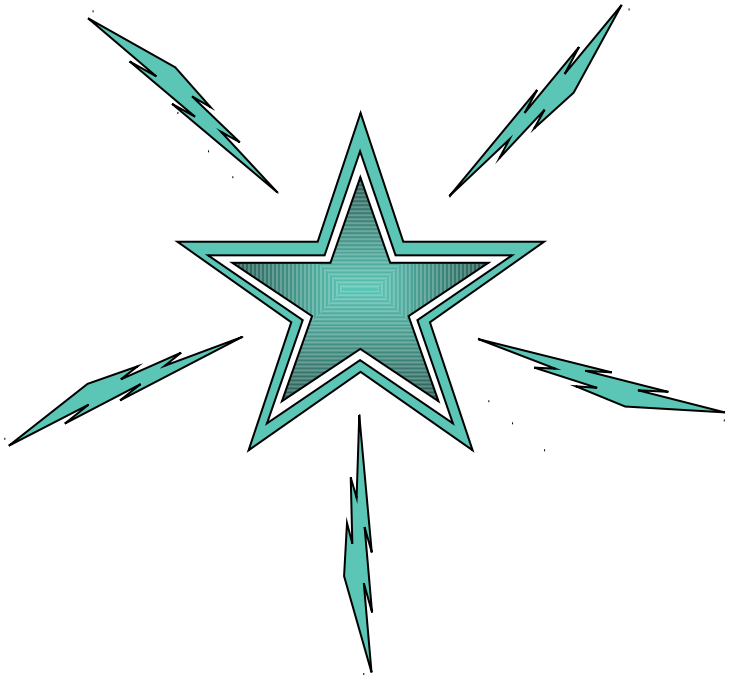
HydroLynx



NovaStar 5

Part I

User Manual

A102721-4

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1 Program Description

NovaStar 5 is a data collection and management software system designed to receive real-time hydro-meteorological data from ALERT radio transmissions and to solicit data from two-way radio systems and other external sources. Transmission of data may be initiated by the remote station, either on a set schedule or when a defined event occurs; for example at each tip of a rain gage. NovaStar 5 can also poll an external source for data on a configured schedule, like a remote station equipped with a model 50386 data collection unit or the USGS National Water Information Server (NWIS) Web. NovaStar 5 can ingest USGS stream gage data and process data formats including text files in the Standard Hydrologic Exchange Format (SHEF files), commercial satellite, and GOES satellite data.

NovaStar 5 is designed to act as a client-server application. The NovaStar 5 central data server runs under a Linux operating system and receives data broadcast on specified radio frequencies through serial or USB ports on the dedicated server computer. A web browser allows clients to log-on to the server from any computer with internet capabilities. Clients include one or more system administrators and any number of users. Users are not given access to the s that would allow them to alter the data structures defined by the administrator.

To make data useful for analysis and decision-making, the software administrator configures NovaStar 5 to perform error checking on the incoming data, and to convert sensor output into appropriate engineering units that are correctly associated with their geographic location and the time of the measurement. The system administrator can also configure NovaStar 5 to provide automatic warning to any number of users via screen alarms, audible alarms, emails, pager alarms, and phone/voice auto-dialed alarms if specific conditions are met. All users including the administrator are able to respond to alarms, customize map displays, view, analyze and plot data and generate data reports.

NovaStar 5 stores data in an ODBC compliant Postgresql database that can be accessed for analysis and display of time series point data by the administrator and users, either with NovaStar 5's internal mapping and reporting tools, or with compatible applications supporting SQL queries, like ArcGIS, Microsoft Excel, Microsoft Access, etc. The database is editable and includes post-event and historical data processing functions including statistical and time interval data analyses, time-based rating tables, and daily and monthly rainfall and streamflow reporting. Rainfall, water level and streamflow data can be summarized on varying time steps (daily, monthly, yearly).

1.1 What is new in NovaStar 5 for NovaStar 4X Users?

NovaStar 5 is a completely new application rather than an upgraded or a revised NovaStar 4X. While previous NovaStar applications ran under the QNX operating system, NovaStar 5 was developed with a Linux operating system and uses an open, ODBC-compliant relational database called Postgresql. However, users familiar with NovaStar 4X will find many familiar features in NovaStar 5. Differences include:

- ☑ NovaStar 5 provides a program that is map-based and accessible from any computer with Internet access.
- ☑ Stations are located on the map using their geo-reference of latitude and longitude rather than a coordinate mapping reference.
- ☑ In NovaStar 4X, it was not necessary to define stations. Only sensor definitions were needed to store sensor data reports in the database. NovaStar 5 has a hierarchical structure of *stations* and *points*. A station has a physical location and reports sensor

readings in data reports. The data reports may contain data readings for one or more sensors. Each sensor reading is stored as a separate point in the database.

- ☑ In NovaStar 4X, raw data reports were stored in the database. Scaled data was computed when the database was queried by a report display program. NovaStar 5 computes and stores the scaled data so it can be pulled directly from the database.
- ☑ In NovaStar 4X, rating table computation of streamflow was done when the database was queried by a report display program. NovaStar 5 computes streamflow when a data report is filed and stores the streamflow data in a separate table so it can be pulled directly from the database.
- ☑ In NovaStar 4X, digital status readings were stored in one data report. The line number was used to pull the desired status bit from the data report value. NovaStar5 automatically extracts the digital status bit value and assigns the value to a point.
- ☑ In NovaStar 4X, ALERT wind run and direction readings were stored in one data report. When the database was queried by a report display program, wind run was separated from direction and wind speed computed. NovaStar 5 automatically extracts the wind run and direction, computes wind speed and stores wind speed and direction in separate points.
- ☑ In NovaStar 4X, real-time equations were executed when the database was queried by a report display program. A real-time equation computes a new data value from one or more sensor data reports. For example, Dewpoint Temperature could be computed from Air Temperature and Relative Humidity. NovaStar 5 automatically computes the equation data when the data reports are received and stores the computed data report in a separate point in the database.
- ☑ Alarm Groups are built around points in NovaStar 5. Groups were optional in 4X, but they are mandatory in NovaStar 5. A group can contain one or more points. Setting up alarms for many points with similar alarm criteria are expedited by forming a group.
- ☑ For data validation procedures comparing the change in value between a new data report and previous data reports, NovaStar 5 compares calibrated data reports and the **Change** value should therefore also be entered using calibrated units. In NovaStar 4X, change values used raw value units.

1.2 How to Use this Manual

The manual is intended to assist first-time users, and especially new administrators, by describing in sequence the steps required to create a data visualization and management system that truly informs decision-making processes by providing accurate, meaningful and timely data for both emergency response and post-event analysis. Part I of this manual describes the menu commands that allow any user to view, analyze and plot data using the **Tabular Data, Report Data, Plot Data and Map Data** commands. Part II describes the system configuration process for system administrators, but also includes information, particularly at the beginning of each section, that can be useful for users who are able to view (but not edit) the structures that have been created by the system administrator to organize and map data and configure alarms. Each chapter includes information relating the program to likely goals of its use and describes issues that impact the program's implementation for typical applications.

Each chapter also relates specifically to each of the available program "pages" that allow users to with the program. Working through the manual sequentially is likely to be unnecessary for those users familiar with previous NovaStar base station applications, but questions about how to proceed with any page you find on your screen should be easy to find in the section of this manual named after the page in question.

2 Server Platform Requirements

NovaStar 5 is installed on a dedicated or virtual server computer running the Linux operating system. The recommended minimum requirements for hardware are provided.

2.1 Linux Operating System

The recommended operating system is Debian Linux *stable* or *testing* release. The *testing* distribution contains packages that haven't been accepted into a *stable* release yet, but they are in the queue for that. The main advantage of using this distribution is that it has more recent versions of software.

2.2 Hardware Requirements

The server should be configured with the following:

- Intel Dual Core CPU
- 4 GB RAM storage
- Dual 500 GB SATA 7200 hard disk drives
- DVD-RW
- SVGA video card
- Minimum 19-inch LED monitor
- Gigabit NIC
- USB ports for keyboard, mouse, serial adapters
- Speakers

2.3 Local Backup of Data Management System

Backup of data and system configuration information is accomplished using the dual 500 GB SATA 7200 hard drives and RAID1 backup software.

2.4 Remote Access

Remote access to the server computer is provided through the web page interface or ssh command line connections.

2.5 Installation

The NovaStar 5 application is available from the HydroLynx distribution site (hyrdolynx.com). The installation package can be downloaded with an authorized user name and password using secure shell file transfer protocol (ssh). Once access to the site is established, the following files are required in order to install the NovaStar 5 application:

- novastar5install.exe

The application can be installed by a user with sudo privileges using the command:

```
sudo ./novastar5install.exe
```

The computer must be rebooted after installation of the application is complete.

Software updates are also available from the same web site. The installation of software updates will not erase an existing database; however, it is good practice to backup any existing databases before installing an update. A backup of the database can be made using the NovaStar 5 database backup program:

```
nsdbbackup “filename.backup"
```

After installation, NovaStar 5 can be accessed either at the server or by any computer with Internet access.

2.6 System Configuration

To complete installation of the NovaStar 5 system, a few system configuration items should be addressed by either the local network administrator or the NovaStar 5 administrator. These system configuration items are addressed from within the NovaStar 5 application; using the **System** menu command on the *Administrator* **Home** page. The default administrator login is:

- User name: admin
- Password: admin

These **System** parameters provide options that are useful for local network management and allow administrators to set certain system defaults.

When you click on the **System** menu command on the *Administrator* **Home** page, the **Configuration List** page appears, and the **System** menu command expands to show all of the **System** subcommands, including **Configuration List**, **Data Flag List**, **Nova Score List**, **Scheduler List**, **Serial Port List**, and **View Log File**. The **Configuration List** and the **Serial Port List** should be addressed as the final step required for completing installation. Refer to Part II Operator and Administrator Manual, Section 9, on how to configure your data collection system and complete the installation.

3 NovaStar 5 Basic Concepts

The operation of NovaStar 5 requires an understanding of some basic concepts and terminology which are introduced here and used throughout the document.

Station: In a standard ALERT network, each station is uniquely identified by its name, coordinate location (latitude/longitude), and station ID. Acceptable ALERT station ID numbers can range from 0 to 8191. NovaStar5 can accept station ID numbers from 0 to 99,999,999.

Station Type: Each station is equipped with a datalogger/data collection unit/transmitter installed at the station (HydroLynx 5096, Sutron 8210, Handar 555, or HydroLynx 50386). In NovaStar 5, station types describe attributes of this equipment.

Point: A station may have a number of different sensors installed, and in NovaStar 5 these data sources associated with a station are referred to as points. Examples of installed sensors at a station include battery voltage, rain gage, and pressure transducer to monitor water level, wind speed/direction sensor, air temperature sensor, and relative humidity sensor. Point data may also be obtained from other external sources, for example when data is obtained via satellite or web. The data packets provided by most of these stations contain one measurement per remote sensor identifier. Some exceptions are digital status (multiple digital inputs per data value transmission) and ALERT wind (wind run and wind direction are combined in one value transmission). When these compound sensor data reports are received, the data value is parsed to store individual sensor data values in the points assigned to the remote sensor identifier. A point represents a single measurement data stream in the database; either a data value received from a remote sensor or a computed or derived value.

Point Type: A point type characterizes the data values returned from a remote sensor. Sensors producing data values of a similar nature are grouped into point types to facilitate configuration of the system, definition of alarm levels, and display of data. Point types specify the data unit associated with data from a point and can be used to configure data calibration and data checking for those point types for which point-level data calibration and checking is appropriate. The creation of point types is left to the administrator.

Calibration: A calibration is a collection of values that are used to convert raw sensor data into scaled point data in the desired engineering units before storing in the NovaStar 5 database.

Alarm group: Points producing data values that can be evaluated for alarm conditions using the same criteria are grouped into an alarm group. An alarm group lets you assign the same alarm threshold criteria and trigger values to multiple points. For example, an alarm group may be defined containing all batteries. The group is then assigned a low limit voltage alarm level, typically 11.0 volts. Incoming data for any battery in the group is checked against the alarm level defined for the group. The alarm group concept facilitates the configuration and display of alarm conditions for multiple sensors with similar alarm conditions.

Time Series: A time series is a temporally sequential grouping of data that are displayed on a consistent time step.

Display Interval: The display interval is used to create time series information from uneven-interval data for display purposes. ALERT data reports are received on uneven time intervals and are stored within the database as such. The display interval can range from 5 minutes to 1 year and sequentially increments from the starting time to the ending time set by the user. Without subsequent data analysis, the display interval can be used to create a time series display from uneven-interval data where the data point displayed at the interval boundary is the last one that occurred within the interval.

4 NovaStar 5 on the Web

NovaStar 5 provides for web-based access to the server using your preferred browser. Therefore, your toolbar layout may be different than what is shown in this manual. However, the NovaStar 5 application will function as documented. Browser capabilities that refresh the current page or move from the current page to a previous or subsequent page can be used as usual.

The NovaStar 5 home page URL is:

http://*myservername*:8180/NovaStar5/index.do.

The server domain name or IP address, *myservername*, must be provided by your local network administrator. Port number 8180 is the standard NovaStar 5 web page browser port. This may be changed by the NovaStar 5 system administrator.

Within NovaStar5, buttons are provided to allow you to conveniently move between pages.

- **Add** opens a page of blank or default fields to add a database record for the list type.
- **Apply** saves changes to the current page and then remains in that page for further input. Frequently using the **Apply** button allows a page to differentiate based on user inputs, allowing NovaStar 5 to adapt the input fields as required.
- **Assign/Remove** opens a pop-up window to let you move items from the unassigned Pick list to the Assigned list.
- **Back** returns you to the previous page without saving changes to the current page.
- **Bottom of page** jumps to the bottom of the current page. This is useful when you want to get to the bottom of a long list of information or to the bottom of a long edit page.
- **Cancel** ignores any changes to the current page and returns to the previous page.
- **Choose details…** opens **List Details** page where you can choose which fields are displayed, the sort order, and limits are applied to the list of data displayed.
- **Copy** opens a copy page from an edit page. The parameters on the previous edit page are copied to the new page. When you click **OK** or **Apply** on a copy page, a new record is added to the database.
- **Delete** removes the information displayed on an edit page from the database.
- **Detach** opens another copy of the current page in its own browser window. Your browser must allow pop-ups for this button to work.
- **Details** opens **List Details** pop-up window where you can choose which fields are displayed, the sort order, and limits are applied to the list of data displayed.
- **Display** opens a Data Display page for the request page.
- **Edit** opens an edit page for the database record selected from a list. The parameters shown in the page can be modified and saved to the database.
- **List** displays a list of database records for the type of information shown next to the button.
- **Move Down** moves the selected detail down one row.
- **Move Up** moves the selected detail up one row.
- **OK** saves any changes that have been made in the current page. Then you are returned to the previous page.
- **Poll** opens a Station Poll page for the station. You can poll a remote station from this page to retrieve data and file in the NovaStar 5 database.
- **Refresh** will reload the current page from the server. This is useful when you think the database has changed and you want to have the latest information displayed.
- **Reset** will update the page with the default selections.

- **Select All** selects all details.
- **Top of page** jumps to the bottom of the current page. This is useful to return to the top of the page when you have scrolled or jumped to the page bottom.
- **View** displays the view or edit page for the database record selected from a list. The parameters shown in the page can be modified by an *operator* or *administrator*.

- **Button Icons**

Button	Action
	Move all from (unassigned) pick list to assigned list.
	Move from(unassigned) pick list to assigned list. Decrease display window width.
	Move from assigned list to (unassigned) pick list. Increase display window width.
	Move all from assigned list to (unassigned) pick list.
	Decrease pick list length. Decrease display window height.
	Increase pick list length. Increase display window height.
	Reset pick list to single select. Reset display window size to default.
	Expand section to show contents. Expand pick list to multiple select.
	Collapse section to hide contents. Collapse pick list to single select.
	Run command; display activity in command display window.
	Stop command.
	Clear display window.

5 The NovaStar 5 Home Page (User)

When you first access NovaStar 5, you will reach the NovaStar 5 default home screen. Without even logging in to the system you are able to view data in either tabular or graphical form and see recent data values displayed on the map or in formatted data reports, depending upon the system configuration that has been provided by the NovaStar 5 administrator.

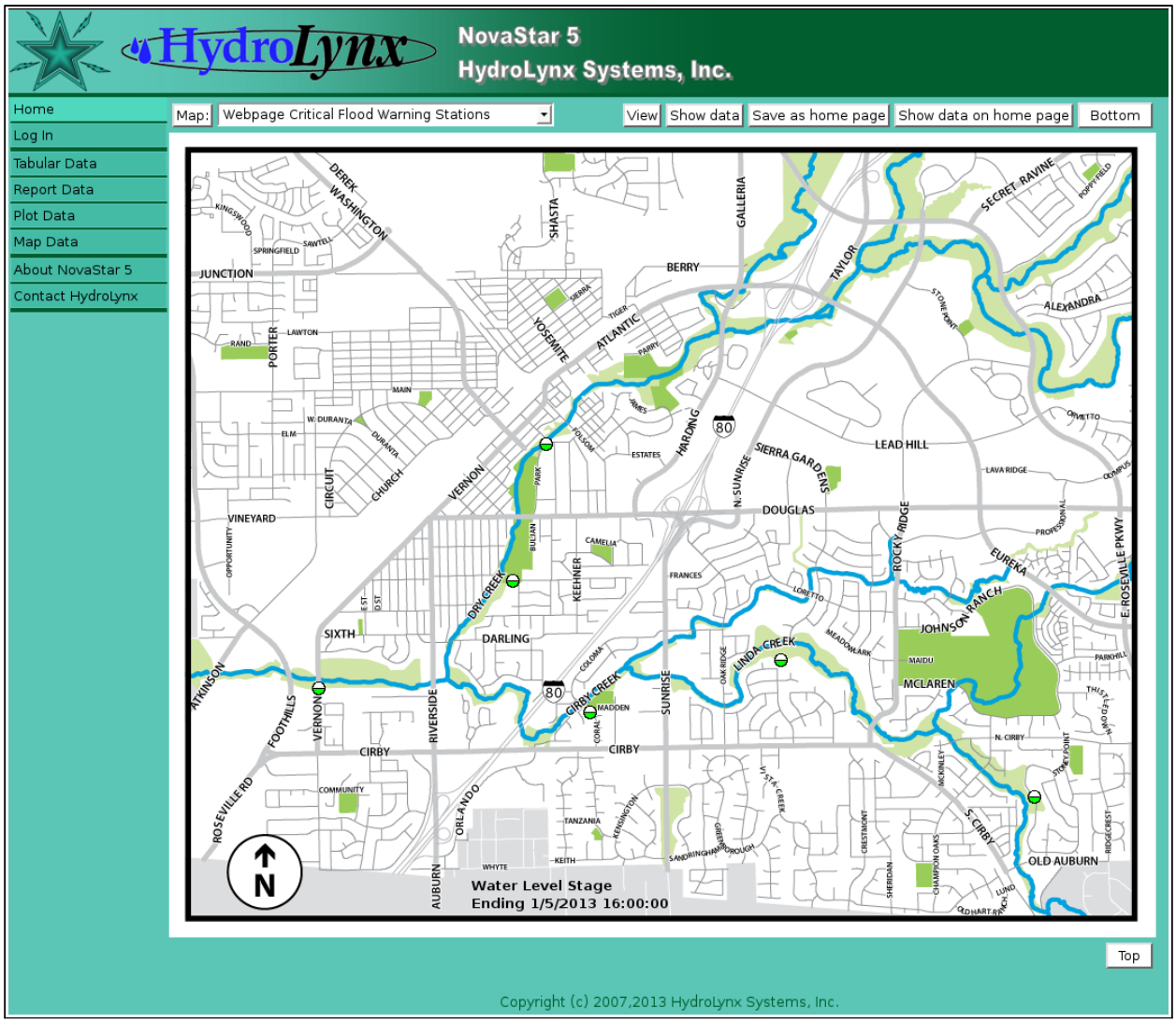


Figure 5.1. NovaStar 5 Web Home Page

The NovaStar 5 homepage can include a general map of the monitored area of interest, with each station identified by a green dot. Clicking on a dot allows access to a pop-up menu that displays information about the station and point associated with the data point.

The command menu will include the **Home, Log In, Tabular Data, Report Data, Plot Data** and **Map Data** commands, as well as the **About NovaStar 5** and **Contact HydroLynx** commands. These commands are described in Part I of this manual for all users. Once you have logged in as a user, the *User* **Home** Page appears. The menu of commands at the upper left side of the screen expands upon login, allowing you to access system commands including **Stations, Points, Alarms, Data, Forecast, Maps, Reports and System**. These commands are described in Part II as they apply to administrators, who have full read/write access to the database configuration capabilities accessed by these commands. Users have read-only access to database configurations, with limited exceptions (especially with regard to active alarms), but users should refer to Part II of this manual as needed for information about these commands.

5.1 Log In

When you select the **Log In** command from the NovaStar 5 Home Page menu, the login dialogue box appears. The login window prompts you for your user name and password.

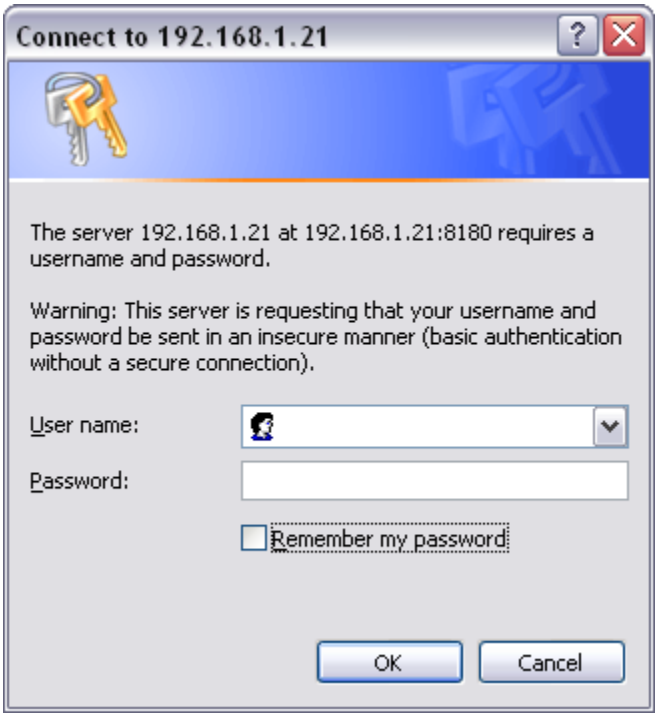


Figure 5.2. Log In

Users should enter the login name and password that has been given to you by the system administrator. The default login for an administrator is:

- User name: admin
- Password: admin

Click **OK** to login and your session will start. Click **Cancel** to return to the home page. The password is not echoed. Invalid passwords will result in an error message.

6 Tabular Data

A request to display point data in a tabular format can be made by any user. Click on the **Tabular Data** menu list option, and the **Tabular Data Request** page is displayed.

