

TSTool Training

Introduction to Commands

Version: 9.07.02, 2010-08-20

Duration: Less than 30 minutes

Level: Introduction

Colorado's Decision Support Systems

Developed by DWR and CWCB



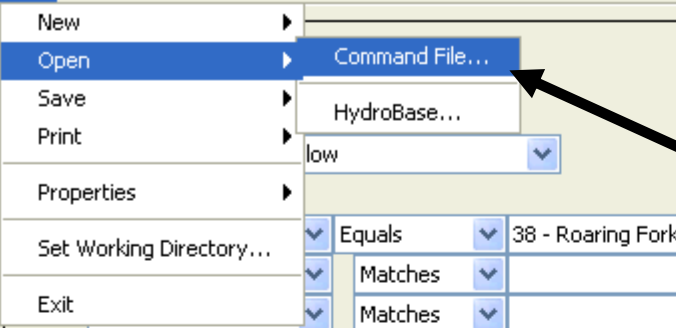
This Presentation

- Provides an introduction to TSTool commands
- Is designed for self-paced training
- Is accompanied by examples, each of which reside in a folder distributed with this presentation
 - See the doc/Training folder under the software installation
 - Full use of TSTool requires access to databases and internet (some examples will not work without such access)

Opening and Running an Existing Command File

- File...Open...Command File
- Select a *.TSTool file (in this case choose example1-StreamflowCommands\StreamflowCommands.TSTool)
- Press the Run All Commands button under the command list
- View the results

Opening and Running a Command File



Open an existing command file

	ID	CO Abbrev.	Name/Description	Da
1	09072550	ROALMCCO	ROARING FORK RIVER ABV LOS...	US
			NICOLN CREEK BELOW GRIZZL...	US
			ROARING FORK RIVER AB DIFFIC...	US
			ROARING FORK RIVER NEAR AS...	US
			ROARING FORK RIVER AT ASPE...	US
6	09073700		HUNTER CREEK ABOVE MIDWAY...	US
7	09073720		HUNTER CREEK FEEDER CONDUI...	US

Buttons: Get Time Series List, Copy Selected to Commands, Copy All to Commands

Commands (4 commands, 0 selected, 0 with failures, 0 with warnings)

```
1 # Simple command file to read a DateValue file, which contains all the
2 # daily streamflow time series from HydroBase for Water District 38
3 # (Roaring Fork). After reading the time series are read in, they can be viewed.
4 ReadDateValue(InputFile="RoaringFork-Streamflow-Month.dv")
5
6
7
8
9
10
```

Commands have a readable text form, with comments used to describe processing

Run Selected Commands

Run All Commands

Run commands to generate results

Clear Commands

Results

Ensembles Output Files Problems Tables Time Series Views

71 time series, 71 selected

```
1) MIDDLE CUNNINGHAM CREEK FEEDER CANAL NR. - CUNCANCO.DWR.Streamflow.Month (1906-04 to 2009-09)
2) ROCKY FORK CREEK NEAR MEREDITH, CO. - 09080300.DWR.Streamflow.Month (1906-04 to 2009-09)
3) ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN - ROABMCCO.DWR.Streamflow.Month (1906-04 to 2009-09)
4) THOMPSON CREEK FEEDER DITCH NEAR HAYSTACK, CO - THOMUPCO.DWR.Streamflow.Month (1906-04 to 2009-09)
5) ROARING FORK RIVER ABV LOST MAN CR NEAR ASPEN, CO - 09072550.USGS.Streamflow.Month (1906-04 to 2009-09)
6) LINCOLN CREEK BELOW GRIZZLY RESERVOIR NR ASPEN, CO - 09073005.USGS.Streamflow.Month (1906-04 to 2009-09)
7) ROARING FORK RIVER AB DIFFICULT C NR ASPEN, CO. - 09073300.USGS.Streamflow.Month (1906-04 to 2009-09)
8) ROARING FORK RIVER NEAR ASPEN, CO. - 09073400.USGS.Streamflow.Month (1906-04 to 2009-09)
9) ROARING FORK RIVER AT ASPEN, CO. - 09073500.USGS.Streamflow.Month (1906-04 to 2009-09)
10) HUNTER CREEK ABOVE MIDWAY CREEK, NEAR ASPEN, CO. - 09073700.USGS.Streamflow.Month (1906-04 to 2009-09)
```

Second level menus correspond to commands that can be inserted in the command list

Second level menus correspond to commands that can be inserted in the command list

Ready

The Commands Area

Input/Query Options

Input Type:

Input Name:

Data Type:

Time Step:

Where:

Where:

Where:

	ID	CO Abbrev.	Name/Description	Da
1	09072550	ROALMCCO	ROARING FORK RIVER ABV LOS...	US
2	09073005	LINGRRCO	LINCOLN CREEK BELOW GRIZZL...	US
3	09073300	ROADIFCO	ROARING FORK RIVER AB DIFFI...	US
4	09073400	ROAASPCO	ROARING FORK RIVER NEAR AS...	US
			ROARING FORK RIVER AT ASPE...	US
			HUNTER CREEK ABOVE MIDWAY...	US
			HUNTER CREEK FEEDER CONDUI...	US

Useful information about the command list

Commands (4 commands, 1 selected, 0 with failures, 0 with warnings)

```

1 # Simple command file to read a DateValue file, which contains all the
2 # monthly streamflow time series from HydroBase for Water District 38
3 # (Roaring Fork). After reading the time series are read in, they can be viewed.
4 ReadDateValue(InputFile="RoaringFork-Streamflow-Month.dv")
5
6
7
8
9
10
```

Right click on the command list to access the popup menu that provides command actions

Show Command Status (Success/Warning/Failure)

Edit

Cut

Copy

Paste (After Selected)

Delete Command(s)

Find Command(s)...

Select All Commands

Deselect All Commands

Convert selected commands to # comments

Convert selected commands from # comments

Run All Commands (create all output)

Run All Commands (ignore output commands)

Run Selected Commands (create all output)

Run Selected Commands (ignore output commands)

Results

Ensembles Output Files Problems Tables Time Series Views

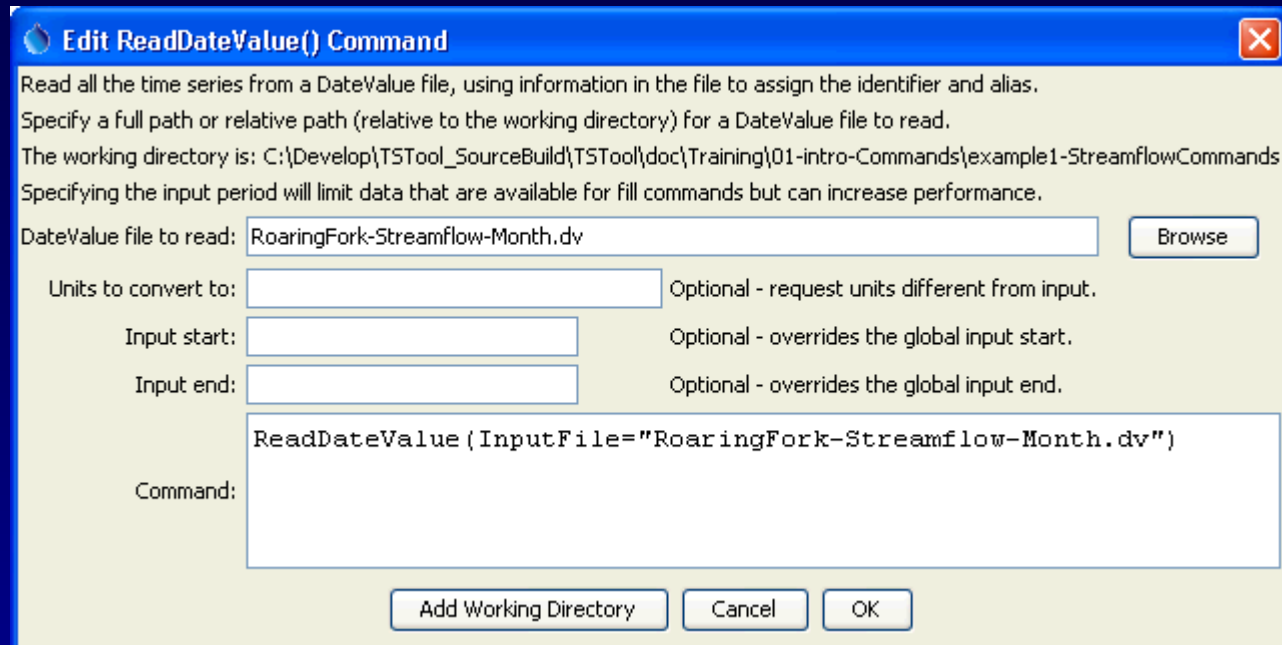
71 time series, 71 selected

```

1) MIDDLE CUNNINGHAM CREEK FEEDER CANAL NR. - CUNCANCO.DWR.Streamflow.Month (1906-04 to 2009-09)
2) ROCKY FORK CREEK NEAR MEREDITH, CO. - 09080300.DWR.Streamflow.Month (1906-04 to 2009-09)
3) ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN - ROALMCCO.DWR.Streamflow.Month (1906-04 to 2009-09)
4) THOMPSON CREEK FEEDER DITCH NEAR HAYSTACK, CO - THOMUPCO.DWR.Streamflow.Month (1906-04 to 2009-09)
5) ROARING FORK RIVER ABV LOST MAN CR NEAR ASPEN, CO - 09072550.USGS.Streamflow.Month (1906-04 to 2009-09)
6) LINCOLN CREEK BELOW GRIZZLY RESERVOIR NR ASPEN, CO - 09073005.USGS.Streamflow.Month (1906-04 to 2009-09)
7) ROARING FORK RIVER AB DIFFICULT C NR ASPEN, CO. - 09073300.USGS.Streamflow.Month (1906-04 to 2009-09)
8) ROARING FORK RIVER NEAR ASPEN, CO. - 09073400.USGS.Streamflow.Month (1906-04 to 2009-09)
9) ROARING FORK RIVER AT ASPEN, CO. - 09073500.USGS.Streamflow.Month (1906-04 to 2009-09)
10) HUNTER CREEK ABOVE MIDWAY CREEK, NEAR ASPEN, CO. - 09073700.USGS.Streamflow.Month (1906-04 to 2009-09)
```

