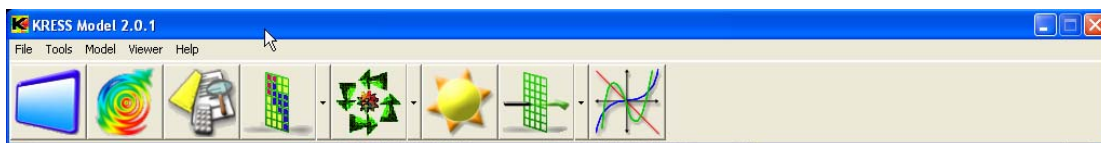


Exercise 7

Building a Time Step Non-Linear Model of Cattle Distribution in the California Foothills

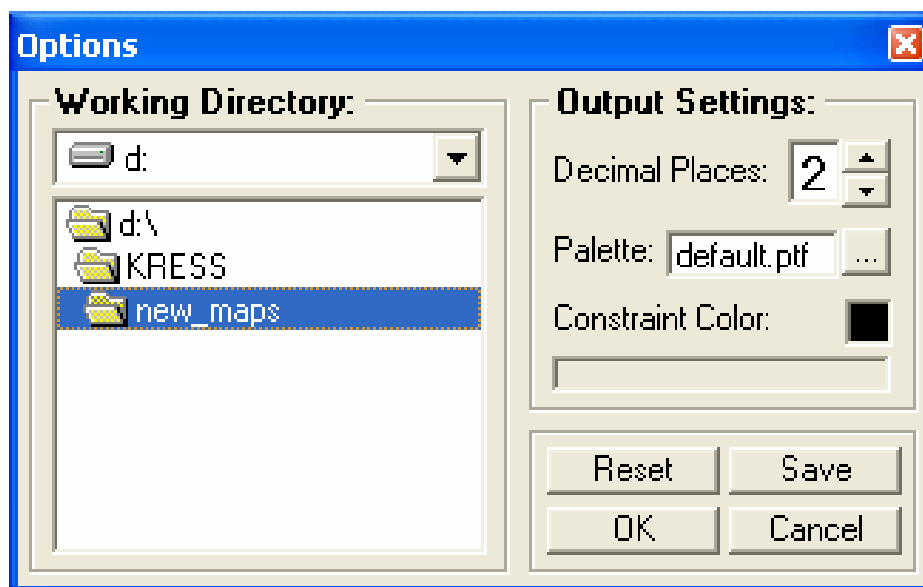
Step 1: Start KRESS program

To launch the KRESS model, double click on the icon.



Step 2: Set the Working Directory and Output Setting

Depending on where you saved the files for this exercise, set your working directory. Choose a palette for the factor and constraint layers.

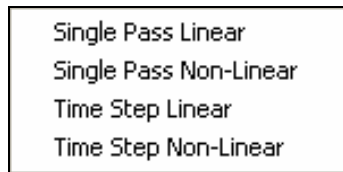


Step 3: Launching the Multi-Criteria Analyses

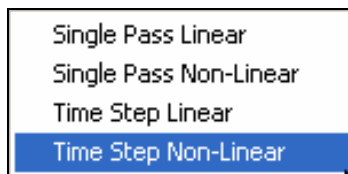


From the lower tool bar, click on the Multi-Criteria Analyses icon.

This will initiate a dropdown menu that has four choices: Single Pass Linear, Single Pass Non-Linear, Time Step Linear, and Time Step Non-Linear. You can choose one of these four types of models.



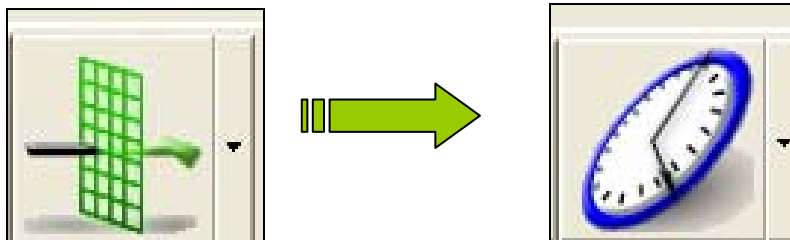
For this exercise, click on the fourth choice, "Time Step Non-Linear".



You can also click "Model" on the menu bar, then "New", "Time Step MCE", and "Non-Linear", or hit the F5 key.



Notice that the icon changes to display a clock.



Step 4: Setting the Starting and Ending Date and Time - Time Step Information – Step 1/5

This will open a new window entitled “Time Step Information – Step 1/5”

Year: 1 Month: January Day: 1
Start: 1 January 1
Year: 1 Month: January Day: 10
End: 1 January 10
Time Step Increment: 1 Day

Extended Exit **Next >** Help

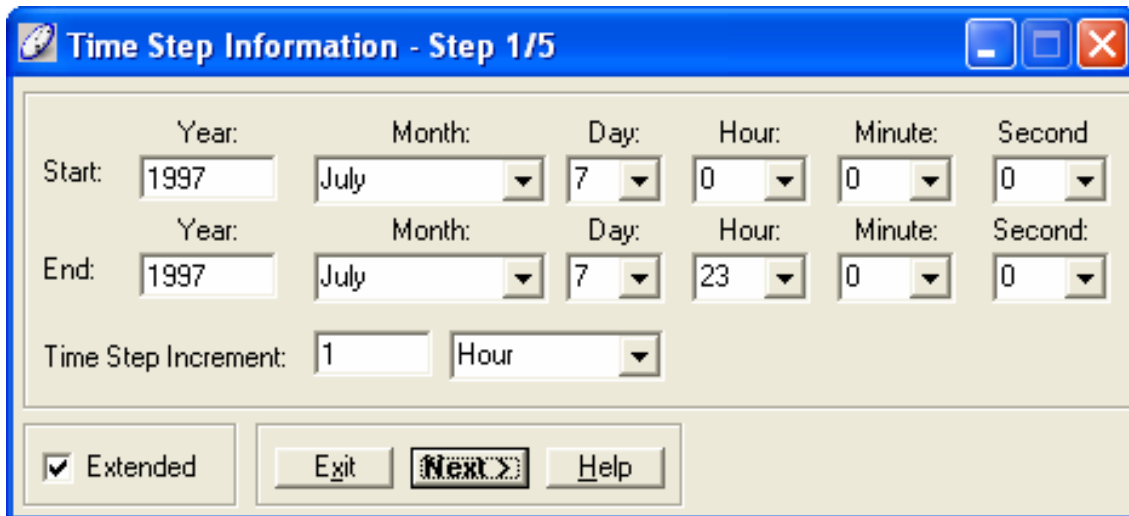
Click the “Extended” checkbox on the “Time Step Information” module.

Year: 1 Month: January Day: 1 Hour: 0 Minute: 0 Second: 0
Start: 1 January 1 0 0 0
Year: 1 Month: January Day: 10 Hour: 0 Minute: 0 Second: 0
End: 1 January 10 0 0 0
Time Step Increment: 1 Day

Extended Exit **Next >** Help

Choose the following using the drop down arrows:

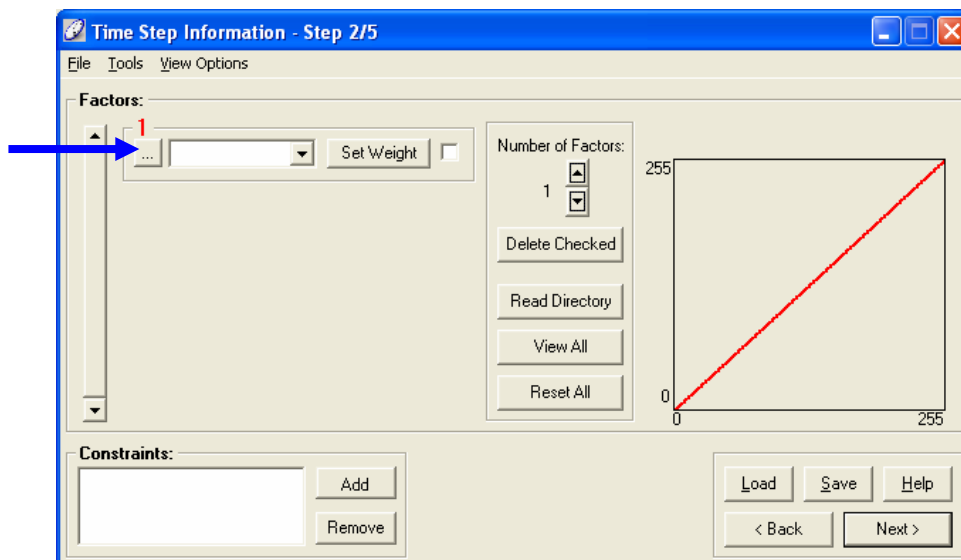
The data used in this exercise cover a 24 hour period on July 07, 1997.



