Time Series Baseline Plot

statgraphics 18®
centurion

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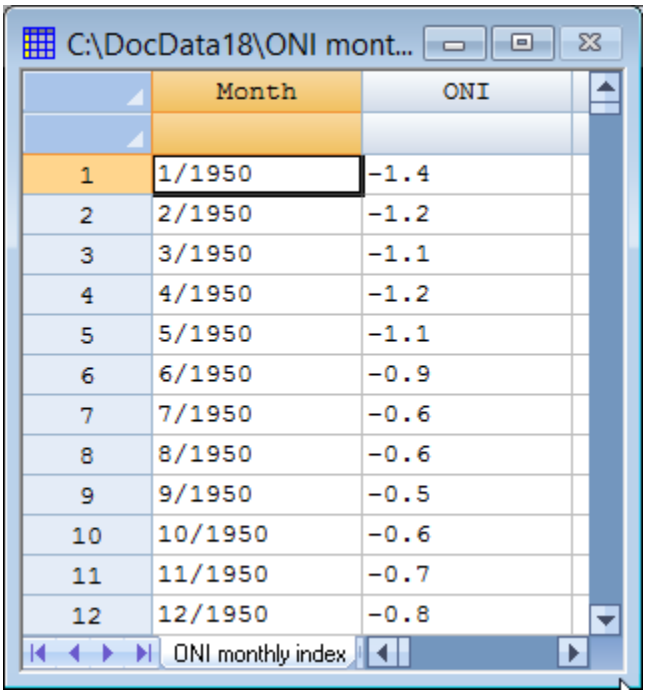
Summary

This procedure plots a time series in sequential order, identifying points that are beyond lower and/or upper limits. It is widely used to plot monthly data such as the Oceanic Niño Index.

Sample StatFolio: *ONI plot.sgp*

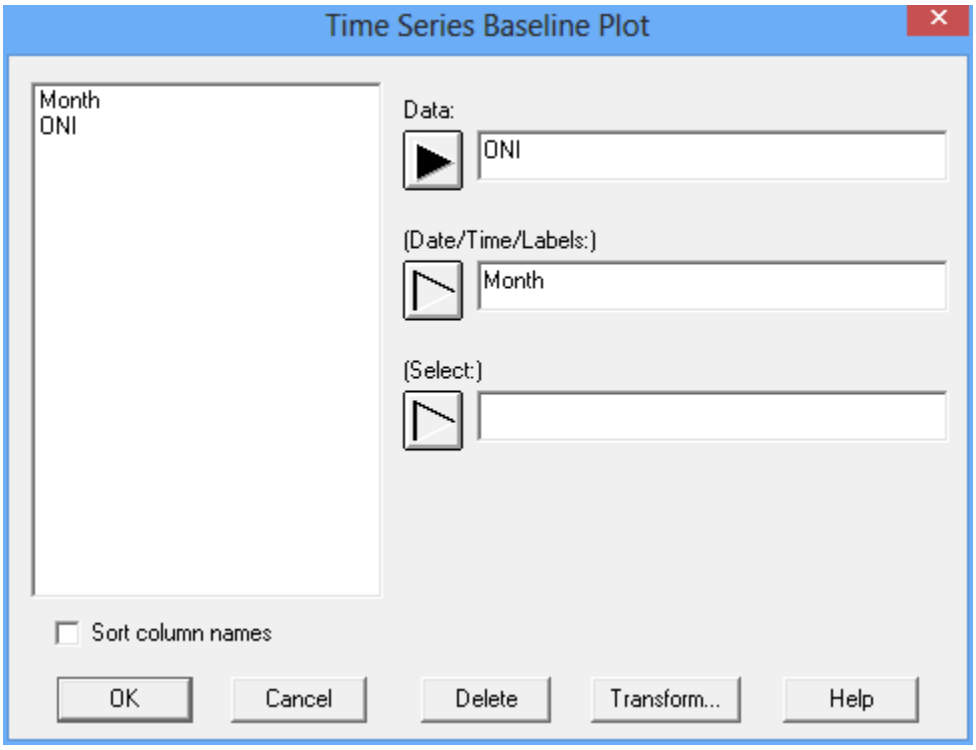
Sample Data:

The file *ONI monthly index.sgd* contains monthly values of the Oceanic Niño Index between January, 1950 and May, 2017. The ONI is one measure of the El Niño-Southern Oscillation in sea surface temperatures. A portion of the data is shown below:



Data Input

To create a time series baseline plot, complete the following data input dialog box:

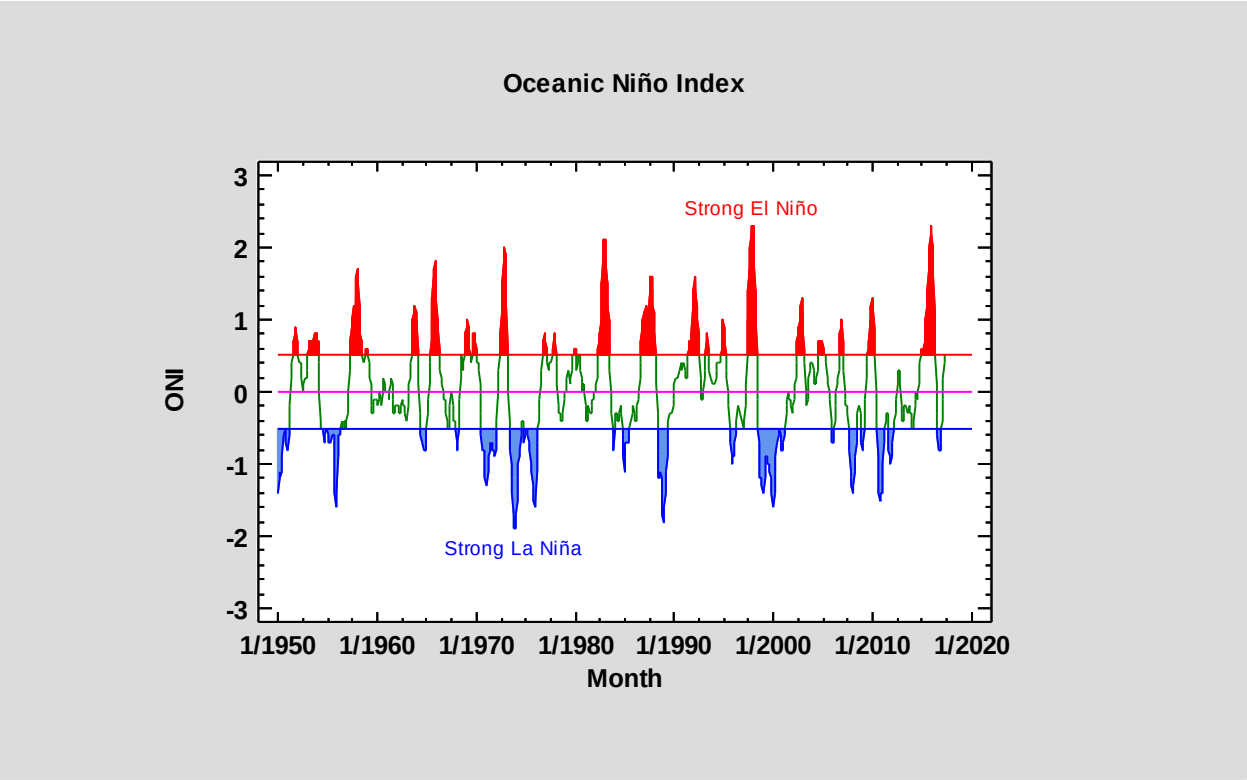


- **Data:** numeric column containing the data to be plotted.
- **Date/Time/Labels:** optional column containing row identifiers, used to scale the X axis. If this field is left blank, then row numbers are used to identify observations.
- **Select:** subset selection.

The data column should be in sequential order. If the *Date/Time/Labels* column is of type "Month", then an extended data table will be displayed.

Baseline Plot

The baseline plot displays the data values in sequential order:

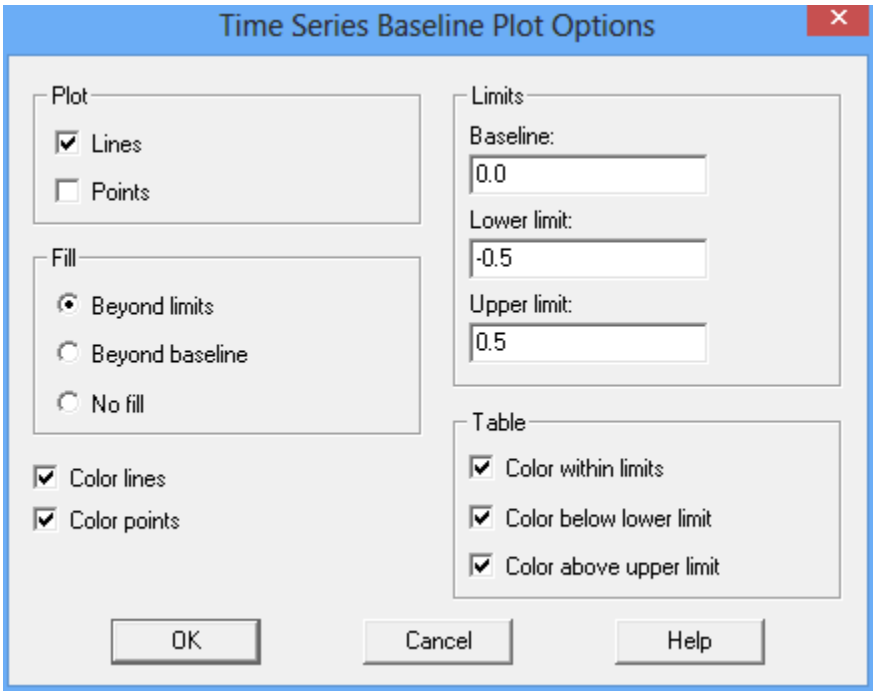


The areas above the upper limit may be filled using fill color #1. The areas below the lower limit may be filled using fill color #2. To create the above plot, the *Graphics Options* dialog box has been used to set these colors to red and blue, respectively.

