
Appendix: TSTool Release Notes

Version, 8.14.02, 2008-02-24, Acrobat Distiller

This appendix provides information about changes that have occurred in TSTool versions.

1. TSTool Version History

The following table summarizes the TSTool release history. See the following sections for more detailed information about each version. Only recent versions are documented in detail.

TSTool Version History Summary (most current at top)

TSTool Version	Version Information	Release Date
8.13.00 to 8.14.02	Add commands to set properties, for use by other commands (e.g., to configure file names). Continue updating commands to utilize the new error handling.	2008-02-20
8.03.00 to 8.12.06	Update many commands to utilize new error handling and consistently handle the TSList parameter. Add ensemble processing to many commands. Enable ability for read commands to run in discovery mode to let other commands know time series identifiers. Add more commands to compute statistics time series.	2008-01-14
8.00.00 to 8.02.00	Update main interface to use new error-handling visualization features. Add several commands to allow TSTool to perform regression tests on itself.	2007-12-03
7.04.00	Various updates for HydroBase including adding support for administrative flow station. Allow reading StateMod rights files and handle new StateCU file formats.	2007-06-22
7.01.00	Support new SFUT(G) coding for HydroBase diversion classes, and allow CIU when filling diversion data. Fix a number of bugs in the <code>analyzePattern()</code> , <code>fillInterpolate()</code> , and <code>cumulate()</code> commands	2007-03-02
7.00.00	Begin distributing software using a new installer. Add CASS livestock data and human population data.	2006-10-31
6.19.00	Update to extend period when filling with diversion comments.	2006-05-19
6.18.00	Add the <code>runCommands()</code> command to facilitate data processing.	2006-05-02
6.17.00	Add the <code>compareFiles()</code> command to facilitate testing.	2006-04-17
6.16.02	Begin adding commands to test data, for alarms.	2006-04-17
6.16.01	Time series to map link is enabled. Improve UNC support. Improve startup performance in batch mode.	2006-02-16
6.16.00	Begin adding support for NDFD (National Digital Forecast Database) input type, and maintenance.	2006-01-31
6.15.00	Begin adding time series to map link.	2006-01-16

TSTool Version	Version Information	Release Date
6.14.00	Update some commands to named parameter notation, and maintenance.	2005-12-14
6.13.00	Internal release.	2005-11-13
6.12.00	Improve error handling when running in batch mode with graphs.	2005-10-05
6.11.00	Enable the ColoradoSMS input type for hydrograph annotations and update batch mode features to better utilize the CDSS configuration file.	2005-10-05
6.10.09	Maintenance release – convert some commands to use named parameters.	2005-09-28
6.10.08	Maintenance release – convert some commands to use named parameters. Add the newStatisticYearTS () command.	2005-09-22
6.10.07	Maintenance release – convert some commands to use named parameters.	2005-08-24
6.10.06	Release corresponding to the CDSS CD release.	2005-08-04
6.10.05	Respond to CDSS testing feedback.	2005-08-01
6.10.04	Respond to CDSS testing feedback. Add additional query filters for HydroBase stations and structures.	2005-07-20
6.10.03 BETA	Begin phasing in saving time series products to HydroBase and RiversideDB.	2005-07-08
6.10.02 BETA	Update the openHydroBase () command to use free-format parameters.	2005-06-28
6.10.01 BETA	Begin enabling data flags for time series to support enhancements to fill commands.	2005-06-03
6.10.00 BETA	Initial release supporting HydroBase stored procedures with initial prototypes of Mixed Station Analysis and related features. Implement new message log viewer and commands to simplify comparison of time series.	2005-06-01
6.09.03	Maintenance release.	2004-12-21
6.09.02	Maintenance release.	2004-10-05
6.09.01	Add NWSRFS FS5Files input type.	2004-09-01
6.09.00	Add readHydroBase () commands.	2004-08-27
6.08.02	Documentation made current to include all version 6 changes.	2004-07-27
6.08.01	Allow HydroBase connection to be made at startup.	2004-07-20
6.08.00	Allow wildcards in commands that read from StateCU and StateModB input types.	2004-07-11
	Initial Java version.	1997-10-23

Changes in Versions 8.13.00 – 08.14.02

- Continue updating commands to have new error handling and to enable ensemble processing for many commands.
- Add SetProperty () and SetPropertyFromNwsrfsAppDefault () commands to set controlling information for processing. In particular, it is envisioned that this capability will be used to set date/time and filename information at the top of a command file, for use in other commands throughout the command file.