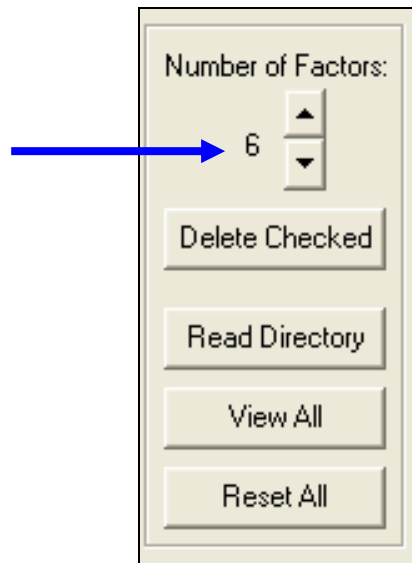
Then click the “Next” button to access the Time Step Information Step 2/5.

Step 5: Loading the Factors - Time Step Information Step 2/5

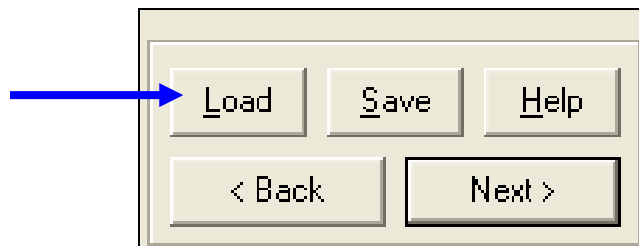
The next step is loading the factors in the “Time Step Information - Step 2/5” window. The factors can be loaded either one at a time or all at once. To do them individually, click on the “...” button next to the file name to search for the desired file. The file name can also be typed directly into the blank text space; however, for the file to be found there can be no spelling errors.



Set the number of factors to 6.



If you want to add all the files in a working directory, click on the “Load” button. It is important to remember that all factor formats are ASCII raster layers and should have the “.asc” extension.

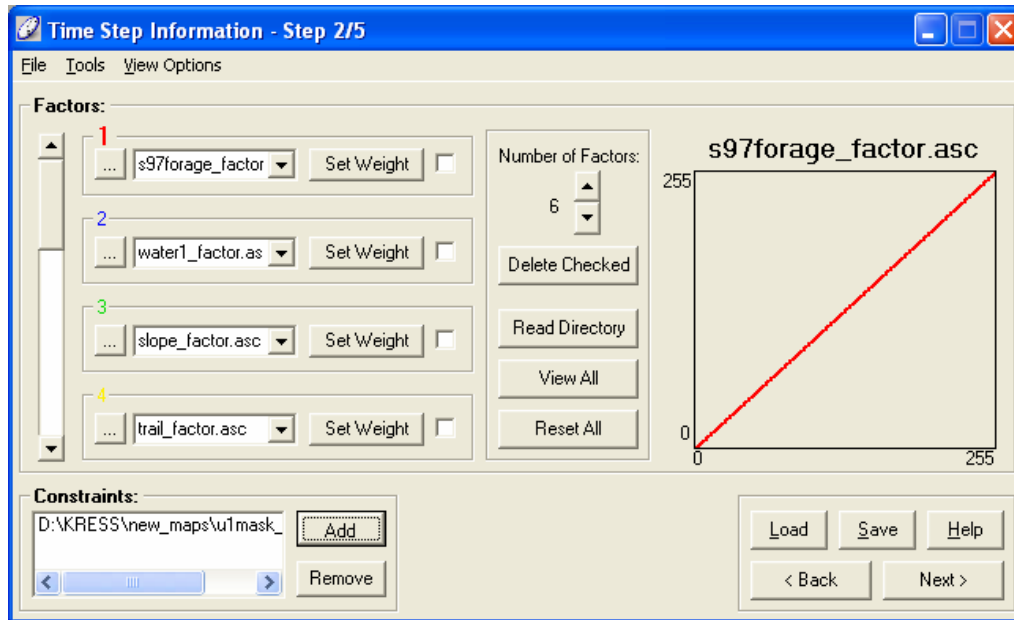


From \Program Files\KRESS\Maps folder select the following files:

1. “s97forage_factor.asc”,
2. “water1_factor.asc”,
3. “slope_factor.asc”,
4. “trail_factor.asc”,
5. “supplements97_factor.asc”, and
6. “temp00.asc” (solar/temperature).

Step 6: Add the Constraint Layer

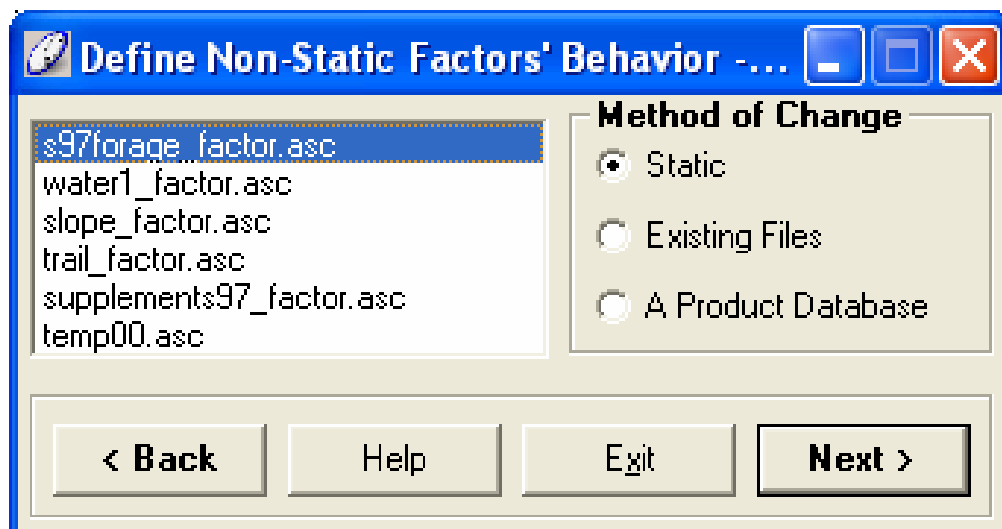
Click the “Add” button for the “Constraints” box and select “u1mask_10m.asc”.



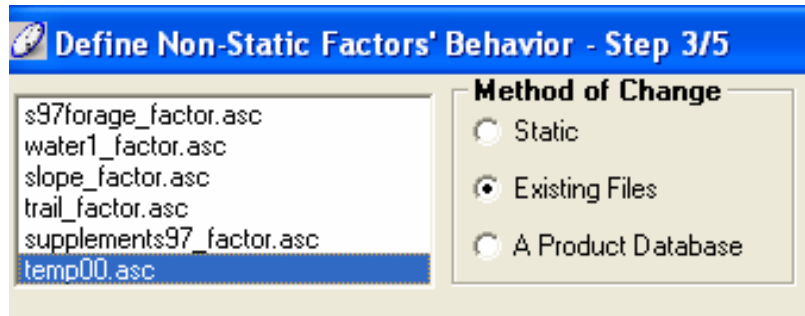
Define weights for each using the “Set Weight” button as done in the previous exercise.

When done click the “Next” button.

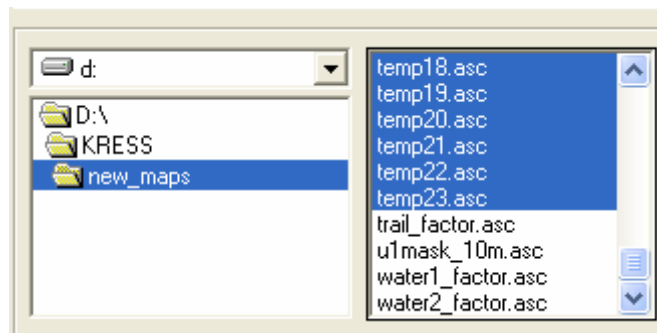
Step 7: Define Non-Static Factors' Behavior - Time Step Information Step 3/5