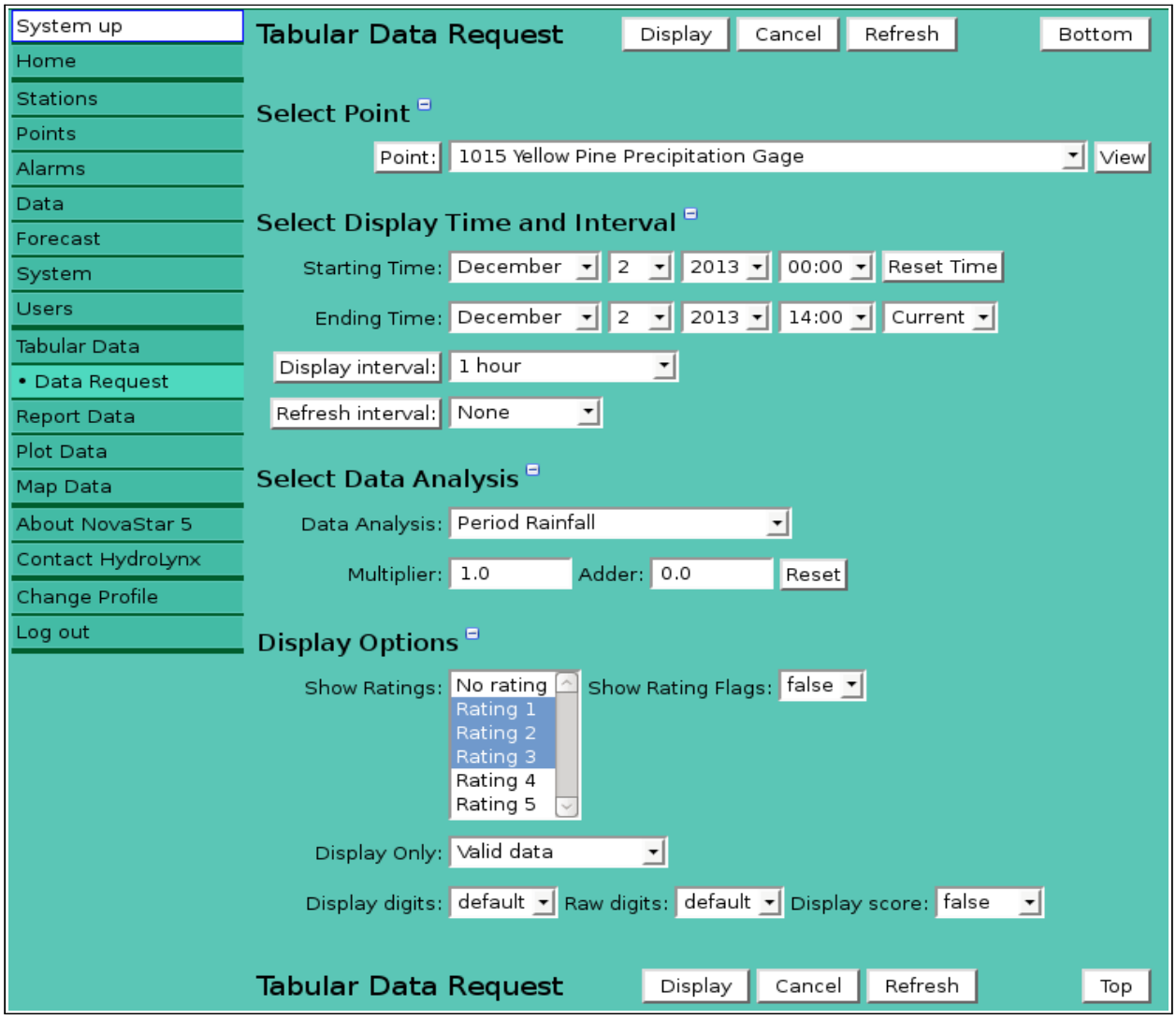


Figure 6.1. Tabular Data Request

6.1 Tabular Data Request

The **Tabular Data Request** page is used to query the database for data from a selected point. The data returned from the database query depends on the data request parameters. The data display is organized based on the tabular data list details. Click the **Display** button to retrieve the data specified in the input fields organized under the **Select Point, Select Display Time and Interval, Select Data Analysis, Display Options** headings. Your browser will remember your tabular data request parameters and restore them the next time you select this page. Click **Cancel** to return the previous page.

6.1.1 Select Point

The point pick list lets you select a point from the database.

Point: Select the point to display from the pick list. Click **Point:** button to change **Point Pick Details** and order, see Section 6.1.2. **View** button displays the **Point Edit**

page for the selected point, see Section 3.1.4 in Part II, Operator and Administrator Manual.

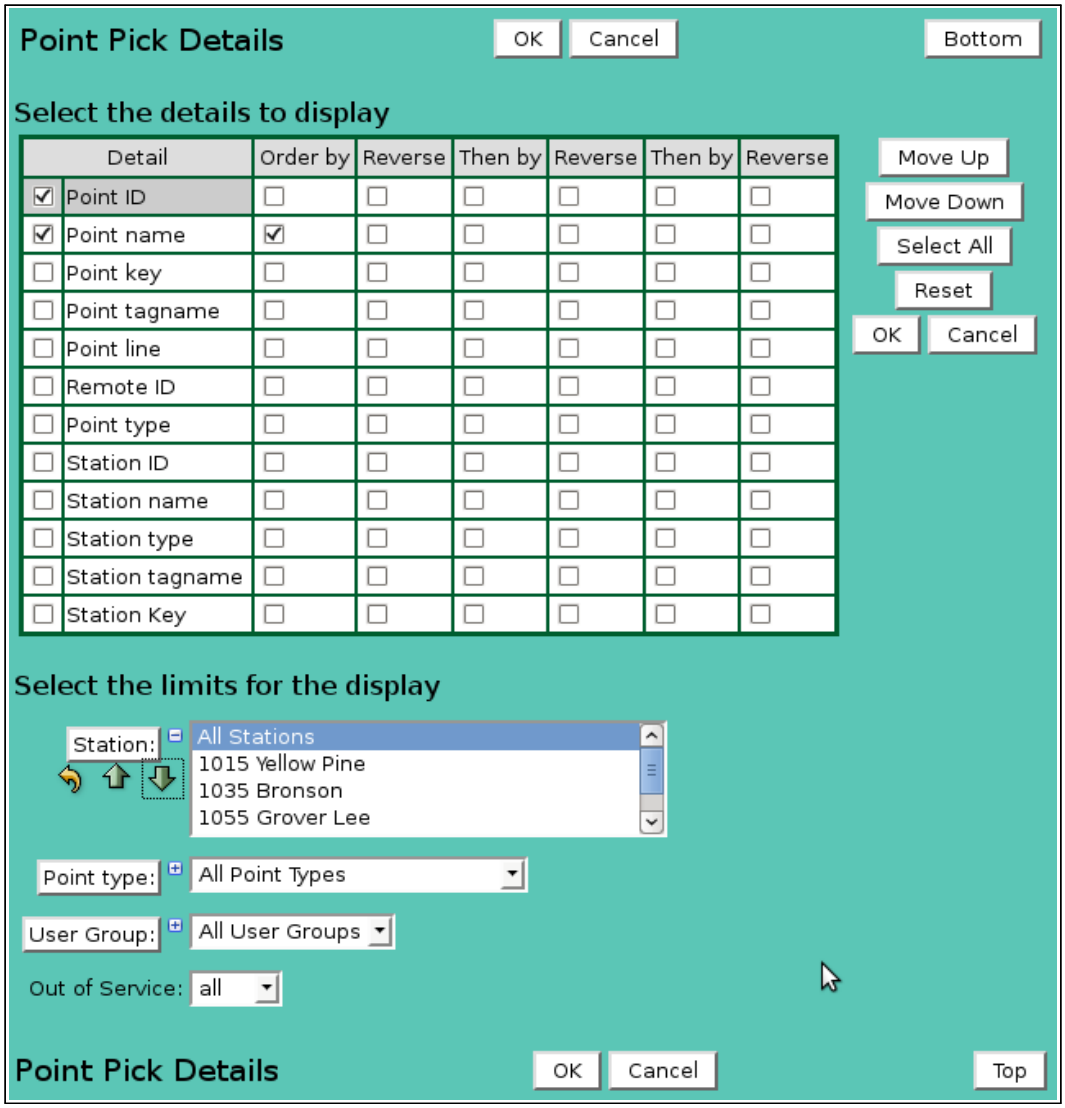


Figure 6.2. Point Pick Details

6.1.2 Point Pick Details

The check boxes on **Point Pick Details** page control the items, organization, sort order, and limit the records displayed on the pick list.

Select the details to display

Check the box to the left of a detail to display. Details are displayed in the order shown.
Check the Order by box for the detail to sort first. Check Reverse for a descending sort.
Check the Then by box for the detail to sort second. Check Reverse for a descending sort.
Check the second Then by box for the detail to sort third. Check Reverse for a descending sort.

Button	**Action**
Move Up	Move the selected detail up one row.
Move Down	Move the selected detail down one row.
Select All	Select all details.
Reset	Reset to default details.
OK	Return to previous page with new details selected.
Cancel	Return to prevous page with no changes.

Select the limits for the display

Station: Limit display to points assigned to the station(s). Click **Station:** button to change **Station Pick Details** and order. The pick list is a single select list by default. Click the ⊞ button to change to a multiple pick list. Control the pick list length with the buttons that appear below the pick list label button.

Button	Action
	Reset pick list to single select.
	Decrease pick list length.
	Increase pick list length.

Point type: Limit display to points assigned to the point type(s). Click **Point type:** button to change **Point Type Pick Details** and order. The pick list is a single select list by default. Click the ⊞ button to change to a multiple pick list. Control the pick list length with the buttons that appear below the pick list label button.

User Group: Limit display to points assigned to the user group(s). Click **User Group:** button to change **User Group Pick Details** and order. The pick list is a single select list by default. Click the ⊞ button to change to a multiple pick list. Control the pick list length with the buttons that appear below the pick list label button.

Out of Service: Limit display to points with out of service state: *all* ignores out of service, *false* only displays points in service, *true* only displays points out of service.

6.1.3 Select Display Time and Interval

Starting Time: Select the starting time for the data display. Click **Reset Time** to start of day for ending time. Note: the starting time must be before the ending time.

Ending Time: Select the ending time for the data display. Select *Current* in the pick list to set the ending time to the current time. The *Historic* selection is shown when a past ending time is selected.

Display Interval: Select the time interval for the data display. The database query will return data reports at even time intervals from the starting time to the ending time. Select *Show Data Reports* to display all data reports between the starting and ending time. Click the button to alternate between interval selection from a pick list or from time interval fields.

Refresh Interval: Select the interval to automatically refresh the data display. Click the Refresh Interval: button to select from a list of intervals. Click the button again to use the time interval fields. This field is only available when the Ending Time is set to the Current time.

6.1.4 Select Data Analysis

These fields are hidden when the display interval is set to *Show Data Reports.*

Data Analysis: Select the data analysis for the data display. See the data analysis appendix for a description of the analysis types. *Use default analysis* will do the default analysis for the point type.

Analysis Interval: The *Rainfall Intensity* data analysis requires an analysis interval. Click the Analysis Interval: button to select from a list of intervals. Click the button again to use the time interval fields.

Multiplier: Multiply the data analysis computed value by this constant.

Adder: Add this constant to the data analysis computed value.

6.1.5 Display Options

Show Ratings: Click the *No rating* field to expand the pick list. Select one or more ratings (*Rating 1* - *Rating 5*) to display in this multiple pick list with the [Ctrl] mouse click combination. Click the *No rating* field again to collapse the pick list.
Show Rating Flags: Select *true* to display rating flags as well as the rating data values.
Display Only: Select the display data restrictions:

Display type	Database information displayed
All data	All data, valid or questioned
Valid data	Data reports with a valid flag. A valid flag is automatically set by the system when data checking criteria is met.
Verified data	Data reports with a verified flag. A verified flag is set by an operator using the data editor to certify that the data is valid.
Maintenance data	Data reports with a maintenance flag. A maintenance flag is manually set by an operator to indicate test data not used for public viewing. The maintenance flag is also set when a point of station is out of service or when the data report received has the test flag set.

Display digits: Select *default* to display scaled or analysis data with the number of decimal digits assigned to the point type. Select a number of decimal digits to override the default.
Raw digits: Select *default* to display raw data with the number of decimal digits assigned to the point type. Select a number of decimal digits to override the default.
Display score: Select *true* to highlight the data display with colored backgrounds when the data report score is greater than one.

6.2 Tabular Data Display

After the tabular data request parameters are entered, click **Display** to display the data. The header above the data table displays the point label for the point and data analysis.

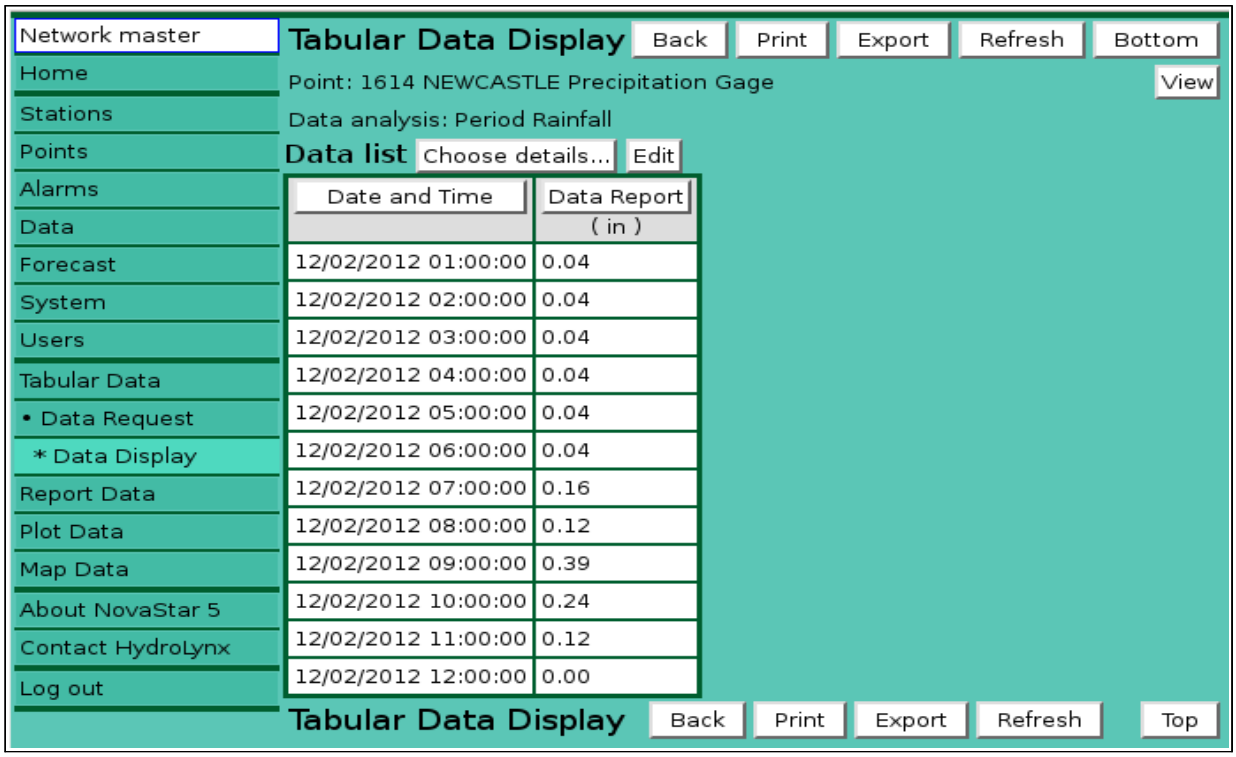


Figure 6.3. Tabular Data Display Interval Data

Point: Click on the point label to activate the point pick list. If you select a new point from the point pick list then its data is immediately displayed. Click **Point:** button to change **Point Pick Details** and order, see Section 6.1.2. **View** button displays the **Point Edit** page for the selected report, see Section 3.1.4 in Part II, Operator and Administrator Manual.

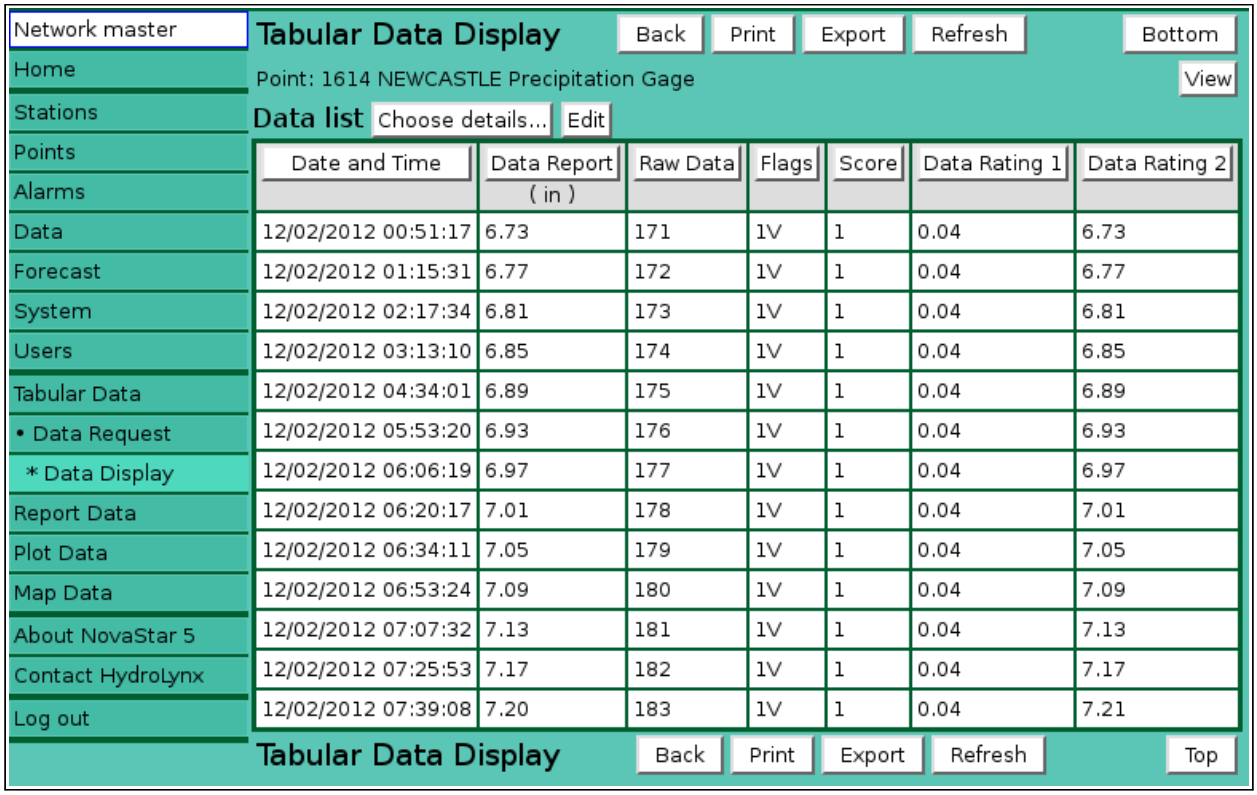


Figure 6.4 Tabular Data Display Show Reports

6.2.1 Tabular Data List Details

Click on the table column headers to resort the table for this column; first ascending, then descending. Click on the **Choose details...** button to change the details and display order, see Figure 6.4. Click **Edit** button to display and modify the point data from the starting to ending time in the Data Edit page, see Section 5 in Part II Operator and Administrator Manual.

The check boxes on Tabular Data List Details page control the items, organization, sort order, and affect the data analysis and display of the point data.

Select the details to display

Check the box to the left of a detail to display. Details are displayed in the order shown.
Check the Order by box for the detail to sort first. Check Reverse for a descending sort.
Check the Then by box for the detail to sort second. Check Reverse for a descending sort.
Check the second Then by box for the detail to sort third. Check Reverse for a descending sort.

Button	**Action**
Move Up	Move the selected detail up one row.
Move Down	Move the selected detail down one row.
Select All	Select all details.
Reset	Reset to default details.
OK	Return to previous page with new details selected.
Cancel	Return to prevous page with no changes.

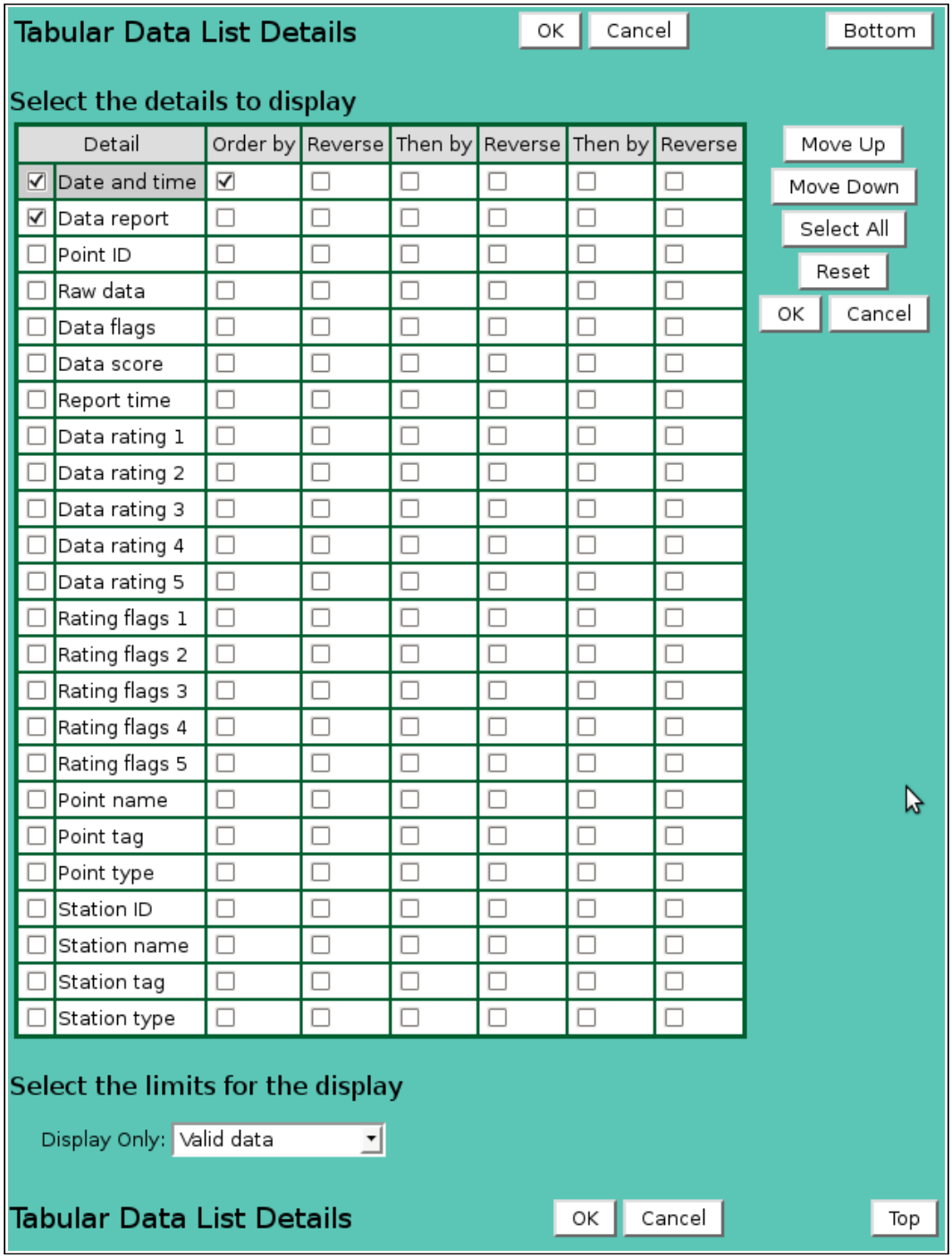


Figure 6.5. Tabular Data List Details

Display Only: Select the display data restrictions:

Display type	**Database information displayed**
All data	All data, valid or questioned
Valid data	Data reports with a valid flag. A valid flag is automatically set by the system when data checking criteria is met.
Verified data	Data reports with a verified flag. A verified flag is set by an operator using the data editor to certify that the data is valid.
Maintenance data	Data reports with a maintenance flag. A maintenance flag is manually set by an operator to indicate test data not used for public viewing. The maintenance flag is also set when a point

	of station is out of service or when the data report received has the test flag set.

