

# **StateCU Wizard**

# **Quick Start Manual**

**Version 13.01**

**March 2010**

## Introduction

StateCU was developed to allow the user to determine monthly crop consumptive use by the Modified or Original Blaney-Criddle methods and the Pochop Method for bluegrass, daily crop consumptive use by the ASCE Standardized Penman-Monteith method, and calculate monthly water budgets by structure. StateCU was recently enhanced with the creation of the Wizard, which allows a user to develop a StateCU scenario in four easy steps.

This Quick Start Manual is a very shortened and step-by-step description of what the model can perform. Should you desire to learn how to develop further complex analysis, the StateCU Documentation manual is far more extensive than this manual and contains explicit information on developing a scenario dataset.

The two scenarios that will be covered here are:

- Climate Station Scenario (Crop Irrigation Water Requirement by CU Location)
- Structure Scenario (Water Supply Limited Crop Consumptive Use by Structure).

## Climate Station Scenario

From the StateCU main screen, click on “File”, then in the drop down menu, click “Create new StateCU scenario with HydroBase Wizard”.



A welcome screen will open up; it is recommended that you read the pop-up windows to understand the default settings within this program. The default settings are set conservatively. Should a consultant desire to change these settings, supporting documentation should be provided to prove his/her position.

The following screen will open up indicating if the user is connected to HydroBase. Step 1 requires the user to provide a name for the scenario.

In Step 2, the user can designate which crops will be used in the scenario. Fill in the percentages of your crops, they must total 100%. If the user would like to apply an elevation adjustment to the TR-21 crops, check the box in the lower left corner.

Coef Type	Long Name
TR21	SCS TR21
CCRG	Rio Grande Calib Coef
UGHA	Upper Gunnison High Alt Calib...
CCLP	Lower S Platte Calib Coef
CCUP	Upper S Platte Calib Coef
DWHA	Denver Water High Alt Calib Coef
POCHOP	Pochop Bluegrass Coef

Crop Name	Percent
<input checked="" type="checkbox"/> ALFALFA.TR21	50
<input checked="" type="checkbox"/> GRASS_PASTURE.TR21	50
<input type="checkbox"/> ORCHARD_WITH_COVER.TR21	0
<input type="checkbox"/> ORCHARD_WO_COVER.TR21	0
<input type="checkbox"/> GRAPES.TR21	0
<input type="checkbox"/> DRY_BEANS.TR21	0
<input type="checkbox"/> SPRING_GRAIN.TR21	0
<input type="checkbox"/> CORN_SILAGE.TR21	0
<input type="checkbox"/> SUGAR_BEETS.TR21	0
<input type="checkbox"/> CORN_GRAIN.TR21	0
<input type="checkbox"/> SWEET_CORN.TR21	0
<input type="checkbox"/> SNAP_BEANS.TR21	0
<input type="checkbox"/> COTTON.TR21	0

Click on the “View info about selected crop” button for more information about the selected crop. Please note that calibrated crop coefficients have been developed for various regions of the state. The TR-21 crop coefficients tend to be more conservative. You cannot make any changes to the crop coefficients at

this point, however changes to the crop characteristics and coefficients can be made through the GUI. The following is an example of the information available for TR-21 Alfalfa.

The screenshot shows a window titled "StateCU: Crop information." containing a table with two columns: "Parameter Name" and "Value". The table lists various parameters for the crop "ALFALFA.TR21", including planting and harvest dates, season length, moisture temperatures, deficit levels, root zone depths, water holding capacity, application depth, frost date flags, and cutting intervals.

Parameter Name	Value
Crop Name	ALFALFA.TR21
Planting Month	1
Planting Day	1
Harvest Month	12
Harvest Day	31
Days to Full Cover (not used by Blaney-Criddle, used by PM)	75
Length of Season	365
Temperature Early Moisture (F) (source: generally SCS TR-21)	50
Temperature Late Moisture (F) (source: generally SCS TR-21)	28
Management Allowable Deficit Level (source: ASCE Manual...)	55
Initial Root Zone Depth (ft) (source: ASCE Manual 70)	4.9
Maximum Root Zone Depth (ft) (source: ASCE Manual 70)	4.9
Available Water Holding Capacity	0
Maximum Application Depth (inch)	3
Spring Frost Date Flag (0=mean,1=28 deg,2=32 deg)	0
Fall Frost Date Flag (0=mean,1=28 deg,2=32 deg)	1
Days between 1st 2nd cuts for alfalfa	45
Days between 2nd 3rd cuts for alfalfa	45

Click on Continue and the following window will open. Step 3 allows the user to designate a climate station to be used in the scenario.

**StateCU Scenario Wizard**


### Step 3. Select climate station(s)

Select one or more climate stations from the list below. If multiple climate stations are selected, they are equally weighted.

Search by  
 ID  Name  
  
 Enter partial name/id or leave blank for all stations.

Narrow the search by  
 Show All  Division  District  County

Div	Name
1	South Platte
2	Arkansas
3	Rio Grande
4	Gunnison
5	Colorado
6	Yampa, White
7	San Juan

Refresh list 

ID	Name	Div	Dist	Prec. Start Year	Prec. End Year
0092	AGATE 3 SW	1	1	1948	1953
0620	BENNETT	1	1	1989	1995
0945	BRIGGSDALE	1	1	1948	2008
1179	BYERS 5 ENE	1	1	1948	2008
2162	DEER TRAIL	1	1	1948	2001
2211	DENVER INTL AP	1	1	1995	2008
2496	EASTONVILLE 2 NNE	1	1	1956	1966
2494	EASTONVILLE 2 NNW	1	1	1956	2008
2593	ELBERT	1	1	1962	1980
2595	ELBERT 2 WNW	1	1	1956	1966
2597	ELBERT 3 SE	1	1	1956	1966

View station info View Precip Data View Temp Data

Exit Wizard Continue

The user can search by climate station name or ID, or leave the box blank and select a Division or District; clicking the green arrow will refresh the list. If you scroll to the right, you can see the Start Year, End Year and data count and make a determination of which station is the best for your analysis.

**StateCU Scenario Wizard**


### Step 3. Select climate station(s)

Select one or more climate stations from the list below. If multiple climate stations are selected, they are equally weighted.

Search by  
 ID  Name  
  
 Enter partial name/id or leave blank for all stations.

