TSTool Training

Data Filling

Version: 9.07.02, 2010-08-20

Duration: 30 minutes

Level: Introduction

This Presentation

- Provides an introduction to TSTool data filling features
- 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

TSTool Data Filling Features

- Every time series has a missing data value indicator (-999 and NaN are common)
- Displays show blanks for missing data
- Many commands are available to fill missing data
- Filled values can be flagged and annotated in reports
- Tools are available to evaluate extent of data gaps

TSTool Data Filling Commands

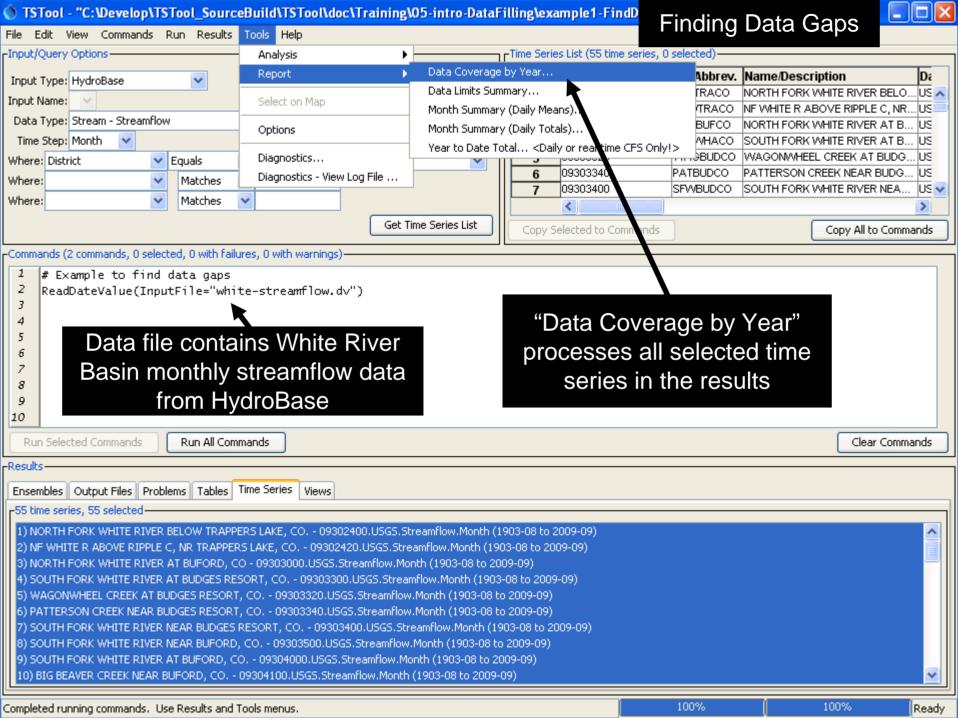
- FillConstant()
- FillDayTSFrom2MonthTSAnd1DayTS() prorate "volume"
- FillFromTS() useful for merge
- FillHistMonthAverage()
- FillHistYearAverage()
- FillInterpolate()
- FillMixedStation() regression technique
- FillMOVE2() regression technique
- FillPattern() uses historical averages in "bins"
- FillProrate()
- FillRegression()
- FillRepeat()

Not all the commands are discussed in this training – see TSTool documentation.

Tools to Find Data Gaps

- Data coverage report
- Period of record graph

See example: example1-FindDataGaps\ FindDataGaps.TSTool



Scroll to right to see the most recent years, which have more data

Print

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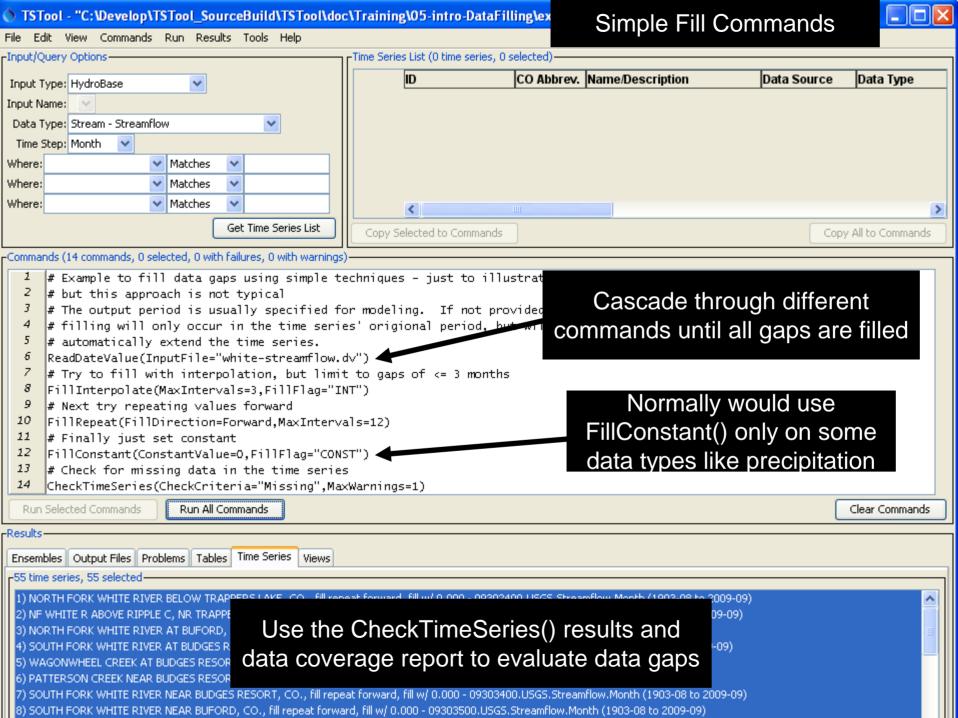
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Simple Fill Commands

