Command Reference: RunningStatisticTimeSeries()

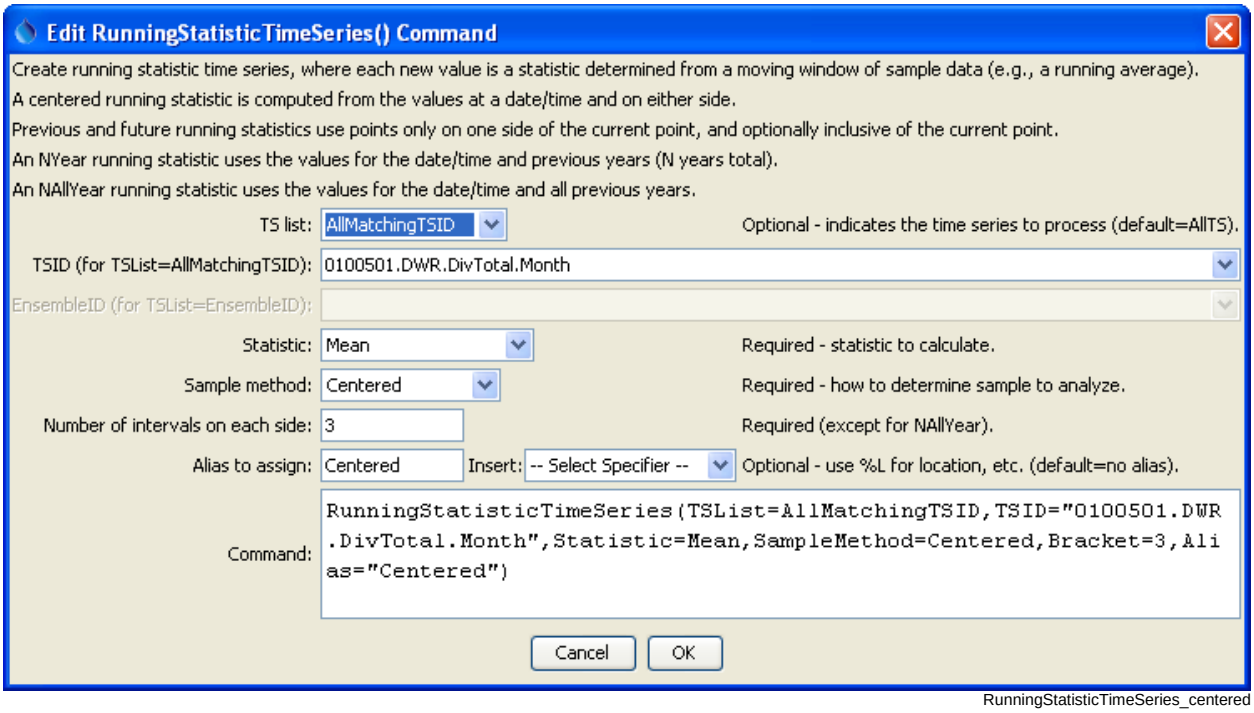
Create a new time series containing running statistics computed from input

Version 10.00.01, 2011-04-18

The `RunningStatisticTimeSeries()` command uses a sample of values from a time series to compute a running statistic, resulting in new time series. The resulting time series will have a time series identifier (TSID) that is the same as the original, with "`-Running-`" and the statistic appended to the data type. There are several approaches to determining the sample for the running statistic (as specified by the `SampleMethod` command parameter):

- The centered running statistic requires that the number intervals on each site of a point be specified (e.g., specifying 1 will use 3 values at each point).
- The previous/future running statistic requires that the number of intervals prior to or after the current point be specified.
- The N-year running statistic is computed by processing the current year and N - 1 values from previous years, for a specific date. A resulting value is produced only if N non-missing values are available. Currently N-year running statistic values for Feb 29 for daily or finer data will always be missing because a sufficient number of values will not be found – an option may be added in the future to allow Feb 29 values to be computed based on fewer than N values.
- A special case of the N-year running statistic (`NAllYear`) is to use all previous years' and the current value.

The following dialog is used to edit the command and illustrates the centered running average command syntax.



RunningStatisticTimeSeries_centered

RunningStatisticTimeSeries() Command Editor for Centered Running Average

The command syntax is as follows:

```
RunningStatisticTimeSeries(Parameter=Value,…)
```

