Command Reference: NewStatisticYearTS()
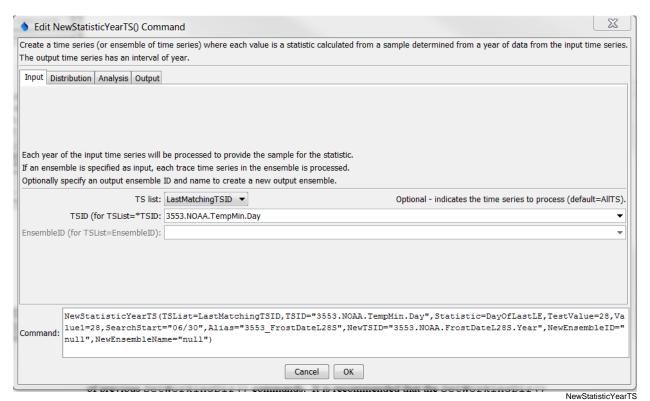## Create a new yearly time series containing a statistic determined from each year of the input time series
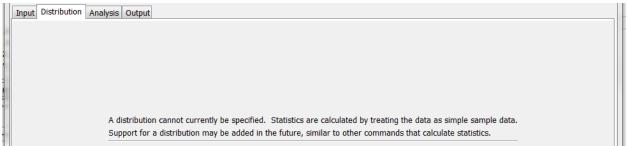Version 11.09.00, 2016-02-29

The `NewStatisticYearTS()` command creates a new year-interval time series, where each yearly value in the resulting time series contains a statistic determined from the sample of points from the corresponding year in the original time series. For example, if the original time series has a daily time step, then the sample that is analyzed will contain 365 or 366 values (depending on leap year). Calendar years are used by default; however, the `OutputYearType` parameter can be used to specify that different year types are analyzed. Other commands (e.g., `ChangeInterval()`) can produce a similar result for a limited number of statistics, for example converting a monthly time series to an annual total or mean. See also the `NewStatisticTimeSeries()`, `NewStatisticTimeSeriesFromEnsemble()`, `CalculateTimeSeriesStatistic()`, and `CheckTimeSeries()` commands.

For hourly and finer interval, values are considered to be in a year when the year in the date/time matches the year of interested. This may lead to some issues if the last value in a year is actually recorded at hour 0 or later of the following year.

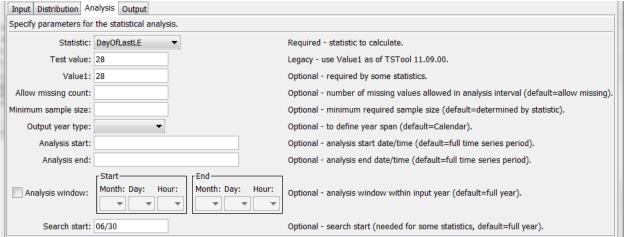The following dialog is used to edit the command and illustrates the syntax for the command.

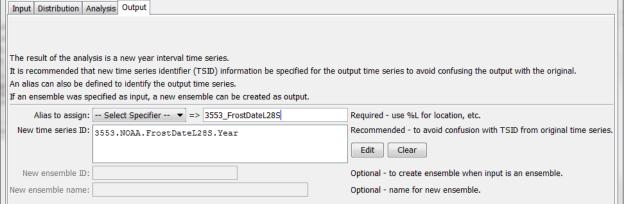**NewStatisticYearTS() Command Editor Showing Input Parameters**

