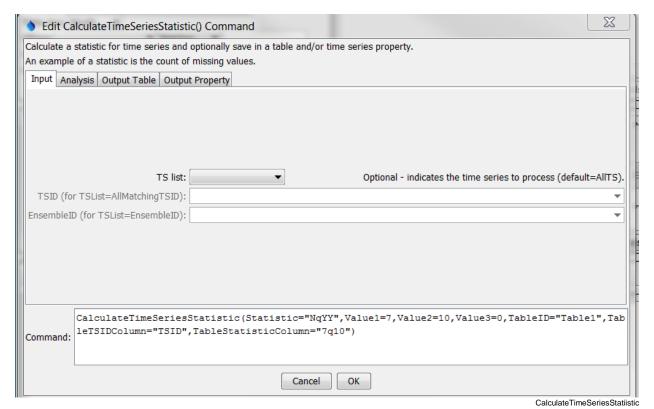
Command Reference: CalculateTimeSeriesStatistic()

Calculate time series statistic

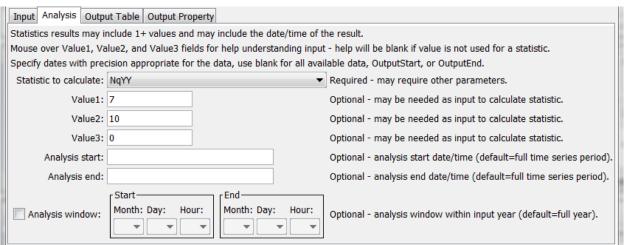
/ersion 11.02.00, 2015-05-18

The CalculateTimeSeriesStatistic() command calculates a statistic for a time series (typically a single value, but may have multiple output values) and optionally adds the result to a table and/or sets a time series property. Multiple time series can be processed. The sample from each time series consists of data values for the full period or a shorter analysis period if specified for the command. Missing values typically are ignored unless significant for the statistic (e.g., Statistic=MissingCount).

The following dialog is used to edit the command and illustrates the command syntax. Most statistics do not require additional input; however, those that do utilize the Value* parameters to specify additional information. See the documentation below and move the mouse over the entry fields in the dialog.

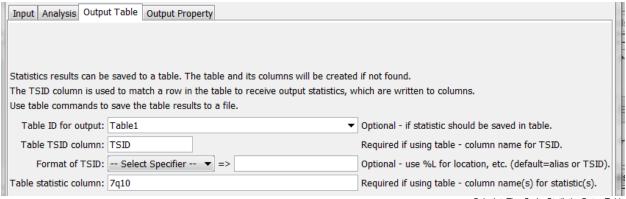


CalculateTimeSeriesStatistic() Command Editor Showing Input Parameters



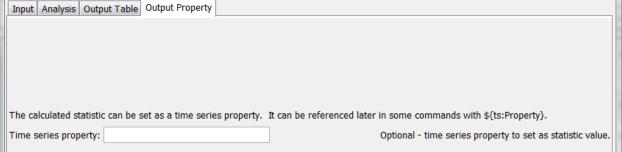
CalculateTimeSeriesStatiistic_Analysis

CalculateTimeSeriesStatistic() Command Editor Showing Analysis Parameters



CalculateTimeSeriesStatiistic_OutputTable

CalculateTimeSeriesStatistic() Command Editor Showing Output Table Parameters



CalculateTimeSeriesStatiistic_OutputProperty

CalculateTimeSeriesStatistic() Command Editor Showing Output Property Parameters

The command syntax is as follows:

CalculateTimeSeriesStatistic(Parameter=Value,...)

