Colorado's Decision Support Systems (CDSS)

TSTool Training

Introduction to Commands

Version: 10.00.01, 2011-05-09

Duration: Less than 30 minutes

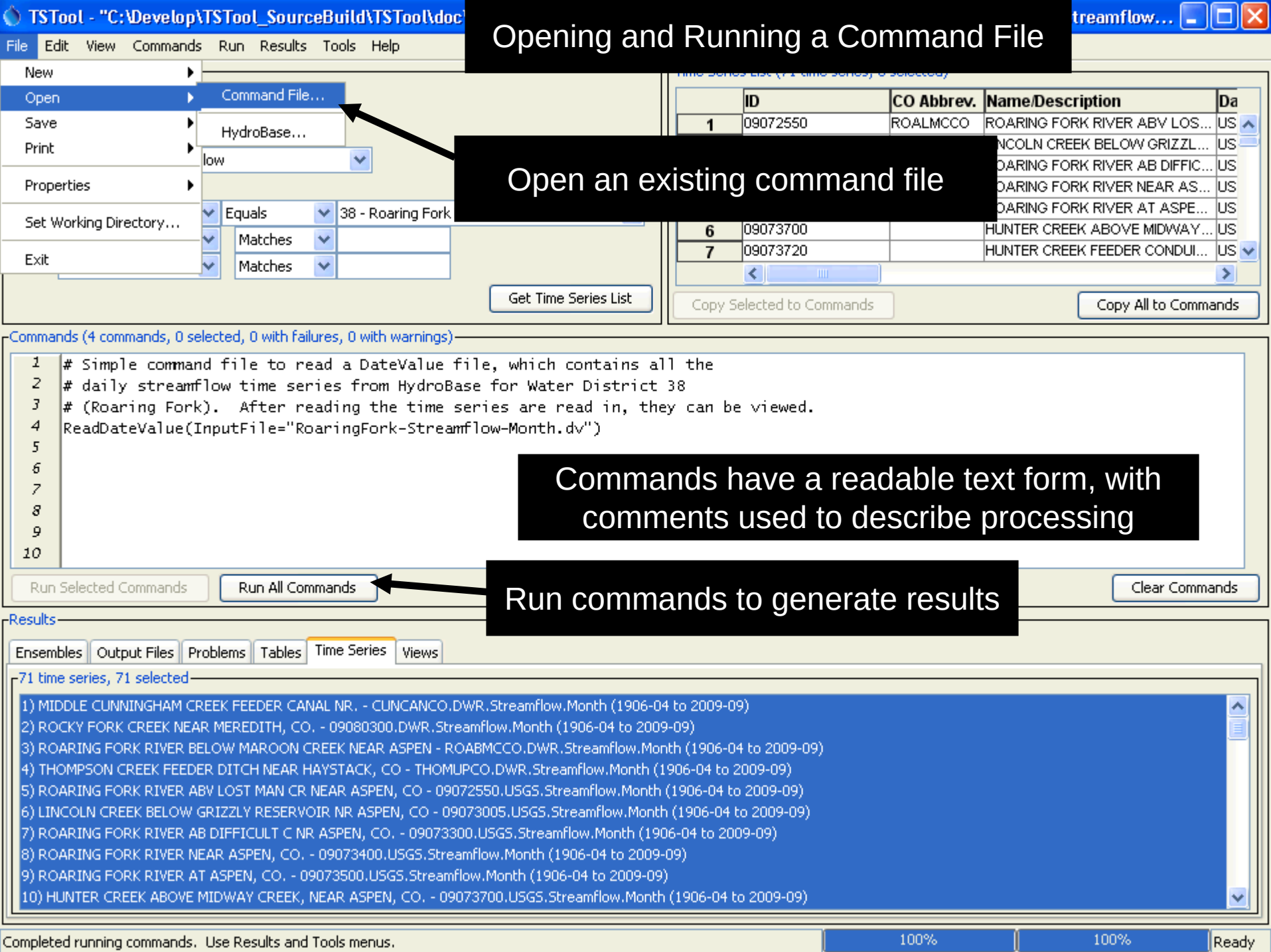
Level: Introduction

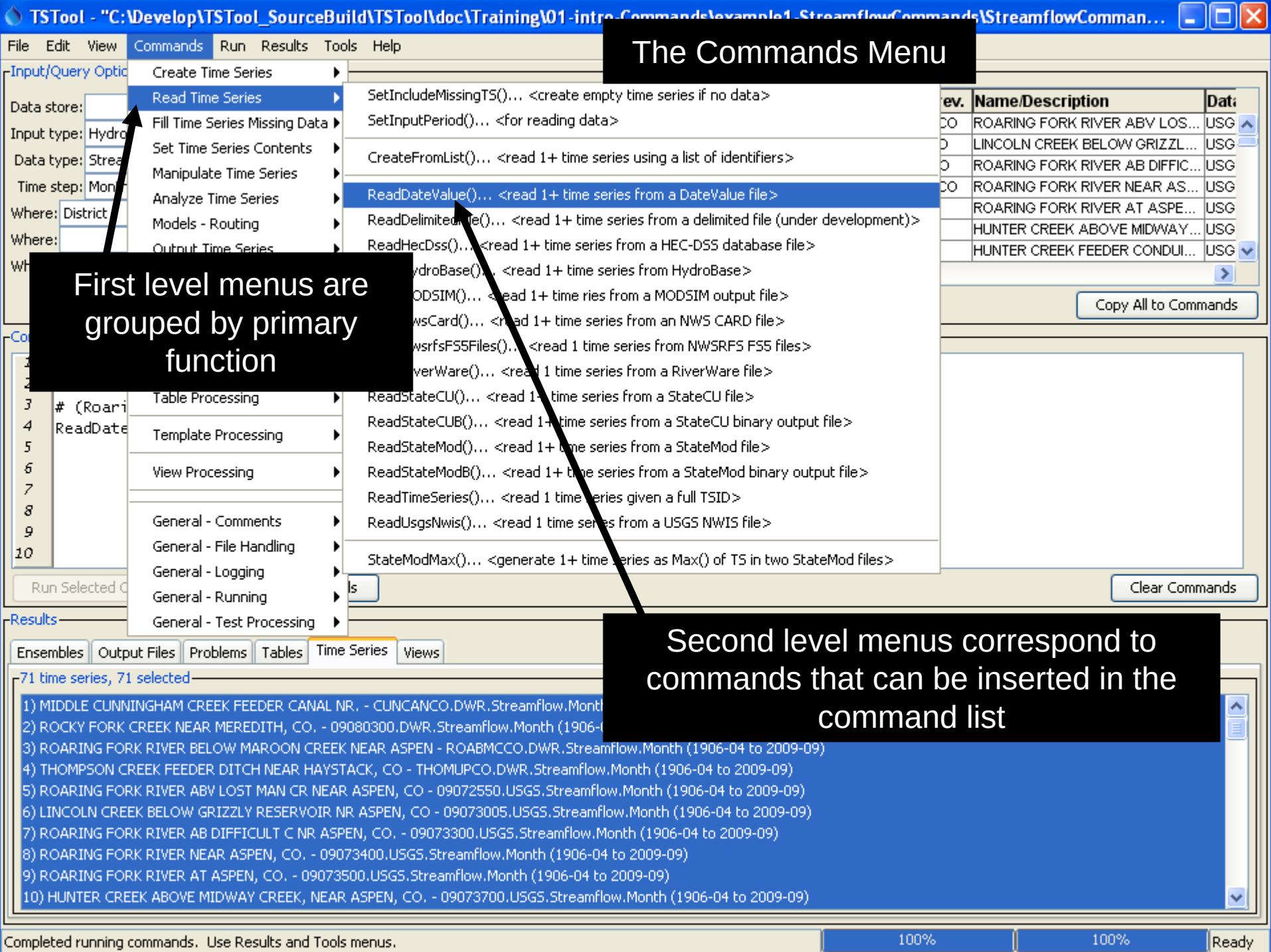
This Presentation

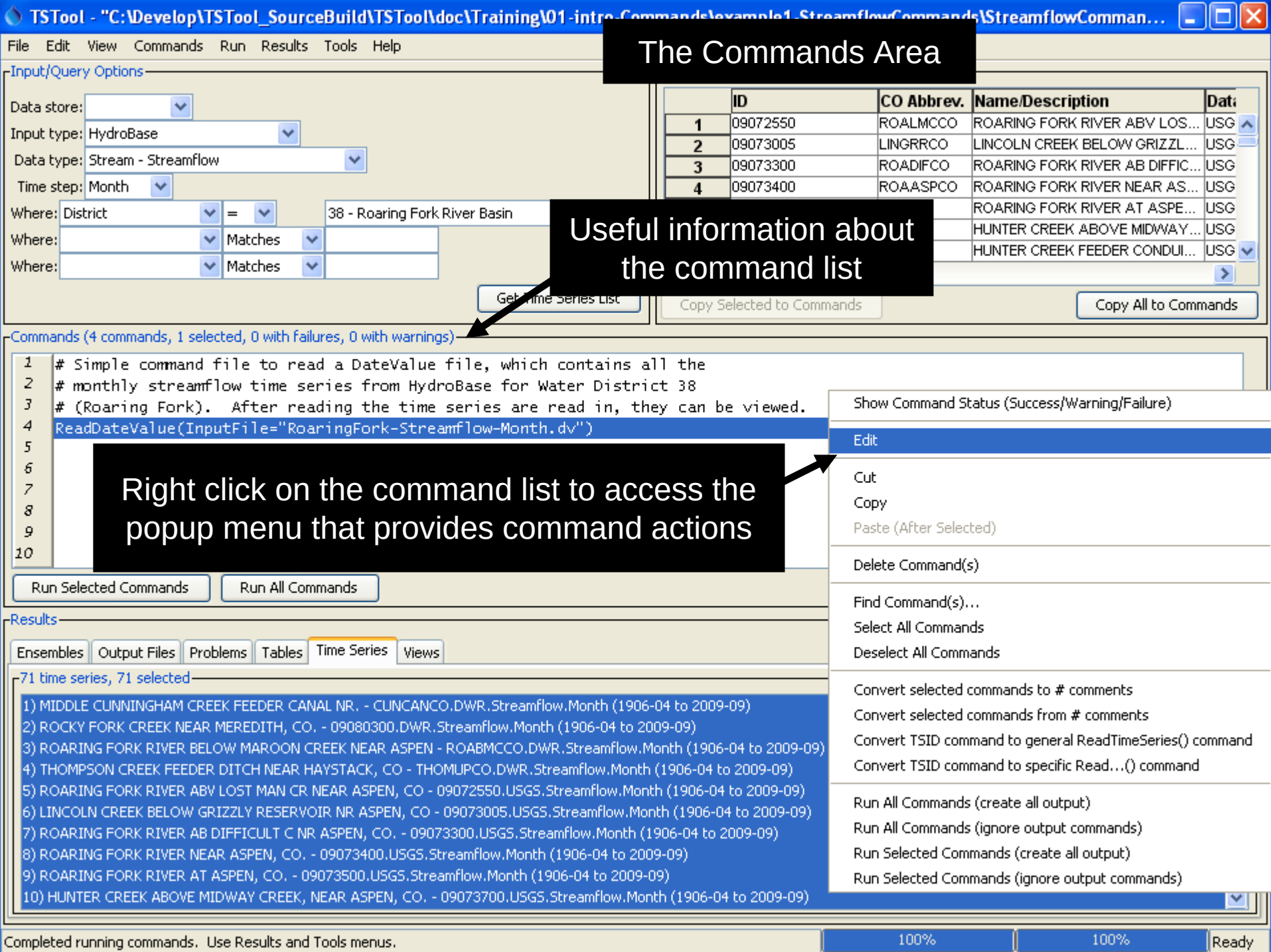
- Provides an introduction to TSTool commands
- Is designed for self-paced training
- Is accompanied by examples, each of which reside in a folder distributed with this presentation
  - See the doc/Training folder under the software installation
  - Full use of TSTool requires access to databases and 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