The *Analysis Options* dialog box affects various aspects of the plot.

Analysis Options

The *Analysis Options* dialog box controls various features of the plot:



- **Plot:** If *Lines* is checked, consecutive data values will be connected by a line. If *Points* is checked, point symbols will be used to plot each data value.

- **Limits:** *Baseline* specifies the location of the centerline (if any). *Lower limit* and *Upper limit* specify the limits beyond which points will be identified as anomalies. Any of the fields may be left blank, in which case the associated line will not be plotted.

- **Fill:** controls the location on the plot at which solid fills will begin.

- **Color lines:** If checked, the segments of the line connecting the data values beyond the limits will be colored differently than the segments within the limits.

- **Color points:** If checked, the point symbols beyond the limits will be colored differently than the point symbols at or within the limits.

- **Table:** For monthly data, determines how data values in the extended data table will be colored.

Analysis Summary

The *Analysis Summary* summarizes the data on the plot:

Time Series Baseline Plot - ONI
Data variable: ONI

788 values ranging from -1.9 to 2.3

Baseline	0.0	
Lower Limit	-0.5	187 below
Upper Limit	0.5	187 above

It indicates how many data values are beyond the limits.

If the data column was entered in a column with month format, an extended data table will be displayed:

	JAN	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
1950	-1.4	-1.2	-1.1	-1.2	-1.1	-0.9	-0.6	-0.6	-0.5	-0.6	-0.7	-0.8
1951	-0.8	-0.6	-0.2	0.2	0.2	0.4	0.5	0.7	0.8	0.9	0.7	0.6
1952	0.5	0.4	0.4	0.4	0.4	0.2	0.0	0.1	0.2	0.2	0.2	0.3
1953	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.7
1954	0.7	0.4	0.0	-0.4	-0.5	-0.5	-0.5	-0.7	-0.7	-0.6	-0.5	-0.5
1955	-0.6	-0.6	-0.7	-0.7	-0.7	-0.6	-0.6	-0.6	-1.0	-1.4	-1.6	-1.4
1956	-0.9	-0.6	-0.6	-0.5	-0.5	-0.4	-0.5	-0.5	-0.4	-0.4	-0.5	-0.4
1957	-0.3	0.0	0.3	0.6	0.7	0.9	1.0	1.2	1.1	1.2	1.3	1.6
1958	1.7	1.5	1.2	0.8	0.7	0.6	0.5	0.4	0.4	0.5	0.6	0.6
1959	0.6	0.5	0.4	0.2	0.1	-0.2	-0.3	-0.3	-0.1	-0.1	-0.1	-0.1
1960	-0.1	-0.2	-0.1	0.0	-0.1	-0.2	0.0	0.1	0.2	0.1	0.0	0.0
1961	0.0	0.0	-0.1	0.0	0.1	0.2	0.1	-0.1	-0.3	-0.3	-0.2	-0.2
1962	-0.2	-0.2	-0.2	-0.3	-0.3	-0.2	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4
1963	-0.4	-0.2	0.1	0.2	0.2	0.4	0.7	1.0	1.1	1.2	1.2	1.1
1964	1.0	0.6	0.1	-0.3	-0.6	-0.6	-0.7	-0.7	-0.8	-0.8	-0.8	-0.8
1965	-0.5	-0.3	-0.1	0.1	0.4	0.7	1.0	1.3	1.6	1.7	1.8	1.5
1966	1.3	1.0	0.9	0.6	0.3	0.2	0.2	0.1	0.0	-0.1	-0.1	-0.3
1967	-0.4	-0.5	-0.5	-0.5	-0.2	0.0	0.0	-0.2	-0.3	-0.4	-0.4	-0.5
1968	-0.7	-0.8	-0.7	-0.5	-0.1	0.2	0.5	0.4	0.3	0.4	0.6	0.8
1969	0.9	1.0	0.9	0.7	0.6	0.5	0.4	0.5	0.8	0.8	0.8	0.7
1970	0.6	0.4	0.4	0.3	0.1	-0.3	-0.6	-0.8	-0.8	-0.8	-0.9	-1.2

Values above the upper limit are colored red by default. Values below the lower limit are colored blue. The coloring may be changed using the *Analysis Options* dialog box.

References

The data were obtained from the Climate Prediction Center of the National Weather Service at:

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/ensostuff/ensoyears.shtml