Table 6.1. Data List Details

Detail	**Description**
Date and time	Time of the data report when the display interval is *Show Data Reports.* Otherwise it is the time of the display time interval.
Data report	Scaled data value stored in the database when the display interval is *Show Data Reports*. Otherwise it is the value returned by the data analysis.
Raw data	Raw data value received from the remote sensor.
Data flags	Flags set for data report, see Section 8.2 in Part II.
Data score	Nova score flag, see Section 8.4 in Part II.
Report time	Report time of report found by analysis for display interval. For example, the time of a report returned by a maximum analysis request.
Data Rating 1 - 5	Data rating values for data report. Up to 5 different ratings can be computed and stored with each data report. For example, discharge may be computed for a water level sensor. Incremental and seasonal rainfall are computed for precipitation sensors.
Rating Flags 1 - 5	Data rating flags for data report ratings. Data ratings flags can be V for valid, U for under or below the lowest rating index value, O for over or above the highest rating index value.
Point ID	Point numeric ID for selected point.
Point name	Point name for selected point.
Point tag	Point tag for selected point.
Point type	Point type name for selected point.
Station ID	Station numeric ID for selected point.
Station name	Station name for selected point.
Station Tag	Station tag for selected point.
Station type	Station type name for selected point.

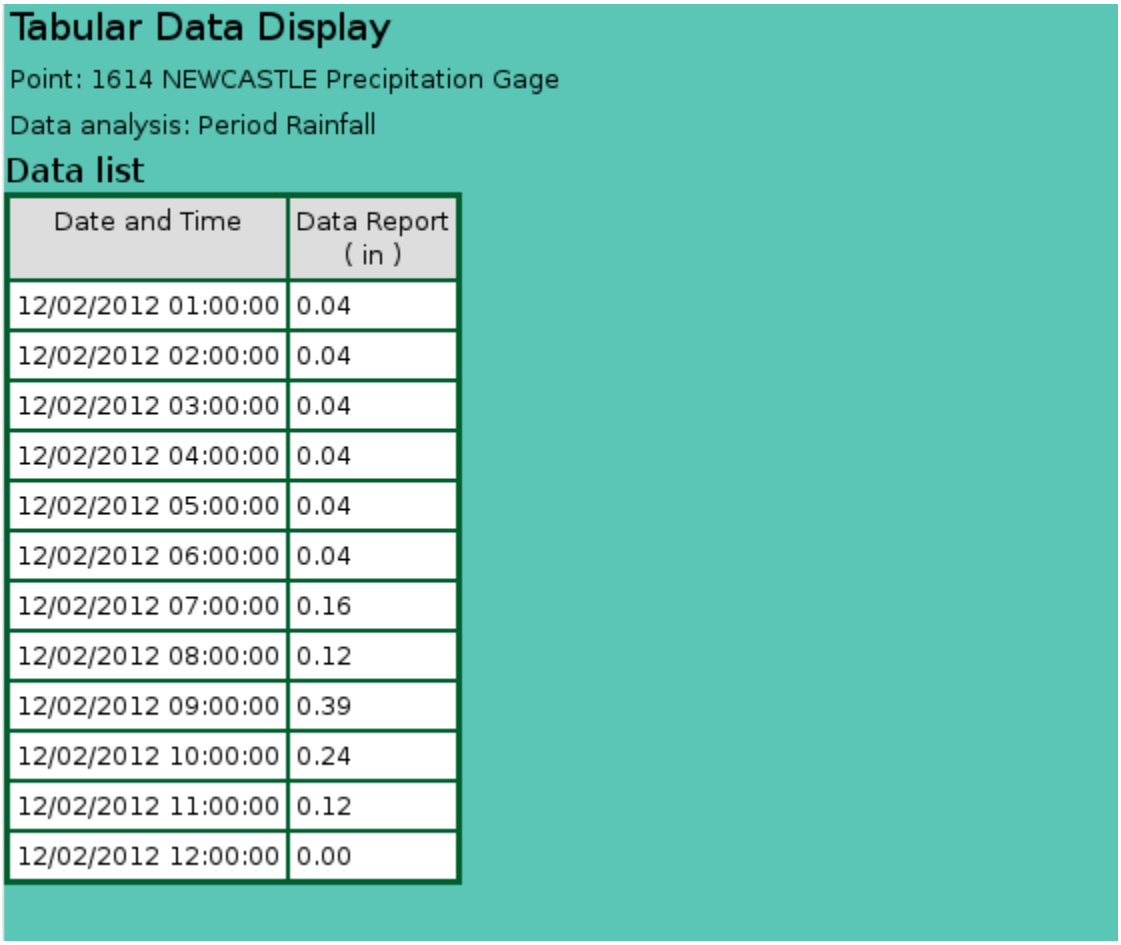
6.3 Tabular Data Print

Click on the **Print** button at the top or bottom of the **Tabular Data Display** to prepare the data display for printing. The data display is redrawn with no links, header, footer, or menu.

Use the *Print* feature in your browser to print the page. Click the browser **Back** button to return to the **Tabular Data Display** page.

6.4 Tabular Data Export

Click on the **Export** button at the top or bottom of the **Tabular Data Display** to prepare the data display for export. The data display is redrawn with no links, header, footer, or menu in a comma delimited format.



Tabular Data Display

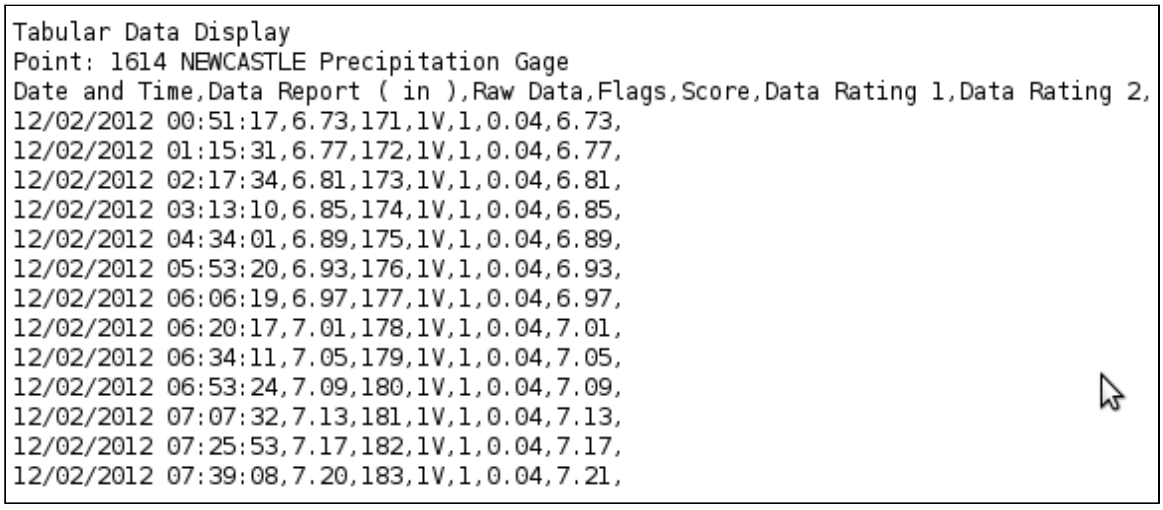
Point: 1614 NEWCASTLE Precipitation Gage

Data analysis: Period Rainfall

Data list

Date and Time	Data Report (in)
12/02/2012 01:00:00	0.04
12/02/2012 02:00:00	0.04
12/02/2012 03:00:00	0.04
12/02/2012 04:00:00	0.04
12/02/2012 05:00:00	0.04
12/02/2012 06:00:00	0.04
12/02/2012 07:00:00	0.16
12/02/2012 08:00:00	0.12
12/02/2012 09:00:00	0.39
12/02/2012 10:00:00	0.24
12/02/2012 11:00:00	0.12
12/02/2012 12:00:00	0.00

Figure 6.6. Tabular Data Print



```
Tabular Data Display
Point: 1614 NEWCASTLE Precipitation Gage
Date and Time,Data Report ( in ),Raw Data,Flags,Score,Data Rating 1,Data Rating 2,
12/02/2012 00:51:17,6.73,171,1V,1,0.04,6.73,
12/02/2012 01:15:31,6.77,172,1V,1,0.04,6.77,
12/02/2012 02:17:34,6.81,173,1V,1,0.04,6.81,
12/02/2012 03:13:10,6.85,174,1V,1,0.04,6.85,
12/02/2012 04:34:01,6.89,175,1V,1,0.04,6.89,
12/02/2012 05:53:20,6.93,176,1V,1,0.04,6.93,
12/02/2012 06:06:19,6.97,177,1V,1,0.04,6.97,
12/02/2012 06:20:17,7.01,178,1V,1,0.04,7.01,
12/02/2012 06:34:11,7.05,179,1V,1,0.04,7.05,
12/02/2012 06:53:24,7.09,180,1V,1,0.04,7.09,
12/02/2012 07:07:32,7.13,181,1V,1,0.04,7.13,
12/02/2012 07:25:53,7.17,182,1V,1,0.04,7.17,
12/02/2012 07:39:08,7.20,183,1V,1,0.04,7.21,
```

Figure 6.7. Tabular Data Export

Use the *File – Save As* feature in your browser to save the page to a file. Click the browser **Back** button to return to the **Tabular Data Display** page.

7 Report Data

A request to display data from multiple points in a table can be made by any user. Click on the **Report Data** menu list option, and the **Report Data Request** page is displayed.

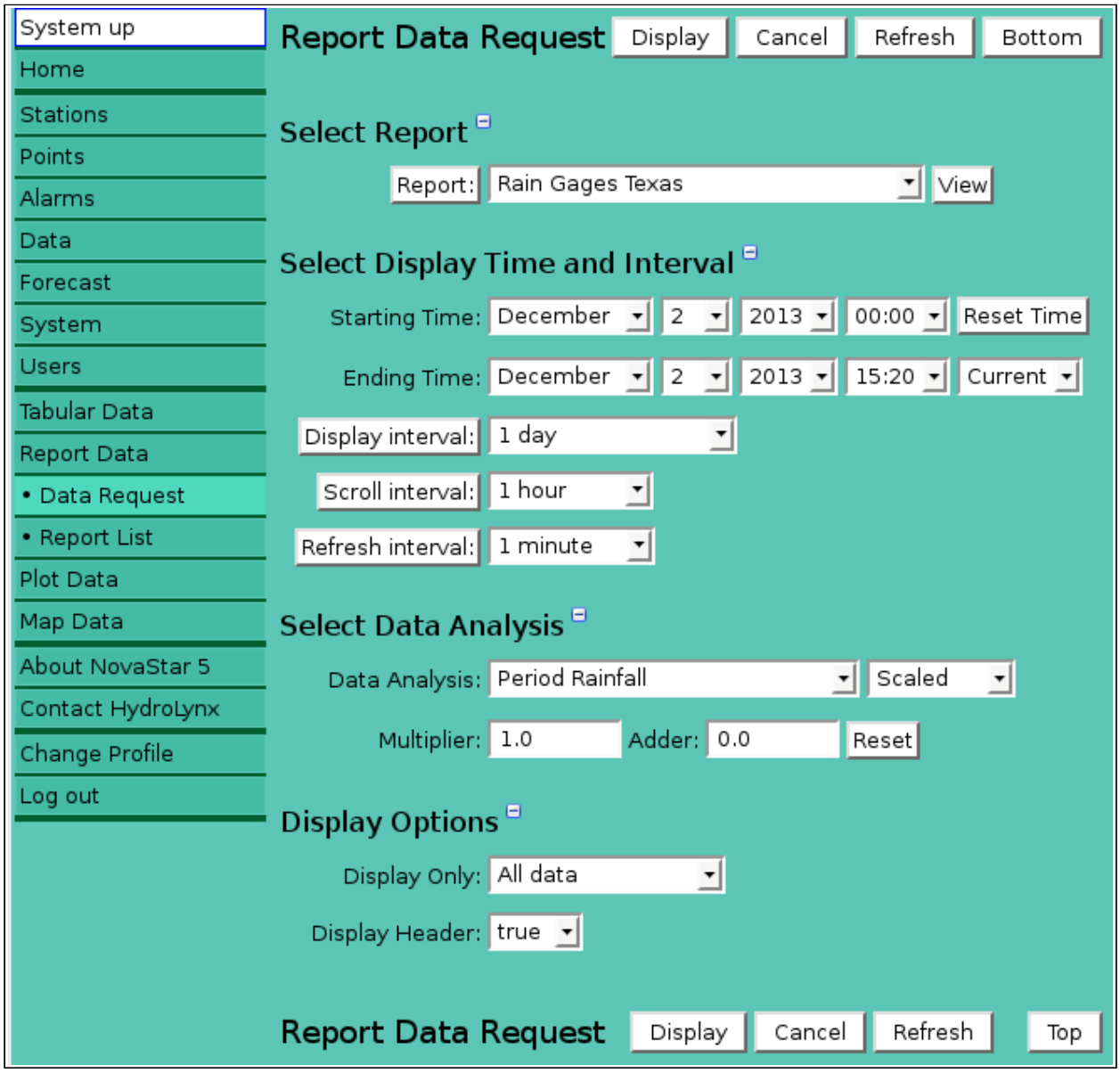


Figure 7.1. Report Data Request

7.1 Report Data Request

The **Report Data Request** page is used to query the database for data from a predefined report group or from selected report points. The data returned from the database query will be organized based on the report group parameters. Click the **Display** button to retrieve the data specified in the input fields organized under the **Select Report, Select Display Time and Interval, Display Options** headings. Your browser will remember your report data request parameters and restore them the next time you select this page. Click **Cancel** to return the previous page.

7.1.1 Select Report

Report: Select the report group to display from the pick list. Click **Report:** button to change **Report Pick Details** and order, see Section 7.1.2.
View button displays the **Report Edit** page for the selected report, see Section 8.1.4 in Part II, Operator and Administrator Manual.

7.1.2 Report Pick Detail

The check boxes on **Report Pick Details** page control the items, organization, sort order, and limit the records displayed on the pick list.

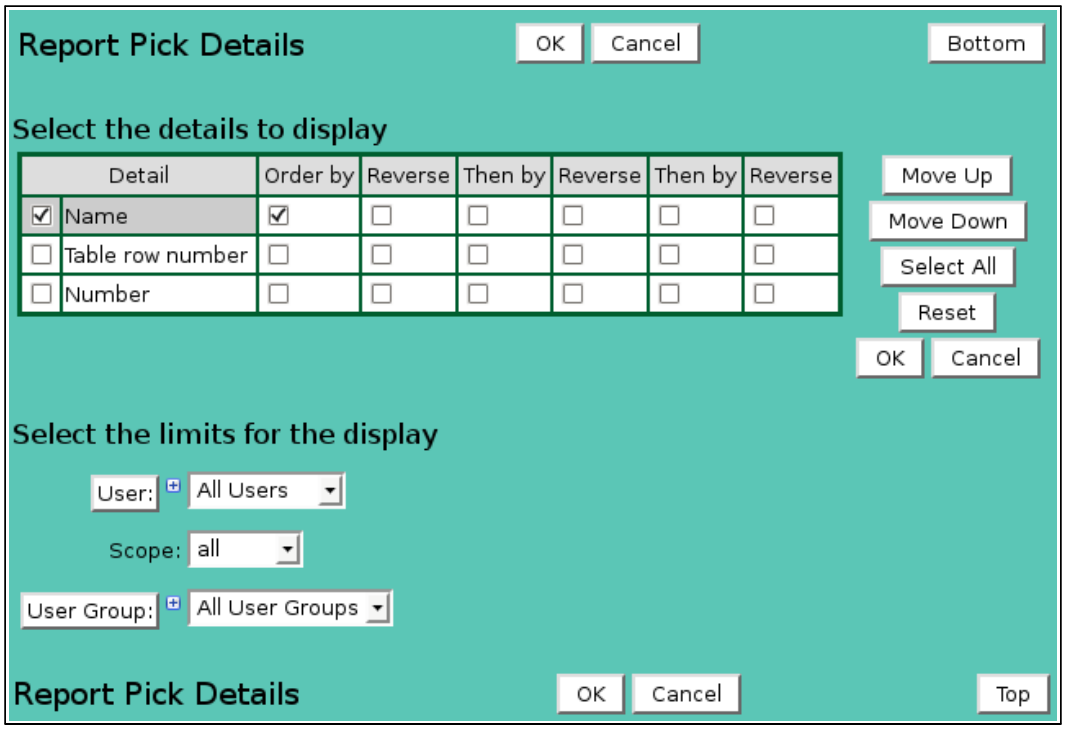


Figure 7.2. Report Pick Details

Select the details to display

Check the box to the left of a detail to display. Details are displayed in the order shown.
Check the Order by box for the detail to sort first. Check Reverse for a descending sort.
Check the Then by box for the detail to sort second. Check Reverse for a descending sort.
Check the second Then by box for the detail to sort third. Check Reverse for a descending sort.

Button	Action
Move Up	Move the selected detail up one row.
Move Down	Move the selected detail down one row.
Select All	Select all details.
Reset	Reset to default details.
OK	Return to previous page with new details selected.
Cancel	Return to prevous page with no changes.

Select the limits for the display

User: Limit display to reports assigned to the user(s). Click **User:** button to change **User Pick Details** and order. The pick list is a single select list by default. Click the ⊞ button to change to a multiple pick list. Control the pick list length with the buttons that appear below the pick list label button.

Button	Action
	Reset pick list to single select.

Decrease pick list length.
Increase pick list length.

Scope: Limit display to reports with scope: *all*, *public*, *private*.

User Group: Limit display to reports assigned to the user group(s). Click **User Group:** button to change **User Group Pick Details** and order. The pick list is a single select list by default. Click the ⊞ button to change to a multiple pick list. Control the pick list length with the buttons that appear below the pick list label button.

7.1.3 Report Point List

If the selected report group has a point override parameter set to true then the Point list is displayed. The **Point List** displays the report point, analysis, and display parameters defined for this report data request.

Click on the table column headers to resort the table for this column; first ascending, then descending. Click on the **Choose details...** button to change the details and display order, see Figure 7.4. Click on a table field to edit the text. Click **Add** to add an new point; the point list add panel is opened, see Figure 7.5. Click **Edit** to edit an existing point; the edit panel is opened, see Figure 7.6.

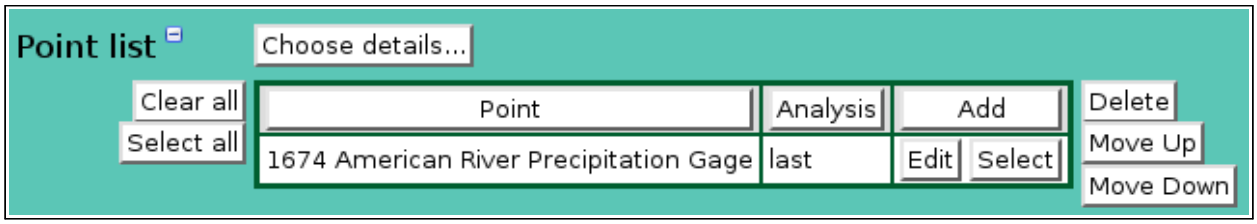


Figure 7.3. Report Point List

Button	Action
Clear all	Clear selection of all rows in this table.
Select all	Select all rows in this table.
Add	Opens the edit panel where you can enter the parameters for a new record.
Edit	Open the edit panel for this record.
Select	Select row for applied changes from the edit panel; first select, then clear select.
Delete	Mark selected rows for deletion; first select, then clear select.
Move up	Move the selected rows up one row.
Move down	Move the selected rows down one row.
Apply	Assign changed field values to this and all other selected rows in the table. Changed fields are highlighted with a blue-green background while unchanged fields have a white background.
Close	Close the edit panel without saving changes; you will be warned if changes will be lost by this action.

ReportPoint List Details

The check boxes on **Report Point List Details** page control the items, organization, sort order, and limit the records displayed on the associated **List** page.

Select the details to display

Check the box to the left of a detail to display. Details are displayed in the order shown.
Check the Order by box for the detail to sort first. Check Reverse for a descending sort.
Check the Then by box for the detail to sort second. Check Reverse for a descending sort.
Check the second Then by box for the detail to sort third. Check Reverse for a descending sort.

Button **Action**

Move Up	Move the selected detail up one row.
Move Down	Move the selected detail down one row.
Select All	Select all details.
Reset	Reset to default details.
OK	Return to previous page with new details selected.
Cancel	Return to prevous page with no changes.

Figure 7.4. Report Point List Details

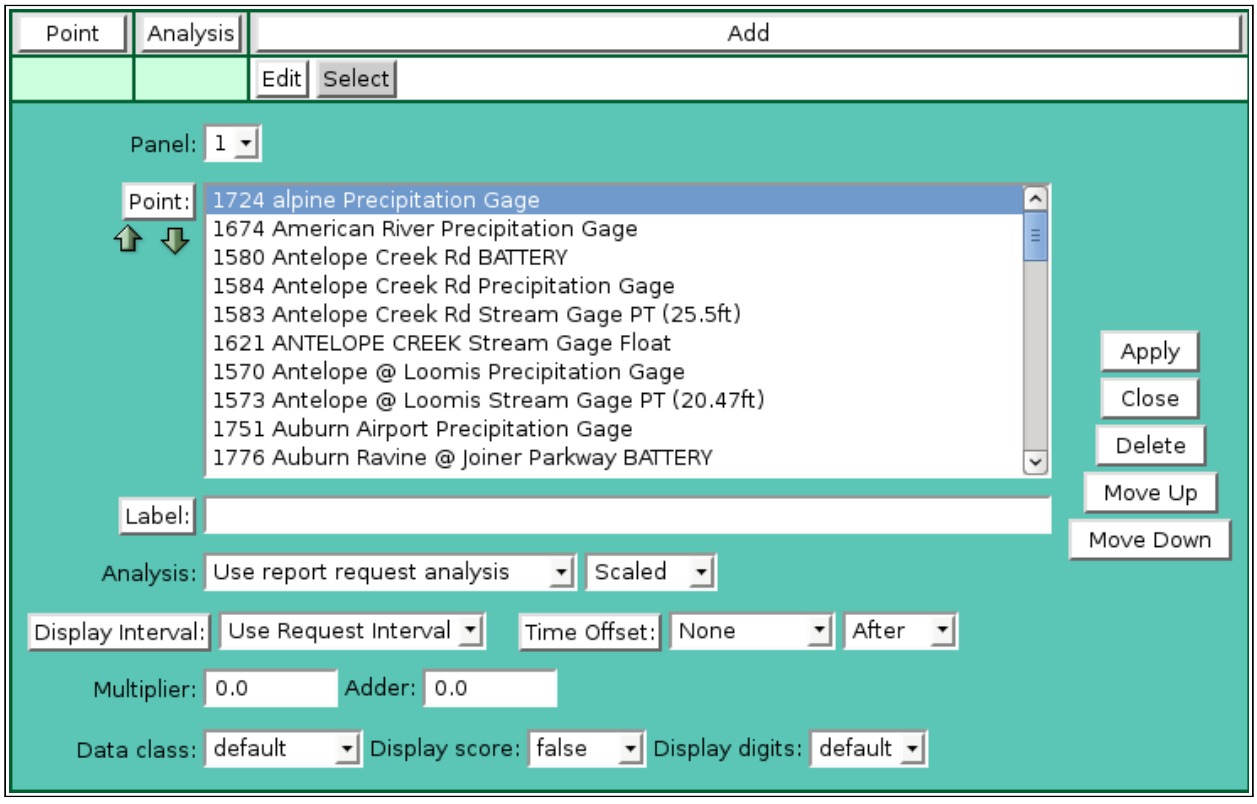


Figure 7.5. Report Point Add Panel

Point: Select points to add to the point list from the pick list. Hold down the [Ctrl] key and click to select multiple points. Hold down the [Shift] key and click to select points from last selected to current selection. Click button to change **Point Pick Details** and order, see Section 3.1.2.