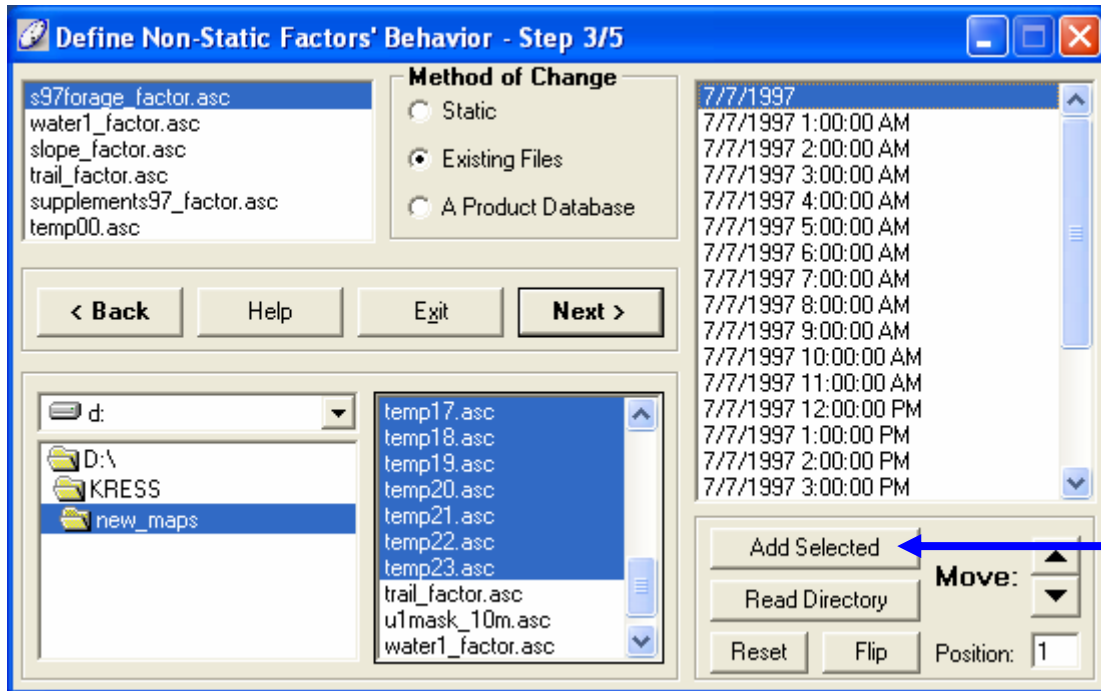
Define Non-Static Factors. Highlight the temperature file “temp00.asc” from file list and click the “Existing Files” selector for “Method of Change”.



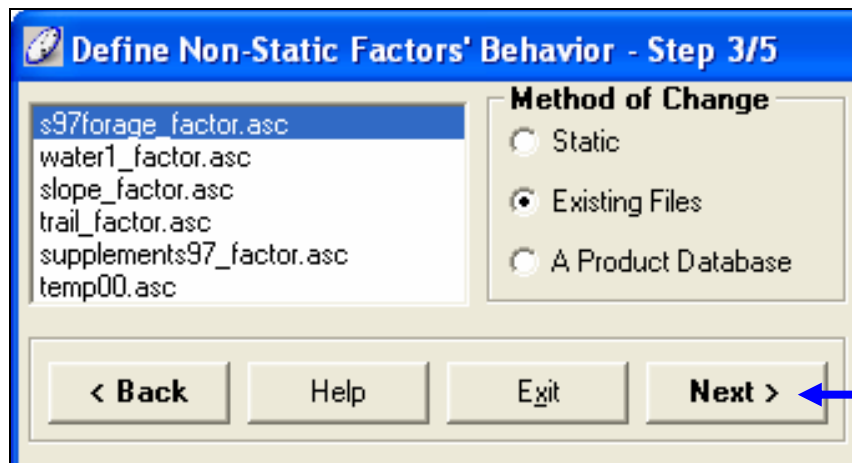
Highlight “temp00.asc” in file selection list, hold down the shift key, then scroll down and click on “temp23.asc” to select all files through “temp23.asc”.



Next, click to highlight “7/7/1997” and then click on the “Add Selected” button.



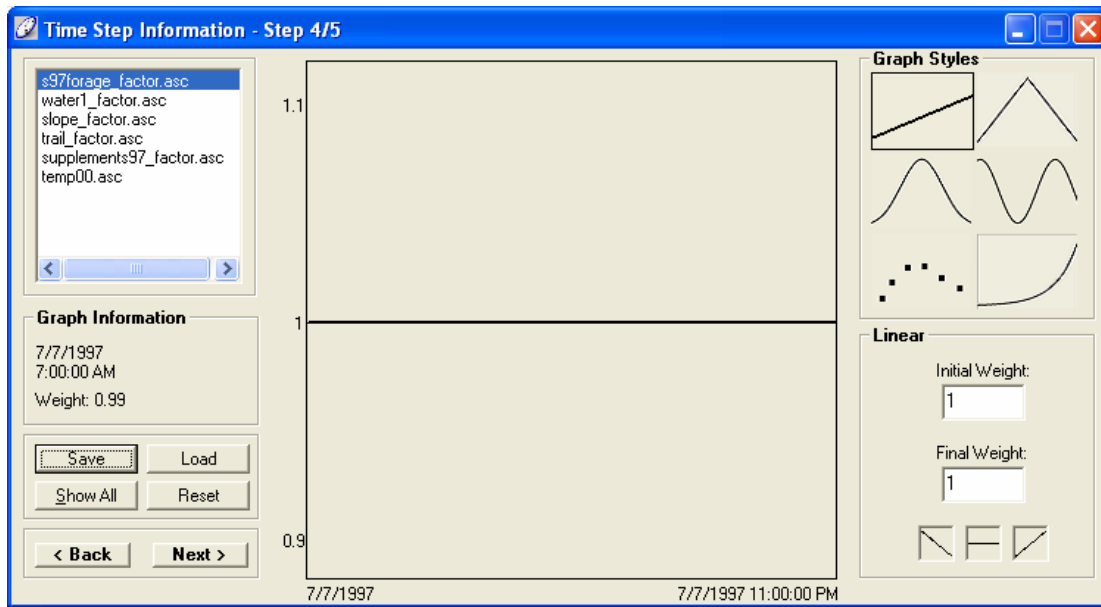
Click the “Next” button.



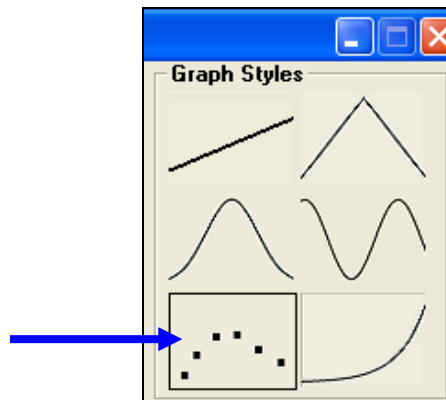
Step 8: Set Weights for Behavior – Time Step Information Step 4/5

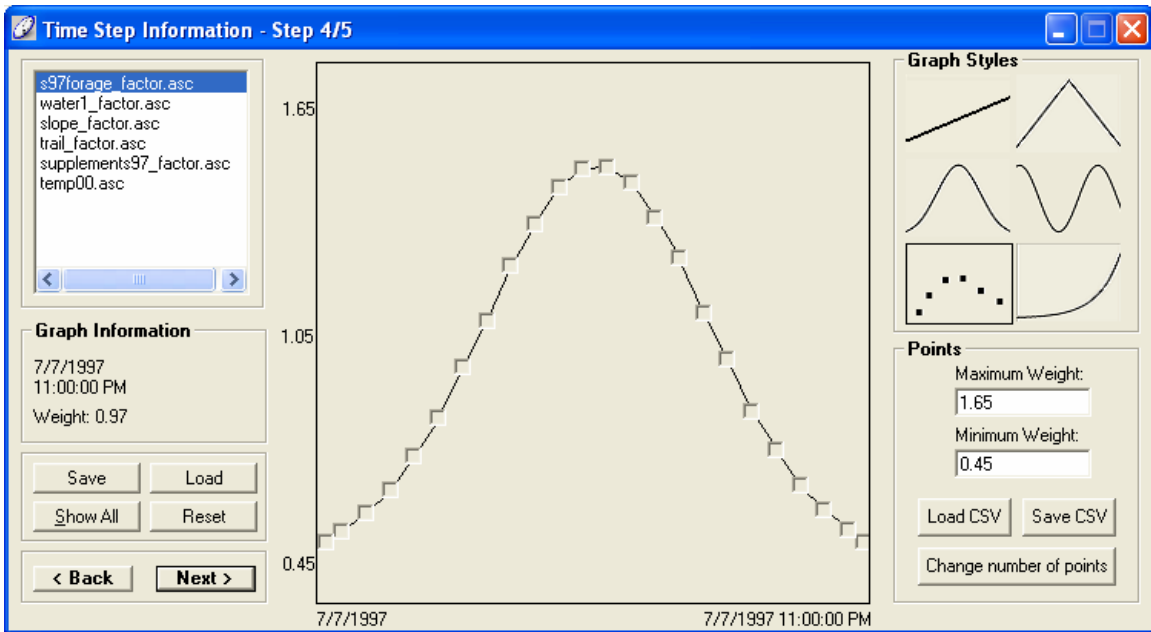
Time Step Information – Step 4/5. Set weights for behavior over the time period for each factor using either weighting graphs or define using *.csv files.

The default setting shows a linear relationship between weights. To change this, click on the “Graph Styles” tab.