- Add ability to recognize `${Property}` in read/write commands for `DateValue`, `NwsCard`, and `NwsrfsEspTraceEnsemble` commands. This capability will be added to other commands in future releases.
- Add the ability to set the time series alias dynamically in the `ReadNwsrfsEspTraceEnsemble()` command.
- Warning dialogs in command editors were inadvertently turned off in a previous release and have been enabled again.
- Add preliminary capability in the `ReadDelimitedFile()` command – additional work will be completed to fully enable this command.
- Add the `ComputeErrorTimeSeries()` command, to create a time series indicating the difference between, for example, observed and simulated time series. Percent error is enabled and additional error measures may be added in the future.
- Fix so that the `TSAlias` is used if specified in time series product files. This allows aliases to be configured in commands and passed to pre-generated product files, to streamline product processing.
- The `RunPython()` command has been enabled in preliminary fashion, with the goal of implementing full support for calling external Python processing scripts, to support more complex processing.
- The `WriteDateValue()` command has been updated to include a `Delimiter` parameter (e.g., to allow comma to be specified) and the output period can be set in the command. The alias is also now printed in column headings if it has been specified.
- Add the `ResequenceTimeSeriesData()` command to resequence years of data in a time series, given a list of years.

Changes in Versions 8.03.00 – 08.12.06

- Many releases occurred to continue updating commands to have new error handling and to enable ensemble processing. More details follow below.
- Many commands have been updated to use the `TSList` parameter, which indicates the time series to be processed by the command. Commands are backward compatible; however, the new parameter will not be recognized by older versions of TSTool. Once this parameter is enabled in a command, it will allow additional values to be recognized in the future (e.g., getting the list of time series from a table may be enabled). A consistent approach for the parameter also promotes consistency between commands.
- As much as possible, update commands that read time series to provide the list of time series identifiers to other commands. This facilitates command editing. For example, when a `Read*()` command is inserted, it will partially run (discovery mode) to read time series information, but not the full data. The time series information is then made available to later commands to facilitate editing the commands.
- Fix `NwsrfsEspTranceEnsemble` handling to handle leap year and correct bug where time zone was not being handled properly (one hour off).
- Expand the capabilities of the `SetTimeSeriesProperty()` to include setting whether editable – editable time series will enable editing capabilities in the graph view. Add the `DefaultSaveFile` parameter to the `ProcessTSProduct()` command to help automate saving edited time series.
- Change all results to a tabbed panel of lists, with appropriate mouse actions. For example, a variety of actions can be taken by right-clicking on the time series results. However, for output files, a single click on a file will result in the file being displayed.
- Include most output files in the results tab. Some secondary files are not yet included but will be as additional commands are updated with improved error handling.
- Reorganize general command menus to group related commands and avoid a long list of general commands.
- Reorganize into a separate command menu commands that only apply to ensembles.

- Add the `CreateEnsemble()` command to create an ensemble of time series from a single time series (e.g., by shifting and overlapping each year of the time series).
- Add the `CopyEnsemble()` command, which copies each time series in an ensemble.
- Add the `NewStatisticTimeSeriesFromEnsemble()` command, which generates a statistic (e.g., “Mean”) time series from an ensemble.
- Add a command group and results tab for table processing. Add the `ReadTableFromDelimitedFile()` command, for example to read a CSV file. It is envisioned that table commands will be used to further automate and streamline processing.
- Remove obsolete commands from menus. Running old command files will warn about the obsolete commands and recommend new commands. Most of these commands have not been used for a long time: `SetConstantBefore()` was previously replaced with `SetConstant()`. `FillCarryForward()` was previously replaced with `FillRepeat()`.
- The performance of the `ShiftTimeByInterval()` command has been greatly improved.
- The `NewStatisticTimeSeries()` command has been added to generate a statistic time series determined from a time series. For example, for the “Mean” statistic, the mean of all Jan 1 daily values are repeated throughout the period for each Jan 1. This allows the mean to be graphed or otherwise used for analysis.
- Running “TSTool File.TSTool” will cause the command file to be loaded, but not run. To run in batch mode, continue to run with “TSTool –commands File.TSTool”.

