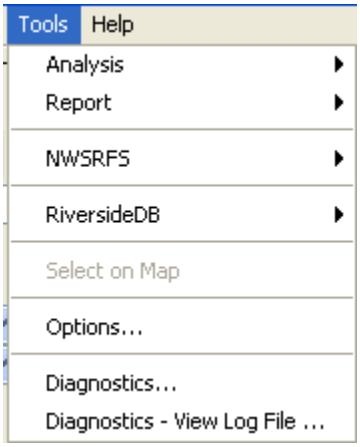
5 Tools

Version 10.20.00, 2013-04-21

This chapter discusses the tools available under the ***Tools*** menu. The ***Tools*** menu lists tools that perform additional analysis on time series that are selected in the ***Time Series Results*** list. These features are similar to the ***Results*** menu features in that a level of additional analysis is performed to produce the data product. Tools may or may not correspond to commands – often tools internally execute the features available in commands, in order to implement a more complicated analysis. Tools are interactive, whereas commands can be used in automated processing.



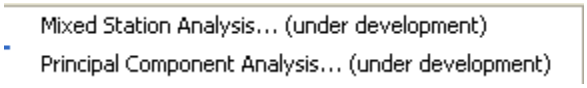
Menu_Tools

Tools Menu

Tools may be specific to a datastore type and consequently some tools may not be available in TSTool for all configurations. Where possible, TSTool functionality is included in commands to facilitate automation.

5.1 Analysis Tools

Analysis tools analyze time series and typically produce an output report.