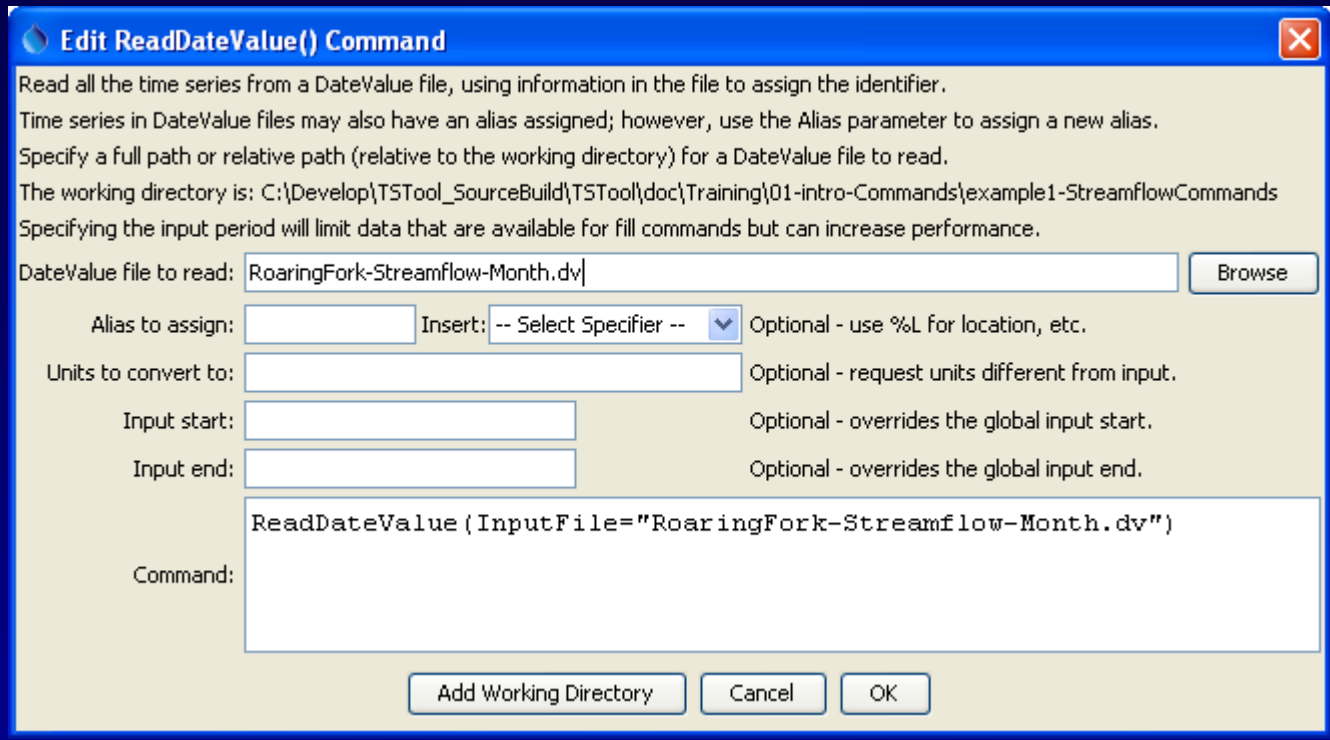

TSTool - "C:\Develop\TSTool_SourceBuild\TSTool\doc
treamflow...
Opening and Running a Command File
File Edit View Commands Run Results Tools Help
New
Open
Save
Print
Properties
Set Working Directory...
Exit
Command File...
HydroBase...
Open an existing command file
low
Equals
38 - Roaring Fork
Matches
Matches
Get Time Series List
ID
CO Abbrev.
Name/Description
1 09072550 ROALMCCO ROARING FORK RIVER ABV LOS...
6 09073700 HUNTER CREEK ABOVE MIDWAY...
7 09073720 HUNTER CREEK FEEDER CONDUI...
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")
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)
Completed running commands. Use Results and Tools menus.
100%
100%
Ready


The Commands Menu
First level menus are grouped by primary function
Second level menus correspond to commands that can be inserted in the command list
TSTool - "C:\Develop\TSTool_SourceBuild\TSTool\doc\Training\01-intro-Commands\example1-StreamflowCommands\StreamflowComman...
File Edit View Commands Run Results Tools Help
Create Time Series
Read Time Series
Fill Time Series Missing Data
Set Time Series Contents
Manipulate Time Series
Analyze Time Series
Models - Routing
Table Processing
Template Processing
View Processing
General - Comments
General - File Handling
General - Logging
General - Running
General - Test Processing
SetIncludeMissingTS()... <create empty time series if no data>
SetInputPeriod()... <for reading data>
CreateFromList()... <read 1+ time series using a list of identifiers>
ReadDateValue()... <read 1+ time series from a DateValue file>
ReadDelimitedFile()... <read 1+ time series from a delimited file (under development)>
ReadHecDss()... <read 1+ time series from a HEC-DSS database file>
ReadHydroBase()... <read 1+ time series from HydroBase>
ReadMODSIM()... <read 1+ time ries from a MODSIM output file>
ReadNwsCard()... <read 1+ time series from an NWS CARD file>
ReadNwsrfsFS5Files()... <read 1 time series from NWSRFS FS5 files>
ReadRiverWare()... <read 1 time series from a RiverWare file>
ReadStateCU()... <read 1+ time series from a StateCU file>
ReadStateCUB()... <read 1+ time series from a StateCU binary output file>
ReadStateMod()... <read 1+ time series from a StateMod file>
ReadStateModB()... <read 1+ time series from a StateMod binary output file>
ReadTimeSeries()... <read 1 time series given a full TSID>
ReadUsgsNwis()... <read 1 time series from a USGS NWIS file>
StateModMax()... <generate 1+ time series as Max() of TS in two StateMod files>
Name/Description
ROARING FORK RIVER ABV LOS...
LINCOLN CREEK BELOW GRIZZL...
ROARING FORK RIVER AB DIFFIC...
ROARING FORK RIVER NEAR AS...
ROARING FORK RIVER AT ASPE...
HUNTER CREEK ABOVE MIDWAY...
HUNTER CREEK FEEDER CONDUI...
Copy All to Commands
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
2) ROCKY FORK CREEK NEAR MEREDITH, CO. - 09080300.DWR.Streamflow.Month (1906-
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)
Completed running commands. Use Results and Tools menus.
100%
100%
Ready


TSTool - "C:\Develop\TSTool_SourceBuild\TSTool\doc\Training\01-intro-Commands\example1-StreamflowCommands\StreamflowComman...
File Edit View Commands Run Results Tools Help
The Commands Area
Input/Query Options
Data store:
Input type: HydroBase
Data type: Stream - Streamflow
Time step: Month
Where: District = 38 - Roaring Fork River Basin
Where: Matches
Where: Matches
Get Time Series List
ID CO Abbrev. Name/Description Dat
1 09072550 ROALMCCO ROARING FORK RIVER ABV LOS... USG
2 09073005 LINGRRCO LINCOLN CREEK BELOW GRIZZL... USG
3 09073300 ROADIFCO ROARING FORK RIVER AB DIFFIC... USG
4 09073400 ROAASPCO ROARING FORK RIVER NEAR AS... USG
ROARING FORK RIVER AT ASPE... USG
HUNTER CREEK ABOVE MIDWAY... USG
HUNTER CREEK FEEDER CONDUI... USG
Copy Selected to Commands
Copy All to Commands
Useful information about the command list
Commands (4 commands, 1 selected, 0 with failures, 0 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
Run Selected Commands
Run All Commands
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
Convert TSID command to general ReadTimeSeries() command
Convert TSID command to specific Read...() command
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 - 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)
Completed running commands. Use Results and Tools menus.
100%
100%
Ready

Inserting/Editing Commands

- Use the Commands menu to insert a command
- Double-click, or right-click (and Edit) on an existing command to edit