Button	Action
⇧	Decrease pick list length.
⇩	Increase pick list length.

Click the **Apply** button to add all selected points to the point list. The point list add panel will change to the point list edit panel for the last point added. Then you assign other parameters to each point. First click **Clear all** to de-select all points except the one shown in the edit panel.

Point list parameters

Panel: Select the report panel for this point.

Point: Select the point from the pick list. Click **Point:** button to change pick list details and order, see Section 6.1.2.

Label: Enter the report legend for this point. If blank the point pick list label is used. Click button to fill in the default label for editing from the point pick details.

Analysis: Select the data analysis for the point readout. See the data analysis appendix for a description of the analysis types. *Use default analysis* will do the report data request analysis selected. Any other analysis type selected will override the report data request analysis.

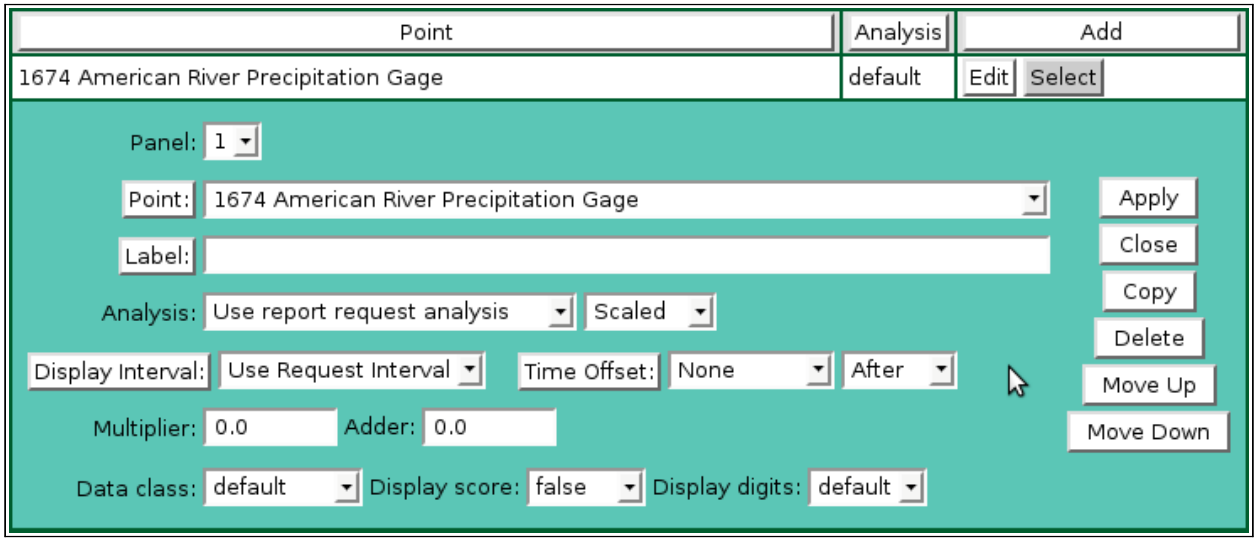
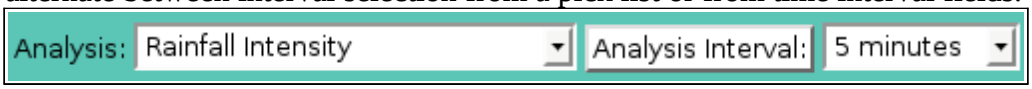


Figure 7.6. Report Point Edit Panel

Data type: Select the type of data displayed:

Data type	Database information displayed
Scaled	Scaled or analysis value
Raw	Raw data value
Score	Nova score value
Rating1-Rating5	Rating value 1 - 5
Date	Date of data report
Time	Time of day of data report
DateTime	Date and time of data report

Analysis Interval: The *Rainfall Intensity* data analysis requires an analysis interval. Click button to alternate between interval selection from a pick list or from time interval fields.



Display Interval: Select the time interval for the data analysis. The time interval is used to compute the start time for the data analysis from the end time. Click the button to alternate between interval selection from a pick list or from time interval fields. *Use Request Interval* and *Show Data Reports* will use the report data request display interval if selected or 1 day by default

Time Offset: Select the time offset from the report data request end time for the data analysis period, default if 0.0 seconds. A positive time offset starts in the future (*After*), a negative time offset starts in the past (*Before*). Click the Time Offset: button to select from a list of intervals. The time offset direction is selected from the *After/Before* list. Click the button again to use the time offset fields.

Multiplier: Multiply the data analysis computed value by this constant.

Adder: Add this constant to the data analysis computed value.

Data class: Select a class from the report style sheet to define the report data display style. The *default* style is *reportdata*.

Display score: Select *true* to change the data class displayed for the data analysis score value. The score value (1-5, 0 for missing) is appended to the data class name. For example if the data class name is reportdata then a score of 1 will use the class reportdata**1**, a score of 2 will use the class reportdata**2**, and so on. Missing data will use the class reportdata**0**. This feature is *false* by default.

```
/* Report readout background colors for scores */
td.reportdata0 {color:#888888;background-color:#ffffff;}
td.reportdata,
td.reportdata1 {background-color:#ffffff;} /* white */
td.reportdata2 {background-color:#ffff44;} /* yellow */
td.reportdata3 {background-color:#ffaa44;} /* orange */
td.reportdata4 {background-color:#ff8866;} /* pink */
td.reportdata5 {background-color:#ff4444;} /* red */
```

Display digits: Set the number of decimal digits to display to the right of the decimal point. Select default to use the number of display digits assigned to the point type.

7.1.4 Select Display Time and Interval

Starting Time: Select the starting time for the report. Click **Reset Time** to start of day for ending time. Note: the starting time must be before the ending time.

Ending Time: Select the ending time for the report. Select *Current* in the pick list to set the ending time to the current time. The *Historic* selection is shown when a past ending time is selected.

Display Interval: Select the report point time interval for the report. Select *Show Data Reports* to report data reports at the data report time. Click the button to alternate between interval selection from a pick list or from time interval fields. This display interval is only used if the report point analysis display interval is set to *Use Request Interval*.

Scroll Interval: Select a scroll interval for time paging through report data. Click the Scroll Interval: button to select from a list of intervals. Click the button again to use the time interval fields.When a scroll interval is selected and the report is displayed, then **Back, Forward** and **Now** buttons are displayed above the report. Click the **Back** button to decrement or the **Forward** button to increment the **Ending Time**

by the Scroll Interval; the report is re-displayed with the new ending time. Click **Now** to reset the **Ending Time** to the current time.

Refresh Interval: Select the interval to automatically refresh the report data display. Click the Refresh Interval: button to select from a list of intervals. Click the button again to use the time interval fields. This field is only available when the Ending Time is set to the Current time.

7.1.5 Select Data Analysis

These fields are hidden when the display interval is set to *Show Data Reports.*

Data Analysis: Select the data analysis for the report data display. See the data analysis appendix for a description of the analysis types. *Use default analysis* will do the default analysis for the point type.

Data type: Select the type of data displayed:

Data type	Database information displayed
Scaled	Scaled or analysis value
Raw	Raw data value
Score	Nova score value
Rating1-Rating5	Rating value 1 - 5
Date	Date of data report
Time	Time of day of data report
DateTime	Date and time of data report

Analysis Interval: The *Rainfall Intensity* data analysis requires an analysis interval. Click the Analysis Interval: button to select from a list of intervals. Click the button again to use the time interval fields.

Multiplier: Multiply the data analysis computed value by this constant.

Adder: Add this constant to the data analysis computed value.

7.1.6 Display Options

Display Only: Select the display data restrictions:

Display type	Database information displayed
All data	All data, valid or questioned
Valid data	Data reports with a valid flag. A valid flag is automatically set by the system when data checking criteria is met.
Verified data	Data reports with a verified flag. A verified flag is set by an operator using the data editor to certify that the data is valid.
Maintenance data	Data reports with a maintenance flag. A maintenance flag is manually set by an operator to indicate test data not used for public viewing. The maintenance flag is also set when a point of station is out of service or when the data report received has the test flag set.

Display Header: Select *true* to display the report header above the report display panel. The report header is the report name, data analysis, ending time and display interval. Select *false* to prevent the data table display.

7.2 Report Data Display

After the report data request parameters are entered, click **Display** to display the report. The report header above the report displays the report label for the report group selected, report data analysis, report ending time, display interval, and the scroll interval and buttons if selected.

Report Data Display | Choose details... | Back | Print | Refresh | Bottom

Report: City of Roseville Precipitation Report | View

Data analysis: Period Rainfall

Ending time: 12/02/2012 11:00:00 Interval: 5 minutes | Now | Scroll interval: 1 hour | Back | Forward

City of Roseville Rainfall for different time intervals

Device ID	Name	5min	15min	30min	1hour	3hours	6hours	12hours	1day	7days	1month
1628	CHAMPION OAKS Precipitation Gage	0.00	0.04	0.04	0.08	1.50	1.85	2.13	2.40	5.71	7.80
1620	CIRBY CREEK @ TINA Precipitation Gage	0.00	0.00	0.00	0.08	1.22	1.69	1.97	2.32	5.63	7.76
1604	Target at Douglas & Rocky Ridge Precipitation Gage	0.00	0.00	0.00	0.08	1.10	1.54	1.73	2.01	5.12	6.93
1584	Antelope Creek Rd Precipitation Gage	0.00	0.00	0.00	0.04	1.02	1.38	1.61	1.89	4.96	7.01
1631	Saugstad Park Precipitation Gage	0.00	0.00	0.00	0.12	1.30	1.81	2.13	2.48	5.94	8.19
1572	Woodcreek Oaks Blvd Precipitation Gage	0.00	0.00	0.00	0.00	0.39	1.02	1.34	2.20	5.16	7.36
1601	DIAMOND OAKS G.C. Precipitation Gage	0.00	0.00	0.08	0.08	0.75	1.30	1.57	1.89	5.16	7.32
1602	ROSEVILLE F.S.#2 Precipitation Gage	0.00	0.00	0.00	0.08	0.98	1.50	1.77	1.93	4.65	6.73

Report Data Display | Choose details... | Back | Print | Refresh | Top

Figure 7.7. Report Data Display

Report: Click on the report group label to select a new report group from the report pick list. The new report group is immediately reportted. Click button to change **Report Pick Details** and order, see Section 7.1.2. **View** button displays the **Report Edit** page for the selected report, see Section 8.1.4 in Part II, Operator and Administrator Manual.

Scroll Interval: Click the **Back** button to decrement or the **Forward** button to increment the **Ending Time** by the Scroll Interval; the report is re-displayed with the new ending time. Click **Now** to reset the **Ending Time** to the current time.

7.2.1 Report Data List Details

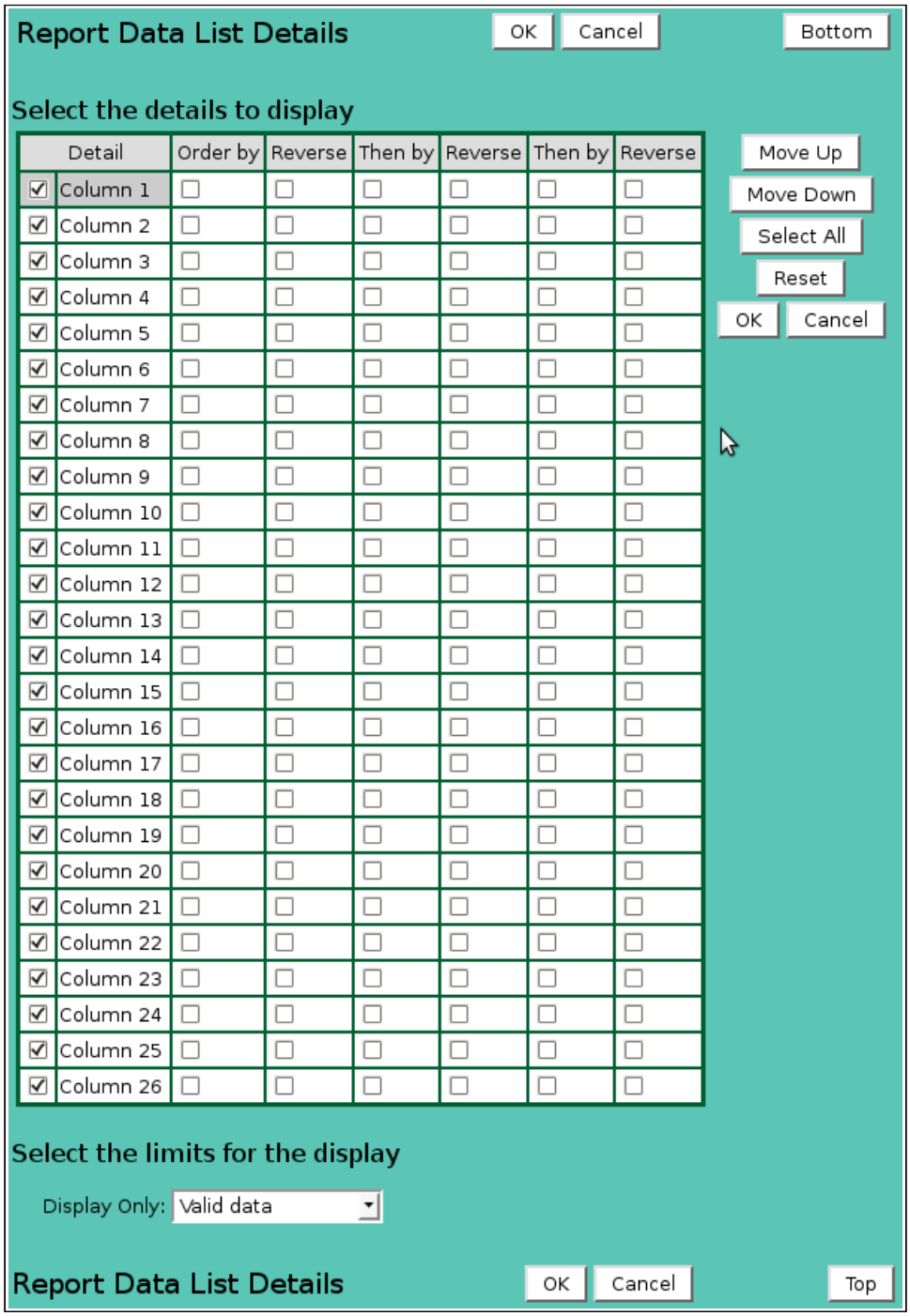


Figure 7.8. Report Data List Details

Click on the table column headers to resort the table for this column; first ascending, then descending. Click on the **Choose details...** button to change the details and display order, see Figure 7.8.

The check boxes on Report Data List Details page control the items, organization, sort order, and affect the data analysis and display of the report data.

Select the details to display

Check the box to the left of a detail to display. Details are displayed in the order shown.
Check the Order by box for the detail to sort first. Check Reverse for a descending sort.
Check the Then by box for the detail to sort second. Check Reverse for a descending sort.

Check the second Then by box for the detail to sort third. Check Reverse for a descending sort.

Button	**Action**
Move Up	Move the selected detail up one row.
Move Down	Move the selected detail down one row.
Select All	Select all details.
Reset	Reset to default details.
OK	Return to previous page with new details selected.
Cancel	Return to prevous page with no changes.

Display Only: Select the display data restrictions:

Display type	**Database information displayed**
All data	All data, valid or questioned
Valid data	Data reports with a valid flag. A valid flag is automatically set by the system when data checking criteria is met.
Verified data	Data reports with a verified flag. A verified flag is set by an operator using the data editor to certify that the data is valid.
Maintenance data	Data reports with a maintenance flag. A maintenance flag is manually set by an operator to indicate test data not used for public viewing. The maintenance flag is also set when a point of station is out of service or when the data report received has the test flag set.

7.3 Report Data Print

Click on the **Print** button at the top or bottom of the **Report Data Display** to prepare the report for printing. The report data display is redrawn with no links and no NovaStar 5 header or menu.

Report Data Display

Report: City of Roseville Precipitation Report

Data analysis: Period Rainfall

Ending time: 12/02/2012 11:00:00 Interval: 5 minutes

City of Roseville Rainfall for different time intervals

Device ID	Name	5min	15min	30min	1hour	3hours	6hours	12hours	1day	7days	1month
1628	CHAMPION OAKS Precipitation Gage	0.00	0.04	0.04	0.08	1.50	1.85	2.13	2.40	5.71	7.80
1620	CIRBY CREEK @ TINA Precipitation Gage	0.00	0.00	0.00	0.08	1.22	1.69	1.97	2.32	5.63	7.76
1604	Target at Douglas & Rocky Ridge Precipitation Gage	0.00	0.00	0.00	0.08	1.10	1.54	1.73	2.01	5.12	6.93
1584	Antelope Creek Rd Precipitation Gage	0.00	0.00	0.00	0.04	1.02	1.38	1.61	1.89	4.96	7.01
1631	Saugstad Park Precipitation Gage	0.00	0.00	0.00	0.12	1.30	1.81	2.13	2.48	5.94	8.19
1572	Woodcreek Oaks Blvd Precipitation Gage	0.00	0.00	0.00	0.00	0.39	1.02	1.34	2.20	5.16	7.36
1601	DIAMOND OAKS G.C. Precipitation Gage	0.00	0.00	0.08	0.08	0.75	1.30	1.57	1.89	5.16	7.32
1602	ROSEVILLE F.S.#2 Precipitation Gage	0.00	0.00	0.00	0.08	0.98	1.50	1.77	1.93	4.65	6.73

Figure 7.9. Report Data Print

Use the *Print* feature in your browser to print the page. Click the browser **Back** button to return to the **Report Data Display** page.

7.4 Report Data Export

Click on the **Export** button at the top or bottom of the **Report Data Display** to prepare the data display for export. The data display is redrawn with no links, header, footer, or menu in a comma delimited format.

8 Plot Data

A request to plot data in a trend chart can be made by any user. Click on the **Plot Data** menu list option, and the **Plot Data Request** page is displayed.

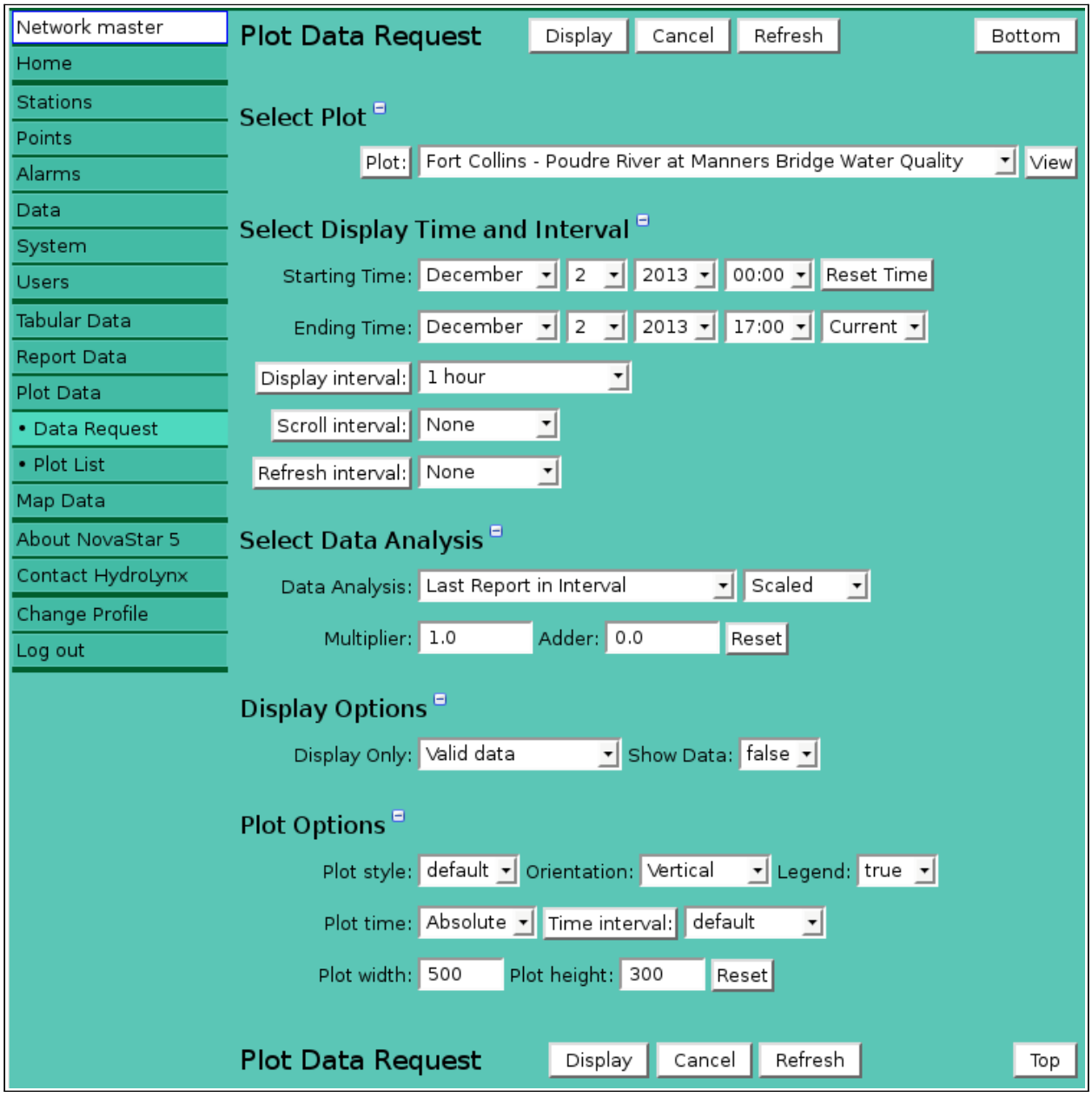


Figure 8.1. Plot Data Request

8.1 Plot Data Request

The **Plot Data Request** page is used to query the database for data from a predefined plot group or from selected plot points. The data returned from the database query will be plotted in a trend chart. Click the **Display** button to retrieve the data specified in the input fields organized under the **Select Plot, Select Display Time and Interval, Display Options, Plot Options** headings. Your browser will remember your plot data request parameters and restore them the next time you select this page. Click **Cancel** to return the previous page.

8.1.1 Select Plot

The plot pick list lets you select a predefined plot group or select points and plot parameters.

Plot: Select the plot group to display from the pick list. Select the first choice in the pick list, *Select point*, to display Point list, see below. If the selected plot group has a point override parameter set to true then the Point list is also displayed. Click **Plot:** button to change **Plot Pick Details** and order, see Section 8.1.2. **View** button displays the **Plot Edit** page for the selected plot, see Section 7.1.4 in Part II, Operator and Administrator Manual.

