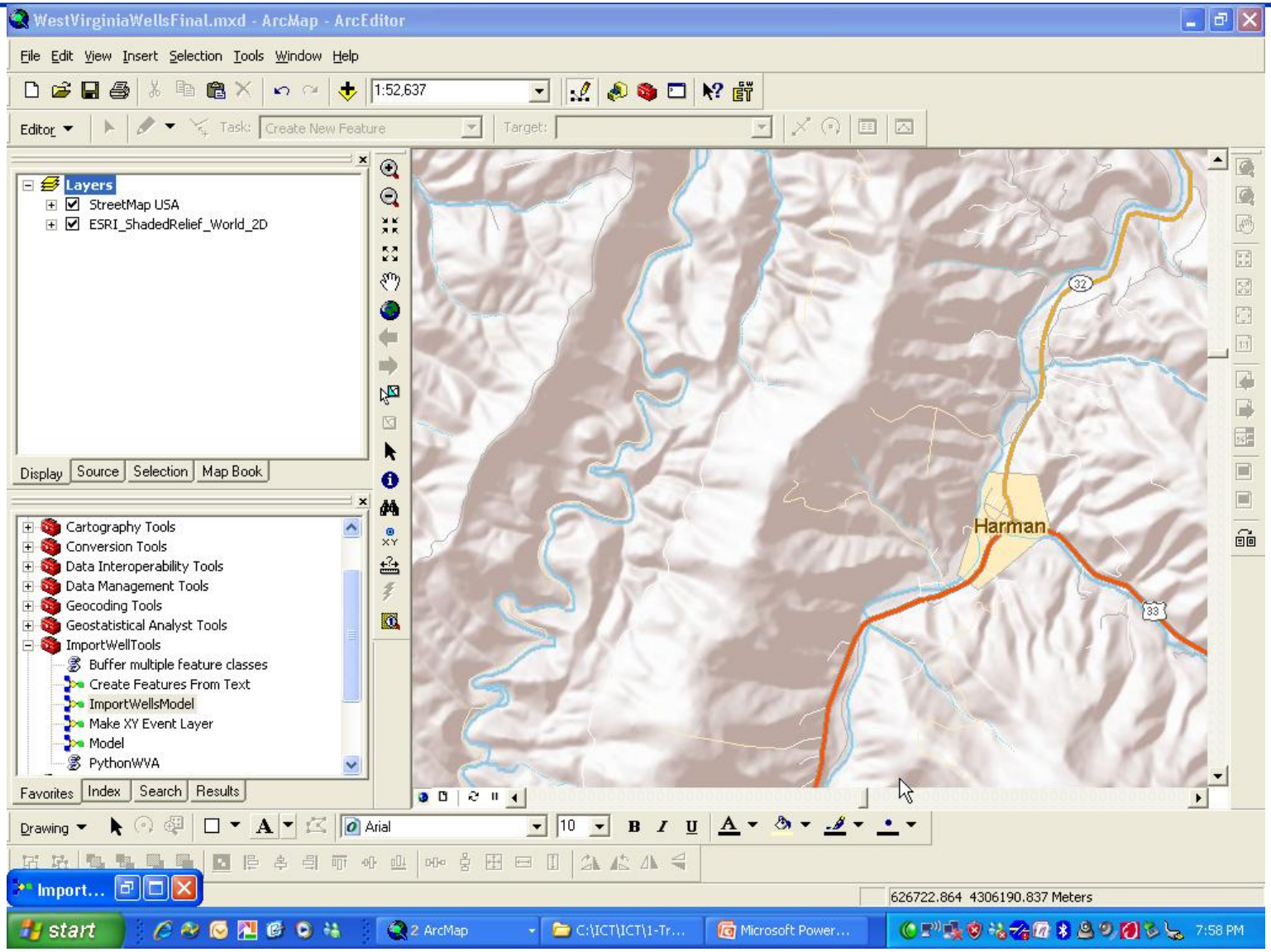
WVA.csv - Notepad

File Edit Format View Help

```
WVA STATE LANDS,625701,4309693,624438,4310931,1
WVA STATE LANDS,625701,4309683,624438,4310651,2
WVA STATE LANDS,625701,4309673,624438,4310371,3
BROOKS ET AL,625701,4309663,624438,4310091,4
BROOKS ET AL,625701,4309653,624438,4309811,5
PULS OIL INC,625701,4309643,624438,4309531,6
PULS OIL INC,625701,4309633,624438,4309251,7
PULS OIL INC,625701,4309623,624438,4308971,8
WVA STATE LANDS,625721,4309693,626984,4310931,9
WVA STATE LANDS,625721,4309683,626984,4310651,10
BROOKS ET AL,625721,4309663,626984,4310091,12
PULS OIL INC,625721,4309643,626984,4309531,14
PULS OIL INC,625721,4309633,626984,4309251,15
```