Narrow the search by  
 Show All  Division  District  County

WD	Name	Div
12	Arkansas: Salida to P...	2
13	Wet Mountain Valley	2
14	Arkansas: Portland to...	2
15	Saint Charles	2
16	Cucharas River	2
17	Arkansas: Fowler to L...	2
18	Apishapa River	2

Refresh list 

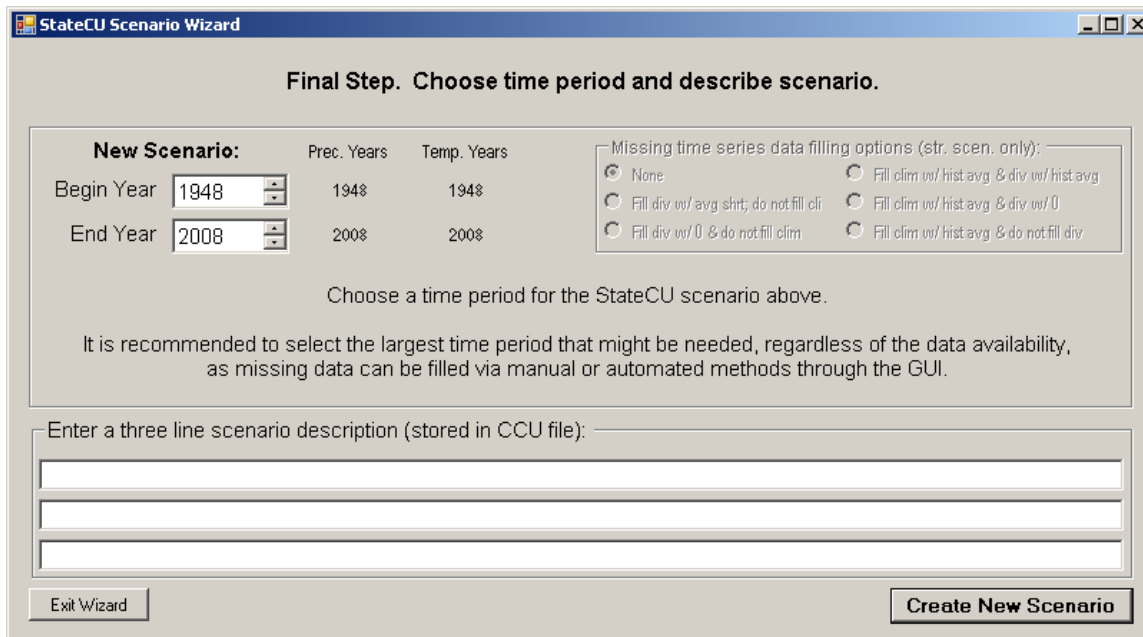
Dist	Prec. Start Year	Prec. End Year	Prec. Meas. Count	Temp. Start Year	Temp. End Year	Temp. Meas. Count
12	1948	2008	668	1948	2008	677
12	1963	1964	13	1963	1964	13
12	1948	2003	67	1948	2003	67
12	2005	2008	31	2005	2008	31
12	1948	1951	37	-999	-999	-999
12	1950	2006	661	-999	-999	-999
12	1950	1950	5	-999	-999	-999
12	1948	1973	285	-999	-999	-999
12	1948	1968	222	1948	1968	222
12	1949	1953	44	-999	-999	-999
12	1968	1976	72	1968	1976	71

View station info View Precip Data View Temp Data

Exit Wizard Continue

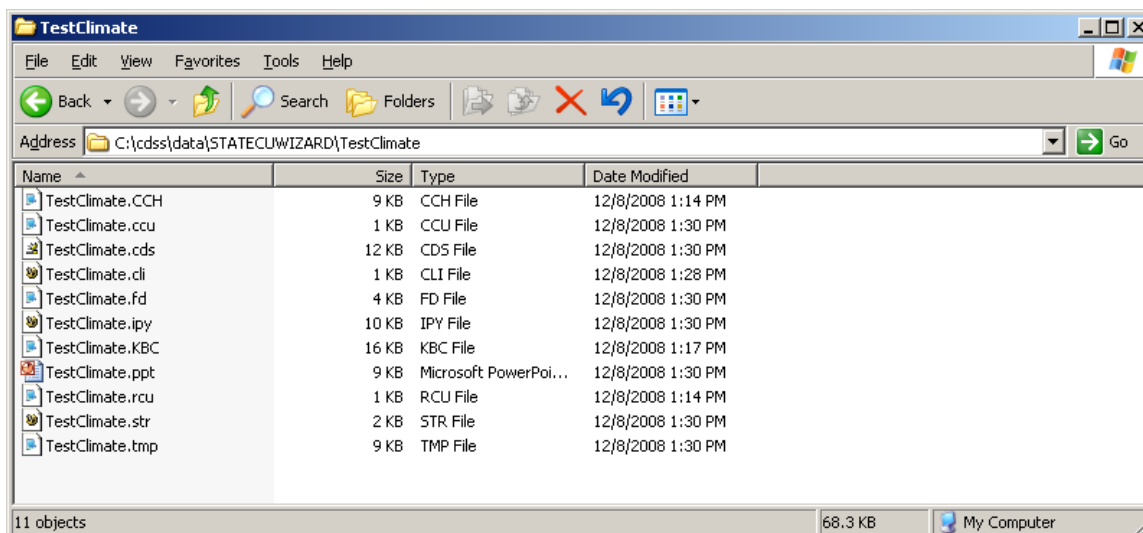
After pressing Continue, the following window will open up. Recommended Start and End Years based on available climate data are set, however if you want your period of record to go back even further, change the Begin Year to the value you want, then at a later time you can back fill that data. Type identifying information in the three line scenario description and click on the "Create New Scenario"

button. At this point the Wizard will create a set of StateCU input files reflecting the scenario selections the user made in the previous steps.