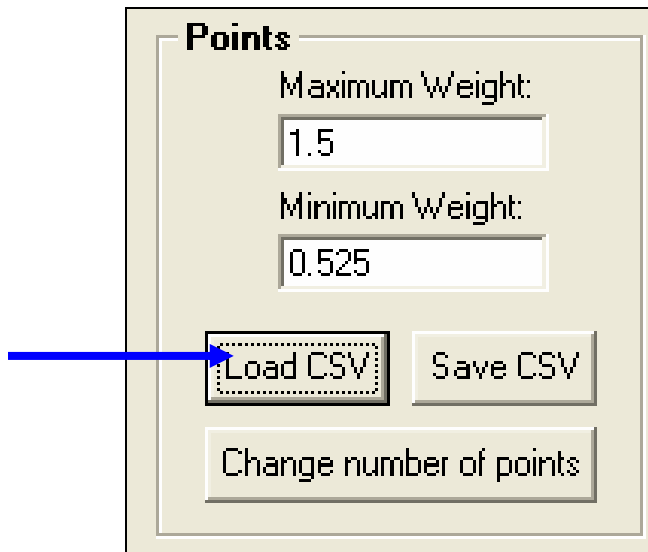


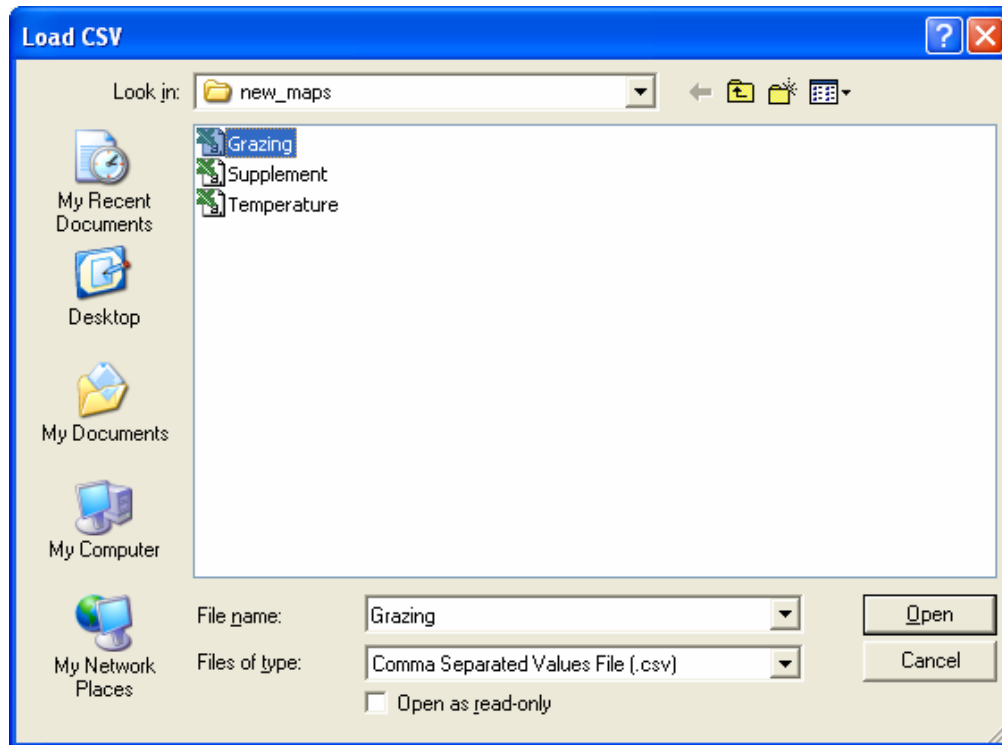
If you want to use a .csv file, click the graph box for an editable graph (lower left box of the six) and a button labeled “Load CSV” will appear. The curve shown is from a .csv file called “grazing.csv” which is scaled from data showing the percentage of cows grazing for each hour in summer.



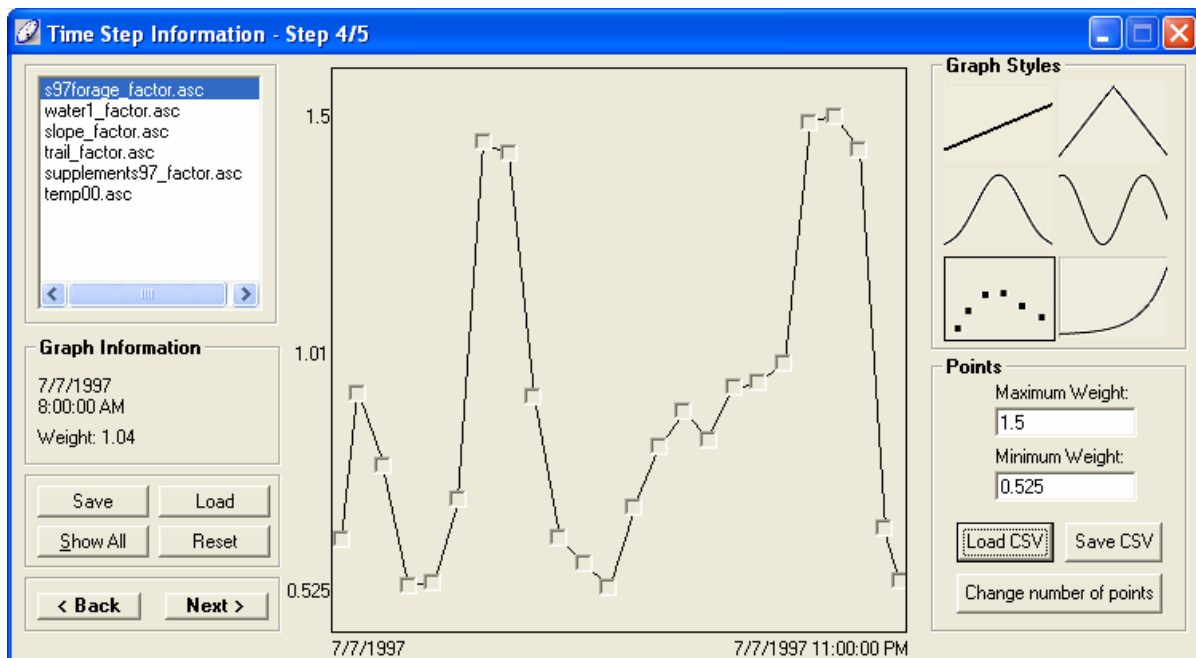


Click on the “Load CSV” button.





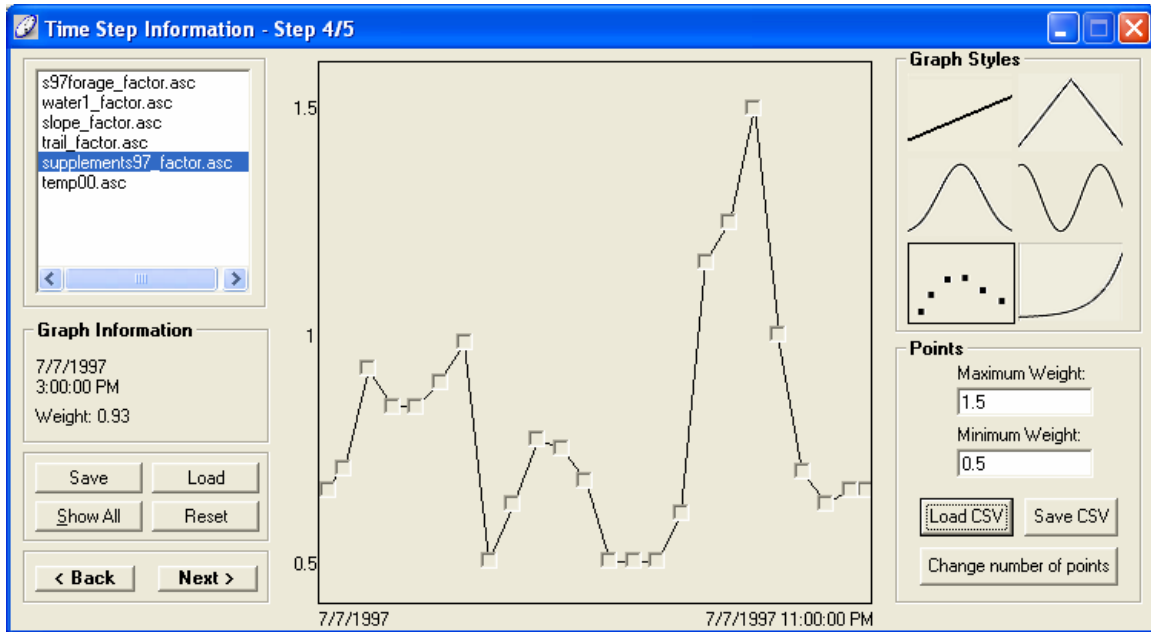
Forage Factor



Time periods in the .csv file must match the increments of the time step (24 entries for 24 hours in day).

