

StateMod GUI Training

Getting Started

Version: 7.04.00, 2012-04-25

Duration: Approximately 45 minutes

Level: Introduction

Colorado's Decision Support Systems

Developed by DWR and CWC



This Presentation

- Provides an introduction to the StateMod graphical user interface (StateMod GUI) for new users
- Assumes some familiarity with the StateMod model and water allocation modeling
- Is designed for self-paced training
- Is accompanied by a sample StateMod dataset
 - See the doc/Training/data-cm2009 folder under the software installation
 - This is the Colorado main stem dataset

StateMod Model

- Developed for Colorado's Decision Support Systems (CDSS)
- Is the water allocation model, which simulates water deliveries, use, and return flows considering demands, water rights, physical data, and operating rules
- Is a command-line FORTRAN executable program that reads text input files and produces text and binary output files

StateMod GUI

- Is a graphical user interface (GUI) program that:
 - Provides visualization of StateMod data (input and output)
 - Runs StateMod
 - Provides the ability to edit data sets, with limitations
 - Enforces modeling conventions

CDSS Data-Centered Approach

- Open access to data
- Share data for multiple uses
- Applications focus on analysis and generating results/products

Data Collection

Data-Centered Management:
GIS/HydroBase

Data Management Interfaces
(DMIs)/Access Tools:

- TSTool, StateDMI, StateDGI, etc.
- StateView, Website

Applications/Models:

- Consumptive Use (StateCU)
- **Water Allocation (StateMod)**
- Groundwater (MODFLOW)
- Other

StateMod

Water Allocation Model

- Software and baseline data sets are provided by the State of Colorado (<http://cdss.state.co.us> – see Modeling Data...Surface Water)
- Refer to data set documentation
- StateMod software documentation describes model files
- StateDMI documentation describes data-centered approach to create model files

CDSS Automated Data Processing

Process Data

HydroBase

Model Network

Raw Data Files

Create StateMod input files by using StateDMI, TSTool, etc. to edit and run command files

Run Model

StateMod Input Files from processing

StateMod response (*.rsp) and control (.ctl) files

Run StateMod

Process Results

StateMod Output Files
Text reports and binary results files

View/Process/Publish Output
Using Editor, TSTool, **StateMod GUI**, etc.

To modify model input files, adjust command files and rerun DMI programs

Indicates activities that can be controlled by the StateMod GUI

StateMod GUI – Getting Started

Benefits of Automation

- “Touches” on data are more visible
- Logic is documented by command files
- Troubleshooting is facilitated by sequential processing, logging, and checks
- Processing is repeatable, and automated tests can be implemented
- Overall processing time can be much faster than non-automated processing
- Quality control can be automated

Limitations of Automation

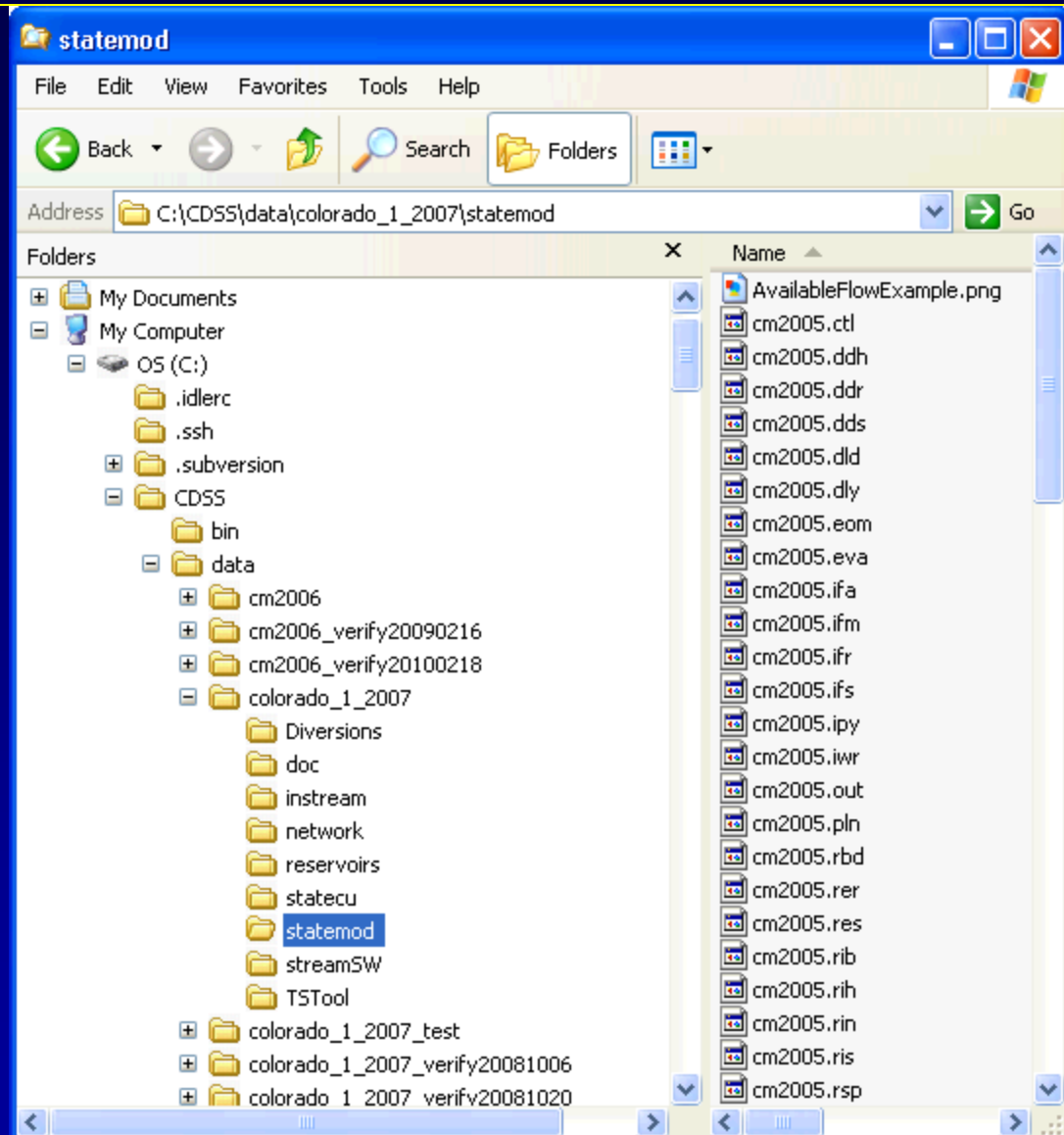
- Automation does not eliminate the need for human insight and review
- Modelers still need to understand model software, representation of the system, and input files
- Modelers still need to understand data processing and limitations of data

Role of the StateMod GUI

- The GUI provides features to navigate data sets, run StateMod, and visualize input and output
- Editing performed in the GUI should normally be limited to minor changes because the automated data-centered process will not be aware of such “one off” edits
- Future enhancements to the GUI will improve integration of automated processing and subsequent edits in the GUI

StateMod Dataset Files

- The “statemod” folder contains final model input files and results (can be distributed without other work files)
- Subfolders may be used for different scenarios (historical, calculated demands, etc.)