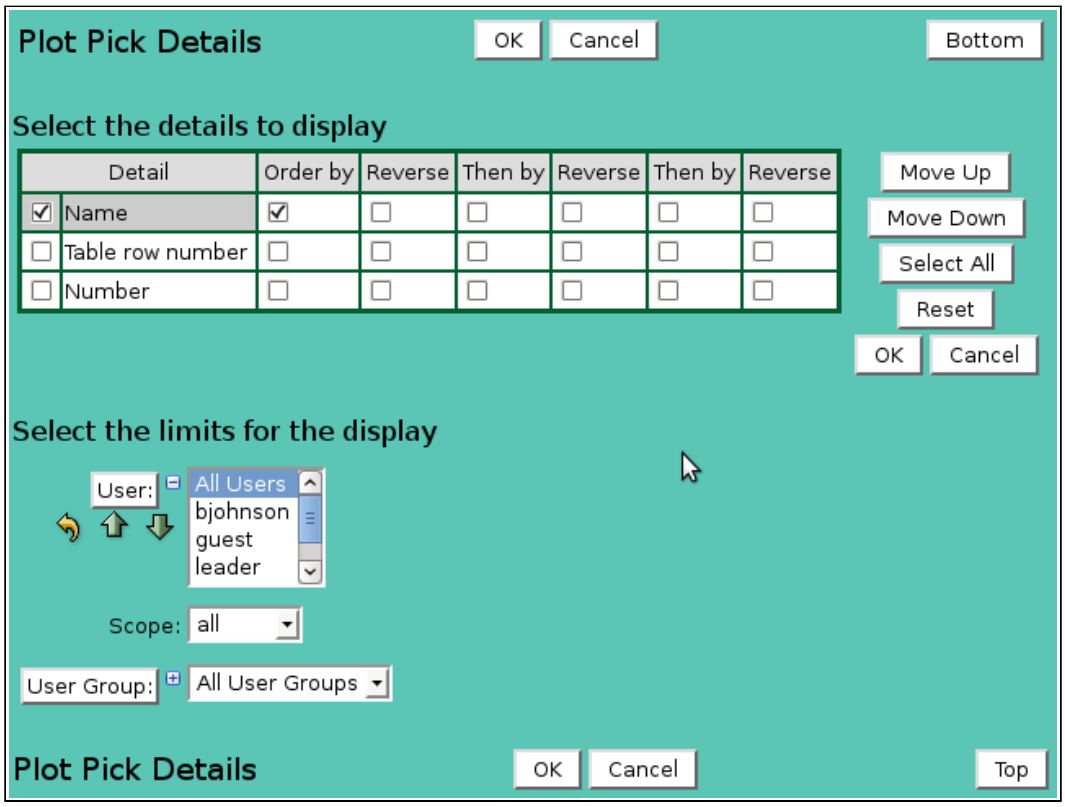


Figure 8.2. Plot Pick Details

8.1.2 Plot Pick Detail

The check boxes on **Plot Pick Details** page control the items, organization, sort order, and limit the records displayed on the pick list.

Select the details to display

Check the box to the left of a detail to display. Details are displayed in the order shown.
Check the Order by box for the detail to sort first. Check Reverse for a descending sort.
Check the Then by box for the detail to sort second. Check Reverse for a descending sort.
Check the second Then by box for the detail to sort third. Check Reverse for a descending sort.

Button	**Action**
Move Up	Move the selected detail up one row.
Move Down	Move the selected detail down one row.
Select All	Select all details.
Reset	Reset to default details.
OK	Return to previous page with new details selected.
Cancel	Return to prevous page with no changes.

Select the limits for the display

User: Limit display to plots assigned to the user(s). Click **User:** button to change **User Pick Details** and order. The pick list is a single select list by default. Click the ⊞

button to change to a multiple pick list. Control the pick list length with the buttons that appear below the pick list label button.

Button	Action
	Reset pick list to single select.
	Decrease pick list length.
	Increase pick list length.

Scope: Limit display to plots with scope: *all*, *public*, *private*.

User Group: Limit display to plots assigned to the user group(s). Click **User Group:** button to change **User Group Pick Details** and order. The pick list is a single select list by default. Click the ⊞ button to change to a multiple pick list. Control the pick list length with the buttons that appear below the pick list label button.

8.1.3 Plot Point List

The **Point List** displays the plot point and plot parameters defined for this plot data request. Plot point parameters define the point data analysis and plot options. Plot options include the plot scale (left or right), plot scale invert, plot scale range type and limits, plot type (line, area, bar, step, ...), line color, line type, line thickness, point point shape, shape color, shape filled. Multiple plot levels can be defined to change the plot line color at different limits.

Click on the table column headers to resort the table for this column; first ascending, then descending. Click on the **Choose details...** button to change the details and display order, see Figure 8.4. Click on a table field to edit the text. Click **Add** to add an new point; the point list add panel is opened, see Figure 8.5. Click **Edit** to edit an existing point; the edit panel is opened, see Figure 8.6.

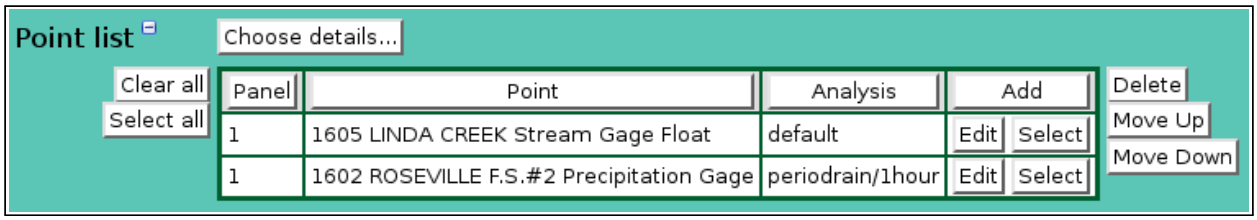


Figure 8.3. Plot Point List

Button	Action
Clear all	Clear selection of all rows in this table.
Select all	Select all rows in this table.
Add	Opens the edit panel where you can enter the parameters for a new record.
Edit	Open the edit panel for this record.
Select	Select row for applied changes from the edit panel; first select, then clear select.
Delete	Mark selected rows for deletion; first select, then clear select.
Move up	Move the selected rows up one row.
Move down	Move the selected rows down one row.
Apply	Assign changed field values to this and all other selected rows in the table. Changed fields are highlighted with a blue-green background while unchanged fields have a white background.
Close	Close the edit panel without saving changes; you will be warned if changes will be lost by this action.

PlotPoint List Details

The check boxes on **Plot Point List Details** page control the items, organization, sort order, and limit the records displayed on the associated **List** page.

Select the details to display

Check the box to the left of a detail to display. Details are displayed in the order shown.
Check the Order by box for the detail to sort first. Check Reverse for a descending sort.
Check the Then by box for the detail to sort second. Check Reverse for a descending sort.
Check the second Then by box for the detail to sort third. Check Reverse for a descending sort.

Button	Action
Move Up	Move the selected detail up one row.
Move Down	Move the selected detail down one row.
Select All	Select all details.
Reset	Reset to default details.
OK	Return to previous page with new details selected.
Cancel	Return to prevous page with no changes.

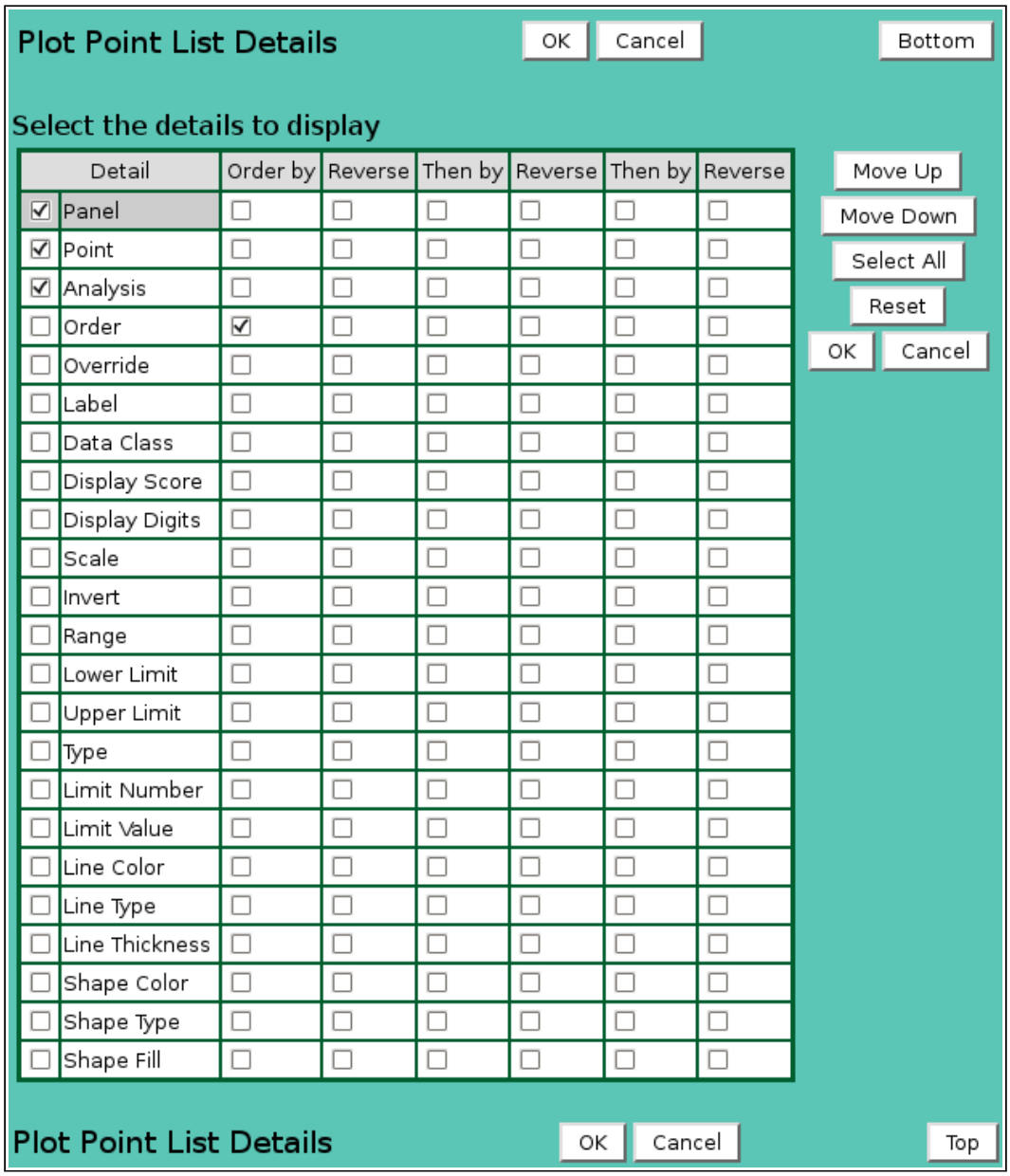


Figure 8.4. Plot Point List Details

Point: Select points to add to the point list from the pick list. Hold down the [Ctrl] key and click to select multiple points. Hold down the [Shift] key and click to select

points from last selected to current selection. Click button to change **Point Pick Details** and order, see Section 3.1.2.

Button	Action
⇧	Decrease pick list length.
⇩	Increase pick list length.

Click the **Apply** button to add all selected points to the point list. The point list add panel will change to the point list edit panel for the last point added. You will then need to assign the other parameters to each point. First click **Clear all** to de-select all points except the one shown in the edit panel.

Point list parameters

Panel: Select the plot panel for this point.

Point: Select the point from the pick list. Click button to change pick list details and order, see Section 6.1.2.

Label: Enter the plot legend for this point. If blank the point pick list label is used. Click button to fill in the default label for editing from the point pick details.

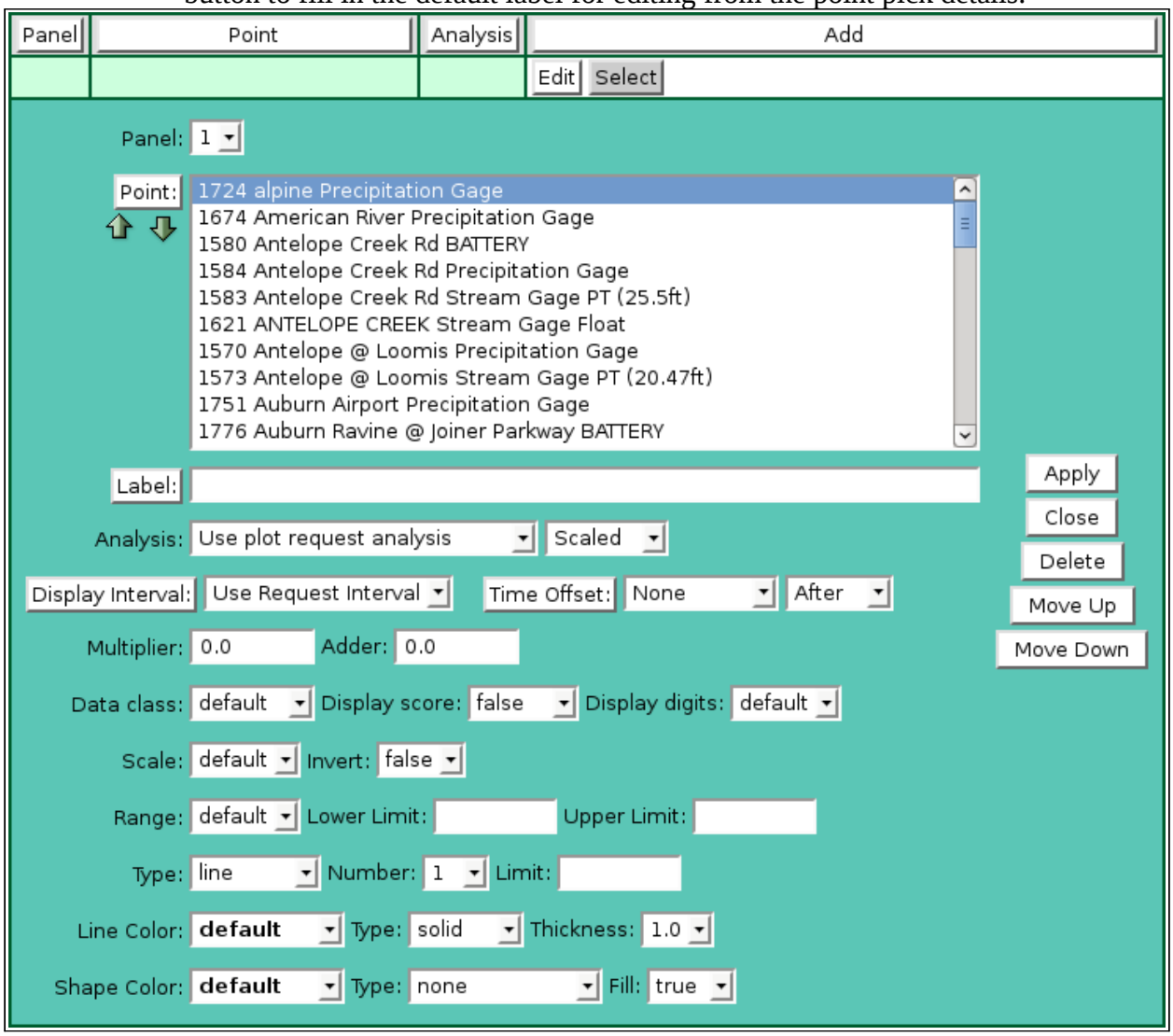


Figure 8.5. Plot Point Add Panel

Analysis: Select the data analysis for the point readout. See the data analysis appendix for a description of the analysis types. *Use default analysis* will do the plot data request analysis selected. Any other analysis type selected will override the plot data request analysis.

Data type: Select the type of data displayed:

Data type	Database information displayed
Scaled	Scaled or analysis value
Raw	Raw data value
Score	Nova score value
Rating1-Rating5	Rating value 1 - 5
Date	Date of data report
Time	Time of day of data report
DateTime	Date and time of data report

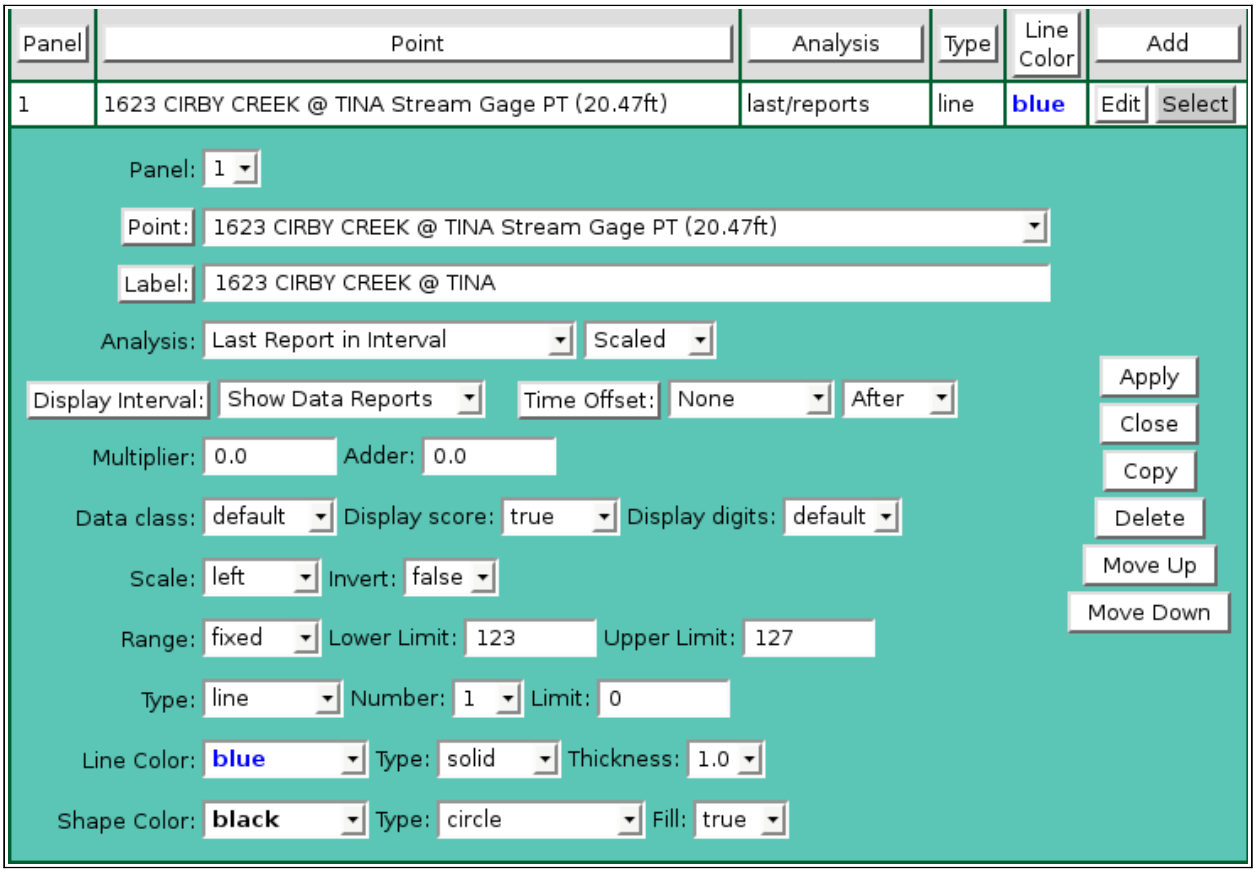


Figure 8.6. Plot Point Edit Panel

Analysis Interval: The *Rainfall Intensity* data analysis requires an analysis interval. Click button to alternate between interval selection from a pick list or from time interval fields.

Display Interval: Select the time interval for the data analysis. The time interval is used to compute the start time for the data analysis from the end time. Click the button to alternate between interval selection from a pick list or from time interval fields. *Use Request Interval* and *Show Data Reports* will use the plot data request display interval if selected or 1 day by default

Time Offset: Select the time offset from the plot data request end time for the data analysis period, default if 0.0 seconds. A positive time offset starts in the future (*After*), a negative time offset starts in the past (*Before*). Click the Time Offset: button to

select from a list of intervals. The time offset direction is selected from the *After/Before* list. Click the button again to use the time offset fields.

Multiplier: Multiply the data analysis computed value by this constant.

Adder: Add this constant to the data analysis computed value.

Data class: Select a class from the plot style sheet to define the plot data list display style. The *default* style is *plotdata*.

Display score: Select *true* to change the data class displayed for the data analysis score value. The score value (1-5, 0 for missing) is appended to the data class name. For example if the data class name is plotdata then a score of 1 will use the class plotdata**1**, a score of 2 will use the class plotdata**2**, and so on. Missing data will use the class plotdata**0**. This feature is *false* by default.

```
/* Plot readout background colors for scores */
td.plotdata0 {color:#888888;background-color:#ffffff;}
td.plotdata,
td.plotdata1 {background-color:#ffffff;} /* white */
td.plotdata2 {background-color:#ffff44;} /* yellow */
td.plotdata3 {background-color:#ffaa44;} /* orange */
td.plotdata4 {background-color:#ff8866;} /* pink */
td.plotdata5 {background-color:#ff4444;} /* red */
```

Display digits: Set the number of decimal digits to display to the right of the decimal point. Select default to use the number of display digits assigned to the point type.

Scale: Select the plot scale for this plot point:

- *default*: Let the plot program assign the plot scale.
- *Left*: Use the left plot scale.
- *Right*: Use the right plot scale.
- *3 – 9*: Use the plot scales 3 – 9 to the right of the right plot scale.

Invert: Select the plot scale invert:

- *normal*: No inversion. Plot scale has highest on top and lowest on bottom.
- *invert*: Invert the plot scale from lowest on top to highest on bottom.

Range: Select the plot scale range computation for this plot point:

- *default*: Use the plot data request scale parameter.
- *auto*: Let the plot program compute the plot scale.
- *fixed*: Use the plot scale limit to the right.
- *point*: Use the point plot scale limits.

Lower Limit: Lower plot scale limit for fixed plot range.

Upper Limit: Upper plot scale limit for fixed plot range.

Type: Select the plot type for this plot point:

- *line*: Draw a line between plot points.
- *point*: Draw plot points only – no line.
- *bar*: Draw histogram bars.
- *step*: Draw stepped lines between plot points.
- *area*: Draw a line between plot points and fill in area under plot line.
- *steparea*: Draw a stepped line between plot points and fill in area under plot line.

Number: Select the limit number for this plot point. Multiple plot points can be added to a plot that will plot point data in different colors for data ranges.

Limit: Plot data limit for this plot data range. All data values from this limit to the next are plotted with this plot point parameters. All data less than the first limit uses that limit's plot point parameters. All data greater than the last limit uses that limit's plot point parameters.

Line color: Plot line color for this level. Colors are: *default, black, blue, cyan, gray, gray dark, gray light, green, magenta, orange, pink, red, yellow*.

Line type: Plot line type for this level. Line types are: *solid, dashed, dotted*.
Thickness: Plot line thickness in pixels for this level. Thicknesses are: *1.0,1.5,2.0,2.5,...,5.0*.
Shape color: Plot shape color for this level. Colors are: *default, black, blue, cyan, gray, gray dark, gray light, green, magenta, orange, pink, red, yellow*.
Shape type: Plot shape at data points for this level. Shapes are: *none, box, circle, diamond, ellipse, rectangle down, rectangle up, triangle up, triangle down, triangle left, triangle right*.
Fill: Plot shape fill for this level: *true* or *false*.

8.1.4 Select Display Time and Interval

Starting Time: Select the starting time for the plot. Click **Reset Time** to start of day for ending time. Note: the starting time must be before the ending time.
Ending Time: Select the ending time for the plot. Select *Current* in the pick list to set the ending time to the current time. The *Historic* selection is shown when a past ending time is selected.
Display Interval: Select the plot point time interval for the plot. Select *Show Data Reports* to plot data reports at the data report time. Click the button to alternate between interval selection from a pick list or from time interval fields. This display interval is only used if the plot point analysis display interval is set to *Use Request Interval*.
Scroll Interval: Select a scroll interval for time paging through plot data. Click the Scroll Interval: button to select from a list of intervals. Click the button again to use the time interval fields.When a scroll interval is selected and the plot is displayed, then **Back, Forward** and **Now** buttons are displayed above the plot. Click the **Back** button to decrement or the **Forward** button to increment the **Ending Time** by the Scroll Interval; the plot is re-displayed with the new ending time. Click **Now** to reset the **Ending Time** to the current time.
Refresh Interval: Select the interval to automatically refresh the plot data display. Click the Refresh Interval: button to select from a list of intervals. Click the button again to use the time interval fields. This field is only available when the Ending Time is set to the Current time.