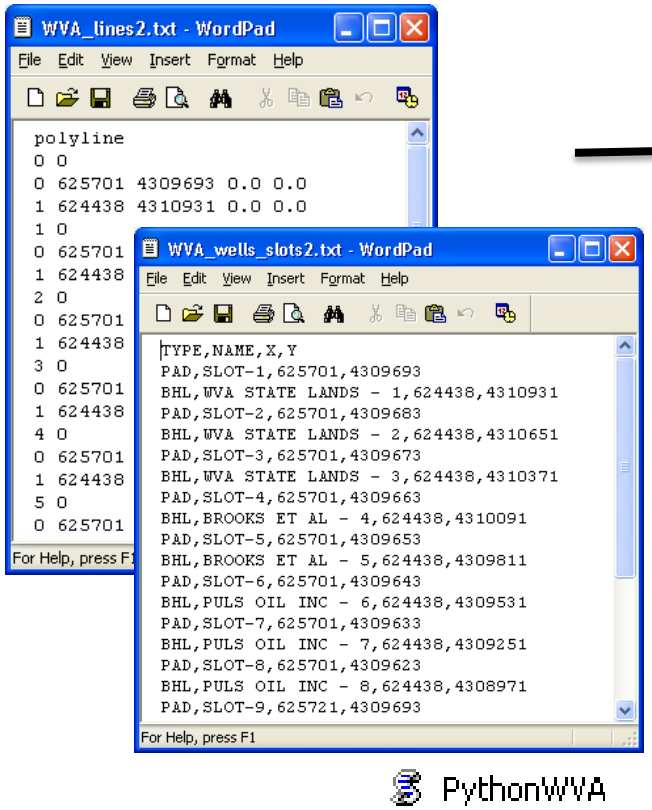



-Where do you start?


WestVirginiaWellsFinal.mxd - ArcMap - ArcEditor
File Edit View Insert Selection Tools Window Help
1:52,637
Editor
Task: Create New Feature
Target:
Layers
StreetMap USA
ESRI_ShadedRelief_World_2D
Display Source Selection Map Book
Cartography Tools
Conversion Tools
Data Interoperability Tools
Data Management Tools
Geocoding Tools
Geostatistical Analyst Tools
ImportWellTools
Buffer multiple feature classes
Create Features From Text
ImportWellsModel
Make XY Event Layer
Model
PythonWVA
Favorites Index Search Results
Harman
32
33
Drawing
Arial
10
626722.864 4306190.837 Meters
Import...
start
2 ArcMap
C:\ICT\ICT\1-Tr...
Microsoft Power...
7:58 PM