NewStatisticYearTS_Distribution

NewStatisticYearTS() Command Editor Showing Distribution Parameters

NewStatisticYearTS_Analysis

NewStatisticYearTS() Command Editor Showing Analysis Parameters

NewStatisticYearTS_Output

NewStatisticYearTS() Command Editor Showing Output Parameters

The command syntax is as follows:

```
NewStatisticYearTS(Parameter=value,…)
```

The following older command syntax is updated to the above syntax when a command file is read:

```
TS Alias = NewStatisticYearTS (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. Can be specified using processor `${Property}`.	Required if `TSList=*TSID`.
EnsembleID	The ensemble to be processed, if processing an ensemble. Can be specified using processor `${Property}`.	Required if `TSList= EnsembleID`.
Statistic	See the **Available Statistics** table below.	None – must be specified.
TestValue	A test value used when analyzing the statistic. This parameter is being phased out – instead use `Value1`.	This parameter is required for some statistics and not used for others. See the statistics table below.
Value1	Value needed by statistic.	See the statistics table below.
AllowMissing Count	The number of missing values allowed in the source interval(s) in order to produce a result. If an analysis window is specified (default is to analyze full years), then missing values outside of the analysis window are not considered as missing. Gaps at the end of the time series will be considered missing if within the analysis window.	Allow any number of missing values.
Minimum SampleSize	The minimum sample size in order to compute the statistic.	No minimum, although the statistic may have requirements.
OutputYearType	The output year type. For example, an output year type of `NovToOct` spans November of the previous calendar year to October of the current calendar year. All other parameters should still be specified in calendar year and the `AnalysisWindowStart` can have a month that is prior to the `AnalysisWindowEnd` month.	`Calendar`

Parameter	Description	Default
AnalysisStart	The starting date/time for the analysis using calendar dates (e.g., 2001-01-01), with precision consistent with the time series interval. This will limit the data being analyzed at the ends of the time series and controls the length of the output time series. The analysis period is typically set to align with years consistent with the output year type. Can specify using processor ${Property}.	Analyze the full period, extending the period to include full years.
AnalysisEnd	The ending date/time for the analysis using calendar dates (e.g., 2001-01-01) , with precision consistent with the time series interval. This will limit the data being analyzed at the ends of the time series and controls the length of the output time series. The analysis period is typically set to align with years consistent with the output year type. Can specify using processor ${Property}.	Analyze the full period, extending the period to include full years.
Analysis WindowStart	The calendar date/time for the analysis start 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. Data will be considered missing only if missing within this analysis window. If specifying for other than calendar year, the analysis window start month may be greater than the analysis window end month.	Analyze the full year.
Analysis WindowEnd	Specify date/time for the analysis end within each year. See AnalysisWindowStart for details.	Analyze the full year.
SearchStart	Within the analysis window, this indicates the starting date/time for the search. 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. This parameter is useful in cases where the processing considers seasonal aspects of the analysis window; for example, use when determining frost dates (when temperature is less than or equal to freezing) to ensure that the search starts from the middle of the normal growing season. Searches move forward in time except for the following statistics, in which case SearchStart will be the start of the search window, but will be the last value checked: DayOfLast*, MonthOfLast*.	Use the analysis window start and end. Search forward for most statistics. Search backward for DayOfLast* and MonthOfLast* statistics.
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). Can specify using processor ${Property}.	None – must be specified.

Parameter	Description	Default
NewTSID	The time series identifier to be assigned to the new time series, which is useful to avoid confusion with the original time series. Can specify using processor ${Property}.	Use the same identifier as the original time series, with an interval of Year and a scenario matching the statistic.
NewEnsembleID	New ensemble identifier for results.	Ensemble is not output.
NewEnsemble Name	Name for new ensemble.	Ensemble is not output.

Available Statistics

The following statistics are computed from a sample determined using the analysis window. If no analysis window is specified, then the default is to analyze complete years, where the years correspond to the OutputYearType. For example, for OutputYearType=NovToDec, November 1, 2000 to October 31, 2001 from the input corresponds to output year 2001.

Statistic	Description	Limitations
DayOfCentroid	The day of the year (1-366) that is the centroid of the values, computed as sum(DayOfYear*value)/sum(values).	Input time series must be daily or smaller interval.
DayOfFirstGE	Julian day of the year (1-366, relative to the start of the OutputYearType) for the first data value >= Value1. Searches start at the start of the analysis window and move forward.	Input time series must be daily or smaller interval.
DayOfFirstGT	Similar to DayOfFirstGE, for values > Value1.	Input time series must be daily or smaller interval.
DayOfFirstLE	Similar to DayOfFirstGE, for values <= Value1.	Input time series must be daily or smaller interval.
DayOfFirstLT	Similar to DayOfFirstGE, for values < Value1.	Input time series must be daily or smaller interval.
DayOfLastGE	Julian day of the year (1-366, relative to the start of the OutputYearType) for the last data value >= Value1. Searches start at the start of the analysis window and move backward.	Input time series must be daily or smaller interval.
DayOfLastGT	Similar to DayOfLastGE, for values > Value1.	Input time series must be daily or smaller interval.
DayOfLastLE	Similar to DayOfLastGE, for values <= Value1.	Input time series must be daily or smaller interval.
DayOfLastLT	Similar to DayOfLastGE, for values < Value1.	Input time series must be daily or smaller interval.

Statistic	Description	Limitations
DayOfMax	Julian day of the year (1-366, relative to the start of the OutputYearType) for the first maximum value in the time series.	Input time series must be daily or smaller interval.
DayOfMin	Julian day of the year (1-366, relative to the start of the OutputYearType) for the first minimum value in the time series.	Input time series must be daily or smaller interval.
GECount	Count of values in a year >= Value1.	
GEPercent	Percent of values in a year >= Value1, based on the total number of points in the year.	
GTCount	Count of values in a year > Value1.	
GTPercent	Percent of values in a year > Value1, based on the total number of points in the year.	
LECount	Count of values in a year <= Value1.	
LEPercent	Percent of values in a year <= Value1, based on the total number of points in the year.	
LTCount	Count of values in a year < Value1.	
LTPercent	Percent of values in a year < Value1, based on the total number of points in the year.	
Max	Maximum value in a year.	
Mean	Mean of values in a year.	
Min	Minimum value in a year.	
MissingCount	Number of missing values in a year.	
MissingPercent	Percent of missing values in a year.	
MonthOfCentroid	The month of the year (1-12) that is the centroid of the values, computed as sum(MonthOfYear*value)/sum(values).	Input time series must be monthly or smaller interval.
MonthOfFirstGE	Month the year (1-12, relative to the start of the OutputYearType) for the first data value >= Value1. Searches start at the start of the analysis window and move forward.	Input time series must be monthly or smaller interval.
MonthOfFirstGT	Similar to DayOfFirstGE, for values > Value1.	Input time series must be monthly or smaller interval.
MonthOfFirstLE	Similar to DayOfFirstGE, for values <= Value1.	Input time series must be monthly or smaller interval.
MonthOfFirstLT	Similar to DayOfFirstGE, for values < Value1.	Input time series must be monthly or smaller interval.
MonthOfLastGE	Month of the year (1-12, relative to the start of the OutputYearType) for the last data value >= Value1. Searches start at the end of the analysis window and move backward.	Input time series must be monthly or smaller interval.
MonthOfLastGT	Similar to DayOfLastGE, for values > Value1.	Input time series must be monthly or smaller interval.

Statistic	Description	Limitations
MonthOfLastLE	Similar to DayOfLastGE, for values <= Value1.	Input time series must be monthly or smaller interval.
MonthOfLastLT	Similar to DayOfLastGE, for values < Value1.	Input time series must be monthly or smaller interval.
MonthOfMax	Month of the year (1-12, relative to the start of the OutputYearType) for the first maximum value in the time series.	Input time series must be monthly or smaller interval.
MonthOfMin	Month of the year (1-12, relative to the start of the OutputYearType) for the first minimum value in the time series.	Input time series must be monthly or smaller interval.
NonMissingCount	Number of non-missing values in a year.	
NonMissingPercent	Percent of non-missing values in a year.	
Total	Total of values in a year.	

Example

The following example commands file computes the last spring frost date for 28 degrees and 32 degrees, searching backwards from June 30 each year, and the first fall frost date for 32 and 28 degrees, searching forwards from July 1 each year:

```
StartLog(LogFile="FrostDates_HydroBase.log")
SetOutputPeriod(OutputStart="1950-01",OutputEnd="2004-12")
# 3553 - GREELEY UNC
3553.NOAA.TempMin.Day~HydroBase
NewStatisticYearTS(TSID="3553.NOAA.TempMin.Day",Alias="3553_FrostDateL28S",
  NewTSID="3553.NOAA.FrostDateL28S.Year",
  Statistic=DayOfLastLE,Value1=28,SearchStart="06/30")
NewStatisticYearTS(TSID="3553.NOAA.TempMin.Day",Alias=" FrostDateL32S",
  NewTSID="3553.NOAA.FrostDateL32S.Year",
  Statistic=DayOfLastLE,Value1=32,SearchStart="06/30")
NewStatisticYearTS(TSID="3553.NOAA.TempMin.Day",Alias="3553_FrostDateF32F",
  NewTSID="3553.NOAA.FrostDateF32F.Year",
  Statistic=DayOfFirstLE,Value1=32,SearchStart="07/01")
NewStatisticYearTS(TSID="3553.NOAA.TempMin.Day",Alias="3553_FrostDateF28F",
  NewTSID="3553.NOAA.FrostDateF28F.Year",
  Statistic=DayOfFirstLE,Value1=28,SearchStart="07/01")
Free(TSID="*.*.TempMin.*")
WriteStateCU(OutputFile="Results/Test.FrostDates")
```