Changes in Versions 8.00.00 – 08.02.00

- Several releases occurred to introduce new error handling. More details follow below.
- Initial implementation of new error-handling features, which display graphics to the left and right of the command area indicating warnings and failures. The intent is to provide users with more immediate and accessible feedback and minimize the need to review the log file. Black dots after running indicate commands that have not been updated to the new error handling. Right click on a command and select “Show Command Status” to see useful information about resolving a problem. A command has 3 phases: initialization, discovery, and run, each with a status of unknown, success, warning, or failure.
- Process commands on a separate thread. This allows the GUI to remain responsive and show command progress during running. Features are being implemented to cancel processing.
- Add `CreateRegressionTestCommandFile()` and `StartRegressionTestResultsReport()` commands to facilitate creating command test suites, to allow regression testing. Use these commands to create test suites for testing, to automate testing for future releases.
- Add the `WriteProperty()` command to write a processor property (e.g., the output start date) to a file, primarily for use in testing.
- Add the `RemoveFile()` command for use in testing, and can also be used in normal processing.
- Add the `NewPatternTimeSeries()` command, which can be used to generate test data for other commands, and can also be used for normal processing.
- The `Copy()` command now requires a new time series identifier to be specified, in order to avoid confusion with the original time series identifier. Old commands will fail if a valid new identifier is not specified. A simple workaround is to use the same location and interval as the original time series and “copy” for the scenario. Because an alias is assigned to the copy, this full time series identifier will likely only be used for displays about time series details.
- Begin distributing TSTool such that when installed the software lives in a separate versioned folder with a name similar to “TSTool-08.02.00”. This allows different versions of the software to be installed at the same time, in case a specific version must be used and to allow for transition to new versions without conflicts with other software that may share components. A zip file install is available and a full installer is being created, similar to previous versions.

Changes in Versions 7.02.00 – 07.04.00

- Remove checkbox for stored procedures from HydroBase login – the transition to stored procedures has been complete for some time.
- Allow the `readStateMod()` command to read water rights files – this was implemented to verify CDSS StateDMI software processing.
- Add support for HydroBase administrative flow stations.
- Add the `setToMin()` command similar to `setMax()`.
- Update the TSTool PDF documentation to include navigation.
- Update the HydroBase `fillUsingDiversionComments()` command to optionally fill with the CIU (currently in use) flag.
- Improve the sizing of the time series query list table.
- Change installer so that when TSTool is run in batch mode from the command line, the working directory is the starting location, rather than the software installation home.
- Update to allow the `readNWSRFSFS5Files()` command to work in batch mode.
- Update to handle new StateCU file formats.

Changes in Version 7.01.00

- HydroBase 20061003 and later has a G: at the end of the SFUT and the F: has been expanded to seven characters. This version of TSTool handles the new identifiers and is backward compatible with older databases and commands files. Old commands files using SFUT should return the same results as before.
- The time series list area now has a minimum height consistent with the HydroBase input type – lists of time series from StateMod or other files are now more readable.
- The `analyzePattern()` command dialog now correctly forces the user to use percentiles in the range of 0 to 1. The command has also been updated to use the output period from `setOutputPeriod()` and the year type from `setOutputYearType()` to write the pattern file. Consequently, the input time series are no longer required to be the specific water year period to control output. The previous version added “_pattern” on the location part of the TSID, but the current version instead sets the data type to “Pattern” – this will allow the pattern file output to be directly used with `fillPattern()`, using standard locations.
- When saving commands files, the “TSTool” file extension is automatically added. This is compatible with the new installer, which lets the operating know that the extension should be associated with TSTool.
- Fix the `fillInterpolate()` command to allow time series identifiers with space.
- Fix the `cumulate()` command to allow the `HandleMissingHow` parameter to not be specified – it will default to `SetMissingIfMissing`.
- The `fillUsingDiversionComments()` command has been updated to use the CIU HydroBase data to provide more zeros.
- Update to support new StateCU file formats with longer crop names, consistent with similar StateDMI software updates.
- The installer includes several improvements, including more ability to configure the HydroBase information, and displaying previously set HydroBase configuration information as defaults.