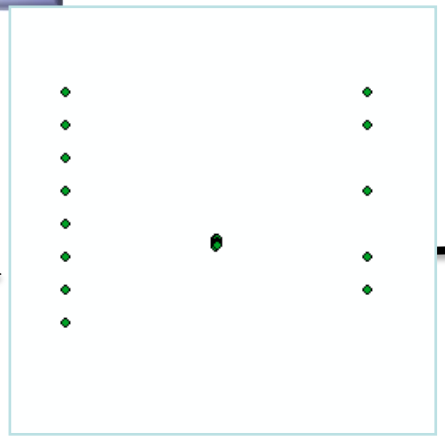
# The Process

**1.** Split the text file into a file for the lines and a file for the points.



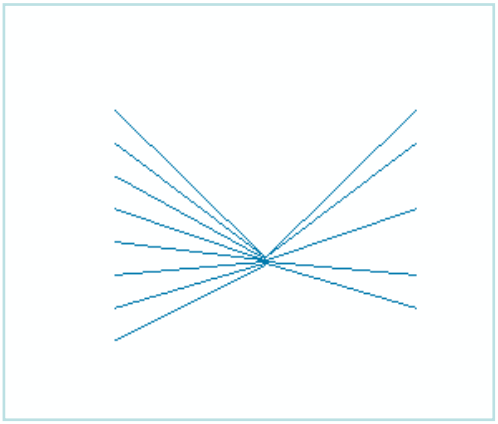

PythonWVA

**2.** Generate the point layer



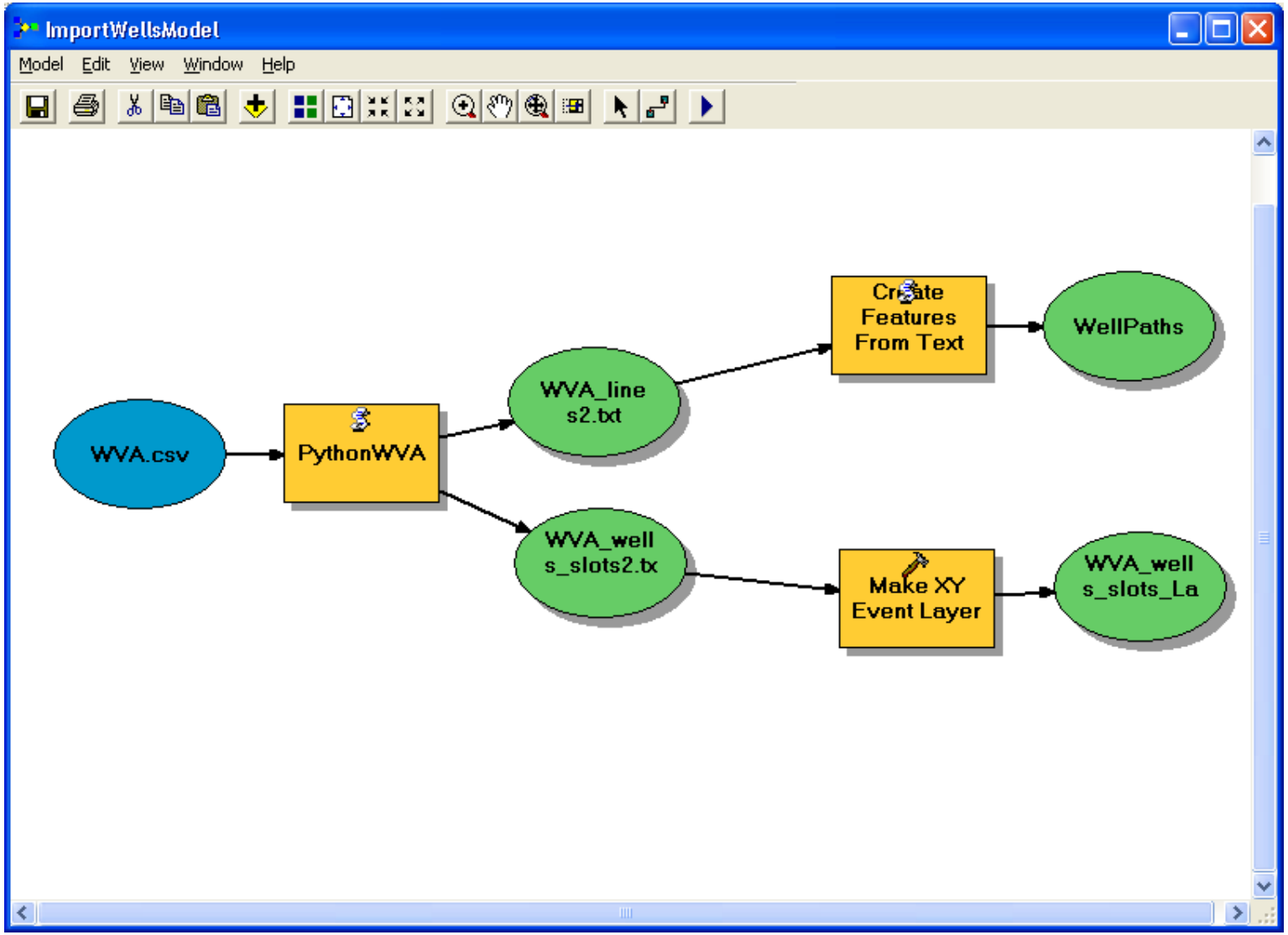
Make XY Event Layer

**3.** Generate the line layer



Create Features From Text File

# The Model

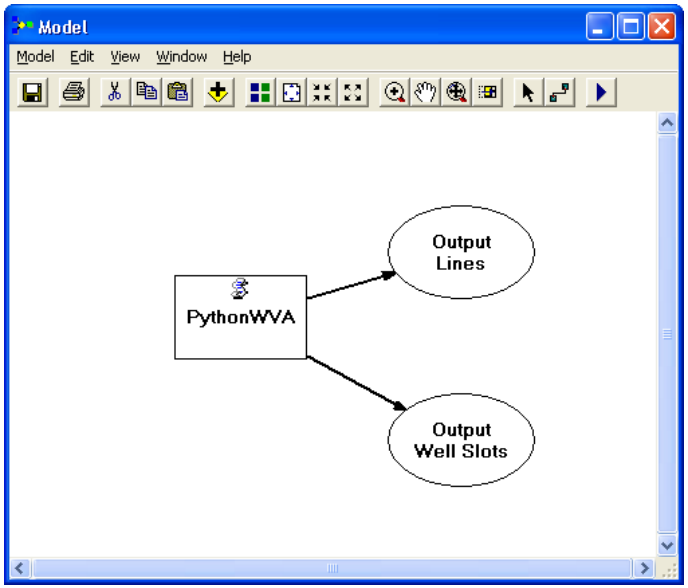

ImportWellsModel
Model Edit View Window Help
WVA.csv
PythonWVA
WVA_lines2.txt
WVA_wells_slots2.tx
Create Features From Text
WellPaths
Make XY Event Layer
WVA_wells_slots_La