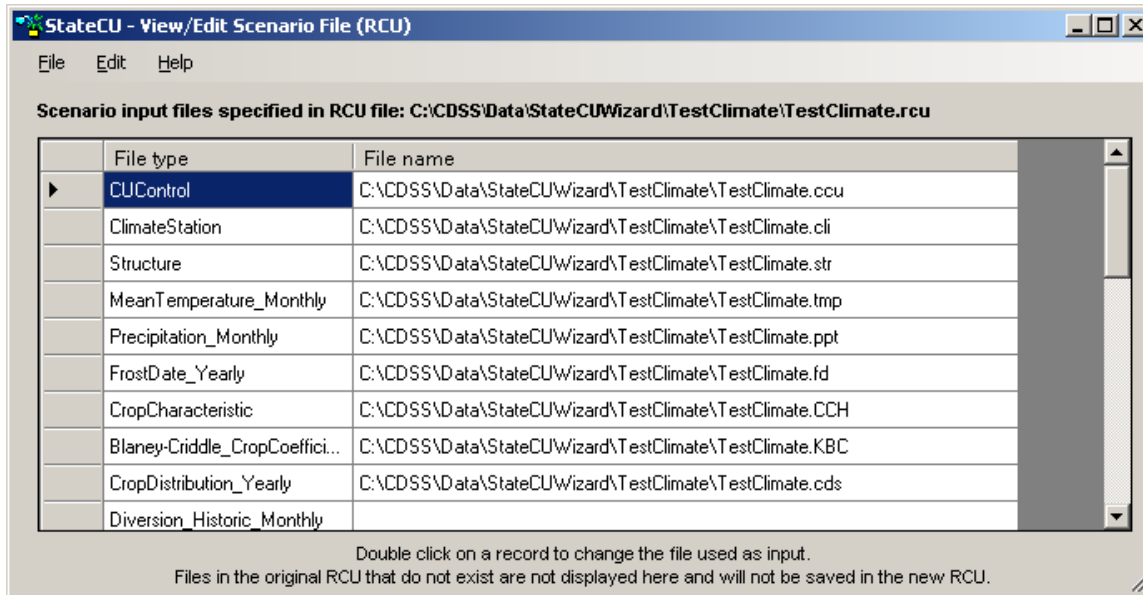
After creating the new scenario, a window for StateCU Wizard Default Settings will open up. Read the default settings then, press OK. The StateCU main page will come up, and the new scenario will already be loaded into StateCU.

The input files created by the Wizard are saved to the C:\CDSS\Data\StateCUWizard folder. The following image reflects the input files that the Wizard has created.



## Edit Climate Station Scenario through the GUI

As the scenario is already loaded into StateCU, the user can review the input files by clicking on the “Input File List” under the “Edit” menu. Here you can redirect the file paths should you wish.



Analysis options, including CU method and effective precipitation methods, as well as scenario descriptions, can be viewed by clicking on the “Model Control Options” under the “Edit” menu.

To make changes to the selected climate station or create a new CU location, click on “Edit”, and then click on “Climate Station Information”. It is on this page that you can make create a climate station for your site (Add a Field Location) and you can make adjustments to your Crop Types percentages (View/Edit Crop Types).

StateCU - Climate Station Information

File Help

Select a climate station or field location:

Name	ID
CANON CITY	1294

Climate Station Data

1294 CANON CITY

Location1: FREMONT

Location2: 11020002

Latitude: 38.47

Elevation (ft): 5366.14

Temp. Gage Ht (ft): NA

Wind Gage Ht (ft): NA

Additional Field Options

Add a Field Location View/Edit Field Weighting and Orographic Adjustments View/Edit Crop Types

Available Climate Station Time Series Data

Monthly Temperature	Daily Max Temperature	Daily Wind Speed
Monthly Precipitation	Daily Min Temperature	Daily Solar Radiation
Annual Frost Date	Daily Precipitation	Daily Vapor Pressure

Click on “Add a Field Location”. You will need to enter a 4 digit number in the Field ID and a Field Name. You can make the adjustments to the Latitude and Elevation, as well as adjustments to the Precipitation factor. The Colorado Decision Support System (CDSS) and Division of Water Resources (DWR) web sites provide the State Climatologist long-term annual precipitation values for all locations in the state. The weather station long-term average should be compared against the State Climatologist value for the field site so that a precipitation correction factor can be applied to the weather station data for use at the field site. A temperature adjustment of 3.6 degrees cooler per 1000 feet of elevation gain is typically accepted if no other data exists.

Once you’ve made your adjustments, click on “File”, then “Save”. Your new location will show up under the existing climate station. If you need to make changes to the crop types, click on “View/Edit Crop Types”. You can highlight a box and change values, and right click on the box for copy/paste options. Remember to save these changes under the “File” menu.



StateCU - View/Edit Crop Acreage Data

File Edit View Help

Crop Data for Station: 1294 CANON CITY

Crop Name	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
ALFALFA - SCS TR21	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
GRASS_PASTURE - SCS ...	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
ORCHARD_WITH_COVER...	0	0	0	0	0	0	0	0	0	0
ORCHARD_WO_COVER - ...	0	0	0	0	0	0	0	0	0	0
GRAPES - SCS TR21	0	0	0	0	0	0	0	0	0	0
DRY_BEANS - SCS TR21	0	0	0	0	0	0	0	0	0	0
SPRING_GRAIN - SCS TR21	0	0	0	0	0	0	0	0	0	0
CORN_SILAGE - SCS TR21	0	0	0	0	0	0	0	0	0	0
SUGAR_BEETS - SCS TR21	0	0	0	0	0	0	0	0	0	0
CORN_GRAIN - SCS TR21	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>

Upper grid displays fraction of land for each crop type in any year. Lower grid displays total and fractions should sum to 1.

Back to the main page, click on Edit, and then click on “Crop Characteristics/Coefficients”. On this page you can make adjustments to the crop characteristics and coefficients (View/Edit Crop Coefficients”).

StateCU - Crop Characteristics/Coefficients

File Help

Select [Crop] - [Coefficient Type] Pair:

- ALFALFA - SCS TR21
- GRASS\_PASTURE - SCS TR21
- ORCHARD\_WITH\_COVER - SCS TR21
- ORCHARD\_WO\_COVER - SCS TR21
- GRAPES - SCS TR21
- DRY\_BEANS - SCS TR21
- SPRING\_GRAIN - SCS TR21
- CORN\_SILAGE - SCS TR21
- SUGAR\_BEETS - SCS TR21
- CORN\_GRAIN - SCS TR21
- SWEET\_CORN - SCS TR21
- SNAP\_BEANS - SCS TR21
- COTTON - SCS TR21
- WHEAT\_FALL - SCS TR21
- WHEAT\_SPRING - SCS TR21
- VEGETABLES - SCS TR21
- ALFALFA - Rio Grande Calib Coef
- GRASS\_PASTURE - Rio Grande Calib Coef
- POTATOES - Rio Grande Calib Coef
- SMALL\_GRAINS - Rio Grande Calib Coef
- GRASS\_PASTURE - Upper Gunnison High Alt Calib Coef
- DRY\_BEANS - Lower S Platte Calib Coef
- GRASS\_PASTURE - Lower S Platte Calib Coef
- SPRING\_GRAIN - Lower S Platte Calib Coef

View/Edit Crop Coefficients

**Begin Growing Season Specification**

Mean Temp (deg): 50

28 deg

32 deg Frost

**End Growing Season Specification**

Mean Temp (deg): 28

28 deg Frost

32 deg

**Other Growing Season Constraints**

	Month	Day
Earliest Growing Season Start Date:	1	1
Latest Harvest Date:	12	31
Maximum Length of Growing Season (days):	365	

**Other Crop Characteristics**

Maximum Root Zone (feet): 4.9

Maximum Application Depth (inches): 3.0

Days between 1st and 2nd cuttings for Alfalfa: 45

Days between 2nd and 3rd cuttings for Alfalfa: 45

Once all your parameters are adjusted, select “Run”, then “Run Simulation”. Click on “Results” for output options, although the “Time Series Data Report Generator” allows the user to create custom output files.