Changes in Version 7.00.00

- Begin using the Nullsoft Scriptable Install System (NSIS) to build software installers.

- Begin distributing TSTool as an executable file *TSTool.exe*, which starts up the Java Runtime Environment. This allows for simpler configuration of the **Start** menu and gives users a more traditional executable to run.
- The software organization is slightly different from the previous releases in order to recognize clearer boundaries between components. Several new Jar files are provided, rather than being merged with other Jar files. The **Installation and Configuration Appendix** lists the files.
- Add support for Colorado Agricultural Livestock Statistics and human population time series in HydroBase.

Changes in Version 6.19.00

- Update `fillUsingDiversionComments()` to extend time series with diversion comments available outside the normal diversion records period, if no query or output period has been specified.

Changes in Version 6.18.00

- Add `runCommands()` to allow a controlling commands file to run other commands files.

Changes in Version 6.17.00

- Add `compareFiles()` to help with regression testing, to verify current and expected results.

Changes in Version 6.16.02

- Begin adding data test commands in development mode – these commands will evaluate time series for critical conditions.
- Reenabled `fillMove2()`, which was unintentionally disabled in a previous release.

Changes in Version 6.16.01

- First version that includes operational features to support link between time series and map interface.
- Increase performance at startup when no main GUI is shown, for cases when TSTool is being used to provide graphs for other software.
- Add support for Universal Naming Convention (UNC) for software home in startup files.
- Change **View...Map Interface** to **View...Map**.

Changes in Version 6.16.00

- Implement hooks for the NDFD input type.
- Improve handling of NWS Card file extensions in commands and **File...Save** menu choices.
- Add map interaction features. See the **Installation and Configuration Appendix** for more information about configuring links with maps.

Changes in Version 6.15.00

- Begin implementing link between time series and map interface.
- Reorder general command menus to be more consistent with other software.
- Add warning if time series cannot be retrieved from the RiversideDB input type.

Changes in Version 6.14.00

- Change the `setQueryPeriod()` command to `setInputPeriod()` to be consistent with other software nomenclature. The old command is still supported.
- The `readNwsCard()` and `TS Alias = readNwsCard()` commands both now use the named-parameter notation and have the new `Read24HourAsDay` parameter.
- Blank lines in commands files now display properly.
- Fix bug where time series table sometimes showed half-drawn rows.
- Fix bugs where `StateMod` binary and `StateCU` input type file chooser prompt would not allow a cancel of the file select to occur. Cancel now results in the previous file that was selected being displayed.

Changes in Version 6.12.00

- Improve error handling for processing time series products. In particular, TSTool now returns a non-zero exit status if there is an error processing a product. This can be detected by external software that is running TSTool.

Changes in Version 6.11.00

- Enable the `ColoradoSMS` input type and begin adding alert annotations for streamflow graphs.
- Fix bug so that if a commands file is specified using a relative path, the working directory is interpreted correctly to determine the full path to the commands file.
- Add the ability to accept `Parameter=Value` command line parameters. This will allow override of configuration file information.
- Convert `processtSPROduct()` to use named parameters and ensure that output can be viewed even if in batch mode with no main GUI.
- Update so that for batch runs, the *CDSS.cfg* file information for HydroBase is used to make the initial connection. Phase out the HydroBase database properties in the *TSTool.cfg* file.

Changes in Version 6.10.09

- Convert `cumulate()` to use named parameters and begin development of a new `Reset` parameter.
- Convert `readStateModB()` to use named parameters and add the `Version` parameter to allow reading of old files. The features associated with the `Version` parameter are under development.
- Update the `newStatisticYearTS()` to support calculation of maximum and minimum values in a year and count of values in a year above/below a test value. Also update the command to better handle incomplete data at the end of the analysis period.
- Update the `openHydroBase()` command to check the *CDSS.cfg* information and provide database server and database name choices to the user, to minimize errors in use.

Changes in Version 6.10.08

- Convert `fillConstant()` to use named parameters.
- Convert `newTimeSeries()` to use named parameters.
- Add the `newStatisticYearTS()` command, in particular to support calculation of frost date time series.
- Update `openHydroBase()` to accept the database name parameter.
- Double-clicking on a command will now cause the editor for the command to be displayed.
- Add a Command Glossary to the documentation and begin to standardize command parameter names to be consistent.

