COA 690/790 GIS in Marine Science

Lecture 11
Introduction to model builder

Wei Wu

April 24, 2017

What is a model

- A representation / abstraction of reality

o Conceptual model

o Analytic model

o Simulation model

Why use model or model builder

- Document and automate the processing steps (workflow) you carry out
1) You will forget
2) You may need to do it again
3) Re-run the analysis to experiment with different parameters to study how results are affected
4) Re-run the analysis if you find a mistake
5) Carry out repetitive, multi-step tasks

Concepts and terms for model builder

Elements: Variables, tools and connectors

Variables: Containers that hold values that can be changed. Data or value variables

A data variable: input or output (derived)

Value variable: e.g. buffer distance

Tools: common system tools, script tools, model tools, or custom tools.

Connectors: Lines that connect data to tools. Can be a simple data connector, an environment setting, a precondition, or feedback.
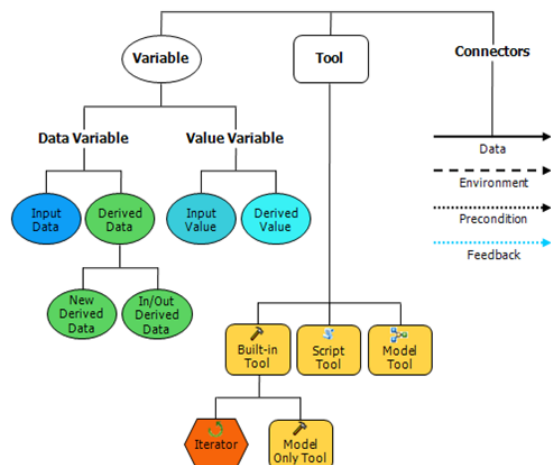
Concepts and terms for model builder

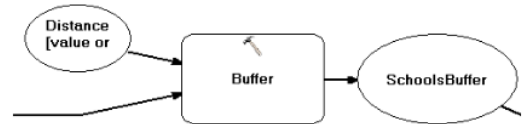Process: Consisting a tool and all variables connected to it (input data, derived data)

Process states: no-ready-to-run, ready-to-run, has-been-run

Click an item below.

Not ready to run
Ready to run
Already run

When model elements are white, they are NOT ready to run. The reasons for elements not being ready to run are varied. Maybe a tool parameter isn't properly set, or maybe the input data is incomplete, corrupt, or has some other problem.
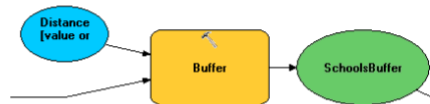
Concepts and terms for model builder

Click an item below.

Not ready to run
Ready to run
Already run

Model elements that are displayed in color are ready to run. The parameters for these elements have all been properly set.

Click an item below.

Not ready to run
Ready to run
Already run

The shadow, or shading, behind a model element indicates that the element has already been run. Only tool and derived data elements will display a shadow. Input data elements won't display a shadow because these elements are used only to produce derived data.

Intermediate data

Any data in a process that does not exist before the process is executed.

When you run a model from ModelBuilder, intermediate data remains: you need to delete it manually from the Model menu option. If you run the model from its tool dialog box, intermediate data is automatically deleted.

Location of derived data

The location in the Scratch Workspace environment variable. If this variable is blank, then

the location of the Current Workspace environment variable. If this variable is blank, then

the location of the first project data you add to the tool. If this location is read-only, then

your system temp directory.

It is recommended that you use a file geodatabase or a shapefile workspace for your scratch workspace.

Lab

ESRI online course:

Building Models for GIS Analysis Using ArcGIS

ESRI online tutorial:

Bathymetric landscape features and gray whale habitat usage

Working with NetCDF data in ArcGIS
http://desktop.arcgis.com/en/arcmap/10.3/manage-data/netcdf/exercise-1-displaying-a-raster-layer-from-a-netcdf-file.htm