8.1.5 Select Data Analysis

These fields are hidden when the display interval is set to *Show Data Reports.*

Data Analysis: Select the data analysis for the plot data display. See the data analysis appendix for a description of the analysis types. *Use default analysis* will do the default analysis for the point type.
Data type: Select the type of data displayed:

Data type	**Database information displayed**
Scaled	Scaled or analysis value
Raw	Raw data value
Score	Nova score value
Rating1-Rating5	Rating value 1 - 5
Date	Date of data report
Time	Time of day of data report
DateTime	Date and time of data report

Analysis Interval: The *Rainfall Intensity* data analysis requires an analysis interval. Click the Analysis Interval: button to select from a list of intervals. Click the button again to use the time interval fields.

Multiplier: Multiply the data analysis computed value by this constant.

Adder: Add this constant to the data analysis computed value.

8.1.6 Display Options

Display Only: Select the display data restrictions:

Display type	Database information displayed
All data	All data, valid or questioned
Valid data	Data reports with a valid flag. A valid flag is automatically set by the system when data checking criteria is met.
Verified data	Data reports with a verified flag. A verified flag is set by an operator using the data editor to certify that the data is valid.
Maintenance data	Data reports with a maintenance flag. A maintenance flag is manually set by an operator to indicate test data not used for public viewing. The maintenance flag is also set when a point of station is out of service or when the data report received has the test flag set.

Show Data: Select *true* to display the plot data reports in a table below the plot data display. Select *false* to prevent the data table display.

8.1.7 Plot Options

Plot style: Plot headings and data lists are drawn with the default styles for the NovaStar5 server. Select a custom plot style from **Plot style** list. The style files are Cascading Style Sheets and are stored in the folder: /tomcat/local/styles.

Orientation: Select the multiple plot panel orientation: *Vertical* or *Horizontal*.

Legend: Select *true* to display the plot legend at the bottom of the plot, *false* for no legend.

Plot time: Select *Absolute* to display the plot time scale as date and time. Select *Relative* to display the plot time scale as relative time from right to left.

Time interval: Select the plot time scale tick interval, default will automatically select an interval. Click the TimeInterval: button to select from a list of intervals. Click the button again to use the time interval fields.

Plot width: Enter the plot image width in pixels.

Plot height: Enter the plot image height in pixels. Click Reset to set the default width (500) and default height (300).

8.2 Plot Data Display

After the plot data request parameters are entered, click **Display** to display the plot. The plot header above the plot image displays the plot label for the plot group selected, point labels if points were selected on the plot request page, plot ending time, display interval unless *Show Data Reports* selected, and the scroll interval and buttons if selected.

Plot: Click on the plot group label to select a new plot group from the plot pick list. The new plot group is immediately plotted. Click button to change **Plot Pick Details** and order, see Section 8.1.2. **View** button displays the **Plot Edit** page for the selected plot, see Section 7.1.4 in Part II, Operator and Administrator Manual.

Point: Click on the plot point label to select a new plot point from the point pick list. Click button to change **Point Pick Details** and order, see Section 6.1.2. **View**

button displays the **Point Edit** page for the selected plot, see Section 3.1.4 in Part II, Operator and Administrator Manual. After changing plot points, click the **Display** button to display the plot data display with the newly selected points.

Scroll Interval: Click the **Back** button to decrement or the **Forward** button to increment the **Ending Time** by the Scroll Interval; the plot is re-displayed with the new ending time. Click **Now** to reset the **Ending Time** to the current time.

Data List: Click **Show Data** to display the data reports table. Click **Hide Data** to eliminate the data report table, see Section 8.2.3.

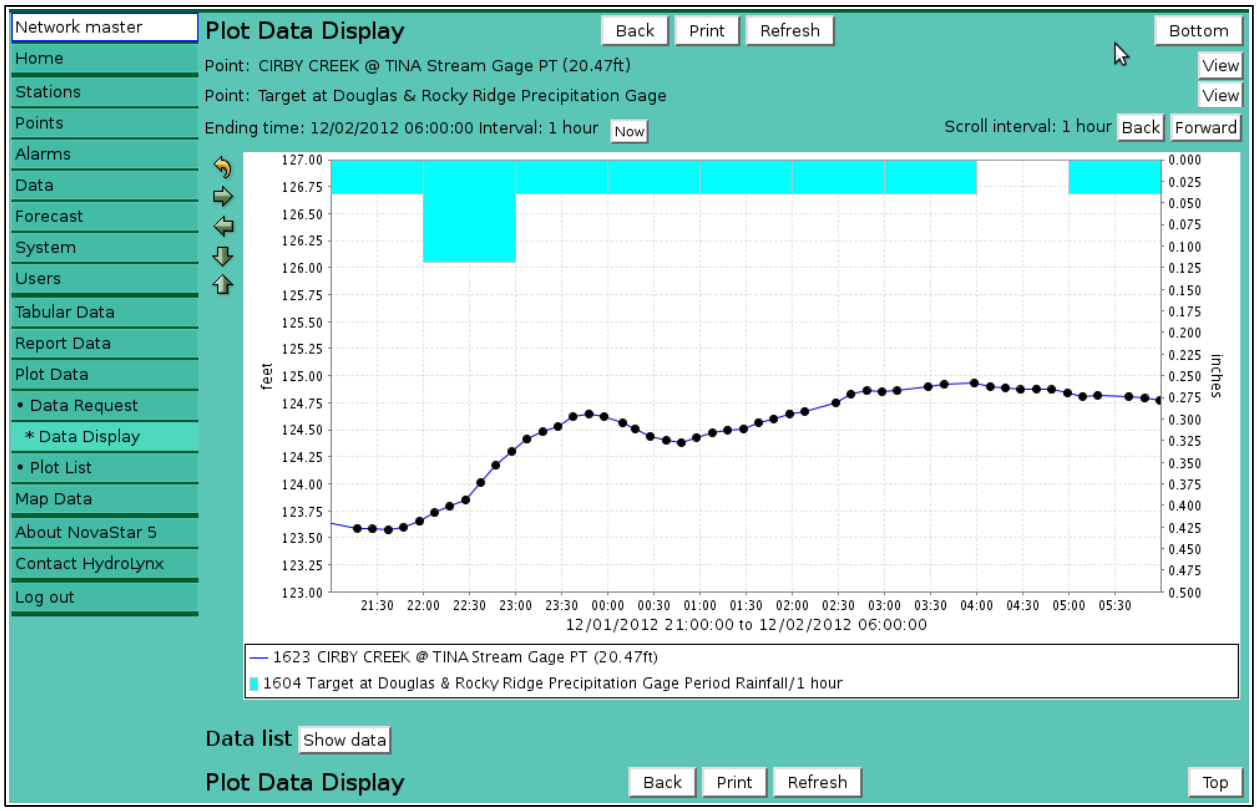


Figure 8.7. Plot Data Display

8.2.1 Plot Image Resizing

Icons on the left side of the plot can used to resize the plot.

Button	Action
	Reset plot size to default.
	Decrease plot height.
	Increase plot height.
	Decrease plot width.
	Increase plot width.

8.2.2 Plot Data Tooltip

On the **Plot Data Display** you can mouse over a plot point to display a tooltip that shows the point label, plot point time and data value. The point label is the point pick details or the point label defined for the plot point.

8.2.3 Plot Data Drill Down

Click on a plot point to display the Data View/Edit page for the point, see Section 5 in Part II Operator and Administrator Manual. This page is displayed showing the point data reports from the plot starting to ending time.

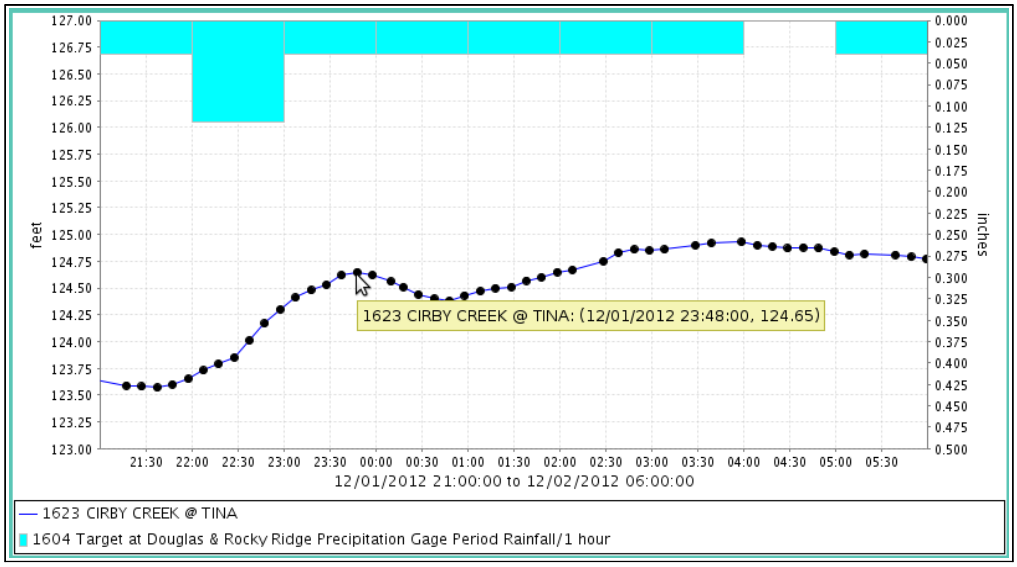


Figure 8.8. Plot Data DisplayTooltip

8.2.4 Plot Data List

Select **Show Data:** *true* on the **Plot Data Request** page or click the **Show data** button below the plot on the **Plot Data Display** page to show the plot data list.

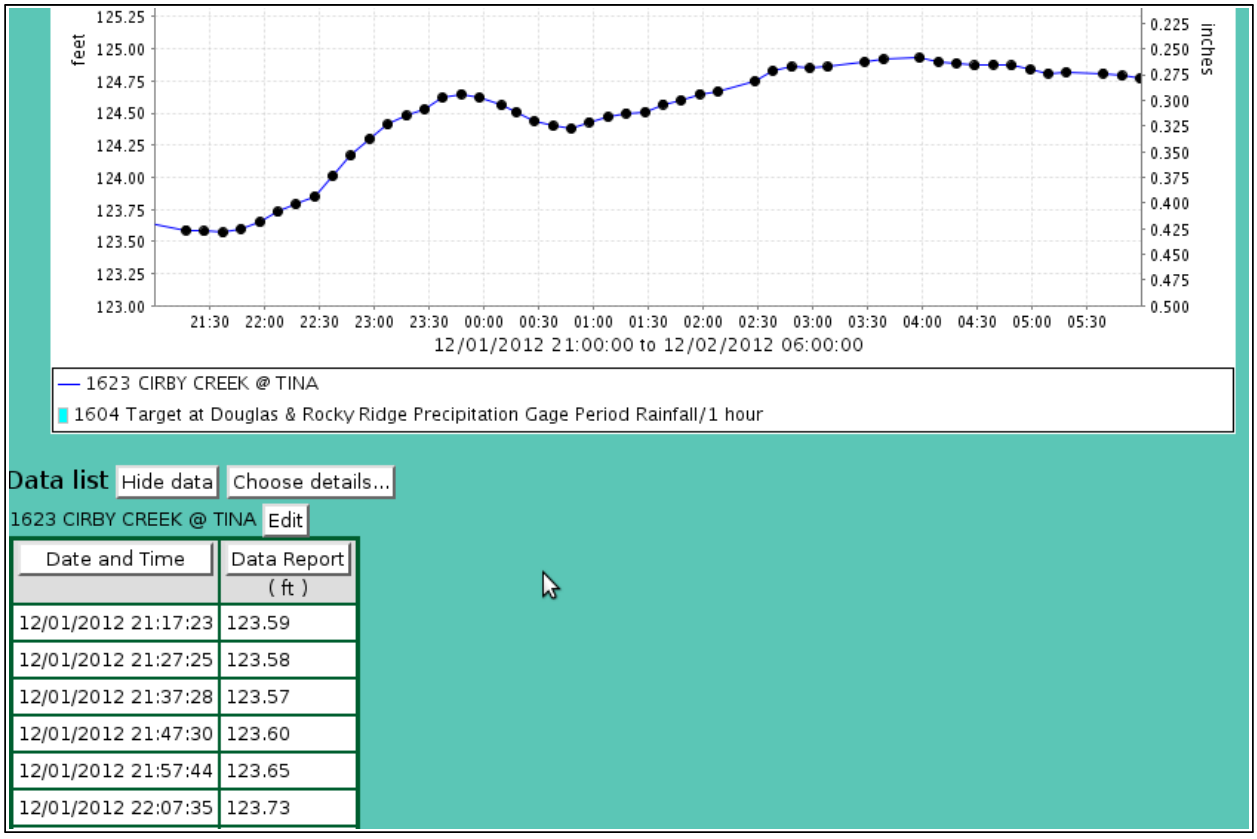


Figure 8.9. Plot Data List

The **Data list** table shows all the point data reports plotted in vertically stacked tables. Clicking on any of the column heading buttons will reorder the **Data list**, numerically or alphabetically,

by that detail. The **Choose details…** button allows you to specify what information is displayed in the **Data list** using the **Plot Data List Details** page, see Section 8.2.5.

Click on the **Edit** button to the right of the point lable to display the **Data Edit** page showing the point data reports from the plot starting to ending time.

8.2.5 Plot Data List Details

The check boxes on **Plot Data List Details** page control the items, organization, sort order, and limit the records displayed on the data list.

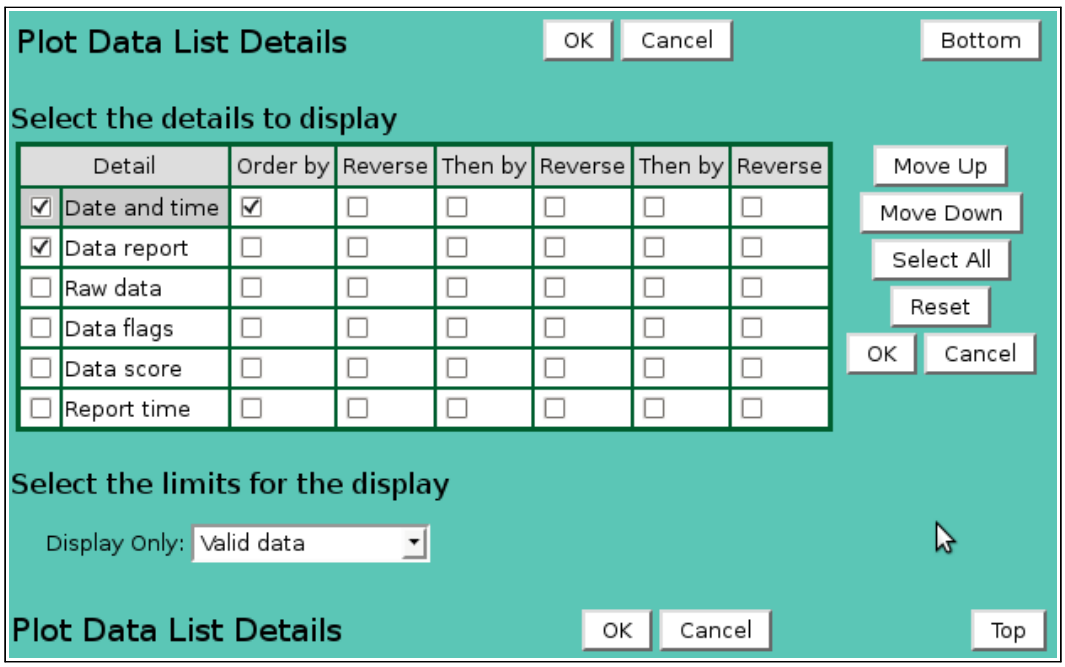


Figure 8.10. Plot Data List Details

Select the details to display

Check the box to the left of a detail to display. Details are displayed in the order shown.
Check the Order by box for the detail to sort first. Check Reverse for a descending sort.
Check the Then by box for the detail to sort second. Check Reverse for a descending sort.
Check the second Then by box for the detail to sort third. Check Reverse for a descending sort.

Button	**Action**
Move Up	Move the selected detail up one row.
Move Down	Move the selected detail down one row.
Select All	Select all details.
Reset	Reset to default details.
OK	Return to previous page with new details selected.
Cancel	Return to prevous page with no changes.

Select the limits for the display

Display Only: Select the display data restrictions:

Display type	**Database information displayed**
All data	All data, valid or questioned
Valid data	Data reports with a valid flag. A valid flag is automatically set by the system when data checking criteria is met.
Verified data	Data reports with a verified flag. A verified flag is set by an

	operator using the data editor to certify that the data is valid.
Maintenance data	Data reports with a maintenance flag. A maintenance flag is manually set by an operator to indicate test data not used for public viewing. The maintenance flag is also set when a point of station is out of service or when the data report received has the test flag set.

8.3 Plot Data Print

Click on the **Print** button at the top or bottom of the **Plot Data Display** to prepare the plot for printing. The plot data display is redrawn with no links, header, footer, or menu.

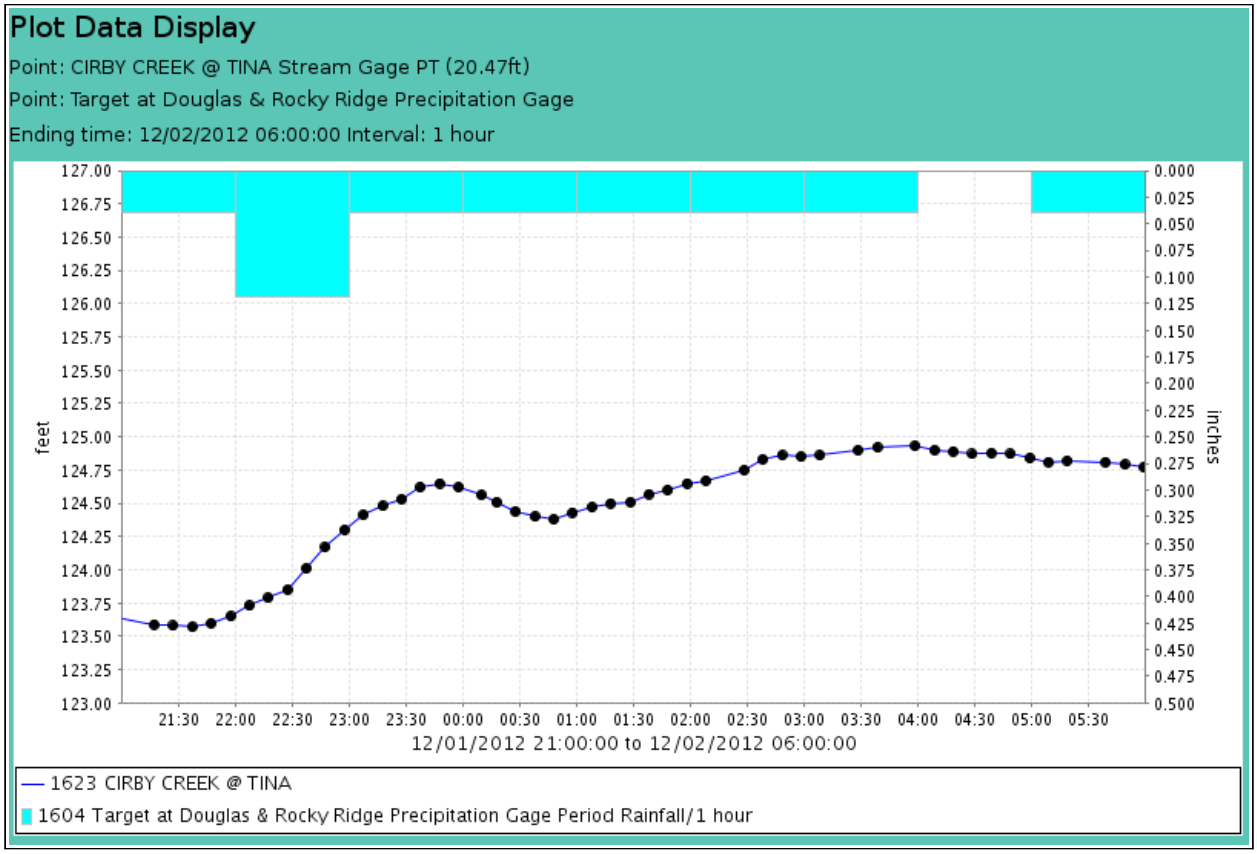


Figure 8.11. Plot Data Print

Use the *Print* feature in your browser to print the page. Click the browser **Back** button to return to the **Plot Data Display** page.

9 Map Data

A request to plot data on a map background can be made by any user. Click on the **Map Data** menu list option, and the **Map Data Request** page is displayed.

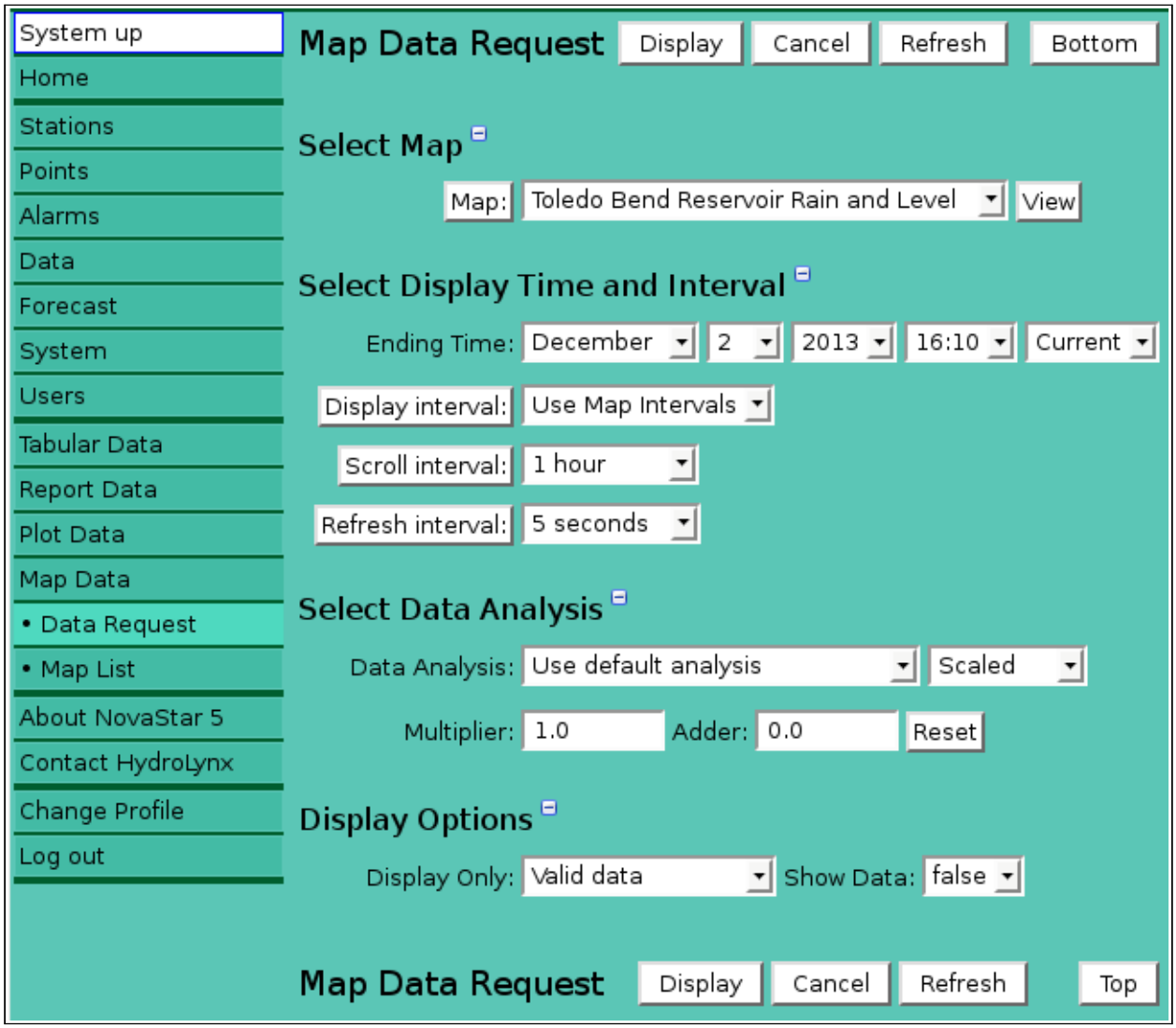


Figure 9.1. Map Data Request

9.1 Map Data Request

The **Map Data Request** page is used to query the database for data from a predefined set of map points. The data returned from the database query will be superimposed upon a background map image. Click the **Display** button to retrieve the data specified in the input fields organized under the **Select Map, Select Display Time and Interval, Display Options** headings. Your browser will remember your map data request parameters and restore them the next time you select this page. Click **Cancel** to return the previous web page.