Changes in Version 6.10.07

- Convert `scale()` to use named parameters.
- Change `TS X = ...` to `TS Alias = ...` in menus. Start to change notation in documentation and command dialogs.
- Convert `copy()` to use named parameters and add the ability to assign a new TSID to the copy.
- Convert `writeStateMod()` to use named parameters and add ability to select time series to write.
- Convert `readStateMod()` to use named parameters and add parameters for the input period..

Changes in Version 6.10.06

- Official release to support stored procedures.
- Documentation made current to reflect changes since the last documentation issue.
- Respond to feedback from previous 6.10.x incremental releases.
- Fix bug where XY-Scatter graph was not working due to changes in the 6.10.00 BETA release.

Changes in Version 6.10.05

- Add the `lagK()` command.
- Update the `fillProrate()` command `InitialValue` parameter to support `NearestForward` and `NearestBackward`.

Changes in Version 6.10.04

- Add additional input filter choices for HydroBase structures and stations, consistent with the StateView software.
- Update the `fillProrate()` command to include the `ComputeFactorHow` parameter to allow computing the proration factor based on an average of ratios. Update the command to support free-format parameters.
- Update the `selectTimeSeries()` command to allow combinations of selection filters, to allow more flexibility.
- Add the ability to query HydroBase infrequent diversion and reservoir release time series.

Changes in Version 6.10.03 BETA

- Input filters for HydroBase well structures and stations are now handled properly.
- Add initial support for saving time series products to HydroBase and RiversideDB.

Changes in Version 6.10.02 BETA

- Update the `openHydroBase()` command to use free-format parameters.

Changes in Version 6.10.01 BETA

- Enable ability to have data flags for daily and monthly data.
- Update the `writeRiverWare()` command to handle time steps other than hourly.

Changes in Version 6.10.00 BETA

- Begin releasing support for HydroBase stored procedures.

- Begin development of generic `changeInterval()` command and update to free-format parameters.
- Begin work on the Mixed Station Analysis tool and `fillMixedStation()` command.
- Update the `fillRegression()` command to support free-format parameters.
- Begin work on the `analyzePattern()` command.
- Add the **Commands...Analyze Time Series** menu for analysis commands.
- Add the **Commands...Models** menu for more complicated modeling commands.
- Add the **Tools...Analysis** menu for analysis tools.
- Begin implementing the generic log file viewer, which allows links between commands and log messages.
- Change defaults to NOT display messages to the console, to improve performance.
- Add the point graph type.
- Add the predicted value graph type.
- Add the predicted value residual graph type.
- Add the `sortTimeSeries()` command.
- Add the ability for the `readNWSCard()` command to read 1+ time series.
- Add the `startLog()` command.
- Add the `compareTimeSeries()` command.
- Update the `fillHistMonthAverage()` and `fillHistYearAverage()` commands to have fill flag and free-format parameters.
- Add a warning in the `add()` command when frost date time series are added and indicate more appropriate commands.

Changes in Version 6.09.03

- Fix bug where initial directory with spaces in name was causing errors.

Changes in Version 6.09.02

- Added release notes to documentation.
- Fix bug in NWSRFS FS5Files input type where identifiers with underscores were not being handled.
- StateModB input type reservoir data types (and some well types) had ? for data groups – this has been resolved using StateMod 10.27 HTML documentation.

Changes in Version 6.09.01

- Added NWSRFS FS5Files input type support, for use with the National Weather Service River Forecast System (NWSRFS).
- Fix summary reports (daily totals and means) to handle minute data.

Changes in Version 6.09.00

- Add the `readHydroBase()` command to read one or more HydroBase time series while filtering based on location, ID, etc.

Changes in Version 6.08.02

- Documentation updated to reflect all version 6 changes.
- Minor corrections to interface based on documentation review.

Changes in Version 6.08.01

- For the HydroBase input type, allow the ODBC DSN to be specified in the TSTool configuration file, to allow a HydroBase connection to be made at startup without prompting. This supports the CDSS CD distribution.

Changes in Version 6.08.00

- Allow StateCU input type time series read commands to allow wildcards.
- Allow StateMod input type time series read commands to allow wildcards.