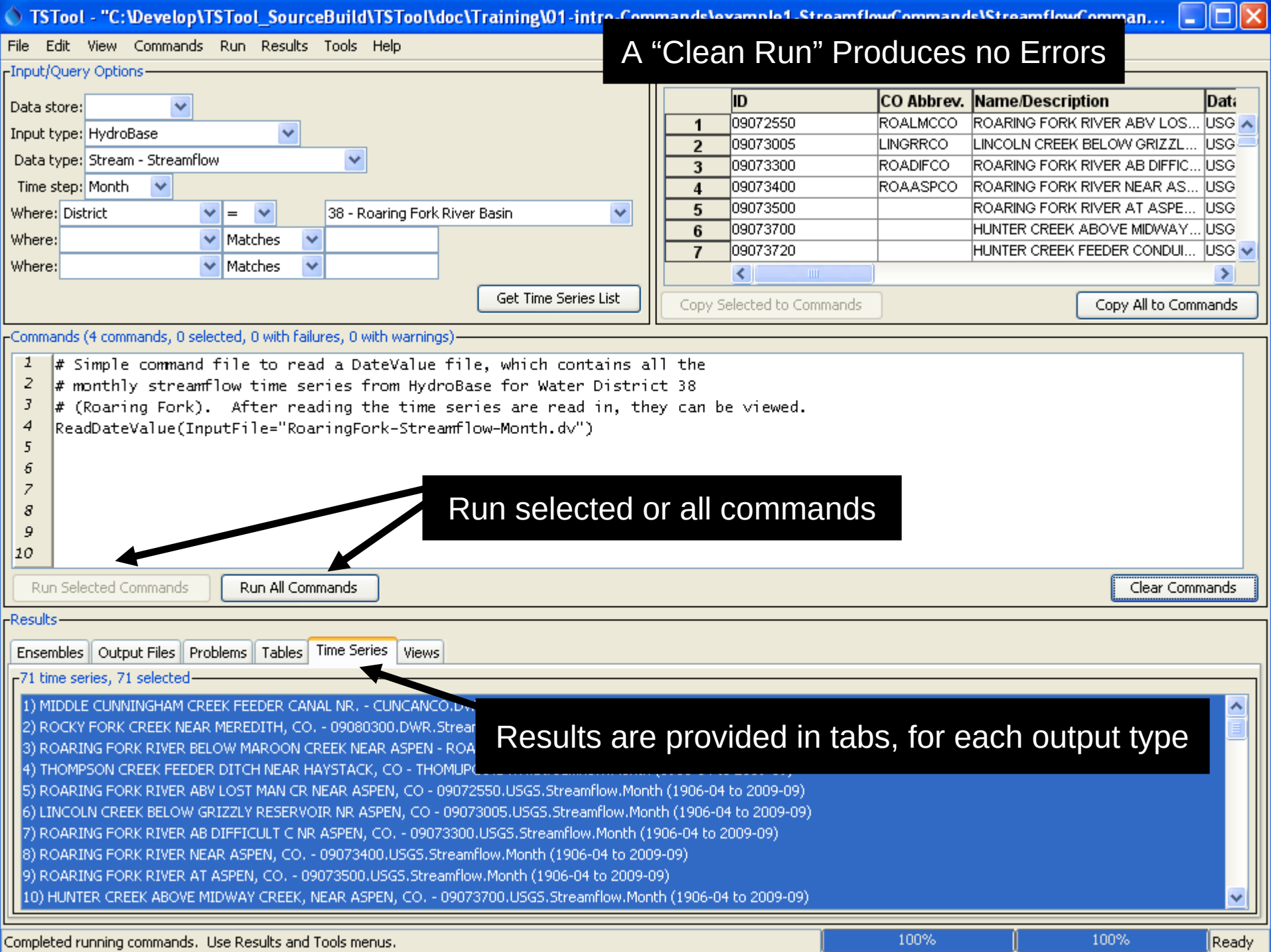


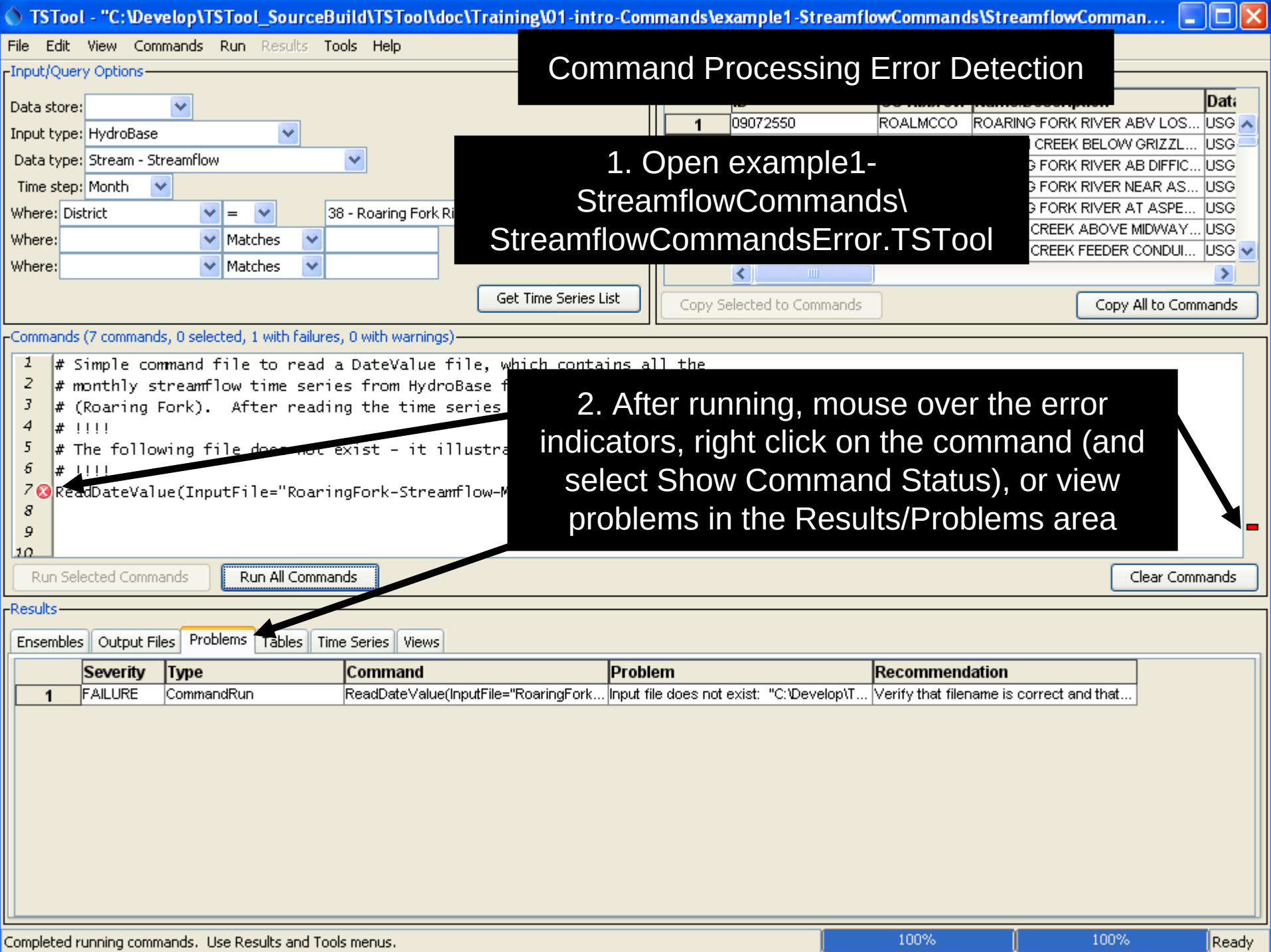
- Command editors provide choices and check input

See also the Command Reference in the TSTool documentation.