Inserting/Editing Commands

- Use the Commands menu to insert a command
- Double-click, or right-click (and Edit) on an existing command to edit
- Command editors provide choices and check input



The screenshot shows a dialog box titled "Edit ReadDateValue() Command". It contains the following text and controls:

Read all the time series from a DateValue file, using information in the file to assign the identifier and alias.
Specify a full path or relative path (relative to the working directory) for a DateValue file to read.
The working directory is: C:\Develop\TSTool_SourceBuild\TSTool\doc\Training\01-intro-Commands\example1-StreamflowCommands
Specifying the input period will limit data that are available for fill commands but can increase performance.

DateValue file to read:

Units to convert to: Optional - request units different from input.

Input start: Optional - overrides the global input start.

Input end: Optional - overrides the global input end.

Command:

```
ReadDateValue ( InputFile="RoaringFork-Streamflow-Month.dv")
```

At the bottom are three buttons: "Add Working Directory", "Cancel", and "OK".

See also the Command Reference in the TSTool documentation.

Command Editing Hints

- Insert/copy/paste/delete depend on what is selected – right click on commands and use Deselect All to add a command at the end of the command list.
- To save time duplicating commands, highlight commands, use copy/paste, and then edit to change.
- Experienced users can edit command files with a text editor (commands will be checked at load and can be corrected).

Input/Query Options

Input Type:

Input Name:

Data Type:

Time Step:

Where:

Where:

Where:

A "Clean Run" Produces no Errors

	ID	CO Abbrev.	Name/Description	Da
1	09072550	ROALMCCO	ROARING FORK RIVER ABV LOS...	US
2	09073005	LINGRRCO	LINCOLN CREEK BELOW GRIZZL...	US
3	09073300	ROADIFCO	ROARING FORK RIVER AB DIFFIC...	US
4	09073400	ROAASPCO	ROARING FORK RIVER NEAR AS...	US
5	09073500		ROARING FORK RIVER AT ASPE...	US
6	09073700		HUNTER CREEK ABOVE MIDWAY...	US
7	09073720		HUNTER CREEK FEEDER CONDUI...	US

Commands (4 commands, 0 selected, 0 with failures, 0 with warnings)

```

1 # Simple command file to read a DateValue file, which contains all the
2 # monthly streamflow time series from HydroBase for Water District 38
3 # (Roaring Fork). After reading the time series are read in, they can be viewed.
4 ReadDateValue(InputFile="RoaringFork-Streamflow-Month.dv")
5
6
7
8
9
10