- Fill with constant, interpolation, or repeat, use when more a complex method is not possible
- Also use as a final fill technique when gaps remain after other fill techniques (e.g, fill precipitation with zero if no other choice)

See example: example2-SimpleFill\SimpleFill.TSTool



Command Problem Summary Total number of failures: 0

Check File HTML Report

Total number of commands with warnings: 1

Total number of warnings: 216

Total number of commands with failures: 0

Time, sec.	Warnings	Failures	Command		
0.000	0	0	# Example illustrating errors in commands		
0.000	0	0	#Problem is that the filename is incorrect (remove X to fix)		
0.047	0	0	ReadDateValue(InputFile="streamflow.dv")		
0.000	0	0	# Fill the time series with historical monthly average		
0.016	0	0	FillHistMonthAverage(FillFlag="Auto")	List of comm	nands with
0.000	0	0	# Write the filled time series to a different filename	count of war	nings and
0.093	0	0	WriteDateValue(OutputFile="streamflow-filled.dv",Precision=2)	failures	
0.000	0	0	# Check the time series for missing data and write a check file		
0.016	216	0	CheckTimeSeries(CheckCriteria="Missing",Flag="MISSING",FlagDesc="No recorded value")		
0.000	0	0	WriteCheckFile(OutputFile="streamflow-checks.html",Title="Streamflow		
	Time, sec. 0.000 0.000 0.047 0.000 0.016 0.000 0.093 0.000 0.016 0.000	0.000 0 0.000 0 0.047 0 0.000 0 0.016 0 0.093 0 0.000 0 0.016 216	0.000 0 0.000 0 0.047 0 0.000 0 0.016 0 0.093 0 0.016 0 0.016 0 0.000 0 0.016 0 0.016 0 0.016 0 0.016 0	0.000 0 # Example illustrating errors in commands 0.000 0 # Problem is that the filename is incorrect (remove X to fix) 0.047 0 0 ReadDateValue(InputFile="streamflow.dv") 0.000 0 0 # Fill the time series with historical monthly average 0.016 0 0 FillHistMonthAverage(FillFlag="Auto") 0.000 0 0 # Write the filled time series to a different filename 0.093 0 0 WriteDateValue(OutputFile="streamflow-filled.dv",Precision=2) 0.000 0 # Check the time series for missing data and write a check file 0.016 216 0 CheckTimeSeries(CheckCriteria="Missing",Flag="MISSING",FlagDesc=	0.000 0 # Example illustrating errors in commands 0.000 0

Command Problem Details

216

Total number of failures: 0 Total number of commands with failures: 0

0.172

Total number of warnings: 216

Total number of commands with warnings: 1

Details about each warning and failure

#	Severity	Туре	Command	Problem	Recommen
				Time series	
				06711590.USGS.Streamflow.Month	
			CheckTimeSeries(CheckCriteria="Missing",Flag="MISSING",FlagDesc="No	value -999.000000 at 1902-01 is	
1	WARNING	Missing	recorded value")	missing	
				Time series	

Fill Using Regression

- Ordinary Least Squares regression or MOVE2
- Log transform (or no transform)
- See FillRegression() and FillMOVE2() commands

Fill HydroBase Diversion Records Using Diversion Comments

- Special case where annual values are recorded to indicate zero diversion
- Can also use "currently in use" flag to fill with additional zeros
- See FillUsingDiversionComments() command

Fill Using Historical Averages

- Suitable for controlled data such as diversion and reservoir time series
- Use FillHistMonthAverage() to fill monthly time series with historical averages
- For more detail, use AnalyzePattern() to determine wet/dry/average characteristics of indicator time series and then fill data with FillPattern()

More Information

Help...View Documentation to view the TSTool documentation