Notes on File Organization

- Does change over time, but has become relatively standardized
- Allows modelers to focus on specific files (e.g., diversions) in sub-folders to “divide and conquer” when preparing data files
- Working files in sub-folders ultimately result in files that are copied into the main “statemod” folder for distribution and model runs

StateMod Model and GUI Interaction

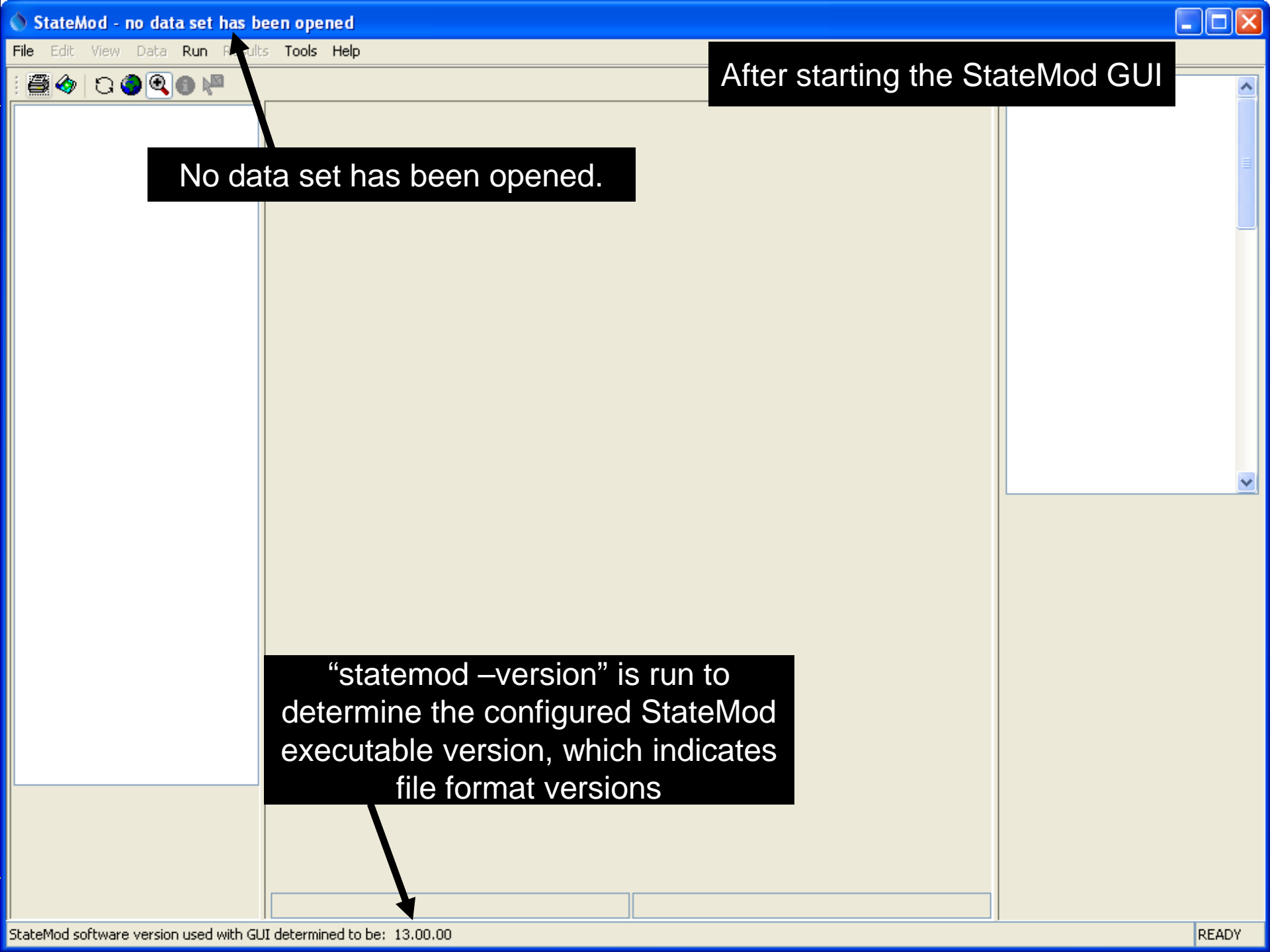
- The GUI is written in Java, whereas the StateMod software is FORTRAN
- The StateMod executable is run using a “system call” with command line parameters
- Screen output from StateMod is captured and displayed by the GUI
- The exit code and screen output from StateMod are interpreted by the GUI to determine whether an error occurred during the StateMod run
- All data exchange between StateMod and the GUI is via input and output files

Running the StateMod GUI

To run the GUI:

Start...All Programs...CDSS...StateModGUI-Version

(where Version is the installed version)