Once in the “Time Series Data Report Generator” is selected, the following window will appear. On this table you will click the “Add Row from Data Source” button. Click on the drop down for “ID (Name)” and select your station. Then click on the “Data Type” drop down to show the “Irrigation Water Requirement” as well as other output options.

StateCU Time Series Data Tool

File View Help

Select Data Source: Enter an existing StateCU binary output file (\*.BD1)

C:\CDSS\Data\StateCU\Wizard\TestClimate\TestClimate BD1 Browse for File

Select Data to View: Add rows to the following table for each time series variable to view in the report from the above source.

Add Row from Data Source Delete Selected Row Delete All Rows

	STATION TYPE	ID (NAME)	INTERVAL	DATA TYPE	UNITS	I/O TYPE	SOURCE FILE NAME
1	CU Structure	All Structures	Month	[double-click here]		StateCU Output	eCU\Wizard\TestClimate\TestClin

All Structures  
1294 (CANON CITY)  
9999 (TestClimate)

Select the report time period

Begin Year 1948  
End Year 2008

Select a particular report or output type for the above time series:

Tabular Data Preview (columnar grid) StateMod STM File  
Excel Graph and Worksheet Custom Columnar Report File (\*.CCR)  
Time Series Summary File (text)

Create IDS AWAS "Import" file using ALL structures in BD1 file

After selecting the time series data, select the time period and then choose a graph, summary report or table.

Close

Click on the “Time Series Summary File” for a text file containing your results. It will show the Max, Min, and Mean at the bottom of the page. Graphing and export to Excel is also available.

Congratulations! You have completed a Climate Station Scenario.

## Structure Scenario

From the StateCU main screen, click on “File”, then in the drop down menu, click “Create new StateCU scenario with HydroBase Wizard”. Click on the Structure Scenario, you then have the option of using the crop acreage and diversion data from HydroBase. Step 1 requires the user to provide a name for the scenario.

The screenshot shows a software window titled "StateCU Scenario Wizard" with a blue header bar. The main content area is titled "Step 1. Consumptive Use Analysis Options". It is divided into two main sections. The left section, titled "Choose analysis type", contains two radio buttons: "Climate Station Scenario" (unselected) and "Structure Scenario" (selected). Below these are two checked checkboxes: "Use crop acreage data from HydroBase" and "Use diversion data from HydroBase". The right section, titled "Online DWR HydroBase Status", displays the word "Connected!" in green text. At the bottom, there is a text input field labeled "Enter new scenario name" containing the text "Riverside". Below the input field are two buttons: "Exit Wizard" on the left and "Continue" on the right.

In this example we are using the Riverside Canal in Water District 1. Type the name in, click on District, and press the green arrow to show the diversion structures with the name Riverside in them. Highlight the structure to be analyzed. You can view the structure info or view the diversion total. If analyzing a single source/type of diversions, you can click on “Select Individual DivClass” which will open Step 2A seen below. In most cases you will probably take the total diversion into the structure, then manipulate the data in the GUI.

**StateCU Scenario Wizard**


## Step 2. Select a water supply structure

Select a water supply structure under which the CU analysis will be calculated.

Search by:  
 WDID or  Name  
  
 Enter a partial name or leave blank for all structures.

Narrow the search by:  
 Show All  Division  District  County

WD	Name	Div
1	South Platte: Greeley ...	1
2	South Platte: Denver ...	1
3	Cache La Poudre River	1
4	Big Thompson River	1
5	St. Vrain Creek	1
6	Boulder Creek	1
7	Clear Creek	1
8	South Platte Cheesm...	1

Refresh list 

WDID	Name	Div
0100503	RIVERSIDE CANAL	1
0100710	RIVERSIDE DITCH	1
0100698	RIVERSIDE EMBANKMENT DR	1
0100508	RIVERSIDE RES OUT D	1

Use structure DivTotal  
 Select individual DivClass

**Select HydroBase diversion data for structure 0100503**

## Step 2A. Select structure diversion records to use:

Multiple selected DivClass time series are summed; Divtotal must be selected alone. \* = Infrequent Diversion Record

Type	Time Step	Identifier	Quality	Start Year	End Year	Meas Count
<input checked="" type="checkbox"/> Diversion	Annual	Total		1950	2007	672
<input type="checkbox"/> Diversion	Annual	S:4 F:0303732 U:Q T:3 G:0...		2006	2006	12
<input type="checkbox"/> Diversion	Annual	S:4 F:0104620 U:Q T:3 G:		2004	2004	12
<input type="checkbox"/> Diversion	Annual	S:4 F:0104620 U:1 T: G:		1962	1971	24
<input type="checkbox"/> Diversion	Annual	S:1 F: U:Q T:3 G:		1988	2007	240
<input type="checkbox"/> Diversion	Annual	S:1 F: U:Q T:0 G:		1983	1987	48
<input type="checkbox"/> Diversion	Annual	S:1 F: U:1 T: G:		1950	2007	660
<input type="checkbox"/> Diversion	Annual	S:1 F: U:0 T:0 G:		1985	1985	12
<input type="checkbox"/> Diversion	Annual	S:1 F: U:0 T: G:		1970	1988	24
<input type="checkbox"/> Release	Annual	S:6 F:0102525 U:Q T:6 G:		2004	2004	12

Press "Continue" and the crop type and acreage from the most recent irrigated acreage assessment in HydroBase for the structure will be shown. You can make changes in this table by clicking on the value and typing your new value in.

**StateCU Scenario Wizard**

### Step 3. Select crop(s) and acreage

Note: The following are the most recent crops and acreages for this structure downloaded from HydroBase. The refresh button is disabled and all

Narrow the crop list by:

Show All    Crop Type    Coefficient Type

Apply elev adj to all TR21 crop coefficients

Refresh list

Crop Name	Acres
<input checked="" type="checkbox"/> ALFALFA.TR21	9794.748
<input checked="" type="checkbox"/> GRASS_PASTURE.TR21	1669.44775
<input type="checkbox"/> ORCHARD_WITH_COVER.TR21	0
<input type="checkbox"/> ORCHARD_WO_COVER.TR21	0
<input type="checkbox"/> GRAPES.TR21	0
<input checked="" type="checkbox"/> DRY_BEANS.TR21	560.4017
<input checked="" type="checkbox"/> SPRING_GRAIN.TR21	1051.6781
<input type="checkbox"/> CORN_SILAGE.TR21	0
<input checked="" type="checkbox"/> SUGAR_BEETS.TR21	659.569153
<input checked="" type="checkbox"/> CORN_GRAIN.TR21	9700.391
<input type="checkbox"/> SWEET_CORN.TR21	0
<input type="checkbox"/> SNAP_BEANS.TR21	0
<input type="checkbox"/> COTTON.TR21	0

View info about selected crop

Exit Wizard   **Continue**

If the user would like to apply an elevation adjustment to the TR-21 crops, check the box in the lower left corner. Click on “Continue” to move to the next step.