```

Run selected or all commands

Results

Ensembles Output Files Problems Tables Time Series Views

71 time series, 71 selected

- MIDDLE CUNNINGHAM CREEK FEEDER CANAL NR. - CUNCANCO.DWR
- ROCKY FORK CREEK NEAR MEREDITH, CO. - 09080300.DWR.Stream
- ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN - ROA
- THOMPSON CREEK FEEDER DITCH NEAR HAYSTACK, CO - THOMUPC
- ROARING FORK RIVER ABV LOST MAN CR NEAR ASPEN, CO - 09072550.USGS.Streamflow.Month (1906-04 to 2009-09)
- LINCOLN CREEK BELOW GRIZZLY RESERVOIR NR ASPEN, CO - 09073005.USGS.Streamflow.Month (1906-04 to 2009-09)
- ROARING FORK RIVER AB DIFFICULT C NR ASPEN, CO. - 09073300.USGS.Streamflow.Month (1906-04 to 2009-09)
- ROARING FORK RIVER NEAR ASPEN, CO. - 09073400.USGS.Streamflow.Month (1906-04 to 2009-09)
- ROARING FORK RIVER AT ASPEN, CO. - 09073500.USGS.Streamflow.Month (1906-04 to 2009-09)
- HUNTER CREEK ABOVE MIDWAY CREEK, NEAR ASPEN, CO. - 09073700.USGS.Streamflow.Month (1906-04 to 2009-09)

Results are provided in tabs, for each output type

Input/Query Options

Input Type:

Input Name:

Data Type:

Time Step:

Where:

Where:

Where:

Command Processing Error Detection

1. Open example1-StreamflowCommands\StreamflowCommandsError.TSTool

Get Time Series List

Copy Selected to Commands

Copy All to Commands

Commands (7 commands, 0 selected, 1 with failures, 0 with warnings)

```

1 # Simple command file to read a DateValue file, which contains all the
2 # monthly streamflow time series from HydroBase f
3 # (Roaring Fork). After reading the time series
4 # !!!!
5 # The following file does not exist - it illustra
6 # !!!!
7 ReadDateValue(InputFile="RoaringFork-Streamflow-M
8
9
10
    
```

2. After running, mouse over the error indicators, right click on the command (and select Show Command Status), or view problems in the Results/Problems area

Run Selected Commands

Run All Commands

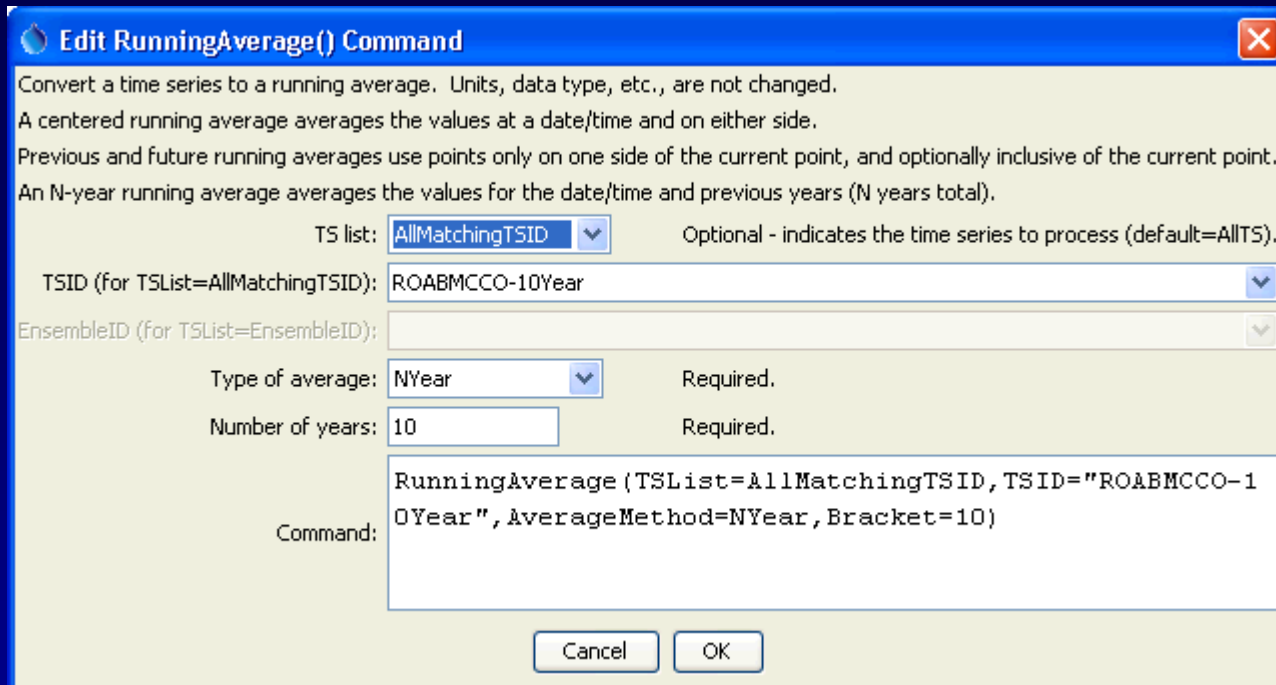
Clear Commands

Results

Ensembles Output Files Problems Tables Time Series Views

	Severity	Type	Command	Problem	Recommendation
1	FAILURE	CommandRun	ReadDateValue(InputFile="RoaringFork...	Input file does not exist: "C:\Develop\T...	Verify that filename is correct and that...