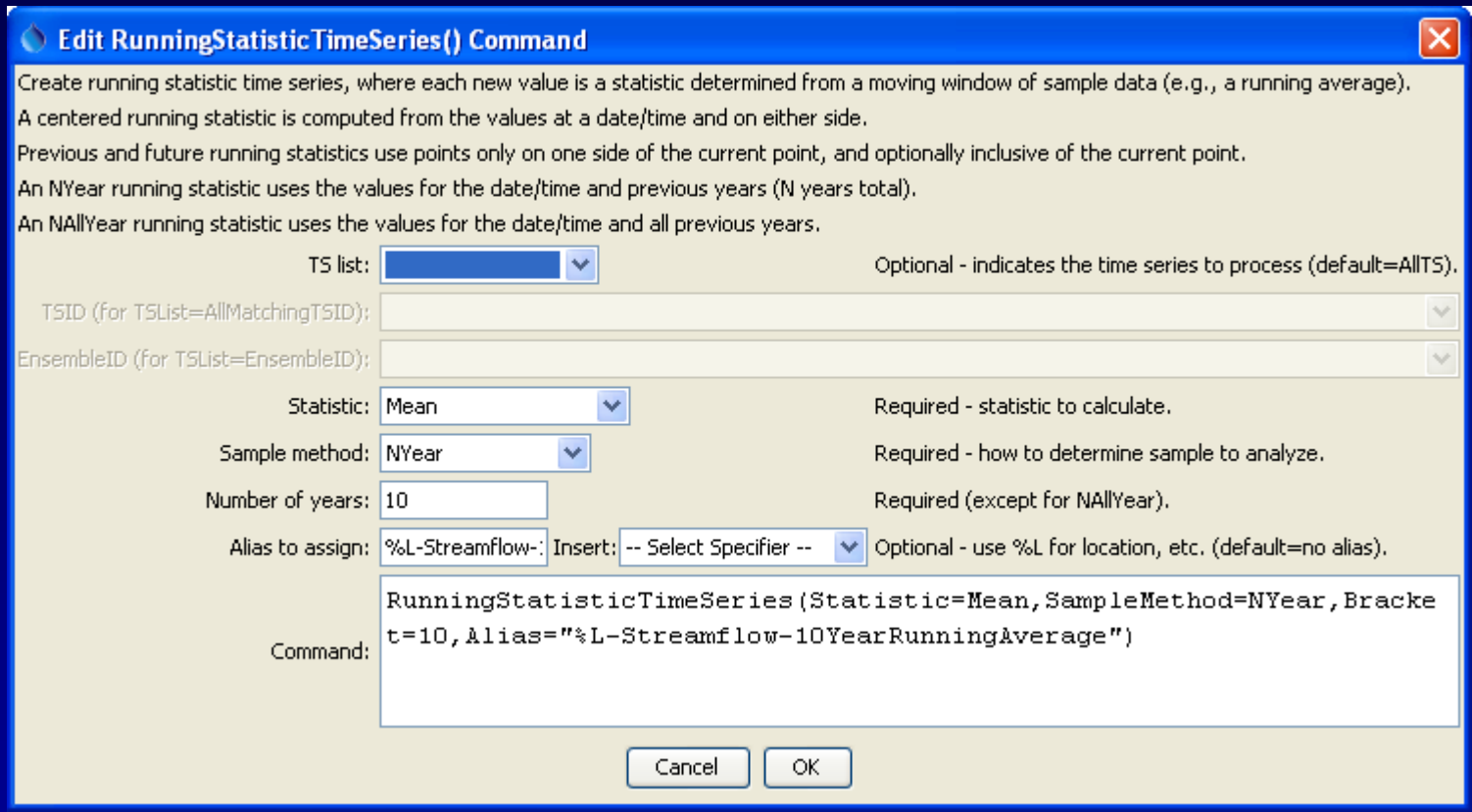
Command Editing Hints

- 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).


TSTool - "C:\Develop\TSTool_SourceBuild\TSTool\doc\Training\01-intro-Commands\example1-StreamflowCommands\StreamflowComman...
File Edit View Commands Run Results Tools Help
A "Clean Run" Produces no Errors
Input/Query Options
Data store:
Input type: HydroBase
Data type: Stream - Streamflow
Time step: Month
Where: District = 38 - Roaring Fork River Basin
Where: Matches
Where: Matches
Get Time Series List
ID CO Abbrev. Name/Description Data
1 09072550 ROALMCCO ROARING FORK RIVER ABV LOS... USG
2 09073005 LINGRRCO LINCOLN CREEK BELOW GRIZZL... USG
3 09073300 ROADIFCO ROARING FORK RIVER AB DIFFIC... USG
4 09073400 ROAASPCO ROARING FORK RIVER NEAR AS... USG
5 09073500 ROARING FORK RIVER AT ASPE... USG
6 09073700 HUNTER CREEK ABOVE MIDWAY... USG
7 09073720 HUNTER CREEK FEEDER CONDUI... USG
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 # 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
Run Selected Commands
Run All Commands
Clear Commands
Results
Ensembles Output Files Problems Tables Time Series Views
71 time series, 71 selected
1) MIDDLE CUNNINGHAM CREEK FEEDER CANAL NR. - CUNCANCO.DW
2) ROCKY FORK CREEK NEAR MEREDITH, CO. - 09080300.DWR.Strea
3) ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN - ROA
4) THOMPSON CREEK FEEDER DITCH NEAR HAYSTACK, CO - THOMUP
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)
Results are provided in tabs, for each output type
Completed running commands. Use Results and Tools menus.
100% 100% Ready