Command Parameters

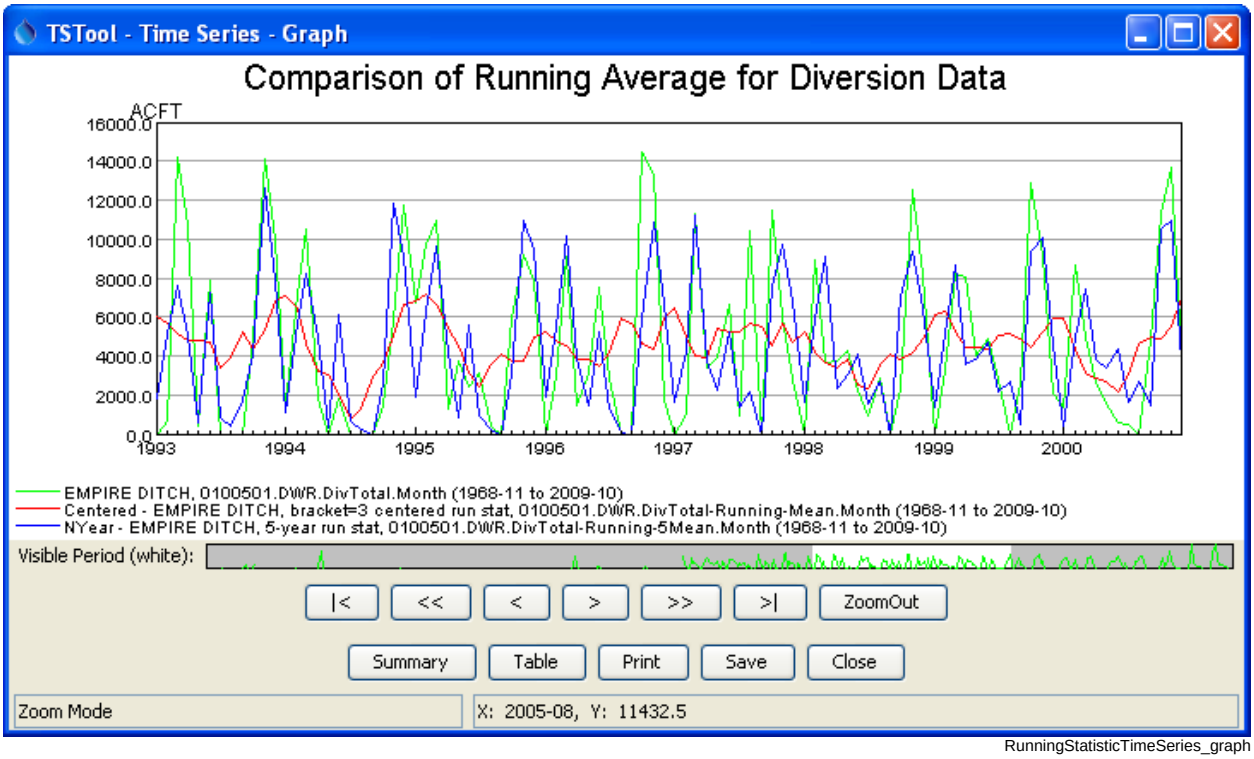
Parameter	Description	Default
TSList	Indicates the list of time series to be processed, one of: • AllMatchingTSID – all time series that match the TSID (single TSID or TSID with wildcards) • AllTS – all time series generated before the command • EnsembleID – all time series in the ensemble • FirstMatchingTSID – 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	AllTS
TSID	The time series identifier or alias for the time series to be processed, using the * wildcard character to match multiple time series.	Required if TSList=*TSID.
EnsembleID	The ensemble to be processed, if processing an ensemble.	Required if TSList=EnsembleID.
Statistic	The statistic to compute for each point in the created time series, one of: • Lag-1AutoCorrelation – the autocorrelation between values and the those that follow in the next time step, given by: $r_k = \frac{\sum_{i=1}^{N-k}(Y_i - Y_{mean})(Y_{i+k} - Y_{mean})}{\sum_{i=1}^{N}(Y_i - Y_{mean})^2}$ • Max – maximum value • Mean – mean value • Median – median value • Min – minimum value • Skew – skew coefficient, as follows: $Cs = \frac{N\sum_{i=1}^{N}(Y_i - Y_{mean})^3}{(n-1)(n-2)s^3}$ where s = standard deviation • StdDev – standard deviation • Total – sum of values • Variance – variance	None – must be specified.
SampleMethod	The method used to determine the data sample for each statistic calculation, one of: • Centered – N (bracket) values on each side of a	None – must be specified.

Parameter	Description	Default
	date/time and the center value • `Future` – average the next N (bracket) values but do not include the current value • `FutureInclusive` – average the next N (bracket) values and also include the current value • `NYear` – values for the current year and (N – 1) preceding years, for the same date/time in each year • `NAllYear` – values for the current year and all preceding years, for the same date/time in each year (missing values are allowed) • `Previous` – the previous N (bracket) values but do not include the current value • `PreviousInclusive` – the previous N (bracket) values and also include the current value	
`Bracket`	For centered `SampleMethod`, the bracket is the number of points on each side of the current point (therefore a value of 1 will average 3 data values). For future and previous `SampleMethod`, the bracket is the number of previous or future values. For N-year `SampleMethod`, the bracket is the total number of years to process, including the current year.	None – must be specified.
`Alias`	The alias to assign to the time series, as a literal string or using the special formatting characters listed by the command editor. The alias is a short identifier used by other commands to locate time series for processing, as an alternative to the time series identifier (TSID).	None – must be specified.

A sample command file to convert State of Colorado HydroBase diversion time series to running averages is as follows:

```
# SetInputPeriod(InputStart="1993-01",InputEnd="2000-12")
# 0100501 - EMPIRE DITCH
0100501.DWR.DivTotal.Month~HydroBase
RunningStatisticTimeSeries(TSList=AllMatchingTSID,
    TSID="0100501.DWR.DivTotal.Month",Statistic=Mean,SampleMethod=Centered,
    Bracket=3,Alias="Centered")
RunningStatisticTimeSeries(TSList=AllMatchingTSID,
    TSID="0100501.DWR.DivTotal.Month",Statistic=Mean,SampleMethod=NYear,
    Bracket=5,Alias="NYear")
ProcessTSProduct(TSProductFile="Test_RunningStatisticTimeSeries_Example.tsp")
```

The resulting graph is as follows:



RunningStatisticTimeSeries_graph

Results from RunningStatisticTimeSeries() Commands