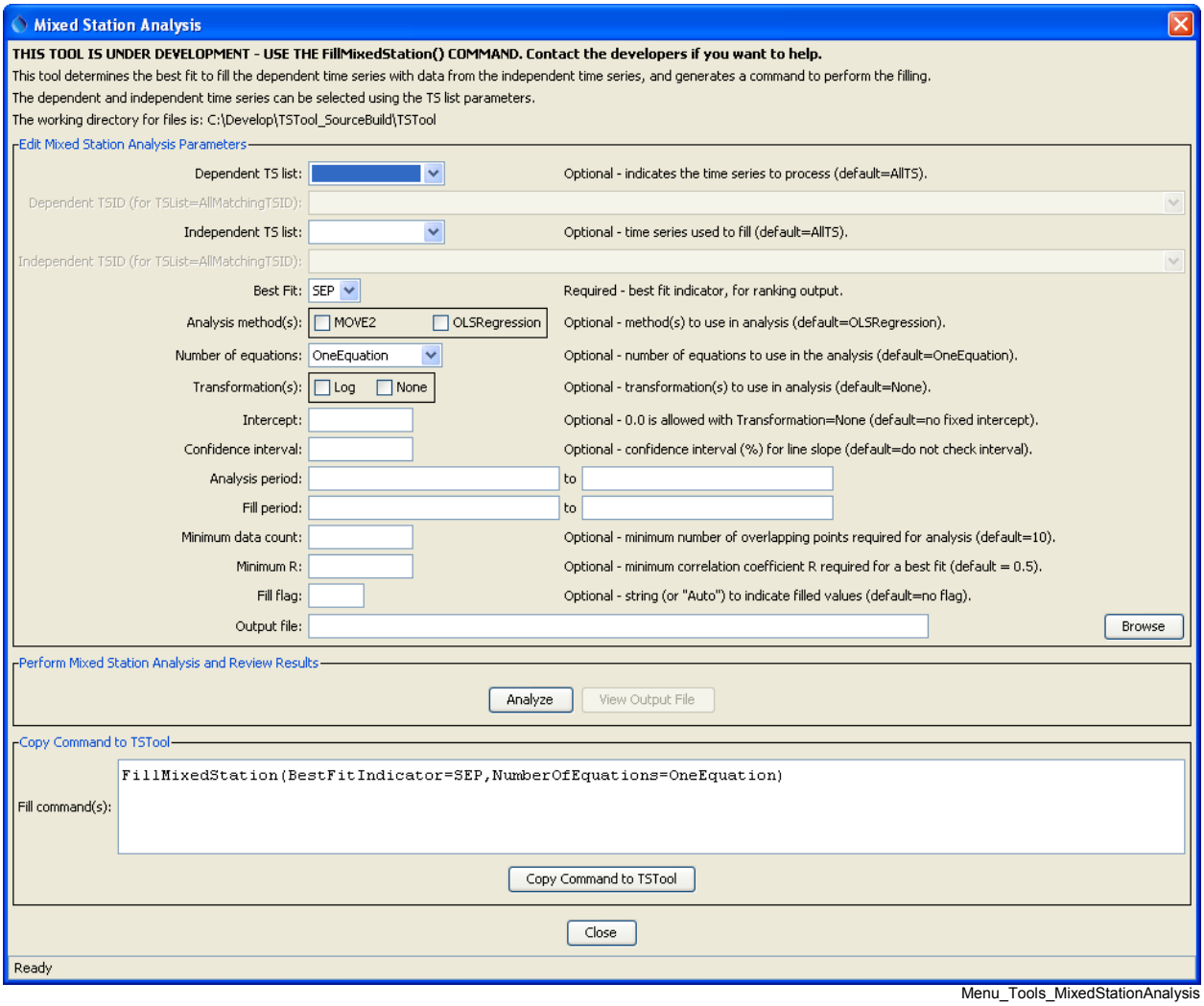
Menu_Tools_Analysis

Tools…Analysis Menu

5.1.1 Mixed Station Analysis

The Mixed Station Analysis tool is under development and not ready for production use. Instead, use the `FillMixedStation()` and `FillRegression()` commands, which provide most of the functionality envisioned by the interactive tool. The following documentation is retained for discussion purposes and to guide future enhancements.

The Mixed Station Analysis tool is an interactive tool that tries to find the best combination of time series necessary to fill data using regression or the MOVE2 method. The optimal results can then optionally be used as parameters for the `FillMixedStation()` command. The following figure illustrates the Mixed Station Analysis tool.

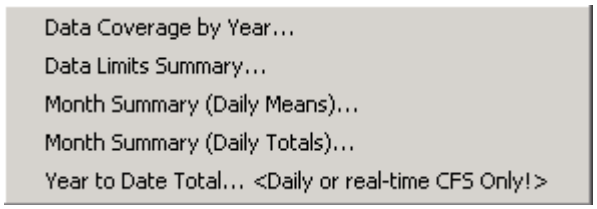


Menu_Tools_MixedStationAnalysis

Mixed Station Analysis Interface

5.2 Report Tools

Report tools analyze time series, typically creating a summary report.