TSTool - "C:\Develop\TSTool_SourceBuild\TSTool\doc\Training\01-intro-Commands\example1-StreamflowCommands\StreamflowComman...
File Edit View Commands Run Results Tools Help
Command Processing Error Detection
1. Open example1-StreamflowCommands\StreamflowCommandsError.TSTool
Input/Query Options
Data store:
Input type: HydroBase
Data type: Stream - Streamflow
Time step: Month
Where: District = 38 - Roaring Fork Ri
Where: Matches
Where: Matches
Get Time Series List
1 09072550 ROALMCCO ROARING FORK RIVER ABV LOS... USG
CREEK BELOW GRIZZL... USG
G FORK RIVER AB DIFFIC... USG
G FORK RIVER NEAR AS... USG
G FORK RIVER AT ASPE... USG
CREEK ABOVE MIDWAY... USG
CREEK FEEDER CONDUI... USG
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...
Completed running commands. Use Results and Tools menus.
100% 100% Ready

Simple Example – Running Average

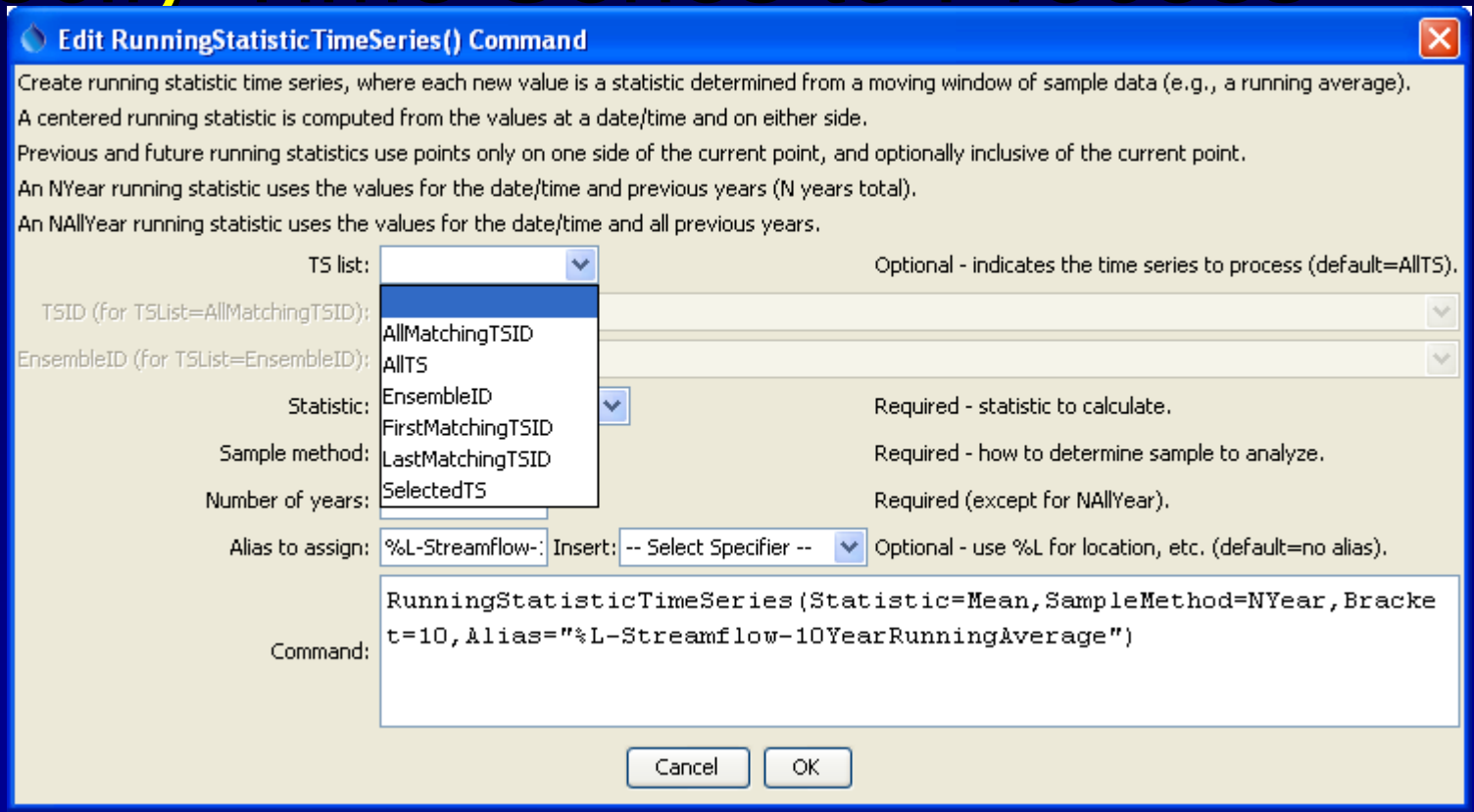


See example2-RunningAverage\RunningAverage.TSTool

See also the Command Reference in the TSTool documentation.

