4 VPlotter

4.1 Introduction

VISTA is a group of tools for retrieving, managing and manipulating time series data. Time series data is stored in HEC-DSS format. This allows efficient and easy access to large amounts of time series data.

VISTA provides the following four tools:

1. VISTA GUI. This is a graphical user interface that provides a fast and easy way of accessing time series data in HEC-DSS format.
2. VPLOTTER. This is a graphical user interface that bridges the gap between user interfaces and scripts by providing a template approach to repeatable operations.
3. VSCRIPT. This is a scripting interface for controlling the many individual components of VISTA.
4. VSERVER. This is a tool for distributing data over a network.

VPlotter is the latest in this group of tools for retrieval, manipulation and management of time series data. VPlotter is built on top of existing functionality of VISTA and VScript. Whereas VISTA stresses on browsing a DSS file or files, VPlotter stresses on repeatability and automation. VPlotter can call any function that is available using VScript and thus is as extensible as VScript. This chapter summarizes VPlotter. For details on VISTA, see the previous annual progress reports *Methodology for Flow and Salinity in the Sacramento-San Joaquin Delta and Suisun Marsh* (1998, 1999).

4.2 Installing VPlotter

The VISTA package comes with an installer which installs all the above mentioned programs. A user can download the zip file from the Delta Modeling Section's home page at http://wwwdelmod.water.ca.gov, unzip it and double click on the install.bat file. This starts a user interface that guides the user in installing the product. Once installed on Windows, a VISTA folder appears in the user's START button which contains the above mentioned tools. This VISTA folder contains all the VISTA tools, including VPlotter. VISTA is supported on Solaris and Windows platforms and with minimal effort can be ported to any platform supported by Java.

4.3 Using VPlotter

VPlotter sets up a template of operations to retrieve data from HEC-DSS files, manipulate and operate on that data, and then execute a set of standard actions on the resulting set of time series. This standard set of actions includes: Graph, Tabulate, Run Script, Write To DSS, Write To Text, Save To Web and Save To GIF/JPEG. Standard time series arithmetic operations are available with time series specific operations such as moving average and period averages. Scripts that may be written by users may provide additional operations.