In Step 4, you will choose your climate station. Find the one closest to your site that has a good period of record for precipitation and temperature data. You can scroll over to the right to see the period of record for the climate data.

**StateCU Scenario Wizard**

### Step 4. Select climate station(s)

Select one or more climate stations from the list below. If multiple climate stations are selected, they are equally weighted.

Search by:

ID    Name

Enter partial name/id or leave blank for all stations.

Narrow the search by:

Show All    Division    District    County

Refresh list

ID	Name	Div	Dist	Prec. Start Year	Prec. End Year
2598	ELBERT 4 SSW	1	1	1956	1966
2601	ELBERT 5 SW	1	1	1956	1966
2603	ELBERT 8 SW	1	1	1956	1966
2631	ELIZABETH 2 ENE	1	1	1996	2008
<b>3038</b>	<b>FORT MORGAN</b>	<b>1</b>	<b>1</b>	<b>1948</b>	<b>2008</b>
3643	GROVER 10 W	1	1	1948	1970
4155	HOYT	1	1	1948	1951
4585	KIOWA 4 SW	1	1	1956	1966
4584	KIOWA 5 SE	1	1	1956	1967
4856	LAST CHANCE	1	1	1964	1965
5025	LONDON 4 S	1	1	1988	2008

View station info   View Precip Data   View Temp Data

Exit Wizard   **Continue**

Press “Continue” to move onto the Final Step as shown in the next window.

**StateCU Scenario Wizard**

**Final Step. Choose time period and describe scenario.**

**New Scenario:**

	Prec. Years	Temp. Years
Begin Year	1948	1948
End Year	2008	2008

Missing time series data filling options (str. scen. only):

- None
- Fill clim w/ hist avg & div w/ hist avg
- Fill div w/ avg shrt; do not fill cli
- Fill clim w/ hist avg & div w/ 0
- Fill div w/ 0 & do not fill clim
- Fill clim w/ hist avg & do not fill div

Choose a time period for the StateCU scenario above.

It is recommended to select the largest time period that might be needed, regardless of the data availability, as missing data can be filled via manual or automated methods through the GUI.

Enter a three line scenario description (stored in CCU file):

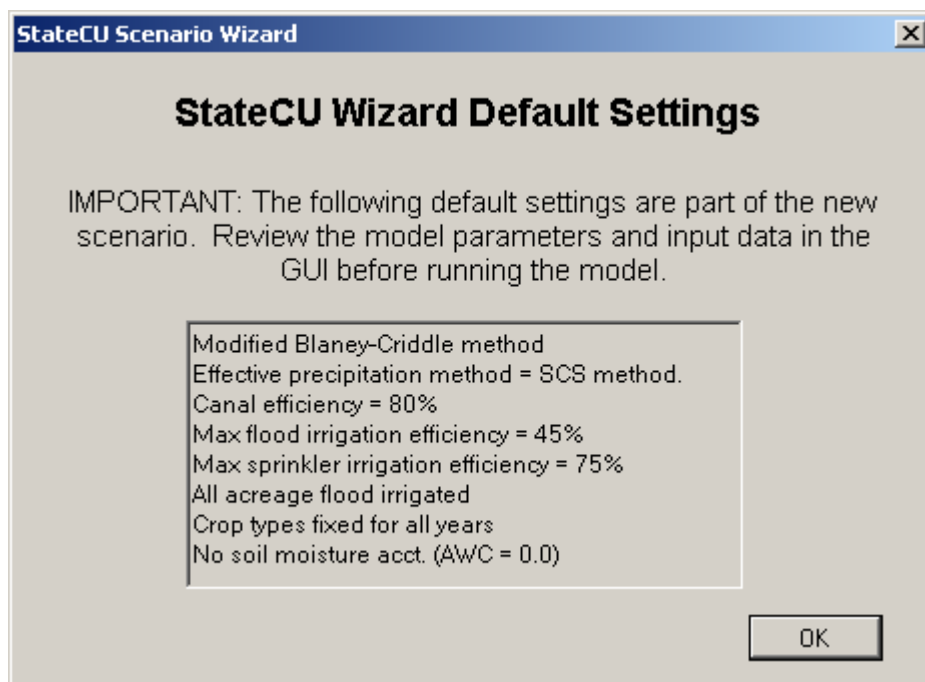
\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Exit Wizard      Create New Scenario

On this table you have the option to leave any missing data blank or to fill in with averages or some other value. Note that data will be filled only during the StateCU simulation process, the filled data is not reflected in your input files. Recommended Start and End Years based on available climate data are set, however if you want your period of record to go back even further, change the Begin Year to the value you want, then at a later time you can back fill that data.

If you have a lot of climate data to fill, it is recommended that you don't use the Fill clim w/ hist ave. A regression fill should be done using a climate station that has a complete period of record. This can be accomplished in our TSTool program. If there is just a small handful of missing data, then for time and convenience, use the average climate fill.

Type identifying information in the three line scenario description and click on the "Create New Scenario" button. The following default window will open. It is recommended that you read the pop-up windows to understand the default settings within this program. The default settings are set conservatively. Should a consultant desire to change these settings, supporting documentation should be provided to prove his/her position. These values can be adjusted through the GUI.



At this point the Wizard will create a set of StateCU input files reflecting the scenario selections the user made in the previous steps.

### **Edit Structure Scenario through the GUI**

The scenario is already loaded into StateCU and the program returns to the StateCU main page. Under "Edit" click on the "Model Control Options" to view analysis options, including CU method and effective precipitation methods, as well as scenario descriptions. Under "Analysis Options" you can also opt to use Soil Moisture by checking the box. This will activate the "Soil Moisture Options" button.