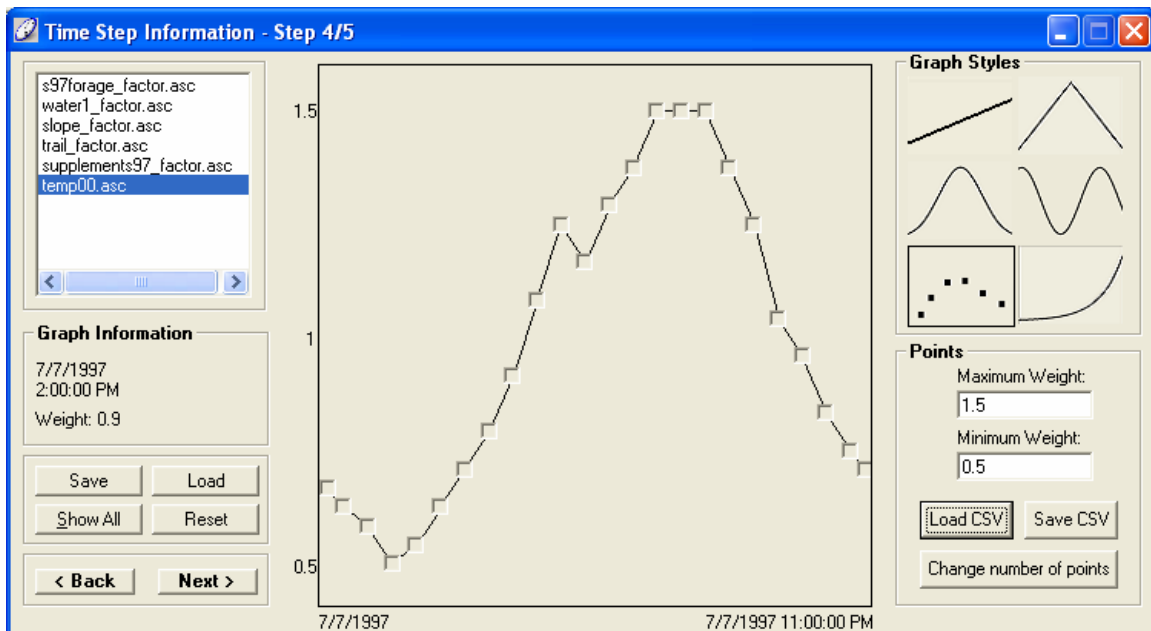
Additional .csv files are included for “supplement.csv”.

Supplement Factor



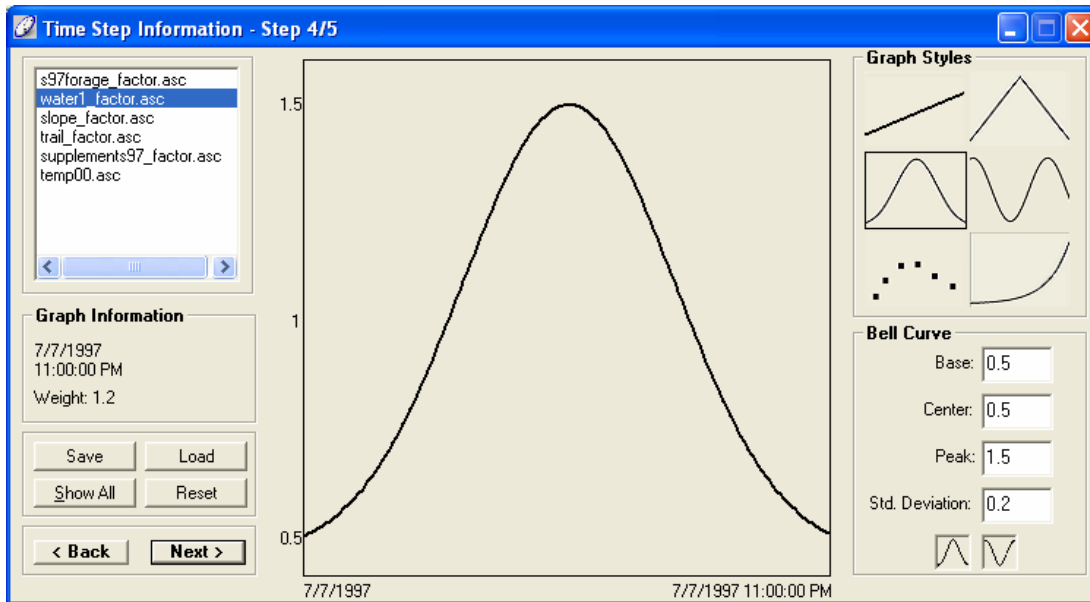
and “temperature.csv”.

Temperature Factor



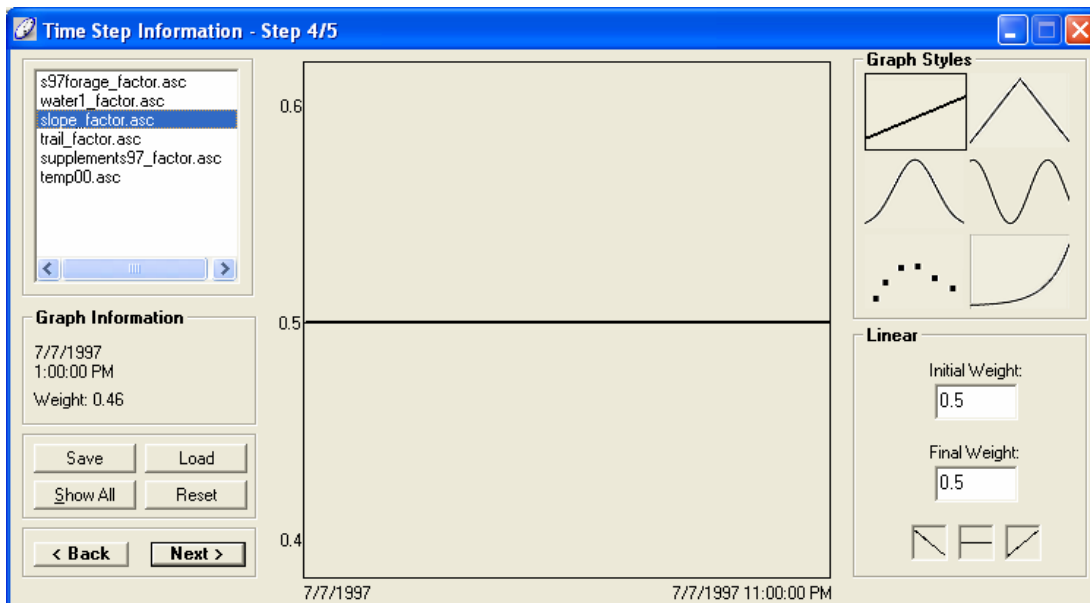
“Water1_factor.asc” can be modeled with a bell-shaped curve with a Base of “0.5”, a Center of “0.5”, a Peak of “1.5” and a Std. Deviation of “0.2”.

Water Factor

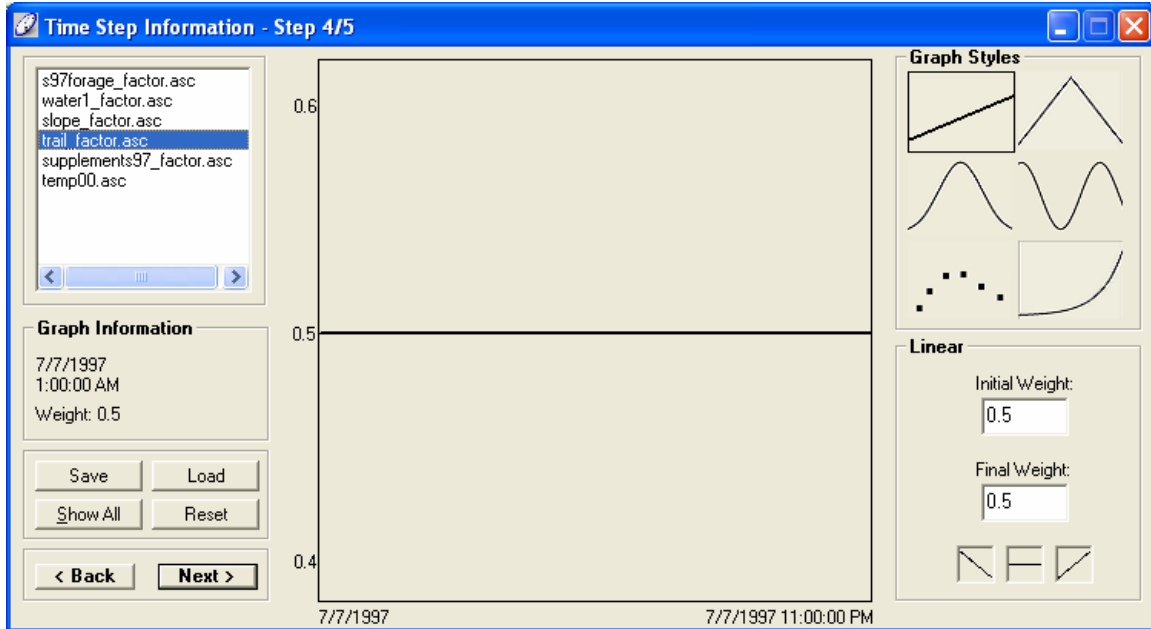


“Slope_factor.asc” and “trail_factor.asc” can be modeled with a straight line with an Initial Weight of “0.5” and a Final Weight of “0.5”.