VPlotter defines three levels: study, graph, and plot. The topmost level is the study level. The study level can contain multiple graphs. The graph level can contain multiple plots. This hierarchy is represented by a tree structure similar to a file manager. The selected level is highlighted and the operations are done with context to that level.
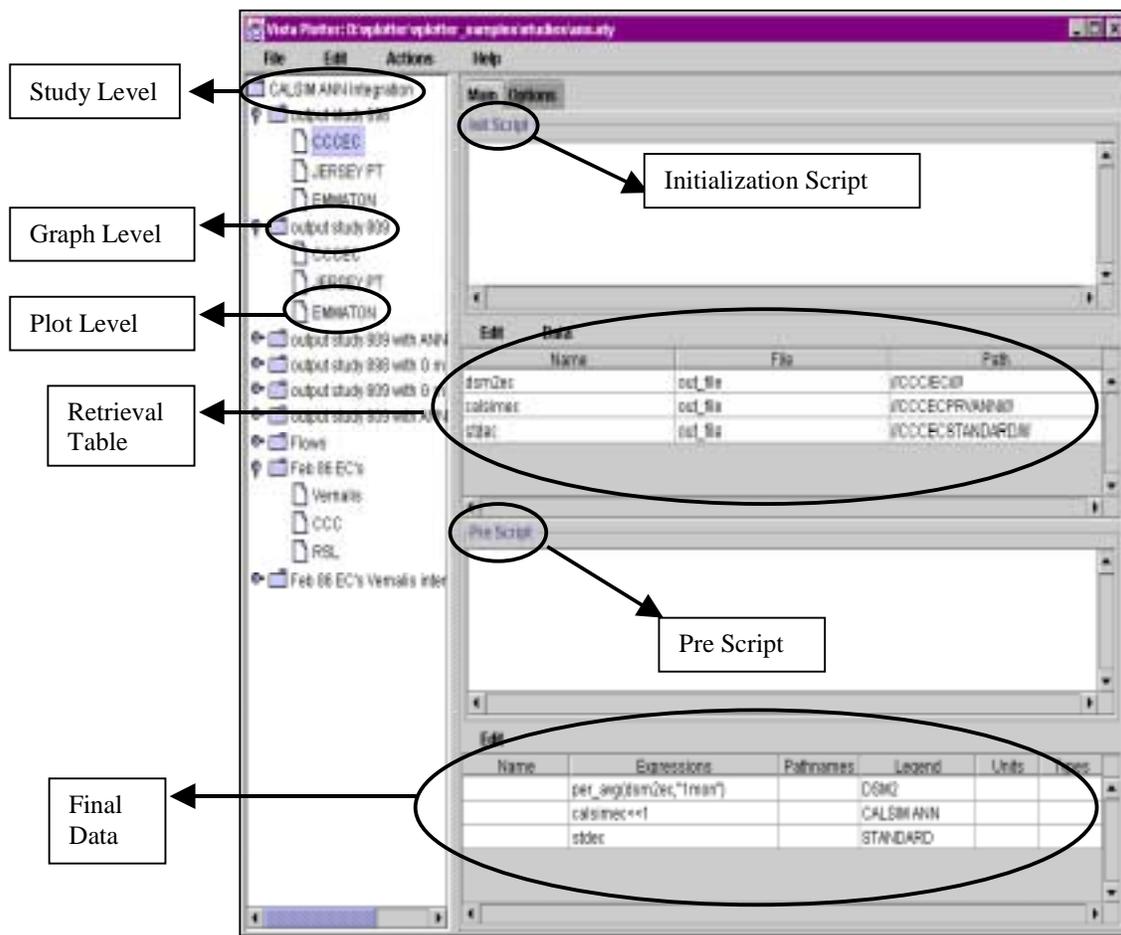

Figure 4-1: Sample Vplotter Session.

At the study level the user can define global definitions that are accessible at all contained levels. The graph level contains its own set of definitions as well as a graph title and the preferred layout of the plots in the graph.

The plot level contains its own set of definitions, a table of named items that are time series retrieved from a filename and pathname specification. This is followed by a set of actions called "Pre-script" and then a table with expressions that result in time series. These expressions result in time series on which the set of standard actions applies.

The options tab at the plot level contains the time window for retrieval, the plot title, the axis labels and their range. Arbitrary plot text is allowed and a comment section is allowed for each plot as well.

Users can extend VPlotter's functionality by writing functions in VScript. Existing time series can be examined and data can be extracted from them. This data may be used from multiple time series to create another set of data from which a new time series may be created. The created time series is identical in behavior to time series retrieved from HEC-DSS files and can be manipulated identically.

User help is available in the form of online help in VPlotter and VISTA. There is also documentation for advanced users, which is generated from the source code for VISTA. In addition, the underlying languages used by VISTA, which are Jpython and Java, are well documented at http://www.jpython.org and at http://java.sun.com respectively.

4.4 References

Sandhu, Nicky. (1998). "Chapter 8: VISTA (Visualization Tool and Analyzer)." *Methodology for Flow and Salinity Estimates in the Sacramento-San Joaquin Delta and Suisun Marsh. 19th Annual Progress Report to the State Water Resources Control Board.* California Department of Water Resources. Sacramento, CA.

Sandhu, Nicky. (1999). "Chapter 5: VSCRIPT: A Scripting Language Extension for VISTA." *Methodology for Flow and Salinity Estimates in the Sacramento-San Joaquin Delta and Suisun Marsh, 20th Annual Progress Report to the State Water Resources Control Board.* California Department of Water Resources. Sacramento, CA.