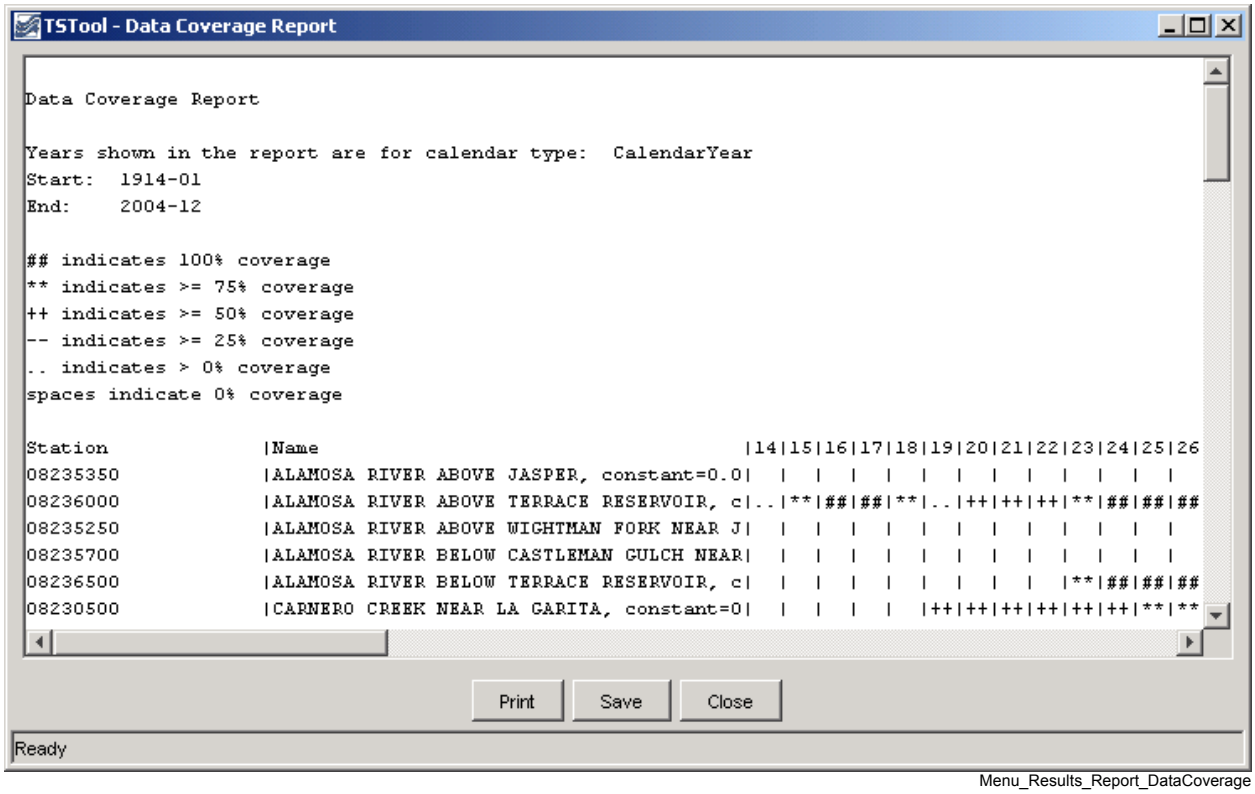


Menu_Results_Report

Tools…Report Menu

5.2.1 Data Coverage by Year Report

The ***Tools…Report - Data Coverage by Year*** menu processes the time series that have been selected and produces a report similar to the following (abbreviated). This report is useful, in particular, for evaluating data availability for multiple time series over a period. Although effort has been taken to make the report as compact as possible, it will likely need to be printed in landscape format on a large paper size.