Command Parameters

Parameter	Description	Default
TSList	Indicates the list of time series to be processed,	AllTS
	one of:	
	• AllMatchingTSID – all time series that	
	match the TSID (single TSID or TSID with	
	wildcards).	
	• AllTS – all time series before the command.	
	• EnsembleID – all time series in the	
	ensemble.	
	• FirstMatchingTSID – the first time	
	series that matches the TSID (single TSID or TSID with wildcards).	
	• LastMatchingTSID - the last time series	
	that matches the TSID (single TSID or TSID	
	with wildcards).	
	• SelectedTS – the time series selected with	
	the SelectTimeSeries() command.	
TSID	The time series identifier or alias for the time	Required if
	series to be processed, using the * wildcard	TSList=*TSID.
	character to match multiple time series.	D : 1:0
EnsembleID	The ensemble to be processed, if processing an	Required if
Statistic	ensemble.	TSList=EnsembleID.
Statistic	Statistic to compute as shown in the Statistic Details table below.	None – must be specified.
Value1	Input data required by the statistic. Currently the	See Statistic Details
	dialog does not check the value for correctness –	table below.
	it is checked when the statistic is computed.	
Value2	Input data required by the statistic. Currently the	See Statistic Details
	dialog does not check the value for correctness –	table below.
	it is checked when the statistic is computed.	
Value3	Input data required by the statistic. Currently the	See Statistic Details
	dialog does not check the value for correctness – it is checked when the statistic is computed.	table below.
AnalysisStart	The date/time to start analyzing data as valid	Full period is analyzed.
Imalysisscare	date/time string or \${Property}.	Tun period is analyzed.
AnalysisEnd	The date/time to end analyzing data as valid	Full period is analyzed.
	date/time string or \${Property}.	Tun period is unaryzed.
Analysis	The calendar date/time for the analysis start	Analyze the full year.
WindowStart	within each year. Specify using the format MM,	
	MM-DD, MM-DD hh, or MM-DD hh:mm,	
	consistent with the time series interval precision.	
	A year of 2000 will be used internally to parse	
	the date/time. Use this parameter to limit data	
	processing within the year, for example to	
	analyze only a season. The analysis window has	
	only been enabled for Count, GECount,	
	GTCount, LECount, LTCount, Max, Min,	

Parameter	Description	Default
	MissingCount, MissingPercent,	
	NonmissingCount, and	
	NonmissingPercent statistics.	
Analysis	Specify date/time for the analysis end within each	Analyze the full year.
WindowEnd	year. See AnalysisWindowStart for details.	
TableID	Identifier for table that receives the statistic. An	Optional – table output is
	existing table can be specified. If not found, a	not required.
	new table will be created.	
TableTSIDColumn	Table column name that is used to look up the	Optional – table output is
	time series. If a matching TSID is not found, a	not required.
	row will be added to the table. If a TSID is	
	found, the statistic cell value for the time series is	
	modified. The column name can use time series	
	% specifiers (e.g., %L for location) and properties	
	using syntax \${ts:Property}.	
TableTSIDFormat	The specification to format the time series	Time series alias if
	identifier to insert into the TSID column. Use the	available, or the time
	format choices and other characters to define a	series identifier.
	unique identifier.	
TableStatistic	Table column name(s) to receive the statistic	Optional – table output is
Column	value(s). If not found in the table, a new column	not required.
	is added automatically. The column names can	
	use time series % specifiers (e.g., %L for location)	
	and properties using syntax \${ts:Property}.	
TimeSeries	If specified, the output statistic will be set as a	No property is set.
PropertyName	property value for the time series. In the future,	
	statistics with multiple values will use a variation	
	of the property name.	

The following table provides additional information about specific statistics, in particular to describe how the statistic is computed, whether additional input needs to be provided with Value command parameters, and whether multiple statistic values are output in results.

Statistic Details

Statistic	Description	Required Values
Count	Number of data values total, including missing and non-missing.	
DeficitMax	Maximum deficit value (where deficit is mean minus value).	
DeficitMean	Mean deficit value (where deficit is mean minus value).	
DeficitMin	Minimum deficit value (where deficit is mean minus value).	
DeficitSeqLengthMax	Maximum number of sequential intervals where each value is less than the mean (for example maximum drought length).	

Statistic	Description	Required Values
DeficitSeqLengthMean	Mean number of sequential intervals where each	
	value is less than the mean (for example mean	
	drought length).	
DeficitSeqLengthMin	Minimum number of sequential intervals where each	
	value is less than the mean (for example minimum	
Da fil alt Ca aMila	drought length).	
DeficitSeqMin	Maximum sum of sequential values where each value is less than the mean (for example maximum	
	drought water volume).	
DeficitSeqMean	Mean of the sum of sequential values where each	
Delielebegnean	value is less than the mean (for example mean	
	drought water volume).	
DeficitSeqMin	Minimum sum of sequential values where each	
	value is less than the mean (for example minimum	
	drought water volume).	
GECount	Count of values greater than or equal to Value1.	Value1-
		criteria to check
GTCount	Count of values greater than Value1.	Value1-
		criteria to check
Lag-1AutoCorrelation	Autocorrelation between values and the those that	
	follow in the next time step, given by:	
	$r_k = \frac{\sum_{i=1}^{N-k} (Y_i - Y_{mean})(Y_{i+k} - Y_{mean})}{\sum_{i=1}^{N} (Y_i - Y_{mean})^2}$	
	$\sum_{i=1}^{N} (Y_i - Y_{mean})^2$	
Last	Last non-missing value. Second statistic is the	
TRO	date/time of the value.	
LECount	Count of values less than or equal to Value1.	Value1-
TEG		criteria to check
LTCount	Count of values less than Value1.	Value1-
Mora	Maniform	criteria to check
Max Mean	Maximum value. Mean value.	
Min	Minimum value.	
MissingCount		
MissingPercent	Number of missing values. Percent of values that are missing.	
MissingSeqLengthMax	Maximum number of sequential values that are	
HISSINGSEQUENCE	missing.	
NonmissingCount	Number of non-missing values.	
NonmissingPercent	Percent of values that are not missing.	
NqYY	This statistic is typically used to evaluate the return	Value1-
_	period of low flows and is implemented only for	specify the
	daily data. The N indicates the number of daily	number of daily
	values to be averaged and YY indicates the return	values to be
	interval. For example, 7q10 indicates the flow	averaged.
	corresponding to the 10-year recurrence interval for	Currently this
	minimum average daily flow (for 7 days) in a year.	must be an odd
	This statistic is computed as follows, using 7q10 as	number to allow
	an example:	