The screenshot shows the "StateCU - Model Control Options" dialog box with the "Analysis Options" tab selected. The dialog has a menu bar with "File" and "Help". The "Analysis Options" tab contains several sections:

- CU Method Time Step:** Radio buttons for "Monthly (BC, mod BC, Pochop)" (selected) and "Daily (ASCE Penmon-Montieth)".
- Effective Precip Methods:** Radio buttons for "None", "SCS TR-21 method (monthly)" (selected), "USBR method (monthly)", "Max total inches per day (daily)", "Fraction of total precip (daily)", and "SCS NEH4 method (daily)".
- WATER SUPPLY:** Radio buttons for "Yes" (selected) and "No".
- WATER RIGHTS:** Radio buttons for "Yes" and "No" (selected).
- GROUND WATER:** Radio buttons for "Yes" and "No" (selected).
- TAILWATER/ DRAIN SUPPLY:** Radio buttons for "Yes", "No" (selected), and "\*Yes - allow neg values".
- Soil Moisture:** A checkbox labeled "Soil Moisture" (unchecked) next to a "Soil Moisture Options" button.
- View/Edit Administration Processing Method and Daily Diversion Data:** A button at the bottom right.

A note at the bottom states: "\* - used in special cases only".

By clicking the "Soil Moisture Options" the following window will open. Here you can set the initial soil moisture capacity if known or use the Presimulation option. Winter carryover percentages can be set here as well.

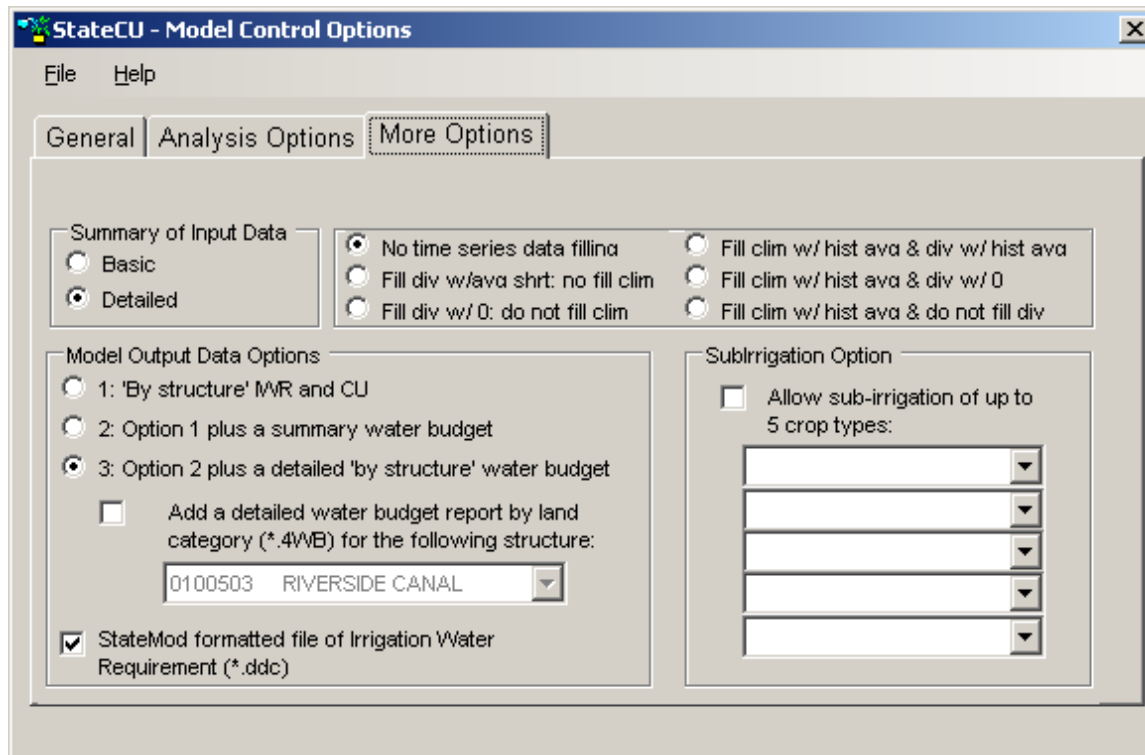
The screenshot shows the "StateCU - Soil Moisture Variables" dialog box. It contains the following options:

- Method Used to Operate Soil Moisture Input/Output:** Radio buttons for "Seniority" and "Proration" (selected).
- Method Used to Set Initial Soil Moisture Content:** Radio buttons for "Presimulation" and "User" (selected).
- Fraction of Soil Moisture Capacity Initially Filled:** A text input field containing the value "0".
- Fraction of Winter Precipitation to Soil Moisture Reservoir:** A text input field containing the value "0".

At the bottom, there are "Cancel" and "Save and Exit" buttons.



Back under “Model Control Options”, under the “More Options” tab, you can choose your type of output and review your filling options. Remember to save your revisions under the “File” menu and clicking on “Save”.



Close out of the “Model Control Options” window, return to the StateCU main page and click on “Edit” menu and then click on “Structure Information”.

In this window, you can view and edit climate station assignments, diversion data, crop acreages, efficiencies, latitude/elevation, and AWC of the structure. The AWC soil capacity values (in/in) can be found on the <http://websoilsurvey.nrcs.usda.gov/app/> website for your specific site.

StateCU - Structure Information

File Help

**Select a structure:**

Name	ID
RIVERSIDE CANAL	010050...

**Selected Structure Data**

**RIVERSIDE CANAL**

Location1:

Location2:

Latitude (deg):

Elevation (ft):

Soil Moisture Capacity (in/in):

Water Rights Information (view only):