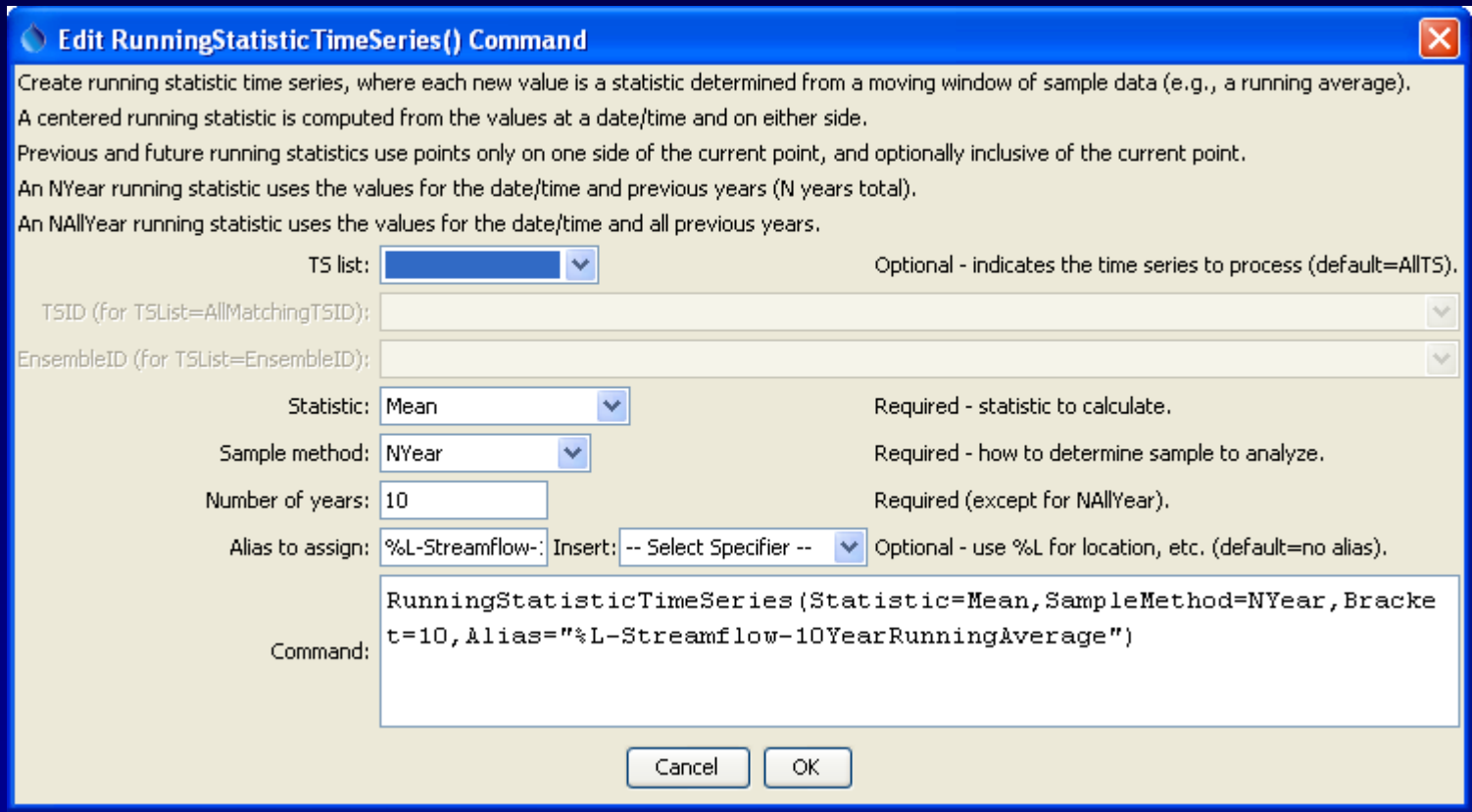
Command Editor

Specify Time Series to Process

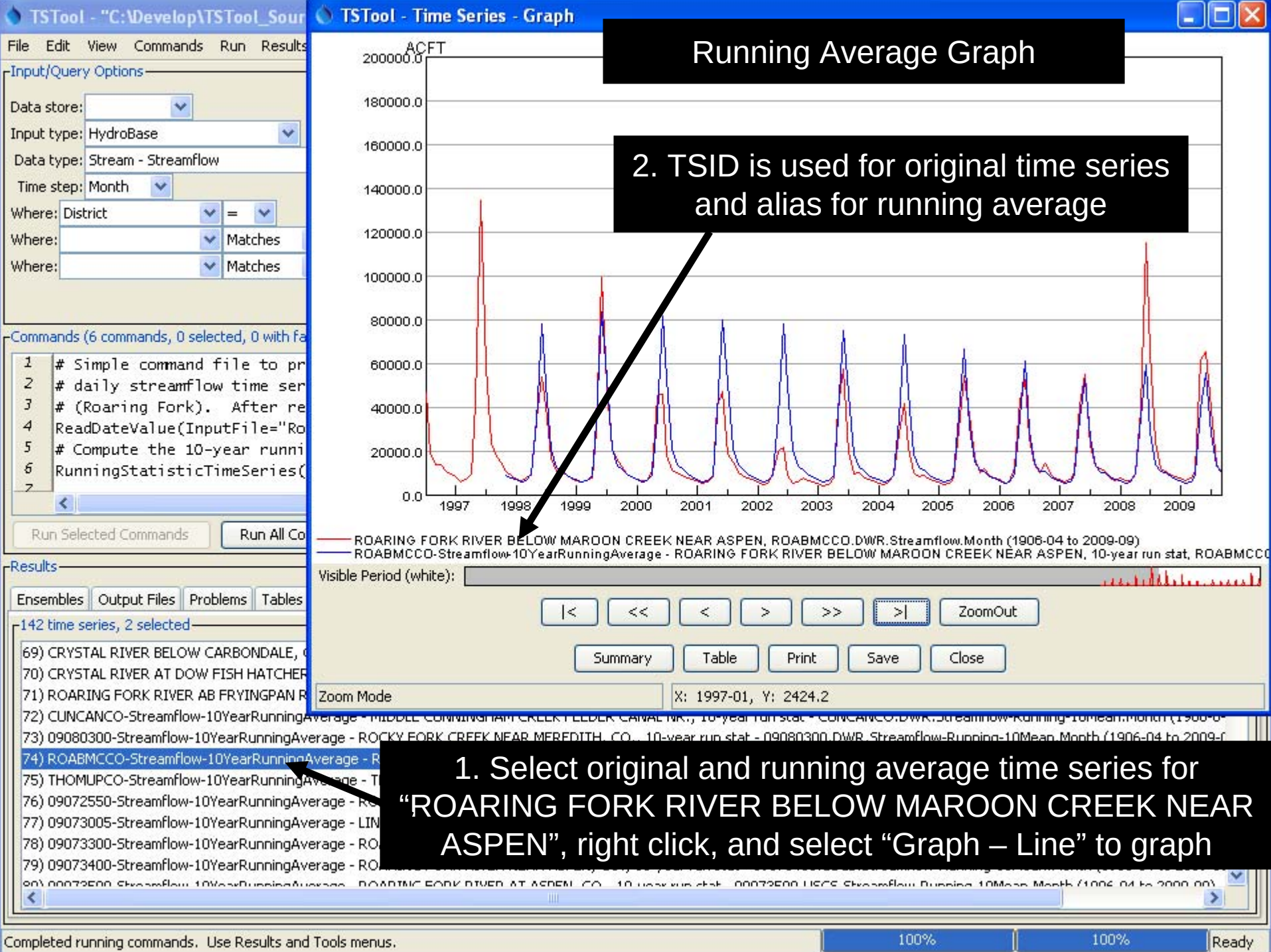


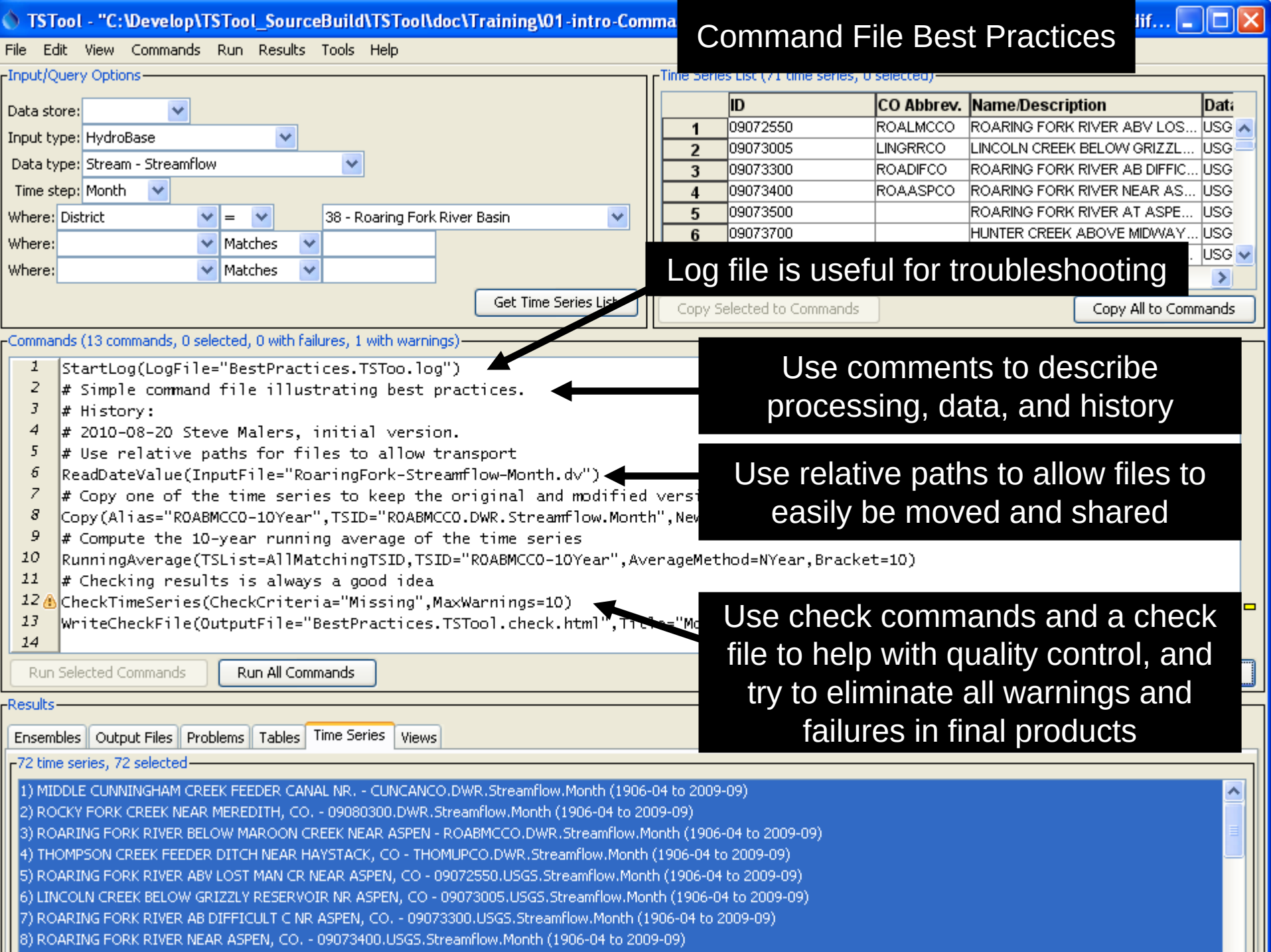
- Most commands provide a TSList and related parameters to specify the time series to process.
- Match TSIDs using a *.*.*.* pattern, match alias using *.

Simple Example – Running Average



In this case, all time series are processed and each new statistic time series is assigned an alias.


TSTool - "C:\Develop\TSTool_Sour
File Edit View Commands Run Results
Input/Query Options
Data store:
Input type: HydroBase
Data type: Stream - Streamflow
Time step: Month
Where: District =
Where: Matches
Where: Matches
Commands (6 commands, 0 selected, 0 with fa
1 # Simple command file to pr
2 # daily streamflow time ser
3 # (Roaring Fork). After re
4 ReadDateValue(InputFile="Ro
5 # Compute the 10-year runni
6 RunningStatisticTimeSeries(
Run Selected Commands
Run All Co
Results
Ensembles Output Files Problems Tables
142 time series, 2 selected
69) CRYSTAL RIVER BELOW CARBONDALE,
70) CRYSTAL RIVER AT DOW FISH HATCHER
71) ROARING FORK RIVER AB FRYINGPAN R
72) CUNCANCO-Streamflow-10YearRunningAverage
73) 09080300-Streamflow-10YearRunningAverage - ROCKY FORK CREEK NEAR MEREDITH, CO...
74) ROABMCCO-Streamflow-10YearRunningAverage -
75) THOMUPCO-Streamflow-10YearRunningAverage -
76) 09072550-Streamflow-10YearRunningAverage -
77) 09073005-Streamflow-10YearRunningAverage - LIN
78) 09073300-Streamflow-10YearRunningAverage - RO
79) 09073400-Streamflow-10YearRunningAverage - RO
Completed running commands. Use Results and Tools menus.
100%
100%
Ready
TSTool - Time Series - Graph
Running Average Graph
ACFT
200000.0
180000.0
160000.0
140000.0
120000.0
100000.0
80000.0
60000.0
40000.0
20000.0
0.0
1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
2. TSID is used for original time series and alias for running average
ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN, ROABMCCO.DWR.Streamflow.Month (1906-04 to 2009-09)
ROABMCCO-Streamflow-10YearRunningAverage - ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN, 10-year run stat, ROABMCCO
Visible Period (white):
|< << < > >> >| ZoomOut
Summary Table Print Save Close
Zoom Mode
X: 1997-01, Y: 2424.2
1. Select original and running average time series for "ROARING FORK RIVER BELOW MAROON CREEK NEAR ASPEN", right click, and select "Graph – Line" to graph


TSTool - "C:\Develop\TSTool_SourceBuild\TSTool\doc\Training\01-intro-Comma
Command File Best Practices
File Edit View Commands Run Results Tools Help
Input/Query Options
Data store:
Input type: HydroBase
Data type: Stream - Streamflow
Time step: Month
Where: District = 38 - Roaring Fork River Basin
Where: Matches
Where: Matches
Get Time Series List
Time Series List (71 time series, 0 selected)
ID CO Abbrev. Name/Description
1 09072550 ROALMCCO ROARING FORK RIVER ABV LOS...
2 09073005 LINGRRCO LINCOLN CREEK BELOW GRIZZL...
3 09073300 ROADIFCO ROARING FORK RIVER AB DIFFIC...
4 09073400 ROAASPCO ROARING FORK RIVER NEAR AS...
5 09073500 ROARING FORK RIVER AT ASPE...
6 09073700 HUNTER CREEK ABOVE MIDWAY...
Copy Selected to Commands
Copy All to Commands
Log file is useful for troubleshooting
Commands (13 commands, 0 selected, 0 with failures, 1 with warnings)
1 StartLog(LogFile="BestPractices.TSToo.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 versi
8 Copy(Alias="ROABMCCO-10Year",TSID="ROABMCCO.DWR.Streamflow.Month",Nev
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",
14
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
Run Selected Commands
Run All Commands
Results
Ensembles Output Files Problems Tables Time Series Views
72 time series, 72 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)

More Information

Help…View Documentation to view the TSTool documentation.