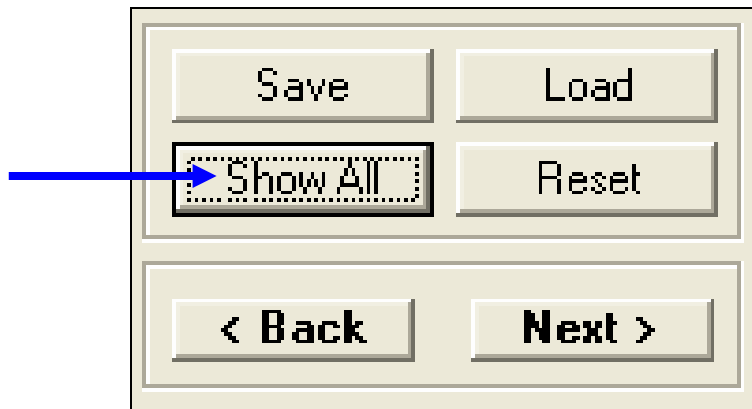
Slope Factor

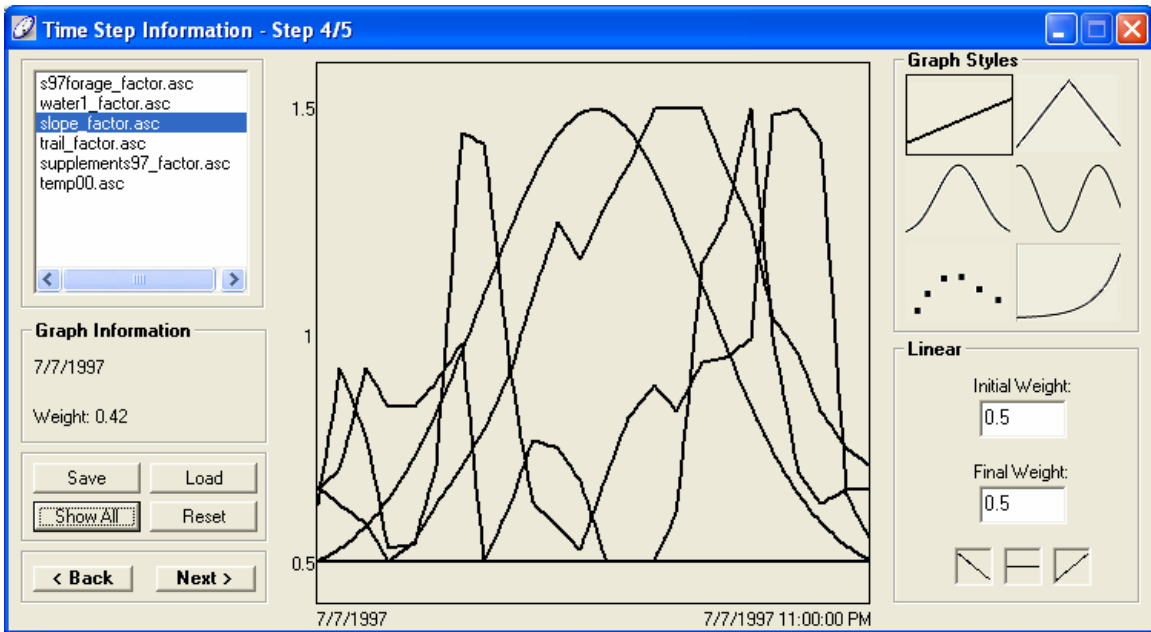


Trail Factor



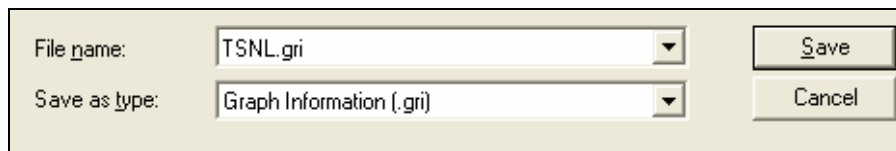
All weights can be shown on a single graph by clicking the "Show All" button.



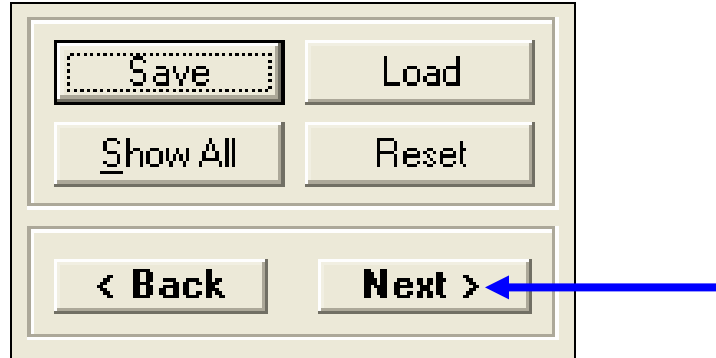


Step 9: Saving Graph Information

The graph information (weights) should be saved. Click on the “Save” button to do this. The file name can remain the same because the file type changes to a “Graph Information” file (“*.gri”).

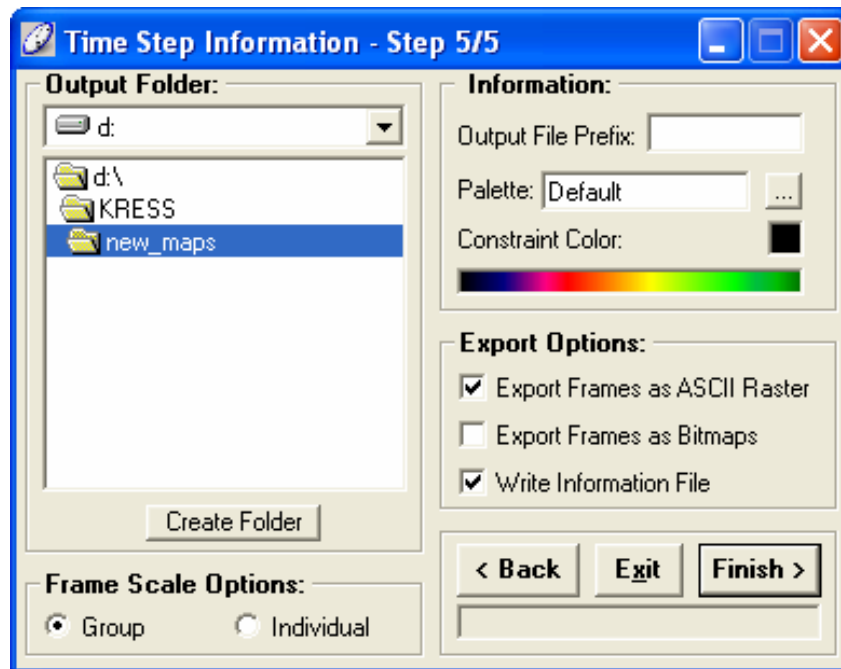


Click the “Next” button.



Step 10: Output Information – Time Step Information – Step 5/5

Choose a folder to write files to, enter a name for files, choose a palette and constraint color. The “Frame Scale Option” you want is “Group”. You have the option to output time steps as individual .ascii or .bmp files for import into other programs. Then click on the “Finish” button and the data will be processed.



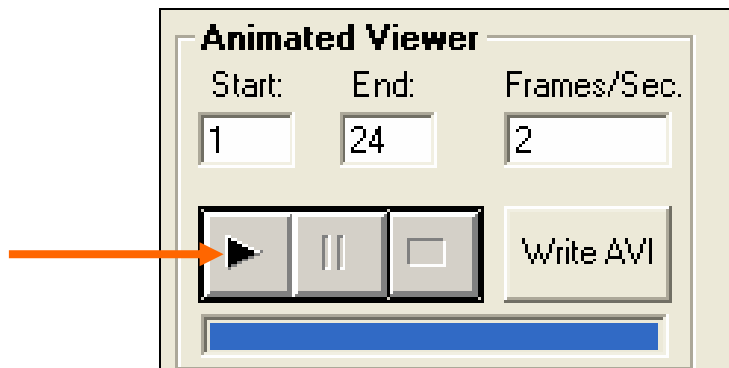
Step 11: Run the Model

Once the model has been saved, you can run it. Click on the “Finish” button and watch the progress bar indicating the length of time before completion. This process should not take more than few seconds.