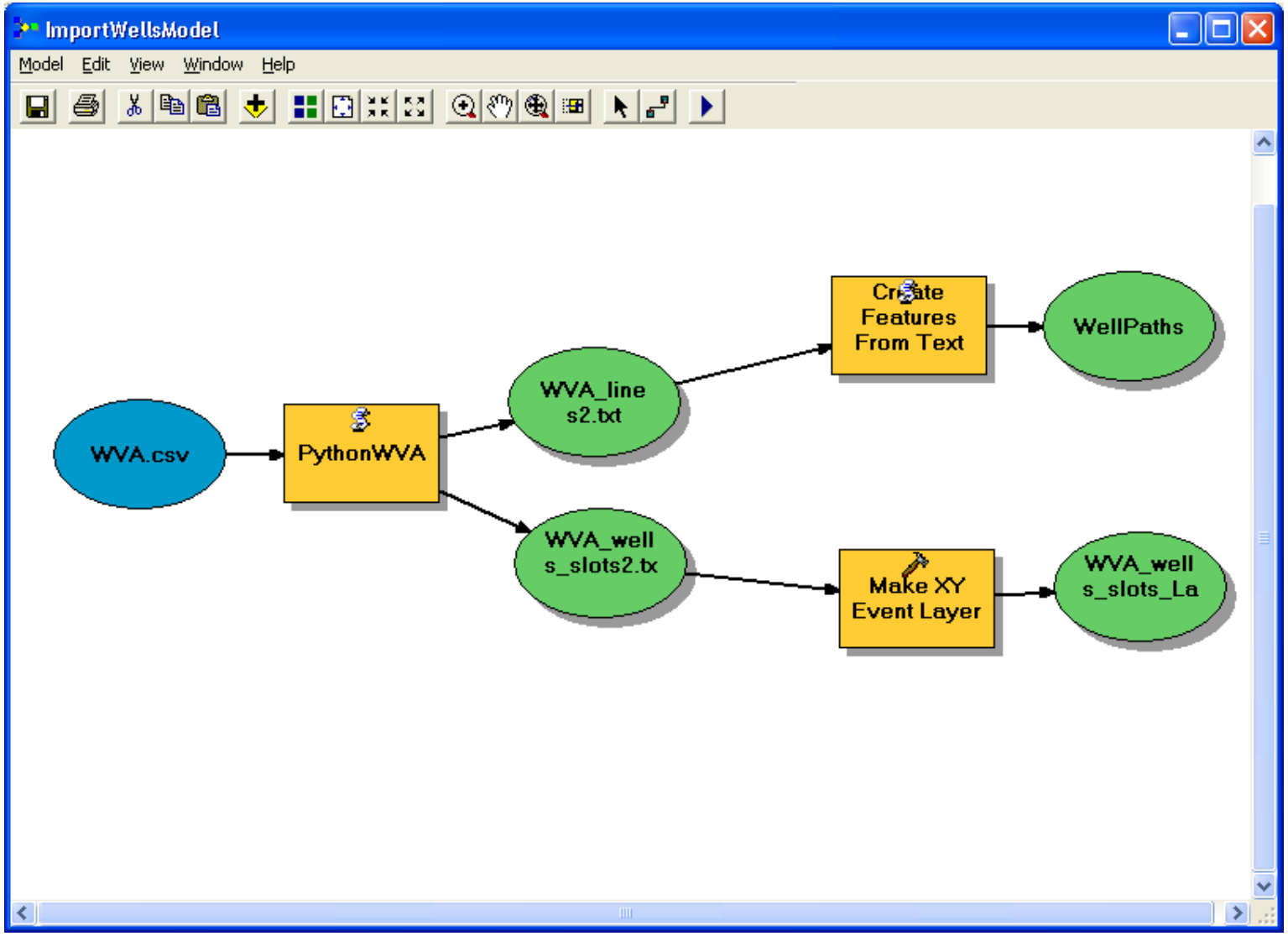
# The Python Script

-The scripts has 2 outputs: the line text file and the point text file.

pythonWVA2.py

```
#!/usr/bin/python

# parse input
import sys

input = sys.argv[1]
out = sys.argv[2]
out1 = sys.argv[3]
output = 'del ' + sys.argv[2]
output1 = 'del ' + sys.argv[3]

# delete previously existing output files

import os
os.system(output)
os.system(output1)



# set up the input/output files

fin = None                      # init fin (so cleanup will not throw)
fout = None                     # init fout for same reason
fout1 = None
try:                                    # file IO is "dangerous"
  fin = open(input,"r")               # open input.txt, mode as in c fopen
  fout = open(out,"w")        # open output.txt, mode as in c fopen
  fout1 = open(out1,"w")
```



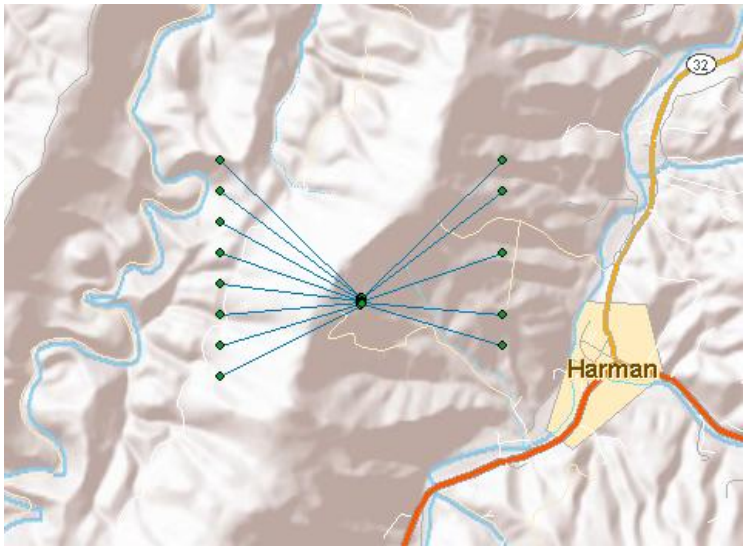

ImportWellsModel
Model Edit View Window Help
WVA.csv
PythonWVA
WVA_line s2.txt
WVA_well s_slots2.tx
Create Features From Text
Make XY Event Layer
WellPaths
WVA_well s_slots_La

# Show Movie

WVA.csv - Notepad

File Edit Format View Help

```
WVA STATE LANDS,625701,4309693,624438,4310931,1
WVA STATE LANDS,625701,4309683,624438,4310651,2
WVA STATE LANDS,625701,4309673,624438,4310371,3
BROOKS ET AL,625701,4309663,624438,4310091,4
BROOKS ET AL,625701,4309653,624438,4309811,5
PULS OIL INC,625701,4309643,624438,4309531,6
PULS OIL INC,625701,4309633,624438,4309251,7
PULS OIL INC,625701,4309623,624438,4308971,8
WVA STATE LANDS,625721,4309693,626984,4310931,9
WVA STATE LANDS,625721,4309683,626984,4310651,10
BROOKS ET AL,625721,4309663,626984,4310091,12
PULS OIL INC,625721,4309643,626984,4309531,14
PULS OIL INC,625721,4309633,626984,4309251,15
```



# Questions?

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