StateCU Release Notes

StateCU

- **Version Number:** 13.03 (model), 7.0.1.3 (GUI)
- **Release Date:** November, 2010
- **File Name:** statecu.exe (model), statecui.exe (GUI)
- **File Size:** ~1432 KB (model), ~1900 KB (GUI)
- **Description:** The State of Colorado's Consumptive Use Model (StateCU) was developed to estimate/report both crop and non-crop consumptive use within the state. It consists of a FORTRAN-based computer program and an associated graphical user interface. The crop consumptive use methods employed in the program and the interface are the modified Blaney-Criddle, the original Blaney-Criddle, and the Pochop (for bluegrass only) consumptive use methods with calculations on a monthly basis and the ASCE Standardized Penman-Monteith method with calculations on a daily basis. Other crop consumptive use methods available when the FORTRAN program is operated independently of the interface include the Penman-Monteith and Modified Hargreaves methods, operated on a daily time step.

  This model is distributed as an installation program that will install the StateCU model and graphical user interface (GUI). Also included in the installation program is the StateCU Documentation (StateCU_09_2008.pdf), several .dll and .ocx files that are required to run the GUI, and some Excel template files (*.xlt) that are used by the GUI when creating output graphs.

  IMPORTANT: Previous versions of StateCU should be completely removed prior to installing this new version. Recent official releases of StateCU can be removed using the Windows “Control Panel”/”Add or Remove Programs” feature. Files associated with older versions (and testing/demo versions) can be removed manually from the \CDSS\bin folder.

  This version of StateCU will be installed in the \CDSS\StateCU\bin folder.

  It is recommended to store StateCU datasets in the C:\CDSS\Data folder, using a separate sub-folder for each dataset. For example, the South Platte climate station scenario could be saved in the \CDSS\Data\SPclim\StateCU directory. Scenario data sets created with the new StateCU Wizard are located in the \CDSS\Data\StateCUWizard folder.

Features that are new in StateCU model version 13.03 and StateCU GUI version 7.0.1.3:

- Modified the StateCU GUI to correct the Frost Date display table.
- Modified the StateCU model to support up to 1200 structures and an additional output option.

Features that are new in StateCU model version 13.01 and StateCU GUI version 7.0.1.2:

- Modified the StateCU GUI so that it puts the correct StateCU GUI version on the header lines in data files.
- Modified the StateCU Wizard so that it puts the correct unit string descriptors of “F” and "IN" on the header lines when creating the TMP and PPT climate data input files.

Features that are new in StateCU model version 13.01 and StateCU GUI version 7.0.1:

- Modified StateCU Wizard so that it correctly builds the DDH (diversion data) file when specific div classes are selected instead of “Total Through Structure”
- Modified the StateCU model to use unit string descriptors of “ACFT” and "ACRE" instead of “AF” and

"ACRES" when creating the BD1 (binary data) file.
- Corrected column header labels on the climate data editing form for precipitation.

Features that are new in version 13.00 (GUI 7.0.0):

- Major upgrades and many changes to both the StateCU model and the StateCU GUI.
- A “Wizard” was added to the GUI which allows creation of a complete StateCU scenario from scratch using data from a live internet connection to Hydrobase.
- The GUI source code was ported from the discontinued VB6 environment to the modern VB.NET environment.
- The StateCU FORTRAN model code was standardized to allow compilation and use of the model in many environments and on various computer platforms. This current Windows release was compiled using the modern optimizing FORTRAN compiler from Intel that integrates with MS Visual Studio for the powerful debugging capabilities. However, the same code also compiles using the modern Gnu gfortran compiler, allowing the model to be used on many computing workstations types, including Linux.
- Most of the data associated with a StateCU scenario is now fully editable in the GUI using modern (.NET) forms. These updated forms use data editing methods familiar to spreadsheet users (cutting and pasting, etc.). Most of these forms also contain data validation rules to help the user QA/QC data prior to model runs.
- New time series output report format (Custom Columnar Report, *.CCR) that is similar to the DWB/SWB format, but allows the user to choose the columns to include. (Similar to the *.XDC format in StateMod)
- Optional output of district sub-total and basin total time series in the binary output file (BD1 file).
- Several new data filling options for missing climate and diversion data.
- Completely redesigned log file structure in an easy to read tabular format containing informational and warning messages useful for model analysis, debugging and QA/QC.
- A new output option in the GUI to build an IDS AWAS “import” file containing pumping and return flow time series so they can be lagged using AWAS.
- Many improvements to the GUI such as more data validation rules, user interface design, editing of RCU file, etc. See new documentation for GUI details.
- Many improvements to the FORTRAN model such as redesigned winter carry over precipitation logic, more error checking, better performance, etc. See new documentation for model details.