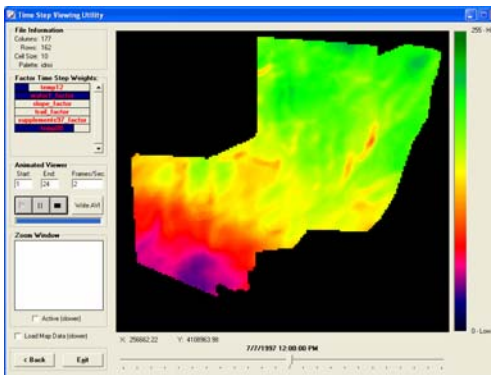
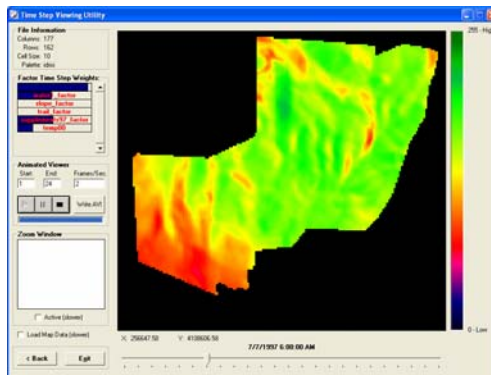
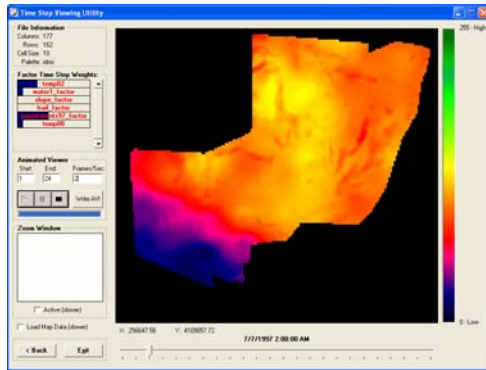
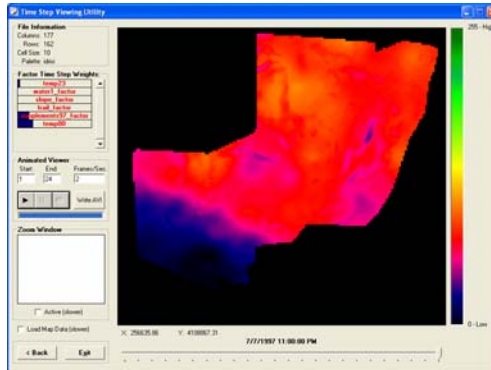


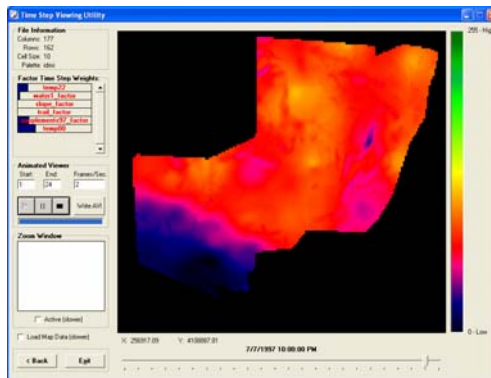
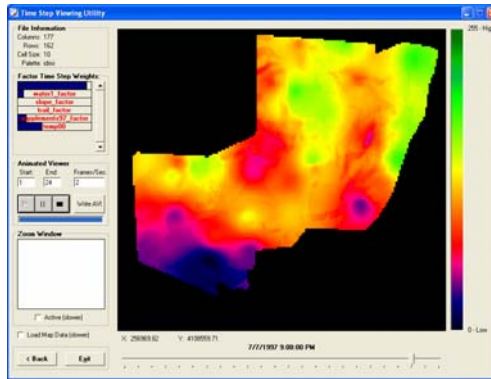
Step 12: Viewing Animated Maps

When the “Time Step Viewing Utility” window opens, type in the number of frames to show in “Frames/Sec.” and click the play button to view the sequence.



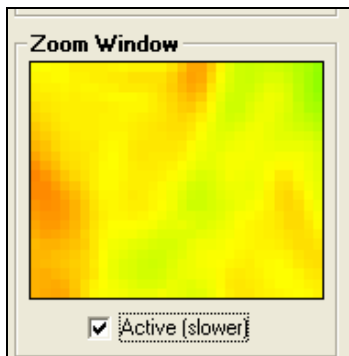
Sample of output map

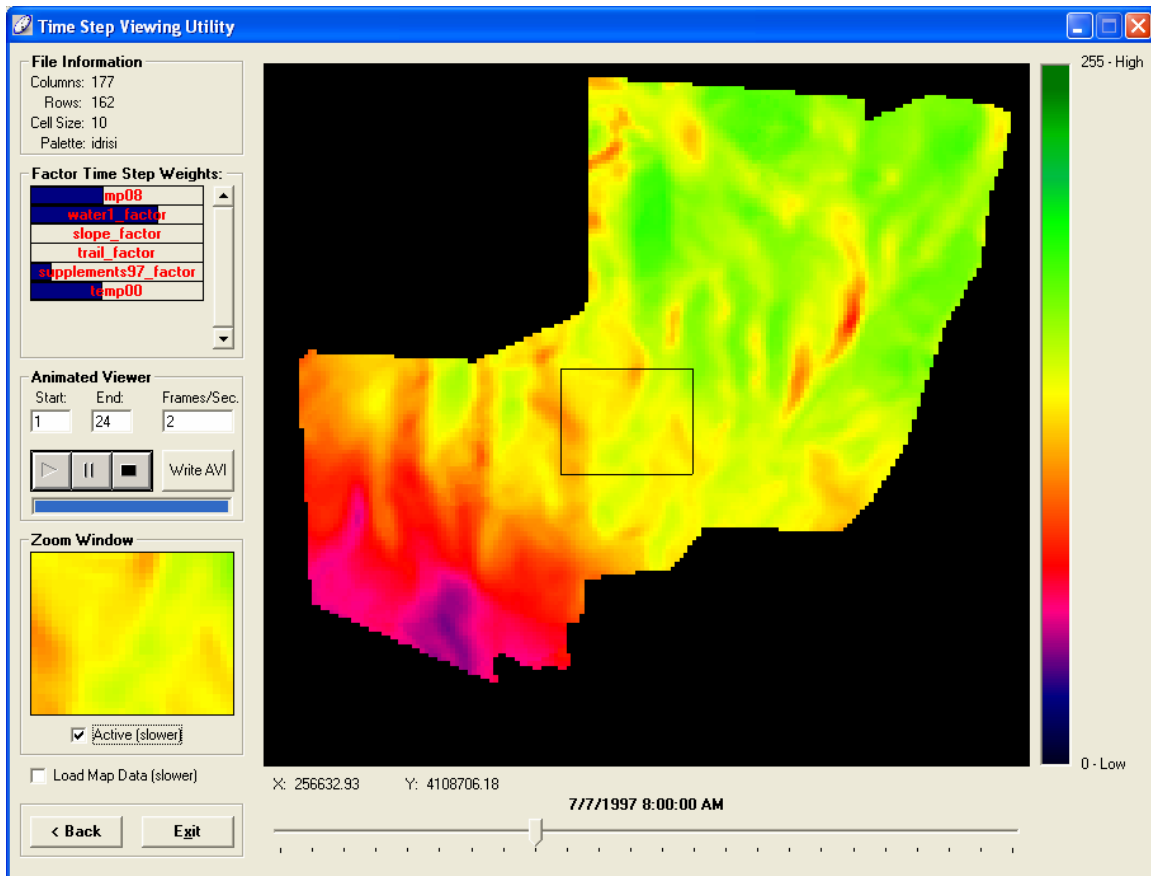




Step 13: Zooming to Area of Interest

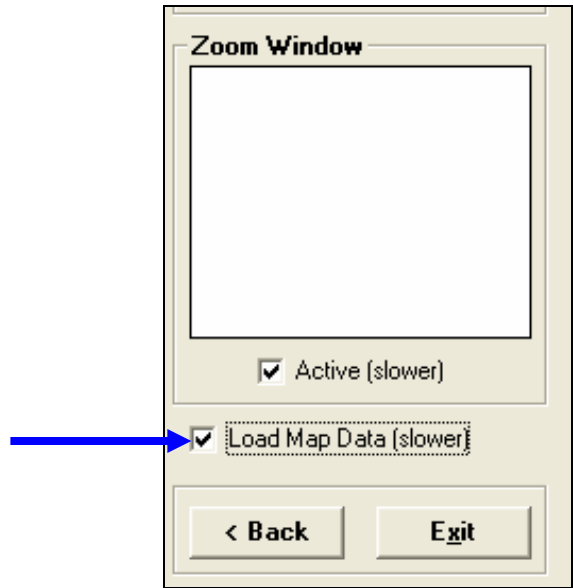
You can zoom in on an area of interest by clicking and drawing out a box with your mouse.