9.1.1 Select Map

Map: Select map for display from the pick list. Click **Map:** button to change **Map Pick Details** and order, see Section 9.2. **View** button displays the **MapEdit** page for the selected map, see Section 6.1.2 in Part II, Operator and Administrator Manual.

9.1.2 Map Pick Detail

The check boxes on **Map Pick Details** page control the items, organization, sort order, and limit the records displayed on the pick list.

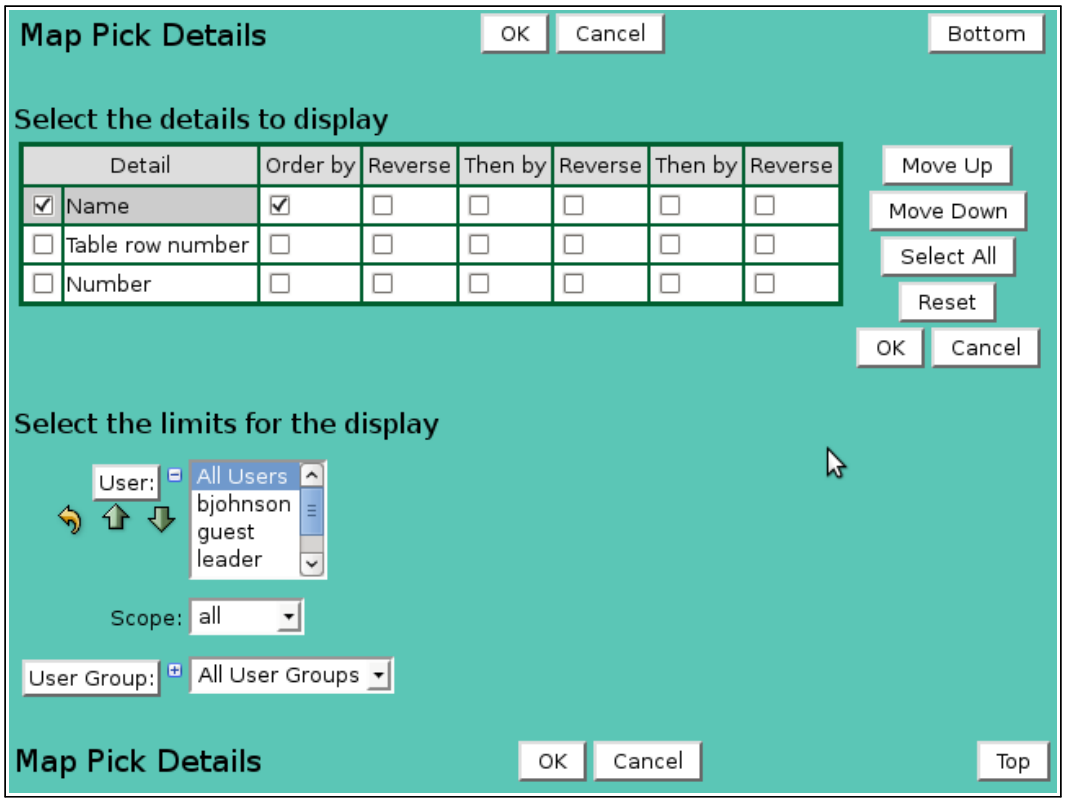


Figure 9.2. Map Pick Details

Select the details to display

Check the box to the left of a detail to display. Details are displayed in the order shown.
Check the Order by box for the detail to sort first. Check Reverse for a descending sort.
Check the Then by box for the detail to sort second. Check Reverse for a descending sort.
Check the second Then by box for the detail to sort third. Check Reverse for a descending sort.

Button	Action
Move Up	Move the selected detail up one row.
Move Down	Move the selected detail down one row.
Select All	Select all details.
Reset	Reset to default details.
OK	Return to previous page with new details selected.
Cancel	Return to prevous page with no changes.

Select the limits for the display

User: Limit display to maps assigned to the user(s). Click **User:** button to change **User Pick Details** and order. The pick list is a single select list by default. Click the ⊞ button to change to a multiple pick list. Control the pick list length with the buttons that appear below the pick list label button.

Button	Action
↶	Reset pick list to single select.
↑	Decrease pick list length.
↓	Increase pick list length.

Scope: Limit display to maps with scope: *all*, *public*, *private*.

User Group: Limit display to maps assigned to the user group(s). Click **User Group:** button to change **User Group Pick Details** and order. The pick list is a single select list by default. Click the ⊞ button to change to a multiple pick list. Control the pick list length with the buttons that appear below the pick list label button.

9.1.3 Select Display Time and Interval

Ending Time: Select the ending time for the data report search. Select *Current* in the pick list to set the ending time to the current time. The *Historic* selection is shown when a past ending time is selected. The **Map Data Request** page does not use a **Starting Time**. The starting time is computed by subtracting the display interval from the Ending Time.

Display Interval: Select the time interval for the map data analysis. The time interval is used to compute the start time for the data analysis from the end time. Click the Display Interval: button to select from a list of intervals. Click the button again to use the time interval fields.

Scroll Interval: Select a scroll interval for time paging through map data. Click the Scroll Interval: button to select from a list of intervals. Click the button again to use the time interval fields.When a scroll interval is selected and the map is displayed, then **Back, Forward** and **Now** buttons are displayed above the map. Click the **Back** button to decrement or the **Forward** button to increment the **Ending Time** by the Scroll Interval; the map is re-displayed with the new ending time. Click **Now** to reset the **Ending Time** to the current time.

Refresh Interval: Select the interval to automatically refresh the map data display. Click the Refresh Interval: button to select from a list of intervals. Click the button again to use the time interval fields. This field is only available when the Ending Time is set to the Current time.

9.1.4 Select Data Analysis

Data Analysis: Select the data analysis for the map data display. See the data analysis appendix for a description of the analysis types. *Use default analysis* will do the default analysis for the point type.

Data type: Select the type of data displayed:

Data type	Database information displayed
Scaled	Scaled or analysis value
Raw	Raw data value
Score	Nova score value
Rating1-Rating5	Rating value 1 - 5
Date	Date of data report
Time	Time of day of data report
DateTime	Date and time of data report

Analysis Interval: The *Rainfall Intensity* data analysis requires an analysis interval. Click the Analysis Interval: button to select from a list of intervals. Click the button again to use the time interval fields.

Multiplier: Multiply the data analysis computed value by this constant.

Adder: Add this constant to the data analysis computed value.

9.1.5 Display Options

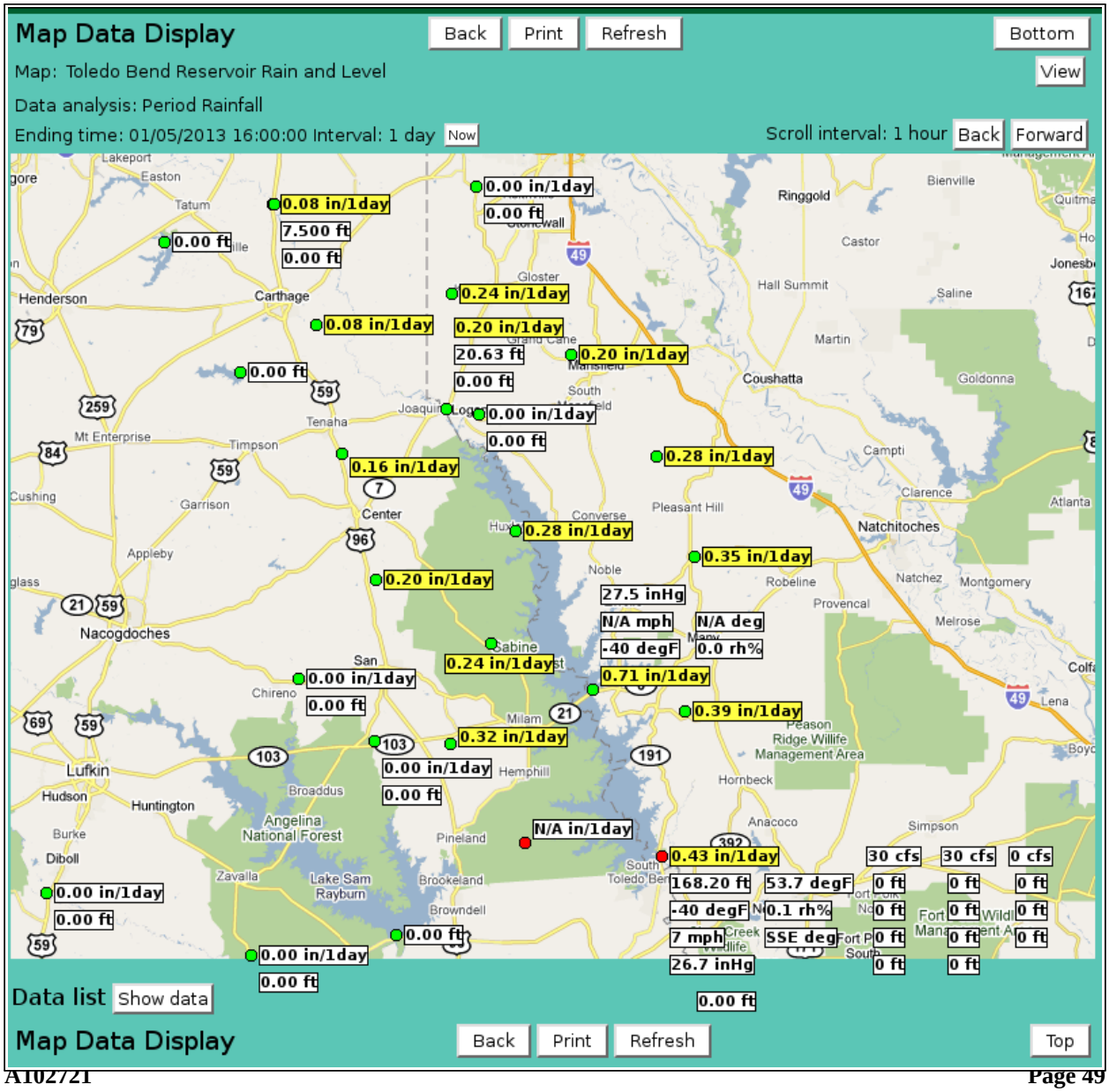
Display Only: Select the display data restrictions:

Display type	Database information displayed
All data	All data, valid or questioned
Valid data	Data reports with a valid flag. A valid flag is automatically set by the system when data checking criteria is met.
Verified data	Data reports with a verified flag. A verified flag is set by an operator using the data editor to certify that the data is valid.
Maintenance data	Data reports with a maintenance flag. A maintenance flag is manually set by an operator to indicate test data not used for public viewing. The maintenance flag is also set when a point of station is out of service or when the data report received has the test flag set.

Show Data: Select *true* to display the map data reports in a table below the map data display. Select *false* to prevent the data table display.

9.2 Map Data Display

After the map data request parameters are entered, a request for mapped data can be executed by clicking **Display.** An example of the mapped display is shown below.



The name of the map, the data analysis, ending time, and interval are displayed above the map. Point data readouts are displayed on the map to the right of the green site marker. If no data was available for the point, the string "N/A" is displayed and the site marker is red. Data readouts can be highlighted with background colors for differenct nova scores. The background color gets hotter (white yellow,orange,pink,red) as the nova score increases from 1 to 5. Use of the scored background color is selected by the map owner when the map point readout is defined. A pop-up tool-tip will appear when you mouse over a point readout or site marker, see Section 9.4.

Map: Click on the map name to activate a selection list. Select another map for display from the pick list. Click **Map:** button to change **Map Pick Details** and order, see Section 9.1.1. **View** button displays the **MapEdit** page for the selected map, see Section 6.1.2 in Part II, Operator and Administrator Manual.

Scroll Interval: Click the **Back** button to decrement or the **Forward** button to increment the **Ending Time** by the Scroll Interval; the map is re-displayed with the new ending time. Click **Now** to reset the **Ending Time** to the current time.

Data list: Click **Show data** to display the map data reports in the data list table. Click **Hide data** to eliminate the data list table, see Section 9.2.3.

9.2.1 Map Data Tooltip

On the **Map Data Display** you can mouse over a point data readout to display a tooltip that shows the point label and data analysis. The point label is the point pick details or the point label defined for the map point by the map owner.

9.2.2 Map Data Drill Down

Click on a point data readout to display the map point link page assigned to the point by the map owner. The default map point link page is the Data Edit page, see Section 5 in Part II Operator and Administrator Manual. This page is displayed showing the point data reports in the map display interval up to the ending time.

9.2.3 Map Data Popup Menu

Right click on a point data readout to display the map point menu.

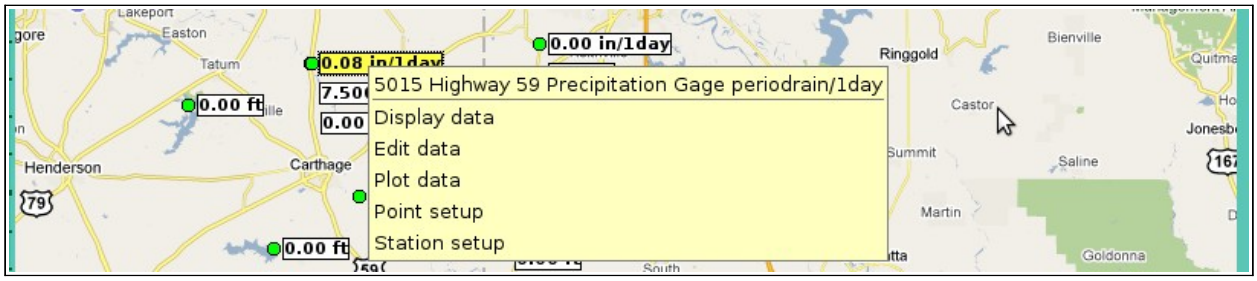
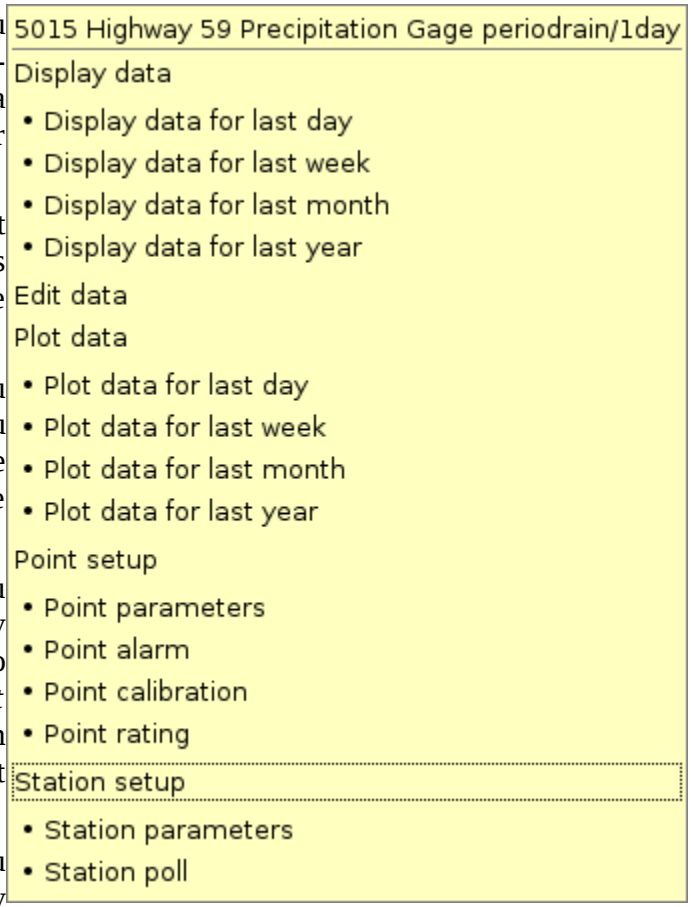


Figure 9.4. Map Data Popup Menu

The popup menu header is the tooltip displayed when you mouse over a map point readout. Click on this menu item to display the map point link page assigned to the point by the map owner.



Click **Display data** to expand the menu section, then click on a display data sub-menu selection to display tabular data reports for the last day, week, month, or year ending at the map display ending time.

Click **Edit data** to display the Data Edit page for the point showing the data reports for the map display interval ending a the map display ending time.

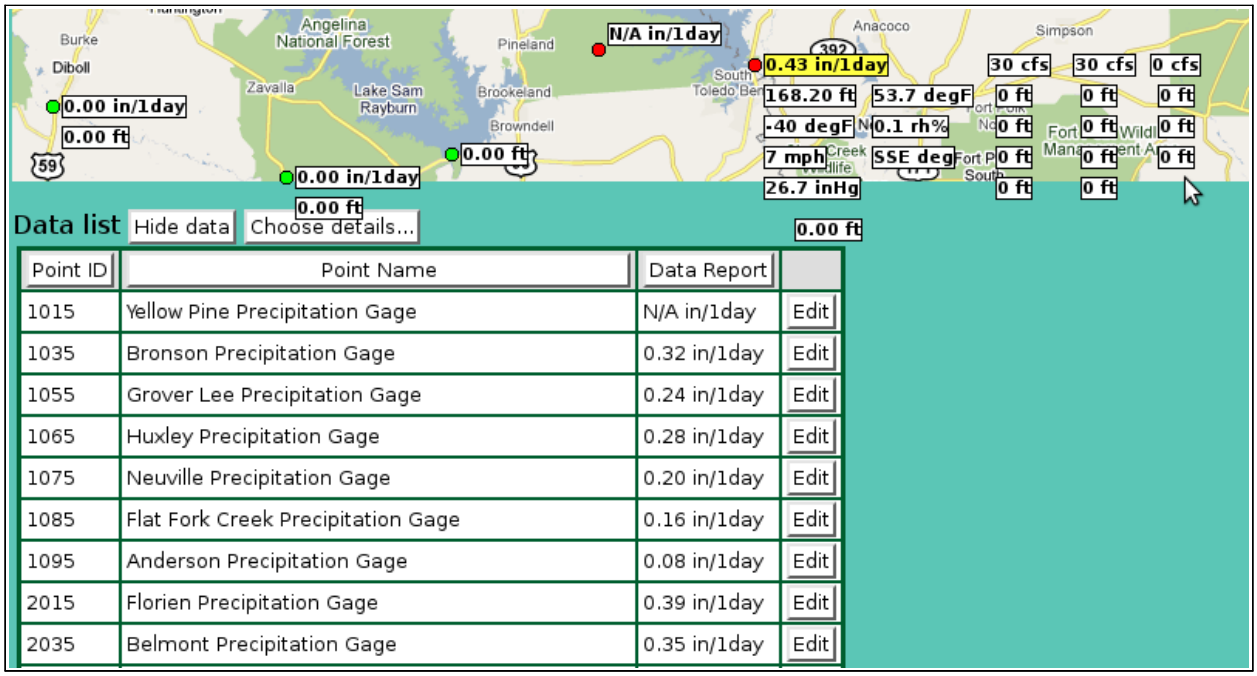
Click **Plot data** to expand the menu section, then click on a plot data sub-menu selection to plot point data reports for the last day, week, month, or year ending at the map display ending time.

Click **Point setup** to expand the menu section. Click *Point parameters* to display the point edit page. Click *Point alarm* to display the point alarm groups. Click *Point calibration* to display the point calibration list. Click *Point rating* to display the point rating assignments.

Click **Station setup** to expand the menu section. Click *Station parameters* to display the point's assign station edit page. Click *Station poll* to display the station polling page.

9.2.4 Map Data List

Select **Show Data:** *true* on the **Map Data Request** page or click the **Show data** button below the map on the **Map Data Display** page to show the map data list.



Point ID	Point Name	Data Report	
1015	Yellow Pine Precipitation Gage	N/A in/1day	Edit
1035	Bronson Precipitation Gage	0.32 in/1day	Edit
1055	Grover Lee Precipitation Gage	0.24 in/1day	Edit
1065	Huxley Precipitation Gage	0.28 in/1day	Edit
1075	Neuville Precipitation Gage	0.20 in/1day	Edit
1085	Flat Fork Creek Precipitation Gage	0.16 in/1day	Edit
1095	Anderson Precipitation Gage	0.08 in/1day	Edit
2015	Florien Precipitation Gage	0.39 in/1day	Edit
2035	Belmont Precipitation Gage	0.35 in/1day	Edit

Figure 9.5. Map Data List

The **Data list** table shows all the map point data report plotted on the map background. Clicking on any of the column heading buttons will reorder the **Data list**, numerically or alphabetically, by that detail. The **Choose details…** button allows you to specify what information is displayed in the **Data list** using the **Map Data List Details** page, see Section 9.2.4.

Click on the **Edit** button in the right column of a map point data row in the **Data list** table to display the **Data Edit** page and show the point data reports for the map display interval ending a the map display ending time.

9.2.5 Map Data List Details

The check boxes on **Map Data List Details** page control the items, organization, sort order, and limit the records displayed on the pick list.