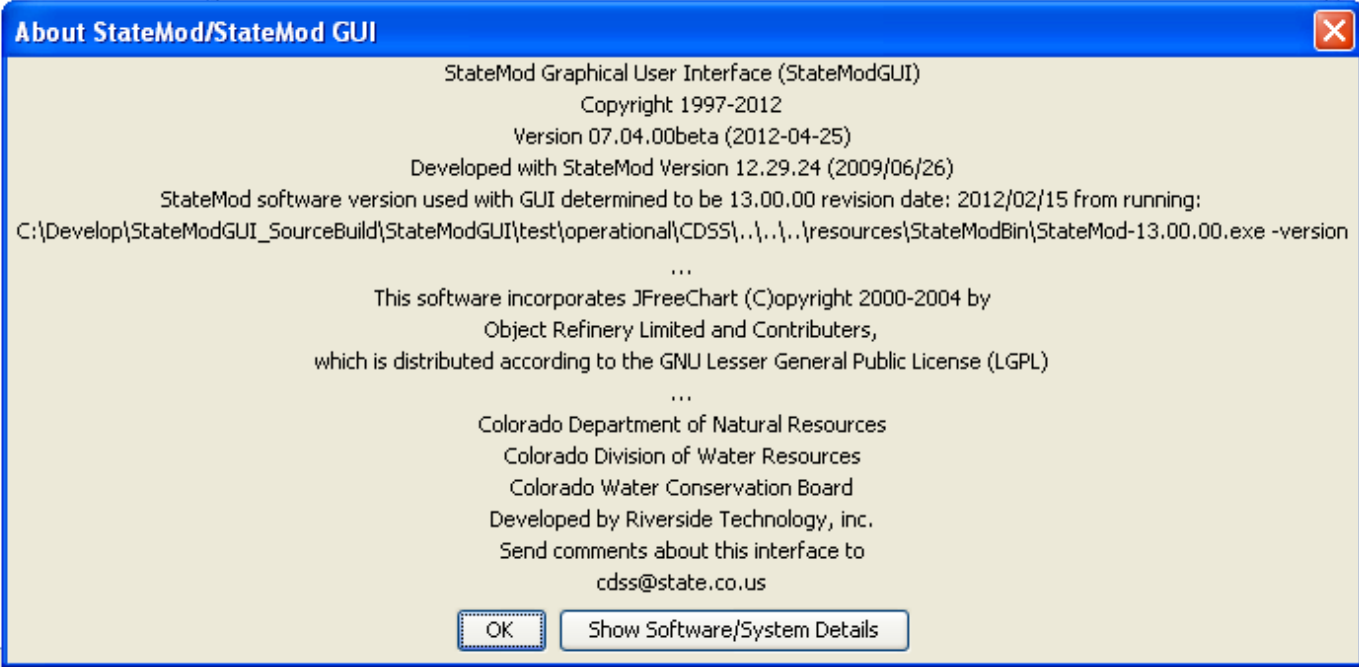
No data set has been opened.