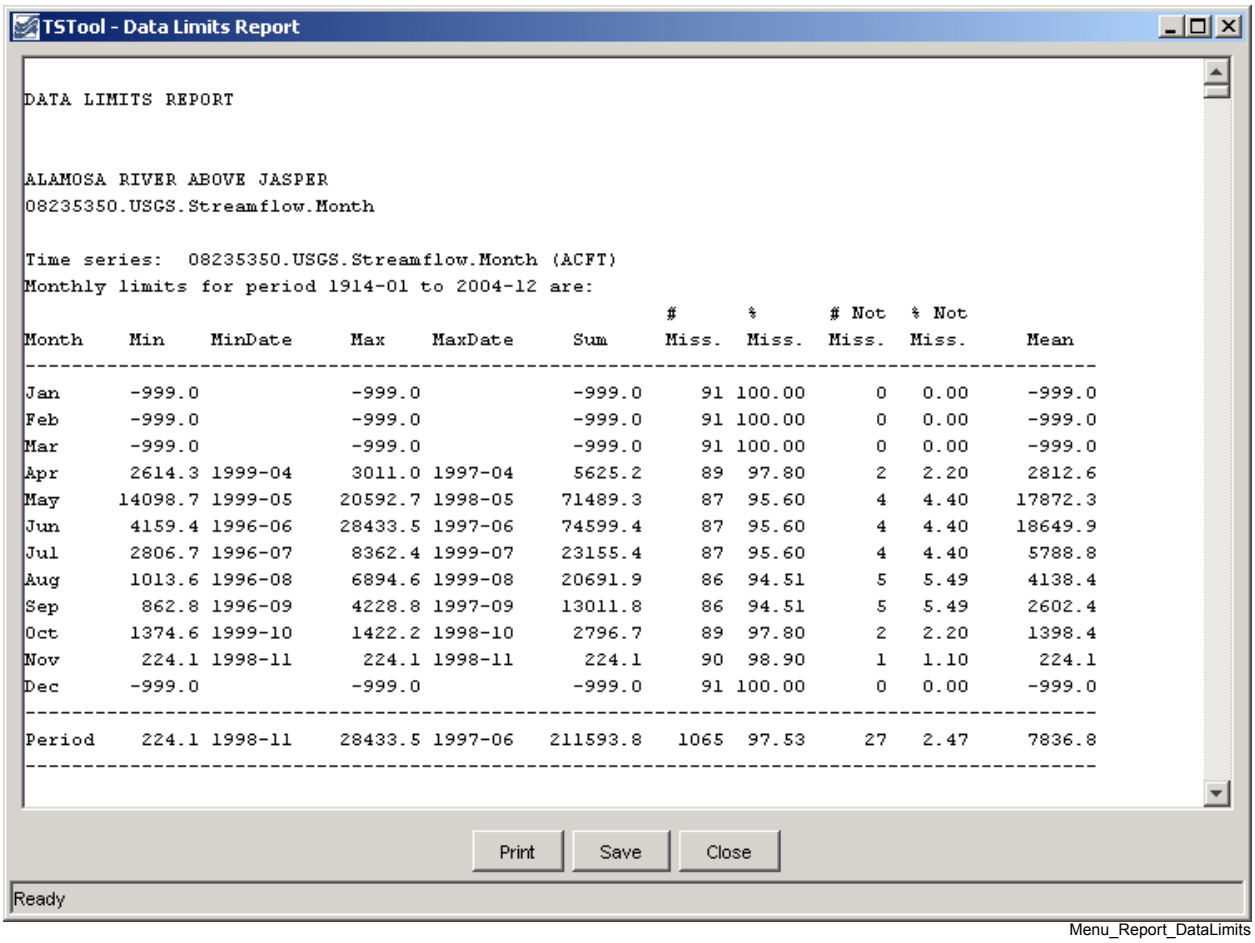


Menu_Results_Report_DataCoverage

Data Coverage by Year Report

5.2.2 Data Limits Summary Report

The ***Tools…Report - Data Limits Summary*** menu processes the time series that have been selected and produces a report similar to the following (abbreviated). The data limits summary for each time series is included. This report is useful, in particular, for evaluating data availability for specific time series. Currently, only monthly time series have detailed summaries. All other data intervals shown overall period summaries. The value `-999` is used to indicate missing data.