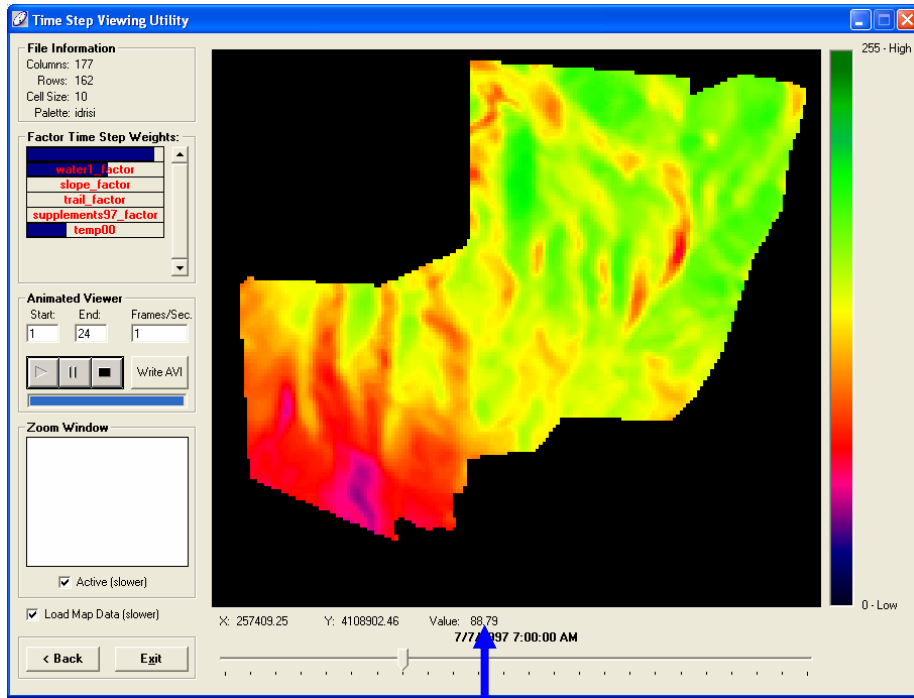


Step 14: Querying the Output

To query the output, check the box next to “Load Map Data.” Because this option makes the analysis move at a slower pace, the default leaves it unmarked. After selecting this option, move your cursor over the map, noticing that there are X and Y positions attributed to the area.

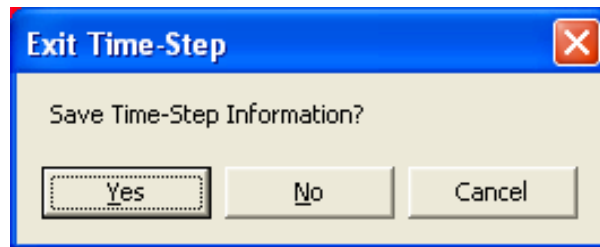


As you move the cursor over the map, the value changes.



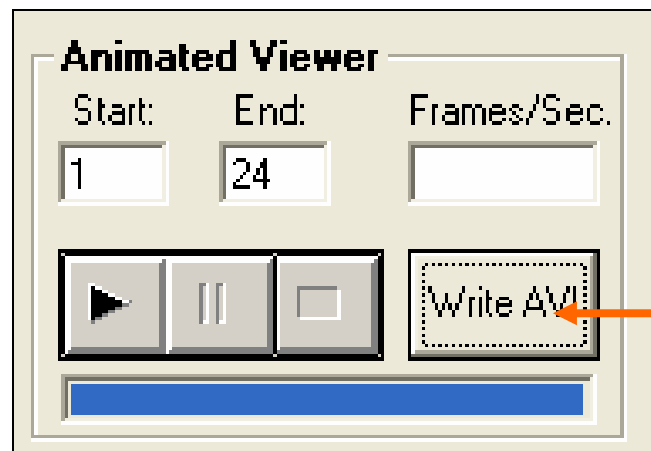
Step 15: Saving the Model Information

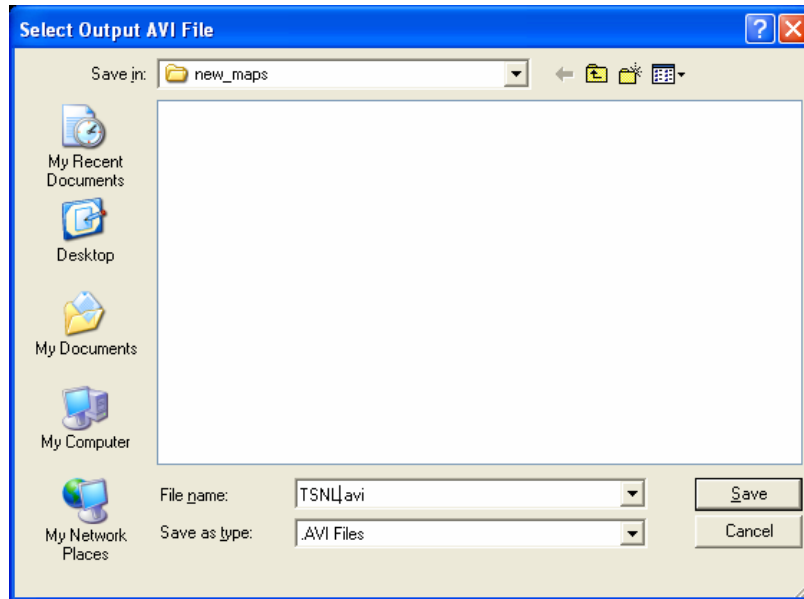
Save the Time-Step Information, if desired upon closing this window.



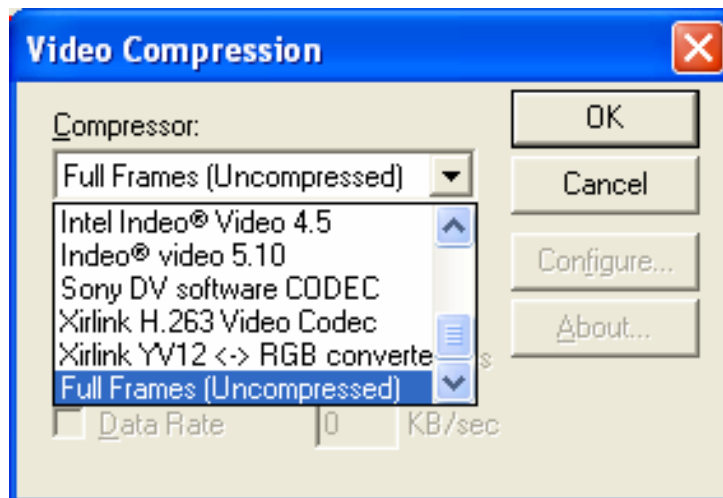
Notice the file extension is *.tsi (Time Step Information).

The model using the provided weighting graphs performed adequately during the hours between 8 AM and 4 PM but performed worse than a random model during the hours between 7 PM and 7 AM (with the exception of 12 AM). We feel this is a problem with the weighting of the variables and not with the program's operation.





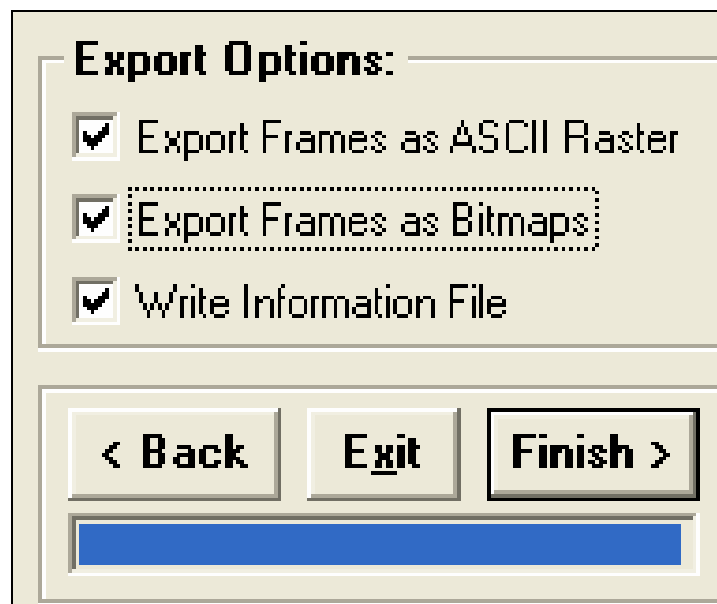
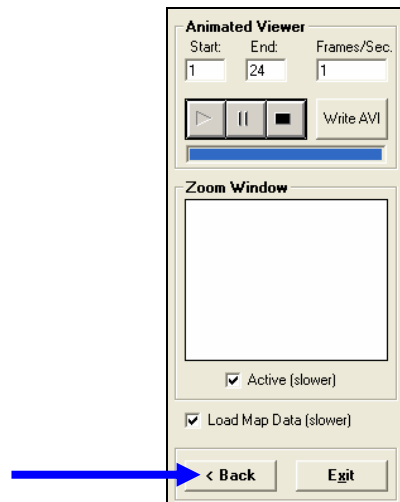
Under compressor you have 14 options to choose from. Select “Full Frames (Uncompressed)”.



Click OK.

Step 16: Exporting Frames as Bitmaps

If you would like to export frames as Bitmaps, click on the “Back” button.





Finally, you can select either “Exit to Builder” to run another model or “Exit to Main” to return to the main page of KRESS Model.