Decree Amount (cfs)	Administration Number

View/Edit Additional Structure Information

Climate Station Assignments

Historical Surface Water Diversions

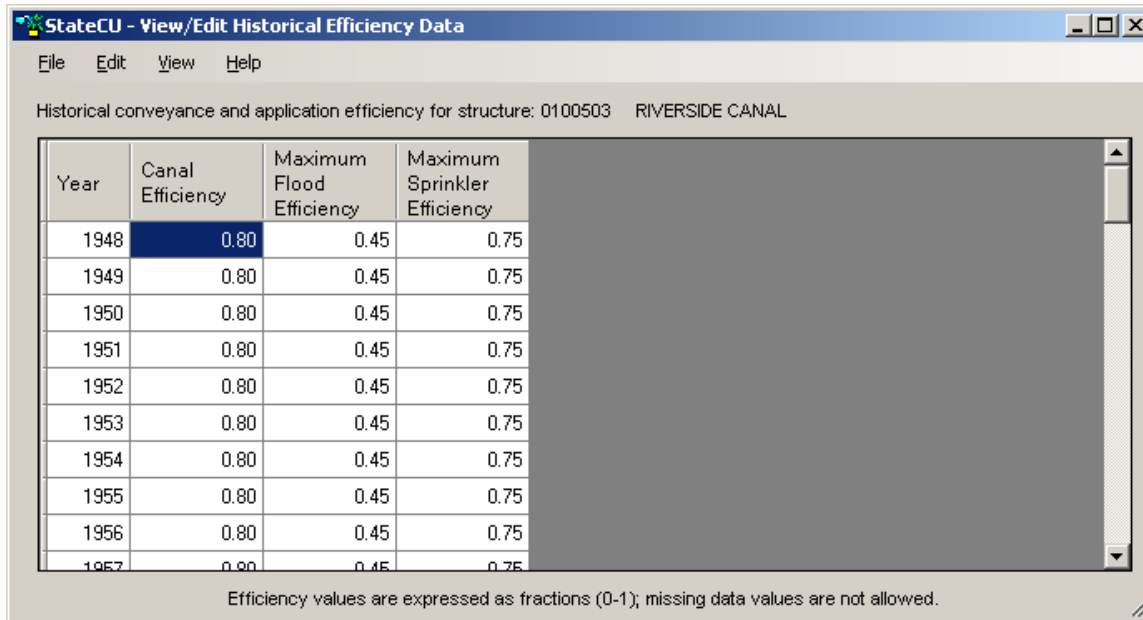
Historical Ground Water Pumping Data

Crop Acreage Data

Efficiency Information

Irrig. Method and Max Pumping Rate Data

Click on the “Efficiency Information” to change the conveyance and irrigation efficiencies. You can click on one and make the change, then copy the value down. Remember to save changes to both the efficiency window and the structure information window by clicking on “File” and then “Save”.



StateCU - View/Edit Historical Efficiency Data

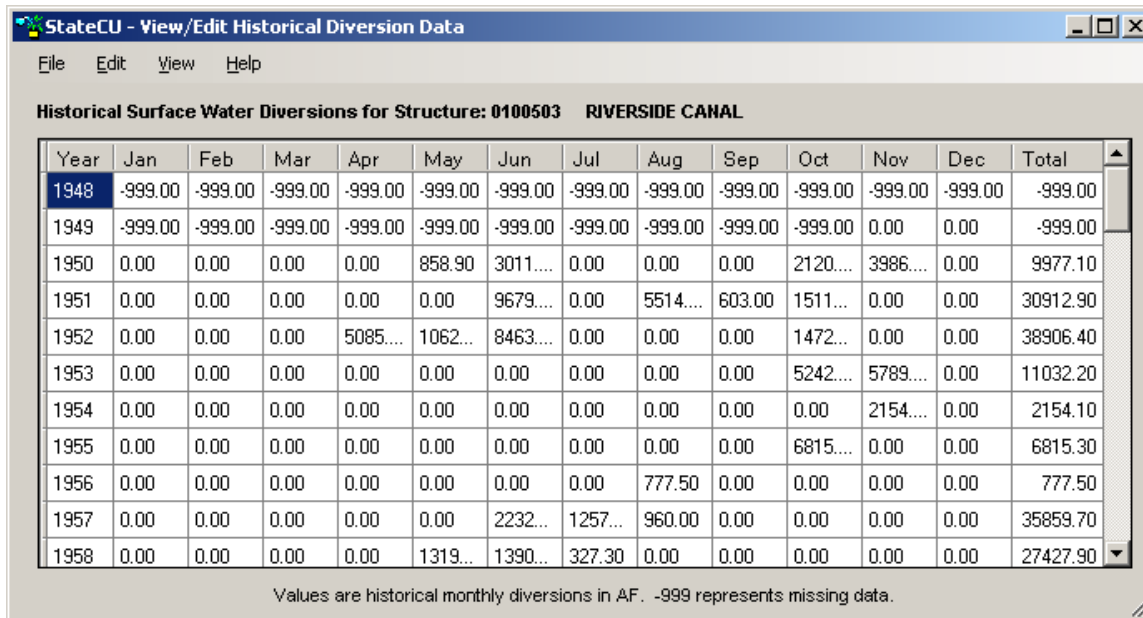
File Edit View Help

Historical conveyance and application efficiency for structure: 0100503 RIVERSIDE CANAL

Year	Canal Efficiency	Maximum Flood Efficiency	Maximum Sprinkler Efficiency
1948	0.80	0.45	0.75
1949	0.80	0.45	0.75
1950	0.80	0.45	0.75
1951	0.80	0.45	0.75
1952	0.80	0.45	0.75
1953	0.80	0.45	0.75
1954	0.80	0.45	0.75
1955	0.80	0.45	0.75
1956	0.80	0.45	0.75
1957	0.80	0.45	0.75

Efficiency values are expressed as fractions (0-1); missing data values are not allowed.

Click on “Historical Surface Water Diversions” to adjust the historical diversions of the structure. This window will allow you to copy all the data to an Excel spreadsheet where you can manipulate the data, then paste the data back into this window.



StateCU - View/Edit Historical Diversion Data

File Edit View Help

Historical Surface Water Diversions for Structure: 0100503 RIVERSIDE CANAL

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1948	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00
1949	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	0.00	0.00	-999.00
1950	0.00	0.00	0.00	0.00	858.90	3011....	0.00	0.00	0.00	2120....	3986....	0.00	9977.10
1951	0.00	0.00	0.00	0.00	0.00	9679....	0.00	5514....	603.00	1511....	0.00	0.00	30912.90
1952	0.00	0.00	0.00	5085....	1062...	8463....	0.00	0.00	0.00	1472...	0.00	0.00	38906.40
1953	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5242....	5789....	0.00	11032.20
1954	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2154....	0.00	2154.10
1955	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6815....	0.00	0.00	6815.30
1956	0.00	0.00	0.00	0.00	0.00	0.00	0.00	777.50	0.00	0.00	0.00	0.00	777.50
1957	0.00	0.00	0.00	0.00	0.00	2232...	1257...	960.00	0.00	0.00	0.00	0.00	35859.70
1958	0.00	0.00	0.00	0.00	1319...	1390...	327.30	0.00	0.00	0.00	0.00	0.00	27427.90

Values are historical monthly diversions in AF. -999 represents missing data.

Should you have a ditch that is divided up into shares, it is easy to scale down the diversions to match the shares. Highlight the diversion records, right click for scaling/adding options, then enter a fraction to scale the diversions by. Remember to save changes to both the diversion window and the structure information window by clicking on “File” and then “Save”.