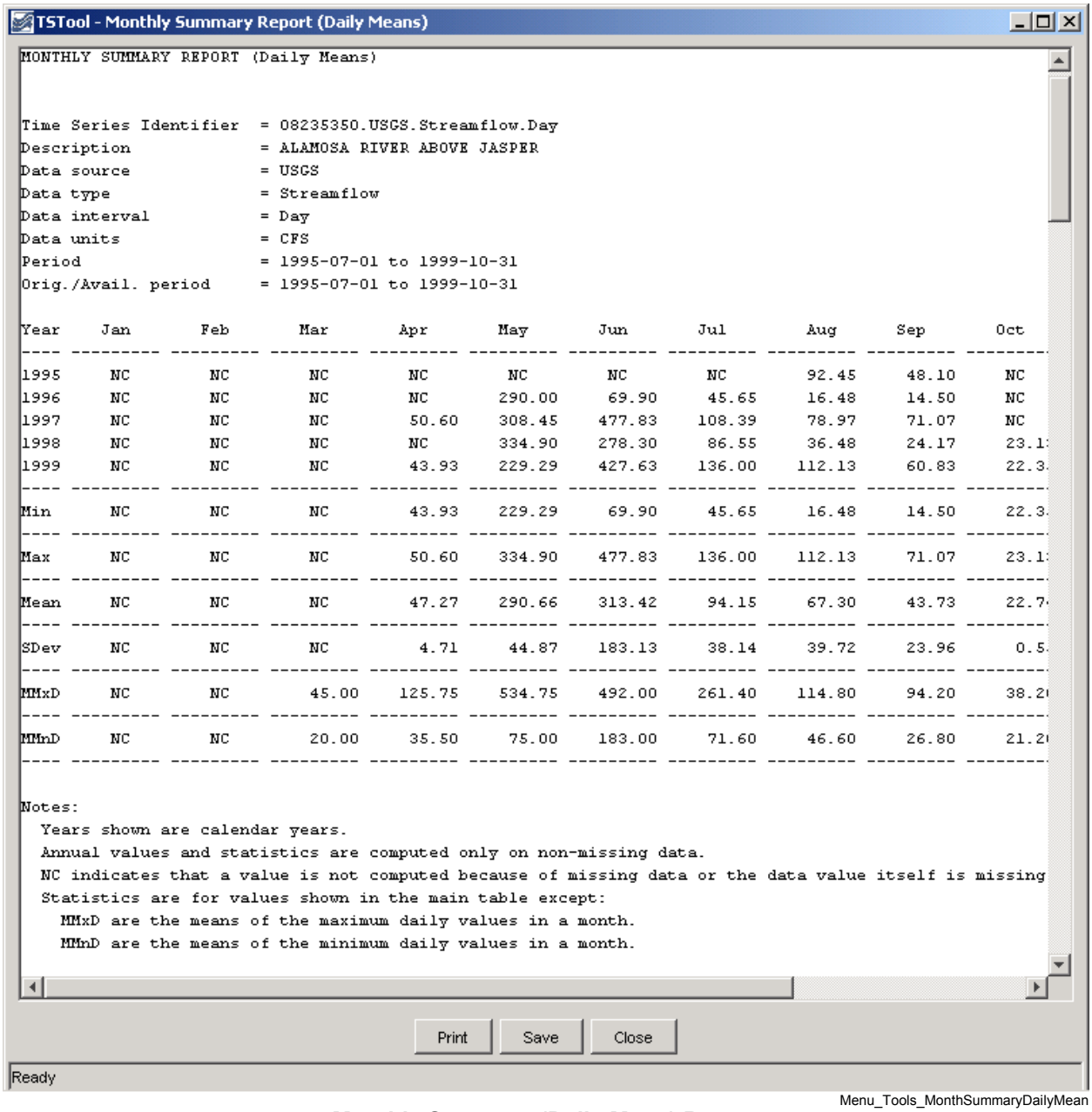


Menu_Report_DataLimits

Data Limits Summary Report

5.2.3 Month Summary Reports

The ***Tools…Report - Month Summary*** menus process the time series that have been selected and produces a report similar to the following (abbreviated). This report is similar to default summary output for monthly time series; however, it is applied to shorter data intervals, including minute, hour, and day interval. Values are first accumulated to daily values (by averaging the values in a day if the ***Daily Means*** report is chosen or by totaling the values in a day if the ***Daily Totals*** report is chosen). For example, use total for precipitation and means for average flows or daily temperature. The daily values are then further accumulated to produce monthly values, again using means or totals. The report includes a header for the time series, the report, and footnotes. Values are only shown if full data are available for a month and statistics are computed using only complete months.