Statistic	Description	Required Values
	Determine the number of years to be analyzed	bracketing the
	(from analysis period command parameters or	current day.
	time series data).	
	2. For each year, loop through each day from	Value2-
	January 1 to December 31. Compute an average	specify the
	flow by averaging 7 days, in this case with 3	return interval
	values on each side of the current day and	(e.g., 10).
	including the current day. If at the end of the	
	year, use 3 values from adjoining years. The	Value3-
	number of missing data allowed is controlled by	specify the
	the Value3 command parameter.	number of
	3. For the year, save the minimum 7-day average.	missing values
	4. Utilize the minimum values for all years, with	allowed in the
	log-Pearson Type III distribution, to determine	average (e.g., 0
	the value for the 10-year recurrence interval.	for most
	See	rigorous
	http://pubs.usgs.gov/sir/2008/5126/section3.html	analysis). It
	for a description of NqYY and "Hydrology for	may be useful to
	Engineers, 3 rd Edition," Linsley, Kohler,	set this value if,
	Paulhus for a description of log-Pearson Type III distribution.	for example, a
	III distribution.	single daily
		value is available in the
		time series, for example entered
		on the first day
		of the month.
Skew	Skew coefficient, as follows:	
	$Cs = N \sum_{i=1}^{N} (Y_i - Y_{mean})^3$	
	$(n-1)(n-2)s^3$	
	where $s = $ standard deviation	
StdDev	Standard deviation.	
SurplusMin	Maximum surplus value (where surplus is value	
	minus mean).	
SurplusMean	Mean surplus value (where surplus is value minus	
CumplugMin	mean).	
SurplusMin	Minimum surplus value (where surplus is value minus mean).	
SurplusSeqLengthMax	Maximum number of sequential intervals where	
	each value is greater than the mean (for example	
	maximum water surplus length).	
SurplusSeqLengthMean	Mean number of sequential intervals where each	
	value is greater than the mean (for example mean	
	water surplus length).	
SurplusSeqLengthMin	Minimum number of sequential intervals where each	
	value is greater than the mean (for example	
	minimum water surplus length).	

Statistic	Description	Required Values
SurplusSeqMin	Maximum sum of sequential values where each	
	value is greater than the mean (for example	
	maximum water surplus volume).	
SurplusSeqMean	Mean of the sum of sequential values where each	
	value is greater than the mean (for example mean	
	water surplus volume).	
SurplusSeqMin	Minimum sum of sequential values where each	
	value is greater than the mean (for example	
	minimum water surplus volume).	
Total	Total of values.	
TrendOLS	Ordinary least squares analysis is used to compute	
	results that are named TableStatisticColumn	
	with appended _Intercept, _Slope, and _R2.	
Variance	Variance.	

The following example illustrates how to use the command to compute the 7q10 statistic for daily flow:

```
ReadDateValue(Alias="linsley",InputFile="Data\linsley.dv")
NewTable(TableID="Table1",Columns="TSID,string;7q10,double")
CalculateTimeSeriesStatistic(Statistic="NqYY",Value1=7,Value2=10,Value3=6,
TableID="Table1",TableTSIDColumn="TSID",TableStatisticColumn="7q10")
WriteTableToDelimitedFile(TableID="Table1",
OutputFile="Results/Test CalculateTimeSeriesStatistic 7q10 linsley out.csv")
```

CalculateTimeSeriesStatistic()	Command	TSTool Documentation
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