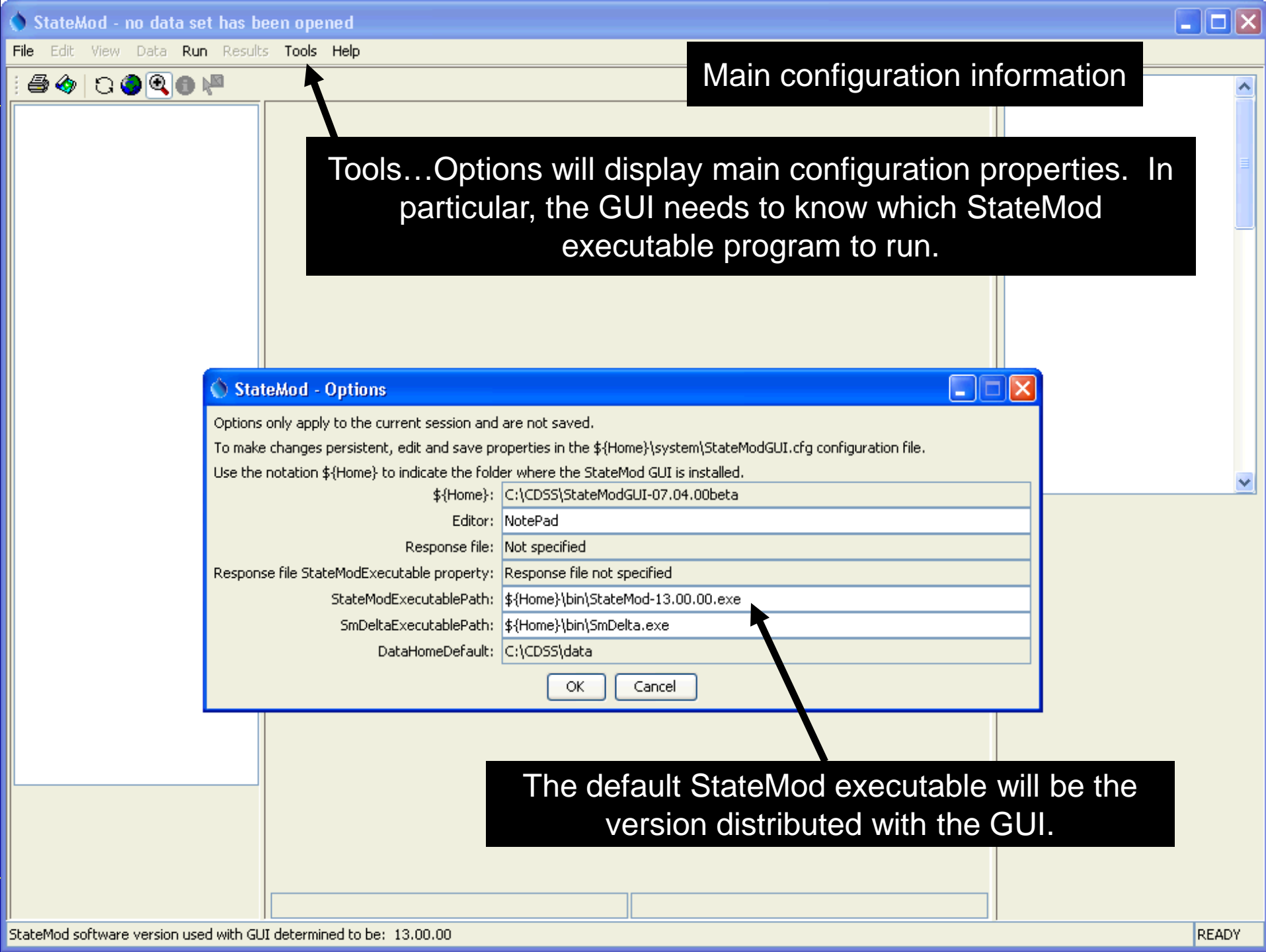
After starting the StateMod GUI

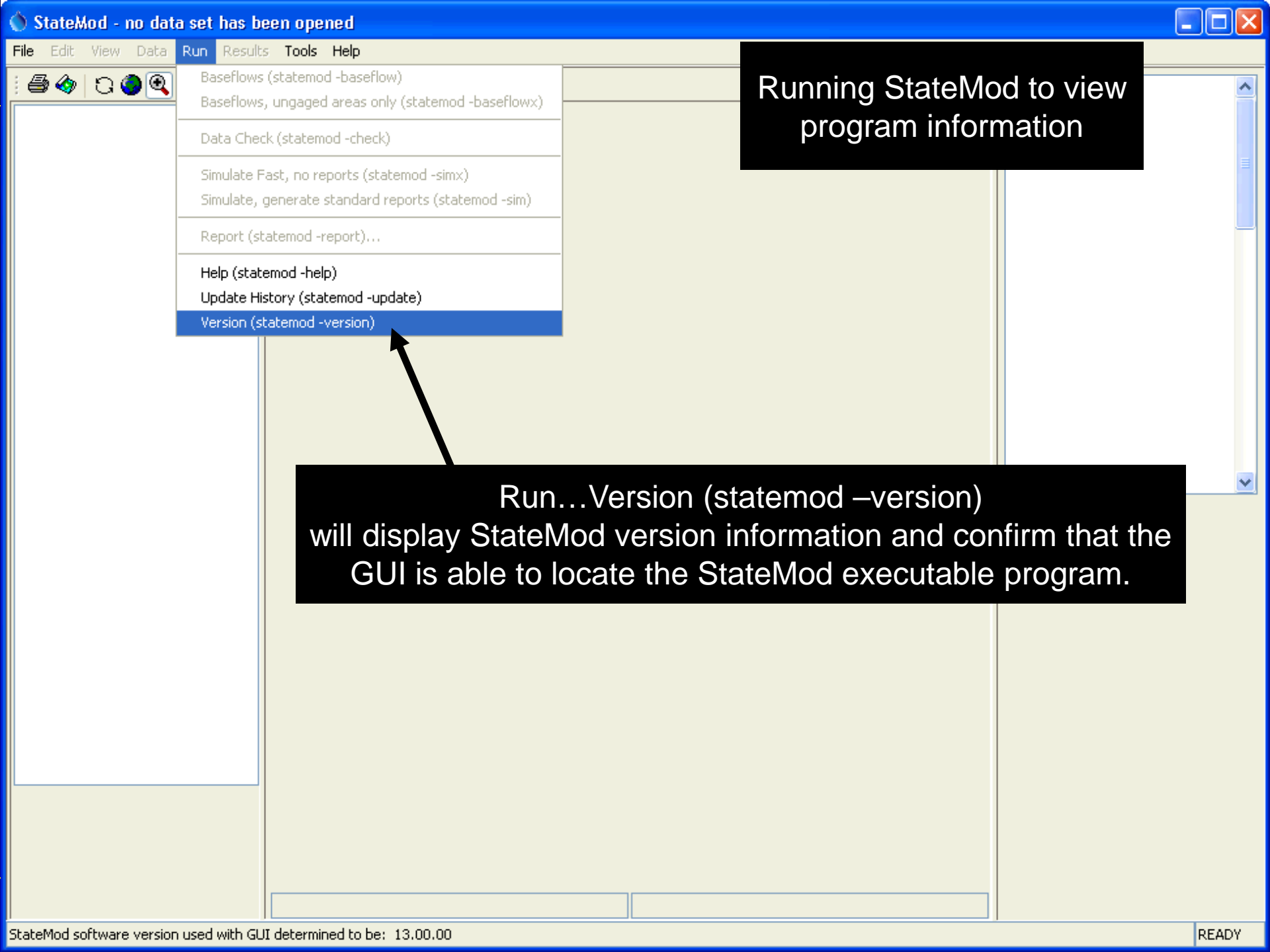
“statemod –version” is run to determine the configured StateMod executable version, which indicates file format versions