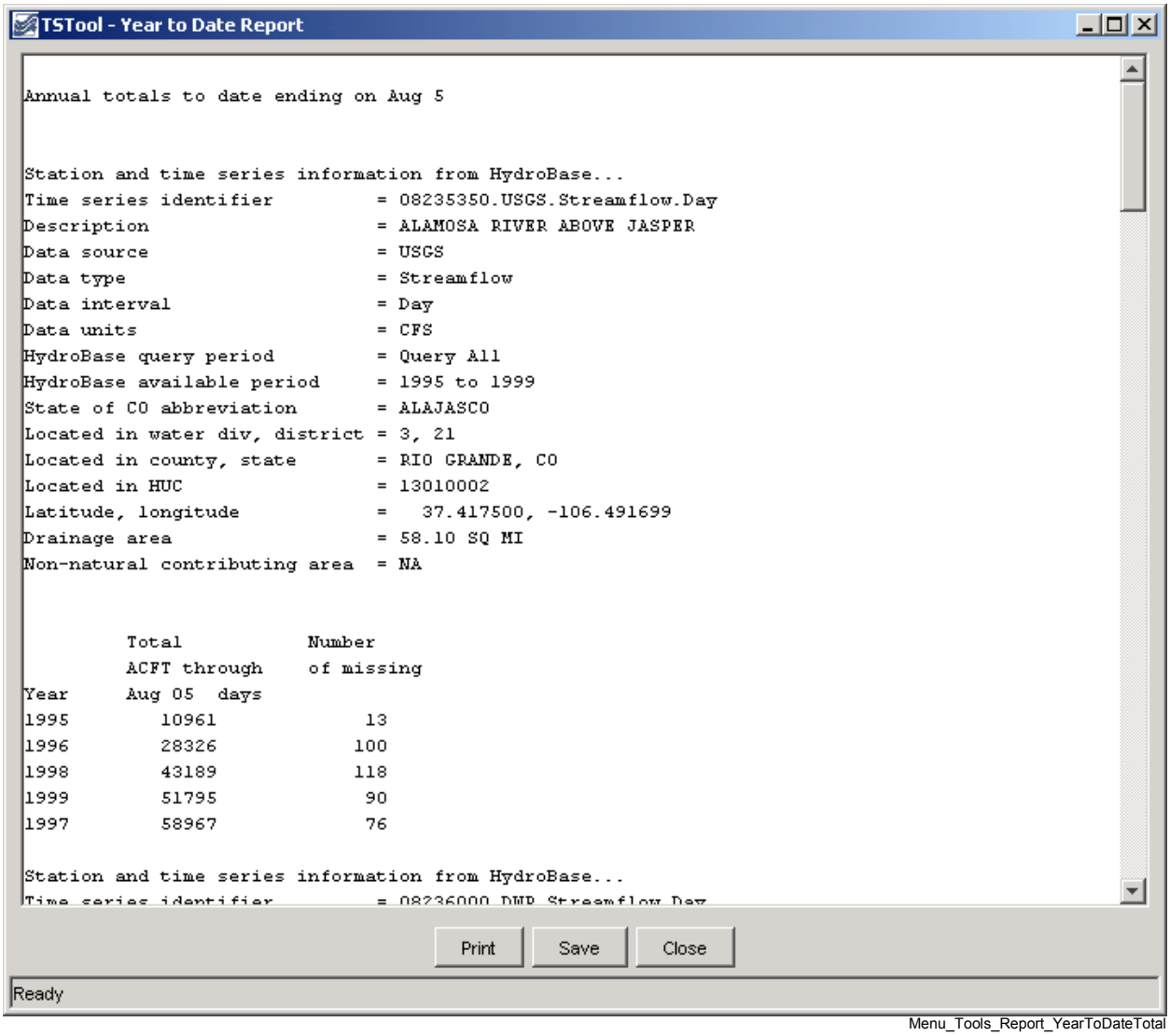


Menu_Tools_MonthSummaryDailyMean

Monthly Summary (Daily Mean) Report

5.2.4 Year to Date Total Report

The ***Tools…Report - Year to Date Total*** menu processes the time series that have been selected and produces a report similar to the following (abbreviated). This report is useful, in particular, for comparing on a volumetric basis the different years of a time series over a full period. The year-to-date volumes are sorted; to find a particular year, use the ***Search*** button on the report display. The report information can then be used, for example, to select time series traces for analysis and output. Currently, this report can only be used to process daily `CFS` data. Real-time data can be analyzed by first converting to a daily interval using the `ChangeInterval()` command. **Warning: some years may have no data at the beginning of a year and the corresponding year-to-date totals will consequently be zero. Refer to the data coverage and data limit reports for more detail.**



Menu_Tools_Report_YearToDateTotal

Year to Date Total Report

5.3 Map Tools

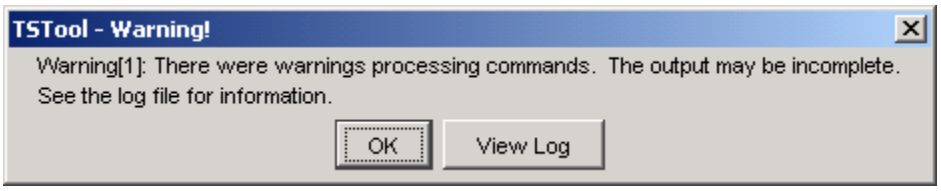
The ***Tools…Select on Map*** menu button is enabled when a map is displayed (using ***View…Map***) and time series are listed in the upper right part of the main window. The locations corresponding to selected time series or all time series in this list can be displayed on the map. See **Chapter 8 – Using the Map** for more information. Map features are implemented at only a basic level.

5.4 TSTool Options

The ***Tools…Options*** menu provides a way to set TSTool options during the session. Minimal capabilities are provided. Instead, the TSTool environment is typically configured in its configuration file (see the **Installation and Configuration** appendix), data store configuration files, and with commands.