StateCU - View/Edit Historical Diversion Data

File Edit View Help

**Historical Surface Water Diversions for Structure: 0100503 RIVERSIDE CANAL**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1948	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00
1949	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	-999.00	0.00	0.00	-999.00
1950	0.00	0.00	0.00	0.00	858.90	3011....	0.00	0.00	0.00	2120....	3986....	0.00	9977.10
1951	0.00	0.00	0.00	0.00	0.00	9679....	0.00	5514....	603.00	1511...	0.00	0.00	30912.90
1952	0.00	0.00	0.00	5085....	1062...	8463....	0.00	0.00	0.00	1472...	0.00	0.00	38906.40
1953	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				1032.20
1954	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				2154.10
1955	0.00	0.00	0.00										3815.30
1956	0.00	0.00	0.00							0.00	0.00	0.00	777.50
1957	0.00	0.00	0.00	0.00	0.00	2232...	1257...	960.00	0.00	0.00	0.00	0.00	35859.70
1958	0.00	0.00	0.00	0.00	1319...	1390...	327.30	0.00	0.00	0.00	0.00	0.00	27427.90

Values are historical monthly diversions in AF. -999 represents missing data.

Once all your parameters are adjusted, select “Run”, then “Run Simulation”. Click on “Results” for output options. The detailed water budget output file (dwb), shown below, provides a lot of detail on the structure, including potential CU, IWR, non-consumed water and total CU.



Riverside.dwb - Notepad

File Edit Format View Help

ID: 0100503 RIVERSIDE CA

Soil Moisture Capacity: 0.00 af  
 Starting Soil Moisture: 0.00 af  
 Maximum Irrigation Efficiency: 0.36

Yearly Totals 1948 - 2008

Year/ Month	Analysis Method	Potential Crop ET	Effect Precip	Irrigation Water Requirement (IWR)	EOM Winter Precip Carryover	IWR After Winter Precip	River Diversion Accounting				Soil Moisture Contents	Estimated Crop CU			
							Historic Diversion	Destination CU	Non- I consumed	Efficiency Calc. Div to System (X)		From Diversion	From Soil Moisture	Total	
1948	Calculated	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	0.	-999.	-999.	-999.
1949	Calculated	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	0.	-999.	-999.	-999.
1950	Calculated	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	0.	-999.	-999.	-999.
1951	Calculated	25217.	6581.	10639.	0.	10639.	20813.	4608.	0.	26108.	4608.	16.	4608.	0.	4608.
1952	Calculated	21111.	4767.	24344.	0.	24344.	39306.	3690.	0.	35316.	3690.	9.	3690.	0.	3690.
1953	Calculated	28961.	7674.	19287.	0.	19287.	11032.	320.	0.	10713.	320.	3.	320.	0.	320.
1954	Calculated	28522.	7672.	20850.	0.	20850.	2154.	0.	0.	2154.	0.	0.	0.	0.	0.
1955	Calculated	28467.	7472.	21015.	0.	21015.	6815.	253.	0.	6562.	253.	4.	253.	0.	253.
1956	Calculated	27718.	9885.	17732.	0.	17732.	776.	280.	0.	496.	280.	36.	280.	0.	280.
1957	Calculated	25460.	7291.	18170.	0.	18170.	26950.	7625.	0.	28225.	7625.	21.	7625.	0.	7625.
1958	Calculated	27300.	8324.	19066.	0.	19066.	27426.	3908.	0.	23520.	3908.	14.	3908.	0.	3908.
1959	Calculated	27906.	4785.	23121.	0.	23121.	20289.	3761.	0.	16528.	3761.	19.	3761.	0.	3761.
1960	Calculated	27220.	4776.	22444.	0.	22444.	37992.	5107.	0.	38175.	5107.	16.	5107.	0.	5107.
1961	Calculated	25449.	8082.	17367.	0.	17367.	29626.	5720.	0.	23906.	5720.	19.	5720.	0.	5720.
1962	Calculated	26888.	8868.	17700.	0.	17700.	2817.	1014.	0.	1803.	1014.	36.	1014.	0.	1014.
1963	Calculated	20065.	7377.	22666.	0.	22666.	11802.	480.	0.	11322.	480.	4.	480.	0.	480.
1964	Calculated	27588.	4921.	22666.	0.	22666.	2253.	811.	0.	1442.	811.	36.	811.	0.	811.
1965	Calculated	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	0.	-999.	-999.	-999.
1966	Calculated	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	0.	-999.	-999.	-999.
1967	Calculated	24358.	7480.	16878.	0.	16878.	15957.	3155.	0.	12802.	3155.	20.	3155.	0.	3155.
1968	Calculated	28184.	8107.	21077.	0.	21077.	7506.	584.	0.	6921.	584.	8.	584.	0.	584.
1969	Calculated	28271.	526.	22946.	0.	22946.	3382.	8345.	0.	24637.	8345.	12.	8345.	0.	8345.
1970	Calculated	28729.	8780.	22948.	0.	22948.	3548.	4268.	0.	31217.	4268.	25.	4268.	0.	4268.
1971	Calculated	28264.	3915.	22359.	0.	22359.	30429.	7860.	0.	22469.	7860.	26.	7860.	0.	7860.
1972	Calculated	27232.	7069.	20164.	0.	20164.	14404.	2531.	0.	11873.	2531.	18.	2531.	0.	2531.
1973	Calculated	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	-999.	0.	-999.	-999.	-999.

Also available through the “Results” menu, the “Time Series Data Report Generator” allows the user to create custom output files.

StateCU Time Series Data Tool

File View Help

Select Data Source: Enter an existing StateCU binary output file (\*.BD1)

C:\CDSS\Data\StateCU\Wizard\Riverside\Riverside.BD1 Browse for File

Select Data to View: Add rows to the following table for each time series variable to view in the report from the above source.

Add Row from Data Source Delete Selected Row Delete All Rows

	STATION TYPE	ID (NAME)	INTERVAL	DATA TYPE	UNITS	I/O TYPE	SOURCE FILE NAME
1	CU Structure	0100503 (RIVERSIDE CA)	Month	Total Irrigated Acreage		StateCU Output	C:\StateCU\Wizard\Riverside\River...
				Max Application Effic			
				Calc SW Applic Effic			
				Calc SW System Effic			
				SW Soil Content			
				Crop CU from SW			
				Crop CU from Soil			
				Total Crop CU			
				CU Shortage			

Select the report time period

Begin Year: 1948  
End Year: 2008

Select a particular report or output type for the above time series:

Tabular Data Preview (columnar grid) StateMod STM File  
Excel Graph and Worksheet Custom Columnar Report File (\*.CCR)  
Time Series Summary File (text)

Create IDS AWAS "Import" file using ALL structures in BD1 file

After selecting the time series data, select the time period and then choose a graph, summary report or table.

Close

Congratulations! You have completed a Structure Scenario.

Not covered in this manual is the ability to incorporate groundwater. Additionally, there is the ability to determine a water supply limited crop consumptive use by structure and priority. StateDMI is needed to create some of the files for this determination.

See the StateCU, TSTool and StateDMI User’s Manuals for more information on simulation options and additional input files.