Simple Example – Running Average



Edit RunningAverage() Command

Convert a time series to a running average. Units, data type, etc., are not changed.
A centered running average averages the values at a date/time and on either side.
Previous and future running averages use points only on one side of the current point, and optionally inclusive of the current point.
An N-year running average averages the values for the date/time and previous years (N years total).

TS list: Optional - indicates the time series to process (default=AllTS).

TSID (for TSList=AllMatchingTSID):

EnsembleID (for TSList=EnsembleID):

Type of average: Required.

Number of years: Required.

Command:

```
RunningAverage (TSList=AllMatchingTSID, TSID="ROABMCCO-10Year", AverageMethod=NYear, Bracket=10)
```

See `example2-RunningAverage\RunningAverage.TSTool`

See also the Command Reference in the TSTool documentation.

Command Editor

Specify Time Series to Process

Edit RunningAverage() Command

Convert a time series to a running average. Units, data type, etc., are not changed.
A centered running average averages the values at a date/time and on either side.
Previous and future running averages use points only on one side of the current point, and optionally inclusive of the current point.
An N-year running average averages the values for the date/time and previous years (N years total).

TS list: AllMatchingTSID Optional - indicates the time series to process (default=AllTS).

TSID (for TSList=AllMatchingTSID):

EnsembleID (for TSList=EnsembleID):

Type of average: EnsembleID Required.

Number of years: FirstMatchingTSID Required.

Command: LastMatchingTSID
SelectedTS
RunningAverage (TSList=AllMatchingTSID, TSID="ROABMCCO-10Year", AverageMethod=NYear, Bracket=10)

- Most commands provide a TSList and related parameters to specify the time series to process.
- Match TSIDs using a *.*.*.* pattern.

File Edit View Commands Run Results Tools Help

Input/Query Options

Input Type:

Input Name:

Data Type:

Time Step:

Where:

Where:

Where:

Get Time Series List

Time Series List (71 time series, 0 selected)

	ID	CO Abbrev.	Name/Description	Da
1	09072550	ROALMCCO	ROARING FORK RIVER ABV LOS...	US
2	09073005	LINGRRCO	LINCOLN CREEK BELOW GRIZZL...	US
3	09073300	ROADIFCO	ROARING FORK RIVER AB DIFFIC...	US
4	09073400	ROAASPCO	ROARING FORK RIVER NEAR AS...	US
5	09073500		ROARING FORK RIVER AT ASPE...	US
6	09073700		HUNTER CREEK ABOVE MIDWAY...	US

Log file is useful for troubleshooting

Copy Selected to Commands

Copy All to Commands

Commands (13 commands, 0 selected, 0 with failures, 0 with warnings)

```

1 StartLog(LogFile="BestPractices.TSTool.log")
2 # Simple command file illustrating best practices.
3 # History:
4 # 2010-08-20 Steve Malers, initial version.
5 # Use relative paths for files to allow transport
6 ReadDateValue(InputFile="RoaringFork-Streamflow-Month.dv")
7 # Copy one of the time series to keep the original and modified vers
8 TS ROABMCCO-10Year = Copy(TSID="ROABMCCO.DWR.Streamflow.Month", NewTS
9 # Compute the 10-year running average of the time series
10 RunningAverage(TSList=AllMatchingTSID, TSID="ROABMCCO-10Year", AverageMethod=NYear, Bracket=10)
11 # Checking results is always a good idea
12 CheckTimeSeries(CheckCriteria="Missing", MaxWarnings=10)
13 WriteCheckFile(OutputFile="BestPractices.TSTool.check.html", Title="M
14

```

Run Selected Commands

Run All Commands

Use comments to describe processing, data, and history

Use relative paths to allow files to easily be moved and shared

Use check commands and a check file to help with quality control, and try to eliminate all warnings and failures in final products

Results

Ensembles Output Files Problems Tables Time Series Views

Severity	Type	Command	Problem	Recommendation
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More Information

Help...View Documentation to view the TSTool documentation.