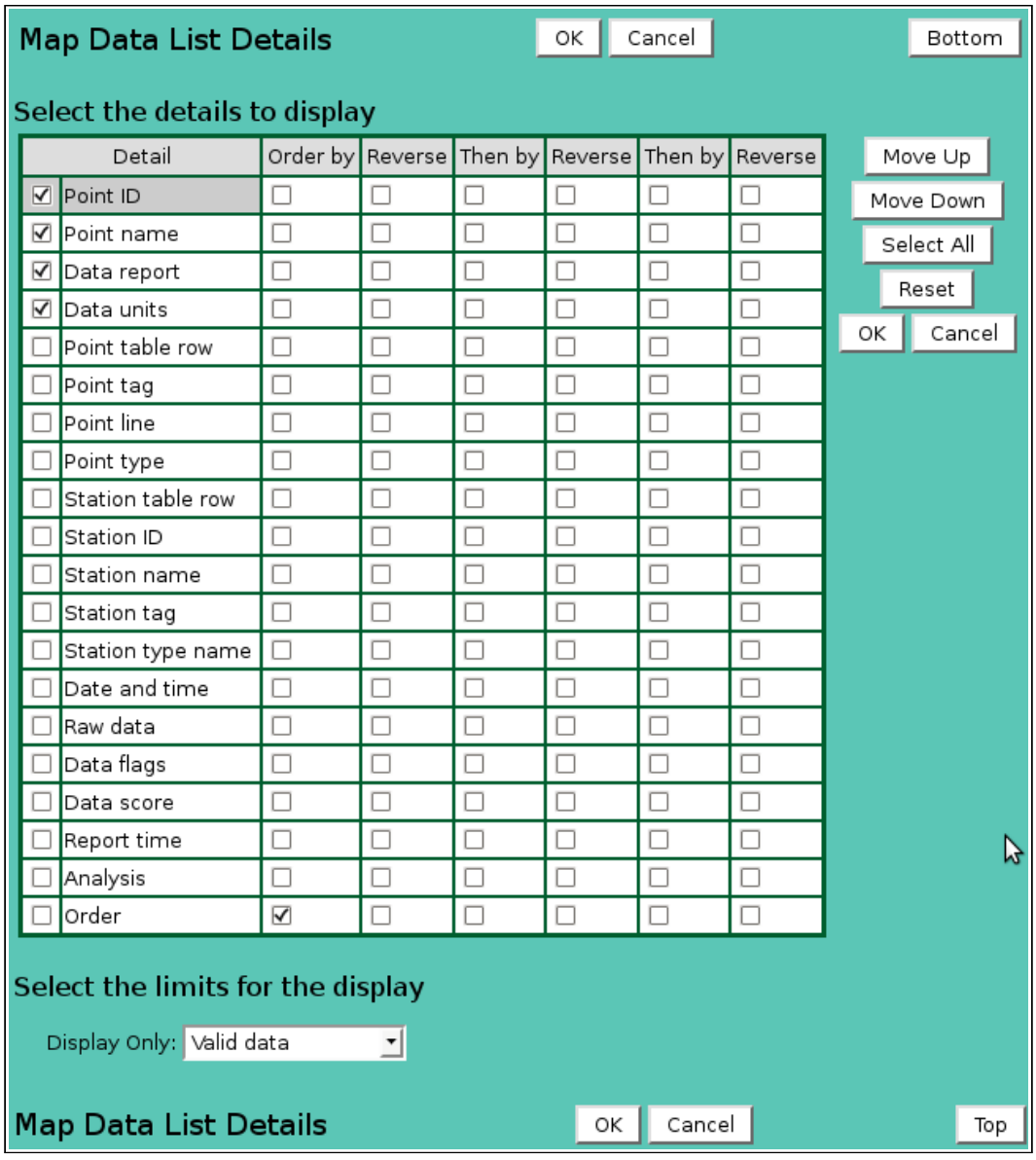


Figure 9.6. Map Data List Details

Select the details to display

Check the box to the left of a detail to display. Details are displayed in the order shown.
Check the Order by box for the detail to sort first. Check Reverse for a descending sort.
Check the Then by box for the detail to sort second. Check Reverse for a descending sort.
Check the second Then by box for the detail to sort third. Check Reverse for a descending sort.

Button	Action
Move Up	Move the selected detail up one row.
Move Down	Move the selected detail down one row.
Select All	Select all details.
Reset	Reset to default details.
OK	Return to previous page with new details selected.
Cancel	Return to prevous page with no changes.

Select the limits for the display

Display Only: Select the display data restrictions:

Display type	Database information displayed
All data	All data, valid or questioned
Valid data	Data reports with a valid flag. A valid flag is automatically set by the system when data checking criteria is met.
Verified data	Data reports with a verified flag. A verified flag is set by an operator using the data editor to certify that the data is valid.
Maintenance data	Data reports with a maintenance flag. A maintenance flag is manually set by an operator to indicate test data not used for public viewing. The maintenance flag is also set when a point of station is out of service or when the data report received has the test flag set.

9.3 Map Data Print

Click on the **Print** button at the top or bottom of the **Map Data Display** to prepare the msp for printing. The map data display is redrawn with no links, header, footer, or menu.

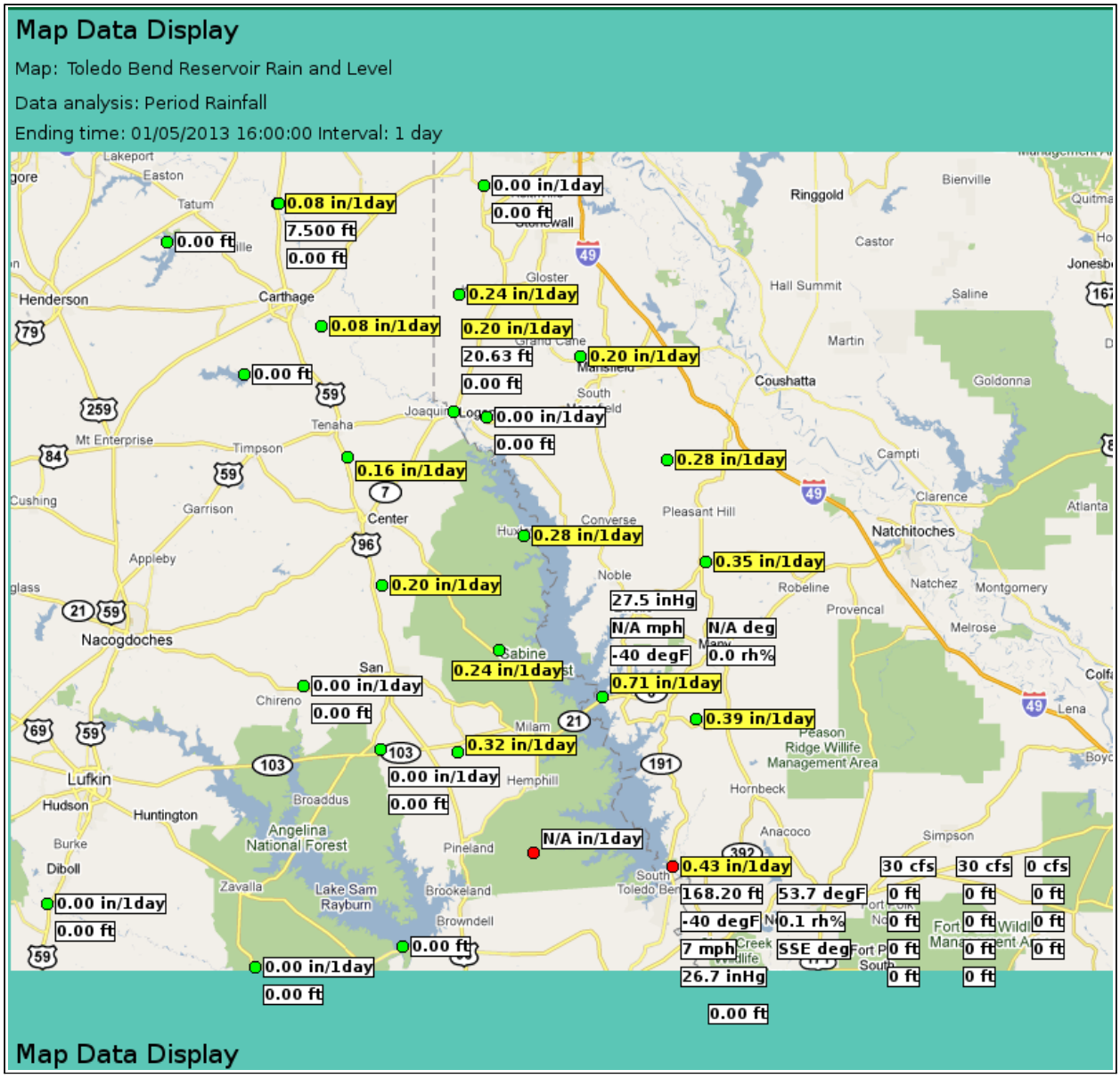


Figure 9.7. Map Data Print

Use the *Print* feature in your browser to print the page. Click the browser **Back** button to return to the **Map Data Display** page.

10 About NovaStar 5

Click on the **About NovaStar 5** menu list option to display the **NovaStar 5 Version** page. This page displays the current software version and general contact information for HydroLynx Systems, Inc. Links to documentation pages are shown under the menu button.

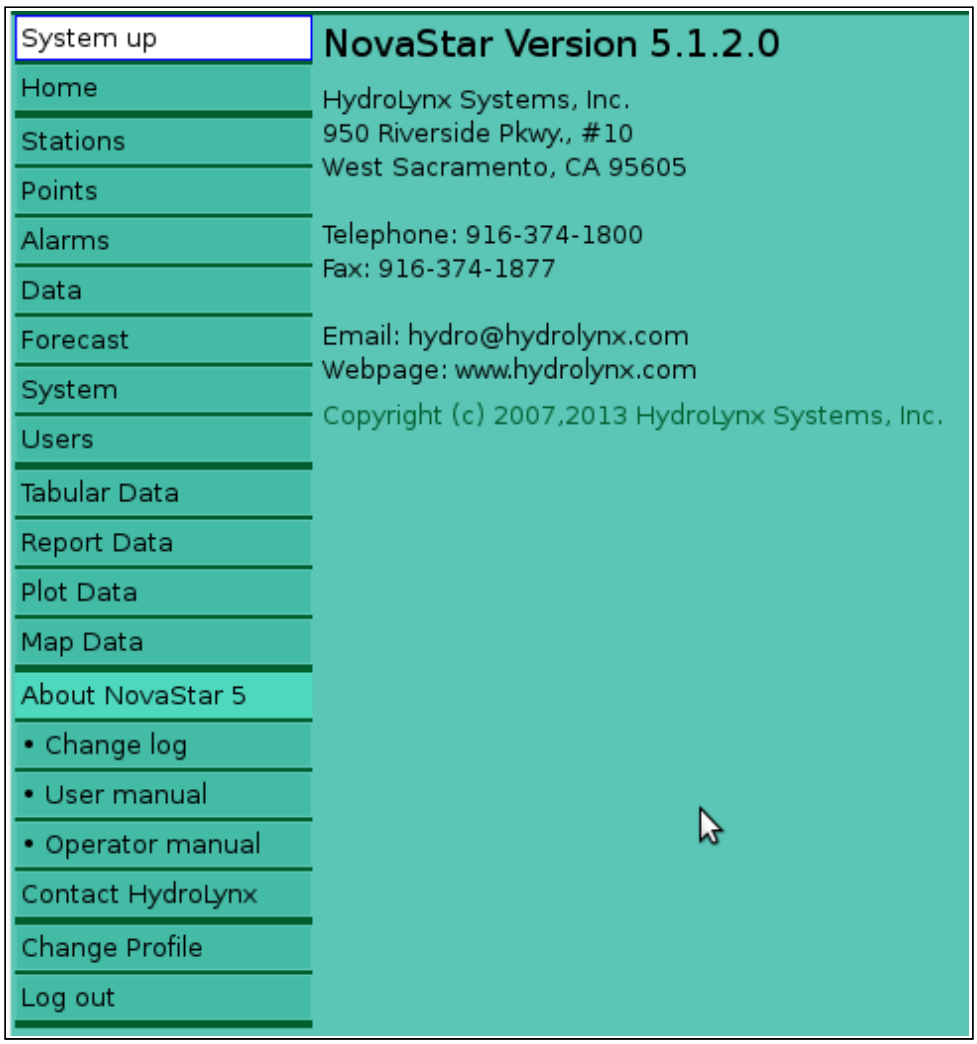


Figure 10. About NovaStar 5 Page

10.1 Documentation Links

Links to documentation pages are shown under the **About NovaStar 5** menu button.

10.1.1 Change log

Displays a list NovaStar 5 versions and changes made to the program for the version upgrades.

10.1.2 User manual

Displays the NovaStar 5 Part I User Manual as a PDF document.

10.1.3 Operator manual

Displays the NovaStar 5 Part II Operator and Administrator Manual as a PDF document.

11 Contact HydroLynx

Click on the **Contact HydroLynx** menu list option to display the **HydroLynx Contact Information** page. This page displays specific contact information for HydroLynx Systems, Inc. staff working in customer support, sales, and general information.

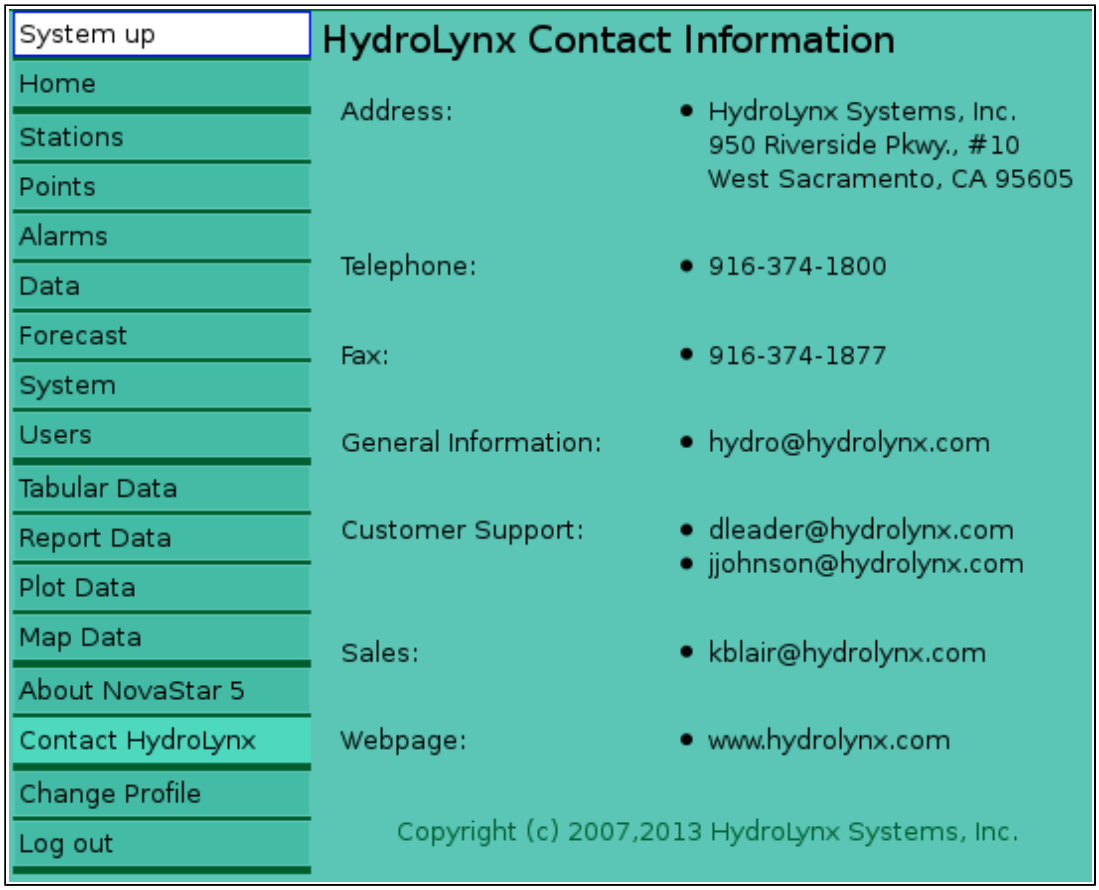


Figure 11. HydroLynx Contact Information

12 Change Profile

Click on the **Change Profile** menu list option to display the **User Edit** page. This page displays your login profile and allows you to change your password.

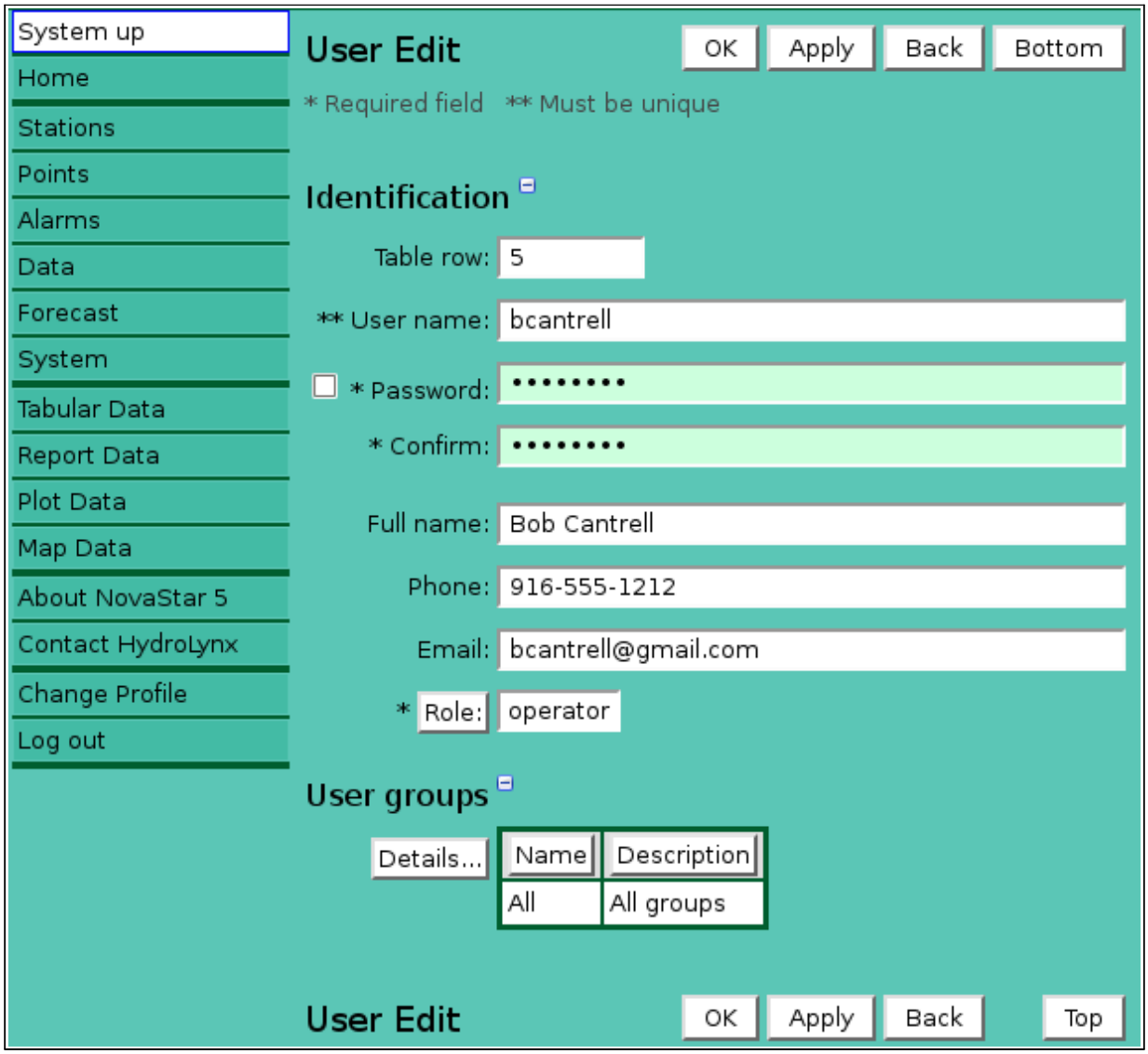


Figure 12. Change Profile

If you change your password then it must be confirmed. Press the *Enter* or *Tab* key on the Password field and the Confirm field will appear. Enter the password a second time in this field and press the *Enter* or *Tab* key again.

Identification

Table row: Field can not be modified; it is assigned automatically when a record is added.
User name: Login name can only be changed by *administrator*.
Password: Password for login name. The password characters are hidden. Max: 50 characters. If you change the password, you will be asked to
Confirm: If you change the password, you must confirm it on this line.
Full name: Full name of user. Max: 100 characters.
Phone: User telephone number. Max: 50 characters.
Email: User email address. Max: 100 characters.

Role: Role defines the data access and security level of the user. The role can only be changed by the *administrator*. Click **Role:** button to change **User Role Pick Details** and order, see Section 10.2.2 in Part II, Operator and Administrator Manual.

Role	**Access**
administrator	Read/write system access
guest	Read only access
operator	Read/write data access
supervisor	Read/write group access

User groups

The **User groups** table shows the user groups currently assigned to the user. Clicking on any of the column heading buttons will reorder the user groups in the User groups list, numerically or alphabetically, by that detail. Click the **Details:** button to change the User Group List details and display order, see Section 10.3.1in Part II, Operator and Administrator Manual.

Click the **Apply** button to save the user parameters and stay on this page. Click **OK** to return to the previous page.

A) Data Analysis

A number of statistical processing options available from the **Data Analysis** drop-down list can create processed information that will be displayed for a point on a data display page when the Display Interval is not *Show Data Reports.*

Table A.1.1. Data Analysis

Data Analysis	**Description**
Use default analysis	The default analysis used to process data depends on the point type and rating assignment. Points that are assigned ratings to compute incremental rainfall use the Period Rainfall analysis. Counter class point types use the Difference in Report Values analysis. Total class point types use the Sum of Report Values analysis. All other point types use the Nearest Report to Interval analysis.
Nearest Report to Interval	Find the data report nearest to the end of the Display interval boundary. The report may occur before or after the interval boundary.
Last Report in Interval	Find the last data report in the Display interval boundary without going past the boundary.
Number of Reports	Count the total number of reports in the Display interval.
Period Rainfall	Sum the incremental rainfall in the Display interval. The point must be assigned an incremental rainfall rating.
Storm Rainfall	Find the last data report storm rainfall rating value in the Display interval. The storm rainfall rating sums the incremental rainfall until the incremental rainfall is 0. A time gap in the incremental rainfall of more then the storm rainfall rating computation interval will restart the storm rainfall accumulation.
Season Rainfall	Find the last data report season rainfall rating value in the Display interval. The season rainfall rating sums the incremental rainfall from the season rainfall starting date. The season rainfall starting date is set in the season rainfall rating effective time.
Rainfall Intensity	Find the maximum period rainfall for the Analysis interval over the Display interval. For example, find the maximum period rainfall for a 5 minute Analysis interval over a one month Display interval.
Difference in Report Values	Compute the difference between the last report in the Display interval and the last report from the prior Display interval.
Sum of Report Values	Compute the sum of report values within the Display interval.
Maximum	Find the maximum value for the Display interval.
Minimum	Find the minimum value for the Display interval.
Mean	Find the time-weighted average of the report values within the Display interval.
Variance	Compute the variance of the time-weighted values within the Display

	interval.
Standard Deviation	Compute the standard deviation of the time-weighted values within the Display interval.
Skew	Compute the skew of the time-weighted values within the Display interval.
Coefficient of Skew	Compute the coefficient of skew of the time-weighted values within the Display interval.
Cooling Hours	Compute cooling hours from a base temperature that is defined as the *Adder* under Data Analysis.
Heating Hours	Compute heating hours from a base temperature that is defined as the *Adder* under Data Analysis.
Rate of Change in Units per Second, Minute, Hour, or Day	Compute the rate of change for the last report in the Display interval relative to the prior report in the Display interval. You can request rate of change units as per day even if the Display interval is one hour. The analysis result displayed will be multiplied by 24 (e.g. a change of 1 unit per hour = 24 units per day). You may wish to do this because some SCADA applications expect data to be provided in gallons per day.
Runtime in Seconds, Minutes, Hours, Days	Runtime is the amount of time a digital status value is not zero. The concept can also be applied to any other data type. The runtime is computed to determine values that answer questions like "How long was the pump running on this day?" The time units (seconds, minutes, hours, days) define the output value. For example, 55 seconds, 35 minutes, 2.5 hours, or .5 days.
Volume in Units per Second, Minute, Hour, or Day	Integrates a volumetric flow rate over time to determine total volume. In NovaStar5, discharge is computed from stage using a rating table or equation. Discharge data are stored in a rated data table. An optional check box is available in the User Interface to display rated data. The volume computation units are the beginning data units integrated over time. So if the data is stored in cubic feet per second or the rating table output is cubic feet per second, then the volume units are cubic feet. To convert cubic feet to acre feet, a multiplier is used and is selected from a pick list in the advanced options to simplify the multiplier value entry.
Wind Speed	Compute the wind speed in units per hour from an incrementing anemometer wind sensor (a non-ALERT wind point type) for the last report in the Display interval.