Help...About StateMod/StateMod GUI
also displays the StateMod version

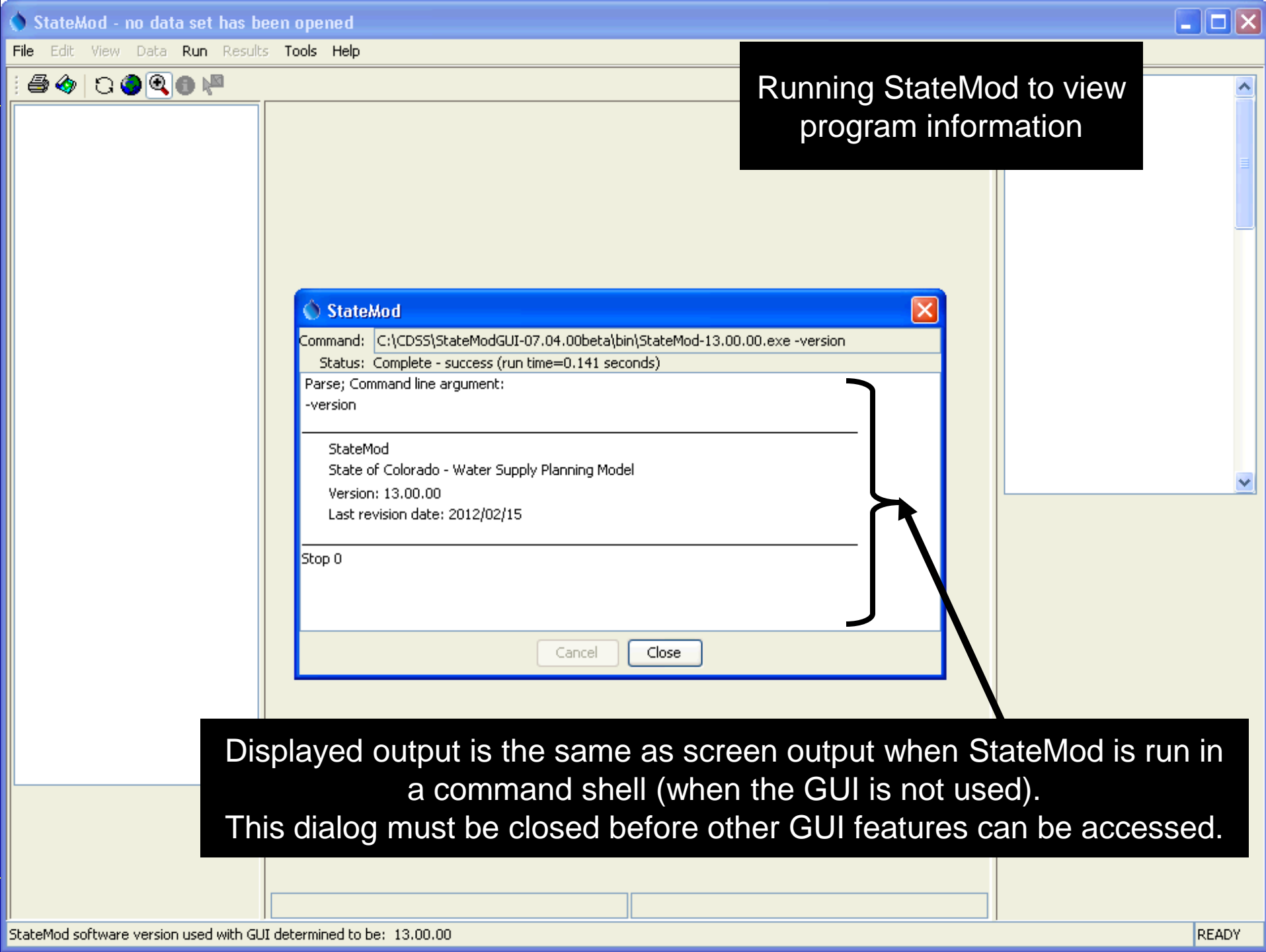






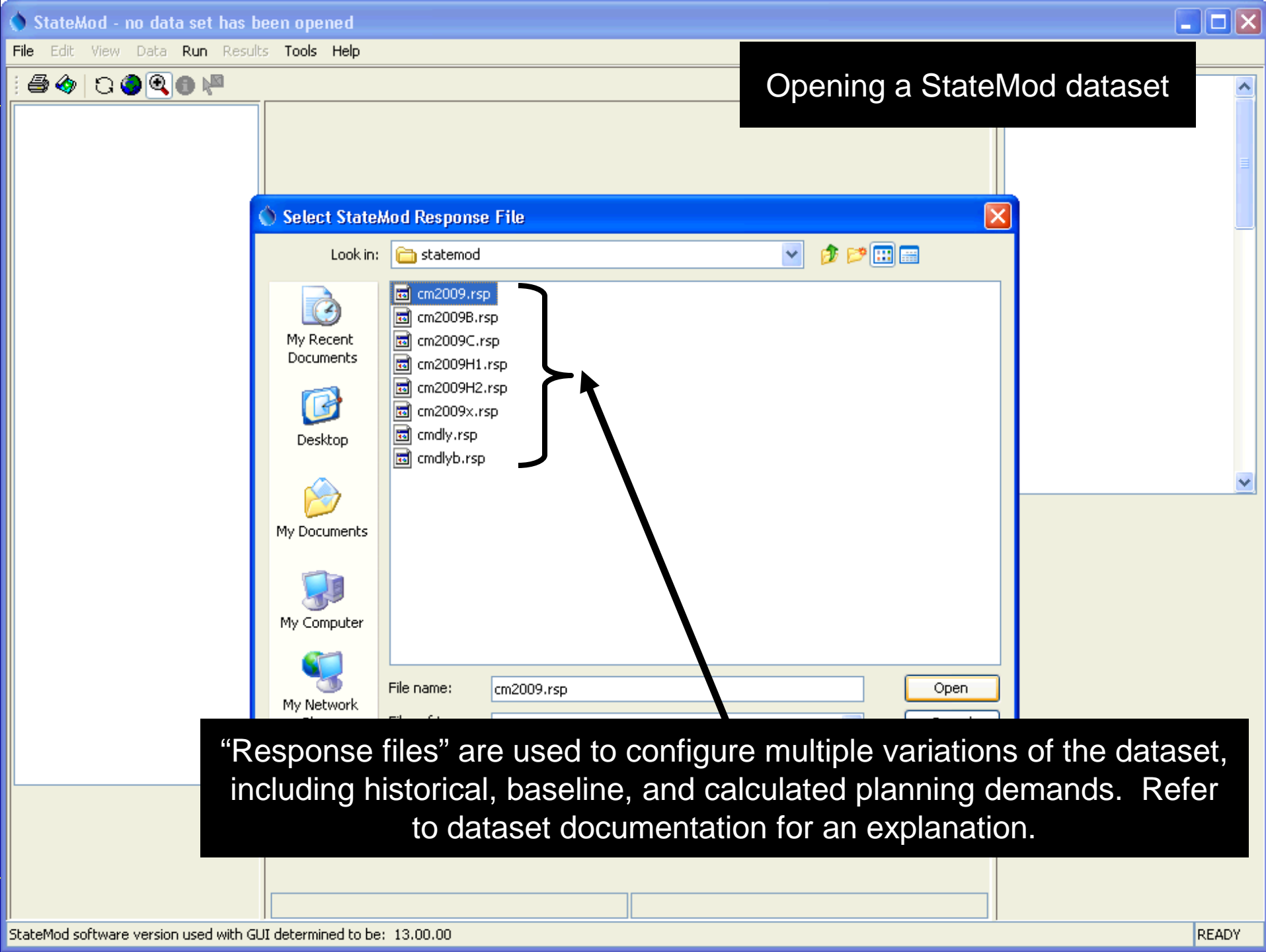
Running StateMod to view
program information