5.5 Diagnostics

Diagnostics features are useful for troubleshooting. When an error occurs, a small warning dialog may be displayed, as shown in the following figure:



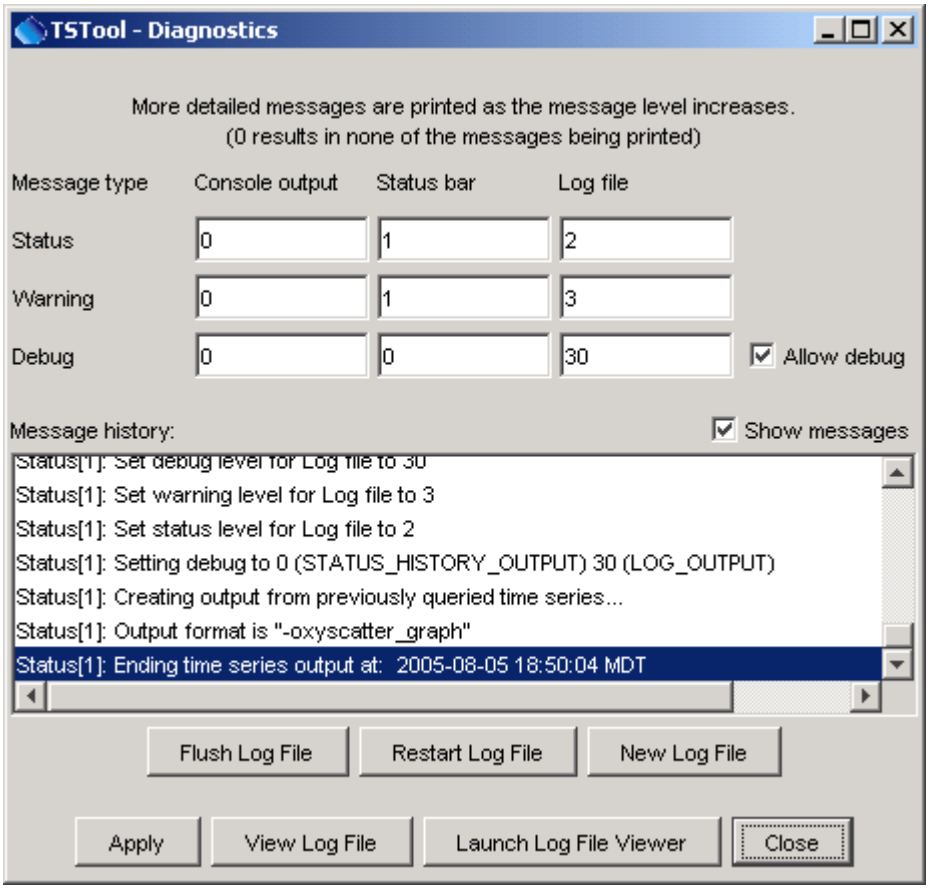
Diagnostics_Warning

Example Warning Message Dialog

If results are not as expected, also review the messages in the status bar at the bottom of the main or secondary windows.

5.5.1 Diagnostics Settings

The ***Tools…Diagnostics*** menu item displays the ***Diagnostics*** dialog, which is used to set message levels and view messages as the application runs. The ***Diagnostics*** dialog (see the following figure) can be used to evaluate a problem.