Features that are new in version 12.14/(GUI 6.2.2):

- Model upgraded to handle fourth irrigation land category – surface water source with sprinkler application.
- IPY file format changed.
- Added time series output binary file (BD1) from model and an associated time series report generator in the GUI.
- Added capability for orographic adjustments to climate data used to estimate potential ET.
- Major upgrade of FORTRAN code data handling logic for daily data associated with the ASCE PM daily ET method.
- Major upgrade of FORTRAN code in water supply limited CU calculations (efficiency calculations, soil moisture accounting, groundwater pumping, etc.)
- Major upgrade of GUI to handle ASCE PM daily ET method.

Features that are new in version 11.3/(GUI 5.1):

- The format for the detailed water budget output (*.dwb) file was revised to maintain compatibility with a MODFLOW preprocessor used for RGDSS.

Features that are new in version 11.2/(GUI 5.0):

- Revisions were made to several input file formats including the response (*.rcu), climate station information (*.cli), structure information (*.str), and crop distribution (*.cds) files.
- A *Climate Station Scenario* option was added to allow for a simplified set of input data requirements for analyses that only compute the potential crop consumptive use, as reflected by a simplified set of input screens displayed by the GUI. The water supply limited crop consumptive use and other more complex levels of analyses are available under a *Structure Scenario* option.
- An elevation adjustment option to the original and modified Blaney-Criddle consumptive use methods was added to the FORTRAN and GUI.
- The Pochop consumptive use method (for bluegrass only) was added to the FORTRAN and GUI.
- The ASCE Standardized Penman-Monteith consumptive use method was added to the FORTRAN (this method is not yet available through the GUI).

Features that are new in version 10.2/(GUI 4.35):

- Revisions were made to the Edit Control Parameter screen to allow the selection of detailed Blaney-Criddle output without requiring the detailed structure water budget output. Other enhancements resulted in the re-design of the Edit Control Parameter screen.

Features that are new in version 10.2/(GUI 4.3):

- Revisions were made to correct problems opening and displaying data for a daily administration file.

Features that are new in version 10.1/(GUI 4.2):

- A third methodology ("maximize supply") is now available to model the interaction between surface and ground water. Ground water can be chosen as the only source for sprinklered lands, thereby allowing non-sprinklered lands to maximize the use of available surface water.

Features that were new in version 10.0/(GUI 4.1):

- StateCU can now use both maximum conveyance and application efficiencies, or can read a combined system efficiency, for determining the amount of river diversion or well diversion available to the crops.
- StateCU now has a "presimulation" function to allow the program to estimate the best soil moisture reservoir level for beginning of an actual historic simulation.
- StateCU now reads (by structure) total acreage, acreage with access to supplemental ground water, and acreage served by sprinkler versus flood application methods.
- StateCU can read historic pumping estimates or can estimate historic pumping on acreage with access to ground water. Estimates of historic pumping are limited by an input total ground water permitted capacity.
- StateCU now has a CU and Losses Summary feature that will combine crop CU and non-agricultural CU and Losses for a basin, or subbasin as defined by the user.
- StateCU is now able to track junior and senior water stored in the soil reservoir to allow "senior" water to displace "junior" priority water in the soil reservoir.
- StateCU has been modified to include the original Blaney-Criddle Method (in addition to the Modified Blaney-Criddle already incorporated).
- StateCU now has a daily diversion data priority preprocessor to allow diversions to be classified as "senior" or "junior" based on daily records.

See the model documentation for more information.

MODEL/GUI INSTALLATION:

Select the product from the web page. This will allow you to download an msi (Microsoft Install) file to

your computer. Save the StateCU install file to your desktop or any convenient location on your computer.

From Windows Explorer (etc.) right click on the msi file. Select “Install” to start the installation. You will be prompted for a location to store the application. The default executable location will be set to *C:\cdss\bin*. The default location for documentation is *C:\cdss\docs\StateCU*

To run the application, use the *CDSS...StateCU* menu item on the Start menu, or select the StateCU shortcut put on the windows desktop.