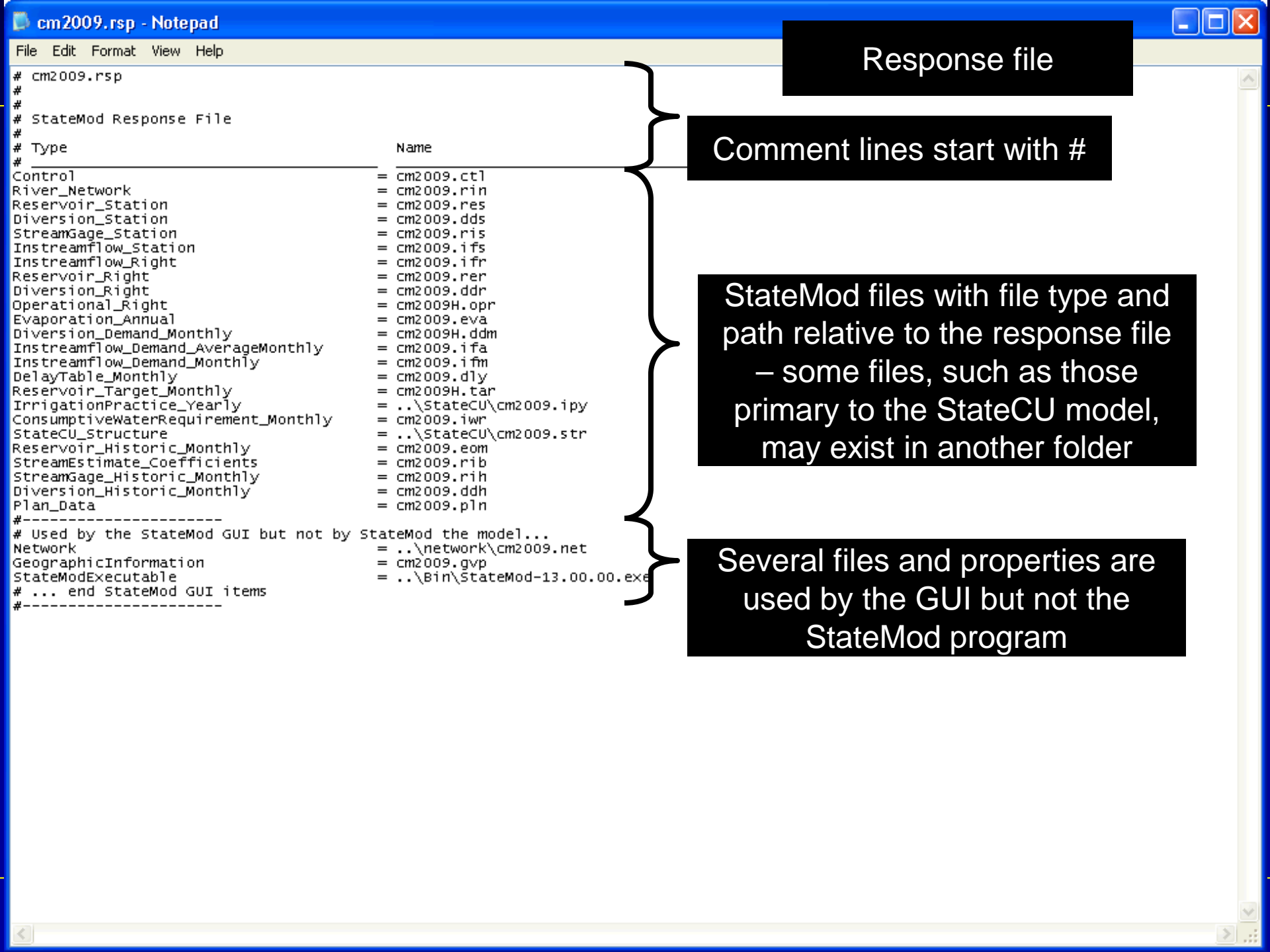
Run...Version (statemod -version)
will display StateMod version information and confirm that the
GUI is able to locate the StateMod executable program.



Opening an Existing Dataset

- File...Open...
- Select a *.rsp file in the “statemod” folder of the dataset
- For this example, choose the following (assuming defaults for installation):
 - C:\CDSS\StateModGUI-Version\doc\Training\data-cm2009\statemod\cm2009.rsp





Response file

Comment lines start with #

StateMod files with file type and path relative to the response file – some files, such as those primary to the StateCU model, may exist in another folder

Several files and properties are used by the GUI but not the StateMod program

Response file name

StateMod GUI after opening dataset

Tree
navigator for
dataset
components

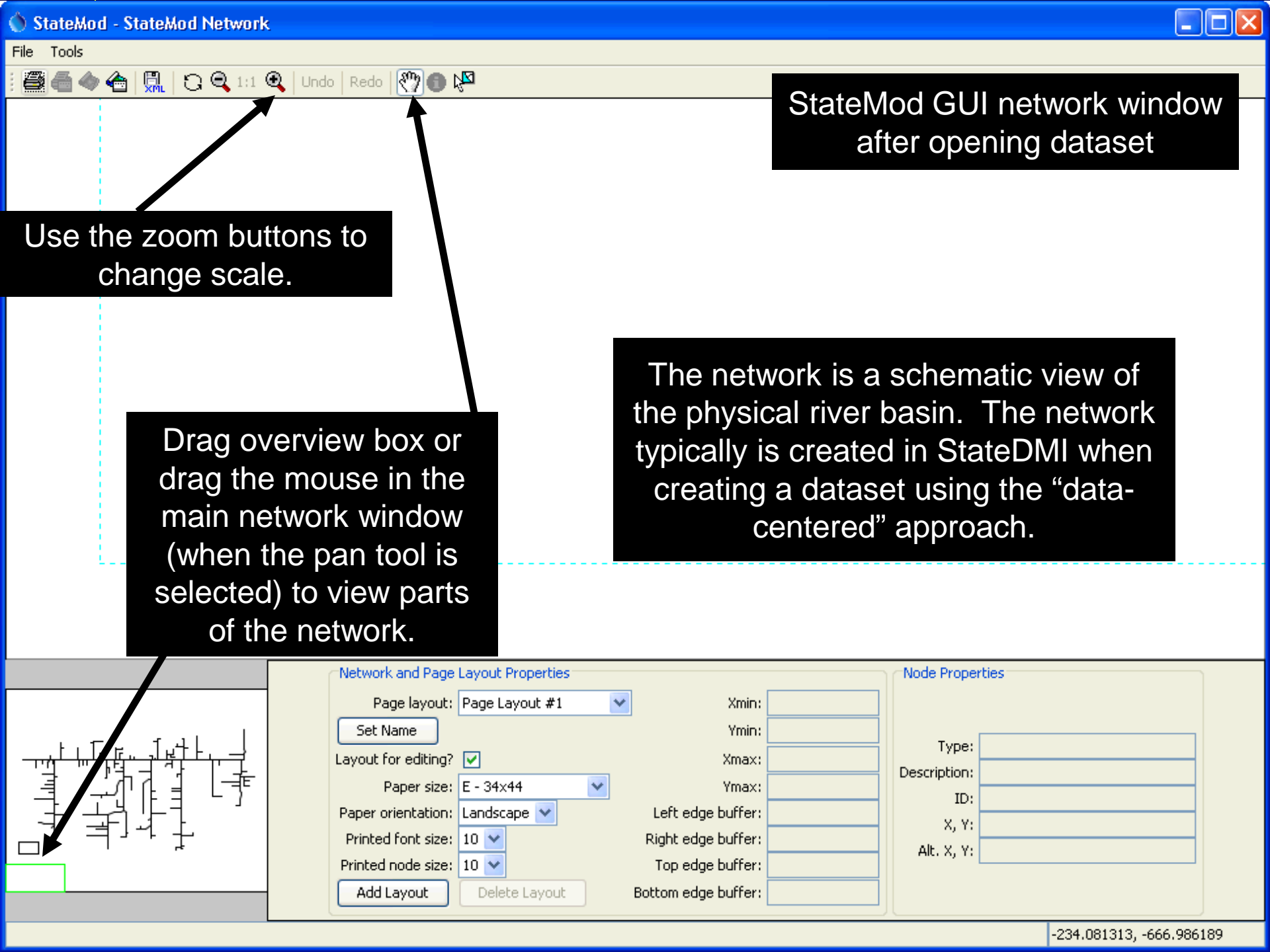
Interactive map to navigate dataset and view data (if dataset has been configured with map).