Diagnostics

Diagnostics Interface

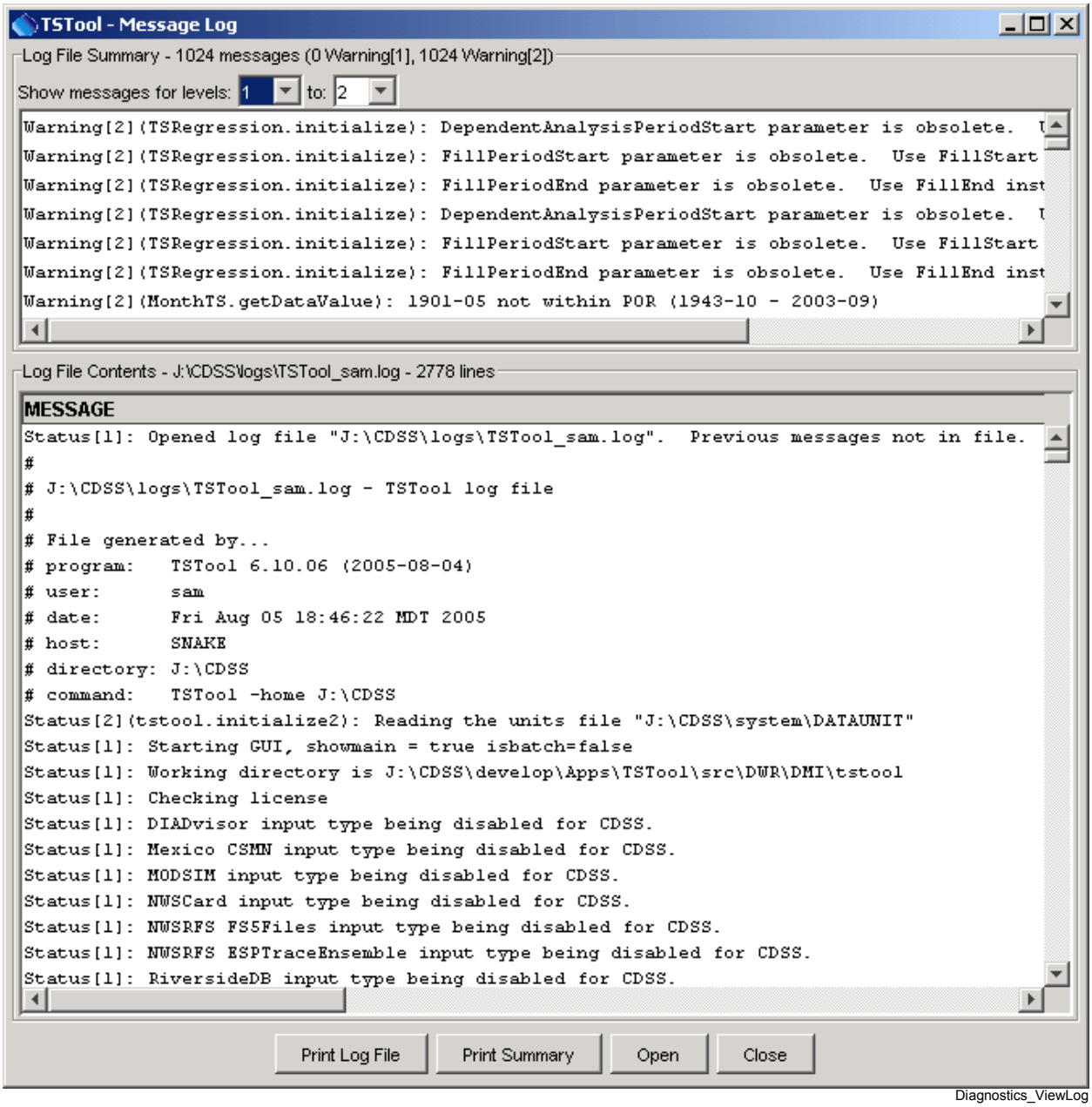
The settings at the top of the dialog are used to specify the level of detail for messages printed to the console window, the status area at the bottom of the main window (and the ***Diagnostics*** dialog), and the log file. The log file contains warning, status, and debug messages, many of which are not normally displayed in the main interface. The log file is created in the *logs* directory under the installation directory. The ***Diagnostics*** interface features are as follows:

Status, ***Warning***, ***Debug***	Enter integer values, with larger numbers resulting in more output and slower performance. Zero indicates no output. If troubleshooting, a good guideline is to set the debug level to 10 or 30 (and select the ***Allow Debug*** checkbox). The default settings are often enough for normal troubleshooting and result in good software performance.
Allow Debug	Select to enable debug messages. Turning on debug messages will significantly slow down the software.

Show Messages	Select to display messages in the ***Diagnostics*** window.
Flush Log File	Force messages to be written to the log file. Messages can be buffered in memory and may not otherwise immediately be written to the log file.
Restart Log File	Restart the log file. This is useful if a long session has occurred and troubleshooting will occur on new actions.
New Log File	Open a new log file, with a new name.
Apply	Apply the settings in the ***Diagnostics*** dialog.
View Log File	View the log file in an integrated window. The ***View Log File*** button will be enabled if the log file has been opened.
Launch Log File Viewer	View the log file using a viewer from the operating system. On Windows computers, Notepad will be used.
Close	Apply the settings in the ***Diagnostics*** dialog and close the window.

5.5.2 Diagnostics – View Log File

The ***Tools…Diagnostics – View Log File*** menu item displays the integrated log file viewer. Selecting this menu item is equivalent to selecting the ***View Log File*** button in the ***Diagnostics*** dialog. The log file viewer will be displayed in a window as shown in the following figure:



Diagnostics_ViewLog

Log File Viewer Window

The log file messages can be scrolled. To find a string in the log file, right-click and select the ***Find*** menu item. The information in the log file can also be copied and pasted into email, when contacting support.