GeoView Project Opened

X, Y: 440470.162749,4429671.247740 UTM,13

Read all information for: "cm2009.rsp"

READY



StateMod GUI network window
after opening dataset

Use the zoom buttons to
change scale.

Drag overview box or
drag the mouse in the
main network window
(when the pan tool is
selected) to view parts
of the network.

The network is a schematic view of
the physical river basin. The network
typically is created in StateDMI when
creating a dataset using the "data-
centered" approach.

Network and Page Layout Properties

Page layout: Page Layout #1

Set Name

Layout for editing? ☒

Paper size: E - 34x44

Paper orientation: Landscape

Printed font size: 10

Printed node size: 10

Add Layout

Delete Layout

Xmin:

Ymin:

Xmax:

Ymax:

Left edge buffer:

Right edge buffer:

Top edge buffer:

Bottom edge buffer:

Node Properties

Type:

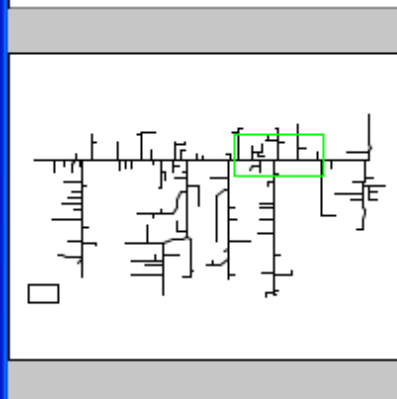
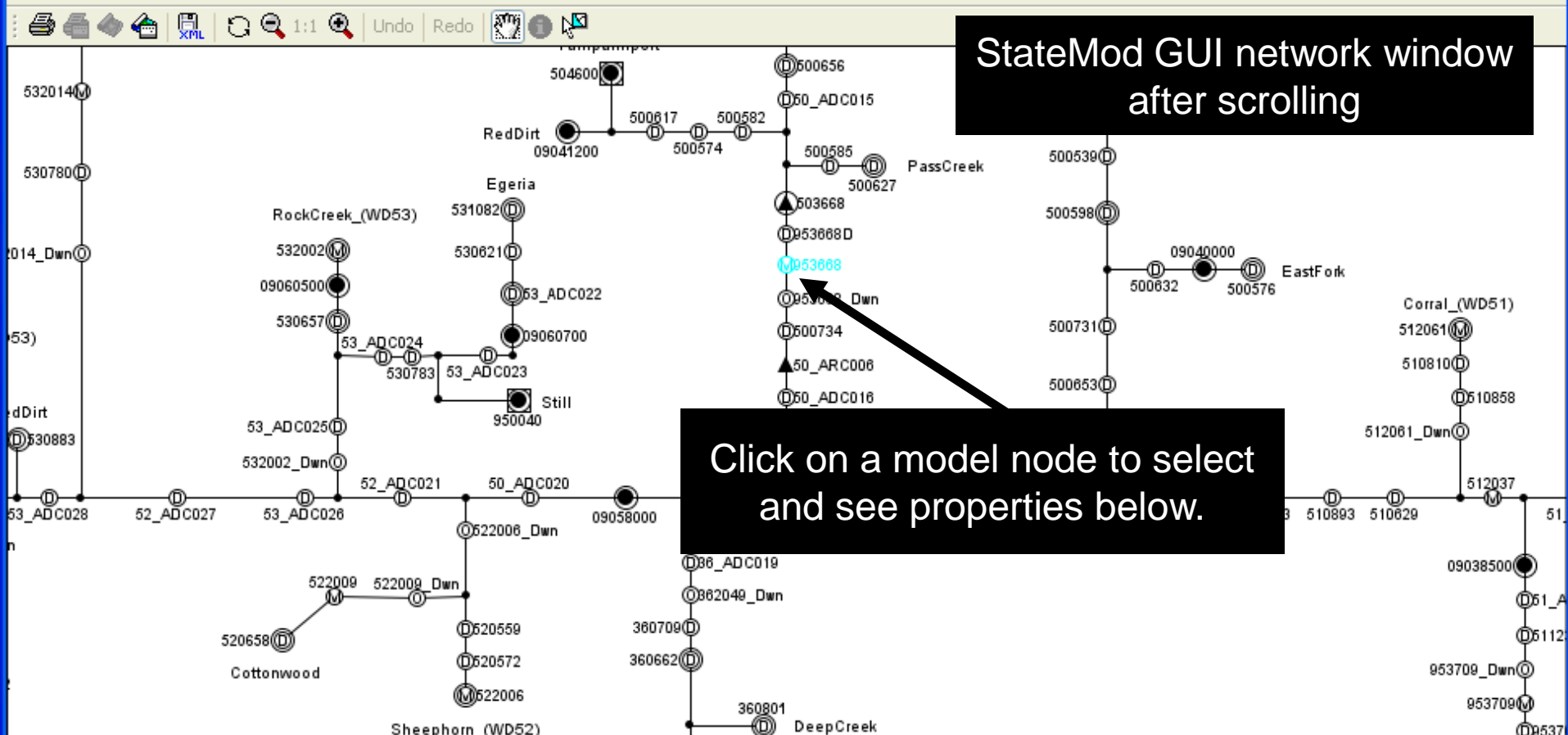
Description:

ID:

X, Y:

Alt. X, Y:

File Tools



Network and Page Layout Properties

Page layout: Page Layout #1

Set Name

Layout for editing? ☒

Paper size: E - 34x44

Paper orientation: Landscape

Printed font size: 10

Printed node size: 10

Add Layout

Delete Layout

Xmin:

Ymin:

Xmax:

Ymax:

Left edge buffer:

Right edge buffer:

Top edge buffer:

Bottom edge buffer:

Node Properties

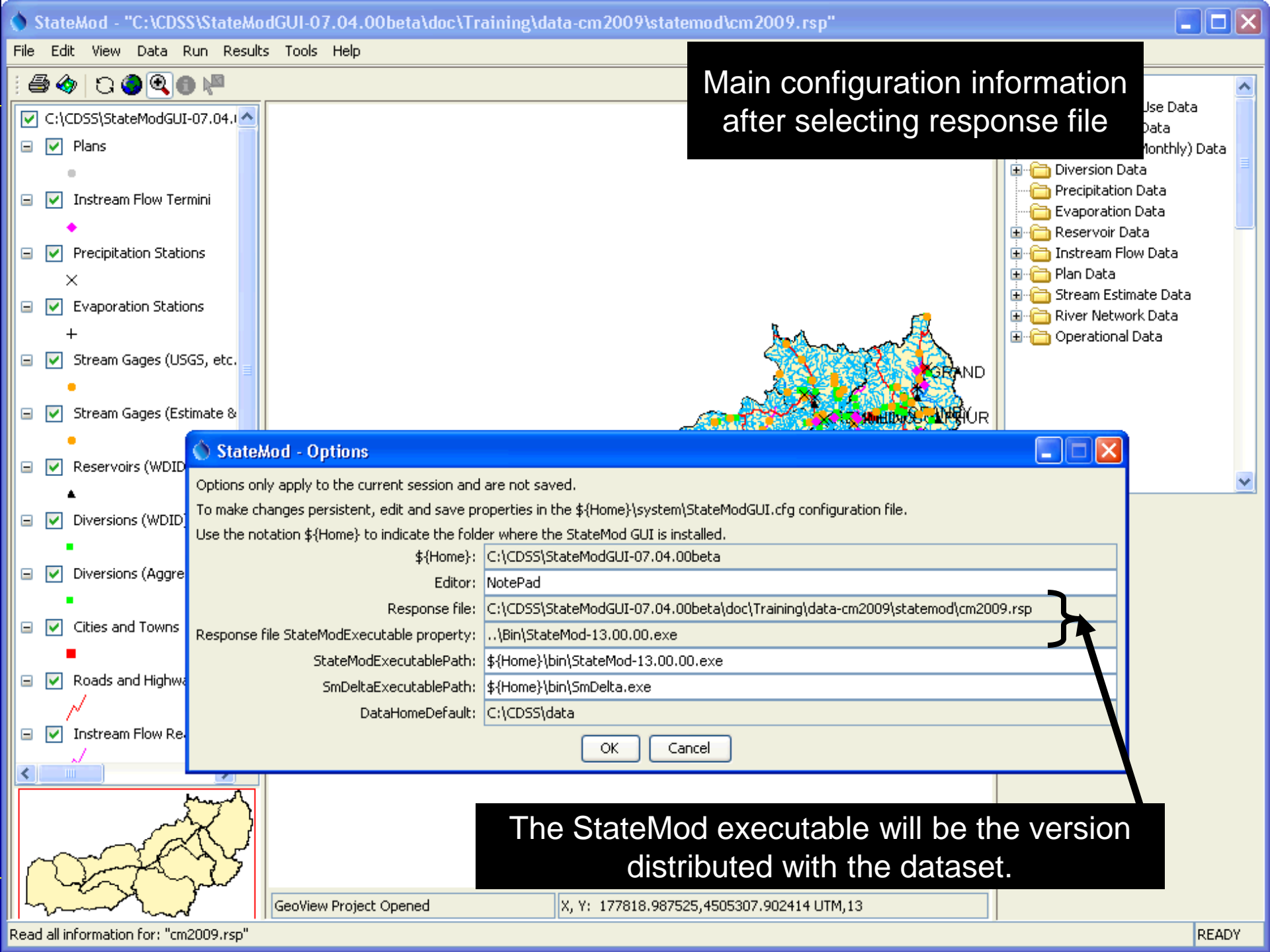
Type: Instream Flow

Description: WOLFORD RES BYPASS

ID: 953668

X, Y: 2469.787234, 1659.444444

Alt. X, Y: -1.000000, -1.000000



Main configuration information
after selecting response file

StateMod - Options

Options only apply to the current session and are not saved.
To make changes persistent, edit and save properties in the \${Home}\system\StateModGUI.cfg configuration file.
Use the notation \${Home} to indicate the folder where the StateMod GUI is installed.

Home:	C:\CDSS\StateModGUI-07.04.00beta
Editor:	NotePad
Response file:	C:\CDSS\StateModGUI-07.04.00beta\doc\Training\data-cm2009\statemod\cm2009.rsp
Response file StateModExecutable property:	..\Bin\StateMod-13.00.00.exe
StateModExecutablePath:	\${Home}\bin\StateMod-13.00.00.exe
SmDeltaExecutablePath:	\${Home}\bin\SmDelta.exe
DataHomeDefault:	C:\CDSS\data

OK Cancel

The StateMod executable will be the version
distributed with the dataset.

GeoView Project Opened

X, Y: 177818.987525,4505307.902414 UTM,13

Read all information for: "cm2009.rsp"

READY

Recommendations for Modelers

- Use CDSS best practices for modeling, including data-centered approach for preparing StateMod data files.
- Use the StateMod GUI for visualizing data, running StateMod, and visualizing results.
- Limit the editing performed in the GUI if such editing will negatively impact data-centered processes.
- Provide feedback on software, data sets, and documentation to foster continued improvement.

More Information

Help...View Documentation to view the StateMod and StateMod GUI documentation.

Help...View Training Materials to view additional StateMod GUI training materials.

Basin model documentation describes in detail the sources of data, estimates, and processes that were used to create the data sets, and summarizes results.

Numerous task memoranda, reports, software documentation, and other documents provide technical information and are available on the CDSS web site:

<http://cdss.state.co.us>